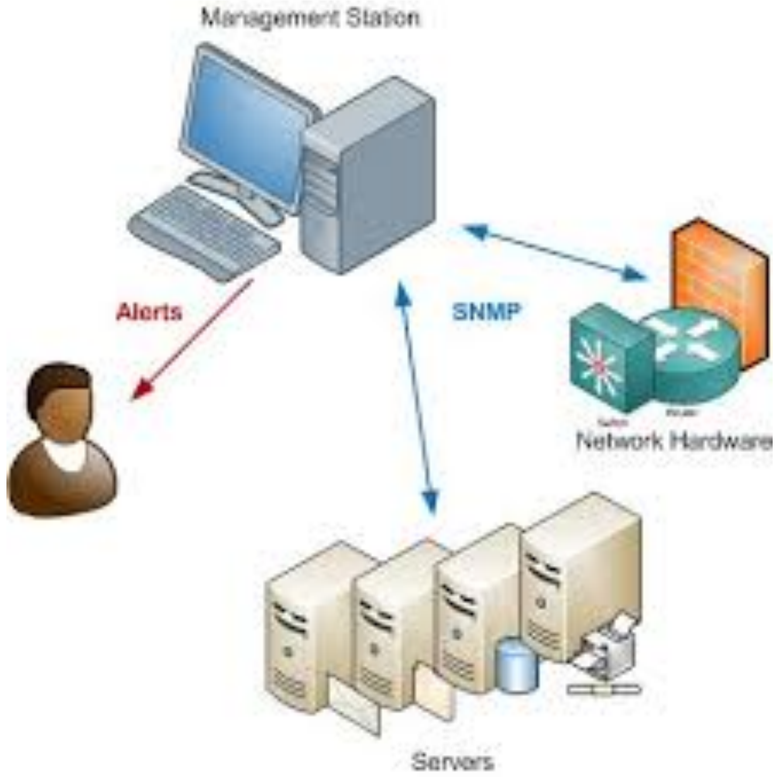
SNMP

Monitoring and Log Management

SNMP Data Collection

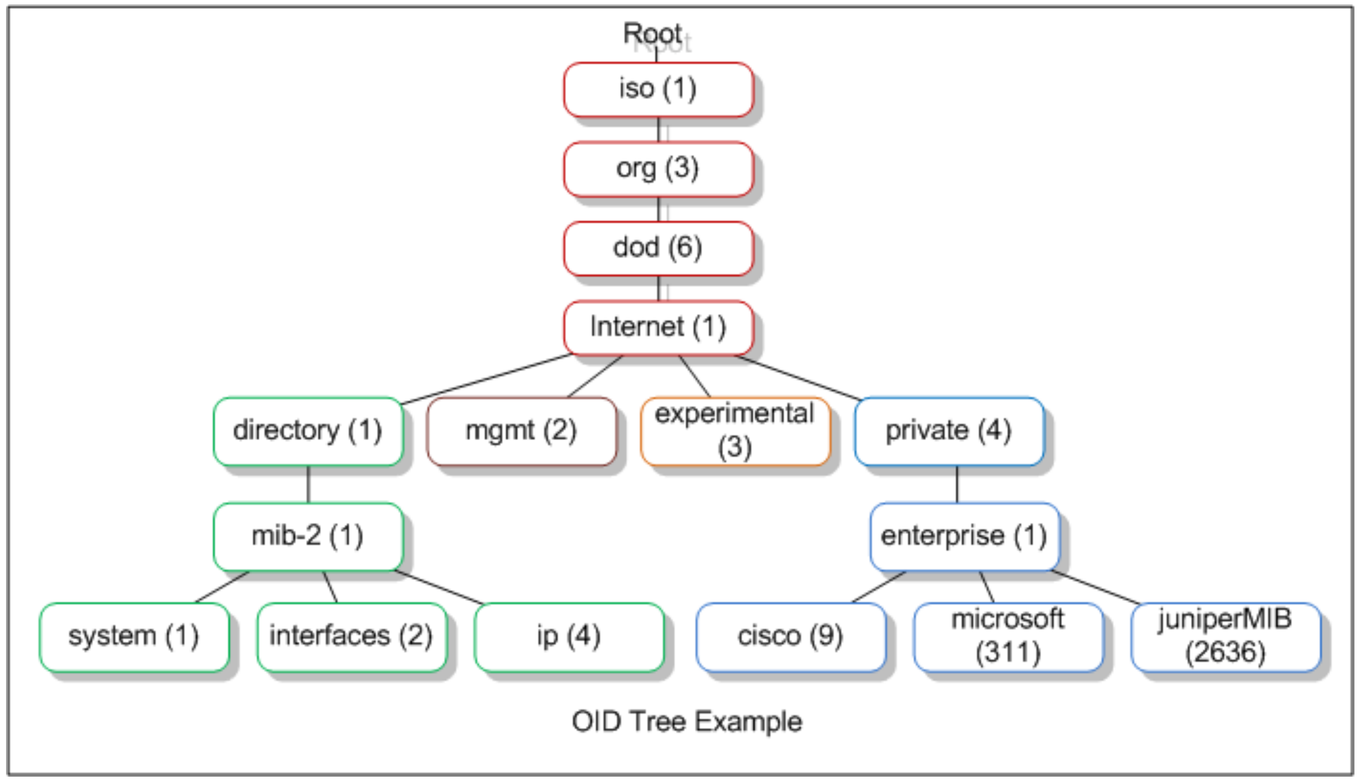
- The Simple Network Management Protocol was created to provide a simple mechanism for remotely retrieving system information and changing settings
- It has been around a long time and the first versions did not take security into account, current versions do
- It is commonly set up with a single network monitoring station retrieving and storing data from agent programs running on hosts being monitored



