Virtual private networks (VPN) are becoming an important market opportunity for many network service providers. While a VPN provides the ideal solution for customers who want to be free of day-to-day network operations, it is common for a customer to be unwilling to relinquish total control of their network. Many service providers address this need through some form of VPN customer service management which has become an important component of any outsourcing solution.

Hence, this session will highlight the business opportunities derived from offering VPN customer service management and how Nortel will assist you in taking advantage of them. The presentation will focus on Magellan ServiceMonitor, a product designed to allow Magellan network operators to provide service management capability for a virtual private network on a PC.

The session will be of interest to Magellan Service Providers who would like to be able to quickly deliver VPN service management capabilities, and those Magellan enterprise networks pursuing an outsourcing strategy.

About the presenter:

Walter Lessberg-König is a product marketing specialist for Magellan network management products in Europe. He has been working with Nortel's network management value added applications since joining Nortel, Germany, in 1995. Walter Lessberg-König graduated with a MBA from the SDA Bocconi Graduate Business School in Milan in 1994.

Agenda

- **Virtual Private Network Service Management**
  - **VPN Opportunities**
  - **Business Drivers**
  - **VPN Service Management**
- **Summary**
- **ServiceMonitor Solution**

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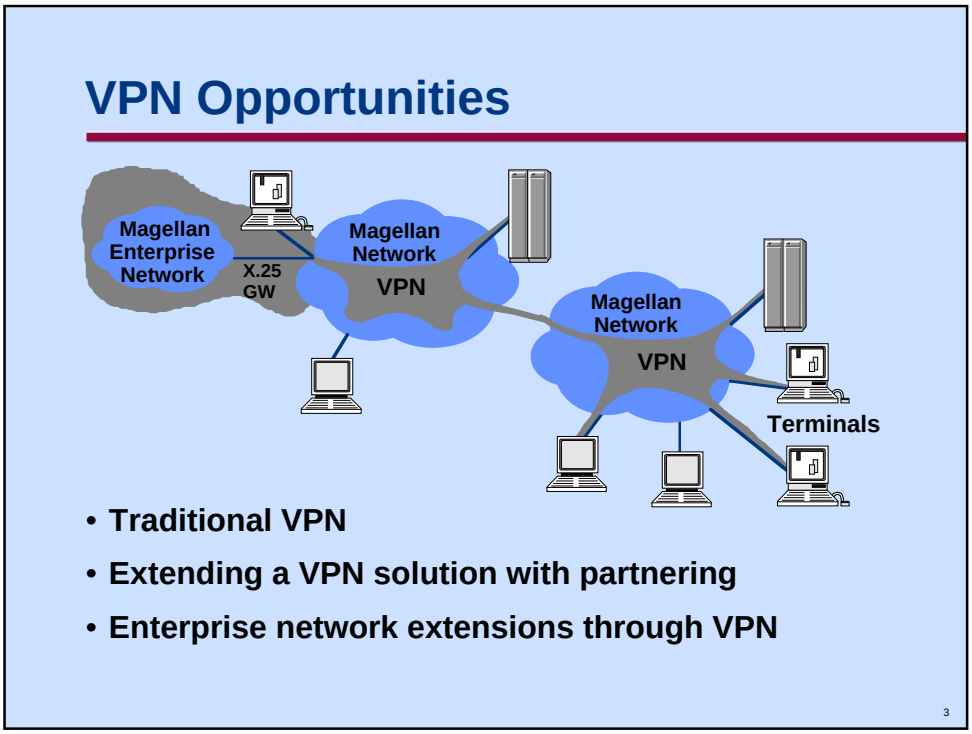
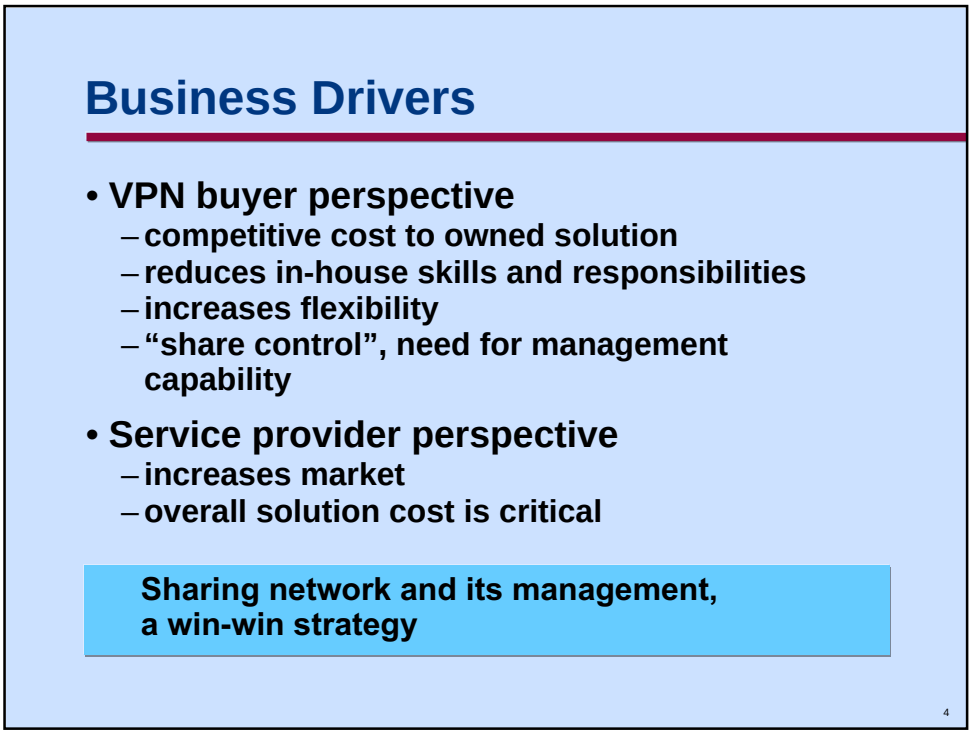


