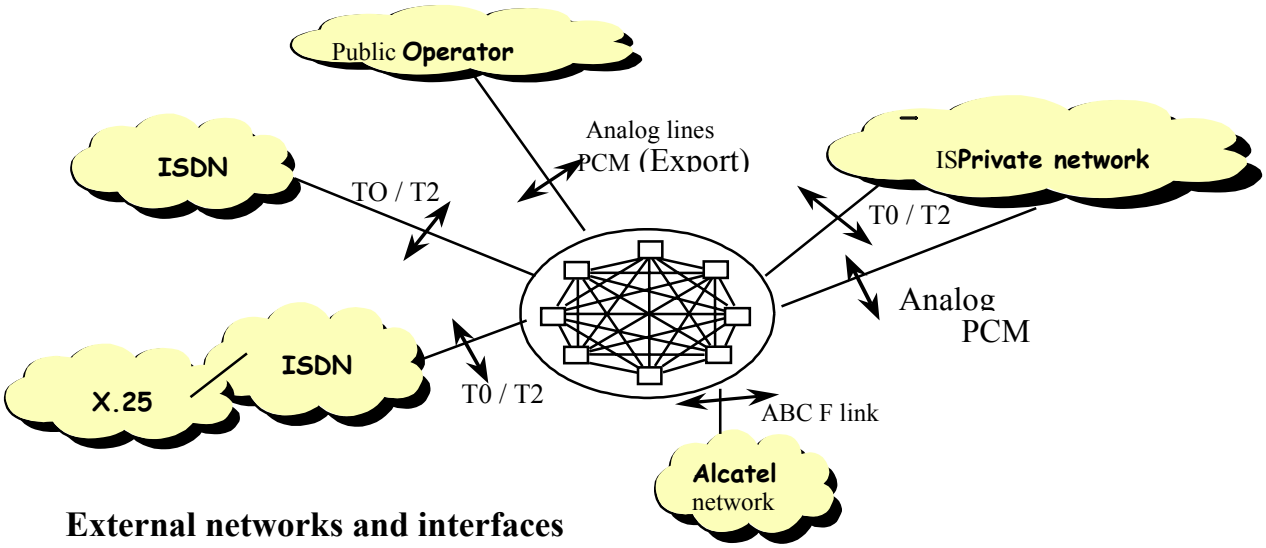
Experiment # 7
Intersystem Links - A visit to KFUPM Voice Network

Objectives:

After this experiment, the students should be able identify different types of voice and data network links.

Type of private voice networks:

1. Homogenous (ABC-F2 or E1 protocol)
2. Alcatel Heterogeneous (ABC_F1 protocol)
3. Heterogeneous (QSIG protocol)



External networks and interfaces

The IP facilities use the following transmission media: - Ethernet network - X25 network - V24 serial links - Inter ACT link.

