Problem Statement for Sigtran Network Management
draft-cui-tsvwg-snm-ps-00.txt
&
SCTP Association Changeover Guideline
draft-cui-tsvwg-assoc-changeover-00.txt
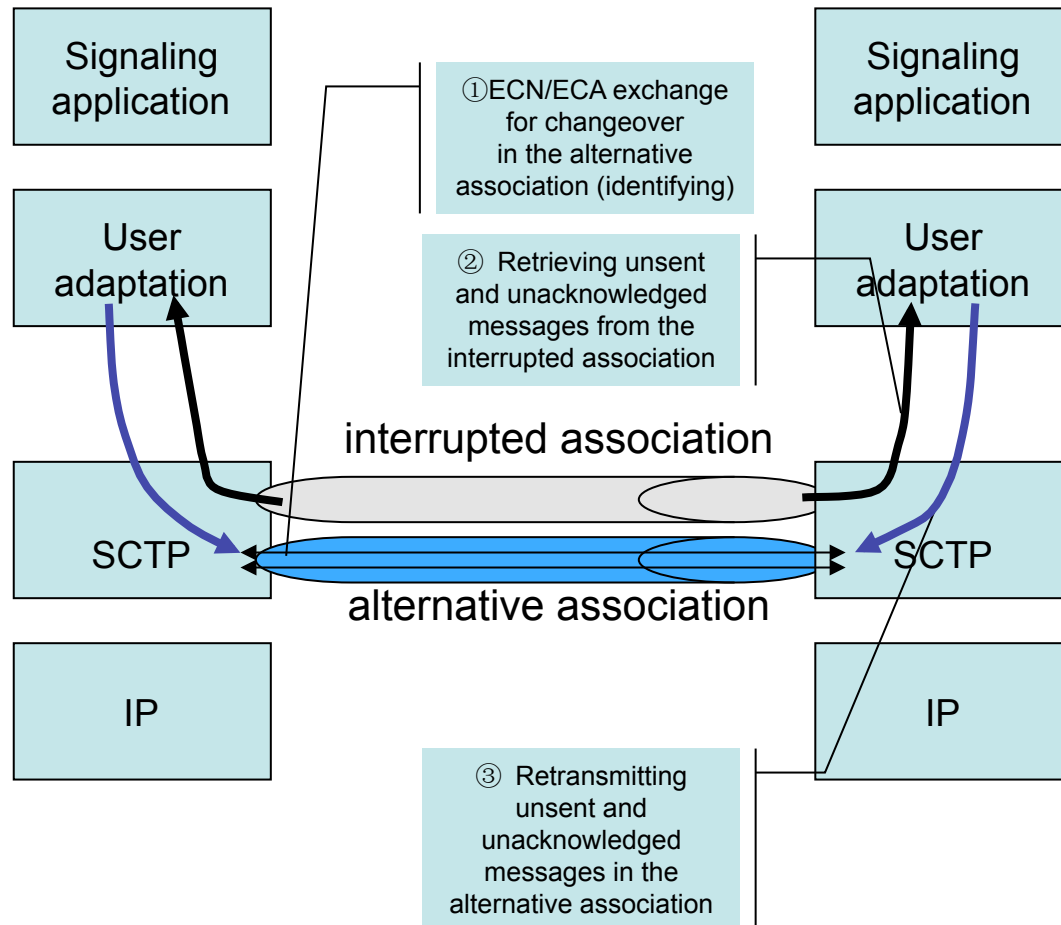
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SCTP Association Changeover Motivation

- In Sigtran message is identified by Sequence Number of TSN in SCTP while in SS7 message is identified by Sequence Number of FSN & BSN in MTP2

  -- <u>Identifying</u> the unacknowledged messages by sequence number

- In Sigtran endpoint is identified by IP address (managed by SCTP) while in SS7 Signaling Point is identified by Signaling Point Code (managed by MTP3)

  -- <u>Selecting</u> the alternative signaling connection between the same node pair

- In Sigtran ETN/ETA exchange in SCTP layer is introduced to achieve the identifying function and provide assistance on retrieval function while in SS7 COO/COA exchange in MTP3 layer is used to identify the unacknowledged messages and indicate the changeover procedure

  -- <u>Exchanging</u> the sequence number information with peer node

- In Sigtran messages are buffered in SCTP association while in SS7 messages are buffered in signaling link (SCTP association is similar to MTP link)

  -- <u>Retrieving</u> the buffered & unacknowledged messages from the out queue

- Retrieving messages from SCTP association has been adopted in current SCTP specification (i.e., Receive Unsent Message & Receive Unacknowledged Message)

  -- <u>MTP-similar changeover</u> is easy to be implemented and can obviously improve the performance of Sigtran network !

