



Alcatel-Lucent 1642 EMUX

ISA Board Ethernet Switching System (ES4E) | Release 1.5

Craft Terminal Operator's Guide

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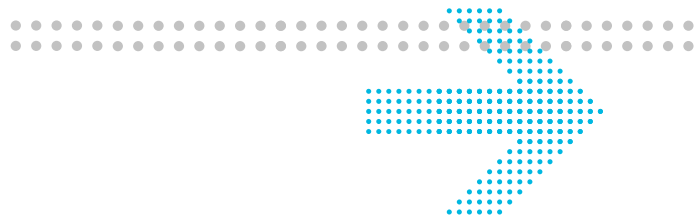
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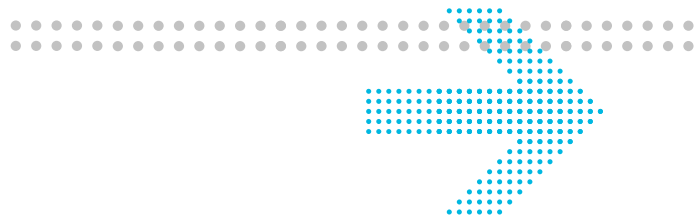
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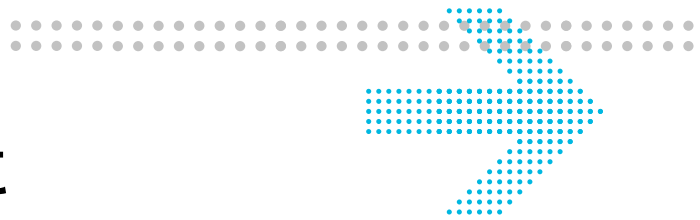
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About this document

Purpose

This document provides general information and operational procedures common to all Alcatel-Lucent ISA Board ES4E performing ES4E functions (Alcatel-Lucent ISA ES1/4).

Reason for reissue

This document is the first issue of Release 1.5.

History

Issue	Date	Reason
01	December 2009	First validated issue of this guide

Intended audience

This Operator Handbook is intended primarily for telecommunications technicians and communications network providers.

It is a common handbook for several equipments of different product-releases using ES4E product. The use of this handbook is indicated in the list of the Technical Handbook of the Network Element, as listed in [Table 1 \(p. xix\)](#). This handbook is not applied to a specific Network Element product-release; being the document dedicated to a set of equipments, screens are inserted as "example" and can be extracted from any of the referred equipments. Handbooks relevant to software applications (typically the Operator's Handbooks) are not modified unless the new software "version" distributed to Customers implies man-machine interface changes or in case of slight modifications not affecting the understanding of the explained procedures.

How to use this document

This manual is divided into several chapters and it is useful to the trained operator or system administrator.

Safety information

For your safety, this document contains safety statements. Safety statements are given at points where risks of damage to personnel, equipment, and operation may exist. Failure to follow the directions in a safety statement may result in serious consequences.

Admonishments

To avoid hazardous conditions, observe the following admonishments:



DANGER

Possibility of personal injury.



CAUTION

Possibility of service interruption.



WARNING

Possibility of equipment damage.

Conventions used

The following typographical conventions are used in this guide:

Appearance	Description
Italicized text	• File and directory names • Emphasized information • Titles of publications • A value that the user supplies
Graphical user interface text or key name	• Text that is displayed in a graphical user interface or in a hardware label • The name of a key on the keyboard
input text	Command names and text that the user types or selects as input to a system
output text	Text that a system displays or prints

For the remainder of this document, “Alcatel-Lucent ISA ES1/4” is used in place of Alcatel-Lucent ISA Board ES4E in most cases.

Related documentation

This Handbook is always supplied with Technical Handbook and Craft Terminal (CT) Operator's Handbook dedicated to the specific network element. Each manual has its own part number.

Example of Equipment 1660SM Rel. 4.5.

The following table provide additional information about the Alcatel-Lucent ISA Board:

Table 1 Alcatel-Lucent ISA ES1/4 documentation set

Document Number	Document Title
8DG 08763 AAAA	<i>Alcatel-Lucent ISA ES1/4 Technical Handbook</i>
Where the manuals are listed as:	
• 1320CT-Basic Operator Handbook	
• AS Operator's Handbook	
• ELB Operator's Handbook	
• OMSN-Operator Handbooks	
• OMSN-Technical Handbooks	

Training

Alcatel-Lucent University provides courses for system planning, engineering, and ordering, as well as courses to train telecommunications technicians in installation, operations, and maintenance. Suitcasing of these courses is also available. Contact Alcatel-Lucent University at 1 (888) 582-3688 to enroll in training classes. To arrange suitcase sessions, call the Product Training Manager at 1 (800) 432-6317 (within USA) or +1 (614) 764-5542 (worldwide). For a list of available courses, see the Alcatel-Lucent University web site at <https://training.lucent.com>.

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Packaging collection and recovery requirements

Countries, states, localities, or other jurisdictions may require that systems be established for the return and/or collection of packaging waste from the consumer, or other end user, or from the waste stream. Additionally, reuse, recovery, and/or recycling targets for the return and/or collection of the packaging waste may be established. For more information regarding collection and recovery of packaging and packaging waste within specific jurisdictions, contact the Alcatel-Lucent Environment, Health and Safety organization.

Recycling/take-back/disposal of product and batteries

Electronic products and batteries bearing or referencing the symbols shown below shall be collected and treated at the end of their useful life, in compliance with applicable European Union and other local legislation. They shall not be disposed of as part of unsorted municipal waste. Due to materials that may be contained in the product and batteries, such as heavy metals, the environment and human health may be negatively impacted as a result of inappropriate disposal.

Note 1: For electronic products put on the market in the European Union, a solid bar under the crossed-out wheeled bin indicates that the product was put on the market after 13 August 2005.

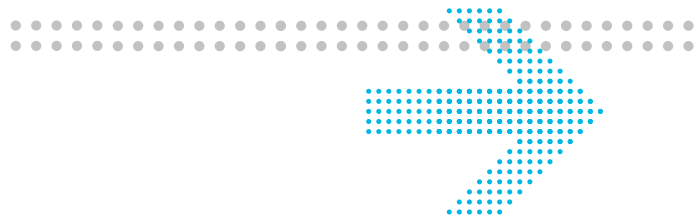


Note 2: For batteries put on the market in the European Union, a chemical symbol Hg (mercury), Cd (cadmium), or Pb (lead), or a combination of those symbols, beneath the cross-out wheeled bin indicates that the battery contains the corresponding heavy metals.



Moreover, in compliance with legal requirements and contractual agreements, where applicable, Alcatel-Lucent will offer to provide for the collection and treatment of Alcatel-Lucent products bearing the logo at the end of their useful life, or products displaced by Alcatel-Lucent equipment offers.

For information regarding take-back of equipment by Alcatel-Lucent, or for more information regarding the requirements for recycling/disposal of a product, please contact your Alcatel-Lucent account manager. Visit the [Alcatel-Lucent Take-Back](http://www.alcatel-lucent.com/product_takeback) (http://www.alcatel-lucent.com/product_takeback) web page, or contact [Alcatel-Lucent Takeback Support](mailto:takeback@alcatel-lucent.com) (takeback@alcatel-lucent.com). For technical information on product treatment, consult the [Alcatel-Lucent Recycling Information](http://www.alcatel-lucent.com/product_recycling) (http://www.alcatel-lucent.com/product_recycling) web page.



1 Introduction

Overview

Purpose

This chapter describes the main features of the graphical interface for the Alcatel-Lucent Integrated Services Adapter-Ethernet Switching (ISA-ES) Operator and provides a general overview of the system architecture.

Reading rules

All the manuals describe menus, but not necessarily all the options of these menus. When a menu option is not detailed in a manual, the information is given in another manual.

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Ethernet technique

Description

The Ethernet (also called MAC 802.3) technique, operating at level 2 of the ISO-OSI protocol stack, is used to transport data packets originated by the network layer (level 3). It is based over the concept of “Multi Access Channel”; i.e., a single channel is shared among many users that are connected on the same communication medium. The MAC (Medium Access Control) functions provide to manage the access to the physical channel and the related possible access conflicts that can arise. The channel used to connect many users is called LAN (Local Area Network).

The data packets are encapsulated into the MAC frame (illustrated in [Figure 1-17 \(p. 1-31\)](#) and [Figure 1-18 \(p. 1-31\)](#)), and then are sent into the Ethernet physical layer (level 1), after conversion using the Manchester encoding procedure.

ES1/4 system

Description

Alcatel-Lucent ISA-ES is a system operating at layer 2 by means of the MAC protocol. It acts as an Ethernet Switch (or **bridge**), used to connect different LANs between them. The LANs may be local or remote, where remote LANs are linked using the existing SDH physical backbone, by means of the EOS (Ethernet Over SDH/SONET) procedure.

For more information about Ethernet/MAC, refer to IEEE 802.3 standard.

Table 1-1 Ethernet layer stack over SDH

3	NETWORK	Any network "packetized" data service
2	DATA LINK	ETHERNET
1	PHYSICAL	SDH

The Alcatel-Lucent ES system can manage packets data streams transported over "local" Ethernet FE or GbE (Fast Ethernet, Gigabit Ethernet) and "remotized" ethernet over GFP/SDH or LAPS/SDH.

ES4E board with an SDH equivalent capacity of 4 VC4, has 4 FE and 4 FX local ports, 2 GbE, and 8 remote MIII ports, or 2 remote GMII ports.

The bridge function may be carried out by means of the "MAC autolearning" procedure (802.1D Rec.) or by means of manual "engineered" point-to-point connections.

The Ethernet **Bridge** representation is schematically illustrated in [Figure 1-2 \(p. 1-7\)](#) and also [Figure 1-5 \(p. 1-11\)](#). The insertion of the ES Bridge into the SDH network is illustrated in [Figure 1-3 \(p. 1-8\)](#).

ES system can act also as a "Virtual Bridge" (802.1Q Rec.) or as a "Provider Bridge" (802.1ad/D1.3 Rec.) managing the VLAN (user tag) and S-VLAN (provider tag) fields of the MAC frame (also called "VLAN-tagged MAC frames"); in this way it can further support the SLA with differentiated CoS.

The use of VLAN permits the aggregation of many users over a single virtual circuit, also if they are not physically tied on the same physical segment, and can communicate each other as if they were on the same LAN. In this way, users may also move from a segment to another without changing their physical address.

The **Virtual Bridge** representation is schematically illustrated in [Figure 1-5 \(p. 1-11\)](#) See also [Figure 1-6 \(p. 1-11\)](#).

A **Provider Bridge** application is illustrated in [Figure 1-7 \(p. 1-12\)](#).

Some generic examples about VLAN and S-VLAN utilization (in engineered mode) are reported in [Figure 1-8 \(p. 1-13\)](#) and [Figure 1-9 \(p. 1-14\)](#).

For more details about VLAN/LLC, refer to IEEE 802.1Q standard.

Furthermore, it accomplishes the functions requested by the Spanning Tree Protocol (STP, RSTP, PerVLAN-STP, MSTP). This procedure “breaks” all the loops of the network, permitting only one path from a Bridge to any other Bridge, in order to prevent “infinite loops” (i.e., infinite replaying of the frames) due to redundantly connected bridges networks.

Moreover, the (X)STP procedures accomplish the resilience of the network against STP failures. It provides, if the bridged network is redundantly protected, to recover the network connectivity (with respect to the STP topology). For instance by electing a new Root Bridge (that is the root of the tree), if the actual one has failed; or by deactivating a failed link and activating a backup one, if existing. STP functions are compliant to 802.1d, 802.1w, 802.1s Rec.

Some STP examples are illustrated in [“Framing Procedures”](#) (p. 1-31).

Furthermore, ES4E systems support the following functions:

- **Port Mirroring**, see [“Port mirroring management”](#) (p. 1-58).

The framing procedures and the various **Ethernet frames formats** are illustrated in [“E-VPL, end-to-end implementation example”](#) (p. 1-27). The other frames formats are reported in the related OMSN (1640FOX/1650SMC/1660SM) Technical Handbooks, listed in [Table 1](#), (p. xix), and in the standard recommendations.

The ISA-ES system and **protocol stacking** is illustrated in the figure below [[Figure 1-1](#) (p. 1-6)].

An example of Port-to-Port cross-connected Ethernet link is illustrated in [Figure 1-10](#) (p. 1-15).

An example of generic Point-to-Point (P2P) link creation, showing the use of the main resources involved, is reported in [“ES1/4 system”](#) (p. 1-4).

Other examples and applications are reported in [“Example of end-to-end ETS link creation”](#) (p. 1-16), up to [“E-VPL, end-to-end implementation example”](#) (p. 1-27).

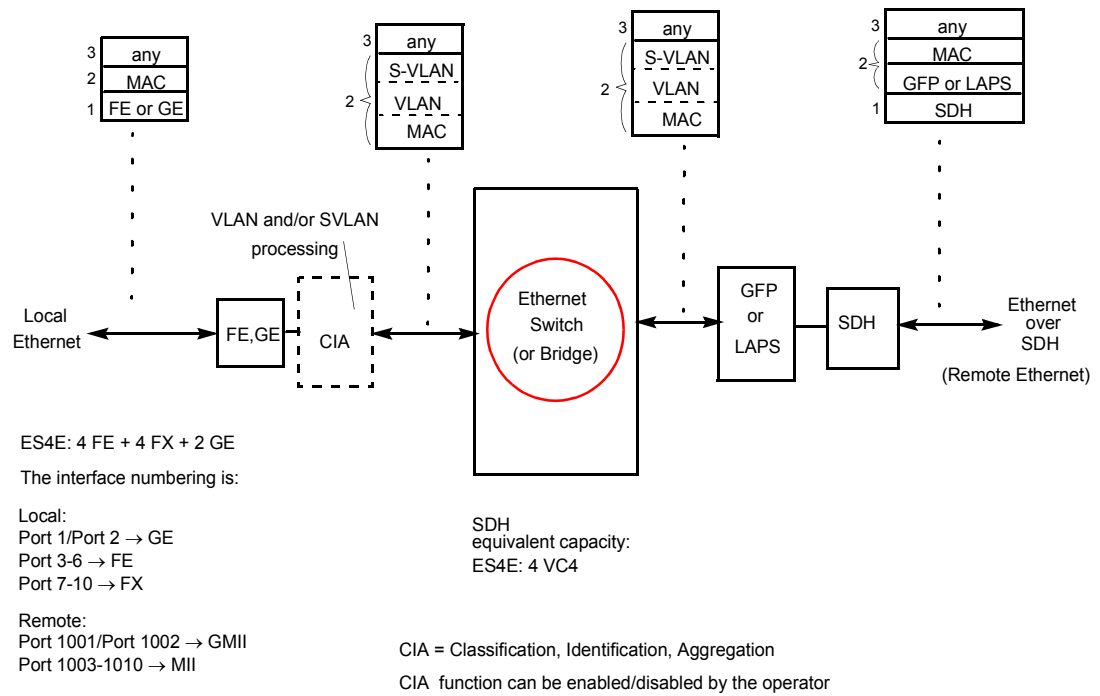
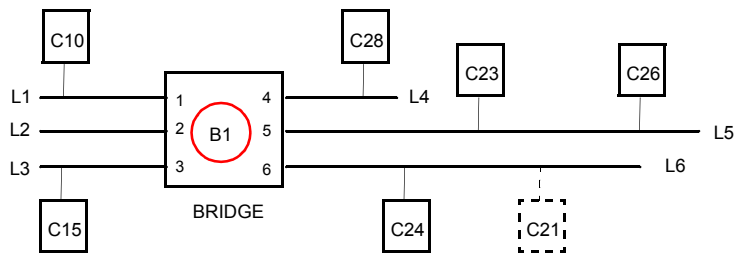
Figure 1-1 ISA-ES subsystem, protocol stacking

Figure 1-2 Bridge representation example and relevant FDB table



NOTES:

1, 2, 3, 4, 5, 6 : ports of the bridge

L1, L2, L3, L4, L5, L6: LANs

C_n : Computer with its own MAC address

C_n : new inserted computer

Computer Address	Port
MAC-C10	1
MAC-C15	3
MAC-C23	5
MAC-C24	6
MAC-C26	5
MAC-C28	4

FDB table
(Filtering Data Base table)

Bridge operations examples:

C15 to C26 → FORWARD to port5

C26 to C23 → DISCARD

C10 to C21 → LEARNING

C21 to C28 → LEARNING (adding C21 on FDB)

- A “MAC Bridge” takes into account the MAC addresses.
- A “Virtual Bridge” takes into account the MAC addresses and the VLAN identifiers (user tag), see next figure.
- A “Provider Bridge” takes into account the MAC addresses and the S-VLAN identifiers (provider tag), see next figure.
- The “Provider Bridge” can work in mixed mode, taking into account the VLAN and the S-VLAN identifiers.
- In any of the above configurations, the Bridge ports work in “promiscuous” mode.

Auto-Learning mechanism

Unknown incoming frames are flooded on all ports of the bridge, except the port where they arrived. When a far station responds back on a port, the bridge “learns” that frames having this received MAC-Address (and, if existing, the associated VLAN-ID) have to be forwarded to that port. This connection is written on the FDB table, used to forward next incoming frames.

Note: One VLAN will be learned and forwarded, on a given port, only if registered on that port; otherwise, it will be discarded.

Figure 1-3 S System into SDH network, example

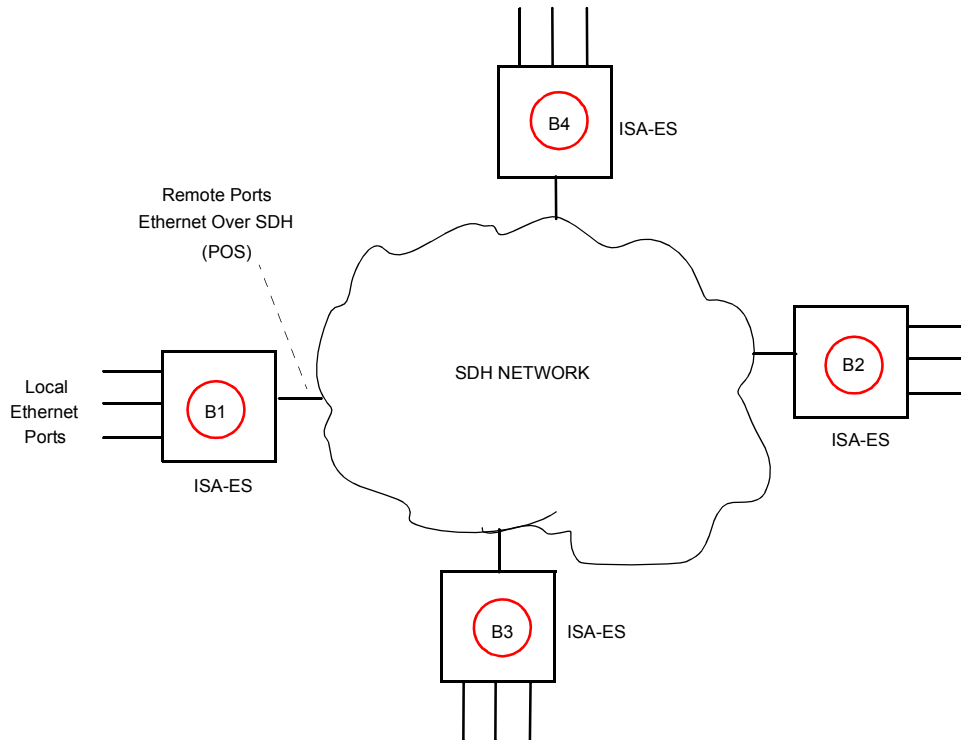
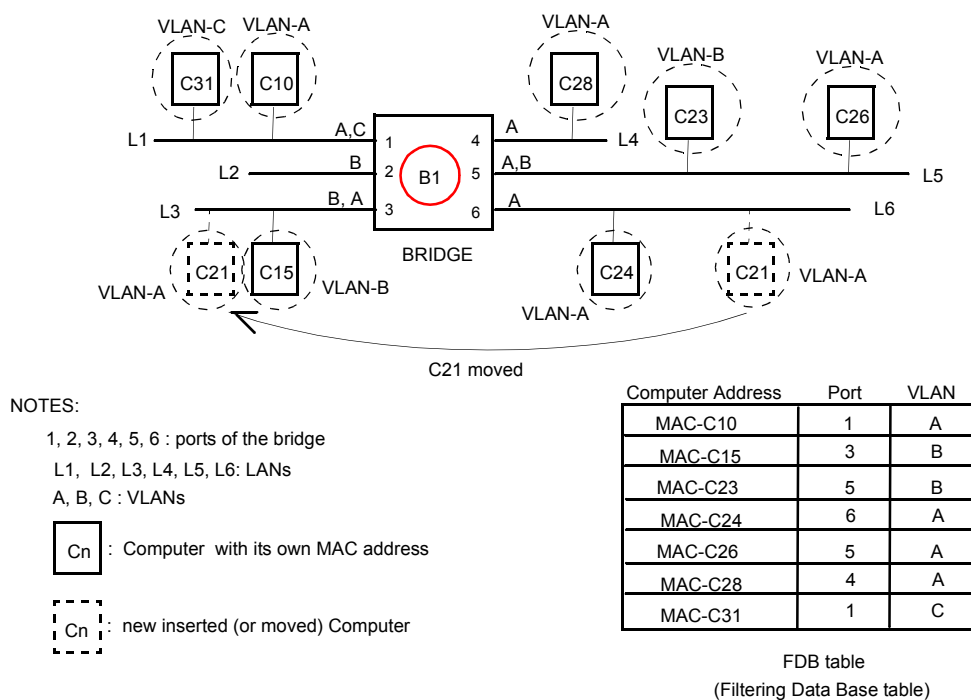


Figure 1-4 VLAN Bridge representation example and relevant FDB table

**Note:**

The Bridge (ISA-ES) is configured in Virtual or Provider mode.

The afferent VLANs have to be registered on the relevant ports; otherwise, they are discarded.

In this way, incoming frames having a given VLAN-ID are distributed only to those ports registered on that VLAN (distribution domain "Member Set").

Bundling examples are shown on ports 1,3,5 (more VLANs are registered over one single port).

Frames Ingress Acceptance criteria on Bridge ports:

The ISA-ES system permits to set the Frames Filtering criteria on ingress of Virtual or Provider Bridge ports (ETB), by means of the menu option **“Transmission: BridgePort Management: Configure Bridge Port”**. The related parameters are the following:

Acceptable Frames: possible values: **“AdmitAll”/“AdmitOnlyVlanTagged”**

If **“AdmitAll”**: all types of MAC frames are accepted by the port

If **“AdmitOnlyVlanTagged”**: only VLAN tagged frames are accepted by the port

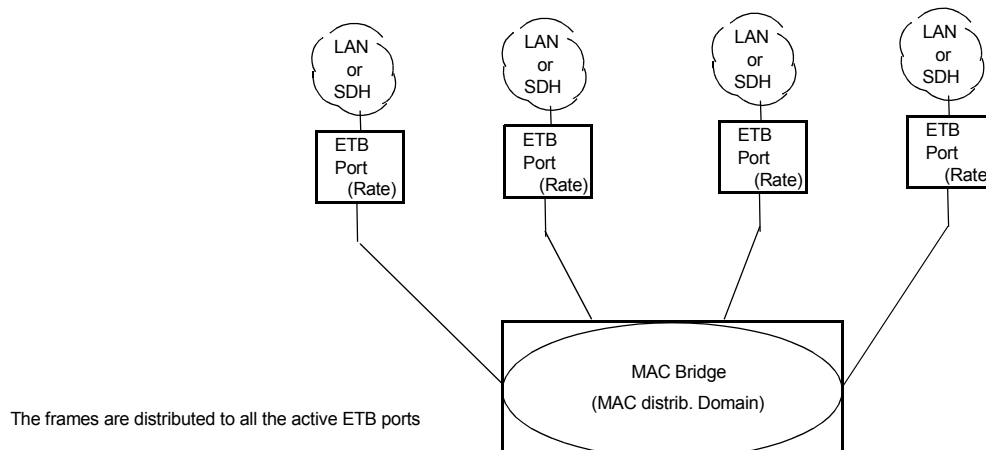
Ingress Filtering: possible values: True/False

If True: only registered VLAN's are accepted by the port

If False: all frames are accepted by the port

In case that **untagged** (or only-priority-tagged) frames are provisioned to be accepted, then they will be forwarded by attaching to them the **PVID**, i.e. the Port Vlan Id. assigned by means of the menu option **“Transmission: BridgePort: Modify Virtual/Provider Port PVID”**.

For details about the specific configurations here recalled, see their relevant paragraphs.

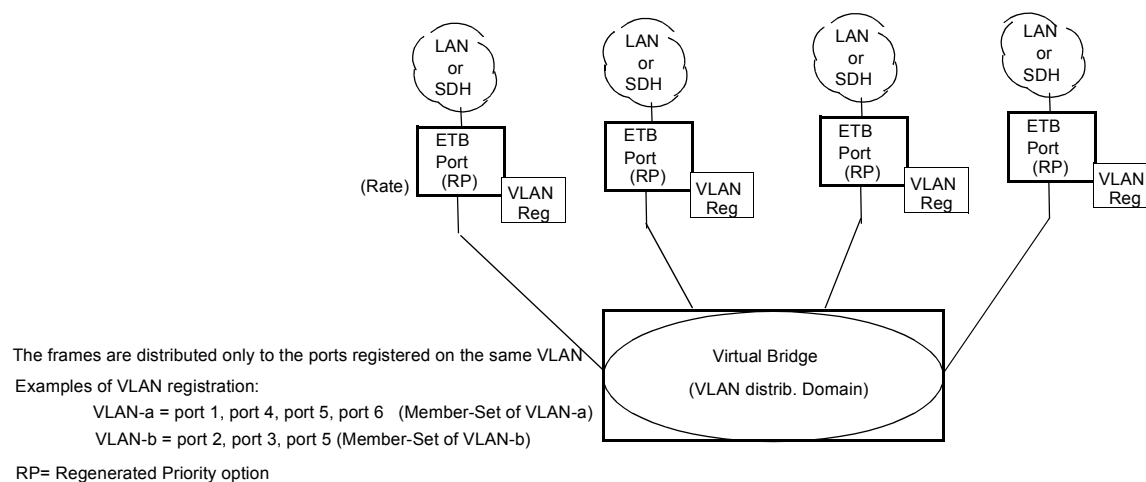
Figure 1-5 MAC bridge distribution domain (example)**Note:**

ETB ports can be either Remote or Local.

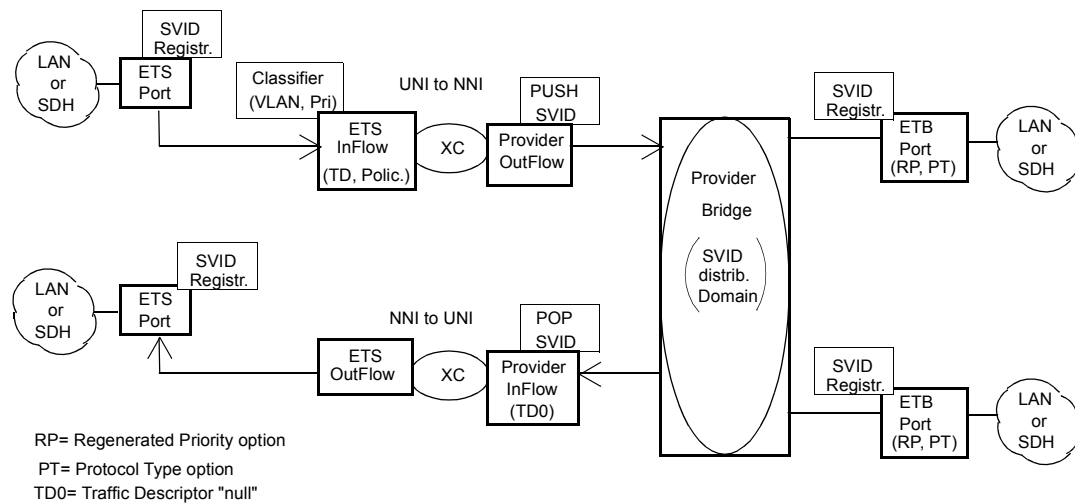
The incoming frames are distributed to all the active ETB ports in MAC-learning modality (in case of VLAN Bridge, the frames are distributed only to the ports registered on the same VLAN).

No XC is necessary, as the frames distribution is based upon the FDB table. The "Static Unicast/Multicast Filtering" option of the FDB table can be used to create a "permanent" cross-connection.

This configuration is used for "Point-to-Multipoint," "Multipoint-to-Multipoint," or so called "E-Lan" applications.

Figure 1-6 Virtual bridge distribution domain (example)**Note:**

E-VLAN type (see notes of previous figure)

Figure 1-7 Provider bridge distribution domain (example)**Note:**

ETS ports and ETB ones, can be Remote or Local.

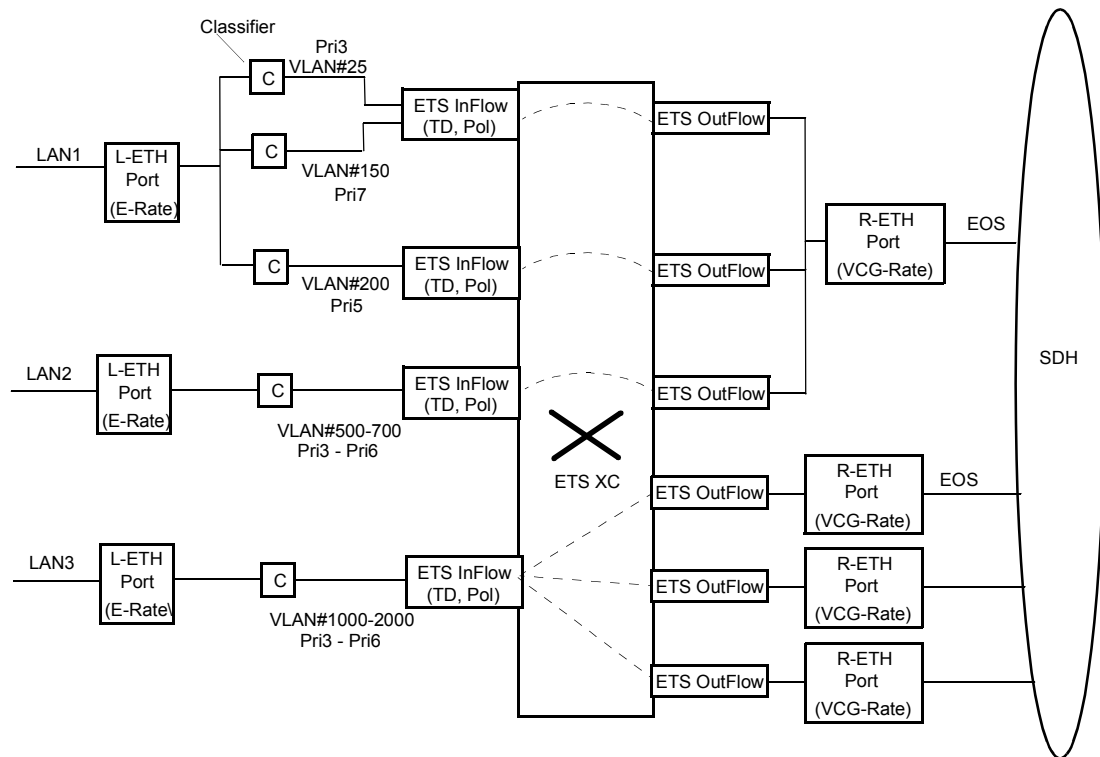
The two XCs can also be created over the same ETS port.

The “Uni-Nni XC OneStep” procedure, described in [“Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)” \(p. 4-191\)](#), provides to create a bidirectional Uni-Nni connection over the same Ets Port.

More data flows can be defined over one port (for Multiplexed and Differentiated Services).

The incoming frames are distributed only to the ports registered over the relevant S-VLAN, i.e. parts of the “member set” distribution domain of that S-VLAN (SVID registration). In this way, ports registered on the same SVID can exchange Ethernet frames.

The Provider to edge connection is accomplished by means of “One-Step” procedure.

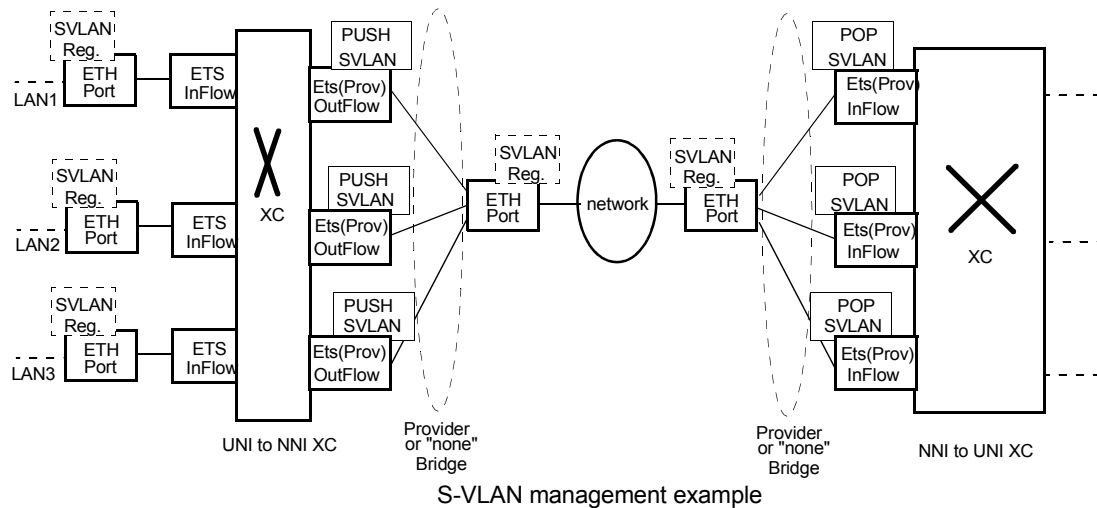
Figure 1-8 Generic VLAN Classification-Identification-Aggregation (example)**Note:**

L-ETH	Local Ethernet
R-ETH	Remote Ethernet
EOS	Ethernet Over SDH
VCG	Virtual Concatenation Group
TD	Traffic Descriptor
Pol	Policing
C	Classifier
PRI	Priority
XC	Cross-Connection
E-Rate	Rate of the Ethernet port
VCG-rate	Rate of the SDH Port

- The involved ports can be Remote or Local.
- Classifiers, InFlows, and OutFlows are internal resources.

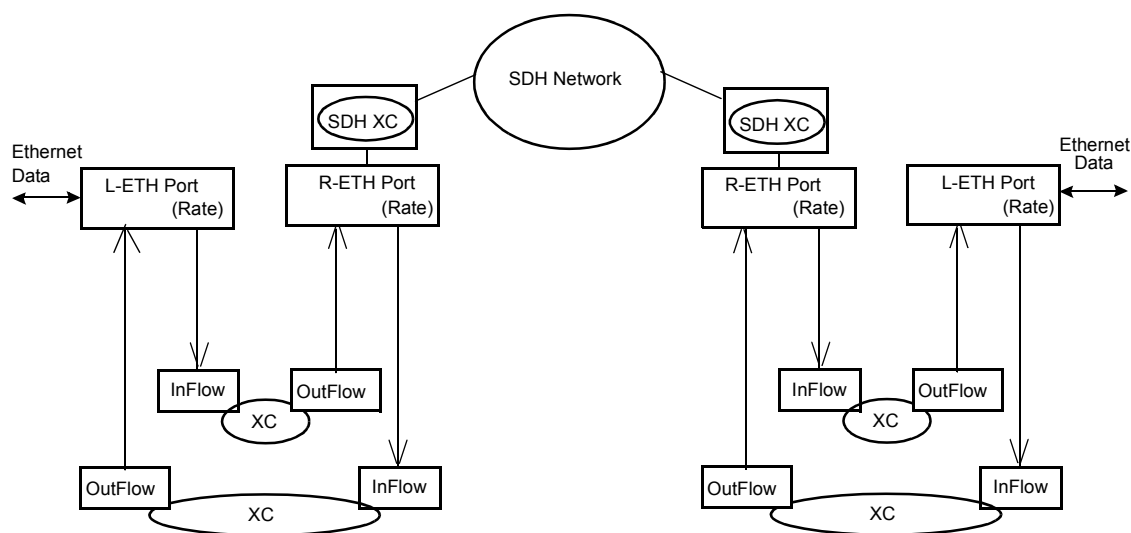
- A frame with VLAN tag that is not defined on Classifiers is discarded.
- More VLANs and more Priorities can be defined by one classifier (Bundling).
- More InFlows/OutFlows resources can be created over one Port (Multiplexing).
- The VLAN usage is possible in “none” or Virtual or Provider Bridge configuration.
- The VLAN identifiers on LAN1 and LAN2 must be not-overlapping.
- Classification of more VLANs and Service Multiplexing with differentiated CoS are possible only in “none” or Provider bridge Configuration.
- The E-Rate, sum of TD rates and VCG-Rate must be congruent.
- The VLAN's on LAN1 and LAN2 are aggregated on the same SDH resource.
- LAN3 shows an example of multicast connection (Point-to-Multipoint).

Figure 1-9 Stacked VLAN management (example)



Note:

- Creation and cross-connections of S-VLAN resources are possible in provider and “none” bridge configurations and are managed by means of “Create-XC OneStep” procedures.
- PB = Provider bridge domain.
- Classification and identification of the single data flows is possible, as shown in [Figure 1-8 \(p. 1-13\)](#).
- The involved ports must be registered on the relevant S-VLANs (in case of “Provider” config.).
- SVLAN registration is not needed, in case of “none” Bridge config.
- VLANs classification, traffic description, policing and color profile are also possible.

Figure 1-10 Transparent Mac/Virtual port-to-port XC “onestep” (Example)

Transparent Port-to-Port (p2p) XC example bidirectional

Note:

The ports are devoted to only one data flow, in transparent mode, without traffic classification nor policing.

The two involved Ethernet ports may be either local or remote.

The operations to create this structure are reported in [“MEF \(Metro Ethernet Forum\) applications”](#) (p. 1-19).

Example of end-to-end ETS link creation

Figure 1-11 (p. 1-18) shows an application example of unidirectional, end-to-end ETS link.

Note: This is only a generic example, in order to show the main resources involved in a link.

A bidirectional link can be accomplished, by creating, under the same port, the relative InFlow and OutFlow resources.

More Inflows/OutFlows can be created under the same port.

The Bridge Type is configured as "none".

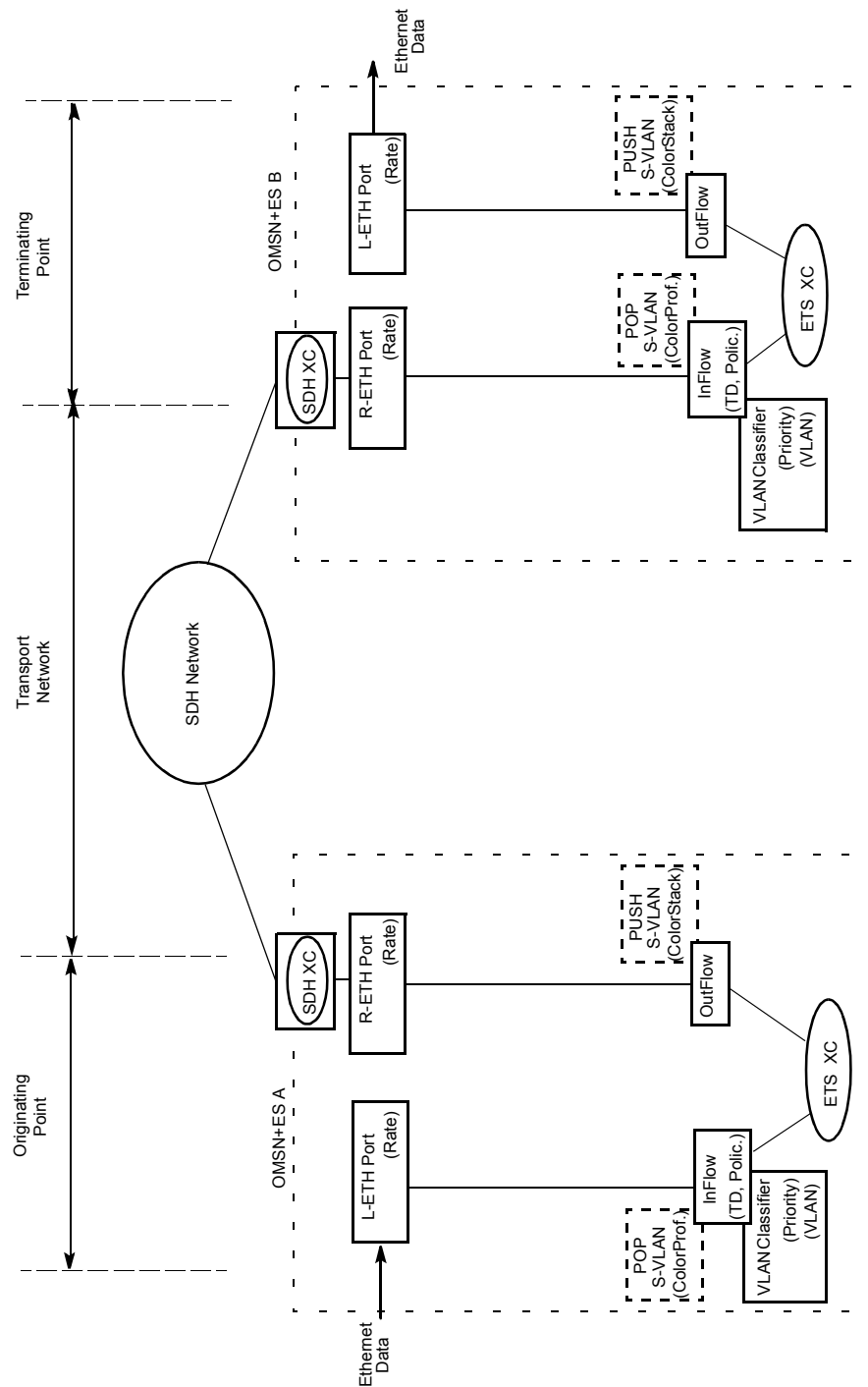
For details about the specific configurations here recalled, see their relative paragraphs.

- **On the first end (OMSN+ES A):**

1. In Transmission context, configuration of the Bridge (in "none" mode):
 "Transmission" -> "NodeManagement" -> "ConfigureNode"
 set the "BridgeType"= "none" and the "ProtocolType"
2. Creation of the required ETS Traffic Descriptors (TD), with the appropriate CIR/PIR and CBS/PBS values for both sides:
 ("Configuration" -> "Traffic Descriptor" -> "ETS Traffic Descriptor")
3. In Transmission context, configuration of GFP or LAPS framing on the involved Remote Ethernet Ports:
 "Transmission" -> "EthernetPortManagement" -> "SubstituteServerLayer"
4. In Transmission context, activation of all the involved ETS ports:
 "Transmission" -> "EthernetPortManagement" -> "ConfigureEthernetPort"
 set "PromiscuousMode" = "enabled"; "AdminStatus"= "up"
 For the involved Remote Ethernet Ports, set the Sdh VCG rate in the "TP/GFP (or LAPS) SDH Configuration" Sector
5. Cross-Connections creation, by means of the option:
 "Connection" -> "EthernetPort" -> "CreateEtsXConeStep"
 This operation is described in "CreateEtsXConeStep", described in ["Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)"](#) (p. 4-191) and ["Connection: Ethernet Port : Create Ets XC One Step \(Provider\)"](#) (p. 4-194); it permits to create all the necessary resources (InFlows/OutFlows, Classifiers, VLAN Management, etc.)

-
6. In Connection context, creation of eventual Static Unicast Filtering entries:
"Connection" -> "BridgeManagement" -> "FilteringDataBase"
then follow the procedure described in the relevant paragraph **"Connection: BridgeManagement: FilteringDataBase"**, selecting "Static Unicast Filtering" folder.
 7. Connection into the transport SDH network
The involved ETS Ports must be associated to suitable Sdh-VC's (VC12 or VC3 or VC4 or VCn-xv) and then cross-connected in the SDH network.
These operations are done on SDH-CT (see SDH Operator's Handbook for details).
Example (VC12 case):
 - Remote Ethernet Port association to a VC12 or to a group of VC12 (VC12-xv), in case of VCG link
 - LCAS configuration, if used
 - Cross-connection of VC12 to TU12
 - Association of TU12 to VC4, and VC4 connection as indicated in the figure.
 - **On the other involved OMSN+ES equipment:**
Similar operations as in the first equipment

Figure 1-11 End-to-End ETS link Example



NOTE: a BIDIRECTIONAL link can be accomplished by creating, under the same port, an InFlow and an OutFlow associated to the related data flow, and so on.
 VLAN, S-VLAN and TD are possible only in Provider configuration (and also in "none" bridge)
 More InFlows/OutFlows over a port are possible, in Provider config. (and also in "none" bridge")

Note: Cross-Connections Creations are managed by means of "Create-XC OneStep" procedure.

MEF (Metro Ethernet Forum) applications

The MEF (Metro Ethernet Forum) specifies, in MEF-10-2004 and MEF-6-2004 recommendations, the basic models, services and applications for ethernet users.

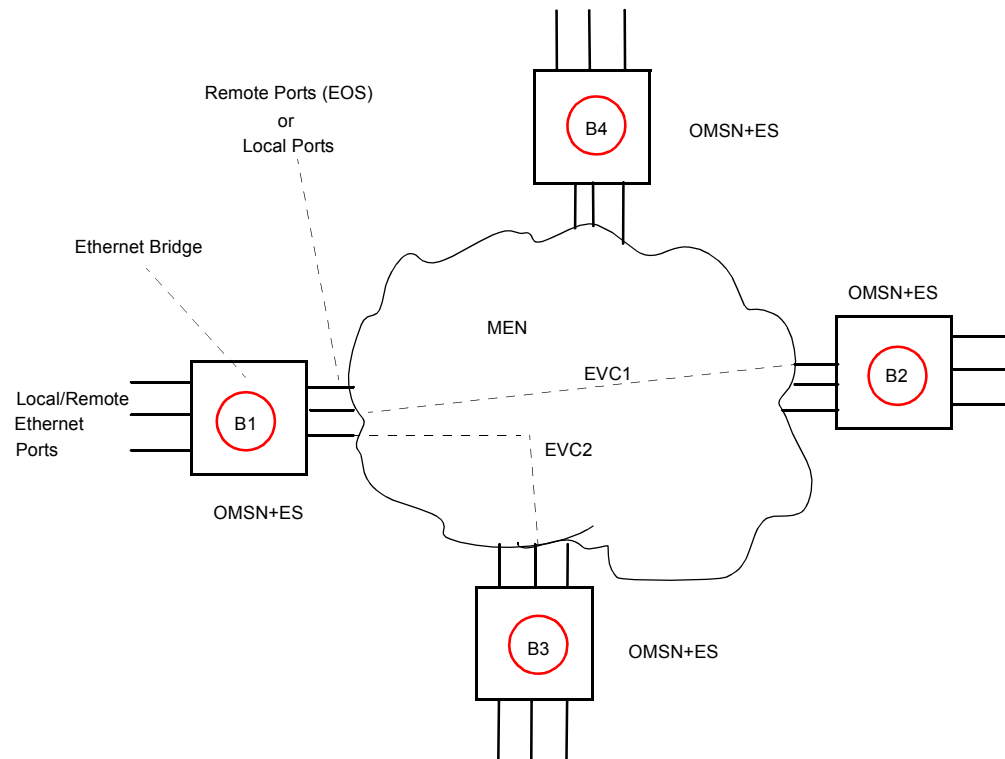
This paragraph illustrates some examples implementing MEF structures, by using ISA-ES Data Systems.

Network connections types (MEF terminology):

- **EVC** (Ethernet Virtual Connection) can be:
 1. **Point-to-Point** (P2P), or **E-Line**. It can be:
 - a. Ethernet Private Line (**EPL**)
 - b. Ethernet Virtual Private Line (**EVPL**)
 2. **MultiPoint-to-MultiPoint** (MP2MP), or **E-LAN**

MEF-Network connections accomplishment on ISA-ES Data system:

- The EPL can be achieved, on ISA-ES Data system, using the transparent "Port-to-Port" connection. See [Figure 1-13 \(p. 1-22\)](#).
- The E-LAN can be achieved by means of the FDB function, either in MAC Bridge, or Virtual Bridge (also called E-VLAN), or Provider Bridge modality. See [Figure 1-14 \(p. 1-24\)](#) (centralized LAN) and [Figure 1-15 \(p. 1-26\)](#) (distributed LAN).
- An example of EVPL with Services Multiplexing and differentiated CoS is shown in [Figure 1-16 \(p. 1-29\)](#).
- The Bundling service can be achieved in Provider and Virtual Bridge configuration, by registering more VLAN's over one EthernetPort. Either it can be achieved, in Provider bridge mode, by defining a range of customer VLAN's for a single Classifier associated to a data flow.
- The Service Multiplexing can be achieved in Provider Bridge configuration, by creating more and different user data flows over one EthernetPort. See EVPL, [Figure 1-16 \(p. 1-29\)](#).

Figure 1-12 MEF-network application for OMSN+ISA-ES system**Note:**

- EVC (Ethernet Virtual Connection) is a connection between two or more Ethernet enabled Network Elements (such as OMSN+ES System).
- MEN = Metro Ethernet Network.

Ethernet private line (EPL), end-to-end implementation example

Refer to [Figure 1-13 \(p. 1-22\)](#).

For details about the specific configurations here recalled, see their relative paragraphs.

All involved ports are in ETS mode, concerning the client layer: see [“Transmission: Ethernet Port/Aggregator: Substitute Client Layer” \(p. 4-109\)](#).

- **On the first end (OMSN+ES A):**

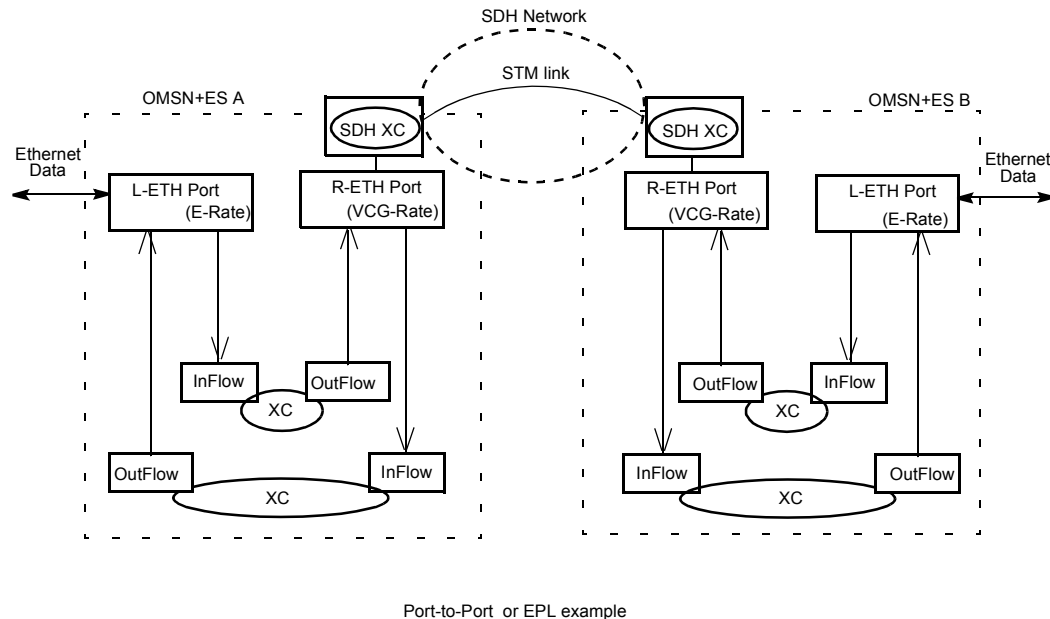
1. In Transmission context, activation of the desired Local EthernetPort (L-ETH):
“Transmission” -> “EthernetPortManagement” -> “ConfigureEthernetPort”
set “PromiscuousMode” = “enabled”; “AdminStatus” = “up”
2. In Transmission context, configuration of GFP or LAPS framing on the desired Remote EthernetPort (R-ETH):
“Transmission” -> “EthernetPortManagement” -> “SubstituteServerLayer”
3. In Transmission context, activation of the desired Remote EthernetPort (R-ETH):
“Transmission” -> “EthernetPortManagement” -> “ConfigureEthernetPort”
set “PromiscuousMode” = “enabled”; “AdminStatus” = “up”
set the Sdh VCG rate in the “TP/GFP (or LAPS) SDH Configuration” Sector
4. In Connection context, creation and connection of a bidirectional ETS flow:
select one of the above activated Local or Remote Ethernet Port
“Connection” -> “EthernetPort” -> “CreateEtsXcOneStep”
(In case of Provider Bridge, choose the “Port->Port” option)
then follow the procedure described in the relevant paragraph “Connection: EthernetPort: CreateEtsXcOneStep”, selecting “Connection Type = Bidirectional”.
5. Connection into the transport SDH network

The created Ethernet flow passes through the SDH network; the involved Remote Port must be associated to suitable Sdh-VC's (VC12 or VC3 or VC4) and then cross-connected.

These operations are to be done on SDH-CT (see SDH Operator's Handbook for details about SDH configuration and connection). Example (VC12 case):

- Remote Ethernet Port association to a VC12 or to a group of VC12, in case of VCG link
- LCAS configuration, if used
- Bidirectional cross-connection of VC12 to TU12
- Association of TU12 to AU4
- Optical fibers connection

- **On the second end (OMSN+ES B):**
The same operations as in the first end

Figure 1-13 EPL application example**Note:**

- E-Rate = rate of the Ethernet LAN link (10/100/1000/10000 Mbps)
- VCG-Rate = rate of the Ethernet over SDH link, that can also be concatenated over more SDH paths
- VCG = Virtual Concatenation Group
- The E-Rate and VCG-Rate must be congruent.
- The STM link is bidirectional and LCAS option can be used.
- Local (L-ETH) and Remote (R-ETH) Ethernet ports are ETS type.
- The ports are devoted to only one flow, in transparent mode, without traffic classification nor policing.
- The two involved Ethernet ports may be either local or remote.
- The connection is done by means of the "OneStep Port-to-Port" procedure (see "Connection": "Create Ets XC One Step").
- This link is EPL (Ethernet Private Line) type (also called point-to-point).

E-Lan/E-VLan, end-to-end implementation example

Refer to [Figure 1-14 \(p. 1-24\)](#) (centralized LAN) or [Figure 1-15 \(p. 1-26\)](#) (distributed LAN).

For details about the specific configurations here recalled, see their relative paragraphs.

All involved ports are in ETB mode (except if the Bridge is Provider). In case of Provider Bridge, see next para. for more information.

- **On the first end (OMSN+ES A):**

1. In Transmission context, configuration of the Bridge (MAC or Virtual or Provider):
 "Transmission" -> "NodeManagement" -> "ConfigureNode"
 set the **"BridgeType"** and the **"ProtocolType"**
2. In Transmission context, substitution of the involved ports from ETS to ETB mode:
 "Transmission" -> "EthernetPortManagement" -> "SubstituteClientLayer"
 set **"ETS -> ETB Layer"**
3. In Transmission context, configuration of GFP or LAPS framing on the involved Remote Ethernet Ports:
 "Transmission" -> "EthernetPortManagement" -> "SubstituteServerLayer"
4. In Transmission context, configuration of Regenerated Priority mapping on the involved Ports:
 "Transmission" -> "EthernetPortManagement" -> "ConfigureEthernetPort"
 select the **"RegenerationUserPriority"** item
5. In Transmission context, activation of all the involved ETB ports:
 "Transmission" -> "EthernetPortManagement" -> "ConfigureEthernetPort"
 set **"PromiscuousMode" = "enabled"; "AdminStatus" = "up"**
 For the involved Remote Ethernet Ports, set the Sdh VCG rate in the **"TP/GFP (or LAPS) SDH Configuration"** Sector
6. In Transmission context, configuration of Bridge Ports:
 "Transmission" -> "BridgePortManagement" -> "ConfigureBridgePort"
 set the Ingress Filtering Criteria and the STP parameters
7. In Transmission context, registration of the involved VLAN's on the relative ETB ports:
 "Transmission" -> "BridgeManagement" -> "Vlan Registration"
8. In Connection context, creation of eventual Static Unicast Filtering entries:
 "Connection" -> "BridgeManagement" -> "FilteringDataBase"
 then follow the procedure described in the relevant paragraph ["Connection: Bridge : Filtering Data Base" \(p. 4-184\)](#), selecting **"Static Unicast Filtering"** folder.

9. Connection into the transport SDH network

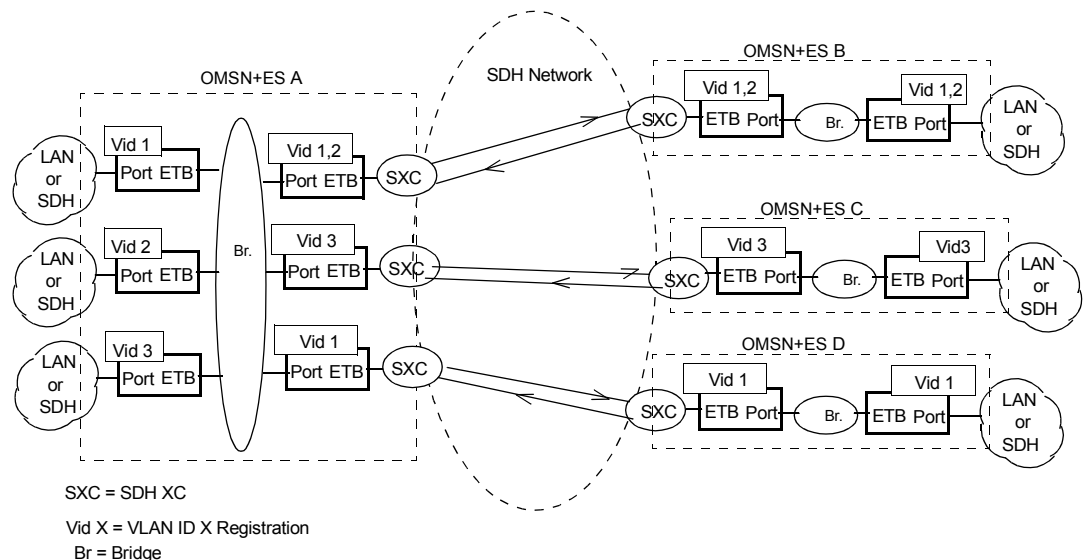
The involved ETB Remote Port must be associated to suitable Sdh-VC's (VC12 or VC3 or VC4 or VCn-xv) and then cross-connected.

These operations are done on SDH-CT (see SDH Operator's Handbook for details).

Example (VC12 case):

- Remote Ethernet Port association to a VC12 or to a group of VC12 (VC12-xv), in case of VCG link
- LCAS configuration, if used
- Cross-connection of VC12 to TU12
- Association of TU12 to VC4, and VC4 connections as indicated in the figure.
- **On the other involved OMSN+ES equipment:**
Similar operations as in the first equipment

Figure 1-14 Example of E-Lan/E-VLan implementation (1: centralized LAN)

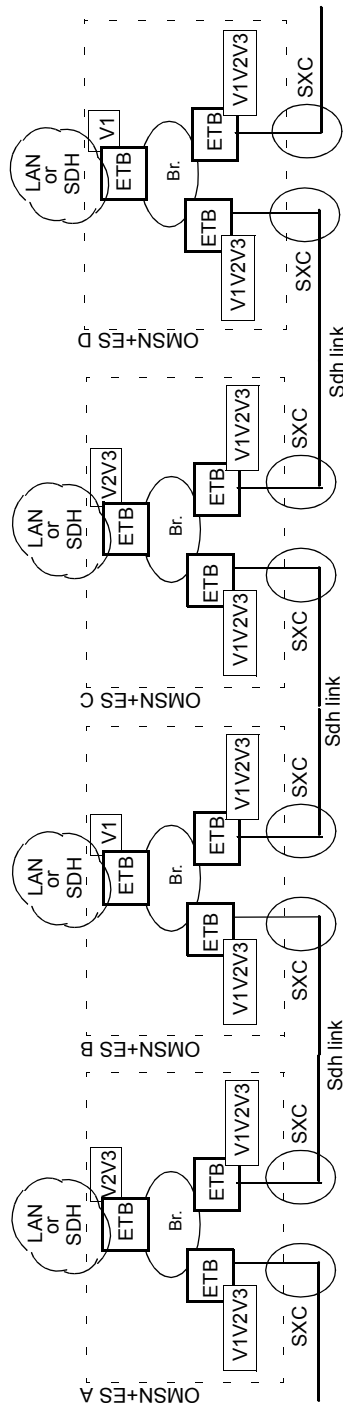


Note:

- The Bridges can be Mac or Virtual or Provider.
- In case of MAC Bridge no registration is needed and the MAC frames are forwarded on all active ETB ports of the bridge (E-Lan implementation).
- In case of Virtual or Provider Bridge, the incoming frames are distributed only to the ports registered over the same VLAN, i.e. to those ports that are parts of the "member set" distribution domain (DD) of that VLAN.
- More VLANs can be registered on one port.
- More ports can be part of the "member set" distribution domain (DD) of one VLAN.
- The indicated links are bidirectional.
- The frames distribution is based upon the FDB table.
- ETB ports can be Remote (for SDH) or Local (for LAN).

- Where ETB ports are Remote, they need SDH XC (SXC) and eventual VCG association.
- The LCAS feature can be used on the SDH-VCG links, in order to improve the band utilization.
- The "Static Unicast Filtering" option of the FDB table can be used, in order to avoid the initial flooding of unknown frames destinations.
- The E-VP Lan structure can be implemented by using Provider bridge, for Differentiated and Multiplexed Services applications (see next example for some details about Provider Bridge configuration).
- This application is called "MultiPoint-to-MultiPoint" or "E-Lan/E-VLan".
- The Regenerated Priority option can be used, on the ETB ports.

Figure 1-15 Example of E-Lan/E-VLan implementation (2: distributed LAN)



SXC = SDH XC

Vx = VLAN x Registration

Br = Bridge

The indicated links are bidirectional

The SDH network emulates an E-VLAN for VLAN's ID 1,2,3

E-VPL, end-to-end implementation example

Refer to [Figure 1-16 \(p. 1-29\)](#) illustrating an EVPL example with Service Multiplexing and Differentiated Class of Services.

For details about the specific configurations here recalled, see their relative paragraphs.

- **On the first end (OMSN+ES A):**
 1. In Transmission context, configuration of the Bridge (Provider):
"Transmission" -> "NodeManagement" -> "ConfigureNode"
 set the **"BridgeType"** and the **"ProtocolType"**
 2. In Transmission context, substitution of relevant ports from ETS to ETB mode:
"Transmission" -> "EthernetPortManagement" -> "SubstituteClientLayer"
 set **"ETS -> ETB Layer"**
 3. In Transmission context, configuration of GFP or LAPS framing on the involved Remote Ethernet Ports:
"Transmission" -> "EthernetPortManagement" -> "SubstituteServerLayer"
 4. In Transmission context, configuration of Regenerated Priority (if used) on the involved Ports:
"Transmission" -> "EthernetPortManagement" -> "ConfigureEthernetPort"
 select the **"RegenerationUserPriority"** item
 5. In Transmission context, activation of all the involved ETB ports:
"Transmission" -> "EthernetPortManagement" -> "ConfigureEthernetPort"
 set **"PromiscuousMode" = "enabled"; "AdminStatus" = "up"**
 For the involved Remote Ethernet Ports, set the Sdh VCG rate in the **"TP/GFP (or LAPS) SDH Configuration"** Sector
 6. In Transmission context, configuration of Bridge Ports:
"Transmission" -> "BridgePortManagement" -> "ConfigureBridgePort"
 set the Ingress Filtering Criteria and the STP parameters
 7. In Transmission context, VLAN's registration on the involved ETS and ETB ports:
"Transmission" -> "BridgeManagement" -> "Vlan Registration"
 8. In Connection context, creation of eventual Static Unicast Filtering entries:
"Connection" -> "BridgeManagement" -> "FilteringDataBase"
 then follow the procedure described in the relevant paragraph ["Connection: Bridge : Filtering Data Base"](#) (p. 4-184), selecting **"Static Unicast Filtering"** folder.
 9. In Connection context, creation of ETS-Cross Connections and related resources:
"Connection" -> "EthernetPortManagement" -> "CreateEtsXcOneStep-Provider"
 follow the **"OneStep"** procedure described in the relevant paragraph ["Connection: Ethernet Port : Create Ets XC One Step \(Provider\)"](#) (p. 4-194).

10. Connection into the transport SDH network

The involved ETB Remote Port must be associated to suitable Sdh-VC's (VC12 or VC3 or VC4 or VCn-xv) and then cross-connected.

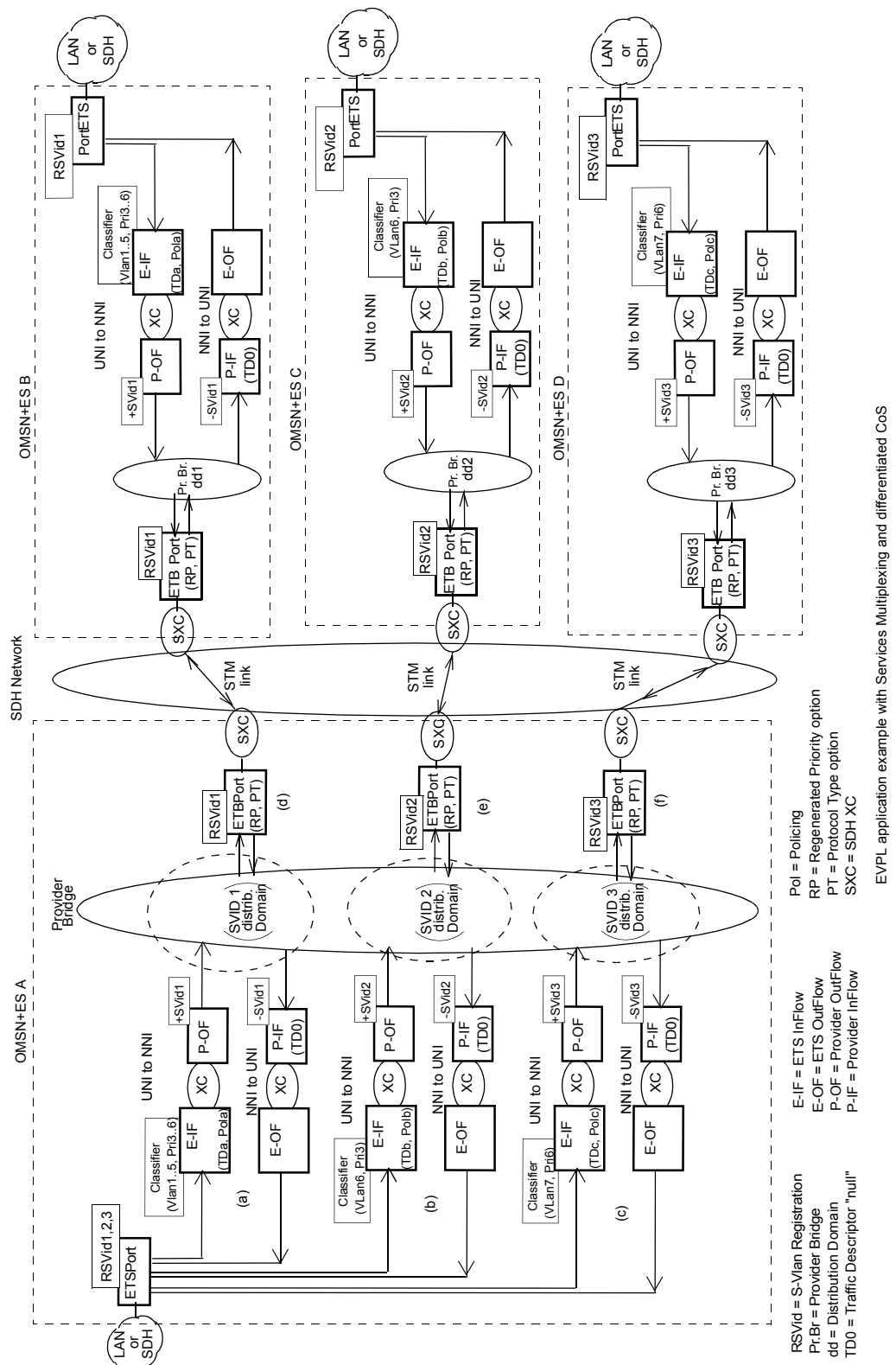
The indicated STM links are bidirectional.

These operations are done on SDH-CT (see SDH Operator's Handbook for details).

Example (VC12 case):

- Remote Ethernet Port association to a VC12 or to a group of VC12 (VC12-xv), in case of VCG link
 - LCAS configuration, if used
 - Cross-connection of VC12 to TU12
 - Association of TU12 to VC4, and VC4 connection as indicated in the figure.
- **On the other involved OMSN+ES equipment:**
Similar operations as in the first equipment

Figure 1-16 EVPL implementation example



Note: about [Figure 1-16 \(p. 1-29\)](#):

- The links a to d, b to e, c to f are parts of three different EVC's, afferent to one single ETS port.
- (a), (b), (c): bidirectional links for different users; VLAN id, Priority (Pri), Traffic Descriptors (TD) and Policing (Pol) on these connections can be different.
- VLAN 1...5 means that VLAN's on range 1 to 5 are transported over this data flow (bundling).
- The priority (Pri) for a group of VLAN's can also be defined as a range, e.g. from Pri3 to Pri5.
- RSVID 1,2,3 means that S-VLAN 1,2 and 3 are registered on this port.
- (d), (e), (f): these ETB ports are used as Bridge Network Interfaces respectively for the data flows a, b, c.
- ETS ports, as well as ETB ones, can be Remote (for SDH) or Local (for LAN).
- Where ports are Remote, they need SDH XC and VCG association.
- The frames are distributed only to the ports registered over the relevant S-VLAN, i.e. parts of the "member set" distribution domain of that S-VLAN (SVID registration).
- More data flows can be created under one ETS port.
- More S-VLAN Id can be registered on a single port.
- More ports can be headed to one S-VLAN.
- More (or a range of) customer VLAN's can be defined on one Classifier (user VLAN Bundling).
- The CoS of one traffic (Priority) may be changed at the ingress of the provider bridge network, in ETB port, RP option.
- The Protocol Type of one traffic (Protocol Type) may be changed at the ingress of the provider bridge network, in ETB port, PT option.
- The Provider UNI/NNI or NNI/UNI connections are accomplished by means of "One-Step" procedure (see ["Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)" \(p. 4-191\)](#))).

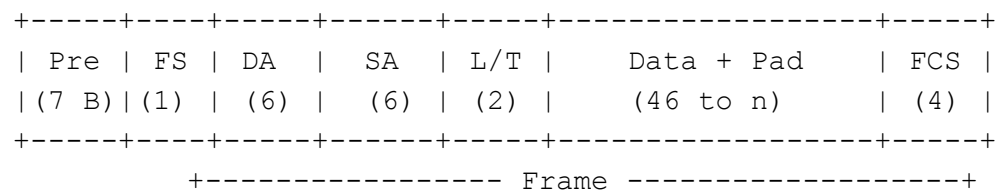
Framing Procedures

Figure 1-17 Ethernet Packet format

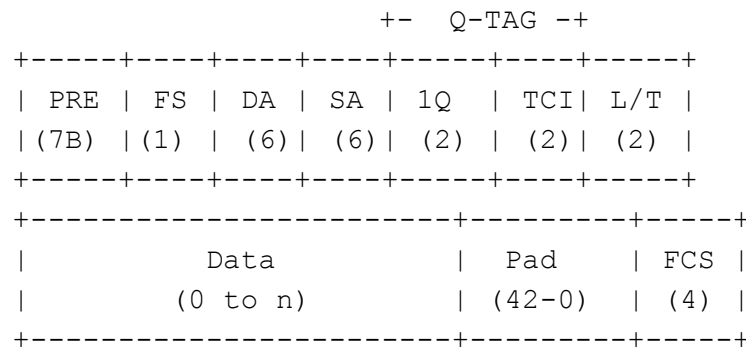


- **IPG**= Inter Packets Gap
- **Preamble**= fixed pattern, used to lock the synchronization circuitry with the received frame's timing
- **SFD**= Start of Frame Delimiter; it is fixed to 10101011
- **Frame Size** :
 - Minimum frame size: 64 bytes
 - Maximum frame size (MTU= Maximum Transmit Unit, or MRU= Maximum Receive Unit):
 - MTU/MRU = 1518 bytes if the frame is "untagged"
 - MTU/MRU = 1600 bytes for NNI interface
 - MTU/MRU = 1574 bytes for UNI interface
 - Jumbo Frame (JF): frames with length greater than 1574 (UNI) or 1600 (NNI):
 - JF-MTU/MRU = 2008 bytes
 - JF-MTU/MRU = 2026 bytes

Figure 1-18 Ethernet packet and MAC frame format



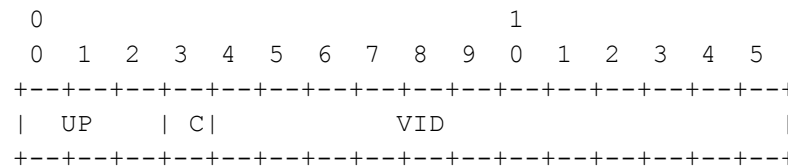
- **Pre** = Preamble
- **FS** = Frame Start, also called SFD: start of frame delimiter
- **DA**: Destination Address
- **SA**: Source Address
- **n**: max number of bytes contained in the data field, depending from the MTU value (see [Figure 1-17 \(p. 1-31\)](#)) in this case n= MTU-18
- **L/T** = Length (of-data-field) / Type; it indicates the Length or Type of the frame:
 - If its value is less than 1536 decimal, then L/T field indicates the number of MAC client data octets contained in the subsequent "Data" field of the frame.
 - If its value is greater than or equal to 1536 decimal, then L/T field indicates the nature of the MAC client protocol.
- **PAD** = optional field, containing fixed stuff, to be added in case that the "Data" field is less or equal than 46 bytes, in order that the frame length (from DA to FCS) is at least 64 bytes.
- **FCS** = Frame Check Sequence: it contains a cyclic redundancy check (CRC), computed over all fields except Preamble, SFD, FCS

Figure 1-19 Ethernet “Q-Tagged” MAC 802.3 frame format

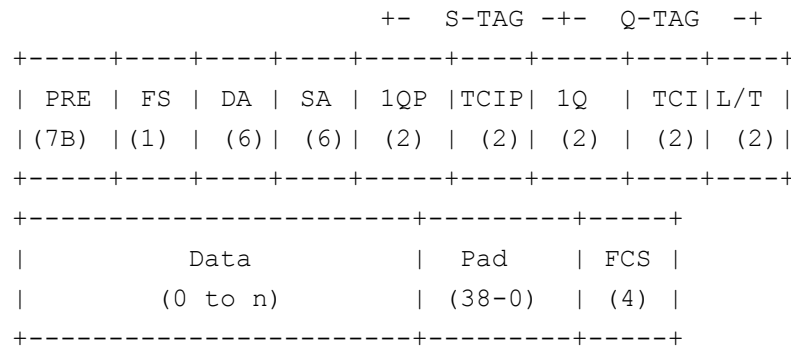
- **PRE:** preamble; FS: Frame Start; DA: Destination Addr.; SA: Source Addr.
- **1Q:** “ProtocolType” 802.1Q field (a constant fixed value= hex“0x8100”)
- **TCI :** Tag Control Information = (3bits: user priority 802.1p)+(1bit: CFI)+(12bits: VLAN identifier 802.1q); [CFI: Canonical Field Id.]
- **L/T:** MAC client Length/Type

Note: The PAD is an optional field, containing fixed stuff, to be added in case that the data field is less or equal than 42 bytes, in order that the frame length (from DA to FCS) is at least 64 bytes.

- **n:** max number of bytes contained in the data field, depending from the MTU value (see [Figure 1-18 \(p. 1-31\)](#))

Figure 1-20 TCI Field format (802.1Q VLAN Tag)

- **UP:** User Priority (3 bits)
- **C:** CFI, Canonical Field Identifier (1 bit)
- **VID:** VLAN Identifier (12 bits)

Figure 1-21 Ethernet “Stacked VLAN” frame format

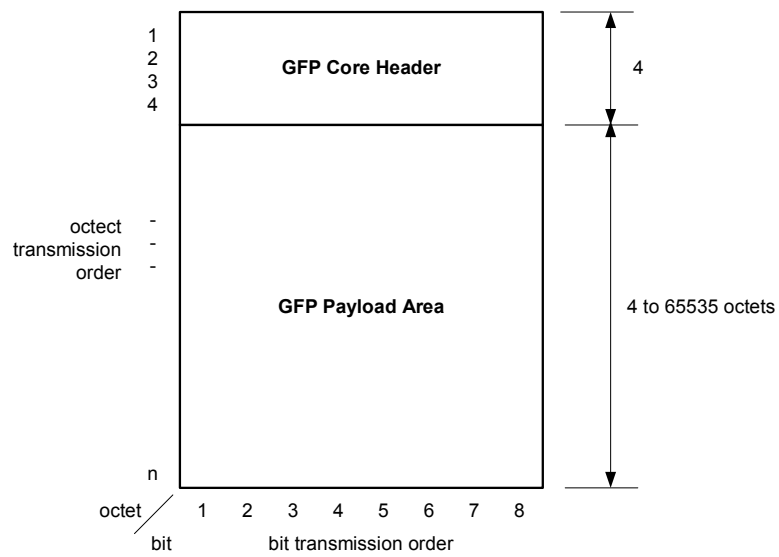
- **PRE:** preamble; FS: Frame Start; DA: Destination Addr.; SA: Source Addr.
- **1Q:** “ProtocolType” (PT) 802.1Q field (a constant fixed value= hex“0x8100”)
- **TCI :** “Tag Control Information” = (3bits: user priority 802.1p)+(1bit: CFI)+(12bits: VLAN identifier 802.1q); [CFI: Canonical Field Id.]
- **L/T:** MAC client Length/Type
- **1QP:** 2 bytes “provider-ProtocolType”, similar to the 1Q identifier, settable by the Service Provider
- **TCIP:** 2 bytes “provider-Tag Control Information”, similar to the TCI bytes
 - (3 bits: provider-priority)+(1bit:CFI)+(12bits:provider-VLAN id.),
 - settable by the Service Provider

Note: Q-TAG is also called C-TAG (Customer Tag, or User Tag); S-TAG is also called P-TAG

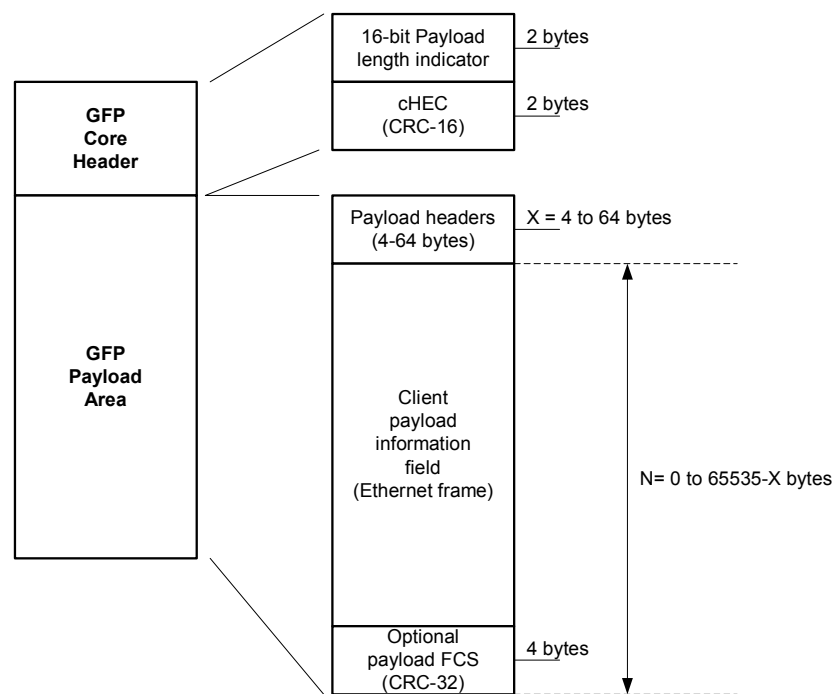
Note: the PAD is an optional field, containing fixed stuff, to be added in case that the data field is less or equal than 38 bytes, in order that the frame length (from DA to FCS) is at least 64 bytes.

- **n:** max number of bytes contained in the data field, depending from the MTU value (see [Figure 1-18 \(p. 1-31\)](#)).

Figure 1-22 Ethernet “Stacked VLAN” frame format



GFP Frame size and transmission order



Fields constituting a GFP client frame

Figure 1-23 Ethernet encapsulation into GFP frame (from G.7041/Y.1303)

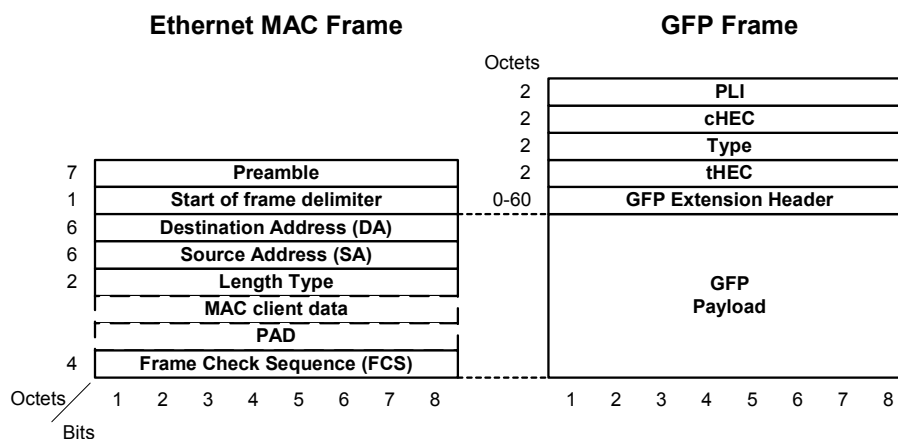


Figure 1-24 Ethernet/LAPS encapsulation (ITU-T X.86)

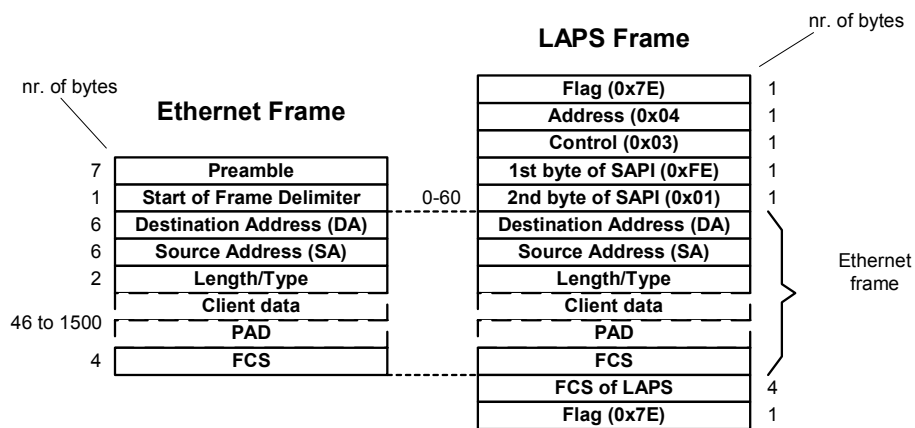
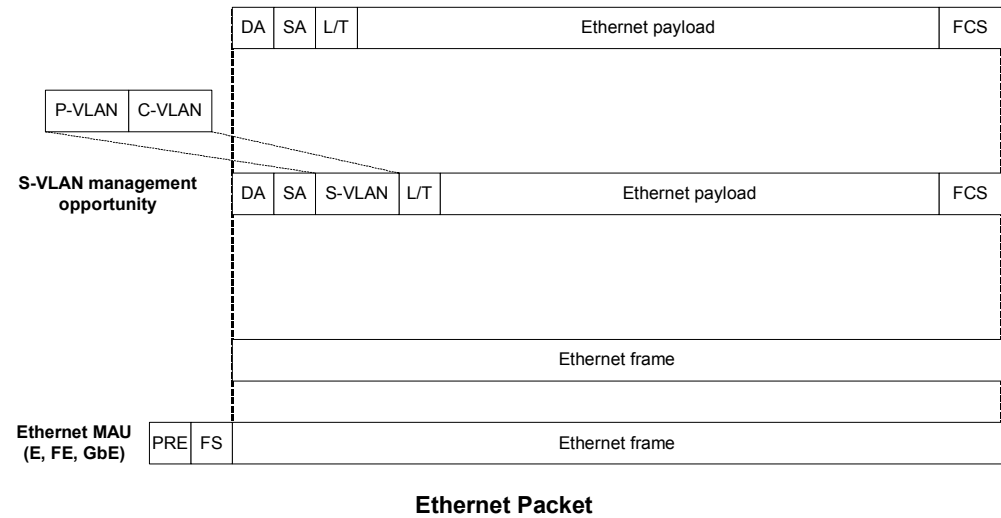
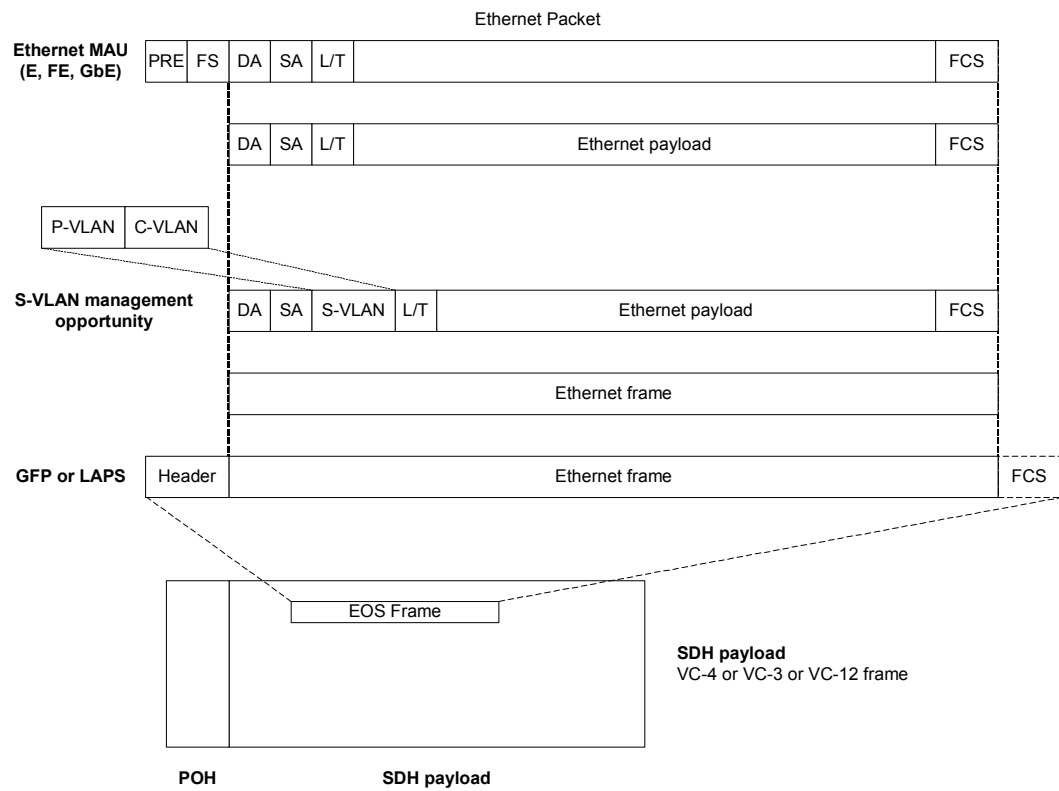


Figure 1-25 Ethernet Framing (on Local Ethernet Port)



Note:

P-VLAN = Provider VLAN
C-VLAN = Customer VLAN

Figure 1-26 Ethernet over SDH Framing (Remote Ethernet Port)**Note:**

The FCS on GFP or LAPS is optionally included

- P-VLAN = Provider VLAN
- C-VLAN = Customer VLAN

STP functionality (Spanning Tree Protocol)

Figure 1-27 Spanning Tree example

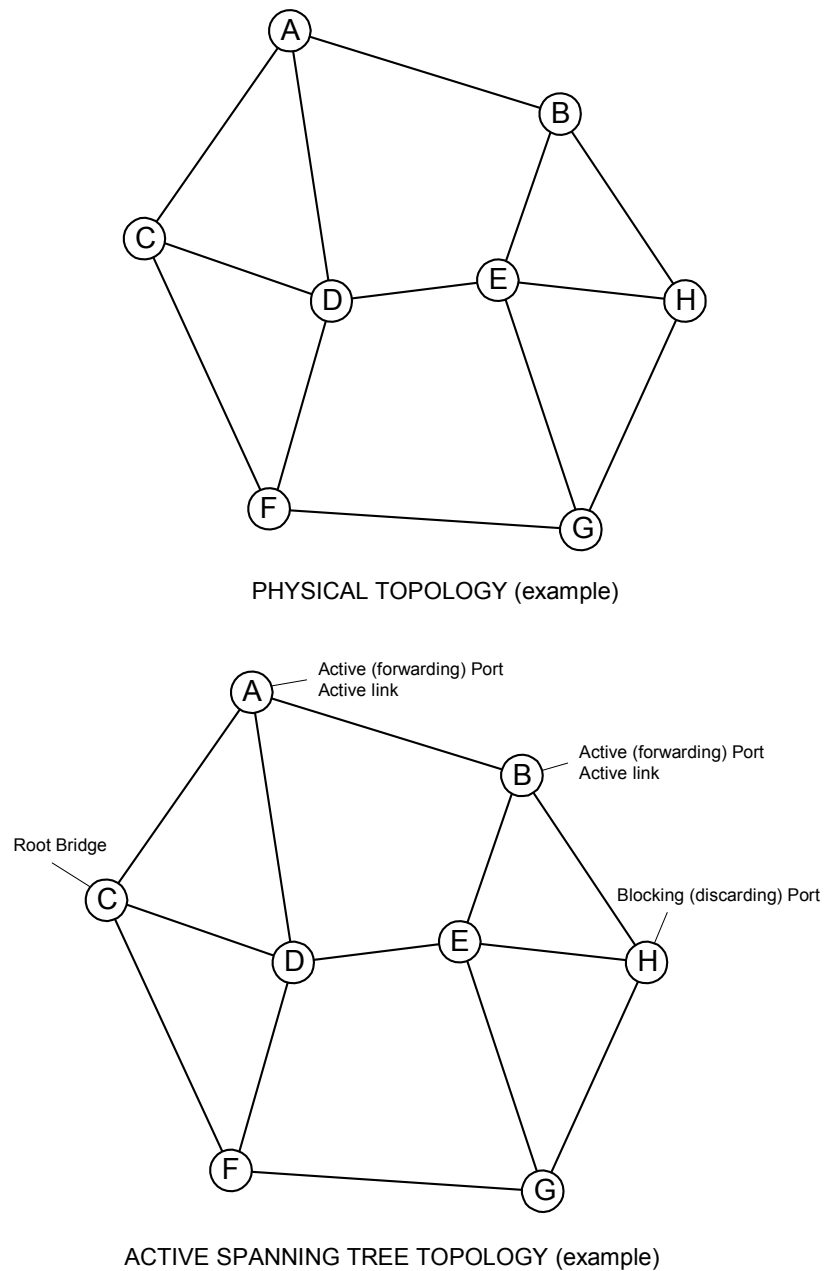
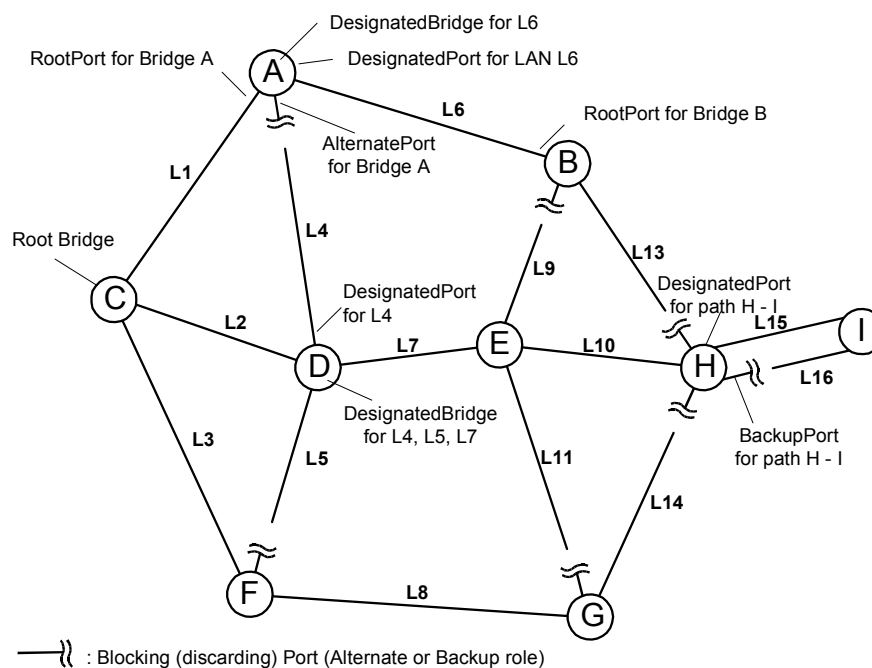


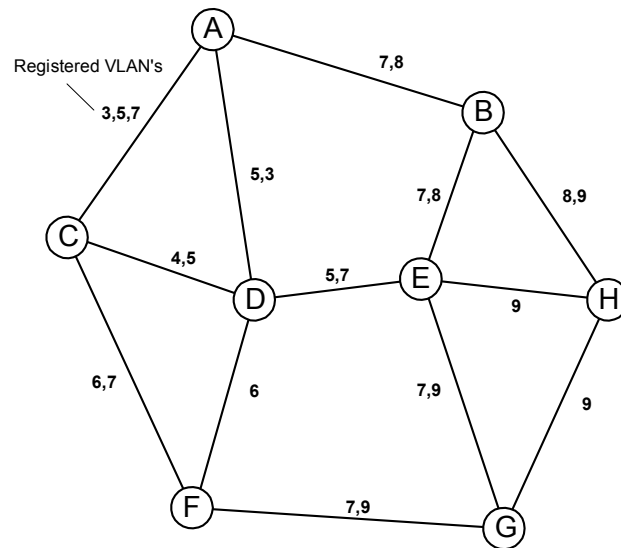
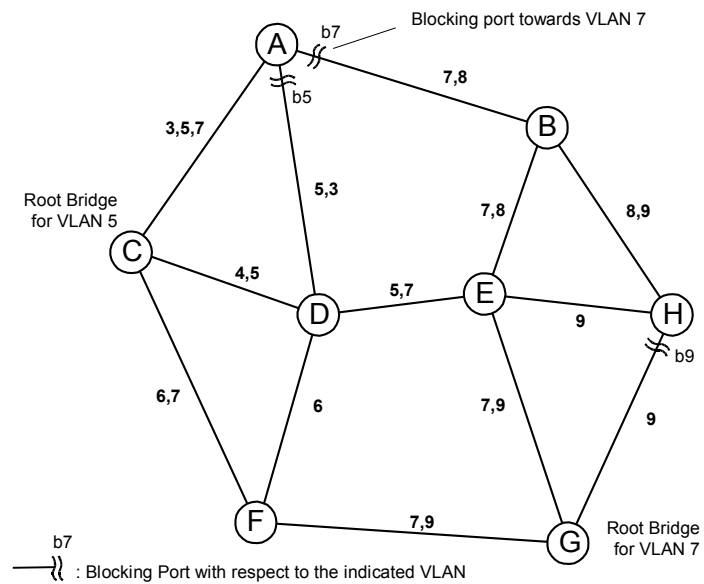
Figure 1-28 Some examples of Bridges and Ports roles in xSTP network



BRIDGE and PORT ROLES (example)

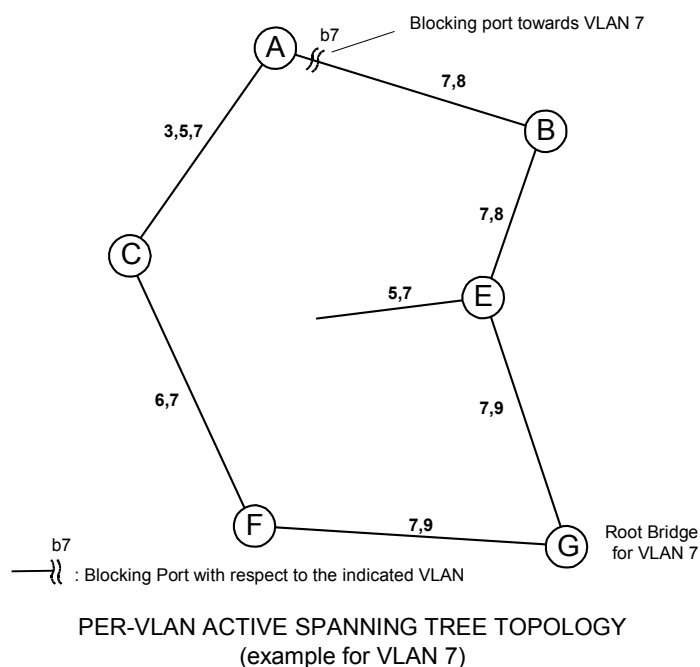
Note:

- A, B,... : bridges
- L1, L2, ... : LAN's
- The active STP topology is dynamic, therefore it will change on occurrence of certain events/failures.
- The Root Bridge (i.e. the root of the tree) is the bridge having the highest priority, or, at priority equality, the identifier with lowest numerical value.
- The STP procedure is managed by means of control frames BPDU (Bridge Protocol Data Unit).
- The “blocking” (or discarding) Ports can be configured to accept control BPDU frames.
- Each Bridge and each Port has its own cost parameter and priority parameter.
- The “Root Path Cost” for a given bridge is the sum of the costs of all the Root Port encountered along the path to reach the Root Bridge. If this value is zero, the selected bridge is the Root Bridge.
- The best path from a bridge to the root is calculated taking into account the cost and, at costs equality, the priority parameters of ports and bridges along the path.
- The parameters indicated will be detailed in this handbook, where they will be used (see “ConfigureBridgePort” para. “Transmission: Ethernet Port: Create Provider OutFlow” (p. 4-108) and subsequents. See also, for instance: “BridgePort: ControlPlane STP-Per Bridge Management” (p. 4-130), “BridgePort: ControlPlane STP-PerPort Management” (p. 4-133), etc.).

Figure 1-29 PER-VLAN Spanning Tree example**PHYSICAL TOPOLOGY and Registered VLAN's****PER-VLAN ACTIVE SPANNING TREE TOPOLOGY (example)**

Note: In this case, the STP procedure is applied, independently, to each afferent VLAN, as if there were as many independent networks as the VLAN's are (see example in next figure).

