Q.2 a. Describe TCP/IP based networks. Write down the protocol used in network management.

Answer:

TCP/IP based networks are given below:

- TCP/IP is a suite of protocols
- Internet is based on TCP/IP
- IP is Internet protocol at the network layer level
- TCP is connection-oriented transport protocol and ensures end-to-end connection
- UDP is connectionless transport protocol and provides datagram service
- E-mail, WWW, FTP, Telnet: TCP/IP
- Network mgmt. (SNMP): UDP/IP
- ICMP: part of TCP/IP suite

Protocols used in network management are given below:

- SNMP(v1, v2, v3)
  - Simple Network Management Protocol
- ICMP
  - Internet Control Message Protocol
  - Ping , traceroute
- ARP/RARP
  - Address Resolution Protocol/ (Reverse ARP)
- TCP
  - Socket
- Telnet/SSH
- HTTP+XML

b. Draw a diagram Top-down view of network management functions.

Answer:

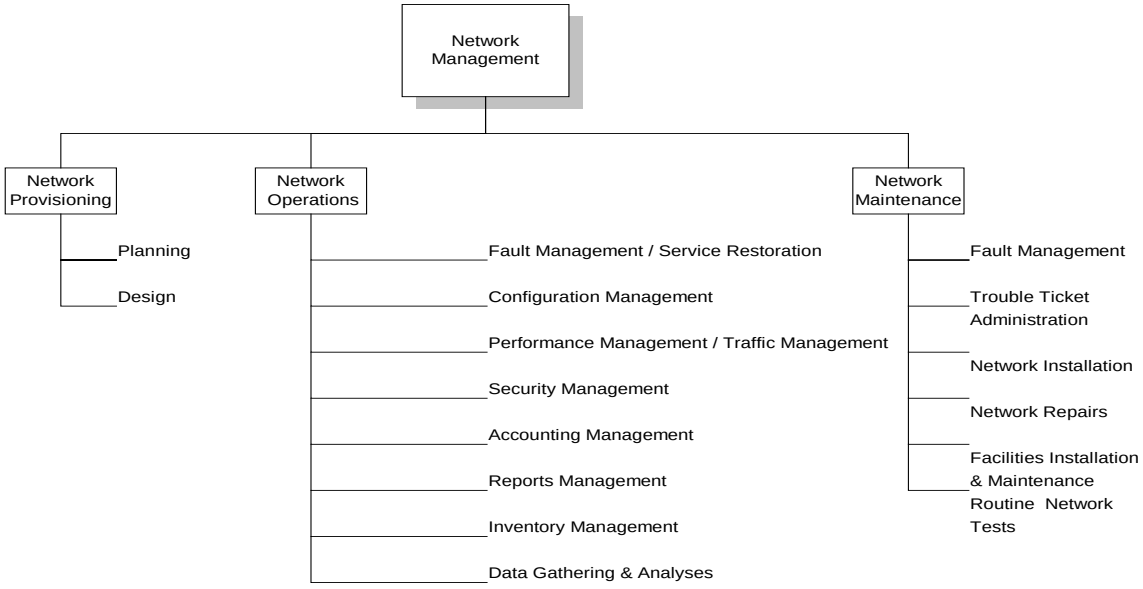


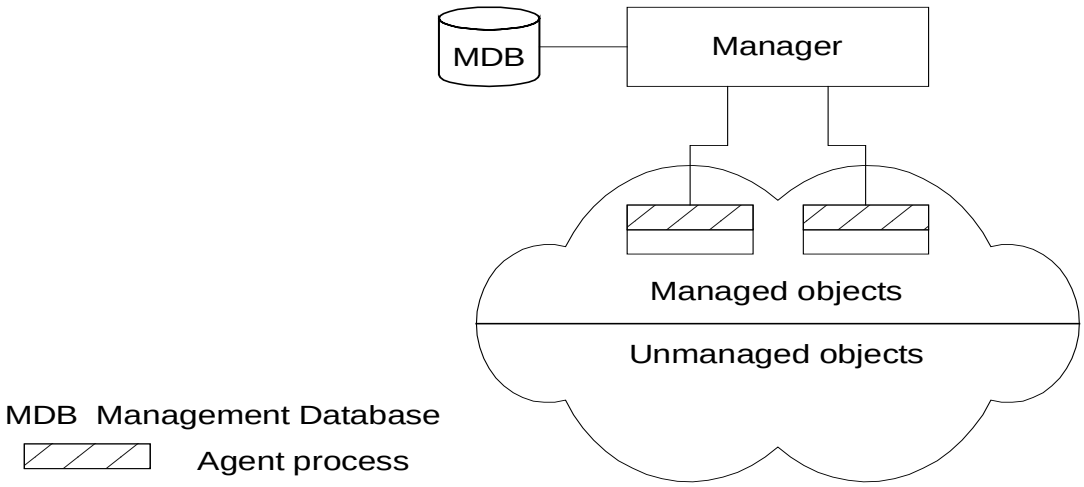
Figure 1.21 Network Management Functional Groupings

