

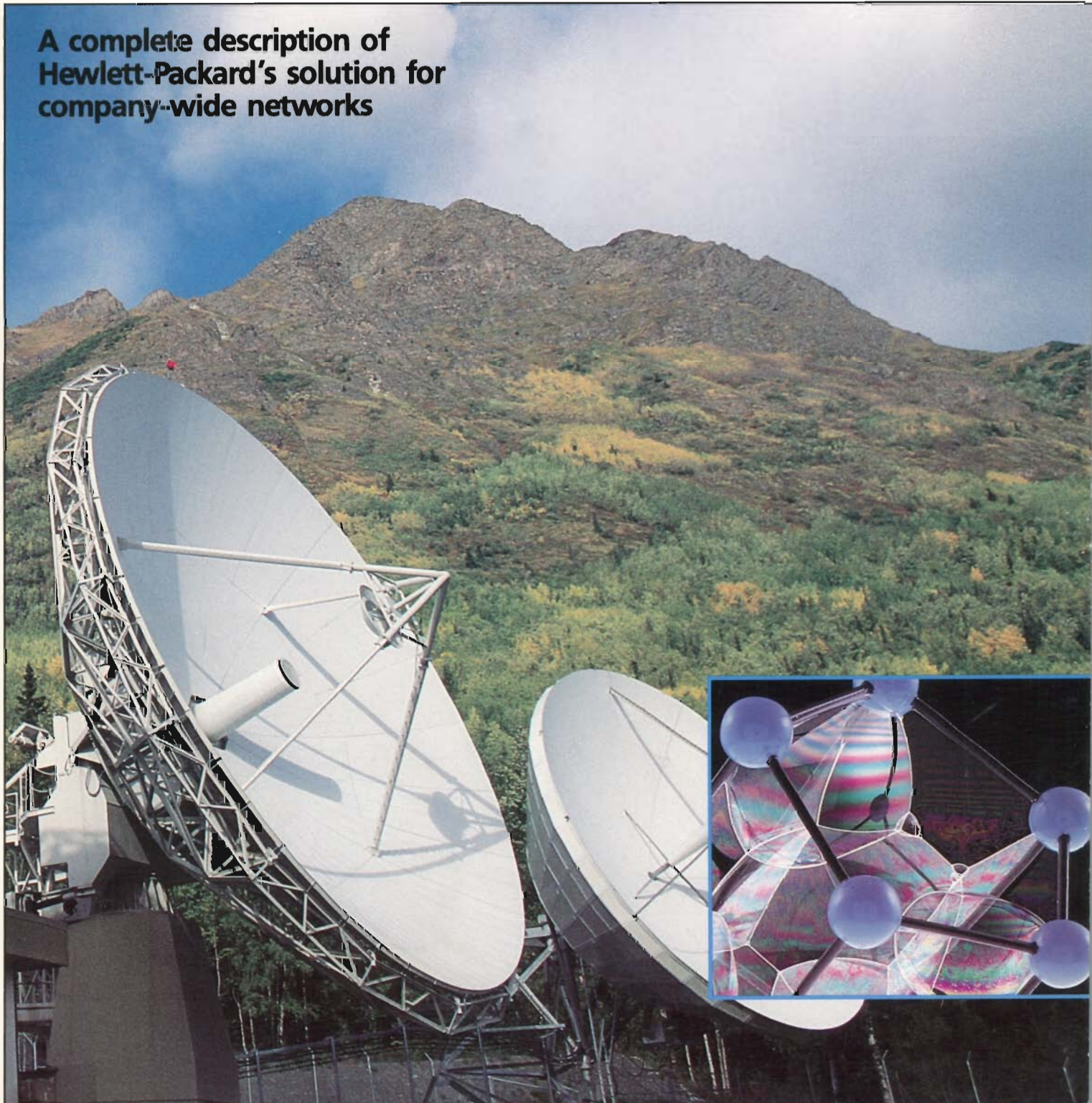
# HEWLETT-PACKARD

## **HP AdvanceNet for the Company-wide Network**

March 1988

Solution Guide

**A complete description of  
Hewlett-Packard's solution for  
company-wide networks**





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# Preface

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This solution guide contains network descriptions for the HP AdvanceNet Company-wide Network solution.

The guide includes information on HP products that can be used with HP systems or tied into other vendors' data processing and office automation equipment.

HP AdvanceNet offers a broad range of alternatives for both local and remote communications. HP's networking products are easy to install and maintain, even as the network grows in size and complexity. HP AdvanceNet is also based on a firm commitment to industry standards, such as the International Standards Organization's Open Systems Interconnection (OSI) reference model.

This commitment ensures lasting value for hardware and software, and facilitates communication with other vendors' standards-based networks. HP also supports multivendor communications by offering products that are compatible with other vendors' proprietary networks, such as those of IBM and DEC.

The Company-wide Network solution is one of five HP solutions designed to meet networking needs within different business environments; the others are Business Office, Regional Sales and Service, Engineering and Computer Integrated Manufacturing.

Every business environment has its own unique needs, characteristics and computing automation programs. Recognizing this, HP has created a way to tailor network technologies to help users meet these needs and implement their programs.

Within a computing automation program, different projects are defined that make up a phased and successful implementation. To facilitate such projects, HP has created networking modules; each solution, and its guide, is thus divided into several modules.

A module consists of products grouped together to address a specific communications problem. Examples within the Company-wide Network solution are the X.25 Network and SNA Access modules.

Subdividing solutions into modules ensures that when implementation proceeds one project at a time, integration of the projects later on will be easy. Using this approach, for example, a company can specify, design and implement its computer room as one project, and devise a system for end-user communication as another project; integrating these steps creates a total solution.

Within a module, there are often several scenarios that look at potential or common variations of the problem addressed. Each scenario in turn might encompass several alternatives, depending on the size of the network and its load.

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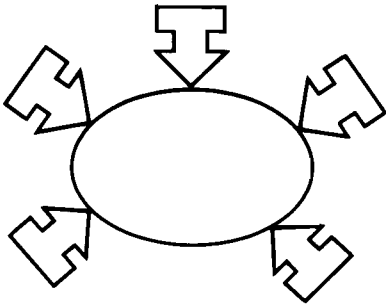
In addition, each solution guide includes a Network Support module, which describes the services HP offers to help customers tailor networks to their exact needs. Planning and design, implementation, maintenance and education are among these services.

Product data sheets, which provide detailed information on individual products and are sources of configuration and ordering information, are available in the 1988 HP AdvanceNet Specification Guide. Your HP Sales Representative or local HP Sales Office can provide copies of the specification guide.

# Introduction

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## Company-wide Data Communication



HP AdvanceNet's company-wide network makes information available on an immediate basis to everyone who needs it, across the office or around the world.

The company-wide network is designed to international standards so it can meet your needs in today's multivendor environment.

The network is also flexible enough to grow with new technologies to solve tomorrow's problems. It will reduce operating costs by making your information exchange more productive and more cost-effective.

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## Company-wide Remote Communication

The company-wide network is based on the X.25 international standard, which has been adopted by all major computer and telecommunications manufacturers. The popularity of the X.25 standard ensures multivendor connectivity today and in the future.

The network is augmented by a range of point-to-point and dial alternatives to provide your company with a total solution for your communication needs.

HP AdvanceNet's company-wide network integrates all parts of your company, from corporate headquarters and business offices to regional and branch offices, manufacturing facilities and engineering departments, regardless of location.

The network provides a complete range of user services for on-line interactive access to remote information and electronic mail. It also provides efficient data transfers between your distributed processors, mainframes, minicomputers and personal computers no matter where they're located.

The company-wide network offers these capabilities for Hewlett-Packard computers and terminals and for equipment from IBM and other vendors.

