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CCITT SG XV
Working Party XV/1
Experts Group for ATM Video Coding

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TITLE : Introduction to AAL type 1

PURPOSE : Information only

CCITT SG XVIII made a lot of progress in B-ISDN studies towards 1992 Recommendations at its Melbourne meeting during 2 - 13 December, and sent a number of Liaison documents to groups involved for IVS (Integrated Video Services) studies.

Among those documents, full text of AAL type 1 (I.363 section 2) has been sent to SG XV Experts Group for ATM Video Coding and CMTT. This is because SG XVIII thought AAL type 1 for two layer services, i.e. asynchronous and synchronous circuit transport, is becoming stable. And review and assessment of protocols for those layer services are useful and necessary to progress in development of AAL type 1 for video signal transport, which is scheduled to be complete at 1994 Recommendation by joint and cooperative work between SG XVIII and coding groups.

This document presents figures and explanations of AAL type 1 for supplementing Recommendation I.363 section 2. Purpose of this document is to give tutorial and getting-started information of AAL type 1, as well as background and overview of some specific functions and protocols such as source clock frequency recovery and structured data transfer. It does not describe detailed protocols, since articles are drafted from AAL user's viewpoint. Note that figures included in this document are neither equal to those of Recommendations nor intended to be in Recommendation.

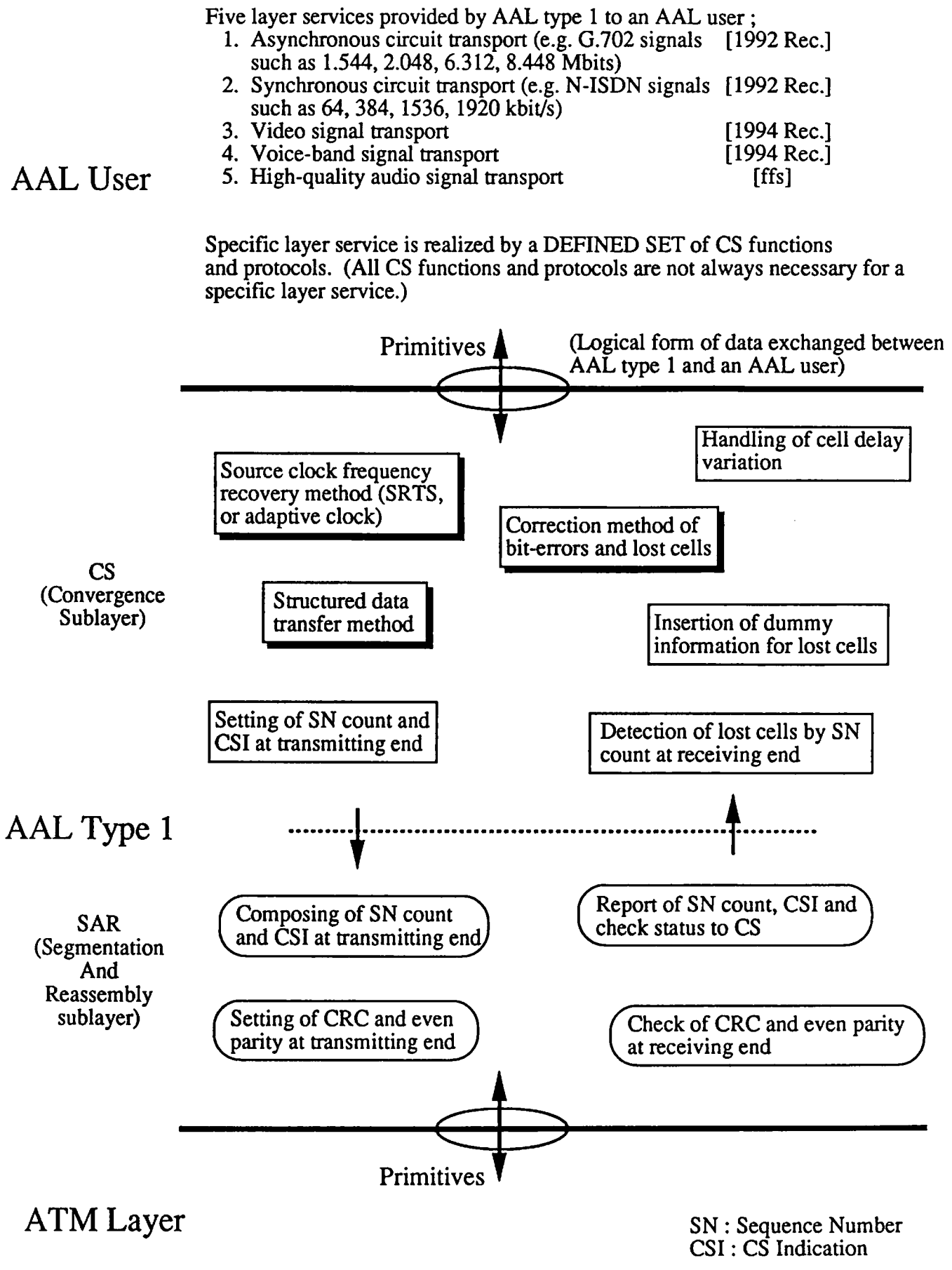
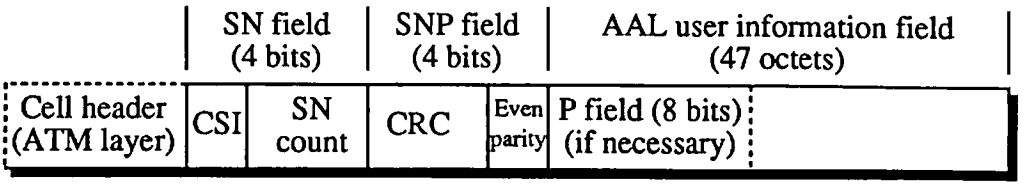


