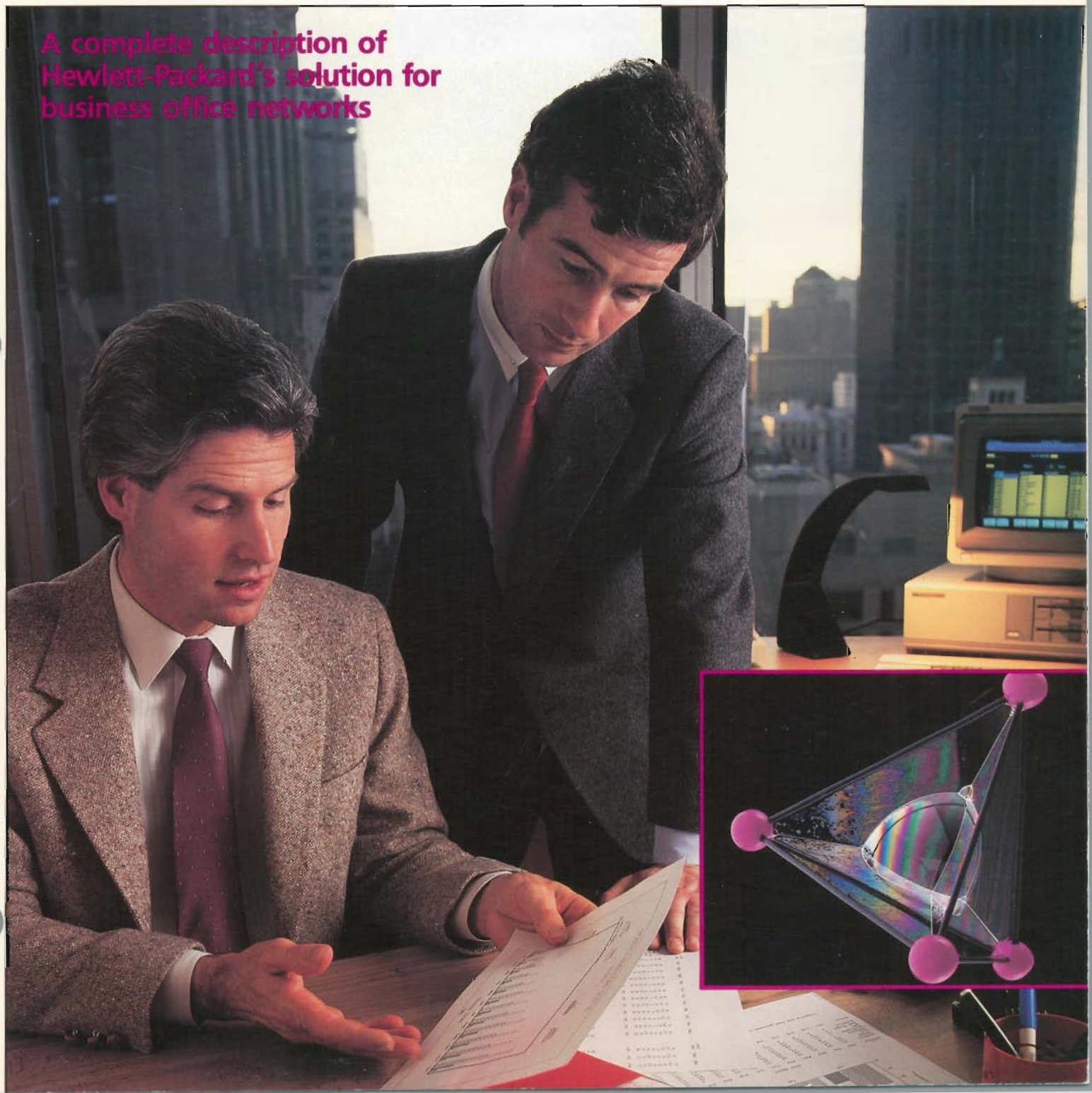
HEWLETT-PACKARD

HP AdvanceNet for the Business Office

March 1988

Solution Guide



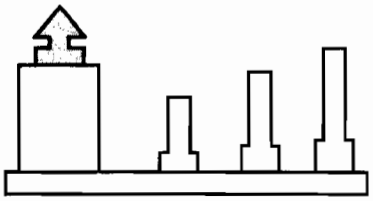
6) Standard 802.3 LAN	6) Investment is preserved through standards, plus system throughput is increased, allowing large amounts of data to be transferred between systems at very high speeds.
7) ThinLAN Hub	7) Provides flexible and cost-effective connections and wiring that are easy to install.
8) Block mode asynchronous terminal support	8) High-performance terminal communications tailored to interactive terminal traffic, with high-performance block mode support giving users faster response.

Product Reference List

HP 32344A	Network Services 3000/V
HP 36920A	Network Services 300/XL
HP 28645A	ThinLAN HUB
HP 30240A	ThinLAN Link 3000/V
HP 36921A	LAN Link 3000/XL
HP 30228A	Digital Multiplexer Interface
HP 2345A	Distributed Terminal Controller
HP 2346A/B/C	Distributed Terminal Controller
HP 30144A	ATP System Interface Board
HP 30145A	ATP Direct Connect Port Controller
HP 30155A	ATP Modem Connect Port Controller
HP 30273A	ATP Direct Connect Expansion Package
HP 30274A	ATP Modem Connect Expansion Package
HP 30276A	ATP/Meridian SL-1
HP 30277A	ATP/Meridian SL-1 Expansion Package
HP 30288A	HP Digital Multiplexer Interface (DMI)
HP 40290A	Advanced Terminal Processor (Model M)

Company-wide Access Module

Introduction

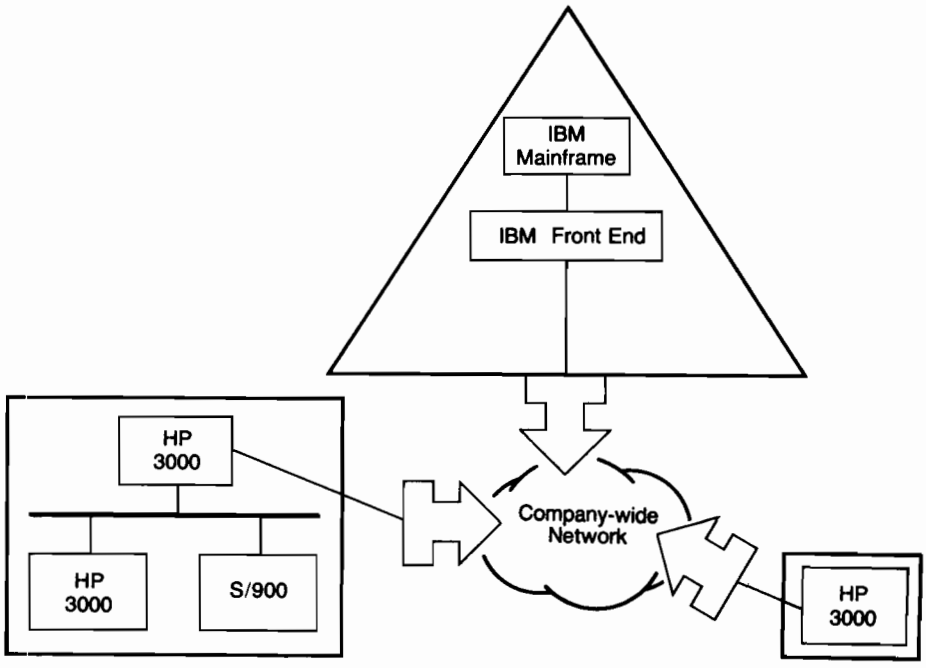


In the Business Office environment there is often a need to share information with systems located in other remote data centers within the company (e.g., corporate headquarters, manufacturing and engineering sites and other business office sites). These data-exchange capabilities are needed for end users who access remote applications and data bases, and for software processes running over multiple systems. There may also be a need for HP 3000 users to communicate with an IBM mainframe at corporate headquarters to update a data base, access an IBM 3270 application or exchange electronic mail with corporate IBM users.

