

Name

Farhan Ali

ID

12761

Degree

Bs (Telecom)

Subject

Telecommunication
Management.

Instructor

Engr. Muhammad Shekeel

(Q1)

Explain the principle of simple Network Management Protocol (SNMP)?

(Ans) Simple Network Management Protocol (SNMP) is an application layer protocol for monitoring and managing network devices on a local area network (LAN) or wide area network (WAN).

The purpose of SNMP is to provide network devices such as routers, switches and printers with a common language for sharing information with a network management system (NMS).

* Principle of SNMP

SNMP work on an Application layer of OSI model traditionally UDP is used as a transport and interaction between agent and manager performs with a encapsulated PDU (Protocol Data Unit) objects. When encryption is enabled default TAPS are sent to udp port 10162 and communication is done on udp port 10161.

* SNMP Components:

(1) SNMP Managers

A manager or management system is a separate entity that is responsible to communicate with the SNMP agent implemented

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network device. This is typically a computer that is used to run one or more network management systems.

(2) Managed Device

A managed device or the network element is part of that network that require some form of monitoring and management. e.g router, switches.

(3) SNMP Agent

The agent is programmed that is packaged with in the network element. Enabling the agent allow it to collect the management information database from the device locally and makes it available to the SNMP manager.

Q2 Name the features of common Management Information Services (CMIS). Explain the services of associated with CMIS?

(Ans) Feature of CMIS:

Services based on simple request/response approach

⇒ Association Services.

⇒ Operation Services.

⇒ Notification Services.

* Scoping.

* Synchronization.

* Linked Replies.

* Functional Units.

(★a) Association Services:-

⇒ Provided by ACSE

- Used to negotiate functional units and protocol and versions.

= A-Associate.

⇒ Establishes a management association

= A-Release.

⇒ Terminates a management association (in an orderly manner)

= A-Abort.

⇒ Terminates a management association (in an abrupt manner)

6) Operation Services :-

= MA-GET

⇒ Used to retrieve the values of one or more attributes of one or more MAs

⇒ Scoping / Filtering, Linked Replies and Synchronization

⇒ Confirmed service only.

* MA-SET :-

⇒ Used to replace the value of one or more attributes of one or more MAs.

⇒ Scoping / Filtering linked replies and Synchronization.

⇒ May be Confirmed or Unconfirmed.

* M-Action :

- ⇒ convey object Class/Instance, Action type and optional action specific information.
- ⇒ Meaning dependent on MO action Specification
- ⇒ Scoping/Filtering, Linked Replies and Synchronization.
- ⇒ May be confirmed or Unconfirmed.

MN-Create,

- ⇒ Permits creation of new instances of object classes.
- ⇒ Permits specification of default values (of attributes, explicitly and/or by reference)
- ⇒ confirmed service only.

* M-Delete,

⇒ Permit deletion of object class instances.

⇒ Scoping / Filtering, Linked Replies and Synchronizations

⇒ Confirmed service only.

* M-Cancel-Get,

⇒ Permits a linked GET response to be terminated confirmed ^{service} only.

(K) Notification Service

* M-Event-Report:

⇒ Convey object class report instance, Event type and optional event-specific information

⇒ Meaning dependent on MHO notification specifier

⇒ May be confirmed or unconfirmed.

* Scoping and Filtering

= Scoping: select object to be operated with in the managed objects containment tree.

⇒ Scoped defined relative to a base managed object.

= base object only

= Nth level subordinate object only

= Base object plus all of its subordinates (entire subtree).

* Filtering

Permits object within scope to be selected according to test criteria

⇒ operation applied to all selected objects.

⇒ Multiple (linked) Replies used if more than one object selected.

* Synchronizer:-

⇒ Applies only to operations on Multiple objects (via filtering)

⇒ Atomic Synchronizer
- All or Nothing constraint

⇒ Best Effort Synchronizer
- no guarantees.

* Linked Replies

⇒ Permits Multiple Responses to a single operation request

→ Application only if scoping/filtering used.

⇒ Cancel GET permits abrupt terminate of linked Get responses.

