Network maintenance and management for Network transmission Devices

Telecommunication networks evolve from year to year, and increasingly people rely on these networks for conducting their business. As a result, performance and reliability of these infrastructures have become an essential requirement in today's world.

Improving efficiency

OneAccess offers a complete range of maintenance and management tools for its Network transmission Devices for keeping its access solutions tuned to their optimal performance level. It includes both interactive and script-based software operating on a multitude of operating systems.

The combination of these complementary systems drastically improves the efficiency of the day-to-day operation of those networks. The concept allows to co-ordinate the work of the *field engineer* and the operations handled by the *network manager*. The *field engineer* is responsible for installing the access equipment both at the access point and on the customer premises. The field engineer works very closely with *the network manager*, who is responsible for the supervision of the network. The network manager detects network problems in its earliest stages. However, only the field engineer can solve some of those problems because they require on-site intervention. At this point, when the field engineer can use powerful maintenance tools to verify locally the condition of the access equipment, the co-ordination between the network manager and field engineer can be significantly improved.

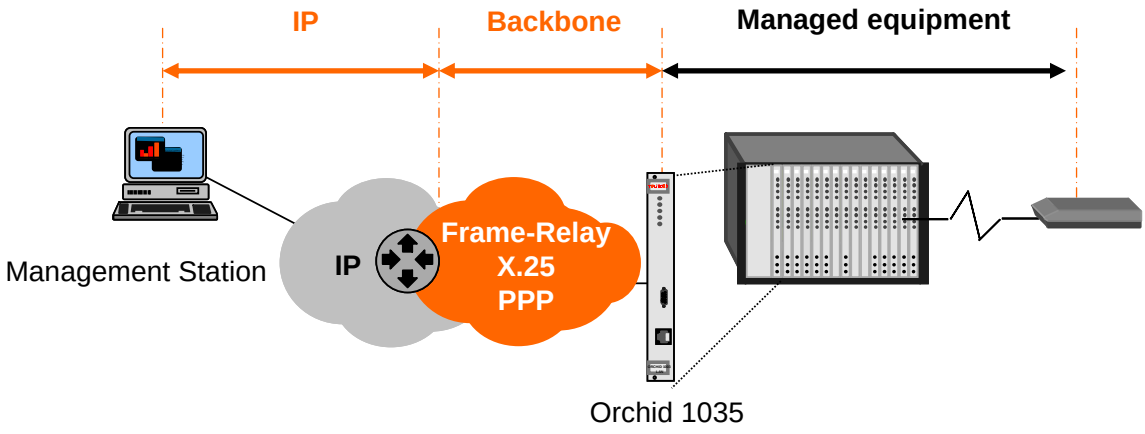
Flexible transport of management information

One of the traditional problems in the network management of access equipment is the multiplicity of backbone networks in service. This can cause difficulties because the network-management information needs to be transported from the access equipment to a central management centre. For practical and economic reasons, it is desirable to use the backbone itself for this transport and not to use a separate overlay network.

Most of the described maintenance and management mechanisms below use IP as the underlying protocol to communicate with the OneAccess equipment. Ethernet Access devices and Routers have a built-in IP protocol stack and can be directly managed.

Other equipment that are not having any IP protocol stack integegrated, such as legacy transmission devices (e.g. SHDSL or Fibre transmission) are connected through a controller device (1035 Orchid) which acts as an IP proxy device. Only centrally installed equipment is connected to the 1035 Orchid. An out-band auxiliary channel on the modem-link is used to give management access to remote equipment. Also more complex configurations such as management on extended links are possible.

The controller device (1035 Orchid) is equipped with a 10/100 Base-T connection for direct IP connectivity or it can encapsulate the IP management traffic directly into Frame-Relay and ATM PVCs or PPP serial links. This permits the transport of the management information over different types of backbone installations without the need for an overlay network.