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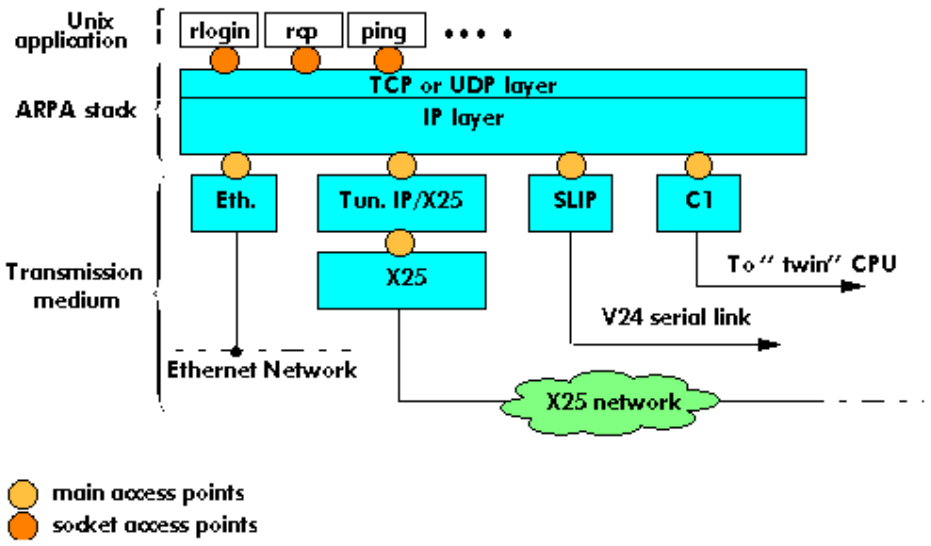
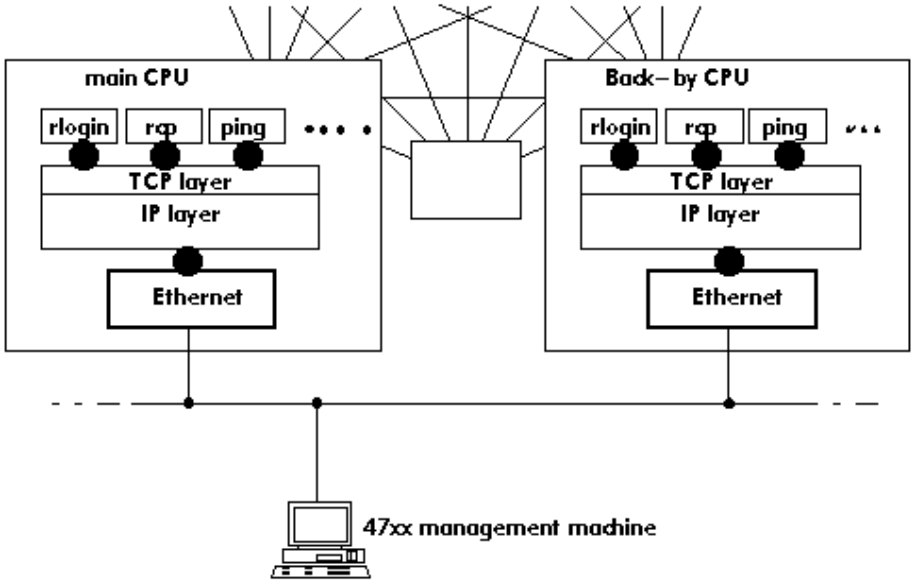


1. ETHERNET INTERFACE

The Ethernet interface enables the PABX to be connected to an Ethernet network.



2. IP/X25 TUNNEL INTERFACE

The tunnel enables the internal X25 network between the PABXs to act as a communications medium. The function of the IP/X25 tunnel is to transform the datagrams which leave the IP layer into X25 packets. The IP/X25 tunnel also