The Company-wide Access module describes the way HP systems can interconnect with remote HP or IBM systems across the backbone network. The alternatives depend upon which type of backbone network is installed as the company-wide network.

For access to either a public or private X.25 network, HP offers two types of communications. HP 3000 computers can communicate with remote HP data centers using either 1) direct X.25 system access or 2) X.25 system access through a LAN gateway. If it is necessary for HP computers to communicate with IBM systems, then the alternatives are 1) an HP 3000 X.25 to SNA Gateway or 2) SNA/X.25 Protocol Conversion.

If access to SNA is desired in order to communicate between HP and IBM computers, the options are 1) an SNA gateway to IBM or 2) standalone SNA access from HP 3000 to IBM.



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When the company-wide network is based entirely on point-to-point connections, the only option for system access from the business office to another data center is a point-to-point connection.

Alternatives for each of these cases are described in more detail in the following sections of this module.

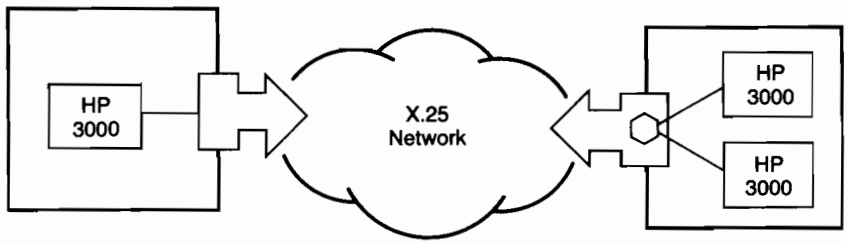
Access to an X.25 Company-wide Network

Alternative 1: HP System-to-HP System Communication Over X.25

Alternative 1a: Direct X.25 System Access

Direct connection of one or several HP 3000 computers to an X.25 network is the best alternative when the X.25 traffic is heavy and performance is a priority.

Functional Description



By running the NS 3000/V Network Services, terminal users and software processes can open multiple sessions to remote locations. They can logon to remote systems, transfer data and access remote files, data bases and peripherals. An X.25 line concentrator can be used to allow several systems to share one single access line to an X.25 network. HP 3000 computers can communicate over public and private X.25 networks.

Features and Benefits

Features	Benefits
1) Direct X.25 network connection	1) Saves cost and overhead of gateway system
2) Powerful Network Services providing access to remote data, programs and peripherals	2) Programmers and users can utilize resources throughout the network, saving costs and improving asset utilization
3) Runs over public and private X.25 networks	3) High connectivity to remote systems
4) International standards protocols	4) Preserves network investments
5) Interactive and batch data exchange	5) Serves multiple purposes
6) Share multiple access to the network through an X.25 line concentrator	6) Minimizes network access costs
7) One single network access for both terminal and system-to-system calls	7) Minimizes network costs
8) Programmatic access X.25 Level III	8) Ability to communicate with non-HP CPUs
9) Transparent gateway to LAN	9) High connectivity and ease of use

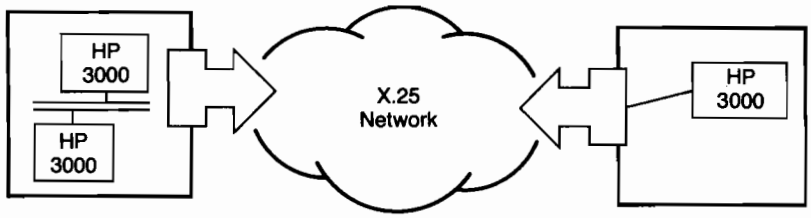
Product Reference List

HP 32344A NS 3000/V Network Services
HP 24405A NS X.25 3000/V Network Link

Alternative 1b: X.25 System Access Through a LAN Gateway

This alternative is appropriate when the customer's HP 3000 computers are interconnected over a LAN, and when minimizing network access costs, rather than performance, is a priority.

Functional Description



The HP 3000 computers are connected to the LAN via NS Network Services and the ThinLAN 3000/V link. One of these systems is also connected to the X.25 network via NS X.25 3000/V link. If there is a limited need for X.25 data communications, it will act as a LAN to X.25 gateway for the other systems, when required. In the case of high data communication traffic, it may be desirable to dedicate the system to the gateway function.

Features and Benefits

Features	Benefits
1) Interactive and batch data exchange	1) Serves multiple application needs with same network, lowering overall costs
2) One single X.25 network access for all LAN-based systems	2) Minimize network access costs
3) Same access link for remote workstations and remote systems	3) Minimize network access costs
4) Transparent gateway to LAN	4) Ease of use

Product Reference List

HP 32344A NS/3000 Network Services
HP 24405A NS X.25 3000/V Link
HP 30240A ThinLAN 3000/V Link
HP 36923A ThinLAN 3000/XL Link

Alternative 2: SNA Over X.25 Network

The SNA over X.25 solution is appropriate when:

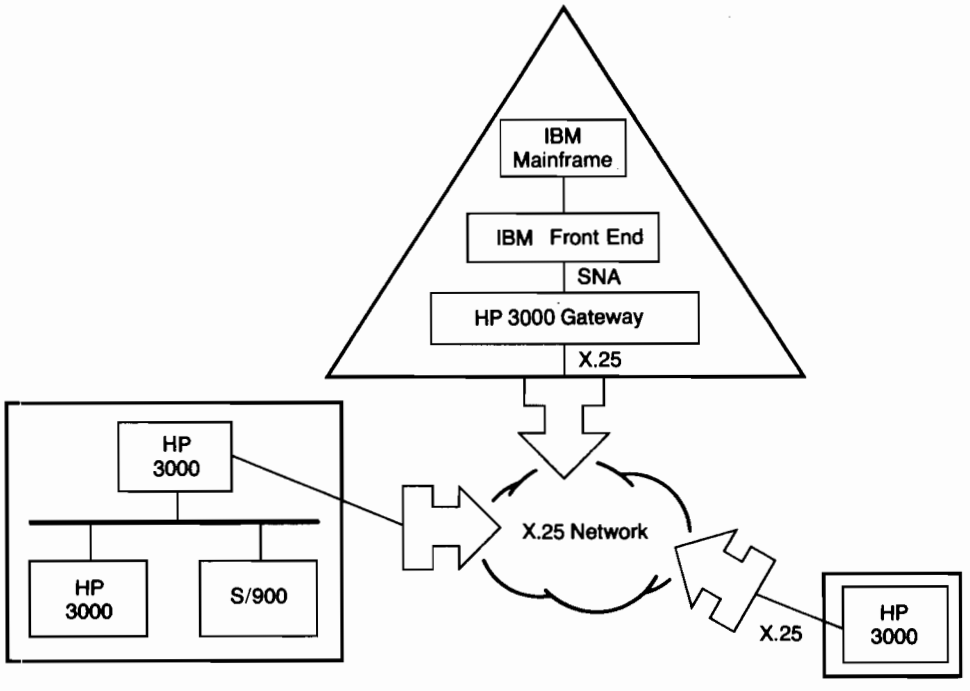
- The customer has standardized on X.25 as a backbone.
- The customer wishes to communicate from an HP 3000 to an IBM mainframe with SNA software and to another HP system with NS 3000 over an X.25 network and he does not want to maintain two separate networks.
- The X.25 backbone can also be used to carry SNA communications between IBM systems and IBM terminals.