Flexible transport of management information

SNMP and Syslog

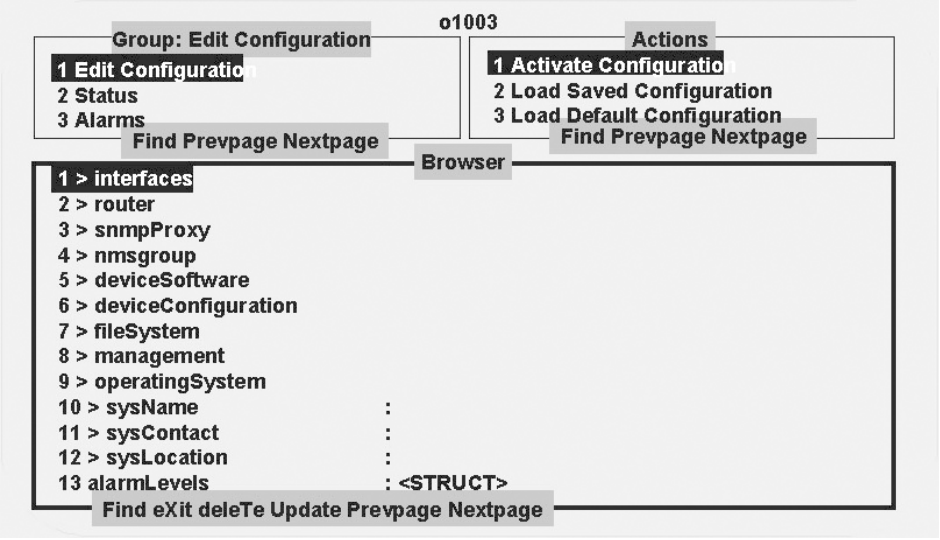
All OneAccess equipment (for equipment without built-in IP protocol stack through the use of the IP proxy controller called *1035 Orchid*) supports both the standard SNMP Simple Network Management Protocol) MIB 2 as well as a private MIB. It is ideal for performance monitoring based on the polling of different parameters (e.g. noise level, line attenuation). Additionally, it offers an open interface for integrating the management into *third-party management platforms*.

Alternatively Syslog can be used for logging alarm conditions to a Syslog server.

Telnet and SSH

Every field engineer can use a Telnet session (for equipment without built-in IP protocol stack through the *1035 Orchid*) to reach any OneAccess access device in the network. This Telnet interface offers an interactive windows-like interface, offering full configuration possibilities for the device, and giving access to status and statistical information. The Telnet interface also provides a command-line interface that allows the same actions in script-mode.

The Connection can be done through a regular Telnet session, or through a secured SSH connection.

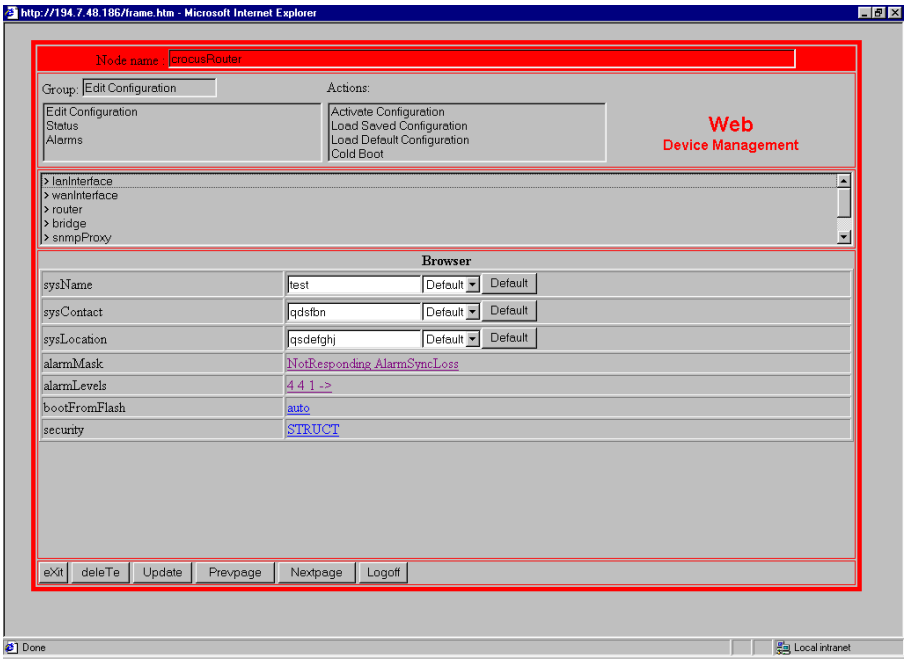


Telnet interface (use command "atwin" to launch)

