BCN 3023
NETWORK MANAGEMENT

CHAPTER 3

Network Management Architecture

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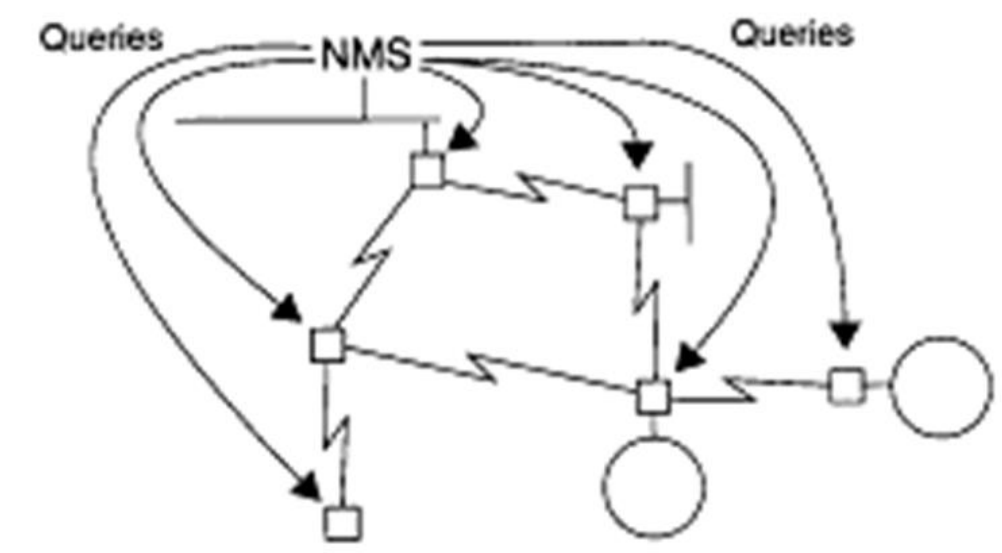
Network Management Architecture

3 TYPES:

1. **CENTRALIZED**

2. **DISTRIBUTED**

3. **HIERARCHICAL**

CENTRALIZED

- Management is centralized to the Network Management Station (NMS) on the backbone network
- NMS could also part of one LANs
- The network manager gathers information about activities on the LANs by using the NMS and SNMP packets to query the agents on the LAN devices
- The device agents copy and store information from transmitted and received packets
- The agents on the probe copy and store packets on the network segment to which they are attached when requested to do so by the NMS
- Disadvantage – centralized NMS configuration:

Failure of a router , shuts down all management of the LAN to which it is connected