Fig. 1 Overall Structure of AAL Type 1



CSI (CS Indication) : 1 bit

- Conveyance of SRTS information, when SRTS is used,
- Indicating existence of P field, when structured data transfer method is used,
- Indicating the first cell of the octet-interleaved matrix, when error correction method of Reed-Solomon code combined with octet interleaver is used,
- CSI value is provided by CS to SAR at transmitting end, and reported by SAR to CS at receiving end.

Note) When both SRTS and structured data transfer method are to be used ; CSI bits of SN count 0, 2, 4, 6 are used for indicating existence of P field, and CSI bits of SN count 1, 3, 5, 7 are used for conveyance of SRTS information.

SN count (Sequence Number count) : 3 bits

- Counter numbered modulo 8,
- Counter value is provided by CS to SAR at transmitting end, and reported by SAR to CS at receiving end.

CRC (3 bits) and even parity (1 bit)

- Polynomial to be used is x3+x+1,
- Two modes of operation ; Correction mode capable of single-bit error correction, and Detection mode capable of multiple-bit error detection.

P field (Pointer field) : 8 bits

- This field is placed, when structured data transfer method is used,
- Indicating the first octet of the structured data within AAL user information field,
- The pointer should be used as often as necessary to ensure robustness of protocol.

Fig. 2 Format and Coding of AAL Type 1

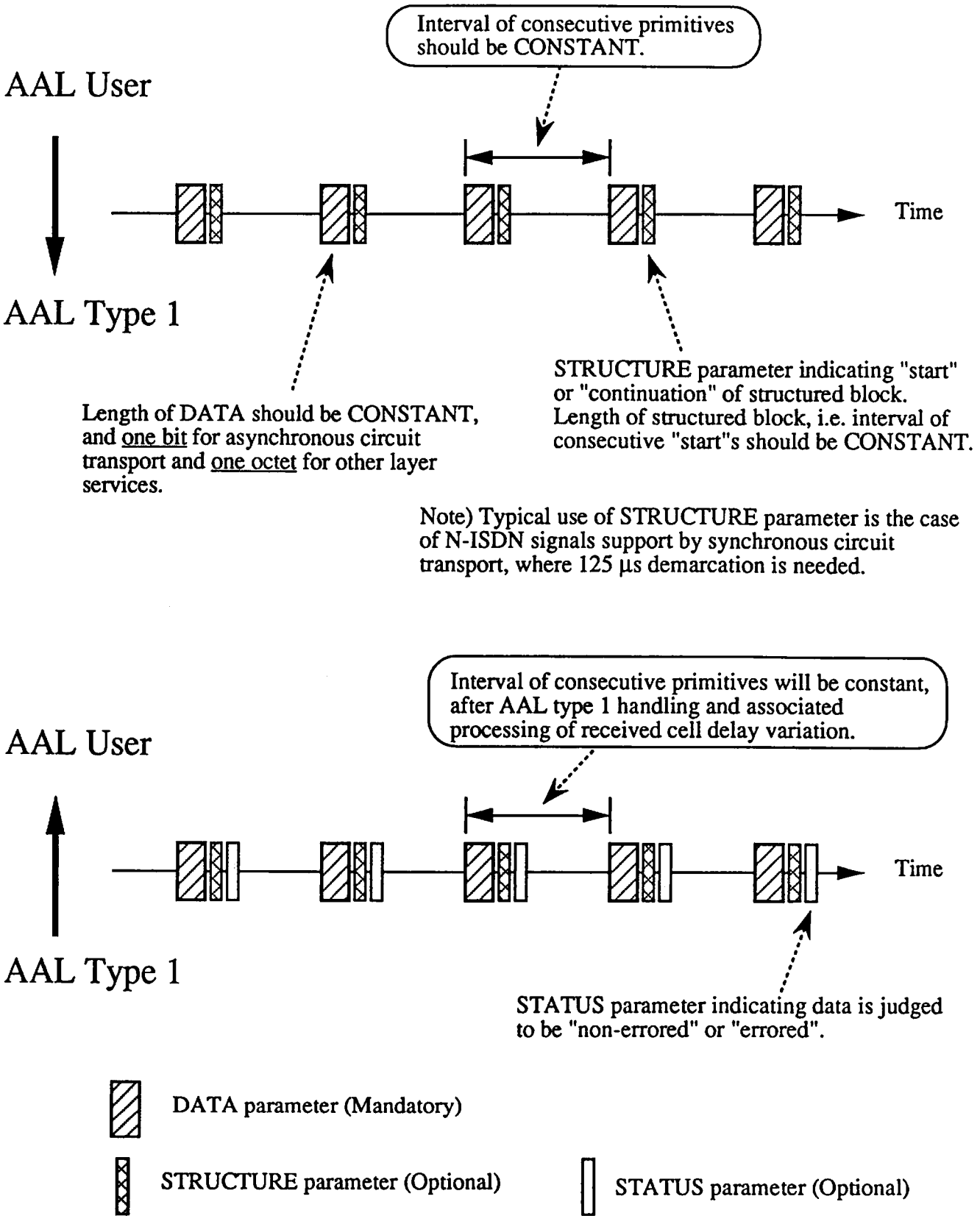
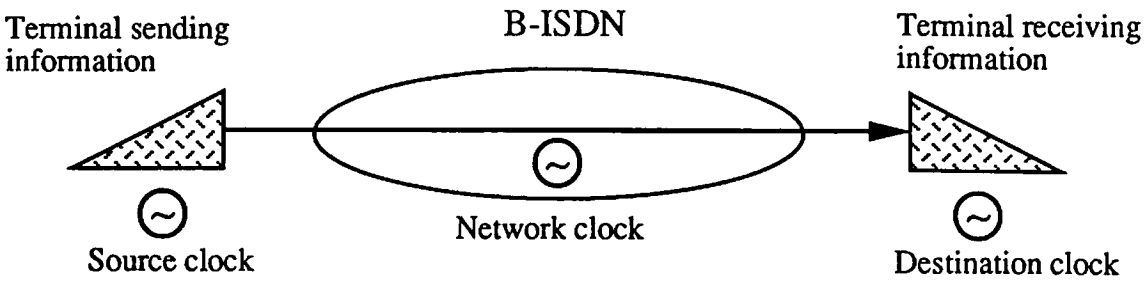


Fig. 3 Primitives between AAL Type 1 and an AAL User



Source clock frequency recovery is required when ;

- Source clock is not locked to the network clock, and
- Destination clock should be locked to source clock.

Examples of need for source clock frequency recovery are ;

- G.702 signals transport by asynchronous circuit transport, when source and destination clock are not locked to the network clock,
- Camera clock delivery from source to destination terminal, when sufficient jitter performance is required.

Note 1) Source clock frequency recovery is not always required for a given layer service. It will also depend on detailed layer service requirement such as jitter performance.

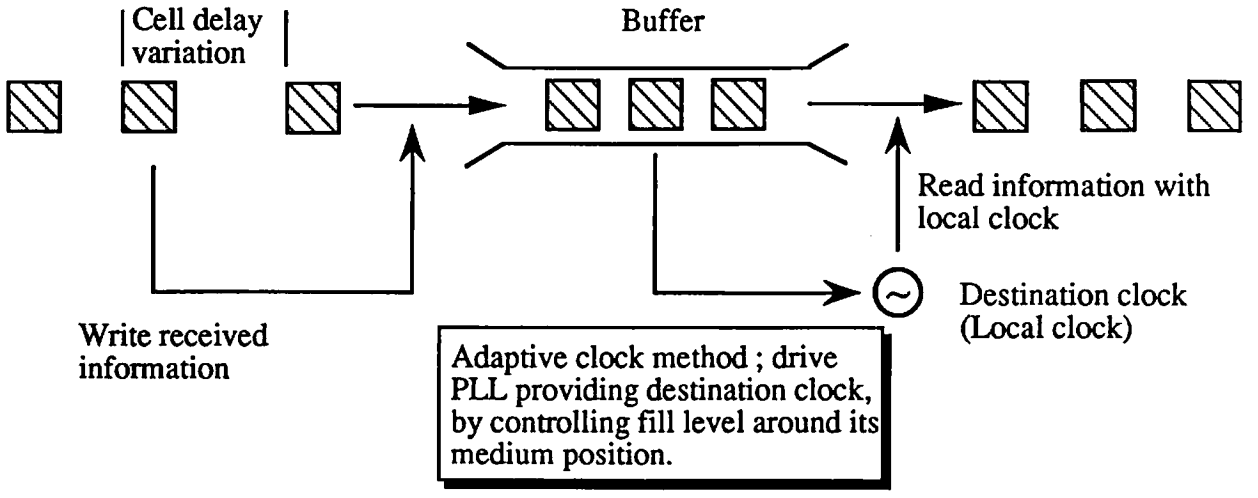
Three methods are recommended ;

