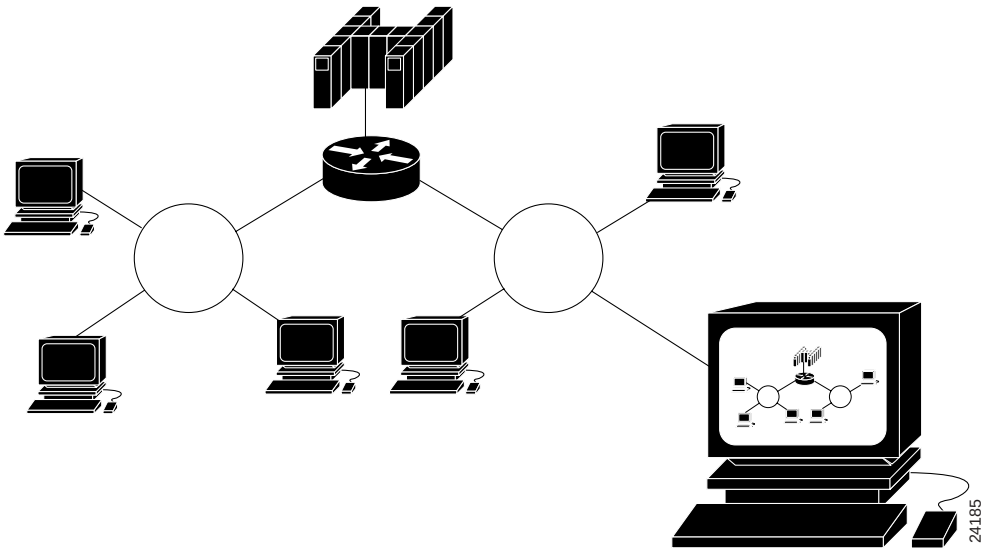
IBM Network Management

Background

IBM network management refers to any architecture used to manage IBM Systems Network Architecture (SNA) networks or Advanced Peer-to-Peer Networking (APPN) networks. IBM network management is part of the IBM Open-*Network Architecture* (ONA) and is performed centrally by using management platforms such as NetView and others. It is divided into five functions that are similar to the network management functions specified under the Open System Interconnection (OSI) model. This chapter summarizes the IBM network management functional areas, network management architecture, and management platforms. Figure 50-1 illustrates a basic managed IBM network.

Figure 50-1 IBM network management handles SNA or APPN networks.



IBM Network-Management Functional Areas

IBM divides network management into the following five user-based functions: *configuration management, performance and accountant management, problem management, operations management,* and *change management*.

IBM Configuration Management

IBM configuration management controls information describing the physical and logical characteristics of network resources, as well as the relationships between those resources. A central management system stores data in a configuration management-databases and might include information such as system software or microcode version numbers; serial numbers of hardware or software; physical locations of network devices; and names, addresses, and telephone numbers of contacts. As might be expected, IBM configuration management corresponds closely to OSI configuration management.

Configuration-management facilities aid in maintaining an inventory of network resources and in ensuring that network-configuration changes are reflected in the configuration-management database. Configuration management also provides information that is used by problem-management and change-management systems. Problem-management systems use this information to compare version differences and to locate, identify, and check the characteristics of network resources. Change-management systems use the information to analyze the effect of changes and to schedule changes at times of minimal network impact.

IBM Performance and Accounting Management

IBM performance and accounting management provides information about the performance of network resources. The functions of the performance-and accounting-management facilities include monitoring response times of systems; measuring availability of resources; measuring the use of resources; and tuning, tracking, and controlling network performance. The information gathered by the performance- and accounting-management functions is useful for determining whether network performance goals are being met and whether problem-determination procedures should be initiated based on performance. IBM performance and accounting management performs functions similar to those handled by OSI performance management and OSI accounting management.

IBM Problem Management

IBM problem management is similar to OSI fault management in that it handles error conditions that cause users to lose the full functionality of a network resource. Problem management is performed in five steps: problem determination, problem diagnosis, problem bypass and recovery, problem resolution, and problem tracking and control. Problem determination consists of detecting a problem and completing the steps necessary for beginning problem diagnosis, such as isolating the problem to a particular subsystem. Problem diagnosis consists of determining the precise cause of the problem and the action required to solve it. Problem bypass and recovery consists of attempts to bypass the problem, either partially or completely. It provides only a temporary solution and relies on problem resolution to solve the problem permanently. Problem resolution consists of efforts to eliminate the problem. It usually begins after problem diagnosis is complete and often involves corrective action, such as the replacement of failed hardware or software. Problem tracking and control consists of tracking each problem until final resolution is reached. Vital information describing the problem is recorded in a problem database.

IBM Operations Management

IBM operations management consists of managing distributed network resources from a central site, using two sets of functions: operations-management services and common-operations services. Operations-management services provide the capability to control remote resources centrally using the following functions: resource activation and deactivation, command cancellation, and clock setting. Operations-management services can be initiated automatically in response to certain system-problem notifications.

Common-operations services allow for the management of resources not explicitly addressed by other management areas, using specialized communication through new, more capable applications. Common-operations services offer two important services, the execute command and resource-management service. The **execute** command provides a standardized means of executing remote command. Resource-management service provides a way to transport information in a context-independent manner.