Figure 1-30 PER-VLAN Spanning Tree (example of active topology for a single VLAN)



RSTP (Rapid Spanning Tree Protocol)

The **RSTP** differs from STP in some parameters:

The convergence time is reduced to 5 sec (instead it is 30 s in STP) and in the possible States of the Ports: Data Frame Discarding, Learning, Forwarding (STP Port States are 5, including “Disabled” and “Listening”). The descriptions of these parameters are given in “Configure Bridge Port”.

The **BPDU** (Bridge Protocol Data Unit) Frame for MSTP networks (from IEEE Std. 802.1Q-2003):

“MSTP (Multiple STP) provides simple and full connectivity for frames assigned to any given VLAN throughout a Bridged LAN comprising arbitrarily interconnected Bridges, each operating MSTP, STP or RSTP. MSTP allows frames assigned to different VLAN’s to follow separate paths, each based on an independent Multiple Spanning Tree Instance (MSTI), within Multiple Spanning Tree (MST) Regions composed of LAN’s and or MST Bridges. These Regions and the other Bridges and LAN’s are connected into a single Common Spanning Tree (CST)...” (from IEEE Std. 802.1Q-2003).

The MSTP-BPDU frame (see figure below) is compatible with the STP/RSTP BPDU, with the addition of fields conveying MST topology information and Regional Instances. Each MST Instance is represented by an additional field attached to the MSTP-BPDU, called MSTI Configuration Message. Up to a max of 64 “MSTI Configuration Messages” are allowed in a network.

Figure 1-31 MSTP BPDU Frame format

	Octet
Protocol Identifier	1-2
Protocol Version Identifier	3
BPDU Type	4
CIST Flags	5
CIST Root Identifier	6-13
CIST External Path Cost	14-17
CIST Regional Root Identifier	18-25
CIST Port identifier	26-27
Message Age	28-29
Max Age	30-31
Hello Time	32-33
Forward Delay	34-35
Version 1 Length = 0	36
Version 3 Length	37-38
MST Configuration Identifier	39-89
CIST Internal Root Path Cost	90-93
CIST Bridge Identifier	94-101
CIST Remaining Hops	102
MSTI Configuration Messages (may be absent)	103-39 + Version 3 Length

MSTI BPDU parameters and format

	Octet
MSTI Flags	1
MSTI Regional Root Identifier	2-9
MSTI Internal Root Path Cost	10-13
MSTI Bridge Priority	14
MSTI Port Priority	15
MSTI Remaining Hops	16

MSTI Configuration Message parameters and format

In particular, the octets in the field “MST Configuration Identifier” of the frame contain the meaningful parameters defining a Region, i.e.:

- Configuration Identifier Format Selector (fixed by the standard to value 0)
- Configuration Name
- Revision Level
- Configuration Digest

Thus, by definition, Bridges having the same value of “MST Configuration Identifier” are considered to be part of the same Region, if they are connected between them by a LAN contained in the same Region, i.e. if the CIST designated Bridge for that LAN is in the same Region. (CIST = Common and Internal Spanning Tree).

In a same region, frames assigned to different VLAN’s can follow separate paths, each based on an independent nMultiple Spanning Tree Instance (MSTI); in other words, the VLANs associated to an Instance of the Region are routed independently, as if there were as many independent networks as the VLAN-Instances are.

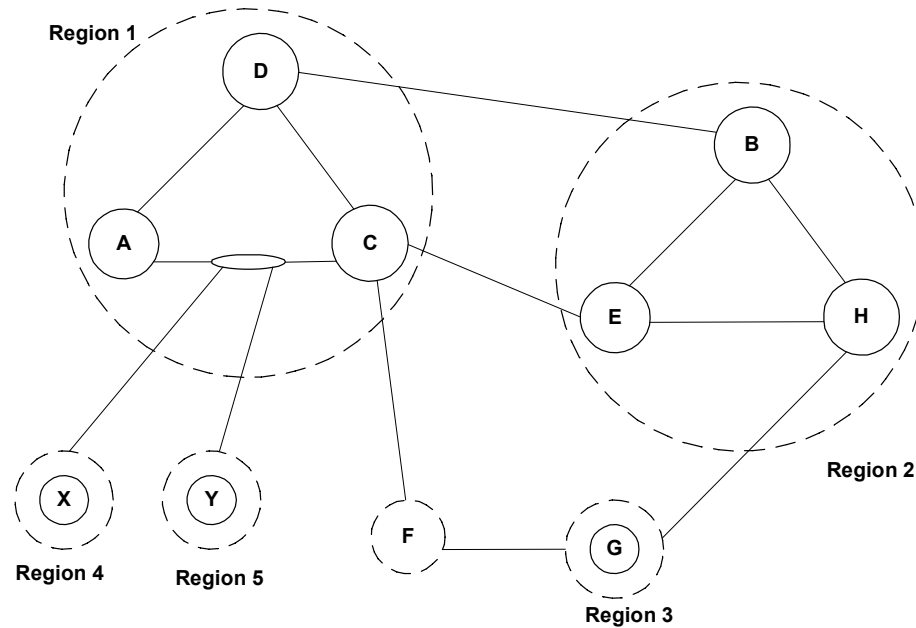
The parameters of one Port of an MSTP Bridge can be set in differentiated mode, for different MSTP Instances.

Furthermore, a Region of an MSTP network can be seen as a single Bridge whose Ports are those Ports that are connecting the Region with the other Region of the network.

An example of MSTP Bridge network and MSTID use is shown in [Figure 1-34 \(p. 1-46\)](#).

The setting of the MSTP parameters is done by means of the option “Configure Bridge Port”, described in [“Transmission: Ethernet Port: Bridge Port: Configure Bridge Port \(Virtual\)” \(p. 4-115\)](#), and subsequent ones.

Figure 1-32 MSTP Network topology example



MSTP TOPOLOGY Example

One Bridge in all the network is chosen as the CIST Root Bridge: that one having the lowest numerical Bridge Identifier of all the Bridges in the network.

One Bridge in each Region is chosen as the CIST Regional Root Bridge: that one having the lowest External Root Path Cost through a boundary Port.

Bridges A, C and D are in the same MST Region (Region 1) because they have the same “MST Configuration Identifier”.

Bridges B, E and H belong to Region 2 because they have the same “MST Configuration Identifier”, but different from those contained in Region 1.

Bridge G is in Region 3 because its “MST Configuration Identifier” is different from the Bridges contained in Region 1 and Region 2.

Bridge F is outside of any region, because it is not an MSTP Bridge (can be STP or RSTP).

Bridges X and Y are in different Regions, even though they had the same “MST Configuration Identifier”, because the LAN that connects them, e.g. by means of an hub, is in a different Region.

Region 1 and Region 2 can be seen, from the MSTP point of view, as “collapsed” single bridges, as illustrated in [Figure 1-33 \(p. 1-45\)](#).

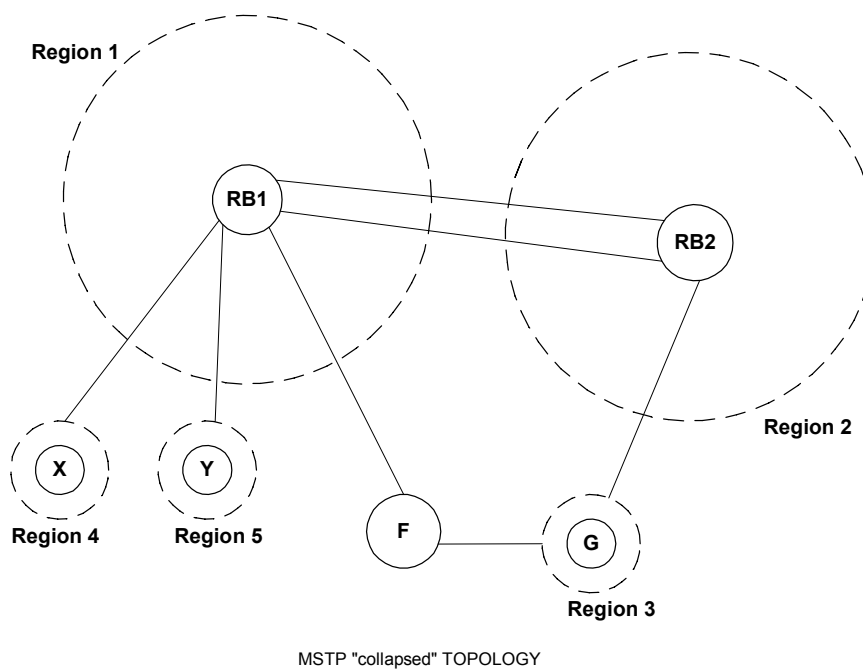
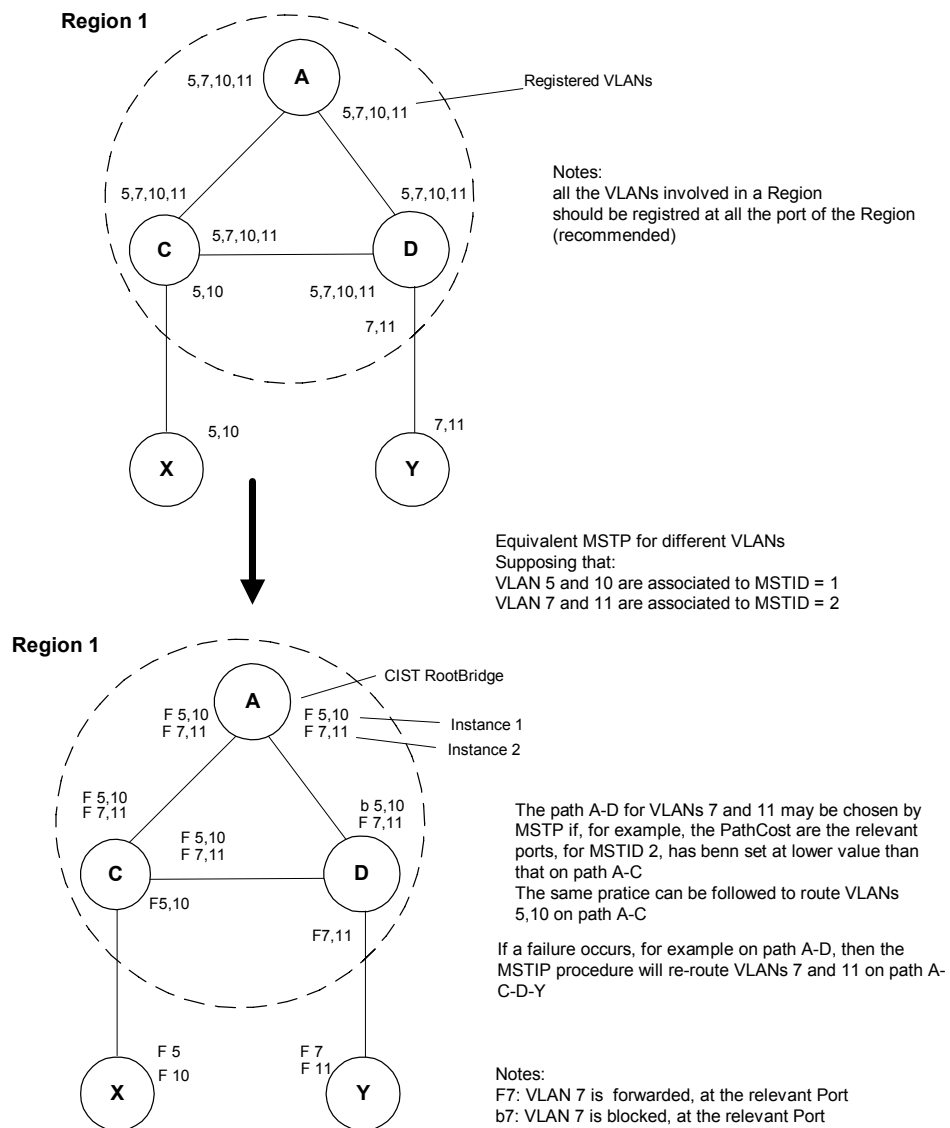
Figure 1-33 MSTP “collapsed” topology example

Figure 1-34 MSTP, VLAN differentiated routing example

Virtual Concatenation and LCAS

The ISA-ES system supports (at the SDH side) Virtual Concatenation and LCAS features.

The **Virtual Concatenation** consists in the fact that frames not fitting into a single SDH-container are transported over more individual containers, indicated with the symbol VCn-Xv (e.g. VC12-3v indicates the virtual concatenation of 3 VC12).

The original frame is paralleled “Time Slot-by-Time Slot” and loaded over different payloads.

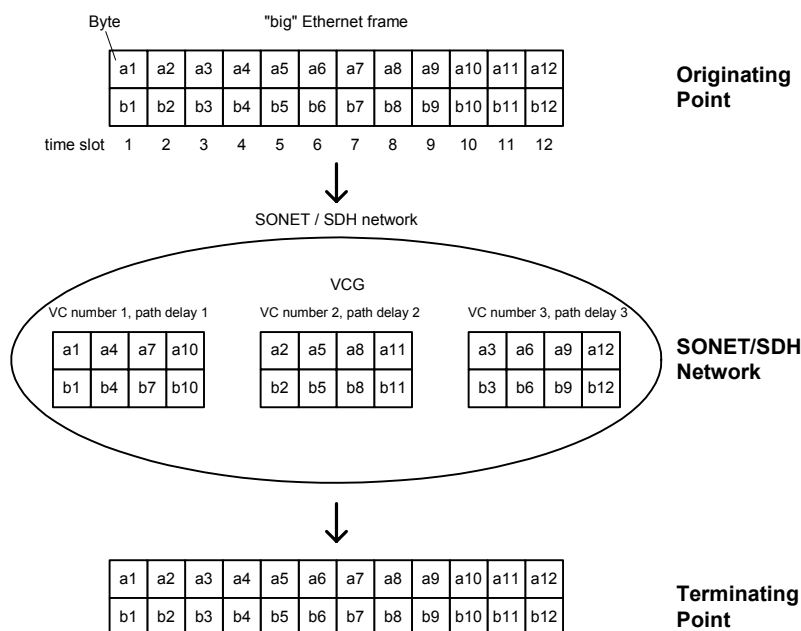
The individual containers can follow different paths in the network, with different delays, and they need to be reassembled at the end points, taking into account the different path delays.

This feature is compliant to ITU-T G.707 rec.

A schematic example is illustrated in the figure below (example with concatenation granularity = 3).

The **LCAS** feature (Link Capacity Adjustment Scheme) permits the operator to “hitless” modify the bandwidth capacity of a virtual concatenated link, in order to meet the bandwidth needs of the service (by adding or removing virtual containers in all the involved nodes of the network). It can also temporarily remove failed links of the group, in automatic and hitless mode. In case of failure or addition of links, the traffic is automatically redistributed over the working links. Reference: ITU-T G.7042 rec.

Figure 1-35 Virtual Concatenation (example)



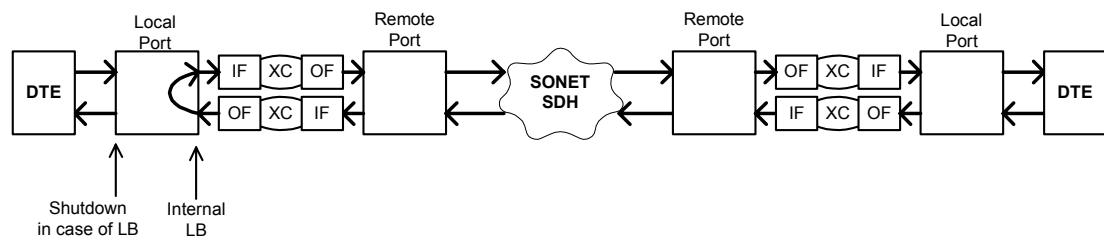
Internal Loop-Back management

The ISA-ES system supports the Internal Loop-Back feature, in order to check the network link integrity.

The loop-back configuration is done by means of “Configure (LOCAL) Ethernet Port”, see [“Transmission: Ethernet Port : Configure \(LOCAL\) Ethernet Port”](#) (p. 4-66).

The loop-back scheme is illustrated in the [Figure 1-36](#) (p. 1-48).

Figure 1-36 Internal Loop Back scheme



Note:

- The internal LB is possible only in case of Port-to-Port connection (P2P)
- LB = Loopback
- IF = InFlow
- OF = OutFlow
- XC = Cross-connection
- DTE = Data Terminal Equipment

CSF alarm management

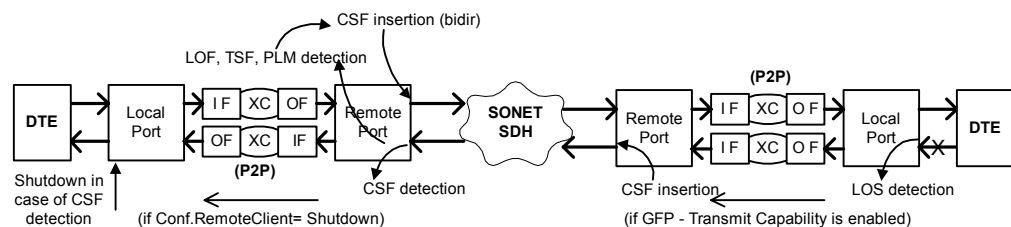
The ISA-ES system supports the CSF alarm management (Client Signal Fail), in order to indicate signal failure occurrences on Ethernet line or on network link. The CSF alarm is coded inside the GFP frame, in the “Type” bytes of the header.

The Shut-Down triggering (on local-port) can be enabled or disabled by means of “**Configure (LOCAL) Ethernet Port**”: MAU: “**Configure Remote Client**” = “shutdown”, see “[Transmission: Ethernet Port : Configure \(LOCAL\) Ethernet Port](#)” (p. 4-66).

The CSF is managed by means of “**Configure (REMOTE) Ethernet Port**”: GFP: “**TransmitCapability**”, see “[Transmission: Ethernet Port: Configure \(REMOTE\) Ethernet Port](#)” (p. 4-77).

The CSF can be managed using the “old G.7041 standard” (unidir and bidir) or the “new” G.7041 standard (unidir UPI-LOF and bidir UPI-LOF). The two functionalities are the same, but changing only the coding of UPI byte inserted into the GFP frame. UPI= User Payload Identifier. The CSF is inserted towards SDH network, if TransmitCapability is enabled, in case of LOS (“unidir”) or in case of LOS, LOF, TSF, PLM (“bidir”). The ShutDown on TX Local Port is carried out if “**Conf.RemoteClient**” = “shutdown”, on the same local Port. The CSF mechanism scheme is illustrated in [Figure 1-37](#) (p. 1-49).

Figure 1-37 CSF alarm management



CSF insertion modality:

(If GFP-TransmitCapability is enabled)

- UNIDIR (or Unidir UPI-LOF): CSF is inserted after LOS detection on connected Local Port.
- BIDIR (or Bidir UPI-LOF): CSF is inserted after LOS or LOF or TSF or PLM detection.

LocalPort TxShutDown: triggered by CSF detection, if Conf.RemoteClient = Shutdown

Note:

- The management of CSF alarm is possible only in case of GFP port type.

- The shut-down mechanism is possible only in case of Port-to-Port connection (P2P).
- IF = InFlow
- OF = OutFlow
- XC = Cross-connection
- DTE = Data Terminal Equipment

VC-AIS alarm management

The ISA-ES Data system supports the VC-AIS alarm management (Virtual Container - Alarm Indication Signal), in order to propagate Ethernet signal failure indications to the SDH systems. This option is possible only in case of GFP framing on server layer, in "Port-to-Port" connection. The VC-AIS insertion is unidirectional.

The VC-AIS alarm is coded inside the SDH frame header. The VC-AIS function is supported on 10/100 Mbps ports (also on 1000 Mbps port, in ES4E board).

The VC-AIS is managed by means of "**Configure (REMOTE) Ethernet Port**": "GFP" sector: "Transmit Capability" item (see [Figure 1-35 \(p. 1-47\)](#). and para. "[Transmission: Ethernet Port: Configure \(REMOTE\) Ethernet Port](#)" (p. 4-77)).

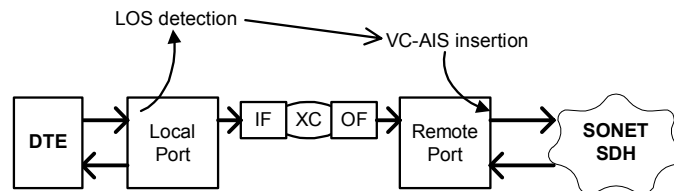
The "**Transmit Capability**" possible options are: "unidir"/ "bidir" / "Unidir VC-AIS"/ "disabled".

For this issue, the "Transmit Capability" parameter has to be set to "**Unidir VC-AIS**".

The AIS alarm will be inserted on the SDH transport containers, as a consequent action after local Ethernet Port failure (Ethernet LOS detection).

The other "Transmit Capability" options ("unidir"/ "bidir/ ... etc.") are relative to CSF alarm management (Client Signal Failure), described in "[CSF alarm management](#)" (p. 1-49). The VC-AIS mechanism scheme is illustrated in [Figure 1-38 \(p. 1-51\)](#).

Figure 1-38 VC-AIS alarm management



Note:

- The VC-AIS alarm is inserted on the SONET/SDH containers upon Ethernet LOS detection.
- The VC-AIS alarm insertion is uni-directional
- The ShutDown on local port must be disabled
- The Flow Control function on local port must be disabled
- The management of VC-AIS alarm is possible only in case of GFP server layer
- The management of VC-AIS alarm is possible only in case of Port-to-Port connection (P2P)
- IF = InFlow
- OF = OutFlow
- XC = Cross Connection
- DTE = Data Terminal Equipment

This option is obtained, after selecting a REMOTE EthernetPort, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “Configure Ethernet Port”.

An example of the window displayed (GFP sector) is reported in figure below.

For a correct working, follow the instructions noted below.



WARNING

The switch between GFP and LAPS framing type is done by means of “Transmission”: “Ethernet Port Management”: “Substitute Server Layer” menu option (when the REMOTE port is in down state).



WARNING

The Flow Control function must be disabled on LOCAL port (see “Port mirroring management” (p. 1-58)). This is done by means of “Transmission”: “Ethernet Port Management”: “Configure Ethernet Port”: MAU:: “DefaultPause” = “disabled”, “AutoNegotiation”- “AdminStatus” = “enabled”, “AutoNegotiation”- “LocalCapabilityOptions (current)” = “b10baseTFD” (in case of 10Mbps) / “b100baseTXFD” (in case of 100Mbps) / “b1000baseXFD” (in case of 1000Mbps). See Figure 1-40 (p. 1-53) for 10/100 Mbps case.



WARNING

The ShutDown function must be disabled on LOCAL port. This is done by means of “Transmission”: “Ethernet Port Management”: “Configure Ethernet Port”: “Conf.RemoteClient” = “disabled”; see Figure 1-40 (p. 1-53) and para. “Transmission: Ethernet Port : Configure (LOCAL) Ethernet Port” (p. 4-66).



WARNING

The TSF alarm visualization must be disabled on REMOTE port. This is done by means of the following steps:

- *Create a specific ASAP with TSF alarm cleared, by means of “Configuration”: “Alarms Severity”: “Create”; then selecting the TSF alarm and associate to it the “Severity” = “cleared”; then giving a name in the field “ASAP Identifier” (e.g. “TSF_cleared”).*
- *Associate this created ASAP to the remote port by means of “Transmission”: “Ethernet Port Management”: “Configure Ethernet Port”: “AsapName” = “TSF_cleared”.*

Figure 1-39 Configure (remote) EthernetPort: GFP: VC-AIS setting

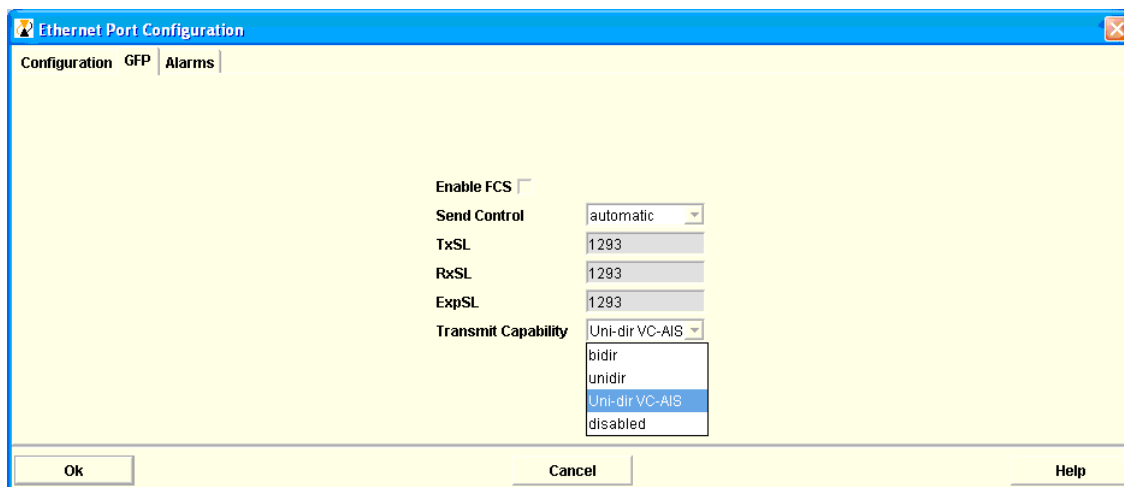
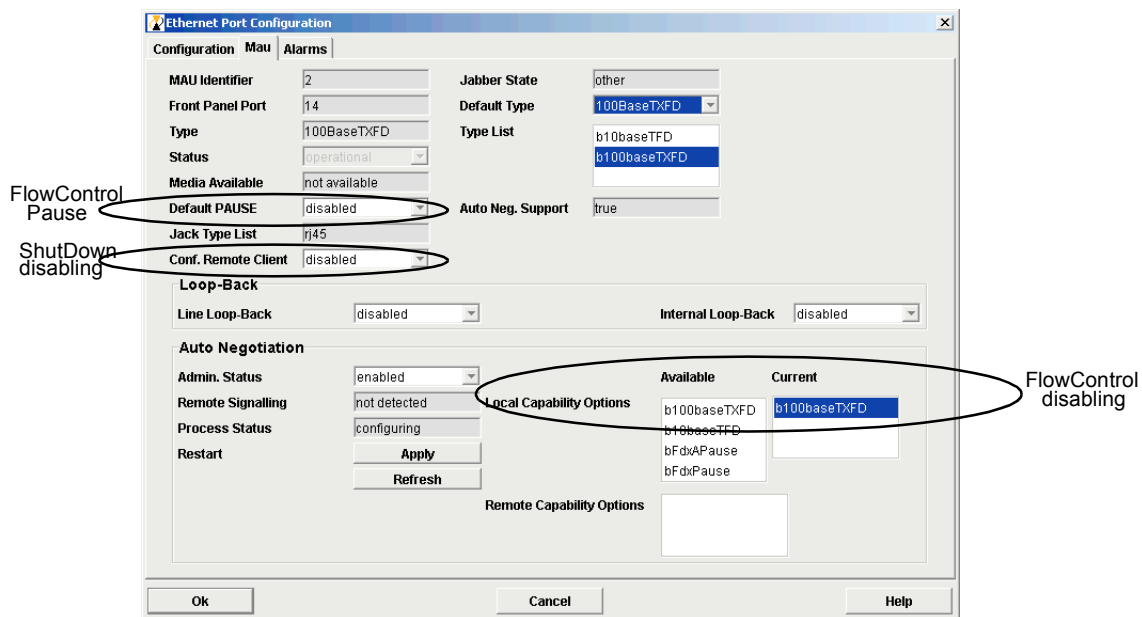


Figure 1-40 Configure (local) EthernetPort: MAU: FlowControl and ShutDown disabling



Auto-Negotiation management

The ES1/4 system supports the start up of a communication link by means of the Auto-Negotiation function. Possible only in Point-To-Point links.

AutoNegotiation is supported on electrical 10 Mbps and 100 Mbps (FE), and on optical 1Gbps interfaces (only on ES4N-enhanced board). It is not supported on optical 10/100-FE interface.

This function provides the capability, for an ethernet local interface, to advertise the interface connected at the far end about its transmission facilities (rate, Half Duplex or Full Duplex technology, etc.), and to detect the same information sent from the far end device.

In this way the two connected devices can communicate their transmission capabilities in order to determine if they are compatible. They can then establish the data transmission at the best conditions offered by their common technology.

For example:

- one interface can work at 10Mbps, 100Mbps-HD. (HD= Half Duplex)
- the other interface can operate at 100Mbps-HD, 100Mbps-FD. (FD= Full Duplex)

then the Auto-Negotiation algorithm will select the best capability common to the two connected devices, that is 100Mbps-HD.



WARNING

Half Duplex (HD) transmission mode is used in an area where several ethernet interfaces are interconnected and share the same LAN medium. Multiple and simultaneous attempts to access the same medium can occur, causing transmission interferences. The arising conflicts are managed by means of the CSMA/CD protocol.

Full Duplex (FD) transmission mode is used in a point to point connection, where only two ethernet interfaces are connected by means of a link segment, and they can transmit and receive simultaneously without transmission interferences.

The setting of the Auto-Negotiation function is done by means of the “Configure Local Ethernet Port” option, described in [“Transmission: Ethernet Port : Configure \(LOCAL\) Ethernet Port”](#) (p. 4-66). See also next [Figure 1-41](#) (p. 1-56).

Flow-control management

The ISA-ES Data system supports the Flow Control feature (FC). Only in Full Duplex transmission modality, and only in Port-To-Port links (P2P).

This function provides the capability, for an ethernet system, to advertise the system connected at the far end about its state of congestion. The receiving system, when starts to be congested, sends a special “Pause” MAC control frame (PF), in order to inform the far-end connected system to stop sending new frames for a given period of time. After this pause period the data transmission is continued.

The FC is initiated when the data rate of an ingress port exceeds the max bandwidth on the corresponding egress port.

FC can be Symmetric or Asymmetric:

- **Asymmetric FC:** the local system can generate PF towards peer ethernet system, but cannot support incoming PF: input PF are silently discarded.
- **Symmetric FC:** the local system can generate PF towards peer ethernet system. It supports also incoming PF: input PF are used to slow down the rate on the opposite direction of the link towards peer ethernet system.

For instance, FC starts when the rate on a local port exceeds the capacity of the corresponding Sdh-VC on the connected Remote Port.

In case of 1Gb Port (ES4E board), the FC is started also if the received rate exceeds the value set on “FractionalRate” (not available in current release).



WARNING

In occurrence of FlowControl enabled, the traffic Policing should be disabled.

The setting of the Flow Control function is done by means of the “Configure Local Ethernet Port” option, see [“Transmission: Ethernet Port : Configure \(LOCAL\) Ethernet Port”](#) (p. 4-66).

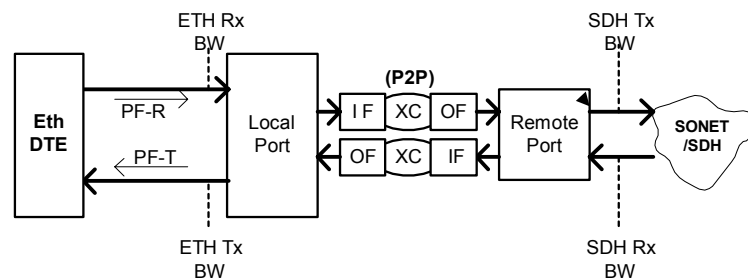
The “LocalPort-MAU Configuration” dialog window is also reported in next [Figure 1-42](#) (p. 1-57).

1. In case of AutoNegotiation disabled (i.e. with **AutoNegotiation: Admin.Status = ”disabled”**), the FlowControl is configured as follows:
 - Enabling: select, in “**Default Pause**” item: “**asymmetric**” or “**symmetric**” options
 - Disabling: select, in “**Default Pause**” item: “**disabled**”
2. In the case of AutoNegotiation enabled (i.e. with **AutoNegotiation: Admin.Status = ”enabled”**). In this case the above said “**Default Pause**” item is not considered and the FlowControl is configured as follows:

- FlowControl enabling:
 - for **100Mbps** case, **Asymmetric FC**:
 - select, in **Local Capability Options**, in the “**available**” field, the following 3 items: “*b100baseTXFD*”, “*bFdxAPause*” and “*bFdxPause*”.
 - for **100Mbps** case, **Symmetric FC**:
 - select, in **Local Capability Options**, in the “**available**” field, the following 3 items: “*b100baseTXFD*”, “*bFdxSPause*” and “*bFdxPause*”.
 - for **10Mbps** case, **Asymmetric FC**:
 - select: “*b10baseTFD*”, “*bFdxAPause*” and “*bFdxPause*”.
 - for **10Mbps** case, **Symmetric FC**:
 - select: “*b10baseTFD*”, “*bFdxSPause*” and “*bFdxPause*”.
 - for **1000Mbps** case, **Asymmetric FC**:
 - select: “*b1000baseXFD*”, “*bFdxAPause*” and “*bFdxPause*”.
 - for **1000Mbps** case, **Symmetric FC**:
 - select: “*b1000baseXFD*”, “*bFdxSPause*” and “*bFdxPause*”.
- Flow Control disabling

Select, in **Local Capability Options**, in the “**available**” field, only the following one item: “*b100baseTXFD*” (100Mbps case). In case of **10Mbps**: “*b10baseTFD*”. In case of **1000Mbps**: “*b1000baseXFD*”.

Figure 1-41 Flow Control scheme

**Asymmetric FC:**

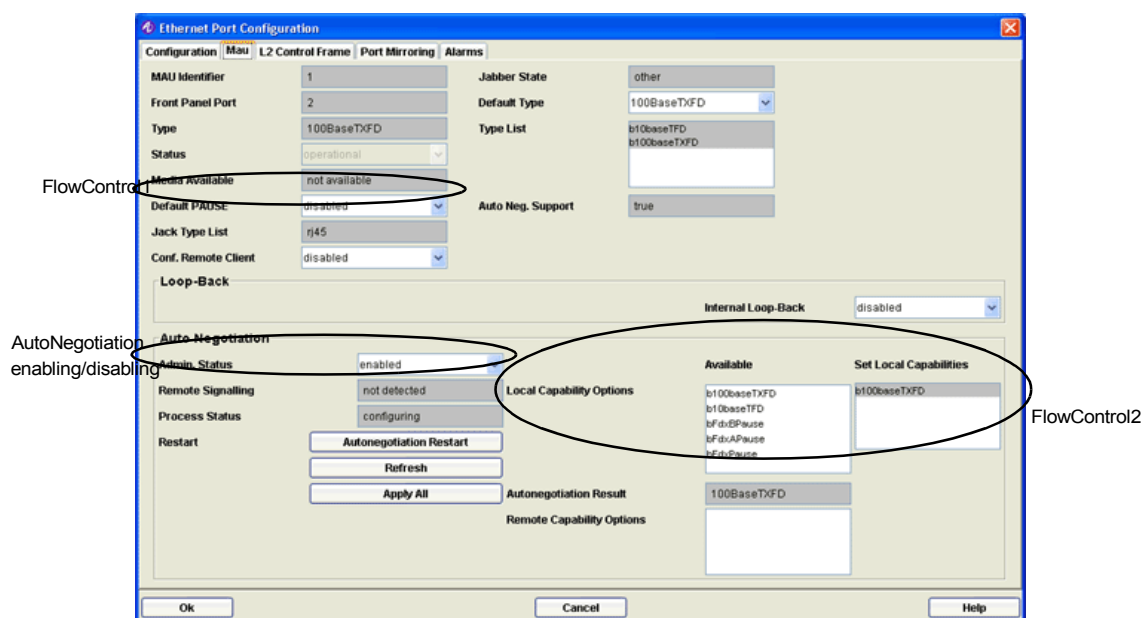
- $\text{EthRx-BW} > \text{SdhTx-BW} \Rightarrow \text{PF-T}$ are generated to slow down Eth-DTE rate
- $\text{EthRx-BW} > \text{SdhTx-BW} \Rightarrow \text{PF-R}$ are silently discarded by LocalPort

Symmetric FC:

- $\text{EthRx-BW} > \text{SdhTx-BW} \Rightarrow \text{PF-T}$ are generated to slow down Eth-DTE rate
- $\text{EthRx-BW} > \text{SdhTx-BW} \Rightarrow \text{PF-R}$ are accepted by LocalPort and the Tx-rate towards Eth-DTE is slowed down

Note:

- The FlowControl is supported only in case of Port-to-Port Connection (P2P)
- The Traffic policing should be disabled, in case of FC enabled.
- IF = InFlow, OF = OutFlow, BW = Bandwidth
- PF-R = Pause Frame received
- PF-T = Pause Frame transmitted
- XC = Cross-Connection
- DTE = Data Terminal Equipment

Figure 1-42 Configure (local) EthernetPort: MAU: FlowControl setting**MAU - 10/100 FE Port**

Port mirroring management

Description

This function is activated in “Transmission” context, in the “Configure Ethernet Port (Local)” window, see [“Transmission: Ethernet Port : Configure \(LOCAL\) Ethernet Port”](#) (p. 4-66).



WARNING

It is not supported on Remote Ports, and on Link Aggregations, and LAG-Ports.

It is not supported on GE Port (ES4E board).

It is not supported on ES1-3FE board.

The function of this option is to create a copy of the traffic over a port in service. The copy of this traffic is sent to another port, without affecting the services alive on the original port.

The adding or removing of mirroring ports does not affect the in-service traffic.

LAG ports can not be mirrored.

This feature can be used for testing or analysis of the traffic on a port.

Mirroring can be done either on received or on transmitted traffic, but only one direction of only one port at a time can be mirrored. The traffic direction on the “copy” mirror-port is always outgoing.

An illustrative example is reported in [Figure 1-43](#) (p. 1-59).

The ES1/4 system provides some pre-defined ports (mirror-port) dedicated for mirroring the other ports, in the following combinations:

ES1-8FE and ES1-8FX:

input or output Local Ports 9 to 15 ==> mirrorable on mirror-port 16



WARNING

Only one single direction of one single port at a time can be mirrored over a mirror-port.

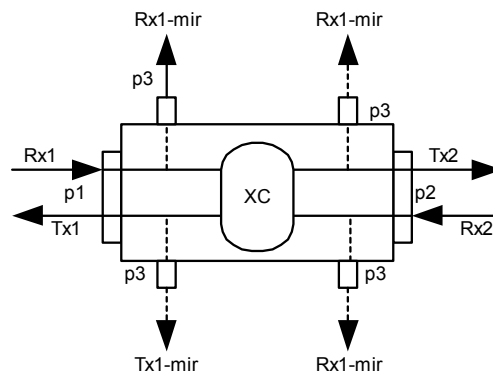
ES4E:

input or output Local FE Ports 3 to 5 ==> mirrorable on mirror-port 6 (GE Local Port 1 and Port 2 can not be mirrored)



WARNING

Only one single direction of one single port at a time can be mirrored over a mirror-port.

Figure 1-43 Port mirroring example

Traffic Rx1 on port **p1** is mirrored on port **p3**, or

Traffic Tx1 on port **p1** is mirrored on port **p3**, or

Traffic Tx2 on port **p2** is mirrored on port **p3**, or

Traffic Rx2 on port **p2** is mirrored on port **p3**

Note: Port **p3** is the unique mirror-port, this example illustrates that **p3** can be used for mirroring different ports and different directions, but in **mutually exclusive mode**.

Management software

The transportation of Ethernet frames is achieved by integrating the necessary hardware and software functions into the SDH Network Elements.

The software related to the Ethernet Switch (ES) management provides a human interface permitting the Operator to manage the relevant functions. The human interface can be integrated on a Personal Computer representing the ES Craft Terminal (ES-CT), or on a Work Station representing the ES Operations System (ES-OS).

ES-CT is installed on a Common Platform CT, and ES-OS is installed on a Common Platform OS.

The Alcatel-Lucent-NE's management is based on a software platform, common to all the transport equipment, resulting on the NES operator interface (Network Elements Synthesis); the description of the NES interface and some generic procedures, common to all the Alcatel-Lucent-NE's, are reported on 1320CT Operator Handbook, listed in [Table 1, \(pg. 1-xix\)](#); the hardware configuration, features and functionalities of Alcatel-Lucent Network Elements supporting ES services are described in the relevant Technical Handbooks, listed in [Table 1, \(pg. 1-xix\)](#); the SDH traffic management by means of the SDH-CT is described in the relevant OMSN-CT Operator Handbooks, listed in [Table 1, \(pg. 1-xix\)](#).

The ES management by means of the OS is described in the relevant TMN Operations System Operator's Handbooks.

The aim of this handbook is to illustrate the operational procedures to access and to handle the Ethernet traffic by means of the ES-Craft Terminal (ES-CT).

The ES-CT permits to manage the functions and the parameters relevant to the ES service, such as:

- signal rate, bandwidth, interface type, traffic contract, cross-connections, manual and automatic switching, alarms, performance monitorings, etc.

The ES traffic and network management signaling inside the existing SDH network is accomplished by means of a dedicated communication protocol, as indicated in [“Ethernet over SDH Management” \(p. 1-62\)](#).

The provided CT software needs a WINDOWS computer operating environment. The operator's interface is organized in a WINDOWS system. A skill on these tools is required on behalf of the user.

The CT Common Platform (i.e. 1320CT) software package has to be already installed, before installing the ES-CT.

The software product is distributed by Alcatel-Lucent in a CD-ROM.

This CD-ROM contains:

- Software products for management by means of the craft terminal
- Software product for updating the NE (download)

The software products used for management permits the dialog between the Craft terminal and the NE, to realize the functions of the applications as configuration, alarms management, etc.

The software product used for updating the NE must be installed on the PC and then downloaded on the NE, thus following product evolution. The download of the NE is done in the SDH-CT environment, therefore the relevant download operations are reported in the specific OMSN-Operator Handbook

The list with the part numbers of the software product relevant to ES service is reported in [“Software product and licenses description” \(p. 2-2\)](#).

Ethernet over SDH Management

The management of SDH equipment is organized as required by the 7-layers ISO/OSI protocol stack, while the Ethernet, MPLS and ATM equipment (ISA) are usually managed by means of SNMP (Simple Network Management Protocol), that is an application of the 5-layers TCP/IP reference model.

By carrying the Ethernet traffic over the SDH network structures there is the need to manage together and contemporarily SDH and Ethernet equipment; this function is accomplished by means of the encapsulation of SNMP messages inside the OSI layers ("IP over OSI tunneling"). In this way the Ethernet management information is transported over the existing SDH networks.

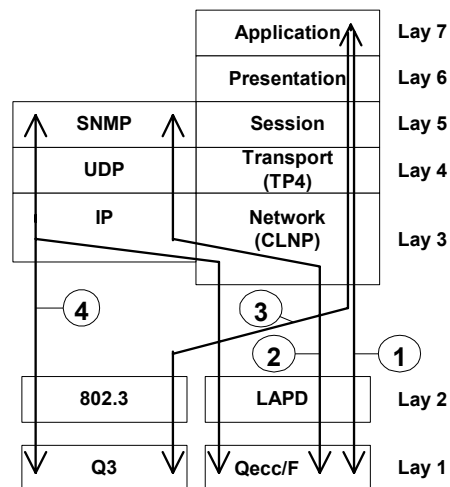
The various protocols relations are illustrated in [Figure 1-44 \(p. 1-62\)](#).

An example of Ethernet/MPLS/SDH network management is shown in [Figure 1-45 \(p. 1-63\)](#).

In this example, the OS enters the network management messaging over an Ethernet link (IEEE-802.3 protocol) of a Gateway NE (GNE); here the messages are transported over the optical Qecc links by means of the LAPD protocol; at the remote managed nodes, the messages are acknowledged as belonging to:

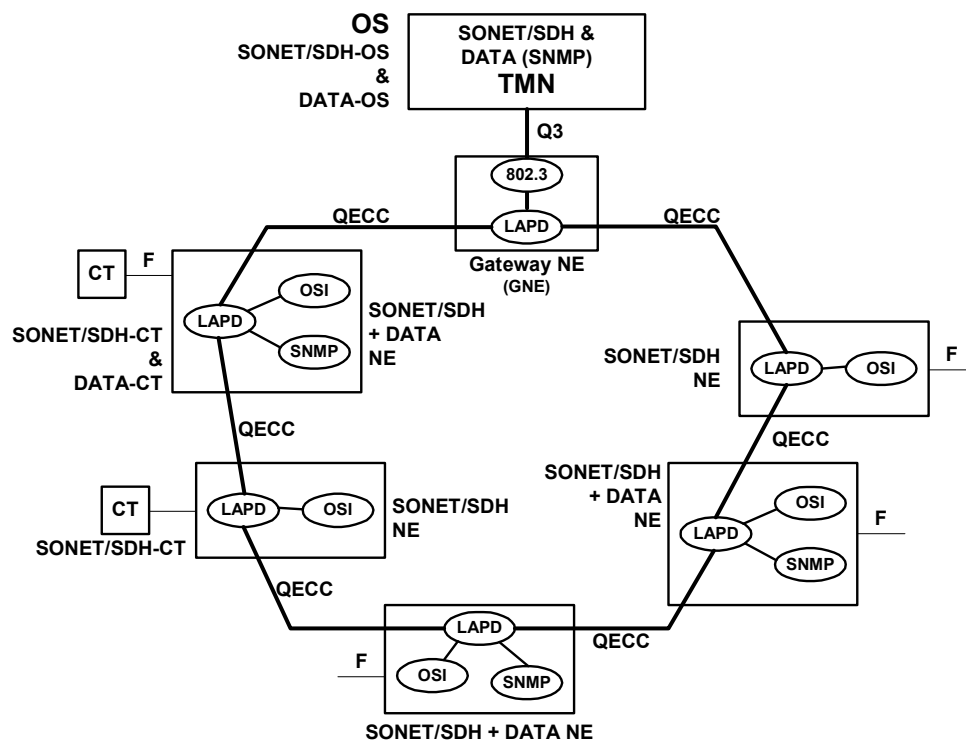
- OSI reference model, for SDH management
- TCP/IP (SNMP) reference model, for Ethernet, ATM and MPLS management

Figure 1-44 Protocol stack for ATM/MPLS/Ethernet over SDH management

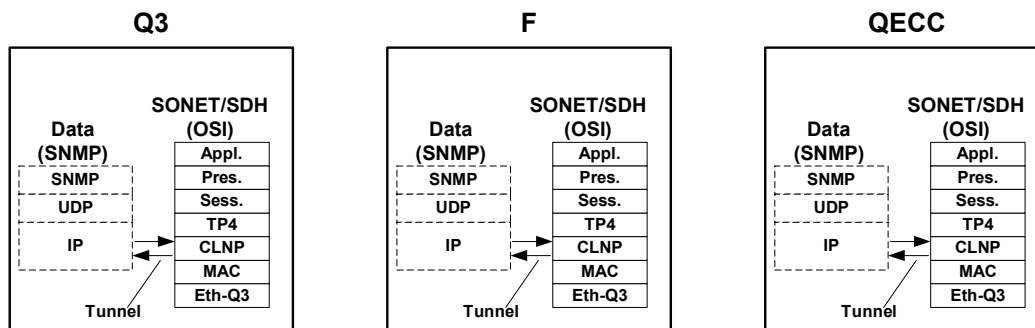


1. OSI stack for SDH management (F/Qecc Interface)
2. IP over CLNP tunneling for iSA management (F/Qecc Interface)
3. OSI stack for SDH management (QB3/Qecc Interface)
4. IP over CLNP tunneling for iSA management (GNE entry from OS, IEEE-802.3)

Figure 1-45 Example of management of an SDH network with SDH and ES traffic



Protocol stack at different interfaces:



Note:

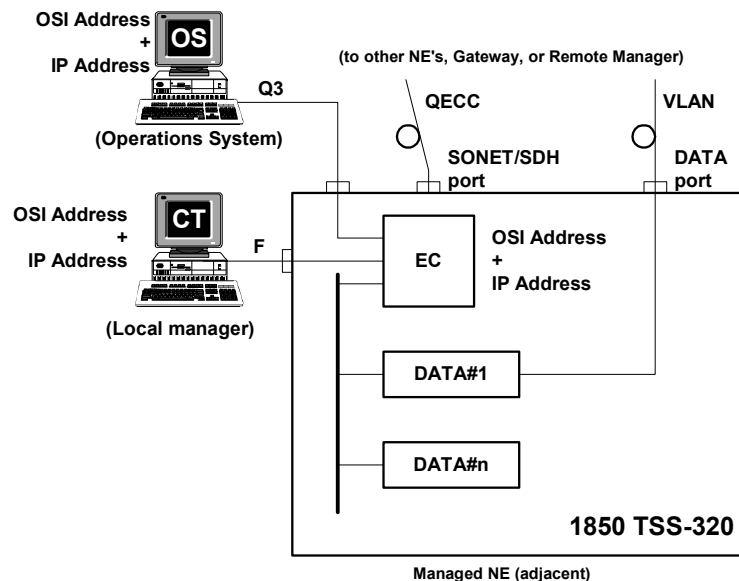
- The tunnel IP over CLNP is initiated inside the Manager (CT or OS) and terminated at the destination NE, in order to carry SNMP management messages into the SDH network.
- The SNMP messages are tunneled in the NE's where the message is not to be opened

Important! In order to transfer the management information, the involved entities need an OSI address (for the ISO/OSI information messages) and an IP address (for the SNMP information messages). In particular:

- the CT (personal computer, local manager or craft terminal) needs to be associated to an OSI address and to an IP address. The OSI address is assigned by means of the Alcatel-Lucent Lower Layers Manager (ALL) application; the IP address assignment is done in the WINDOWS environment by means of the "Network" application of the "ControlPanel". Refer to the 1320CT Basic Handbook listed in [Table 1, \(pg. 1-xix\)](#) for these operations.
- the EC (Equipment Controller board of the NE) needs to be associated to an OSI address and to an IP address. The OSI address and IP address are assigned by means of the SDH-CT application ("Configuration: Comm/Routing:..." options). Refer to the OMSN Operator's Handbook listed in [Table 1, \(pg. 1-xix\)](#) for these operations.
- the ISA board needs to be associated to an IP address. The IP address is assigned by means of the SDH-CT application ("Configuration: Comm/Routing:..." options). Refer to the OMSN Operator's Handbook listed in [Table 1, \(pg. 1-xix\)](#) for these operations.

An illustrative example is reported in [Figure 1-46 \(p. 1-64\)](#).

Figure 1-46 OSI and IP addressing example



ES-CT main management menus

The main menus presented by the ES Craft Terminal are the following:

1. Supervision

It permits to manage the access to the ES functions from the various levels of management.

2. Configuration

It permits to manage the configuration of the following functions:

- Alarms Severities Assignment Profiles (ASAP)
- Threshold data table setting for Performance monitoring
- Traffic contract descriptor setting.

3. Diagnosis

It permits to open the Alarms Surveillance (AS) application.

4. MIB Management

It permits to save/load the MIB (data base) of the ES functionality configurations.

5. Transmission

It permits to manage the functions related to the Transmission domain:

- creation, configuration, modification and deletion of the ES resources (ES-Node, Ethernet-Ports, in/outFlows, Classifiers, etc.).

6. Connection

It permits to manage the functions related to the Connection domain:

- creation, configuration, modification and deletion of the links, cross-connections on ISA-ES.

7. Performance Monitoring

It permits to manage the functions related to the Performance domain:

- configuration, modification and deletion of data collections related to the Performance Monitoring (PM) on the ES resources.

2 Software product and licence



Overview

Purpose

This chapter describes the software packages list, the software licenses list, and their relevant part-numbers.

Contents

This chapter provides information on the following topics:

Software product and licenses description	2-2
Software products, licenses and part numbers	2-3

Software product and licenses description

Overview

The software products are distributed by Alcatel-Lucent in a CD-ROM.

This CD-ROM contains:

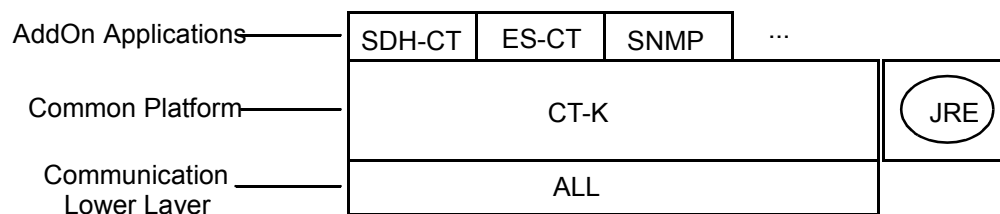
- Software packages for ES management by means of the craft terminal
- Software packages to be downloaded into the NE (by means of the download function)

The software package used for management permits the dialog between the ES-CT and the NE, to configure all the ES functions. The overall generic structure of the Alcatel-Lucent Management Software is illustrated in [Figure 2-1](#) below.

The software package used for updating the NE must be installed on the PC and then downloaded on the NE, thus following product evolution. The download on the NE is done in the SDH-CT environment, therefore the relevant download operations are reported in the specific-NE Operator Handbook.

Alcatel-Lucent, typically, offers several software licenses for the software product. They are referred both to the Network Element software features and to the Craft Terminal software features.

Figure 2-1 Management software, generic structure



JRE: Java Running Environment

CT-K: Craft Terminal Kernel

ALL: Alcatel-Lucent Lower Layer

Software products, licenses and part numbers

The Software Product is identified by a denomination and one or more part numbers, as listed on the following table.

Table 2-1 Software product part numbers

Denomination	ANV Part Number	Factory Part Number	Note
SWP-ES4E R.1.5 (CD-ROM)	8DG 15324 AA	-.-.-	

In order to use the above software product, one or more software licenses may be requested.

Every Software license is identified by a denomination and a part number, listed in the following table.

Table 2-2 Software licenses part numbers

Name	ANV Part Number	Factory Part Number	Note
SWL-OMNSN METRO Vers. “A” ETH LP	8DG 15540 AB	-.-.-	a
SWL ENH ETH (ES4E): OAM,LAG, IGMP	8DG 15540 AF	-.-.-	c

Note:

- a. To be used for OMSN and ES functionalities
- b. To be used for ES4E “enhanced” functionalities

Note: This product includes software developed by the Apache Software Foundation (<http://www.apache.org>).

3 ES software installation



Overview

Purpose

This procedure describes how to install the software required by the ES-Craft Terminal and how to de-install it, if necessary.



WARNING

The figures included in this chapter are only examples, in order to explain the installation procedures. In the real installation, some version/edition/release numbers inside the windows may be different, but the procedure is the same.

Contents

This chapter provides information on the following topics:

Software version	3-2
Start-up of the personal computer	3-3
Host computer configuration	3-4
Summary procedure for ES software installation	3-6
ES-CT Installation procedure	3-8
NE-ES package installation procedure	3-29
Software Uninstallation procedure	3-34
NE-ES software downloading	3-37
Start-up of the ES craft terminal management software	3-40

Software version

Description

The edition of this Handbook refers to the features of ISA-ES product developed in **MPLS ES4E FAST ETH 1.5.9** (CT_ES1-sw) that are the released versions for **ISA-ES4E** Rel. 1.5 (see next figure).

The ES4E file descriptor version is ES4E_DSC = 1.5.19 (NE_ES4E-sw)

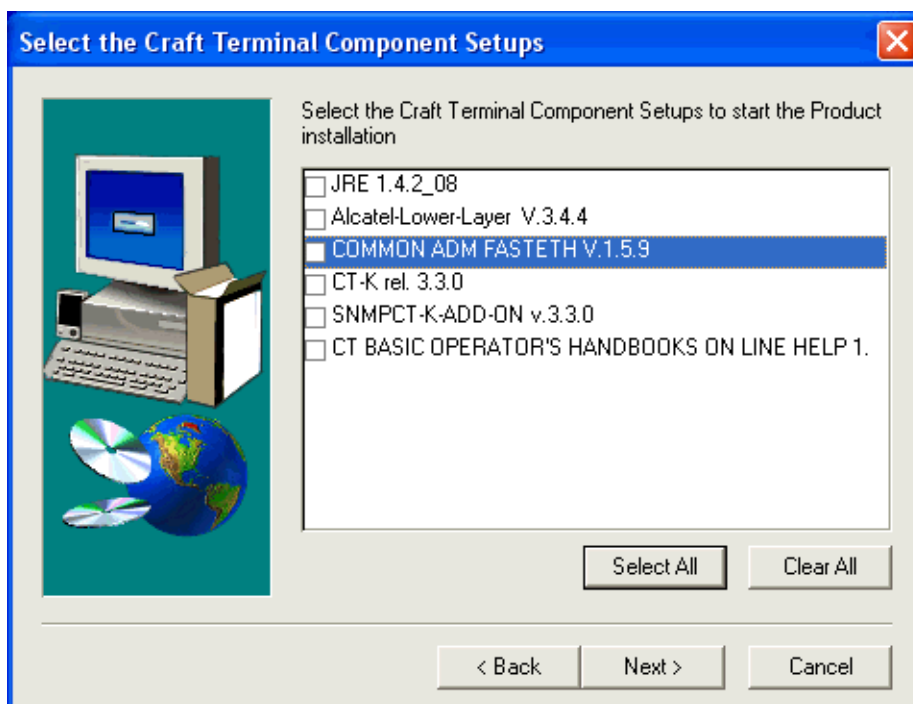
The USM version is FASTETH V1.5.22.



WARNING

In some subsequent figures of this document, software version numbers may be different, since they can have been derived by previous releases of this handbook, but they are to be considered as mere illustrative examples.

Figure 3-1 Craft terminal components versions



Start-up of the personal computer

Overview

The PC is started by means of the relevant switch.

**WARNING**

Administrator privileges for WINDOWS environment are needed, to install and de-install the ES-CT software package.

**WARNING**

The Alcatel-Lucent Craft Terminal Common Platform (i.e., 1320CT) software package already installed is needed, before starting the installation of the ES-CT software package.

At this point, the Windows application starts automatically and the operator will see the Windows desktop.

Host computer configuration

Description

The configuration of the Personal Computer hosting the ES Craft Terminal is the same as the configuration for Alcatel-Lucent Craft Terminal Common Platform (i.e. 1320CT). See the 1320CT Basic Handbook [listed in [Table 1 \(p. xix\)](#)] for details about this issue.



WARNING

The IP address assignment to the host computer (PC) is necessary, before using the ES-CT; the procedure to assign this IP address is reported into the 1320CT-Basic Handbook listed in [Table 1 \(p. xix\)](#); the steps to verify that the IP address to the PC has been assigned are recalled in the following paragraph.



WARNING

If, for any reason, the IP address is changed, the following customization WINDOWS command is necessary: "Start->Programs->Alcatel->SNMPCT-K-ADDON->SNMP-AddOn Customization".



WARNING

If a previous ES-CT version is installed, then the following system Backup from WINDOWS environment is suggested: "Start->Programs->Alcatel->1320CT Backup&RestoreTools->SystemBackup" (see 1320CT Operator Handbook listed in [Table 1 \(p. xix\)](#) for details).

Verification of IP address assignment for the host computer



WARNING

The following procedure is here described only for WINDOWS-NT environment, but for WINDOWS-XP or others it is similar; refer to 1320CT Basic Handbook listed in [Table 1 \(p. xix\)](#) for details.

1. Verify that the "LLman Lower Layers" adapter is installed:
 - a. In WINDOWS environment: "Start>Setting>ControlPanel"
 - b. In the Control Panel view, start the "Network" application
 - c. In the Network view, open the "Adapters" folder
 - d. In the Adapters folder, verify that the item "LLman NIC LowerLayerAdapter" is listed
2. Verify that the IP address to the PC is assigned:
 - a. In WINDOWS environment: "Start>Setting>ControlPanel".

-
- b. in the Control Panel view, start the “**Network**” application
 - c. in the Network view, open the “**Protocols**” folder
 - d. in the Protocols folder, select the item “**TCP/IP Protocol**” and then click on the key “**Properties**”
 - e. in the opened “properties” window, in the “**Adapters**” pull-down menu, select the item “**LLman NIC LowerLayerAdapter**”
 - f. in the IP address fields, verify if the IP-address and related mask are already assigned

If any of the above features is not verified, refer to 1320CT Basic Handbook [listed in [Table 1 \(p. xix\)](#)] for the Alcatel-Lucent Lower Layer manager installation and for the IP address assignment.

Summary procedure for ES software installation



WARNING

*Before starting the SW installation, verify that the USM-CT SW (on PC) and the NE-SW (on the equipment) are **aligned**, else provide to align them by installing, on the PC, the appropriate CT-SW that can handle that NE release (see 1320CT Basic Handbook listed in [Table 1 \(p. xix\)](#) for details).*

The following steps have to be done, mainly, for ES software installation:

1. Installation of 1320CT and SDH-CT packages, see 1320CT Basic Handbook listed in [Table 1 \(p. xix\)](#) (see also note below).
2. Installation of SDH-NE software package into the PC, see 1320CT Basic Handbook listed in [Table 1 \(p. xix\)](#).
3. Download of SDH-NE software into the NE, see the specific OMSN Operator's Handbook listed in [Table 1 \(p. xix\)](#).
4. Installation of ES-CT, see para. “[ES-CT Installation procedure](#)” (p. 3-8).
5. Installation of ES-NE software package into the PC, see para. “[NE-ES package installation procedure](#)” (p. 3-29).
6. Download of ES-NE software into the NE, see para. “[NE-ES software downloading](#)” (p. 3-37).
7. Activation of the ES-NE software into the NE, see para. “[Start-up of the ES craft terminal management software](#)” (p. 3-40).



WARNING

*In case of **OMSN migration** from a release to another one (for instance from [Rel. 4.3 to 4.4](#)), the presence of the previous release of SDH-USM software package (see 1320CT Operator Handbook) is necessary, in order to download the new software release, otherwise the equipment-SW and the CT-SW are not aligned and the equipment cannot be supervised anymore. Hence the operator is recommended to **keep the previous release of the SDH-USM**, until the actual SW-package will be downloaded into the equipment.*

**WARNING**

*In case of **OMSN migration** to a new (never used before) release containing a new “ADD-ON” (Service Specific packet such as the ES-swp), from an old release containing another service packet (for instance an ATM-swp), the download of the software into the NE must be done in two steps:*

- *First step downloading the new SDH packet associated with the known service packets [e.g.: enhanced OMSN with ATM, see also para. “NE-ES package installation procedure” (p. 3-29)].*
- *Second step downloading the new SDH packet associated with the new service packet (e.g.: enhanced OMSN with ES).*

**WARNING**

*In case of **OMSN UPGRADE** from an OLD release to a NEW release that is not consecutive, the download of the software into the NE must be done in two steps:*

- *First step: the release of the software into the NE and the release of the CT must be aligned (i.e., if the CT is in current release, it must be downgraded, thus installing the CT aligned to the NE software resident into the NE); in these conditions the new SW_package can be downloaded and activated, using the old CT.*
- *Second step: instal the new CT release and access the NE. If the Data Service board (ES) was not present in the old release, then download the new SDH packet associated with the new service packet (e.g.: enhanced OMSN with ES).*

**CAUTION**

All installations must be done on the same disk partition of the host Personal Computer.

ES-CT Installation procedure

Description

The software of the ES Craft Terminal is contained in a Compact Disk (CD-ROM), supplied by Alcatel-Lucent.

The part number of this product is reported in “[Software products, licenses and part numbers](#)” (p. 2-3).

As an alternative it can be received from an Internet distribution Alcatel-Lucent Service site, managed by Alcatel; in this latter case the installation can be slightly different from this following procedure.



WARNING

Every Craft Terminal application (NES, ES-CT, EML-USM, etc.) must be closed, before starting the installation.



CAUTION

In order to guarantee the correct operations, all the Craft Terminal (SDH and ES) software packages must be installed in the same PC disk partition.

Important! This product includes software developed by the Apache Software Foundation (<http://www.apache.org>).

The sequence of the installation procedure will be different, according to software and selection conditions:

- First installation, without ES-CT software previously installed in the PC
- Installation with ES-CT software of previous or same version already installed in the PC.

These differences will be explained.

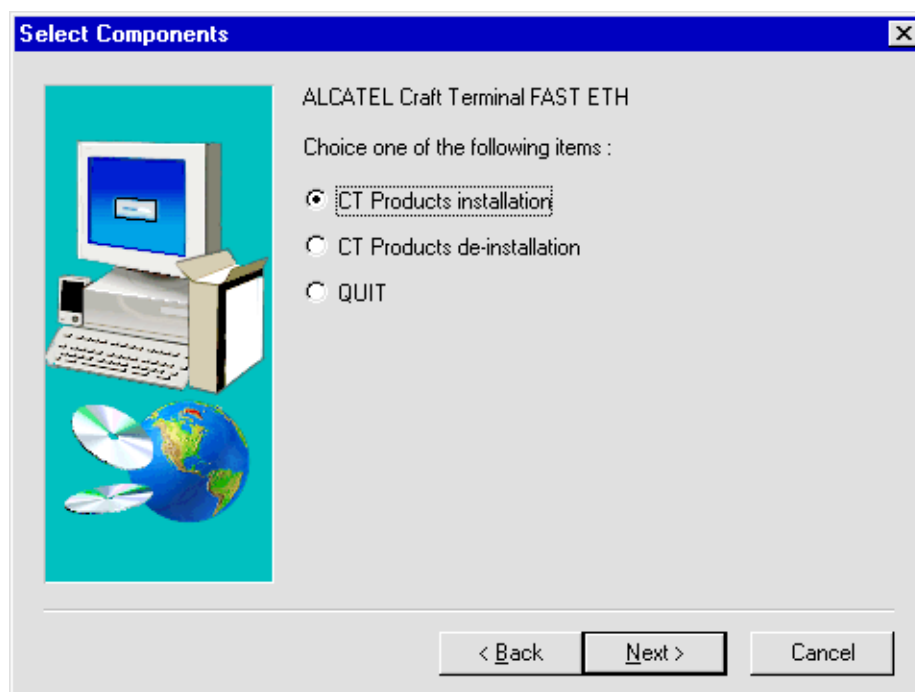
To install the ES-CT software execute the following operations:

1. Insert the CD-ROM disk into the CD-ROM drive (example E:).
2. The installation program automatically starts and after an intermediate screen shown in [Figure 3-2 \(p. 3-9\)](#), the window of [Figure 3-3 \(p. 3-9\)](#) will appear:

Figure 3-2 Initial presentation intermediate screen



Figure 3-3 Selecting installation procedure (1st step)



Note: The **Back** button permits to go back to the previous window; the **Cancel** button permits to abort the present window: these functions are the same in all the screens where they are present.

3. Refer to [Figure 3-3 \(p. 3-9\)](#). The above view permits to select the following options:

- Installation of the ES-CT software product: “**CT Products installation**”.

- The “**CT Products de-installation**” option is not operative.

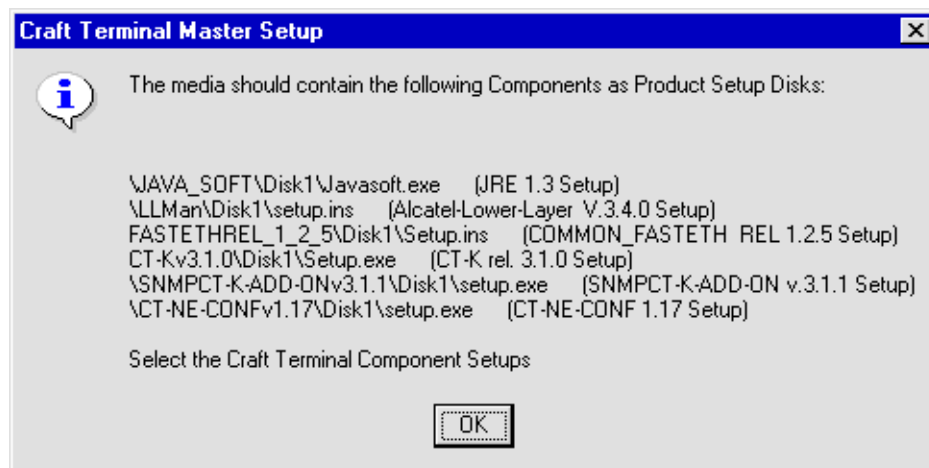
The uninstallation of the application has to be done in the Windows-NT environment, see instructions at para. “[Software Uninstallation procedure](#)” (p. 3-34).

- “**Quit**”, to exit the installation procedure.

In this phase select the first option (**CT Products installation**).

Then click on **Next** button, to access the next dialog box shown in [Figure 3-4 \(p. 3-10\)](#).

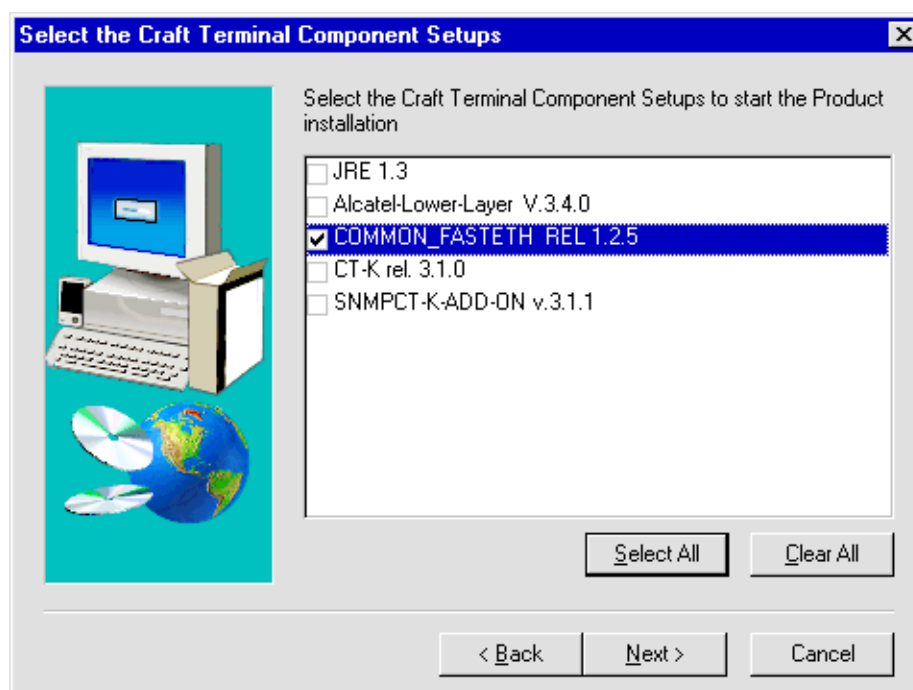
Figure 3-4 Craft Terminal master setup, list of detected Components on the media



4. Refer to [Figure 3-5 \(p. 3-11\)](#). The screen lists the installed Software Components detected.

Click **OK** to have the next dialog box:

Figure 3-5 Selecting Craft Terminal components (1st step)



5. Refer to [Figure 3-5 \(p. 3-11\)](#). This view permits to select the software components to be installed. They are:
- **JRE** (Java Runtime Environment, to support java software procedures)
 - **Alcatel-Lower-Layer V...** (to manage the interfaces communication between the computer and the Network Element)
 - **COMMON_FASTETH_REL...** (supporting ES management functionality)
 - **CT-K rel...** (to support the 1320CT Craft Terminal Common Platform)
 - **SNMPCT-K-ADD-ON v...** (Add-on software to manage the SNMP communication)

**WARNING**

*The procedures to install the components **JRE**, **Alcatel-Lower-Layer** and **CT-K** are the same as described in the 1320CT Basic Handbook [listed in [Table 1 \(p. xix\)](#)], therefore they are not described in this manual; refer to the 1320CT Basic Handbook [listed in [Table 1 \(p. xix\)](#)].*

**WARNING**

*As regards the **CT-K component**, the most recent version is recommended to be installed, after comparing the installed version and the one contained in current package (see also the following note).*

**WARNING**

*In case of CT-K upgrading, the system **Backup** from WINDOWS environment is recommended: “Start->Programs->Alcatel->1320CT Backup&RestoreTools->SystemBackup” (see 1320CT Operator Handbook listed in [Table 1 \(p. xix\)](#) for details).*

**WARNING**

The installation can be done by selecting more than one or all the components together, in this window, or selecting only one of them at a time; in general, the installation of one component at a time is advisable.

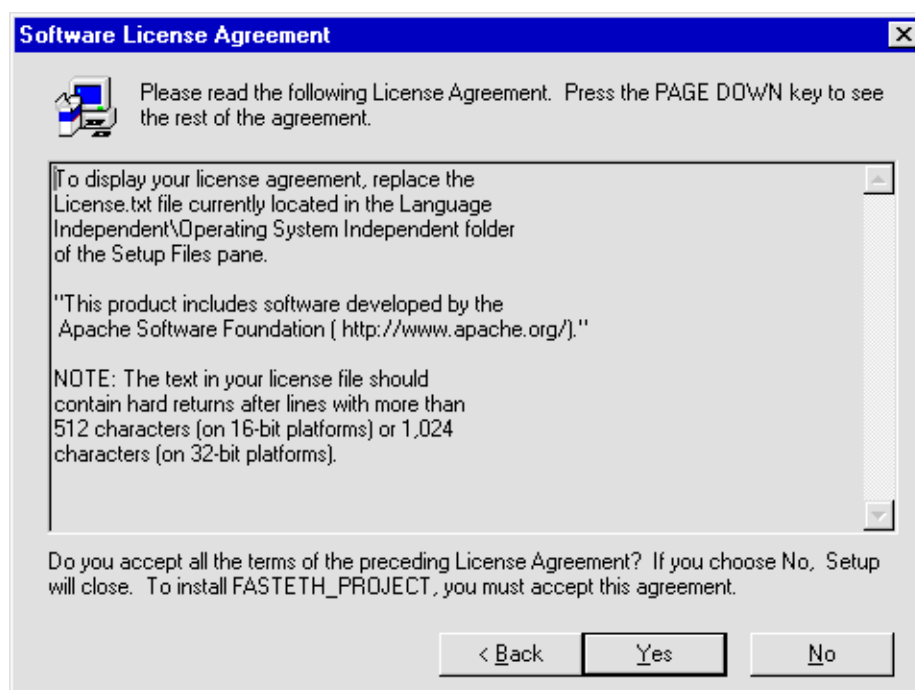
**WARNING**

The procedure can be slightly different, if all the components are selected, since some windows will be skipped, in this latter case.

**WARNING**

The overall generic structure of the Alcatel-Lucent Management Software is illustrated in [Figure 2-1 \(p. 2-2\)](#).

Click on Clear All button, then click on the check box to COMMON_FASTETH component to mark it with a check, and then click on Next to have the following window:

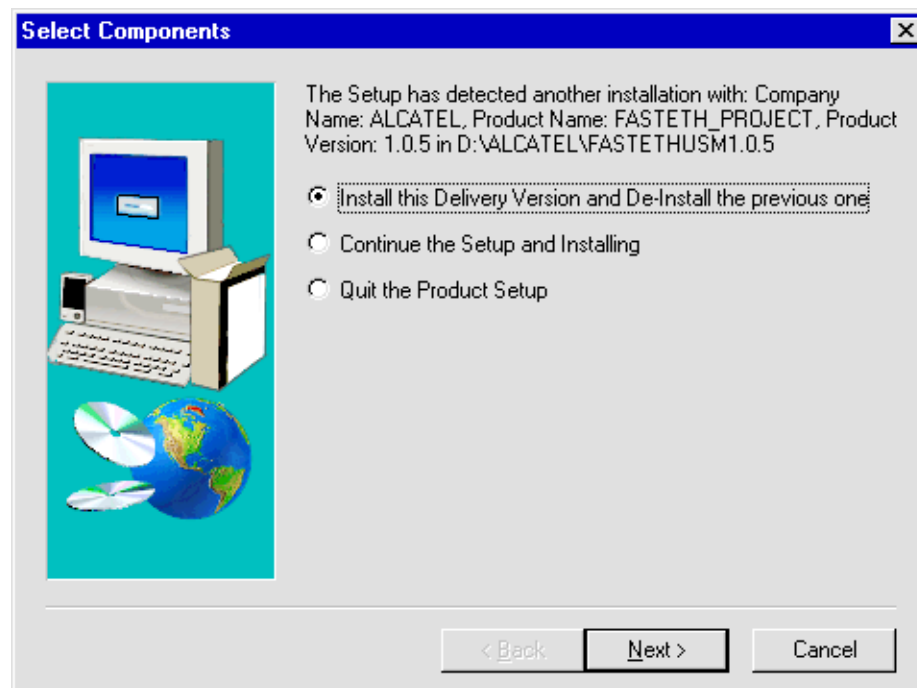
Figure 3-6 Software License agreement

6. Refer to [Figure 3-6 \(p. 3-13\)](#). This view presents the terms of the license for the usage of the ES-CT.

Click the **Yes** button for acceptance, then the procedure can continue toward two directions:

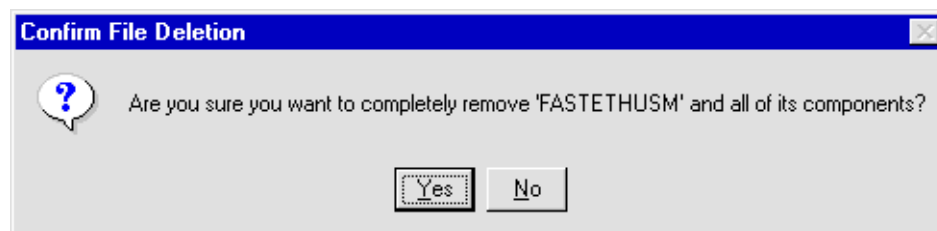
- If another ES-CT component is already existing in the host computer, then the procedure will ask if it has to be uninstalled; in this case the following [Figure 3-7 \(p. 3-14\)](#) will be displayed
- Otherwise, [Figure 3-10 \(p. 3-16\)](#) will be shown.

If an **already existing ES-CT** software has been detected, then the following figure will be displayed:

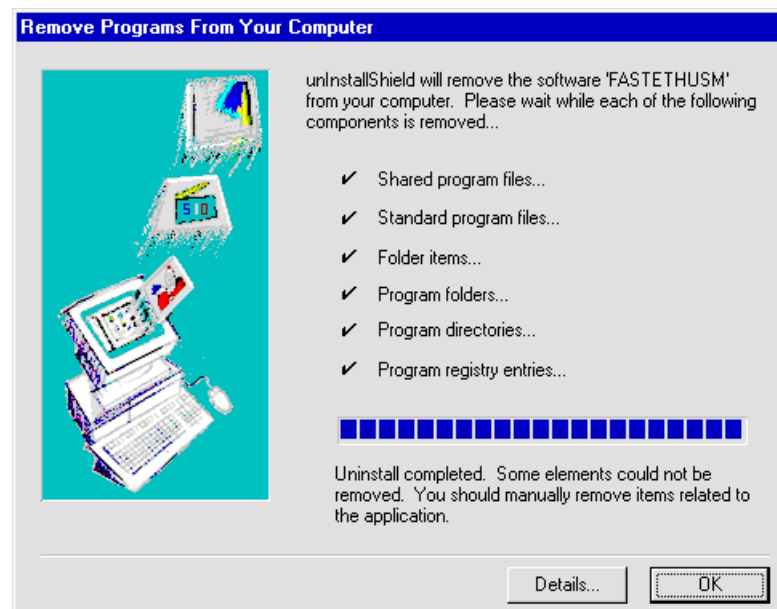
Figure 3-7 Existing previous ES-CT version uninstall

7. Refer to [Figure 3-7 \(p. 3-14\)](#). Click on "Install this Delivery version and De-install the previous one" option, to mark it.

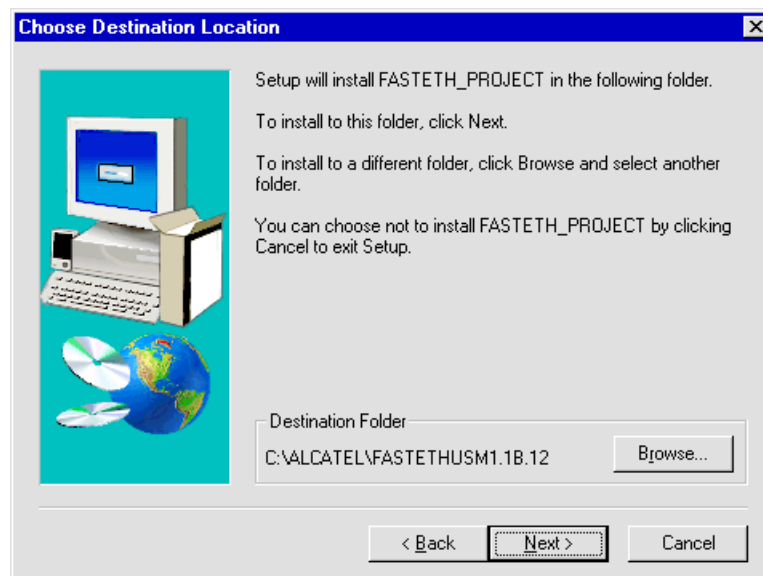
Then click on **Next** button to continue on the following:

Figure 3-8 Uninstall confirmation

8. Refer to [Figure 3-8 \(p. 3-14\)](#). Click on **Yes** button to continue:

Figure 3-9 Uninstall previous ES-CT version successfully completed

9. Refer to [Figure 3-9 \(p. 3-15\)](#). This window informs that the de-installation of the previous ES-CT software has been successfully completed.
Clicking on **Ok** button, the procedure will return the following [Figure 3-10 \(p. 3-16\)](#).

Figure 3-10 Choose destination folder for ES-CT installation

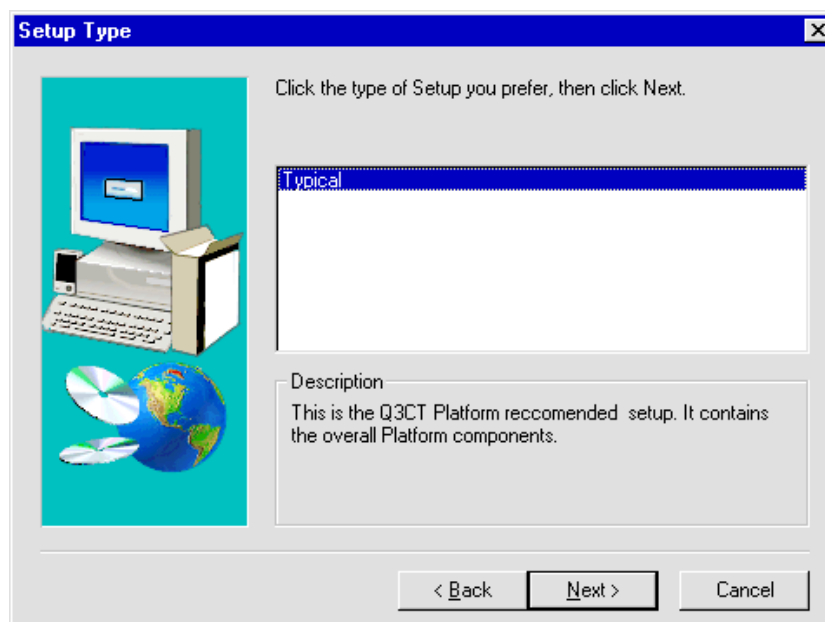
10. Refer to [Figure 3-10 \(p. 3-16\)](#). The procedure proposes the default directory (**C:\...**) for the installation.

**CAUTION**

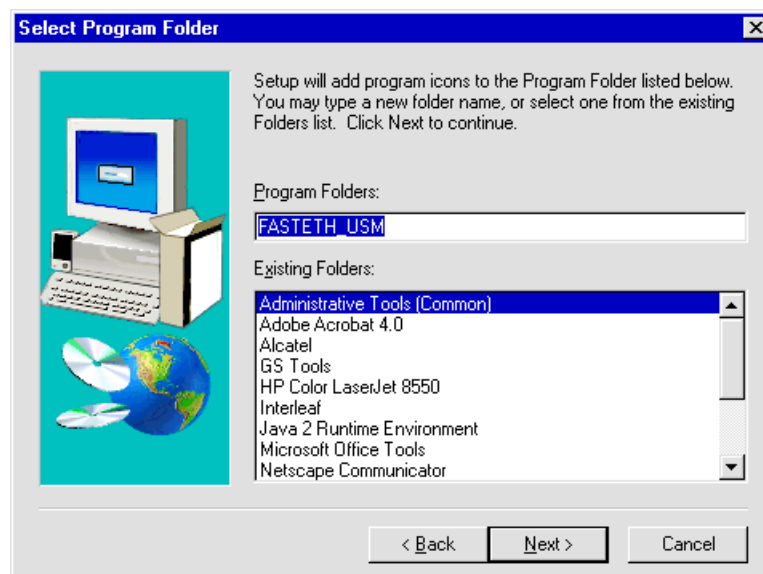
All the applications for the ES-Craft Terminal must be installed under the same disk partition of the host Personal Computer.

The **Browse** button can be used to change directory: in this case a file manager box will be opened to choose a new folder.

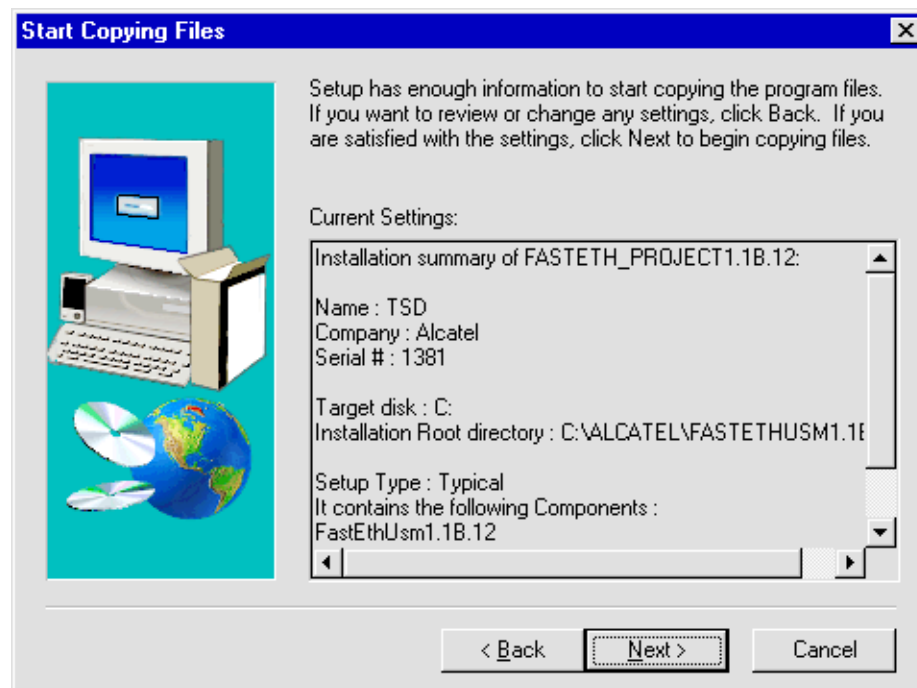
When finished, select **Next** button.

Figure 3-11 Setup type

11. Refer to [Figure 3-11 \(p. 3-17\)](#). It proposes the setup type, that is only the Typical one.
Click on **Next** button.

Figure 3-12 Program Folder denomination

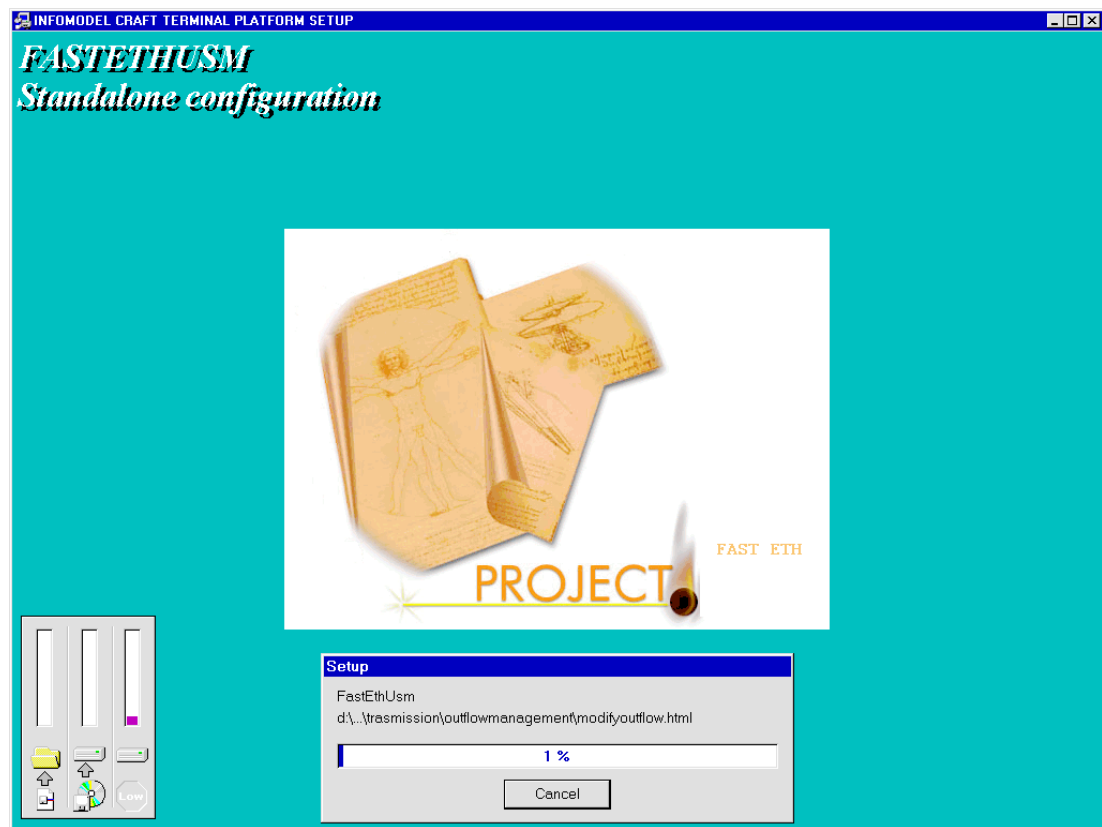
12. Refer to [Figure 3-12 \(p. 3-17\)](#). It suggests the default program-icon name and permits to change it, if necessary.
Click on **Next** button.

Figure 3-13 Start copying files and current settings summary

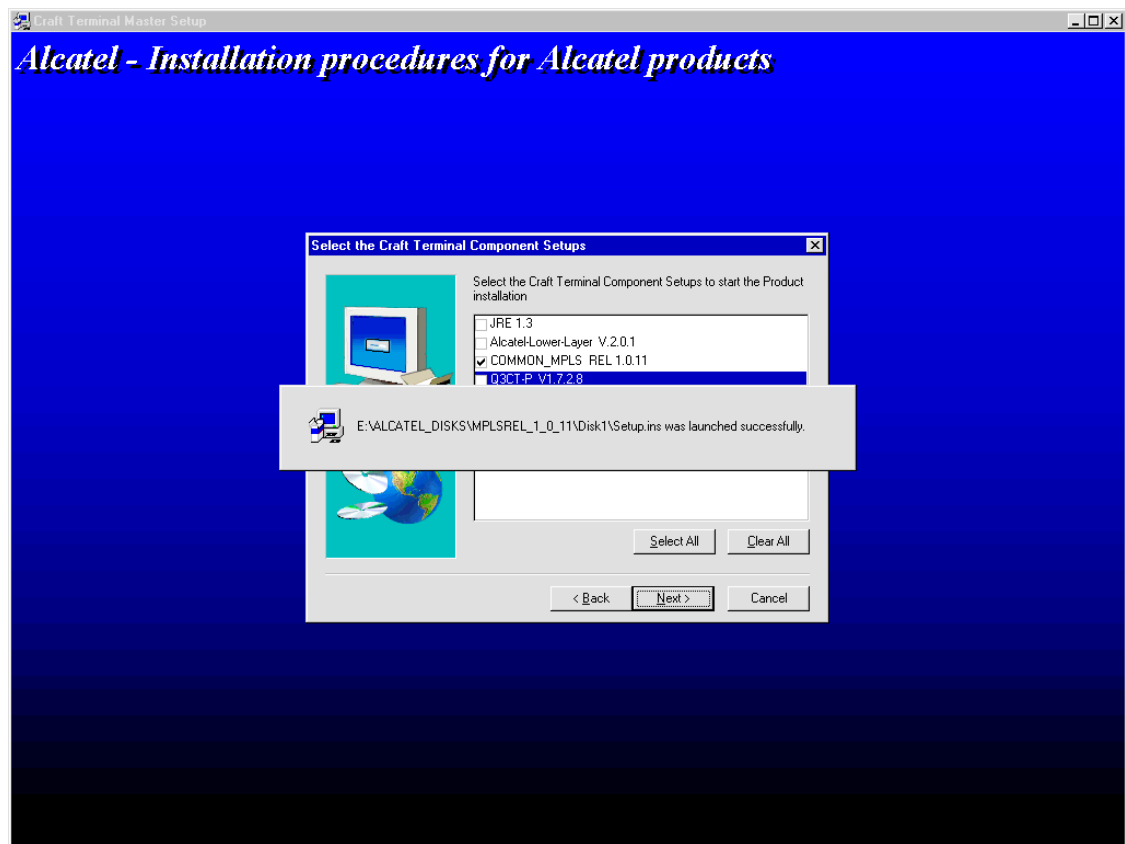
13. Refer to [Figure 3-13 \(p. 3-18\)](#). It displays the current settings for the installation.

If any displayed setting is not correct, click on **Back** option for a review, otherwise: click on **Next** button to start the files copying.

Then, a series of automatic windows presentation will be displayed, showing the setup in progress; see an example in next figure:

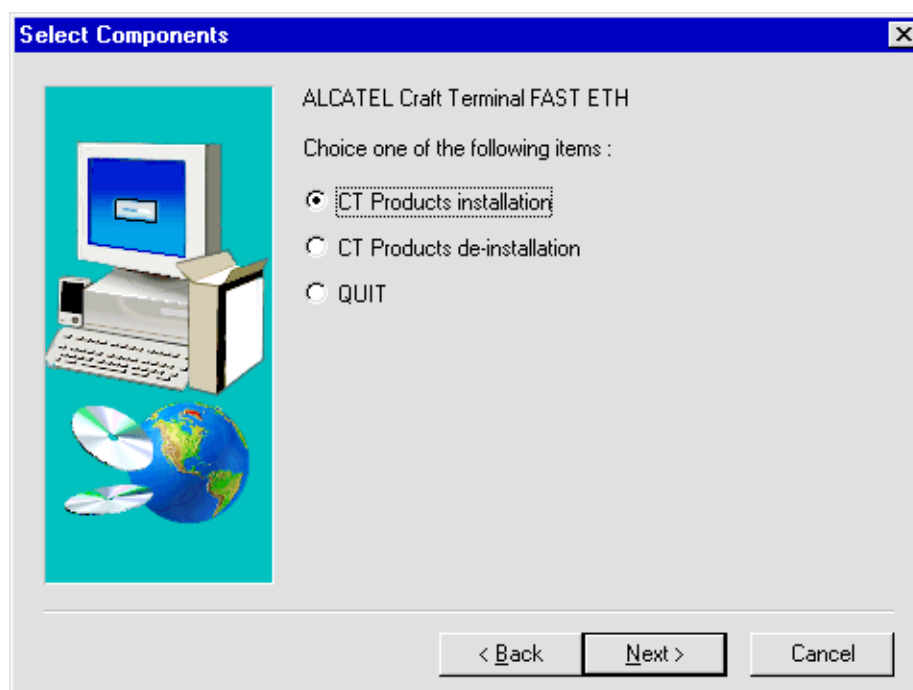
Figure 3-14 Setup in progress, temporary windows sequence presentation

14. Refer to [Figure 3-14 \(p. 3-19\)](#). The ES-CT installation procedure starts and, after intermediate automatic screens, it will continue toward two directions:
- If more than one component installation at a time has been chosen in [Figure 3-5 \(p. 3-11\)](#), then the following [Figure 3-15 \(p. 3-20\)](#) will be displayed.
 - otherwise, if only one component installation at a time has been chosen in [Figure 3-5 \(p. 3-11\)](#), then the [Figure 3-16 \(p. 3-21\)](#) will be displayed.

Figure 3-15 Successive installation, temporary windows presentation

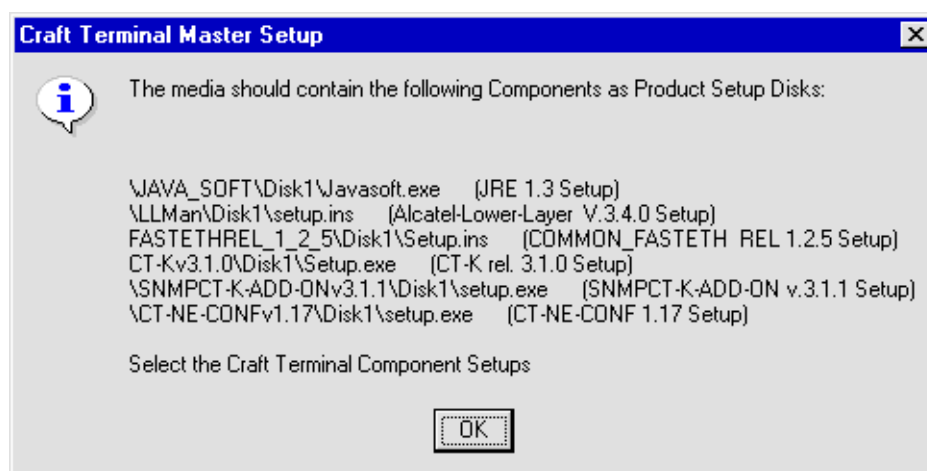
15. Refer to [Figure 3-15 \(p. 3-20\)](#). The sequence of successive components installation procedure continues and, after intermediate automatic screens, the procedure will continue as detailed in the point [Step 19](#).

Figure 3-16 Installation procedure menu window (2nd step)



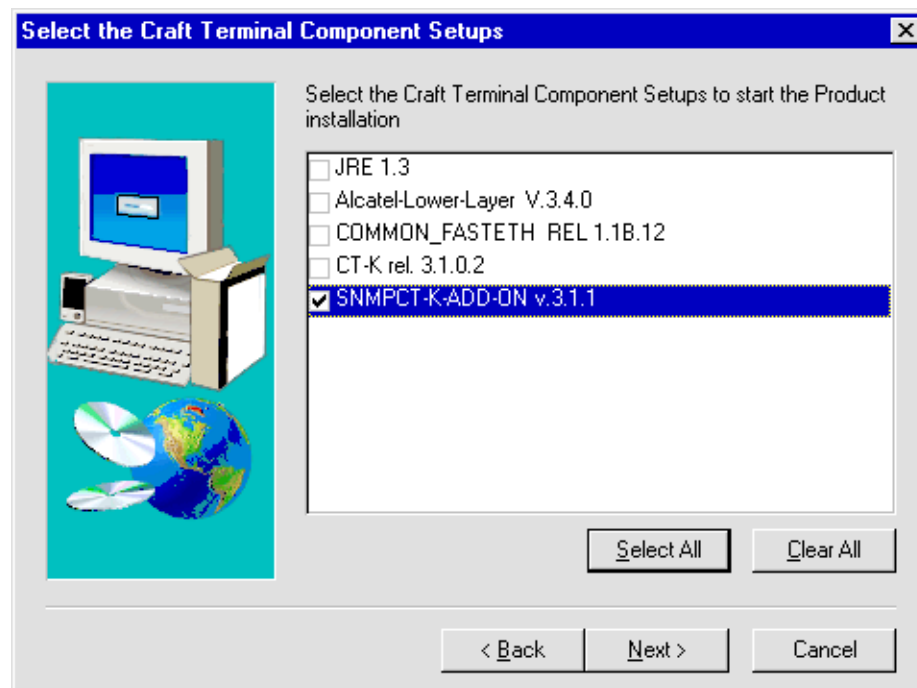
16. Refer to [Figure 3-16 \(p. 3-21\)](#). To install the “SNMPCT-K-ADD-ON” component click on “CT products installation” and then on “Next” to access the following view shown in [Figure 3-17 \(p. 3-21\)](#).