Web browser interface (HTTP and HTTPS)

Text based web interface

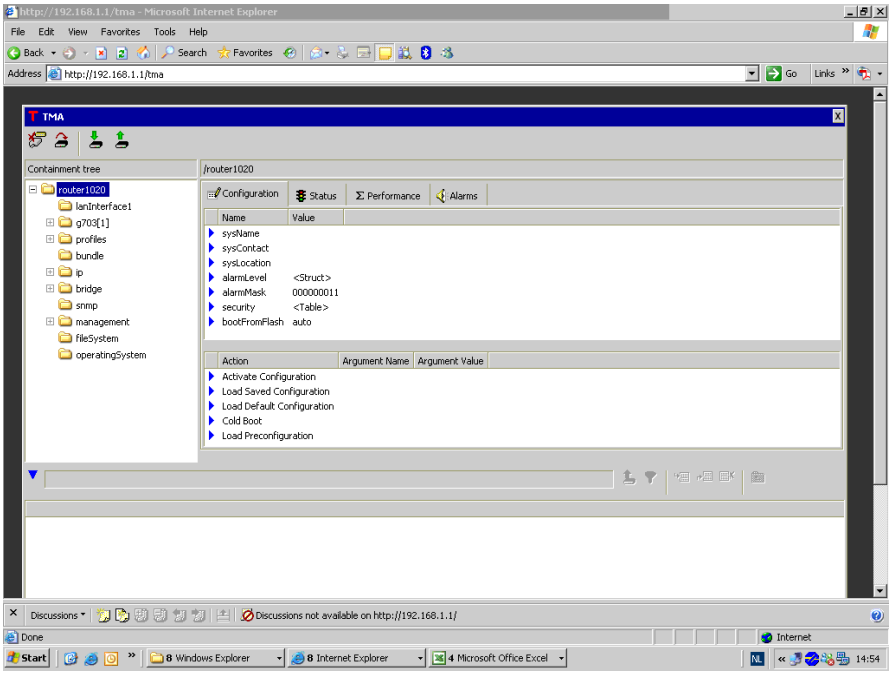
It is possible to use a simple web browser client to control any network element. The functionality of the standard web browser interface is identical to the Telnet interface described above. The Connection can be done through a regular (HTTP) or secure (HTTPS) connection



Default Web browser interface

Graphical TMA Web interface*

By typing the products' ip address followed by "/tma" (e.g. 192.168.1.1/tma), a user friendly graphical web interface is available.