Centralized

In a centralized architecture the single network management is responsible for all management duties on all network devices.
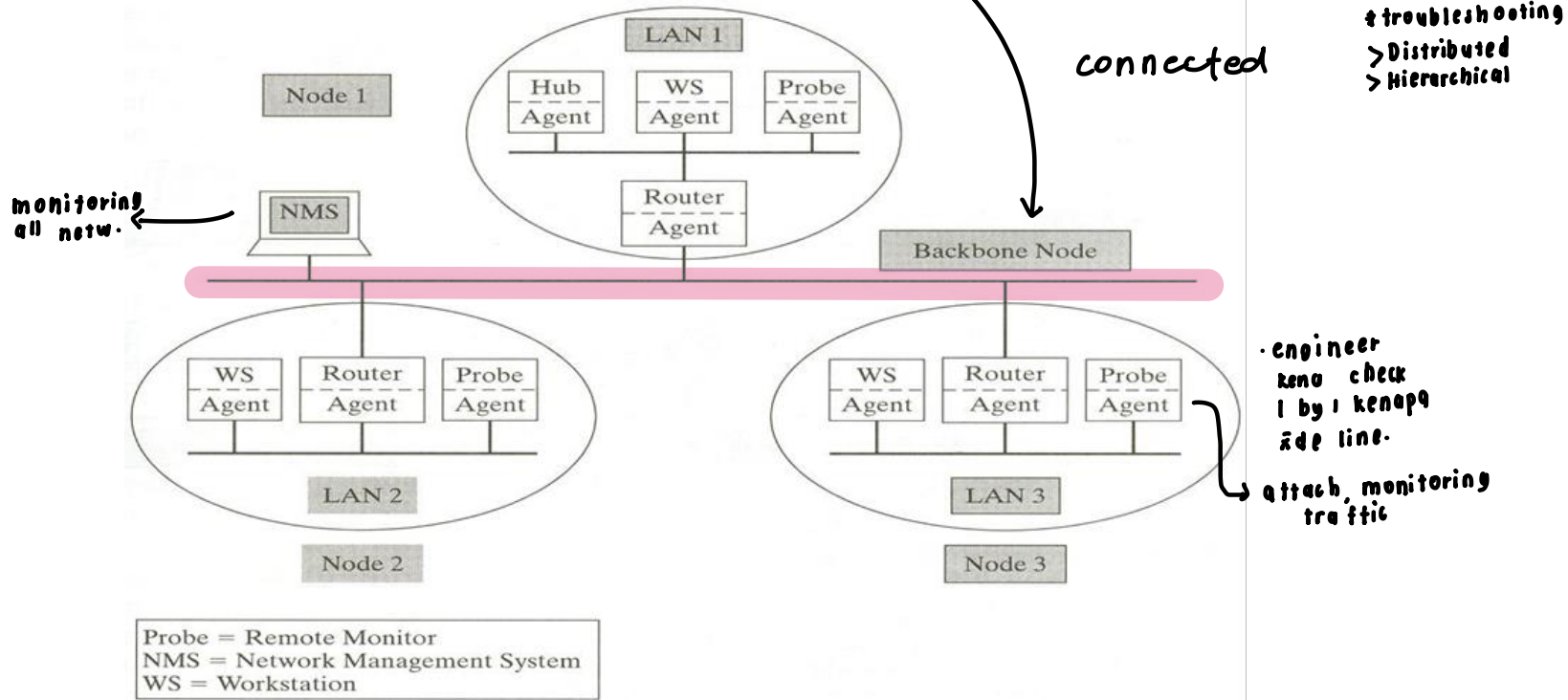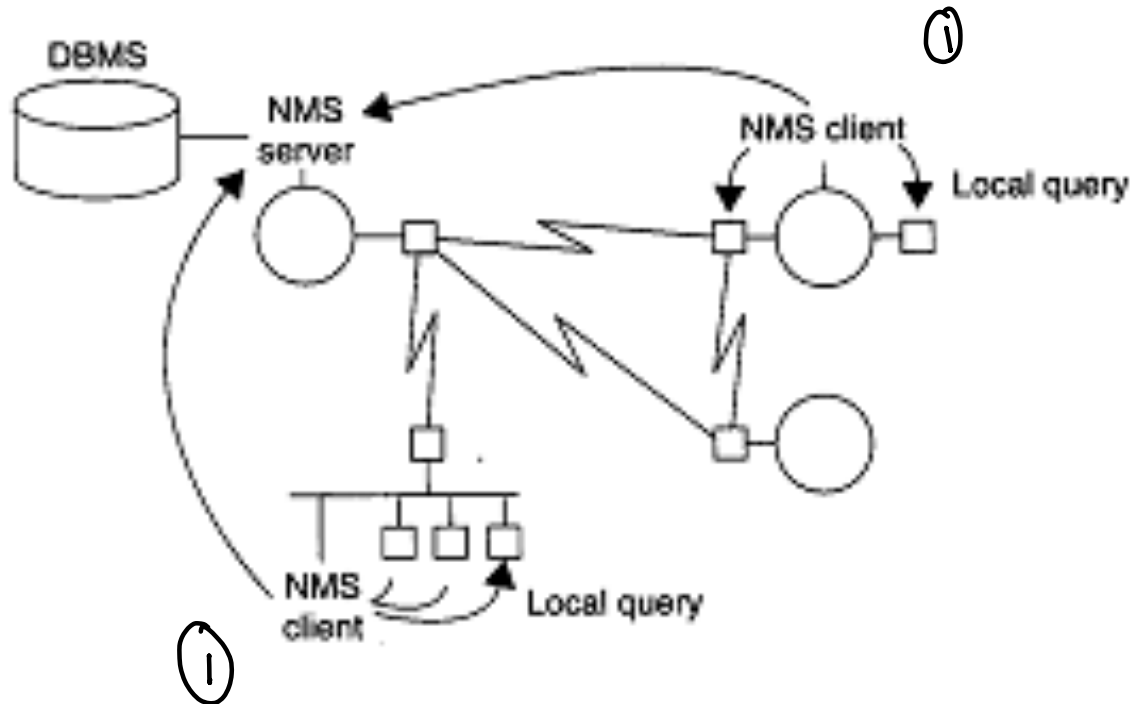
Centralized

Figure 3.2 Centralized Network Management

Handwritten annotations:
- connected
- monitoring all netw.
- † troubleshooting
  > Distributed
  > Hierarchical
- · engineer kena check 1 by 1 kenapa ade line.
- attach, monitoring traffic

Diagram labels:
- LAN 1
- Node 1
- Hub Agent | WS Agent | Probe Agent
- Router Agent
- NMS
- Backbone Node
- WS Agent | Router Agent | Probe Agent
- LAN 2
- Node 2
- WS Agent | Router Agent | Probe Agent
- LAN 3
- Node 3