Providing SNMP Data

- The snmpd daemon provides access to system information using SNMP as the protocol
- The Ubuntu agent can be installed with apt, package name snmpd
- The command line tools to access the SNMP service are in the snmp package
- The default config may restrict access to localhost and a limited dataset in read-only mode - it may also log every snmp request to syslog which is a lot of log entries
- The dontLogTCPWrappers directive can be set to true in the snmpd.conf file to only log failed snmp requests

OIDs and MIBs



OID Tree Example

- An object identifier (OID) is the key used to specify a data element
- OIDs are hierarchical and specified using a numeric index scheme for each level of the hierarchy
- SNMP uses a management information base (MIB) to translate the oids from numeric index strings to names
- Install or update your mibs before using the snmp tools if you want translated oids
- snmp-mibs-downloader is the package on Ubuntu, download-mibs is the command to download them

SNMP Access Control

- Community-based access, trivial names used to ask for access, no passwords in version 1 and version 2c
- User-based access controls with passwords and/or SSH/(D)TLS in V3
- Users and communities can be limited to views of the mib

CLI Tools

- snmpconf - daemon configuration tool
- snmpusm - access control configuration tool (obtuse)
- snmpstatus - snmpd state reporter
- snmpdf - remote df using snmp
- snmpnetstat - remote netstat using snmp
- snmpwalk - mib browser
- snmpget - oid retriever

snmpconf

- snmpconf is a configuration helper
- The -g option will run you through the basic config, asking you for settings to use
- snmpconf can be used to automatically add comments to your existing snmpd.conf file (-a)
- snmpusm can be used to add and remove users in your live configuration, but is difficult to figure out

snmpstatus

- snmpstatus can be used to test whether a target host answers snmp connections
- If the host answers, some host identification will be displayed along with network statistics and warnings if any network interfaces are down
- Most snmp commands require a community and version to be specified on the command line using -c and -v
- Additional command line options for user authentication and encryption are required if you have v3 configured for auth or Priv modes

snmpdf/snmpnetstat

- snmpdf allows you to get a summary of storage usage from a target host, including memory usage
- snmpnetstat allows you to run netstat on a target host via snmp
- snmpnetstat allows netstat command options using -C
- Requires community and version to be specified on the command line using -c and -v

snmpwalk

- A MIB contains a great many potential data items in a number of formats
- Knowing which ones your device provides, and which ones have valid data in them can be challenging
- snmpwalk allows you to browse the data returned from an snmp agent and see the data items and values
- It is useful for identifying specific values to retrieve for monitoring purposes in scripts or management software packages
- Requires community and version to be specified on the command line using -c and -v

snmpget

- snmpget allows you to retrieve a specific data item via snmp
- It can be used on the command line for quick tests
- It can be incorporated into scripts for automated monitoring
- Many monitoring packages use snmpget under the covers
- Requires community and version to be specified on the command line using -c and -v

SNMP v3 Basics

- v3 adds authentication, encryption, and security models
- Security model can be user-based (usm), transport-based (tsm - tls, dtls, ssh), or kerberos-based (ksm) - usm is the most efficient and resilient to DoS but the most nuisance to maintain the configuration
- Users are created by stopping the daemon, modifying the /etc/snmp/snmpd.conf file to have createUser and r[ow]user lines, then starting the daemon, which makes usmuser entries in /var/lib/snmp/snmpd.conf
- Removing a user is done by stopping the daemon, removing the createUser lines from /etc/snmp/snmpd.conf, the usmuser lines from /var/lib/snmp/snmpd.conf, and optionally the r[ow]user lines in /etc/snmp/snmpd.conf for the removed users
- Alternately, you can use the snmpusm command to create the usmuser lines for your /var/lib/snmp/snmpd.conf

SNMP Lab


Software can be chaotic, but we make it work
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