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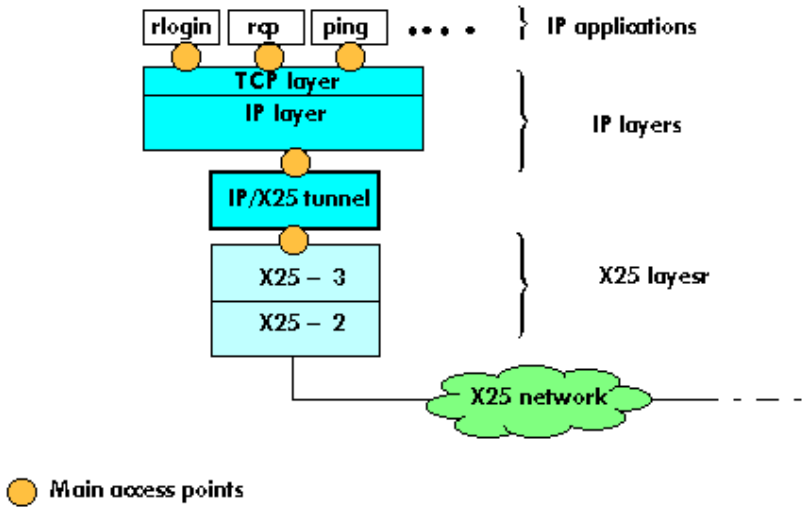
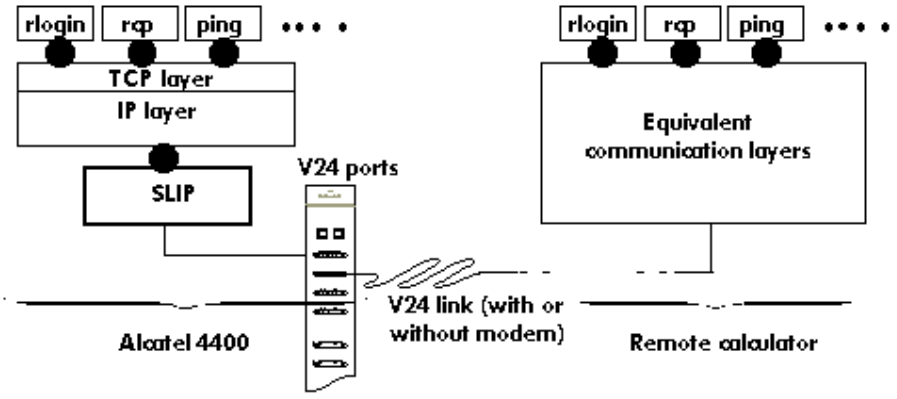
controls the transforming of the off-line IP protocol into on-line X25 protocol. For this, it establishes and releases the X25 connections.

The IP/X25 tunnel only works on ABC links.



3. SERIAL LINK

The management equipment or other equipment of the PABX may be connected by a V24 type serial link. For this mode of communication, two protocols are suggested: the SLIP protocol and the PPP protocol



4 C1 Link

The C1 link allows the master and slave CPU to communicate with each other via the ACT.

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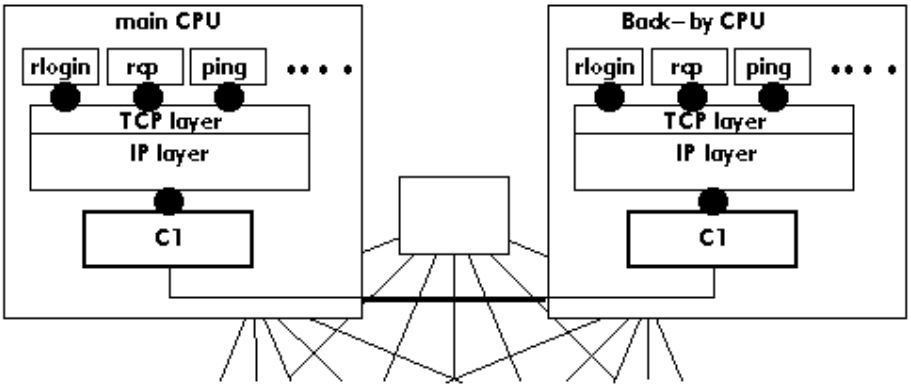
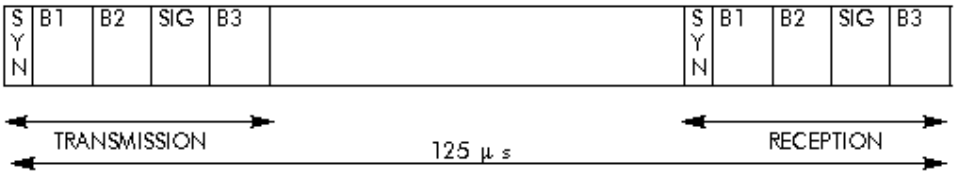


UA link The terminal adapters (TA) and dedicated sets are connected to the system via this UA link, which carries 4 x 64Kbit/s channels (3 B channels and one signaling channel). It is used to multiplex voice and data on the same physical link. The UA link presents a 125 micro second frame with the following format:



For example, in the case of a V24 terminal connected behind a UA set, the multiplexing is carried out as follows: - the SIG channel carries the UA signaling exchanged between the set and system, - one B channel caries voice, - one B channel carries the V24 terminal data.