Alternative 2a: HP 3000 X.25-to-SNA Gateway

An HP 3000 X.25-to-SNA gateway solution is appropriate when:

- There is limited traffic between the remote HP 3000 systems and the IBM system at headquarters.
- An HP 3000 is available at headquarters. The HP 3000 gateway need not be dedicated to this function and can be used for other applications, depending on traffic load.
- Reduced costs have priority over HP-IBM performance.
- Transparent access is not required for HP-IBM communications.

Functional Description



An HP 3000 system can be used at headquarters to serve as an X.25-to-SNA gateway. The remote HP 3000 systems will communicate with the HP 3000 gateway system using NS over X.25. When remote users require access to applications on the IBM mainframe, the HP 3000 gateway system provides protocol conversion between an NS session on the HP 3000 and SNA to the IBM. This conversion is not transparent to the users or programs on the remote system; programming must be done on the gateway HP 3000 to provide transparent access or route output back to the originator's node.

SNA products are only required on the HP 3000 gateway system; the remote HP 3000s only need the NS services and X.25 products. All the remote HP-to-HP communications are accomplished via the X.25 network.

When planning for this alternative, it is advisable to consult with an HP Network Consultant on performance and implementation issues.

Features and Benefits

Features	Benefits
1) Only NS and X.25 link products needed on remote systems.	1) Lowers cost of communications to IBM. Simplifies network management and maintenance.
2) HP-to-IBM products are only needed on the HP 3000 gateway system (except HP OfficeConnect to DISOSS).	2) Lowers cost, easy to maintain, less CPU overhead on the remote HP 3000 systems.

Product Reference List

On Gateway

HP 30247A/R	SNA IMF/V
HP 30245A/R	SNA NRJE/V
HP 30246A	SNA Link/V
HP 32344A	NS/3000 Network Services
HP 24405A	NS X.25 3000/V Link

On Remote Node

HP 32344A	NS 3000 Network Services
HP 24405A	NS X.25 3000/V Link

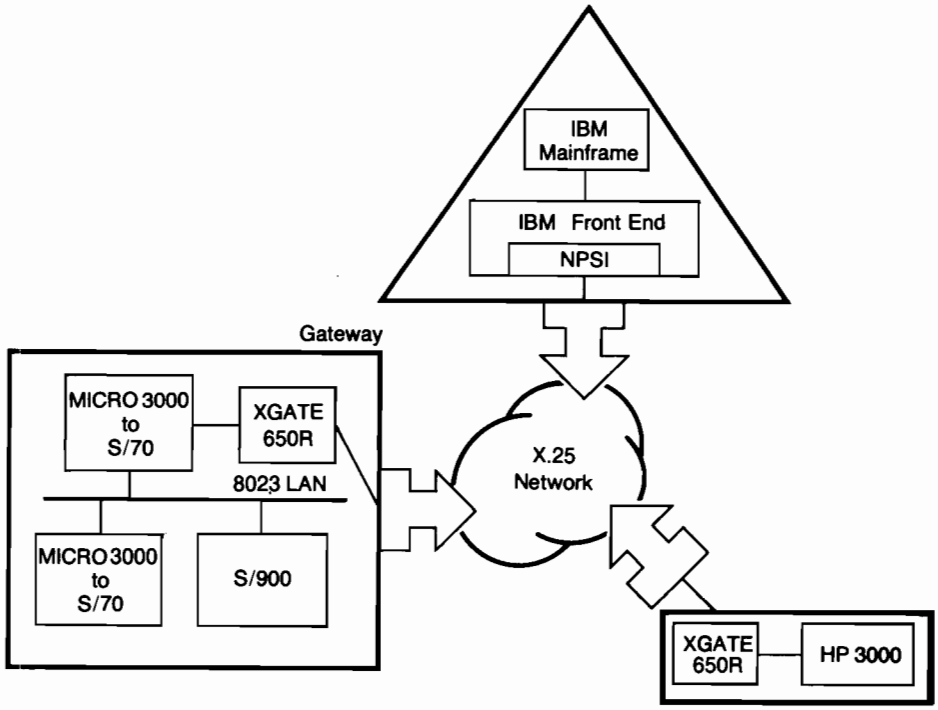
Alternative 2b: SNA/X.25 Protocol Conversion

Protocol conversion is an appropriate solution when:

- There is a need for heavy data communication traffic between remote HP systems and IBM mainframes at headquarters.
- High performance for HP-to-IBM communications is a priority over lower datacomm costs.
- It is acceptable to have two X.25 access lines or one X.25 access line with a small X.25 concentrator at each remote site.

The XGATE protocol converter can front-end either an SNA Gateway on an 802.3 LAN or a standalone HP 3000 running SNA communication software.

Functional Description



Using an SNA/X.25 protocol converter, an HP 3000 system running the HP-IBM SNA communication software (SNA, NRJE, SNA IMF and SNA Link) can access an IBM mainframe over a public or private X.25 network.

As part of the Value-Added Marketing Program, Hewlett-Packard has tested the XGATE 650R SNA/X.25 protocol converter from XMIT AG. Based on extensive testing in HP laboratories, the XGATE 650R is the HP-recommended solution. Although the XGATE 650R is recommended by HP, it does not appear on the HP price list and all product service is performed by XMIT AG.

Features and Benefits

Features	Benefits
1) SNA/X.25 protocol conversion.	1) Cost savings of using X.25 backbone network for both HP-to-IBM and HP-to-HP traffic.
2) No change to the SNA NRJE and SNA IMF interface when using the XGATE 650R SNA/X.25 protocol converter.	2) SNA/X.25 is totally transparent to the end user who accesses SNA NRJE and SNA IMF in exactly the same way that it would be if he had an SNA/SDLC point-to-point connection.
3) Performs SNA/X.25 conversion without adding overhead to the HP 3000.	3) High-performance HP 3000-to-IBM access is provided for both SNA/SDLC point-to-point and X.25 connections.

Product Reference List

On MPE/V HP 3000 System

HP 30247A/R	SNA IMF/V
HP 30245A/R	SNA NRJE/V
HP 30246A	SNA Link/V

On MPE/XL HP 3000 System

HP 30293A/R	SNA IMF/XL
HP 30292A/R	SNA NRJE/XL
HP 30291A/R	SNA Link/XL

Referenced Non-HP Products

XMIT XGATE 650R: SNA/X.25 Protocol Converter

Access to an SNA Company-wide Network

SNA Over SNA/SDLC Network

HP 3000-to-IBM communications products can be used when an SNA network has been installed. However, an X.25 network provides a more economical and more flexible alternative to a hierarchical SNA network. An X.25 subnetwork can be installed for (HP 3000) peer-to-peer communications supporting applications distributed across several locations. Over the same X.25 subnetwork, users can access IBM mainframes using the SNA over X.25 products referred to in the previous section (SNA over X.25).