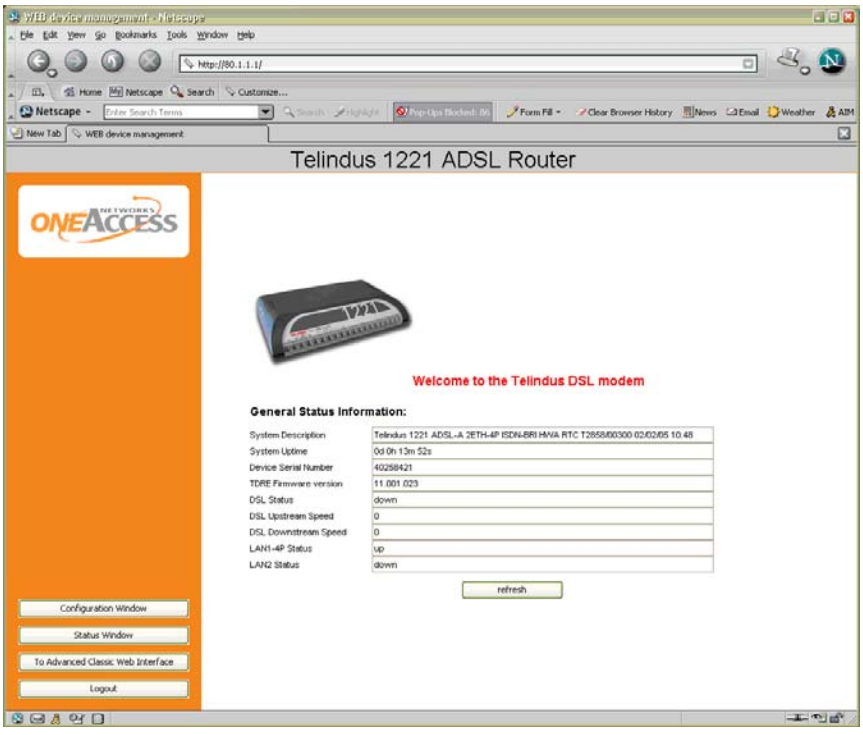


Graphical "Webtma" web interface

*Note: only available on latest software releases

Customisable Web interface

OneAccess products with a built-in IP protocol stack also can be configured through a web interface that can be tailored to the end-user needs. This "Easy configurator" allows to write an XML based web-interface where the parameters, status, performance and alarms that will be visible to the user can be fully controlled.



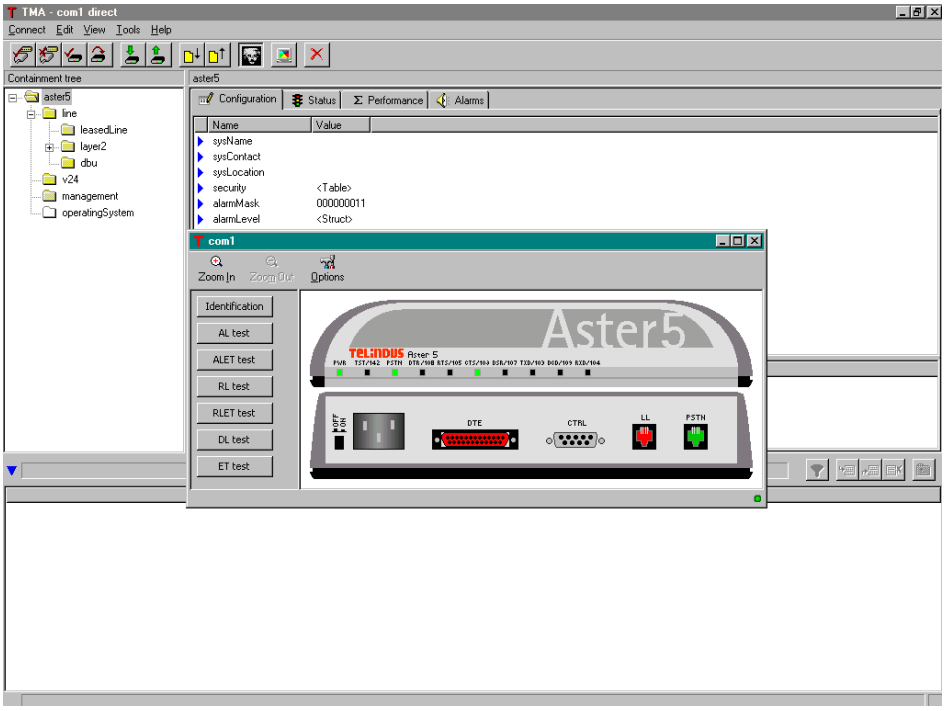
Customisable "Easy configurator" Web interface

OneAccess Maintenance Application

TMA (OneAccess Maintenance Application) is a free Windows® software for the complete control of locally and remotely installed OneAccess access equipment. The system offers not only configuration functionality, but also includes the creation of configuration profiles stored on the hard-disk, a completely interactive picture of the connected device, real-time monitoring, interrogation and export of status and statistics, test-loop facilities, etc.