The network is managed from a central location so your experienced network people can monitor operations, costs and maintenance. The network grows modularly, and modification and expansion can be handled on-line without interrupting network operations.

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## **Simplified Modular Network**

HP AdvanceNet's company-wide network is built from several modules that solve specific communication problems for different functions throughout your company. This building block approach simplifies configurations and allows you to grow one step at a time.

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### **The Company-wide X.25 Network Module**

The central module of HP AdvanceNet's company-wide network solution is a backbone network based on a private X.25 network. With its wide selection of switching and performance capabilities, the X.25 network provides a cost-effective, multivendor transport mechanism for computers and workstations from Hewlett-Packard and other vendors.

The X.25 network's built-in redundancy and security schemes protect vital communication links. Network monitoring and troubleshooting are accomplished through extensive management facilities, complemented by Hewlett-Packard's communications instruments.

For companies that have implemented IBM's proprietary SNA offering, the flexibility of Hewlett-Packard's X.25 network module permits integration of SNA communications, while taking advantage of the greater efficiencies of an X.25 network.

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### **Company-wide Access Module**

To connect your computer centers to the company-wide network, HP AdvanceNet offers a full range of network services, including program-to-program, file transfers, data base access and virtual terminal support.

Equipment and line costs can be decreased by choosing the most cost-effective solution from a wide variety of connectivity options, ranging from dial-up to point-to-point and X.25 connections. In addition, you can share network access among several computer systems, either through a gateway system or an X.25 concentrator.

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### **SNA Access Module**

Hewlett-Packard computers and workstations can access remote IBM host applications and data bases through the company-wide network. Capabilities include batch services that allow Hewlett-Packard computers to process jobs on remote IBM mainframes and interactive services which connect Hewlett-Packard computers and workstations to IBM hosts.

These capabilities are available over IBM's SNA network architectures. They are offered on all Hewlett-Packard systems and workstations, allowing full communications between your users and corporate mainframes.

In addition, these remote HP-to-IBM communications can be integrated into your Hewlett-Packard distributed data network. For example, one HP 3000 can serve as a gateway between Hewlett-Packard networks and IBM SNA networks. You could also use a single X.25 network for your Hewlett-Packard and your IBM communications.



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## Top-rated Support

To make sure HP AdvanceNet's company-wide network meets your specific communication requirements, our sales representatives and network consultants will work with you to analyze the information needs throughout your organization.

Drawing on their years of experience with our large networking customer base, our consultants will help you plan, design and implement your network.

We also provide comprehensive training for your network users, programmers and maintenance people. To make sure your network operates effectively, we have extensively trained engineers who can assist you with maximizing the network's uptime.

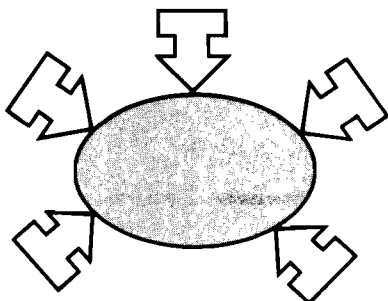
Hewlett-Packard's support has consistently been rated as the best in the industry (based on overall excellence as reported in the Datapro surveys for each of the past six years). Our support teams are ready to protect the value of your network now and in the future.





# Company-wide X.25 Network Module

## Introduction



Efficient and reliable exchange of information over long distances is critical for companies with operations distributed in multiple sites. This exchange of data may involve computer systems and workstations from different vendors and may be spread out over many different geographical areas.

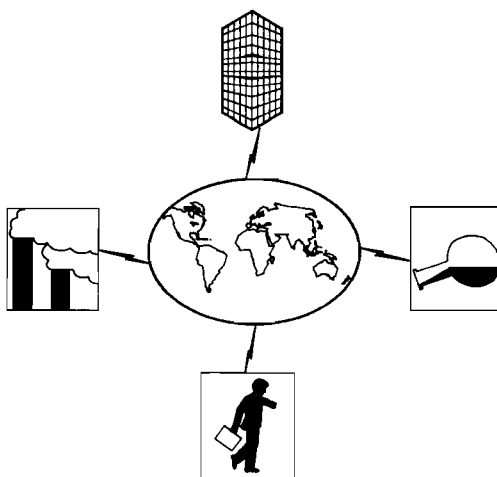
For these companies, the company-wide network solution must minimize the communication costs, provide the users with the performance and services they require, while offering all the control functions necessary to ensure reliability and security in the transport of data vital for the corporation.

The HP X.25 network module provides a complete answer to company-wide networking needs by giving customers the products to build efficient and reliable transport solutions and to control, monitor and troubleshoot their networks.

The HP company-wide network is based on X.25, the CCITT international recommendation widely accepted by the communications and computer industry, which provides the basis for cost-effective multivendor communications. An X.25 network is ideally suited to carry all the company data, even between non-HP equipment, or between equipment using proprietary communication protocols such as IBM.

For the specific case of a network linking a limited number of systems in a very stable environment the X.25 network is best achieved by point-to-point connections over leased or dial-up lines. This network alternative and the related HP product offering is described more extensively in the Company-wide Access module.

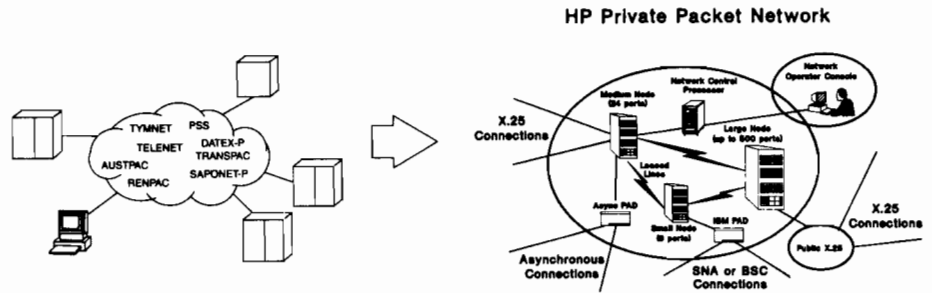
## Customer Environment



- Geographical dispersion
- Multivendor environment
- Rising costs
- Integrated applications

The HP X.25 Network module offers two alternatives: 1) public X.25 networks or 2) the HP Private Packet Network. In many cases, a hybrid solution based on a combination of public and private X.25 networks will be the preferred choice.

## Customer Alternatives



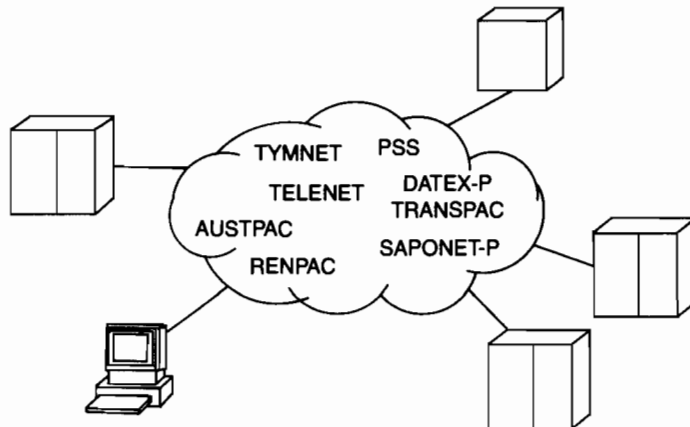
### Alternative 1: Public X.25 Networks

This alternative is appropriate for customers:

- Who need high connectivity between worldwide sites and multivendor equipment
- Who have many dispersed offices with relatively low volume of data communications
- With low requirements in terms of confidentiality and control
- Who want to experiment X.25 networking with a minimum capital investment.

This alternative does not require specific HP private X.25 network products, but can be implemented with the HP X.25 access products described in the Company-wide Access module. HP's access products are certified with all the major public X.25 networks around the world. In addition, users can benefit from the wide range of HP protocol analyzers and test equipment for monitoring and troubleshooting their network.