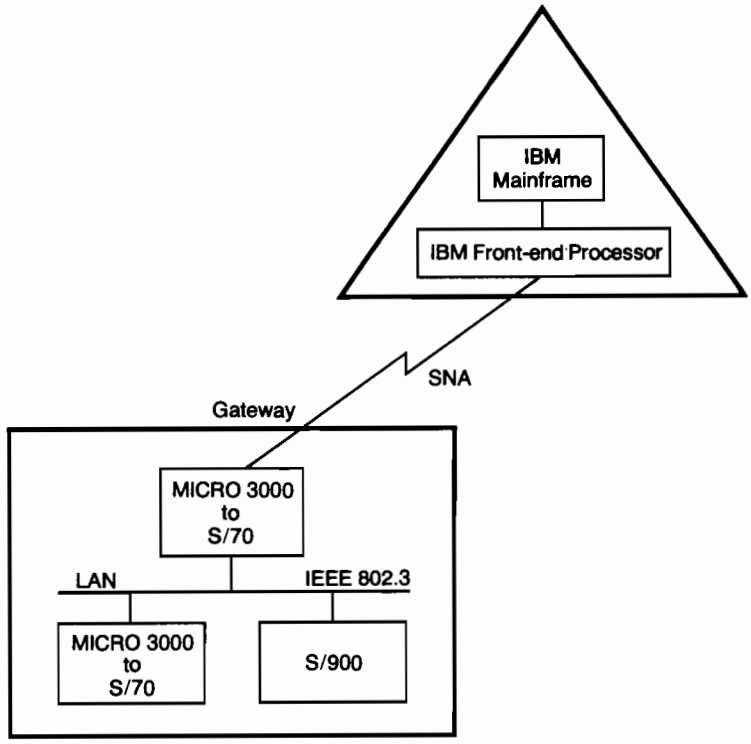
Alternative 1: MPE/V SNA Gateway (HP 3000 to IBM)

An MPE/V SNA Gateway solution is appropriate when:

- At least 2 – 3 systems require IBM access.
- Users are willing to accept lower performance than a standalone solution in order to pay a lower price for the datacomm required.
- User desires all datacomm overhead on one system.
- It is acceptable for all applications that programmatically access IBM to reside on the gateway node.
- User needs IBM access to first-release HP 3000 Series 900.

Note: Standalone SNA access is now available on the HP 3000 Series 900 via SNA Link/XL, SNA IMF/XL and SNA NRJE/XL.

Functional Description



The picture shows two HP 3000 systems accessing an SNA Gateway to IBM. The gateway provides SNA batch job submission, SNA interactive access to 3270 applications and SNA LU 6.2 access to DISOSS for electronic mail exchange to/from HPDesk users.

All HP 3000 systems, ranging from a MICRO 3000 to a Series 70 to the new 900 Series, can access the gateway. The gateway itself can be any MPE/V-based HP 3000 (MICRO 3000 to Series 70) depending on performance requirements. Notice that only the gateway system is running the SNA emulation software (SNA NRJE, SNA IMF, LU 6.2 Base and SNA Link) in addition to the SNA Server product which makes this system the gateway. In contrast, the two user systems only need to install SNA Server Access to be able to use the gateway. All three systems use NS 3000/V and LAN/V Link to communicate over the IEEE 802.3 LAN.

Features and Benefits

Features	Benefits
1) Users can submit batch jobs through SNA NRJE and SNA IMF as if those products were installed on their own systems.	1) No additional training is required for SNA IMF or SNA NRJE users.
2) Batch job output and printing from interactive applications are automatically routed back to user nodes.	2) Users save time and effort by not having to go to the gateway processor to retrieve their output.
3) OfficeConnect to DISOSS needs to be installed on each HP system that will exchange messages with DISOSS; LU 6.2 Base needs to be installed on the gateway system only.	3) Users save money because the products were designed to be used in a gateway configuration.

Product Reference List

On Gateway

HP 30247A/R	SNA IMF/V
HP 30245A/R	SNA NRJE/V
HP 30246A	SNA Link/V
HP 30252A/R	LU 6.2 Base
HP 30254A/R	SNA Server
HP 27515A	HP OfficeConnect to DISOSS
HP 32344A/R	NS 3000/V Network Services
HP 30240A	ThinLAN 3000/V Link

On User Node

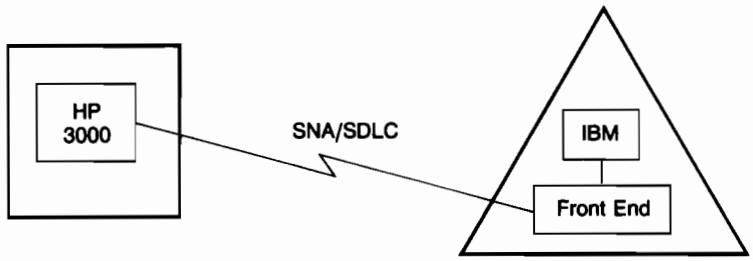
HP 30255A/R	SNA Server Access/V
HP 30256A/R	SNA Server Access/XL
HP 27515A	HP OfficeConnect to DISOSS
HP 32344A/R	NS 3000/V Network Services
HP 30240A	ThinLAN 3000/V Link

Alternative 2: Standalone SNA Access (HP 3000 to IBM)

The standalone SNA products are appropriate when:

- Only one or two systems at the site require IBM mainframe access.
- Optimal performance is a priority over saving money on datacomm costs.
- It is acceptable to run HP-IBM datacomm software on each system.
- It would not be acceptable to run applications that require programmatic access to SNA IMF and SNA NRJE on the gateway node.

Functional Description



The same types of SNA emulation that are done through the SNA gateway are also available as standalone products: SNA IMF for interactive access, SNA NRJE for batch job submission, and LU 6.2 Base (together with HP OfficeConnect to DISOSS) for electronic mail exchange and DISOSS library access. An SNA Link is required on each system and all three of the above products can be supported on the same system over the same link.

Features and Benefits

Features	Benefits
1) High performance alternative to the SNA Gateway.	1) Provides more efficient use of the HP 3000 system.
2) Interactive access to IBM through 3274 cluster controller emulation.	2) Improves productivity and reduces cost since only one HP terminal is required to access applications on both an HP 3000 and on an IBM mainframe.
3) SNA batch job access with sophisticated output management.	3) Improves productivity through quick and efficient access to IBM host-based resources with output routed to any HP 3000 or distributed laser print stations.
4) Reverse NRJE access to the HP 3000.	4) Increases productivity of IBM users by allowing them to access HP 3000 applications not provided on the IBM mainframe.
5) DISOSS connection using Revisable Form DCA, Final Form DCA and Library Services (on MPE/V HP 3000 systems only).	5) Improves company-wide communications by creating a shared electronic mail network and permits users to easily share documents located in a central DISOSS library.
6) LU 6.2 application programming interface.	6) SNA program-to-program communication between HP 3000 user-written applications and IBM mainframe LU 6.2 applications improves run-time performance and enhances error detection and recovery for uses that include file transfer and data base update.

Product Reference List

On MPE/V HP 3000 System

HP 30247A/R	SNA IMF/V
HP 30245A/R	SNA NRJE/V
HP 30246A	SNA Link/V
HP 30252A/R	LU 6.2 Base
HP 27515A	HP OfficeConnect to DISOSS
HP 30253A/R	LU 6.2 API

On MPE/XL HP 3000 System

HP 30293A/R	SNA IMF/XL
HP 30292A/R	SNA NRJE/XL
HP 30291A/R	SNA Link/XL

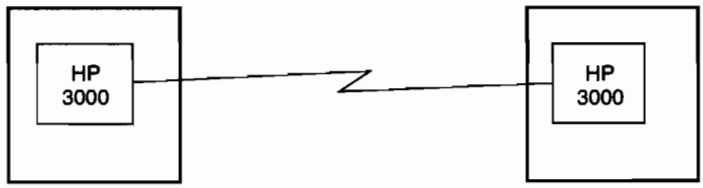
A Point-to-Point Company Network

If the company's wide area network is based on point-to-point links, then the only solution for remote system-to-system communication is direct point-to-point link.

Synchronous communications are preferable when there are needs for high data security and performance requirements.

Asynchronous communications are better for customers looking for low-cost/low-speed solutions for limited batch or short interactive traffic.

Functional Description



The NS/Point-to-Point and the Asynchronous Serial Network Links (ASNL) are the synchronous and asynchronous modem connections for HP 3000 computers. They feature the networking capabilities of the NS Network Services for end users and software processes to access remote computers. Transport level is common to the Point-to-Point, ASNL and LAN links.