Q.3 a. Describe a list and an ordered list is ASN.1 syntax, Indentify the difference between them.

Answer: Page Number 149 of Text Book

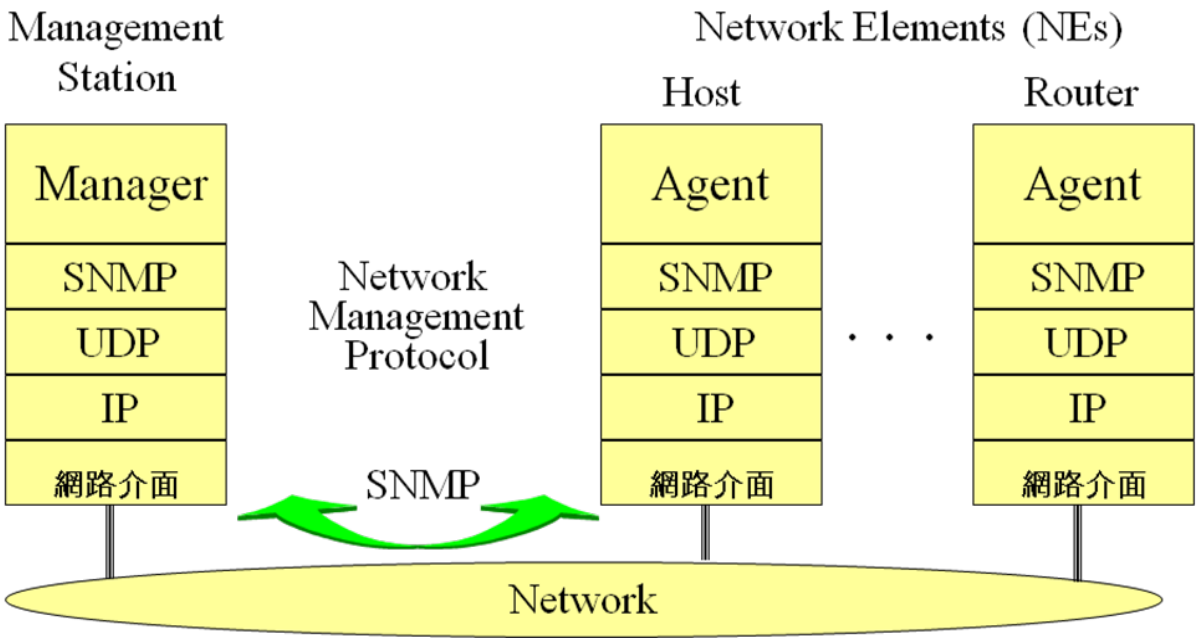
b. Give the difference between two-tier and three-tier network management organization model.

Answer:



Q.4 a. Describe SNMP System Architecture and the services provided by SNMP.

Answer:



SNMP Services

- Get Request:
  - Retrieve the values of objects in the MIB of an agent.
- Get-Next Request:
  - Retrieve the values of the next objects in the MIB of an agent.
- Set Request:
  - Update the values of objects in the MIB of an agent.
- Trap Request
  - Report extraordinary events to the manager.

Q.5 a. What SNMP operations comprised of ? Explain Get Request –PDU and Get Next Request-PDU operation.

