TSN: Lecture 28
SS7 Signalling II

Topics Covered
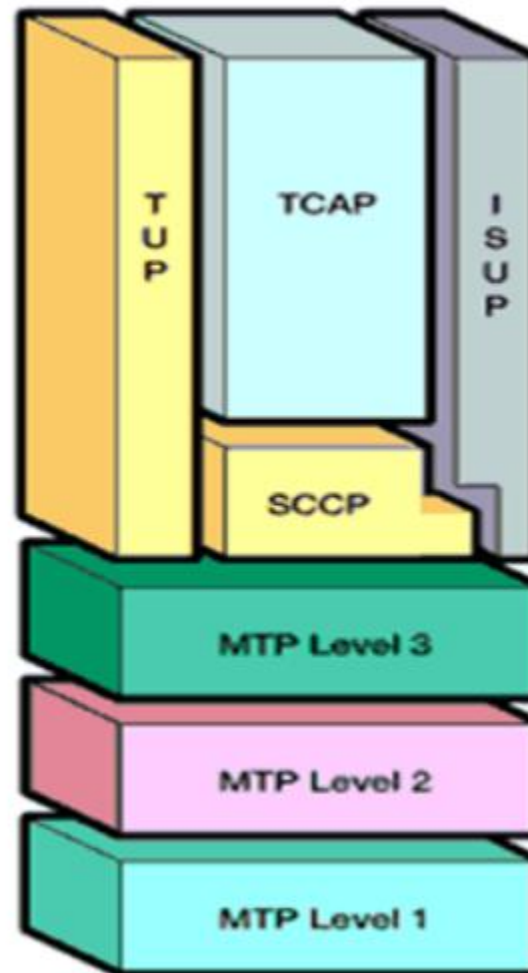
- SS7 Protocol Stack
- SS7 Layers Distribution
- MTP Level
- Signal Transfer Point

SS7 Protocol Stack

SS7 Layers Distribution

- **Network Services Part**
  - MTP Level 1
  - MTP Level 2
  - MTP Level 3
  - SCCP
- **User Part**
  - TCAP
  - TUP
  - ISUP

MTP Level 1 (Physical)

- Represents the physical layer
- Responsible for connection of SS7 signalling points into the transmission network (communication)
- Message to electrical signal for digital transmission
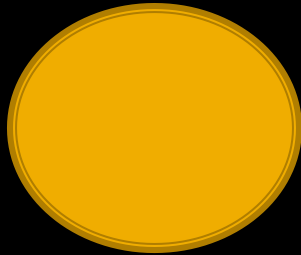
MTP Level 2 (Data Link)

- Monitors the links and reports their status
- Uses packets called signal units for transmission
- Error detection, sequence checking, flow control, message retransmission, signal unit error correction
- Provides reliable transfer of signalling messages between two signalling points
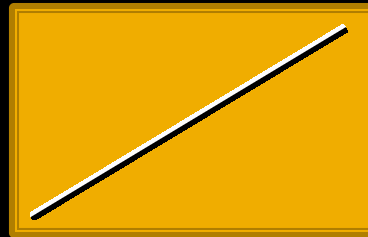
MTP Level 3 (Network)