Figure 3-17 Craft Terminal master setup, list of detected Components on the media



17. Refer to [Figure 3-17 \(p. 3-21\)](#). The screen lists the installed Software Components detected.

Click on **OK** to present next dialog box:

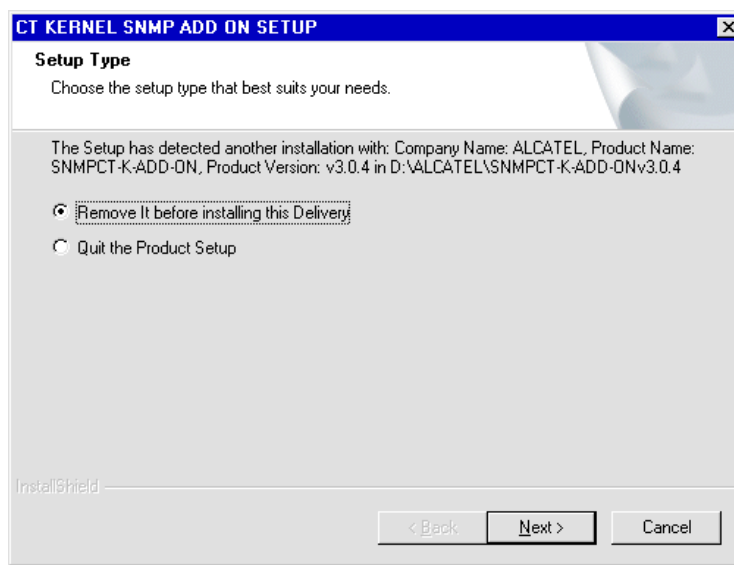
Figure 3-18 Selecting SNMPCT component

18. Refer to [Figure 3-18 \(p. 3-22\)](#). This view permits to select the software components to be installed.

To install the SNMPCT Manager: click on **Clear All** button, then click on the check box to **SNMPCT-K-ADD-ON** component to mark it with a check, and then click on **Next**.

19. At this point the procedure can continue toward the following directions:
- If no previous **SNMPCT-K-ADD-ON** component is installed in the host computer, then the procedure will continue presenting the following figures: [Figure 3-21 \(p. 3-25\)](#), then [Figure 3-22 \(p. 3-26\)](#), then [Figure 3-24 \(p. 3-27\)](#), and then [Figure 3-25 \(p. 3-28\)](#).
 - If another **SNMPCT-K-ADD-ON** component is already existing in the host computer, then two cases will be possible:
 - Different release: in this case the procedure will ask if it has to be uninstalled, displaying [Figure 3-19 \(p. 3-23\)](#), then [Figure 3-21 \(p. 3-25\)](#), and so on, skipping [Figure 3-23 \(p. 3-27\)](#).
 - Equal or similar release: in this case (maintenance) the procedure will continue displaying [Figure 3-20 \(p. 3-24\)](#), then [Figure 3-21 \(p. 3-25\)](#), and so on.

If another release of **SNMPCT** software has been detected, then the following figure will be displayed:

Figure 3-19 Existing different SNMPCT release to be uninstalled

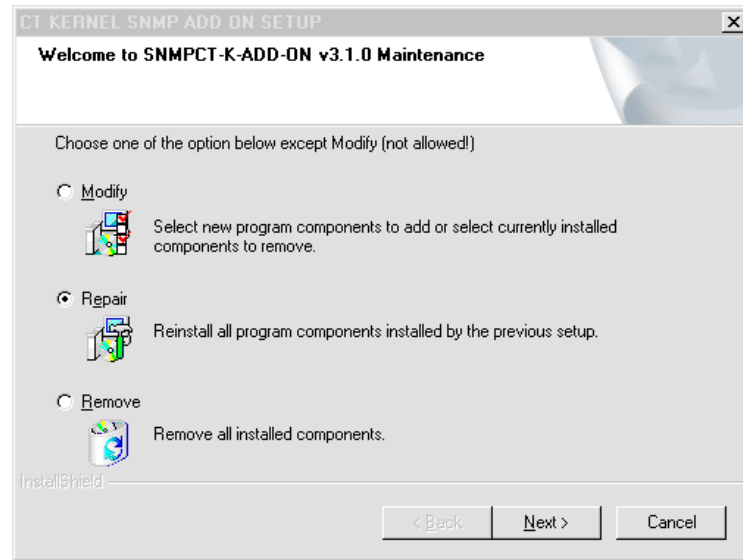
20. Refer to [Figure 3-19 \(p. 3-23\)](#). This view permits to uninstall the different software components.

To uninstall the SNMPCT component: select the **Remove it...** item, and then click on **Next**.

The procedure will continue on [Figure 3-21 \(p. 3-25\)](#).

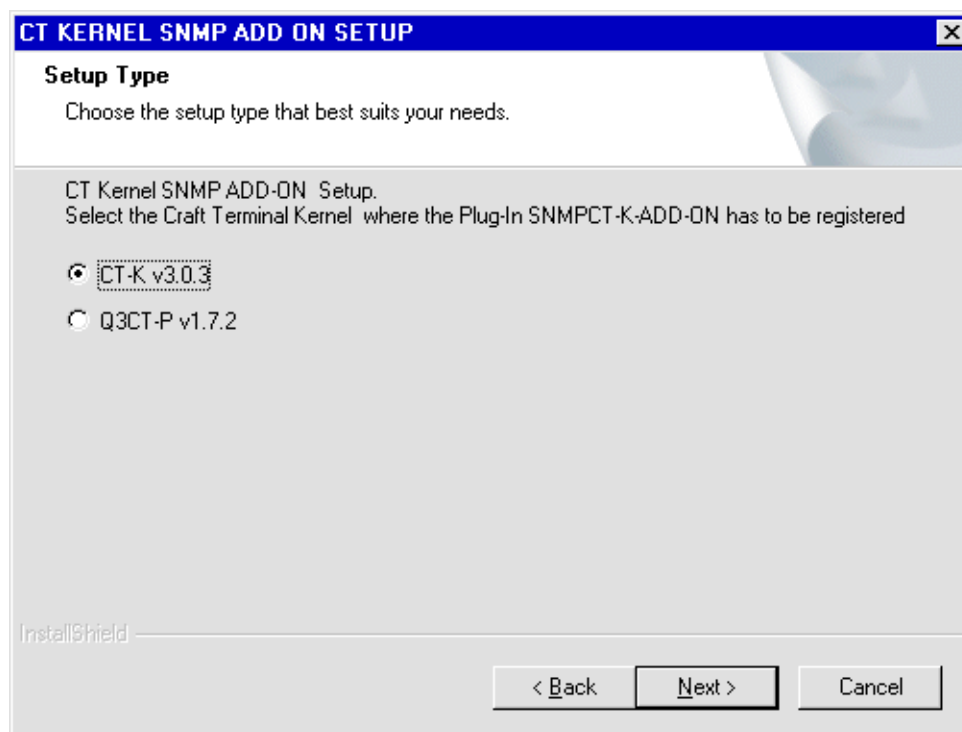
If another release of **SNMPCT** software has been detected, then the following figure will be displayed:

Figure 3-20 Existing previous similar release to be maintained: “REPAIR”



21. Refer to [Figure 3-20 \(p. 3-24\)](#). Select the “**Repair**” item, to maintain the software release.

Then click on **Next** button to continue to the following:

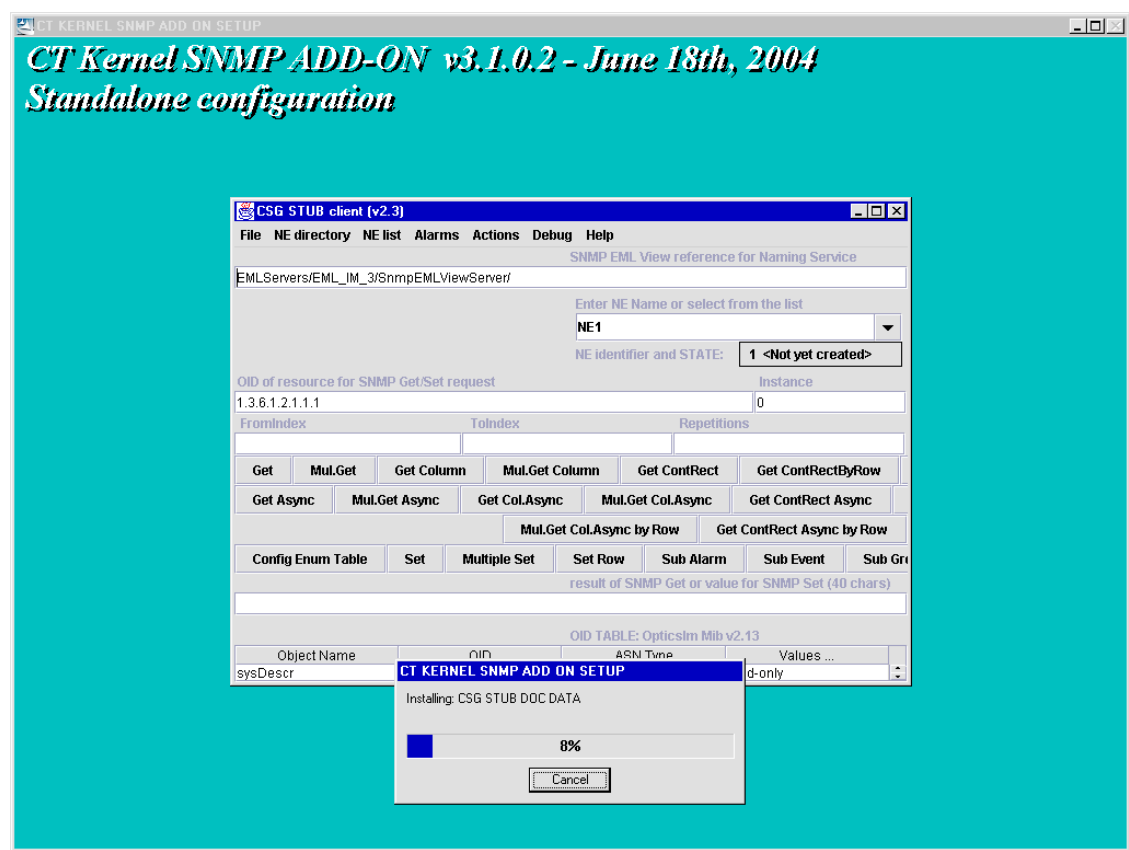
Figure 3-21 SNMP CT Add On setup

22. Refer to [Figure 3-21 \(p. 3-25\)](#). This window permits to choose between CT-K (new CT version) or the Q3CT-P (old CT version) where the SNMP-AddOn packets are to be inserted.

Click on **CT-K...** to select the new CT version.

Then, clicking on **Next** button, the procedure will display the following [Figure 3-22 \(p. 3-26\)](#).

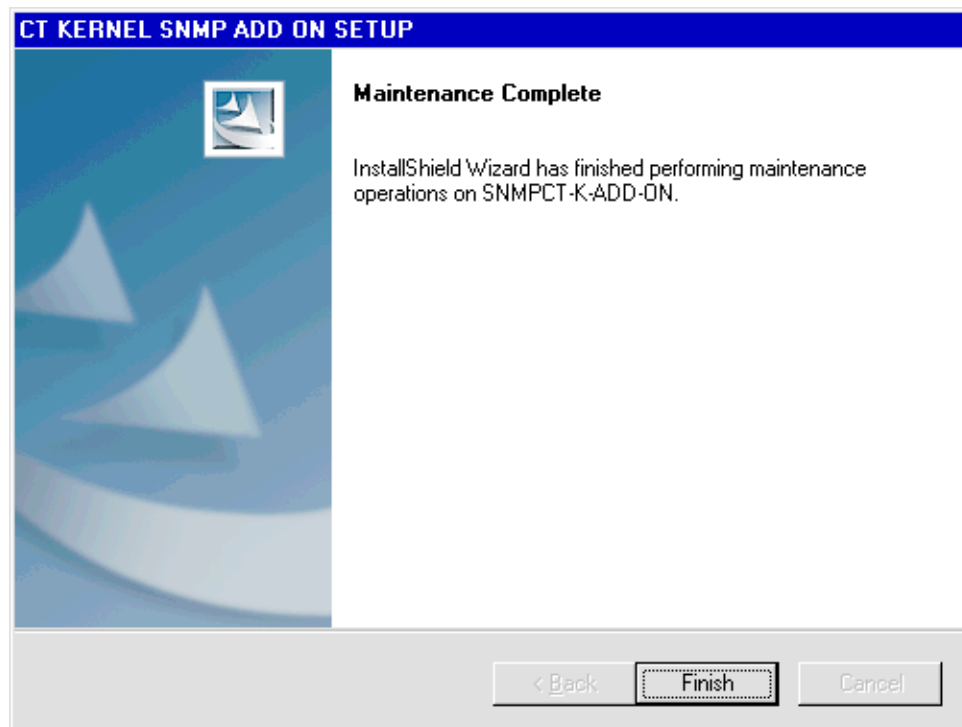
Figure 3-22 SNMPCT setup in progress temporary window



23. Refer to [Figure 3-22 \(p. 3-26\)](#). This is a temporary window showing the setup progress.

Maintenance case (skipped in case of first installation):

Figure 3-23 Maintenance Finished

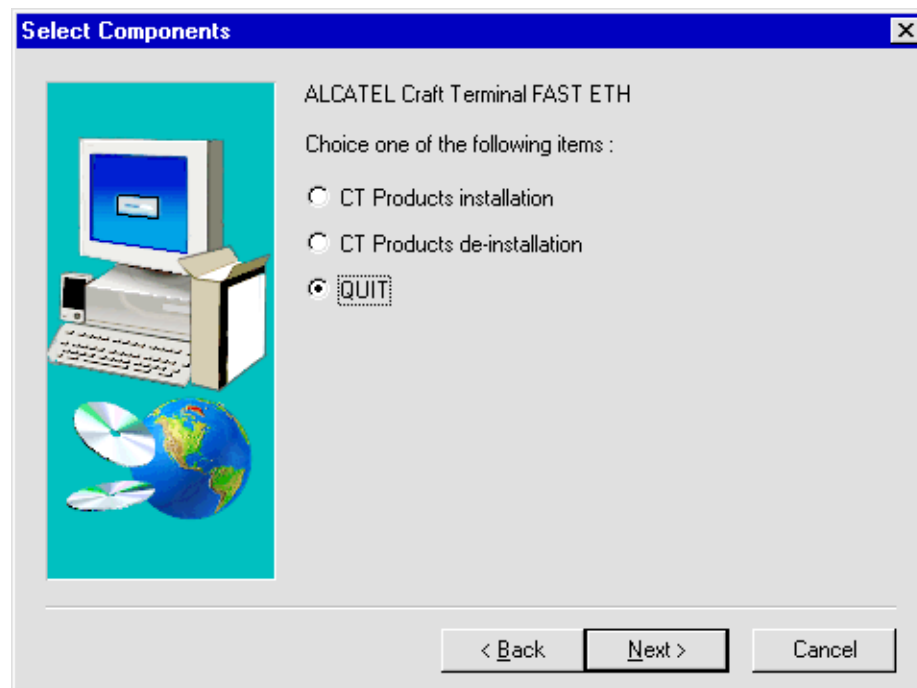


24. Refer to [Figure 3-23 \(p. 3-27\)](#). This window informs that maintenance is completed. Click on **Finish** to continue.

Figure 3-24 SNMPCT installation completed



25. Refer to [Figure 3-24 \(p. 3-27\)](#). This window informs that the installation of the SNMPCT software has been completed. Click the **OK** button, then the following figure will be shown:

Figure 3-25 Selecting installation procedure (end step)

26. Refer to [Figure 3-25 \(p. 3-28\)](#). The above view permits to select the installation procedures options.

In this final phase select the last option (**QUIT**), then click on **Next** button to end and to leave the installation application.

**WARNING**

After finished the installation, a "Restart" of the personal computer is necessary ("Start" -> "ShutDown" -> "Restart the computer").

**WARNING**

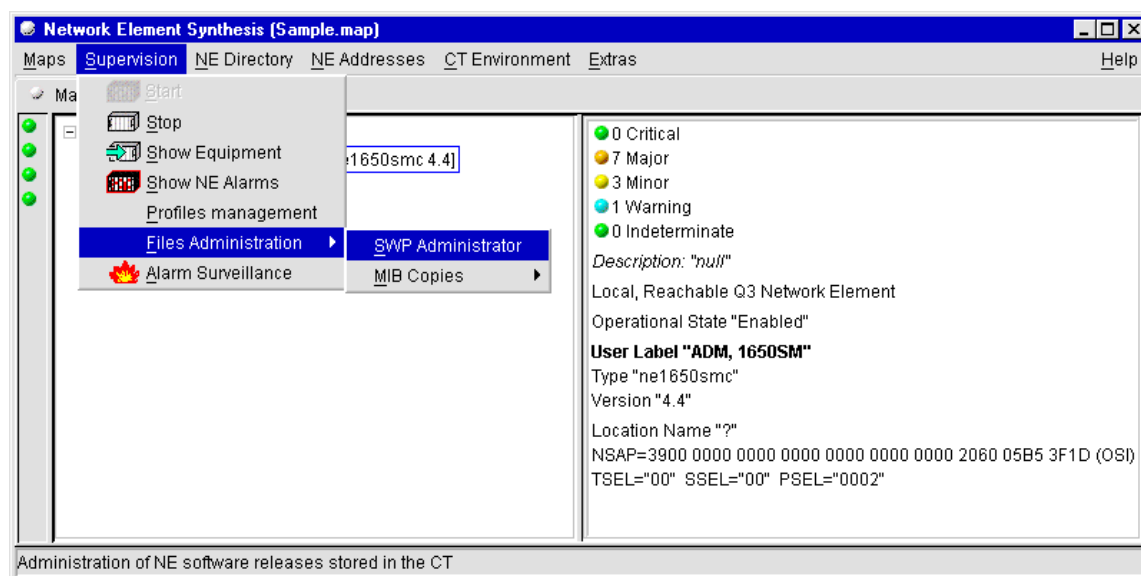
After the restart of the personal computer, the following window operation is necessary: "Start" -> "Programs" -> "Alcatel" -> "SNMPCT-K-ADDON" -> "SNMP-AddOn Customization".

NE-ES package installation procedure

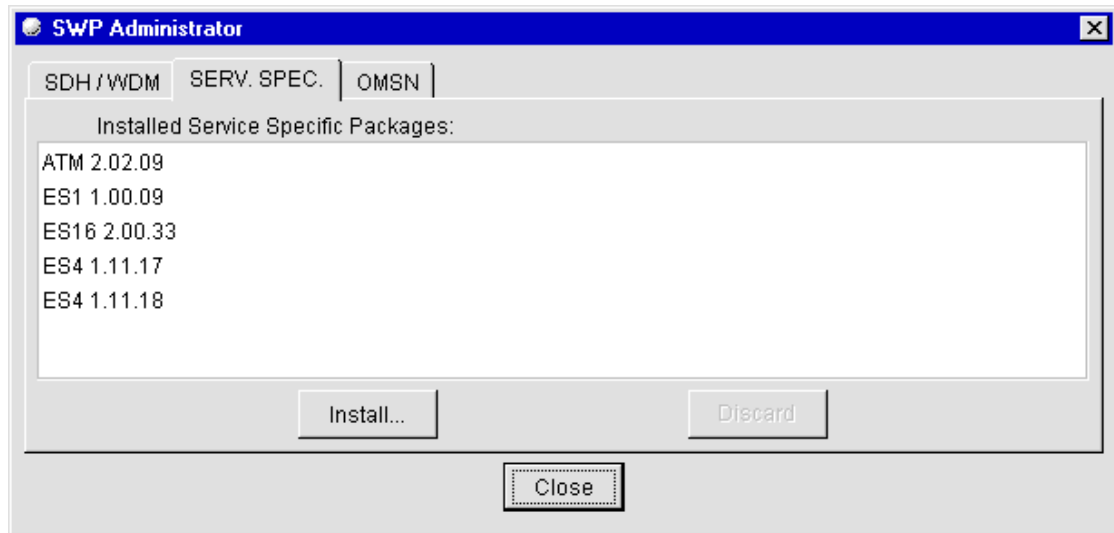
After the installation of the craft-terminal packages, the installation of the NE-ES package (i.e. the file descriptor for the ES part, to be downloaded inside the NE in a subsequent step) is needed. Execute the following operations:

Start the NES ("Network Element Synthesis") view as described in ["Start-up of the ES craft terminal management software"](#) (p. 3-40), then the following window will be displayed:

Figure 3-26 Descriptor files administration



1. Refer to [Figure 3-26 \(p. 3-29\)](#). In this window, select the menu options:
Supervision > Files Administration > SWP Administrator.
 The "Software Package Administration" window will be opened:

Figure 3-27 Software Package Administration-ES service specific

2. Refer to [Figure 3-27 \(p. 3-30\)](#). This window contains three folders: SDH, SERV.SPEC. and OMSN;
select the “**SERV.SPEC.**” (Service Specific) folder, then click on **Install** button.
A file-manager box will be opened, as shown in [Figure 3-28 \(p. 3-31\)](#).
In this file-browser box, select the **CD-ROM driver** (e.g. E:\, see note below) and the filename path: **Ect\Swdw\ESx\(*version*)\ESx.dsc** (i.e. the ES descriptor file); then click on **Open** button; at this point the installation will start.

**WARNING**

*If not already in, insert the ES software CD-ROM into the PC driver, the installation setup is started automatically; stop the setup clicking on **Cancel** button and then confirm with **Exit Setup**.*

Figure 3-28 File-Browser for Software Package installation

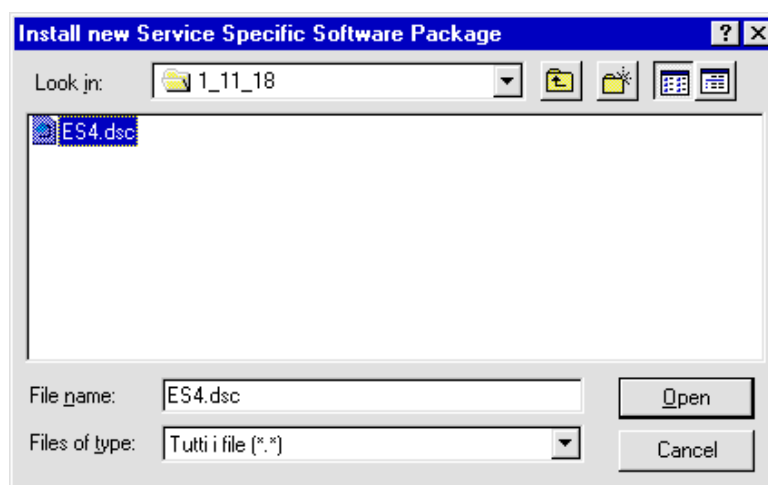
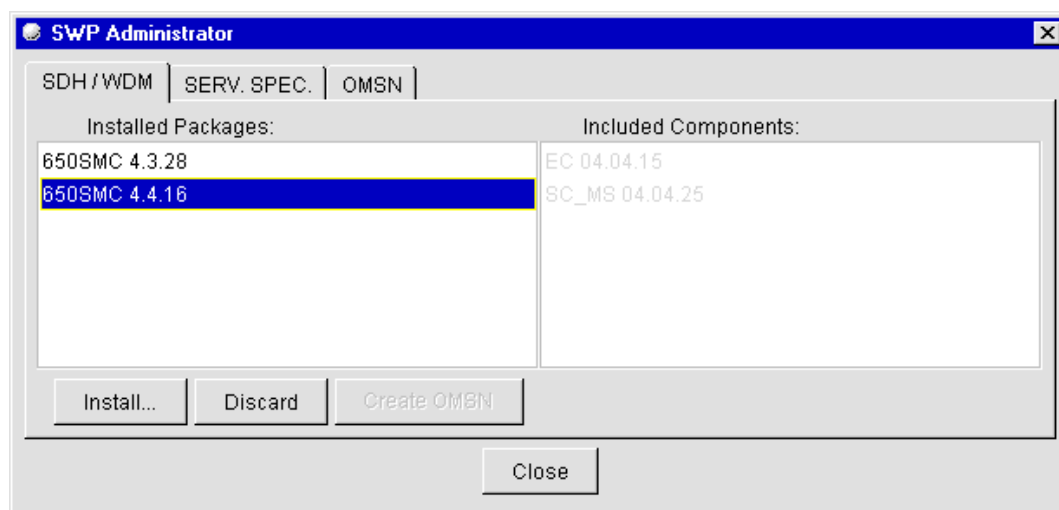


Figure 3-29 Software Package Administration - create Enhanced OMSN



3. Refer to [Figure 3-30 \(p. 3-32\)](#). In this window click on the “SDH/WDM” folder, then select the specific equipment with the desired version to be associated with the ES part.

**WARNING**

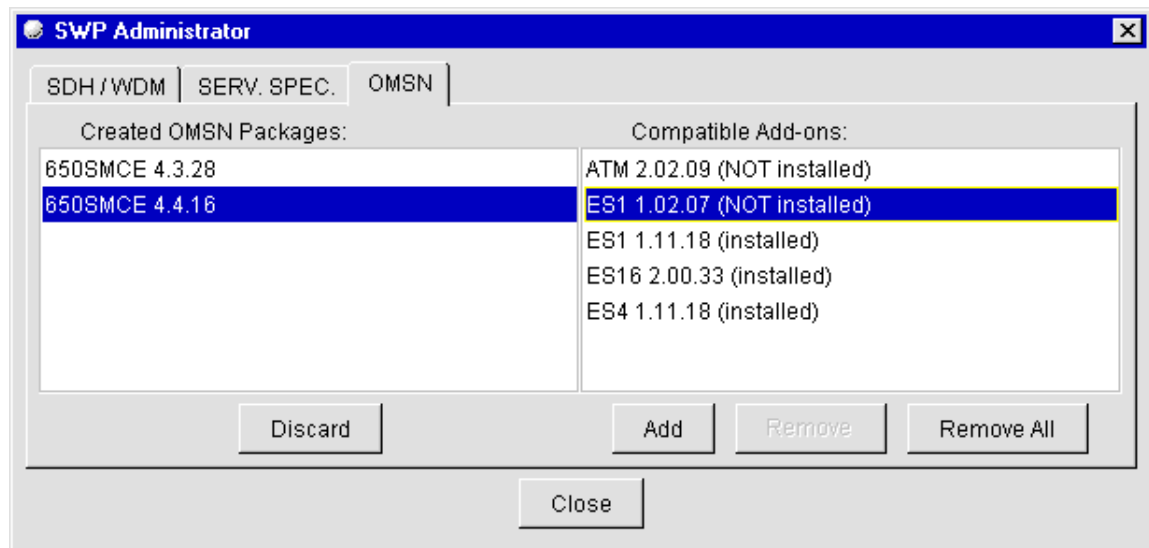
If the appropriate SDH/WDM Package is not already installed, it must be done in the same way as described for the ES “Service-Specific” package, in the previous [Step 2](#); [for more details see 1320CT Handbook listed in [Table 1 \(p. xix\)](#)].

Click on **Create OMSN** button, to create a new software package: SDH+ES, whose name will be the same of the equipment, with the “E” suffix (“Enhanced”).

**WARNING**

If the **Create OMSN** button is “greyed” (i.e. not available), it means that the relevant OMSN is already existing: in this case go to the next step.

Figure 3-30 Software Package Administration - add ES service



4. Refer to [Figure 3-27 \(p. 3-30\)](#). In this window click on the “OMSN” folder. In the “**Created OMSN Packages**” field, select the specific “Enhanced” OMSN, as created in the previous point.

Select the ES version (in the “**Compatible Add-Ons**” field) and click on **Add** button.

**WARNING**

If the **Add** button is “greyed” (i.e. not available), it means that the relevant add-on service is already installed

**WARNING**

In case of migration to a new release containing a new “ADD-ON” (Service Specific packet such as the ES-swp), from an old release containing another service packet (for instance an ATM-swp), the download of the software into the NE must be done in two steps:

- a. *first step* downloading the new SDH packet associated with the known service packet (e.g.: enhanced OMSN with ATM)
- b. *second step* downloading the new SDH packet associated with the new service packet (e.g.: enhanced OMSN with ES).

After the aforesaid operations, the software package SDH+ES is installed in the host computer and can be downloaded into the NE, in a subsequent step, from the EML-USM environment, as described in [“NE-ES software downloading”](#) (p. 3-37).

5. Refer to [Figure 3-27](#) (p. 3-30). At the end of the operation, exit this application by means of the **“Close”** button.

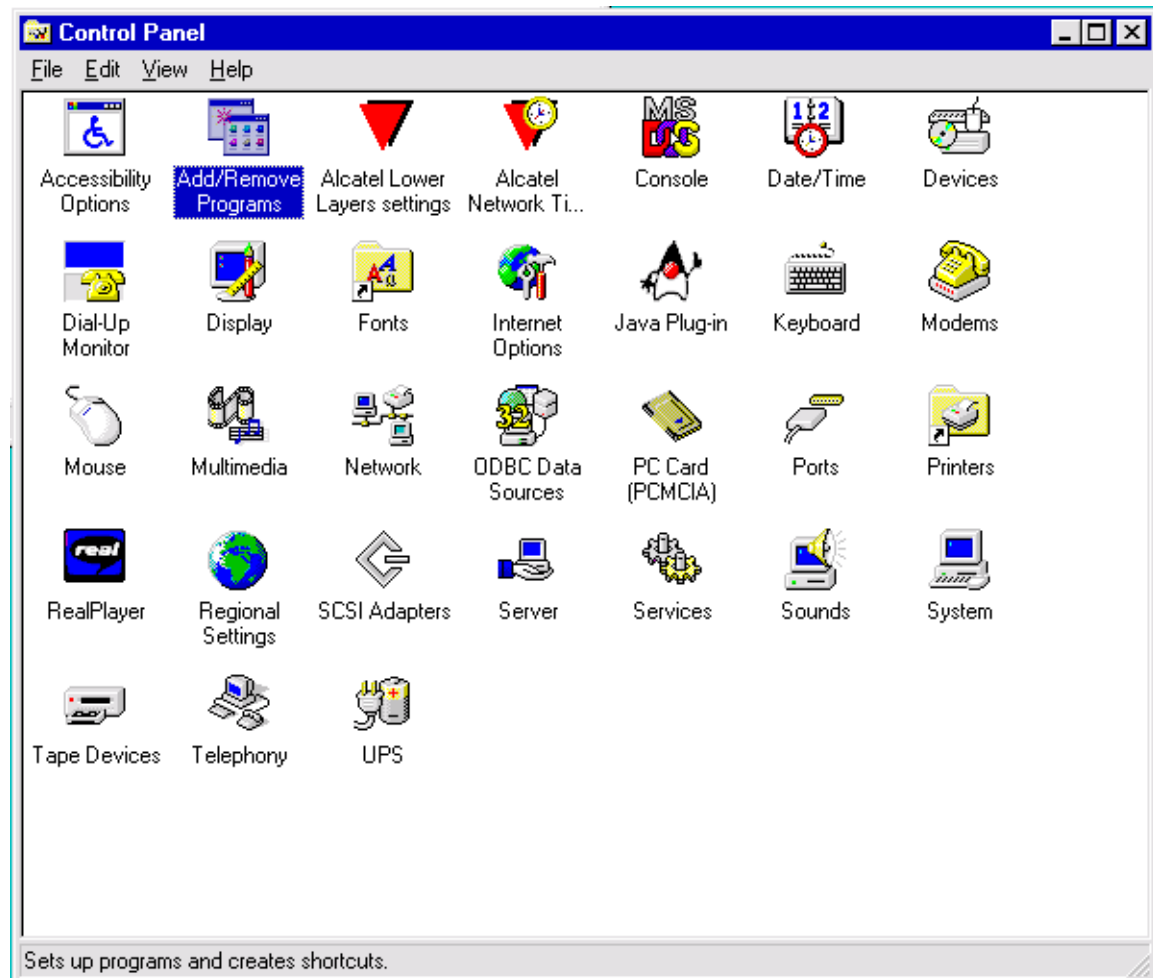
Software Uninstallation procedure

ES-CT Uninstallation

To de-install the software in WINDOWS environment, execute the following operations:

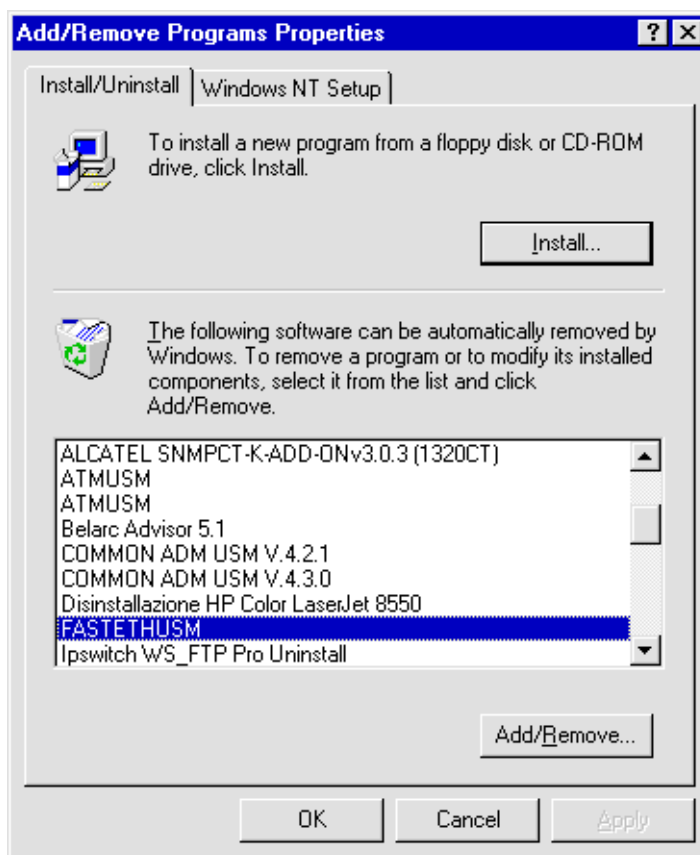
1. Open the Windows-Control Panel (**Start -> Settings -> ControlPanel**) and select the **Add/Remove Programs** icon, as for the following figure.

Figure 3-31 Add/Remove Programs icon selection



2. Refer to [Figure 3-31 \(p. 3-34\)](#). Click twice on the **Add/Remove Programs** icon to open it; then the next window will appear:

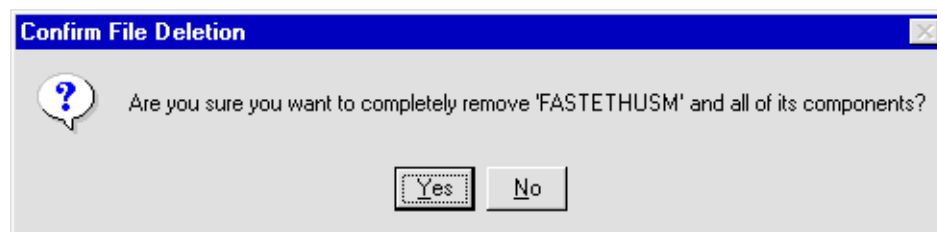
Figure 3-32 Add/Remove Programs view



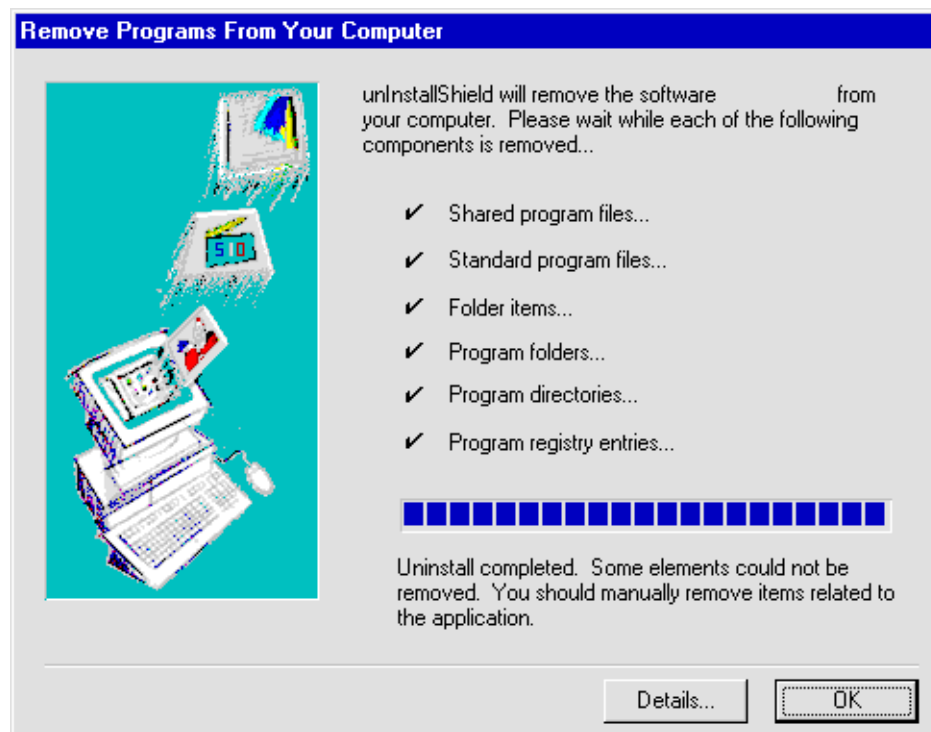
3. Refer to [Figure 3-32 \(p. 3-35\)](#). Select, in the **Install/Uninstall** tab of this window, the application "FASTETHUSM" (or "ALCATEL SNMPCT...", or other CT components) and click on the **Add/Remove** button.

A confirmation message is presented:

Figure 3-33 Delete confirmation (example)



4. Refer to [Figure 3-33 \(p. 3-35\)](#). After confirmation with **Yes** button, next figure (example) appears, indicating the deleting process:

Figure 3-34 Delete completed (example)

Refer to [Figure 3-34 \(p. 3-36\)](#). At the end of the deleting process click **OK**.

The uninstallation of the SNMPCT component can be done in a similar way, by selecting the "Alcatel-Lucent CT Kernel (SNMP Add-On v...)" row in [Figure 3-32 \(p. 3-35\)](#). The de-installation procedure for other Craft Terminal components is the same too.

Then it is possible to de-install other Alcatel-Lucent Craft Terminal software components or close the Control Panel window, exiting the procedure.

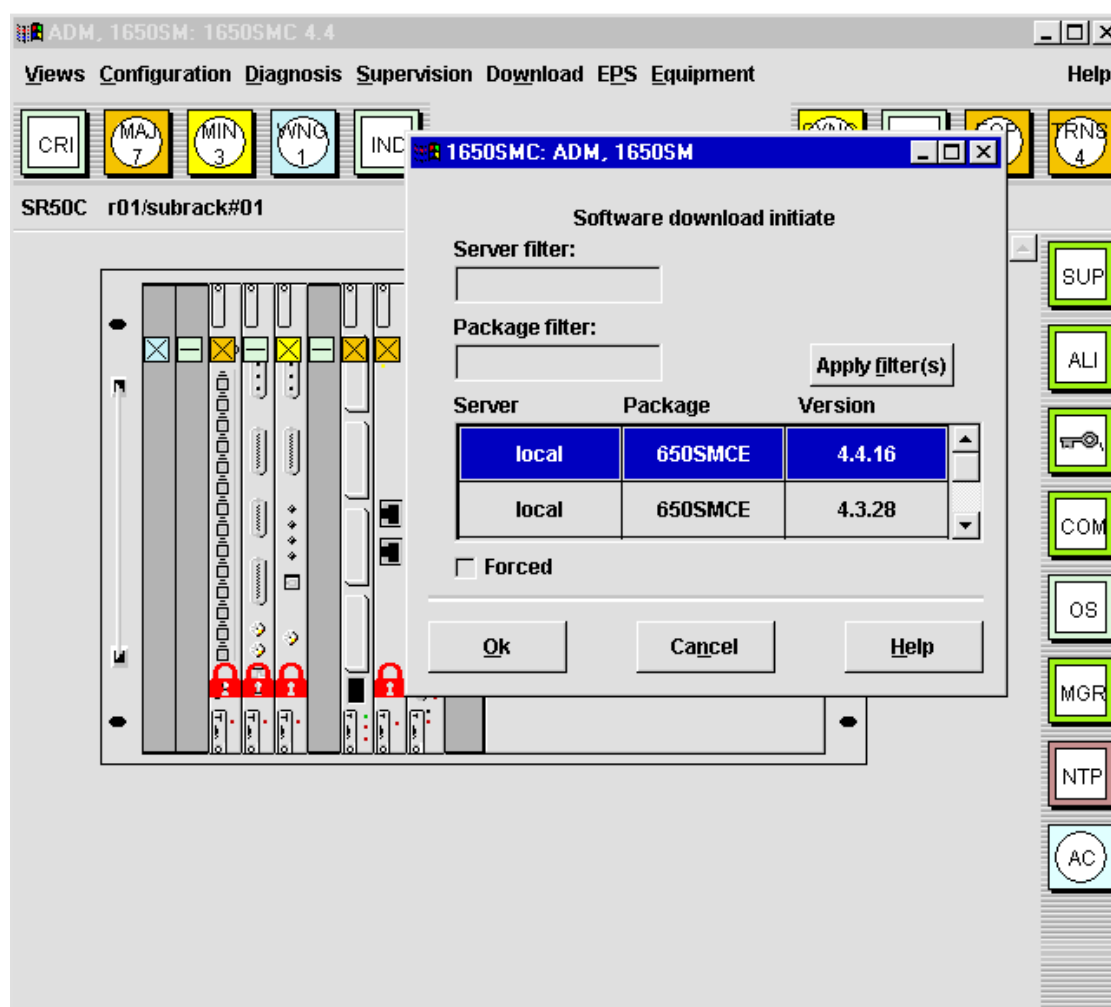
NE-ES software downloading

The download is the operation that permits to transfer a software package from the computer (server) to the specific equipment (client). The “download” generalities and details are reported in the operator handbook relevant to the specific equipment. The download is to be done in the EML-USM context (i.e., SDH-CT); to start the sdh-ct select (in the NES view) the OMSN hosting the ES board and then the option “**Supervision**” -> “**Show Equipment**” [see also “[Start-up of the ES craft terminal management software](#)” (p. 3-40)].

To download the ES-NE software, execute the following operations:

1. In the EML-USM view, select the menu options: **Download > Init Download...** to activate the following window:

Figure 3-35 Download initiate (example)



-
2. Refer to [Figure 3-35 \(p. 3-37\)](#). In this box, select the software package containing the ES service, i.e. that one with the "E" suffix (in this example 650SMCE).

Click the **Ok** button to start, a box showing the progress of the downloading process will be then displayed; when the download will finish with the message "Software download completed", **Close** that box.

Refer to [Figure 3-35 \(p. 3-37\)](#). Click on **Cancel** to close this box, after download completed.

3. In the EML-USM view, select the menu options: **Download > Units Info...** to have the following window:

Figure 3-36 NE software package activation (example)

1650SMC: ADM, 1650SM

Software packages information

650C V4.4.16 650C V4.4.13

Software package: 650C V4.4.13

Service Specific Components

ES16	02.00.33
ATM	02.02.10

Operational state: Enabled

Activation date: Not activated yet!

Vendor:

Current state\Action: Standby (none) (none) **Activate** Force

SW units det.

Ok Cancel Help

4. Refer to [Figure 3-36 \(p. 3-39\)](#). Select the appropriate equipment-version tab of this window. Select the **Activate** option of the “CurrentState\Action” pull-down field, and then the **Ok** button, to activate the selected Software package.

Click the **Ok** button on the further displayed confirmation box.

The **SW Units Det.** button opens another box giving some information about the selected downloaded package.

Refer to [Figure 3-36 \(p. 3-39\)](#). Click on **Cancel** button to close this box.

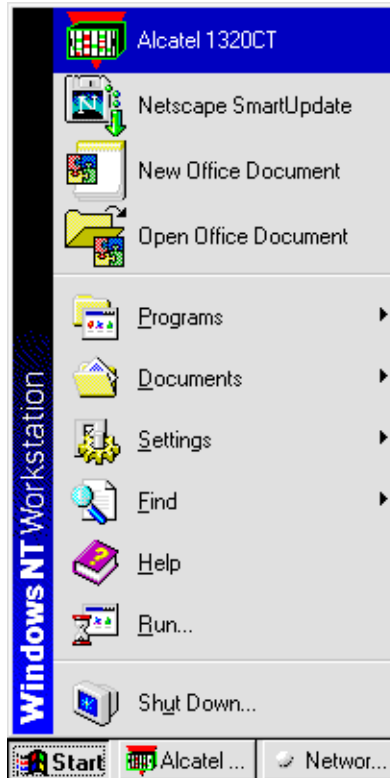
Start-up of the ES craft terminal management software

Description

In order to activate the Alcatel-Lucent product, perform the following sequence (as shown in next figure):

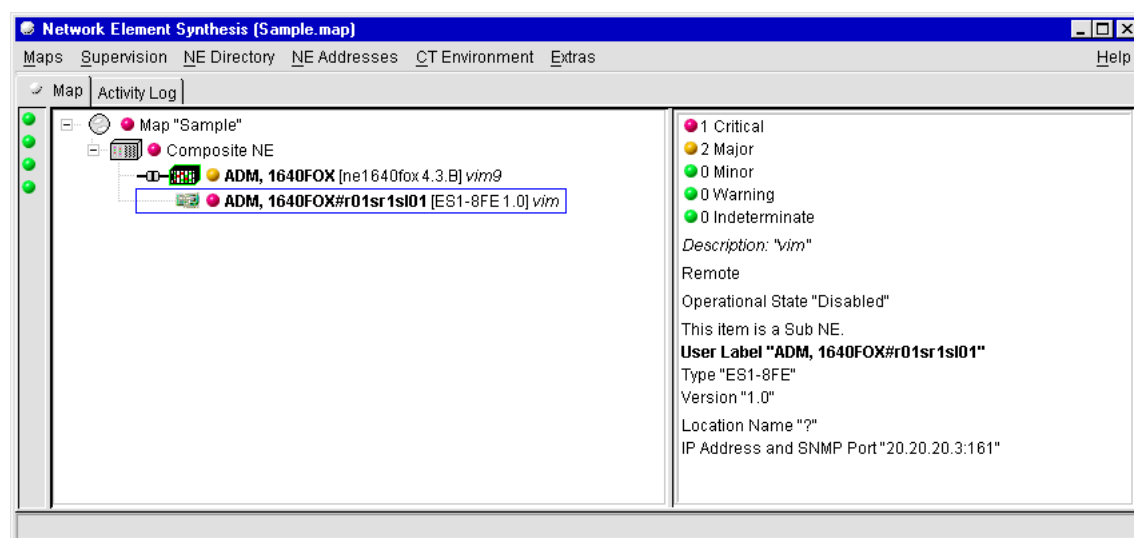
Start > Alcatel 1320CT

Figure 3-37 1320CT software start-up



Then, the Network Elements Synthesis (NES) window will be displayed (see next figure).

Figure 3-38 NES view example



In the NES window, select the specific host equipment in the **map** folder, and then the following menu options: **Supervision > Start Supervision**, then, by means of the pop-up menu: **"Realign ISA Board Population"**.

When the realignment phase is finished, select the ES equipment and then the following menu options:

1. **Supervision > Start Supervision**,
2. **Supervision > Show Equipment**.

Then, the ES-USM view will be displayed.

The ES-CT application can be also activated from the SDH-CT view, by selecting the ES board and then the following menu option: **Equipment > ISA Navigate** (anyway this is possible only after the "realignment" and the "start supervision" operations from NES view).



WARNING

*Before using the ES-CT, the **downloading** of the ES software into the NE, and the assignment of the **IP addresses** to the host computer, to the Controller board and to the ES Board (from sdh-ct: **"Configuration" > "Comm/Routing" > "IPConfiguration" > "ISABoardIPAddress"**) are necessary. See para ["NE-ES software downloading"](#) (p. 3-37) for details about download procedure, the OMSN-Operator Handbook for the board IP address setting, and the 1320CT Basic Handbook listed in [Table 1](#) (p. xix) for the PC IP address setting.*

4 Craft terminal for ES management



Overview

Purpose

This chapter describes all the views presented by the ES-Craft Terminal, including all the information needed to set the various ISA-ES parameters and configurations.

Contents

This chapter provides information on the following topics:

Summary procedure for ES Management	4-4
Main view	4-5
List of the menus options	4-12
Supervision management	4-24
Generic and common functions	4-26
Diagnosis and Alarms Configuration	4-32
MIB Management	4-47
Transmission	4-49
OAM	4-162
Connection	4-184
Performance	4-215

Overview

This application (here named “ES-CT”) permits to manage the ES boards provisioned for the OMSN equipment.



WARNING

Before using the ES-CT, the assignment of some IP addresses is necessary:

- a. *to the CT (personal computer). See the 1320CT-Basic Operator Handbook listed in [Table 1 \(p. xix\)](#) for details about IP address setting for the host computer.*
- b. *to the EC (controller) board (from sdh-ct: “Configuration”>“Comm/Routing”>“IPConfiguration”>“IPAddressOfPointToPointInterface”). See the OMSN-Operator Handbook listed in [Table 1 \(p. xix\)](#) for details about IP address setting for EC board.*
- c. *to the ES board (from sdh-ct: “Configuration”>“Comm/Routing”>“IPConfiguration”>“ISABoardIPAddress”). See the OMSN-Operator Handbook listed in [Table 1 \(p. xix\)](#) for details about IP address setting for ES board.*



WARNING

If, for any reason, the IP address is changed, the following customization WINDOWS command is necessary: “Start->Programs->Alcatel->SNMPCT-K-ADDON->SNMP-AddOn Customization”.

It has to be used in conjunction with the 1320CT platform, because it is an option of this latter; the activation of “ES-CT” starts from the “Network Element Synthesis” view, by doing the following operations:

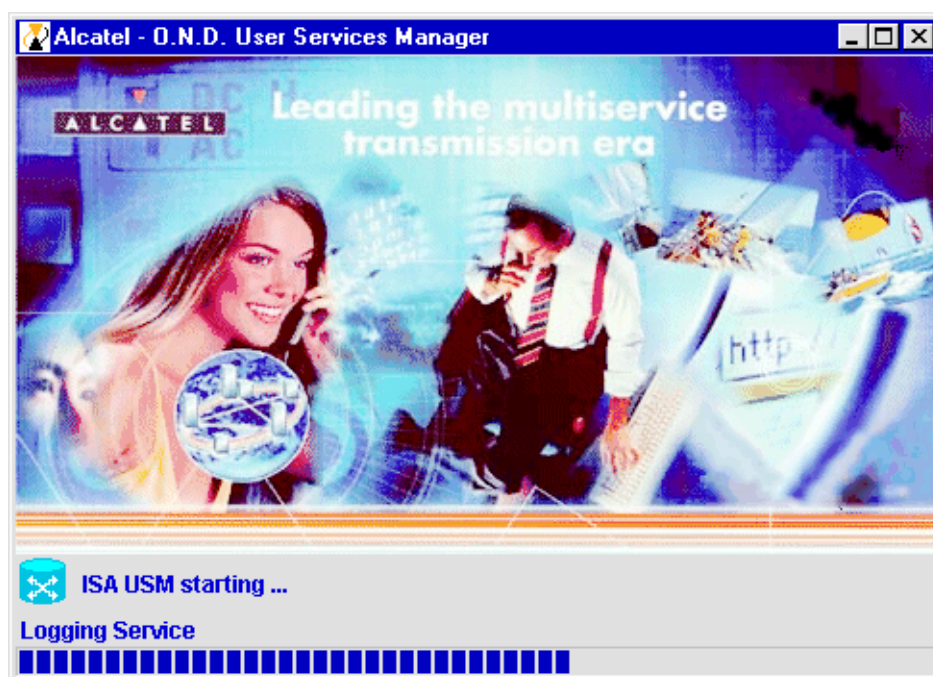
- select the NE hosting the ES board; then, with the pop-up menu: “**Realign ISA Board Population**”; then select the displayed ES-NE and with the pop-up menu: “**Start Supervision**”.

After having done these latter operations, the entering into ES-CT can be done:

- a. from the NES view, by selecting the ES object and then the pop-up menu option “**Show Equipment**”
- b. from the SDH-CT view, by selecting the ES board and then the menu option “**Equipment -> ISA Navigate**”.

After the activation, the following temporary screen is displayed.

Figure 4-1 Logon view



Summary procedure for ES Management

The following actions have to be done, mainly, for ES traffic management (the order of sequence is mandatory, for a correct working):

- a. IP address assignment for the Craft Terminal, the EC board and the ES board
- b. definition of SDH virtual ports and containers to be used for ES signals and relevant Remote Ethernet Ports associations (via the menu **"Configuration": "ISA Port Configuration"**, on SDH-CT)
- c. cross-connection of virtual SDH containers transporting Ethernet (on SDH-CT)
- d. Bridge configuration (on ES-CT)
- e. Ethernet or Bridge Ports definition: ETS or ETB (on ES-CT)
- f. Local and Remote Ethernet ports configuration and GFP or LAPS interface definition (on ES-CT)
- g. Bridge Ports configuration (on ES-CT)
- h. traffic contract definition (on ES-CT)
- i. V-LAN Registration, in case of Virtual or Provider Bridge (on ES-CT)
- j. InFlow/OutFlows creation: see NOTE
- k. Classifiers definition: see NOTE
- l. Cross-Connection between InFlows and OutFlows: see NOTE
- m. Configuration of Performance Monitoring points (on ES-CT).

Note: The points (j), (k), (l) must be done in one single step by means of the Connection wizard: **"Create ETS XC One Step"**. See ["Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)"](#) (p. 4-191) and ["Connection: Ethernet Port : Create Ets XC One Step \(Provider\)"](#) (p. 4-194).

Main view

After the temporary logon view, the shown screen is similar to the following [Figure 4-2, \(p. 4-7\)](#), where a generic view is reported in order to explain the meaning of its main components.

The following fields and areas are generally displayed:

- **title** : window frame containing name of Craft Terminal and release and equipment labels.
- **menu bar**: bar containing the applications pull-down menus: **Views**, **Configuration**, **Diagnosis**, **Supervision**, **Mib_Management**, **OAM Domain**, **Transmission / Connection / Performance** (alternative: the desired menu application can be activated either from the “**Views**” options, or from the application tabs), **Help** (see [“List of the menus options” \(p. 4-12\)](#)).
- **tool bar** : providing some fast buttons (from left to right): “go to the previous view”; “go to the next view”; “refresh tree”, “properties of selected resource”; “delete the selected resource”; “print the selected resource”; “help about the clicked item”.

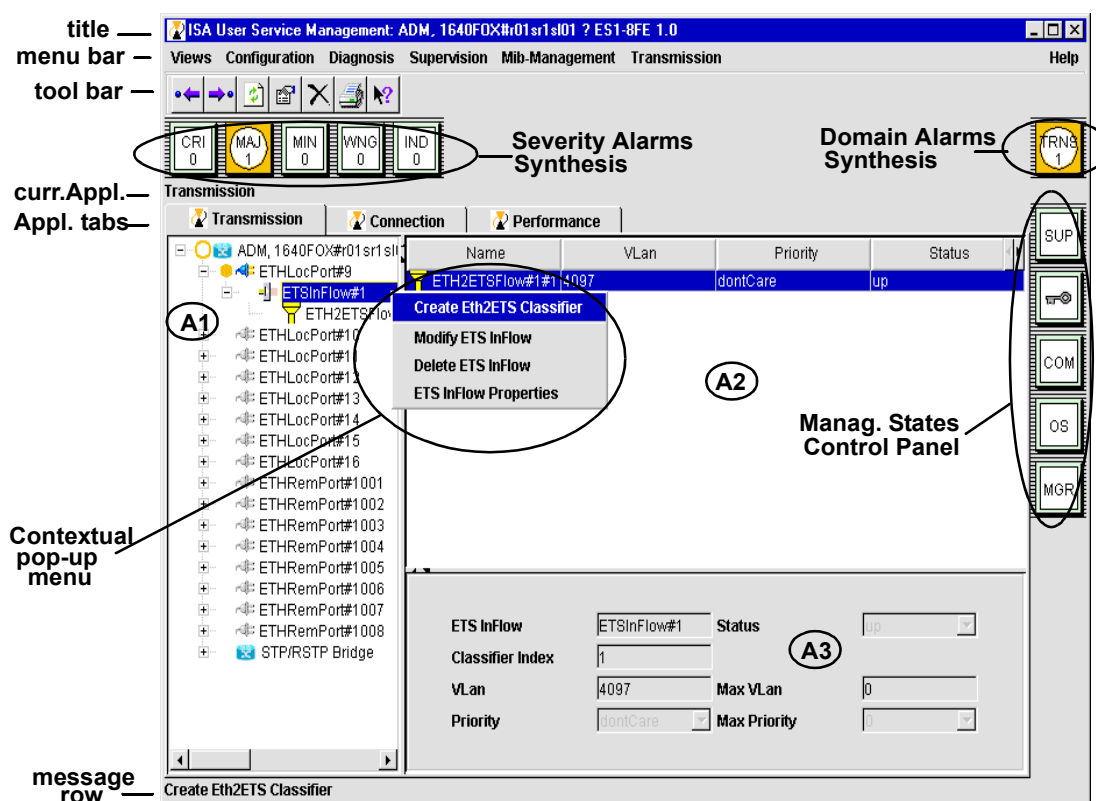
Note: In the “**Performance**” and “**Connection**” applications, some further buttons are displayed (fast keys), in order to switch among different modalities of the function).

- **curr.Appl.** : Current selected application.
- **Appl.tabs** (Application tabs): containing the tabs to enter the main ES applications: **Transmission**, **Connection**, **Performance**. By clicking on these tabs, the corresponding alternative menu is displayed in the menu-bar, and the displayed areas are changed, according to the selected application.
- **message row** : it displays an help/information message about the current action or the object on which the mouse is transiting over.
- **Severity Alarms Synthesis**: a series of boxes reporting the alarms and their current counting, subdivided according to the assigned severity: CRITical, MAJor, MINor, WarNinG, INDeterminate; the detailed description is reported in [Chapter 5, “Maintenance”](#).
- **Domain Alarms Synthesis**: a box reporting the alarms counting relevant to the Transmission Domain; the detailed description is reported in the [Chapter 5, “Maintenance”](#).
- **Management States Control Panel**: a series of boxes displaying the states of the management control: SUPervised, local access (key), COM (CT-communication port connected), OS (1353SH presence), Manager (upper level NM-manager presence); the detailed description is reported in [Chapter 5, “Maintenance”](#), see also para. [“Supervision management” \(p. 4-24\)](#).

-
- **A1 (Resources Tree Area):** this area displays the available resources by means of a tree structure; when an item is indicated by a "+" sign it means that the resource contains more lower resources and can be expanded, if indicated by "-" it means the resource is already expanded, if no sign is present it means that the resource is a leaf. An item of the tree can be selected by clicking on the left mouse button; a pop-up menu, containing the actions that can be done on the selected item, is generated by clicking on the right mouse button. See details in "[Resources TREE area \(A1\)](#)" (p. 4-8).
 - **A2 (Application Table Area):** this area lists, in tabular form, the object contained in the selected resource (selected in the tree). A row of the table can be selected by clicking on the left mouse button; a pop-up menu, containing the actions that can be done on the selected item, is generated by clicking on the right mouse button.
 - **A3 (Resource Information Area):** this area displays, only for information purpose, the details about the selected resource, after selecting it in the above area A2; the displayed information depends on the application that is being used.
 - **Pop-up menus :** some menus pop up in the areas A1 or A2, after selecting a resource and clicking on the right button of the mouse; the pop-up menus yield directly the possible options, for that particular selected resource, that are related to the current selected application.

The pop-up menus appearing in the tree-area (A1) are also called "***contextual pop-up menu***". The items contained in the "contextual pop-up menus" are the same as those contained in the specific menus of the menu-bar. The pop-up menu can also be activated after selecting a resource in the application-table-area A2.

Figure 4-2 Main view



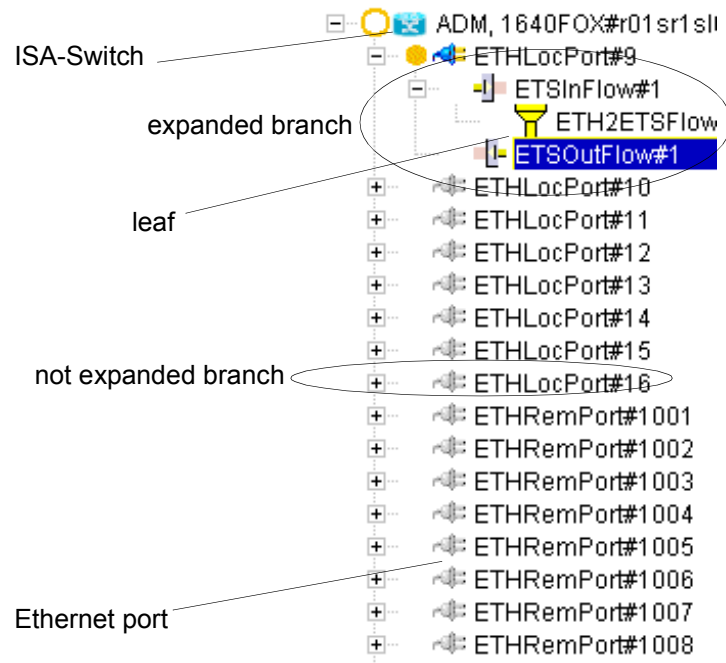
The whole window and also the "A1", "A2" and "A3" areas can be stretched, by means of the mouse arrow.

Further, a self-explaining message appears under the mouse cursor, when it is passed over an active field; this message reports the status-information, when the mouse is passed over the resources listed in the "Tree" area (see "[Spontaneous Informations about Resources in the Tree Area](#)" (p. 4-11)).

Resources TREE area (A1)

The Tree is composed of: a “root” (the ISA ES Node), “branches” and “leaves”. A branch contains one or more leaves and is expandable, to see the leaves. It is preceded by a little square containing a “+” sign or a “-” sign; the “+” means that the branch is contracted and can be expanded, the “-” means that the branch is already expanded and can be contracted. A leaf is not preceded by any sign and means that cannot be expanded.

Figure 4-3 TREE area example



All the ports are visualized automatically by the system in the tree; if not yet defined, they are greyed.

Resources Visualization in the Tree Area

“**ES Node**” (with active alarms):



The colored circle before the switch is a visual indication of the alarms synthesis, see below for details.

“**ETHERNET port**”



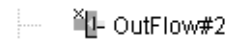
- configurable, not in service (down)
- Local (or Remote), in-service (up), with active alarms
- in not usable state, not configurable:

The colored ball before the port is a visual indication of the alarms synthesis, see below for details.

“**IN-FLOW**” Point

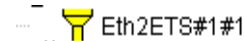


“**OUT-FLOW**” Point



The presence of a little upper cross (“X”) means that the point is connected.

“**CLASSIFIER**” POINT



The presence of a little upper cross (“X”) means that the point is connected.

“**ETB Port**” orange colored (also called

“(R)STPBridgePort”)



“**AggGroup-Root**”: named “**AggGroup-Management**”, it collects all created LAGs



“**LAG**”, i.e., “Link Aggregation Group”



Note:

- **ES Node**: representing the ISA-ES virtual node
- **LOCAL ETHERNET PORT**: representing the local ethernet access
- **REMOTE ETHERNET PORT**: representing the remote ethernet access, i.e. the interface towards the network, mapping the ethernet frames over SDH
- **IN-FLOW**: internal resource used into a “Local” or “Remote” ethernet port, in order to define and characterize an incoming ethernet data flow

- **OUT-FLOW**: internal resource used into a “Local” or “Remote” ethernet port, in order to define and characterize an outgoing ethernet data flow
- **Eth2ETS CLASSIFIER**: representing the Classifier Point (identification), to classify the ethernet data flow; it defines the priority and the Vlan number of the flow; it can define also a range of Vlan links into an ethernet flow, if they are directed towards the same way
- **ETB Port** (also called “(R)STPBridgePort”): representing the Ethernet Ports that have been configured to work in “autolearning” modality. The color is changed to orange, after their swapping
- **AggregateGroupManagement**: representing the logical point to organize all the “LinkAggregated” resources
- **LAG**: representing the logical resource grouping the links to be aggregated.

Visualization of Resources Conditions in the Tree Area

Colors of the displayed resource:

- colored (yellow, or blue, green, etc.) = available and in-service (active)
- light grey = available but not-in-service
- dark grey = out-of-context (not manageable in current application)

A little upper cross (above the resource symbol) means that the resource is a **connection point**.

A little lower black point (under the resource symbol) means that the resource contains active **PM (Performance Monitoring)** points.

Note: The black point is displayed only in the “Performance” domain.

Alarms Visualization in the Tree Area

Alarms summary:  (at level of ES Node)

The Alarms summary is visualized only at the ES Node level, reporting the colors of the maximum alarm severities, detected in the current ES Node (inner circle) and in the contained resources (outer rings). If the inner circle is not colored, it means that the alarms are in the contained resources and not in the parent one.

Alarms synthesis (only at the ports level): 

The Alarms synthesis is visualized at all the ports, reporting all the alarm severity colors (in form of concentric rings), detected in the current resource (inner circle) and in the contained resources (outer rings). If the inner circle is not colored, it means that the alarms are in the contained resources and not in the parent one.

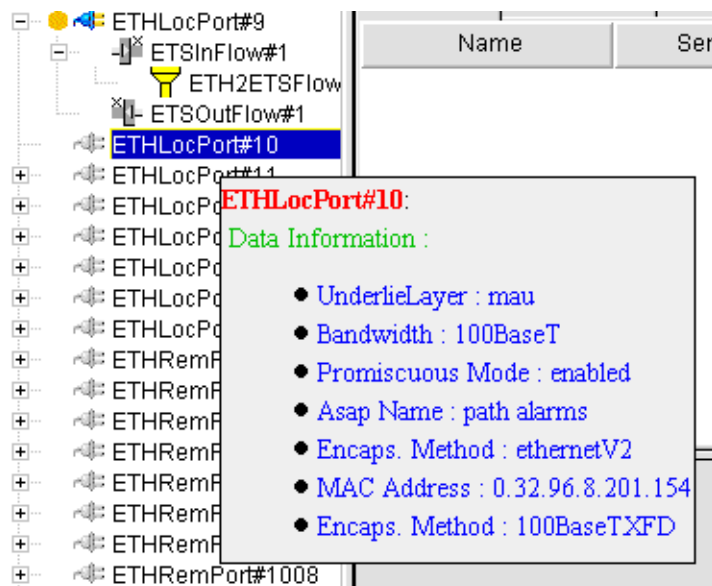
The colors of the alarms are detailed in [Chapter 5, “Maintenance”](#).

Spontaneous Informations about Resources in the Tree Area

A self-explaining message appears under the mouse cursor, when it is passed over an active field; this message reports the status-information, when the mouse is passed over the resources listed in the “Tree” area (see [Figure 4-4, \(p. 4-11\)](#)); more information is given by pressing the F12 key on the keyboard.

This spot gives information about: Traffic Label, Traffic Contract, Connection Type, Alarms, etc.

Figure 4-4 Spontaneous information message example



List of the menus options

The menu bar contains all the options for the configuration and supervision of the ISA-ES Elements.

These paragraphs list all the menus options. Their usages and functions are described in other paragraphs that are referenced; here a brief description is given for someone of them.



WARNING

Some option of the menus can be sometime deactivated (grayed) if its function is not congruent with the currently selected item or application, or when it is not yet operative. Specifically, OAM, LAPS, IGMP, and Link Aggregation (LAG) are not supported; the option of the menus for these functions are grayed out.

The menu bar contains “permanent menus” (always displayed) and other “specific menus”, alternative between them, displayed only when a particular application is selected in the “**Application tabs**”, or when they are selected in the “**Views**” items. Starting from left, the menus are:

- **Permanent Menus**

- **Views** (first column). See options in “[Views menu introduction](#)” (p. 4-13).
- **Configuration** (second column). See options in “[Configuration menu introduction](#)” (p. 4-14).
- **Diagnosis** (third column). See options in “[Diagnosis menu introduction](#)” (p. 4-14).
- **Supervision** (fourth column). See options in “[Supervision menu introduction](#)” (p. 4-15).
- **MIB-Management** (fifth column). See options in “[Mib-Management menu introduction](#)” (p. 4-15).
- **OAM Domain** (sixth column). See options in “[OAM Domain menu introduction](#)” (p. 4-15).
- **Help** (last column: it activates the help system). See options in “[Help menu introduction](#)” (p. 4-16).

- **Specific alternative Menus**

- **Transmission** (seventh column) See options in “[Transmission menu introduction](#)” (p. 4-16).
- **Connection** (seventh column). See options in “[Connection menu introduction](#)” (p. 4-21).
- **Performance** (seventh column). See options in “[Performance menu introduction](#)” (p. 4-22).

- **Pop-up Menus**

The menu items contained in the **“contextual” pop-up menus** are the same as those contained in the specific menus of the menu-bar; e.g.: the contextual pop-up item **“Configure Ethernet Port”** of the Transmission application can be also activated by selecting, in succession: **“Transmission”** in the applications tabs, then a Local (or Remote) Ethernet port in the “Tree area”, then, in the menu-bar, **“Transmission”** -> **“Ethernet Port Management”** -> **“Configure Ethernet Port”**. Therefore, for their details, refer to the description given for the equivalent menu-bar options.

Permanent menus

Views menu introduction

It contains the following entries:

- **Backward:** To go to the backward view.
- **Forward:** To go to the forward view.
- **Transmission:** to enter the Transmission application. See options in [“Transmission menu introduction” \(p. 4-16\)](#).

It yields the “Transmission” menu in the seventh column of the menu bar.

- **Connection:** to enter the Connection application. See options in [“Connection menu introduction” \(p. 4-21\)](#).

It yields the “Connection” menu in the seventh column of the menu bar.

- **Performance:** to enter the Performance application. See options in [“Performance menu introduction” \(p. 4-22\)](#).

It yields the “Performance” menu in the seventh column of the menu bar.

- **Arrange Windows:** not yet operative
- **Refresh:** It refreshes the graphical views.

It contains the following sub-options:

- **Refresh Tree:** It refreshes the resources TREE.
- **Open Object:** not yet operative
- **Open In Window...:** not yet operative
- **Search...:** It activates a general search window from which a specific (or a group of) resource can be searched. (See [“Views -> Search” \(p. 4-29\)](#)).
- **Filter...:** not yet operative
- **Print:** It causes the printing of details for the selected resource list shown in the “Application Table” area. (See [“Views -> Print” \(p. 4-31\)](#)).
- **Close...:** not yet operative
- **Exit:** To close the ES-CT session.

Configuration menu introduction

It contains the following entries:

- **Alarms Severities:** To manage the Alarms Severity Assignment Profile (ASAP). See [“Configuration -> Alarms Severity \(ASAP management\)”](#) (p. 4-33).
- **Set Alarms Severities:** To associate an ASAP to a resource. See [“Set Alarms Severities”](#) (p. 4-37).
- **List CEPST Instances:** not yet operative
- **Loop-Back Management:** See [“Configuration -> Loop Back Management”](#) (p. 4-40).
- **Set ACD level:** not yet operative
- **Traffic Descriptor:** To manage the parameters defining the traffic.

It contains the following sub-options:

- **ETS Traffic Descriptor:** to manage the Ethernet traffic parameters. See [“Configuration -> Traffic Descriptor -> ETS Traffic Descriptor”](#) (p. 4-50).
- **Link Creation Wizard:** (not yet operative).
To start a wizard program for helping during the Links configurations. This procedure recalls, in the right order, the necessary dialog windows to configure the links parameters.
- **Connection Wizard:** (not yet operative). To start a wizard program for helping during the Connections configurations. This procedure recalls, in the right order, the necessary dialog windows to configure the cross-connections.
- **Options:** To set some options relevant to the CT graphic interface and to the applications (default values, measurement units, etc.). See [“Configuration -> Options”](#) (p. 4-26).

Diagnosis menu introduction

It contains the following entries:

- **Alarms:** To enter the “Alarms Surveillance” (AS) application. See [“Alarms Surveillance \(Diagnosis -> Alarms option\)”](#) (p. 4-41). It contains the following sub-options:
 - **ISA Alarms:** for the “Surveillance” of alarms relevant to the ES board.
 - **Object Alarms:** for the “Surveillance” of alarms relevant to the selected object.
 - **Transmission Alarms:** for the “Surveillance” of alarms relevant to the Transmission domain.
- **Log Retrieval:** To manage the Event Log Browser (ELB).
See [“Event Log Browser \(Diagnosis -> Log Retrieval\)”](#) (p. 4-43). It contains the following sub-options:
 - **Event:** to “browse” the logs relevant to the ES events.

- **Alarm:** to “browse” the logs relevant to the ES alarms.
- **Navigation:** It contains the following sub-options:
 - **EMLUSM:** To navigate to the parent EML-USM layer (OMSN equipment). See [“Diagnosis -> Navigation to EML-USM”](#) (p. 4-46).

Supervision menu introduction

It contains the following entries:

- **Access State:** To manage the supervision access states. See 4.5.1 page 140.
It contains the following sub-options:
 - **OS:** to switch the access from CT to the OS
 - **Requested:** to request the access for the local CT
- **Alarms:** To manage the alarms relevant to the supervision state.
It contains the following sub-options:
 - **Re-synchronize:** See [“Alarms re-synchronization”](#) (p. 4-41).
 - **Allow Notification:** See [“Allow/Inhibit Alarms Notifications”](#) (p. 4-41).
 - **Inhibit Notification:** See [“Allow/Inhibit Alarms Notifications”](#) (p. 4-41).
- **Set Manager List:** To manage the accesses to the local node from the various types of managers that are available. See [“Set Manager list”](#) (p. 4-25).
- **Restart ISA:** To restart the equipment software. See [“Restart ISA \(Not operative\)”](#) (p. 4-25).
Not operative in current release.

Mib-Management menu introduction

It contains the following entries:

- **Backup/Restore DB:** To manage the backup and restore of the MIB (configuration data-base). See [“Backup/Restore DB”](#) (p. 4-47).
- **Compare two Backup Files:** Not operative in current release. See [“Compare two Backup Files”](#) (p. 4-48).

OAM Domain menu introduction

It contains the following entries:

- **Configure Resources (OAM):** To manage the resources of OAM Domain. See [“OAM Domain: Configure Resources \(OAM\)”](#) (p. 4-163).
- **Properties Resources (OAM):** To show properties for resources of OAM Domain. See [“OAM Domain: Properties Resources \(OAM\)”](#) (p. 4-178).

-
- **Configure (OAM):** To manage the “Global” parameters for OAM. See [“OAM Domain: Configure \(OAM\)”](#) (p. 4-179).
 - **Properties (OAM):** To show the “Global” parameters for OAM. See [“OAM Domain: Properties \(OAM\)”](#) (p. 4-180).
 - **Configure LoopBack (OAM):** To manage the parameters for “Alcatel-Lucent-Proprietary” LoopBack. See [“OAM Domain: Configure LoopBack \(OAM\)”](#) (p. 4-181).
 - **LoopBack Properties (OAM):** To show the parameters for “Alcatel-Lucent-Proprietary” LoopBack. See [“OAM Domain: Loop Back Properties \(OAM\)”](#) (p. 4-183).

Help menu introduction

It contains the following entries:

- **On Context:** To activate a contextual help.
- **Glossary:** To display the glossary of the terms used.
- **About:** To display information about the ES-CT software.

Specific alternative Menus

Transmission menu introduction

It contains the following entries:

- **ISA Management:** To manage the transmission parameters for the ISA-ES unit.

It contains the following sub-options:

- **Configure ISA:** See [“Transmission: ISA : Configure ISA”](#) (p. 4-61).
- **VLAN Registration:** See [“Transmission: ISA : Vlan Registration”](#) (p. 4-110).
- **ISA Properties:** See [“Transmission: ISA : ISA Properties”](#) (p. 4-64).
- **Private VLAN Registration:** Not operative.
- **Resources Availability:** Not operative.
- **IGMP Management:**
 - **Configure IGMP:** See [“Transmission: ISA: IGMP Management: Configure IGMP”](#) (p. 4-150).
 - **IGMP Properties:** See [“Transmission: ISA: IGMP Management: IGMP Properties”](#) (p. 4-152).
- **Ppp Port Management:** Not operative
- **Ethernet Port Management:** To manage the transmission parameters for an Ethernet port (Local or Remote). It contains the following sub-options:

-
- **Substitute Ethernet -> Ppp:** (Not operative)
 - **Substitute Server Layer:** See [“Transmission: Ethernet Port: Substitute Server Layer”](#) (p. 4-88).
 - **ETH on GFP**
 - **ETH on LAPS**
 - **Substitute Client Layer:** See [“Transmission: Ethernet Port/Aggregator: Substitute Client Layer”](#) (p. 4-109).
 - **Ethernet(ETS) -> Bridge(ETB)**
 - **Bridge(ETB) -> Ethernet(ETS)**
 - **GFP Client Layer Management:** (Not operative)
 - **Queue (QoS) Management:**
 - **Configure Queue:** See [“Transmission: Ethernet Port: Queue \(QoS\): Configure Queue”](#) (p. 4-143).
 - **Properties Queue:** See [“Transmission: Ethernet Port: Queue \(QoS\): Properties Queue”](#) (p. 4-147).
 - **Bridge Port Management** To manage transmission parameters for an ETB Port. It contains the following sub-options:
 - **Configure Bridge Port (Virtual):** See [“Transmission: Ethernet Port: Bridge Port: Configure Bridge Port \(Virtual\)”](#) (p. 4-115)
 - **Configure Bridge Port (Provider):** See [“Transmission: Ethernet Port: Bridge Port : Configure Bridge Port \(Provider\)”](#) (p. 4-118)
 - **Configure Bridge Port (MAC):** See [“Transmission: Ethernet Port: Bridge Port : Configure Bridge Port \(MAC\)”](#) (p. 4-123)
 - **Bridge Port Properties:** See [“Transmission: Ethernet Port: Bridge Port: Bridge Port Properties”](#) (p. 4-142)
 - **Show VLAN info:** See [“Transmission: Ethernet Port: Bridge Port: Show VLAN Info”](#) (p. 4-142).
 - **CEPST Management:** (Not operative)
 - **Aggregation Port:**
 - **Configure:** See [“Transmission: Ethernet Port: Aggregation Port: Configure”](#) (p. 4-161).
 - **Properties:** See [“Transmission: Ethernet Port: Aggregation Port:”](#) (p. 4-161).
 - **Create Flow Group:** Not operative.
 - **Create ETS InFlow:** See [“Transmission: Ethernet Port: Create ETS InFlow”](#) (p. 4-88).

-
- **Create ETS OutFlow:** See “Transmission: Ethernet Port : Create ETS OutFlow” (p. 4-95).
 - **Create Provider InFlow:** See “Transmission: Ethernet Port: Create Provider InFlow” (p. 4-105).
 - **Create Provider OutFlow:** See “Transmission: Ethernet Port: Create Provider OutFlow” (p. 4-108).
 - **Configure Ethernet Port:**
 - **Local port:** See “Transmission: Ethernet Port : Configure (LOCAL) Ethernet Port” (p. 4-66).
 - **Remote port:** See “Transmission: Ethernet Port : (REMOTE) Ethernet Port Properties” (p. 4-87)
 - **IGMP Management:**
 - **Configure IGMP:** See “Transmission: ISA: IGMP Management: Configure IGMP” (p. 4-150).
 - **IGMP Properties:** See “Transmission: ISA: IGMP Management: IGMP Properties” (p. 4-152).
 - **Characterization Service:**
 - **Other:** See “Transmission: Ethernet Port : Characterization Service” (p. 4-88).
 - **Ets Virtual Switch (Service) :** Not operative
 - **Port To Port (Service):** See “Transmission: Ethernet Port : Characterization Service” (p. 4-88).
 - **Traffic Management:**
 - **Traffic Enabled:** See “Transmission: Ethernet Port: Traffic Management” (p. 4-88).
 - **Traffic Disabled:** See “Transmission: Ethernet Port: Traffic Management” (p. 4-88).
 - **Ethernet Port Properties:**
 - **Local port:** See “Transmission: Ethernet Port : Configure (LOCAL) Ethernet Port” (p. 4-66).
 - **Remote port:** See “Transmission: Ethernet Port: Configure (REMOTE) Ethernet Port” (p. 4-77).
 - **Aggregator Management:**
 - **Create Aggregator:** See “Transmission: Aggregator: Create Aggregator” (p. 4-159).

- **Aggregator:** (for LAG resource).
To manage the transmission parameters for a Link Aggregation Group.
It contains the following sub-options:
 - **Substitute Client Layer:** See [“Transmission: Ethernet Port/Aggregator: Substitute Client Layer”](#) (p. 4-109)
 - **ETB Layer**
 - **ETS Layer**
 - **Bridge Port Management :**
 - **Configure Bridge Port (Provider):** See [“Transmission: Ethernet Port: Bridge Port : Configure Bridge Port \(Provider\)”](#) (p. 4-118)
 - **Configure Bridge Port (Virtual):** See [“Transmission: Ethernet Port: Bridge Port: Configure Bridge Port \(Virtual\)”](#) (p. 4-115)
 - **Configure Bridge Port (MAC):** See [“Transmission: Ethernet Port: Bridge Port : Configure Bridge Port \(MAC\)”](#) (p. 4-123)
 - **Bridge Port Properties:** See [“Transmission: Ethernet Port: Bridge Port: Bridge Port Properties”](#) (p. 4-142).
 - **Show VLAN Info:** See [“Transmission: Ethernet Port: Bridge Port: Show VLAN Info”](#) (p. 4-142).
 - **CEPST Management :** (not operative)
 - **Create Flow Group :** (not operative)
 - **Create ETS InFlow:** See [“Transmission: Ethernet Port: Create ETS InFlow”](#) (p. 4-88).
 - **Create ETS OutFlow:** See [“Transmission: Ethernet Port : Create ETS OutFlow”](#) (p. 4-95).
 - **Create Provider InFlow:** See [“Transmission: Ethernet Port: Create Provider InFlow”](#) (p. 4-105).
 - **Create Provider OutFlow:** See [“Transmission: Ethernet Port: Create Provider OutFlow”](#) (p. 4-108).
 - **Configure Aggregator:** See [“Transmission: Aggregator: Configure Aggregator”](#) (p. 4-160).
 - **Delete Aggregator:** See [“Transmission: Aggregator : Delete Aggregator”](#) (p. 4-161).
 - **Traffic Management:** See [“Transmission: Aggregator : Traffic Management”](#) (p. 4-88)
 - **Traffic Enable**
 - **Traffic Disable**

-
- **IGMP Management:**
 - **Configure IGMP:** See “[Transmission: Aggregator: IGMP: Configure IGMP](#)” (p. 4-158).
 - **IGMP Properties:** See “[Transmission: Aggregator: IGMP: IGMP Properties](#)” (p. 4-158).
 - **Aggregator Properties:** See “[Transmission: Aggregator : Aggregator Properties](#)” (p. 4-160).
 - **Group Flow Management:** (Not yet operative).
 - **MPLS Port Management:** (Not operative)
 - **MPLS InSegment Management:** (Not operative)
 - **MPLS OutSegment Management:** (Not operative)
 - **ETS InFlow Management:** To manage the transmission parameters for an InFlow point.

It contains the following sub-options:

- **Create Eth2ETS Classifier:** See “[Transmission: ETS InFlow : Create Eth2ETS Classifier](#)” (p. 4-101).
 - **Modify ETS InFlow:** See “[Transmission: ETS InFlow : Modify ETS InFlow](#)” (p. 4-99).
 - **Delete ETS InFlow:** See “[Transmission: ETS InFlow : Delete ETS InFlow](#)” (p. 4-100).
 - **ETS InFlow Properties:** See “[Transmission: ETS InFlow : ETS InFlow Properties](#)” (p. 4-99).
 - **ETS OutFlow Management:** To manage the transmission parameters for an OutFlow point.
- It contains the following sub-options:
- **Modify ETS OutFlow:** See “[Transmission: ETS OutFlow : Modify ETS OutFlow](#)” (p. 4-99).
 - **Delete ETS OutFlow:** See “[Transmission: ETS OutFlow : Delete ETS OutFlow](#)” (p. 4-100).
 - **ETS OutFlow Properties:** See “[Transmission: ETS OutFlow : ETS OutFlow Properties](#)” (p. 4-99).
 - **Classifier Management:** To manage the transmission parameters for an ETS-Classifier point.

It contains the following sub-options:

- **Modify Classifier:** See “[Transmission: Classifier : Modify Classifier](#)” (p. 4-104).
- **Delete Classifier:** See “[Transmission: Classifier : Delete Classifier](#)” (p. 4-104).

-
- **Classifier Properties:** See [“Transmission: Classifier : Classifier Properties”](#) (p. 4-104).

Connection menu introduction

It contains the following entries:

- **Bridge Management:** To manage the connection parameters for the Bridge.
It contains the following sub-options:
 - **Filtering Data Base:** See [“Connection: Bridge : Filtering Data Base”](#) (p. 4-184).
 - **Segregated Port management:** (Not operative)
- **Ethernet Port Management:** To manage the connection parameters for an Ethernet port.
It contains the following sub-options:
 - **Segregated Port Set:** (Not operative)
 - **Create Ets XC One Step (MAC/Virtual):** See [“Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)”](#) (p. 4-191).
 - **Delete Ets XC One Step (MAC/Virtual):** See [“Connection: Ethernet Port : Delete Ets XC One Step \(MAC & Virtual\)”](#) (p. 4-202).
 - **Create Ets XC One Step (Provider):** See [“Connection: Ethernet Port : Create Ets XC One Step \(Provider\)”](#) (p. 4-194).
 - **Delete Ets XC One Step (Provider):** See [“Connection: Ethernet Port : Delete Ets XC One Step \(Provider\)”](#) (p. 4-204).
- **Link AggregatorGroup Management:** To manage the connection parameters for a LAG.

Note: These options are the same as the above “EthernetPortManagement”.

It contains the following sub-options:

- **Segregated Port Set:** (Not operative).
- **Create Ets XC One Step (MAC/Virtual):** See [“Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)”](#) (p. 4-191).
- **Delete Ets XC One Step (MAC/Virtual):** See [“Connection: Ethernet Port : Delete Ets XC One Step \(MAC & Virtual\)”](#) (p. 4-202).
- **Create Ets XC One Step (Provider):** See [“Connection: Ethernet Port : Create Ets XC One Step \(Provider\)”](#) (p. 4-194).
- **Delete Ets XC One Step (Provider):** See [“Connection: Ethernet Port : Delete Ets XC One Step \(Provider\)”](#) (p. 4-204).
- **MPLS InSegment Management:** (Not operative).
- **MPLS OutSegment Management:** (Not operative).

-
- **ETS InFlow Management:** To manage the connection parameters for an InFlow point. It contains the following sub-options:
 - **Create Ets XC:** (Not operative) See [“Connection: ETS InFlow : Create Ets XC \(not operative\)”](#) (p. 4-208) 4.11.7 on page 305
 - **Modify Ets XC:** See [“Connection: ETS InFlow : Modify Ets XC”](#) (p. 4-211)
 - **Ets XC Properties:** See [“Connection: ETS InFlow : Ets XC Properties”](#) (p. 4-212)
 - **ETS OutFlow Management:** To manage the connection parameters for an OutFlow point. It contains the following sub-options:
 - **Create Ets XC:** (not operative) See [“Connection: ETS OutFlow : Create Ets XC \(not operative\)”](#) (p. 4-213);
 - **Modify Ets XC:** See [“Connection: ETS OutFlow : Modify Ets XC \(not operative\)”](#) (p. 4-213); (not operative)
 - **Delete Ets XC:** See [“Connection: ETS OutFlow : Delete Ets XC”](#) (p. 4-214)
 - **Ets XC Properties:** See [“Connection: ETS OutFlow : Ets XC Properties”](#) (p. 4-213)

Performance menu introduction

It contains the following entries:

- **MPLS Switch Management:**

To manage the Performance Monitoring (PM) Granularity for the Bridge. It contains the following sub-options:

 - **Granularity 15 Minutes:** See [“Performance: Mpls Switch: Granularity 15Minutes/1Hour”](#) (p. 4-216)
 - **Granularity 1 Hour:** See [“Performance: Mpls Switch: Granularity 15Minutes/1Hour”](#) (p. 4-216).
- **MPLS Port Management:** (not operative)
- **MPLS InSegment Management:** (not operative)
- **M0PLS OutSegment Management:** (not operative).
- **Ethernet Port Management:**

To manage the Performance Monitoring (PM) parameters for an Ethernet port. It contains the following sub-options:

 - **Configure Eth Aggr:** See [“Performance: Ethernet Port : Configure Eth. Aggr.”](#) (p. 4-217)
 - **Eth Aggr Properties:** See [“Performance: Ethernet Port : Eth Aggr. Properties”](#) (p. 4-218).

- **Flow Group Management:** (Not operative)
- **ETS InFlow Management:** To manage the Performance Monitoring (PM) parameters for an InFlow point. It contains the following sub-options:
 - **Configure InFlow:** See “[Performance: ETS InFlow : Configure InFlow](#)” (p. 4-220)
 - **InFlow Properties:** See “[Performance: ETS InFlow: InFlow Properties](#)” (p. 4-221).
- **ETS OutFlow Management:** To manage Performance Monitoring (PM) parameters for an OutFlow point. It contains the following sub-options:
 - **Configure OutFlow:** (Not operative). See “[Performance: ETS OutFlow: Configure OutFlow \(not operative\)](#)” (p. 4-223)
 - **OutFlow Properties:** (Not operative). See “[Performance: ETS OutFlow: OutFlow Properties \(not operative\)](#)” (p. 4-224).

Supervision management

In this paragraph and relevant sub-paragraphs general configuration referred to the equipment supervision are described (ES-Craft Terminal access, local and upper management list, etc.).

Access state (allow or inhibit ES-Craft access)

The ES-NE can be managed by the OS (Operations System) or by the ES-CT. To control the competition of the OS and the CT, a Local Access Control (LAC) is available.

- a. If the LAC is "granted" that means the CT is allowed to manage the NE. The icon with a **key** symbol has a rectangular shape and its border is green.



- b. If the NE is "isolated" the icon with a **key** symbol has a rectangular shape and its border is blue.
- c. If the LAC is "access denied" that means the OS manages the NE and the CT is not allowed to modify NE configuration (it can only "read"). The icon with a key symbol has a circular shape.



If the LAC is "requested" that means the CT has requested permission from the OS and is waiting for a replay.

However the OS does continue to provide a certain number of services. These services include: Reception and processing of alarms, Performance processing, Switching back to the OS access state.

The access state of an NE can be modified as follows:

1. Switching from the OS to the ES Craft Terminal access state

Select the **Supervision** pull down menu. Then select the **Requested** option from the **Access State** cascading menu.

From the confirmation dialog that opens you can confirm or cancel the "Craft access" operation using the **Yes** or **No** push buttons. the request is up to the OS, which accepts or refuses it.

If the OS doesn't answer in a predefined time it is assumed that the NE is in the Craft access state and can be managed from an ES-CT.

2. Switching from the ES-CT access state back to the OS access state

Select the **Supervision** pull down menu. Then select the OS option from the **Supervision -> Access State** cascading menu.

From the confirmation dialog that opens you can confirm or cancel the "OS access" operation.

The NE is now managed by the OS.

Important! The key symbol icon on the management states of the NE view indicates whether the NE is managed by a craft terminal or by the OS.

Important! Local Craft Terminal access is denied on recovery phases after a loss of communication of the NE. When communication is lost with the NE, the OS automatically recovers the communication and puts the state that was set before the loss of communication (therefore the Craft Terminal access can be denied or granted).

Set Manager list

This option allows the user to set the Manager list, i.e. to define the list and the priorities of the entities that the ES-CT can access and manage.

Select the **Set Manager list** option from the **Supervision** pull down menu.

The dialog-box contains the following field:

- **Current Value:** to define the current Operator as BM (Bandwidth Manager) or EML (Element Management Layer).

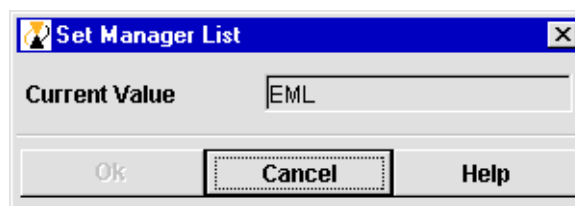
According to the user profile, the list can be read or read/write. If the user is not allowed, the "Current Value" cannot be edited.

OK button is used to validate the selection.

Cancel button closes the dialog without changes of the data.

Help button provides some useful information about the dialog.

Figure 4-5 Set Manager list



Restart ISA (Not operative)

The restart operation is a software restart.

Select the **Restart ISA** option from the **Supervision** cascading menu.

Generic and common functions

This paragraph and relevant sub-paragraphs describe the generic menu items, common to all the applications:

- **Configuration -> Options**
- **Views -> Search**
- **Views -> Print**

Configuration -> Options

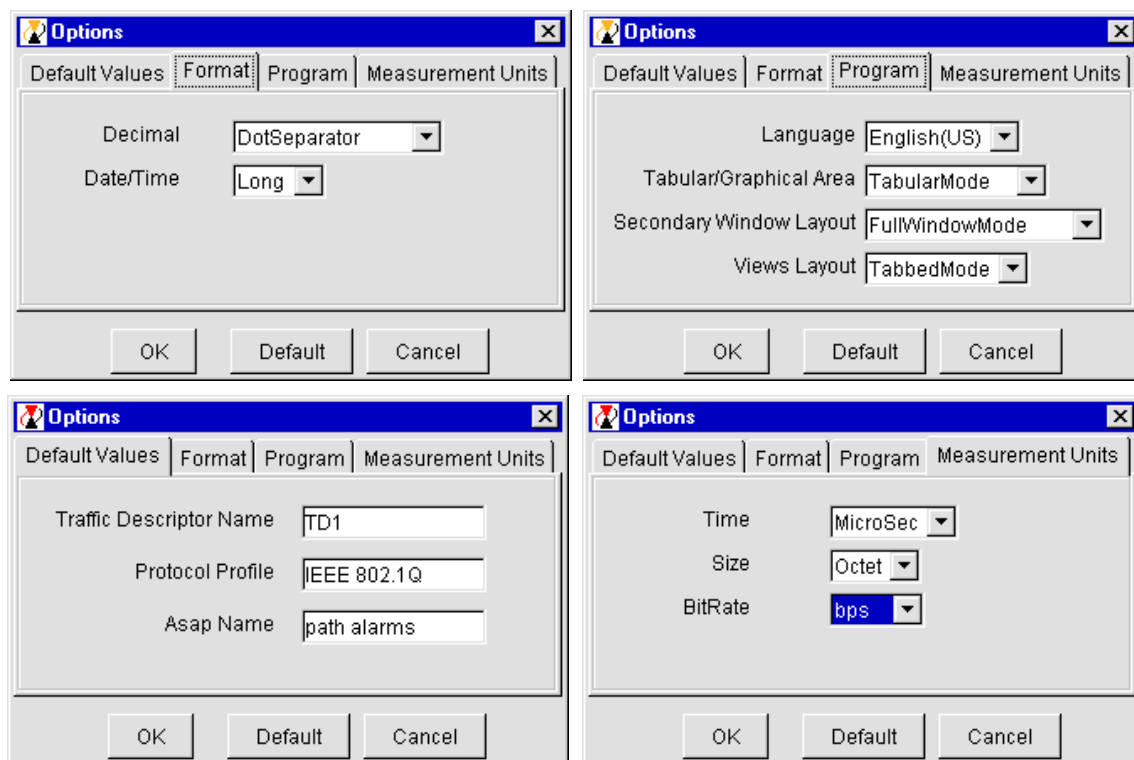
This function is accessible by selecting, in the menu bar: **Configuration -> Options**

An example of the displayed dialog window is reported in [Figure 4-7, \(p. 4-28\)](#).

These options permit to set some general parameters relevant to the initial default settlement, graphic interface, etc. A set of tabbed windows is displayed, where each of them is shown by clicking on the relevant tab ("Default Values", "Format", "Program", "Measurement Units"):

- **Default Values**, i.e. the initial values that the system will automatically assign to some parameters:
 - **Traffic Descriptor Name**: default TD name
 - **Protocol Profile**: default Protocol Profile name (see "Transmission" -> "EthernetPort Configuration" for details)
 - **ASAP Name**: default ASAP name
- **Format**, i.e., the format for some parameters:
 - **Decimal**: Dot Separator (".") or Comma Separator (",") numerical notation
 - **Date/Time**: Long or Short
- **Program**, i.e. some parameters relevant to the graphical interface:
 - **Language**: the options are: "English (UK)", or "English (US)", or "Italian"
 - **Tabular/Graphical Area**: It is relevant to the Application Area; the options are: "TabularMode", or "GraphicalMode". The "GraphicalMode" (not operative) is applicable only in Performance Monitoring (PM).
 - **Secondary Window Layout**: it is relevant to the displayed dialog windows; possible options: "Full window Mode" (the dialogs are presented on only one window) or "Tabbed Window Mode" (the dialogs are presented on more windows, accessible by relative tabs), see ["Windows Presentation: FullWindow" and "TabbedWindow"](#) (p. 4-28).
 - **Views Layout** : the only option is "Tabbed Mode"
- **Measurement Units**:
 - **Time**: possible options: "MicroSec" or "MilliSec"

- **Size:** possible options: “Octet”
- **BitRate:** possible options: “kbps” or “Mbps”

Figure 4-6 Configuration -> Options

Windows Presentation: "FullWindow" and "TabbedWindow"

This function is accessible by selecting, in the menu bar: **Configuration -> Options** and then clicking on **"Program"** tab, **"SecondaryWindowLayout"** field.

It is relevant to the displayed dialog windows; possible options: **"Full window Mode"** (the dialogs are presented on only one window) or **"Tabbed Window Mode"** (the dialogs are presented on more windows, accessible by relative tabs). They report the same fields, but represented in two different manners; see examples on [Figure 4-7](#) and [Figure 4-8](#).