Probe = Remote Monitor
NMS = Network Management System
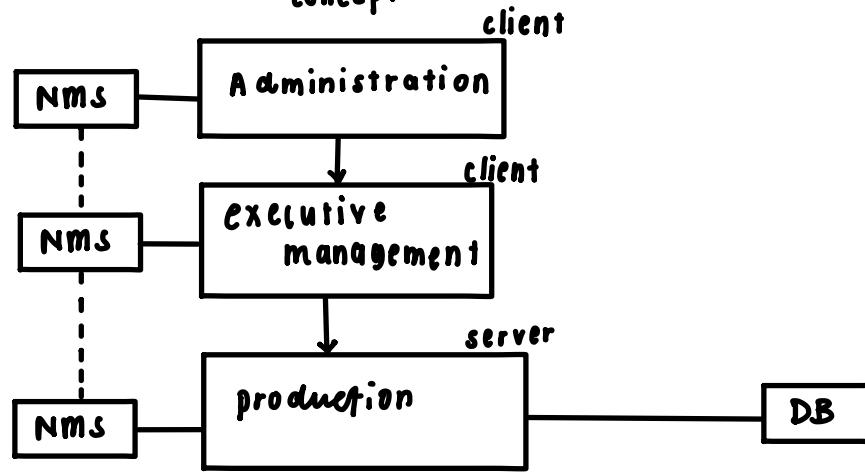WS = Workstation

HIERARCHICAL

- Uses multiple system – one system act as server , others as clients
- Some NMS function reside within the server, others in client
- Central database on server, client access database from server through network
- Central system need redundancy

Hierarchical

Hierarchical

→ clustering
  concept

NMS — Administration *client*

NMS — executive management *client*

NMS — production *server* — DB

HIERARCHICAL

HIERARCHICAL FEATURES:
- Not dependent on a single system
- Distribution of network management task
- Network monitoring distributed throughout network
- Centralized information storage

DISTRIBUTED

- Good choice for Enterprise network

  - More backbone devices

  - More LAN devices

- More robust system
- LANs are managed by a Local Administrator (using local NMS)
- Central Administrator managed backbone devices using NMS attached to backbone network

Distributed

- LAN NMS capability – provide management required by that network
.
- Backbone NMS capability – provide more comprehensive

  management
- •   Example from table 3.9
  - NMS near the top of the table for the LAN
  - NMS near the bottom of the table for the backbone
- Each node's NMS maintain a MIB for that node only
  - •   –   Reduces storage management NMS that become quite large because many tables and

    objects have to be stored
- Backbone NMS could maintain MIB for each LAN
  - Each LAN keep its MIB updated
- Backbone NMS have a complete Enterprise view