### Public X.25 Network



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## Product Reference List

HP 2334A	HP 2334A Plus X.25 Multiplexer
HP 4951C	Portable Protocol Analyzer
HP 4952A	High-Speed Portable Protocol Analyzer
HP 4953A	High-Speed Protocol Analyzer
HP 4955A	Basic Programmable Protocol Analyzer

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## Alternative 2: Private X.25 Network

This alternative is appropriate as the X.25 network solution for companies:

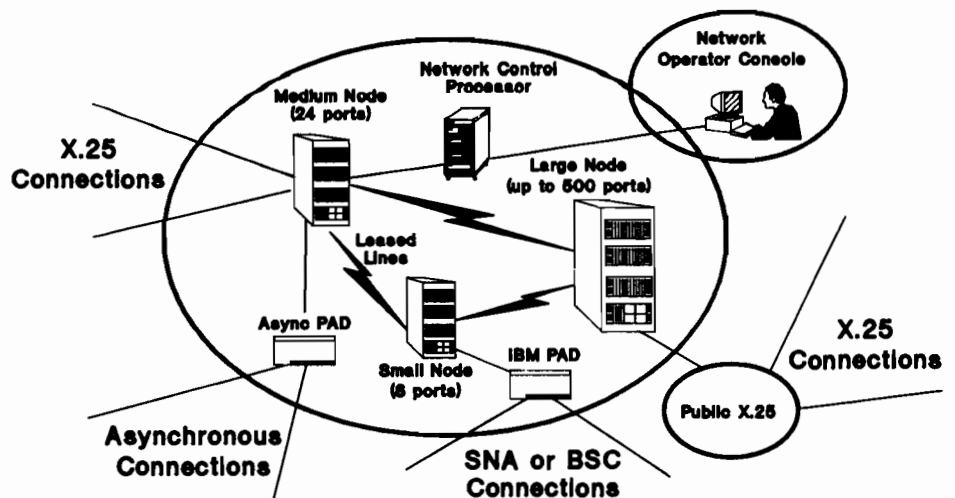
- Who need high connectivity including communications between multi-vendor equipment
- Who have medium-to-high data communication traffic between multiple sites with a mix of interactive and batch communications
- Who want to have a tight control over their network operations
- Who have special requirements in performance, data security or network control
- Who want to optimize their network investment by tailoring it to the exact company's requirements.

The private X.25 network alternative can be used in conjunction with public X.25 networks to build hybrid networks combining the powerful features of the private network for the high traffic and important connections with the public network facilities for the low-volume connections to remote areas around the world.

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## Functional Description

### HP Private Packet Network



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## Features and Benefits

### Features

- 1) X.25 protocol, X.25 gateway to public X.25 networks and support of protocol converters.
- 2) Powerful and easy-to-use network control system.
- 3) Modular family of switching nodes, with wide range of performance, redundancy and connectivity levels.
- 4) Built-in redundancy and on-line reconfiguration capabilities.
- 5) Access checking mechanism.
- 6) Total solution from HP

### Benefits

- 1) High connectivity with multi-vendor equipment and public X.25 networks.
- 2) Control of costs and network operations with a minimum of specialized personnel.
- 3) Cost-effective and flexible network design, with the possibility of gradual and indefinite growth.
- 4) Maximization of network uptime.
- 5) High security for confidential communications.
- 6) Top-rated single vendor for network delivery, installation and support, available worldwide.

The HP Private Packet Network is a private X.25 network consisting of:

- A modular family of X.25 switching nodes offering a wide range of performance, redundancy and connectivity levels. These switching nodes route data by switching internode connections and establish the interfaces with the connected devices.

Some nodes can also function as a gateway to interconnect the private network to other X.25 networks, public or private.

- The network control processor runs a large set of network management software and manages central network data bases. It monitors and controls network access and activities, allows remote network configuration, performs network diagnostics and provides network statistics and usage accounting.

The operator interface to the network control processor is supplied by network operator consoles from which all network operations are achieved through menu-driven programs. Auxiliary Service Processors can be added in some nodes in order to decentralize control functions from the network control processor and thus increase overall network performance and reliability.

- Asynchronous and synchronous PADs, for connection to the network of asynchronous devices, such as terminals or PCs, and of IBM equipment. The HP asynchronous PADs are an integral part of the network since they can be remotely controlled and configured from the network control processor. The synchronous PADs are third-party equipment, provided by HP, for connecting IBM SNA and BSC devices to the network.

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## **Product Reference List**

### **Switching Nodes/HP Private Packet Network**

HP 24460A Small-node Model 60  
HP 24470A Medium-node Model 70  
HP 24480A Large-node Model 80

### **Network Control System for HP Private Packet Network**

HP 24452A NCP Software

### **HP Private Packet Network Asynchronous PAD**

HP 2334A HP 2334A Plus X.25 Multiplexer

### **Protocol Analyzers**

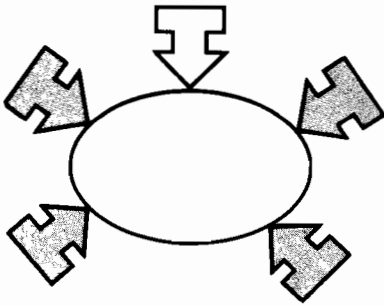
HP 4951C Portable Protocol Analyzer  
HP 4852A High-Speed Portable Protocol Analyzer  
HP 4953A High-Speed Protocol Analyzer  
HP 4955A Basic Programmable Protocol Analyzer





# Company-wide Access Module

## Introduction



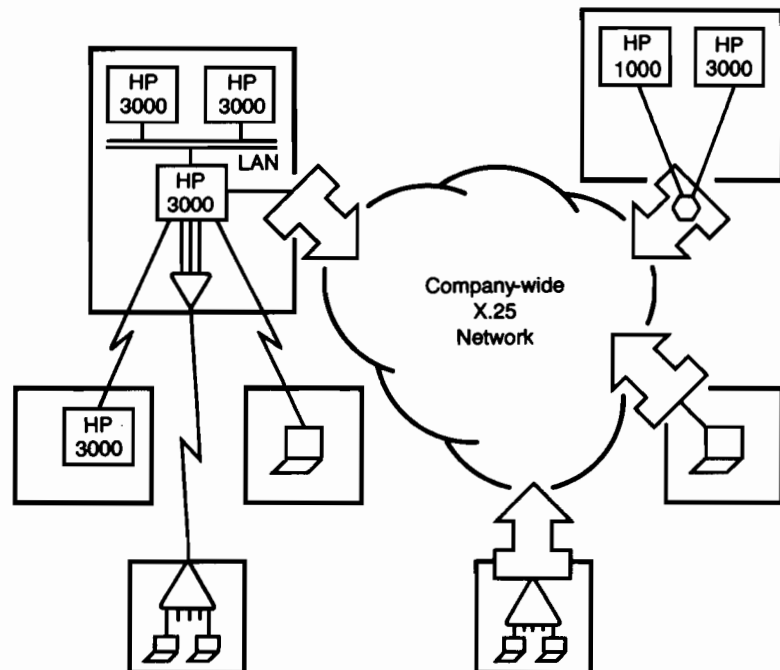
In companies with widely distributed sites, there is often a need to share information. Data exchange capabilities are needed for:

- End-users who access data base applications on remote computers, and who want to communicate from workstation to workstation.
- Systems which run software processes, exchange and consolidate data with remote systems.

The Company-wide Access module describes the way HP computers and end users interconnect with remote systems across the backbone network. HP offers total solutions for customers with small to large networks.

