T1X1

Digital Hierarchy and Synchronization

A Technical Subcommittee of
Standards Committee T1
Telecommunications

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Ken Biholar
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Mark Jones
Vice Chairman

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TITLE: **Liaison from T1X1 to IETF ccamp regarding draft-ietf-ccamp-lmp-test-sonet-sdh-02.txt**

TO: **IETF ccamp Working Group**

CC: **ITU-T Q.14/15 (for information)**

SOURCE*: **T1X1**

FOR: **Action**

DEADLINE: **9 June 2003**

PROJECT: **T1X1-01: Optical Interface Standard for Fiber Optic Interconnection**

This liaison statement responds to email from Bert Wijnen (IETF sub-IP Area Director) regarding the proposed application and format of information to be carried in SONET/SDH overhead bytes such as J0/J1/J2 bytes and Line/Section DCC by draft-ietf-ccamp-lmp-test-sonet-sdh-02.txt. Within this liaison, we provide some input related to:

- Context of application space
- Usage of Jx bytes
- Required updates to SDH equipment specifications
- Terminology differences
- Further Study items

Context of Application Space

The subject draft is an implementation of the procedure for "Verifying Link Connectivity" (clause 5 of draft-ietf-ccamp-lmp-08.txt) for SONET and SDH, which states:

"In this section, an optional procedure is described that may be used to verify the physical connectivity of the data links and dynamically learn (i.e., discover) the TE link and Interface_Id associations. The procedure SHOULD be done when establishing a TE link, and subsequently, on a periodic basis for all unallocated (free) data links of the TE link."

It is currently our understanding that the use case scenario for which this procedure is applied encompasses both transport plane

connectivity verification as well as correlation of these entities with the control plane. ITU-T G.7714.1 is focused on discovering the transport plane link connection end point relationships and verifying their connectivity. This Recommendation defines two procedures for performing the connectivity verification function, one of which utilizes either the Jx or the DCC bytes of the server signal (termed “in-service”). The other approach in G.7714.1, termed as “out of service”, corresponds to inserting a test signal in the payload of the server signal. Based on an analysis of the data link state definitions in draft-ietf-ccamp-lmp-08.txt, we understand that the approach defined in the LMP test for physical connectivity occurs in the context of the “out of service” state (as described in G.7714.1). Please confirm this.

Usage of Jx bytes

In defining the Jx bytes within G.7714.1, the following was taken into account:

1. One consideration involved the case where the Discovery Agent is located in an external system, and an external interface is used by the Network Element to provision and receive the Trail Trace message. As an existing text-oriented Man-Machine Language, such as TL1, may be reused to provide this interface, it was decided that the discovery message be limited to printable characters. Specifically, the TTI characters should be limited to printable characters as per T.50 with trailing NULLs or SPACEs. Use of arbitrary bit patterns in the lower 7 bits of each byte could prematurely terminate the pattern or trigger fault notification for certain hardware or software implementations. The strategy chosen in G.7714.1 avoids the danger by limiting the information content of each byte to 6 bits (84 bits total) and uses a base 64 coding according to RFC 2045 to place the information in the available bits.
2. Another consideration involved providing a means for distinguishing this use of the Jx bytes from the traditional use for Trail Trace identifiers in new equipments. As a result, G.7714.1 includes a distinguishing character (“+”) as the first non-CRC byte that will never appear as the first character of a TTI. This requires modification of the trail termination functions to prevent the raising of TTI mismatch alarms during the connectivity verification process.

While the context for testing the transport plane connectivity is different between the two documents, they both use the Jx bytes of the server signal, and we invite the IETF to determine the appropriateness of the above aspects in their test signal definitions. Even if these considerations are not relevant to this context, it will be necessary to augment G.783 equipment functions to recognize this new usage of Jx messages.

Required Updates to SDH Equipment Specifications

SDH equipment specifications as they currently exist reflect the usage of the Jx bytes prior to the development of G.7714.1. ITU-T Study Group 15 has as a work item to revise these equipment functions to include support for these new functions. Specifically, this will involve updates to trail termination functions to generate and receive the new messages and to avoid unnecessary alarms in the case where the new messages are received. In addition, non-intrusive monitoring functions will need to be revised so that unnecessary alarms are not raised when the messages are observed en-route.

Whether or not there is further alignment between the message formats used in G.7714.1 and the subject draft, the new functions to support the subject draft will also need to be reflected in the atomic functions in G.783. The sending and receiving of these messages can be reflected in the trail termination functions in a similar way to what we plan to do for support of G.7714.1 functions.

Terminology Differences

Within G.7714.1, in-service and out-of-service are defined consistent with the historical usage of these terms within transport network management, as described below:

(a) In-Service Discovery Process

In this process the server layer trail overhead is used to discover the peer TCPs (e.g. TCP3S to TCP3R in Figure 1 below). The server layer trail overhead is used to carry the discovery message. The CP-to-CP relationships are inferred from the TCP-to-TCP relationships using local knowledge of the configuration of the adaptation function and its relationship with the trail termination function.

(b) Out-of-Service Discovery Process

In this process a test signal is used to discover the peer TCPs (e.g. TCP1S to TCP1R in figure 1). The CP-to-CP relationship is inferred from the local knowledge of the matrix connection that was previously set up to connect the test signal to the desired CP (shown in Figure 1). In contrast to the in-service discovery process, this approach can only be used if the link connection is not carrying any client traffic.