The term VPN can mean different things to different people. Whatever its interpretation, virtual private networks offer an important market opportunity for many network service providers as well as for enterprises pursuing an outsourcing strategy. VPNs are attractive to corporate users, who can enjoy the functionality of a private network without having to invest in network equipment and skilled staff. It is this lower cost that is central to the growing popularity of VPNs. Over 60% of the 100 largest multinationals are running some of their voice and data applications over a VPN.

Traditional VPN: There is what we can call a "traditional VPN", where the VPN is a subset of a single network. Here, a VPN allows a corporate user to enjoy the functionality of a private network without having to invest in an owned solution.

Extending a VPN solution by partnering: Some global customers cannot have all their communications needs met by a single service provider because of geographical limitations. However, by extending the network by cooperating with partners, a service provider can increase its geographical reach to meet its customer' requirements. For the end-user, this means the benefit of a single point-of-contact, as he deals with one service provider in all national locations, avoiding the need to get involved in negotiations with a number of service providers.

Enterprise network extensions through VPN: For enterprise networks, VPN services can be an effective way of extending their geographical reach.

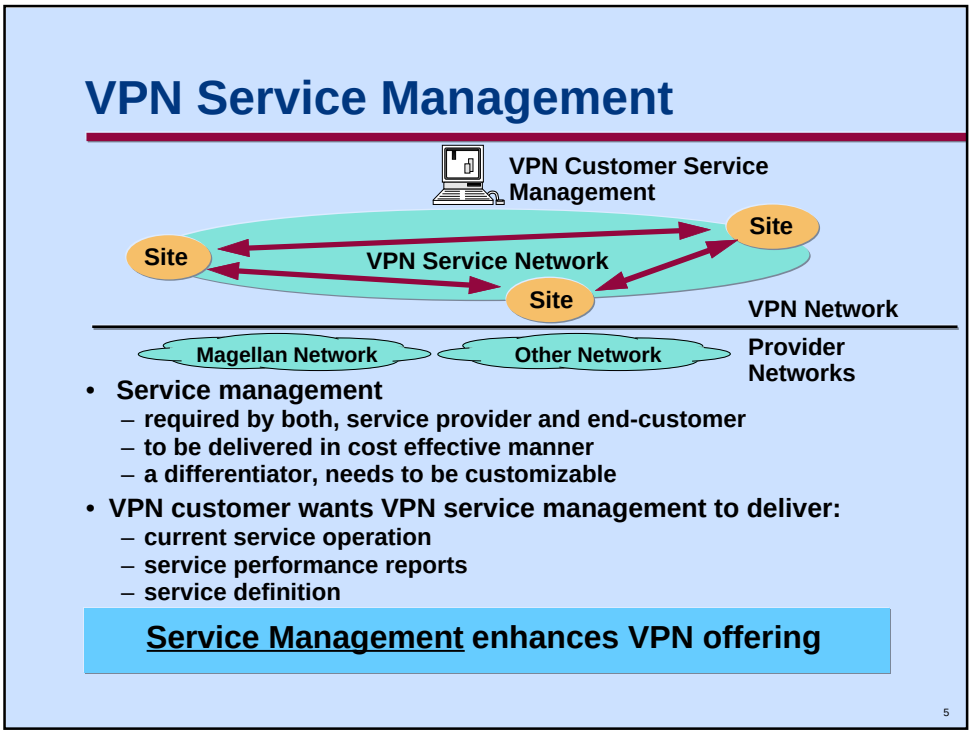


VPNs are an important alternative to corporate networks. VPNs provide customers with one or more communications services, such as voice or data, with competitive pricing, as compared to a fully customer-owned solution. In addition, customers also have an opportunity to reduce the required in-house skills and responsibilities by allowing their service provider to manage the network on a day-to-day basis. Outsourcing also increases flexibility, by allowing companies to implement applications faster and get quicker paybacks.