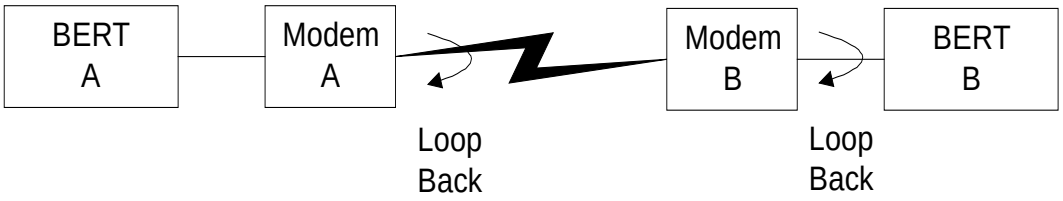
Answer: Page Number 237 of Text Book

b. Explain RMON1 function at the data link layer.

Answer: Page Number 352 of Text Book

Q.6 a. What is Bit Error Rate Tester? How it can be useful for in network management tools?

Answer:



- Physical layer monitoring tool
- Important for WAN and Broadband access
- Generates and detects bits
- Bit error rate (BER) is calculated by comparing the transmitted pattern with received pattern
- BER can be measured for a modem or two modems and the link in between

b. What do you understand by system management? What parameters can be measured using system management tools.

Answer: Page Number 520-521 of Text Book

Q.7 a. Describe fault and performance management in network management applications.

Answer:

Fault Management

- Fault is a failure of a network component
- Results in loss of connectivity
- Fault management involves:

- Fault detection
  - Polling
  - Traps: *linkDown, egpNeighborLoss*
- Fault location
  - Detect all components failed and trace down the tree topology to the source
  - Fault isolation by network and SNMP tools
  - Use artificial intelligence / correlation techniques
- Restoration of service
- Identification of root cause of the problem
- Problem resolution

Performance Management

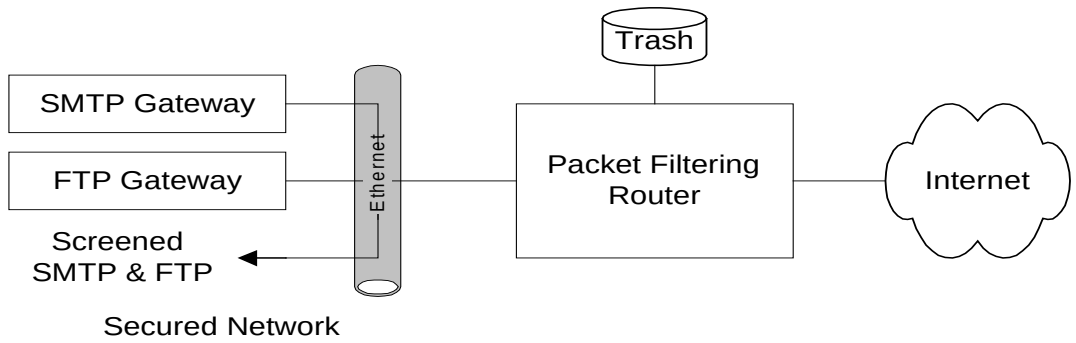
- Tools
  - Protocol analyzers
  - RMON
  - MRTG
- Performance Metrics
- Data Monitoring
- Problem Isolation
- Performance Statistics

b. What is packet filtering firewall? Discuss the types of encryption techniques.

Answer:

Packet Filtering Firewall uses:

- Uses protocol specific criteria at DLC, network, and transport layers
- Implemented in routers - called screening router or packet filtering routers
- Filtering parameters:
  - Source and/or destination IP address
  - Source and/or destination TCP/UDP port address, such as ftp port 21
- Multistage screening - address and protocol
- Works best when rules are simple



Types of encryption techniques

- Private Key Encryption
  - Encryption Key = Decryption Key
  - Also called Symmetric-Key Encryption, Secret-Key Encryption, or Conventional Cryptography.

- Public Key Encryption
  - Encryption Key ≠ Decryption Key
  - Also called Asymmetric Encryption

Q.8 a. What do you understand by Report Management? List three categories of reports and type of reports in each category.