There are five main alternatives for access to remote computers:

- 1) X.25 system connections, for medium to large networks with needs for both interactive and batch transfers.
- 2) Point-to-point system connections, for small networks with well-defined needs.
- 3) Single end-user, asynchronous connection, for limited traffic.
- 4) Single end-user, public X.25 PAD connections, for limited traffic in dispersed environments.
- 5) Multiple end-user, private X.25 PAD connections, for terminal clusters with needs for high traffic and high reliability.



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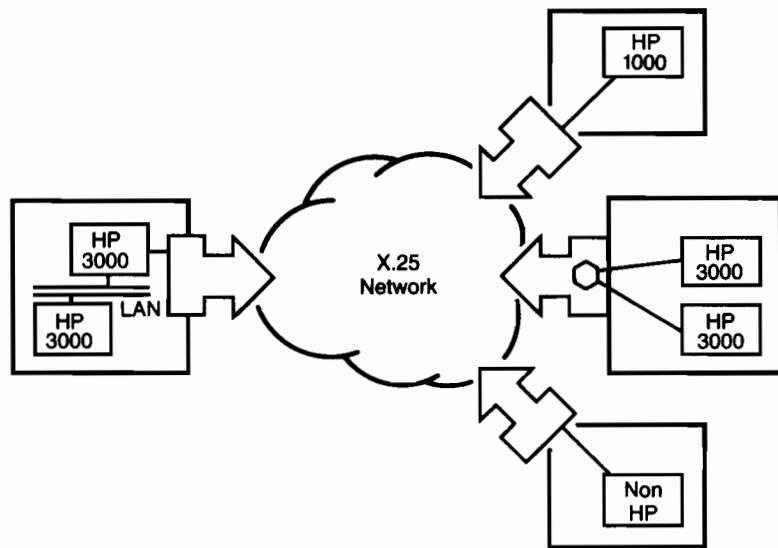
## Alternative 1: X.25 System Connections

This alternative is appropriate for customers with:

- Needs for high connectivity between remote manufacturing, business office, and research and development sites
- Medium-to-high data communication traffic
- Both interactive and batch data exchange
- Needs to communicate between multivendor equipment
- Growing data communication needs
- An X.25 public or private backbone network

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### Functional Description



HP 3000 and HP 1000 computers can communicate over public and private X.25 networks with remote HP or non-HP computers.

By running the NS 3000 Network Services over the X.25 link, terminal users and software processes on HP 3000s can logon to remote HP 3000s, transfer data, and access remote files, data bases and peripherals.

The HP 1000s provide similar networking capabilities, as well as communications to HP 3000s.

When connecting to an X.25 line concentrator, multiple systems can access an X.25 network over one single line.

An HP 3000 on a LAN can be used as a gateway to an X.25 network for the other systems on the LAN.

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## Features and Benefits

Features	Benefits
1) Powerful Network Services providing access to remote data, programs and peripherals	1) The network becomes transparent to the user
2) International-standard protocols	2) Preserves networking investments
3) Runs over public and private X.25 networks	3) High connectivity to remote systems
4) Interactive and batch data exchange	4) Serves multiple purposes
5) Transparent gateway to LANs	5) High connectivity and ease of use
6) Programmatic access to X.25 level 3	6) Ability to communicate with non-HP computers
7) One single network access for both terminal and system-to-system calls	7) Minimized network access costs
8) Shared access to the network through an X.25 line concentrator	8) Minimized network access costs

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## Product Reference List

HP 32344A NS 3000/V Network Services  
HP 24405A NS X.25 3000/V Network Link  
HP 91790A NS/1000  
HP 91751A HP X.25/1000

### Referenced Non-HP Product

X.25 Line Concentrator: Dynapac Multi-Switch X.25 Model 8

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## Alternative 2: Point-to-Point System Connections

This alternative is appropriate for customers:

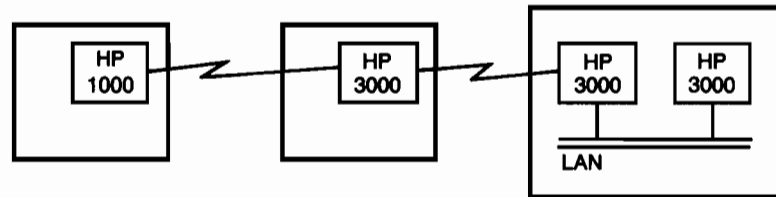
- With limited connectivity and traffic between systems
- Access to multiple systems over telephone lines

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.

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### Functional Description



The NS Point-to-Point link and the Asynchronous SERIAL Network Link (ASNL) are the synchronous and asynchronous modem connection on 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. HP 1000s can synchronously access HP 3000 computers and exchange data.

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### Features and Benefits

Features	Benefits
1) Powerful Network Services	1) User-transparent network
2) Standard transport-level protocol	2) Transparent gateway to LAN
3) Programmatic access to Transport level 4 on HP 3000s	3) Optimized performance
4) Choice of synchronous high speed or asynchronous low speed	4) Adapts to the user's need: high performance and low-cost solutions

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### Product Reference List

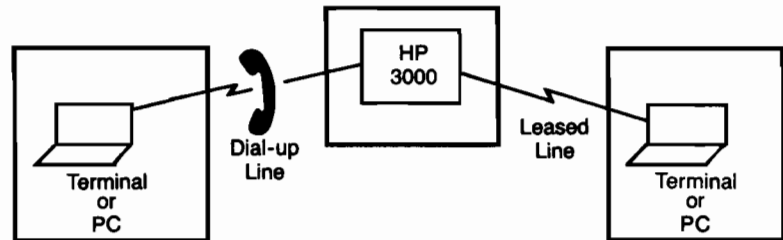
HP 32344A	NS 3000/V Network Services
HP 91790A	NS/1000
HP 30284A, 30285A	NS Point-to-Point Network Link
HP 32003A	Asynchronous SERIAL Network Link (ASNL) (see HP SERIAL Network)
HP 12007B	NS/HDLC Modem Connect Interface/1000 (see DS 1000)

## Alternative 3: Single End-User, Asynchronous Connections

This alternative is appropriate for customers with:

- One or two terminals, printers or PCs on the site
- Portable computers that are moved from one office to another
- Limited amount of connection time (dial up)
- Little investment in data communication equipment

### Functional Description



HP terminals, printers, plotters, personal computers and HP 9000 workstations can be directly connected to one or more remote computers via an asynchronous link. The asynchronous connection can use either a dial-up line for low traffic and short connections or a leased line for heavy traffic loads. These configurations support most HP applications.

For PC-to-host communications, the powerful HP Personal Productivity Center (PPC) applications can be used over these asynchronous connections. Remote PC users can then transparently access system data bases or share system peripherals. With AdvanceLink, a remote PC can transfer files to the HP 3000 or access a full range of HP 3000 applications. The HP 9000 workstations can use the UNIX UUCP program to transfer files to remote UNIX workstations.



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## Features and Benefits

### Features

- 1) Dial-up line or leased line connections
- 2) PC-to-system applications with Asynchronous HP SERIAL Network Link
- 3) Support of all HP applications
- 4) Connection to standard computer, terminals, plotters, printers, PCs and workstation ports

### Benefits

- 1) Choice between low-traffic or heavy-traffic connections. Low-cost connection.
- 2) Increased reliability and transparent user access to system resources.
- 3) Transparent user access.
- 4) No extra hardware investment and ease of installation.