Features and Benefits

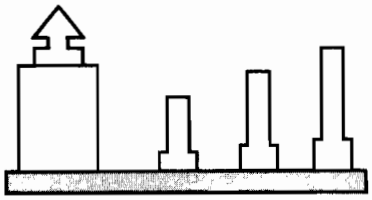
Features	Benefits
1) Powerful Network Services providing access to remote data, programs and peripherals.	1) Programmers and users can utilize resources throughout the network, saving costs and improving asset utilization.
2) Transparent gateway to HP 3000 on LAN.	2) Users don't need extensive training to access company-wide resources.
3) Choice of synchronous high-speed and asynchronous low-speed connections.	3) Adapted to users' need: high performance and low-cost solutions.

Product Reference List

HP 32344A	NS 3000/V Network Services
HP 30284A, HP 30285A	NS Point-to-Point 3000/V Network Link
HP 32003A	Asynchronous SERIAL Network Link (for HP 3000s)

HP SiteWire Module

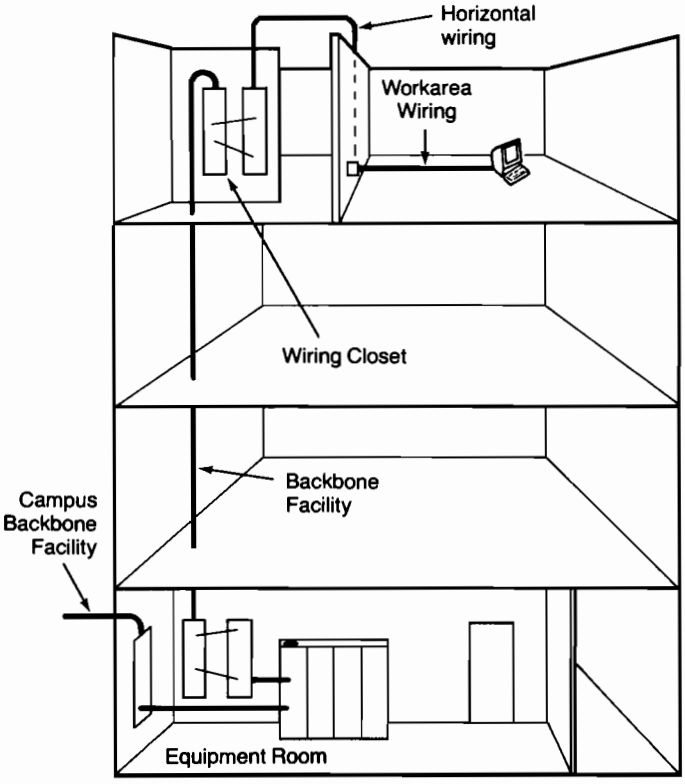
Introduction



In today's competitive marketplace, companies are looking for ways to become more productive while reducing costs. Choosing the right network to improve communications in your business office is the key to cost-effective productivity improvements.

The office network must be versatile to meet the wide range of information needs in your organization and be flexible so it can grow to meet your changing needs. The network must provide connection to many vendors' systems to protect your investment and solve complex communication problems.

To achieve all this connectivity, the network must be based on a comprehensive wiring foundation. Users need to be connected together in logical workgroups to share data and resources. Workgroups then must be connected to a site backbone to provide facility-wide communication. The office wiring system must be well defined and limited to a uniform medium to eliminate costly rewiring for moves, adds or changes.



Office Wiring Solutions

Office environments tend to be clean, quiet and have phones on every desk. Offices tend to have a pattern of work locations that is stable, like individual closed offices or a grid of modular partitions. This encourages a permanent installation of wiring to the work locations.

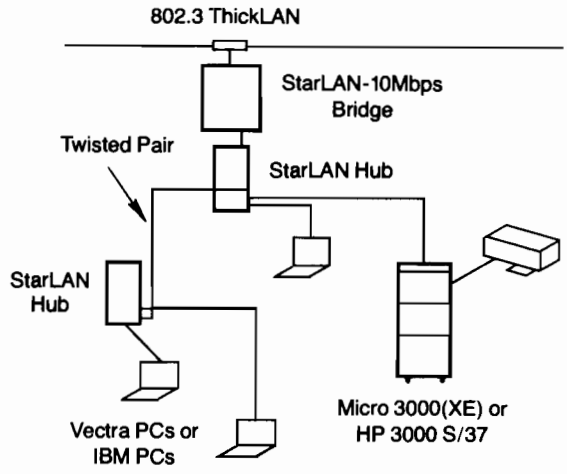
Unshielded twisted-pair cable is the logical choice as it is required for the telecommunication system and is often already in place. Unshielded twisted-pair cable offers a flexible, economical alternative to coaxial cable. HP offers a wide range of links that are supported over unshielded twisted pair: low-speed asynchronous links (ATP); integrated voice-data digital PBX connections (DMI); and 1 Mbps StarLAN connections.

Subnetwork Alternatives

Alternative 1: Twisted-Pair

HP StarLAN is HP's twisted-pair local area network solution for HP Vectra and IBM PCs and provides access to HP's Personal Productivity Center office automation applications and distributed data processing. HP StarLAN also provides local peripheral sharing with HP Vectra PCs or HP 3000s acting as servers.

Functional Description



HP StarLAN was designed to run over unshielded twisted-pair cable to provide a more flexible, low-cost networking solution.

AT&T's Premises Distribution System (PDS) represents HP's preferred wiring solution for office applications. PDS is a uniform wiring system tying together voice, data and office products from multiple vendors. PDS is designed to exploit unshielded twisted-pair technology to the fullest extent possible.

The foremost reason for HP's decision to recommend PDS is AT&T's commitment to maintaining PDS as an open-wiring architecture with demonstrated multivendor compatibility. HP believes that PDS offers the highest degree of flexibility and functionality when compared with competitive offerings.

For offices already wired with twisted-pair cabling, HP offers a service (HP WireTest) to verify that the existing cable is suitable for HP StarLAN.

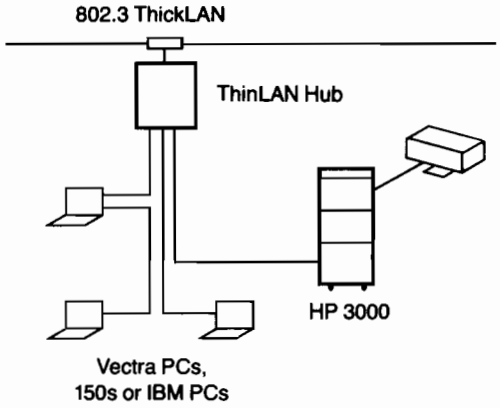
Features and Benefits

Features	Benefits
1) Least expensive media for LAN installations	1) Allows funds to be allocated for other use
2) Flexible and easy to install	2) Minimizes installation cost
3) May already be installed	3) Leveraged investment
4) Twisted-pair is required anyway for the phone system	4) You only have to install one cabling system

Alternative 2: ThinLAN Coaxial Cable

HP ThinLAN is HP's local area network solution for Touchscreen PCs that allows access to HP's Personal Productivity Center applications and distributed data processing.

Functional Description



HP ThinLAN runs at 10 Mbps and offers an alternative to HP StarLAN in technical environments that require office automation solutions in addition to technical applications.

Features and Benefits

Features	Benefits
1) Easy to retrofit in small areas	1) You can implement one small area at a time
2) Supports HP Touchscreen PC	2) Protects your investment in HP Touchscreen PC

Backbone Alternatives

Office subnetworks are linked together with a site backbone. HP offers several alternative backbone technologies.