Distributed
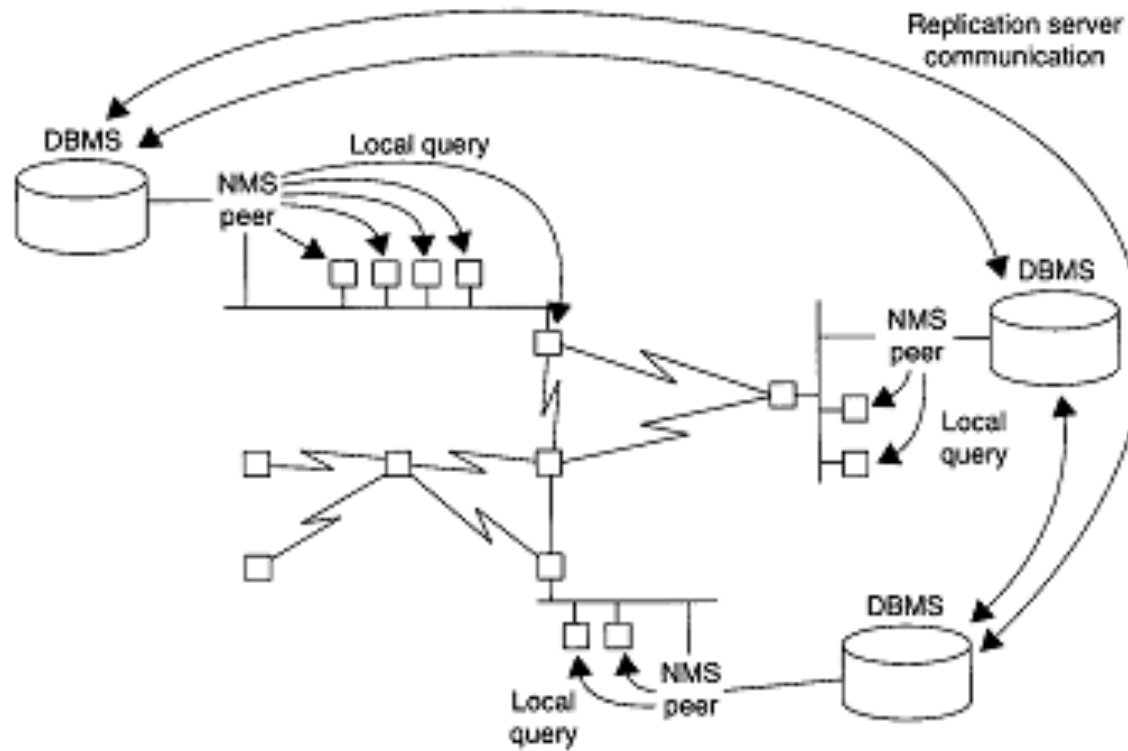
DISTRIBUTED

DISTRIBUTED FEATURES:

- Single location for all network information, alerts and events

- Single location to access all management applications

- Not dependent on a single system

- Distribution of network management tasks

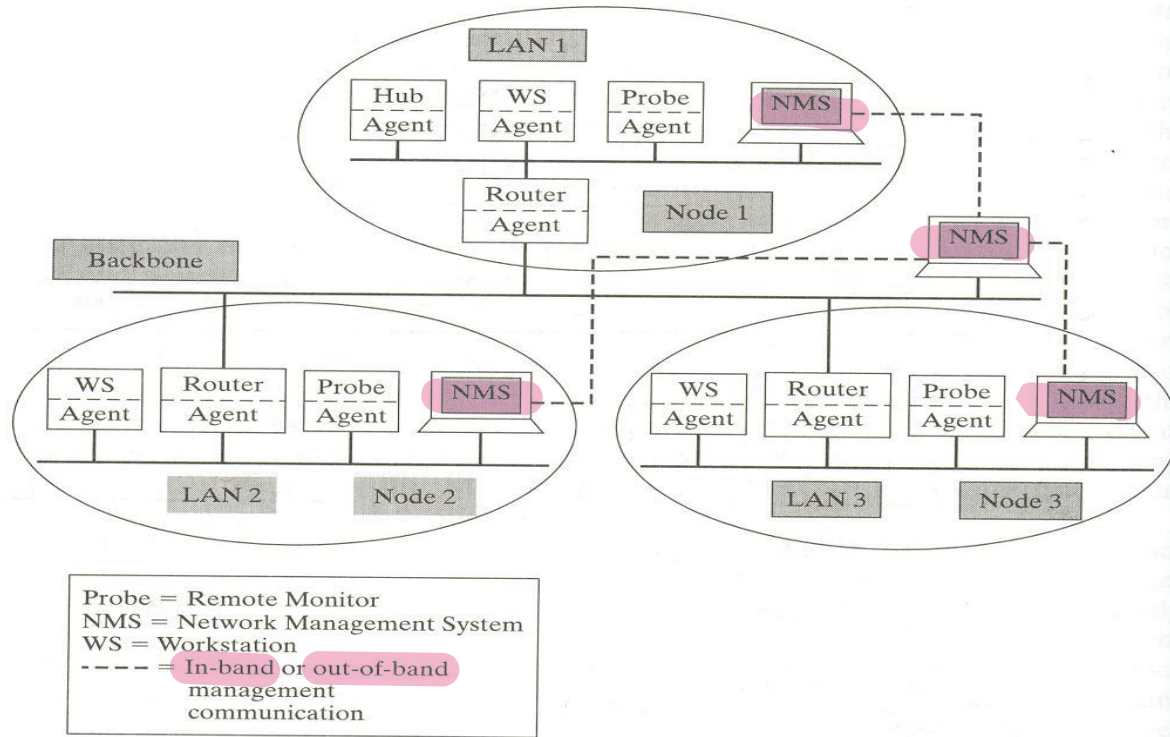- Distribution of network monitoring throughout the network

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Distributed

Probe = Remote Monitor
NMS = Network Management System
WS = Workstation
- - - - = In-band or out-of-band management communication

Figure 3.3 Distributed Network Management

→ separate the management & production communication.

→ troubleshooting < centralized

→ cost > centralized = < Hierarchical

SME
↓
Shared
↓
FCAPS
↓
Centralized / Distributed

SME
↓
shared
↓
architecture
↓
model

Distributed

- Backbone NMS and LAN NMS could query/access information from each other to get information about devices on other LANs
- Advantage:
  - In case of a network fault, some level of network management still available
  - Decentralized configuration is more important these days because organization now relies on its network

END OF CHAPTER 3