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## Product Reference List

- HP 68333F AdvanceLink 2392 (HP Vectra PCs)  
HP 45431A AdvanceLink (HP Touchscreen PCs)  
(see HP 68333F)  
HP 32003A Asynchronous HP SERIAL Network Link  
(see HP SERIAL)  
HP 50910F HP SERIAL Network User Link  
(HP Vectra PCs)  
HP 50910A HP SERIAL Network User Link  
(HP Touchscreen PCs)

### Referenced Non-HP Product

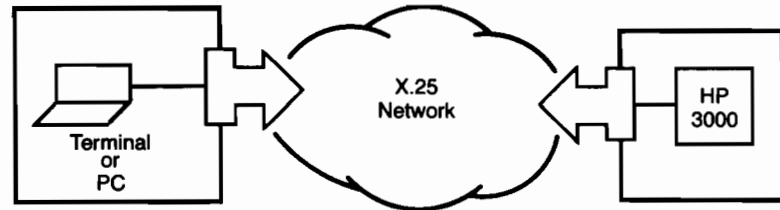
- HP 82863K REFLECTION 1 (HP Portable Plus)  
Opt. 400

## Alternative 4: Single End-User, Public X.25 PAD Connections

This alternative is appropriate for customers with:

- One or two terminals, printers or PCs on the site
- Limited amount of traffic
- Dispersed sites, in particular international communications
- Character mode applications
- A public or private X.25 backbone network

### Functional Description



HP terminals, printers, plotters and personal computers can communicate with a remote computer through an X.25 network by using a public Packet Assembler Disassembler (PAD). Character mode and VPLUS applications can work over a public X.25 PAD. The AdvanceLink programs give to the HP personal computers the ability to act as an HP 3000 terminal and to transfer files to a remote HP 3000 or to another PC.

### Features and Benefits

Features	Benefits
1) Public X.25 PAD access	1) Worldwide connectivity. Costs proportional to amount of traffic.
2) Support PCs, terminals, printers, plotters	2) No extra cost for the remote device.
3) Standard X.3, X.28, X.29 CCITT recommendations	3) Access to HP and non-HP computers.

### Product Reference List

HP 68333F	AdvanceLink 2392 (HP Vectra PCs)
HP 45431A	AdvanceLink (HP Touchscreen PCs) (see HP 68333F)
HP 24405A	NS X.25 3000/V Network Link
HP 91751A	HP X.25 Link/1000

### Referenced Non-HP Product

HP 82863K	REFLECTION 1 (HP Portable PLUS) Opt. 400
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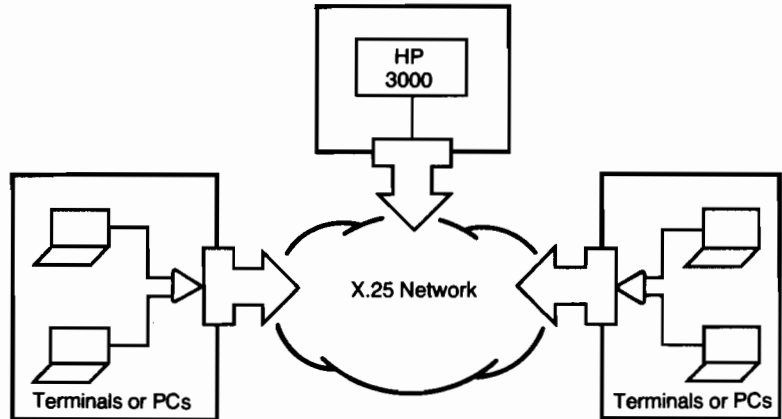
## Alternative 5: Multiple End-User, Private X.25 PAD Connections

This alternative is appropriate for customers with:

- Several terminals, printers or PCs on the same site
- Interactive and batch traffic
- High reliability requirements
- High connectivity needs
- Character mode and block mode applications
- A public or private X.25 network

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### Functional Description



Several devices (terminals, plotters, printers, workstations) can be connected to one or more remote computers through an HP 2334A Plus X.25 Multiplexer. The HP 2334A Plus connections can be made over a point-to-point leased line or through an X.25 network, private or public.

The HP 2334A Plus can be used as a statistical multiplexer or as a cluster controller.

- In the statistical multiplexer configuration, it supports most HP applications. For PC-to-host communications, most HP Personal Productivity Center (PPC) applications can be used over the HP 2334A Plus. In particular, AdvanceLink allows remote PCs to transfer files to an HP 3000 or to access any HP 3000 applications as a standard HP 3000 terminal. The HP 9000 workstations can use the UNIX UUCP program to transfer files to remote UNIX workstations.
- In the cluster controller configuration, character mode and VPLUS applications are supported.



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## Features and Benefits

Features	Benefits
1) Can work over a point-to-point leased line	1) Dedicated bandwidth for high volume (e.g., printers)
2) X.25 network connections	2) High connectivity to HP and non-HP computers
3) Point-to-point or X.25 network connections	3) Optimized cost/performance
4) Share remote connections of up to 16 terminals, printers, plotters or workstations	4) Reduced communication costs
5) Support most HP applications in statistical multiplexer configuration	5) Transparent user access

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## Product Reference List

HP 68333F	AdvanceLink 2392 (HP Vectra PCs)
HP 45431A	AdvanceLink (HP Touchscreen PCs) (see HP 68333F)
HP 2334A	HP 2334A Plus X.25 Multiplexer
HP 24405A	NS X.25 3000/V Network Link
HP 91751A	HP X.25 Link/1000

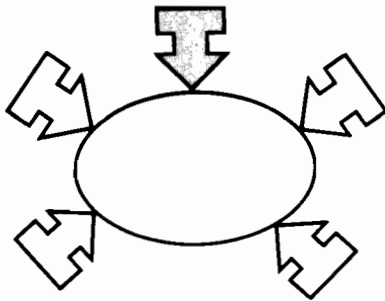
### Referenced Non-HP Product

HP 82863K	REFLECTION 1 (HP Portable Plus) Opt. 400
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# SNA Access Module

## Introduction



Throughout the company there is often a need to communicate with an IBM mainframe at corporate headquarters to update a data base, access an IBM 3270 application such as payroll or accounting, submit a batch job for month-end financial consolidation, or exchange electronic mail with corporate users. In addition, there is a need to distribute reports and documents from corporate systems to remote HP 3000 sites.

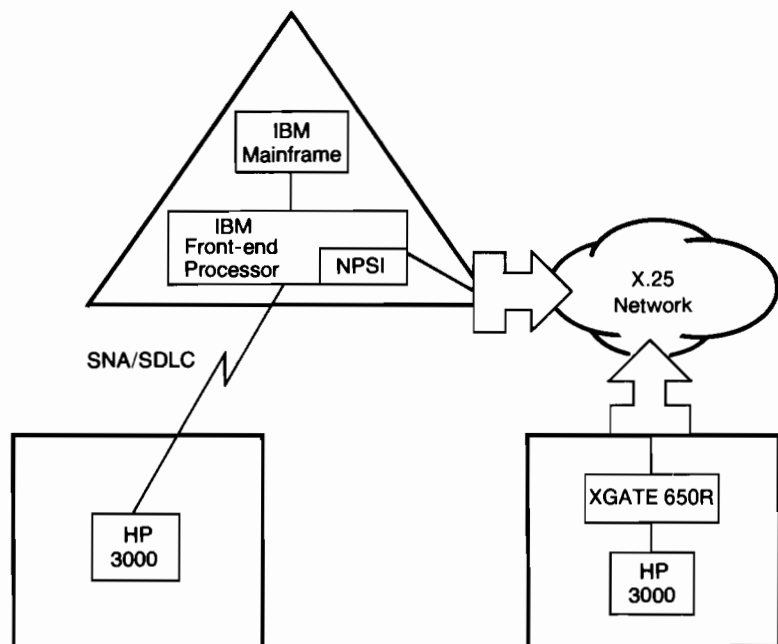
For HP 3000 minicomputers in the Business Office or Regional Sales and Service Office, HP offers SNA access to IBM mainframes over both SNA/SDLC point-to-point lines and public or private X.25 networks.

Over either network, HP offers three types of HP-IBM communication:

- Interactive access to mainframe applications
- Batch access for file transfer
- Office connection to exchange electronic mail with IBM mainframe users.