Alternative 1: Baseband

A baseband backbone using ThickLAN coaxial cable is the recommended backbone for office wiring solutions. The baseband backbone allows connection of StarLAN or ThinLAN subnetworks. StarLAN networks are connected to the baseband backbone with a StarLAN to 10 Mbps Bridge. ThinLAN networks are connected to the baseband backbone with a ThinLAN Hub.

HP supports connection of up to three 500-meter backbone LAN segments, using HP's Repeater Kit. Each backbone segment can connect up to 100 ThinLAN Hubs together, supporting the IEEE 802.3 limit of 1,024 nodes. Larger networks can be supported by using the HP 10 Mbps-10 Mbps LAN Bridge. In addition to increasing the maximum network size, the 10 Mbps-10 Mbps LAN Bridge provides address filtering capabilities to isolate traffic and add security between workgroups.

Baseband backbones can be extended between buildings in a campus environment with a fiber optic link. Siecor's Fiber Optic Transceiver is referenced for use with HP's Repeater Kit or 10 Mbps-10 Mbps LAN Bridge to provide a fiber optic inter-building link.

Features and Benefits

Features	Benefits
1) Simple technology	1) Easy maintenance and installation
2) Industry standard (802.3)	2) Lets you choose the right solution independent of the vendor
3) Robust set of HP accessories available today	3) Allows connection to several subnetworking solutions

Alternative 2: Broadband

Broadband may provide a suitable backbone technology for office applications within a manufacturing operation. Broadband is a more expensive alternative but provides a flexible topology, multiple channels and many connection types. Broadband is the recommended backbone for manufacturing applications. StarLAN or ThinLAN subnetworks can be "bridged" onto the broadband backbone. HP recommends Buffered Repeaters from Ungermann-Bass to provide this connectivity.

Features and Benefits

Features	Benefits
1) Covers large distances	1) One cabling system for large buildings or campuses
2) Multiple channels	2) Allows growth wth changes to the cabling system
3) Industry standard (802.7)	3) Lets you choose the right solution independent of the vendor
4) Preferred cabling system for manufacturing environments	4) One cabling system for your whole facility

SiteWire Module Products and Planning Assistance

HP SiteWire

HP provides the assistance you need to plan your office network with high utility and lasting value. Through HP SiteWire, HP provides a complete set of wiring guidelines for Office, Engineering and Manufacturing buildings and campuses. HP SiteWire is implemented by HP Network Consultants in conjunction with a network of third-party specialists.

HP Network Planning and Design

HP's Network Planning and Design service provides the assistance you need to select the best network strategy to support your business objectives. Our experienced Network Consultants analyze your data communications requirements and create a detailed design to satisfy your current and future needs.

Features

- Custom Solution
- Flexibility for Future Needs
- Low Cost
- Multivendor Compatibility

HP SiteWire is provided as an integral part of the Network Planning and Design service. This service provides you with a custom wiring plan based on your application and HP guidelines for a multivendor wiring foundation.

For more information on HP Network Planning and Design, contact your local HP Sales Representative.

Product Reference List

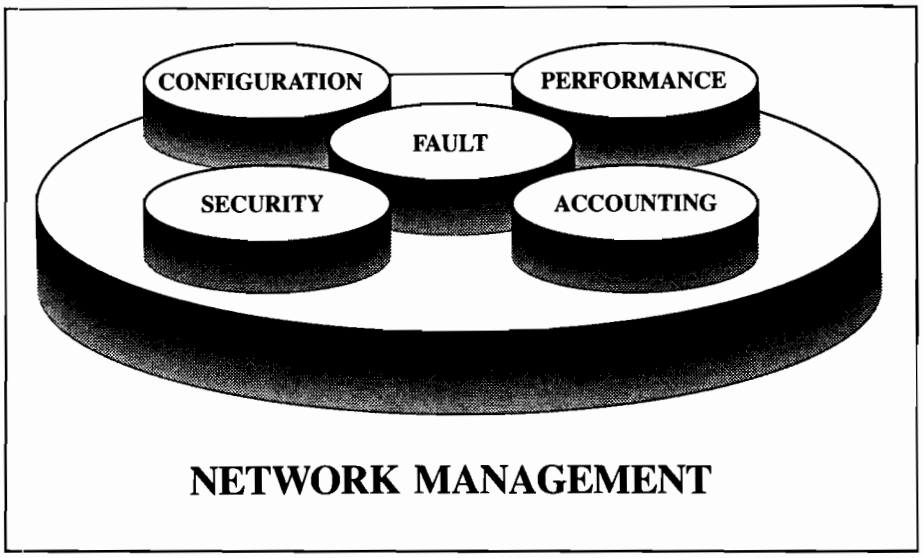
HP 92223A Repeater Kit
HP 28645A ThinLAN Hub
HP 27212A StarLAN Hub
HP 28647A StarLAN-10 Mbps Bridge

Buffered Repeater (Ungermann-Bass)
HP Network Planning and Design
HP 28648A 10 Mbps-10 Mbps LAN Bridge
Fiber Optic Transceiver (Siecor)
HP WireTest

Network Management Module

Introduction

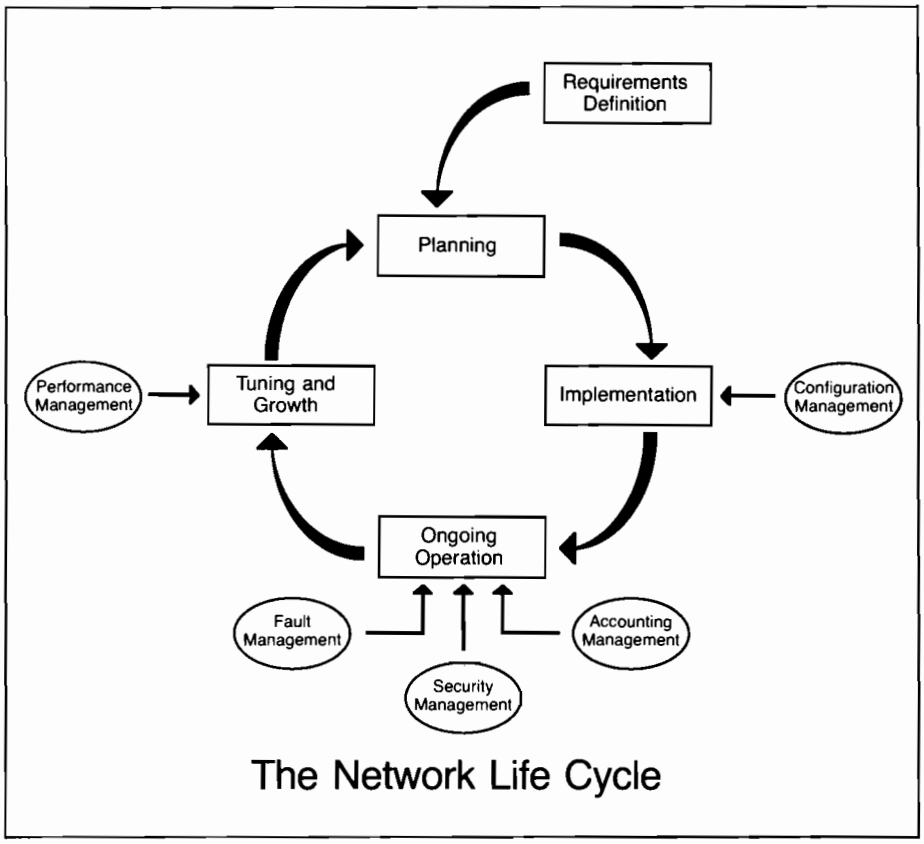
Network Management is the ability to monitor, diagnose and control each component of a network. The International Standards Organization (ISO) has identified five Network Management functions: Fault Management, Performance Management, Accounting Management, Configuration Management and Security Management.