- Message routing between signaling points in the SS7 network
- Signaling network management that provides traffic, links and routing management, as well as congestion (flow) control
- Re-routes traffic away from failed links and signaling points, controls traffic when congestion occurs
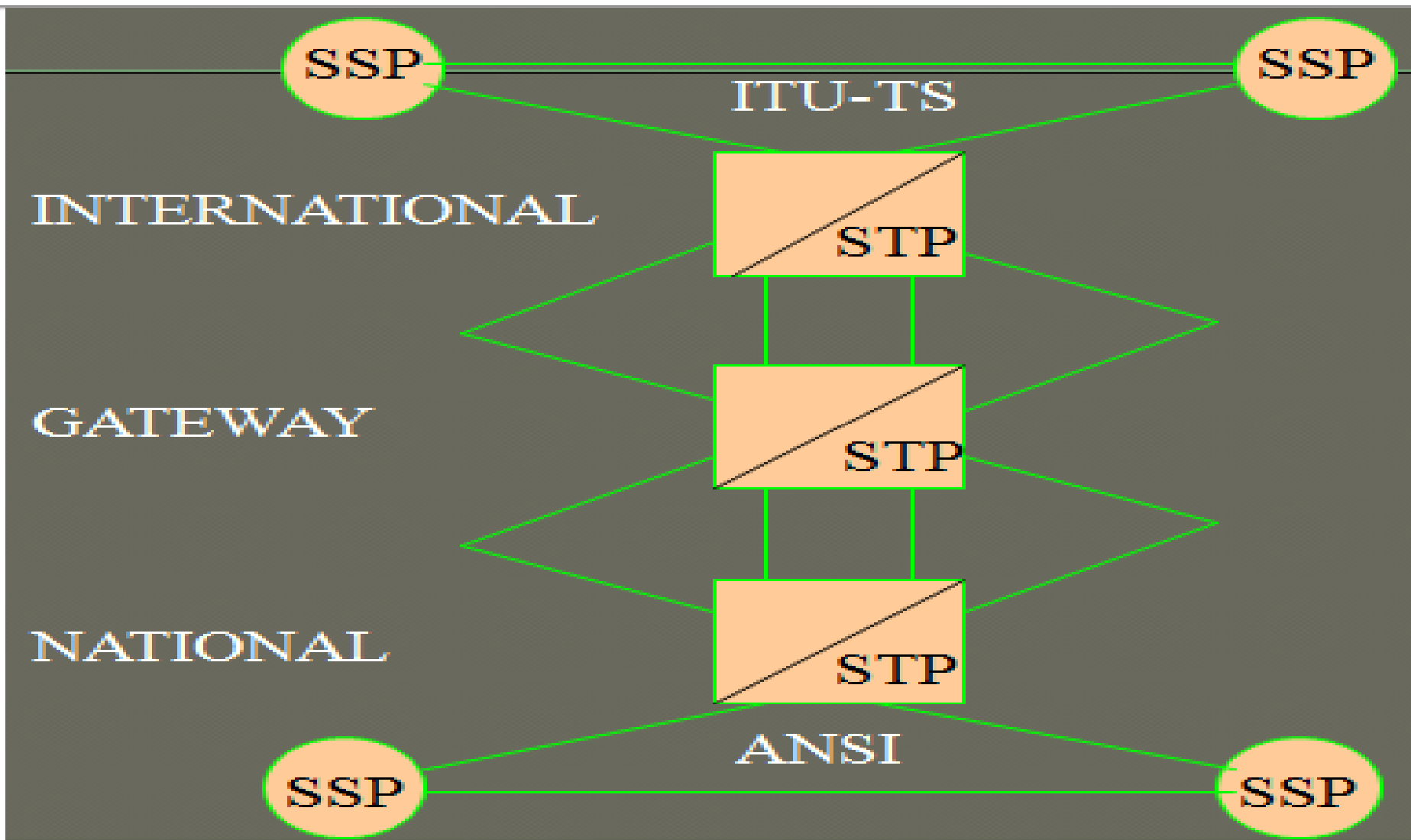
Components of SS7 Network

SSP

STP

SCP

Signal Transfer Point (STP)

- 'Knots' that hold the network together
- Provide network access to other nodes
- Transfer messages around the network
- Maintain routing tables for directing message
- Paired to ensure reliability and hence robustness

STP Levels

Service Switching Point (SSP)