- Use of adaptive clock supported by AAL type 1 (See Fig. 5),
- Use of SRTS supported by AAL type 1 (See Fig. 6),
- Use of synchronization pattern within AAL user information flow (AAL type 1 is not involved for source clock frequency recovery).

Note 2) SRTS will provide for better jitter performance but require complicated protocol compared to adaptive clock method.

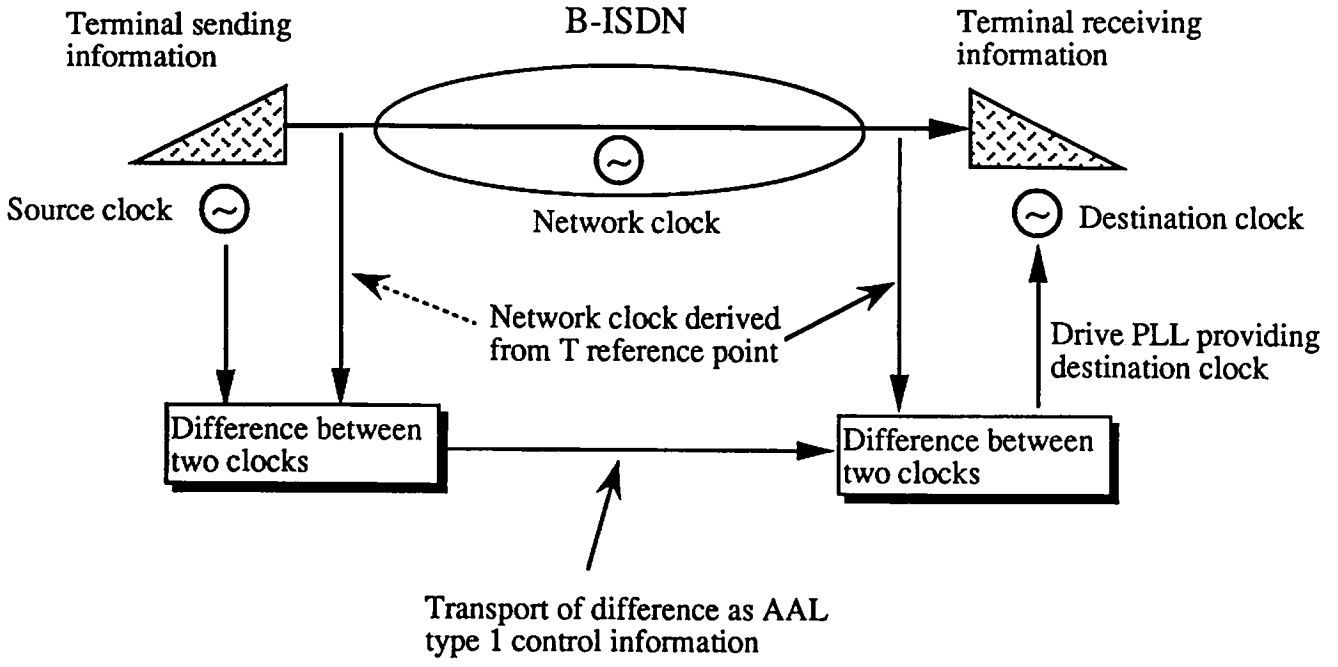
Note 3) For service aspects of timing and synchronization issues including source clock frequency recovery, see Recommendation I.211 section 2.5.

Fig. 4 Source Clock Frequency Recovery



Note) When source clock frequency is not required, e.g. N-ISDN signals transport, local clock will be locked to the network clock.

Fig. 5 Handling of Cell Delay Variation and Adaptive Clock



Note) Typical example of the use of SRTS is G.702 signals transport to meet jitter performance specified in Recommendations G.823 and G.824.

Fig. 6 SRTS (Synchronous Residual Time Stamp)