Important! This option is not effective, in current release.

Figure 4-7 Configuration -> Options - Program ("Full Window Mode" example)

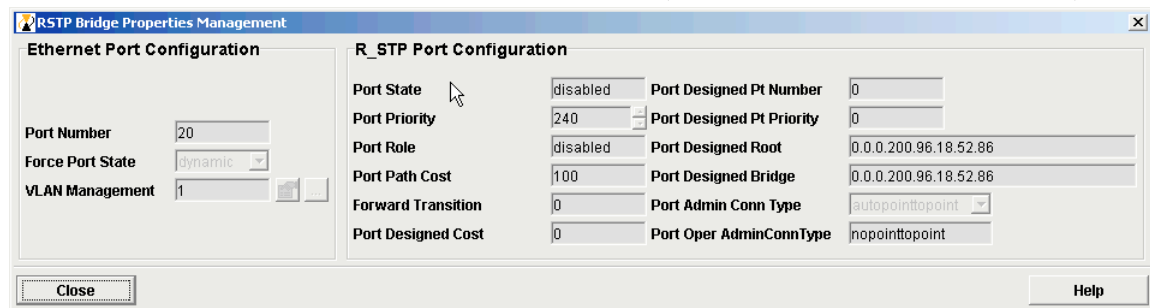
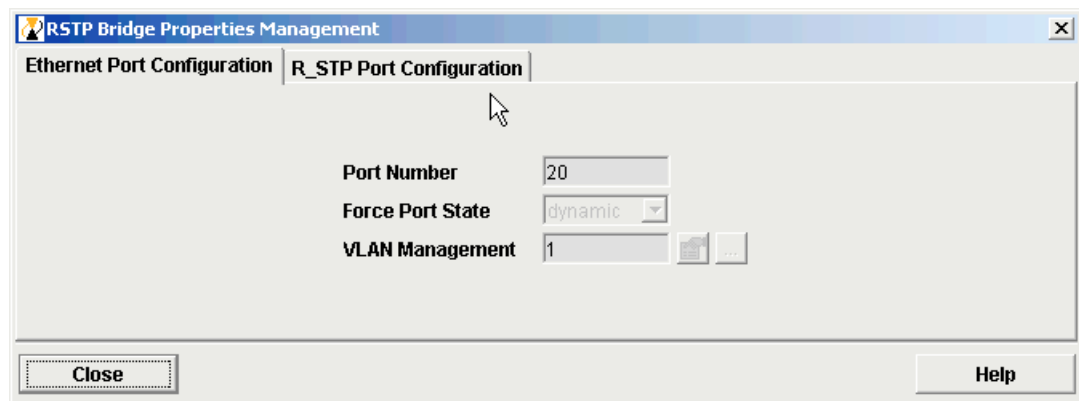


Figure 4-8 Configuration -> Options - Program ("Tabbed Window Mode" example)



Note: All the dialog windows described in this handbook are reported in **"FullWindow"** mode, the information fields reported in the **"TabbedWindow"** mode are the same.

Views -> Search

This function is accessible by selecting, in the menu bar: **Views -> Search**.

An example of the displayed dialog window is reported in [Figure 4-9, \(p. 4-30\)](#).

This same dialog is also always recalled by the other applications, when a specific resource has to be searched and associated to the calling application.

This function permits to search a resource (or a group of). A set of tabbed windows is displayed, where each of them is shown by clicking on the relevant tab :

ETS InFlow, ETS OutFlow, Ethernet Port.

The searching can be extended over all the existing resources of that type or restricted to some particular conditions of that resource (e.g. connected/not connected, in a range, etc.) by entering other parameters relevant to the resource to be searched; i.e. the searching can be done also without defining any specific parameter, in this case it will find all the resources related to the tab window.

The possible parameters for the searching criteria are listed below:

- **ETS OutFlow :**
 - **Status :** *up / down*
 - **XC Status:** *Cross Connected / Not Cross Connected*
 - **Server Type :** *Ethernet*
 - **Port Range :** *from... to...*
- **ETS InFlow :**
 - **Status :** *up / down*
 - **XC Status:** *Cross Connected / Not Cross Connected*
 - **Service Type :** *Ethernet*
 - **Port Range :** *from... to...*
- **Ethernet Port :**
 - **Status :** *up / down*
 - **Client Type :** *ets / etb*
- **Agg Group:**
 - **Status :** *up / down*
 - **Client Type :** *ets / etb*

Figure 4-9 Views -> Search

Search

ETS InFlow | ETS OutFlow | Ethernet Port

☐ Status: up
☐ XC Status: Cross Connected
☐ Service Type: Ethernet
☐ Port Range: From 19 To 1018

Search

Name	Service Type	Parent ID	Status
ETSIInFlow#8	Ethernet	ETHLocPort#19	up
ETSIInFlow#1	Ethernet	ETHLocPort#20	up
ETSIInFlow#2	Ethernet	ETHLocPort#20	down
ETSIInFlow#3	Ethernet	ETHLocPort#20	down
ETSIInFlow#5	Ethernet	ETHLocPort#21	up
ETSIInFlow#7	Ethernet	ETHLocPort#23	up
ETSIInFlow#4	ProviderBridge	ETHLocPort#20	up
ETSIInFlow#6	ProviderBridge	ETHLocPort#21	up

Create Delete Search
 Apply Close Print Help

At the bottom of the window there are the following buttons:

- **Create** : to create a new search criterion.
- **Delete** : to delete the selected search criteria.
- **Search** : to start the searching: at the end of the operation, the search results are tabled in the window.
- **Apply** : this key is used when the search has been called by an application, to browse a resource; by pressing this key the selected resource will be passed to the relevant application.
- **Close** : to close the Search window.
- **Print**: to print the results of the searching. It shows the dialog described in [“Views -> Print”](#) (p. 4-31).
- **Help** : to get helps about this function.

Views -> Print

This function is accessible by selecting, in the menu bar: **Views -> Print**

An example of the displayed dialog window is reported in [Figure 4-10](#).

This function permits to print the details concerning the list of resources shown in the “*Application area*” of the main view.

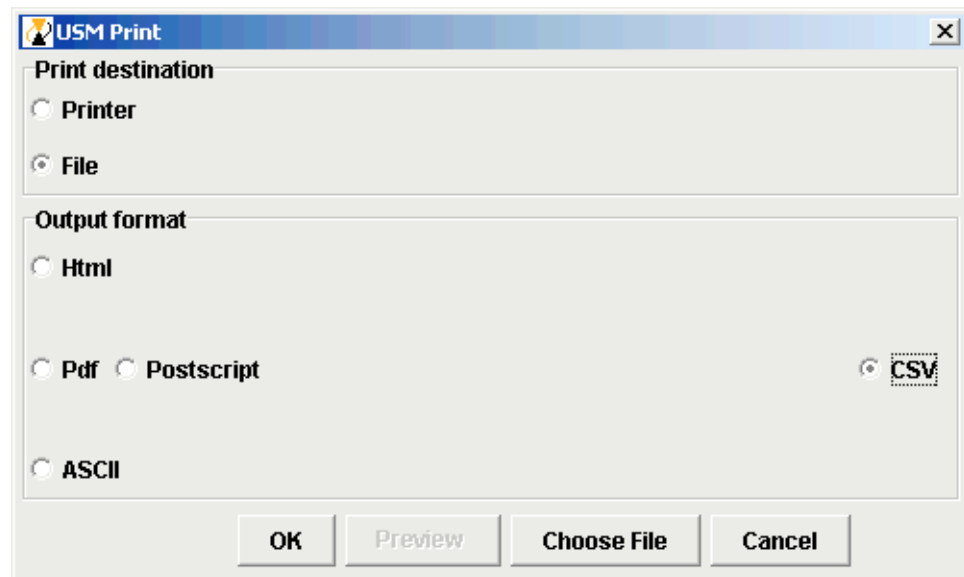
The printing can be addressed to a Printer or to a File.

In case of “File”, the user can browse the desired file by clicking on the key “**Choose File**”; the “**Output Format**” of the file can be chosen among “*Pdf*”, “*Html*”, “*Postscript*”, “*CSV*” or “*Ascii*” types.

This same dialog is also always recalled by the other applications, when the properties details associated to a resource have to be printed.

Click on “**Ok**” to print, on “**Preview**” to preview, or on “**Cancel**” to leave the dialog without printing.

Figure 4-10 Views -> Print



Diagnosis and Alarms Configuration

Alarms indications are always present on the operator's workspace. The different types of alarms, their number and their severity level are represented in the various views and areas of the ES-CT (Severity and Domain Alarms Synthesis, Tree-Area, Information-Area, Alarms Surveillance application, etc.). The alarms are represented by symbols, or icons, or texts (depending on the context), which change color when the relevant alarm is active. Thus, at any time, the user can know the number of alarms and their severity.

This paragraph and relevant sub-paragraphs describe some operations mainly related to the associations of the alarms with an appropriate severity for faults diagnosis, and the activation of “Alarms Surveillance”. The faults and alarms details and description as well as their relevant maintenance are reported in the [Chapter 5, “Maintenance”](#).

The following functions are related:

- Alarms Severity Assignment Profile (ASAP) management
- Alarms re-synchronize
- Allow/Inhibit alarms notification
- Restart ISA
- Alarms Surveillance: ISA alarms
- Alarms Surveillance: Object alarms
- Alarms Surveillance: Transmission alarms

Configuration -> Alarms Severity (ASAP management)

Managed entities yield alarms when they have some malfunctions. This paragraph deals with the configuration of ASAPs. An ASAP is a list of Alarm probable causes to which Severities Profiles are assigned, predefined or set by the operator.

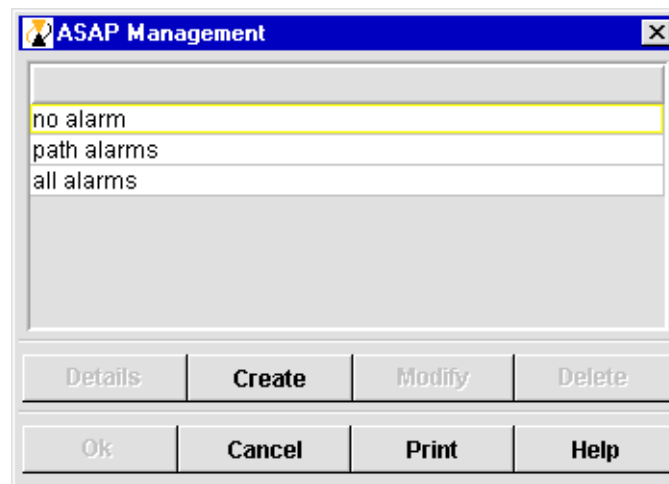
This option permits to configure (create, modify, etc.) the ASAPs.

This same dialog is also always recalled by the other applications, when the association of an ASAP to a selected alarm or resource is needed.

Select the **Alarms Severities** option from the **Configuration** pull down menu.

The ASAP Management dialog is displayed, as follows:

Figure 4-11 ASAP Management dialog



The default presented profiles are:

- “**no alarm**”: all the alarms are disabled (“cleared”), i.e. they are not displayed by the ES-CT.
- “**path alarms**”: all the alarms are enabled and set to “major” severity.
- “**all alarms**”: all the alarms are enabled and set to “minor” severity.

The predefined profiles of these default ASAPs are listed in [Table 4-1, \(pg. 4-36\)](#).

By clicking on any of the keys: **Details** or **Create** or **Modify**, a window as that of [Figure 4-12, \(p. 4-34\)](#) is displayed (example).

At the bottom of the window shown in [Figure 4-11, \(p. 4-33\)](#) there are the following other buttons:

- **Delete** : to delete the selected ASAP.
- **Cancel** : to close the window.
- **Print** : to print the list of ASAPs.

- **Help** : to get helps about this function.
- **Ok** : this button is not active, because it can be used only to set the Alarm Severity to a resource, when this dialog is recalled by the relevant resource configuration.

Figure 4-12 ASAP: Severities profile example

Creating an ASAP:

As soon as the previous window shown in [Figure 4-11, \(p. 4-33\)](#) is presented, only the **Create** button is available, therefore, by clicking on this key the window of [Figure 4-12, \(p. 4-34\)](#) is displayed and the user can create a new ASAP.

For this purpose follow the following steps:

- **ASAP Identifier** : fill this field with a name
- **Probable Causes Families** : the category of alarms can be chosen among:
 - *Communication* or *Error Processing* or *Equipment* or *Quality Of Service* the choosing of these families is not operative, in current release.
- **Probable Cause Name** : a list of alarms names belonging to the above selected family; the relevant severity associated to a selected alarm of the list is shown in the adjacent field “Severity”; the other two fields indicate if it is “No Service Affecting” or “Service Independent” (these latter two fields are not operative).
 - **Severity**: this field contains a pull-down list of the possible severities to be associated to the selected alarm, they are: “*cleared*”, “*major*”, “*warning*”, “*minor*”, “*critical*”, “*indeterminate*”; the meaning of these alarms severities is described in [Chapter 5, “Maintenance”](#).

At the bottom of the window there are the following buttons:

- **Ok** : to confirm the creation of this new asap.
- **Cancel** : to close the window without doing any operation.
- **Print** : to print a detail list of this ASAP.
- **Help** : to get helps about this function.

Getting details on ASAPs:

After selecting a profile in the window of [Figure 4-11, \(p. 4-33\)](#) and clicking on the **Details** key, details about it are given on the displayed “**ASAP Severity**” window, the same as [Figure 4-12, \(p. 4-34\)](#).

In this case the user can just check the associated severities, by clicking on the alarms name in the list ***Probable Cause Name*** and reading the associated severity in the ***Severity*** field; at the end click on **Cancel** button to leave the dialog.

Modifying an ASAP:

After selecting a profile in the window of [Figure 4-11, \(p. 4-33\)](#) and clicking on the **Modify** key, the user can modify it, on the displayed “**ASAP Severity**” window shown in [Figure 4-12, \(p. 4-34\)](#).

In this case the user can change the associated severities, by clicking on the alarms name in the list ***Probable Cause Name*** and then choosing the appropriate severity in the pull-down list of the ***Severity*** field; at the end click on the **Ok** button to confirm the modifications.

Setting an ASAP to a Resource:

The ASAP association to a resource is carried out from the option “**Configuration...** (a resource)”, in the “**Transmission**” context; e.g.: for an Ethernet-port, select the Transmission application, then select the relevant Ethernet-port, then, in the pop-up menu, select the “**Configure Ethernet Port**” option; in the presented window, in the “**Configuration**” sector there is the field “**ASAP Name**”, where the desired ASAP can be configured: clicking on the [...] button, the window of [Figure 4-11, \(p. 4-33\)](#) will be recalled, then select the desired ASAP and click on “**Ok**” button.

Table 4-1 Alarms & Severities association in predefined ASAPs

ALARM name	ASAP_ID: "no alarm"	ASAP_ID: "path alarms"	ASAP_ID: "all alarms"
LOS (Loss Of Signal)	cleared	major	major
LOF (Loss Of Frame)	cleared	major	major
TSF (Trail Signal Fail)	cleared	major	major
PLM (PayLoad Mismatch)	cleared	major	major
GTM (GFP Type Mismatch)	cleared	major	minor
SCD (SDH Concatenation Degrade)	cleared	cleared	minor
CSF (Client Signal Failure)	cleared	major	major

Note: "cleared" means that the alarm is not displayed by the ES-CT. The meaning of the other alarms severities is described in [Chapter 5, "Maintenance"](#).

Set Alarms Severities

This option permits to send (i.e. to provision) a chosen ASAP to a selected EthernetPort, or to all the Ethernet Ports of the ES node.

Select the **Set Alarm Severities** option from the **Configuration** pull down menu.

The ASAP Enhanced dialog is displayed, as for the window shown in [Figure 4-13, \(p. 4-39\)](#).

The ASAP currently operative on the selected object (only if EthernetPort) is highlighted, permitting to check the currently used ASAP.

To set an ASAP, fill fields and areas as follows:

- **Select Object** : reporting the selected resource
 - **List of ASAPs** sector:

the list reports all the existing ASAP's. One of them can be highlighted, if an EthernetPort has been selected.

Select one of the listed ASAP's to be provisioned

Detail: it gives details about the selected ASAP, with the same procedure as seen in “[Configuration -> Alarms Severity \(ASAP management\)](#)” (p. 4-33).
 - **Apply** to sector:

(active only if an ASAP has been selected in the list of ASAPs)

 - **Choose Scope** items:

Selected Object Only : it is active only if an EthernetPort has been selected. If marked it means that the selected ASAP will be sent only to the selected object.

ISA Switch: if marked it means that the selected ASAP will be sent to all the objects of that class (in this case Ethernet Ports) of the node.

Selected Object and Subordinate: not operative.
 - **Choose Class(es)** items:

All Classes : if marked it means that the selected ASAP will be sent to all the objects and all the classes of the node

Specific Class(es): if marked, it means that the selected ASAP will be set on all the objects classes listed in the field below (Ethernet Ports).

Choose Current Asap : it applies a filter to provision only the objects that are associated with the ASAP here indicated (path alarms/all alarms/ignore).

- **Execution Monitoring** sector:

(it reports the progress counting of the resources as they are provisioned)

Object Processed counter: total number of objects processed

Object Ok counter: number of objects successfully processed

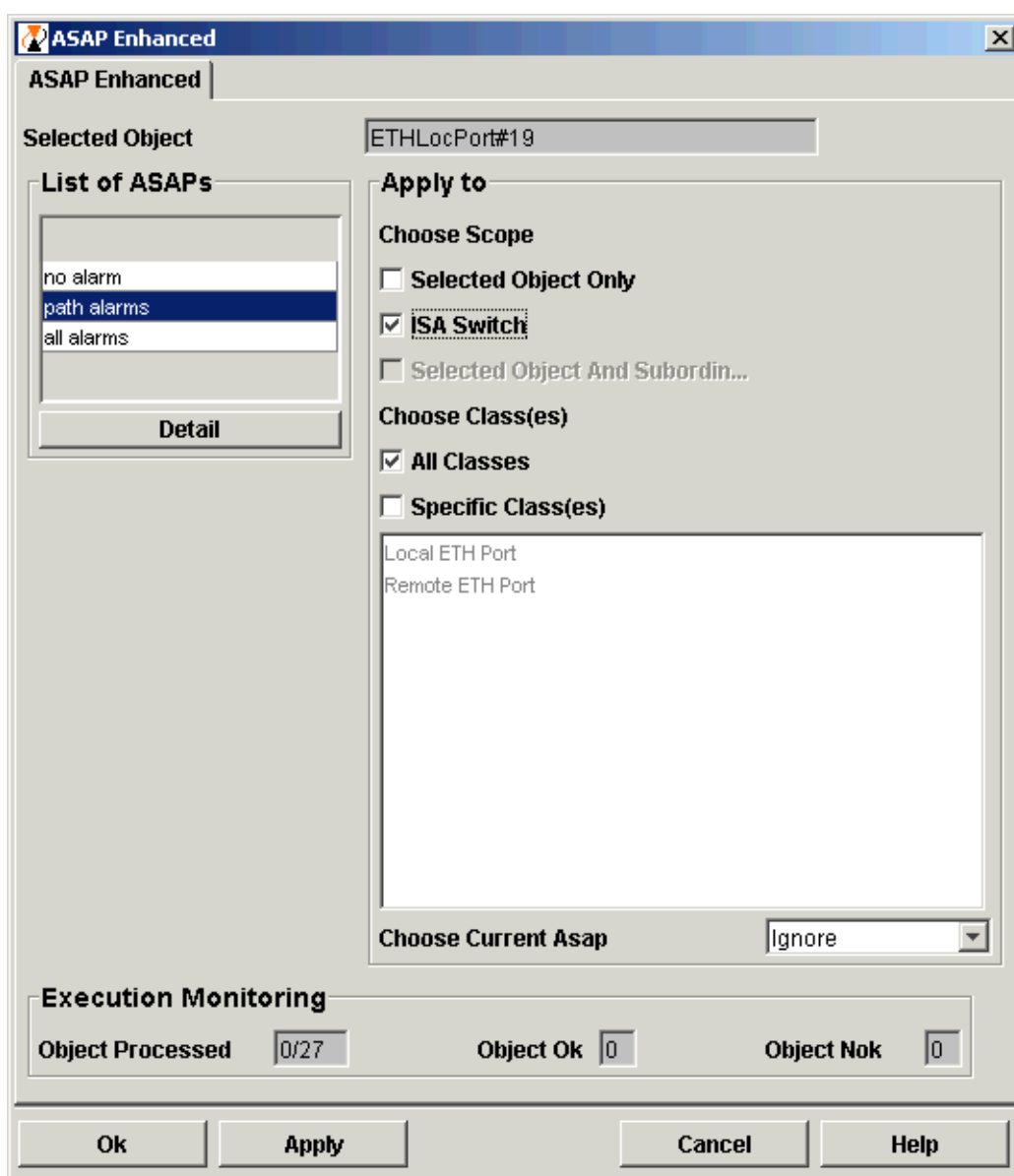
Object Nok counter: number of objects where the ASAP could not be changed.

At the bottom of the window there are the following other buttons:

- **Ok** : to provision the selected ASAP and close the window
- **Apply** : to provision the selected ASAP without closing the window
- **Cancel** : to close the window without doing any operation
- **Help** : to get helps about this function.

Note: The ASAP association to a resource can be carried individually out also from the option "**Configure** (a resource)", in the "**Transmission**" context; e.g.: for an Ethernet-port, select the Transmission application, then select the relevant Ethernet-port, then, in the pop-up menu, select the "**Configure Ethernet Port**" option; in the presented window, in the "**Configuration**" sector there is the field "**ASAP Name**", where the desired asap can be configured (e.g. see "[Transmission: Ethernet Port : Configure \(LOCAL\) Ethernet Port](#)" (p. 4-66)).

Figure 4-13 ASAP: Set Alarm Severities (example)



Configuration -> Loop Back Management

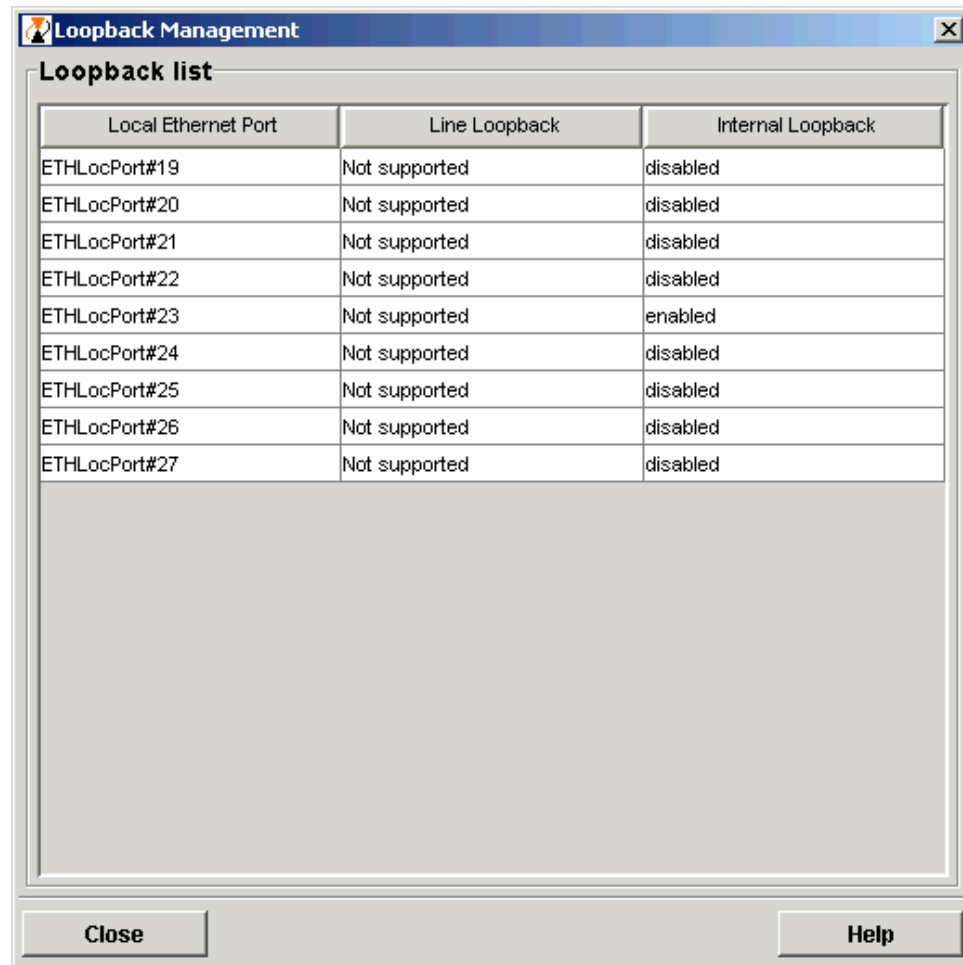
The Local Ethernet ports support the Internal Loopback function, as described in [“Internal Loop-Back management”](#) (p. 1-48).

This option is recalled from the **Configuration** pull down menu, selecting the **Loop-Back Management** item.

The Loop Back Management dialog is displayed in [Figure 4-14, \(p. 4-40\)](#). It reports the list of all the local ports of the ES node, and, correspondingly, the state of the Internal LoopBack, that can be *“enabled”* (i.e. activated) or *“disabled”*. The loopback is possible only on active ETS local ports containing a “Port-to-Port” connection. Its enabling is managed in the option “Configure Ethernet Port (local)”, described in [“Transmission: Ethernet Port : Configure \(LOCAL\) Ethernet Port”](#) (p. 4-66).

Note: The Line Loopback is not supported in the current version of ISA-ES4E.

Figure 4-14 Loop Back Management dialog



Allow/Inhibit Alarms Notifications

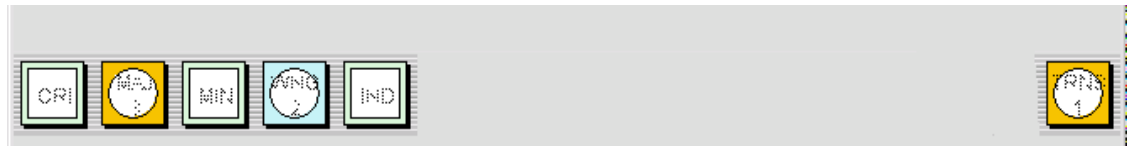
The system provides the possibility to allow/inhibit the spontaneous incoming alarms notifications on the ES-CT.

a. To inhibit alarm notification,

Select the **Supervision** pull down menu and then select the **Inhibit Notification** option from the **Alarms** cascading menu.

From the confirmation dialog that opens you can confirm or cancel the operation using the **Ok** or **Cancel** push buttons respectively.

To inform the operator that alarms have been inhibited, the labels of the alarm panel are greyed out, as shown below:



Note: Inhibiting the alarms notification means that they are not forwarded to the ES-CT, but alarms are still generated by the NE.

b. To allow alarm notification

Select the **Supervision** pull down menu and then select the **Allow Notification** option from the **Alarms** cascading menu; note: this option will be available only after the above described “*Inhibit Notification*”.

From the confirmation dialog that opens you can confirm or cancel the operation using the **Ok** or **Cancel** push buttons respectively; after this operation, the alarms will be displayed and notified again by the ES-CT.

Alarms re-synchronization

The system provides the possibility to recover alarms present on the ES-NE and to update the current problem list (Alarms Surveillance) of the NE. After this operation, the ES-NE and the ES-CT current alarms list (Alarms Surveillance) will be consistent.

To re-synchronize the alarms, select the **Supervision** pull down menu and then select the **Resynchronize** option from the **Alarms** cascading menu.

Alarms Surveillance (Diagnosis -> Alarms option)

This paragraph illustrates the access to the “Alarms Surveillance” application of the ES-CT.

Note: Detailed information about the significance of alarms and statuses is given in [Chapter 5, “Maintenance”](#) of this handbook.

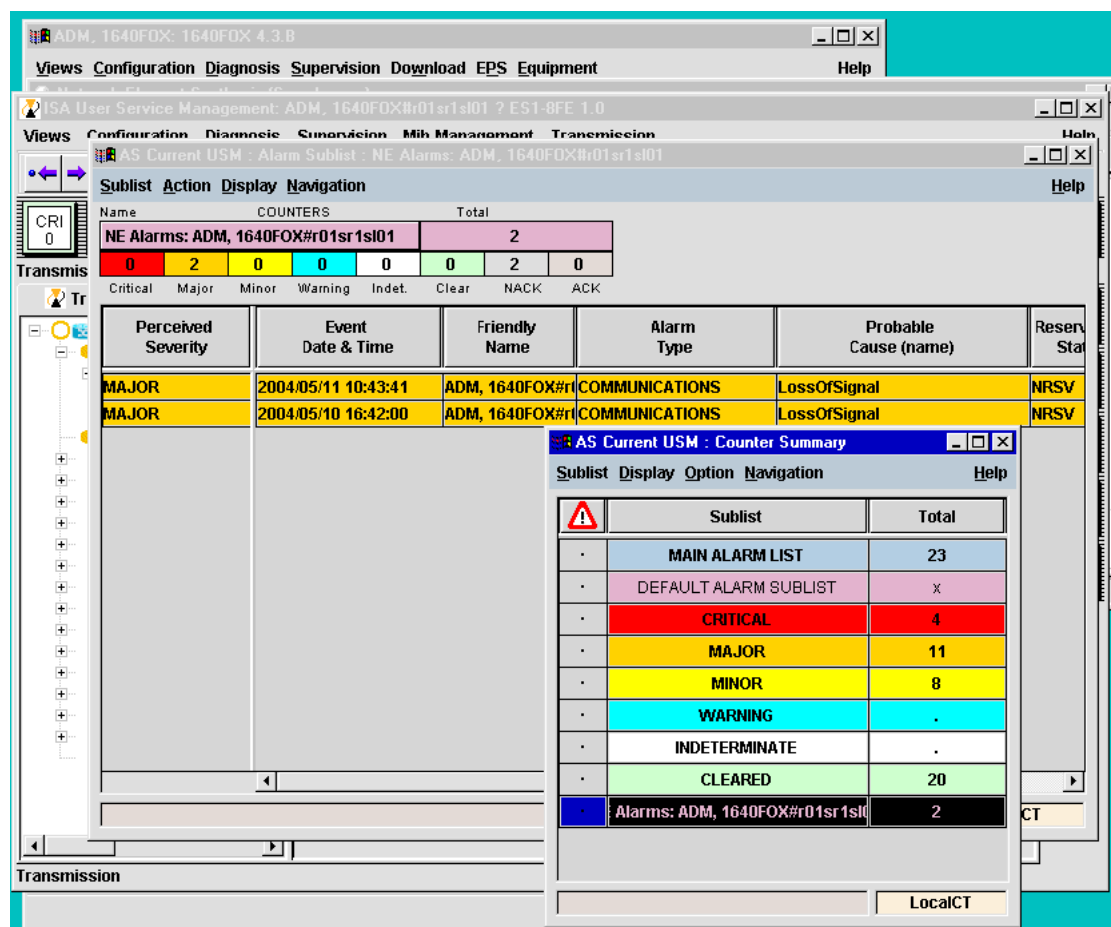
Select the **Diagnosis** pull down menu and then the **Alarms** cascading menu; the following options are offered:

- **ISA Alarms:** all the ES alarms are listed in the Alarms Surveillance report which is activated.
- **Object Alarms:** only the alarms relevant to the selected object are listed in the Alarms Surveillance report.
- **Transmission Alarms:** only the alarms relevant to the Transmission context are listed in the Alarms Surveillance report.

Selecting one of the above options, the Alarms Surveillance (AS) report is displayed as for the example of the following figure (this example is relative to "ISA Alarms" option).

This view shows first a synthesis of the ES-NE alarms ("Counter Summary" window) with the sum of all alarms, then a detailed list of alarms of the selected filter (Alarms Sublist).

Figure 4-15 Alarms Surveillance ("ISA Alarms" example)



Detailed information for each alarm is supplied in the "Alarm Sublist" window.

For example: the resource where the alarm is detected, the status, the type, the probable cause of the relevant alarm, etc.

The listing of all the Alarms or the filtering of a class of them is also possible.

The information supplied helps the operator, typically during troubleshooting operation, presented in next section of this handbook ([Chapter 5, “Maintenance”](#)), where more details about alarms are given).

Detailed description about this application is given in the AS Operator's Handbook, listed in [Table 1, \(pg. 1-xix\)](#).

Event Log Browser (Diagnosis -> Log Retrieval)

This paragraph illustrates the access to the “Event Log Browser” (ELB) application of the ES-CT.

Note: More information about the significance of alarms and statuses is given in [Chapter 5, “Maintenance”](#) of this handbook.

Note: Detailed description about the Log application is given in the ELB Operator's Handbook, listed in [Table 1, \(pg. 1-xix\)](#).

Select the **Diagnosis** pull down menu and then the **Log Retrieval** cascading menu; the following options are offered:

- **Event:** all the events related to the selected ES Unit are listed in the log report that will be activated.
- **Alarm:** all the alarms related to the selected ES Unit are listed in the log report that will be activated.

Selecting one of the previously seen options, the Event Log Browser (ELB) starts. First of all it displays a “Filter” dialog windows, where the user can choose the object and the time period to be applied to the log report. After completing the filter dialog, the ELB displays the desired report, where detailed information for each Event or Alarm is supplied.

This information helps the operator typically during troubleshooting operation, presented in next section of this handbook ([Chapter 5, “Maintenance”](#)), where more details about alarms are given.

- **Event:** in this case the filter dialog presents an “Event Type” and an “Event Time” panels, in order to choose the filter parameters, as shown in [Figure 4-16, \(p. 4-44\)](#).

Figure 4-16 Log Retrieval: Event (Filter example)

Filters

☒ Event Type

Attribute Value Change
Object Creation
Object Deletion
State Change

☒ Event Time

Day Month Year : Hours Min Sec

☒ Fr... 1 7 2004 : 10 3 26

☒ To 20 7 2004 : 10 3 26

☐ Last 5 minut...

Current Time: 20-lug-04 10.11.54

Filter No Filter Clear All Cancel

Click on **Filter** key and the Event report is then displayed as for [Figure 4-17, \(p. 4-44\)](#).

Figure 4-17 Log Retrieval: Event (Report example)

node_F#01sr1s107 ES1-8FE 1.0 - Event Log Browsing Application

File Filters Options Windows Help

Event Log Display

Alarm Log Display Event Log Display

Event Time And Date	Notification Id	Explanation
2004/07/19 17:19:41	33	Attribute Value Change in the Sys Location object
2004/07/15 13:32:07	10	Attribute Value Change in the Optics IM Sdh If Vc Type 1.3.6.1.4.1.637.54.1.1.5.1.22.1.4:8 object
2004/07/15 13:32:07	9	Attribute Value Change in the Optics IM Sdh If Type 1.3.6.1.4.1.637.54.1.1.5.1.22.1.3:8 object
2004/07/15 13:32:07	8	Attribute Value Change in the Optics IM Sdh If Underlie Layer 1.3.6.1.4.1.637.54.1.1.5.1.22.1.2:8 object
2004/07/15 13:32:07	7	Attribute Value Change in the Optics IM Sdh If Speed RemPort#8 object
2004/07/15 13:32:07	6	Attribute Value Change in the Optics IM Eps Active Role object
2004/07/15 13:32:07	5	Attribute Value Change in the Optics IM Eps Conf Status object
2004/07/16 17:16:27	30	Attribute Value Change in the Optics IM Sdh If Speed RemPort#7 object
2004/07/16 17:15:04	29	Attribute Value Change in the Optics IM Sdh If Vc Type 1.3.6.1.4.1.637.54.1.1.5.1.22.1.4:7 object
2004/07/16 17:15:04	28	Attribute Value Change in the Optics IM Sdh If Type 1.3.6.1.4.1.637.54.1.1.5.1.22.1.3:7 object
2004/07/16 17:15:04	27	Attribute Value Change in the Optics IM Sdh If Underlie Layer 1.3.6.1.4.1.637.54.1.1.5.1.22.1.2:7 object
2004/07/16 17:10:55	26	Attribute Value Change in the 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5:8 object
2004/07/16 17:10:55	25	Attribute Value Change in the Optics IM Sdh If Speed RemPort#8 object
2004/07/16 17:08:49	24	Attribute Value Change in the 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5:8 object
2004/07/16 17:08:49	23	Attribute Value Change in the Optics IM Sdh If Speed RemPort#8 object
2004/07/16 17:08:09	22	Attribute Value Change in the 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5:8 object
2004/07/16 17:08:09	21	Attribute Value Change in the Optics IM Sdh If Speed RemPort#8 object
2004/07/15 13:37:03	19	Attribute Value Change in the Tsdim Sdh Ne Label object
2004/07/15 13:37:03	18	Attribute Value Change in the Sys Location object
2004/07/15 13:33:35	15	Attribute Value Change in the 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5:8 object
2004/07/15 13:33:35	14	Attribute Value Change in the Optics IM Sdh If Speed RemPort#8 object
2004/07/15 13:32:07	11	Attribute Value Change in the 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5 1.3.6.1.4.1.637.54.1.1.5.1.22.1.5:8 object
2004/07/19 17:19:43	34	Attribute Value Change in the Tsdim Sdh Ne Label object

Print Preview

- **Alarm:** in this case the filter dialog presents an “Event Type”, an “Event Time”, a “Perceived Severity” and a “Probable Cause” panels, in order to choose the filter parameters, as shown in [Figure 4-18, \(p. 4-45\)](#).

Figure 4-18 Log Retrieval: Alarm (Filter example)

The 'Filters' dialog box contains the following sections:

- Event Type:** A list box with 'Communications Alarm' selected. Other options include Environmental Alarm, Equipment Alarm, Processing Error Alarm, and Quality of Service Alarm.
- Event Time:** Includes checkboxes for 'Event Time', 'From', 'To', and 'Last'. The 'From' and 'To' fields are set to 10:14:46 on 7/20/2004. The 'Last' field is set to 5 minutes.
- Perceived Severity:** A list of severity levels with checkboxes: CRITICAL, MAJOR, MINOR, WARNING, CLEARED, and INDETERMINATE.
- Probable Causes:** A list of causes including Fuse Failure, GFP Type Mismatch, Generator Failure, Heating or Ventilation or Cooling System Problem, High BER, High Bias Current, High Humidity, and High Laser Temperature.
- Current Time:** Displays '20-lug-04 10.17.25'.
- Buttons:** Filter, No Filter, Clear All, and Cancel.

- Click on **Filter** key and the Event report is then displayed as for [Figure 4-19, \(p. 4-45\)](#).

Figure 4-19 Log Retrieval: Alarm (Report example)

The application window title is 'node_F#r01sr1sl07 ES1-8FE 1.0 - Event Log Browsing Application'. The 'Alarm Log Display' tab is active, showing the following table:

Event Time And Date	Perceived Severity	Event Type	Notification Id	Managed Object Class	Managed Object Instance	Probable Cause
2004/07/15 13:32:07	CLEARED	Communications Alarm	13	Opticsim GFP Conf Fcs	GFPCConf#8	Trail Signal Failure

At the bottom of the window, there is a 'Print Preview' button.

Diagnosis -> Navigation to EML-USM

This function allows to navigate to the SDH context of the NE, i.e. to the SDH-Craft Terminal.

Select, in the menu-bar, the **Diagnosis** item and then the **Navigation -> EMLUSM** option.

MIB Management

This paragraph and relevant sub-paragraphs describe some operations related to the MIB management; MIB: Management Information Base, i.e. it is the data-base of the ES-NE configuration.

Backup/Restore DB

This function is accessible by selecting, in the menu bar: **MIB-Management -> Backup/Restore DB**.

An example of the displayed dialog window is reported in [Figure 4-20, \(p. 4-47\)](#).

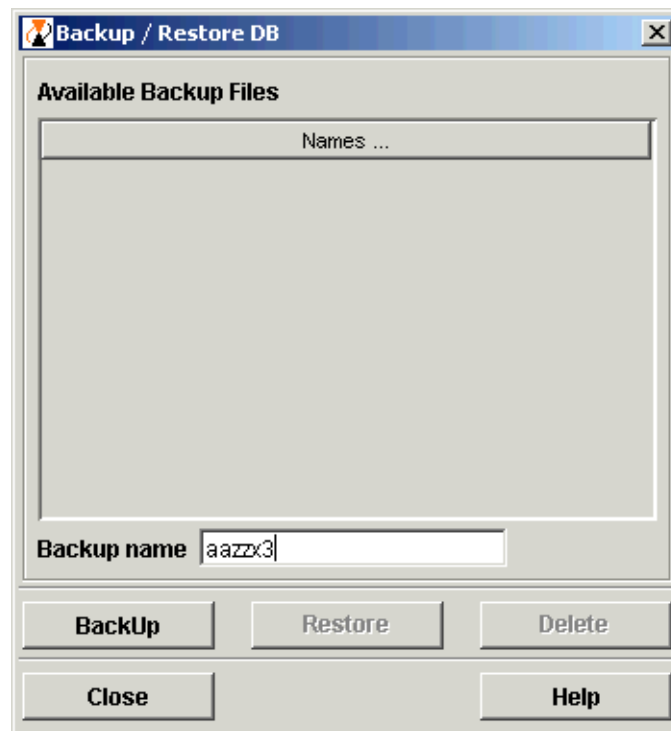
This function permits to save (backup) the ES-NE configuration and/or to restore it.

The backup (save) can be done writing a name for the current configuration in the field “**Backup name**” and then clicking on the “**BackUp**” key.

The restore can be done selecting a name in the field “**Available Backup Files**” and then clicking on the “**Restore**” key.

The restoration function will take some time to finish and during this interval the ES-NE will not respond to the ES-CT.

Figure 4-20 MIBmanagement -> Backup/Restore DB



At the bottom of the window there are the following other buttons:

- **Delete** : to delete the selected backup file.
- **Close** : to close the window without doing any operation.
- **Help** : to get helps about this function.

Compare two Backup Files

Not operative.

Transmission

The transmission application permits to manage all the parameters related to the transmission context.

It can be entered by selecting, in the menu-bar: **“Views”** -> **“Transmission”**, or by clicking on its relevant tab of the main view.



WARNING

All the dialog windows described in this handbook are reported in “FullWindow” mode, the information fields reported in the “TabbedWindow” mode are the same as described in “Windows Presentation: “FullWindow” and “TabbedWindow”” (p. 4-28).

Ethernet ports denomination and numbering



WARNING

The Remote Ethernet Ports are to be configured at the SONET/SDH side, before their usage, associating them with SONET/SDH containers; the choice of the SONET/SDH containers should be done according to the rate of the total forecast data traffic; (SDH-CT option: “Configuration”-> “ISA Port Configuration”); see OMSN Operator's Handbook listed in [Table 1 \(p. xix\)](#) for details about SDH configuration and connection.

The correspondence of Ports denomination between ES side and SDH side is the following:

	ES-CT context	SDH CT context
Local Ethernet Ports:	ETHLocPort#n	Port Number=n
Remote Ethernet Ports:	ETHRemPort#10	Port Number=n

Note: 10n stands for 1000+n.

ES4E board can manage:

- **Remote interfaces**
 - 8 MII RemEthPorts numbered 1003...1010 on ESCT corresponding to 3...10 on SDHCT, or:
 - 2 GMII RemEthPorts numbered 1001,1002 on ESCT corresponding to 1, 2 on SDHCT.



WARNING

MII and GMII are mutually exclusive. In ES4E, GMII-MII selection check is not supported, port 1001 & 1002 are always fixed as GMII.

- **Local interfaces:**
 - 4 Fast Ethernet LocalEthPorts numbered **13 to 16** and 4 FX LocalEthPorts numbered **17 to 20** on ES-CT (the same on SDH-CT), they are directly accessible at the 8 apposite connectors on the front panel of the board; the numbering order, 3 to 6, are FE ports, 7 to 10 are FX ports.
 - 2 Gigabit Ethernet LocalEthPort numbered **11 to 12** on ES-CT (the same on SDH-CT), accessed directly at the 2 apposite connectors on the front panel of the board, port 1 to 2.

Configuration -> Traffic Descriptor -> ETS Traffic Descriptor

This option is obtained by selecting, in the menu-bar:

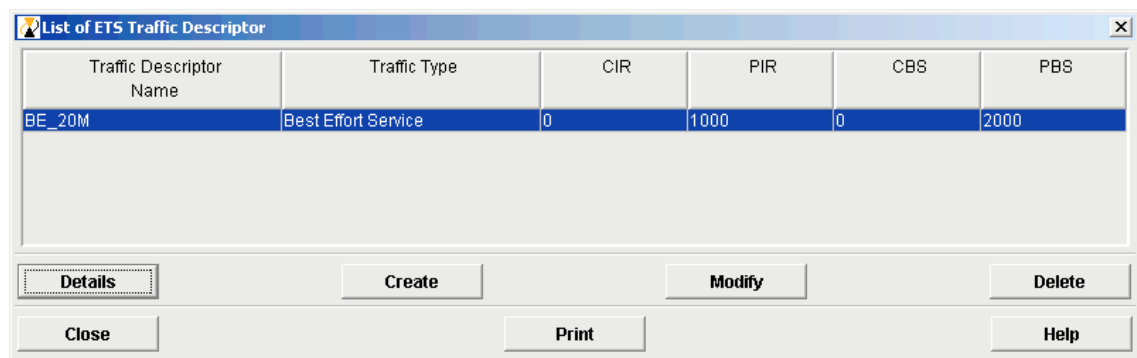
"Configuration" -> "Traffic Descriptor" -> "ETS Traffic Descriptor".

An example of the displayed dialog window is reported in [Figure 4-21, \(p. 4-50\)](#).

The function of this option is to show the existing traffic descriptions related to the ETS traffic, or to create a new one, to display (or print) the details about a selected one, and also to delete one of them.

This same dialog is also always recalled by the other Transmission applications, when the association of a Traffic Descriptor (TD) to the relevant resource is needed.

Figure 4-21 Configuration: ETS Traffic Descriptor (example)



The parameters listed in [Figure 4-21, \(p. 4-50\)](#) are:

- **Traffic Descriptor:** name of the traffic descriptor;
- **Traffic Type:** Traffic codification, according to international standard conventions (details are given in next para. ["Creating a new ETS Traffic Descriptor" \(p. 4-52\)](#)).
- **CIR:** Committed Information Rate;
- **PIR:** Peak Information Rate;
- **CBS:** Committed Burst Size;
- **PBS:** Peak Burst Size.

These latter parameters are explained in [“Creating a new ETS Traffic Descriptor”](#) (p. 4-52).

The keys presented at the bottom of [Figure 4-21](#), (p. 4-50) are:

- **Create** (see [“Creating a new ETS Traffic Descriptor”](#) (p. 4-52)), **Details** (see [“Getting details about ETS Traffic Descriptor”](#) (p. 4-53)), **Modify** (see [“Modifying an ETS Traffic Descriptor”](#) (p. 4-54)): to create a new *Traffic Descriptor*, or to get details about or to modify a Traffic Descriptor
- **Delete**: to delete the selected *Traffic Descriptor*
- **Close**: to close the window
- **Print**: to print details about the selected *Traffic Descriptor*
- **Help**: to get helps about this function.



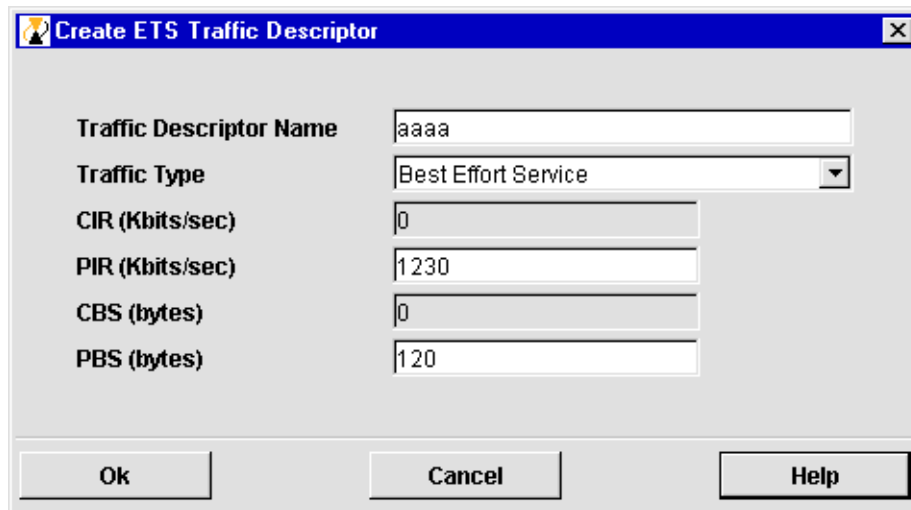
WARNING

*When this dialog is recalled by a resource configuration, it displays the additional keys “**Apply**” (to associate the selected Traffic Descriptor to the resource), and “**Cancel**” (to exit without TD association).*

Creating a new ETS Traffic Descriptor

After clicking on “**Create**” key in the panel of [Figure 4-21, \(p. 4-50\)](#), the following dialog is popped-up (example):

Figure 4-22 Create an ETS Traffic Descriptor (example)



Referring to [Figure 4-22, \(p. 4-52\)](#), fill fields and areas as follows:

- **Traffic descriptor Name:** insert a traffic descriptor name;
- **Traffic Type:** identification of the traffic, in terms of international standard codifications; possible options:
 - *Best Effort Service*
 - *Guaranteed Service*
 - *Regulated Service*
 - *Regulated Service1* (available only in Provider Bridge mode)
 - *Regulated Service3* (available only in Provider Bridge mode)
 - *Regulated Service4* (available only in Provider Bridge mode)
 - *Guaranteed Service2* (available only in Provider Bridge mode)
 - *Back Ground Service* (available only in Provider Bridge mode)

According to the Traffic Type, the following QoS parameters will be displayed in the dialog of [Figure 4-22, \(p. 4-52\)](#):

- **CIR:** Committed Information Rate; range= 0 to PIR (expressed in kb/sec). It is the normal medium rate of the data flow (Effective Bandwidth). It is settable only if the traffic (c) has been selected; in case (a) it is set to 0 by the system; in case (b) it is set equal to PIR value.

- **PIR** : Peak Information Rate; range= 64 to physical-line-rate of the relative Port (expressed in kb/sec). It is the maximum rate up to which the source can transmit for a short time period.
- **CBS** : Committed Burst Size (committed number of bytes for which the source may transmit the PIR); range= 0 to 128 kbytes. It is settable only if the traffic (c) has been selected; in case (a) it is set to 0 by the system; in case (b) it is set equal to PBS value.
- **PBS** : Peak Burst Size (maximum number of bytes for which the source may transmit the PIR); range= 1 to 128 kbytes. A value greater than the MTU is advisable.

for details about above parameters, see also NOTES below.

To confirm the inserted values click on **Ok** button.



WARNING

*In case of “Provider Bridge”, the **RegulatedService** (1, 3, and 4) traffic types are scheduled to different priority queues, depending on the type of PCP decoding mode; see “Traffic Scheduling and Forwarding (ETB ports, MAC & Virtual Bridge)” (p. 4-58).*



WARNING

*In case of “Provider Bridge”, the **GuaranteedService** and **GuaranteedService2** traffic types are scheduled to different priority queues, depending on the type of PCP decoding mode; see “Traffic Scheduling in Provider Bridge case (ETB ports)” (p. 4-59).*



WARNING

*In general, the incoming packets are forwarded by the **Policer/Scheduler** functions, towards egress ports, marking their “dropping precedence” in the following way:*

- packets rated below **CIR** are marked **GREEN** (high priority)
- packets rated between **CIR** and **PIR** are marked **YELLOW** (medium priority)
- packets rated above **PIR** are marked **RED** (red packets are to be discarded)

For more details see also para. “Traffic Descriptor, Forwarding Priority and Class of Service” (p. 4-55).

Getting details about ETS Traffic Descriptor

After selecting a *Traffic Descriptor* and clicking on “**Details**” key as for [Figure 4-21, \(p. 4-50\)](#), a dialog window similar to [Figure 4-22, \(p. 4-52\)](#) is popped-up.

The displayed dialog is read-only and gives the actual values of the parameters for the selected Traffic Descriptor. The meaning of the displayed parameters is described in the previous para. “[Creating a new ETS Traffic Descriptor](#)” (p. 4-52).

Modifying an ETS Traffic Descriptor

After selecting a *Traffic Descriptor* and clicking on “**Modify**” key as for [Figure 4-21, \(p. 4-50\)](#), a dialog as that in [Figure 4-22, \(p. 4-52\)](#) is popped-up.

The displayed dialog permits to change only the name, in the field “*Traffic Descriptor Name*”.

Associating an ETS Traffic Descriptor to a resource

The Traffic Descriptor association to a resource is carried out from the options “**Configure or Modify... (a resource)**”, in the “**Transmission**” context; e.g.: for an **InFlow** Point, select the **Transmission** application, then select the relevant *InFlow Point*, then, in the pop-up menu, select the “**Modify InFlow**” option; in the presented window there is the field “*Traffic Descriptor*”, where the desired TD can be configured: clicking on the [...] button, the window of [Figure 4-21, \(p. 4-50\)](#) will be recalled, then select the desired TD and click on “**Apply**” button.

Traffic Descriptor, Forwarding Priority and Class of Service

The prioritization of an Ethernet data flow can be indicated on the 3 “VLAN-user-priority” bits (802.1p) of the “Tagged-Ethernet” frame and also on the 3 “stacked-priority” bits of the “Stacked-Vlan” frame; (see frames formats in “[Ethernet technique](#)” (p. 1-3)).

8 levels of **User-priority** can be defined: pri0 ... to pri7, where pri0 is the minimum and pri7 the maximum. The relayed frames towards a generic “**Provider-Network**” (only using **ETB port** types) can be “prioritized” using the “DefaultUserPriority” (i.e., incoming frames, “untagged”, without priority information are forwarded with a unique priority value) or “RegeneratedUserPriority” (i.e. on “tagged” frames, incoming priority values are mapped versus outgoing priorities by using a configurable priority table), as described in “[BridgePort: Regenerated User Priority](#)” (p. 4-126) and para. “[BridgePort: Default User Priority List](#)” (p. 4-128) (in case of MAC Bridge only the DefaultUserPriority is possible).

The Priority bits, on the S-VLAN frames (only in Provider Bridge case), are called “PCP” (Priority Code Point). The use of the PCP field is described in “[Traffic Scheduling in Provider Bridge case \(ETB ports\)](#)” (p. 4-59).

In Provider and “none” Bridge cases, the Prioritization and Classification modes on ETS ports are managed by means of the options “Create ETS Inflow” (para. “[Transmission: Ethernet Port: Create ETS InFlow](#)” (p. 4-88)) and “Create ETS Outflow” (para. “[Transmission: Ethernet Port : Create ETS OutFlow](#)” (p. 4-95)) (see also “Create Provider InFlow/OutFlow”). In these resources, the frames can have 8 levels of priority, and each priority can be colored (by means of the Color Profile) in “green” or “yellow” or “red”, by means of which the scheduler, in case of traffic congestion, can choose the packets to be discarded, checking their prioritization and coloration. In case of congestion, first lower priorities and (in ascending order) red, yellow or green packets are dropped away. Note: this priority is coded on VLAN (802.1p) field.

The policing is a mechanism to check that the data flow is respecting the traffic contract, providing to “cut” or to forward the incoming traffic.

- **Disabled** means that no policing is carried out.
- **Color-Blind** means that the policing is based upon the Traffic Descriptor (TD), without taking into account the Priority or CoS (Class of Service).
- **Color-Aware** means that the policing takes into account the Traffic Descriptor (TD), and the User Priority or CoS, that is mapped into three colors (“Color Profile”); this option is possible only with Traffic Descriptor = “Regulated” (see [Table 4-5, \(pg. 4-94\)](#)).

According to the traffic contract, to the policing mode, to the Color Profile and to the available bandwidth, the forwarding of the frames into the Provider-network is decided by the traffic scheduler of the system.

In case that the policing is in “color-aware” mode, the Provider-prioritization granularity is made deeper, taking into account the single VLAN-priorities, that can have assigned to any of them a green or yellow or red color. “green” color is used for frames to be passed in any case, “yellow” color is used for frames to be passed if the band is available, “red” color is used for frames to be discarded (in cases that no more band is available); the color mapping is done by means of the Color Profile in the EtsInFlows resources.

The **scheduling** is a mechanism to manage the traffic congestions. It uses the “*shaping*” and the “*queueing*” functions.

The queueing configuration modification is allowed only for Provider Bridge case, on ETB ports (see “[Traffic Scheduling in Provider Bridge case \(ETB ports\)](#)” (p. 4-59)). In case of Virtual or MAC or “none” Bridge, the Queueing is fixed by default, into three queues, as indicated in “[Traffic Scheduling and Forwarding \(ETB ports, MAC & Virtual Bridge\)](#)” (p. 4-58).

- The **shaping** provides to adapt the incoming traffic to the available output bandwidth, by smoothing prospective peaks. It is configured by means of two parameters:
 - *mean shaping rate*: output rate (in kb/s) at which the incoming traffic can be moulded.
 - *burst shaping rate*: amount of burst incoming traffic (in bytes) that can be moulded.

Note: The egress shaping is allowed also on ETS ports.

- The **queueing** provides to identify the CoS (Priority bits) of the incoming frames and to line them into different queues that can be served with higher or lower priority by the scheduler.

Several queues are provided, each queue devoted to one or more types of traffic. The packets queued can then be forwarded towards the output in different modes, depending on their Class of Service:

- *Strict Priority (SP)*: The highest priority queue is forwarded firstly; once it is emptied, the forwarding action passes to the lower queue, and so on.
- *WDRR Bandwidth*: (Weighted Deficit Round Robin); each queue is associated to a deficit counter (DC), whose value is proportional to a settable weight. The queues are served in rotational mode, starting from the higher value of the DC counter; the DC is then decremented by the size of the forwarded frame; when the frame size becomes bigger than the DC value, the forwarding action passes to the queue with higher DC, and so on. At the end of the round, the DC counters are restored to their values. This mode can be:
 - *WorkConserving*: empty queues are skipped

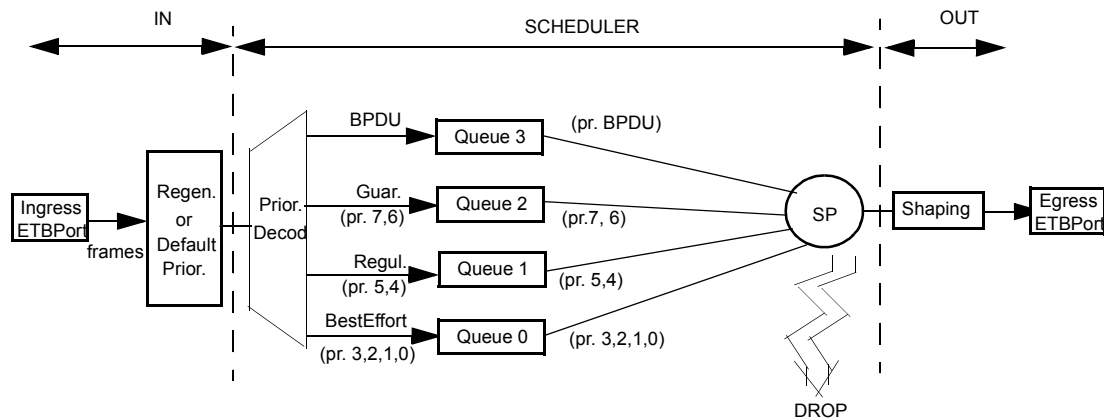
-
- *NonWorkConserving*: (not available in current release); empty queues are served too.

the *Weight* of a queue is settable by means of the option “Configure Queue”, see [“Transmission: Ethernet Port: Queue \(QoS\): Configure Queue”](#) (p. 4-143).

Only for Provider Bridge case, the PCP scheduling mode can be set in two different modes: 5P3D or 8P0D, by using the option “Configure ISA”, para. [“Transmission: ISA : Configure ISA”](#) (p. 4-61). The various PCP scheduling modes are illustrated in [“Traffic Scheduling and Forwarding \(ETB ports, MAC & Virtual Bridge\)”](#) (p. 4-58) (Virtual or MAC Bridge) and para. [“Traffic Scheduling in Provider Bridge case \(ETB ports\)”](#) (p. 4-59) (Provider Bridge).

Traffic Scheduling and Forwarding (ETB ports, MAC & Virtual Bridge)

Figure 4-23 ETB Virtual/MAC Bridge Scheduling Mode



Note:
Regenerated Priority is used only in VirtualBridge and on "PriorityTagged" frames
BPDU frames are always forwarded, also in case of threshold exceeded
Network Control frames are sent into the same Queue of BPDU
The "drop" (discarding) of packets is done in case of congestion; lower priority packets are dropped first
"Queue2" is called "HighPriority", "Queue1" is called "MediumPriority", "Queue0" is called "LowPriority"
SP: Strict Priority, highest priority queue is emptied first
In MAC bridge, the scheduling can be regulated by using the DefaultPriority

On EtsPorts, the scheduling is not performed, since only Port-to-Port connections are permitted, in transparent mode

“Silver Service” traffic is relayed, by the traffic scheduler and policer of the system, if the band on the link is available.

“Gold Service” traffic is relayed, as regarding the CIR, but the exceeding traffic (PIR) can be discarded.

All the “Network Service” traffic is relayed, as regarding either CIR and PIR values.

The User Priority can be configured in Local and Remote ETB ports (“Configure Bridge Port” option), as described in “[BridgePort: Regenerated User Priority](#)” (p. 4-126) and para. “[BridgePort: Default User Priority List](#)” (p. 4-128).

The [Table 4-2](#), (pg. 4-58). shows the typical association between TD, User Priority (UP) and Provider Class of Service (P-CoS), for ETB ports in MAC and Virtual Bridges.

Table 4-2 Typical association between TD, UP and P-CoS (ETB ports MAC/Virtual Bridge)

ETS Traffic Descriptor	User Priority (802.1p)	Provider-Class of Service
BEST EFFORT	0, 1, 2, 3	Silver Service
REGULATED	4, 5	Gold Service
GUARANTEED	6, 7	Network Service

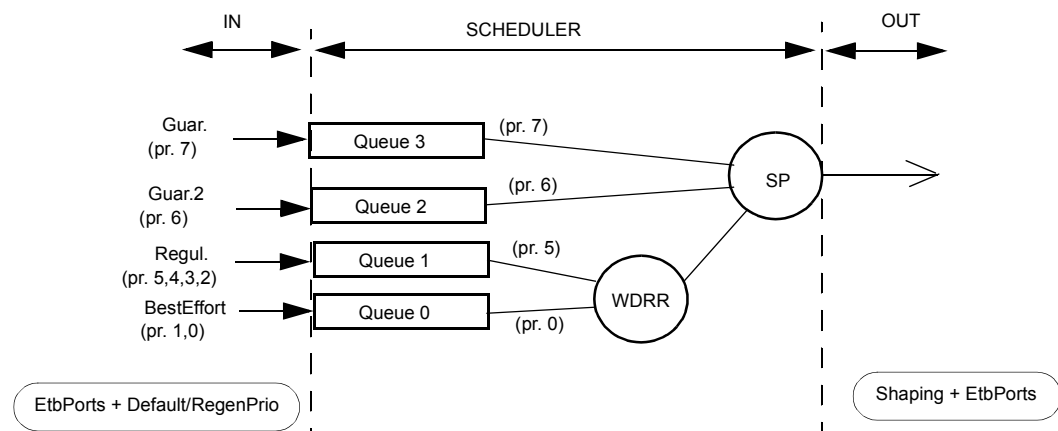
Traffic Scheduling in Provider Bridge case (ETB ports)

Table 4-3 Provider Bridge - Traffic Scheduling in 5P3D mode (ETB ports)

In-Pri	Traffic Type	DP	Queue	Queue-Type	Out-Pri
7	Guar. BPDU	Green	Q3	SP	7
6	Guar. 2	Green	Q2	SP	6
5	Regul.	Green	Q1	WDRR	5
4	Regul.	Yellow	Q1	WDRR	5
3	Regul. 4	Green	Q1	WDRR	5
2	Regul. 4	Yellow	Q1	WDRR	5
1	BestEffort	Green	Q0	WDRR	0
0	BestEffort	Yellow	Q0	WDRR	0

Note: DP (Discarding Priority) column indicates the color attributed by the scheduler to the frames, meaning that green frames must be forwarded, and that yellow frames can be forwarded or discarded, depending on the bandwidth resources.

Figure 4-24 5P3D Scheduling Mode (ETB ports)



Notes:

- Regenerated Priority is used on "PriorityTagged" frames
- BPDU frames are always forwarded, also in case of threshold exceeded
- Network Control frames are sent into the same Queue of BPDU
- The "drop" (discarding) of packets is done in case of congestion; lower priority packets are dropped first
- SP: Strict Priority, highest priority queue is emptied first

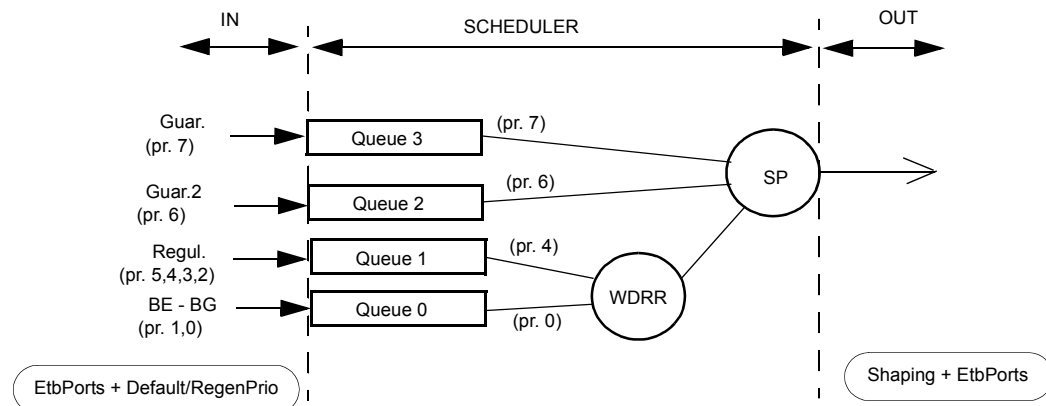
On EtsPorts, the scheduling is carried out using this same schema, if Statically or Dynamically connected by means of FDB feature

On EtsPorts, the scheduling is driven by the TD and 8 priorities and 3 colors for each priority of the inner "VLAN-Tag" as set in EtsInflow and in EtsClassifier (when connected by means of UNI-UNI, Uni-Nni, etc. Connections).

The shaping is possible on EtsPorts too.

Table 4-4 Provider Bridge - Traffic Scheduling in 8POD mode (ETB ports)

In-Pri	Traffic Type	DP	Queue	Queue Type	Out-Pri
7	Guar. BPDU	Green	Q3	SP	7
6	Guar. 2		Q2	SP	6
5	Regul. 1		Q1	WDRR	4
4	Regul.		Q1	WDRR	4
3	Regul. 3		Q1	WDRR	4
2	Regul. 4		Q1	WDRR	4
1	BackGround		Q0	WDRR	0
0	BestEffort		Q0	WDRR	0

Figure 4-25 8POD Scheduling Mode (ETB ports)**Notes:**

- Regenerated Priority is used on "PriorityTagged" frames
- BPDU frames are always forwarded, also in case of threshold exceeded
- Network Control frames are sent into the same Queue of BPDU
- The "drop" (discarding) of packets is done in case of congestion; lower priority packets are dropped first
- SP: Strict Priority, highest priority queue is emptied first

On EtsPorts, the scheduling is carried out using this same schema, if Statically or Dynamically connected by means of FDB feature

On EtsPorts, the scheduling is driven by the TD and 8 priorities and 3 colors for each priority of the inner "VLAN-Tag" as set in EtsInflow and in EtsClassifier (when connected by means of UNI-UNI, Uni-Nni, etc. Connections).

The shaping is possible on EtsPorts too.

Transmission: ISA : Configure ISA

This option is obtained, after selecting the ISA-ES node, by means of the contextual pop-up menu, or by selecting in the menu-bar:

"Transmission" -> "ISA Management" -> "Configure ISA".

An example of the displayed dialog window is reported in [Figure 4-26, \(p. 4-63\)](#).

The function of this option is to manage the transmission parameters of the selected ISA-ES node.



WARNING

The de-activation of every underlying resource (Ethernet Ports, InFlows, OutFlows, etc.) is necessary, before swapping from one Bridge Type to another.

To configure the ISA-ES node, fill fields and areas as follows:

- **System Info** sector:
 - **System Location:** indicating where the ISA-ES is placed (read only field)
 - **Up Time:** incremental time since the node was started up (read only field)
 - **Mgmt IP Address:** indicating the assigned IP address (read only field)
 - **Software Version:** it is relevant to the SW downloaded into the NE (read only field)
- **Bridge Management** sector:
 - **Bridge Type:** (see note below); possible pull-down options:
 - *bridge 802.1d*: for MAC bridge functions
 - *bridge 802.1Q*: for Virtual bridge functions
 - *bridge 802.1S-AD*: for Provider bridge functions



WARNING

The de-activation of every underlying resource (Ethernet Ports, InFlows, OutFlows, etc.) is necessary, before swapping from one Bridge Type to another.

- **Protocol Type:** possible pull-down options:
 - *STP*: for simple Spanning Tree Protocol functions
 - *RSTP*: for Rapid Spanning Tree Protocol functions
 - *RSTP+*: for enhanced RSTP functions (not operative)
 - *PERVLANSTP*: for "per-VLAN" Spanning Tree Protocol functions;
This option is not available in "MAC-Bridge" case.
 - *MSTP*: for "Multiple" Spanning Tree Protocol functions;
This option is not available in "MAC-Bridge" case.

- *manualDisable*: to disable the Spanning Tree Protocol functions.
- **PB Profile**: (displayed only in case of Provider Bridge); to define the traffic scheduling modality, encoded into the PCP bits (Priority Code Point) of the S-VLAN; possible pull-down options:
 - *8P0D*: see details in [“Traffic Descriptor, Forwarding Priority and Class of Service”](#) (p. 4-55),
 - *5P3D*: see details in [“Traffic Descriptor, Forwarding Priority and Class of Service”](#) (p. 4-55). See also para. [“Transmission: Ethernet Port: Queue \(QoS\): Configure Queue”](#) (p. 4-143).
- **MIB Default Value** sector:
 - **Asap Severity**: this field associates, among those reported in the pull-down menu, a severity to the alarm on violating the default values.
- **MTU/MRU** sector:

This field establishes the “maximum transmit unit” and the “maximum receive unit” (MTU/MRU), i.e., the maximum size of ethernet packets that can be received/transmitted by the board. This value will be applied to all ports of the board. Its value must be in the range from **1518** to **10240**.

**WARNING**

MTU/MRU values will be applied only on the Remote Ports of the board. Local Ports will not filter frames with MTU/MRU sizes different than this one (larger or smaller).

Figure 4-26 Configure ISA

The figure displays four sequential screenshots of the 'ISA Configuration' dialog box, illustrating the configuration steps for an ISA.

Screenshot 1: System Info Tab
The 'System Info' tab is selected. Fields include:
System Location: I&V @IP LAB
Mgmt Ip Address: 20.20.20.14
Up Time: 6683055
Software Version: V010315
Buttons: Ok, Cancel, Help

Screenshot 2: Bridge Management Tab
The 'Bridge Management' tab is selected. Fields include:
Bridge Type: bridge 802.1S-AD
Protocol Type: manualDisable
PBProfile: 5P3D (selected from a list containing 5P3D, 8P0D, and 5P3D)
Buttons: Ok, Cancel, Help

Screenshot 3: MIB Default Value Tab
The 'MIB Default Value' tab is selected. Field includes:
Asap Severity: minor
Buttons: Ok, Cancel, Help

Screenshot 4: MTU/MRU Tab
The 'MTU/MRU' tab is selected. Field includes:
MTU/MRU: 10240
Buttons: Ok, Cancel, Help

Transmission: ISA : ISA Properties

This option is obtained, after selecting the ISA-ES node, by means of the contextual pop-up menu, or by selecting in the menu-bar:

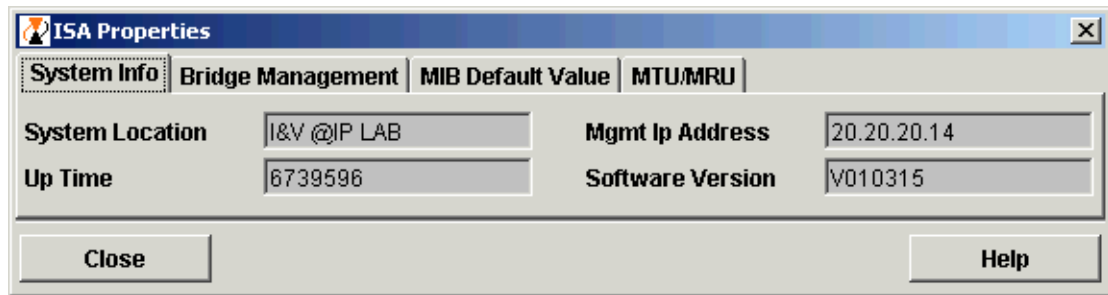
“Transmission” -> “ISA Management” -> “ISA Properties”.

An example of the window displayed is reported in [Figure 4-27, \(p. 4-64\)](#).

The function of this option is to show the transmission parameters set for the selected ISA-ES node.

All the reported information fields are read-only, and are the same as those explained ones for [“Transmission: ISA : Configure ISA” \(p. 4-61\)](#).

Figure 4-27 ISA Properties



ISA: application table in the Transmission context

An example of Application Table associated to the ISA-ES node is illustrated in [Figure 4-28, \(p. 4-65\)](#). It is displayed in the area A2, after selecting the ISA-ES node in the resource-tree. It reports, in tabular form, the resources of the selected ISA-ES node.

The table contains two folders: “*Local Ethernet Ports*”, “*Remote Ethernet Ports*” .

- “**Local Ethernet Ports**” lists the main parameters related to this topic:
“Alarms Synthesis,” “Name,” “Total Bandwidth (indicated by the supporting pipe),”
“Oper. Status,” “Administration Status.”
- “**Remote Ethernet Ports**” lists the main parameters related to this topic:
“Alarms Synthesis,” “Name,” “Total Bandwidth (indicated by the supporting pipe),”
“Oper. Status,” “Physical Type,” “Administration Status.”

The properties of a resource of the table are displayed in the information area (A3), after selecting a row of the table.

A pop-up menu, related to the selected resource, can be activated, after selecting an item of the table and pressing the right button of the mouse.

The listed parameters, the displayed properties and the options of the pop-up menu are described in the successive paragraphs.

Figure 4-28 ISA-ES node: transmission application table

The screenshot displays the ISA User Service Management interface. The top menu bar includes Views, Configuration, Diagnosis, Supervision, Mib-Management, and Transmission. The left sidebar shows a tree view of resources under the node 'node_F#r01sr1sl07 Loc'. The main area is divided into two sections: a table of resources and a detailed configuration panel for the selected resource.

Transmission Application Table:

Alarm Synthesis	Name	Total Bandwidth	Oper. Status	Phy. Type	Admin. Status
●	ETHRemPort#1...VC12		down	gfp	down
●	ETHRemPort#1...VC12		down	gfp	down
●	ETHRemPort#1...VC12		down	gfp	down
●	ETHRemPort#1...VC12-10v		down	gfp	down
●	ETHRemPort#1...VC12		down	gfp	down
●	ETHRemPort#1...VC12		down	gfp	down
●	ETHRemPort#1...VC12		down	gfp	down
●	ETHRemPort#1...VC12-10v		up	gfp	up

Configuration Panel (Selected Resource: ETHRemPort#1001):

Configuration	GFP	Alarms
Name	ETHRemPort#1001	Admin. Status
Type	ethernetCsmacd	Oper. Status
Last Change	0	Eth. Avail. Bandwidth [Kbs]
MTU	1600	Link Up Down Trap
Connector	false	Promiscuous Mode
MAC Address	0.7.114.4.137.173	Encaps. Method
Alias	Interface #1001	Asap Name
Discard Errored Frames	true	

Transmission: Ethernet Port : Configure (LOCAL) Ethernet Port

This option is obtained, after selecting a LOCAL EthernetPort, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “Configure Ethernet Port”.

An example of the window displayed (in TabbedWindow mode) is reported in [Figure 4-29, \(p. 4-72\)](#) and [Figure 4-30, \(p. 4-73\)](#).

The function of this option is to manage the transmission parameters of the selected local EthernetPort.

The board **ISA-ES4E** supports:

- 4 Fast Ethernet LocalEthPorts numbered **13 to 16** and 4 FX LocalEthPorts numbered **17 to 20** on ES-CT (the same on SDH-CT), they are directly accessible at the 8 opposite connectors on the front panel of the board; the numbering order 3 to 6 are FE ports, 7 to 10 are FX ports.
- 2 Gigabit Ethernet LocalEthPort numbered **11 to 12** on ES-CT (the same on SDH-CT), accessed directly at the 2 apposite connectors on the front panel of the board, port 1 to 2.

To configure a local EthernetPort, fill fields and areas as follows:

- **Configuration** sector:
 - **Name:** Indicating the name assigned by the system to the Port (read only field)
 - **Type:** Indicating the type of port (read only field, fixed to "ethernetCsmacd")
 - **Underlying Layer:** Associated layer (read only field, in this case fixed to “mau”)
 - **Last Change:** The value of System Time when the port entered its current operational state
 - **MTU:** Maximum Transmit Unit; size of the largest packet which can be sent/received on the interface, specified in octets [read only field, fixed by means of [“Transmission: ISA : Configure ISA” \(p. 4-61\)](#)].
 - **Connector:** (True/false) Indicating if the interface has a physical connector (read only field)
 - **MAC Address:** Address of the selected ethernet port (logical address set by the system)
 - **Discard Errored Frames:** Indicating whether errored frames are to be discarded (read only field, set by the system= “true”)
 - **Client Type:** (Read only field, set by means of “SubstituteClientLayer”), indicating the transported layer:
 - *ets*: For Ethernet Transparent System
 - *etb*: For Ethernet Bridge System
 - *LinkAgg*: For Link Aggregation utilization

-
- **Ets Service Type:** (Read only field), Settable by means of “Characterization Service.” See [“Transmission: Ethernet Port : Characterization Service”](#) (p. 4-88), indicating the Service for which this Port is dedicated:
 - *portToPort*: In this case, it supports only PortToPort connections.
 - *other*: In this case, it is ETB port, or supports UNI-Bridged connections.
 - *EtsVirtSw*: Not supported service; in this case, it is used for Ets Virtual Switch connections (only in “none-Bridge”, not available).
 - **Ets Egress Port (Peer):** (Read only field): Set after that a “port-to-port” XC has been created (in Connection context):
 - *none*: In this case, the port is not connected or used for UNI-Bridged connections.
 - *ETH...port#...*: Indicating the name of Peer port connected in PortToPort.
 - **Traffic Enabled:** [Read only field, settable by means of “TrafficManagement”, see details in [“Transmission: Ethernet Port: Traffic Management”](#) (p. 4-88)], indicating if the traffic afferent to this port is “Up” or “Down”.
 - **Admin. Status:** Administration status, possible pull-down options:
 - *up*: To set the port in-service
 - *down*: To set the port out-of-service
 - **Oper. Status:** Operational status, (read only field, set by the system) possible options:
 - *up*: The port is available
 - *down*: The port is unavailable
 - **Bandwidth:** Max band capacity offered by the associated underlying physical channel (read only field, set by the system); possible pull-down options:
 - *10BaseT*: 10 Mb/s
 - *100BaseT*: 100 Mb/s
 - *1000BaseT*: 1Gb/s
 - **Alias:** Friendly name for the interface that can be specified by the user
 - **Link Up Down Trap:** Indicating whether linkUp / linkDown traps (notification upon the changing of the node operational state from up to down and vice versa) should be generated for this interface; possible options: enabled / disabled .
 - **Promiscuous Mode:** Indicating whether this interface has to inspect the MAC addresses; possible options:
 - *enabled*: The MAC frames are accepted regardless of their MAC addresses.
 - *disabled* (not available): The MAC frames addresses are inspected before their acceptance, in order that only frames addressed to this port can be seen

- **Encaps. Method:** Method of MAC packets encapsulation inside the underlying physical layer; possible options:
 - *ethernetV2*: Default mode, set by the system
 - *IEEE8023*: Not yet operative
- **Asap Name:** Name of alarms profile to be associated to the current Port:
 The  key permits to choose and associate an asap to this resource, recalling the dialog described in [“Configuration -> Alarms Severity \(ASAP management\)”](#) (p. 4-33)
 The  key gives the asap properties currently associated to this resource
- **Protocol Profile:** Name of the 2-bytes provider VLAN-protocol-tag (PT) to be “pushed” into the ethernet frame of data flows afferent to the current Port.

Important! It is settable only if the port is in “down” state, and the Bridge Type is “Provider”).

The  key permits to choose and associate a provider protocol-tag (PT) to this resource, recalling the dialog described in [“Create Protocol Profile”](#) (p. 4-74)

The  key gives the Prot.-tag properties currently associated to this resource

- **MAU sector:**
 - **MAU Identifier:** Assigned by the system (read only field, fixed to “1”)
 - **Front Panel Port:** Assigned by the system; identifier of the MAU connector, located in front of the board, that is associated to this port; possible values are: (for ES4E: 1 to 9, 1 is used for GE i/f, 2 to 9 for FE i/f)
 - **Type:** Symbolic name of the mau interface
 - **Status:** MAU current status (read only field), possible pull-down options:
operational / shutdown (state of the Transmit i/f)
 - **Media Available:** (Read only field); Medium availability; options: “available”/“not available”/“other”
 - **Default Pause:** Pause signal that is inserted in the Flow Control signaling. It applies only in the case that the “AutoNegotiation-AdminStatus” is in “disabled” state (see below).
 - *disabled*: To disable the Flow Control function
 - *asymmetric*: To enable the Flow Control function, Asymmetric mode: i.e., Pause Frames are transmitted but not received.
 - *symmetric*: To enable the Flow Control function, Symmetric mode: i.e., Pause Frames are transmitted and received.

Note: Some details about AutoNegotiation and Flow Control are reported in [“Auto-Negotiation management”](#) (p. 1-54) and [“Flow-control management”](#) (p. 1-55).

- **Jack Type List:** (Read only field) List of available connectors types. Possible values are: “*RJ45*” for FE port, “*FiberLC*” for GbE port.
- **Conf. Remote Client:** Possible options: disabled/shutdown; if “shutdown” is selected, then the Tx i/f (towards the Ethernet line) of this Local Port will be set in “ShutDown” state, in case of CSF alarm detection on the remote port connected to this port. The shut-down mechanism is illustrated in “[Internal Loop-Back management](#)” (p. 1-48) and “[CSF alarm management](#)” (p. 1-49).

Note: The shut-down mechanism is supported only in Port2Port Connection.

- **Jabber State:** (Read only field); State of the jabber process [checking about abnormal data transmissions longer than the max permissible packet length (MTU/MRU)]
- **Default Type:** Possible pull-down options:
 - *10BaseTFD*: 10Mbps i/f (10-FE)
 - *100BaseTXFD* : 100Mbps i/f (100-FE)
 - *1000BaseXFD* : 1000Mbps i/f (GE)
 - *1000BaseSXFD*: 1000Mbps i/f (GE)
- **Type List:** List of available interfaces types
- **Auto Neg. Support:** Read-only, indicating (true/false) if the auto-negotiation is supported; possible values: “*true*” / “*false*”.
- **Loop-Back** sub-sector:
 - **Internal Loop-Back:** possible pull-down options:

Note: The loopback is possible only if a P2P (Port-to-Port) Connection is already existing, on this port;

- *enabled*: The internal LB (from Remote Port-Rx to Remote Port-Tx) is enabled (for more details see “[Internal Loop-Back management](#)” (p. 1-48))
- *disabled* : Loopback disabling

- **Auto Negotiation** sub-sector:

Note: Some details about AutoNegotiation and Flow Control are reported in “[Auto-Negotiation management](#)” (p. 1-54) and para. “[Flow-control management](#)” (p. 1-55).

Note: AutoNeg. on optical 1Gbps interfaces is available only on ES4N-enhanced board).

- **Admin. Status:** Administration status, possible pull-down options:
 - *enabled* : auto-neg. enabling
 - *disabled* : auto-neg. disabling
- **Remote Signaling:** notification about the detection of auto-neg. remote signaling
- **Process Status:** current status of the auto-negotiation process
- **Restart:** possible buttons:
 - *Autonegotiation Restart*: To restart the procedure of link re-negotiation
 - *Refresh*: To refresh the actual values of the link negotiation
 - *Apply All*: To apply the last configured parameters of the link auto-negotiation
- **Local Capability Options:** Used for Flow Control enabling, when the AutoNegotiation is active. If the AutoNeg is disabled, then the above parameter "DefaultPause" is instead considered. It contains two fields: "Available" and "Current", set of capabilities advertised by the local auto-negotiation for Flow Control signaling (FC):

Flow Control enabling:

- For **100 Mbps** case, **Asymmetric FC**:
Select, in Local Capability Options, in the "available" field, the following 3 items: "*b100baseTXFD*," "*bFdxAPause*," and "*bFdxPause*".
- For **100 Mbps** case, **Symmetric FC**:
select, in Local Capability Options, in the "available" field, the following 3 items: "*b100baseTXFD*," "*bFdxSPause*," and "*bFdxPause*".
- For **10 Mbps** case, **Asymmetric FC**:
select: "*b10baseTFD*," "*bFdxAPause*," and "*bFdxPause*".
- For **10 Mbps** case, **Symmetric FC**:
select: "*b10baseTFD*," "*bFdxSPause*" and "*bFdxPause*".
- For **1000 Mbps** case, **Asymmetric FC**:
select: "*b1000baseXFD*," "*bFdxAPause*," and "*bFdxPause*".
- For **1000 Mbps** case, **Symmetric FC**:
select: "*b1000baseXFD*," "*bFdxSPause*," and "*bFdxPause*".

Note: In occurrence of Flow Control enabled, the traffic Policing should be disabled.

Flow Control disabling: Select, in **Local Capability Options**, in the "available" field, only the following one item: "*b100baseTXFD*" (100Mbps case). In case of 10 Mbps: "*b10baseTFD*." In case of 1000 Mbps: "*b1000baseXFD*".

- **Autonegotiation Result:** reporting the AN results (read only field).

- **Remote Capability Options:** Containing the field: “Available”; set of capabilities received from the remote auto-negotiation entity (read only field).
- **L2 Control Frame** sub-sector: (Not displayed in case of ETB port) - It permits to enable or disable the Protocol Frames that can accede to this port:
 - **Protocol List:** It reports all the available Protocol frames (“Bit Name”), and, correspondingly, its “Status”. The Status can be changed by means of the apposite pull-down menu that is activated by clicking on it; possible values: enabled / disabled.
 - *enabled* means that the relative frame protocol is accepted by the Port.
 - *disabled* means that the relative frame protocol is rejected by the Port.
- **Port Mirroring** sector:

It permits to create a copy of the traffic afferent over an active, in service port, sending the copy of that traffic to this selected port.



WARNING

Before to change the **Mirroring type** setting, it is mandatory to set the **Admin. Status:** option in “**down**” state in the “**Configuration sector:**” (p. 4-66). Port Mirror is only supported in FE, it is not supported in the GE and FX port. Port 11-13 can be mirrored to port 14.

Some details about this feature are reported in “**Port mirroring management**” (p. 1-58). By means of the following parameters:

- **Mirroring Type:** possible values:
 - *No Mirroring:* To disable the mirroring
 - *Mirroring Port Output:* To choose the mirroring of the Transmit traffic on relevant port
 - *Mirroring Port Input:* To choose the mirroring of the Receive traffic on relevant port
- **Selected Port:** To choose the Port to be mirrored. It opens a search window as described in “**Views -> Search**” (p. 4-29). Ports to be mirrored must be active and in service.
- **Alarms** sector:

This group reports the alarms relevant to the EthernetPort; their color is green if not-alarmed, if alarmed their color will be congruent with the severity assigned in the associated ASAP; the alarms colors are described in **Chapter 5, “Maintenance”**.

After setting all the desired parameters, click on the “**Ok**” key to send the chosen parameters to the EthernetPort. The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “**Help**” key gives helps about this function.

Figure 4-29 Configure (local) ethernet port - config. & MAU

Ethernet Port Configuration

ConfigurationMauL2 Control FramePort MirroringAlarms

NameETHLocPort#12

TypeethernetCsmacd

Underlying Layermau

Last Change0

MTU2026

Connectortrue

MAC Address0:7:72:f2:a:2b

Discard Errored Framestrue

Client Typeets

Ets Service Typeother

Ets Egress Port (Peer)none

Traffic Enableddown

Admin. Statusdown

Oper. Statusdown

Bandwidth100BaseT

AliasInterface #12

Link Up Down Trapdisabled

Promiscuous Modeenabled

Encaps. MethodethernetV2

Asap Namepath alarms

Protocol Profile0x8100

OkCancelHelp

Ethernet Port Configuration

ConfigurationMauL2 Control FramePort MirroringAlarms

MAU Identifier1

Front Panel Port4

Type100BaseTxFD

Statusshutdown

Media Availableother

Default PAUSEdisabled

Jack Type Listrj45

Conf. Remote Clientdisabled

Jabber Stateother

Default Type100BaseTxFD

Type Listb10baseTFDb100baseTxFD

Auto Neg. Supporttrue

Loop-BackInternal Loop-Backdisabled

Auto Negotiation

Admin. Statusenabled

Remote Signallingnot detected

Process Statusother

RestartAutonegotiation RestartRefreshApply All

Local Capability Options

Availableb100baseTxFD
b10baseTFDbFdxBPause
bFdxAPause
bFdxPause

Set Local Capabilitiesb100baseTxFD
bFdxPause
bFdxAPause

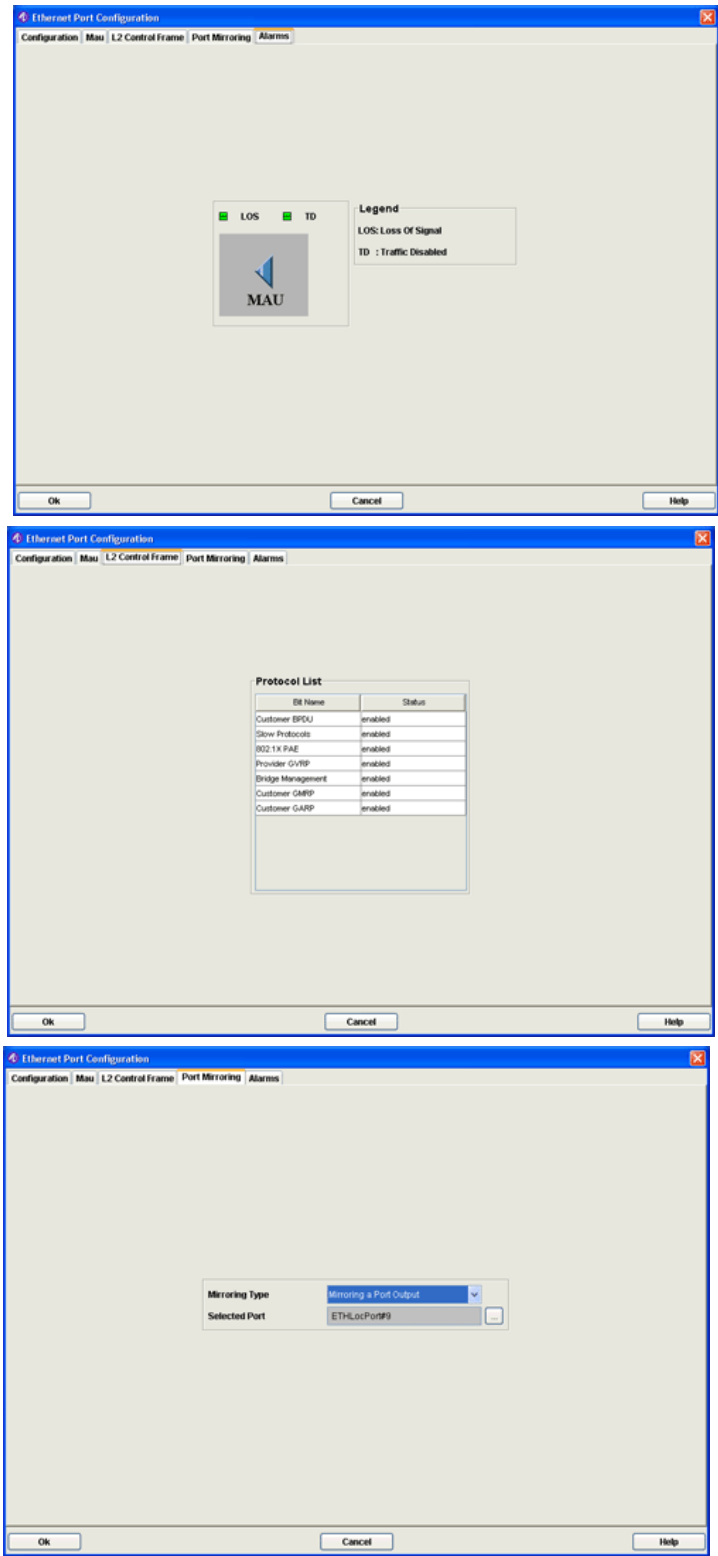
Autonegotiation Result100BaseTxFD

Remote Capability Options

OkCancelHelp

Note: The MTU size is 10240.

Figure 4-30 Configure (local) ethernet port - alarms & L2



Create Protocol Profile

This option is obtained, in the “Configure Ethernet Port” window shown in [Figure 4-29, \(p. 4-72\)](#), after clicking on the  key of the “ProtocolProfile” item.

An example of the window displayed is reported in [Figure 4-31, \(p. 4-74\)](#).

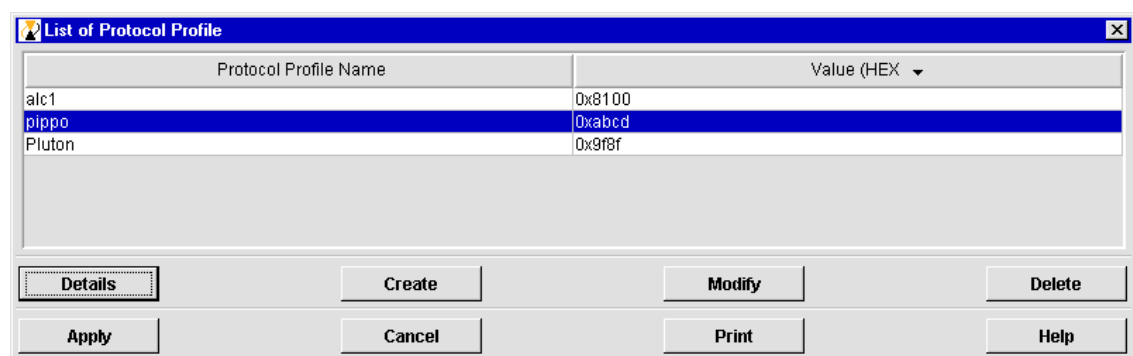
The function of this option is to manage the Protocol Profiles to be associated to the Ethernet Ports resources. The ProtocolProfile defines the protocol-type (PT) contained into the 2-bytes field of the customer VLAN shim header (802.1Q field, default value= hex“0x8100”), see frame format in [Figure 1-21, \(p. 1-33\)](#).

It reports the list of the existing Protocol Profiles, with relevant value in hex code.

Furthermore it contains:

- the “**Create**” button, permitting to create a new ProtocolProfile as explained below;
- the “**Details**” button, permitting to see the properties of an existing ProtocolProfile;
- the “**Modify**” button, permitting to change the name of an existing ProtocolProfile;
- the “**Delete**” button, permitting to delete an existing ProtocolProfile;
- the “**Apply**” button, permitting “to bind” the selected ProtocolProfile to the related port;
- the “**Cancel**” button, permitting to close the window without associating a ProtocolProfile;
- the “**Print**” button, permitting to print the properties of a selected ProtocolProfile;
- the “**Help**” button, permitting to have information about this current function.

Figure 4-31 List of Protocol Profile



To create a ProtocolProfile, click on **Create** key as shown in [Figure 4-31, \(p. 4-74\)](#) and then the dialog box indicated in [Figure 4-32, \(p. 4-75\)](#) will be displayed; fill fields and areas as follows:

- **Protocol Profile Name:** type a mnemonic name.

- **Value (HEX):** Type an hexadecimal value for the provider protocol-type (PT) that is inserted into the 2-bytes field of the VLAN shim header (802.1Q field); the value identifies the customer and has to be 2-bytes long in hexadecimal notation; the third non-included byte is forced by default to "0x."

The PT is used to recognize the type of afferent Vlan frames, i.e. if they are "S-Vlan-tagged" or others; by default, an hex value of 88A8 is interpreted as S-Vlan tagged. Frames with PT value different than this will be treated as non-SVlan-tagged.

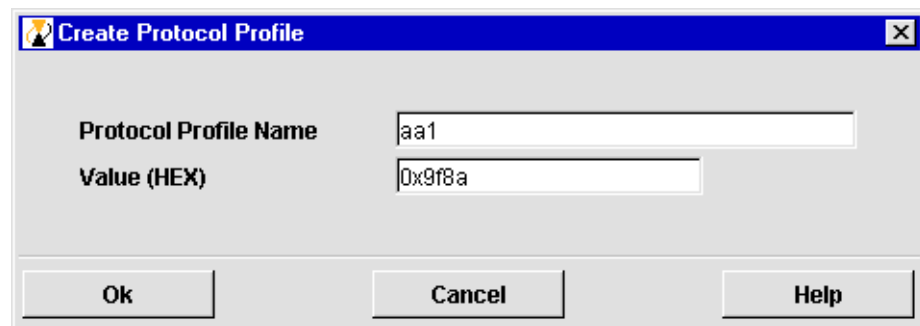
An hex value of 8100 is interpreted as Q-Vlan tagged.

Other values of PT will be interpreted as generic Stacked-Vlan frames, used to interwork among different network providers.

Incoming frames with PT values different from the one associated to a port will be discarded.

- Click on the **Ok** button, to close and save the new ProtocolProfile;
- Click on the **Cancel** button, to close the dialog without saving the new ProtocolProfile;
- Click on the **Help** button, to get information about this window.

Figure 4-32 Create Protocol Profile



Transmission: Ethernet Port : (LOCAL) Ethernet Port Properties

This option is obtained, after selecting a Local EthernetPort, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “EthernetPort Management” -> “EthernetPort Properties”

An example of the window displayed is reported in [Figure 4-33, \(p. 4-76\)](#).

The function of this option is to show the transmission parameters set for the selected local Ethernet port.

All the reported information fields are read-only, and are the same as those explained ones for para. [“Transmission: Ethernet Port : Configure \(LOCAL\) Ethernet Port” \(p. 4-66\)](#), except for the following extra field, displayed in the **Configuration** sector:

- **Eth.Avail.Bandwidth**: remaining bandwidth that is not yet occupied by “children” resources (in kb/s).