==x==x== END

Q3 Briefly Explain the main elements of core network (CN)?

(Ans) Main Elements

- 1) HLR (Home Location Register)
- 2) MSC / VLR (Mobile Service Switching Center / Visitor Location Register)
- 3) GMSC (Gateway MSC)
- 4) SGSN (Serving GPRS (General Packet Radio Service) Support Mode)
- 5) GGSN (Gateway GPRS support Mode)

(1) HLR:-

A home location Register (HLR) is the definitive database of mobile subscriber information for a wireless communications network.

2) VLR:- Is a server in a cellular network that supports roaming function for users outside the coverage area of their own HLR

3) GMSC:-

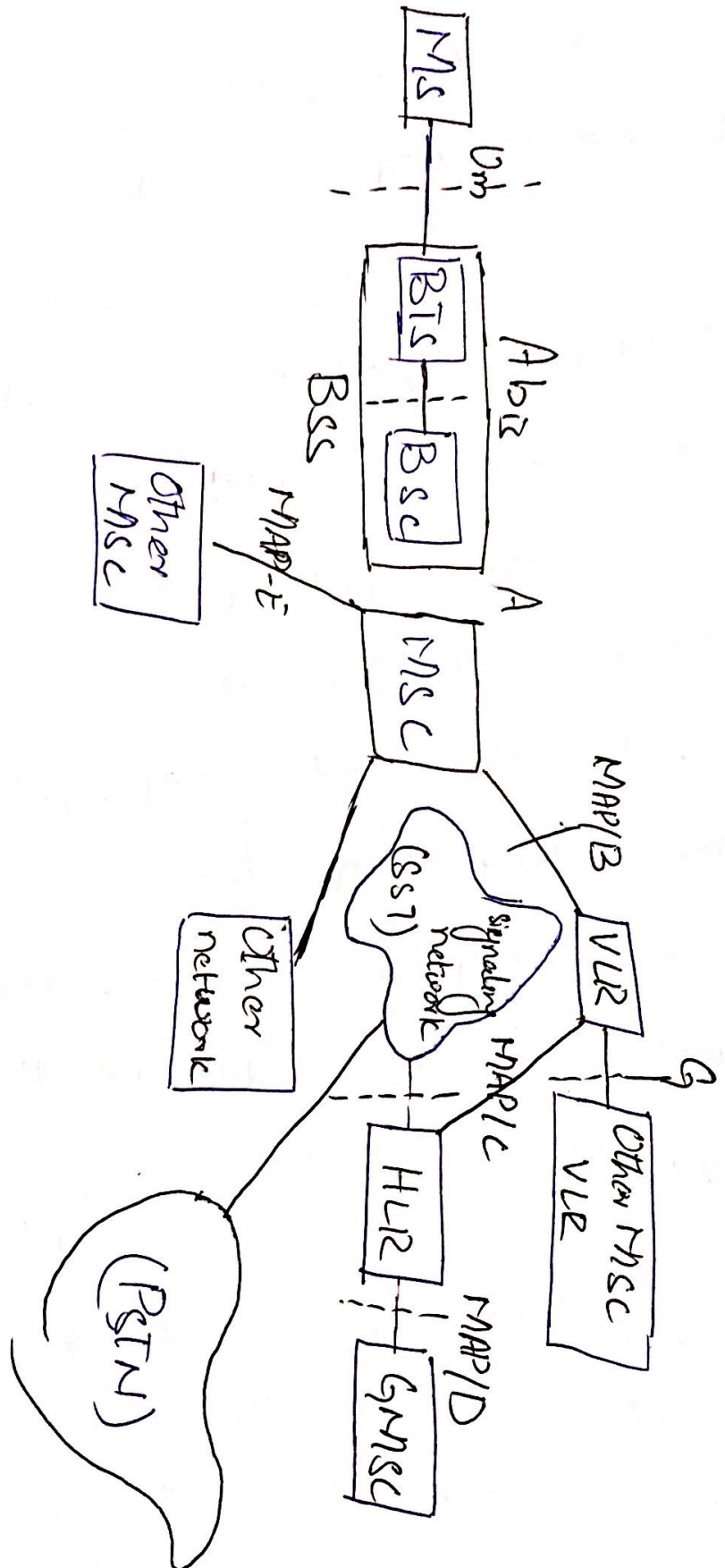
The Gateway Mobile Switching Center (GMSC) is a special kind of MSC that is used to route calls outside the mobile network.

