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SNMP for Macintosh: Tech Bulletin, Network Management (3/93)

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TOPIC --

This article is a technology bulletin on Network Management - SNMP for
Macintosh.

DISCUSSION ---

Today's network managers are looking for the most efficient way to
administer services, con-figure devices, and monitor usage on complex,
multivendor networks. Apple has selected the Simple Network Management
Protocol (SNMP) to meet this customer requirement. SNMP is an
industry-standard protocol for network management defined by the Internet
Engineering Task Force (IETF), the body that regulates the Internet
technology and defines new standards for the TCP/IP protocol suite.

Because manageability is such a fundamental requirement for network
components, Apple will be including SNMP agents in most of its future
network product offerings. Apple Computer endorses SNMP as the management
protocol for its TCP/IP Connection and AppleTalk Connection products.
Together, the IETF and Apple have defined a standard MIB (Management
Information Base) for AppleTalk, which is documented in RFC 1243. In
addition, Apple has defined a MIB for reporting the Macintosh hardware and
software configuration over SNMP, and provides this Macintosh Agent in both
the AppleTalk Connection and TCP/IP Connection products.

Apple recognizes the value of integrating industry standards like SNMP into
AppleTalk and the Macintosh Operating System as one of the ways Apple can
develop the robust networking products required in today's large
organizations. Future Apple network products and services will also have
their own agents, providing the Macintosh with a level of SNMP
manageability that is unmatched by other personal computers.

Apple's SNMP implementation on the Macintosh, called MacSNMP, has been designed to allow for future and third-party extensibility. This extensible architecture was achieved by adding a new manager to the Macintosh Operating System called the SNMP Manager. Designed as a Macintosh System 7 extension, the SNMP Manager and all SNMP Agents are implemented as shared libraries using a facility called the Shared Library Manager. The Shared Library Manager supports fully object-oriented libraries and provides for dynamic loading and linking of system libraries. Libraries designed for the Shared Library Manager also support inheritance and the ability to share code. Developers writing SNMP agents for the Macintosh will be able to implement them as shared libraries and take advantage of the facilities offered by the Shared Library Manager and the MacSNMP development environment.

The MacSNMP architecture consists of several components:

• The SNMP Manager with a built-in Network agent runs on the networked Macintosh, collecting a variety of information from the other SNMP agents and relaying it to the console. The transport-independent SNMP Manager handles all SNMP protocol generation and reception, and is capable of transmitting and receiving management information using AppleTalk, TCP/IP, and other network protocols.

• Different SNMP agents, which interface to their appropriate system components, drivers, entities, or applications, capture the operational variables and report the information that they gather to the SNMP Manager. This information is then passed on to the management console upon query. All protocol stack agents and the SNMP manager's own agent provide the traditional network management functions, capturing statistics on such events as CRC errors, buffer overruns, and timeouts. The Macintosh Agent provides a dynamic hard-ware and software profile of a Macintosh, including RAM and disk space, types of add-in cards, system software versions, and the types and versions of application programs resident on- disk.

• The individual SNMP transport modules provide the transport-independent interface between the different network protocol stacks and the SNMP Manager.

• Two applications, called MacSNMP Client and MacSNMP Admin, allow users and administrators to view and modify SNMP Manager state and configuration information.

This SNMP architecture allows Macintosh computers to be managed by a variety of SNMP consoles, including those from Sun Micro-systems, Hewlett-Packard, IBM, InterCon, Neon Software, and Cabletron.

The SNMP Manager API and developer's kit enables software and hardware developers to create additional SNMP agents for their Macintosh services and products. The architecture can support SNMP agents for routers; mail services; file services; general applications; different protocol stacks; drivers for Token Ring, Ethernet, and FDDI cards; and other peripherals and network products.

Technology Details and System Requirements

Depending on the agents installed, MacSNMP can report a wide variety of
management information to the monitoring console. The following information
is reported by the agents included with the core MacSNMP technology:

Information Reported by the Macintosh Agent
   • Machine name, location, and description
   • Machine icon
   • The amount of time a machine has been turned on
   • User name and phone number
   • Printer type
   • Default zone
   • Chosen printer, printer zone, and printer driver
   • System file location and information
   • Application location and information
   • NuBus card location, information, and identification
   • SCSI device location, information, and identification
   • Amount of RAM
   • ROM and AppleTalk versions

Information Reported by the Network Agent
   • SNMP protocols (such as packet count)
   • Network cards (network speed, the number of cards installed, the type
     of protocol running on the card)
   • The type of computer being used (Macintosh, Sun, and so on)
   • The location of a computer on the network
   • The computer owner's name

Other SNMP agents, which are included with their corresponding products,
are available for
   • The AppleTalk 58 stack (RFC 1243)
   • The MacTCP 2.0 stack (RFC 1213)
   • The Apple Internet Router Basic Connectivity Package

System Requirements
   MacSNMP can be installed on any Macintosh computer running System 7 or
   later (4MB of RAM is recommended).

Ordering and Licensing Information

The core MacSNMP Client software for the Macintosh is available in the
AppleTalk Connection and TCP/IP Connection products. These are available as
retail products consisting of a single-user package with multi-user and
volume license extensions. A MacSNMP developer kit is available from APDA.
See the following product listings for details.

AppleTalk Connection for Macintosh Single-user package. (Order No.
M8069Z/A)
   • AppleTalk stack and driver software
   • MacSNMP Client
   • Macintosh, AppleTalk, and Network agents and MIBs

  • AppleTalk Connection Installation and User's Guide
20-user license extension (Order No. M8065Z/A). This license extension
contains no software.

AppleTalk Administration for Macintosh Single-user package (Order No.
M8066Z/A)
  • Complete AppleTalk Connection product
  • MacSNMP Admin software
  • About AppleTalk Administration
  • MacSNMP Administrator's Guide
  • AppleTalk Connection Installation and User's Guide
  • Planning and Managing AppleTalk Networks

TCP/IP Connection for Macintosh Single-user package (Order No. M8113Z/A)
  • MacTCP stack and driver software
  • MacSNMP Client
  • Macintosh, TCP/IP, and Network agents and MIBs
  • TCP/IP Connection User's Guide
20-user license extension (Order No. M8115Z/A). This license extension
contains no software.

TCP/IP Administration for Macintosh Single-user package (Order No.
M8114Z/A)
  • Complete TCP/IP Connection product
  • MacTCP Admin and MacSNMP Admin software
  • MacTCP Administrator's Guide
  • MacSNMP Administrator's Guide
  • TCP/IP Administration: Overview and Installation
  • TCP/IP Connection User's Guide

MacSNMP 1.0 Developer's Kit
  Available on the Essentials•Tools•Objects (E.T.O.) CD-ROM from APDA.
  (Order No. M0895LL)

To order APDA products or get additional information, contact APDA, whose
addresses and phone numbers are listed in a separate Tech Info Library article.

AppleTalk Connection and TCP/IP Connection Products:
Large-Volume Licenses, Licensing details are available from ESD Licensing
Department at:
  Apple Computer, Inc.
  20525 Mariani Avenue, M/S 35-AE
  Cupertino, CA 95014 U.S.A.
  Telephone: 408-974-2320
  AppleLink address: ESD.LICENSE

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