Figure 4-33 (Local) Ethernet Port Properties

Ethernet Port Properties	
Configuration Mau L2 Control Frame Port Mirroring Alarms	
Name	ETHLocPort#12
Type	ethernetCsmacd
Underlying Layer	mau
Last Change	0
MTU	2026
Connector	true
MAC Address	0:7:72:f2:a:2b
Discard Error Frames	true
Client Type	ets
Ets Service Type	other
Ets Egress Port (Peer)	none
Traffic Enabled	down
Admin. Status	down
Oper. Status	down
Bandwidth	100BaseT
Eth. Avail. Bandwidth (Kbs)	100000
Alias	Interface #12
Link Up Down Trap	disabled
Promiscuous Mode	enabled
Encaps. Method	ethernetV2
Asap Name	path alarms
Protocol Profile	0x8100

Note: The MTU size is 10240.

Transmission: Ethernet Port: Configure (REMOTE) Ethernet Port

This option is obtained, after selecting a REMOTE EthernetPort, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “Configure Ethernet Port”

An example of the window displayed is reported in [Figure 4-34, \(p. 4-82\)](#) (for GFP), [Figure 4-35, \(p. 4-83\)](#) (for L2 Control Frame), and [Figure 4-36, \(p. 4-85\)](#) (for LAPS).

Note: The switch between GFP and LAPS framing type is done by means of “Substitute Server Layer”, see [“Transmission: Ethernet Port: Substitute Server Layer” \(p. 4-88\)](#).

The function of this option is to manage the transmission parameters of the selected remote EthernetPort.

The board ISA-ES4E supports:

- 8 MII Remote EthPorts numbered 1003...1010 on ESCT corresponding to 3...10 on SDHCT,

or:

- 2 GMII Remote EthPorts numbered 1001,1002 on ESCT corresponding to 1, 2 on SDHCT;



WARNING

Before doing this operation, the user should have done, on SdhCT application, the configuration of this same port, defining its SDH specific container. See also the note in [“Inconsistency error on Port configuration” \(p. 4-85\)](#).



WARNING

*In case of ES4E board, the interface type must be congruent with that one equipped in SdhCT side (by means of the **“Equipment -> Set...”** menu option).*

To configure a remote EthernetPort, fill fields and areas as follows:

- **Configuration** sector:
 - **Name:** indicating the name assigned by the system to the Port (read only field)
 - **Type:** indicating the type of port (read only field, fixed to “ethernetCsmacd”)
 - **Last Change:** the value of System Time when the port entered its current operational state
 - **MTU:** Maximum Transmit Unit; size of the largest packet which can be sent/received on the interface, specified in octets (read only field), fixed by means of [“Transmission: ISA : Configure ISA” \(p. 4-61\)](#).
 - **Connector:** (True/false) indicating if the interface has a physical connector (read only field)

-
- **MAC Address:** Address of the selected ethernet port (logical address set by the system)
 - **Alias:** Friendly name for the interface, it can be specified by the user
 - **Discard Errored Frames:** Indicating whether errored frames are to be discarded -- (read only field), set by the system= "*true*"
 - **Client Type:** (Read only field), set by means of "SubstituteClientLayer"), indicating the transported layer:
 - *ets*: For Ethernet Transparent System
 - *etb*: For Ethernet Bridge System
 - **Ets Service Type:** [Read only field, settable by means of "Characterization Service"; see "[Transmission: Ethernet Port : Characterization Service](#)" (p. 4-88)], indicating the Service for which this Port is dedicated:
 - *portToPort*: In this case, it supports only PortToPort connections.
 - *other*: In this case, it is ETB port, or supports UNI-Bridged connections,
 - *EtsVirtSw*: In this case, it is used for Ets Virtual Switch connections (only in "none-Bridge"): Not supported service.
 - **Ets Egress Port (Peer):** (Read only field), set after that a "port-to-port" XC has been created, (in Connection context):
 - *none*: In this case, the port is not connected, or used for UNI-Bridged connections
 - *ETH...port#...*: indicating the name of Peer port connected in PortToPort.
 - **Admin. Status:** Administration status, possible pull-down options:
 - *up*: To set the port in-service.
 - *down*: To set the port out-of-service.
 - **Oper. Status:** Operational status, (read only field, set by the system) possible options:
 - *up*: The port is available.
 - *down*: The port is unavailable.
 - **Link Up Down Trap:** Indicating whether linkUp / linkDown traps (notification upon the changing of the node operational state from up to down and vice versa) should be generated for this interface. Possible options: *enabled* / *disabled* .
 - **Promiscuous Mode:** Indicating whether this interface has to inspect the MAC addresses; possible options:
 - *enabled*: The MAC frames are accepted regardless of their MAC addresses.
 - *disabled* (Not available): The MAC frames addresses are inspected before their acceptance, in order that only frames addressed to this port can be seen

- **Encaps. Method:** Method of MAC packets encapsulation inside the underlying physical layer; possible options:
 - *ethernetV2*: Default mode, set by the system
 - *IEEE8023*: Not yet operative
- **Asap Name:** Name of alarms profile to be associated to the current Port:
 The  key permits to choose and associate an asap to this resource, recalling the dialog described in “[Configuration -> Alarms Severity \(ASAP management\)](#)” (p. 4-33)
 The  key gives the asap properties currently associated to this resource
- **Protocol Profile:** Name of the 2-bytes provider VLAN-protocol-tag (PT) to be “pushed” into the ethernet frame of data flows afferent to the current Port.

Important! It is settable only if the port is in “down” state, and the Bridge Type is “Provider”.

The  key permits to choose and associate a provider protocol-tag (PT) to this resource, recalling the dialog described in “[Create Protocol Profile](#)” (p. 4-74)

The  key gives the Prot.-tag properties currently associated to this resource

- **TP/GFP SDH Configuration** sub-sector:

This group permits to configure the matching between the SDH container and the ethernet bandwidth used by the current port, performing, if activated, a rate limiting control by means of the CAC (Connection Admission Control); see also “[Bandwidth matching](#)” (p. 4-83).

- **Concatenation Type Set:** Available only if “*UnderlyingLayer*”=“*vconc*”; if marked it permits to choose, in the “Bandwidth” field, the possible bandwidths that can be used in virtual-concatenation mode
- **Rate Limiting Set:** Available only if “*UnderlyingLayer*”=“*sdh*”; if marked it permits to choose, in the “Bandwidth” field, the possible bandwidths that can be used in Rate-Limiting mode
- **Underlying Layer:** Possible pull-down options:
 - *vconc*: (Virtual concatenation); To permit the setting of the “virtual concatenation granularity” mode.
 - *sdh*: To permit the setting of the “Rate-Limiting” mode.
- **Bandwidth [bps]:** available bandwidth (band-limit) that can be used by the data flows afferent to the current Port:
 - The  key permits to choose and associate a band-limit value to this resource, recalling the dialog described in “[Bandwidth matching](#)” (p. 4-83).
 - The  key gives the band-limit properties currently associated to this resource

- **Current SDH Speed:** Actual configured sdh rate.
- **Vc Type:** Actual configured sdh VC type.

- **Alarms sector:**

This group reports the alarms relevant to the EthernetPort; their color is green if not-alarmed, if alarmed their color will be congruent with the severity assigned in the associated ASAP; the alarms colors are described in [Chapter 5, “Maintenance”](#).

- **GFP sector**

[Figure 4-34, \(p. 4-82\)](#) shows only the GFP type port, settable by means of the option “SubstituteServerLayer”:

- **Enable FCS:** (Not operative); insertion or removal of GFP-FCS (Frame Check Sequence) field into the optional field pFCS of the GFP frame.
- **Send Control:** Assignment of Signal Label code (SL inserted into GFP frame); possible pull-down options: “*automatic*”/“*forced*” (automatic means the tx SL shall be automatically calculated; forced means the tx SL will be always forced to the “equipped-non-specific” code).
- **TxSL / RxSL / ExpSL:** Signal Label management (*Tx*=transmitted, *Rx*=received, *Exp*=expected).
- **Transmit Capability:** Management of CSF alarm (Client Signal Fail); possible options:
 - ***disabled***: Alarms management is not managed
 - ***unidir***: CSF is inserted, towards the SDH network, into the GFP frame, in case of LOS detection on the local ethernet port connected to this port (Rec. G.7041 2001).
 - ***bidir***: CSF is inserted, towards the SDH network, into the GFP frame, in case of LOS detection on the local ethernet port connected to this port, or in case of one or more of the following alarms received by this port: LOF, TSF, PLM (rec. G.7041 2001).
 - ***unidir UPI-LOF***: Management of CSF as in the above “unidir” case, but with the UPI coding as specified in G.7041 2005.
 - ***bidir UPI-LOF***: Management of CSF as in the above “bidir” case, but with the UPI coding as specified in G.7041 2005. The CSF management is illustrated in [“CSF alarm management” \(p. 1-49\)](#).
 - ***unidir VC-AIS***: For propagation of Ethernet LOS alarm to SDH. The VC-AIS alarm is inserted, towards the SDH network, into the sdh VC container, in case of LOS detection on the local ethernet port connected to this port. The VC-AIS management is illustrated in [“VC-AIS alarm management” \(p. 1-51\)](#).
 - ***Backward (and Backward UPI-LOF)***: Not supported in current release.
- **LAPS sector**

Note: LAPS is not supported in the current version of ISA-ES4E .

- **L2 Control Frame** sub-sector: See [Figure 4-35, \(p. 4-83\)](#) (not displayed in case of ETB port) it permits to enable or disable the Protocol Frames that can accede to this port:
 - **Protocol List:** It reports all the available Protocol frames (“Bit Name”), and, correspondingly, its “Status”. The Status can be changed by means of the apposite pull-down menu that is activated by clicking on it; possible values: enabled / disabled.
 - ***enabled*** means that the relative frame protocol is accepted by the Port.
 - ***disabled*** means that the relative frame protocol is rejected by the Port.

After setting all the desired parameters, click on the “**Ok**” key to send the chosen parameters to the EthernetPort.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “**Help**” key gives helps about this function.

Figure 4-34 Configure (remote) Ethernet Port (GFP)

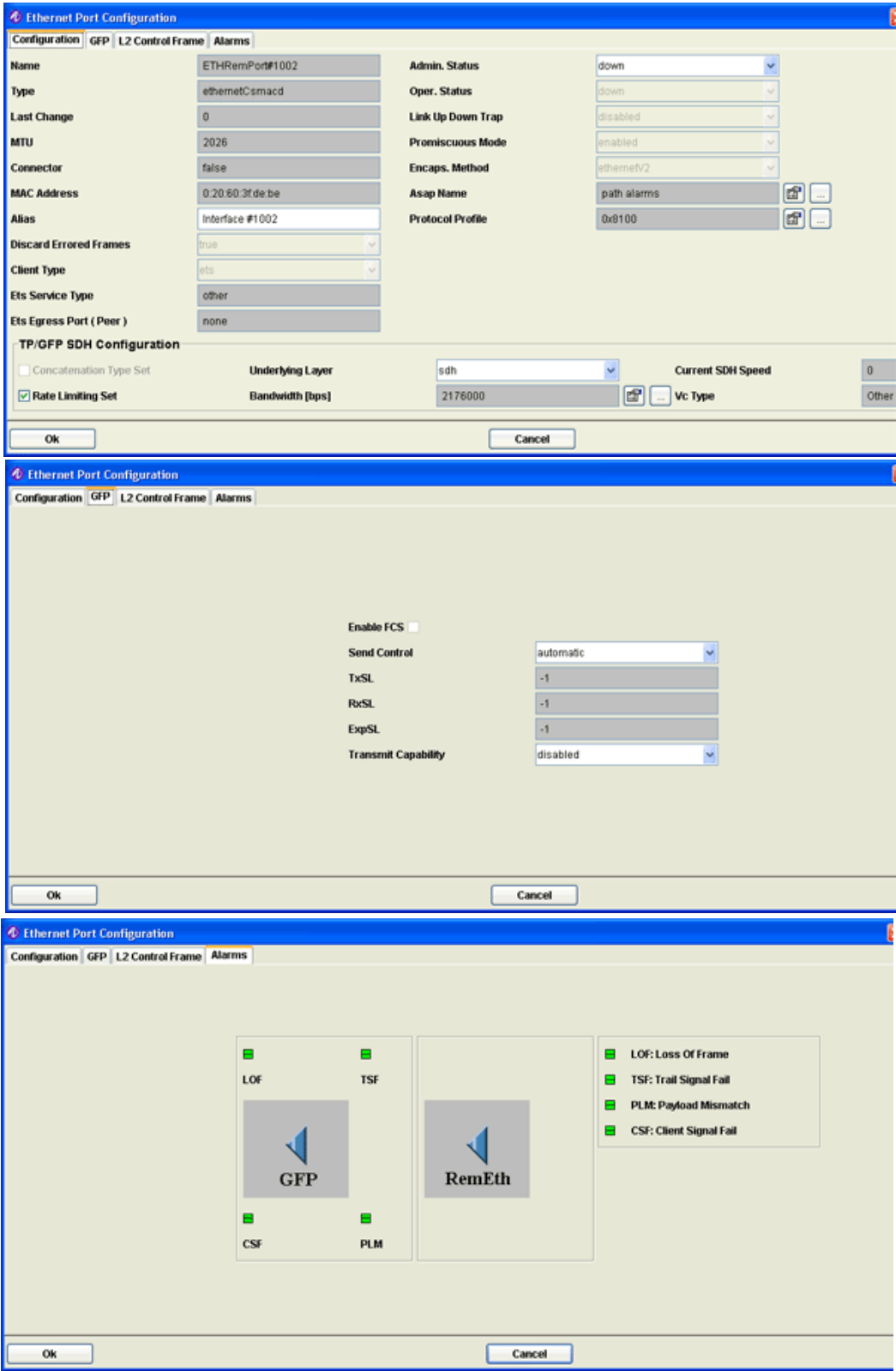
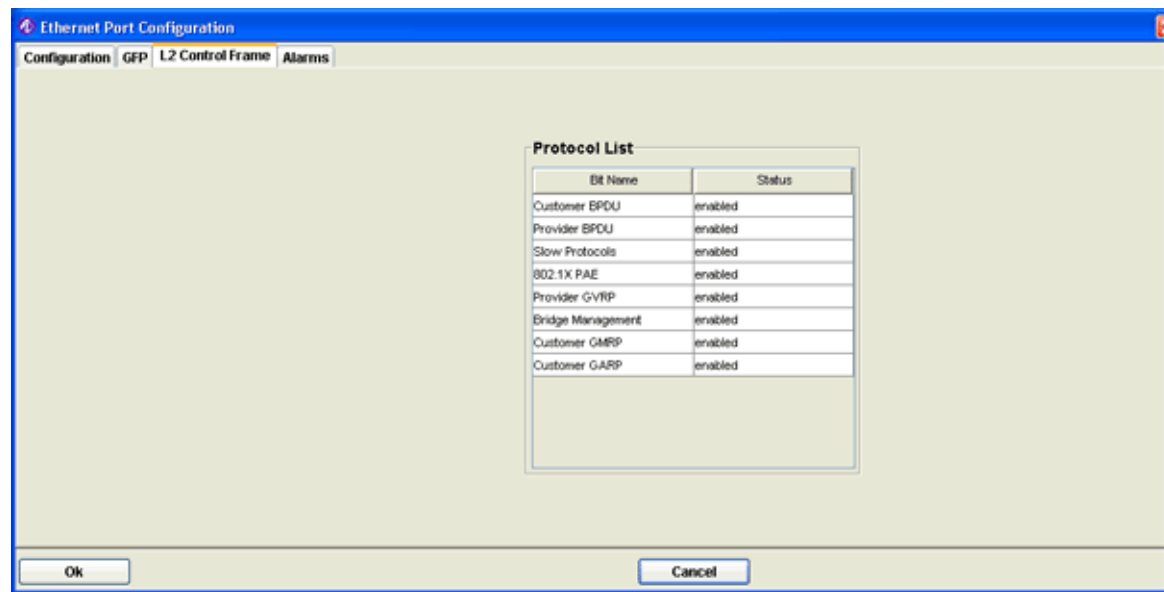


Figure 4-35 Configure (remote) Ethernet Port (L2 Control Frame)



Bandwidth matching

This option is obtained, in the “**Configure (remote) Ethernet Port**” window, shown in [Figure 4-34, \(p. 4-82\)](#), after clicking on the  key of the “**Bandwidth**” item.



WARNING

Before doing this operation, the user should have done, on SdhCT application (with “IsaPortConfiguration” option), the configuration of this same port, defining its SDH specific container. See also the note in “[Inconsistency error on Port configuration](#)” (p. 4-85).

The user is recommended to configure the Ethernet-bandwidth and the SDH-containers in a congruent mode.

The total traffic rate into Remote Ethernet Ports is limited. In fact it can be fixed to 10 or 100 Mb/s, depending on the type of ethernet interface used at the end points. Usually, the SDH available container capacity can be greater or smaller than the band of standard ethernet interfaces.

Thus, the rate-limiting function avoids the configuration of a total committed traffic greater than the physical transport rates.

In case of VirtualConcatenation mode, the function permits to transport a data rate greater than one single SDH-VCx; in fact it sets the usable bandwidth to a multiple of the number of sdh-VC's that are used.

The setting of the rate limiting function should take into account the sum of the CIR parameters of all the data flows afferent to a port, or, in the cases where the CIR is not defined (BestEffort traffic), a single afferent flow's PIR must not exceed that limit.

The window displayed is different, depending on the parameter "UnderlyingLayer".

- If "UnderlyingLayer" = "vconc" (VirtualConc): a window as [Figure 4-36, \(p. 4-85\)](#) will be displayed.

1. **Rate Limiting** case

Note: Low-order VC4 is not supported in the current version of ISA-ES4E.

The function of this option is to manage the Rate Limiting to be associated to the current remote Ethernet Port. It is used to avoid the traffic congestion in cases when two ports at different rates are interworking.

Note: In case that a fractional rate (not available in current release) has been used at the connected local port as well, the two fractional rates must be consistent.

It lists the possible sdh-VC rates that can be used, depending on the VC type that has been configured at the SDH side (by means of the SdhCT), for the current port. It is available only if the chosen sdh-VC is not concatenated. It reports the list of the possible rates, with relevant payload capacity:

- If SdhVC = VC3, the possibilities are: 48,384,000; 10,000,000
- If SdhVC = VC12, the possibilities are: 2,176,000

Furthermore it contains: the "Ok" button, permitting "to bind" the selected RateLimiting to the related port; the "Cancel" button, permitting to close the window without associating a RateLimiting; the "Help" button, permitting to have information about this current function.

2. **Virtual Concatenation Granularity** case [[Figure 4-36, \(p. 4-85\)](#)]

The function of this option is to manage the VirtualConcatenation Granularity to be associated to the current remote Ethernet Port. It permits to set and to limit the bandwidth equivalent to a multiple of the number of VCs that are configured at the sdh side. The congruency between SDH side (container) and ISA-ES side (bandwidth) is recommended.

It contains the following areas and fields:

a. **MII** interface case:

- *Vconc Granularity*: permitting to set the number (n) of concatenated containers, depending on the type of concatenated VC chosen at the SDH side:
SdhVC = VC4: not applicable
if SdhVC = VC3, then n_max=2
if SdhVC = VC12, then n_max=50
- *VCi: Total Vconc Bandwidth*: (VCi = VC12 or VC3); indicating the total concatenated bandwidth
- *SDH Bandwidth*: indicating the actual, configured and active SDH bandwidth.

Note: VC12 or VC3 is not supported in the current version of ISA-ES4E.

b. **GMI** interface case:

- *Vconc Granularity*: permitting to set the number (n) of concatenated containers, depending on the type of concatenated VC chosen at the SDH side:
if SdhVC = VC4, then n_max=4
if SdhVC = VC3, then n_max=12
if SdhVC = VC12, then n_max=63
- *VCi: Total Vconc Bandwidth*: (VCi = VC12 or VC3 or VC4); indicating the total concatenated bandwidth
- *SDH Bandwidth*: indicating the actual, configured and active SDH bandwidth.

Note: VC12 or VC3 is not supported in the current version of ISA-ES4E.

Furthermore it contains:

- the “Ok” button, permitting “to bind” the selected Vconc to the related port;
- the “Cancel” button, permitting to close the window without associating a Vconc;
- the “Help” button, permitting to have information about this current function.

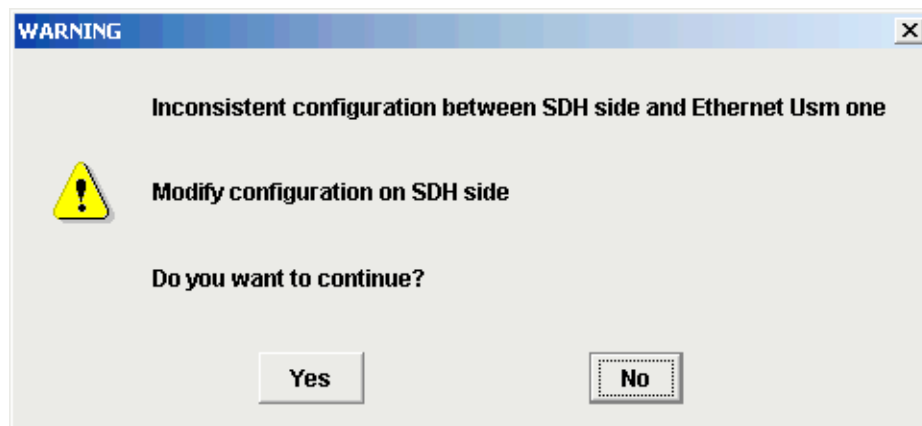
Figure 4-36 Virtual Concatenation Granularity example (MI, VC12 case)

Inconsistency error on Port configuration



WARNING

In case that the selected port has not been configured on SdhCT side, or if the Port actual parameters are not congruent with the Sdh side, the ISA ES-CT will return a window informing that there is an inconsistency between SONET/SDH and port configurations; see figure below:

Figure 4-37 Inconsistency error on Port Configuration

Transmission: Ethernet Port : (REMOTE) Ethernet Port Properties

This option is obtained, after selecting a Remote EthernetPort, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “EthernetPort Management” -> “EthernetPort Properties”.

An example of the window displayed is reported in [Figure 4-38, \(p. 4-87\)](#).

The function of this option is to show the transmission parameters of the selected remote Ethernet port.

All the reported information fields are read-only, and are the same as those explained ones for “Configure Ethernet Port”. See “[Transmission: Ethernet Port: Configure \(REMOTE\) Ethernet Port](#)” ([p. 4-77](#)), except for the following extra field, displayed in the **Configuration** sector:

- **Eth.Avail.Bandwidth:** Remaining bandwidth that is not yet occupied by “children” resources (in kb/s).

Figure 4-38 (Remote) Ethernet Port Properties

Ethernet Port Properties	
Configuration Laps L2 Control Frame Alarms	
Name	ETHRemPort#1002
Type	ethernetCsmacd
Last Change	0
MTU	2026
Connector	false
MAC Address	0:20:60:3f:de:be
Alias	Interface #1002
Discard Errored Frames	true
Client Type	ets
Ets Service Type	other
Ets Egress Port (Peer)	none
TP/LAPS SDH Configuration ☐ Concatenation Type Set Underlying Layer: sdh Current SDH Speed: 0 ☒ Rate Limiting Set Bandwidth [bps]: 2176000 Vc Type: Other	

Transmission: Ethernet Port: Substitute Server Layer

Note: LAPS is not supported in the current version of ISA-ES4E.

Transmission: Ethernet Port : Characterization Service

This option is obtained, after selecting a Local or Remote Ethernet Port (with **AdminStatus = *down***), by means of the contextual pop-up menu, or by selecting in the **“Transmission” -> “Ethernet Port Management” -> “Characterization Service”**.

It contains three sub-options:

- **Other (Service):** active only if the port is currently configured for ETB, Bridge functions, to change from **“Port-to-Port”** to **“Other”** service.
- **Port To Port (Service):** active only if the port is currently configured for transparent Port-to-Port connection, to change from **“Other”** to **“Port-to-Port”** service.
- **Ets Virtual Switch (Service):** not supported in current release. Available only in **“none”** Bridge case (not available). It permits to create a set of differentiated flows afferent to the same input port and output port (all inflows of the same input port must be connected to outflows belonging to the same output port). In this way the data flows between two ports can be treated in different modes, depending on their different CoS (TD, Priority, VLAN).

This option permits to switch the service to which this port has to be deputed.

Transmission: Ethernet Port: Traffic Management

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

Transmission: Aggregator : Traffic Management

This option is obtained, after selecting a Local Port (or a Link Agg Port) (with **AdminStatus = *up***), by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Aggregator” -> “Traffic management”

Its function is the same of the previous above option for **“Transmission: Ethernet Port: Traffic Management”** (p. 4-88).

Transmission: Ethernet Port: Create ETS InFlow

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E

“Transmission” -> “Aggregator” -> “Create ETS InFlow”.



WARNING

The option is available only if the selected ethernet port is ETS type (and not ETB), with AdminStatus = up.



WARNING

his creation must be done in one single step by means of the Connection wizard: “Create ETS XC One Step”. See “Connection: Ethernet Port : Create Ets XC One Step (MAC & Virtual)” (p. 4-191) and “Connection: Ethernet Port : Create Ets XC One Step (Provider)” (p. 4-194). The scope of this paragraph is to describe the settings and meanings of the resource parameters.

An example of the window displayed is reported in Figure 4-39, (p. 4-91).

The function of this option is to create an InFlow resource into the selected ETS ethernet Port.

To create an InFlow object, fill fields and areas as follows:

- **ETS InFlow:** indexed name assigned by the system to the resource (read only)

Note: The index is incremental over all the existing inflows of all the ports

- **User Label:** optional name assigned by the user to describe this resource
- **Service Type:** upper layer service type (read only field): Ethernet
- **Traffic Descriptor** indicating the name of the associated traffic descriptor (TD):
the  key permits to choose and associate a traffic descriptor to the data flow, recalling the dialog described in “Configuration -> Traffic Descriptor -> ETS Traffic Descriptor” (p. 4-50).

the  key gives the properties of the traffic descriptor currently associated.



WARNING

The bandwidth associated to this resource must be congruent with the CIR/PIR values indicated in the contract, with the band indicated in the mother-port, and also with the sdh rate capability of the logical port associated by means of the SDH-Craft Terminal application (see “Configuration -> Traffic Descriptor -> ETS Traffic Descriptor” (p. 4-50)).

- **Classification Mode:** to choose the Priority of this InFlow; possible pull-down options:
 - **priority:** to use the 802.1p priority mode (*prio0* to *prio7*)
 - **dscp:** to use the Ip-ToS (Type-of-Service) mode
- **Status:** notification about the actual status of the resource; possible pull-down options (read only):
 - **up:** the resource is in-service;

- **down**: the resource is out-of-service
- **Policing Mode**: to set the policing on the ETS traffic; possible pull-down options:
 - **disabled**: the policing is not performed (i.e. all rates are forwarded, if the band is available)
 - **color-blind**: the policing is based on the associated TD, without taking into account the user CoS
 - **color-aware**: (not yet available/not operative) the policing is based on the associated TD and on the priority colors of the associated “ColorProfile” explained below
- **Flow Type**: possible options:
 - **unicastNoAutolearning**: for unicast link
 - **multicastOptionA**: (not available in current release) for multicast link
- **Service Id**: (set by the system); indicating the suffix number of the mother-port
- **VLANPop**: (not yet available) possible values: “disabled” or “enabled”; if enabled it pops out the “provider Stacked-VLAN” shim fields of the ethernet frame.

Note: If this is “enabled”, the “priority” field of the relevant Classifier must be different from “untagged” or “don't care”

- **Color Profile**: indicating the name of the association between the user-priorities and the Provider-priority;

Note: If a ColorProfile is associated, the “priority” field of the relevant Classifier must be different from “untagged” or “don't care”

the  key permits to choose and associate a color profile, recalling the dialog described in “[Transmission: Ethernet Port: Create InFlow/ColorProfile](#)” (p. 4-91)

the  key gives the properties of the color profile currently associated
the “**Unbind**” key permits to untie the data flow from the color profile

- **Protocol List** sub-sector

It permits to enable or disable the Protocol Frames that can pass through this inflow.

It reports all the available Protocol frames (**Bit Name**), and, correspondingly, its **Status**. The Status can be changed by means of the apposite pull-down menu that is activated by clicking on it. Possible values:

- **enabled** means that the relative frame protocol is accepted by the Port.
- **disabled** means that the relative frame protocol is rejected by the Port.

Important! More information about the traffic description, Policing, ColorProfile is reported in [“Traffic Descriptor, Forwarding Priority and Class of Service”](#) (p. 4-55).

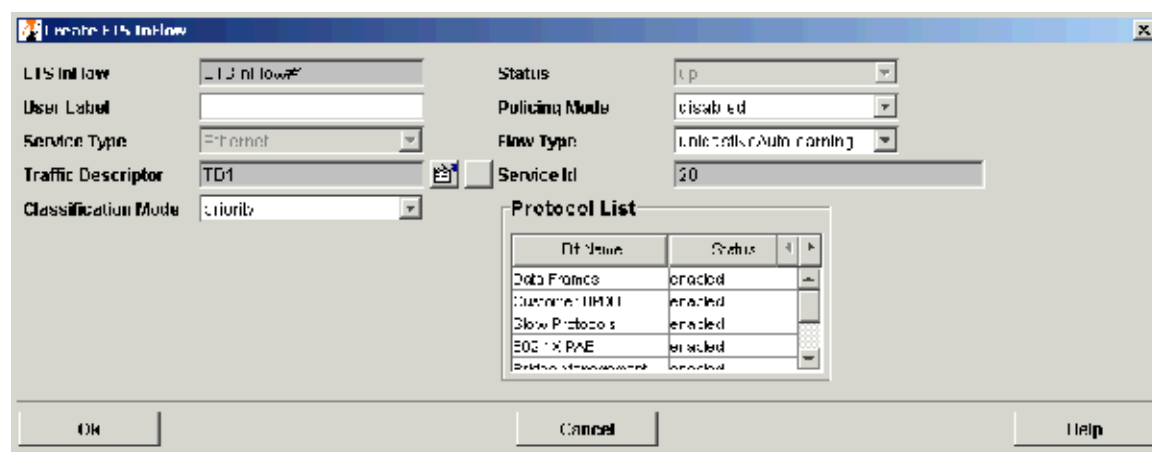


WARNING

Under the same mother ETH Port, all the inflows in “color-aware” mode must have the same “ColorProfile”; i.e., only one ColorProfile per ETH Port is supported.

After setting all the desired parameters, click on the “**Ok**” key to create this new InFlow point, that will be shown in the tree-area, attached to the selected ethernet port. The window will be closed without doing any operation by clicking on “**Cancel**” key. The “**Help**” key gives helps about this function.

Figure 4-39 Create ETS InFlow



Transmission: Ethernet Port: Create InFlow/ColorProfile

This option is obtained, in the “**Create ETS Inflow**” window as depicted in [Figure 4-39](#), (p. 4-91), after clicking on the  key of the “**ColorProfile**” item.

An example of the window displayed is reported in [Figure 4-40](#), (p. 4-92).

The function of this option is to manage the Vlan-Provider traffic coloring for the selected Inflow resources.

It reports the list of the existing Color Profiles, with relevant name and color associated to the relevant priority.

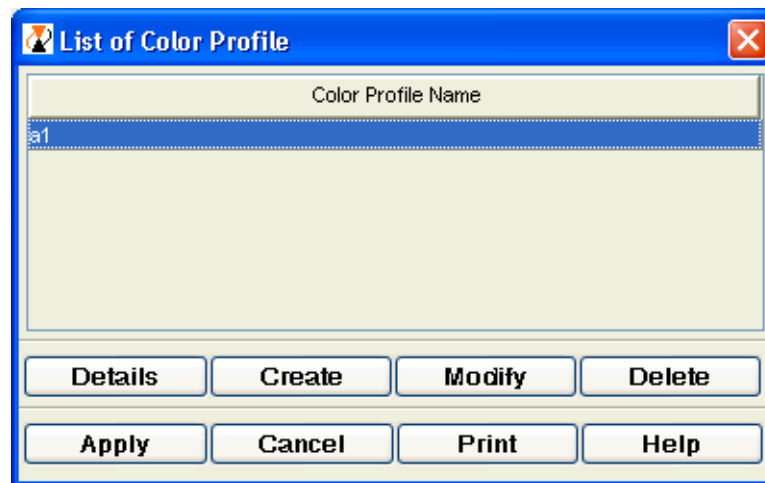
Furthermore it contains:

- the “**Create**” button, permitting to create a new ColorProfile as explained below;
- the “**Details**” button, permitting to see the properties of an existing ColorProfile;
- the “**Modify**” button, permitting to change the properties of an existing ColorProfile;
- the “**Delete**” button, permitting to delete an existing ColorProfile;

- the “**Apply**” button, permitting “to bind” the selected ColorProfile to the related Inflow;
- the “**Cancel**” button, permitting to close the window without associating a ColorProfile;
- the “**Print**” button, permitting to print the properties of a selected ColorProfile;
- the “**Help**” button, permitting to have information about this current function.

Note: More information about the traffic description, Policing, ColorProfile is reported in “[Traffic Descriptor, Forwarding Priority and Class of Service](#)” (p. 4-55).

Figure 4-40 List of Color Profile



To create a ColorProfile, click on “**Create**” key ([Figure 4-40](#)) and then the dialog box indicated in [Figure 4-41](#), (p. 4-93) will be displayed; fill fields and areas as follows:

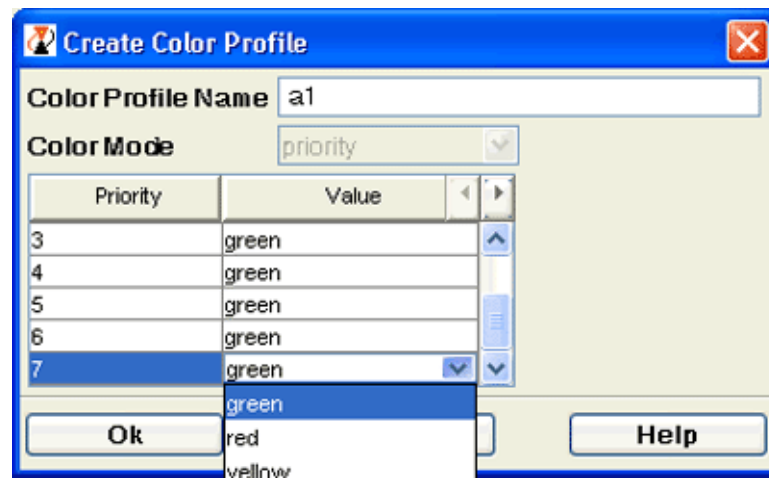
- **Color Profile Name:** type a mnemonic name
- **Color Mode:** not operative; set by the system to “priority”
- **Priority0 ... to Priority7:** choose, by means of the pull-down menu, the desired provider-color (*green* = max-prior., *yellow* = medium-prior., *red* = min-prior.) to be associated to the corresponding user-priority value (*0* = min-Prior, *7* = max-Prior).

click on the “**Ok**” button, to close and save the new ColorProfile;

click on the “**Cancel**” button, to close the dialog without saving the new ColorProfile;

click on the “**Help**” button, to get information about this window.

Figure 4-41 Create Color Profile



The image shows a 'Create Color Profile' dialog box. It has a title bar with a close button. Inside, there is a text field for 'Color Profile Name' containing 'a1'. Below it is a dropdown menu for 'Color Mode' set to 'priority'. A table with two columns, 'Priority' and 'Value', is present. The table has five rows with priorities 3, 4, 5, 6, and 7, all containing the value 'green'. The row with priority 7 is selected. To the right of the table is a large empty area. At the bottom are 'Ok' and 'Help' buttons. A small dropdown menu is open below the table, showing 'green', 'red', and 'yelloww'.

Priority	Value
3	green
4	green
5	green
6	green
7	green

Color Profile Name: a1

Color Mode: priority

Ok Help

Table 4-5 Traffic Descriptor, Policing Mode and Color Profile for INFLOW resource:

Traffic Descriptor	Policing Mode	Color Profile(1)	Scheduler-Color (2)
BEST EFFORT	“disabled”	only “Unbound”	YELLOW
	“color-blind”		YELLOW or RED
GUARANTEED	“disabled”	only “Unbound”	GREEN
	“color-blind”		GREEN or RED
REGULATED	“disabled”	“Unbound”	GREEN
		“Bound” (3)	GREEN or YELLOW
	“color-blind”	“Unbound”	GREEN or YELLOW or RED
	“color-aware”	“Bound” (3)	as assigned by the “ColorProfile”

Note: on Table 9.

Green: max Provider-priority, **Red:** min priority

1. “Unbound” means that “NoProfile” is associated to the ColorProfile field, or the “Unbind” key has been clicked; “Bound” means that a ColorProfile has been assigned
2. In cases different from “color-aware”, the coloring is performed by the scheduler, depending on the traffic condition
3. In this case the “Priority” value of the Classifier associated to this InFlow must be different from “untagged” or “don't care”

Transmission: Ethernet Port : Create ETS OutFlow

This option is obtained, after selecting a remote (or local) ETS EthernetPort or a LAG, by means of the contextual pop-up menu, or by selecting in the menu-bar:

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

“Transmission” -> “Ethernet Port Management” -> “Create ETS OutFlow”.

This description applies also in case of LAG (when an ETB-LAG has been selected):

“Transmission” -> “Aggregator” -> “Create ETS OutFlow”.



WARNING

The option is available only if the selected ethernet port is ETS type (and not ETB), with “AdminStatus” = “up”.



WARNING

This creation must be done in one single step by means of the Connection wizard: “Create ETS XC One Step”. See “[Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)](#)” (p. 4-191) and “[Connection: Ethernet Port : Create Ets XC One Step \(Provider\)](#)” (p. 4-194). The scope of this paragraph is to describe the settings and meanings of the resource parameters.

An example of the window displayed is reported in [Figure 4-42, \(p. 4-96\)](#).

The function of this option is to create an OutFlow resource into the selected ETS EthernetPort.

To create an OutFlow object, fill fields and areas as follows:

- **ETS OutFlow** : indexed name assigned by the system to the resource (read only field)

Note: The index is incremental over all the existing outflows of all the ports

- **User Label**: optional name assigned by the user to describe this resource
- **Server Type**: server layer type (read only): *Ethernet*
- **Server Id**: (set by the system); indicating the suffix number of the mother-port
- **Status**: notification about the actual status of the resource; possible pull-down options:
 - *up*: the resource is in-service
 - *down*: the resource is out-of-service

- **VLAN Management:** (not yet available) automatic incremental index identifying the StackedVLAN-management profile; value “0” means that the SVLAN-management is disabled (“Unbound”): in this case the StackedVLAN shim header is not “pushed” into the ethernet frame

the  key permits to choose and associate a VLAN-management profile, recalling the dialog described in 4.9.19 page 202

the  key gives the properties of the VLAN-management profile currently associated

the “Unbind” key permits to untie the data flow from the VLAN-management profile.

Important! More information about the traffic description, Policing, ColorProfile is reported in [“Traffic Descriptor, Forwarding Priority and Class of Service”](#) (p. 4-55).



WARNING

In case of Multicast (not yet available), all the multi-casted outflows must have the same VLAN-Management parameters.

After setting all the desired parameters, click on the “Ok” key to create this new OutFlow point, that will be shown in the tree-area, attached to the selected ethernet port.

The window will be closed without doing any operation by clicking on “Cancel” key.

The “Help” key gives helps about this function.

Figure 4-42 Create ETS OutFlow

Create ETS OutFlow / VlanManagement (not available)

This option is obtained, in the “**Create ETS Outflow**” window depicted in [Figure 4-42, \(p. 4-96\)](#), after clicking on the  key of the “**VLAN Management**” item.

An example of the window displayed is reported in [Figure 4-43, \(p. 4-98\)](#).

The function of this option is to manage the “Stacked-VLAN” parameters to be associated to the outflow resources. It pushes, if activated, the Stacked-Vlan (provider-ShimHeader) to the ethernet frame.

To create a VLAN-Management profile, fill fields and areas as follows:

- **VLAN index:** Indexed value assigned by the system to this profile (read only)
- **VLAN value:** Stacked-Vlan identifier to which associate these parameters
- **Priority Mode:** [See details in “[Traffic Descriptor, Forwarding Priority and Class of Service](#)” (p. 4-55)]; provider's prioritization mode; possible options:
 - **colorBlind:** The frames are forwarded without provider's coloring
 - **colorAware:** The frames are forwarded associating a provider's coloring information as follows:
 - The “*green*” Provider's color is identified by attaching, to the ethernet frames, the priority value selected into the “**Stack Priority**” field
 - The “*yellow*” Provider's color is identified by attaching, to the ethernet frames, the priority value selected into the “**Stack Priority Yellow**” field
- **Stack Priority:** Priority value to be assigned to the “green” provider-color; possible options:
 - **pri000** to **pri111** (min. priority= “pri000”, max = pri111)
- **Stack Priority Yellow:** Priority value to be assigned to the “yellow” provider-color
- **Stack Status:** Possible options:
 - **up:** To activate this Stacked VLAN management profile
 - **down:** To deactivate this Stacked VLAN management profile

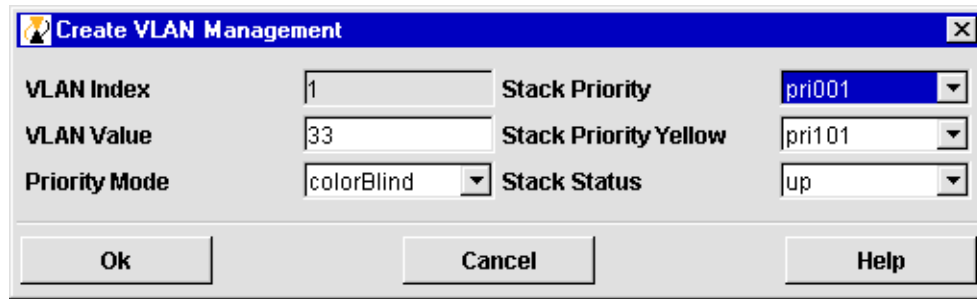
Important! More information about the traffic description, ColorProfile and Stacked-VLAN is reported in “[Traffic Descriptor, Forwarding Priority and Class of Service](#)” (p. 4-55).

After setting the desired parameters, click on the “**Ok**” key to create this new VLAN-Management profile.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “**Help**” key gives helps about this function.

Figure 4-43 Create VLAN Management



The image shows a 'Create VLAN Management' dialog box with a blue title bar and a close button. It contains six input fields arranged in two columns. The left column has 'VLAN Index' (text box with '1'), 'VLAN Value' (text box with '33'), and 'Priority Mode' (dropdown menu with 'colorBlind'). The right column has 'Stack Priority' (dropdown menu with 'pri001'), 'Stack Priority Yellow' (dropdown menu with 'pri101'), and 'Stack Status' (dropdown menu with 'up'). At the bottom are three buttons: 'Ok', 'Cancel', and 'Help'.

VLAN Index	1	Stack Priority	pri001
VLAN Value	33	Stack Priority Yellow	pri101
Priority Mode	colorBlind	Stack Status	up

Ok Cancel Help

Transmission: ETS InFlow : Modify ETS InFlow

This option is obtained, after selecting an InFlow object, by means of the contextual pop-up menu, or by selecting in the menu-bar: **“Transmission” -> “ETS InFlow Management” -> “Modify ETS InFlow”**.

The function of this option is to modify the transmission parameters set for the selected InFlow point.

All the reported information fields are the same as those explained ones for [“Transmission: Ethernet Port: Create ETS InFlow” \(p. 4-88\)](#). It contains, further, in the Protocol List, the extra field **“Actual Status”**.

Transmission: ETS InFlow : ETS InFlow Properties

This option is obtained, after selecting an InFlow object, by means of the contextual pop-up menu, or by selecting in the menu-bar: **“Transmission” -> “ETS InFlow Management” -> “ETS InFlow Properties”**.

The function of this option is to show the transmission parameters set for the selected InFlow point.

All the reported information fields are read-only, and the same as those explained ones for [“Transmission: Ethernet Port: Create ETS InFlow” \(p. 4-88\)](#). It contains, further, in the Protocol List, the extra field **“Actual Status”**.

Transmission: ETS OutFlow : Modify ETS OutFlow

This option is obtained, after selecting an OutFlow object, by means of the contextual pop-up menu, or by selecting in the menu-bar: **“Transmission” -> “ETS OutFlow Management” -> “Modify ETS OutFlow”**.

The function of this option is to modify the transmission parameters set for the selected OutFlow point.

All the reported information fields are the same as those explained ones for [“Transmission: Ethernet Port : Create ETS OutFlow” \(p. 4-95\)](#).

Transmission: ETS OutFlow : ETS OutFlow Properties

This option is obtained, after selecting an OutFlow object, by means of the contextual pop-up menu, or by selecting in the menu-bar: **“Transmission” -> “ETS OutFlow Management” -> “ETS OutFlow Properties”**.

The function of this option is to show the transmission parameters set for the selected OutFlow point.

All the reported information fields are read-only, and the same as those explained ones for [“Transmission: Ethernet Port : Create ETS OutFlow” \(p. 4-95\)](#).

Transmission: ETS InFlow : Delete ETS InFlow

This option is obtained, after selecting an InFlow object, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “ETS InFlow Management” -> “Delete ETS InFlow”.

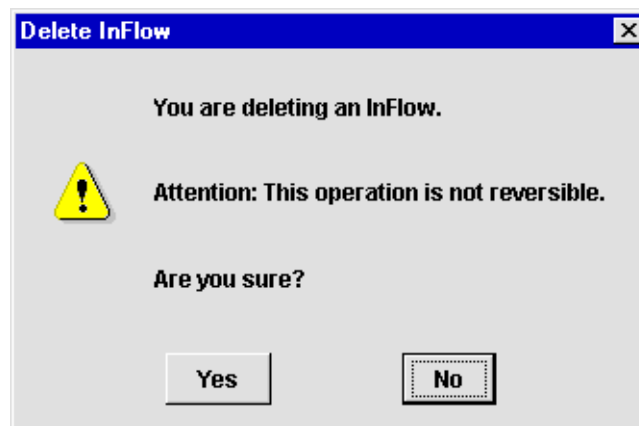
**WARNING**

*The resource will not be deleted if containing any inner resource (**Classifier**), or if it is cross-connected, or also if it contains PM points.*

An example of the window displayed is reported in [Figure 4-44, \(p. 4-100\)](#).

This option permits to delete the selected InFlow point.

Figure 4-44 Delete ETS InFlow

**Transmission: ETS OutFlow : Delete ETS OutFlow**

This option is obtained, after selecting an OutFlow object, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “ETS OutFlow Management” -> “Delete ETS OutFlow”.

**WARNING**

The resource will not be deleted if containing any inner resource, or if it is cross-connected, or also if it contains PM points.

The window displayed is similar to that reported in [Figure 4-44, \(p. 4-100\)](#).

This option permits to delete the selected OutFlow point.

Transmission: ETS InFlow : Create Eth2ETS Classifier

This option is obtained, after selecting an ETS InFlow object, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “ETS InFlow Management” -> “Create Eth2ETS Classifier”.



WARNING

The Classifier cannot be created over a PB (Provider) InFlow.



WARNING

This creation must be done in one single step by means of the Connection wizard: “Create ETS XC One Step”. See “[Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)](#)” (p. 4-191) and “[Connection: Ethernet Port : Create Ets XC One Step \(Provider\)](#)” (p. 4-194). The scope of this paragraph is to describe the settings and meanings of the resource parameters.

An example of the window displayed is reported in [Figure 4-45](#), (p. 4-104).

The function of this option is to create a Classifier of the ethernet traffic into the selected InFlow, defining the parameters of the user LAN's afferent into the related InFlow; every InFlow resource needs one or more classifiers, in order to select the user frames to be transported. More classifiers can be created into the same InFlow, but heading to different VLAN ranges. It classifies the ethernet traffic to be transported over the ETS. Ethernet frames having VLAN tags or user-priorities different from those indicated in the Classifier will be discarded.

To create an Eth2ETS Classifier, fill fields and areas as follows:

Important! Some of the following fields will be / (will not be) editable, depending on the option selected in the field “**Topology Class**”.

- **ETS InFlow:** Indicating the name assigned by the system to the resource (read only field)
- **Classifier Index:** Incremental index assigned by the system to the resource (read only field)
- **VLAN:** VLAN identifier number, in decimal format; range 0 to 4095 (2^{12})
 - **VLAN=4096** is to be used in coincidence with Priority = “*untagged*”; for frames containing neither Vlan nor Priority tags; in this case, incoming tagged frames will be discarded
 - **VLAN=4097** is to be used in coincidence with Priority = “*don'tCare*”; in this case, all ethernet frames will be forwarded, either tagged or untagged.
- **Priority:** To define the ETS priority level; possible pull-down options:

- *pri000, pri010, don'tCare, pri111, pri110, pri001, pri101, pri100, untagged* (min. priority = *pri000*, max = *pri111*)

“*untagged*” means that the incoming frames contains neither Vlan nor Priority values; in this case, incoming tagged frames will be discarded

“*don'tCare*” means that all frames will be forwarded, either tagged or untagged

Important! In cases that the related InFlow has been set with **VLAN-Pop** = *enabled* or **ColorProfile** = *bound*, then this value must be different from “*don'tCare*” or “*untagged*”

- **Ip Dscp:** (range *0* to *63*); it defines the group of user IP DSCP values accepted by this flow.

Important! This field is settable only if, in the relative InFlow, the Classification Mode has been set to “*dscp*”

the special value “*notIpPacket*” (set by the system, if “TopologyClass” = “No_IP”) to indicate that ethernet frames not containing IP packets are associated to this flow

the special value “*dontCare*” (set by the system, if “ClassificationMode” = “priority”) to indicate that the IP-DSCP field is not considered, either if present or not present.

Note: This item is active only when the above item (“**Priority**”) is set to “*dontCare*” and related InFlow is “*dscp*”.

- **Ethernet Type:** to define the transported upper Level3 protocol. Possible values:
 - **IP:** if transporting IP packets
 - **ARP:** if transporting ARP packets
 - **DRARP-RARP:** if transporting DRARP/RARP packets
 - **SNMP:** if transporting SNMP packets
 - **IPv6:** if transporting IPv6 packets
 - **PPP:** for PPP packets
 - **PPPoE-Discovery:** for PPPoE-Discovery packets
 - **PPPoE-Session:** for PPPoE-Session packets
 - **MPLS-multicast:** for MPLS-multicast packets
 - **MPLS-unicast:** for MPLS-unicast packets
- **Classification Mode:** read only, as set by the relative InFlow
- **Status:** possible pull-down options:
 - **up:** to set the resource in-service
 - **down:** to set the resource out-of-service

- **Max Vlan:** max Vlan number on which the data flow can be linked; value '0' means only one Vlan linked (the one indicated in the "Vlan" field); a value greater than "Vlan" field defines the Vlan range, in decimal format (e.g.: "Vlan" = 33 and "Max Vlan" = 50 defines the vlan range from 33 to 50).
- **Max Priority:** max priority associable to this classifier, in binary format; value '0' means only one priority, a value greater than the value set in "Priority" field defines the priority range.
- **Max Ip Dscp:** max IpDscp value associable to this classifier, in decimal format; value '0' means only one priority, a value greater than the value set in "IpDscp" field defines the IpDscp range.
- **Topology Class Possible options:**
 - **VLAN+PRIO+EthType:** in this case, the following parameters are editable, in the dialog box: "Vlan" / "MaxVlan", "Prio" / "MaxPrio", "EthType"
 - **VLAN+PRIO:** in this case, the following parameters are editable, in the dialog box: "Vlan" / "MaxVlan", "Prio" / "MaxPrio"
 - **Untagged+EthType:** in this case, the following parameters are editable, in the dialog box: "EthType", and the other parameters will be fixed to set the frame as "untagged"
 - **Untagged:** in this case, no parameter is editable, and the other parameters will be fixed to set the frame as "untagged"
 - **Default:** in this case, no parameter is available, and the other parameters will be fixed to set the frame as "dontCare"

**WARNING**

The VLAN identifiers defined here must be different from those ones defined in other classifiers of the same ethernet port, otherwise the classifier cannot be created.

After setting all the desired parameters, click on the "Ok" key to create this new Classifier point, that will be shown in the tree-area, attached to the selected InFlow object.

The window will be closed without doing any operation by clicking on "Cancel" key.

The "Help" key gives helps about this function.

Figure 4-45 Create Eth2ETS Classifier
Transmission: Classifier : Modify Classifier

This option is obtained, after selecting a Classifier object, by means of the contextual pop-up menu, or by selecting in the menu-bar: **“Transmission” -> “Classifier Management” -> “Modify Classifier”**.

The function of this option is to modify the transmission parameters set for the selected Classifier point. All the reported information fields are the same as those explained ones for [“Transmission: ETS InFlow : Create Eth2ETS Classifier”](#) (p. 4-101).

Transmission: Classifier : Classifier Properties

This option is obtained, after selecting a Classifier object, by means of the contextual pop-up menu, or by selecting in the menu-bar: **“Transmission” -> “Classifier Management” -> “Classifier Properties”**.

The function of this option is to show the transmission parameters set for the selected Classifier point. All the reported information fields are read-only, and the same as those explained ones for [“Transmission: ETS InFlow : Create Eth2ETS Classifier”](#) (p. 4-101).

Transmission: Classifier : Delete Classifier

This option is obtained, after selecting a Classifier object, by means of the contextual pop-up menu, or by selecting in the menu-bar: **“Transmission” -> “Classifier Management” -> “Delete Classifier”**.

The window displayed is similar to that reported in [Figure 4-44](#), (p. 4-100).

This option permits to delete the selected Classifier point.

**WARNING**

The resource will not be deleted if containing any inner resource, or if it is cross-connected, or also if it contains PM points.

Transmission: Ethernet Port: Create Provider InFlow

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting a remote (or local) ETS Ethernet Port or a LAG, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “Create Provider InFlow”.

This description applies also in case of LAG (when an ETB-LAG has been selected):

“Transmission” -> “Aggregator” -> “Create Provider InFlow”.



WARNING

*The option is available only if the selected ethernet port is ETS type (and not ETB), with AdminStatus = **up**; further the Bridge type has to be **Provider**.*



WARNING

This creation must be done in one single step by means of the Connection wizard: “Create ETS XC One Step”. See “[Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)](#)” (p. 4-191) and “[Connection: Ethernet Port : Create Ets XC One Step \(Provider\)](#)” (p. 4-194). The scope of this paragraph is to describe the settings and meanings of the resource parameters.

The window displayed is reported in [Figure 4-46](#), (p. 4-106).

The function of this option is to create an InFlow resource into the selected ETS EthernetPort, when the Bridge is “Provider” type.

- **ETS PB InFlow:** indexed name assigned by the system to the resource (read only)

Note: The index is incremental over all the existing inflows of all the ports

- **User Label:** optional name assigned by the user to describe this resource
- **Service Type:** upper layer service type (read only field): Provider Bridge
- **Traffic Descriptor** indicating the name of the associated traffic descriptor (TD):
the  key permits to choose and associate a traffic descriptor to the data flow, recalling the dialog described in “[Configuration -> Traffic Descriptor -> ETS Traffic Descriptor](#)” (p. 4-50).
the  key gives the properties of the traffic descriptor currently associated.

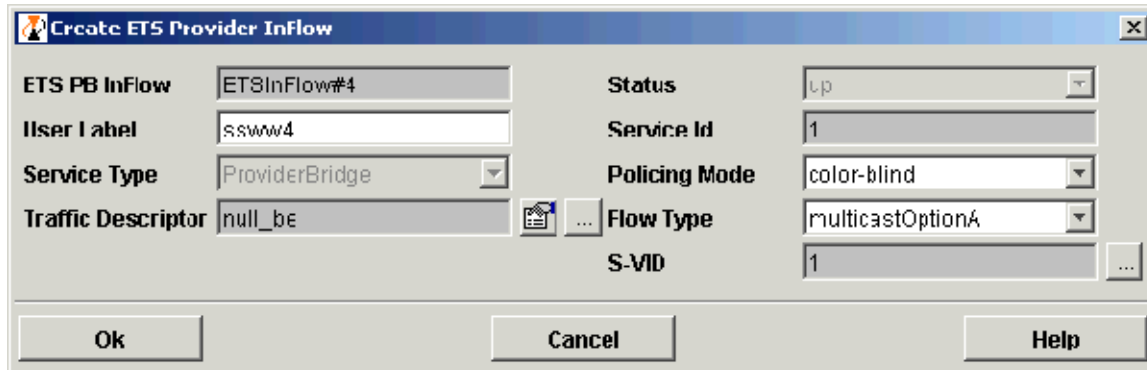
Important! The bandwidth parameters (CIR/PIR, CBS/PBS) associated to this resource must be null.

- **Status:** notification about the actual status of the resource. Possible pull-down options (read only):
 - **up:** the resource is in-service ;
 - **down:** the resource is out-of-service

- **Service Id:** (Set by the system); indicating the suffix number of the mother-port
- **Policing Mode:** To set the policing on the ETS traffic; possible pull-down options:
 - **disabled:** The policing is not performed (i.e. all rates are forwarded, if the band is available)
 - **color-blind:** The policing is based on the associated TD, without taking into account the user CoS
 - **color-aware:** (Not operative) the policing is based on the associated TD and on the priority colors of the associated “ColorProfile”
- **Flow Type:** Possible options:
 - **unicastNoAutolearning:** For unicast link
 - **multicastOptionA:** (Not operative) for multicast link
- **S-VID:** To pop the S-VLAN field from the ethernet frame:

The  key permits to choose and associate one registered VLAN, recalling the dialog described in “[Create Provider InFlow / S-VID Management](#)” (p. 4-107).

Figure 4-46 Create Provider InFlow



ETS PB InFlow	ETSInFlow#4	Status	Up
User Label	ssww4	Service Id	1
Service Type	ProviderBridge	Policing Mode	color-blind
Traffic Descriptor	null_be	Flow Type	multicastOptionA
		S-VID	1

Buttons: Ok, Cancel, Help

Create Provider InFlow / S-VID Management

This option is obtained, in the “Create Provider Inflow/OutFlow” windows as described in “[Transmission: Ethernet Port: Create Provider InFlow](#)” (p. 4-105), or “[Transmission: Ethernet Port: Create Provider OutFlow](#)” (p. 4-108), after clicking on the  key of the “S-VID” item.

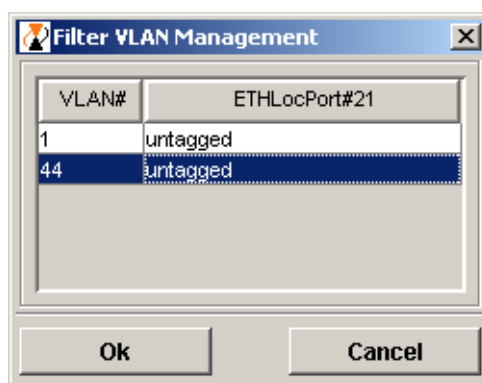
An example of the window displayed is reported below.

The function of this option is to associate one “Stacked-VLAN” to the selected inflow resources. The system will push (for OutFlow), or pop (for InFlow)) the relevant Stacked-Vlan (provider-ShimHeader) to/from the ethernet frame.

The window reports the list of all the VLAN registered over the parent Ethernet Port.

To associate a VLAN, select the desired VLAN and click on “Ok”.

Figure 4-47 Provider Inflow: S-VID Filter



Transmission: Ethernet Port: Create Provider OutFlow

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting a remote (or local) ETS EthernetPort or a LAG, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “Create Provider OutFlow”.

This description applies also in case of LAG (when an ETB-LAG has been selected):

“Transmission” -> “Aggregator” -> “Create Provider OutFlow”.



WARNING

*The option is available only if the selected ethernet port is ETS type (and not ETB), with **AdminStatus** = **up**; further the Bridge type has to be **Provider**.*



WARNING

This creation must be done in one single step by means of the Connection wizard: “Create ETS XC One Step”. See “[Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)](#)” (p. 4-191) and “[Connection: Ethernet Port : Create Ets XC One Step \(Provider\)](#)” (p. 4-194) The scope of this paragraph is to describe the settings and meanings of the resource parameters.

The window displayed is reported in [Figure 4-48, \(p. 4-109\)](#).

The function of this option is to create an OutFlow resource into the selected ETS EthernetPort, when the Bridge is “Provider” type.

- **ETS PB OutFlow:** indexed name assigned by the system to the resource (read only)

Note: The index is incremental over all the existing outflows of all the ports

- **User Label:** optional name assigned by the user to describe this resource
- **Server Type:** upper layer service type (read only field): **ProviderBridge**
- **Status:** notification about the actual status of the resource. Possible pull-down options (read only):
 - **up:** the resource is in-service ;
 - **down:** the resource is out-of-service
- **Server Id:** (set by the system); indicating the suffix number of the mother-port
- **S-VID:** to push the S-VLAN field in the ethernet frame:

the  key permits to choose and associate one registered VLAN, recalling the dialog described in “[Create Provider InFlow / S-VID Management](#)” (p. 4-107).

Figure 4-48 Create Provider OutFlow

Transmission: Ethernet Port/Aggregator: Substitute Client Layer

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E

This option is obtained, after selecting an Ethernet Port (either Local or Remote, in “down” state), or a LAG, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “Substitute Client Layer”

It contains these sub-options:

- **ETS -> ETB Layer:** active only if the current port type is **ETS** (i.e. the afferent traffic switching is manually engineered), to change from *ETS* to *ETB*
- **ETB -> ETS Layer:** active only if the current port type is **ETB** (i.e. the afferent traffic is automatically switched by means of “Mac Autolearning” procedure), to change from *ETB* to *ETS*
- **LinkAggr Layer:** (available only for Local Ports), to change this selected Port into Aggr type: i.e. the afferent traffic is a part of a Link Aggregation Group.

An example of the window displayed is reported in [Figure 4-49, \(p. 4-110\)](#) and [Figure 4-50, \(p. 4-110\)](#).

This option permits to switch the ethernet port resource, between “engineered” ETS and “bridged” ETB, or Link Aggregation.

Figure 4-49 Substitute Port Type (from ETS to ETB)

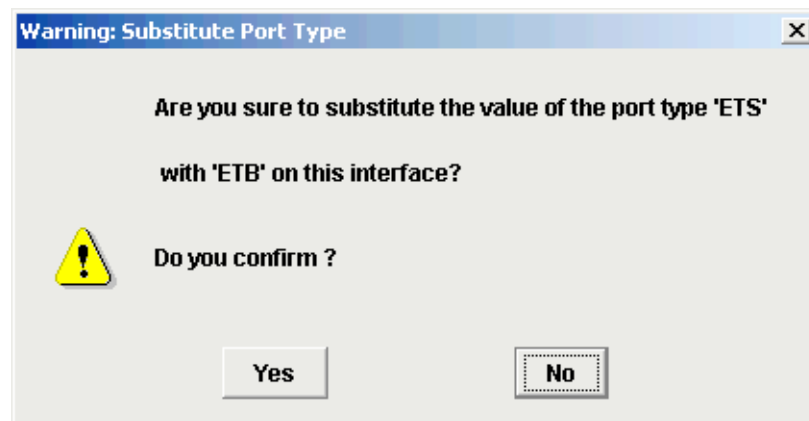
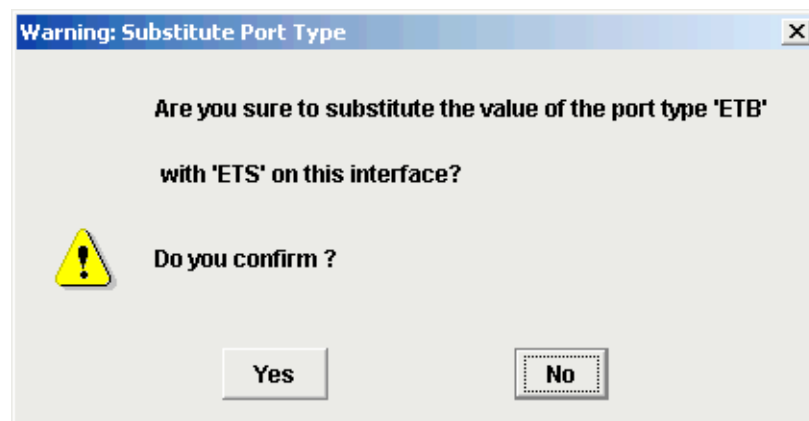


Figure 4-50 Substitute Port Type (from ETB to ETS)



Transmission: ISA : Vlan Registration

This option is obtained, after selecting the Bridge node, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “ISA Management” -> “Vlan Registration”.

An example of the displayed dialog window is reported in [Figure 4-51, \(p. 4-112\)](#).



WARNING

This option is not operative if the Bridge is “MAC” type (i.e. 802.1d, see “Transmission: ISA : Configure ISA” (p. 4-61)).

The function of this option is to manage the static registration of the VLAN Identifiers over the Ports of the selected Bridge node.

Important! In case of Provider Bridge, the VLAN taken under consideration is the S-Vlan, i.e. the provider VLAN.

To register the VLAN Id., fill fields and areas as follows:

- **VLAN# table:** this view reports, in tabular form, the VLAN identifiers already registered on active Ports of the bridge, and, in the same row, the relevant existing Ethernet Ports on which a VLAN is registered; possible values:
 - **tagged** means that the Port is part of the “MemberSet” of the corresponding VLAN domain
 - **untagged** means that the Port is part of the “UntaggedSet” (i.e. frames are accepted, at the relevant port, without Priority nor VLAN information) of the corresponding VLAN domain
 - **n.a.** means that the Port does not belong to the corresponding VLAN domain.

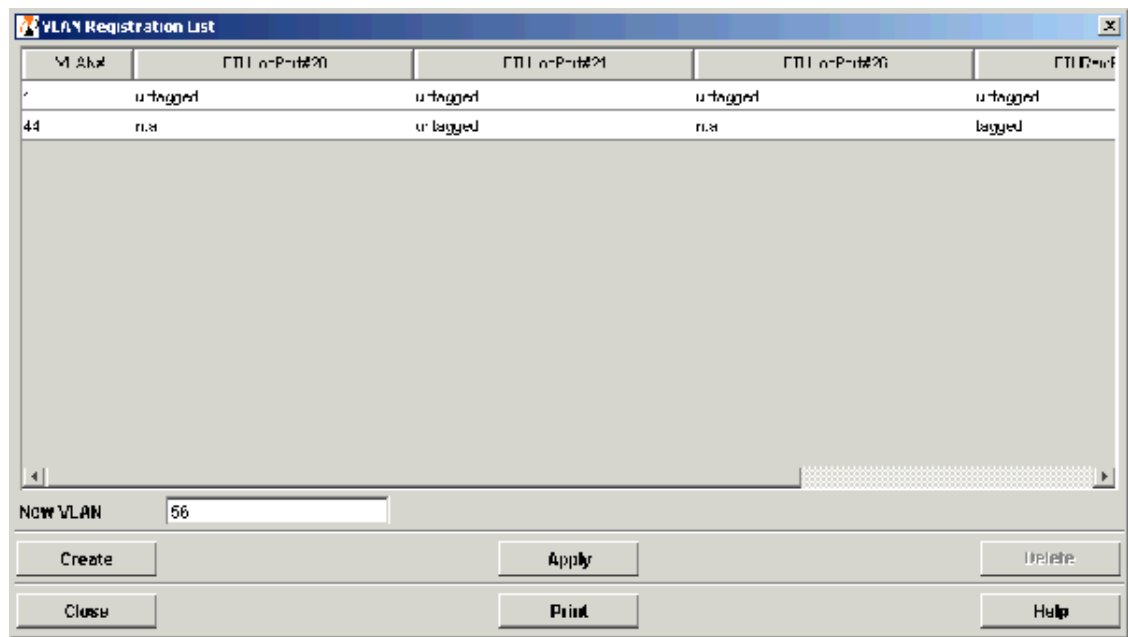
Important! A pull-down button is present on each cell of the table, in the columns of the ports, by means of which the current value can be changed, among the possible ones: “tagged”/”untagged”/”n.a.”

Important! In the case of Virtual Bridge, all the existing (and activated) ETB ports of the board are tabled. While in the case of ProviderBridge all the existing (and activated) ETS and ETB ports of the board are presented.

- **New VLAN:** this field permits the registration of a new VLAN over the selected Data Board, by doing the following operations:
 - a. type the value of the new VLAN Identifier, in the range 2 to 4094
 - b. click on “Create” button, to open the window as reported in [“Bridge: Static VLAN Registration Management”](#) (p. 4-112).
 - c. then follow the instructions on this latter paragraph.
 - d. then the new VLAN will be listed on the table.

The max number of VLAN static registration entries is 1024.

Figure 4-51 VLAN Registration



The “**Apply**” key is used when a value relative to a Port (untagged/tagged/na) has been changed by means of the associated pull down menu. Or whenever this function is recalled by another function.

The “**Delete**” key causes the deletion of the VLAN entry selected on the table.

The “**Print**” key is used to print this table.

After registering all the VLANs afferent to this selected Node, click on “**Close**” key to close the window.

The “**Help**” key gives helps about this function.

Bridge: Static VLAN Registration Management

This function is activated in the “Vlan Registration List” window, shown in [Figure 4-51, \(p. 4-112\)](#), after typing the desired VlanId. on the “**New VLAN**” field and then clicking on “**Create**” key.

An example of the window displayed is reported in [Figure 4-52, \(p. 4-114\)](#).

The function of this option is to manage the “Static VLAN Registration” on the selected Bridge; i.e. the registration of the VLAN under consideration on a group of Ports (membership) on which this VLAN may be present (received/transmitted); this group of ports represents the “Member Set” of that VLAN on this Bridge.

- **Configuration** sector:
 - **VLAN Identifier:** (read-only), current VLAN (as typed in the calling window) to be associated to one or more ports

- **Port Tagged Set** sector: this sector is used to choose the ports belonging to the current VLAN, i.e. where it can be present (received/transmitted).

In case of ProviderBridge, the “**Available Network Ports**” area lists all the available active ETB ports of the bridge.

In case of VirtualBridge, the “**Available Ports**” area lists all the available active ETB ports of the bridge:

The association of a port with the VLAN is done by selecting one of the available ETB ports and then clicking the [>>] key, after which the same port will be listed on the “**Tagged Ports**” area.

An associated port can be removed from the “**TaggedPorts**” list by selecting it and then clicking on the [<<] key.

- **Port Untagged Set:** (only for provider bridge); this sector is used to choose the ports on which the frames belonging to current VLAN can be received/transmitted, but “*untagged*” (i.e. without Priority and VLAN information).

In case of ProviderBridge, the “**Available Customer Ports**” area lists all the available active ETS ports of the bridge.

In case of VirtualBridge, the “**Available Ports**” area contains no ports.

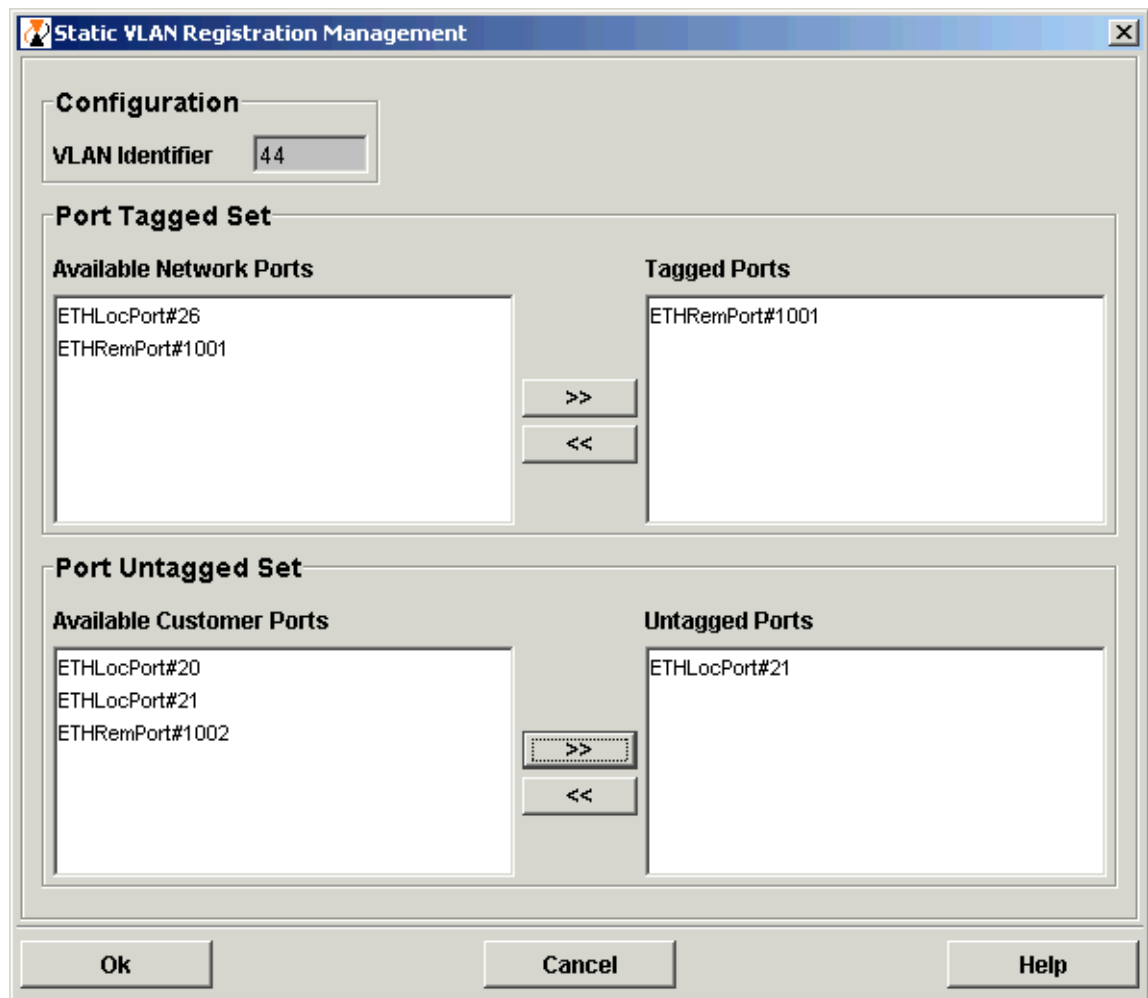
The association of a port with the VLAN is done by selecting one of the available ETS ports and then clicking the [>>] key, after which the same port will be listed on the “*Untagged Ports*” area.

After setting the desired parameters, click on the “**Ok**” key to confirm this VLAN Registration instance.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “**Help**” key gives helps about this function.

Figure 4-52 Static VLAN Registration Management (Provider case)



The dialog box is titled "Static VLAN Registration Management". It contains the following sections:

- Configuration**: A text field for "VLAN Identifier" with the value "44".
- Port Tagged Set**:
 - Available Network Ports**: A list box containing "ETHLocPort#26" and "ETHRemPort#1001".
 - Tagged Ports**: A list box containing "ETHRemPort#1001".
 - Two buttons between the lists: ">>" and "<<".
- Port Untagged Set**:
 - Available Customer Ports**: A list box containing "ETHLocPort#20", "ETHLocPort#21", and "ETHRemPort#1002".
 - Untagged Ports**: A list box containing "ETHLocPort#21".
 - Two buttons between the lists: ">>" and "<<".

At the bottom are three buttons: "Ok", "Cancel", and "Help".

Transmission: Ethernet Port: Bridge Port: Configure Bridge Port (Virtual)

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active Bridge port (i.e., ETB port) or a LAG, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management”-> “Bridge Port Management” -> “Configure Bridge Port”.

This description applies also in case of LAG (when an ETB-LAG has been selected):

“Transmission” -> “Aggregator” -> “Bridge Port Management” -> “Configure Bridge Port”.

An example of the displayed dialog window is reported in [Figure 4-53, \(p. 4-118\)](#).



WARNING

This option is available only if the Bridge is “Virtual” type (i.e., 802.1q, see “Transmission: ISA : Configure ISA” (p. 4-61)).

The function of this option is to manage the transmission parameters of the selected Virtual Bridge port.

To configure the Virtual Bridge (ETB) port, fill fields and areas as follows:

- **Bridge Port Management** sector:
 - **Bridge Port Name:** settable “alias” name for this port
 - **Port VLAN Identifier:**

the  key permits to choose the PVID value for this resource, recalling the dialog described in [“BridgePort: Modify PVID \(Port Vlan Identifier\)” \(p. 4-129\)](#). Default value is *1*; it is the PVID parameter, i.e. the VID to assign to “untagged” or “only-priority-tagged” frames retransmitted by this port. In consequence, this Port is included in the “UntaggedSet” of this indicated VLAN.



WARNING

This option is not available if the Bridge is “MAC” type (i.e. 802.1d).

*This option is operative only if the selected ETB Port is in “**down**” state (i.e. the associated ETS port is in “**down**” state too).*

- **Ingress Filtering:** to enable/disable the receive frame filter. Possible values:
 - **true:** It discards all the frames having VLAN-ID that do not have this port on their relevant “MemberSet,” VLAN dependent BPDU frames (such as GMRP) are filtered too. NOTE: VLAN independent BPDU frames (such as GVRP and STP) are not filtered.
 - **false:** It accepts all incoming ethernet frames.
- **Acceptable Frame Type.** Possible values:

- **admitAll**: To accept either tagged and untagged ethernet frames.
- **admitOnlyVlanTagged**: To accept only VLAN tagged ethernet frames
- **Bridge Port QoS** sub-sector:
 - **Default User Priority**: To set the User Priority to be assigned by default to untagged frames.
The  key permits to choose the Default (retransmitted) Priority for this resource, recalling the dialog described in “[BridgePort: Default User Priority List](#)” (p. 4-128).

**WARNING**

This option is operative only if the selected ETB Port is in “down” state.

- **Regen. User Priority**: To associate a Regeneration Priority to this ETB port.
The  key permits to choose the Regenerated (retransmitted) Priority for this resource, recalling the dialog described in “[BridgePort: Regenerated User Priority](#)” (p. 4-126).

**WARNING**

This option is operative only if the selected ETB Port is in “down” state.

- **Control Plane Configuration** sector:

**WARNING**

In case that the “StpProtocol” is set to “manualDisable”, this sector cannot be used.

- **(X)STP Per Bridge Management**: The value reported is a Bridge Instance number; if the “StpProtocol” is STP or RSTP then this value is “0”, else if “StpProtocol” is PERVLANSTP then this value is “4096+Vlan#”; this item encompasses the STP parameters related to the bridge as seen from this port. In case of STP or RSTP, its parameters will be the same for all ports of the bridge
The  key permits to open the “STP-PerBridge” dialog described in “[BridgePort: ControlPlane STP-Per Bridge Management](#)” (p. 4-130)
The  key permits to view the “STP-PerBridge” properties, i.e. the same window as described in “[BridgePort: ControlPlane STP-Per Bridge Management](#)” (p. 4-130), but in read-only mode.

- **(X)STP Per Port Management:** The value reported is the Port Identifier; this item encompasses the STP parameters related to the port

The  key permits to open the “STP-PerPort” dialog described in [“BridgePort: ControlPlane STP-PerPort Management”](#) (p. 4-133)

The  key permits to view the “STP-PerPort” properties, i.e. the same window as described in [“BridgePort: ControlPlane STP-PerPort Management”](#) (p. 4-133), but in read-only mode

- **List of VLAN:** (available only in case that the relevant Bridge STP-parameter is “STP-Protocol”= “*PERVLANSTP*”). This field lists the identifiers of VLANs afferent to this Port.



WARNING

In this case, the STP procedure is applied, independently, to each afferent VLAN, as if they were as many independent networks as the VLANs are. An example of “PER-VLAN” bridged network and relevant roles is reported in [Figure 1-29](#), (p. 1-40).

MSTP case:



WARNING

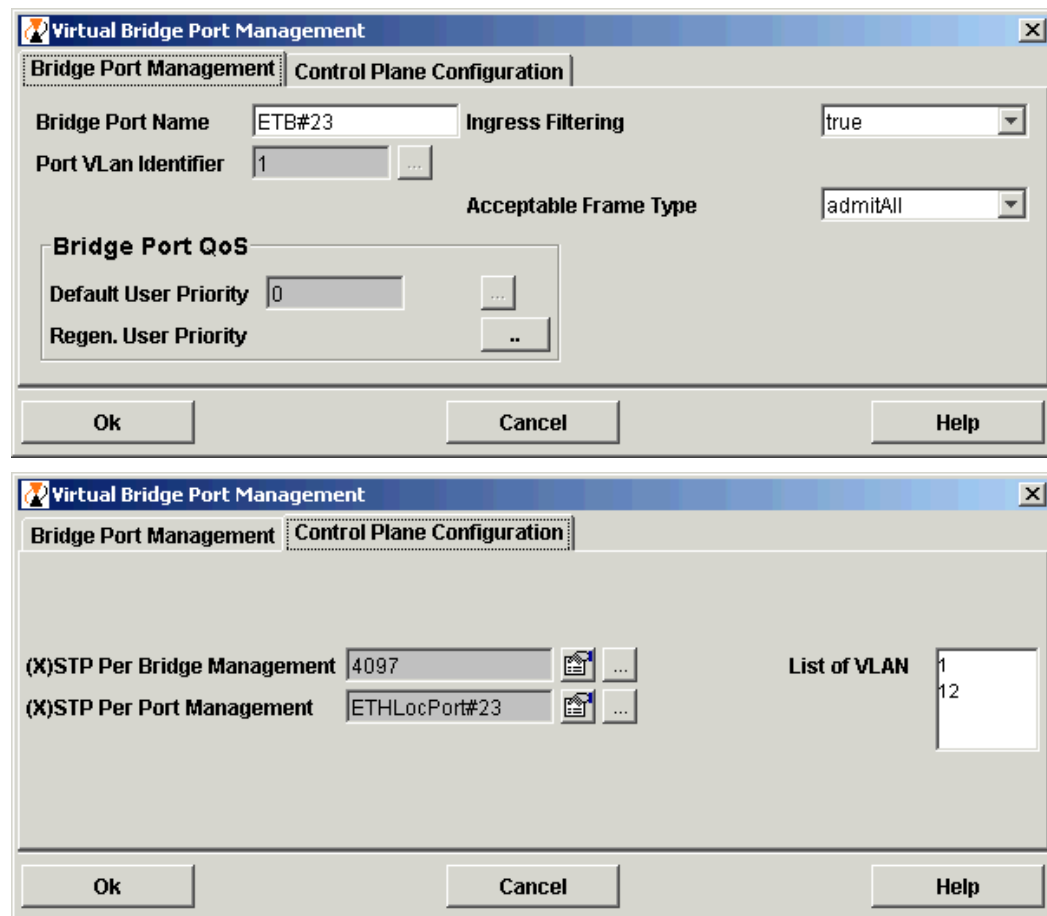
In case that the Bridge STP-Protocol is “MSTP”, the Control Plane sector is configured as described for ProviderBridge, in [“Transmission: Ethernet Port: Bridge Port : Configure Bridge Port \(Provider\)”](#) (p. 4-118).

After setting the desired parameters, click on the “**Ok**” key to confirm.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “**Help**” key gives helps about this function.

Figure 4-53 Configure Bridge Port (Virtual case/PERVLANSTP)



Transmission: Ethernet Port: Bridge Port : Configure Bridge Port (Provider)

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active Bridge port (i.e., ETB port) or a LAG, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management”-> “Bridge Port Management” -> “Configure Bridge Port”.

An example of the displayed dialog window is reported in [Figure 4-54, \(p. 4-122\)](#).



WARNING

This option is available only if the Bridge is “Provider” type (i.e., 802.1s-ad, see “[Transmission: ISA : Configure ISA](#)” (p. 4-61)).

The function of this option is to manage the transmission parameters of the selected Provider Bridge port.

To configure the Provider Bridge (ETB) port, fill fields and areas as follows:

- **Bridge Port Management** sector:
 - **Bridge Port Name:** Settable “alias” name for this port
 - **Port Use DEI:** (Not operative) to set the detection/insertion of the Drop Eligible Indicator (Provider-priority coloration) on incoming/outgoing frames, possible values: “*true*” / “*false*”.
 - **Port PCP Decoding:** (Not operative)
 - **Port VLAN Identifier:**

The  key permits to choose the PVID value for this resource, recalling the dialog described in “[BridgePort: Modify PVID \(Port Vlan Identifier\)](#)” (p. 4-129). Default value is 1; it is the PVID parameter, i.e. the VID to assign to “*untagged*” or “*only-priority-tagged*” frames retransmitted by this port. In consequence, this Port is included in the “*UntaggedSet*” of this indicated VLAN.



WARNING

This option is not available if the Bridge is “MAC” type (i.e., 802.1d).

This option is operative only if the selected ETB Port is in “down” state.

- **Ingress Filtering:** To enable/disable the receive frame filter. Possible values:
 - **True:** It discards all the frames having VLAN-ID that do not have this port on their relevant “MemberSet”. VLAN dependent BPDU frames (such as GMRP) are filtered too. NOTE: VLAN independent BPDU frames (such as GVRP and STP) are not filtered.
 - **False:** It accepts all incoming ethernet frames.
- **Acceptable Frame Type.** Possible values:
 - **admitAll:** To accept either tagged and untagged ethernet frames.
 - **admitOnlyVlanTagged:** To accept only VLAN tagged ethernet frames
- **Bridge Port QoS** sub-sector:
 - **Default User Priority:** To set the User Priority to be assigned by default to untagged frames

The  key permits to choose the Regenerated (retransmitted) Priority for this resource, recalling the dialog described in “[BridgePort: Default User Priority List](#)” (p. 4-128).



WARNING

This option is operative only if the selected ETB Port is in “down” state.

- **Regen. User Priority:** to associate a Regeneration Priority to this ETB port.

The  key permits to choose the Regenerated (retransmitted) Priority for this resource, recalling the dialog described in [“BridgePort: Regenerated User Priority”](#) (p. 4-126).



WARNING

This option is operative only if the selected ETB Port is in “down” state.

- **Control Plane Configuration** sector:



WARNING

In case that the “StpProtocol” is set to “manualDisable”, this sector cannot be used.

- **(X)STP Per Bridge Management:** the value reported is a Bridge Instance number; if the “StpProtocol” is STP or RSTP then this value is “0”, else if “StpProtocol” is PERVLANSTP then this value is “4096+Vlan#”; this item encompasses the STP parameters related to the bridge as seen from this port. In case of STP or RSTP its parameters will be the same for all ports of the bridge.

the  key permits to open the “STP-PerBridge” dialog described in [“BridgePort: ControlPlane STP-Per Bridge Management”](#) (p. 4-130).

The  key permits to view the “STP-PerBridge” properties, i.e. the same window as described in [“BridgePort: ControlPlane STP-Per Bridge Management”](#) (p. 4-130), but in read-only mode.

- **(X)STP Per Port Management:** The value reported is the Port Identifier; this item encompasses the STP parameters related to the port

The  key permits to open the “STP-PerPort” dialog described in [“BridgePort: ControlPlane STP-PerPort Management”](#) (p. 4-133).

the  key permits to view the “STP-PerPort” properties, i.e. the same window as described in [“BridgePort: ControlPlane STP-PerPort Management”](#) (p. 4-133), but in read-only mode.

- **List of VLAN:** (Available only in case that the relevant Bridge STP-parameter is **STP-Protocol = PERVLANSTP**); this field lists the identifiers of VLANs afferent to this Port.



WARNING

In this case, the STP procedure is applied, independently, to each afferent VLAN, as if they were as many independent networks as the VLANs are. An example of “PER-VLAN” bridged network and relevant roles is reported in [Figure 1-29](#), (p. 1-40).

MSTP case:**WARNING**

In case that the Bridge STP-Protocol is “MSTP”, the Control Plane sector is displayed as reported in [Figure 4-55, \(p. 4-123\)](#).

Some details about STP-RSTP-MSTP feature are reported in “[STP functionality \(Spanning Tree Protocol\)](#)” (p. 1-38).

An example of MSTP Bridge network and MSTID use is shown in [Figure 1-32, \(p. 1-43\)](#), and subsequent.

The management panel is subdivided in two parts: CIST and MSTI.

The **CIST** parameters are used to define the Common (global) features and topology of the network (such as Region number, Digest, etc.).

The **MSTI** parameters are used to define the allocation of the VLAN-ID’s over the MSTID instances (i.e. the MST Configuration Table).

- **CIST Bridge Management** (Common and Internal Spanning Tree). This panel is used to define the Port Roles, in the CIST active topology; it reports:
 - The **Region Number** for the CIST function:

The  key permits to open the “MST Region Management” dialog described in “[Bridge Port: CIST: MST Region Management](#)” (p. 4-137).
 - The fields “**PerBridge**” and “**perPort**” Management, to be used as above explained for the other windows.
- **MSTI Bridge Management** (Multiple Spanning Tree Instance). This panel is used to define the Port Roles, in each MSTI active topology; it reports:
 - **MSTID**: To define the MST Configuration Table ...:

The  key permits to open the “MSTID” dialog described in “[Bridge Port: MSTI: MSTID Management](#)” (p. 4-139).
 - **PerBridge Management** is used as in the other above explained STP cases, but recalls the dialog reported in [Figure 4-61, \(p. 4-132\)](#).
 - **PerPort Management** is used as in the other above explained STP cases, but recalls the dialog reported in [Figure 4-63, \(p. 4-136\)](#).

Important! The “**PerBridge**” and “**PerPort**” parameters can be differentiated for different MSTID’s. In order to change these parameters, for example for an already created Instance 3, select **MSTID 3** in the dialog window reported in [Figure 4-66, \(p. 4-141\)](#), and then click “**Ok**”; then the above field MSTID will report the value “**3**”, then the parameters “**PerBridge**” and “**PerPort**” can be modified for the Instance 3.

After setting the desired parameters, click on the “**Ok**” key to confirm.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “Help” key gives helps about this function.

Figure 4-54 Configure Bridge Port (Provider/“PERVLANSTP” case)

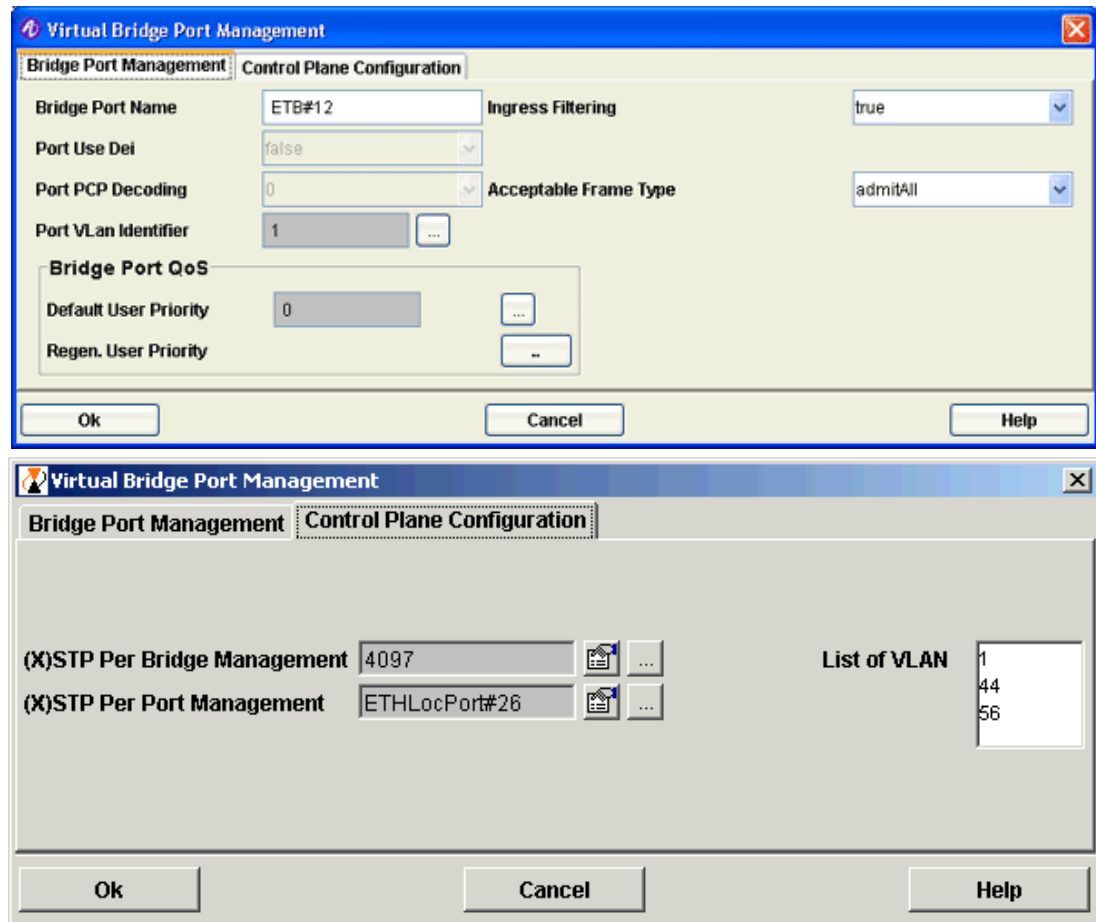


Figure 4-55 Configure Bridge Port (Provider case/MSTP)

Transmission: Ethernet Port: Bridge Port : Configure Bridge Port (MAC)

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active Bridge port (i.e., ETB port) or a LAG, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “Bridge Port Management” -> “Configure Bridge Port”.

This description applies also in case of LAG (when an ETB-LAG has been selected):

“Transmission” -> “Aggregator” -> “Bridge Port Management” -> “Configure Bridge Port”.

An example of the displayed dialog window is reported in [Figure 4-56, \(p. 4-125\)](#).



WARNING

This option is available only if the Bridge is “MAC” type (i.e. 802.1d, see [“Transmission: ISA : Configure ISA” \(p. 4-61\)](#)).

The function of this option is to manage the transmission parameters of the selected MAC Bridge port.

To configure the MAC Bridge (ETB)port, fill fields and areas as follows:

- **Bridge Port Management** sector:
 - **Bridge Port Name:** settable “alias” name for this port
 - **Bridge Port State:** (set by the system); current state of this port, informing about the action this port takes on reception of a frame. Possible values:

- **disabled** : The port is disabled by failure or by the administrative control. A Port in this state does not participate in frame relay or STP operations.
- **dataframediscarding**: Data frames received in this port should be discarded, but the control frame (such as BPDU) should be passed. The information of data frame and control frame is not learned.
- **listening**: The port is waiting to be switched to Learning or to Blocking state (not used in RSTP case).
- **learning** : Data frames and control frames (such as BPDU) can be learned, but can not be forwarded to other Bridge Ports.
- **forwarding**: Data frames and control frames can be learned and forwarded.
- **Default User Priority**: To set the User Priority to be assigned by default to untagged frames

The  key permits to choose the Regenerated (retransmitted) Priority for this resource, recalling the dialog described in [“BridgePort: Default User Priority List”](#) (p. 4-128).



WARNING

This option is operative only if the selected ETB Port is in “down” state.

- **Control Plane Configuration** sector:



WARNING

In case that the “StpProtocol” is set to “manualDisable”, this sector cannot be used.

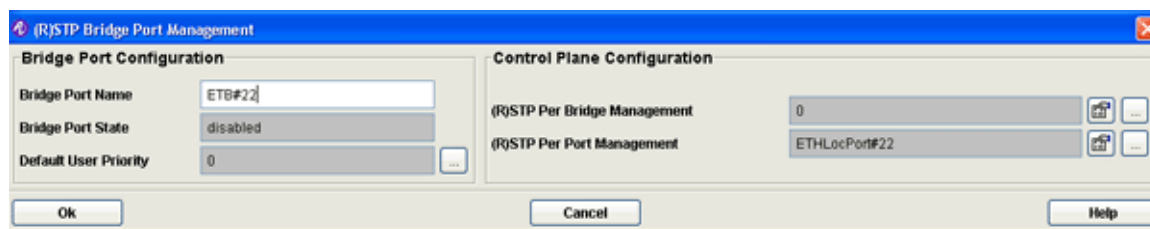
- **(R)STP Per Bridge Management**: the value reported is a Bridge Instance number; this value is set to “0”; this item encompasses the STP parameters related to the bridge as seen from this port; its parameters will be the same for all ports of the bridge
the  key permits to open the “STP-PerBridge” dialog described in [“BridgePort: ControlPlane STP-Per Bridge Management”](#) (p. 4-130)
the  key permits to view the “STP-PerBridge” properties, i.e. the same window as described in [“BridgePort: ControlPlane STP-Per Bridge Management”](#) (p. 4-130), but in read-only mode.
- **(R)STP Per Port Management**: the value reported is the Port Identifier; this item encompasses the STP parameters related to the port
the  key permits to open the “STP-PerPort” dialog described in [“BridgePort: ControlPlane STP-PerPort Management”](#) (p. 4-133)
the  key permits to view the “STP-PerPort” properties, i.e. the same window as described in [“BridgePort: ControlPlane STP-PerPort Management”](#) (p. 4-133), but in read-only mode.

After setting the desired parameters, click on the “**Ok**” key to confirm.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “**Help**” key gives helps about this function.

Figure 4-56 Configure MAC Bridge Port



BridgePort: Regenerated User Priority

This function is activated in the Virtual or Provider “BridgePort Management” window (Figure 4-54, (p. 4-122), or Figure 4-55, (p. 4-123)), after clicking on the  key of the “Regen.UserPriority” item.

An example of the window displayed is reported in Figure 4-57, (p. 4-127).



WARNING

This option is operative only if the selected ETB Port is in “down” state (i.e. the associated ETS port is in “down” state too).

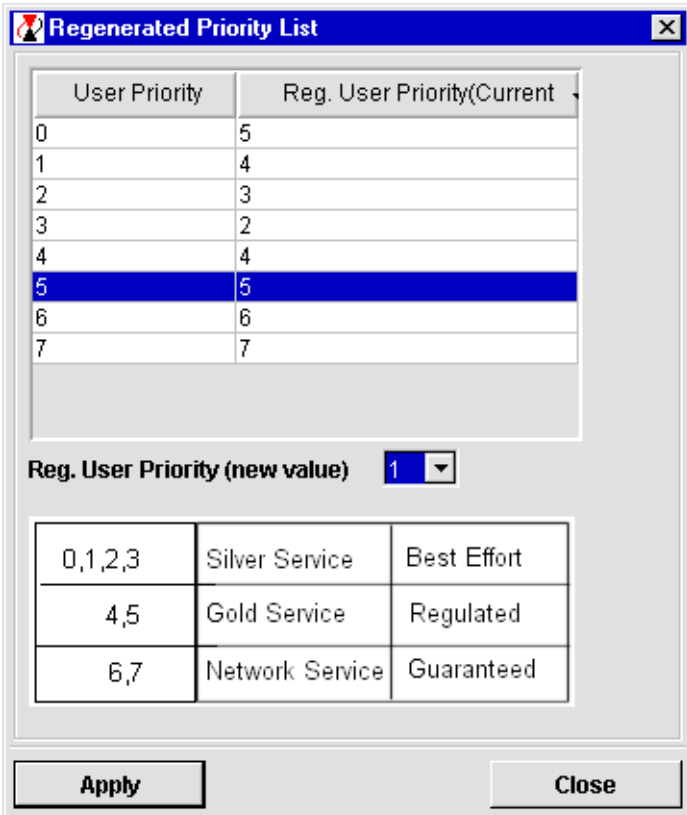
The function of this option is to show the “Regenerated Priority” on the selected ETB port; i.e., the association between received User Priority and the retransmitted one.