However, for enterprises, outsourcing may also imply handing over control of their telecommunications network to service providers. But, as in the case of VPNs, customers would still want some level of management and control. To meet this requirement, service providers can offer a VPN customer service management capability that can provide the right kind of functionality.

Service providers are now discovering that offering VPN services increases market share resulting in the growth of traffic and revenues. Although the core to a successful VPN business is the delivery of high quality communications services at the right price, there is also a very real need to deliver effective management to the customer as part of the solution. In fact, the VPN customer service management capabilities can be one of the key differentiators for your VPN offering.

However, it is very important to to remember that one of the original customer business drivers is cost. The delivery of VPN customer service management must be done in a cost-effective manner, taking into account not only the cost of the platform, but also the cost of operations and administration. Meeting both the opportunity of differentiation, and the need for cost sensitivity, requires a robust and flexible customer service management solution.

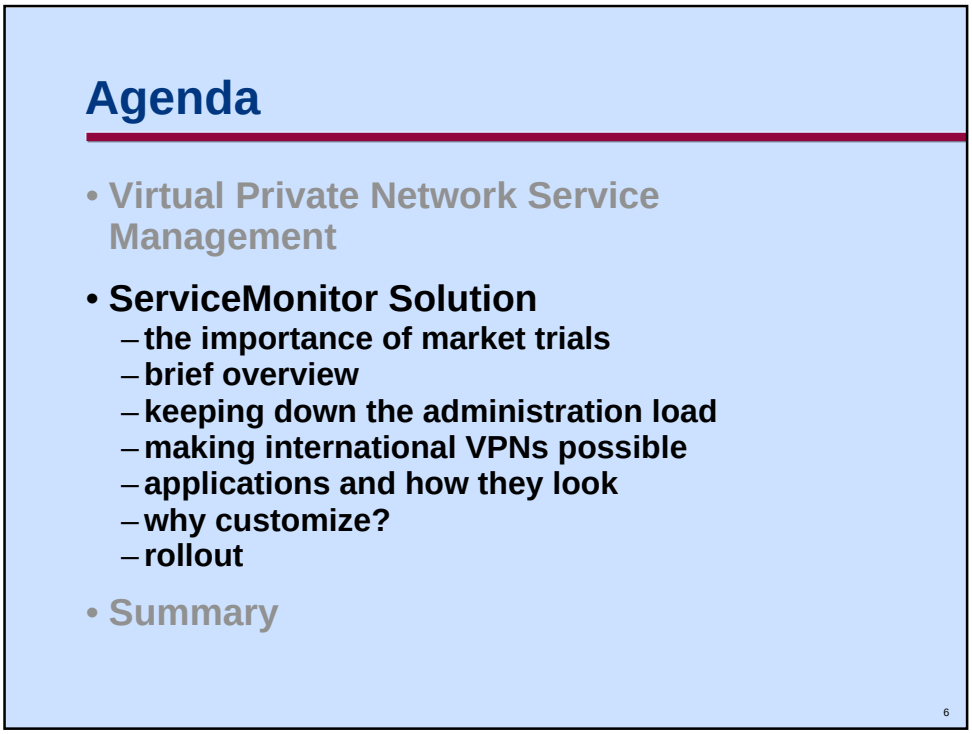


Service providers are faced with a rapidly changing business environment. They need to deal with global competition, reducing the cost of doing business, and rapidly developing new products and services. Although the demand by customers for service management has already been discussed, it is important to realize that the service provider organizations also need it to effectively manage what they sell. The ability to “see” the same thing as the customer is obviously useful during support calls, but it is even more important to ensure service problems are spotted proactively and fixed before the customer calls. Meeting this service provider requirement in a simple, cost effective manner is an important aspect of the overall solution. Service management has to be customizable in order to become a real means of competitively differentiating the services offering.