One possibility to make a maintenance connection to a device is a straight serial cable between the equipment and the PC. It will provide the TMA access to the locally and remotely installed equipment (including also possible extensions of the link).

Other topologies include connectivity over an IP network and the maintenance concentration through a concentration device (1035 Orchid), extending the maintenance access to a large number of network elements from one central location.



OneAccess Maintenance Application (TMA) interface

TMA Specifications

TMA system functionality

- Password protected access
- Reading and changing configuration of the equipment
- Real time monitoring (e.g. of interface signals or line parameters)
- Retrieving status information (current operation) of the equipment, including the current alarm status
- Retrieving statistical information (e.g. covering a period of 24 hours)
- Diagnostic tests
- Configuration storage and retrieval on hard-disk
- Statistics storage and retrieval on hard-disk
- Software download to equipment with flash-memory (software upgrades)
- Interactive pictures reflecting the equipment and the status of indicators and
- push-buttons

Minimum system requirements

- One serial communication port or Ethernet adapter
- Windows XP, Windows Vista

TMA Command Line interface

The Command Line Interface (CLI) module offers an open interface module that can be installed on different operating systems (Windows, Sun Solaris). The module allows the use of a simple ASCII syntax for configuration, initiation of test-loops and retrieval of status or statistical information for all equipment present in the network. It is an ideal base for the development of automated scripts or for the interfacing with custom network management developments.