ISDN interfaces ACT boards

The ISDN boards that can be connected on the ACT backplane are of the following types: - --

BRA board offering 8 E0 bus interfaces

PRA board offering 1 E1 interface.

BPRA board offering 1 E1 interface and 3 E0 bus interfaces

Terminal connection This takes place using interfaces behind the UA set or TA adapters: - asynchronous V24 interface, - synchronous V24/V35/V36 interface, - X21 interface, - S0 interface.

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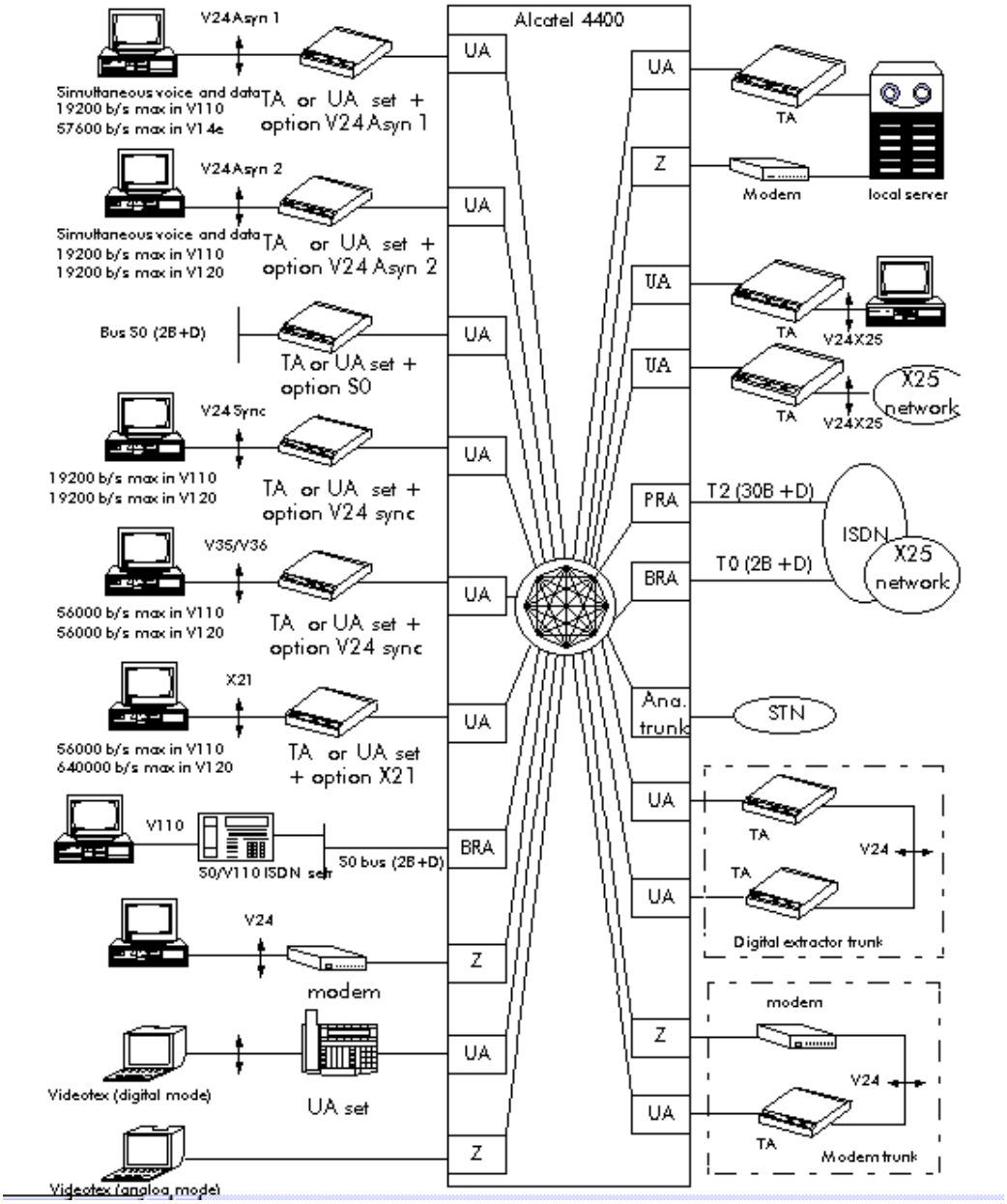