A VPN provides a telecommunications service or a portfolio of telecommunications services. VPN customers are demanding certain capability sets from their service provider which may include:

- **Current service operation** - This is a real-time view into the network which highlights status, response time and real time performance/utilization.
- **Performance reports** - This ensures that they are obtaining their contracted Level of Service (LoS).
- **Service definition** - Reports and real-time views into the contracted configuration, availability and any throughput impacts.

These are some of the key service management functionalities demanded by end-users. How they are delivered can vary from service provider to service provider.



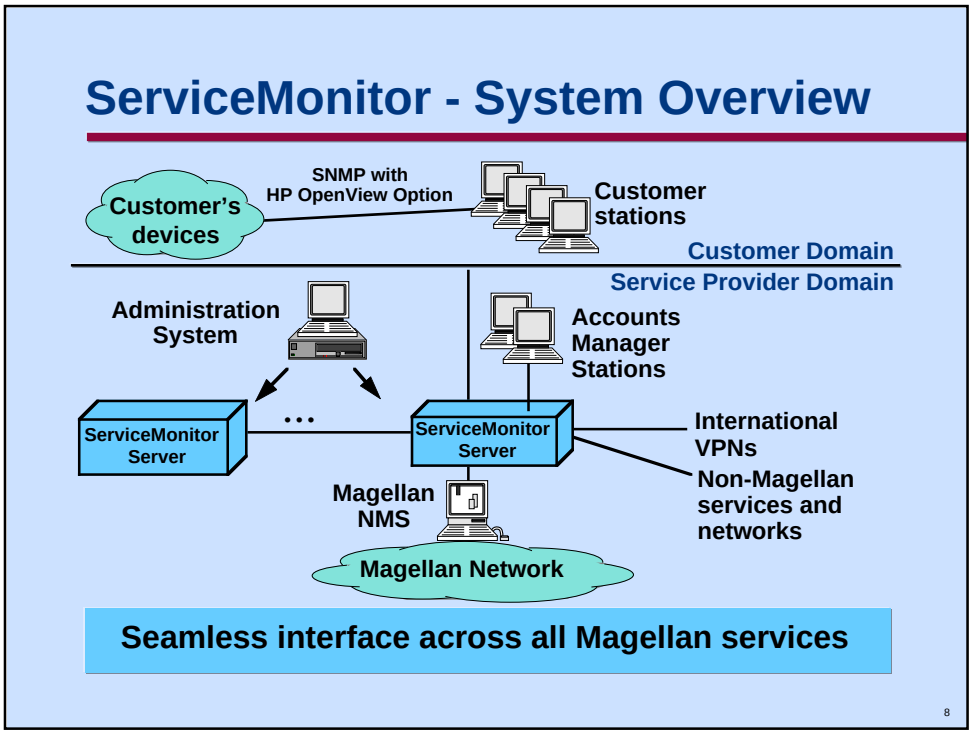
Magellan ServiceMonitor provides Magellan network operators with virtual private network (VPN) service management capabilities on a PC. The benefits of this product for Magellan service providers are:

- Low-cost and simple management for account managers and VPN customers
- International VPN management with other Magellan service providers
- Extensible and open solution

ServiceMonitor has been developed with the involvement of service providers. The product went through extensive market trials with several important European service providers to ensure its suitability. The initial three market trials focused on the end-customer. The primary focus of the trial was on ensuring a simple solution for the end user. One key aspect of this was the use of online help throughout the system as an alternative to formal user training. The trial also introduced the concept of equipment-independent service management. Finally, the trials delivered all of this on a PC platform. These trials provided strong support for these essential elements of ServiceMonitor. The customers stated that "the PC is a good platform for the VPN customer" and that "ServiceMonitor is easy to install and does not require much time for training." They also stated that "the simple user interface was the most impressive aspect of ServiceMonitor" and ServiceMonitor is a very good idea for the management of VPNs." These comments reinforced the basic product choice of a PC platform and the core focus on simplicity. However, the service providers pointed out a number of areas which needed attention before they could deploy the product.

The second set of market trials concentrated on service providers' specific requirements. Nortel addressed the needs for simultaneous management of multiple VPNs required by service provider account managers. Also, ServiceMonitor, which had originally been intended to support only VPNs with hundreds of ports, was extended to manage VPNs with thousands of ports. And finally, major enhancements focused on reducing the cost of administration, were implemented.

Market trial customers worked with us, and Nortel delivered the right solution. This process of strong customer engagement is vital to the future evolution of ServiceMonitor.



Magellan ServiceMonitor allows management of virtual private networks from a PC, enabling users to control and monitor in real-time, their own VPNs. In addition, ServiceMonitor can be integrated into HP OpenView for Windows SNMP management platform, allowing customers a consolidated view of their VPN with other SNMP devices, such as hubs, routers, etc.