- FAULT MANAGEMENT provides the ability to detect, diagnose and resolve problems throughout the network with the assistance of alarms and error reports. Fault management includes the capability to restore components that have failed.
- PERFORMANCE MANAGEMENT is the ability to optimize network performance through the collection and analysis of data about the network (e.g., measurements of response time and throughput).
- ACCOUNTING MANAGEMENT keeps track of network resource utilization and traffic in order to manage costs and accurately bill for network use.
- CONFIGURATION MANAGEMENT helps to provide continuous network operation by controlling standard local and remote configurations of network components.
- SECURITY MANAGEMENT protects network components from access by unauthorized parties.

Network Life Cycle

The objective of Hewlett-Packard's Network Management is to provide network customers with the tools to create and manage private data networks through all phases of the network life cycle.



The Network Life Cycle

First the users define what they want to accomplish using the network. Then comes the planning phase, which involves mapping the user's requirements to the feature set of the network management. The implementation phase begins when the network is installed and configuration tools are used to help in setting up the local and remote systems. Configuration management tools can also be used in the next phase, ongoing operation. It is during day-to-day operation that fault management tools become important for monitoring the network and detecting problems. Accounting management tools to track network use and security management tools to protect the network are also vital to ongoing operation of the network. After the network is up and running, data collected with performance management tools can be used to fine-tune the network. The collected data can then be analyzed to improve the network and to plan for future growth.

Network Management Users

The responsibilities associated with network management cover a wide range of activities. Here we present descriptions of four typical network management users within a corporation. While your company may be organized somewhat differently, the descriptions below provide a perspective on how Hewlett-Packard's Network Management tools can be used to manage your firm's network.

MIS Manager

The MIS Manager makes the buying decision for a company's computer systems and local area network components. This person is looking for a comprehensive set of tools that will enable the department to effectively manage communications throughout the network. A major area of responsibility for the MIS Manager is customer service. This individual is concerned with how network performance affects the end users. In addition, the MIS Manager is accountable for the cost effectiveness of the network, in terms of network and personnel costs. The network and the tools used to manage it must be not only productive but also cost efficient. The MIS Manager plans for the company's communication needs by determining the role distributed systems should play in the company's future and evaluating how the systems in place must grow to meet those needs.

Telecommunications Manager

The Telecommunications Manager's responsibilities are similar to those of the MIS Manager, although they concern the components of the company-wide backbone network. This manager must effectively integrate communications throughout all parts of the company, from corporate headquarters and business offices to regional and branch offices to factories and research facilities. Like the MIS Manager, the Telecommunications Manager is accountable for customer service and network costs. This person is also responsible for efficiently managing the company's telecommunications equipment and circuits. The Telecommunications Manager must plan for the company's future communications needs by determining what role telecommunications will play in the company's future and what equipment will be required to meet those needs.

Data Communications Specialist

The Data Communications Specialist is responsible for the accuracy and timeliness of the data traffic that flows through the network. This specialist's main area of responsibility centers around troubleshooting network communication problems. To perform this task, the Data Communications Specialist needs a wide range of tools to accurately and efficiently diagnose and resolve data communication problems. This person also needs tools to monitor network components so as to optimize network performance. The Data Communications Specialist plays a major role in network maintenance by using network management tools to resolve potential problems in the network before they occur.

Distributed Systems Operator

The Distributed Systems Operator is responsible for managing systems in the network. With networks growing ever larger and more complex, an operator is often required to manage multiple systems from a central site. The Distributed Systems Operator must accurately and efficiently diagnose and troubleshoot problem areas so that computer downtime can be minimized. This person must also maintain current records of the systems' hardware and software configurations so that communications continue smoothly throughout the network.

Alternative 1: HP Network Management for the MIS Manager

Hewlett-Packard provides a complete set of tools and support services that meet the MIS Manager's Network Management responsibilities:

- Customer Service
- Network Cost/Control
- Strategic Planning
- Future Growth

Hewlett-Packard's Network Management tools provide the MIS Manager with the ability to monitor network performance, track network costs and plan for future growth.

Features

1) Graphical representation of network performance
2) Centralized control and monitoring of operations of multiple HP 3000 systems
3) Predictive capabilities
4) Network Consultants to aid in planning future communication needs
5) Support services to efficiently manage the network

Functional Description

1) Graphical representation of network performance

As a network grows and its complexities increase, it becomes impossible to manage performance simply by relying on feedback from users. The MIS Manager needs to know more about what goes on in the network: who is using it, whether the network devices are overloaded and when it needs to grow. This information must be presented clearly and concisely so that the MIS Manager can spend time making decisions to improve the network instead of merely sifting through data. The powerful data analysis software on Hewlett-Packard's LAN and WAN performance analysis systems eases the MIS Manager into managing a network.

2) Centralized control and monitoring of operations of multiple HP 3000 systems

As networks increase in size and complexity, the operational costs also rise. The MIS Manager needs tools to help keep network expenses to a minimum. Hewlett-Packard's Network Management provides centralized control and monitoring of multiple HP 3000 systems. What this means to the MIS Manager is a decrease in personnel costs since it will no longer be necessary to maintain an operations staff at each remote node. Furthermore, these tools help in monitoring usage trends and identifying problem areas so the MIS Manager can take corrective action before the problem seriously affects performance.

3) Predictive capabilities

Network Predictive, an HP Response Center tool, increases network uptime by periodically analyzing error rates logged by network software components. By identifying potential and imminent failures, corrective action may be taken before system reliability and performance are noticeably affected.

4) Network Consultants to aid in planning future communications needs

The rapid growth of networks and changing network technology have created an urgent need for network support services. Hewlett-Packard, the long-recognized industry leader in support and service, offers a comprehensive range of network support services that can be tailored to your company's unique requirements. The Customer Network Center (CNC) is just one of HP's network consulting organizations that provides assistance with the design, implementation and operation of networks worldwide.

5) Support services to efficiently manage the network

Hewlett-Packard's Response Center and factory support engineers assist MIS Managers in the development, maintenance and operation of their networks. HP's comprehensive support offerings include network monitoring, historical trend analysis, network performance tracing and graphical network topology mapping.

Product Reference List

Hardware

4951C	Portable Protocol Analyzer
4952A	High-Speed Portable Protocol Analyzer
4953A	High-Speed Protocol Analyzer
4954A	Portable WAN Protocol Analyzer
4972A	Portable LAN Protocol Analyzer

Software

18212A	LAN Performance Analysis Application Software
18300A	X.25 Network Performance Analyzer
30392A	HP Security Monitor/V
32029A	INCS/3000
32030A	RSOF/3000
32344A	NS 3000/V Network Services

Support Products

Network Planning and Design

51429A
51429B

Network Prepare

52430A
52430B

NetAssure

50047P+16B	Base Support Product
50050P+16B	802.3 Connection
50051P+16B	X.25 Connection
50052P+16B	PBX Connection
50053P+16B	SNA Connection
50054P+16B	HP Proprietary Connection

Network Startup

50050P+16A	802.3 Connection
50051P+16A	X.25 Connection
50052P+16A	PBX Connection
50053P+16A	SNA Connection
50054P+16A	HP Proprietary Connection

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Documentation

32344-90001	NS 3000/V User/Programmer Reference Manual
32344-90002	NS 3000/V Network Manager Reference Manual (Vol. I)
32344-90012	NS 3000/V Network Manager Reference Manual (Vol. II)

Alternative 2: HP Network Management for the Telecommunications Manager

Hewlett-Packard provides a complete set of tools to meet the Telecommunications Manager's Network Management responsibilities:

- Customer Service
- Network Cost/Control
- Telecommunications Management
- Strategic Planning
- Future Growth

Hewlett-Packard's Network Management tools provide the Telecommunications Manager with the ability to monitor network performance, track network costs, manage the telecommunications network and plan for future growth.