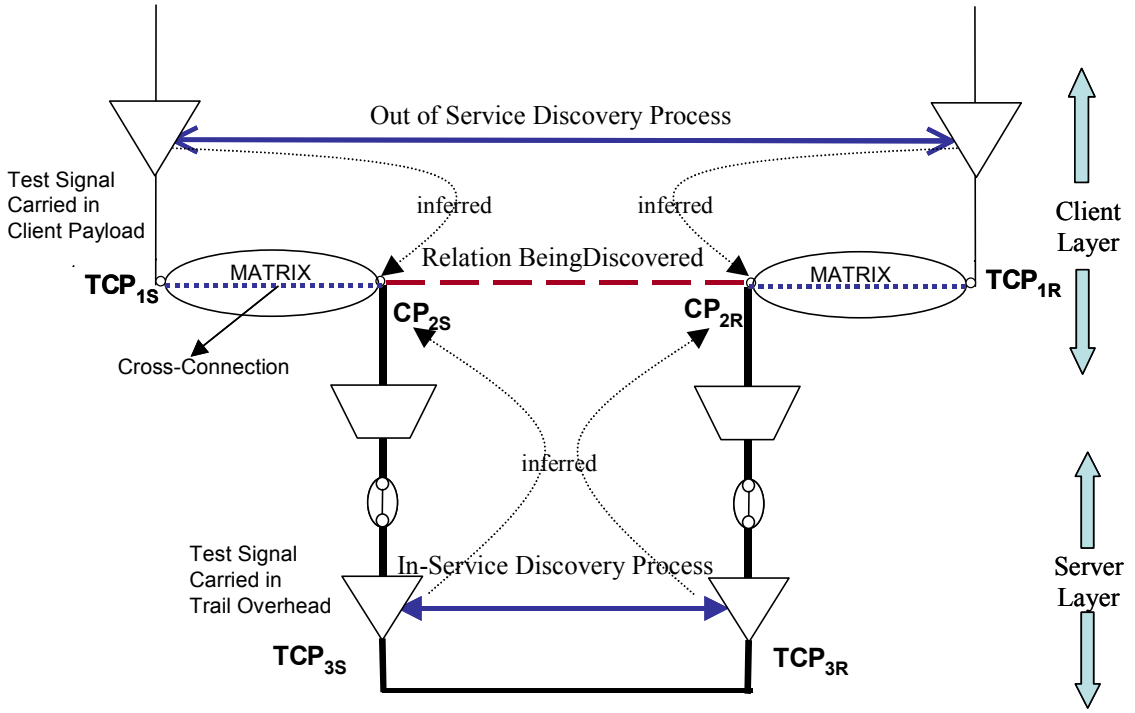

Figure 1/G.7714.1: Entities in the in-service and out-of-service discovery processes.

Based upon draft-ietf-ccamp-lmp-08.txt, Section 11.3.1, the “up/free (in-service)” data link state appears to correspond with what G.7714.1 refers to as “out-of-service”. This difference in terminology has resulted in different interpretations of the context. Explaining the scenarios further in the lmp test document would be beneficial in establishing a translation between the differing uses of the same terms. Within ITU-T, work is being initiated of draft Rec. G.fame, Framework for ASON Management, where control plane/management plane interactions will be addressed.

Further Study Items

Following are some areas where further contributions are requested:

1. For SDH equipment functions in G.783, it needs to be understood whether the application of the lmp test message requires revision of NIM (non-intrusive monitoring) functions. The reason for this is that the test procedure is initiated between control entities at the endpoints of the trail, and intermediate points are not necessarily aware that the test is taking place. For G.7714.1, it was felt important for any termination or NIM function to easily distinguish between the various uses of the Jx bytes. It may be necessary for the subject draft to use a similarly easily recognizable format.

   If no revision to NIM functions is required for the context of this draft, the architecture of the context for this application (demonstrating why the NIM functions are not required) should be reflected in G.803 and/or G.807/G.8080.
2. Determination of whether it would be possible to use the identical message formats in the subject draft as in G.7714.1 for the connectivity verification function.
3. Determination of whether it would be possible to use the same overall structure (distinguishing character, 4 bit message type, 80 bit message body) if a different message format or information content is required.
4. Work is needed to clarify under what configurations/states (for example: no VC-n signals carrying client traffic) the lmp test message is applicable over J0. If the signal can be framed and J0 can be recovered, the Regenerator Section is considered as “in service” from a transport plane perspective. So unlike the J1/J2 case, the application of the lmp test message at the Regenerator Section does not occur in an “out of service” state (from a transport plane perspective).
5. Clarification of the usage of transport and control names for transport resources in the subject draft, as described in G.8080 Amendment 1.
6. Consideration of the ANSI 64-byte J1.

Future Activities

T1X1 welcomes your response to the points raised in this liaison and the progress of the subject draft.

The next meeting at which ITU-T Q.14/15 will discuss control plane topics is from 9-14 June 2003 in Chicago. Please contact the Rapporteur (Mr. Kam Lam, hklam@lucent.com) if any non-ITU-T members wish to participate.

The next meeting of T1X1.5 is from 24-27 June 2003 in Vancouver. Non-T1X1 members are welcome. Details can be found on the Committee T1 website: www.t1.org.

Regards,

Ken Biholar

Chair, T1X1