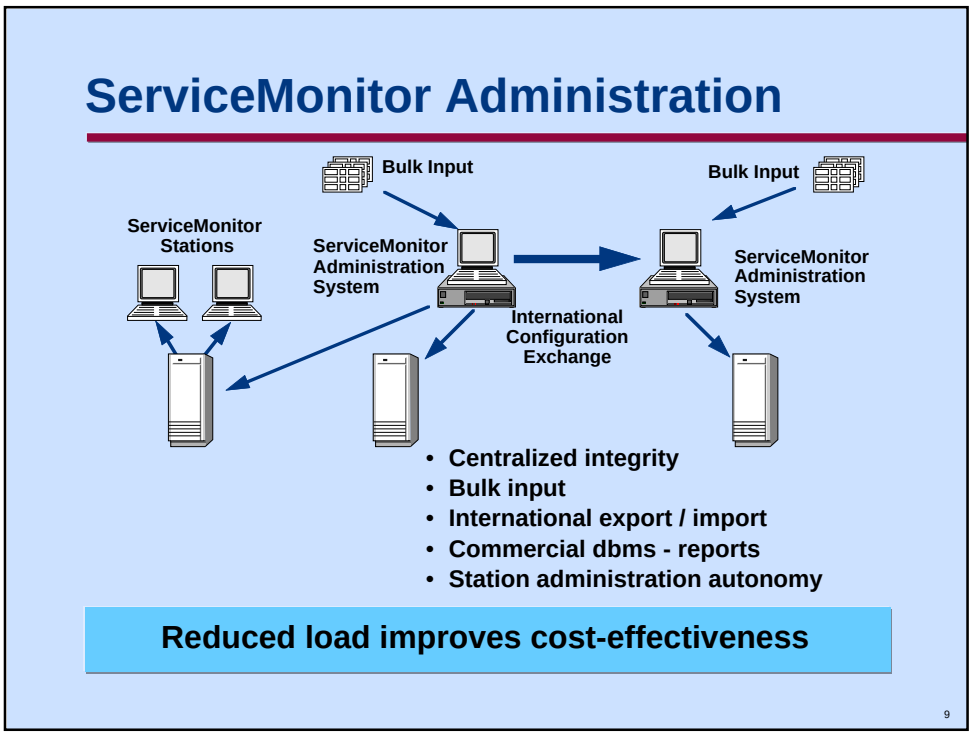
ServiceMonitor consists of a user station, a server, and an administration system. These three elements are all interconnected over IP to provide for greater flexibility and reach.

The station, implemented on a PC, interfaces to a server for all of its VPN services information. The service provider can select for their account manager's, PCs capable of running Windows 3.1. End-customers can use already existing PCs with sufficient capability. The station can be used by either the customer or by the service provider. It provides an easy-to-use Graphical User Interface which displays an overview of the current fault management status of access ports as well as access to additional optional applications.

The server is implemented on a Sun workstation, and provides access to service management information for the stations. ServiceMonitor architecture provides a highly scalable solution by allowing a VPN to be spread out over multiple servers.

The administration system allows Magellan service providers to easily define their customers' VPNs. It provides a forms-based user interface with extensive reporting capabilities. It also enables multiple service providers to cooperate with each other to create international VPNs and thus, to increase their geographical reach and offer their customers the benefits of a single point-of-contact.

The ServiceMonitor solution is intended to be extended by the service provider with applications from multiple sources. This extensibility will allow service providers to best adapt to their particular market requirements and competitively differentiate.