SCTP Association Changeover Approach

- Signaling application
- User adaptation
- SCTP
- IP

①ECN/ECA exchange for changeover in the alternative association (identifying)

② Retrieving unsent and unacknowledged messages from the interrupted association

interrupted association

alternative association

③ Retransmitting unsent and unacknowledged messages in the alternative association

- When an association is interrupted, many many messages are unacknowledged because of the huge Time-Bandwidth Product
- SCTP endpoint can know the peer endpoint and alternative association(s) by IP address (as MTP3 does by SPC)
- ETN (Exchange TSN Notify) and ETA (Exchange TSN Acknowledgement) can help the both endpoints to identify the unacknowledged message in the Out Queue
- ULP can retrieve the unsent and unacknowledged messages and retransmit them in the alternative association

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Questions or Comments?

Thank You For Your Attention!

Background

- Sigtran (Signaling Transport) model, User Adaptation + SCTP + IP, has been widely applied in telecommunication network

- Some signaling applications (H.248, S1-AP, etc.) may run over SCTP layer directly without adaptation layer

- Some routing management functionalities are missed during the re-organizing of signaling transport

  -- Does routing management of Signaling Transport fall into the scope of TSVWG WG or Transport Area?

- Changeover function is also missed in Sigtran specifications because (maybe) that is very difficult for User Adaptation, however, that does badly impact network performance which is very important for tele networks

  -- Is SCTP-based changeover mechanism helpful?

Changeover mechanism in SS7
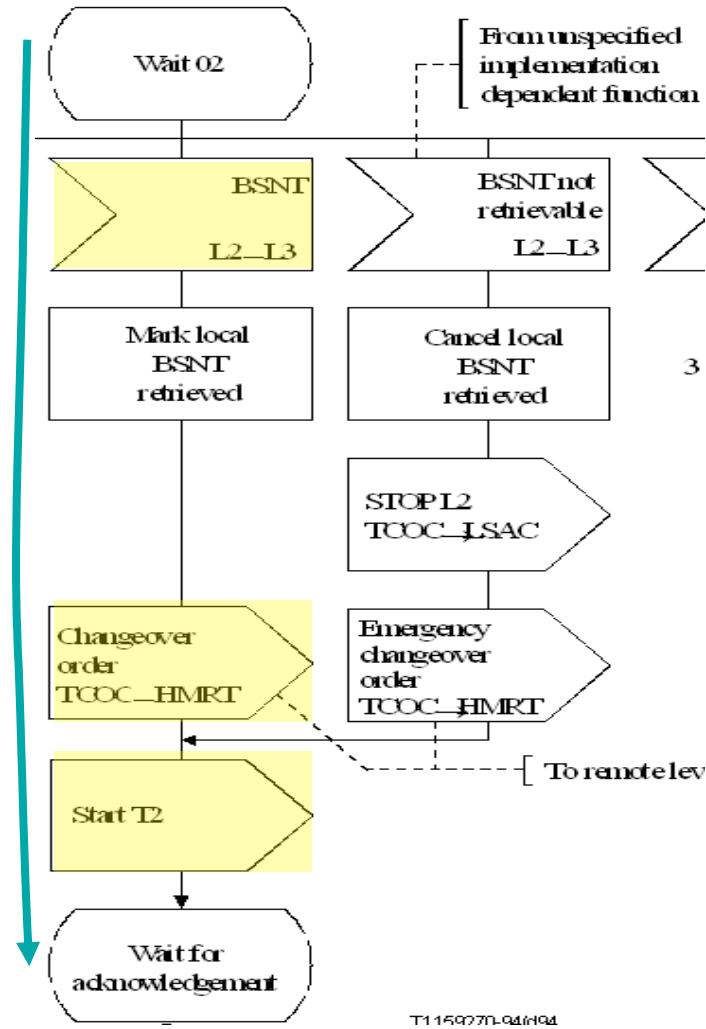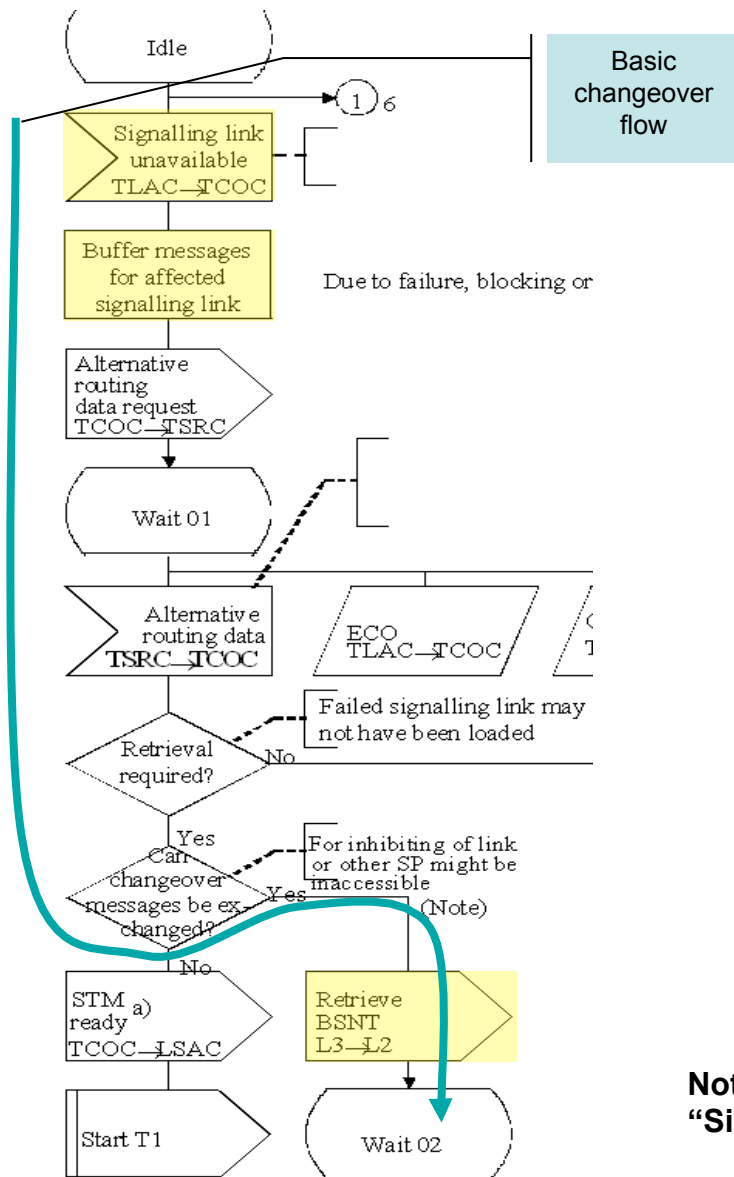
Note: Figures are extracted from Figure 30 of ITU-T Q.704
"Signalling traffic management; changeover control (TCOC)"