- Digital switches that have SS7 software and terminating signaling links
- Handles call setup
- Make queries of unknown databases
- Create packets (signal units) and send those messages to other SSPs
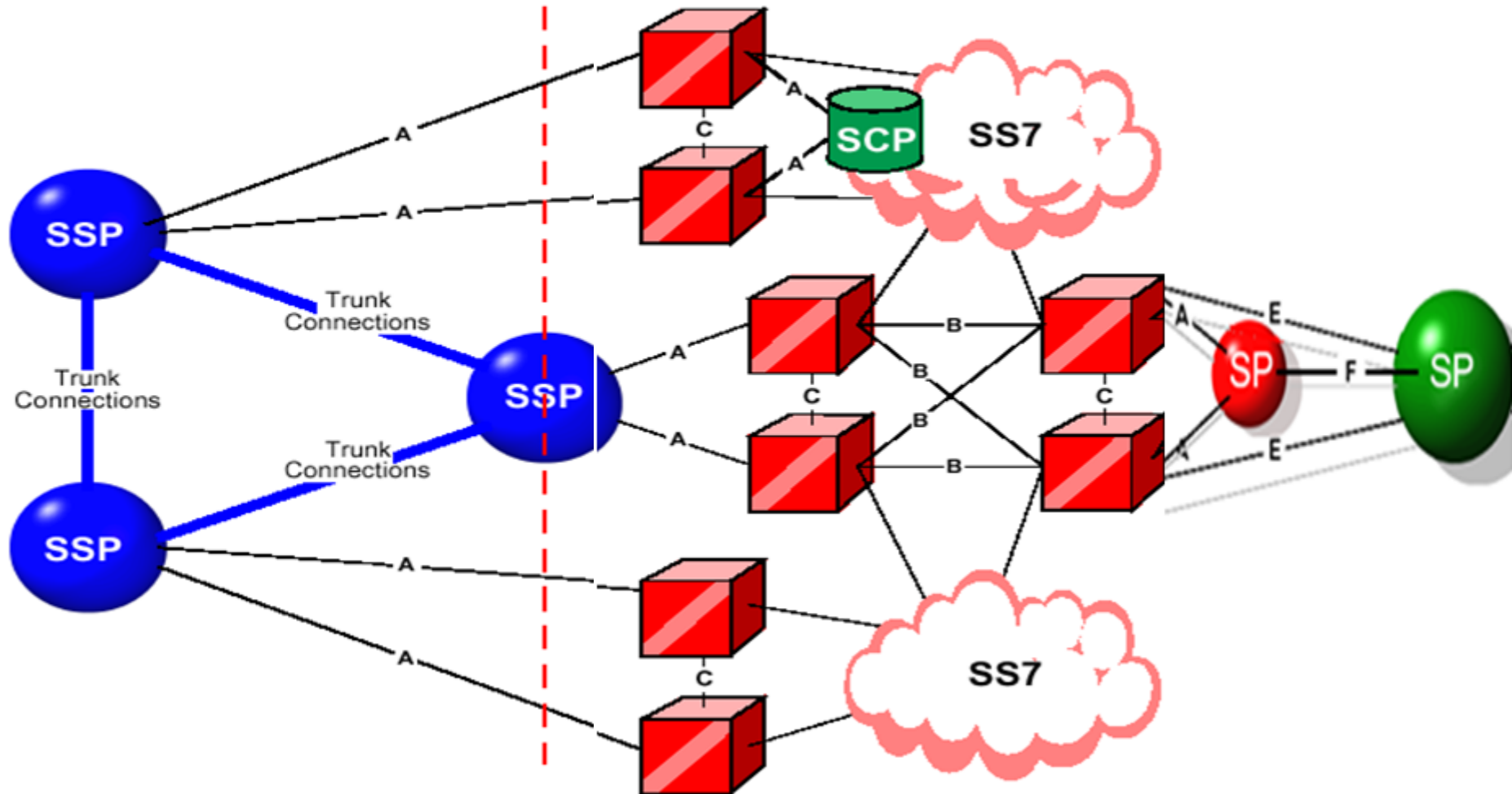- Originate, terminate, or switch calls

Service Control Point (SCP)