TMA Command Line Interface Specifications

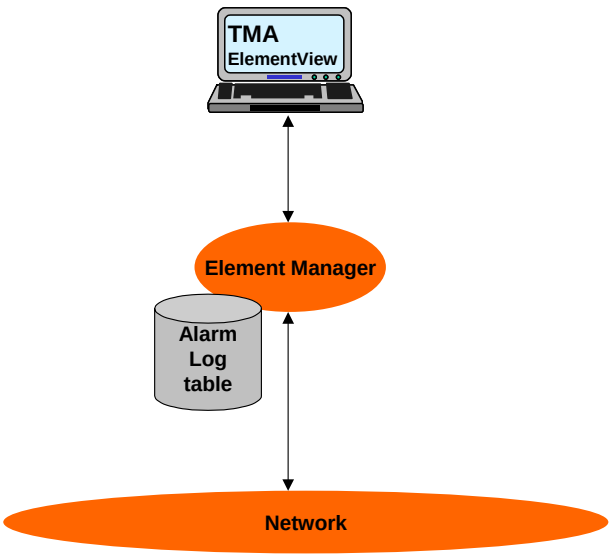
Minimal system requirements

- Solaris 9, Solaris 10
- Windows XP, Windows Vista

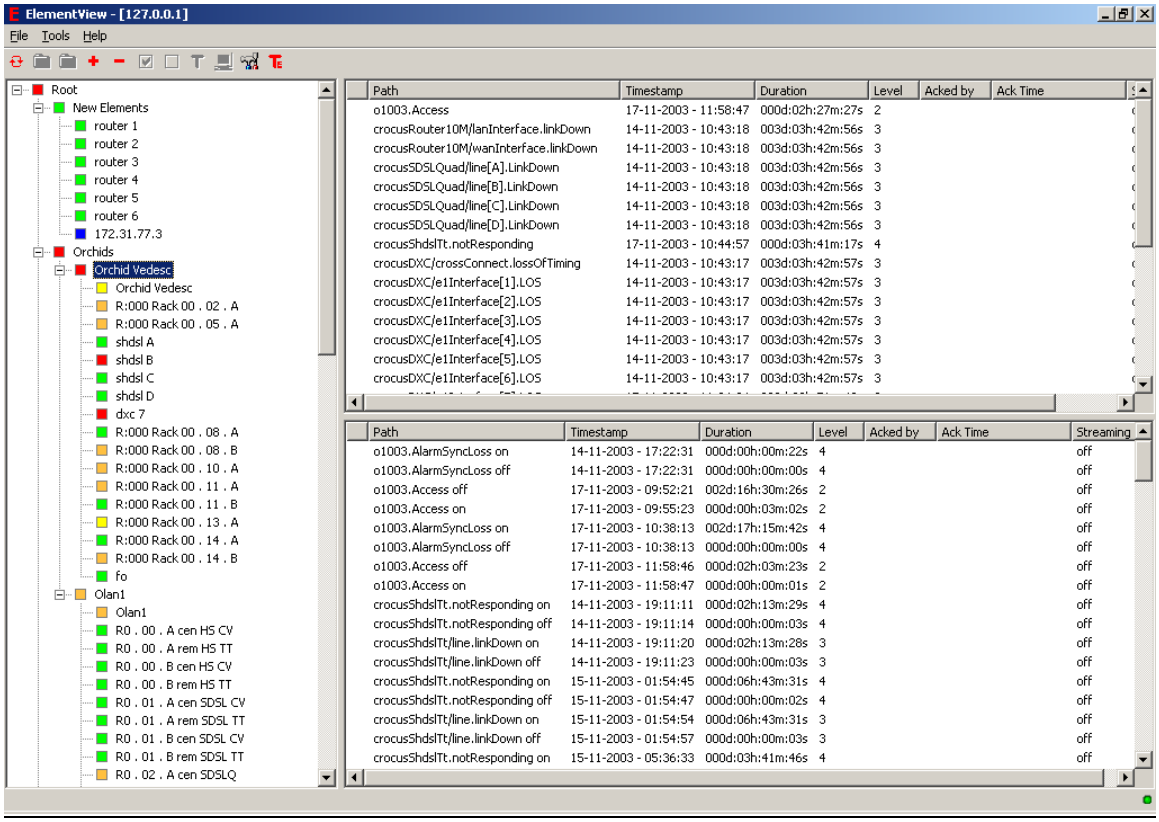
TMA Element Management

TMA Element Management offers a stand-alone element management solution for OneAccess access networks, running on Windows or Unix based platforms. It is constituted of a background process (Element Manager) and one or more graphical user interfaces, called TMA ElementView. It is ideally suited when offering a straightforward and scalable network management solution

TMA Element Management offers a complete network management solution, including a logical representation of the network, status and alarm reporting, configuration, and performance monitoring. Clicking the network icon opens the interactive TMA graphical interface to the selected device.



TMA Element Management architecture



TMA ElementView interface

TMA Element Management specifications

TMA Element Management functionality

> Guaranteed reception of alarm from the network elements by connection oriented sessions

> Alarm status and alarm history

> Alarm re-synchronisation after connection loss

> Alarm history log file in Ascii format

> Alarm visualization by coloured icons

> Alarm acknowledgement

> Start of TMA graphical user session by clicking on the device icon

> Auto-discovery of 1035 Orchid proxied devices

Minimum system requirements

> Solaris 9, Solaris 10
> Windows XP, Windows Vista

TMA inventory management

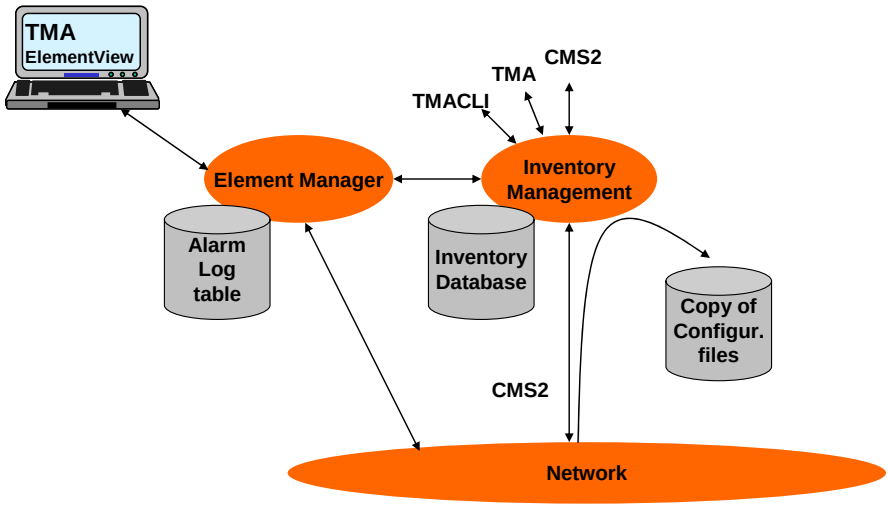
TMA inventory management is an add-on product to TMA Element Manager. It provides a communication interface to a database with inventory information on the OneAccess access products in a network.

