

SNMP

Simple Network Management
Protocol

Interpeak SNMP Agent

Control and supervision of modern networks can quickly become a challenging task, especially when handling heterogenous network topologies. The Interpeak SNMP Agent resolves this by providing a uniform management interface using the industry-standard SNMP protocol.

Control and management of modern networks is a challenging task due to the complexity and diversity of the connected devices. A standardization of the management strategy is therefore a necessity to enable successful supervision of such networks.

The Simple Network Management Protocol (SNMP) is the most widely used network management solution for TCP/IP networks. It is an open standard-based framework that is simple but yet flexible enough to manage many different types of devices in today's distributed network environment.

SNMP Model

The SNMP model assumes the existence of *managers* and *agents*. An SNMP manager is a software module in a management system, responsible for handling of configuration and statistics of

the networked devices. An SNMP agent is a software module which resides in the managed device, and communicates with the manager using the SNMP protocol.

Interpeak recognizes SNMP as the standard for network management, and has designed an SNMP agent tailored specifically for use in dedicated devices. It is the ideal solution for embedded systems that require a fully functional SNMP agent with high performance and yet small footprint. The Interpeak SNMP agent is standards compliant, and supports both SNMP version 1 and 2, as well as the recently defined version 3.

SNMP History

SNMP was defined in the late eighties, with the first implementations appearing in the end of 1988. The original version of the protocol—SNMPv1—contained the five request/response primitives: *get-request*, *set-request*, *get-next-request*, *get-response*, and *trap*.

The second incarnation of SNMP appeared in 1993, and was an ambitious attempt to address a number of deficiencies in SNMPv1 as well as adding new features. Implementations of this new standard did however reveal a number of problems that lead to a major revision of the specifications, with a less comprehensive set of features added. The new SNMPv2 specification was released in 1996, and introduced e.g. a locking mechanism, 64-bit counters and improved error reporting.

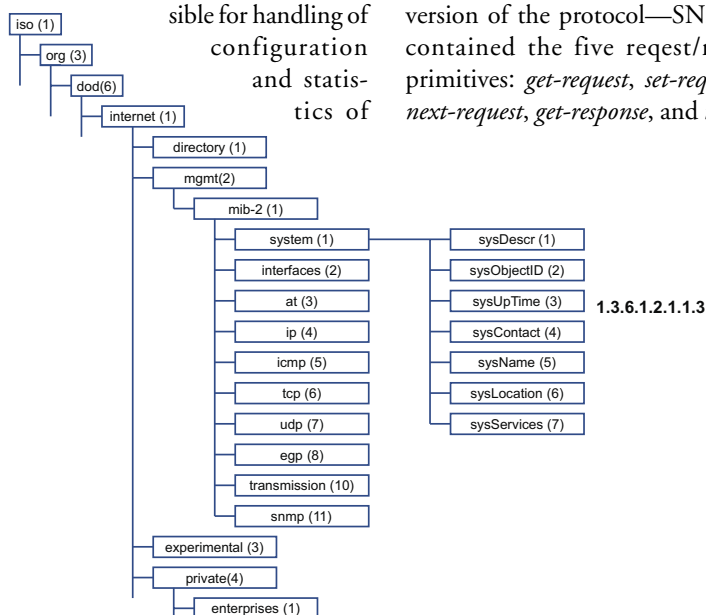
The most recent addition to the protocol is named SNMPv3. It is basically SNMPv2 with a number of security additions like a Security Model and an Access Control Model. The specification documents also describe an overall architecture for describing SNMP management frameworks and a model for message processing and dispatching.

SNMPv3 Security Features

SNMPv3 is designed to secure against the following security threats:

- Modification of Information, i.e. altering of the message in transit.
- Masquerading, i.e. an entity may hide its entity and pretend to be someone else.
- Message Stream Modification, i.e. reordering or replay of the messages.
- Disclosure, i.e. observation of sensitive information such as passwords.

SNMPv3 does however not secure against Denial of Service attacks or Traffic analysis.



Structure of Management Information (SMI).

SNMP Agent Features

The SNMP model of network management that is used for TCP/IP networks includes the following components:

- Management station
- Management agent
- Management information base
- Network management protocol

Management Station

The management station serves as the interface for the human network manager into the network management system. The station translates the network management tasks into actual commands sent on the network. The management station is typically a stand-alone device.

Management Agent

The management agent is the software module that resides on the managed device. It responds to requests for information and actions requested by network management stations. The

- Implements the original SNMP version 1
- Implements SNMPv2c which is the standardized variant of SNMPv2. The “c” means community based SNMPv2.
- Supports SNMPv3 which includes security enhancements.
- Support both for IPv4 and IPv6. The SNMP agent may be configured in IPv4 only, IPv6 only or dual IPv4/IPv6 mode.
- All three Get methods are supported; GetRequest, GetNextRequest and GetBulkRequest
- Implements the SetRequest method.
- Provides generic traps such as coldStart, linkUp/linkDown etc., as well as API functions for sending custom enterprise specific traps.
- Includes community based authentication based on community name, source address/mask and access level.

Interpeak SNMP features.

SNMPv1
RFC 1155
RFC 1157
RFC 1212-1213
RFC 1215

SNMPv2
RFC 2011-13
RFC 2096
RFC 2452
RFC 2454
RFC 2465-66
RFC 2576
RFC 2578-80
RFC 3416-18

SNMPv3
RFC 3410-15

RFCs supported by Interpeak SNMP.

agent may also spontaneously transmit information about events in the device. Agents typically reside on network devices such as host, switches, routers, firewalls, gateways etc.

Management Information Base

The managed information is represented with objects, one for each aspect of the managed device. The object is in essence a data variable of a predefined type. The collection of objects on a specific device is referred to as a Management Information Base or MIB. Each type of device has its own MIB, for example the “Printer MIB” (RFC 1759) or the “UPS MIB” (RFC 1628).

Network Management Protocol

The protocol used for management of TCP/IP networks is SNMP. Usually it

runs over UDP which means that retransmissions have to be handled by the SNMP management stations and agents.

Integrated with Interpeak’s Protocol Stacks

Interpeak SNMP comes by default with support for the MIB-2 snmp and system groups. If using Interpeak’s IPNET TCP/IP stack, the remaining MIB-2 groups are also predefined including the new IPv6 MIBs. Interpeak SNMP also provides a programming interface for private MIBs to support customer products.

The SNMP agent also supports the TestAndIncrement textual convention which can be used to prevent concurrent use of the same MIB object by two different managers. This may be essential in Set operations.

Interpeak Secure Networking Software

Interpeak provides state-of-the-art networking solutions specifically designed for embedded systems. The company's embedded networking and security software is currently used in thousands of applications across the globe.

Headquartered in Stockholm, Sweden, Interpeak operates through a global network of distribution channels and has its own sales and field application force dispersed in strategic locations worldwide, including the USA, Europe, and Asia. For additional information, please visit our homepage www.interpeak.com.

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