- A computer used as a front end to a database system
- Address of an SCP: *point code*
- Address of the database it interfaces with: *subsystem number*
- Accepts a query for information from a subsystem
- Used by STP to perform a function called global title translation
- Databases Accessible via SCP:
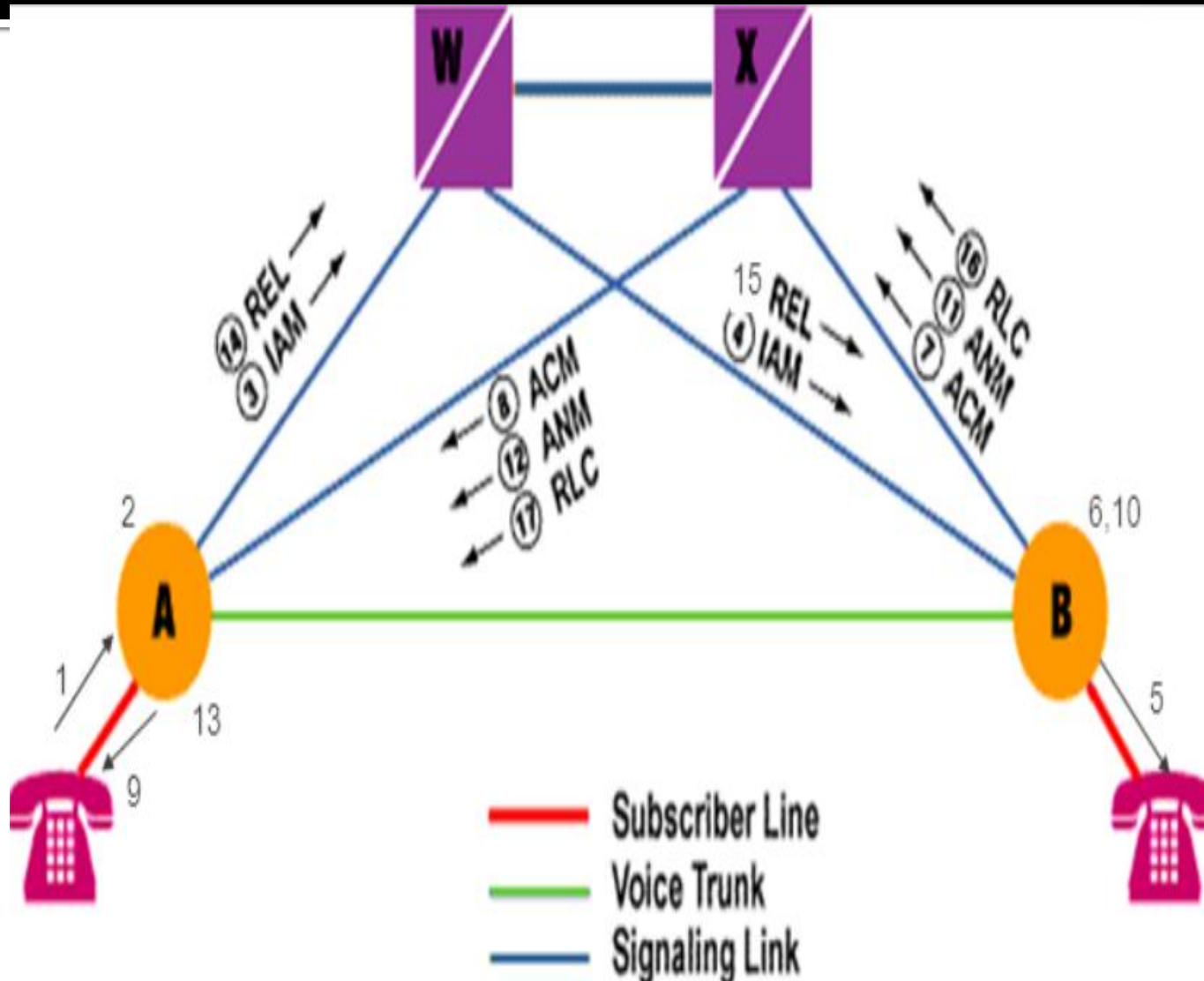 - HLR
  - VLR
  - LNP
  - OSS

Interconnection Among SS7 Components: Links

Basic Call Setup Example

- Initial address message (IAM)
- Address complete message (ACM)
- Answer message (ANM)
- Release (REL)
- Release complete (RLC)

Applications

- Prepaid calling
- Short Message Service (SMS)
- Local Number Portability (LNP)
- Global roaming
- Caller ID
- 1800/ Free phone services
- Location-based services