

SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)

The Simple Network Management Protocol (SNMP) is designed to monitor the performance of network protocols and devices. SNMP protocol data units (PDUs) can be carried in the payload of a UDP datagram, and so its delivery to a destination is not guaranteed. Managed devices, such as routers and hosts, are objects, and each object has a formal ASN.1 definition. For each object, MIB accommodates a database of information that describes its characteristics. With this protocol, a network manager can find the location of a fault. SNMP runs on top of UDP and uses client/server configurations. The commands of this protocol define how to query information from a server and forward information to a server or a client.

The task of SNMP is to transport MIB information among managing centers and agents executing on behalf of managing centers. For each managed MIB object, an SNMP request is used to retrieve or change its associated value. If an unsolicited message is received by an agent, or when an interface or device goes down, the protocol can also inform the managing center. The second version of this protocol, SNMPv2, runs on top of more protocols and has more messaging options, resulting in more effective network

management. SNMPv3 has more security options.

SNMPv2 has seven PDUs, or messages, as follows.

1. GetRequest is used to obtain a MIB object value.
2. GetNextRequest is used to obtain the next value of a MIB object.
3. GetBulkRequest gets multiple values, equivalent to multiple GetRequests but without using multiple overheads.
4. InformRequest is a manager-to-manager message that two communicating management centers are remote to each other.
5. SetRequest is used by a managing center to initiate the value of a MIB object.
6. Response is a reply message to a request-type PDU.
7. Trap notifies a managing center that an unexpected event has occurred.

[Figure 5.12](#) shows the format of SNMP PDUs. Two types of PDUs are depicted: Get or Set and Trap. The Get or Set PDU format is as follows:

- PDU type indicates one of the seven PDU types.
- Request ID is an ID used to verify the response of a request. Thus, a managing center can detect lost requests or replies.
- Error status is used only by Response PDUs to indicate types of errors reported by an agent.
- Error index is a parameter indicating to a network administrator which name has caused an error.

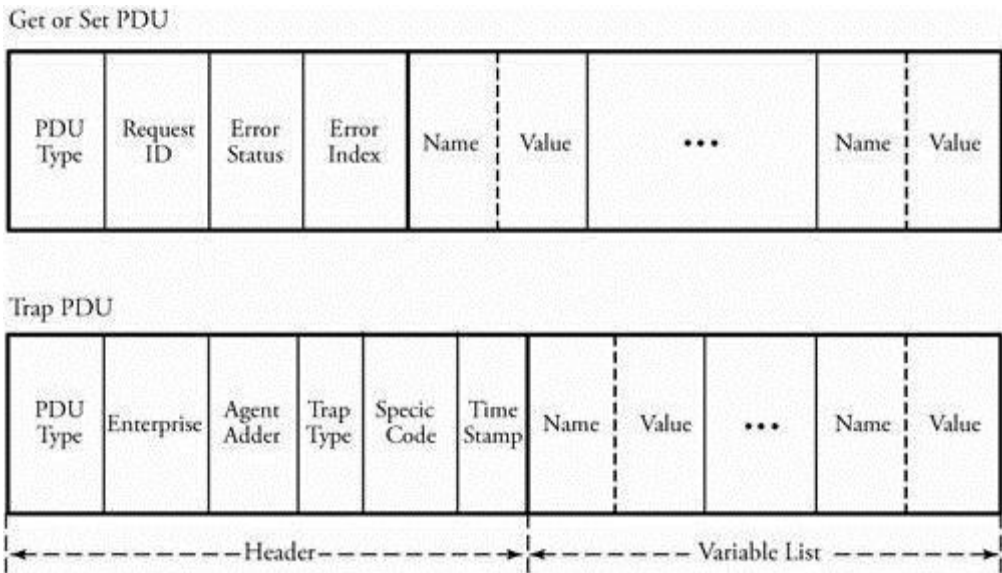


Figure 5.12. SNMP PDU format

If requests or replies are lost, SNMP does not mandate any method for retransmission. Error status and Error index fields are all zeros except for the one in a GetBulkRequest PDU. [Figure 5.12](#) also shows the format of the Trap PDU, whereby the enterprise field is for use in multiple networks; the timestamp field, for measuring up time; and the agent address field, for indicating that the address of the managed agent is included in the PDU header.

Source : <http://elearningatria.files.wordpress.com/2013/10/cse-vi-computer-networks-ii-10cs64-notes.pdf>