IBM Change Management

Change management tracks network changes and maintains change files at remote nodes. Network changes occur primarily for two reasons: changing user requirement and problem circumvention. Changing user requirements include hardware and software upgrades, new applications and services, and other factors that constantly change the needs of network users. Problem circumvention is needed to deal with unexpected changes resulting from the failure of hardware, software, or other network components. Change management attempts to minimize problems by promoting orderly network changes and managing change files, which log network changes. IBM change management is similar in some respects to OSI accounting management.

IBM Network-Management Architectures

Two of the most well-known IBM network-management architectures are the *Open-Network Architecture (ONA)* and *SystemView.*

Open-Network Architecture (ONA)

The Open-Network Architecture (ONA) is a generalized network-management architecture that defines four key management entities: the focal point, collection point, entry point, and service point.

The focal point is a management entity that provides support for centralized network-management operations. It responds to end-station alerts, maintains management databases, and provides a user interface for the network-management operator. Three kinds of focal points exist: primary, secondary, and nested. The primary focal points performs all focal-point functions. The secondary focal point acts as a backup for primary focal points and is used when primary focal points fail. The nested focal point provides distributed management support in large networks. Nested focal points are responsible for forwarding critical information to more global focal points.

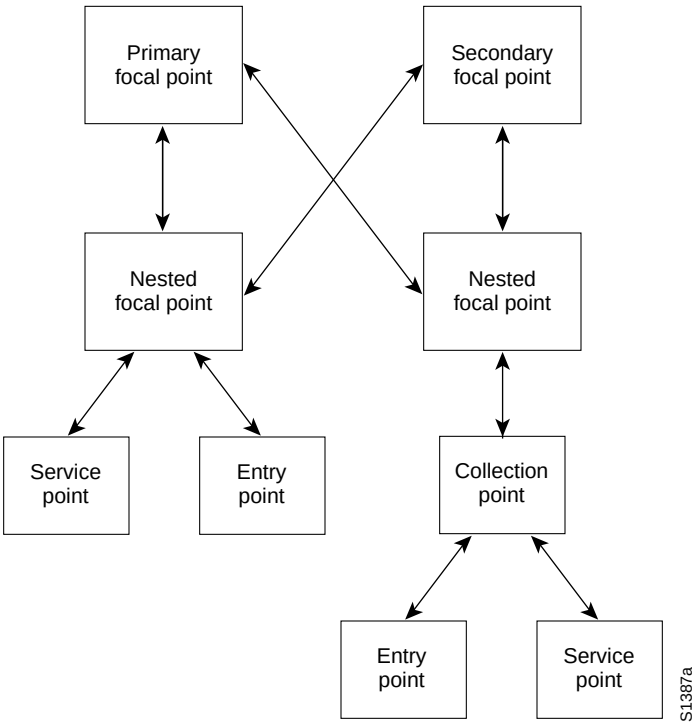
Collection points relay information from self-contained SNA subnetworks to focal points. They are commonly used to forward data from IBM peer-to-peer networks into the ONA hierarchy.

An entry point is an SNA device that can implement ONA for itself and other devices. Most standard SNA devices are capable of being entry points.

A service point is a system that provides access into ONA for non-SNA devices and is essentially a gateway into ONA. Service points are capable of sending management information about non-SNA systems to focal points, receiving commands from focal points, translating commands into a format acceptable to non-SNA devices, and forwarding commands to non-SNA devices for execution.

Figure 50-2 illustrates the relationships between the different ONA management entities.

Figure 50-2 The four types of focal points link to one another within the ONA environment.



SystemView

SystemView is a blueprint for creating management applications that are capable of managing multivendor information systems. SystemView describes how applications that manage heterogeneous networks operate with other management systems. It is the official systems-management strategy of the IBM Systems-*Application Architecture*.

IBM Network-Management Platforms

IBM network management is implemented on several platforms, including *NetView*, *LAN Network Manager* (LNM), and *Simple Network Management Protocol* (SNMP).

NetView

NetView is a comprehensive IBM enterprise network-management platform that provides centralized SNA network-management services. It is used on IBM mainframes and is part of the ONA. NetView consists of the *command-control facility*, *hardware monitor*, *session monitor*, *help function*, *status monitor*, *performance monitor*, and *distribution monitor*. The command-control facility provides network control by issuing basic operator and file-access commands to Virtual Telecommunications Access Method (VTAM) applications, controllers, operating systems, and NetView/PC (an interface between NetView and non-SNA devices). The hardware-monitor function monitors the network and automatically alerts the network operator when hardware errors occur. The session monitor acts as a VTAM performance monitor and provides software-problem determination and configuration management. The help function provides help for NetView users and includes a browse facility, a help-desk facility, and a library of commonly encountered network operation situations. The status

monitor summarizes and presents network status information. The performance-monitor function monitors the performance of front-end processors (FEPs), the Network Control Program (NCP), and other attached resources. The distribution manager plans, schedules, and tracks the distribution of data, software, and microcode in SNA environments.

LAN Network Manager (LNM)

The LAN Network Manager (LNM) is an IBM network-management application that controls Token Ring LANs from a central support site. LNM is an OS/2 Extended Edition-based product that interoperates with IBM NetView (which is aware of such LNM activities as alarms) and other IBM management software.

Simple Network Management Protocol (SNMP)

IBM network management can be implemented by using SNMP. Refer to Chapter 52, “Simple Network Management Protocol (SNMP)” for details about SNMP implementation.