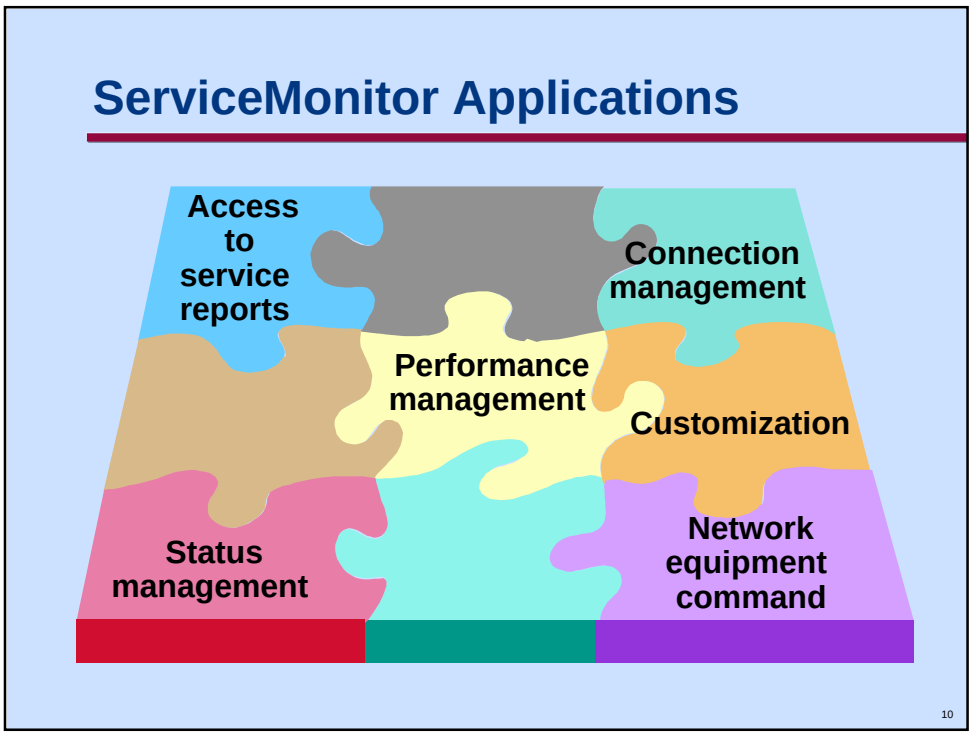


An effective VPN administration capability for ServiceMonitor is provided by the ServiceMonitor Administration System. It is a centralized system, which ensures overall integrity and simplifies the VPN Administration tasks. The VPN Administration System distributes configuration files to the servers.

The ServiceMonitor Administration System is hosted on a PC. It is implemented in Microsoft Access 2.0, a popular relational database management system. Configuration definition is entered into the DBMS through either forms or Bulk Input Files generated from external management systems. There are a number of reports provided by the system, but a service provider can also create its own reports.

Configuration files are extracted from the database for each server and transferred to the servers. There they are loaded and brought into service. This same concept is utilized to exchange configuration information with international ServiceMonitor partners. It is the International Import/Export Configuration Manager that coordinates the interchange of VPN configuration information with other ServiceMonitor international partners.

ServiceMonitor also provides the end-user with some local administration capabilities, such as port naming, grouping and password management. The station is automatically updated at log-in, eliminating the need for the customer to keep the station running without interruption. This station administration autonomy is a cost-effective way of reducing the administration load for the service provider and increasing the service value for the end-customer.



Status management: Access services are assigned one of four statuses: Normal, Troubled, Critical or Unmanaged. Associated with the status is a diagnostic and time. The service provider has the ability to provide customized scripts to assign the status and diagnostics. An overview of current status as well as a log of past status change events are provided.

Performance Management: Graphical displays of real-time and archived performance data on an Access Service. Attributes can include throughput or utilization, but this can be customized by the service provider. The data is derived from scripts or bulk loaded from offline systems.

Connection management: Connections of frame relay, ATM and voice access service (on Passport) can be viewed on user request. This provides the user with the status of all current connections as well as the identity of the remote access service.

Access to service reports: A menu-based interface provides the user with a list of available service reports for a VPN or access service. The selected report(s) are transferred to the station where they are presented. The creation of the reports as well as their display on the station is completely open to the service provider.

Network equipment command: A menu-based interface provides the list of permitted network equipment commands to be applied to an access service. In addition, the service provider can provide customized macros.

ServiceMonitor User Interface

- **Common user interface for:**
  - **sub-Windows**
  - **optional ServiceMonitor applications**
- **Flexible main window**
  - **single view**
  - **multiview**
  - **HP OpenView**
- **Common applications for shared visual space**
- **On-line help**

