Network Management (SNMP)

Chapter 39
Simple Network Management Protocol

Managing An Internet
• A Network Manager is a person responsible for monitoring and controlling an internet.
• Hard failures are usually the easiest to find and fix.
• Intermittent or partial failures are harder to locate because protocols accommodate packet loss.
  – Retransmissions waste bandwidth.
  – These failures usually get worse over time.
  – A failure caused by one computer can affect others.
• Network management software helps.

Clients, Servers, Managers, Agents
• Network management is not defined as part of the transport or internet protocols.
• It operates at the application level.
  – A client on the manager’s computer talks to a server on a network device (switch, router, etc.) using UDP or TCP.
  – To avoid confusion the client is called a manager and the server is called an agent.

Simple Network Management Protocol
• Simple Network Management Protocol (SNMP) is a standard that defines how a manager communicates with an agent.
• Each SNMP message is encoded with Abstract Syntax Notation.1 (ASN.1).
  – ASN.1 sends integer numbers as length and value.

Fetch-Store Paradigm
• SNMP does not use a large set of commands.
  – Fetch is used to get a value from a device
  – Store is used to set a value in a device.
  – Each object that can be fetched or stored is given a unique name (object).
• Control operations are defined to be the side-effect of storing into an object.
  – A device might execute a reboot when a value such as zero is stored into an object named “reboot.”

Management Information Database
• Both the manager and the agent must agree on the unique names for objects.
• Collectively all objects that SNMP can access are known as a Management Information Database (MIB).
• Objects in a MIB are defined with the ANS.1 naming scheme.
  – A count of the number of IP datagrams received:
    iso.org.dod.internet.mgmt.mib.ip.ipInReceives
  – Each part of the name has an integer value:
    1.3.6.1.2.1.4.3
  – A name can also refer to an array.