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Changeover mechanism in SS7 (cont.)
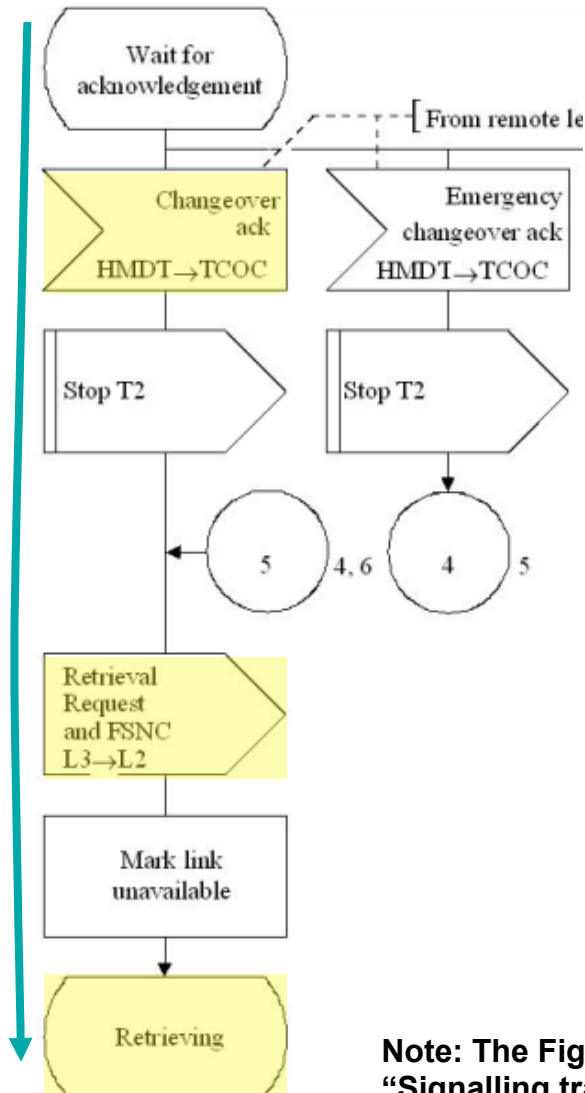
Summary:

- The objective of the changeover procedure: signalling delivery as quickly as possible while avoiding message loss, duplication or mis-sequencing.

- Identifying all unacknowledged messages in the retransmission buffer of the unavailable signalling link

- Transferring the concerned messages to the transmission buffer(s) of the alternative link(s)

Note: The Figure is extracted from Figure 30 of ITU-T Q.704 "Signalling traffic management; changeover control (TCOC)"

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Backup

Discussion in Sigtran List

- The requirement of changeover (to improve the network performance) is confirmed by active participants

- There will be a great amount of unacknowledged messages in the interrupted association (In general all messages will have been sent unless limited by the TX window)

- Comparison with other approach is discussed