Four different network configurations are possible. These are organized as follows:

- Alternative 1: SNA over X.25 Network
  - HP 3000 X.25-to-SNA Gateway
  - SNA/X.25 Protocol Conversion
- Alternative 2: SNA over SNA/SDLC Network
  - SNA Gateway
  - Standalone SNA Access



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## Alternative 1: 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.

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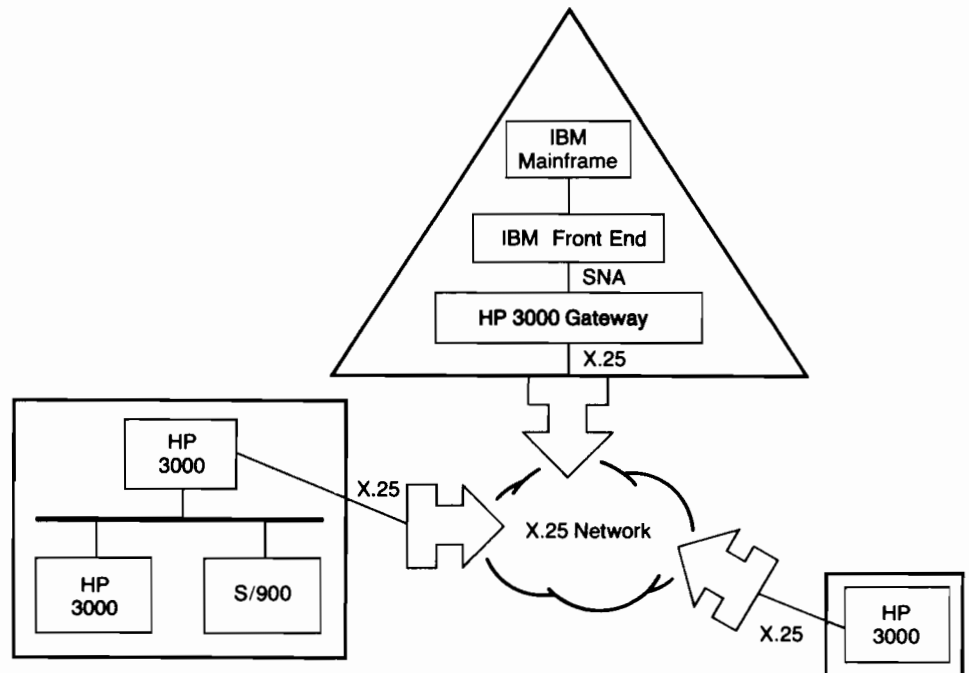
## Alternative 1a: HP 3000 X.25-to-SNA Gateway

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.

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## 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.

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SNA products are only required on the HP 3000 gateway system, the remote HP 3000s only need the NS 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.

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## 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.	2) Lowers cost. Easy to maintain. Less CPU overhead on the remote HP 3000 systems.

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## Product Reference List

### On Gateway

HP 30247A SNA IMF Interactive Mainframe Facility  
HP 30245A SNA NRJE Network Remote Job Entry  
HP 30246A SNA Link  
HP 32344A NS 3000/V Network Services  
HP 24405A NS X.25 3000/V Network Link

### On Remote Node

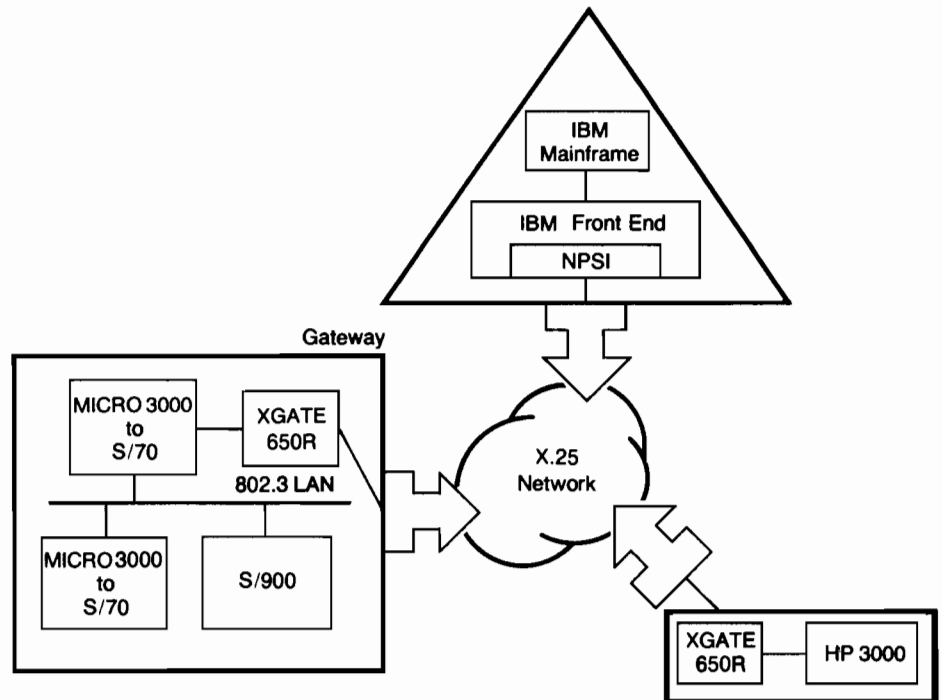
HP 32344A NS 3000/V Network Services  
HP 24405A NS X.25 3000/V Network Link

## Alternative 1b: 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 the 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.

## 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.

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## 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.

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## Product Reference List

HP 30247A SNA IMF Interactive Mainframe Facility  
HP 30245A SNA NRJE Network Remote Job Entry  
HP 30246A SNA Link

### Referenced Non-HP Product

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

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## Alternative 2: SNA Over SNA/SDLC Network

Using HP 3000-to-IBM SNA products over an SNA network is appropriate when there are no plans to use a public or private X.25 network.

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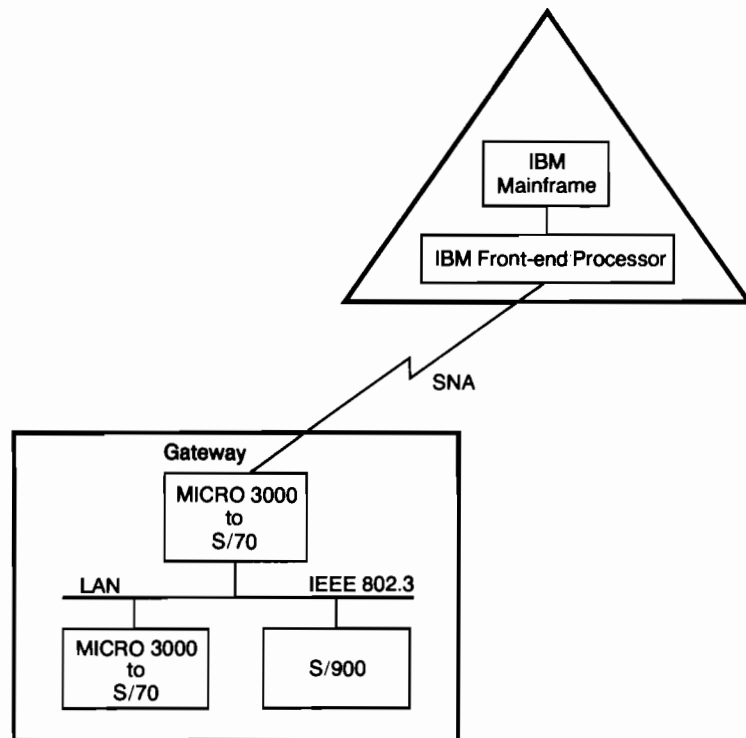
## Alternative 2a: SNA Gateway (HP 3000 to IBM)

An SNA Gateway solution is appropriate when:

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

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### 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 LU6.2 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, LU6.2 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.



