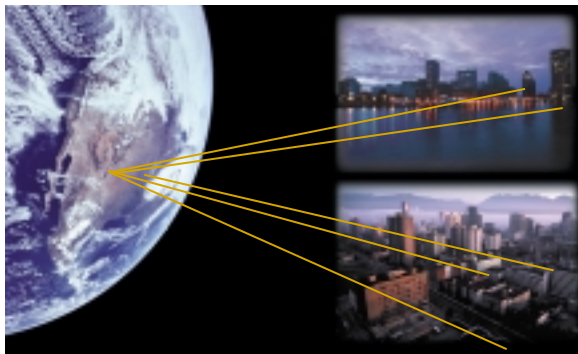


- > data
- > voice
- > video

*TMS enables flexible
multi-tiered grouping
of properties which
aligns management
with service provider
defined service areas.*

Tut Management System™ Network Management Software



Tut Management System

The Tut Management System (TMS) is an integrated network and service management platform for Tut's IntelliPOP™ System. TMS maximizes service provider profits and reduces operating costs enabling the simplified maintenance and provisioning of multiple services.

TMS Features and Benefits Include:

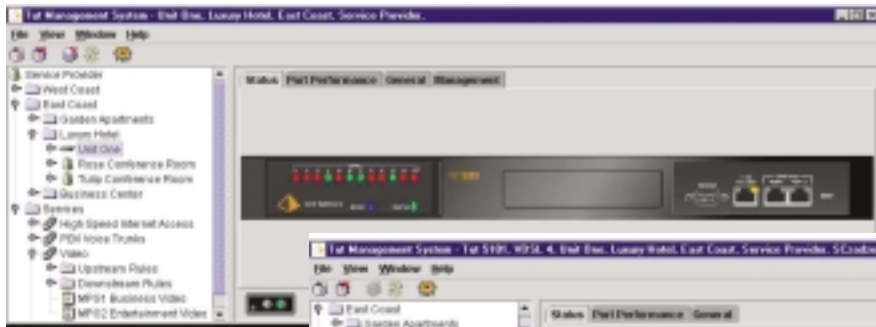
- > Drag-and-drop services to subscribers
- > Intuitive user interface with left pane navigation and right pane detail
- > Flexible multi-tiered grouping of properties to align management with service provider defined areas
- > Management of IntelliPOP's software distribution
- > Automatic equipment identification for faster provisioning
- > Scalable to manage thousands of properties over a single user interface
- > Utilization of SNMP and LDAP standards for integration into broader network management solutions
- > Runs on Sun® Solaris® and Windows® 2000
- > Management of subscriber IP addresses
- > Command line scripting



TMS manages software distribution to the IntelliPOP™ Service Gateway, which leverages directory enabled network standards to create and manage policy-based services. TMS enables flexible multi-tiered grouping of properties which aligns management with service provider defined service areas. It also scales to manage from hundreds to thousands of properties with a single consistent user interface.

Element Management

Element Management includes an active graphical representation of the front panel appearance of Tut products as shown in Figure 1. The Tut 5212 and 5101 are shown (Figure 1).



TMS makes a number of statistics available in tabular and graphical displays. Figure 2 shows packet rates for unicast and non-unicast packets both upstream and downstream. Additional displays show the total link capacity of each VDSL line in an IntelliPOP™ Service Gateway and current transmit and receive statistics.

Service Provisioning

TMS allows the provisioning to subscribers with a single drag-and-drop action. Once IntelliPOP™ equipment is installed in the property and subscribers are connected to the Tut Service Gateway ports, subscribers can then be identified in TMS. Identifying subscribers connected to a port is accomplished by a simple drag-and-drop of the subscriber to the appropriate physical port.

Figure 1



TMS with Network Management

Tut products support SNMP and industry standard MIBs as well as MIBs unique to Tut products. TMS extends this functionality with HP OpenView Network Node Manager by incorporating a plug-in that enables TMS to be launched from OpenView. TMS may be launched from the toolbar or by "clicking" on the Tut product shown in the OpenView network topology display.