4) SGSN:- The Serving GPRS support Node (SGSN) is a main component of the GPRS network which handles cell packet switched data within the network.

5) GGSN:- A Gateway GPRS support Node is a part of the core network that connects GSM based 3G network for the internet.

(Q4) What is public Mobile Network (PLMN)? Draw and describe the network elements in PLMN.

PLMN :- A Public Land Mobile network (PLMN) is any wireless communication system intended for use by terrestrial subscribers in vehicles or on foot. Such systems a ~~public~~ can be stand alone but often it is connected with a fixed system such as Public Switched Telephone Network (PSTN).
The most familiar example of PLMN end user is a person with a cell phone.



* BTS Bsc and MSC;

The Base Station Controller (Bsc) is in control of and supervises for the allocation of Base Transceiver Station (BTS). The Bsc is responsible for the allocation of radio resources to a mobile call and for the handover that are made between base stations. Under the control other handovers are under control of the MSC.

* HLR AND VLR

- HLR is basically home location Register is a database use for permanent storage of customer information.

* VLR is basically visitor location Register is similar to HLR but it store details of subscriber.

(Q5)

Explain Enterprise WAN Architecture with help of diagram.

(Ans)

⇒ Enterprise WANs Architecture

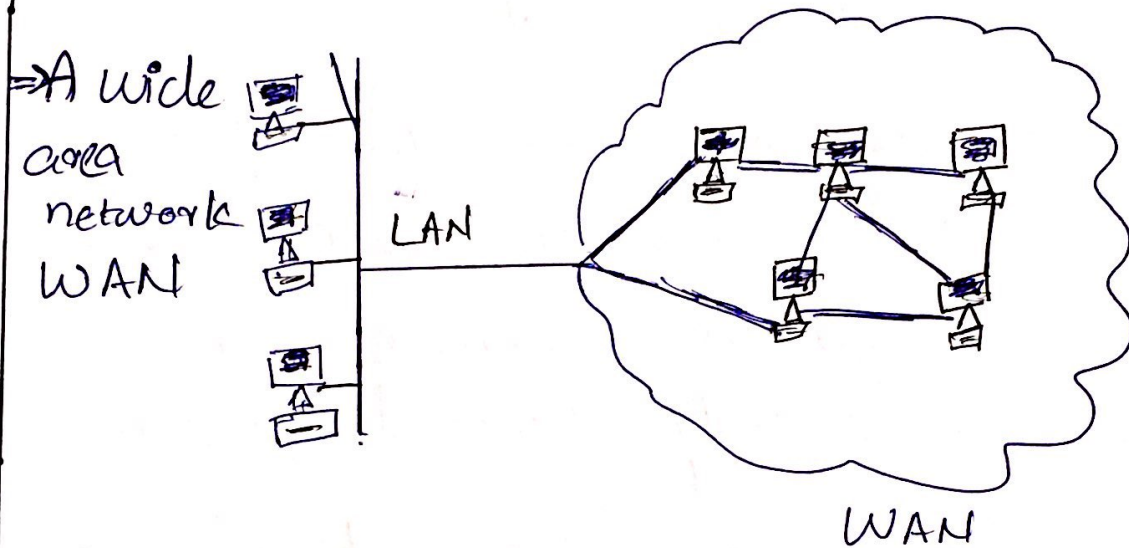
allow users to share access to application services and other centrally located resources.

⇒ This eliminates the need to install the same application server, firewall or other resources in multiple locations for example.

⇒ WANs are restricted to the same geographical location as a LAN would be.

⇒ A LAN can be set up in any number of geographical areas and is not constrained to one specific location.

Diagram



is a telecommunication network that extends over a large geographical area for the primary purpose of computer networking. wide area are often established with leased telecommunication circuits.