It permits the association of a Virtual or Provider User Priority profile to the retransmitted frames (“Priority-Tagged” or “Q-Tagged” or “S-Tagged” frames), when the network manager is requested to change this priorities profile. The appropriate use of User Priority regeneration is specified in 802.1Q rec. [See also “Traffic Descriptor, Forwarding Priority and Class of Service” (p. 4-55)].

The association is set by selecting one priority from the list, and then selecting the desired value in the “Reg.UserPriority (new value)” pull-down list; possible values: 0 to 7; the relative classes of services are also indicated in the window.

After finishing the priorities mapping, the window can be closed by clicking on “Close” key.

Figure 4-57 Bridge Port: Regenerated Priority List



The dialog box titled "Regenerated Priority List" contains a table with two columns: "User Priority" and "Reg. User Priority(Current)". The table lists values for priorities 0 through 7. The row for priority 5 is highlighted in blue. Below the table is a dropdown menu for "Reg. User Priority (new value)" set to 1. At the bottom is a table mapping priority ranges to service types and their corresponding priority values. The "Apply" and "Close" buttons are at the bottom right.

User Priority	Reg. User Priority(Current)
0	5
1	4
2	3
3	2
4	4
5	5
6	6
7	7

Reg. User Priority (new value) 1

0,1,2,3	Silver Service	Best Effort
4,5	Gold Service	Regulated
6,7	Network Service	Guaranteed

Apply Close

BridgePort: Default User Priority List

This function is activated in the Virtual or Provider “BridgePort Management” window (Figure 4-53, (p. 4-118), or Figure 4-54, (p. 4-122), or Figure 4-56, (p. 4-125)), after clicking on the  key of the “DefaultUserPriority” item.

An example of the window displayed is reported in Figure 4-58, (p. 4-128).



WARNING

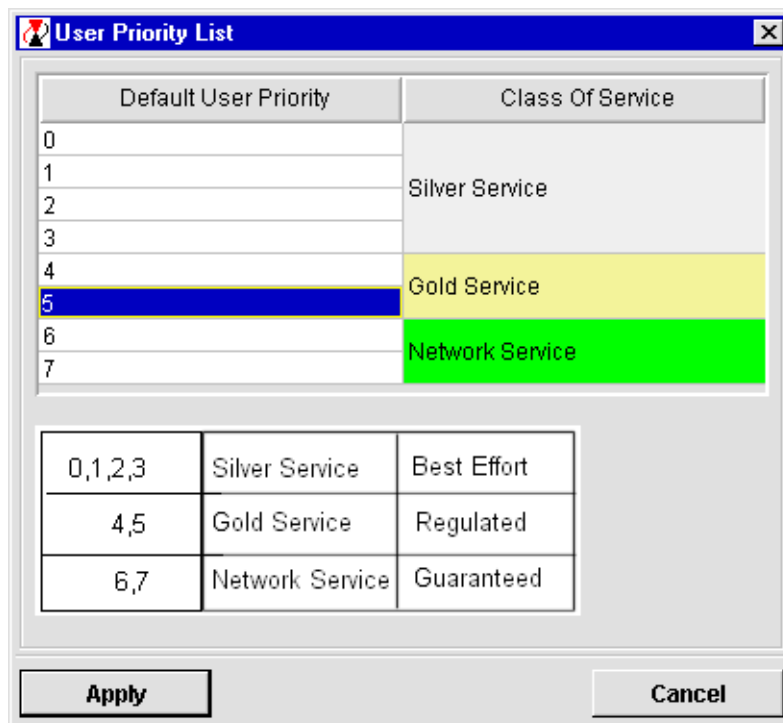
This option is operative only if the selected ETB Port is in “down” state (i.e. the associated ETS port is in “down” state too).

The function of this option is to manage the “Default User Priority” on the selected ETB port; i.e., the association of a User Priority to the retransmitted frames (towards the network), when incoming frames do not have the priority information (“Untagged” frames). [See also “Traffic Descriptor, Forwarding Priority and Class of Service” (p. 4-55)].

This association is set by selecting one priority from the list, and then clicking on the “Apply” key.

The window will be closed without doing the association, by clicking on “Cancel” key.

Figure 4-58 Bridge Port: Default User Priority



Default User Priority	Class Of Service
0	
1	
2	Silver Service
3	
4	
5	Gold Service
6	Network Service
7	

0,1,2,3	Silver Service	Best Effort
4,5	Gold Service	Regulated
6,7	Network Service	Guaranteed

Apply Cancel

BridgePort: Modify PVID (Port Vlan Identifier)

This function is activated in the Virtual or Provider “BridgePort Management” window (Figure 4-53, (p. 4-118), or Figure 4-54, (p. 4-122)), after clicking on the  key of the “Port VLAN Identifier” item.

An example of the window displayed is reported in Figure 4-59, (p. 4-129).

**WARNING**

This option is not operative if the Bridge is “MAC” type (i.e., 802.1d).

*This option is operative only if the selected ETB Port is in “**down**” state.*

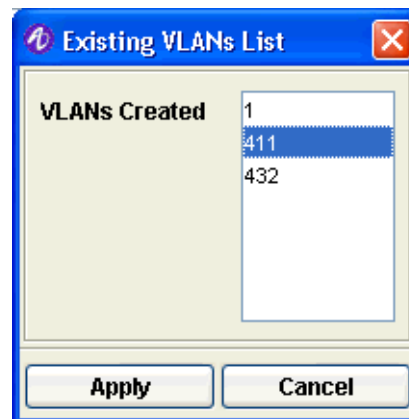
The function of this option is to manage the PVID (Port VLAN Identifier) parameter, i.e., the VID to be assigned to “*untagged*” or “*only-priority-tagged*” frames retransmitted by this port. As a result, this Port will be included in the “UntaggedSet” of the VLAN under consideration.

The window reports the list of the already registered VLAN’s of the port.

To assign the PVID to the port, select one VLAN on the list, and then click on “**Apply**”.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

Figure 4-59 BridgePort: Modify Port VLAN Identifier (PVID)



BridgePort: ControlPlane STP-Per Bridge Management

This function is activated in the **ControlPlane: "Configure Virtual (or MAC or Provider) BridgePort"** window [Figure 4-53, (p. 4-118), or Figure 4-54, (p. 4-122), or Figure 4-56, (p. 4-125)], after clicking on the  key of the "(X)STP PerBridge Management" item.

An example of the window displayed is reported in Figure 4-60, (p. 4-132). In case of Stp-Protocol= "MSTP", the window will be as reported in Figure 4-61, (p. 4-132), when recalled by the MSTI sub-sector.

The function of this option is to manage the "STP-PerBridge Instances" to be associated to this ETB port.

Important! The STP procedure selects as Root Bridge of the network the bridge having the "**Address**" parameter (described below) with lowest numerical value.

Important! The STP procedure will calculate the best path to reach the Root Bridge, identifying the key elements on this path (DesignatedBridges, RootPorts, DesignatedPorts), according to Path Cost criteria. If there are two or more paths with the same Path Cost, then the priority parameters of the involved elements will be used to select the best path. Further, the Root Bridge will have the "**RootPathCost**" parameter equal to zero.

An example of bridged network and relevant xSTP roles is reported in Figure 1-27 and Figure 1-28, (p. 1-39).

An example of "PER-VLAN" bridged network and relevant roles is reported in Figure 1-29, (p. 1-40).

To set the PerBridge STP instances, fill fields and areas as follows:

- **Priority:** priority of the Bridge (to whom this port belongs) to become the root bridge, at start-up or in case of failure of the actual root-bridge; 16-bit decimal value, but only the most significant 4 bits are settable. This value is used by STP procedure to designate the Root Bridge (see below).

The possible options are **16** values, settable by means of the associated incrementing/decrementing keys: (best priority = least numerical value).

- **Address:** (read only, set by the system); Bridge identifier of this selected bridge, as specified in IEEE802.1D, composed of 8 octets, of which the first 4 bits representing a priority parameter (as fixed in the above item), the next 12 bits are considered as local system ID, the remaining 6 octets represent the bridge MAC address. The Root Bridge of the network is the bridge having this parameter with lowest numerical value.
- **Designated Root:** (read only) representing the Bridge Identifier of the Bridge assumed to be the Root Bridge for the current Spanning Tree instance.

- **Root Path Cost:** (read only) representing the cost of the path to the Root Bridge as seen from this bridge for this spanning tree instance. When this Bridge is the Root Bridge this parameter has the value zero. Otherwise, it is equal to the sum of the values of all the Root Port Costs of the Bridges encountered along the path to reach the Root Bridge.

Note: The Root Port Cost is the sum of Port Path Cost and Port Designed Cost (defined in “[BridgePort: ControlPlane STP-PerPort Management](#)” (p. 4-133)) of the Root Port for this bridge

- **Root Port:** (read only) the port number of the port which offers the lowest cost path from this bridge to the root bridge for this spanning tree instance. I.e., that Port for which the Path Cost to reach the Root Bridge is the lowest.
- **Hold Time:** (read only, only for STP, fixed to one second); interval length during which no more than one Configuration Bridge PDUs shall be transmitted by this node.
- **Time Since Change:** time (in hundredths of second) since the last time a topology change was detected by this spanning tree instance.
- **Topology Changes:** (read only) total number of topology changes detected by this spanning tree instance since the management entity was last restarted or initialized.
- **Hello Time:** (read only: actual value that this instance is currently using); amount of time between the transmission of Configuration bridge PDUs by this instance on any port when it is the Root Bridge of the spanning tree or trying to become so, in units of hundredths of a second; (range = **1** to **10** sec).
- **Max Age:** (read only: actual value that this instance is currently using); maximum age of Spanning Tree Protocol information learned from the network on any port before it is discarded, in units of hundredths of a second; (range = **6** to **40** sec).
- **Fwd Delay:** (read only: actual value that this instance is currently using); this value, measured in units of hundredths of a second, controls how fast a port changes its spanning state when moving towards the Forwarding state. The value determines how long the port stays in each of the Listening and Learning states, which precede the Forwarding state. This value is also used, when a topology change has been detected and is underway, to age all dynamic entries in the filtering Database. (Range = **4** to **30** sec)
- **Next Best Root Cost:** (only for RSTP); cost of the path to the root through the next best root port as seen from this bridge for this spanning tree instance.
- **Next Best Root Port:** (only for RSTP); port number of the next port which offers the lowest cost path from this bridge to the root bridge for this spanning tree instance. The port here indicated will become root port if the actual root port goes down.
- **TxHoldCount:** (only for RSTP); used by the Port Transmit state machine to limit the maximum transmission rate.

- **Bridge Convergence Sensibility** sector:

the values considered in this sector are used by all bridges (for STP convergence sensibility) when this bridge is acting as the Root Bridge.

Hello Time / Max Age / Fwd Delay: their meaning is the same as explained above.

After setting the desired parameters, click on the “Ok” key to confirm these STP Instances set.

The window will be closed without doing any operation by clicking on “Cancel” key.

The “Help” key gives helps about this function.

Figure 4-60 BridgePort: STP-PerBridge Management

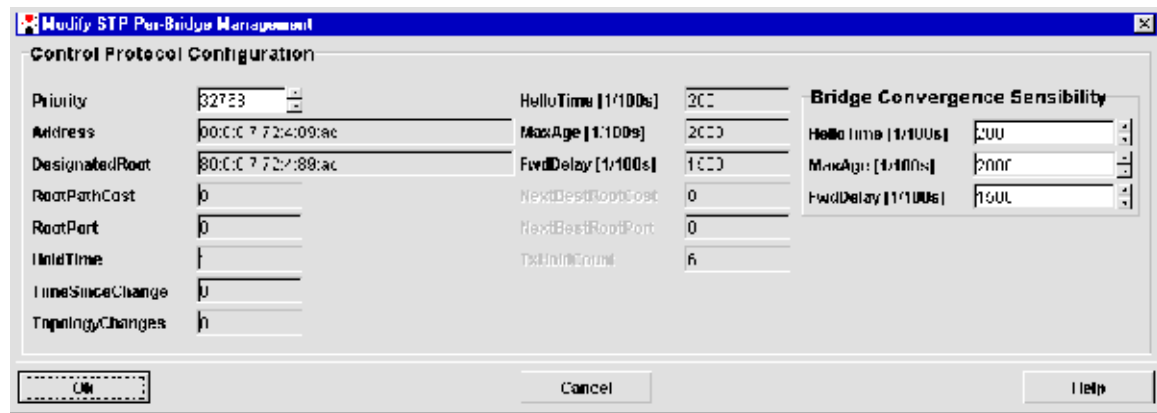
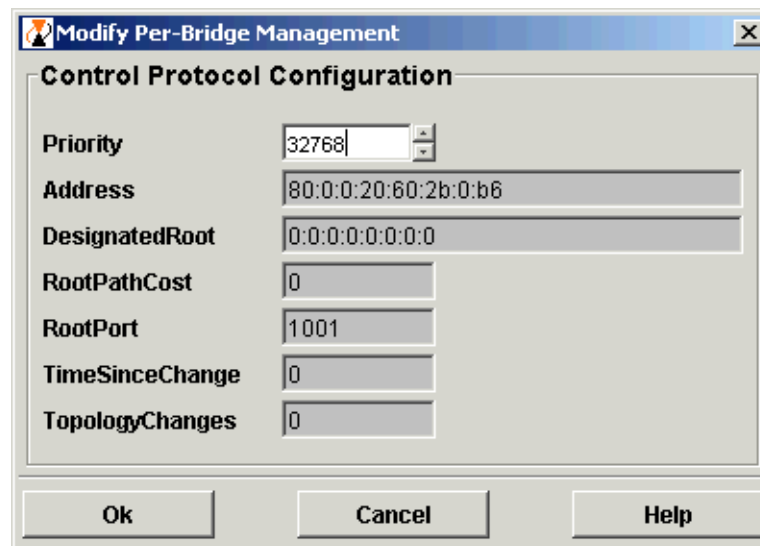


Figure 4-61 BridgePort: STP-PerBridge Management (MSTI case)



BridgePort: ControlPlane STP-PerPort Management

This function is activated in the **ControlPlane: Configure Virtual** (or **MAC** or **Provider**) **BridgePort** window (Figure 4-53, (p. 4-118), or Figure 4-54, (p. 4-122), or Figure 4-56, (p. 4-125)), after clicking on the  key of the "(X)STP PerPort Management" item.

An example of the displayed dialog window is reported in Figure 4-62, (p. 4-136). In case of **Stp-Protocol= MSTP**, the window will be as reported in Figure 4-63, (p. 4-136), when recalled by the MSTI sub-sector.

The function of this option is to manage the "STP-PerPort Instances" to be associated to this ETB port.

An example of bridged network and relevant roles is reported in Figure 1-27 and Figure 1-28, (p. 1-39).

An example of "PER-VLAN" bridged network and relevant roles is reported in Figure 1-29, (p. 1-40).

To set the PerPort STP instances, fill fields and areas as follows:

- **Ethernet Port Configuration** sector:
 - **Port Number**: (read only); assigned by the system, according to the selected port
 - **Force Port State**: (read only); indicating the forced current state; possible values:
 - **Dynamic** : the port is managed by the Spanning Tree Protocol. It comprises the following States:
 - *Listening*: the port is waiting to be switched to Learning or to Blocking state (not used in RSTP case).
 - *Learning* : the port is not yet in forwarding state, but can learn new MAC destinations.
 - **Blocked** : the frames received by this port will be discarded, thus forcing it out of the active topology, for preventing frame duplication arising through multiple paths; STP control frames (BPDU) are not discarded.
 - **Forwarding** : the port is participating in the frames relay, STP algorithm computation and MAC learning procedures, thus it is included in the active topology.
 - **Disabled** : used to disable the port. In this state, all frames received will be discarded, further the Port does not participate in the operations of the STP or MAC learning processes.

Note: In RSTP configuration, only three Port-States are used: Discarding, Learning, Forwarding.

- **Port Configuration** sector:
 - **Port State:** (Read only): Indicating the current port state regard the STP process; possible values are as detailed in the sector above (item “ForcePortState”).
 - **Port Priority:** Priority of this port to become the root port (for the Bridge to whom this port belongs); at start-up or in case of failure, if the other cost parameters are the same, this value will be taken into account to designate the Root Port; 8-bit decimal value, but only the most significant 4 bits are settable. The possible options are **16** values, settable by means of the associated incrementing/decrementing keys. (best priority = least numerical value).
 - **Port Role:** (Read only): The following values are available (see 802.1D Recom.):
 - **root** : The port offers the lowest cost path from this bridge to the root bridge. It is to be part of the active topology connecting the Bridge to the Root Bridge.
 - **designated**: The port is connecting a LAN, through the current Bridge, to the Root Bridge
 - **alternate** : Alternate Port if the Bridge is not the Designated Bridge for the attached LAN. It offers an alternate path (after failure) in the direction of the Root Bridge to that provided by the Bridge Root Port.
 - **backup** : Backup Port if the Bridge is the Designated Bridge for the attached LAN. Backup Port acts as a backup (after failure) for the path provided by a Designated Port in the direction of the leaves of the Spanning Tree. Backup Ports exist only where there are two or more connections from a given Bridge to a given LAN.
 - **disabled** : The Port has no role within the operation of Spanning Tree.
 - **master** : The Port provides connectivity from this Region to a Root that lies into another Region.
 - **Port Path Cost:** Contribution of this port to the path cost of paths towards the spanning tree root that include this port. 802.1D recommends that the default value of this parameter be in inverse proportion to the speed of the attached LAN; (examples: 10Mbs=100, 100Mbs=19, 1Gbs=4).
 - **Port Designed Root:** Unique Bridge Identifier of the Bridge recorded as the Root Bridge in the Configuration BPDUs transmitted by the Designated Bridge for the segment to which the port is attached.
 - **Port Designed Cost** : Path cost of the Designated Port of the segment connected to this port. This value is summed to the Port Path Cost.
 - **Port Designed Bridge** : Identifier of the bridge that this port considers to be the Designated Bridge for the LAN attached to this port.
 - **Port Designed Pt Number:** Number of the designated port, in decimal format.
 - **Port Designed Pt Priority** : Priority of the designated port, in decimal format.

-
- **Forward Transition:** Number of times this port has switched from Learning state to the Forwarding state.
 - **Port Admin Conn Type:** Administrative connection type of the port, from the STP point of view, i.e. its connectivity state for BPDU frames transport, to identify the topological situation of current port. This parameter is used to optimize the Rapid STP (RSTP). The following values are available:
 - **autopointpoint:** The connection state of the port is automatically sensed, by means of an auto-test, and notified on the parameter below:
“PortOperAdminConn Type”
 - **edgeport:** The port is a “target” port, situated at the edge of the STP network, it can be connected to other adjacent networks; this connection blocks the BPDU frames towards the external network.
 - **pointpoint:** The port is directly connected, in point-to-point mode, to another bridge of the network
 - **nopointpoint:** The port is connected not directly to another bridge of the network; it is connected across other shared media or devices such as: shared LAN’s, Hubs, etc.
 - **Port Oper Admin Conn Type :** Notification about current operational connection type of the port.

After setting the desired parameters, click on the “**Ok**” key to confirm.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “**Help**” key gives helps about this function.

Figure 4-62 BridgePort: STP-PerPort Management

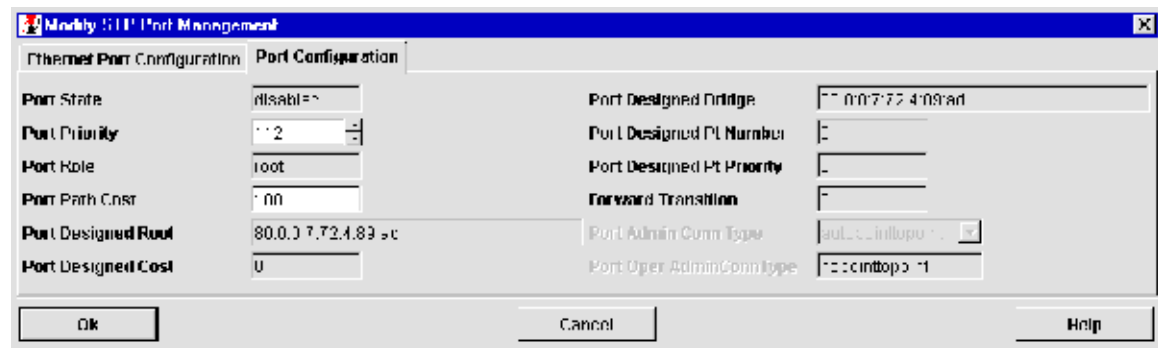
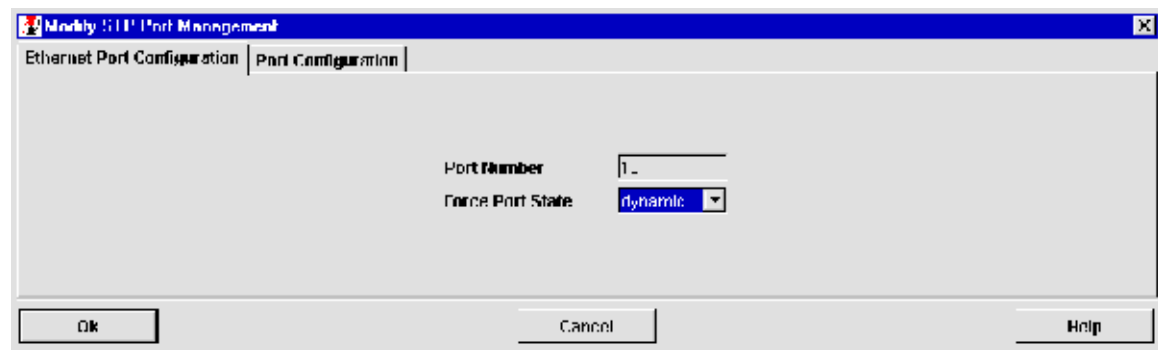
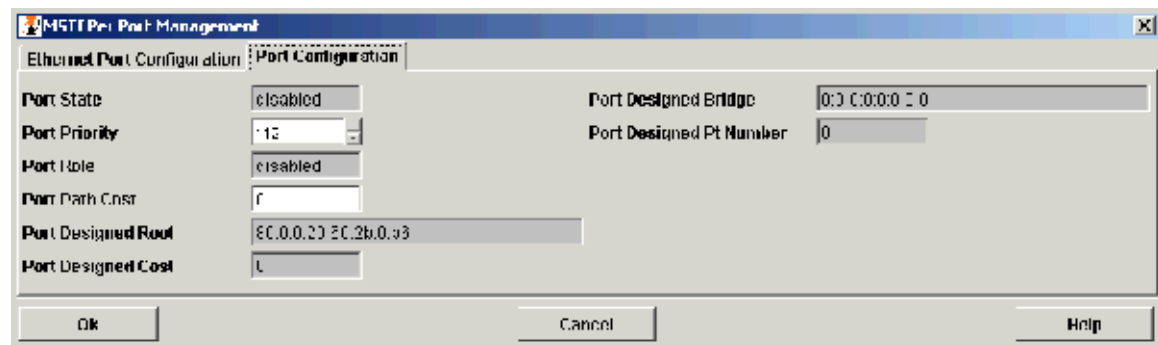


Figure 4-63 BridgePort: STP-PerPort Management (MSTI case)



Bridge Port: CIST: MST Region Management

This function is activated, when the STP-Protocol Type is “**MSTP**”, in the “**Configure (Virtual or Provider) BridgePort**” window (see [Figure 4-55, \(p. 4-123\)](#)), after clicking on the  key of the “**Region Number**” item on the CIST management area.

An example of the window displayed is reported in [Figure 4-64, \(p. 4-138\)](#).

The function of this option is to set the Region information for the use of MSTP instances.

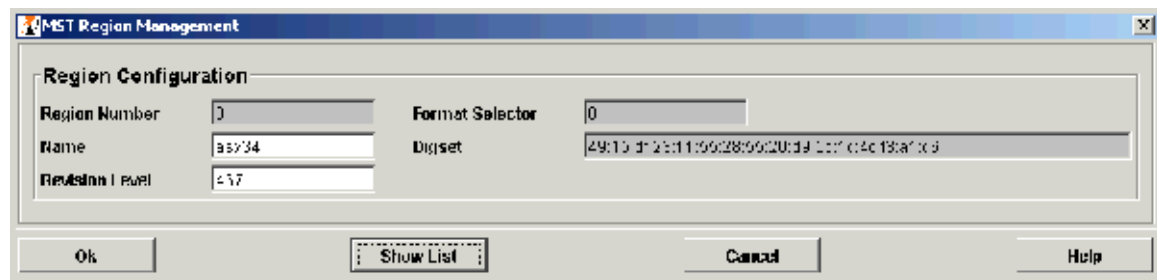
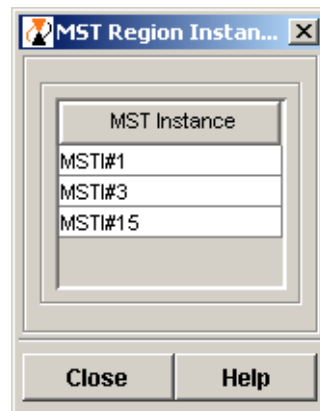
It contains the following fields:

- **Region Number:** it is the Region Number as indicated in 802.1Q-2003 std.
- **Name:** text string encoded within a fixed field of 32 octets. This value is settable by the operator, but must be the same for all the bridges belonging to the same MST Region.
- **Revision Level:** integer number encoded within a fixed field of 2 octets (65535). This value is settable by the operator, but must be the same for all the bridges belonging to the same MST Region.
- **Format Selector:** format of the setting. Value **0** indicates the compliance to 802.1Q-2003 std.
- **Digset:** it defines the “Configuration Digest” as indicated in 802.1Q-2003 std., it is a code of 16 octets of type HMAC-MD5 (see IETF RFC 2104). This value is automatically calculated by the MSTP procedure, after the setting of the MST instances.

Important! In order to be part of the same Region, all the Bridges of that Region must have the same values for the following parameters: *Name, Revision Level, Format Selector, Digest*.

The **Show List** key opens the [Figure 4-65, \(p. 4-138\)](#) showing the MST Region Instance List.

Note: The Show List will be updated only after the operations described in next para. “[Bridge Port: MSTI: MSTID Management](#)” (p. 4-139).

Figure 4-64 Bridge Port: CIST: MST Region Management**Figure 4-65 Bridge Port: CIST: MST Region List**

Bridge Port: MSTI: MSTID Management

This function is activated in the “**Configure (Virtual or Provider) BridgePort**” window (see [Figure 4-55, \(p. 4-123\)](#)), after clicking on the  key of the “MSTID” item on the MSTI management area.

An example of the window displayed is reported in [Figure 4-66, \(p. 4-141\)](#).

The function of this option is to create an MST Instance (MSTI), and to associate one or more VLAN’s to an active MSTID.

Important! The Instances creation are valid for the entire Bridge node, and not only for the selected Port. I.e. the same Instances created on a port are valid at all the other ports of the Bridge, and any port sees the same Instances of the other Ports.

It contains a table having the following columns:

- **MSTID:** (MST Instance Identifier) range **0** to **63** (Note: 0 is not usable because it is used for the Common, or global, Instance (CIST)).
- **Status:** “*notInService*” / “*active*”; this status can be changed from “*notInService*” to “*active*” by using the “**Create**” key or from “*active*” to “*notInService*” by using the “**Delete**” key.

The “**Create**” key permits to switch the selected entry from “*notInService*” to “*active*”, thus creating the MST Instance.

Assignment Management of VLANs to the Instances:

If the Status of the selected MSTID instance is “*active*”, then the “**Assign**” key will open the [Figure 4-67, \(p. 4-141\)](#), that lists all the possible VLANs id., from **1** to **4094**. The association of one or more VLAN’s is possible, by selecting on the list (more VLANs selections are possible, by moving the mouse by keeping pressed its left button and contemporary pressing the <**SHIFT**> key on the keyboard; or individually, by using the mouse button and the <**CTRL**> key of the keyboard on the desired VLANs).

The assignment of a VLAN to an MSTID implies the cancellation of the same VLAN association from the MSTID = 0 or from any other MSTID, if existing. I.e. one VLAN can be associated only to one MSTID, any subsequent association of the same VLAN to another Instance implies the transfer of this VLAN from the previous association to the actual.

The association of a VLAN to a certain MSTI can be deleted by doing the association of that VLAN to the MSTI = 0.

The “**Details**” key shows the list of VLAN’s associated to the selected active MSTID, see [Figure 4-68, \(p. 4-141\)](#). (The “**Reset**” key can be used to delete a selected assignment).

The “**Delete**” key permits to switch the selected MSTID entry from “*active*” to “*notInService*”. After deleting an MSTID, all VLAN’s to it associated are automatically transferred to MSTID = 0.

The “**Ok**” key permits to confirm this MSTID setting, returning to [Figure 4-55, \(p. 4-123\)](#), where the “*PerBridge*” and “*PerPort*” parameters related to this selected MSTID can then be configured.

Figure 4-66 Bridge Port: MSTI: MSTI Management

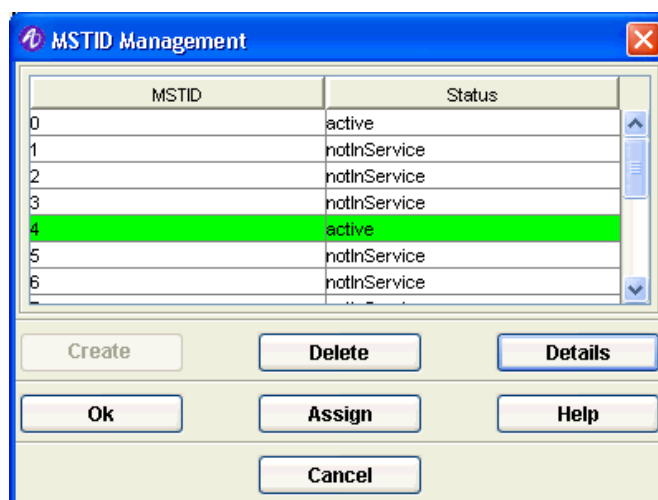


Figure 4-67 Bridge Port: MSTI: MSTID/VLAN Assignment

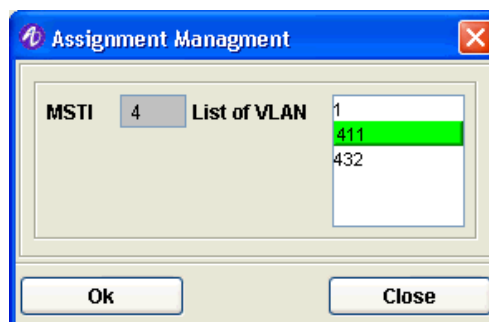
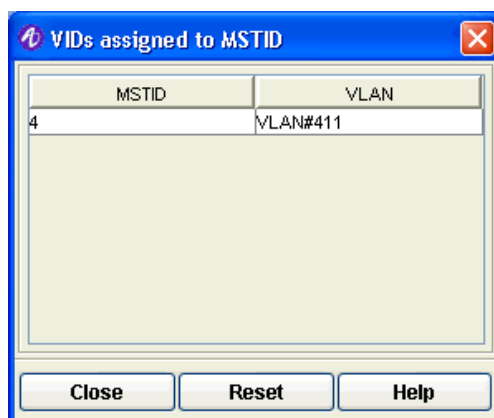


Figure 4-68 Bridge Port: MSTI: MSTID/VLAN List



Transmission: Ethernet Port: Bridge Port: Bridge Port Properties

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting a MAC, or Virtual, or Provider Bridge port (ETB port) by means of the contextual pop-up menu, or by selecting in the menu-bar:

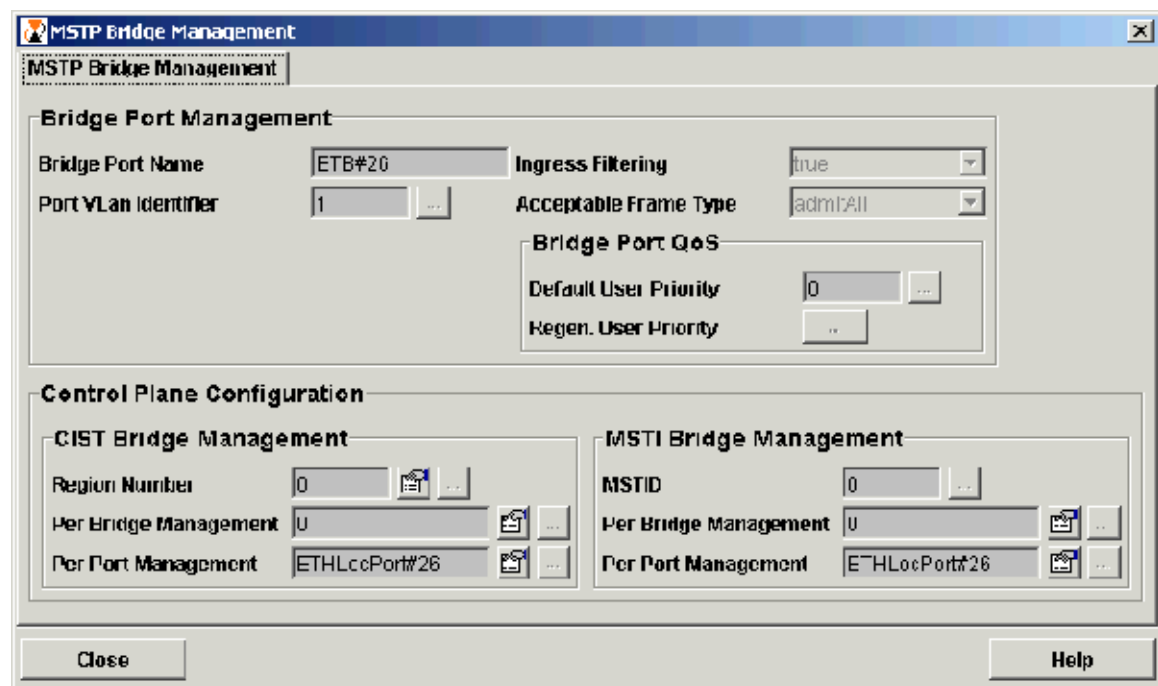
“Transmission” -> “Ethernet Port Management” -> “Bridge Port Management” -> “Bridge Port Properties” (MAC or Virtual or Provider case).

An example of the window displayed is reported in [Figure 4-69, \(p. 4-142\)](#) (ProviderBridge case)

The function of this option is to show the transmission parameters set for the selected Bridge ETB Port.

All the reported information fields are read-only, and are the same as those explained ones for “Configure Virtual (or Provider or MAC) Bridge Port”, para. “[Transmission: Ethernet Port: Bridge Port: Configure Bridge Port \(Virtual\)](#)” (p. 4-115), para. “[Transmission: Ethernet Port: Bridge Port : Configure Bridge Port \(Provider\)](#)” (p. 4-118), para. “[Transmission: Ethernet Port: Bridge Port : Configure Bridge Port \(MAC\)](#)” (p. 4-123).

Figure 4-69 Bridge Port Properties (Provider/MSTP case)



Transmission: Ethernet Port: Bridge Port: Show VLAN Info

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active Virtual (or Provider) Bridge ETB port by means of the contextual pop-up menu, or by selecting in the menu-bar:

"Transmission" -> "Ethernet Port Management" -> "Bridge Port Management" -> "Show VLAN Info".



WARNING

*This option is operative only if the selected ETB Port is in **"up"** state (i.e. the associated ETS port is in **"up"** state too).*

*This option is not operative if the Bridge is **"MAC"** type (i.e. 802.1d, see ["Transmission: ISA : Configure ISA"](#) (p. 4-61)).*

An example of the window displayed is reported in [Figure 4-70, \(p. 4-143\)](#).

The function of this option is to show the VLAN's afferent to this selected ETB Port, and, correspondingly, the state of the port with respect to that VLAN, with its **"tagged/untagged"** (Format Outgoing Frames) condition.

The VLAN registered on this port are listed, and, correspondingly, the state of the port with respect to that VLAN, with its Format-Outgoing-Frames: **"tagged/untagged"** condition.

The state of the Port can be: **"dynamic"**, or **"blocked"**, or **"forwarding"**, or **"disabled"** (the meanings of these states are as explained in **"STP-PerPortManagement"**, para. ["BridgePort: ControlPlane STP-PerPort Management"](#) (p. 4-133)).

Figure 4-70 Show VLAN Info

VLAN#	Bridge Port State Per VLAN	Format Outgoing Frames
1	disabled	untagged
234	disabled	tagged
237	disabled	tagged

Transmission: Ethernet Port: Queue (QoS): Configure Queue

This option is obtained, after selecting an Ethernet port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

"Transmission" -> "Ethernet Port Management" -> "Queue (Qos) Management"-> "Configure Queue"

An example of the window displayed is reported in [Figure 4-71](#), (p. 4-146).

For more details see explanations in “[Traffic Descriptor, Forwarding Priority and Class of Service](#)” (p. 4-55).

The function of this option is to set the Queueing parameters for this selected Port, such as Shaping Rate, etc.

- **Queueing Handling Per-Port** sector:

The *shaping* provides to adapt the incoming traffic to the available output bandwidth, by smoothing the prospective peaks. It is configured by means of two parameters:

- **Mean Shaping Rate:** egress shaping rate (sustained rate permitted by egress traffic shaping) in kb/s. Value **0** means that the egress shaping rate limitation is disabled: this is the default value.



WARNING

*This value must be congruent with the “**Rate Limiting**” parameter defined in “**Configure remote Port**” (see “[Bandwidth matching](#)” (p. 4-83)).*

- **Burst Shaping Rate:** amount of burst traffic (in bytes) that can be moulded on the egress. Value **0** means that the egress burst shaping limitation is disabled: this is the default value.

The following parameters are available only in case of ProviderBridge:

- **Scheduling Discipline.** Possible options:
 - **WorkConserving:** (only for weighted queues), empty queues are skipped, by the WDRR (Weighted Deficit Round Robin) algorithm of the scheduler.
 - **NonWorkConserving:** not available in current release. Empty queues are served too, by the WDRR.
- **Forwarding Class Num...:** range **0** to **7**; this field (together with the following “Queue Number”) permits to create a QoS Customer Profile (not operative in current release) that overrides the value (8P0D or 5P3D) set in “[Transmission: ISA : Configure ISA](#)” (p. 4-61).

the  key opens the “**Forwarding Class Mapping**” dialog as in [Figure 4-72](#), (p. 4-146), that permits to set:

Egress FC Queue: it indicates the egress queue where the Forwarding Class will be sent ...

the  key permits to view the “**Forwarding Class Mapping**” properties, as above described, but in read-only mode

- **Queue Number:** range 0 to 3; this field (together with the following “Queue Number”) permits to create a QoS Customer Profile (not operative in current release). Only the “QueueWeight” can be set. For more details see [“Traffic Descriptor, Forwarding Priority and Class of Service”](#) (p. 4-55).

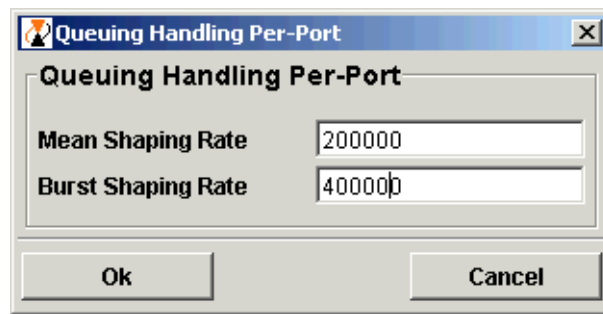
the  key opens the “Management Queue” dialog as in [Figure 4-73](#), (p. 4-146), that permits to set:

Queue Type: possible options:

- *Weightedbandwidth*: weight and priority are considered, in forwarding operations.
- *strictPriority*: only priority is considered, in forwarding operations. The highest priority queue is forwarded firstly; once it is emptied, the forwarding passes to the lower queue, and so on.
- *Queue Weight*: (applicable only in case of “weightedbandwidth”); weight to be applied for the selected Queue, on forwarding operations. It is supposed to be proportional to the forwarding priority of the traffic.

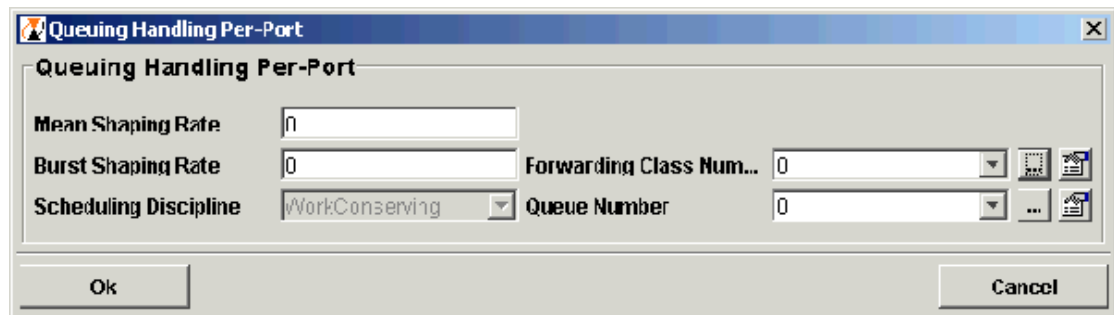
The  key permits to view the “Management Queue” properties, as above described, but in read-only mode.

Figure 4-71 Queue (QoS) Management



The dialog box titled "Queuing Handling Per-Port" contains two input fields: "Mean Shaping Rate" with the value 200000 and "Burst Shaping Rate" with the value 400000. At the bottom are "Ok" and "Cancel" buttons.

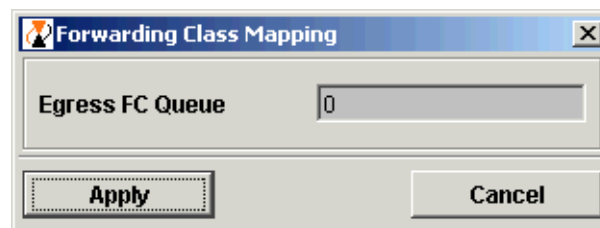
Virtual/MAC Bridge case



The dialog box titled "Queuing Handling Per-Port" contains four input fields: "Mean Shaping Rate" (0), "Burst Shaping Rate" (0), "Forwarding Class Num..." (0), and "Scheduling Discipline" (WorkConserving). There are also "Queue Number" (0) and "Queue Number" (0) fields with icons. At the bottom are "Ok" and "Cancel" buttons.

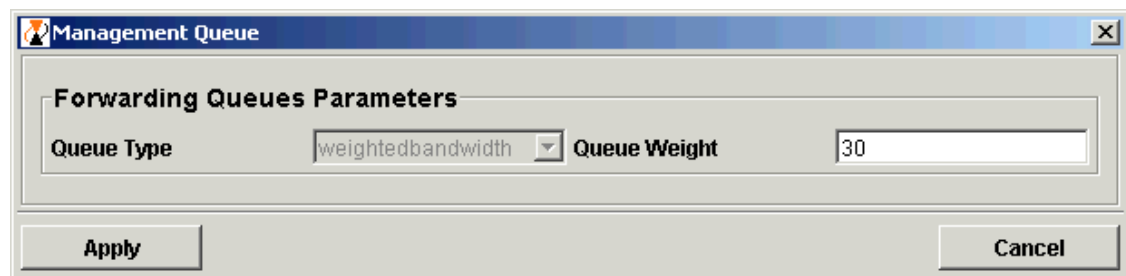
ProviderBridge case

Figure 4-72 QoS Management: Forwarding Class Number



The dialog box titled "Forwarding Class Mapping" contains one input field: "Egress FC Queue" with the value 0. At the bottom are "Apply" and "Cancel" buttons.

Figure 4-73 QoS Management: Queue Number



The dialog box titled "Management Queue" contains two input fields: "Queue Type" (weightedbandwidth) and "Queue Weight" (30). At the bottom are "Apply" and "Cancel" buttons.

Transmission: Ethernet Port: Queue (QoS): Properties Queue

This option is obtained, after selecting an Ethernet port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “Queue (Qos) Management”-> “Properties Queue”

An example of the window displayed is reported in [Figure 4-74, \(p. 4-148\)](#).

The function of this option is to show the Queueing parameters for this selected Port. All the reported information fields are in read-only mode, and their meaning is described in [“Transmission: Ethernet Port: Queue \(QoS\): Configure Queue” \(p. 4-143\)](#).

In case of **Provider Bridge** only, it will open, by means of:

- **List Forwarding Class** button: (see [Figure 4-75, \(p. 4-148\)](#)):

it reports the “ForwardingClassMapping”; i.e. the association between the Priority (“ForwardingClass”, FC) and “ForwardingQueue” (FQ) that has been set. For instance, in 5P3D case, the FC#0 and FC#1 are associated to the FQ# 1 etc.

In this figure the PCP= 5P3D configuration is illustrated (in 8P0D it is similar). The PCP value is set para. [“Transmission: ISA : Configure ISA” \(p. 4-61\)](#).

- **List Queue** button: (see [Figure 4-76, \(p. 4-149\)](#)):

it reports the List of the Queues and their relevant parameters:

- **Queue Number**: it is the number of the “ForwardingQueue” (FQ)
- **Queue Type**: “strictPriority” or “WeightedBandwidth”
- **Queue Weight**: value of the weights for the queues, assigned by default or by the operator as seen in [Figure 4-73, \(p. 4-146\)](#).

Figure 4-74 Queue (QoS) Properties

Queueing Handling Per-Port

Mean Shaping Rate: 0

Burst Shaping Rate: 0

Close Help

Virtual/MAC Bridge case

Queueing Handling Per-Port

Mean Shaping Rate: 0

Burst Shaping Rate: 0

Scheduling Discipline: WorkConserving

List Forwarding Class

List Queue

Close Help

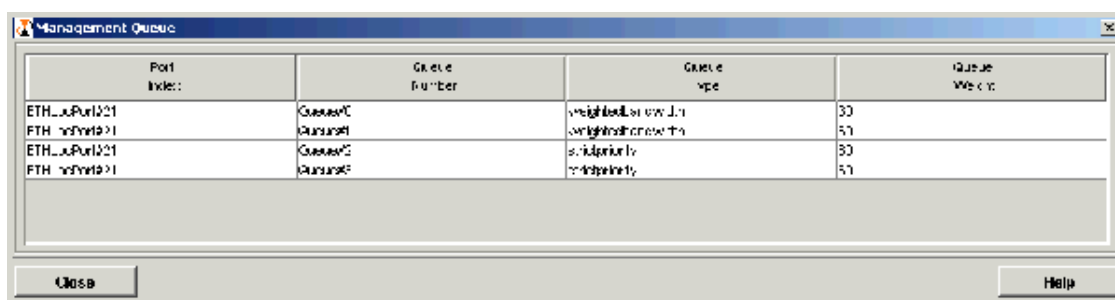
ProviderBridge case

Figure 4-75 QoS Properties: Forwarding Class Mapping

Port Index	Forwarding Class	Forwarding Queue
ETHLocPort#21	FClass#0	
ETHLocPort#21	FClass#1	0
ETHLocPort#21	FClass#2	1
ETHLocPort#21	FClass#3	1
ETHLocPort#21	FClass#4	1
ETHLocPort#21	FClass#5	1
ETHLocPort#21	FClass#6	2
ETHLocPort#21	FClass#7	3

Close Help

Figure 4-76 QoS Properties: Queue Number List



The screenshot shows a window titled "Management Queue" with a table containing four columns: "Port Index", "Queue Number", "Queue type", and "Queue Weight". There are three rows of data, all for "ETH_LuPort0>1". The first row has "Queue0" and "weighted round robin" with a weight of 30. The second row has "Queue1" and "weighted round robin" with a weight of 50. The third row has "Queue2" and "strict priority" with a weight of 80. At the bottom of the window are "Close" and "Help" buttons.

Port Index	Queue Number	Queue type	Queue Weight
ETH_LuPort0>1	Queue0	weighted round robin	30
ETH_LuPort0>1	Queue1	weighted round robin	50
ETH_LuPort0>1	Queue2	strict priority	80

Transmission: ISA: IGMP Management: Configure IGMP

Note: IGMP is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting the ISA-ES Node, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “ISA Management” -> “IGMP Management”-> “Configure IGMP”

**WARNING**

This option is not allowed for MAC Bridge case.

The VLAN's to be associated to IGMP should be already registered.

An example of the window displayed is reported in [Figure 4-77, \(p. 4-151\)](#).

The function of this option is to set the IGMP (Internet Group Management Protocol) parameters for the ISA node, common to all the ports. Some general details about IGMP are described in [“Management software” \(p. 1-60\)](#).

The first window presented by the option permits to select the VLAN-ID to be associated to the IGMP group. The following parameters are displayed:

- **VLAN Range... From ... To :** a range of VLAN-Id to be searched can be defined; default is **1** to **100**.

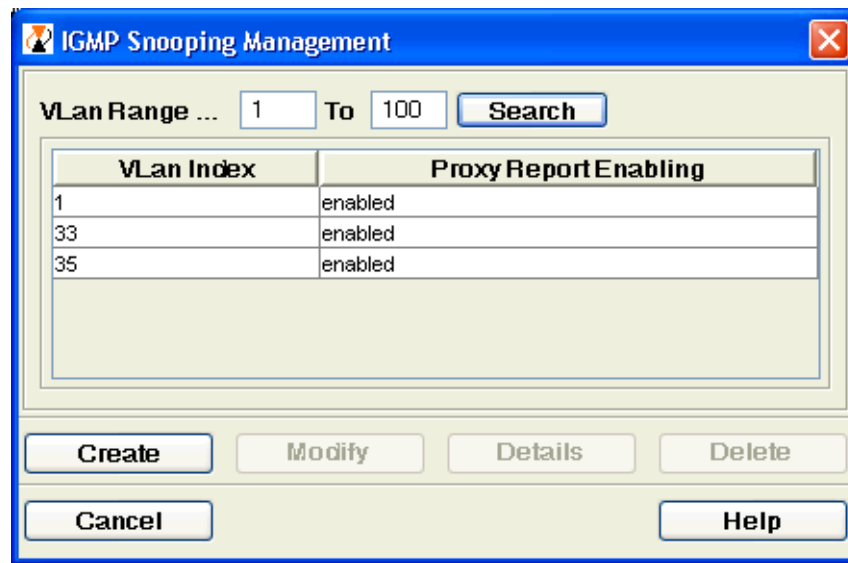
Subsequently, after clicking on **“Search”** key, the VLAN's already associated to an IGMP instance are displayed in the table.

- **VLAN Index :** identifier of the VLAN's already associated to IGMP
- **Proxy Report Enabling** Possible values:
 - **enabled** means that the VLAN delegates the ES (acting as Proxy) to report to the Router one summarized collective message, together with the other VLAN's involved in the same IGMP group.
 - **disabled** means that this VLAN is not interested in the collective Proxy reporting.
- **Create:** this key permits to associate a new VLAN to the IGMP instance, by opening the dialog window reported in [Figure 4-78, \(p. 4-152\)](#). See next para. [“ISA: IGMP Snooping Management: Vlan association” \(p. 4-151\)](#).

The other keys presented at the bottom of the window are:

- **Modify :** it permits to modify the IGMP parameters for the selected VLAN of the above list.
- **Details :** it permits to check the IGMP parameters associated to the selected VLAN of the list.
- **Delete :** to de-associate from the IGMP instance the selected VLAN.
- **Cancel :** to close the window
- **Help :** to get helps about this function.

Figure 4-77 ISA: IGMP Snooping Management List



ISA: IGMP Snooping Management: Vlan association

After clicking on the “**Create**” key of the window described in the previous paragraph, the dialog box reported in [Figure 4-78, \(p. 4-152\)](#) will be displayed.

It contains the following parameters:

- **VLAN ID:** it permits to choose the Vlan to be associated to the IGMP instance.
the  key opens one “VLAN Search” dialog box, in order to select the desired VLAN-Id among all the registered VLAN’s of the ES.
- **IGMP Status:** possible values: “*up*” / “*down*”, (read-only, set by the system); “*up*” means that this ISA-ES node is enabled to support the IGMP function.
- **Proxy Report Enabling** Possible values:
 - *enabled* means that this VLAN delegates the ES (acting as Proxy) to report to the Router one summarized collective message, together with the other VLAN’s involved in the same IGMP group.
 - *disabled* means that this VLAN is not interested in the collective Proxy reporting. In this case all the reports from the members of the IGMP group are forwarded transparently to the router.
- **Group Memb interval(s):** amount of time (in sec.) after which the IP router can check if no other member of this IGMP group is interested in the multicast transmission, if no Report from users is sent in this interval.
- **Router Timeout(s):** time interval (in sec.) for the ES node for dynamically refreshing the list of existing IP Multicast Routers. After this time, not alive Routers are deleted from the list.

- **Query Max Response Time (1/10s):** max amount of time (in 1/10sec.) for the users (hosts) to respond to a query from the ES-“Proxy” (or from the IP Router).
- **Last Memb Query Count :** (LMQC), number of counts of next parameter “LastMemberQueryInterval”, for the IP Router, before it establishes that no other member of this IGMP group is present and thus removing the multicast transmission.
- **Last Memb Query Interval (1/10s):** (LMQI), time interval, for the IP Router, between the queries sent from the Router to the users, to check if any other member is present on this IGMP group.

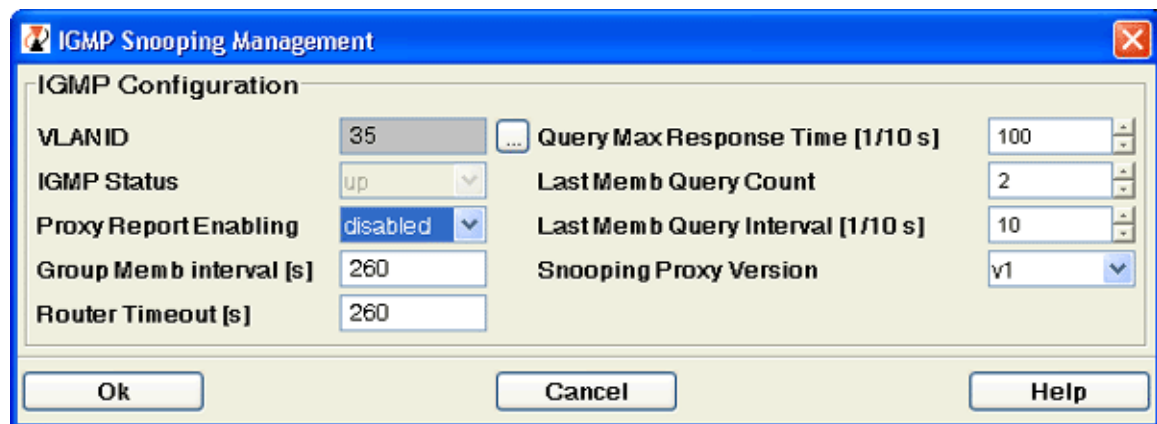
Note: The product of the two previous parameters (LMQC*LMQI) gives the time, for the IP Router, to establish that no other member of this IGMP group is present and thus removing the multicast transmission.

- **Snooping Proxy Version** Possible values:
 - **V1:** it supports the IGMP Query from the Router and the Reports from users.
 - **V2:** it supports, in addition to V1 features, the fast leave of a user from the IGMP group.
 - **V3:** it supports also the “Source Filtering” features: i.e. the possibility, for users, to select some specific sources of Multicast traffic, among all the existing ones in the network. (not yet supported in current release)

The **Ok** key confirms the selected parameters.

The **Cancel** key permits to close the window without associating a VLAN. Click on **Help** to get aids about this function.

Figure 4-78 ISA: IGMP Snooping, VLAN association



Transmission: ISA: IGMP Management: IGMP Properties

Note: IGMP is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting the ISA Node, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “ISA Management” -> “IGMP Management”-> “ IGMP Properties

**WARNING**

This option is not allowed for MAC Bridge case.

The function of this option is to show the IGMP parameters for the ISA-ES Node.

The displayed parameters (presented by clicking on the unique “**Details**” key) are read-only and their meanings are as explained in [“Transmission: ISA: IGMP Management: Configure IGMP”](#) (p. 4-150).

Transmission: Ethernet Port: IGMP: Configure IGMP

Note: IGMP is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active Port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “IGMP Management” -> “Configure IGMP”



WARNING

This option is not possible for MAC Bridge case.

Allowed for “up” ETB Ports only, on VirtualBridge.

Allowed for “up” ETB and ETS Ports on ProviderBridge.

An example of the window displayed is reported in [Figure 4-79, \(p. 4-155\)](#).

Some general details about IGMP are described in [“Management software” \(p. 1-60\)](#).

The function of this option is to set the IGMP parameters for this selected Port, such as “Fast Leave”, “StaticRouterPort”, etc.



WARNING

This association is performed for one VLAN at a time; if more VLAN’s are to be associated to IGMP by means of this port, the operation must be repeated for each VLAN.

It contains the following parameters:

- **Port Label:** read-only field, set by the system to the selected Port.
 - **VLAN ID:** it permits to choose the Vlan to be associated to the IGMP instance.
the  key opens one “VLAN Search” dialog box, in order to select the desired VLAN-Id among all the registered VLAN’s on this Port.
 - **Fast Leave Per Port** Possible values:
 - **enabled** means that this Port permits the FastLeave, i.e. the removal of the Multicast traffic on this Port, upon receiving a single “Leave Report” from a user connected on this Port.
- Note:** This type of Leave procedure is advisable to be used when only one single user is connected behind the selected VLAN on that port.
- **disabled** means that this Port does not permit the FastLeave procedure. In this case the Router has to send some queries in order to check if other members of the IGMP group registered on this Port are interested in the Multicast transmission.
 - **Static Router Per Port** Possible values:
 - **enabled** means that this Port is statically connected to the IP Multicast Router.
 - **disabled** means that this one is not the Port towards the IP Multicast Router.

The “Ok” key confirms the selected parameters.

The **Cancel** key permits to close the window without confirming this setting. Click on **Help** to get aids about this function.

Figure 4-79 Port: IGMP Services Management



Transmission: Ethernet Port: IGMP: IGMP Properties

Note: IGMP is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active Port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Ethernet Port Management” -> “IGMP Management”-> “IGMP Properties”



WARNING

This option is not possible for MAC Bridge case.

Allowed for ETB Ports only, on VirtualBridge.

Allowed for ETB and ETS Ports on ProviderBridge.

An example of the window displayed is reported in [Figure 4-80, \(p. 4-157\)](#).

Some general details about IGMP are described in [“Management software” \(p. 1-60\)](#).

The function of this option is to show the IGMP parameters and services set for this selected Port.

The following parameters are displayed:

- **PortID:** read-only field, set by the system, index of the selected Port.
- **Port Name:** read-only field, set by the system, name of selected Port.
- **VLAN ID ... From ... To :** a range of VLAN-Id to be searched can be defined; default is *1* to *100*.

Subsequently, after clicking on **“Search”** key, the VLAN’s associated to an IGMP instance by means of this Port are displayed in the table.

- **VLAN ID :** identifier of the VLAN’s associated to IGMP on this Port
- **Fast Leave** Possible values:
 - *up* means that the FastLeave feature is enabled on this VLAN.
 - *down* the FastLeave feature is disabled on this VLAN.
- **Static Router Port Status** Possible values:
 - *up* means that this one is the Port statically connected to the IP Multicast Router for the related VLAN.
 - *down* this one is not the Port towards the IP Multicast Router for the related VLAN.
- **Dynamic Router Port IP Address** Actual IP Address of the IP Multicast Router for the related VLAN (it will show the IP address only in case this port is the Router Port).
- **VLAN ID field :** reporting the selected Vlan of the table; or for typing the desired Vlan, for which requesting the “MemberShip Group” information.

- **Request Membership Group:** this key permits to show the IGMP group parameters associated to the selected VLAN; it opens the property window reported in [Figure , \(p. 4-157\)](#), reporting the following tabled information:
 - **VLAN ID:** identifier of possible other VLAN-Id's associated to the same IGMP group
 - **PORT ID:** identifier of the Port on which the related VLAN is associated
 - **Member IP Address:** Multicast IP Group address to which this VLAN is associated
 - **V3 Source IP Address:** IP source address used by ES for sending collective Proxy Reports to the Router (meaningful only if IGMP version V3 is used).
 - **Version:** IGMP version (V1 or V2 or V3)
 - **V3 Group Type:** meaningful only if IGMP version V3 is used, to identify the Group type.

The other keys presented at the bottom of the windows are:

- **Close :** to close the window
- **Help :** to get aids about this window.

Figure 4-80 Port: IGMP Services Properties List

IGMP Service Management

PortID: 9

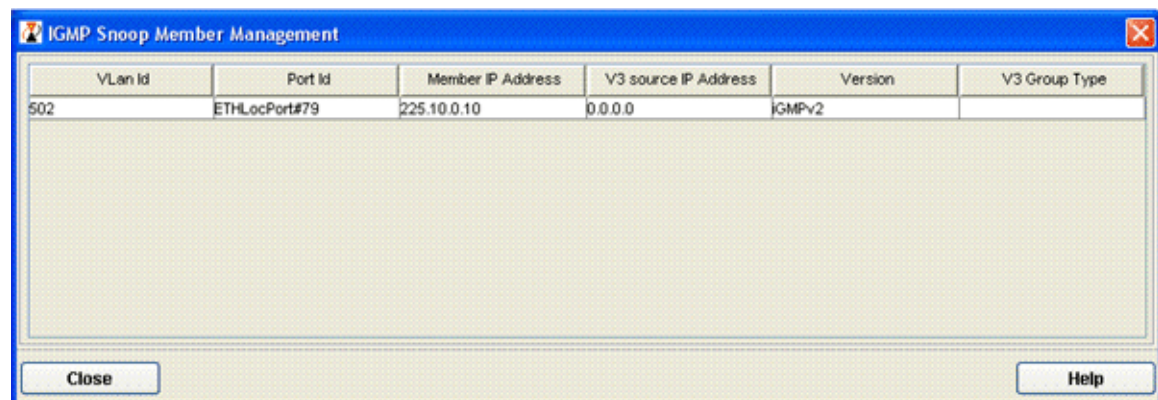
PortName: ETHLocPort#9

VLAN ID From: 1 To: 100 Search

VLAN ID	FastLeave	Static Router Port Status	Dynamic Router Port IP Address
35	up	up	--

VLAN ID: 35 Request Membership Groups

Close Help

Figure 4-81 Port: IGMP Request Membership Group


Vlan Id	Port Id	Member IP Address	V3 source IP Address	Version	V3 Group Type
502	ETHLocPort#79	225.10.0.10	0.0.0.0	IGMPv2	

Transmission: Aggregator: IGMP: Configure IGMP

Note: IGMP is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active Aggregator (LAG), by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Aggregator” -> “IGMP Management”-> “Configure IGMP”

**WARNING**

This option is not possible for MAC Bridge case.

Allowed for ETB LAGs only, on VirtualBridge.

Allowed for ETB and ETS LAGs on ProviderBridge.

The use of this option is the same of that used for EthernetPort:

“Transmission”: “EthernetPort Management”: “IGMP Management”: “Configure IGMP”, described in “[Transmission: Ethernet Port: IGMP: Configure IGMP](#)” (p. 4-154).

Transmission: Aggregator: IGMP: IGMP Properties

Note: IGMP is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active Aggregator (LAG), by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Transmission” -> “Aggregator” -> “IGMP Management”-> “IGMP Properties”

**WARNING**

This option is not possible for MAC Bridge case.

Allowed for ETB LAGs only, on VirtualBridge.

Allowed for ETB and ETS LAGs on ProviderBridge.

The use of this option is the same of the one used for EthernetPort:

“Transmission”: “EthernetPort Management”: “IGMP Management”: “IGMP Properties”, described in **“Transmission: Ethernet Port: IGMP: IGMP Properties”** (p. 4-156).

Transmission: Aggregator: Create Aggregator

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

Transmission: Aggregator: Configure Aggregator

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

Transmission: Aggregator : Aggregator Properties

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

Transmission: Aggregator : Delete Aggregator

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

Transmission: Ethernet Port: Aggregation Port: Configure

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

Transmission: Ethernet Port: Aggregation Port:

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

OAM

The OAM application (Operations, Administration, Maintenance) permits to manage all parameters related to the OAM-Domain context.

In particular, this application manages operations aimed to test the links and the functionality of an existing bridge network such as:

- **Continuity Check:** a test signal is sent by an originating point in the network, in order to detect link failures; (not supported in current release).
- **LoopBack:** a test signal is sent by an originating point and is reflected back at a destination point of a bridged network.
- **LinkTrace:** a test signal is sent by an originating point to a destination point of a bridged network, and every bridge crossed along the path sends back a link signal to the originator. It is used for link fault detection and path discovery.



WARNING

The bridge network must have been already configured and connected, in order to use these features.



WARNING

The OAM function is supported only for “Virtual Bridge” and “Provider Bridge” cases. The involved Ports (or LAG’s) for OAM communications are ETB types.

Summary procedure for OAM configuration

In order to configure the bridged network for OAM, follow the below listed main steps:

1. Configuration of all bridge of this OAM network, as “*Provider*” or “*Virtual*” types
2. Configuration of the OAM ports/Lags as ETB types, for every bridge of the network
3. Creation of the appropriate MD (Maintenance Domain) for every bridge of the network to be covered by the same OAM entity.

Note: All nodes of the same OAM domain must have identical parameters regarding MD configuration

4. Creation of the appropriate MA (Maintenance Association) for every bridge of the network to be covered by the same OAM entity.

Note: All nodes of the same MA region must have identical parameters regarding MA configuration

5. Creation of the appropriate MEP’s (MEG End Point) in each bridge of the network. These items represent the interfaces where the OAM messages enter and go out the bridges.

OAM Domain: Configure Resources (OAM)

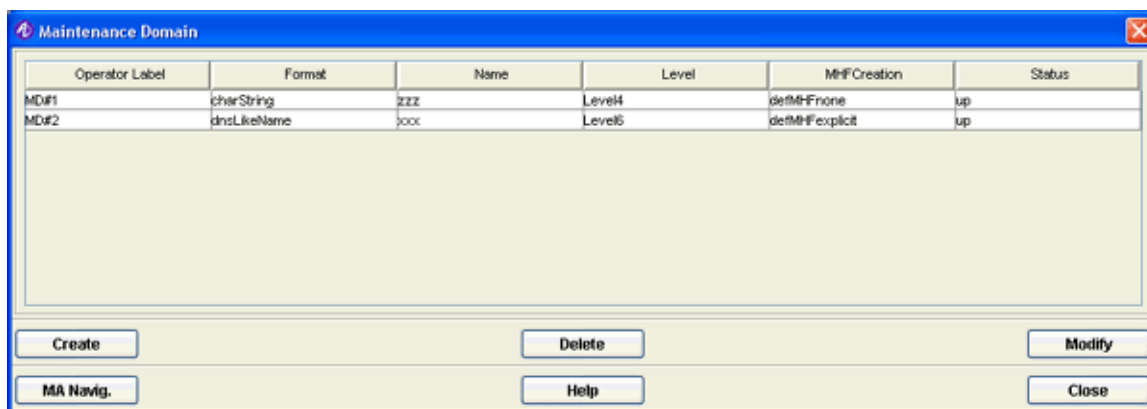
This option is obtained, by selecting in the menu-bar:

"OAM Domain" -> "Configure Resources (OAM)"

An example of the window displayed is reported in [Figure 4-82, \(p. 4-163\)](#).

The function of this option is to configure the parameters for the OAM.

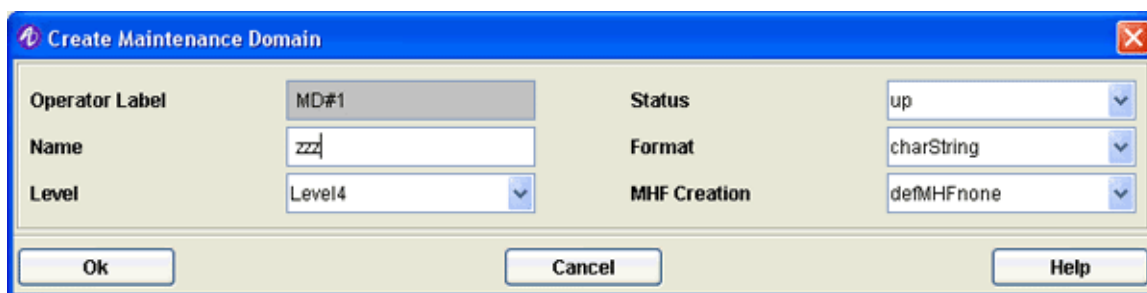
Figure 4-82 OAM: Configure Resources



The window shown in [Figure 4-82](#) reports in tabular form the existing MD (Maintenance Domain), created as described within next [Figure 4-83, \(p. 4-163\)](#).

OAM Configure Resources ([Figure 4-82](#)): Create key ([Figure 4-83](#))

Figure 4-83 OAM: Configure Resources: Create MD



The window of [Figure 4-83](#) permits to create the MD (Maintenance Domain). MD is the area of the network that can be managed and administered, for OAM purposes. For instance, an MD can coincide with an MST region.

It contains the following parameters:

- **Operator Label:** read-only, set by the system
- **Name:** to type a name chosen by the user

- **Level:** to specify the MD Level. It is part of the MD identifier, and can also be used to distinguish among various MD's inside the same network. Possible values: **Level0** to **Level7**.
- **Status:** “*up*”/“*down*”; to activate or deactivate this MD.
- **Format:** to define the format for the name of this MD. Possible values:
 - **none:** (without any name)
 - **charString:**
 - **dnsLikeName:**
 - **macAddressAndUint:**

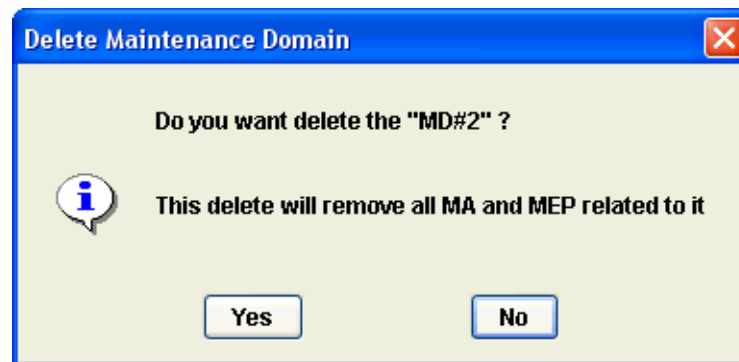
Note: All Bridges belonging to the same MD must have the same format

- **MHF Creation:** to define the MHF (MIP Half Function), (MIP= MEG Intermediate Point, MEG= Maintenance Entity Group) of this MD. Possible values:
 - **defMHFnone:** no MIP can be created for this MD
 - **defMHFdefault:** MIP's can be created for this MD on any bridge port
 - **defMHFexplicit:** MIP's can be created for this MD on bridge ports only if a MEP is created at lower MD Level.

OAM Configure Resource (see [Figure 4-82](#)): Modify key (same content as the “**Create**” key, see [Figure 4-83](#)). The Modify window can be used to modify some parameters of the created MD.

OAM Configure Resource (see [Figure 4-82](#)): Delete key ([Figure 4-84](#))

Figure 4-84 OAM: Configure Resources: Delete MD



It will delete the “MD#” selected in the table.

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85)

Figure 4-85 OAM: Configure Resources: MA Navigation

The screenshot shows a window titled "Maintenance Association". At the top, there is a search bar with "1" in the "From" field and "50" in the "To" field, and a "Search" button. Below this is a table with the following data:

Operator Label	Name	Vlan ID	Status
MA#1#2	ccc	411	up
MA#1#1	bbb	237	up

At the bottom of the window, there are several buttons: "Create", "Delete", "Modify", "Details", "MEP Navigation", "Show All MEP", "MA-MEP List ID", and "Close".

The window of Figure 4-85. permits to navigate and create the MA (Maintenance Association). The MA is described below, within the “**Create**” key.

This window reports, in table form, the already created MA, and their relevant parameters: “*Operator Label*”, “*Name*”, “*Vlan ID*”, “*Status*”.

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85): Create key (Figure 4-86)

Figure 4-86 OAM: Configure: MA Navig.: Create MA

The screenshot shows a window titled "Create Maintenance Association". It contains several input fields and dropdown menus:

- Maintenance Domain:** MD#1 (dropdown)
- Index MA:** 1 (text field)
- CCM Interva:** interval1s (dropdown)
- Format:** primaryVid (dropdown)
- Status:** up (dropdown)
- MA Name:** bbb (text field)
- Mhf Creation:** defMHFnone (dropdown)
- Vid:** 411 (text field)

At the bottom, there are three buttons: "Ok", "Close", and "Help".

The window in Figure 4-86 permits to create an MA (Maintenance Association). The MA is the sub-area of the MD that can be reached by a sub-set of OAM messages. Each MA is independent from other MA's inside the same MD, and thus an OAM message originated inside an MA can circulate only into the same MA.

It contains the following parameters:

- **Maintenance Domain:** a pull-down menu permits to choose the MD among those already created.
- **Index MA:** read-only incremental index, set by the system

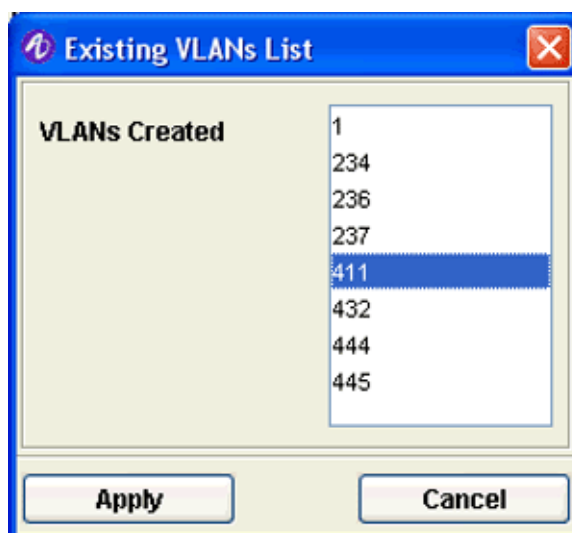
-
- **CCM Interval:** (not operative); time interval for repeating the CCM message (Continuity Check Message). Possible values from **10** ms to **1** min.
 - **Status:** “up”/”down”; to activate or deactivate this MA
 - **Format:** to define the format of this MA. Possible values:
 - *charString*:
 - *rfc2865Vpnld*:
 - *unsignedInt16*:
 - *primaryVid*:

Important! All Bridges belonging to the same MA must have the same format;

- **MA Name:** to type a name chosen by the user
- **MHF Creation:** to define the MHF (MIP Half Function), (MIP= MEG Intermediate Point, MEG= Maintenance Entity Group) of this MA. Possible values
 - *defMHFnone*: no MIP can be created for this MA
 - *defMHFdefault*: MIP’s can be created for this MA on any bridge port
 - *defMHFexplicit*: MIP’s can be created for this MA on bridge ports only if a MEP is created at lower MD Level.
- **Vid:** to associate a Vlan to this MA, by clicking on [...] key, see [Figure 4-87](#).

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85): Create key (Figure 4-86): Vid key (Figure 4-87)

Figure 4-87 OAM: Configure: MA Navig.: Create: Vid



This window permits to associate a VLAN ID to this MA. It reports the existing VLAN. Thus the Vlan's to be used for OAM scopes should have been already registered over the ETB ports to be used for OAM.

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85): MEP Navigation key (Figure 4-88)

(Available after “MA-Create”, after selecting an “MA” in the table of Figure 4-85)

Figure 4-88 OAM: Configure: MA Navig.: MEP Navigation

Operator Label MA#1#1

MEP from 1 **To** 50 **Search**

Operator Label	Status	MEP IfIndex	MEP Direction	Alarm
MEP#1#1#3	Up	ETHLocPort#82	up	
MEP#1#1#2	Down	LAG#2	down	
MEP#1#1#1	Up	LAG#2	up	

Create **Delete** **Modify** **Details**

LoopBack **LinkTrace** **Close** **Help**

The window of Figure 4-88 permits to navigate and create the MEP (Maintenance entity group End Point). The MEP is described below, within the “Create” key.

“**Operator Label**”: name of the selected MA for this item.

The existing MEP’s can be searched, in the specified range “**from ... to**”, clicking on “**Search**” key.

This window reports, in table form, the already created MEP’s, and their relevant parameters: “**Operator Label**”, “**Status**”, “**MEP IfIndex**”, “**MEP Direction**”, “**Alarm**”.

OAM Configure Resource ([Figure 4-82](#)): MA Navig. key ([Figure 4-85](#)): MEP Navigation key ([Figure 4-88](#)): Create key ([Figure 4-89](#))

Figure 4-89 OAM: Configure: MA Navig.: MEP Navigation : Create MEP

The window in [Figure 4-89](#) permits to create an **MEP** (MEG End Point). The MEP is the resource defined over a Bridge, capable of initiating and terminating OAM PDU frames for fault management and performance monitoring. A MEP is headed by an ETB port or ETB LAG.

It contains the following parameters:

- **Operator Label:** read-only incremental index, set by the system
- **Identifier:** integer value set by the user, different from “0”
- **IfIndex:** to associate a Port (or LAG) of the bridge to this MEP, by clicking on [...] key, it opens the “**Search**” window (see “[Views -> Search](#)” (p. 4-29)), permitting to choose the ETB Port/LAG to be used for OAM communications for this MA.

Important! The chosen port must be already registered over the VLAN used for the relevant MA (see [Figure 4-86](#), (p. 4-165))

- **Cci Enabled:** (*true / false*), to enable CCI, only “false”; (not operative)
- **Ltm Priority:** to associate a priority (0 to 7) to the LinkTrace Message, inserted into Vlan-Tag; default is 7
- **Status:** actual state of this MEP (“*up*”/“*down*”), i.e. in-service/out-of-service
- **Direction:** to indicate the direction of OAM messages for this MEP;
 - “*up*” means the OAM messages must traverse the bridge (messages go out from the bridge via other ports).
 - “*down*” means OAM messages are directly sent outside the bridge (messages go out from the bridge via this same port).
- **Active:** (*true / false*), to activate/deactivate this MEP

OAM Configure Resource ([Figure 4-82](#)): MA Navig. key ([Figure 4-85](#)): MEP Navigation key ([Figure 4-88](#)): Modify key:

this Modify key permits to change some parameters of the selected MEP, after it has been created as seen in [Figure 4-89](#).

OAM Configure Resource ([Figure 4-82](#)): MA Navig. key ([Figure 4-85](#)): MEP Navigation key ([Figure 4-88](#)): LoopBack key ([Figure 4-90](#)):

(Available after “MEP-Create”, after selecting a “MEP” in the table of [Figure 4-88](#)).

Figure 4-90 OAM: Configure: MA Navig.: MEP Navigation : Loop Back

The window in [Figure 4-90](#) permits to define and start a LoopBack message.

It contains the following parameters:

- **Operator Label:** displays the selected MEP, set by the system
- **Mep MAC Address:** MAC address of this selected MEP (it is given by the system, as can be seen in MEP Property: see [Figure 4-92](#))
- **Target MAC Address:** MAC address of the target MEP that has to respond to this LoopBack message. Note: this Address can be read in the far “MEP-Properties” of the node to be reached.
- **LoopBack Type:** the only permitted value is “Dest. MAC ADDRESS”; i.e. the LB is done in base of the only MAC Address parameter
- **Target Mep Id:** read-only value set by the system; not operative.
- **Target Is Mep Id:** (*true/false*) read-only value set by the system; not operative.
- **LoopBack Result :** reporting the result (OK/KO) of the LoopBack test, after having clicked on the “Start” key.

OAM Configure Resource ([Figure 4-82](#)): MA Navig. key ([Figure 4-85](#)): MEP Navigation key ([Figure 4-88](#)): LinkTrace key ([Figure 4-91](#)):

(Available after “MEP-Creation”, after selecting a “MEP” in the table of [Figure 4-88](#))

Figure 4-91 OAM: Configure: MA Navig.: MEP Navigation : Link Trace

The window in [Figure 4-91](#) permits to define and start a LinkTrace (LT) message.

It contains the following parameters:

- **Operator Label:** name of the selected MEP, set by the system
- **Mep MAC Address:** MAC address of this selected MEP, set by the system
- **Target MAC Address:** MAC address of the final MEP of the path towards which this LT message has to be sent. Note: this Address can be read in the far “MEP-Properties” of the node to be reached.
- **Egress Identifier:** MAC address of the egress i/f for this LT message, set by the system
- **LinkTrace Type:** the only permitted value is “Dest. MACADDRESS”; i.e. the LT is done in base of the only MAC Address parameter
- **Target Is Mep Id:** (true/false) read-only value set by the system; not operative
- **Target Mep Id:** read-only value set by the system; not operative
- **Transmit Ltm TTL:** max number of bridge nodes this message can traverse before expiring

- **LinkTrace Result:** reporting the result (OK/KO) of the LinkTrace test, after having clicked on the “Start” key. After having clicked on “ShowResult” key, it will report, on any row of the table, the parameters corresponding to each bridge that responded to this LTM.

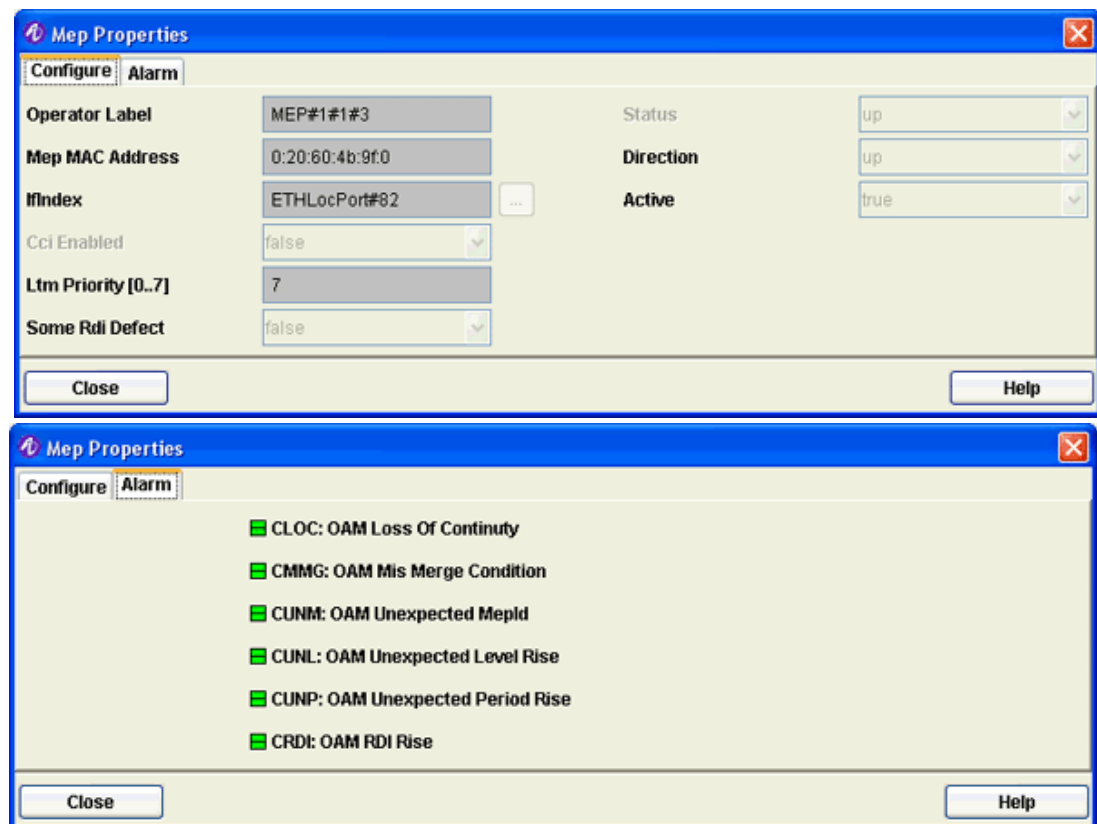
The “ShowResult” key displays the detailed test results. It causes the displaying of LT results on the above “LinkTrace Result” table.

Reported parameters (for each crossed bridge):

- *Entry; TTL; Forwarded; Terminal Mep; LastEgressIdentifier; NextEgressIdentifier; Relay; Ingress; IngressMac; Egress; EgresMac*

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85): MEP Navigation key (Figure 4-88): Details key (Figure 4-92):

Figure 4-92 OAM: Configure: MA Navig.: MEP Navigation : Details



This window in Figure 4-92 permits to read the parameters configured for the selected MEP.

Note: The displayed parameter “Some Rdi Defect” is not operative.

Note: The alarms reported in “Alarm” tab are not operative.

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85): Show All MEP key (Figure 4-93):

Figure 4-93 OAM: Configure: MA Navig.: Show All MEP

Operator Label	Status	MEP IfIndex	MEP Direction	Alarm
MEP#1#1#1	Up	LAG#2	up	
MEP#1#1#2	Down	LAG#2	down	
MEP#1#1#3	Up	ETHLocPort#82	up	

The window in Figure 4-93 permits to search all existing MEP's, and to get their details.

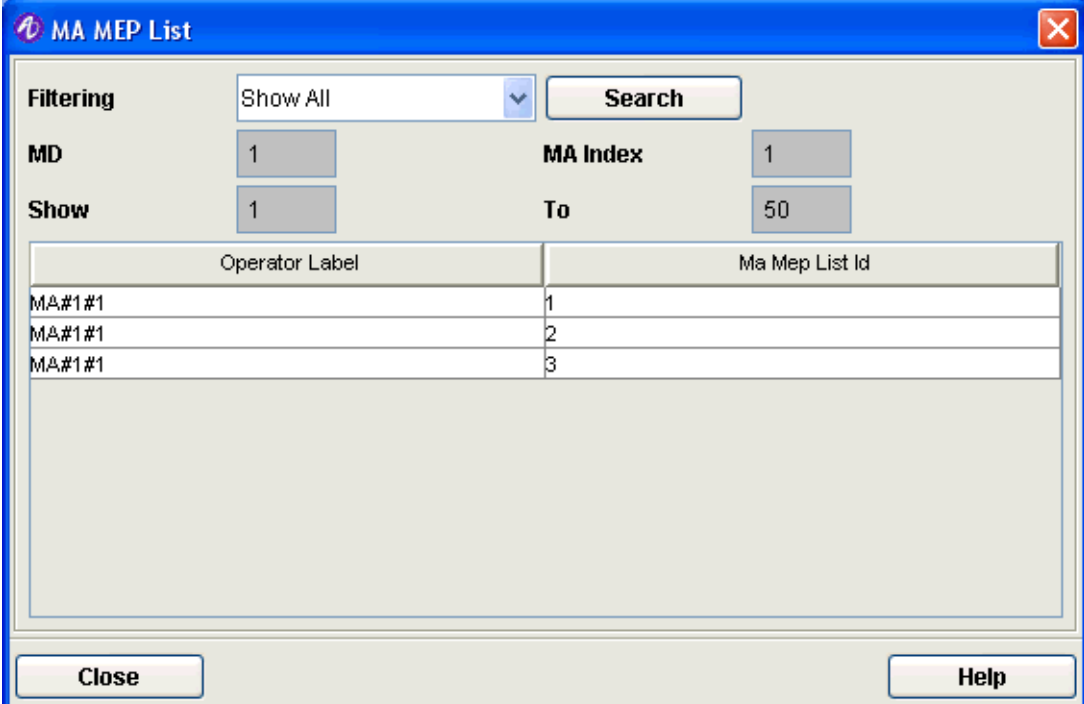
It contains the following fields:

- **Filtering:** filtering criteria; possible pull-down options:
 - *Show All:* to search all MEP's
 - *Specify Criteria:* in this case, the user can define the MD, MA indexes, and the MEP range
- **MD index, MA index, Show from/to** fields are settable only if "Filtering" = "Specify Criteria".
- **Show from/to:** this field is referred to MEP indexes range

The **Details** key, after selecting a MEP in the table, displays the same Detail window described in Figure 4-92, (p. 4-172).

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85): MA-MEP List ID key (Figure 4-94):

Figure 4-94 OAM: Configure: MA Navig.: MA-MEP List ID



The MA MEP List window is a graphical user interface for managing MA-MEP List IDs. It features a title bar with a refresh icon and a close button. The main area contains a 'Filtering' section with a 'Show All' dropdown and a 'Search' button. Below this are input fields for 'MD' (1), 'MA Index' (1), 'Show' (1), and 'To' (50). A table displays the results with columns 'Operator Label' and 'Ma Mep List Id'. The table contains three rows of data. At the bottom, there are 'Close' and 'Help' buttons.

Operator Label	Ma Mep List Id
MA#1#1	1
MA#1#1	2
MA#1#1	3

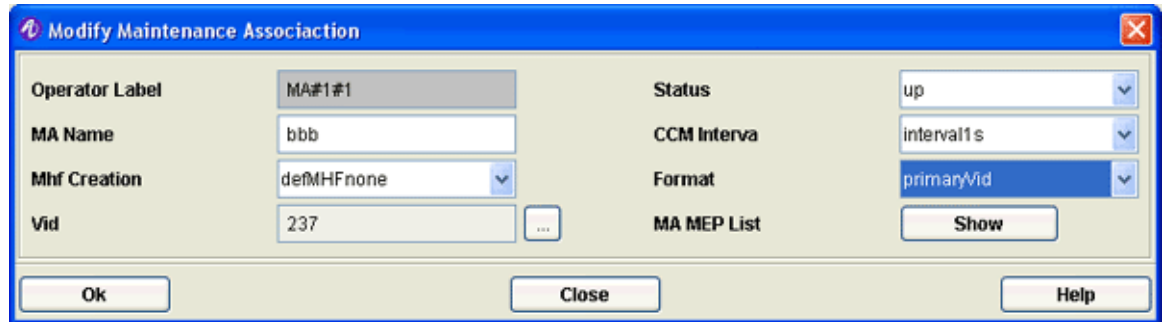
The window in Figure 4-94 permits to search all existing MEP's.

It contains the same fields described for Figure 4-93.

OAM Configure Resource ([Figure 4-82](#)): MA Navig. key ([Figure 4-85](#)): Modify key ([Figure 4-95](#))

(Available after “MA-Creation”, after selecting a “MA” in the table of [Figure 4-85](#))

Figure 4-95 OAM: Configure: MA Navig.: Modify



Operator Label	MA#1#1	Status	up
MA Name	bbb	CCM Interva	interval1s
Mhf Creation	defMHFnone	Format	primaryVid
Vid	237	MA MEP List	Show

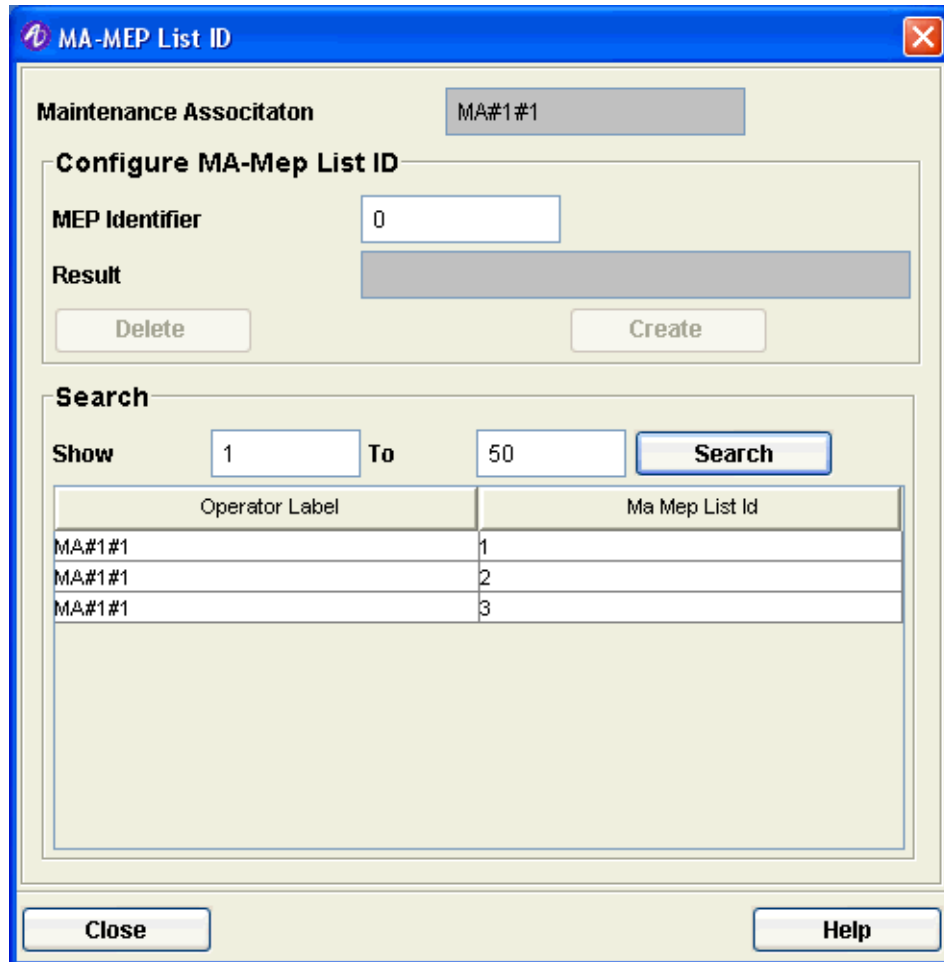
Ok Close Help

The window in [Figure 4-95](#) is very similar to [Figure 4-86](#) (“Create MA”). It permits to modify an existing MA.

Further it contains the key “MA MEP List Show”, that opens a next window as seen in next [Figure 4-96](#).

OAM Configure Resource: MA Navig. key: Modify key: Show key

Figure 4-96 OAM: Configure: MA Navig.: Modify: Show



The dialog box is titled "MA-MEP List ID". It contains the following sections:

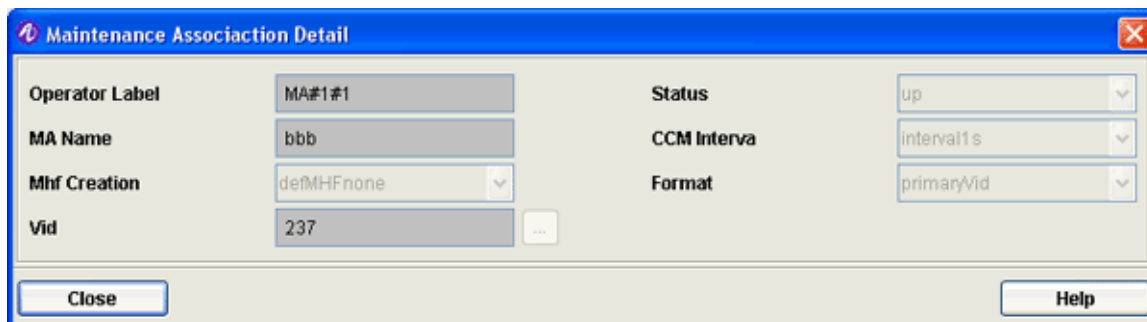
- Maintenance Associaton:** A text field containing "MA#1#1".
- Configure MA-Mep List ID:**
 - MEP Identifier:** A text field containing "0".
 - Result:** A large empty text area.
 - Buttons:** "Delete" and "Create".
- Search:**
 - Show:** A text field containing "1".
 - To:** A text field containing "50".
 - Search:** A button.
 - Table:** A table with two columns: "Operator Label" and "Ma Mep List Id". It contains three rows of data.
- Buttons:** "Close" and "Help".

Operator Label	Ma Mep List Id
MA#1#1	1
MA#1#1	2
MA#1#1	3

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85): Details key (Figure 4-97):

(Available after “MA-Creation”, after selecting a “MA” in the table of Figure 4-85)

Figure 4-97 OAM: Configure: MA Navig.: Details

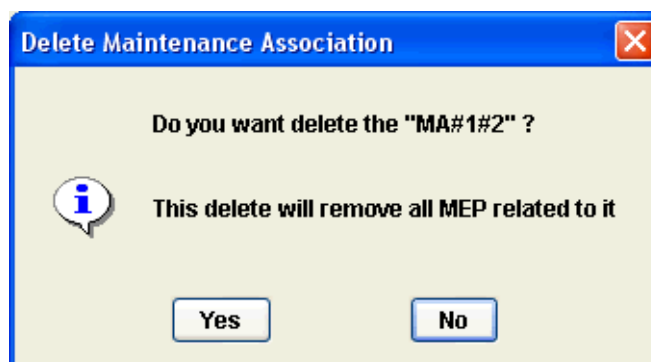


The window in Figure 4-97 permits to get details about the selected MA. It contains the same parameters described for Figure 4-86 (“Create MA”).

OAM Configure Resource (Figure 4-82): MA Navig. key (Figure 4-85): Delete key (Figure 4-98):

(Available after “MA-Creation”, after selecting a “MA” in the table of Figure 4-85)

Figure 4-98 OAM: Configure: MA Navig.: Delete



The window in Figure 4-98 permits to delete the selected MA, and all MEP’s related to it.

OAM Domain: Properties Resources (OAM)

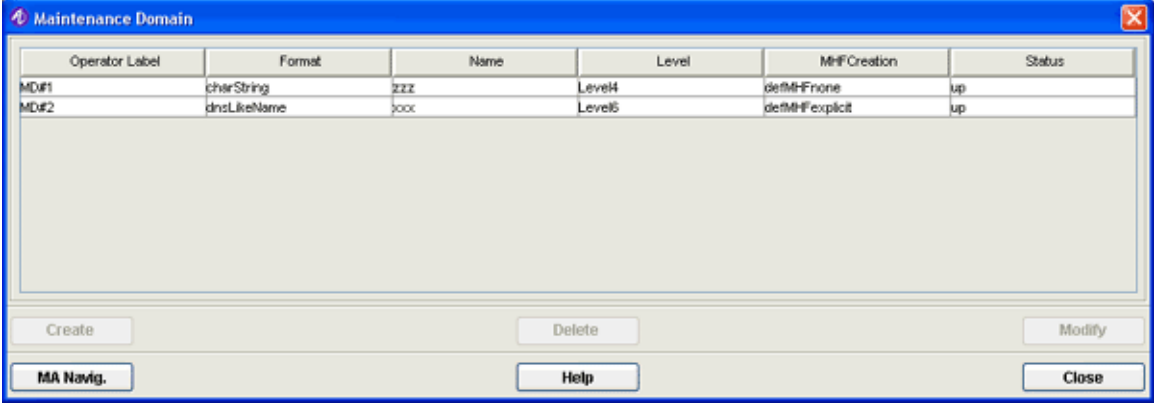
This option is obtained, by selecting in the menu-bar:

“OAM Domain” -> “Properties Resources (OAM)”

An example of the window displayed is reported in [Figure 4-99, \(p. 4-178\)](#).