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## Features and Benefits

### Features

- 1) Users can submit batch jobs through SNA NRJE and SNA IMF as if those products were installed on their own system.
- 2) Batch job output and printing from interactive applications are automatically routed back to user nodes.
- 3) HP OfficeConnect to DISOSS needs to be installed on each HP system that will exchange messages with DISOSS, but LU6.2 Base needs to be installed on the gateway system only.

### Benefits

- 1) No additional training is required for SNA IMF or SNA NRJE users.
- 2) Users save time and effort by not having to go to the gateway processor to retrieve their output.
- 3) Users save money because the products were designed to be used in a gateway configuration.

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## Product Reference List

### On Gateway

HP 30247A SNA IMF Interactive Mainframe Facility  
HP 30245A SNA NRJE Network Remote Job Entry  
HP 30246A SNA Link  
HP 30252A HP LU 6.2 Base  
HP 30254A SNA Server  
HP 27515A HP OfficeConnect to DISOSS  
HP 32344A NS 3000/V Network Services

### On User Node

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



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

The standalone SNA products are appropriate when:

- Only 1 or 2 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.

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## 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 LU6.2 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.

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## Features and Benefits

### Features

- 1) High-performance alternative to the SNA Gateway.
- 2) Interactive access to IBM through 3274 cluster controller emulation.
- 3) SNA batch job access with sophisticated output management.
- 4) Reverse NRJE access to the HP 3000.
- 5) DISOSS connection using Revisable Form DCA, Final Form DCA and Library Services.

### Benefits

- 1) Provides more efficient use of the HP 3000 system.
- 2) Improves productivity and reduces cost since only one HP terminal is required to access applications on both an HP 3000 and an IBM mainframe.
- 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) Increases productivity of IBM users by allowing them to access HP 3000 applications not provided on the IBM mainframe.
- 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.

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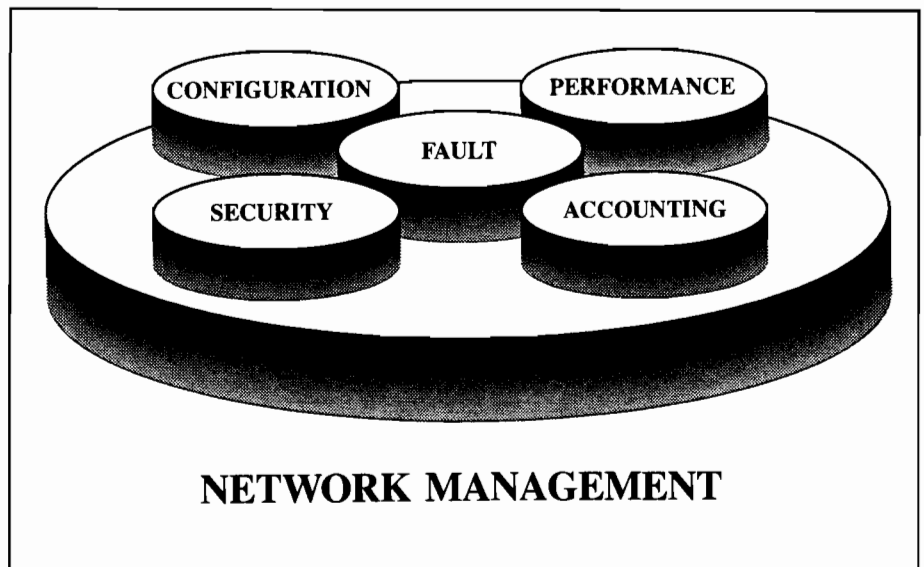
## Product Reference List

HP 30247A SNA IMF Interactive Mainframe Facility  
HP 30245A SNA NRJE Network Remote Job Entry  
HP 30246A SNA Link  
HP 30252A HP LU 6.2 Base  
HP 27515A HP OfficeConnect to DISOSS

# Network Management Module

## Introduction

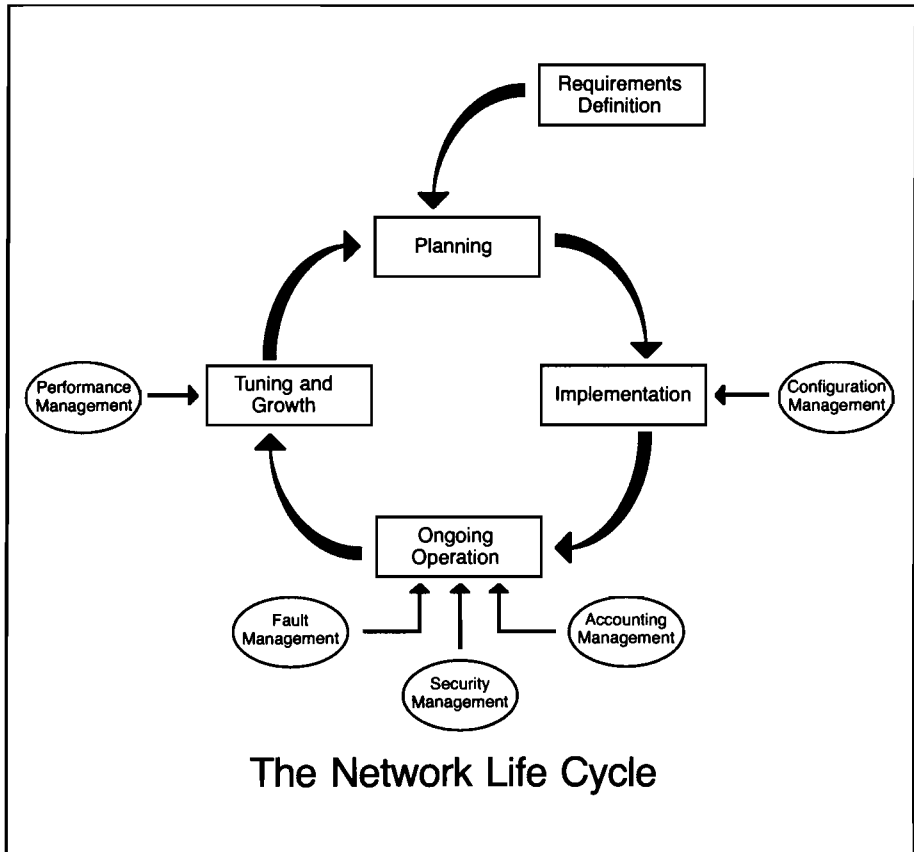
Network Management is the ability to monitor, diagnose and control each component of a network. The International Standards Organization (ISO) has identified five Network Management functions: Fault Management, Performance Management, Accounting Management, Configuration Management and Security Management.



- **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.



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.

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## **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.

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## **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.

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## **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.

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## **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.

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## **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.

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## **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

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## **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.

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### 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.

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## 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

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### 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

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### 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

#### Customer Network Center

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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)

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## 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.

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## 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

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## 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.



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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.

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## 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	Remote Access and Test System

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### Software

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

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## 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

### Customer Network Center

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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.

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## 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

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## 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.

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## **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.

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## 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

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### Software

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

---

### Support Products

#### Network Planning and Design

51429A  
51429B

#### Network Prepare

52430A  
52430B

#### NetAssure

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50051P+16B	X.25 Connection
50052P+16B	PBX Connection
50053P+16B	SNA Connection
50054P+16B	HP Proprietary Connection

#### Network Startup

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

#### Customer Network Center

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## Documentation

5953-7682	LAN 3000/V Configuration Guide
5955-7681	LAN Link Hardware Troubleshooting Manual
5957-4624	Making the LAN Connection
5958-8542	HP SNA Products: Manager's Guide
5958-8543	HP SNA Products: ACF/NCP and ACF/VTAM Guide
5958-8546	HP SNA Products: CICS Guide
5958-8547	HP SNA Products: DISOSS Guide

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## Alternative 4: HP Network Management for the Distributed Systems Operator

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

- Minimizing Computer Downtime
- Systems Hardware and Software Configuration Maintenance
- Troubleshooting System Problems

Hewlett-Packard's Network Management tools provide the Distributed Systems Operator with the ability to minimize system downtime, maintain system configurations and troubleshoot system problems.