Simplicity and flexibility reduce costs

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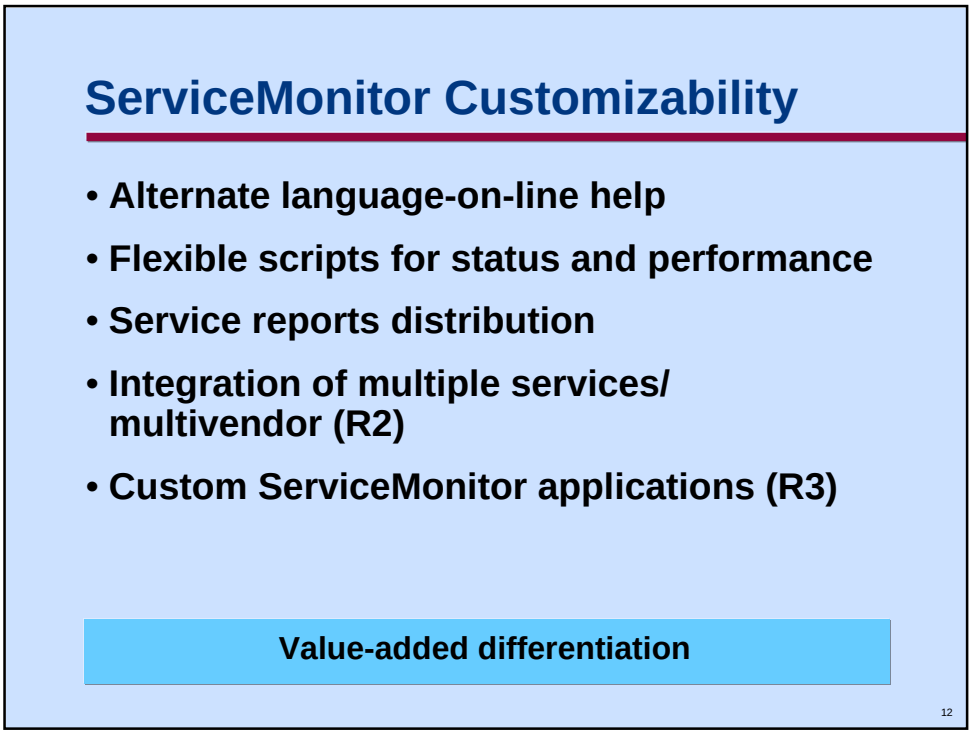
The ServiceMonitor station provides an easy-to-use Graphical User Interface including on-line help. Its main window uses menus to access ServiceMonitor applications.

Although necessary for the end-customer, the user interface functionality is also important to the service provider's account managers. Market trial feedback indicated that service providers need to provide their account managers with the same capabilities they give their customers. Account managers need to share a common visual space with the end-customers. They need to have the view of what the customer is actually viewing on their screen. However, the account manager requires additional functionality enabling them to manage a number of VPNs simultaneously.

ServiceMonitor can optionally be integrated into HP OpenView for Windows, an SNMP management platform. This provides an intuitive graphical map-based user interface to overview the monitoring of a single VPN. HP Openview uses menus to access ServiceMonitor applications. It may be used by customers who require geographic maps or wish to integrate their VPN management with SNMP management.



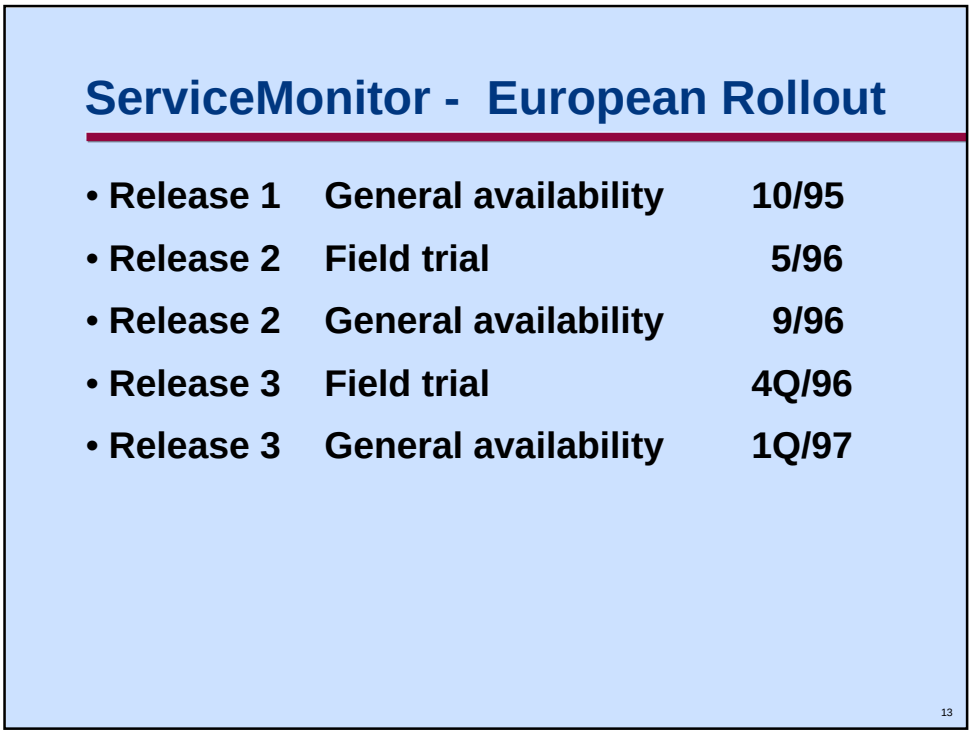
Magellan ServiceMonitor is a highly extensible solution that has been designed to allow the service provider to bring together software from multiple sources. This customization capability allows the service provider to adapt ServiceMonitor to their local market requirements as well to competitively differentiate. ServiceMonitor allows service providers to translate on-line help into alternate languages to accommodate customers in different countries.