TMA inventory management automatically builds a database with a number of inventory parameters from each OneAccess access device in the network. It retrieves the information automatically from the devices and the 1035 Orchid concentrators. All devices under TMA for HP OpenView are concerned. The database includes device information such as the name, the contact person, the location, the description, the unique identification code, the software version(s) and the available interfaces. Additionally the most recent configurations of all devices are stored as well.

The database information is accessible from an outside application, using the OneAccess proprietary CMS2 protocol. This is a CORBA-like protocol, thus making the integration with other network management platforms easier. TMA inventory management includes complete protocol documentation. Once a session with an outside management platform is established, the outside application is automatically triggered of any database changes.

The database information is also available on the TMA user interface. Any changes can be logged in a file.

Subscription of a maintenance contract for TMA inventory management is required. The maintenance contract includes telephone advice and assistance concerning the operation and the application. The service is provided during office hours Central European Time. It also includes free upgrades for new releases for TMA inventory management.



TMA inventory management architecture

TMA Inventory specifications

Inventory database information per OneAccess device

- Most recent configuration files (default 3)
- Device selection name: unambiguously unique name for each device. Based on IP addresses and the name or position for proxied devices.
- sysName: The SNMP sysName value as configured in the device
- sysContact: the SNMP sysContact value as configured in the device
- sysLocation: the SNMP sysLocation value as configured in the device
- sysDescription: the SNMP sysDescription status attribute
- sysObjectID: the SNMP sysObjectID status attribute
- sysServices: the SNMP sysServices status attribute
- Identification: the unique identification code for the device

- Software table. this table contains the software revisions in the device
- Interfaces table: lists all the interfaces. Per interface it contains the following information:
  - name
  - interface reference
  - ifAdminStatus: whether the interface is administratively up or down
  - ifType: SNMP interface type
  - ifSpeed: current interface speed of this interface

Minimum system requirements

- Sun Solaris 7, Solaris 8
- Windows NT 4.0, Windows 2000, Windows XP
- Installation of TMA for HP OpenView or TMA Element management

Applicable Scope

The specifications given in this document apply for following product series:

Products with integrated IP Protocol Stack

- 1021,1022,1023,1031,1032,1033,1034,1041,1042,1043,1061 TDM Routers
- 1221 ADSL Routers
- 1421,1422,1423 SHDSL Routers
- 1424 SHDSLbis Routers
- 1611, 1612, 1621 Fibre Access Devices
- Crocus E3 Mux
- 23xx SHDSL Concentrators
- 24xx DSL Concentrators

Products requiring Orchid 1035 Proxy

- Crocus SHDSL Modem Series
- Crocus FO10M, Crocus FO45M Fibre Modem Series
- Aster 5 Vocieband Modems
- Crocus ADM2P Multiplexer
- Crocus DXC cross Connect
- Crocus CNV Interface Converter Series

Sales Codes

TMA ELEMENT MANAGEMENT (including 1 year maintenance)

- 156986 Demo version for Windows/Solaris (Max 8 devices)
- 502165 TMA element management Sun Solaris Entry level (up to 250 devices)
- 502166 TMA element management Sun Solaris Unlimited
- 502163 TMA element management Windows Entry level (up to 250 devices)
- 502164 TMA element management Window Unlimited

TMA INVENTORY MANAGEMENT (including 1 year maintenance)

- 156986 Demo version for Windows/Solaris (Max 8 devices)
- 502167 TMA inventory management Windows/Solaris Unlimited