Containers

Container names and structure may be defined to suit any management style. In the example, service areas are set as Metro Area 1 and 2. At the same level in the hierarchy, is a container for global services that are available to all subscribers regardless of location. Properties may be defined for each metro area.

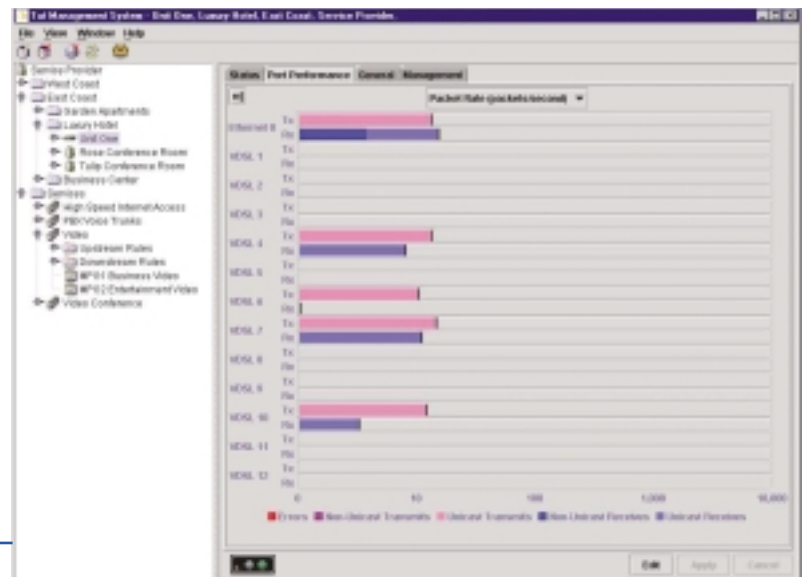
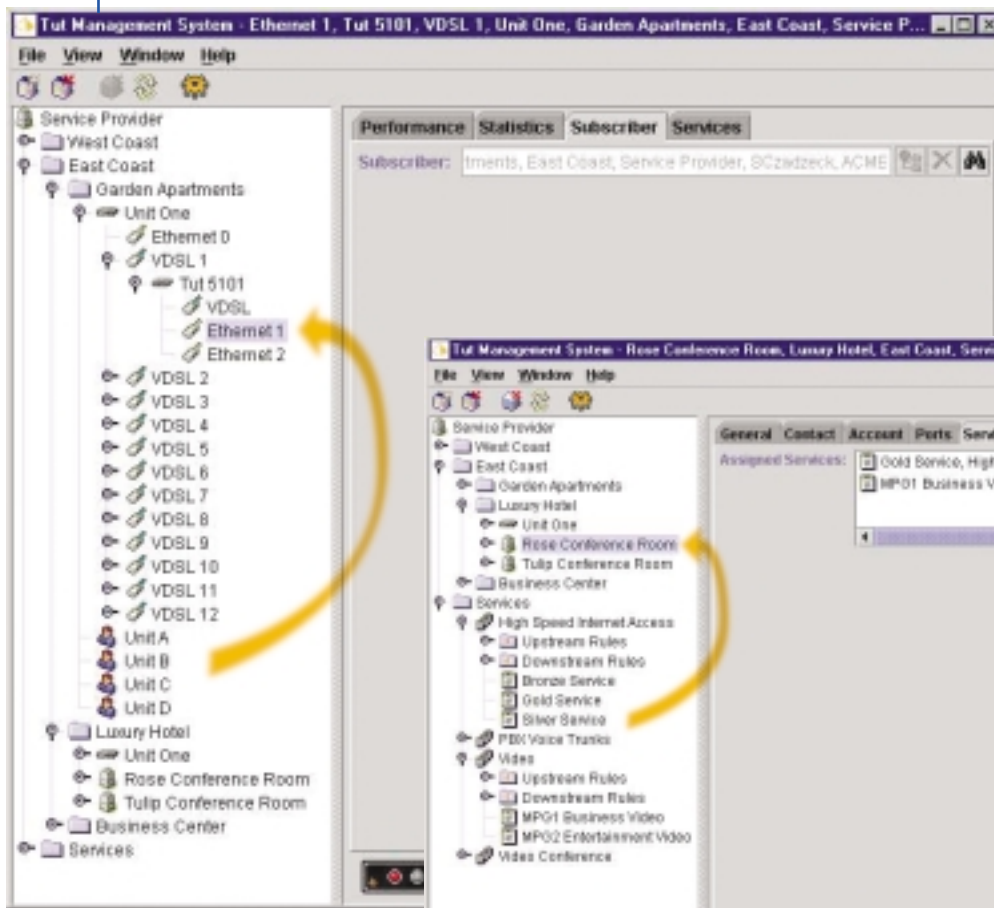


