Overview of IPM

This chapter provides an overview of Cisco Internetwork Performance Monitor (IPM) application. It contains the following sections:

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What is IPM?

IPM is a network management application that allows you to monitor the performance of multi-protocol networks. IPM measures the latency and availability of IP networks on a hop-by-hop (router-to-router) basis. It also measures latency between routers and the mainframe in Systems Network Architecture (SNA) networks, and monitors jitter in networks with more than one server.

Use IPM to:

- Troubleshoot problems by checking the network performance between devices.
- Send Simple Network Management Protocol (SNMP) traps and SNA alerts when a user-configured threshold is exceeded, a connection is lost and reestablished, or a timeout occurs.
What is IPM?

• Analyze potential problems before they occur by accumulating statistics, which then can be used to model and design future network topologies.
• Monitor latency, availability, and errors between two network end points.
• Monitor jitter, packet loss, and errors between two network end points.
• Discover all network paths between two network end points, and monitor network performance statistics on a hop-by-hop basis.
• Provide Web-based access to long-term information to help determine statistical trends.
• Monitor the availability of critical network servers.
• Monitor SNA performance in mainframe environments.
• Establish service-level agreements.

The IPM/SA Agent monitoring solution is composed of:

1. The IPM server
2. The IPM client application
3. The Service Assurance (SA) Agent feature of the Cisco IOS software

The focus of this document is the IPM network management application, which includes the server and the client. In some cases, however, it is not possible to fully describe IPM without including information about the SA Agent feature. Therefore, we have included some information about the Cisco IOS feature. Information about the SA Agent feature provided in the latest Cisco IOS software documentation take precedence over the information about the SA Agent feature contained in this document.
Key Terms and Concepts

The key terms and concepts in IPM are:

- **Network Performance Statistics**—Five key statistics measured by IPM:
  - Latency
  - Availability
  - Jitter
  - Packet Loss
  - Errors

- **Source**—Originating router from which IPM makes network performance measurements. The source router must be running a version Cisco IOS software that supports the SA Agent feature. For detailed information about the supported versions of the Cisco IOS software, see the “Cisco IOS Software Requirements” section in the *Cisco Internetwork Performance Monitor Installation Guide*.

- **Target**—Destination of the network performance measurements. The target can be any IP-addressable device, an IBM Multiple Virtual Storage (MVS) mainframe that can be reached by the source router, or an SA Agent-enabled Cisco router. For jitter measurements, the target must be an SA Agent-enabled Cisco router.

- **Operation**—Set of parameters used in measuring network performance statistics. The parameters specify the type of measurement to be performed.

- **Collector**—Entity defined to measure network performance statistics from a specific router (source) to a specific device (target). The collector definition includes information about its source, target, operation, start time, duration, and type.

- **Interval**—How often, in seconds, the collector on the source router executes the measurement to and from the target. The value is usually every 60 seconds. The valid range is 10 to 3600 seconds (1 hour). The source router automatically aggregates all samples for a single hour into a single set of metrics for that hour. IPM retrieves these metrics from the source router once every hour.

- **Duration**—How long, in days, hours, and minutes, the collector runs and gathers information from the source router. The default value is forever. The valid range is 1 hour to forever.
• **SA Agent Responder**—Component embedded in a target Cisco router, running version 12.1 or later of the Cisco IOS software. It responds to SA Agent request packets from a source router running the SA Agent software, supporting Enhanced UDP measurements such as jitter.

### How Does IPM Work?

IPM measures and displays network performance statistics (latency, availability, jitter, packet loss, and error information) between a source router and a target device.

The target can be an IP-addressable device, an IBM MVS mainframe, or an SA Agent-enabled Cisco router:

- If the target is an IP-addressable device, it can be a network device, a server, or a workstation.
- If the target is an IBM MVS mainframe, it must be running an IPM Virtual Telecommunications Access Method (VTAM) application called NSPECHO for measuring SNA latency. See the “Installing NSPECHO to Measure SNA Response Times” chapter of the *Cisco Internetwork Performance Monitor Installation Guide* for more information.
- If the target is an SA Agent-enabled router, the router must be running version 12.1 or later of the Cisco IOS software. The IPM application is used to configure the SA Agent in each source router. The SA Agent measures the performance between the source router and the target device.

Once each hour, the source router aggregates all measurements into a single sample value for each network performance statistic. IPM gathers the data from the source routers once per hour and stores it in the IPM database. If you want to take measurements between the source router and the target device more often than once an hour, you can use the IPM configuration process to specify more frequent measurement intervals.

IPM also provides a real-time feature that allows you to display the data without waiting for the one-hour data collection interval. However, the data displayed in the Real Time window is not stored in the IPM database.

Additionally, IPM provides an extensive set of reports and graphs for viewing and analyzing the collected performance metrics. IPM supports both standalone and Web-based clients in a multi-platform environment.
Client/Server Architecture

IPM provides central services and database functions on an IPM server, which communicates through a messaging interface to multiple IPM clients (Figure 1-1). The IPM software consists of server software and client software components that can be installed on the same workstation or on different workstations.

**Figure 1-1  IPM Client/Server Architecture**

For this release of IPM, the server software runs on Solaris, Windows NT4.0, Windows 2000 Professional and Server systems. The client software runs on Solaris, Windows 98, Windows NT4.0, Windows 2000 Professional and Server platforms.

The client/server architecture is cross-platform compatible, which allows you to run the client and server software in mixed operating system environments. For example, you can run the IPM server on a Solaris workstation and access it from an IPM client running on a Windows workstation.
The IPM server software consists of a group of functional services that manage the data among the network, client workstations, and the centralized database. The IPM server manages the exchange of data between the IPM database and the network devices, such as the source routers and target routers. The IPM process manager launches and manages all of the IPM servers, providing a robust and reliable launching platform for IPM.

The IPM client software communicates with the IPM server. You can install the IPM client software on the same workstation as the IPM server software, or on a different workstation on the same network as the IPM server. The IPM client integrates with the CiscoWorks2000 desktop.

From a Web browser running on any workstation on the network, you can:

- Access the source, target, operation, and collector definitions
- View Web-based reports of the performance metrics
- Export IPM data
- View seed files
- Access IPM data from the CiscoWorks2000 desktop