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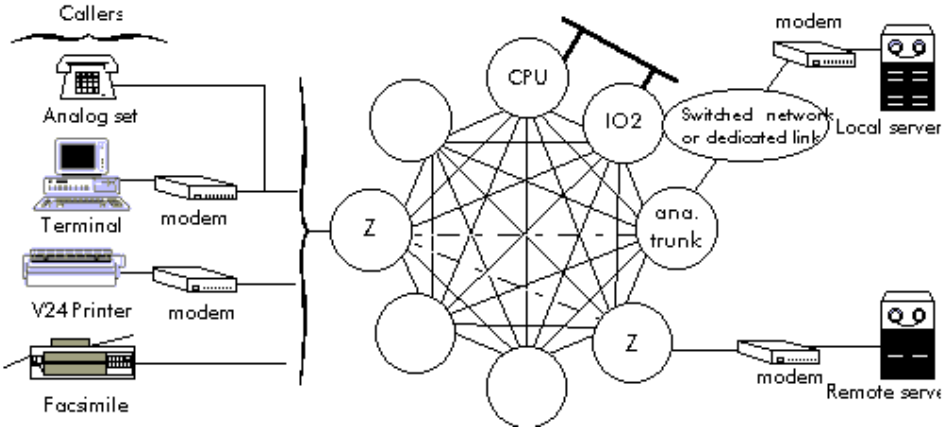
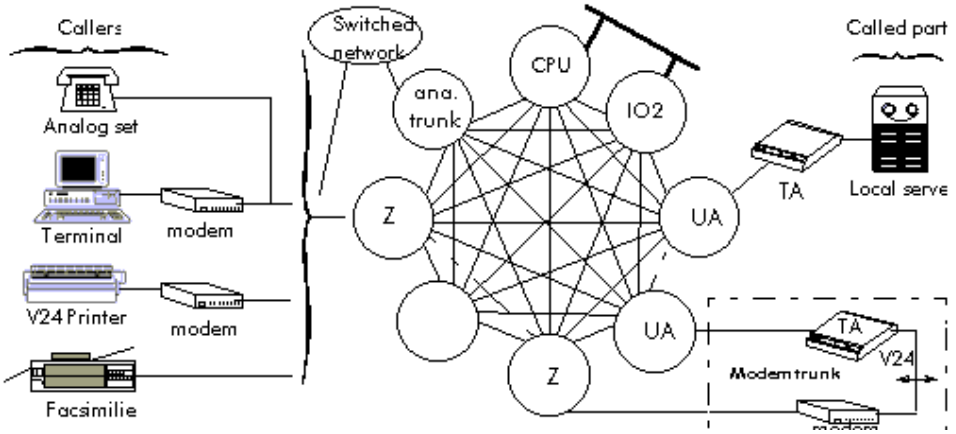
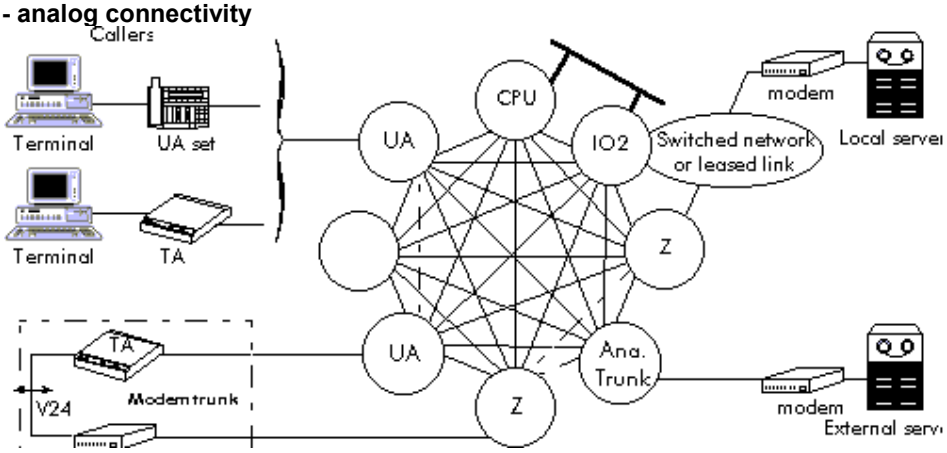
Analog - analog connectivity