Figure 2

Figure 3



The resulting assignment may be viewed from the subscriber object, the service object or equipment object (Figure 3).

TMS supports the ability to assign multiple physical interfaces to the same subscriber. This is important in commercial applications, where a single subscribing organization occupies multiple offices and where each are connected to a separate physical port.

In the case where the subscriber receives service over multiple physical interfaces, the service is assigned to all ports. In addition, services may be assigned to physical ports. This is useful if a special service, e.g. WEB hosting, is provided from one of the ports.

Service Definition

A wide variety of services can be defined based on the Tut Signature Switch™ technology in IntelliPOP™ products. Once a service has been defined it may be easily assigned to any number of subscribers using TMS. This “design once; deploy many” operational style greatly simplifies subscriber provisioning.

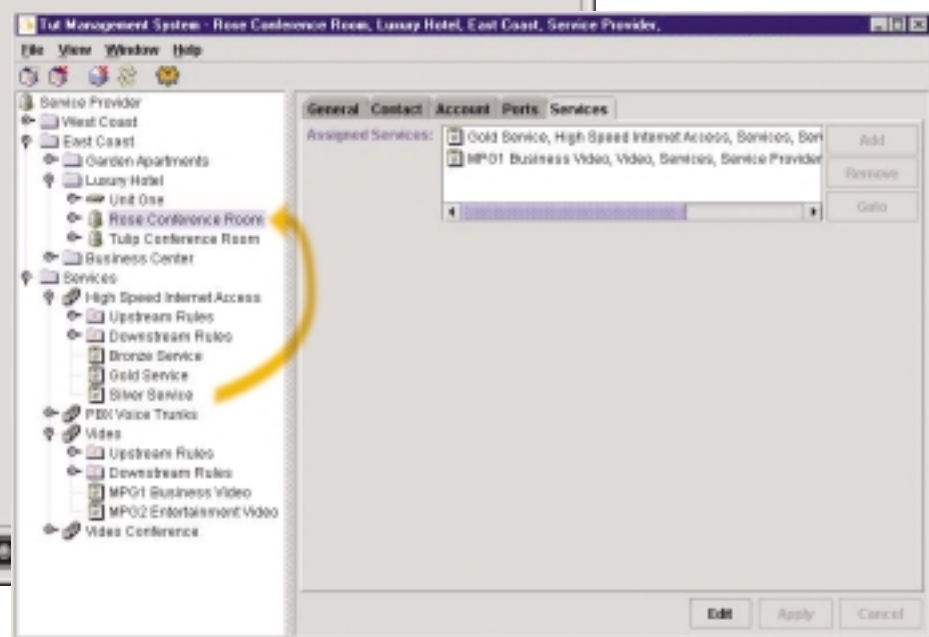


Figure 4

Service definition is accomplished by creating a service anywhere in the container system. Most services are likely to be available across the entire service area and would be placed in a single service container as shown in Figure 4. The Global Services container shows four current services,

- > High-speed Internet access with three service levels
- > PBX voice trunks
- > Video (MPG1 and MPG2)
- > Video conference