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## Features

- 1) System functions to manage the network
- 2) Distributed systems management
- 3) Predictive capabilities
- 4) Support services to efficiently manage the systems
- 5) Third-party offerings that aid in distributed systems management

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## Functional Description

### 1) System functions to manage the network

The Distributed Systems Operator has a variety of tools and utilities available to supervise the operation of the system and the data communication products. Some are provided with the data communication products and some are provided on the HP 3000 operating system.

### 2) Distributed systems management

NetCI (Network Command Interpreter), which is integrated into NS 3000, is a tool that allows centralization of operator functions and thus promotes operator efficiency and effectiveness. NetCI allows a central operator to execute a command remotely to all systems reachable by NS 3000. With this powerful tool, one system operator can manage multiple HP 3000s on the network. This functionality will reduce troubleshooting time and effort by enabling the operator to quickly isolate some network problems from one terminal.

Integrated Network Console Support (INCS/3000) provides a single integrated console to manage multiple HP 3000 computers in a network. INCS/3000 integrates full HP 3000 operator capabilities with data communication network operation and control.

Remote System Operation Facility (RSOF/3000) is the set of software components that resides on all the Remote Node HP 3000 computers, and provides the interface to INCS/3000.

OPT/3000 (On-line Performance Tool) is the systems operator's window into the system, and allows monitoring of system workload, memory and CPU use, I/O traffic, and table utilization. By viewing the activity in detail, the operator can modify the system to improve performance and more efficiently design new applications. Features of OPT/3000 include interactive reporting, graphic presentation and periodic summary reporting of resource use.

### 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) Support services to efficiently manage the systems

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

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## Product Reference List

### Software

30392A	HP Security Monitor/V
32029A	INCS/3000
32030A	RSOF/3000
32238A	OPT/3000
32344A	NS 3000/V Network Services

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### Documentation

32033-90005	System Operation and Resource Management Recovery Manual
32238-90001	OPT/3000 Reference Manual
32344-90001	NS 3000/V User/Programmer Reference Manual
32344-90002	NS 3000/V Network Manager Reference Manual (Vol. I)
32344-90005	NS 3000/V Error Messages and Recovery Manual
32344-90012	NS 3000/V Network Manager Reference Manual (Vol. II)





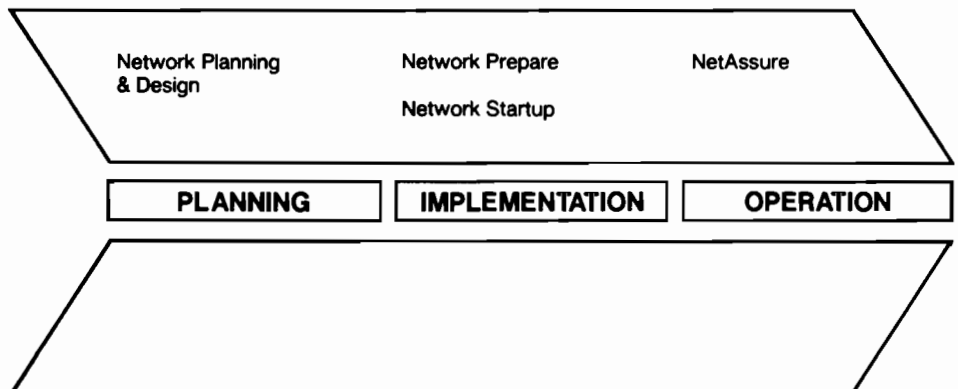
# HP Network Support Module

## Introduction

The rapid growth of networks and changing network technology have created an urgent need for network support services. Hewlett-Packard offers a comprehensive range of network support services that can be tailored to customers' unique requirements — including planning and design, implementation, maintenance and education.

- **Network Planning and Design**  
An HP Network Consultant analyzes the customer's communication requirements and creates a detailed network design that meets current and forecasted needs.
- **Network Prepare**  
HP works with the customer to develop a network implementation plan that contains a schedule of critical activities and recommendations for network staffing, training and operation procedures.
- **Network Startup**  
HP helps the customer get the network up and running quickly, by providing coordination assistance for installation activities and resources, connection verification testing and complete network documentation.
- **NetAssure**  
HP maximizes the uptime of a network by providing network problem isolation and management of problem resolution in multivendor network environments.
- **Customer Education**  
HP provides a range of standard and customized training for network users, operators and managers.

The specific features and benefits of these services follow.



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## Features and Benefits

Features	Benefits
<b>Network Planning and Design</b>	
1) In-depth requirements analysis	1) Custom solution for your customer's unique needs
2) Comprehensive network design	2) Control network costs
3) Growth plan	3) Flexibility for future needs
<b>Network Prepare</b>	
1) Implementation schedule	1) Implementation problems anticipated
2) Network staffing and training recommendations	2) Productivity of the network and users is increased
3) Network procedures identification	3) Operating problems are reduced
<b>Network Startup</b>	
1) Network startup schedule	1) Simplifies the startup process
2) Network configuration and testing	2) Ensures a fully operational network
3) Network documentation	3) A tool for better network management
<b>NetAssure</b>	
1) One phone call	1) Easy problem resolution
2) Multivendor problem management	2) Simplified service interface
3) Fast response time	3) Reduced network downtime
4) NetAssure Newsletter	4) Timely HP network product and support information

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## Hardware and Software Support

The Network Support Program complements HP's standard hardware and software support services:

- **Software Materials Subscription**  
Provides all of the materials and information needed to keep up-to-date on HP software and documentation.
- **Response Center Support**  
Includes the software materials subscription service listed above and telephone assistance from experienced professionals in the HP Response Centers for HP software and applications.
- **Account Management Support**  
Includes the software support services listed above and personalized, on-site support. Through Support Management Reviews and Software Release Planning sessions, an account-assigned support representative assists the customer in preparing for future software needs.
- **Standard System Maintenance Service**  
This same-day hardware service program provides on-site response within four coverage hours for HP systems and peripherals. The coverage hours of this service can be expanded to 24 hours a day, 7 days a week.
- **Basic System Maintenance Service**  
This hardware service program provides a one-workday response time for HP systems and peripherals.

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Hewlett-Packard's support has consistently been rated as the best in the industry, based on overall excellence as reported in the Datapro surveys for the past six years. Your HP Sales Rep will work with you to develop a support strategy to meet your business needs.

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## Product Reference List

### Network Planning and Design

51429A  
51429B

### Network Prepare

51430A  
51430B

### 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

### 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



# Additional Products

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HP 32188A	Satellite Network Link
HP 30271A	Point-to-Point Modem Link
HP 30251A	BSC Link
HP 30248A	RJE/Remote Job Entry
HP 30249A	Multileaving Remote Job Entry
HP 30250A	IMF Interactive Mainframe Facility
HP 91781A	Remote Job Entry-II (RJE/1000-II)
HP 91782A	Multileaving Remote Job Entry (MRJE/1000)
HP 91784A	Programmatic Mainframe Facility
HP 30265A	CODEX 2620 Data Modem (U.S. only)
HP 30266A	CODEX 2640 Data Modem (U.S. only)
HP 30267A	CODEX 2660 Data Modem (U.S. only)
HP 30268A	CODEX 2680 Data Modem (U.S. only)





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