Features

1) Centralized network management
2) Centralized telecommunications management
3) Graphical representation of network performance
4) T1 fault isolation
5) Non-intrusive transmission testing
6) Network Consultants to aid in planning future communication needs

Functional Description

1) Centralized network management

The HP Private Packet Network Control System provides sophisticated and easy-to-use management at the heart of the HP X.25 Private Packet Network. The HP Private Packet Network Control System is made up of one or two Network Control Processors (NCP) and optional Auxiliary Service Processors (ASP) that are connected to the network via X.25. Dual Network Control Processors provide call record redundancy and load sharing to increase performance, response and reliability. The Network Control Processors may directly manage the network or may, in larger networks, download their configuration information to Auxiliary Service Processors situated throughout the network.

The Network Operator Console (NOC) is the user interface to the network control and administration functions. The ease and adaptability of the Network Operator Console user interface in combination with the configuration and administration capabilities of the Network Control Processor and Auxiliary Service Processor provide a simple yet powerful interface to the Network Control System.

2) Centralized telecommunications management

HP RATES is a premier management tool for maintaining a private line network. It combines circuit access equipment, comprehensive measurement and control software, sophisticated data base management software and a centralized computer system to form a complete test and management tool. With this system, tests on distant private lines are performed by centralized test personnel from any conveniently located computer terminal.

Not merely an automated test system, HP RATES includes a comprehensive data base management system that tracks all pertinent information about lines and locations; easy-to-understand test procedures that permit rapid fault isolation and reduce the time needed to master the system; and simple circuit data entry facilities with data validation. Finally, there is the security of a built-in diagnostic system that can pinpoint any problem within HP RATES itself and a fail-safe mechanism that ensures the telephone network will never be affected by the test equipment.

3) Graphical representation of network performance

As a network grows and its complexities increase, it becomes impossible to manage performance simply by relying on users' feedback. The Telecommunications Manager needs to know more about what goes on in the network: who is using it, whether the network devices are overloaded and when it needs to be expanded. By presenting network information in flexible, easy-to-use graphical formats, Hewlett-Packard helps the Telecommunications Manager efficiently manage the network without having to wade through useless data.

4) T1 fault isolation

To achieve the performance and availability objectives of T1 leased and DDS services, the Telecommunications Manager must be able to clear trouble fast. He needs reliable equipment that will trace individual circuits, locate the source of an impairment and determine who should fix it. There is no need to disturb revenue-earning traffic: the HP 3787B Digital Data Test Set has a comprehensive range of in-service performance-monitoring measurements. Apart from its T1 and DDS test capability, the HP 3787B is a powerful tool for testing 56 Kbps switched and packet-switched services.

5) Non-intrusive transmission testing

Telecommunications Managers and their support groups are also responsible for the testing of analog data lines. The HP 4948A is a new Transmission Impairment Measuring Set (TIMS) that allows the users to test voice-grade leased lines while they are still in service.

6) Network Consultants to aid in planning future communication needs

The rapid growth of networks and changing network technology have created an urgent need for network support services. Hewlett-Packard, the long-recognized industry leader in support and service, offers a comprehensive range of network support services that can be tailored to your company's unique requirements.

Product Reference List

Hardware

HP Private Packet Network	Network Control System
3787B	Digital Data Test Set
4925B	Bit Error Rate Test Set
4948A	In-Service Transmission Impairment Measuring Set
4951C	Portable Protocol Analyzer
4952A	Line Analyzer
4953A	High-Speed Protocol Analyzer
4954A	Portable WAN Protocol Analyzer
37100S	HP RATES

Software

18264A	SNA and X.25 Link-Level Statistics
18300A	X.25 Performance Analyzer

Support Products

Network Planning and Design

51429A
51429B

Network Prepare

52430A
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NetAssure

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Network Startup

50050P+16A	802.3 Connection
50051P+16A	X.25 Connection
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Alternative 3: HP Network Management for the Data Communications Specialist

Hewlett-Packard provides a complete set of tools and support services to meet the Data Communications Specialist's Network Management responsibilities:

- Troubleshooting Network Communication Problems
- Optimizing Network Performance
- Network Maintenance

Hewlett-Packard's Network Management tools provide the Data Communications Specialist with all the tools necessary in order to troubleshoot communication problems, track network performance and perform network maintenance.

Features

1) Ability to analyze data across any link
2) Fault isolation
3) Graphical and tabular representation of network performance
4) Predictive capabilities
5) Network simulation
6) Remote operation
7) Network Consultants to assist in network maintenance
8) Support services to efficiently maintain the network

Functional Description

1) Ability to analyze data across any link

HP offers a family of powerful, general-purpose protocol analyzers, with software and accessories to meet the Data Communication Specialist's needs. While maintaining family compatibility, each analyzer is tailored for a different environment, with different features and characteristics. All have common operating, setup, remote transfer and display characteristics. Applications packages guarantee that HP protocol analyzers will not be made obsolete by the specialist's changing needs, or by changing technology and standards.

2) Fault isolation

Troubleshooting data communication problems can be a very involved process since there are many hardware and software components to be investigated. Hewlett-Packard provides a wide range of diagnostic and troubleshooting tools.

3) Graphical and tabular representation of network performance

As a network grows and its complexities increase, it becomes impossible to manage performance simply by relying on feedback from users. The Data Communications Specialist needs to know more about what goes on in the network: who is using it, whether the network devices are overloaded and when it needs to be expanded. By presenting network information in flexible, easy-to-use graphical formats, Hewlett-Packard lets the Data Communications Specialist spend time making decisions to improve the network instead of having to wade through useless data.

4) Predictive capabilities

Network Predictive, an HP Response Center tool, increases network uptime by periodically analyzing error rates logged by network software components. By identifying potential and imminent failures, corrective action may be taken before system reliability and performance are noticeably affected.

5) Network simulation

Beyond the powerful analysis capabilities in non-intrusive monitor mode, all HP protocol analyzers can simulate various network components. Softkey and menu programming allow easy stimulus/response testing of network components without tying up other network resources. All triggering and analysis capabilities are available while actively simulating network components. Simulation can be especially useful in isolating intermittent problems, or for testing a new application or device before system connection.

6) Remote operation

HP protocol analyzers support the remote exchange of data, menus, setups and applications software over RS-232/V.24. The HP 4952A, 4953A and 4972A provide total remote operation over RS-232/V.24. Remote capability gives field service personnel access to central site expertise and central site experts direct access to remote sites that lack qualified service personnel.

7) Network Consultants to assist in resolving communication problems

The rapid growth of networks and changing network technology have created an urgent need for network support services. Hewlett-Packard, the long-recognized industry leader in support and service, offers a comprehensive range of network support services that can be tailored to your company's unique requirements.

8) Support services to efficiently maintain the network

Hewlett-Packard's Response Center and factory support engineers assist Data Communications Specialists in the development, maintenance and operation of their networks. Hewlett-Packard's comprehensive support offerings include network monitoring, historical trend analysis, network performance tracing and graphical network topology mapping.

Product Reference List

Hardware

3787B	Digital Data Test Set
4925B	Bit Error Rate Test Set
4948A	In-Service Transmission Impairment Measurement Set
4951C	Portable Protocol Analyzer
4952A	Line Analyzer
4953A	High-Speed Protocol Analyzer
4954A	Portable WAN Protocol Analyzer
4955A	Programmable Protocol Analyzer
4972A	Portable LAN Protocol Analyzer

Software

18212A	LAN Performance Analysis Application Software
18264A	SNA and X.25 Link-Level Statistics
18300A	X.25 Network Performance Analyzer

Support Products

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