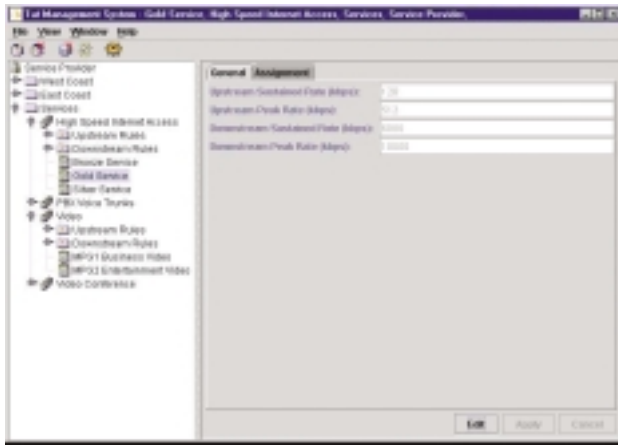


Figure 5 Each of the services may have multiple service levels. For example, High-speed Internet access - Gold Service - can be defined as 6 Mbps downstream with burst to 10 Mbps and 128 Kbps upstream with burst to 512Kbps. PBX trunks can be defined as 4, 12, or 24 as shown in Figure 5. For voice traffic, the peak and sustained rates for both upstream and

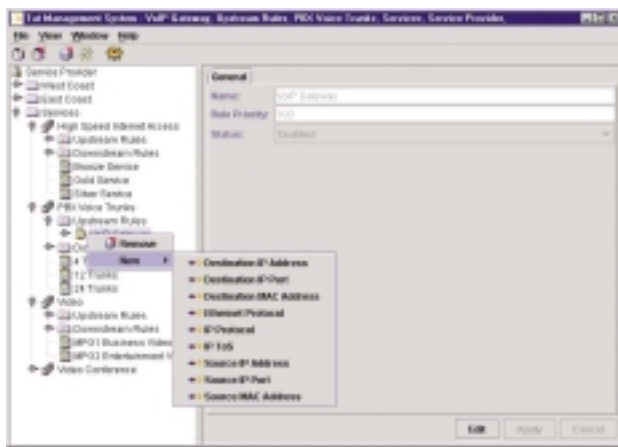


Figure 6 downstream are the same. For other services this may not be the case.

The next step is to define how upstream and downstream packets that transport the service are detected. In Figure 6, voice traffic is routed to a specific VoIP gateway that is designated by a unique destination IP address. Packets meeting this criteria are granted the service defined above. In the downstream direction, IP ToS bits define the service. Parameters may be logically combined offering rich service definitions.

About Tut Systems, Inc.

Tut Systems, Inc. (Nasdaq: TUTS) is the leading provider of next-generation, full-service VDSL systems optimized for provisioning broadband services within neighborhood (NDUs) and multi-tenant unit properties (MTUs). Tut's full service gateways combine advanced technology in multi-layer real-time content switching, high-speed packet forwarding and MTU- and NDU - tuned transmission lines. Tut's systems use the existing copper wiring in buildings to simultaneously deliver multiple broadband services such as interactive digital broadcast services and video-on-demand services (VOD) as well as advanced data, Internet access, and high-quality voice services.

Specifications:

TMS Operating Requirements:

Sun® Systems

- > SunSPARC™ and ultra servers and workstations including multiprocessors
- > Solaris™ 8
- > RAM: 96 MB recommended
- > Bit-mapped display or X-Terminal v Color graphics: 1024x768 minimum resolution (1280x1024 recommended for optimum clarity); 6 color planes minimum (8 color planes recommended)
- > Free disk space: 100 MB
- > CD-ROM
- > LDAP Directory Server: Netscape® iPlanet™ version 4.1

Windows Systems

- > Intel® Pentium® processor
- > Microsoft® Windows® 2000 Professional with TCP/IP networking installed and configured
- > RAM: 96 MB RAM
- > 800x600 monitor with SVGA graphics card
- > Free disk space: 100 MB
- > Network Interface Card (NIC)
- > CD-ROM
- > LDAP Directory Server: Netscape iPlanet version 4.1

TMS Compatibility With Other Management Software:

- > Includes Snap-in for HP OpenView Network Node Manager version 6.1