The function of this option is to show the parameters configured for OAM. It reports, in read-only mode, the same parameters described in [“OAM Domain: Configure Resources \(OAM\)” \(p. 4-163\)](#).

Figure 4-99 OAM: Properties Resources



The screenshot shows a window titled "Maintenance Domain" with a table of OAM properties. The table has six columns: Operator Label, Format, Name, Level, MhFCreation, and Status. There are two rows of data. Below the table, there are buttons for "Create", "Delete", "Modify", "MA Navig.", "Help", and "Close".

Operator Label	Format	Name	Level	MhFCreation	Status
MD#1	charString	zzz	Level4	defMhFnone	up
MD#2	dnsLikeName	xxx	Level5	defMhFexplicit	up

OAM Domain: Configure (OAM)

This option is obtained, by selecting in the menu-bar:

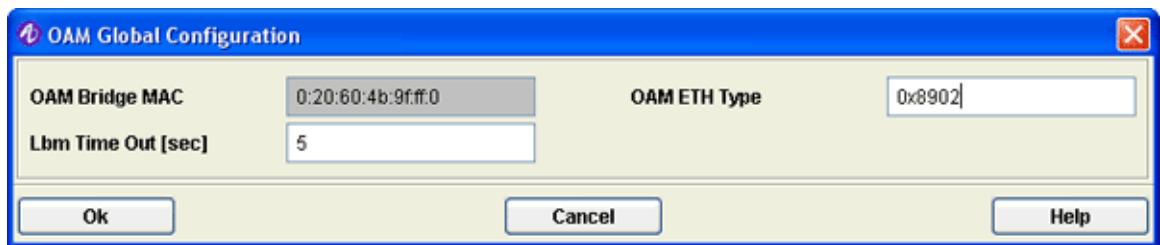
“OAM Domain” -> “Configure (OAM)”

An example of the window displayed is reported in [Figure 4-100](#).

The function of this option is to configure the global OAM parameters for this bridge.

Important! These parameters will be used either for “Standard-OAM” (see [“OAM Domain: Configure Resources \(OAM\)”](#) (p. 4-163)), and for “Proprietary loop-back” (see [“OAM Domain: Configure LoopBack \(OAM\)”](#) (p. 4-181)).

Figure 4-100 OAM: Configure



The window in [Figure 4-100](#) contains the following fields:

- **OAM Bridge MAC:** unique Mac Address for OAM for this bridge, set by the system
- **Lbm Time Out:** number of seconds after which the LoopBack message is considered expired
- **OAM ETH Type:** two-bytes hex value, inserted into OAM PDU frame, after Vlan tag. Its default value is **“8902”**

Click on **Ok** key to confirm the inserted values.

OAM Domain: Properties (OAM)

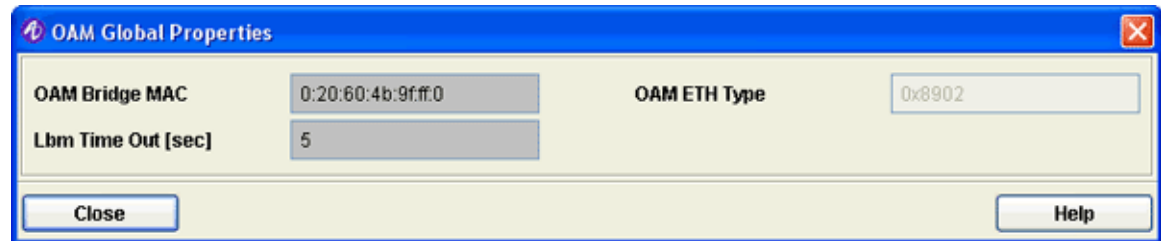
This option is obtained, by selecting in the menu-bar:

“OAM Domain” -> “Properties (OAM)”

An example of the window displayed is reported in [Figure 4-101](#).

The function of this option is to show, in read-only mode, the configured parameters, described in [“OAM Domain: Configure \(OAM\)”](#) (p. 4-179).

Figure 4-101 OAM: Properties



OAM Domain: Configure LoopBack (OAM)

This option is obtained, by selecting in the menu-bar:

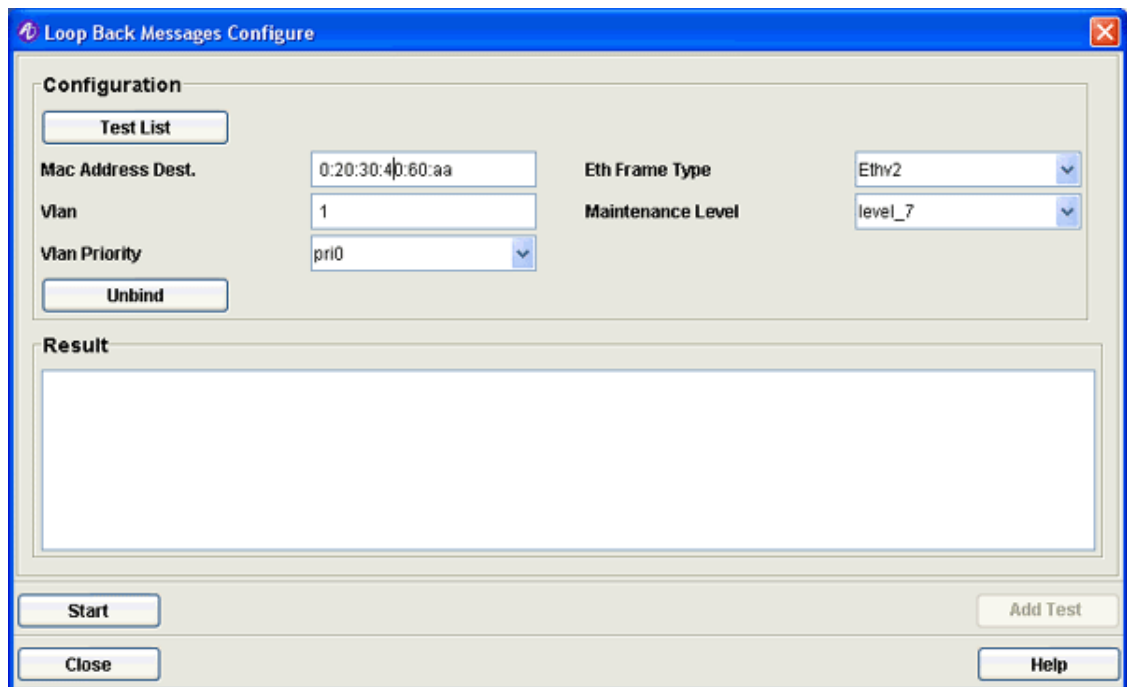
“OAM Domain” -> “Configure Loop Back (OAM)”

An example of the window displayed is reported in [Figure 4-102](#).

The function of this option is to configure a “Proprietary Loop Back”. These parameters are thus independent from configurations described in [“OAM Domain: Configure Resources \(OAM\)”](#) (p. 4-163). The only parameters used here will be those ones set as seen in [“OAM Domain: Configure \(OAM\)”](#) (p. 4-179) (“Global OAM Configuration”).

This proprietary LB differs from the standard LB, because this is done per NE-bridge basis, while the standard one is performed per interface basis. Further, the present one does not need any MD and MA and MEP definitions.

Figure 4-102 OAM: Configure LoopBack



The window in [Figure 4-102](#) contains the following fields:

- **MAC Address Dest.:** MAC address of remote NE to be reached. Note: this parameter can be read in the (global) “OAM Properties” of the far bridge to be reached, as seen in [Figure 4-101](#), (p. 4-180).
- **Vlan :** Vlan to be used for this OAM PDU messages.



WARNING

This Vlan must be registered on ports to be used for OAM purposes.

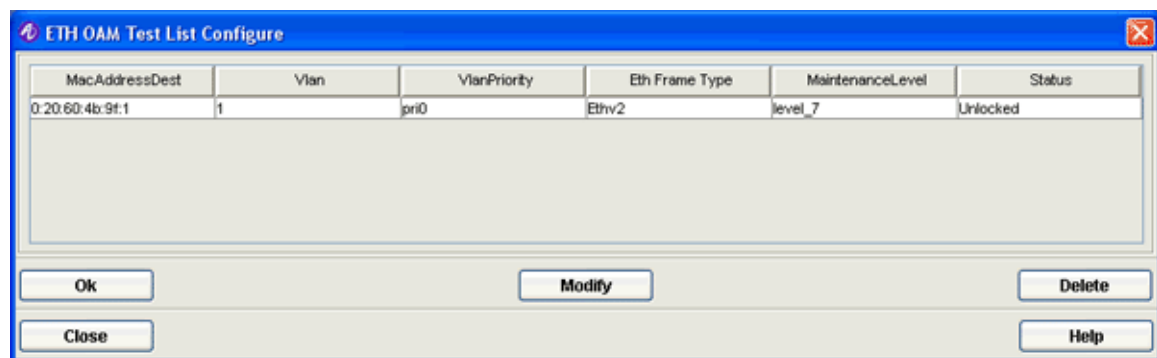
- **Vlan Priority:** priority to be used for this OAM message
- **EthFrame Type:** Possible pull-down values: “*Ethv2*”/“*LLC SNAP*”
- **Maintenance Level:** MD Level. Possible values: *Level0* to *Level7* (default is *7*).

The window contains further the following keys:

- **Unbind:** this button can be used to disassociate the Vlan that was bound to this LoopBack test message.
- **Start:** this button is used to launch this LoopBack test message.
- **Add Test:** this button is used to save the parameters of this LB test into the “Test List”.
- **Test List:** this button permits to get the list of the executed tests, available only if saved by means of previous “Add Test” key. It opens the window reported in [Figure 4-102, \(p. 4-181\)](#).

Click on **Start** key to initiate this LB message.

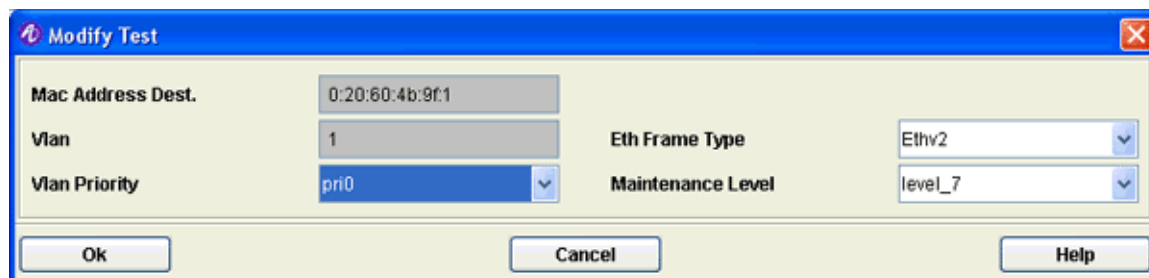
Figure 4-103 OAM: Configure Loop Back: Test List



This window in [Figure 4-103](#) contains the list of executed LB tests, available only if saved by using “**Add Test**” key seen in [Figure 4-102, \(p. 4-181\)](#).

It contains further the following keys:

- **Ok:** this button permits to get the parameters of the selected LB test, transferring the selected parameters into the previous window [Figure 4-102, \(p. 4-181\)](#).
- **Modify:** it permits to change some parameters for the selected LB test. It opens the window reported in [Figure 4-104](#).
- **Delete:** this button is used to delete the selected LoopBack test.
- **Close:** this button is used to close this window without doing any operation.
- **Help:** this button is used to get help about the present function.

OAM Configure LoopBack: Test List key: Modify key**Figure 4-104 OAM: Configure Loop Back: Test List: Modify**

Mac Address Dest.	0:20:60:4b:9f:1	Eth Frame Type	Ethv2
Vlan	1	Maintenance Level	level_7
Vlan Priority	pri0		

This window in [Figure 4-104](#) permits to change some parameters relevant to the LB-Test selected in [Figure 4-103](#), (p. 4-182). Test parameters are described within previous [Figure 4-102](#), (p. 4-181).

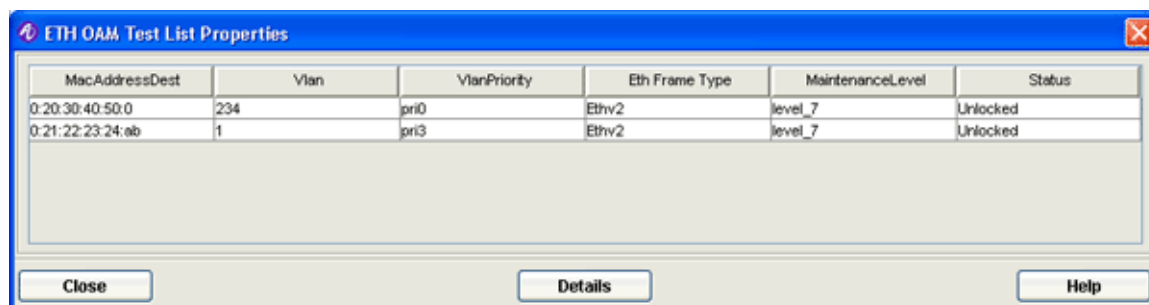
OAM Domain: Loop Back Properties (OAM)

This option is obtained, by selecting in the menu-bar:

“OAM Domain” -> “Loop Back Properties (OAM)”

An example of the window displayed is reported in [Figure 4-105](#).

The function of this option is to show, in read-only mode, the same parameters described in “OAM Domain: Configure LoopBack (OAM)” (p. 4-181), in particular, [Figure 4-102](#), (p. 4-181).

Figure 4-105 OAM: Loop Back Properties

MacAddressDest	Vlan	VlanPriority	Eth Frame Type	MaintenanceLevel	Status
0:20:30:40:50:0	234	pri0	Ethv2	level_7	Unlocked
0:21:22:23:24:ab	1	pri3	Ethv2	level_7	Unlocked

Connection

The Connection application permits to manage all the parameters related to the Connection context.

It can be entered by selecting, in the menu-bar: **“Views” -> “Connection”**, or by clicking on its relevant tab of the main view.

Note: All the dialog windows described in this handbook are reported in “FullWindow” mode, the information fields reported in the “TabbedWindow” mode are the same (see [“Windows Presentation: “FullWindow” and “TabbedWindow””](#) (p. 4-28)).

Connection: Bridge : Filtering Data Base

This option is obtained, after selecting the Switch symbol, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Connection” -> “Bridge Management” -> “Filtering Data Base”.

An example of the window displayed is reported in [Figure 4-106](#), (p. 4-188).

The function of this option is to manage the Filtering Data Base (FDB) Table, such as: **“Dynamic Filtering”**, **“Static Unicast Filtering”**, **“Static Multicast Filtering”**, **“Dynamic Multicast Filtering”**.

The FDB reports the bridge instances, i.e. the rules on how and where the afferent ethernet frames have to be forwarded (connected). These rules can be dynamic (i.e. temporary) or static (i.e. permanent). The forwarding rules are associations among MAC-addresses and Ports; the VLAN-Id is used too, in case of Virtual and Provider bridge.

Dynamic Filtering: unknown incoming frames are flooded on all ports of the bridge. When a far station responds back on a port, the bridge “learns” that frames having this received VLANID/MAC Address couple have to be forwarded to that port. This connection is written on the FDB table. These instances are temporary and are deleted, after passing the ageing time.

Static Filtering: the forwarding (or connection) instances are manually entered by the operator and are permanent.

Furthermore, the FDB instances may be **“Unicast”** (incoming frames are relayed only towards one Port), or **“Multicast”** (incoming frames are relayed towards two or more egress Ports).

The following parameters are listed : **“VLANID”**, **“Port”**, **“MAC Address”**, **“Status”**.

It reports the bridging instances learned by means of the “auto-learning” process, i.e. a mapping between Ports and VID/MAC Addresses. Further it reports the “permanent” (Static) bridging instances, manually set by the operator.

To manage the Filtering Data Base, fill fields and areas as follows:

- **Dynamic Filtering Database** sector:
 - **VLANID**: applicable only in case of Virtual or Provider Bridge (fixed to **1** in case of MAC Bridge); it is the VLAN identifier whose incoming frames are to be bridged to the relevant associated port.
 - **Port**: this is the target Port for the associated VLANID and MAC-Address
 - **MAC Address**: MAC Address whose incoming frames are to be bridged to the relevant associated port.
 - **Status**: it indicates the status of this entry. Possible values:
 - *learned* - the corresponding FDB instance was learned, and is being used.
 - *mgmt* - the corresponding FDB instance is also contained in the Static FDB
 - *invalid* - the corresponding FDB instance is no longer valid (e.g., it was learned, but aged-out), but has not yet been flushed from the table.
 - *Self* - the corresponding FDB instance represents one of the bridge's addresses.
 - *Permanent* - the corresponding FDB instance has been created in static mode.
 - *Other* - the corresponding FDB instance does not fall into any of the above cases.
 - **Ageing Time**:

This sector permits to set the “Ageing Time” of each single item in the FDB table, after selecting the relevant row of the displayed table. After this time, the item of the FDB table that reached this age is removed. Measurement unit in seconds.
Range: **10** s to **1000000** s (recommended value **300s**), granularity 1 s.

To set this parameter, type a value (or select it from the pull-down menu) in the “Ageing Time” field and then click on the “**Set Ageing Time**” key.
 - **Total MAC learned**:

This field shows the number of MAC addresses learned (after “Search”).
 - **Detail (MAC Status)**:

This key permits to get information about the status of a learned MAC selected in the table. It displays, after a row selection, the window reported in [Figure 4-108, \(p. 4-189\)](#).
- **Static Unicast Filtering** sector:

The static FDB table is composed by the same parameters as the Dynamic one, but reporting the static instances.

This sector permits to create static bridging connections (called also permanent forwarding instances), in manual mode, after clicking on the “**NEW**” key. The inserted MAC addresses must be Unicast type, otherwise the operation will be refused by the system.

Note: The **MAC address** must be written separating each octet with a colon, e.g.: "28:29:30:aa:bb:cc".

In order to insert a new static forwarding instance:

- click on **"New"** key
- choose, on **"VLANID"** field, the desired value, by means of the pull-down menu (all the registered VLAN's are listed)
- type, on **"MAC ADDRESS"** field, the appropriate MAC Address of one station to be reached by passing through a given port of the bridge. The address must be Unicast type, otherwise it will be refused by the system.
- choose the port on which the frames having the selected VID/MAC Address couple have to be retransmitted, by selecting it on the **"Available"** field and then using the ">>" key for adding it on the **"Allowed To Go To"** field.
- click on **"Apply"** key. At the end the created instance will be displayed on the FDB table.
- **"Available"** field reports all the ETB ports of the ISA Board, that are part of the "MemberSet" associated with the selected VLANID (i.e. registered, see ["Transmission: ISA : Vlan Registration" \(p. 4-110\)](#)). In the MAC-Bridge case, it reports all the ETB ports. The Data Board can be chosen by means of the associated pull-down menu.
- **"Allowed To Go To"** field reports the port (or ports) on which the frames, having a VID/MAC couple as in the entry selected on the table, are allowed to go, after using the ">>" key.

The properties of an entry of the FDB table can be shown: after selecting an entry of the table, the port (or ports) where the related frames are sent is shown on "Allowed To Go To" field.

- **Static Multicast Filtering** sector:

This sector permits to insert, manually, static multicast bridging connections. The inserted MAC addresses must be Multicast type (i.e. with the LSB of the most-significant-octet fixed to 1, or odd values, e.g.: "27:29:30:aa:bb:cc"), otherwise the operation will be refused by the system.

The meanings and operations on this sector are similar as the previously unicast sector, with the difference that here, the incoming relevant frames (associated to the selected VID/MAC Address couple) can be sent to a group of stations and, correspondingly, to a group of ports ("Egress Ports").

- **Dynamic Multicast Filtering** sector, (see [Figure 4-107, \(p. 4-189\)](#)):

It reports the Dynamic-Multicast FDB instances, in particular the IGMP dynamic instances.

-
- **VLANID:** applicable only in case of Virtual or Provider Bridge (fixed to 1 in case of MAC Bridge); it is the VLAN identifier whose incoming frames are to be multicast to the relevant associated ports.
 - **MAC Group Address Destination:** Multicast MAC Address that is associated to a group of ports involved in a Multicast transmission.
 - **GroupStatus:** it indicates the status of this entry Group. Possible values:
 - **RegisterByIcmp** - the corresponding FDB instance was registered for IGMP purposes.
 - **Other** - the corresponding FDB instance does not fall into any of the above cases.
 - **Egress Ports area:**

This area lists the egress Ports towards which the selected Multicast Group entry Frames are sent.

The “**Search**” key causes the searching of the existing bridge instances of the FDB.

The “**Delete**” key deletes the selected bridge instance of the table.

The “**Help**” key gives helps about this function.

The “**Apply**” key is used to create the static bridge instances, as above explained.

After setting all the desired parameters, click on the “**Close**” key to close the dialog window.

Figure 4-106 Filtering Data Base (Virtual Bridge case)

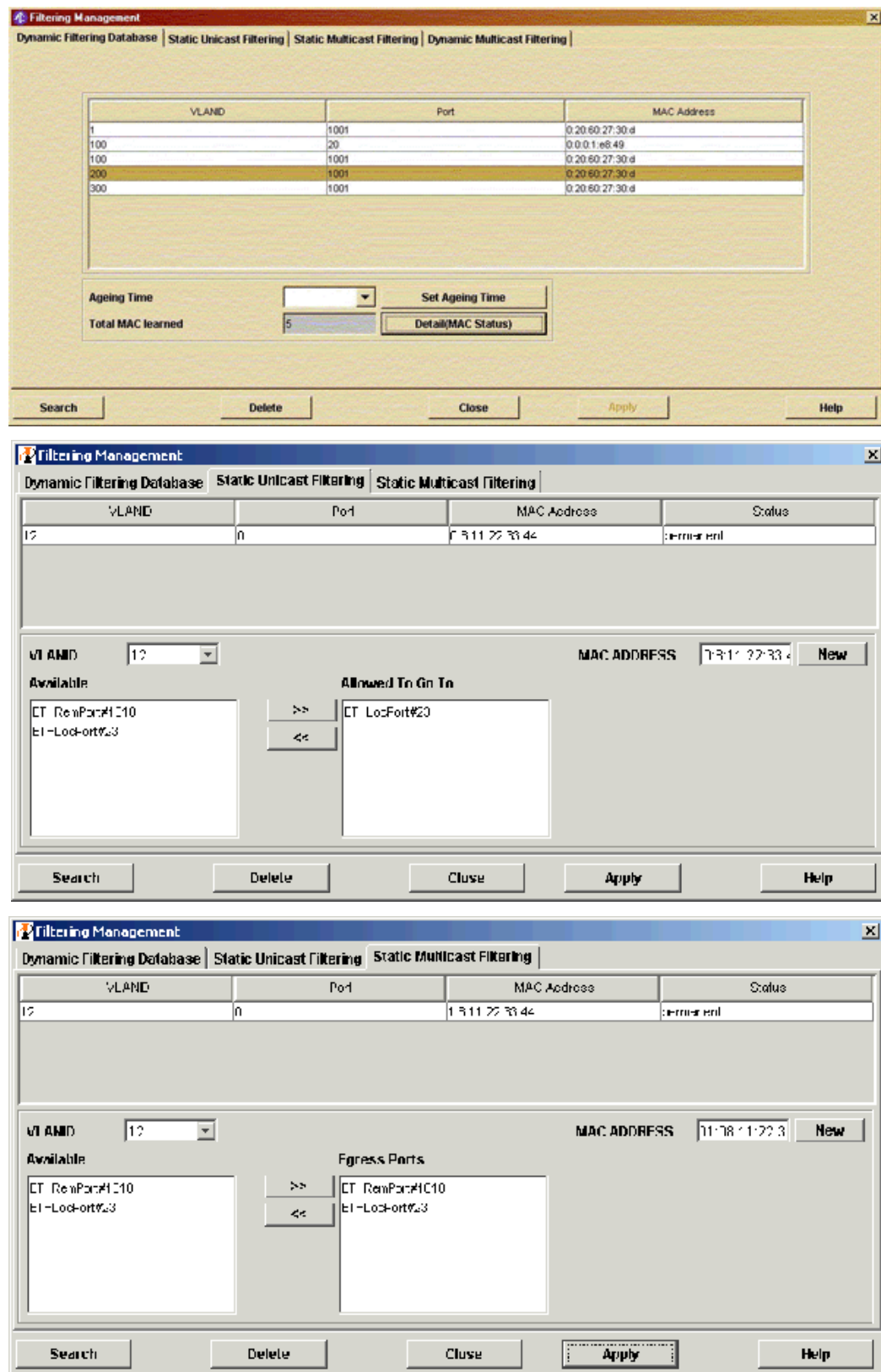


Figure 4-107 Filtering Data Base/Dynamic Multicast Filtering

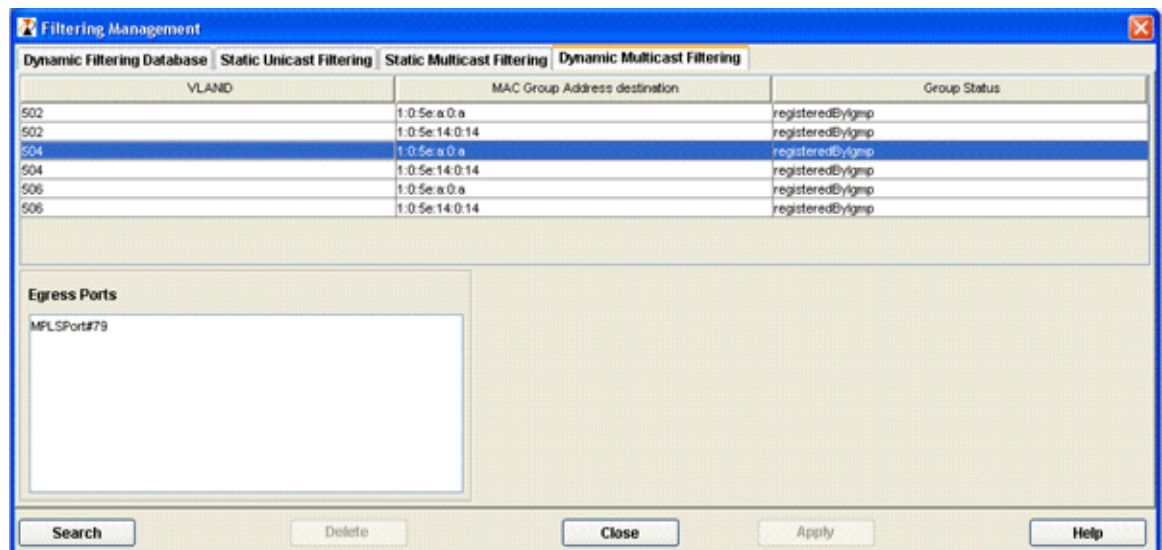
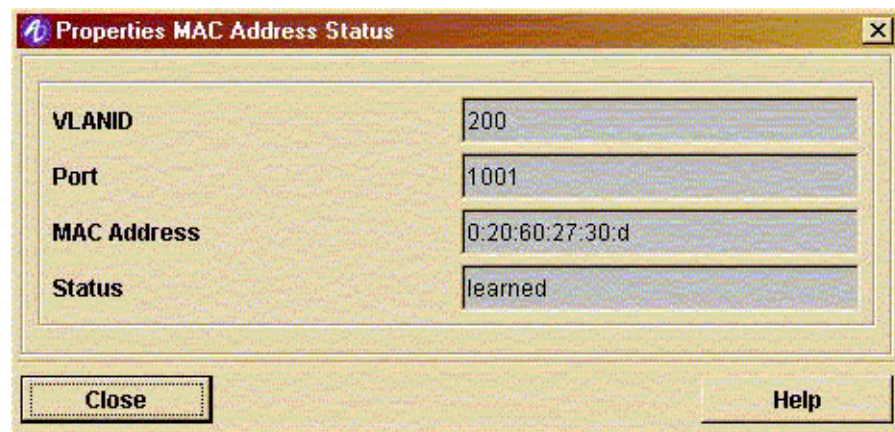


Figure 4-108 Filtering Data Base/Learned Mac Address Details



Ethernet Port: application table in the Connection context

An example of Application Table associated to the EthernetPort is illustrated in [Figure 4-109](#). It is displayed in the area A2, after selecting the EthernetPort in the resource-tree. It reports, in tabular form, the main parameters related to the existing connections into the selected Port:

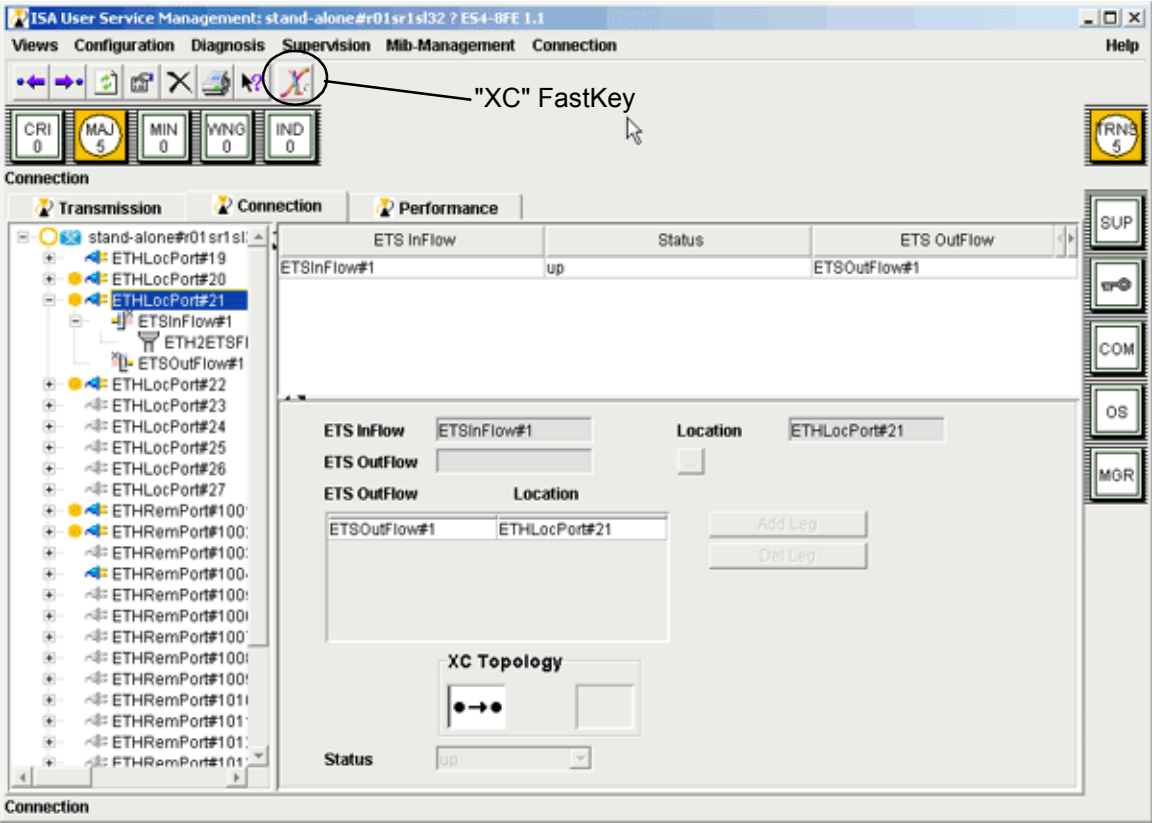
“ETS InFlow”, “Status”, “ETS OutFlow”.

- Note: The Connection view displays in the tool-bar a further fast-key, for quick recalling the EthernetPort option “Create XC One Step”.

Note: In the Connection view the “Bridge” resource displayed into the TREE area is named “Switch”.

The properties of a connection of the table are displayed in the information area (A3), after selecting a row of the table. A pop-up menu, related to the selected resource, can be activated, after selecting an item of the table and pressing the right button of the mouse. The listed parameters, the displayed properties, and the options of the pop-up menu are described in the successive paragraphs.

Figure 4-109 Ethernet Port: Connection application table



Connection: Ethernet Port : Create Ets XC One Step (MAC & Virtual)

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active ETS Ethernet Port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Connection” -> “Ethernet Port Management” -> “Create Ets XC One Step”.

**WARNING**

This option is not available if the Port is ETB type.

This option can also be quickly recalled by the further fast-key added into the tool bar.

This description applies only if the Bridge is MAC or Virtual type (see “Transmission: ISA : Configure ISA” (p. 4-61)); for the Provider bridge case see “Connection: Ethernet Port : Create Ets XC One Step (Provider)” (p. 4-194).

The Remote Ethernet Ports are to be configured and connected also at the sdh side; see OMSN Operator's Handbook listed in Table 1, (pg. 1-xix) for details about SDH configuration and connection.

This connection is possible only if the “Characterization Service” for the two involved ports has been set as “Port-To-Port”: see “Transmission: Ethernet Port : Characterization Service” (p. 4-88).

An application example of MAC or Virtual XC creation is reported in “Ethernet private line (EPL), end-to-end implementation example” (p. 1-21).

An example of the window displayed is reported in Figure 4-110, (p. 4-193).

The function of this option is to create a “One-Step” cross-connection, i.e. the connection point of an ETS EthernetPort in automatic mode, starting from the parent ethernet port (“Ingress”). It can be done for ports not yet containing cross-connected resources (InFlow or OutFlow), as one port is devoted to only one ethernet flow in transparent mode, in current release. Therefore this operation will not be possible if the selected ethernet port contains already connected resources: in this case an error message will be displayed (see Figure 4-111, (p. 4-193)).

The InFlow/Classifier/OutFlow resources will be automatically created with dummy parameters, since the afferent traffic will not be classified nor policed.

To create a “OneStep” connection, fill fields and areas as follows:

- **Port Eth. Ingress:** name of the selected EthernetPort, fixed to “ingress” by the system.
- **Port Eth. Egress:** name of the “egress” EthernetPort

this item is browsed by means of the  key, that recalls the “Search” dialog described in “Views -> Search” (p. 4-29).

-
- **Connection Type:** (settable only after the choice of the above “egress” EthernetPort) possible pull-down options:
 - **UniDirectional:** to create 1 Inflow into the Ingress Port and 1 OutFlow into the Egress Port, unidirectionally connected
 - **BiDirectional:** to create 1 InFlow and 1 OutFlow into the Ingress Port and the same into the Egress Port, bidirectionally connected.
 - **Inflow Section:**
 - **Name Label :** to indicate the user label (optional) of the inflow to be connected;
 - **Name Label BiDirectional :** to indicate the user label (optional) of the second inflow to be bidirectionally connected.

Note: This item will appear only if the bidirectional connection type has been selected.

- **Outflow Section:**
 - **Name Label :** to indicate the user label (optional) of the outflow to be connected;
 - **Name Label BiDirectional :** to indicate the user label (optional) of the second outflow to be bidirectionally connected.

Note: This item will appear only if the bidirectional connection type has been selected.

- **History area:** reporting the operations executed by the program on doing the current connection.

After setting all the desired parameters, click on the “**Apply**” key to set up the cross connection.

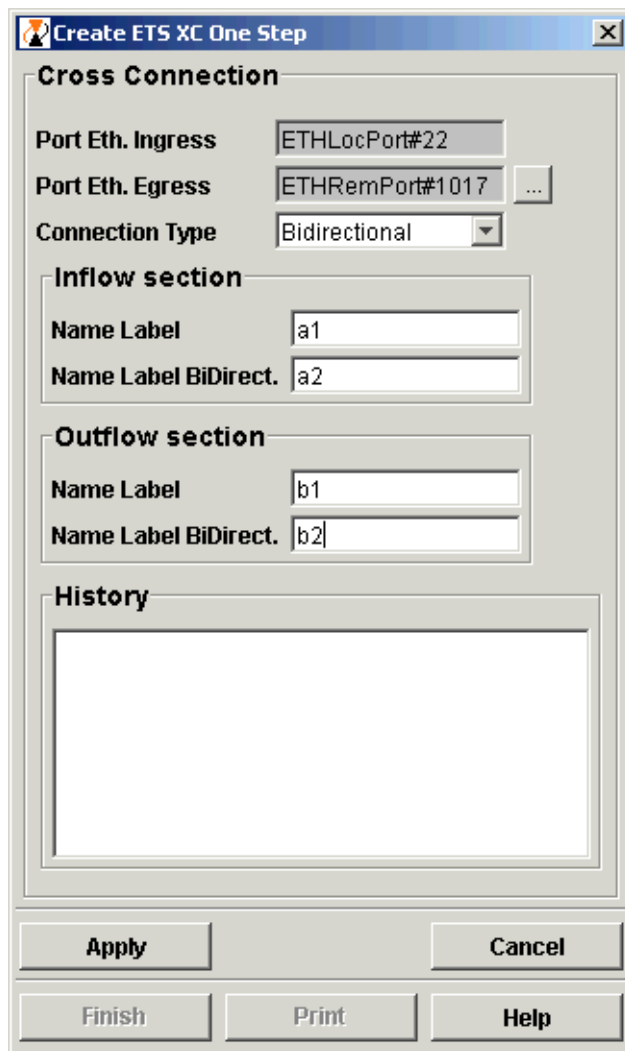
The window will be closed without doing any operation by clicking on “**Cancel**” key.

Once the program executed the requested operations, click on “**Finish**” key to close the dialog window.

The “**Print**” key causes the printing of the operation and its history.

The “**Help**” key gives helps about this function.

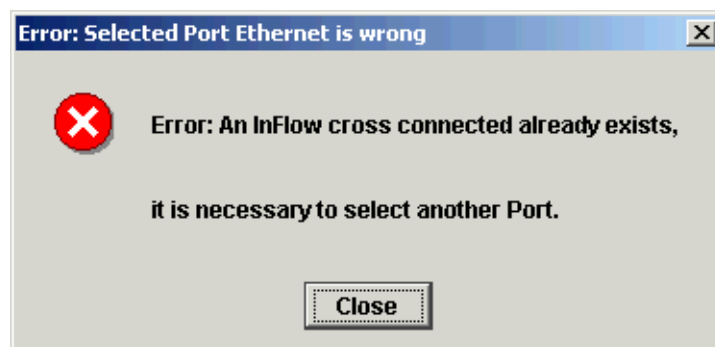
Figure 4-110 Create Ets XC “OneStep”



The dialog box is titled "Create ETS XC One Step". It contains the following sections and fields:

- Cross Connection**
 - Port Eth. Ingress: ETHLocPort#22
 - Port Eth. Egress: ETHRemPort#1017
 - Connection Type: Bidirectional
- Inflow section**
 - Name Label: a1
 - Name Label BiDirect: a2
- Outflow section**
 - Name Label: b1
 - Name Label BiDirect: b2
- History**
 - An empty list box.
- Buttons**
 - Apply
 - Cancel
 - Finish
 - Print
 - Help

Figure 4-111 Error message on “Create Ets XC OneStep”



Connection: Ethernet Port : Create Ets XC One Step (Provider)

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active ETS Ethernet Port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Connection” -> “Ethernet Port Management” -> “Create Ets XC One Step”.



WARNING

This option is not available if the Port is ETB type.

This option can also be quickly recalled by the further fast-key added into the tool bar.

This description applies only if the Bridge is Provider type (see “[Transmission: ISA : Configure ISA](#)” (p. 4-61)); for the MAC or Virtual bridge case see “[Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)](#)” (p. 4-191).

The Remote Ethernet Ports are to be configured and connected also at the sdh side; see OMSN Operator's Handbook listed in [Table 1](#), (pg. 1-xix) for details about SDH configuration and connection.

The Ethernet Ports involved in this XC must have been already declared into the “Member Set” of the VLAN to be associated here (SVID), by means of the “Vlan Registration” described in “[Transmission: ISA : Vlan Registration](#)” (p. 4-110).

The requested “null” Provider Traffic Descriptors must have been already created, with all traffic parameters equal to zero; defining only the “Traffic Type” of the provider connection.

The XC's here created are “unicast” type.

This connection is possible only if the “Characterization Service” for the two involved ports has been set as “Other”: see “[Transmission: Ethernet Port : Characterization Service](#)” (p. 4-88).

An example of Provider domain distribution is illustrated in [Figure 1-7](#), (p. 1-12), an application example of Provider XC creation is reported in “[E-VPL, end-to-end implementation example](#)” (p. 1-27).

An example of the window displayed is reported in [Figure 4-112](#), (p. 4-195).

The function of this option is to create a “One-Step” cross-connection, i.e. the connection point of an ETS EthernetPort in automatic mode, starting from the parent ethernet port (“Ingress”). The Ingress and Egress connection points can also be contained in the same port. The InFlow/Classifier/OutFlow resources will be automatically created by this option.

In order that an ETS port participates to the Provider S-VLAN distribution, an XC involving the provider's resources is necessary, such as UNI/NNI or NNI/UNI, as created by the present procedure.

To create a "OneStep" connection, fill fields and areas as follows (see [Figure 4-112](#)):

- **Topology:** to choose the XC type; possible pull-down options:
 - **Port->Port (p2p):** (not available); to create an XC from an Eth Port to another Eth Port, without involving the Bridge resources; in this case the procedure will continue, after clicking on "Next >>" key, as explained in "[Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)](#)" (p. 4-191). This operation will not be possible if the selected ethernet port contains already connected resources: in this case an error message will be displayed (see [Figure 4-111](#), (p. 4-193)).
 - **UNI->NNI:** to create an XC from a User-Interface to a Network-Interface, where the NNI interface is towards the Bridge domain; in this case the procedure will continue, after clicking on "Next >>" key, as explained in point [a.](#) (p. 4-195)

Note: This "Uni-Nni" procedure provides to create a bidirectional Uni-Nni connection over the same Ets Port.

- **NNI->UNI:** to create an XC from a Network-Interface to a User-Interface, where the NNI interface is towards the Bridge domain; in this case the procedure will continue, after clicking on "Next >>" key, as explained in point [b.](#) (p. 4-198).

Figure 4-112 Topology for "Create Ets XC OneStep" (Provider)



- a. UNI->NNI: refer to [Figure 4-113](#), (p. 4-200):
 - **Port Ingress:** name of the selected EthernetPort, fixed by the system.
 - **Topology XC:** set by the system to the value chosen in the previous window
- **Traffic section:**
 - **Ethernet Traffic Descriptor:** name of the associated "User" traffic descriptor (TD): the key permits to choose and associate a User traffic descriptor to the data flow, recalling the dialog described in "[Configuration -> Traffic Descriptor -> ETS Traffic Descriptor](#)" (p. 4-50).
- **Classifier Section:** parameters meanings and setting are as explained in "Create Eth2ETS Classifier", see "[Transmission: ETS InFlow : Create Eth2ETS Classifier](#)" (p. 4-101).

Important! Some of the following fields will be /(will not be) displayed, depending on the option selected in the field “Topology Class”:

- **Topology Class** : possible options:
- **VLAN+PRIO+EthType**: in this case, the following parameters will be displayed, and thus editable: “Vlan” / “MaxVlan”, “Prio” / “MaxPrio”, “EthType”
- **VLAN+PRIO**: in this case, the following parameters will be displayed, and thus editable: “Vlan” / “MaxVlan”, “Prio” / “MaxPrio”
- **VLAN+IP_DSCP**: in this case, the following parameters will be displayed, and thus editable: “Vlan” / “MaxVlan”, “IpDSCP” / “MaxIpDSCP” (Dscp range is 0 to 63)
- **VLAN/No_Ip+EthType**: in this case, the following parameters will be displayed, and thus editable: “Vlan” / “MaxVlan”, “EthType” (EthType is without IP values)
- **VLAN/No_Ip**: in this case, the following parameters will be displayed, and thus editable: “Vlan” / “MaxVlan”, (EthType is fixed without IP values)
- **Untagged+EthType**: in this case, the following parameters will be displayed, and thus editable: “EthType”; the other parameters will be fixed to set the frame as “untagged”
- **Untagged/No_IP+EthType**: in this case, the following parameters will be displayed, and thus editable: “EthType” (without IP values); the other parameters will be fixed to set the frame as “untagged”
- **Untagged/No_IP**: in this case, no parameters will be displayed: the parameters will be fixed to set the frame as “untagged”, and without IP values
- **Untagged+Ip_DSCP**: in this case, the following parameters will be displayed, and thus editable: “IpDSCP” / “MaxIpDSCP”; the other parameters will be fixed to set the frame as “untagged”
- **Untagged**: in this case, no parameter is displayed. The parameters will be fixed to set the frame as “untagged”
- **Default**: in this case, no parameter is displayed. The parameters will be fixed to set the frame as “dontCare”

the  key opens [Figure 4-114, \(p. 4-200\)](#), permitting to view the “Topology Classification Properties”.

- **Bridge Management section:**

- **Color Profile:** (see “Create ETS InFlow” para. “[Transmission: Ethernet Port: Create ETS InFlow](#)” (p. 4-88). For other details see “[Traffic Descriptor, Forwarding Priority and Class of Service](#)” (p. 4-55)); indicating the name of the association between the VLAN user-priorities and the Provider-VLAN traffic coloring;

Note: If a ColorProfile is associated, the TrafficDescriptor must be “Regulated”, and the “priority” field of the relevant associated Classifier must be different from “untagged” or “don't care”.

the  key permits to choose and associate a color profile, recalling the dialog described in “[Transmission: Ethernet Port: Create InFlow/ColorProfile](#)” (p. 4-91).

the  key gives the properties of the color profile currently associated
the “X” key permits to untie the data flow from the color profile

- **Policing Mode:** to set the policing on the ETS traffic; possible pull-down options:
disabled: the policing is not performed (i.e. all rates are forwarded, if the band is available)
color-blind: the policing is based on the associated TD, without taking into account the user CoS
- **S-VID :** name of the associated “Stacked-VLAN-ID” that will be inserted into the “Provider”-Frame:
the  key permits to choose and associate a VLAN-ID, recalling the dialog as in [Figure 4-115](#), (p. 4-201); that window reports the VLAN’s registered over the involved Ports, permitting to select a VLAN#, and then to associate it by clicking on the “Ok” key.

Note: The ports involved in this XC must have been already declared into the “Member Set” of the VLAN under consideration, by means of the “Vlan Registration” described in “[Transmission: ISA : Vlan Registration](#)” (p. 4-110).

- **Protocol List :** the user can manage the protocol control frames that can pass through this XC:
the  key opens the box as in [Figure 4-116](#), (p. 4-201), that lists all the available protocols (“Bit Name”) and the relevant status; the cells in “List Status” contain a pull-down menu that permits to “enable” or “disable” the access of the corresponding protocol.
the  key permits to view the list of the “Protocols” and their states.

- **User Label section:**

optional name that can be assigned by the user to describe the involved resources.

- **History area:** reporting the operations executed by the program on doing the current connection, after clicking on the “**Apply**” key.

This option will create the following resources:

one ETS InFlow under the Ingress port, with its associated Classifier;

one Provider OutFlow under the Ingress port;

one XC between the ETS InFlow and the Provider OutFlow under the Ingress port;

See more details about the created resources reported in the [Notes about created resources](#): at the end of this paragraph.

- b. **NNI->UNI:** refer to [Figure 4-117, \(p. 4-201\)](#):

- **Port Ingress:** name of the selected EthernetPort, fixed by the system.
- **Topology XC:** set by the system to the value chosen in the previous window

- **Traffic section:**

- **Provider Traffic Descriptor :** name of the associated “Provider” traffic descriptor (TD):

the  key permits to choose and associate a “Provider” traffic descriptor to the data flow, recalling the dialog described in “[Configuration -> Traffic Descriptor -> ETS Traffic Descriptor](#)” (p. 4-50).

Note: In this case the associated TD must be “null”, i.e. with all traffic parameters equal to zero; only the “Traffic Type” must be defined.

- **Bridge Management section:**

- **Policing Mode:** to set the policing on the ETS traffic; possible pull-down options: *disabled*: the policing is not performed (i.e. all rates are forwarded, if the band is available)
- **S-VID :** name of the associated “Stacked-VLAN-ID” that will be inserted into the “Provider”-Frame:

the  key permits to choose and associate a VLAN-ID, recalling the dialog as in [Figure 4-115, \(p. 4-201\)](#); that window reports the VLAN’s registered over the involved Ports, permitting to select a VLAN#, and then to associate it by clicking on the “**Ok**” key.

Note: The ports involved in this XC must have been already declared into the “Member Set” of the VLAN under consideration, by means of the “Vlan Registration” described in “[Transmission: ISA : Vlan Registration](#)” (p. 4-110).

- **User Label section:**

optional name that can be assigned by the user to describe the involved resources.

- **History area:** reporting the operations executed by the program on doing the current connection, after clicking on the “**Apply**” key.

This option will create the following resources:

one ETS InFlow under the Ingress port, with its associated Classifier;

one Provider OutFlow under the Ingress port;

one XC between the ETS InFlow and the Provider OutFlow under the Ingress port;

See more details about the created resources reported in the NOTE at the end of this paragraph.

Notes about created resources:

For the meanings and settings of parameters of the created resources see:

- Create ETS InFlow, para. [“Transmission: Ethernet Port: Create ETS InFlow”](#) (p. 4-88).
- Create ETS OutFlow, para. [“Transmission: Ethernet Port : Create ETS OutFlow”](#) (p. 4-95).
- Create Eth2ETS Classifier, para. [“Transmission: ETS InFlow : Create Eth2ETS Classifier”](#) (p. 4-101).
- Ets XC Properties, para. [“Connection: ETS InFlow : Ets XC Properties”](#) (p. 4-212).
- “CreateProviderInFlow” para. [“Transmission: Ethernet Port: Create Provider InFlow”](#) (p. 4-105) and [“Create Provider InFlow / S-VID Management”](#) (p. 4-107) and also
- “CreateProviderOutFlow” para. [“Transmission: Ethernet Port: Create Provider OutFlow”](#) (p. 4-108), (for more details about “S-VID”)

The properties of the created resources (In/Out-Flows, Classifier, Ets-XC, etc.) are illustrated in their relevant paragraphs of this handbook.

After setting all the desired parameters, click on the “**Apply**” key to set up the cross connection.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The procedure will return to the previous window, if clicking on “<<**Back**” key.

Once the program executed the requested operations, click on “**Finish**” key to close the dialog window.

The “**Print**” key causes the printing of the operation and its history.

The “Help” key gives helps about this function.

Figure 4-113 Create Ets XC “OneStep” (Provider, UNI-NNI)

Create XC One Step

Cross Connection

Port Ingress: ETHLocPort#11
Topology XC: UNI -> NNI

Traffic section

Ethernet Traffic Desc. []

Classifier Section

Topology Class: VLAN+PRIO+EthType
Vlan: 0
Priority: pri0
Max Vlan: 0
Max Priority: 0
Eth Type: IP

Bridge Management

Color Profile: #No Profile
Policing Mode: disabled
S-VID: []
Protocol List: in#1-2-3-4-16-13-17-18

User Label Section

Label Inflow Ethernet: []
Label OutFlow Provider: []

History

[]

Apply Print Cancel
<< Back Finish Help

Figure 4-114 Topology Classification Properties

Topology Information: predefined parameters value

Topology Information

Topology Classification: Default

Vlan	Priority	MaxVlan	MaxPriority	EthType	ClassMode	IpDesc	MaxDesc
4097	dontCare	0	0	dontCare	priority	dontCare	0

Close Help

Figure 4-115 SVID Filter

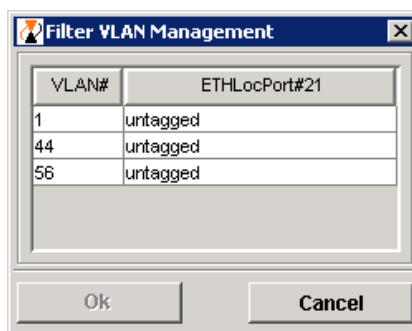


Figure 4-116 Protocol List

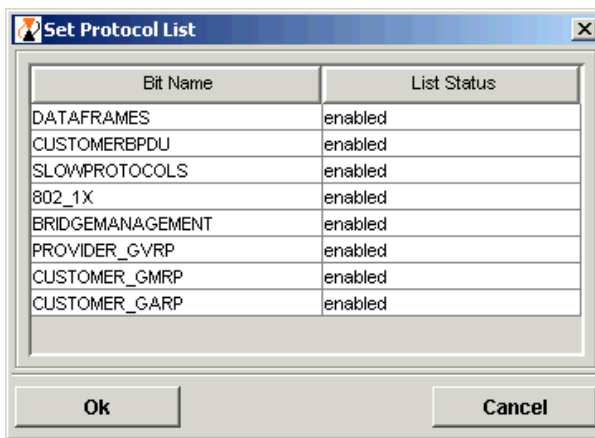
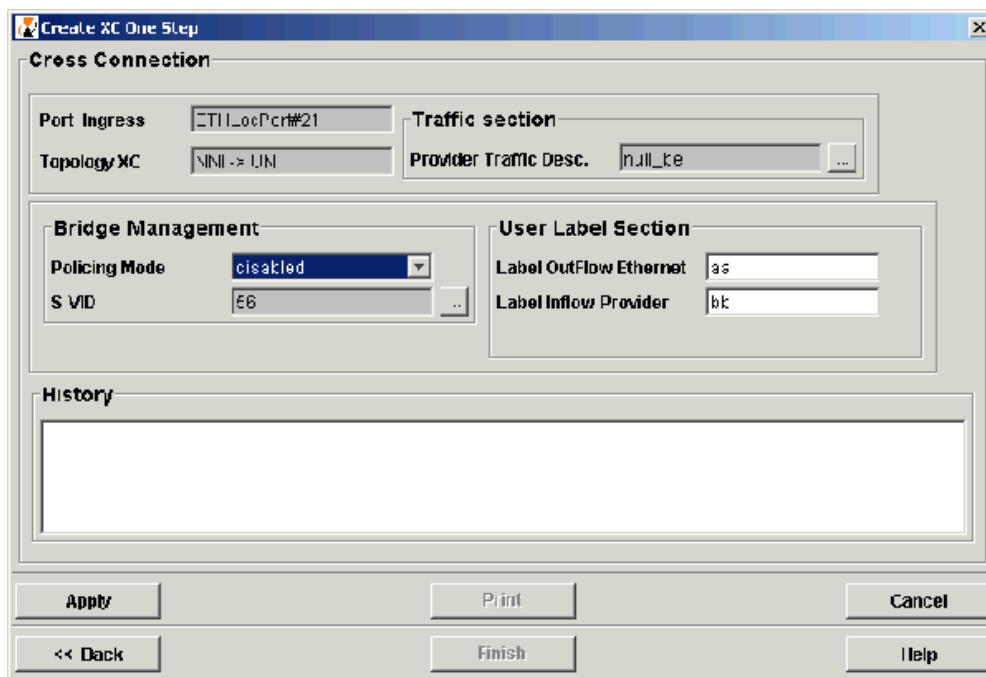


Figure 4-117 Create Ets XC "OneStep" (Provider, NNI-UNI)



Connection: Ethernet Port : Delete Ets XC One Step (MAC & Virtual)

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active ETS Ethernet Port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Connection” -> “Ethernet Port Management” -> “Delete Ets XC One Step”.



WARNING

This option is not available if the Port is ETB type.

This description applies only if the Bridge is MAC or Virtual type (see “Transmission: ISA : Configure ISA” (p. 4-61)); for the Provider bridge case see “Connection: Ethernet Port : Delete Ets XC One Step (Provider)” (p. 4-204).

An example of the window displayed is reported in [Figure 4-118](#), (p. 4-203).

The function of this option is to delete a “One-Step” cross-connection, that was created with the “Create ETS XC OneStep” option detailed in [“Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)”](#) (p. 4-191).

To delete a “OneStep” connection, fill fields and areas as follows:

- **Port Ethernet:** name of the selected EthernetPort, fixed by the system.
- **Connection Type:** (settable only after the choice of the above “egress” EthernetPort). Possible pull-down options:
 - **BiDirectional:** to delete the 1 InFlow and 1 OutFlow into the Ingress Port and also the same ones into the Egress Port, bidirectionally connected.
 - **UniDirectional Egress:** to delete the 1 Inflow into the Egress Port and the 1 OutFlow into the Ingress Port, unidirectionally connected
 - **UniDirectional Ingress:** to delete 1 Inflow into the Ingress Port and the 1 OutFlow into the Egress Port, unidirectionally connected.
- **History area:** reporting the operations executed by the program on doing the current deletion.

After setting all the desired parameters, click on the “**Apply**” key to delete the cross connection.

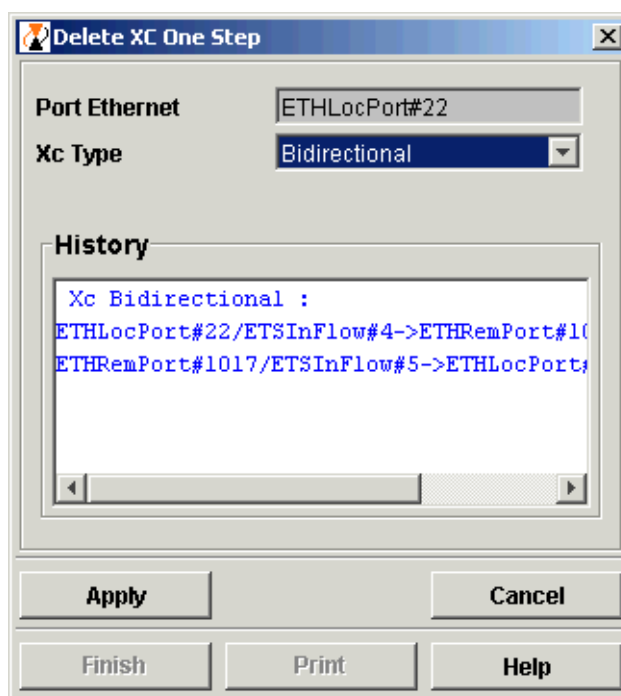
The window will be closed without doing any operation by clicking on “**Cancel**” key.

Once the program executed the requested operations, click on “**Finish**” key to close the dialog window.

The “**Print**” key causes the printing of the operation and its history.

The “**Help**” key gives helps about this function.

Figure 4-118 Delete Ets XC “OneStep” (MAC & Virtual)



Connection: Ethernet Port : Delete Ets XC One Step (Provider)

Note: Link Aggregation (LAG) is not supported in the current version of ISA-ES4E.

This option is obtained, after selecting an active ETS Ethernet Port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Connection” -> “Ethernet Port Management” -> “Delete Ets XC One Step”.



WARNING

This option is not available if the Port is ETB type.

This description applies only if the Bridge is Provider type (see “Transmission: ISA : Configure ISA” (p. 4-61)); for the MAC or Virtual bridge case see “Connection: Ethernet Port : Delete Ets XC One Step (MAC & Virtual)” (p. 4-202).

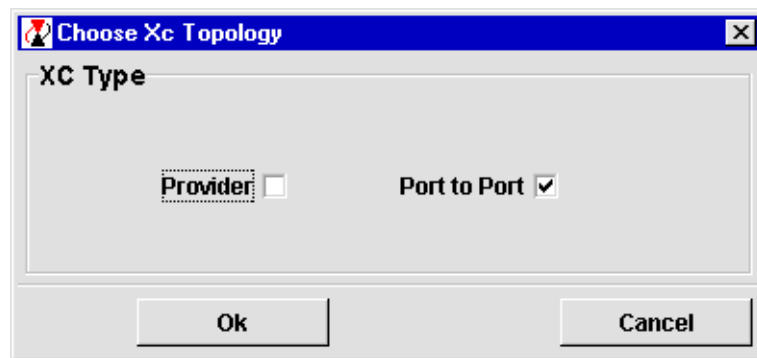
An example of the window displayed is reported in [Figure 4-119](#), (p. 4-205).

The function of this option is to delete a “One-Step” cross-connection, that was created with the “Create ETS XC OneStep” option detailed in [“Connection: Ethernet Port : Create Ets XC One Step \(MAC & Virtual\)”](#) (p. 4-191) or para. [“Connection: Ethernet Port : Create Ets XC One Step \(Provider\)”](#) (p. 4-194).

To delete a “OneStep” connection, fill fields and areas as shown in [Figure 4-119](#), (p. 4-205):

- **XC Type:** to choose the XC type; possible options:
 - **Port to Port:** to delete an XC from an Eth Port to another Eth Port; in this case the procedure will continue, after clicking on “Ok” key, as explained in [“Connection: Ethernet Port : Delete Ets XC One Step \(MAC & Virtual\)”](#) (p. 4-202).
 - **Provider :** to delete an XC in case the bridge is “Provider” type in this case the procedure will continue, after clicking on “Ok” key, towards three different windows, depending on the choice of the parameter “XC Topology”:
 - point [a. \(p. 4-205\)](#), if “XC Topology” is UNI->NNI.
 - point [b. \(p. 4-205\)](#), if “XC Topology” is NNI->UNI.

Figure 4-119 Topology for Delete Ets XC “OneStep” (Provider)



- a. “XC Topology”= “UNI->NNI” : refer to [Figure 4-120, \(p. 4-206\)](#):
 - **Ethernet Port Ingress**: name of the selected EthernetPort, fixed by the system.
 - **XC Topology**: this parameter impacts on the parameters displayed by the window, as explained before (it can be: *UNI-UNI*, or *UNI-NNI*, or *NNI-UNI*).

After having chosen the above parameters, click on “**Search**” key to search the UNI-NNI cross-connections existing between the indicated ports.

The existing cross-connections will be listed into the “**Active Cross Connections**” area.

Select the XC to be deleted and then click on “**Apply**” key to delete it.

- b. “XC Topology”= “NNI->UNI” : refer to [Figure 4-121, \(p. 4-207\)](#):
 - **Ethernet Port Egress**: name of the selected EthernetPort, fixed by the system.
 - **XC Topology**: this parameter impacts on the parameters displayed by the window, as explained before (it can be: *UNI-UNI*, or *UNI-NNI*, or *NNI-UNI*).

After having chosen the above parameters, click on “**Search**” key to search the NNI-UNI cross-connections existing between the indicated ports.

The existing cross-connections will be listed into the “**Active Cross Connections**” area.

Select the XC to be deleted and then click on “**Apply**” key to delete it.

The other parts of the window are:

- **History** area: reporting the operations executed by the program on doing the current connection.

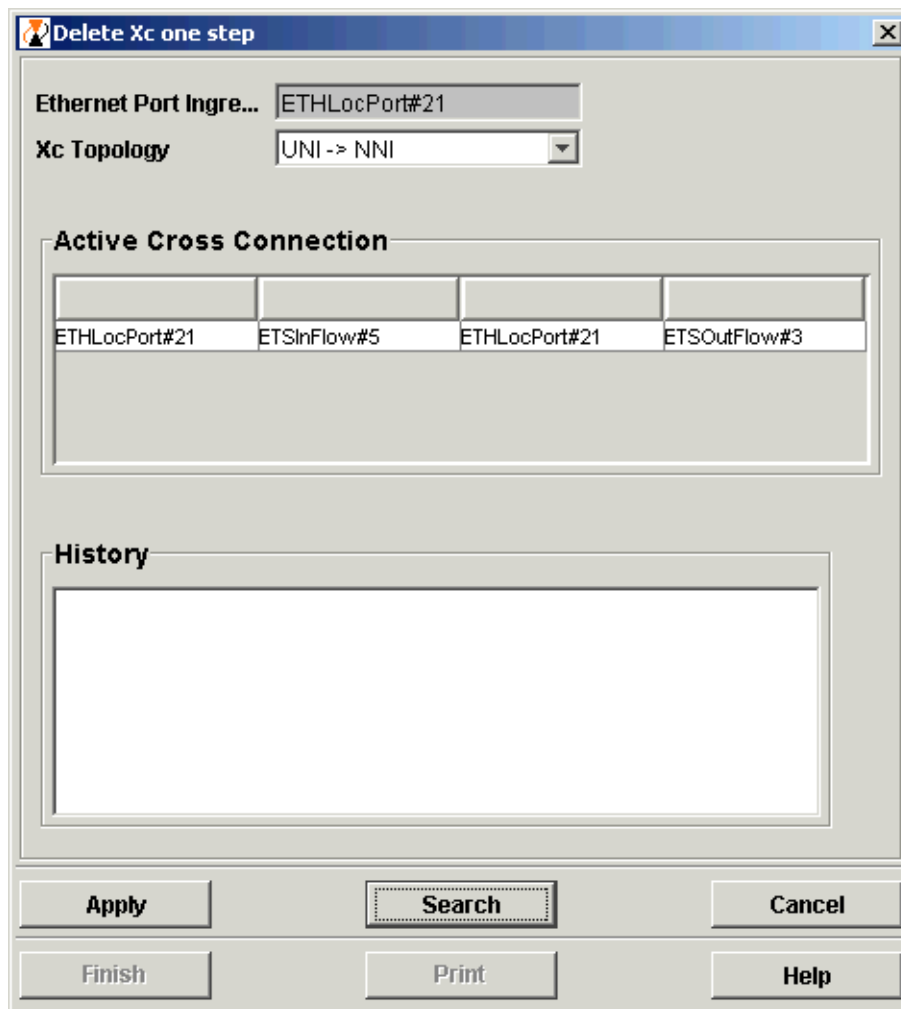
The window will be closed without doing any operation by clicking on “**Cancel**” key.

Once the program executed the requested operations, click on “**Finish**” key to close the dialog **window**.

The “**Print**” key causes the printing of the operation and its history.

The “**Help**” key gives helps about this function.

Figure 4-120 Delete Ets XC “OneStep” (Provider, UNI-NNI)

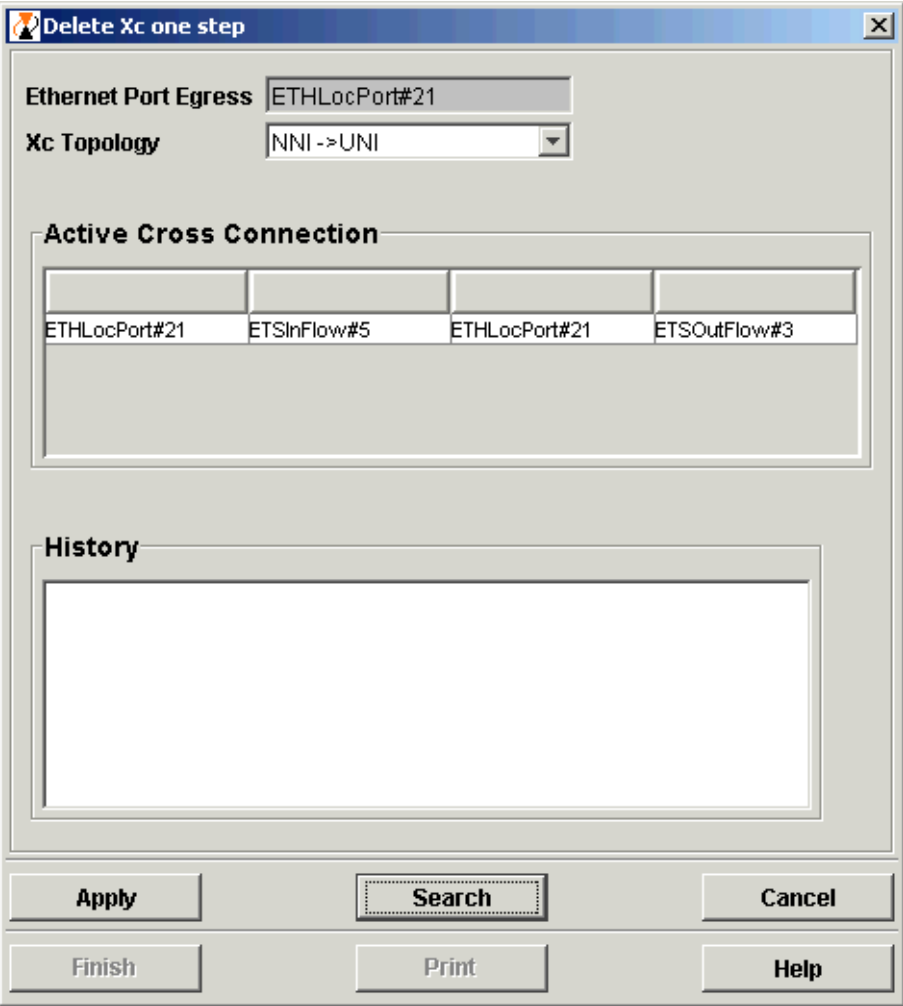


The dialog box titled "Delete Xc one step" contains the following elements:

- Ethernet Port Ingre...**: A text field containing "ETHLocPort#21".
- Xc Topology**: A dropdown menu showing "UNI -> NNI".
- Active Cross Connection**: A table with 4 columns and 1 row of data.
- History**: An empty rectangular box.
- Buttons**: A grid of six buttons: Apply, Search, Cancel, Finish, Print, and Help.

ETHLocPort#21	ETSIInFlow#5	ETHLocPort#21	ETSOOutFlow#3

Figure 4-121 Delete Ets XC “OneStep” (Provider, NNI-UNI)



The dialog box titled "Delete Xc one step" contains the following fields and sections:

- Ethernet Port Egress:** A text field containing "ETHLocPort#21".
- Xc Topology:** A dropdown menu showing "NNI -> UNI".
- Active Cross Connection:** A table with 4 columns and 1 row of data.
- History:** An empty rectangular area for a log.
- Buttons:** "Apply", "Search", "Cancel", "Finish", "Print", and "Help" are located at the bottom.

ETHLocPort#21	ETSIInFlow#5	ETHLocPort#21	ETSOOutFlow#3

Connection: ETS InFlow : Create Ets XC (not operative)

This option is obtained, after selecting an unconnected InFlow point, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Connection” -> “ETS InFlow Management” -> “Create Ets XC”.

**WARNING**

This creation must be done in one single step by means of the Connection wizard: “Create ETS XC One Step”. See “Connection: Ethernet Port : Create Ets XC One Step (MAC & Virtual)” (p. 4-191) and “Connection: Ethernet Port : Create Ets XC One Step (Provider)” (p. 4-194). The scope of this paragraph is to describe the settings, meanings and properties of the resource parameters.

An example of the window displayed is reported in [Figure 4-122](#), (p. 4-210).

The function of this option is to create a unidirectional cross-connection between an InFlow and an OutFlow.

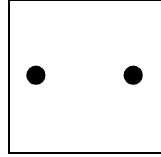
Note: The multicast cross-connection is not yet operative.

To create an ETS connection, fill fields and areas as follows:

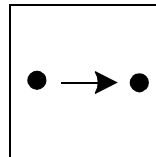
- **ETS InFlow:** indicating the point from which the connection starts (read only field: fixed by the system to the selected InFlow)
- **ETS OutFlow:** to choose the OutFlow point where the connection has to be closed; the syntax of this name has to be in the form: “OutFlow#index”;
the  key permits to choose an OutFlow point (that must be already existing), recalling the “**Search**” dialog described in [“Views -> Search”](#) (p. 4-29). The user can set, on the “**OutFlow**” tab of this dialog, some search criteria (such as “XcStatus”, etc.), to facilitate the search, otherwise the search will be widened on all the existing OutFlow points; the search is carried out by clicking on the “**Search**” key, after which the desired “leg” is set by selecting an item in the search result and then clicking on the “**Apply**” key of the same search window.
- **Add Leg** key: it adds the chosen item typed in the “OutFlow” field into the adjacent list
- **Del Leg** key: it deletes a “leg” selected in the adjacent list
- **XC Topology:** see below
- **Status:** possible pull-down options:
 - **up** : to set the connection in-service (set by the system)
 - **down** : to set the connection out-of-service (not operative).

- **XC Topology** sub-area:

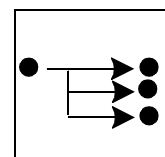
this area contains two figures, the first of which represents the current state of the connection, while the second one its future state, after these under way operations. The meaning of these figures are the following:



Not cross connected points



Unidirectional, unicast
cross connected points



Unidirectional, multicast
cross connected points
(not operative)

Note: The Remote Ethernet Ports are to be configured and connected also at the sdh side; see OMSN Operator's Handbook *listed in Table 1, (pg. 1-xix)* for details about SDH configuration and connection.

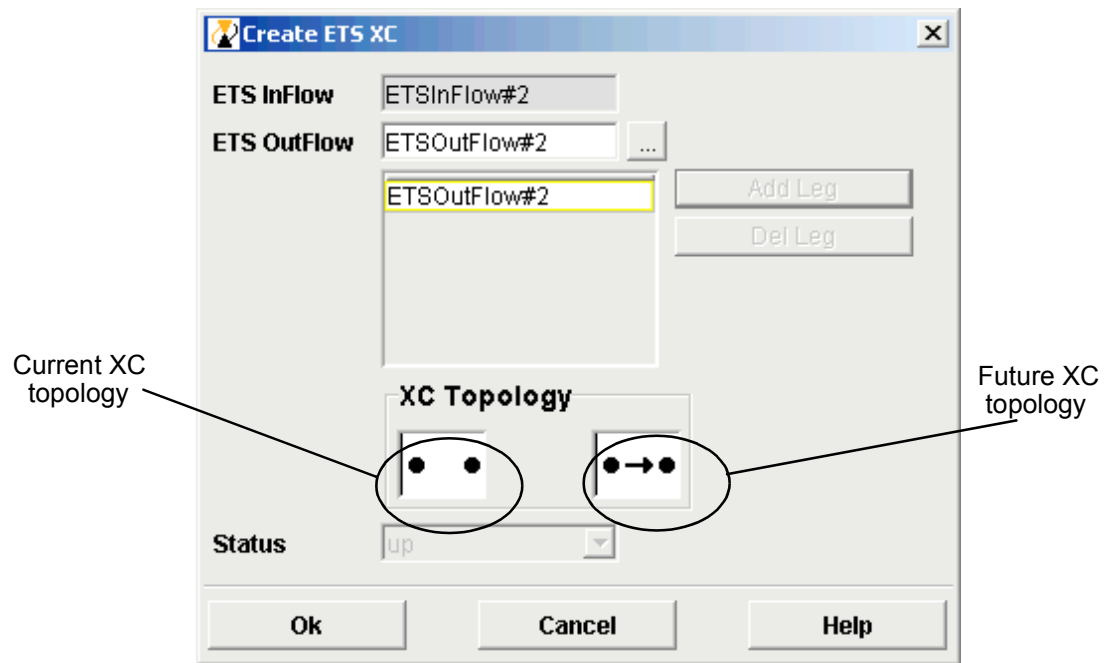
See also point a. and point b. and point C. at the end of this paragraph.

After setting all the desired parameters, click on the “**Ok**” key to set up the cross connection.

The window will be closed without doing any operation by clicking on “**Cancel**” key.

The “**Help**” key gives helps about this function.

Figure 4-122 Create Ets XC



a. CREATING A UNIDIRECTIONAL UNICAST (Point-To-Point) CROSS-CONNECTION

To create this type of connection, simply write (or choose, by means of the [...]) the OutFlow point in the relevant "OutFlow" field, then click on "Add Leg" and then on "Ok".

The involved resources will then be marked, on the TREE area, with an "x", to indicate their cross-connection status.

Please note also that the Rate and the Traffic Descriptor associated to the two involved resources must be coherent, otherwise the XC will not be created (see ["Configuration -> Traffic Descriptor -> ETS Traffic Descriptor"](#) (p. 4-50)).

b. CREATING A UNIDIRECTIONAL MULTICAST (Point-To-MultiPoint) CROSS-CONNECTION (not operative)

To create this type of connection, write (or choose, by means of the [...]) the OutFlow point in the relevant "OutFlow" field and click on "Add Leg", then write (or choose) and add the successive legs in the same way; at the end click on "Ok".

Note: The involved InFlow must have the parameter "FlowType" set to "MulticastOptionA" (see ["Transmission: Ethernet Port: Create ETS InFlow"](#) (p. 4-88)).

Note: The involved OutFlows must belong to different ports (only one leg per Ethernet port)

The involved resources will then be marked, on the TREE area, with an “x”, to indicate their cross-connection status.

Please note also that the Rate and the Traffic Descriptor associated to the involved resources must be coherent, otherwise the XC will not be created (see “[Configuration -> Traffic Descriptor -> ETS Traffic Descriptor](#)” (p. 4-50)).

c. **CREATING A BIDIRECTIONAL UNICAST (Point-To-Point) CROSS-CONNECTION**

To create this type of connection, simply create two Unidirectional connections (as described in point a. (p. 4-210) in the opposite directions.

Please note also that the Rate and the Traffic Descriptor associated to the involved resources must be coherent, otherwise the XC will not be created (see “[Configuration -> Traffic Descriptor -> ETS Traffic Descriptor](#)” (p. 4-50)).

Connection: ETS InFlow : Modify Ets XC

This option is obtained, after selecting a connected InFlow, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Connection” -> “ETS InFlow Management” -> “Modify Ets XC”.

The function of this option is to modify the parameters (such as “*Add Leg*” or “*Del Leg*”) of the selected connected InFlow point.

All the reported information fields and operations are the same as those explained ones for “Create Ets XC”, para. “[Connection: ETS InFlow : Create Ets XC \(not operative\)](#)” (p. 4-208).

Connection: ETS InFlow : Ets XC Properties

This option is obtained, after selecting a connected InFlow, by means of the contextual pop-up menu, or by selecting in the menu-bar:

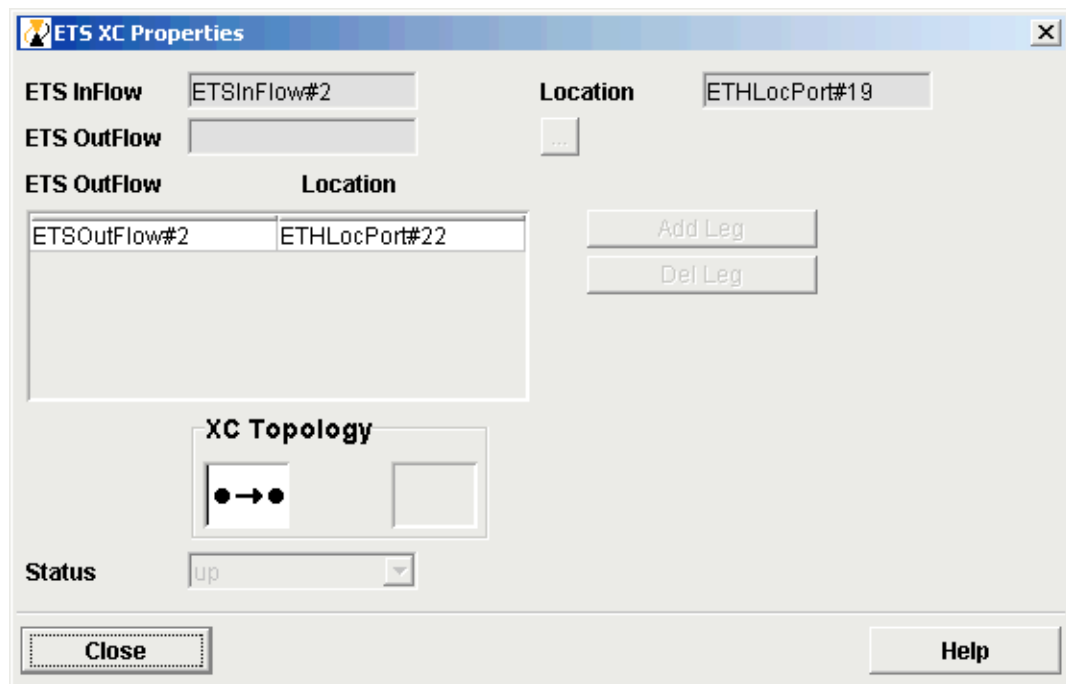
“Connection” -> “ETS InFlow Management” -> “Ets XC Properties”.

An example of the window displayed is reported in [Figure 4-123, \(p. 4-212\)](#).

The function of this option is to show the parameters set for the selected cross-connection.

All the reported information fields are read-only, and the same as those explained ones for “Create Ets XC”, para. [“Connection: ETS InFlow : Create Ets XC \(not operative\)” \(p. 4-208\)](#). Further this properties window reports also the location (i.e. the parent resource) of the resources involved (InFlow, OutFlow), thus facilitating the individuation of their position.

Figure 4-123 Ets XC Properties



Connection: ETS InFlow : Delete Ets XC

This option is obtained, after selecting a connected InFlow point, by means of the contextual pop-up menu, or by selecting in the menu-bar:

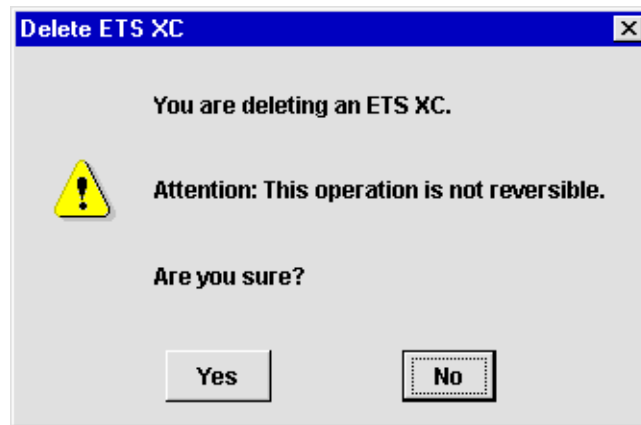
"Connection" -> "ETS InFlow Management" -> "Delete Ets XC".

An example of the window displayed is reported in [Figure 4-124, \(p. 4-213\)](#).

This option permits to delete a selected ETS cross connection.

The XC will be deleted, in all its connected points, after clicking on the **"Yes"** key.

Figure 4-124 Delete Ets XC



Connection: ETS OutFlow : Create Ets XC (not operative)

Connection: ETS OutFlow : Modify Ets XC (not operative)

Connection: ETS OutFlow : Ets XC Properties

This option is obtained, after selecting a connected OutFlow, by means of the contextual pop-up menu, or by selecting in the menu-bar:

"Connection" -> "ETS OutFlow Management" -> "Ets XC Properties".

The function of this option is to show the parameters set for the selected cross-connection.

All the reported information fields are read-only, and the same as those explained ones for InFlow "Ets XC Properties", para. ["Connection: ETS InFlow : Ets XC Properties" \(p. 4-212\)](#).

Connection: ETS OutFlow : Delete Ets XC

This option is obtained, after selecting a connected OutFlow point, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Connection” -> “ETS OutFlow Management” -> “Delete Ets XC”.

The window displayed is similar to that reported in [Figure 4-124, \(p. 4-213\)](#).

This option permits to delete the selected cross-connection.

The XC will be deleted, in all its connected points, after clicking on the **“Yes”** key.

Performance

The Performance application permits to manage all the parameters related to the performance context.

It can be entered by selecting, in the menu-bar: **"Views" -> "Performance"**, or by clicking on its relevant tab of the main view.



WARNING

All the dialog windows described in this handbook are reported in "FullWindow" mode, the information fields reported in the "TabbedWindow" mode are the same (see ["Windows Presentation: "FullWindow" and "TabbedWindow"](#)" (p. 4-28)).



WARNING

The following paragraphs report the terms green, yellow and red. They are the symbolic colors used by the policer/scheduler functions of the system, in order to mark the different priorities of the frames, consequent to the traffic conditions:

- **green:** color of frames to be always relayed
- **yellow:** color of frames to be relayed if the band resource is available
- **red:** color of frames to be discarded



WARNING

*The following paragraphs report the terms **Unicast**, **Multicast** and **Broadcast Frames**:*

- **Unicast Frames:** frames sent to a unique MAC device, having the Mac-Destination Address with LSB of the most-significant-octet different from 1, or even values, e.g.: "28:29:30:aa:bb:cc"
- **Multicast Frames:** frames sent to many MAC devices, having the Mac-Destination Address with LSB of most-significant-octet equal to 1, or odd values, e.g.: "27:29:30:aa:bb:cc"
- **Broadcast Frames:** frames sent to all MAC devices of the network, having the Mac-Destination Address bits equal to all-1 value, e.g.: "ff:ff:ff:ff:ff:ff"

Performance: Mpls Switch: Granularity 15Minutes/1Hour

This option is obtained, after selecting the ES-Switch symbol, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Performance” -> “Mpls Switch Management” -> “Granularity 15 Minutes” or:

“Performance” -> “Mpls Switch Management” -> “Granularity 1 Hour” .

The function of this option is to set the Granularity of the Performance Monitoring (PM) collected data for History Data. The History Data tables are described in [“PM Data Results \(HISTORY and MAINTENANCE\)”](#) (p. 4-226).

To set the granularity, click on the desired item of the displayed menu.

If the **“Granularity 15 Minutes”** has been set (in this case the relevant text of the menu is bold black, and the other one is greyed), the PM History will report the collected data with a 15 minutes granularity (HD-15min). In this case, the history data monitoring are reported over 16 samples; the 17th monitoring sample will be overwritten over the 1st one.

If the **“Granularity 1 Hour”** has been set (in this case the relevant text of the menu is in bold black, and the other one is greyed), the PM History will report the collected data with a 1 hour granularity (HD-1h). In this case, the history data monitoring are reported over 4 samples; the 5th monitoring sample will be overwritten over the 1st one.

Performance: Ethernet Port : Configure Eth. Aggr.

This option is obtained, after selecting an active Ethernet Port (local or remote), by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Performance” -> “Ethernet Port Management” -> “Configure Eth Aggr”.

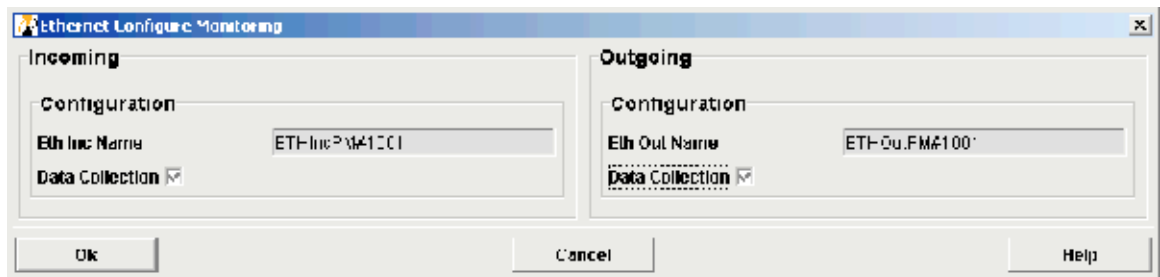
An example of the displayed dialog window is reported in [Figure 4-125, \(p. 4-217\)](#).

The function of this option is to manage the Performance Monitoring (PM) parameters of the selected EthernetPort (local or remote), activating the data collection.

To configure the PM function for an Ethernet Port, fill fields and areas as follows:

- **Incoming** sector (these parameters are relative to the monitoring of the port incoming side):
 - **Eth Inc Name**: name of the selected EthernetPort incoming side (read only field)
 - **Data Collection**: mark this box, in order to start the monitoring. Else, clear this box, in order to stop the monitoring, in this way removing also the PM point.
- **Outgoing** sector (these parameters are relative to the monitoring of the port outgoing side):
 - **Eth Out Name**: name of the selected EthernetPort outgoing side (read only field)
 - **Data Collection**: mark this box, in order to start the monitoring. Else, clear this box, in order to stop the monitoring, in this way removing also the PM point.

Figure 4-125 Ethernet Port Configure Monitoring (example)



Click on “Ok” key to confirm the chosen values. The “Cancel” key aborts the dialog. The “Help” key gives detailed information about this window.

Performance: Ethernet Port : Eth Aggr. Properties

This option is obtained, after selecting a monitored Ethernet Port, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Performance” -> “Ethernet Port Management” -> “Eth Aggr Properties”.

An example of the displayed dialog window is reported in [Figure 4-126, \(p. 4-219\)](#).

The function of this option is to show the Performance Monitoring (PM) parameters and the currently collected values (CD) for the selected Ethernet-Port. All the reported information fields are read-only.

It contains the following information fields:

- **Incoming/Outgoing - Configuration** sectors:
these parameters are the current Eth Port monitoring configuration parameters; their meanings are described in 4.12.2 page 312.
- **Incoming - Information** sector:
these fields indicate the current PM collected values
 - **TRCF**: number of Total Received Correct ethernet Frames
 - **TRCO**: number of Total Received Correct ethernet Octets
 - **TRCF Unicast**: number of Total Received Correct Frames, Unicast type
 - **TRCF Multicast**: number of Total Received Correct Frames, Multicast type
 - **TRCF Broadcast**: number of Total Received Correct Frames, Broadcast type
 - **TDF**: number of Total Discarded ethernet Frames for congestion or policing
 - **TRSEF**: number of Total Received Service Errored ethernet Frames
 - **Start Time**: indicating the time when the performance monitoring was started, as described in [“Performance: Ethernet Port : Configure Eth. Aggr.” \(p. 4-217\)](#).
- **Outgoing - Information** sector:
these fields indicate the current PM collected values
 - **TTF**: number of Total Transmitted ethernet Frames
 - **TTO**: number of Total Transmitted ethernet Octets
 - **TTF Unicast**: number of Total Transmitted Frames, Unicast type
 - **TTF Multicast**: number of Total Transmitted Frames, Multicast type
 - **TTF Broadcast**: number of Total Transmitted Frames, Broadcast type
 - **TDF**: number of Total Discarded ethernet Frames for congestion or policing
 - **Start Time**: indicating the time when the performance monitoring was started as described in [“Performance: Ethernet Port : Configure Eth. Aggr.” \(p. 4-217\)](#).

The **“Reset”** key causes the resetting of the reported values (not operative).

The “**Refresh**” key causes the updating of the reported values.

The “**Close**” key closes the window. The “**Print**” key causes the printing of the reported values. The “**Help**” key gives detailed information about this window.

Figure 4-126 Ethernet Port Monitoring Properties (example)

The screenshot shows the 'Ethernet Properties' dialog box with two main sections: 'Incoming' and 'Outgoing'. Each section has a 'Configuration' area and an 'Information' area.

Incoming Configuration:

- Eth Inc Name: ETHIncPM#65
- Data Collection: ☒

Incoming Information (Current Values):

TRCF	161149476
TRCO	161149476000
TRCFUnicast	0
TRCFMulticast	0
TRCFBroadcast	161149520
TDF	0
TRSEF	0
Start Time	11:28 AM October 29, 2007

Outgoing Configuration:

- Eth Out Name: ETHOutPM#65
- Data Collection: ☒

Outgoing Information (Current Values):

TTF	251940637
TTO	132829401952
TTFUnicast	0
TTFBroadcast	251693334
TTFMulticast	251312
TDF	0
Start Time	11:28 AM October 29, 2007

At the bottom of the dialog are buttons for 'Reset', 'Refresh', 'Close', 'Print', and 'Help'.

PM Data Results (HISTORY and Maintenance)

The history and maintenance monitoring data results are reported in the main view, in the Application-Table-Area (A2), after having selected the EthernetPort in the tree-area (see example reported in “[PM Data Results \(HISTORY and MAINTENANCE\)](#)” (p. 4-226)).

The HISTORY and Maintenance PM data for the Eth Port, reported into the application table area (A2), are detailed in “[Ethernet Port PM data tables \(History and Maintenance\)](#)” (p. 4-229).

Performance: ETS InFlow : Configure InFlow

This option is obtained, after selecting a connected InFlow, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Performance” -> “ETS InFlow Management” -> “Configure ETS InFlow”



WARNING

The selected InFlow has to be already cross-connected, otherwise the PM menu is not active.

An example of the displayed dialog window is reported in [Figure 4-127, \(p. 4-220\)](#).



WARNING

This option is possible only in case of Provider Bridge.

This option is possible only if the InFlow “ServiceType” parameter is “Ethernet”, see “Create ETS InFlow” para. [“Transmission: Ethernet Port: Create ETS InFlow” \(p. 4-88\)](#).

The function of this option is to manage the Performance Monitoring (PM) parameters of the selected InFlow resource: activating the data collection, etc.

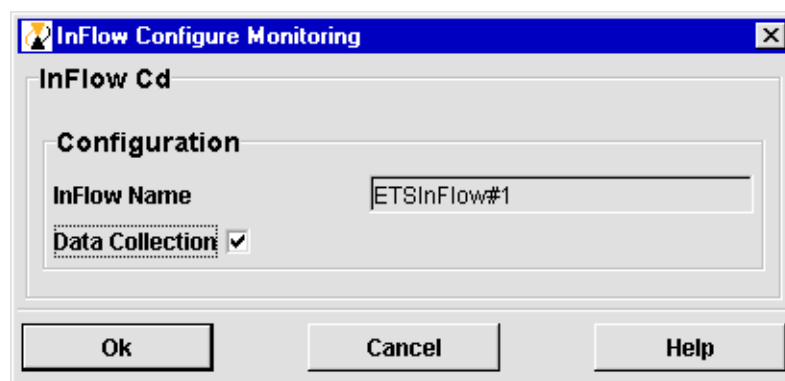
To configure the PM function for an InFlow, fill fields and areas as follows:

- **InFlow Cd - Configuration** sector :

Note: Cd = Current Data

- **InFlow Name:** indicating the name of the selected ETS InFlow (read only field)
- **Data Collection:** mark this box, in order to start the monitoring. Else, clear this box, in order to stop the monitoring, in this way removing also the PM point.

Figure 4-127 InFlow Configure Monitoring (example)



Click on “Ok” key to confirm the chosen values. The “Cancel” key aborts the dialog. The “Help” key gives detailed information about this window.

Performance: ETS InFlow: InFlow Properties

This option is obtained, after selecting a monitored InFlow, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Performance” -> “ETS InFlow Management” -> “ETS InFlow Properties”.



WARNING

The selected InFlow has to be already cross-connected, otherwise the PM menu is not active.



WARNING

This option is possible only in case of Provider Bridge.

This option is possible only if the InFlow “ServiceType” parameter is “Ethernet”, see “Create ETS InFlow” para. “Transmission: Ethernet Port: Create ETS InFlow” (p. 4-88).

An example of the displayed dialog window is reported in [Figure 4-128, \(p. 4-222\)](#).

The function of this option is to show the Performance Monitoring (PM) parameters and the currently collected values for the selected InFlow. All the reported information fields are read-only.

It contains the following information fields:

- **InFlow Cd - Configuration** sector:

Note: Cd = Current Data

these parameters are relative to the current monitoring configuration parameters; their meanings are described in [“Performance: ETS InFlow : Configure InFlow” \(p. 4-220\)](#).

- **InFlow Cd - Information** sector:

these fields indicate the current PM collected values (Cd= Current Data)

- **TRCFg**: number of Total Received Correct ethernet Frames, green colored
- **TRCOg**: number of Total Received Correct ethernet Octets, green colored
- **TRCFy**: number of Total Received Correct ethernet Frames, yellow colored
- **TRCOy**: number of Total Received Correct ethernet Octets, yellow colored
- **Start Time**: indicating the time when the performance monitoring was started, as described in [“Performance: ETS InFlow : Configure InFlow” \(p. 4-220\)](#).

The “Reset” key causes the resetting of the reported values (not operative).

The “Refresh” key causes the updating of the reported values.

The “Close” key closes the window. The “Print” key causes the printing of the reported values. The “Help” key gives detailed information about this window.

Figure 4-128 InFlow Monitoring Properties (example)

Current Values	
TRCFg	0
TRCOg	0
TRCFy	15394229
TRCOy	923653740
Start Time	11:46 AM October 29, 2007

PM Data Results (History and Maintenance)

The history and maintenance monitoring data results are reported in the main view, in the Application-Table-Area (A2), after having selected the ETS InFlow in the tree-area (see example reported in [“PM Data Results \(HISTORY and MAINTENANCE\)”](#) (p. 4-226)).

The HISTORY and Maintenance PM data for the ETS InFlow, reported into the application table area (A2), are detailed in [“ETS InFlow PM data tables - History and Maintenance”](#) (p. 4-233).

Performance: ETS OutFlow: Configure OutFlow (not operative)

This option is obtained, after selecting a connected OutFlow, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Performance” -> “ETS OutFlow Management” -> “Configure ETS OutFlow”.

**WARNING**

The selected OutFlow has to be already cross-connected, otherwise the PM menu is not active.

An example of the displayed dialog window is reported in [Figure 4-129, \(p. 4-223\)](#).

**WARNING**

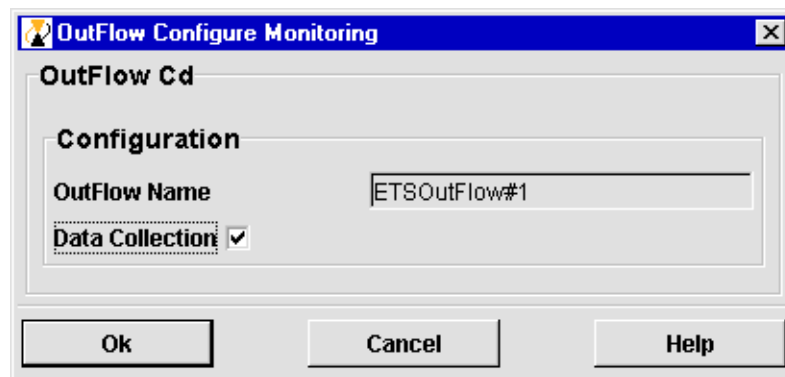
This operation on OutFlow resource is not effective.

The function of this option is to manage the Performance Monitoring (PM) parameters of the selected OutFlow resource: activating the data collection, etc.

To configure the PM function for an OutFlow, fill fields and areas as follows:

- **OutFlow Cd - Configuration** sector : (Cd = Current Data)
 - **OutFlow Name**: indicating the name of the selected ETS OutFlow (read only field)
 - **Data Collection**: mark this box, in order to start the monitoring. Else, clear this box, in order to stop the monitoring, in this way removing also the PM point.

Figure 4-129 OutFlow Configure Monitoring (example)



Click on “Ok” key to confirm the chosen values. The “Cancel” key aborts the dialog. The “Help” key gives detailed information about this window.

Performance: ETS OutFlow: OutFlow Properties (not operative)

This option is obtained, after selecting a monitored OutFlow, by means of the contextual pop-up menu, or by selecting in the menu-bar:

“Performance” -> “ETS OutFlow Management” -> “ETS OutFlow Properties”.

**WARNING**

The selected OutFlow has to be already cross-connected, and with a configured PM, otherwise this PM menu is not active.

This operation on OutFlow resource is not effective.

An example of the displayed dialog window is reported in [Figure 4-130, \(p. 4-225\)](#).

The function of this option is to show the Performance Monitoring (PM) parameters and the currently collected values for the selected OutFlow. All the reported information fields are read-only.

It contains the following information fields:

- **OutFlow Cd - Configuration** sector: (Cd= Current Data)

these parameters are relative to the current monitoring configuration parameters; their meanings are described in [“Performance: ETS OutFlow: Configure OutFlow \(not operative\)” \(p. 4-223\)](#).