Analog - digital connectivity



Digital - analog connectivity



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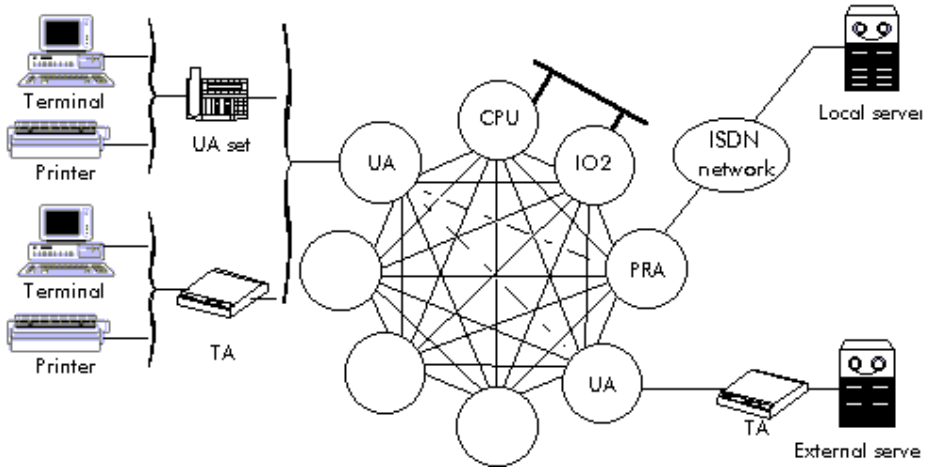
Digital - digital connectivity



Configuration of Inter-system links (E1/T2):

- PCM link is E1 link (uses PCM boards)
- ABC link is special link for inter-node connection (uses PRA boards)
- T2 is ISDN link used for public network connection (uses PRA board)

Time slot 0 is used for alarms, Time slot 16 is used for signaling.

ABC Link management (Inter node links):

- PRA coupler management
- Link configuration
- Channel assignments
- IP/X25 Tunnel management

ABC Trunk Group management (Links b/w heterogeneous systems):

- Trunk group creation
- **Coupler management**

QSIG Protocol:

QSIG is a modern, powerful and intelligent inter-PINX (Private Integrated services Network Exchange) signaling system designed specifically to meet the requirements for sophisticated communications services. It provides:

- a platform for future development supported by international standards organizations;

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- a harmonized method for interconnecting multi-vendor equipment;
- a mechanism for manufacturers to provide innovative features within a heterogeneous environment;
- a flexible and cost efficient method of linking PINX equipment;

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