Service providers can define and edit both state and performance scripts. It is possible to create completely new scripts or to override the standard scripts provided by Nortel. State scripts are used to determine both the status and diagnostics of a PortService. Performance scripts are used to determine the values for performance attributes of a PortService. The service provider can define its own attributes.

ServiceMonitor provides generic facilities to allow a service provider to distribute service reports to the appropriate station. The service provider is responsible for the generation of reports and displays.

A service provider can also select the applications to provide a VPN manager. This can be done on a per station basis. Next, the service provider can choose third-party applications. One example is HP OpenView for Windows which would provide SNMP management and background maps. Another example could be a spreadsheet application to provide performance management charts.

Finally, the service provider will be able to extend ServiceMonitor with new applications. This includes the ability to integrate non-Magellan products for instance. ServiceMonitor extensions are conceived to support the service provider in flexibly implementing its portfolio of communications services.



ServiceMonitor has been deployed by almost a dozen Magellan network operators in Europe since its market launch in October 1995. As already mentioned, Nortel will continue to foster the engagement of customers through trials, in order to ensure the right product is developed. Unfortunately not all features described during this presentation are available at present, but will be available in releases 2 and 3.

ServiceMonitor *Release 1* includes the following applications:

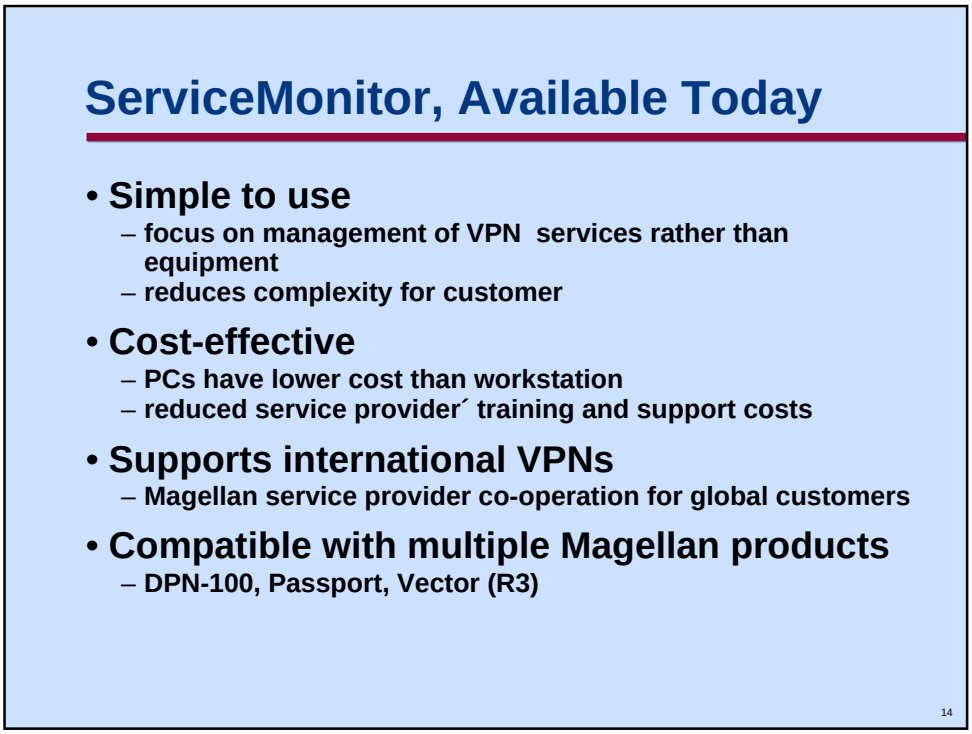
- Status and Performance Management; Integration with HP OpenView; Network Equipment Command

ServiceMonitor *Release 2* will include the following additional applications:

- Service Reports Distribution; Connection Management; Local Station Port Grouping; Third Party PortResource Integration API

And ServiceMonitor *Release 3* will introduce additional capabilities and Magellan network elements as required. Nortel hopes that customers will continue helping to evolve ServiceMonitor so that it provides the functionalities they require.

Availability in regions other than Europe is possible, provided there is sufficient market interest.



For more information, visit the ServiceMonitor demonstration at the Inform ‘96 Demonstration Center.