Answer: Page Number 575 of Text Book

b. Explain service Level Management process.

Answer: Page Number 578 of Text Book

Q.9 a**.** Describe the components used in web-based enterprise management.

Answer:

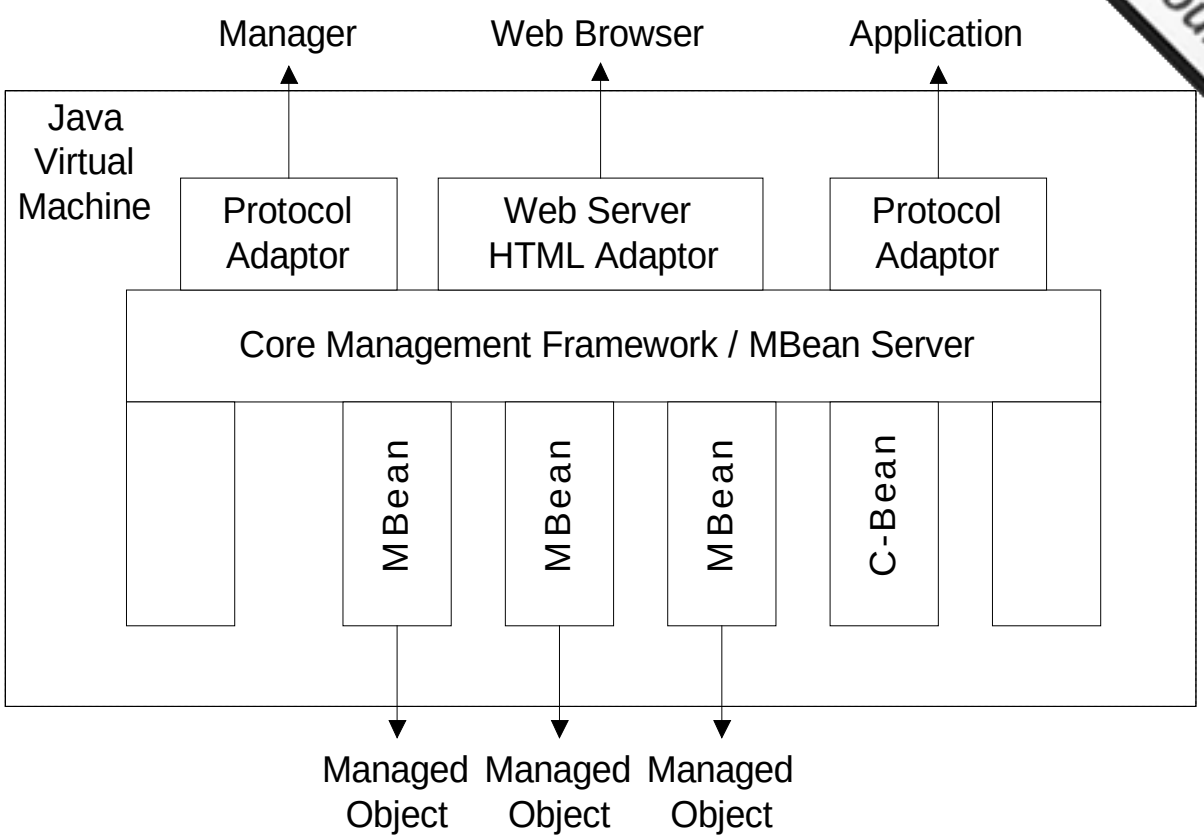
Five components:

- Web client
- CIM object manager (CIMOM)
- CIM schema
- Management protocol
- Managed objects with specific protocol

b. What do you mean by service driven network? How Java Dynamic management kit works?

Answer:

- Network of services (instead of network of components)
- based on Java technology and thin clients.
- It speeds up service creation and deployment, as well as handling provisioning, management and billing.
- Dynamic Management
  - The Service-Driven Network enables you to reconfigure the infrastructure of the network dynamically, by pushing services in real-time, both to the network infrastructure elements, and to consumer devices across the Internet.
- Java technology calls plug-in JavaBean
- MBean is management JavaBean



TEXT BOOK

Network Management Principles and practice, Mani Subramanian, Pearson Education, 2000