- **InFlow Cd - Information** sector:

these fields indicate the current PM collected values (Cd= Current Data)

- **TTFg**: number of Total Transmitted ethernet Frames, green colored
- **TTOg**: number of Total Transmitted ethernet Octets, green colored
- **TTFy**: number of Total Transmitted ethernet Frames, yellow colored
- **TDFg**: number of Total Discarded ethernet Frames, green colored
- **TDFy**: number of Total Discarded ethernet Frames, yellow colored
- **TTOy**: number of Total Transmitted ethernet Octets, yellow colored
- **Start Time**: indicating the time when the performance monitoring was started, as described in [“Performance: ETS InFlow : Configure InFlow” \(p. 4-220\)](#).

The **“Reset”** key causes the resetting of the reported values (not operative).

The **“Refresh”** key causes the updating of the reported values.

The **“Close”** key closes the window. The **“Print”** key causes the printing of the reported values. The **“Help”** key gives detailed information about this window.

Figure 4-130 OutFlow Monitoring Properties (example)

Current Values	
TTFg	0
TTOg	0
TTFy	2232625
TDFg	0
TDFy	0
TTOy	133957500
Start Time	11:48 AM October 29, 2007

PM Data Results (History and Maintenance)

The history and maintenance monitoring data results are reported in the main view, in the Application-Table-Area (A2), after having selected the ETS OutFlow in the tree-area (see example reported in [“PM Data Results \(HISTORY and MAINTENANCE\)”](#) (p. 4-226)).

The HISTORY and Maintenance PM data for the ETS OutFlow, reported into the application table area (A2), are detailed in [“ETS OutFlow PM data tables - History and Maintenance \(not operative\)”](#) (p. 4-235).

PM Data Results (HISTORY and MAINTENANCE)

The history and maintenance monitoring data results are reported in the main view, in the Application-Table-Area (A2), after having selected the relevant resource in the tree-area; as examples see [Figure 4-131, \(p. 4-228\)](#) and [Figure 4-132, \(p. 4-228\)](#).

Important! In the “Performance” application, one further fast key is displayed in the tool-bar: “**PM:Refresh**”, in order to refresh the displayed values. When in “**Graphical Format**” (not operative), three further fast buttons are displayed in the tool-bar: “*GraphicalPM: save an image of the graph*”, “*GraphicalPM: switch between decimal and exponential format*” and “*GraphicalPM: switch between Histogram and Bar representation*”.

Important! The PM Data view will report the “**History Data**” (HD) folders “**HD15m**” or “**HD1h**” depending if the Granularity has been set to 15 minutes or 1 hour (see “[Performance: Mpls Switch: Granularity 15Minutes/1Hour](#)” (p. 4-216)).

Acronyms used in PM views:

CD = Current Data

HD = History Data

The application table area (A2) contains different types of folders:

- **HD 1h/HD 15m**: it means History Data for 1 hour period, (or for 15 minutes, if the granularity was so set). It reports the PM values measured over the entire granularity intervals. This table reports the measured parameters in the last 4 intervals.
In “HD-1h” case, the history data monitoring are reported over 4 samples; the 5th sample will be overwritten over the 1st one.
In “HD-15min” case, the history data monitoring are reported over 16 samples; the 17th sample will be overwritten over the 1st one.
Reported values are the difference between current and previous monitoring period; when the mouse is passed on a value, it pops-up the corresponding absolute value (accumulated since the starting time).
- **HD 24h**: it means History Data for 24 hour period, reported values are absolute values (accumulated since the starting time). This table reports the measured parameters only in the last interval.
- **CD** : it means Current Data. It reports the PM values currently measured up to now, since the PM was started. The monitored data of this view can be updated by clicking on the PM refresh “fast key”.
- **Maintenance** : it reports some monitoring data useful for maintenance operations, such as (examples): total afferent correct frames, errored frames (TRSEF), discarded frames (TDF), frames coloration, etc. Reported values are absolute values. Different monitoring parameters are reported for different resources (see the following sub-paragraphs).

Note: About POLLING: the Maintenance and CD folders display also, in the "Resource Information Area" (A3), a dialog pane in which the user can carry out a sampling in real time of the PM data (polling), by choosing the "**Polling Time**" and the number of samples ("**N. Retries**"), and pressing then on the "**Start Polling**" key. After finishing the collection of the requested number of samples, the polling is automatically stopped, if not yet stopped by the user (by means of the "**Stop Polling**" key).

Further the total polling time is reported in the "**Polling Window**" field.

The polling test can be printed too, by means of the "**Print**" key.

Reported values are the difference between current and previous monitoring period; when the mouse is passed on a value, it pops-up the corresponding absolute value.

The History Data can be displayed either in **tabular** and in **graphical** format.

The choice between tabular and graphical format (not operative) is done by means of the "**Configuration**"-> "**Options**", "**Program**" folder, at the "**Tabular/GraphicalArea**" item, as described in "**Configuration -> Options**" (p. 4-26).

When in "**Graphical Format**" (not operative), the choice between decimal and exponential representation or between histogram and bar representation is done by means of the relevant "fast PM keys" presented in the tool-bar.

An image of the graph (in histogram or bar representation), not operative, can be captured by means of the relevant "*GraphicalPM: save an image of the graph*" fast PM key presented in the tool-bar.

TABULAR format (example)

The view reports (see example in next [Figure 4-131, \(p. 4-228\)](#) and [Figure 4-132, \(p. 4-228\)](#)), in tabular form, the same PM parameters that are described in "[Ethernet Port PM data tables \(History and Maintenance\)](#)" (p. 4-229) for the "EthPort", or para. "[ETS InFlow PM data tables - History and Maintenance](#)" (p. 4-233) for the "InFlow", or para. "[ETS OutFlow PM data tables - History and Maintenance \(not operative\)](#)" (p. 4-235) for the "OutFlow".

Figure 4-131 PM data results (Port example)

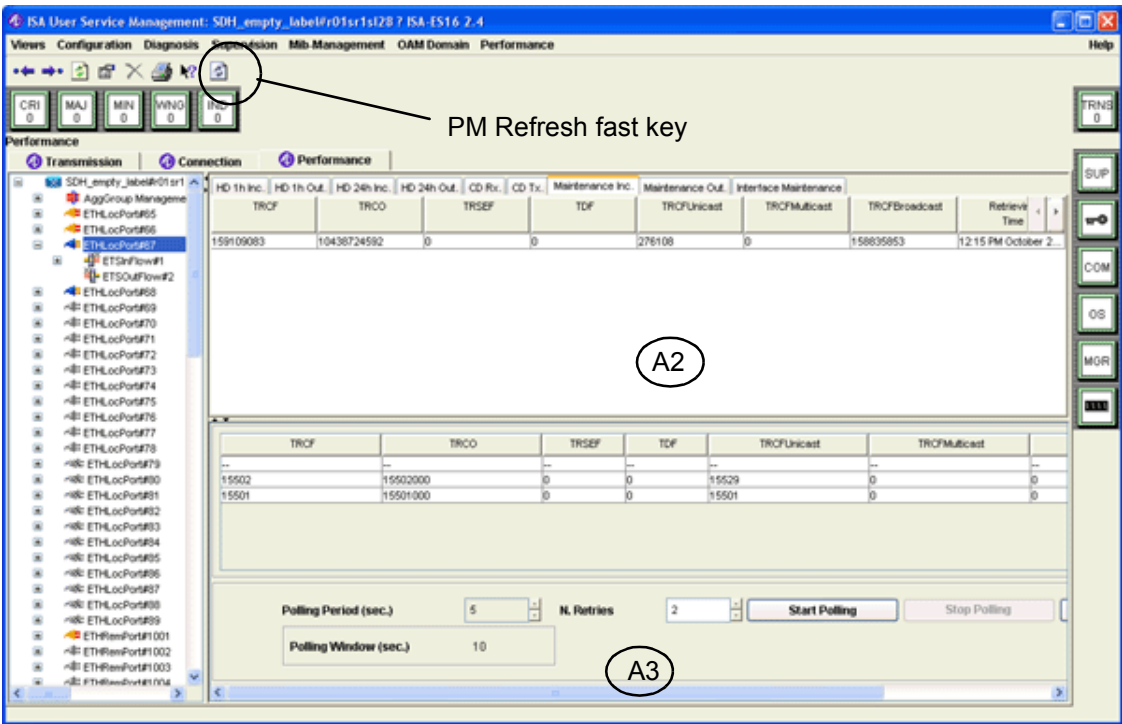
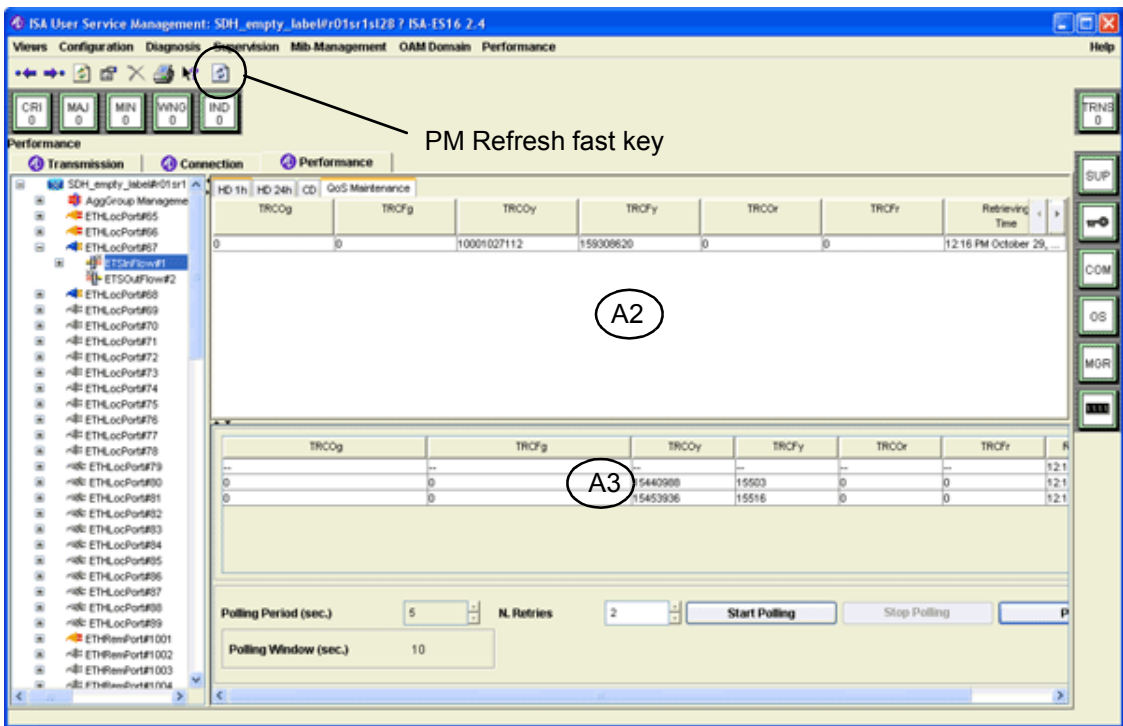


Figure 4-132 PM data results (InFlow example)



Ethernet Port PM data tables (History and Maintenance)



WARNING

The PM Data view will report the “History Data” (HD) folders “HD15m” or “HD1h” depending if the Granularity has been set to 15 minutes or 1 hour (see “Performance: Mpls Switch: Granularity 15Minutes/1Hour” (p. 4-216)).

Acronyms used in PM views:

CD = Current Data

HD = History Data

The application table area (A2) contains, for EthernetPort resources, the following PM data folders:

- **HD1h(15m) Inc., HD1h(15m) Out, HD24h Inc., HD24h Out, CD Rx, CD Tx, Maintenance Inc., Maintenance Out;** the Local ports contain also a folder relevant to the physical interface: **Interface Maintenance**.
- **HD 1h(15m) Inc. /(Out):** It reports the PM values measured over the entire granularity intervals. I.e. the results of the HISTORY collected monitoring data relevant to the 1 hour period (or for 15 minutes, if the granularity was so set), for the Incoming /(Outgoing) side of the port.
- **HD 24h Inc. /(Out) :** it reports the results of the HISTORY collected monitoring data relevant to the 24 hours period, for the Incoming /(Outgoing) side of the port.
- **CD Rx /(Tx) :** It reports the PM values currently measured up to now, since the PM was started. The monitored data can be updated by clicking on the PM Refresh “fast key”. For the Receive and Transmit sides of the port
- **Maintenance Inc. /(Out) :** it reports the results of the Maintenance monitoring data, for the Incoming side /(Outgoing) of the port
- **Interface Maintenance:** (only for Local ports), it reports the results of the Maintenance monitoring data relevant to the local physical interface.

The PM counters displayed in each folder are the following:

- **HD1h Inc. (or HD15m Inc.) folder:**
 - **Index:** number of monitoring interval
 - **Period End Time:** time when interval finished
 - **TRCF:** number of Total Received Correct Frames
 - **TRCO:** number of Total Received Correct ethernet Octets
 - **TRCF Unicast:** number of Total Received Correct Frames, Unicast type
 - **TRCF Multicast:** number of Total Received Correct Frames, Multicast type
 - **TRCF Broadcast:** number of Total Received Correct Frames, Broadcast type
 - **TDF:** number of Total Discarded ethernet Frames for congestion or policing

-
- **TRSEF**: number of Total Received Service Errored ethernet Frames
 - **Start Time**: indicating the time when the performance monitoring was started (by means of “ConfigureAggr.”/”DataCollection”, see [“Performance: Ethernet Port : Configure Eth. Aggr.”](#) (p. 4-217)).
 - **Suspect Interval Flag**: if this value is “true” it means the measurement data is unreliable, if “false” it means the data is reliable.
 - **HD1h Out. (or HD15m Out.) folder**:
 - **Index**: number of monitoring interval
 - **Period End Time**: time when interval finished
 - **TTF**: number of Total Transmitted ethernet Frames
 - **TTF Unicast**: number of Total Transmitted Frames, Unicast type
 - **TTF Multicast**: number of Total Transmitted Frames, Multicast type
 - **TTF Broadcast**: number of Total Transmitted Frames, Broadcast type
 - **TDF**: number of Total Discarded ethernet Frames for congestion or policing
 - **TTO**: number of Total Transmitted ethernet Octets
 - **Start Time**: as above explained
 - **Suspect Interval Flag**: as above explained.
 - **HD24h Inc. folder**:
it contains the same PM parameters as the above explained “**HD1h/15m Inc.**”, but for a 24 h interval.
 - **HD24h Out. folder**:
it contains the same PM parameters as the above explained “**HD1h/15m Out.**”, but for a 24 h interval.
 - **CD Rx folder**:
 - **TRCF**: as above explained
 - **TRCO**: as above explained
 - **TRCF Unicast**: as above explained
 - **TRCF Multicast**: as above explained
 - **TRCF Broadcast**: as above explained
 - **TDF**: as above explained
 - **TRSEF**: as above explained
 - **Start Time**: as above explained

This folder presents also, in the “**Resource Information Area**” (A3), a dialog panel in which the user can carry out a sampling in real time of the PM data (polling); for more details see [“PM Data Results \(HISTORY and MAINTENANCE\)”](#) (p. 4-226).

- **CD Tx** folder:
 - **TTF**: as above explained
 - **TTO**: as above explained
 - **TTF Unicast**: as above explained
 - **TTF Multicast**: as above explained
 - **TTF Broadcast**: as above explained
 - **TDF**: as above explained
 - **TStart Time**: as above explained

This folder presents also, in the “**Resource Information Area**” (A3), a dialog panel in which the user can carry out a sampling in real time of the PM data (polling); for more details see “[PM Data Results \(HISTORY and MAINTENANCE\)](#)” (p. 4-226).

- **Maintenance Inc.** folder:
 - **TRCF**: as above explained
 - **TRCO**: as above explained
 - **TRSEF**: number of Total Received Service Errored Frames
 - **TRCF Unicast**: as above explained
 - **TRCF Multicast**: as above explained
 - **TRCF Broadcast**: as above explained
 - **TDF**: number of Total Discarded Frames for congestion or policing
 - **Retrieving Time**: time of the last PM data refresh

The Maintenance folder presents also, in the “**Resource Information Area**” (A3), a dialog pane in which the user can carry out a sampling in real time of the PM data (polling); for more details see “[PM Data Results \(HISTORY and MAINTENANCE\)](#)” (p. 4-226).

- **Maintenance Out.** folder:
 - **TTF**: as above explained
 - **TTO**: as above explained
 - **TDF**: as above explained
 - **TTF Unicast**: as above explained
 - **TTF Multicast**: as above explained
 - **TTF Broadcast**: as above explained
 - **Retrieving Time**: time of the last PM data refresh dialog panel for PM data sampling (polling): as above explained.
- **Interface Maintenance** folder (only in LocalPorts):

-
- ***Symbol Error***: number of invalid data symbols (due to line code error) received by the port when a valid carrier signal is present; (for 1000Mb/s i/f it is incremented only once per frame, if one or more errors occurred); it is not incremented under a collision event
 - ***Media Available Exits***: number of times the physical medium is not present (LOS event)
 - ***Jabber State Enters***: number of times the physical interface enters in jabber state; i.e. when Ethernet frames are longer than the MTU; (only for 10Mb/s i/f)
 - ***False Carrier***: number of times an invalid carrier signal is received, during IDLE state; (only for 100 or 1000Mb/s interfaces)
 - ***Retrieving Time***: time of the last PM data refresh dialog panel for PM data sampling (polling): as above explained

ETS InFlow PM data tables - History and Maintenance



WARNING

This PM view is effective only if the InFlow “ServiceType” parameter is “Ethernet”, see “Create ETS InFlow” para. [“Transmission: Ethernet Port: Create ETS InFlow”](#) (p. 4-88).



WARNING

The PM Data view will report the “History Data” (HD) folders “HD15m” or “HD1h” depending if the Granularity has been set to 15 minutes or 1 hour (see [“Performance: Mpls Switch: Granularity 15Minutes/1Hour”](#) (p. 4-216)).

Acronyms used in PM views:

CD = Current Data

HD = History Data

The application table area (A2) contains, for InFlow resources, the following PM data folders:

- **HD 1h/(15m)** : it reports the results of the HISTORY collected monitoring data relevant to the 1 hour period (or for 15 minutes, if the granularity was so set).
- **HD 24h** : it reports the results of the HISTORY collected monitoring data relevant to the 24 hours period.
- **CD** : It reports the PM values currently measured up to now, since the PM was started. The monitored data can be updated by clicking on the PM refresh “fast key”.
- **QoS Maintenance** : it reports the results of the Maintenance monitoring data, for the QoS monitoring, with the indications about colorations of the afferent traffic and of the discarded frames.

The PM data counters displayed in each folder are the following:

- **HD1h/(15m)** folder:
 - ***Index***: number of monitoring interval
 - ***Period End Time***: time when interval finished
 - ***TRCFg***: number of Total Received Correct Frames, green colored
 - ***TRCFy***: number of Total Received Correct ethernet Frames, yellow colored
 - ***TRCOg***: number of Total Received Correct ethernet Octets, green colored
 - ***TRCOy***: number of Total Received Correct ethernet Octets, yellow colored
 - ***Start Time***: indicating the time when the performance monitoring was started (by means of “ConfigureInFlow.”/”DataCollection”, see [“Performance: ETS InFlow : Configure InFlow”](#) (p. 4-220)).

-
- **Suspect Interval Flag**: if this value is “true” it means the measurement data is unreliable, if “false” it means the data is reliable.
 - **HD24h** folder:
it contains the same PM parameters as the above explained “HD1h” or “HD15m”, but for a 24 h interval.
 - **CD** folder:
 - **TRCFg**: as above explained
 - **TRCOg**: as above explained
 - **TRCFy**: as above explained
 - **TRCOy**: as above explained
 - **Start Time**: as above explained

This folder presents also, in the “Resource Information Area” (A3), a dialog pane in which the user can carry out a sampling in real time of the PM data (polling); for more details see “[PM Data Results \(HISTORY and MAINTENANCE\)](#)” (p. 4-226).

- **QoS Maintenance** folder:
 - **TRCOg**: as above explained
 - **TRCFg**: as above explained
 - **TRCOy**: number of Total Received Correct ethernet Octets, yellow colored
 - **TRCFy**: number of Total Received Correct Frames, yellow colored
 - **TRCOr**: number of Total Received Correct ethernet Octets, red colored
 - **TRCFr**: number of Total Received Correct Frames, red colored
 - **Retrieving Time**: time of the last PM data refresh

The Maintenance folder presents also, in the “Resource Information Area” (A3), a dialog pane in which the user can carry out a sampling in real time of the PM data (polling); for more details see “[PM Data Results \(HISTORY and MAINTENANCE\)](#)” (p. 4-226).

ETS OutFlow PM data tables - History and Maintenance (not operative)



WARNING

This PM view on OutFlow resource is not effective.

The application table area (A2) contains, for OutFlow resources, the following PM data folders:

- **HD 1h/(15m)** : it reports the results of the HISTORY collected monitoring data relevant to the 1 hour period (or for 15 minutes, if the granularity was so set).
- **HD 24h** : it reports the results of the HISTORY collected monitoring data relevant to the 24 hours period.
- **CD** : It reports the PM values currently measured up to now, since the PM was started. The monitored data can be updated by clicking on the PM refresh “fast key”.
- **QoS Maintenance** : it reports the results of the Maintenance monitoring data, for the QoS monitoring, with the indications about colorations of the afferent traffic and of the discarded frames.

The PM data counters displayed in each folder are the following:

- **HD1h/(15m)** folder:
 - **Index**: number of monitoring interval
 - **Period End Time**: time when interval finished
 - **TTFg**: number of Total Transmitted Correct Frames, green colored
 - **TTOg**: number of Total Transmitted Correct ethernet Octets, green colored
 - **TTFy**: number of Total Transmitted ethernet Frames, yellow colored
 - **TDFg**: number of Total Discarded ethernet Frames, green colored
 - **TDFy**: number of Total Discarded ethernet Frames, yellow colored
 - **TTOy**: number of Total Transmitted ethernet Octets, yellow colored
 - **Start Time**: indicating the time when the performance monitoring was started (by means of “ConfigureOutFlow.”/”DataCollection”).
 - **Suspect Interval Flag**: if this value is “true” it means the measurement data is unreliable, if “false” it means the data is reliable.
- **HD24h** folder:

it contains the same PM parameters as the above explained “HD1h” or “HD15m”, but for a 24 h interval.
- **CD** folder:
 - **TTFg**: as above explained
 - **TTOg**: as above explained
 - **TTFy**: as above explained

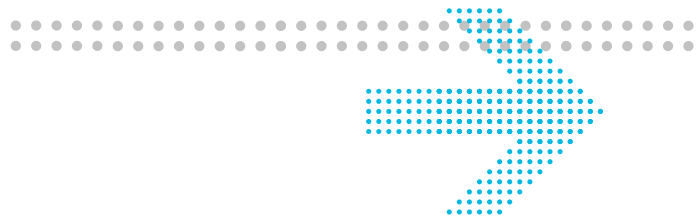
-
- **TDFg**: as above explained
 - **TDFy**: as above explained
 - **TTOy**: as above explained
 - **Start Time**: as above explained

This folder presents also, in the “Resource Information Area” (A3), a dialog pane in which the user can carry out a sampling in real time of the PM data (polling); for more details see “[PM Data Results \(HISTORY and MAINTENANCE\)](#)” (p. 4-226).

- **QoS Maintenance** folder:

- **TTOg**: as above explained
- **TTFg**: as above explained
- **TDFg**: number of Total Discarded Frames due to congestion or policing, green colored
- **TTOy**: number of Total Transmitted ethernet Octets, yellow colored
- **TTFy**: number of Total Transmitted ethernet Frames, yellow colored
- **TDFy**: number of Total Discarded Frames due to congestion or policing, yellow colored
- **Retrieving Time**: time of the last PM data refresh

The Maintenance folder presents also, in the “Resource Information Area” (A3), a dialog pane in which the user can carry out a sampling in real time of the PM data (polling); for more details see “[PM Data Results \(HISTORY and MAINTENANCE\)](#)” (p. 4-226).



5 Maintenance

Overview

Purpose

This chapter describes all the details for periodic checks, faults locations, repair procedures, and restore to normal operations.

Contents

This chapter provides information on the following topics:

General trouble-shooting flow-chart for ISA-ES boards	5-2
Alarms, states and commands on ISA-ES board front cover	5-3
Troubleshooting by means of the ES Craft Terminal	5-4
ISA-ES Units replacement	5-17
Software Upgrading/Downgrading	5-18

Overview

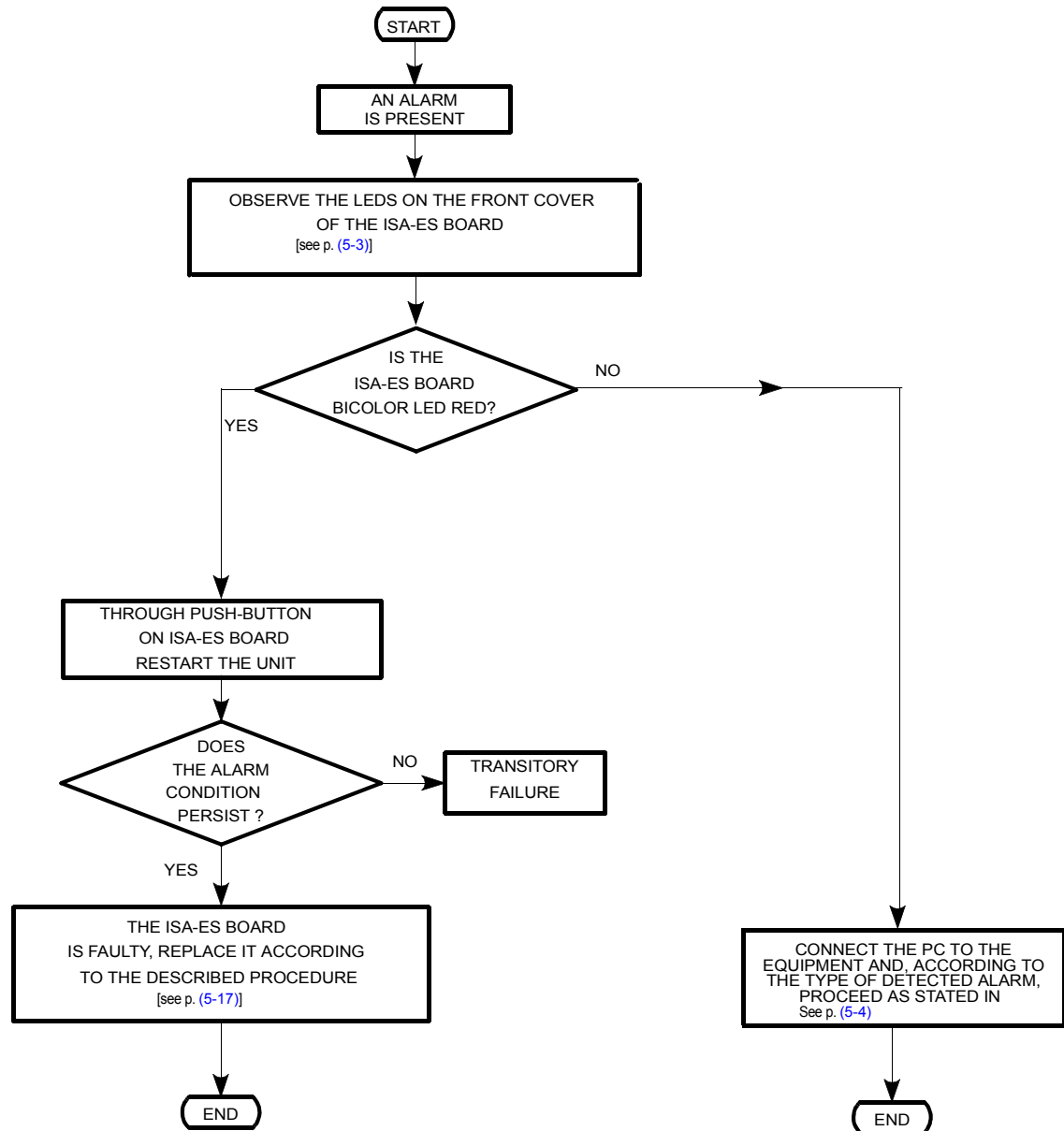
The Maintenance general methodology is reported on the equipment-specific Operator Handbooks; refer to them for: equipment troubleshooting and relevant interventions.

Only the maintenance issues relevant to hardware and software relative to ISA-ES board are reported.

General trouble-shooting flow-chart for ISA-ES boards

In case of faults/defects/failures follow the general troubleshooting procedure illustrated by the following flow-chart.

Figure 5-1 General Flow-chart for ISA-ES board troubleshooting



Alarms, states and commands on ISA-ES board front cover

Description

The state of the ISA-ES unit is indicated by a bi-colored LED, placed in the lower side of the ISA-ES board front cover:

- When red, it indicates internal failure
- When green, it indicates in service unit

In order to give some commands, there is one RESTART push-button on the front of the ISA-ES unit:

- Restart push-button, to restart the unit's software

The positions of the LEDs and command push-buttons on the ISA-ES front cover plate are shown on the equipment-specific Technical Handbook, listed in [Table 1, \(p. xix\)](#).

On-board Switches: see [Table 5-8, \(p. 5-17\)](#).

Troubleshooting by means of the ES Craft Terminal

The information about the alarms will be mainly obtained by means of the craft terminal through the **Alarms Surveillance (AS)** data, the alarms/status indications presented in the **main view**, and in the “**properties windows**”, depending on the level of the resource under observation.

The troubleshoot procedure by means of the the ES-CT consists of the following steps:

- a. observing the active alarms on the **Severity Alarms Synthesis, Domain Alarms Synthesis and Management States Control Panel**, see [Figure 5-2, \(p. 5-5\)](#): they resume all the active alarms on the ES-Node. [Table 5-3, \(p. 5-7\)](#), [Table 5-4, \(p. 5-8\)](#) and [Table 5-5, \(p. 5-8\)](#), and up describe the meaning of these alarms/statuses and the relevant maintenance actions. See the following para. “[Alarms/states organization in the main view](#)” (p. 5-5).
- b. observing the alarms reported in the **tree-area A1**; this structure immediately helps to localize the alarmed resource, since the alarm condition is directly indicated near every resource symbol. The meaning of these alarms is described in “[Alarms indications in the Resources TREE area \(A1\)](#)” (p. 5-9).
- c. the **properties view** (in the "Transmission" context) of each selected resource contains the "Alarms" sector that gives information about the presence of alarms in the resource under observation. See example in “[Alarms indications in the resource properties](#)” (p. 5-10). The information about alarms can also be observed in the resource-information-area A3 (reporting the same information as the property-view). The "Maintenance Actions" in case of alarms is reported in [Table 5-7, \(p. 5-16\)](#)
- d. in case of alarm presence, open the **Alarms Surveillance** application to troubleshoot. This application gives the details of the detected alarms and helps for their localization. See “[Alarms Surveillance \(AS\)](#)” (p. 5-13) and, in particular, [Table 5-7, \(p. 5-16\)](#), indicating the "Probable Cause" of fault and relative "Maintenance Action".
- e. the synthesis of some alarms relevant to the ISA-ES boards is also reported on the views presented in **SDH-CT** (RUM, RUTM, RUP, ICP, VM, etc.): the details about these alarms and further maintenance interventions are reported in the equipment-specific Operator Handbooks, listed in [Table 1, \(p. 1-xix\)](#).

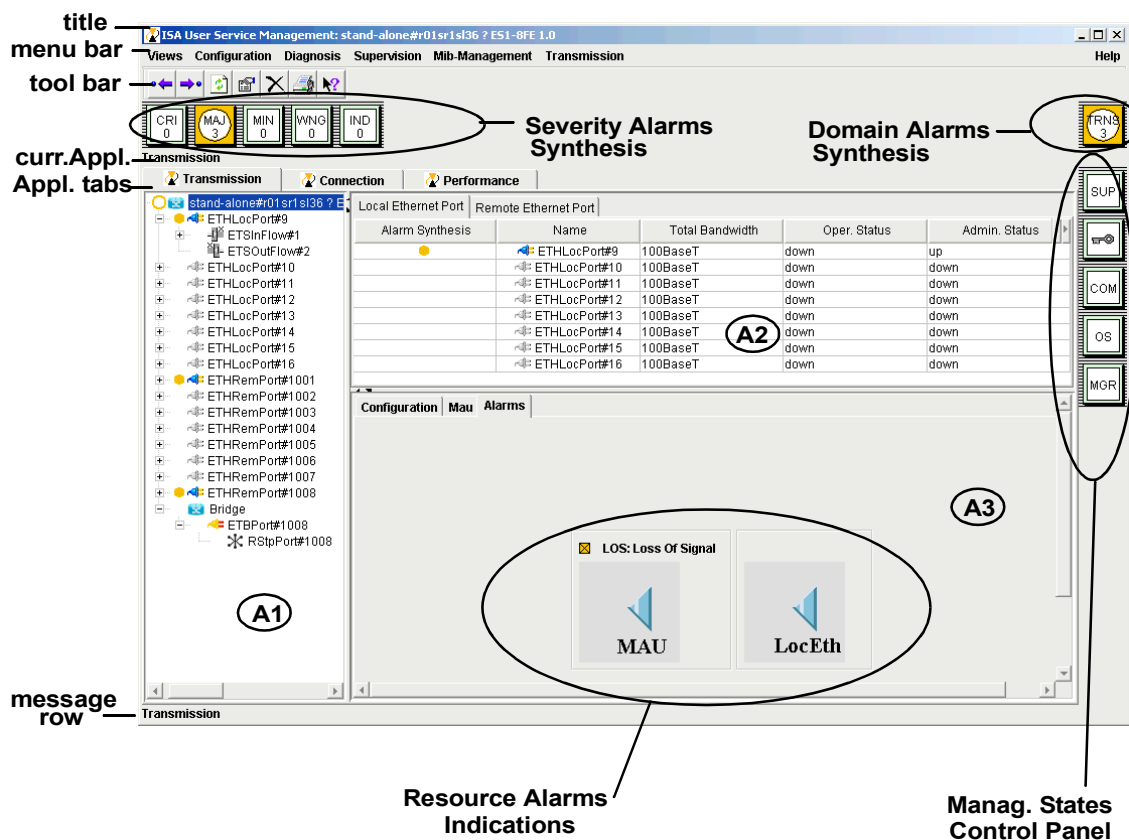
In case of unit replacement, follow the indications reported in “[ISA-ES Units replacement](#)” (p. 5-17).

Alarms/statuses organization in the main view

**WARNING**

The critical (CRI) or major (MAJ) alarms indicate severe alarms that could have impact on the current traffic (interruption or degrade), thus requiring a rapid intervention to restore the regular working condition of the equipment.

Figure 5-2 Alarms/statuses organization in the main-view



A message, activated by the mouse facility when passing over an alarm or status icon, provides the alarm or status complete denomination: a text appears in the "message-row" at the bottom left corner of the view.

The area A3 reports alarms indications too, related to the resource that has been selected in the A2 area.

The tree-structure A1 immediately helps to localize the alarmed resource, since the alarm condition is directly indicated near every resource symbol.

Alarms synthesis indications

Referring to [Figure 5-2, \(p. 5-5\)](#), the icons CRI, MAJ, MIN, WNG, IND are part of the Severity Alarms Synthesis area, they are described in [Table 5-2, \(p. 5-7\)](#); they report the actual number of alarms grouped for different severities, and the relevant color as assigned by the ASAP.

If not alarmed, every alarm icon is green and rectangular shaped.

If alarmed, every alarm icon is ASAP-colored and circular shaped.

The icon TRNS is part of the Domain Alarms Synthesis area, described in [Table 5-4, \(p. 5-8\)](#). it reports the actual number of alarms pertaining to the transmission domain. Its color corresponds to the highest severity among the set of the active alarms for this domain, according to the rules in [Table 5-1, \(p. 5-6\)](#).

The alarms SUP, LAC ("key"), COM, OS, MGR are part of the Management States Control Panel, presented in [Table 5-5, \(p. 5-8\)](#).

All these indications (except for SUP, LAC, COM, OS, MGR) are the summaries of particular types of alarms detected by the equipment, further they report the total counting of alarms per group; the specific cause of alarm is to be found as indicated in this and in the following paragraphs.

Note: The customization of the ASAP's (Alarms Severity Assignment Profile) can change the colors and the assignment of each alarm to the various groups of alarms; the ASAP configuration is reported in "[Configuration -> Alarms Severity \(ASAP management\)](#)" (p. 4-33) and in "[Set Alarms Severities](#)" (p. 4-37).

[Table 5-1, \(p. 5-6\)](#) reports the association between the colors of the Alarms and their Severity.

[Table 5-2](#) reports the colors of the Management States Control Panel when not in "normal" condition.

Example of alarmed representation:  (colored and with internal circular shape).

Example of non-alarmed representation:  (green and with internal rectangular shape)

Table 5-1 Alarms colors and severity association

Alarm Color	Severity
RED	CRITICAL (CRI)
ORANGE	MAJOR (MAJ)
YELLOW	MINOR (MIN)
PALE BLUE	WARNING (WNG)
WHITE	INDETERMINATE (IND)
GREEN	NO ALARM

Table 5-2 Colors of the Management States when in "abnormal" condition (alarmed)

State	State Color
SUP: not supervised	BROWN
"key" (LOCAL ACCESS STATE) : denied	CYAN
COM: NE unreachable	RED
OS: NE managed by the OS	CYAN
MGR: managed by RM	CYAN

Table 5-3 Severity Alarms Synthesis indications

Mnemonic	Alarm/Status Description	Maintenance
CRI	Critical alarms	Synthesis of alarms that need immediate troubleshooting (typical: NE isolation). Note. Open the AS application: see detailed indications in "Alarms Surveillance (AS)" (p. 5-13) .
MAJ	Major (Urgent) alarms	Synthesis of alarms that need immediate troubleshooting. Note. Open the AS application: see detailed indications in "Alarms Surveillance (AS)" (p. 5-13) .
MIN	Minor (Not urgent) alarms	Synthesis of alarms for which a delayed troubleshooting can be defined. Note. Open the AS application: see detailed indications in "Alarms Surveillance (AS)" (p. 5-13) .
WNG	Warning alarms	Synthesis of alarms due to failure of other NE in the network. Note. Open the AS application: see detailed indications in "Alarms Surveillance (AS)" (p. 5-13) .
IND	Indeterminate alarms	Synthesis of alarms not associated to the previous severities. Not operative. Open the AS application: see detailed indications in "Alarms Surveillance (AS)" (p. 5-13) .

Table 5-4 Domain Alarm Synthesis indication

Mnemonic	Alarm/Status Description	Maintenance
TRNS	Transmission alarms	Synthesis of alarms of the Transmission domain. (Indicated as "Communications" Events in the AS application, see “Alarms Surveillance (AS)” (p. 5-13))

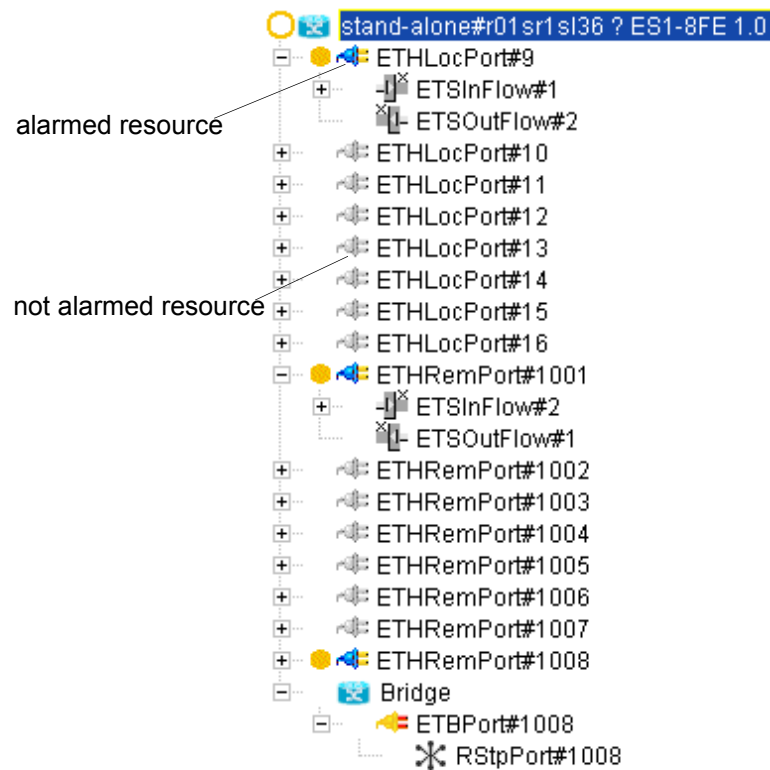
Table 5-5 Management States Control Panel

Mnemonic	Alarm/Status Description	Maintenance
SUPs	Supervision state	Indicates whether or not the NE is under supervision. Used in the OS.
	Local Access state	Indicates whether the Craft Terminal has the OS permission to manage the NE (granted: rectangular shape) or not (denied: circular shape).
COM	Operative System Isolation	Identifies the operational state of the connection between NE and Craft Terminal: "disabled" (NE: Unreachable), or "Enabled" (NE: Reachable).
OS	NE managed by the OS	The NE is being managed by the OS.
MGR	Upper Management assignment	Indicates that the NE is supervised by an Upper Manager (BM or RM, etc.).

Note: Alarms Severity Assignment Profile (ASAP) can modify the assignment of each alarm root to the various synthesis.

Alarms indications in the Resources TREE area (A1)

Figure 5-3 TREE area example



Alarms Visualization

Alarms summary:   (at level of ISA-ES node)

The Alarms summary is visualized only at the ES node level, reporting the colors of the maximum alarm severities, detected in the current ATM switch (inner circle) and in the contained resources (outer rings). If the inner circle is not colored, it means that the alarms are in the contained resources and not in the parent one.

Alarms synthesis (only at the ports level):   Port#14

The Alarms synthesis is visualized at all the ports, reporting all the alarm severity colors (in form of concentric rings), detected in the current resource (inner circle) and in the contained resources (outer rings). If the inner circle is not colored, it means that the alarms are in the contained resources and not in the parent one.

No alarm :  Port#14

The colors of the alarms indicate the associated severity as specified in [Table 5-1](#), (p. 5-6).

Alarms indications in the resource properties

The properties view of each selected resource contains the “Alarms” sector that gives information about the presence of alarms in the resource under observation.

Figure 5-4, (p. 5-10) is an example of property view.

It is obtained by means of the menu path: Transmission -> Ethernet Port Management -> Ethernet Port Properties.

The alarms properties are found also for the other ISA-ES resources where the alarms are foreseen.

The conditions of alarms relevant to a selected resource (selected in the list of the A2 area) can also be observed in the resource-information-area A3 (reporting the same information as the property-view); see example in Figure 5-5, (p. 5-11).

The non-alarmed condition of an alarm is represented by a green color icon and a “-” sign in the box.

The alarmed condition is represented by a color and an "X" sign in the box (the color of the relevant alarm is assigned by the ASAP: see Table 5-1, (p. 5-6)):

Not alarmed condition: 

Alarmed condition: 

The alarms that can be found in the property-view are listed and described in Table 5-7, (p. 5-16), where the relevant maintenance actions are reported too.

Figure 5-4 Example of Ethernet Port Properties alarms

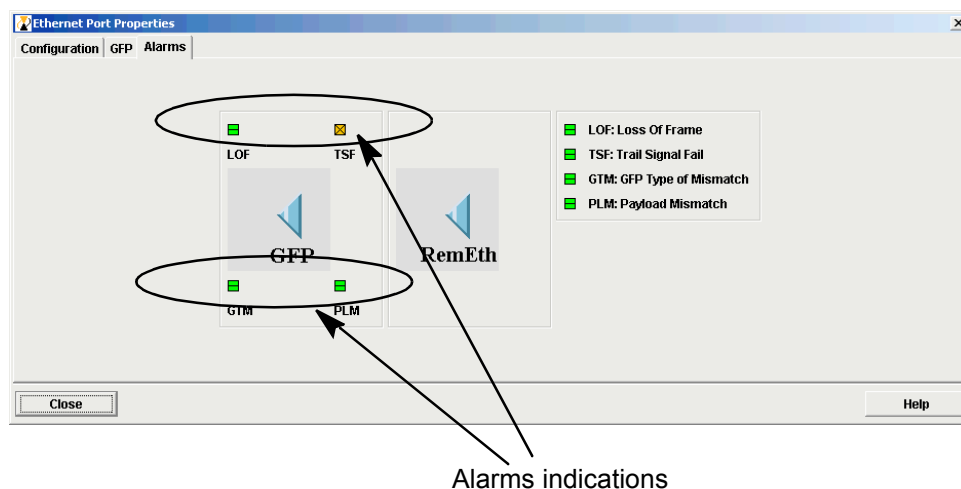


Figure 5-5 Example of alarms reported in the “resource information area A3”

The screenshot displays the ISA User Service Management interface. The top menu bar includes Views, Configuration, Diagnosis, Supervision, Mib-Management, and Transmission. The left sidebar shows a tree view of network components, including ETHLocPort#9 through ETHLocPort#16, ETHRemPort#1001 through ETHRemPort#1008, and Bridge. The main panel is divided into Local Ethernet Port and Remote Ethernet Port sections. The Local Ethernet Port section contains a table with columns: Alarm Synthesis, Name, Total Bandwidth, Oper. Status, and Admin. Status. The Remote Ethernet Port section contains a table with columns: Name, Total Bandwidth, Oper. Status, and Admin. Status. A circled area in the bottom right corner of the main panel highlights the 'Resource Alarms Indications' section, which includes a checkbox for 'LOS: Loss Of Signal' and two buttons labeled 'MAU' and 'LocEth'.

Alarm Synthesis	Name	Total Bandwidth	Oper. Status	Admin. Status
	ETHLocPort#9	100BaseT	down	up
	ETHLocPort#10	100BaseT	down	down
	ETHLocPort#11	100BaseT	down	down
	ETHLocPort#12	100BaseT	down	down
	ETHLocPort#13	100BaseT	down	down
	ETHLocPort#14	100BaseT	down	down
	ETHLocPort#15	100BaseT	down	down
	ETHLocPort#16	100BaseT	down	down

Name	Total Bandwidth	Oper. Status	Admin. Status
ETHRemPort#1001	100BaseT	down	down
ETHRemPort#1002	100BaseT	down	down
ETHRemPort#1003	100BaseT	down	down
ETHRemPort#1004	100BaseT	down	down
ETHRemPort#1005	100BaseT	down	down
ETHRemPort#1006	100BaseT	down	down
ETHRemPort#1007	100BaseT	down	down
ETHRemPort#1008	100BaseT	down	down

Configuration | Mau | Alarms

LOS: Loss Of Signal

MAU LocEth

Resource Alarms
Indications

Alarms relevant to ES-Boards observable on SDH-CT

The synthesis of some other alarms relevant to the ISA-ES boards are reported on the views presented in **SDH-CT**: RUM (unit-missing), RUTM (unit-mismatch), RUP (unit-problems), ICP (communications-problems), VM (version-mismatch), etc. The details about these alarms and further maintenance interventions are reported in the equipment-specific OMSN Operator Handbook, listed in [Table 1, \(p. 1-xix\)](#).

Alarms Surveillance (AS)

In case of presence of alarms, observed as seen in the previous paragraphs, open the **Alarms Surveillance (AS)** application to troubleshoot. For this purpose select, in the menu-bar, the **Diagnosis** pull down menu and then the **Alarms** cascading menu; the following options are offered:

- **ISA Alarms:** all the ES-node alarms are listed in the Alarms Surveillance report that is activated.
- **Object Alarms:** only the alarms relevant to the selected object are listed in the Alarms Surveillance report.
- **Transmission Alarms:** only the alarms relevant to the Transmission context are listed in the Alarms Surveillance report.

Selecting one of these latter options, the Alarms Surveillance (AS) report is displayed as for the example in the following figures (this example is relative to "ISA Alarms" option).

This application shows a synthesis of the ES-NE alarms ("Counter Summary" window, see [Figure 5-6, \(p. 5-13\)](#)) with the sum of all alarms, and then a detailed list of alarms belonging to a group selected in the previous window (see Alarms Supplement in [Figure 5-7, \(p. 5-14\)](#)).

Figure 5-6 AlarmsSurveill - "Counter Summary" window ("ISA Alarms" example)

Sublist	Total
DEFAULT ALARM SUBLIST	x
CRITICAL	.
MAJOR	3
MINOR	1
WARNING	.
INDETERMINATE	.
CLEARED	1
NE Alarms: ADM, 1640FOX	2
NE Alarms: ADM, 1640FOX/10101	2

LocalQ3CT

Figure 5-7 AlarmsSurveill.- "Alarm Sublist" window ("ISA Alarms" example)

The screenshot shows the 'Alarm Sublist' window for 'NE Alarms: ADM, 1640FOX/10101'. It features a 'Counter Summary' table and a main alarm list table.

Counter Summary Table:

Name	COUNTERS						Total
NE Alarms: ADM, 1640FOX/10101							2
	0	2	0	0	0	0	2
	Critical	Major	Minor	Warning	Indet.	Clear	NACK

Main Alarm List Table:

Perceived Severity	Event Date & Time	Friendly Name	Event Type	Probable Cause	Reservation Status	Clearing Status	Al St
MAJOR	2002/11/20 16:16:16	ADM, 1640FOX#r	COMMUNICATIONS	Trail Signal Failure	NRSV	NCLR	NAC
MAJOR	2002/11/20 16:16:16	ADM, 1640FOX#r	COMMUNICATIONS	Trail Signal Failure	NRSV	NCLR	NAC

At the bottom of the window, there is a status bar showing 'Selected : 0' and 'LocalQ3CT'.

Detailed information for each alarm is supplied in the "Alarm Sublist" window. For example: the resource where the alarm is detected, its status, type, probable cause of the relevant alarm, etc. The colors of the alarms indicate the associated severity as specified in [Table 5-1, \(p. 5-6\)](#).

The listing of all the Alarms or the filtering of a class of them is also possible. The filtering is achieved by double clicking on a row of alarm, in the "Counter Summary" little window ([Figure 5-6, \(p. 5-13\)](#)); e.g. the alarms relative to the ISA-ES side are displayed, in the "Alarm Sublist" window, by double clicking on the last row of the "Counter Summary" window.

The alarms scenario is indicated by the colors of the alarms and by the information displayed in the table. For instance, referring to [Figure 5-7, \(p. 5-14\)](#), if an alarm is still active, the whole row has the same color of its relevant "Perceived Severity"; else, if it has been cleared, the color of the row is green (except the "Perceived Severity"). The same information is reported in the "Clearing Status" column.

A more detailed description of the "Alarms Surveillance" (AS) application is given in the "AS Operator's Handbook".

The main information obtained by means of the AS application is shortly described in the following [Table 5-5, \(p. 5-8\)](#) and [Table 5-4, \(p. 5-8\)](#). The maintenance action must take into account the equipment or board or resource where the alarm is detected.

Table 5-6 Alarms Surveillance information general description

Title	Description
• Perceived Severity	The severity assigned to the alarm is indicated, with the relevant color, i.e.: MAJOR, MINOR, WARNING....
• Event date and time	Indicates year, month, day and hour of the alarm.
• Friendly Name	Identifies the rack, subrack, board, port, and TP in which the alarm is detected, e.g.: / r01sr1sl01/#port01-E1S
• Event Type	Indicates the family type of the alarm as subdivided in the ASAP list, i.e.: COMMUNICATIONS, etc.
• Probable Cause	The fault/problem is indicated, i.e.: loss of signal, transmitter degraded, replaceable unit missing, resource isolation, etc.
• Reservation Status	Indicates if the alarm is reserved (RSV) or not (NRSV) according to security management.
• Clearing status	Indicates if the alarm condition is terminated (CLR) or is still active (NCLR). If cleared it has a green background,
• Acknowledge status	Indicates if the alarm has been acknowledged (ACK), with the "Attend" button on the COMPACT ADM unit, or not (NACK).
• Correlated notification flag	Not used
• Repetition counter	Not used

Table 5-7 “Probable Cause” of alarms and relevant maintenance actions

Probable cause Name and/or Acronym of Displayed Alarm	Maintenance
LOS (Loss Of Signal)	Local Port: problems on ethernet line receive path. Check the line continuity on RX LAN.
LOF (Loss Of Frame GFP)	Remote Port: problems on network RX path or on far-end network source. Check the network RX path, and far-end network source.
TSF (Trail Signal Fail)	Remote Port: problems on SDH network receive path. Check the integrity of network path RX (ports, cross-connections, etc.) and relevant connections.
GTM (GFP Type Mismatch) (not operative)	Remote Port: the GFP frame is not congruent with the expected one. Check the involved remote Ethernet ports configuration.
CSF (Client Signal Fail)	Remote Port: problems on far-end ethernet i/f, or on network path (if CSF is bidirectional). Check the far-end Ethernet port signal, or the network path.
PLM (PayLoad Mismatch)	Remote Port: the payload is not congruent with the expected one. Check the involved remote Ethernet ports configuration.
SCD (Sdh Concatenation Degrade)	Remote Port: problems on SDH network path, when an L-CAS VirtualConcatenation is established. Check the SDH network path.

ISA-ES Units replacement



WARNING

This procedure is applicable either for ES1 or ES4 board.

In case that the ISA-ES unit is faulty, replace it by doing the following operations:

1. remove the faulty unit from the equipment
2. insert a new unit into the same slot of the equipment.

(ensure the flash-card of the new unit is formatted: see [Table 5-8, \(p. 5-17\)](#) for “MIB-RESET”)



WARNING

For ISA-ES1-8FE or ISA-ES1-3FE equipped in 1642EM/1642EMC: pull out the flash-card from ISA board and insert it into the “Main-Board”, in order to format it. After finished format, insert it back into ISA board.

The start-up of the new unit can take some minutes.

The ISA-ES board contains two DIP-Switches **I1-1** and **I1-2** (whose position inside the board is reported in MS documents indicated into the 1640FOX/1650SMC/1660SM Technical Handbooks), in order to execute some special operations, as described in the following table:

Table 5-8 DIP-SWITCHES operations

DIP-SWITCH I1-1	DIP-SWITCH I1-1	Function
OFF	OFF	Normal
OFF	ON	MIB RESET (Flash-ROM format)
ON	OFF	Reserved
ON	ON	Reserved

Note:

In case of board presetting by using the above dip switches:

- set the switches on desired configuration
- insert the board on the shelf
- wait some minutes until the CT will take the control again
- extract the board and return the switches in their “normal” configuration
- insert the board on the shelf again
- wait some minutes until the CT will take the control again.

Software Upgrading/Downgrading

The migration of the ISA-ES software from a version to another can be requested in maintenance cases as:

- a. software product evolution
- b. roll back of the software product to older or previous versions.

In these cases, a software package installation (see [“NE-ES package installation procedure”](#) (p. 3-29)) and a download operation (see [“NE-ES software downloading”](#) (p. 3-37)) are necessary.



WARNING

*In case of migration from a release to another one, the presence of the previous release of SDH-USM software package (see 1320CT Operator Handbook, listed in [Table 1](#), (p. 1-xix)) is necessary, in order to download the new software release, otherwise the equipment-SW and the CT-SW are not aligned and the equipment cannot be supervised anymore. Hence the operator is recommended to **keep the previous release of the SDH-USM**, until the actual SW-package will be downloaded into the equipment.*



WARNING

In case of migration to a new release containing a new “ADD-ON” (Service Specific packet such as the ES-swp), from an old release containing another service packet (for instance an ATM-swp), the download of the software into the NE must be done in two steps:

- *first step downloading the new SDH packet associated with the known service packet (e.g.: enhanced OMSN with ATM, see also para. [“NE-ES package installation procedure”](#) (p. 3-29))*
- *second step downloading the new SDH packet associated with the new service packet (e.g.: enhanced OMSN with ES).*

**WARNING**

In case of UPGRADE from an OLD release to a NEW release that is not consecutive, the download of the software into the NE must be done in two steps:

- *first step: the release of the software into the NE and the release of the CT must be aligned (i.e., if the CT is in current release, it must be downgraded, thus installing the CT aligned to the NE software resident into the NE); in these conditions the new SW_package can be downloaded and activated, using the old CT.*
- *second step: instal the new CT release and access the NE. If the Data Service board (ES) was not present in the old release, then download the new SDH packet associated with the new service packet (e.g.: enhanced OMSN with ES)*

A Technical support



Overview

Purpose

This chapter provides important technical assistance information for the Alcatel-Lucent ISA Board ES1-ES4E (Alcatel-Lucent ISA ES1/4).

Contents

This appendix contains the following sections

Technical assistance	A-2
Accessing and navigating the On-Line Customer Support (OLCS) web site	A-7
Other technical support services	A-12

Technical assistance

Overview

Alcatel-Lucent provides the following Technical Support Services:

- Remote Technical Support (RTS) - remote technical support to troubleshoot and resolve system problems.
- On-site Technical Support (OTS) - on-site assistance with operational issues and remedial maintenance.
- Repair and Replacement (R&R) - technical support services for device repair/return or parts replacement.
- Alcatel-Lucent On-Line Customer Support (OLCS) - online access to information and services that can help resolve technical support requests.

Note: Technical Support Services are available 24 hours a day, 7 days a week.

For additional information regarding Alcatel-Lucent Worldwide Services, refer to the Alcatel-Lucent web site at <http://www.alcatel-lucent.com/solutions>.

Select the appropriate category:

- Service Providers
- Enterprise

Note: Use the appropriate steps below for the above categories.

Service Providers:

1. Select **Service Providers**.
2. Select **Services**.
3. Select **Network Support and Maintenance Services** located in the Maintenance section.

Note: An overview of services provided is displayed. If more detailed information on a particular category is needed, then select the appropriate information from the top tabs displayed.

Enterprises:

1. Select **Enterprises**.
2. Under the **Evaluate** section at the bottom of the page, select **Products and Services**.
3. At the **Products and Services** page, select **Services**.

Important! An overview of the services provided is displayed. For more information, select one of the three categories shown at the bottom of the page: Consult & Design, Maintain & Operate, or Integrate & Deploy.

Technical support

Many of our customers have established their own support procedures. These procedures usually involve escalation within their own companies. However, some instances may require additional assistance from Alcatel-Lucent.

Alcatel-Lucent has been and continues to be committed to providing excellence in technical support for its products and services. Therefore, we provide a hierarchical support structure ready and available to solve any Alcatel-Lucent product technical issue.

When additional assistance is required, the Alcatel-Lucent Welcome Center is the first point of contact. An Alcatel-Lucent Welcome Center operator can direct the request to engineers that are highly trained and skilled in resolving issues, involving Alcatel-Lucent products. Technical assistance is available 24 hours a day, 7 days a week.

Alcatel-Lucent Welcome Center

1 866 582 3688, prompt 1 (continental U.S.)
+1 (630) 224 4672 (outside continental U.S.)
(24 hours a day, 7 days a week)

By using the Alcatel-Lucent Welcome Center as the entry point for Alcatel-Lucent support, customers will be assured of a timely and effective technical support service.

On-line customer support

Overview

On-Line Customer Support (OLCS) is the Customer Support web site for our customers' technical support needs. This customer web access tool provides an easy method to access data about Alcatel-Lucent products using the World Wide Web. A customer must first request access to this web site to gain access to the following customer support features:

- Ask AL Knowledgebase
- Customer Assistance Request Entry System (CARES)
- Data Drop Box
- Documentation
- Downloads
- Alcatel-Lucent Alerts
- Product Change Notices
- RMA (Repair and Exchange)

Ask AL Knowledgebase

The Ask AL Knowledgebase web interface feature connects you to the Knowledge Management solutions database. The Ask AL Knowledgebase feature lets you search for solutions by using natural language queries. Many products have an extensive set of Solutions available. Solutions are created by technicians to provide customers with a method to resolve issues without calling for assistance. Solutions are displayed, showing the percentage weight or percent match, based on search criteria. Searches can be performed on all products that are entitled, through the level of service contract a customer has for RTS services.

CARES

The CARES web interface feature makes it easy for you to submit an Assistance Request (AR), subscribe to AR Notifications (be notified when an AR is updated), and view all the customer ARs. The CARES feature lets you open an AR for low severity issues or questions. Any high severity issue should be called into CTAM. Users can stay informed about their ARs by using the flexible AR Notification subscriptions. Users can choose a method for receiving updates: email, text messaging messages, or none. Users can choose when updates are wanted (when the state of the AR changes, any update to the investigation field occurs, or any time any text field is modified). Users can log into the OLCS web site and view ARs 24 hours a day, 7 days a week.

Data Drop Box

The Data Drop Box feature allows Alcatel-Lucent support technicians to provide customers with a quick method to share files. The Data Drop Box allows a technician to provide or receive a file from a customer quickly. These files remain in place for 7 days.

Documentation

The Documentation feature on the OLCS web site contains three areas: Manuals and Guides, Technical Notes, and Release Information.

- **Manuals and Guides**

This section contains the documents that are available in paper or electronic copy and are distributed with a new product. These are the documents that are available within the Alcatel-Lucent Product Documentation web site. The OLCS web site contains links to the actual documents at the Customer Information Center (CIC) web site. The following is a list of possible documents that are available from this site:

- Administration Guide
- Applications Planning Guide (APG)/Applications Planning and Ordering Guide (APOG)
- Getting Started Guide
- Installation Manual (IM)/Installation Guide (IG)

-
- Modification Implementation Procedure (MIP)
 - User Guide
 - Alarm Messaging and Trouble Clearing Guide (AMTCG)
 - Framework User Guide
 - Graphical User Interface (GUI) Guide
 - Maintenance Guide, Provisioning Guide
 - User Operations Guide (UOG)
 - Technical Notes

This section contains documents that are specific to the product and are technical in nature. Most of these documents will provide information in product data sheets or white papers, which are technical documents that explain the operation of a particular part of the system. The following documents are available in this section:

 - Change Notice (CN)
 - Ethernet Management Guide
 - Method of Procedure (MOP)
 - Planning Guide
 - Service Assurance Guide
 - Engineering Change Procedure (ECP)
 - Feature Contents
 - Operations Interworking (OI) Guide
 - Screen Help
 - White Papers

These documents will vary from product to product.

- Release Information

This section contains documents that are specific to the release of a product. The following documents are available in this section:

 - Acceptance Documents
 - Software Release Descriptions (SRD)
 - Specific SRD sections
 - White Papers (release specific)
 - Software Compatibility
 - Upgrade Paths

Downloads

Note: This may not apply to all products.

The Downloads area allows Alcatel-Lucent support technicians to provide access to software downloads that are specific to a customers contract. This feature is only allowed through negotiation with the Account Team and the Product Manager of the product.

Alcatel-Lucent Alerts

The Alcatel-Lucent Alerts tool is a subscription-based tool that provides the same information that our Product Notifications (PNs) did previously provide. This new method of communication is a vehicle to share product and support issues that are of informational, maintenance, or preventive nature. Alcatel-Lucent Alerts contain detailed text descriptions and urgency of Alcatel-Lucent product issues that need to be quickly communicated to customers after the deployment of a release or product.

Product Change Notices

The Product Change Notices (PCN) area provides information on hardware changes for a product. There is a selection of choices to help you search for Change Notices (CNs) or Customer Change Notices (CCNs).

Return Material Authorization (RMA) (Repair and Exchange)

Note: This may not apply to all products.

The RMA area provides a list of contact information on all Alcatel-Lucent products. There is a “request an RMA number” on-line for most Alcatel-Lucent products. An RMA number is required for all returned parts and this feature provides you with an easy method to obtain the RMA number. check the warranty status before submitting a request.

Accessing and navigating the On-Line Customer Support (OLCS) web site

Description

This section provides the method to access the On-Line Customer Support (OLCS) web site, obtain a login (if necessary), and navigate to each feature listed in this document.

Accessing the OLCS web site

To access the Alcatel-Lucent OLCS web site, enter: www.alcatel-lucent.com/support. Once you are at this web page, select **Lucent Global Support**. This will bring you to the web site where you can log in to gain access to the entitled products.

Obtaining a login for OLCS

To request a login, a customer must register, then an email confirmation is sent within 2 business days. The following steps tell you how to register for a login:

1. Select "Register Here" on the top right (just below the Login and Password boxes) of the [Online Customer Support \(https://support.lucent.com/portal/olcsHome.do\)](https://support.lucent.com/portal/olcsHome.do) web site.
2. Follow this registration process:
 - Select the role and accept the terms of use.
 - Provide a business identification, and enter in all of the required information.
 - Validate your email address.
 - Confirm your business identity and set a password.
 - Select content. (This will be verified against the current contract agreements.)
 - Register for the selected content.
3. An email confirmation of the registration and the site access privileges is sent within 2 business days.
4. Customize the web view once you have gained access to the OLCS web site.
 - After logging in, a personalized view of the Customer Support Home page displays. This view is based on the user's and company support entitlements.

Need Help while registering?

From the U.S.	1 (866) 582 3688, prompt 7
From outside the U.S.	+1 (630) 218 7688
In Asia/Pacific	Please contact the in-country technical support hotline.
Via email	Use the email address: olcshelp@alcatel-lucent.com or use the site's "Contact Us" form
Use the OLCS help desk number for OLCS access problems, registration questions, password resets, navigation questions, etc.	

View an OLCS website

After you have logged into the OLCS web site, a personalized view of the Customer Support Home page is displayed. This view is based on the user's and company support entitlements.

To set Customer Support as the default, if it is the primary destination on the www.alcatel-lucent.com website, click "Select default home page" on the left column. The "My Products" section provides you with quick navigation to the entitled products and also quick access to the CARES tool. While navigating through the various tools, you can establish bookmarks to certain tools, documents, or web pages (within OLCS) by clicking "Add to Bookmarks."

The Customer Support home page can be customized by selecting "Customize page layout" and adjusting the fields to be displayed (uncheck the boxes to de-select those elements). These fields can be adjusted at any time. The changes take effect immediately.

There are two methods to find product information. Click "My Products" to choose a product, or click "Documentation" or "Downloads" to display a complete product listing. When the full product list is displayed, use the alphabetic listing (default) or the category list, whichever you prefer. Once a product is selected, a "Product Summary Page" is displayed, which describes all of the tools and features available for this product.

Note: If content has been posted, but contract entitlements do not allow access, then the following padlock icon is displayed:

 Currently, you are not entitled to access these item(s). For access requirements, please review your [Support options](#).

Ask AL Knowledgebase

The Ask AL web page can be accessed from the left column on the Customer Support homepage (unless you changed the view), from the "Technical Support" section in the center of the page, or from the "My Bookmarks" section (if it was added there). Once at

the Ask AL Knowledgebase web page, enter a question or phrase using natural language, and click the check boxes for only the products that should be searched; otherwise, all products checked will be searched.

The results that return show a percentage weight or percent match based on the search criteria. To refine a search, add more details to the question or phrase and answer the other questions displayed. Once you find a solution of interest, select that solution, and the complete solution will display.

Many of the solutions are based on generated ARs or Known Problems from the SRD. To provide quality information, solutions go through a review process before being posted. Content can grow daily as solutions move through the review cycle.

CARES

CARES ARs are accessed from the left column on the Customer Support homepage (unless this view was changed), under the “Technical Support” section in the center of the page, from the “My Bookmarks” section (if CARES was added there), or from the Quick Link section “CARES Assistance Requests,” at the bottom of the Customer Support homepage. Product Notifications and Solutions can also be selected in this section. These are both legacy tools. The new tools, Alcatel-Lucent Alerts and Ask AL Knowledgebase, are discussed in other sections of this document.

When you select CARES, a general web page displays. From that page, a particular function can be selected from the left column. To provide more information on the selected tool, select “More” from the center column.

ARs can be viewed (using “Find an AR” or “Advanced query”), created (using “Create an AR”), or used to report a warranty defect (using “Report a warranty defect”). The CARES web interface has features that keep you informed about the progress of ARs. With the flexible AR Notification subscriptions, CARES can email or send text messages on a variety of activities regarding an AR. A notification is sent when the AR state is changed to Created, Resolved, Closed, or Pending Customer Action. Other conditions that generate notifications are if the following fields are updated: Investigation, Short Description, Current Summary, Description, and Resolution. You can set up (subscribe), remove (unsubscribe), or change these conditions at any time.

Data Drop Box

You can access the Data Drop Box from the left column on the Customer Support homepage (unless your view was changed), from the “Technical Support” menu in the center of the page, or from the “My Bookmarks” section (if Data Drop Box has been added there). Click the “Upload a file” button in the Data Drop Box window to send a file to the Alcatel-Lucent support technician. An email address can also be entered so that the

Alcatel-Lucent technician will be notified when the file has been sent. Click the “Download a file” button from the Data Drop Box if the Alcatel-Lucent technician has sent a file to be downloaded. These files will remain on the site for 7 days.

Documentation

You can access documentation by selecting a product from the “My Products” area. Alternatively, documentation can also be accessed from the left column on the Customer Support home page (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if Documentation has been added there). If accessing Documentation by means other than the “My Products” area, choose the product whose documentation you wish to access by selecting the product from the alphabetical listing or the category list.

Once you are on the product web page, select “Manuals and Guides” from the list under the “Documentation and downloads” section. The “Manuals and Guides” link brings you to the Library of Manuals and Guides for the product you have chosen. The document links bring you to the document stored in the Alcatel-Lucent Customer Information Center (CIC) web site or to another OLCS webpage that contains the product documentation.

Within the “Documentation and Downloads” area, the “Technical Notes” link brings you to a web page which contains documents that are not release specific and are technical in nature.

Also, within the “Documentation and Downloads” area, the Release Information link brings you to a Library of Release Notes web page that contains documents which are release specific and are listed by release.

Click on these links to download or open a PDF file.

Downloads

Note: This may not apply to all products.

You can access downloads by selecting a product from the “My Products” section. Downloads can also be accessed from the left column on the Customer Support homepage (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if Downloads was added there). If accessing Downloads by means other than the “My Products” area, choose the product whose Downloads you wish to access by selecting the product from the alphabetical listing or the category list.

Once you are on the product web page, click the “Downloads: Electronic Delivery” link from the list under the “Documentation and Downloads” area. Select the appropriate release to be downloaded from the drop-down list, and click “Next.” Select the file to be downloaded and click “Next.” On the next web page, enter the path where the file should be downloaded and click “Download.”

Alcatel-Lucent Alerts

You can access Alcatel-Lucent Alerts from the left column on the Customer Support homepage (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if Alcatel-Lucent Alerts is added there).

Once you are on the Alcatel-Lucent Alerts web page, a list of products are displayed. Click on a product to see a list of Alerts for that product. Alternatively, use the “Enter the number of the Alert” field to find a specific Alert, or use the text search to search for Alerts with certain words.

To subscribe to Alcatel-Lucent Alerts, click the “Alerts Subscription Page” link. Once at the “Alcatel-Lucent Alerts Subscription” page, fill out the form and choose the product whose alerts you would like to subscribe to.

You have the option to click “Modify Subscription” or “Cancel Subscription.” Modify Subscription allows you to modify the Urgency, Type, and/or Products selected. “Cancel Subscription” will stop future Alcatel-Lucent Alerts email messages.

Product Change Notices (PCNs)

You can access Product Change Notices (PCNs) from the left column on the Customer Support home page (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if PCNs were added there).

Once on the PCN web page, a list of PCNs is displayed. You can search PCNs by clicking one of the following links:

- PCN cross-reference
- Search for specific text in Class A PCNs
- PCNs added or updated within the past 30 day
- Change Notice summary report

Return Material Authorization (RMA) (Repair and Exchange)

Note: This may not apply to all products.

Return Material Authorization (RMA) can be accessed from the left column on the Customer Support home page (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if it was added there).

Once on the RMA web page, a table with contact information is displayed. Use the contact information provided or choose to fill in the online RMA request form at the bottom of that web page.

Other technical support services

The technical support services expert workshop series

Audience: Technicians, installers, maintenance engineers, technical support personnel, product evaluators, and anyone who has a working knowledge of the products involved and is interested in a hands-on workshop covering advanced troubleshooting issues.

Description: The same engineers that resolve the Assistance Requests (ARs) have developed a series of advanced, hands-on workshops that can be customized to the unique network applications. Individual product modules will provide the knowledge and skills to perform troubleshooting and fault-finding activities at the equipment site or from a remote operations center. There are lab exercises using Alcatel-Lucent network management systems to simulate real-world provisioning and troubleshooting scenarios. In addition, general technology modules will round out the understanding of the network element (NE) troubleshooting performed.

Objectives: Each module has specific objectives. Some overall series objectives are listed below:

- Understand advanced network element security features
- Setup and understand interworking between Alcatel-Lucent network elements
- Perform provisioning operations and remote trouble-shooting using CIT, EMS and TL1 interfaces.
- Analyze Performance Monitoring Data
- Understand alarm handling / alarm management
- Provision and understand system synchronization techniques
- Provision and understand protection schemes (BLSR, UPSR, 1+1 APS)
- Understand network communication issues (OSI and TCP/IP interfacing)

Length: Product Modules are scheduled for 3 days. Technology Modules are scheduled for 1 day.

Expected Foundation Knowledge: Suggested prerequisites are listed on each module's workshop description. Generally, customers should have a basic understanding of digital fundamentals and lightwave transmission systems. In addition, customers should have taken a previous Alcatel-Lucent Operating & Maintenance course or have equivalent experience with operations and maintenance issues related to the product

Activities Prior to Workshop Delivery: The effectiveness of this workshop series relies on the fact that it allows a customer to address the issues experienced in their network today. To achieve this, prior to the workshop, a conference call will be set up with the engineers that will facilitate the workshop. During this call, the logistics of simulating the customer's network environment will be discussed.

Workshop Location: This workshop will be delivered in the Customer Advocate System Test Labs in Westford, MA. The format is 75% hands-on lab exercises, reinforced with 25% classroom instruction.

How to Sign Up:

To enroll in the training course:

- Within the United States,
 - Visit <https://training.lucent.com>
 - Call **1 (888) 582 3688**: *Prompt 2*.
- Outside the continental United States,
 - Visit <https://training.lucent.com>
 - Contact your in-country training representative
 - Call: **+1 (407) 767 2798**
 - Fax: **+1 (407) 767 2677**
- Enter “Advanced Workshops” in the search menu and click “Go.”
- Choose which Advanced Maintenance Workshop you’d like to register for by clicking on the link.
- Read the workshop description(s) and follow the links to register.

Glossary



Acronyms and Abbreviations

A

ACD

Access Control Domain

ADM

Add and Drop Multiplexer

AIS

Alarm Indication Signal

ARP

Address Resolution Protocol

AS

Alarm Surveillance

ASAP

Alarm Severity Assignment Profile

ATM

Asynchronous Transfer Mode

AUI

Attachment Unit Interface

B

BE

Best Effort

BGP

Border Gateway Protocol

BM

Bandwidth Manager

BPDU

Bridge Protocol Data Unit

BW

BandWidth

C**CAC**

Connection Admission Control

CCITT

Telegraph and Telephone International Consultative Committee

CD

Current Data

CD-ROM

Compact Disc Read Only Memory

CE

Customer Edge (device)

C&I

Classification and Identification

CFI

Canonical Field Identifier

CIR

Committed Information Rate

CIST

Common and Internal Spanning Tree

CLNP

ConnectionLess Network layer Protocol

CoS

Class of Service

CPE

Customer Equipment Premise

CR-LDP

Constraint based Routing Label Distribution Protocol

CRC

Cyclic Redundancy Check

CSF

Client Signal Failure

CT

Craft Terminal

D

DB
Data Base
DCC
Data Communications Channel
DCE
Data Communications Equipment
DEMUX
Demultiplexer
DLC
Digital Loop Carrier
DLP
Detailed Level Procedure
DPLL
Digital Phase-Locked Loop
DRI
Dual Ring Interworking
DS1
Digital Signal Level 1
DS3/E3
Digital Signal Level 3
DSLAM
Digital Subscriber Line Access Multiplexer
DSNE
Directory Services Network Element
DSX
Digital Cross-Connect Panel
DT
Distant Terminal
DTE
Data Terminating Equipment
DWDM
Dense Wavelength Division Multiplexing

E

EC
Equipment Controller
EC-1
Electrical Carrier Level 1
ECI
Equipment Catalog Item
EEPROM
Electrically-Erasable Programmable Read-Only Memory
EIA
Electronic Industries Association
ELB
Event Log Browser
EMC
Electromagnetic Compatibility
EMI
Electromagnetic Interference
EOOF
Excessive Out of Frame
EPROM
Erasable Programmable Read-Only Memory
EQ
Equipped (memory administrative state)
ERO
Explicit Route Object
ES
Errored Seconds
ESD
Electrostatic Discharge
ESF
Extended Super Frame
EST
Environmental Stress Testing

F

FCC

Federal Communications Commission

FDDI

Fiber Distribution Data Interface

FDL

Facility Data Link

FE

Far End

FE ACTY

Far End Activity

FEBE

Far End Block Error

FE ID

Far End Identification

FEPROM

Flash EPROM

FERF

Far End Receive Failure

FE SEL

Far End Select

G

GbE
Gigabit Ethernet
GNE
Gateway Network Element
GR
Telcordia Technologies General Requirement
GRE
Generic Routing Encapsulation
GTP
General Telemetry Processor
GTSIP
Global Technical Support Information Platform
GUI
Graphical User Interface

H

HECI
Humans Equipment Catalog Item

I

IC
Internal Clock
ID
Identifier
IEC
International Electrotechnology Commission
IF-IB
In Fiber - In Band
IF-OOB
In Fiber - Out Of-Band
ILA
In Line Amplifier
IMF
Infant Mortality Factor
INC
Incoming Status
I/O
Input/Output
IP
Internet Protocol
IPIP
IP in IP encapsulation
IR
Intermediate Reach
IS
In Service
ISCI
Intershef control Interface
ISI
Intershef Interface
ISDN
Integrated Services Digital Network
ISO
International Standards Organization

ISP

Internet Service Provider

IVHS

Intelligent Vehicle Highway System

J

JRE

Java Running Environment

L

L

Line parameters

LACPDU

Link Aggregation Control Protocol Data Unit

LAG

Link Aggregation Group

LAN

Local Area Network

LAPD

Link Access Procedure "D"

LBO

Line Build Out

LCAS

Link Capacity Adjustment Scheme

LCN

Local Communications Network

LEC

Local Exchange Carrier

LED

Light-Emitting Diode

LER

Label Edge Router

LOF

Loss of Frame

LOP

Loss of Pointer

LOS

Loss of Signal

LPBK

Loopback

LR

Long Reach

LS

Low Speed

LSR

Label Switching Router

M

MAC	
MAC layer parameters to be monitored	
MAU	
Medium Access Unit or Management Attachment Unit	
MD	
Mediation Device	
MJ	
Major Alarm	
MM	
Multimode	
MML	
huMan-Machine Language	
MN	
Minor Alarm	
MPEG	
Moving Picture Experts Group	
MPLS	
Multi-Protocol Label Switching	
MSDT	
Multi-Services Distant Terminal	
MSSPRING	
Multiplex Section Switching Protection Ring	
MSTI	
Multiple Spanning Tree Instance	
MSTP	
Multiple STP	
MTBF	
Mean Time Between Failures	
MTBMA	
Mean Time Between Maintenance Activities	
Mult	
Multipling	
MUX	
Multiplex	

MXBIU

Multiplexer and Backplane Interface Unit

N

NE

Near End

NE

Network Element

NE ACTY

Near-End Activity

NEBS

Network Equipment-Building System

nm

Nanometer (10^{-9} meters)

NMA

Network Monitoring and Analysis

NMON

Not Monitored (provisioning state)

NRZ

Nonreturn to Zero

NARTAC

Lucent North American Regional Technical Assistance Center
call **1-866-LUCENT8** (866-582-3688): *Prompt 1*

NNI

Network-Network Interface

NSA

Not Service Affecting

NSAP

Network Services Access Point

NTF

No Trouble Found

NTP

Network Time Protocol

O**O**

Optical analog parameters

OAM&P

Operations, Administration, Maintenance, and Provisioning

OC-1

Optical Carrier Level 1 Signal (51.84 Mb/s)

OC-3

Optical Carrier Level 3 Signal (155 Mb/s)

OC-12

Optical Carrier Level 12 Signal (622 Mb/s)

OC-48

Optical Carrier Level 48 Signal

OF-OOB

Out of Fiber -Out Of-Band

OLIU

Optical Line Interface Unit

OOF

Out of Frame

OOL

Out of Lock

OPS/INE

Operations System/Intelligent Network Element

OS

Operations System

OSGNE

Operations System Gateway Network Element

OSI

Open Systems Interconnection

OSMINE

Operations Systems Modifications for the Integration of Network Elements

OSP

Outside Plant

OSPF

Open Shortest Path First

OTN

Optical Transport Node

P

P-bit
Performance Bit
PBS
Peak Burst Size
PC
Personal Computer
PCP
Priority Code Point
PCU
Power Conversion Unit
PID
Password Identifier
PID
Program Identification
PINFET
Positive Intrinsic Negative Field Effect Transistor
PIR
Peak Information Rate
PJC
Pointer Justification Count
PLL
Phase-Locked Loop
PM
Performance Monitoring
PMN
Power Minor Alarm
POH
Path Overhead
POP
Points of Presence
POTS
Plain Old Telephone Service
PRM
Performance Report Message

PROTN
Protection
PRS
Primary Reference Source
PST
Primary State
PSU
Power Supply Unit
PVC
Permanent Virtual Circuit
PW
Pseudo Wire
PWR
Power
PXC
Path Cross-Connection

R

RAM
Random Access Memory
ROADM
Reconfigurable Optical Add Drop Multiplexer
RPP
Reliability Prediction Procedure (described in Telcordia Technologies TR-NWT-00032)
RSTP
Rapid Spanning Tree Protocol
RSVP-TE
Resource ReserVation Protocol – Traffic Engineering
RS232
Serial interface
RT
Remote Terminal
RZ
Return to Zero

S**S**

Section parameters

SA

Service Affecting

SCADA

Supervisory Control and Data Acquisition

SD

Signal Degrade

SDH

Synchronous Digital Hierarchy

SEFS

Severely Errored Frame Seconds

SEO

Single-Ended Operations

SES

Severely Errored Seconds

SF

Super Frame (format for DS1 signal)

SID

Site Identifier

SID

System Identification

SLA

Service Level Agreements

SLIM

Subscriber Loop Interface Module

SM

Single Mode

SNCP

SubNetwork Connection Protection

SONET

Synchronous Optical NETwork

SP

Strict Priority

SPE	
Synchronous Payload Envelope	
SQU	
Sync Quality Unknown	
SRD	
Software Release Description	
STS, STS-n	
Synchronous Transport Signal	
STM	
Synchronous Transfer Mode	
STP	
Spanning Tree Protocol or Signaling Transfer Point	
STS-1 SPE	
STS-1 Synchronous Payload Envelope	
STS-3c	
Synchronous Transport Level 3 Concatenated Signal	
STS-12c	
Synchronous Transport Level 12 Concatenated Signal	
SST	
Secondary State	
SWTCH	
Switch	
SYSCTL	
System Controller (circuit pack)	

T**T-MPLS**

Transport - Multi-Protocol Label Switching

T1X1 and T1M1

The ANSI committees responsible for telecommunications standards

TA

Telcordia Technologies Technical Advisory

TABS

Telemetry Asynchronous Byte Serial (Protocol)

TARP

Target ID Address Resolution Protocol

TCA

Threshold-Crossing Alert

TCP/IP

Transmission Control Protocol/Internet Protocol

TCVCXO

Temperature-Compensated Voltage-Controlled Crystal Oscillator

TD

Traffic Descriptor

TDM

Time Division Multiplexing

TID

Target Identifier

TL1

Transaction Language 1

TLB

Timing Looped Back

TNA

Transport Network Identifier

TOP

Task Oriented Practice

TR

Telcordia Technologies Technical Requirement

TSA

Time Slot Assignment

TSI
Time Slot Interchange
TSO
Technical Support Organization

U

UAS
Unavailable Seconds
UID
User Identifier
UILA
Upgradable In Line Amplifier
UNI
User Network Interface
UOC
Universal Optical Connector
UPD/INIT
Update/Intialize
UPSR
Unidirectional Path Switched Ring
UROADM
Upgradable Reconfigurable Optical Add Drop Multiplexer
USB
Universal Serial Bus

V

VCG
Virtual Concatenation Group
VF
Voice Frequency
VLAN
Virtual Local Area Network
VLSI
Very Large Scale Integration
VM
Violation Monitor
VMR
Violation Monitor and Removal
VoIP
Voice over Internet Protocol
VONU
Virtual Optical Network Unit
VPN
Virtual Private Network
VT
Virtual Tributary
VT1.5
Virtual Tributary 1.5 (1.728 Mb/s)
VT-G
Virtual Tributary Group

W

WAN
Wide Area Network
WDM
Wavelength Division Multiplexing
WDRR
Weighted Deficit Round Robin

Z

ZIC

Zero Installation Craft terminal

Terms and Definitions

Numerics

0x1

Set up using unswitched cross connections on UPSR Ring Interfaces.

1+1

The 1+1 protection switching architecture protects against failures of the optical transmit/receive equipment and their connecting fiber facility. One bidirectional interface (two fibers plus associated OLIUs on each end) is designated "service," and the other is designated "protection." In each direction, identical signals are transmitted on the service and protection lines ("dual-fed"). The receiving equipment monitors the incoming service and protection lines independently, and selects traffic from one line (the "active" line) based on performance criteria and technician/OS control. In 1+1 both service and protection lines could be active at the same time (service in one direction, protection in the other).

A

AIS - Alarm Indication Signal

A code transmitted downstream in a digital network that shows that an upstream failure has been detected and alarmed.

Aggregate

A set of flows passing through the same Virtual Ethernet Interface.

AMI - Alternate Mark Inversion

A line code that employs a ternary signal to convey binary digits, in which successive binary ones are represented by signal elements that are normally of alternating, positive and negative polarity but equal in amplitude, and in which binary zeros are represented by signal elements that have zero amplitude.

ASCII - American Standard Code for Information Interchange

A standard 8-bit code used for exchanging information among data processing systems and associated equipment.

Auto

One possible state of a service interface port. In this state, the port will automatically be put "in service" if a good incoming signal is detected on the port.

Available Time

In performance monitoring, the 1-second intervals.

B**B3ZS - Bipolar 3-Zero Substitution**

A line coding method that replaces a string of three zeros with a sequence of symbols having some special characteristic.

B8ZS - Bipolar 8-Zero Substitution

A line coding method that replaces a string of eight zeros with a sequence of symbols having some special characteristic.

Backbone Ring

A host ring.

BER - Bit Error Ratio

The ratio of bits received in error to the total bits sent.

Broadband

Any communications channel with greater bandwidth than a voice channel; sometimes used synonymously with wideband.

C**CCITT - International Telephone and Telegraph Consultative Committee**

An international advisory committee under United Nations' sponsorship that has composed and recommended for adoption worldwide standards for international communications. Recently changed to the International Telecommunications Union Telecommunications Standards Sector (ITU-TSS).

CV - Coding Violation

A performance monitoring parameter.

CVFE - Coding Violation Far-End

An indication returned to the transmitting terminal that an errored block has been detected at the receiving terminal.

D**DCC - Data Communications Channel**

The embedded overhead communications channel in the SONET line. It is used for end-to-end communications and maintenance. It carries alarm, control, and status information between network elements in a SONET network.

DCE - Data Communications Equipment

In a data station, the equipment that provides the signal conversion and coding between the data terminal equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. A DCE may perform other functions usually performed at the network end of the line.

Demultiplexing

A process applied to a multiplexed signal for recovering signals combined within it and for restoring the distinct individual channels of these signals.

Digital Multiplexer

Equipment that combines time-division multiplexing several digital signals into a single composite digital signal.

DRI - Dual Ring Interworking

Two ring networks interconnected at two common nodes.

Drop and Continue

A technique that allows redundant signal appearances at two central offices in a DRI network, allowing protection against central office failures.

DTE - Data Terminating Equipment

That part of a data station that serves as a data source (originates data for transmission), a data sink (accepts transmitted data), or both.

Dual Homing

A network topology in which two Alcatel-Lucent ISA Board shelves serve as hosts supporting up to 8 OC-3 rings or 4 OC-12 rings. Each OC-3 and OC-12 ring is interconnected between the two separate hosts.

E**ES - Errored Seconds**

A performance monitoring parameter.

ESF - Extended Super Frame

The format for a DS1 signal.

ETS - Ethernet Transparent Service

A provider service that emulates the functionality of a traditional Local Area Network.

Ethernet Flow

4-uple <MAC Source Address, MAC Destination Address, 802.1p Priority bits, VLAN tag > representing an Ethernet connection between remote MAC address. Ethernet traffic is tagged with 802.1p VLAN and is classified with 8 Ethernet priority values.

F**FE - Far End**

Any other network element in a maintenance subnetwork other than the one the user is at or working on. Also called remote.

FEBE - Far End Block Error

An indication returned to the near-end transmitting node that an errored block has been detected at the far end.

FEC - Forwarding Equivalence Class

A group of IP packets, which are forwarded in the same manner (e.g. over the same path, with the same forwarding treatment).

FTN - FEC to NHLFE

It maps each FEC to a set of NHLFEs. It defines a rule to compare against incoming packets and an action to be taken on matching packets.

FEPRM - Flash EPROM

Nonvolatile Electrically-erasable Programmable Read-Only Memory.

FERF - Far End Receive Failure

An indication returned to the transmitting terminal that the receiving terminal has detected an incoming section failure.

Flow

Set of Ethernet flows transmitted between two remote customer's sites with the same QoS.

Free Running

An operating condition of a clock in which its local oscillator is not locked to an internal synchronization reference and is using no storage techniques to sustain its accuracy.

Function Unit

Refers to any circuit pack that is designated for Function-Group-C of the Alcatel-Lucent ISA ES1/4 shelf.

G**GNE - Gateway Network Element**

A network element that has an active X.25 link.

H**Hairpin Routing**

A cross-connection within the same function unit (intra-function unit).

Holdover

An operating condition of a network element in which its local oscillator is not locked to any synchronization reference but is using storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronization reference.

I**IC - Internal Clock**

Used in synchronization messaging.

ID

See shelf ID and site ID.

InSegment

It represents an incoming segment in a LSR.

IR - Intermediate Reach

A term used to describe distances of 15 to 40 km between optical transmitter and receiver without regeneration. See long reach.

IS - In Service

One possible state of a port. Other possible states are "auto" (automatic) and "nmon" (not monitored).

J**Jitter**

Timing jitter is defined as short-term variations of the significant instants of a digital signal from their ideal positions in time.

Jabber

A condition wherein a station transmits for a period of time longer than the maximum permissible packet length, usually due to a fault condition.

Jabber Function

A mechanism for controlling abnormally long transmission.

L**Label**

A short fixed length physically contiguous identifier, which is used to identify a FEC, usually of local significance.

Label Stack

An ordered set of labels.

LED - Light Emitting Diode

Used on a circuit pack faceplate to show failure (red) or service state. It is also used to show the alarm and status condition of the system.

LER - Label Edge Router

An MPLS node that connects an MPLS domain with a node, which is outside of the domain, either because it does not run MPLS, and/or because it is in a different domain.

Link

The transmission path between any two interfaces of generic cabling (from ISO/IEC 11801)

Local

See Near-End.

LOF - Loss of Frame

A failure to synchronize to an incoming signal.

LOP - Loss of Pointer

A failure to extract good data from an STS-1 payload.

LOS - Loss of Signal

The complete absence of an incoming signal.

LR - Long Reach

A term used to describe distances of 40 km or more between optical transmitter and receiver without regeneration. See Intermediate Reach.

LSP - Label Switched Path

The path through one or more LSRs at one level of the hierarchy followed by a packet, in a particular FEC.

LSR - Label Switching Router

An MPLS node, which is capable of forwarding native L3 packets.

M**Midspan Meet**

The capability to interface between two lightwave terminals of different vendors. This applies to high-speed optical interfaces.

MPLS Node

A node which is running MPLS. An MPLS node will be aware of MPLS control protocols, will operate one or more L3 routing protocols, and will be capable of forwarding packets on labels. An MPLS node may optionally be also capable of forwarding native L3 packets.

Multiplexing

The process of combining several distinct digital signals into a single composite digital signal.

N**NE - Near End**

The network element the user is at or working on. Also called local.

NE - Network Element

The basic building block of a telecommunications equipment within a telecommunication network that meets SONET/SDH standards. Typical internal attributes of a network element include: one or more high- and low-speed transmission ports, built-in intelligence, synchronization and timing capability, and access interfaces for use by technicians and/or operation systems. In addition, a network element may also include a time slot interchanger.

NHLFE - Next Hop Label Forwarding Entry

It is used when forwarding a labeled packet. It contains the following information:

The packet's next hop

The operation to perform on the packet's label stack; this is one of the following operations:

- Replace the label at the top of the label stack with a specified new label.

- Pop the label stack.

- Replace the label at the top of the label stack with a specified new label, and then push one or more specified new labels onto the label stack.

It may also contain:

- The data link encapsulation to use when transmitting the packet.

- The way to encode the label stack when transmitting the packet.

- Any other information needed in order to properly dispose of the packet.

NMA - Network Monitoring and Analysis

An operations system designed by Telcordia Technologies which is used to monitor network facilities.

NMON - Not Monitored

A provisioning state for equipment that is not monitored or alarmed.

Node

In SONET/SDH, a node is a line terminating element.

Non-Revertive

A protection switching mode in which, after a protection switch occurs, the equipment remains in its current configuration after any failure conditions that caused a protection switch to occur clear or after any external switch commands are reset. See Revertive.

NSAP - Network Services Access Point

An address that identifies a network element. Used for maintenance subnetwork communication using the OSI protocol.

O**OC, OC-n - Optical Carrier**

The optical signal that results from an optical inversion of an STS signal; that is, OC-1 from STS-1 and OC-n from STS-n.

OC-1 = Optical Carrier Level 1 Signal (51.844 Mb/s).

OC-3 = Optical Carrier Level 3 Signal (155 Mb/s).

OC-3c (STS-3c) = Optical Carrier Level 3 Concatenated Signal. Low-speed broadband equivalent to three STS-1s linked together with a single path overhead.

OC-12 = Optical Carrier Level 12 Signal (622 Mb/s).

OC-12c (STS-12c) = Optical Carrier Level 12 Concatenated Signal. High-speed broadband equivalent to twelve STS-1s linked together with a single path overhead.

OC-48 = Optical Carrier Level 48 Signal.

Operations Interface

Any interface that provides information on the system performance or control. These include the equipment LEDs, SYSCTL faceplate, and office alarms.

OS - Operations System

A central computer-based system used to provide operations, administration, and maintenance functions.

OSI - Open Systems Interconnection

Referring to the OSI reference model, a logical structure for network operations standardized by the International Standards Organization (ISO).

OutSegment

It represents an outgoing segment from a LSR.

P**Pass Through**

Paths that are cross-connected directly across an intermediate node in a ring network.

Plesiochronous Network

A network that contains multiple maintenance subnetworks, each internally synchronous and all operating at the same nominal frequency, but whose timing may be slightly different at any particular instant. For example, in SONET/SDH networks, each timing traceable to their own Stratum 1 clock are considered plesiochronous with respect to each other.

PM - Performance Monitoring

Measures the quality of service and identifies degrading or marginally operating systems (before an alarm would be generated).

Port

The physical, electrical, or optical interface on a system.

Port State Provisioning

A feature that allows a user to suppress alarm reporting and performance monitoring during provisioning by supporting multiple states (automatic, in-service, and not monitored) for low-speed ports. *See Channel State Provisioning.*

Proactive Maintenance

Refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending signal fail or signal degrade defect (for example, performance monitoring).

Promiscuous Mode

If active the MAC forwards to upper layers all the received packets. It can be active only on certain type of media.

R**Reactive Maintenance**

Refers to detecting defects/failures and clearing them.

Remote

See Far-End (FE).

Ring

A configuration of nodes comprised of network elements connected in a circular fashion. Under normal conditions, each node is interconnected with its neighbor and includes capacity for transmission in either direction between adjacent nodes. Path switched rings use a head-end bridge and tail-end switch. Line switched rings actively reroute traffic over a protection line.

RPP - Reliability Prediction Procedure

Described in Telcordia Technologies TR-NWT-00032.

RT - Remote Terminal

An unstaffed equipment enclosure that may have a controlled or uncontrolled environment.

S**Self-Healing**

Ring architecture in which two or more fibers are used to provide route diversity. Node failures only affect traffic dropped at the failed node.

SEO - Single-Ended Operations

The maintenance capability that provides remote access to all Alcatel-Lucent ISA ES1/4 systems from a single location over the DCC.

SES - Severely Errored Seconds

This performance monitoring parameter is a second in which a signal fail occurs, or more than a preset amount of coding violations (dependent on the type of signal) occurs.

Status

The indication of a short-term change in the system.

STS, STS-n - Synchronous Transport Signal

The basic building block signal with a rate of 51.840 Mb/s for an STS-1 signal and a rate of n times 51.840 Mb/s for an STS-n signal.

STS-1 SPE - STS-1 Synchronous Payload Envelope

A 125-microsecond frame structure composed of STS path overhead and the STS-1 payload.

Subnetwork

Group of SONET/SDH network elements that share a SONET/SDH data communications channel.

Synchronization Messaging

SONET/SDH synchronization messaging is used to communicate the quality of network timing, internal timing status, and timing states throughout a subnetwork.

SYSCTL - System Controller

The system controller circuit pack that provides overall administrative control of the terminal.

T**TCA - Threshold Crossing Alert**

A condition set when a performance monitoring counter exceeds a user-selected threshold. A TCA does not generate an alarm but is available on demand through the CIT and causes a message to be sent to NMA via the TL1 interface.

TL1 - Transaction Language 1

A Telcordia Technologies machine-to-machine communications language that is a subset of ITU-TSS, formerly CCITT's, human-machine language.

U**UAS - Unavailable Seconds**

In performance monitoring, the count of seconds in which a signal is declared failed or, in which, 10 consecutively severely errored seconds (SES) occurred, until the time when 10 consecutive non-SES occur.

Unidirectional

A protection switching mode in which the system at each end of an optical span monitors both service and protection lines and independently chooses the best signal (unless overridden by an equipment failure or by an external request, such as a forced switch or lockout). In a system that uses unidirectional line switching, both the service and protection lines may be active simultaneously, with one line carrying traffic in one direction and other line carrying traffic in the other direction. For a 1+1 protection scheme the K1 and K2 bytes in the SONET/SDH line overhead are used to convey to the far end which line the near-end receiver has chosen, so that an "active" indication may be made at the far end.

UOC - Universal Optical Connector

Receptacles on the faceplate of some OLIUs that accept *ST*, SC, or FC connectors.

V**VT1.5**

A 1.728 Mb/s virtual tributary.

VT-G - Virtual Tributary Group

A 9-row by 12-column SONET structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte-interleaved within the VT-organized STS-1 synchronous payload envelope

X**XC**

It represents a cross-connection, which is used to associate in and out segments together, in order to form a cross-connection.

Z**Zero Code Suppression**

A technique used to reduce the number of consecutive zeros in a line-codes signal (B3ZS for DS3/E3 signals and B8ZS for DS1 signals).

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