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Abstract

This Internet Draft defines a protocol supporting the transport of SS7 MTP Layer 3 signaling messages over IP using the services of the Stream Control Transmission Protocol (SCTP). This protocol would be used between SS7 Signaling Points employing the MTP Level 3 protocol. The SS7 Signaling Points may also employ standard SS7 links using the SS7 Message Transfer Part (MTP) Layer 2 to provide transport of MTP Layer 3 signaling messages.
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1. Introduction

1.1 Scope

There is a need for Switched Circuit Network (SCN) signaling protocol delivery over an IP network. This includes delivery from a Signalling Gateway (SG) to a Media Gateway Controller (MGC) or IP Signaling Point, as described in the Framework Architecture for Signalling Transport [1]. This could allow for convergence of some signaling and data networks. SCN Signaling nodes would have access to databases and other devices in the IP network domain that do not employ SS7 signaling links. There may also be operational cost and performance advantages when traditional signaling links are replaced by IP network "connections".

The delivery mechanism described in this document allows for full MTP3 message handling and network management capabilities between any two SS7 nodes, communicating over an IP network. An SS7 node equipped with an IP network connection is called an IP Signaling Point (IPSP). The IPSPs function as traditional SS7 nodes using the IP network instead of SS7 links.

The delivery mechanism should

* Support seamless operation of MTP3 protocol peers over an IP network connection.
* Support the MTP Level 2 / MTP Level 3 interface boundary.
* Support management of SCTP transport associations and traffic instead of MTP2 Links.
* Support asynchronous reporting of status changes to management.

1.2 Terminology

MTP - The Message Transfer Part of the SS7 protocol [2].

MTP2 - MTP Level 2, the MTP signaling link layer.

MTP3 - MTP Level 3, the MTP signaling network layer.

MTP2-User - A protocol that normally uses the services of MTP Level 2. The only MTP2 user is MTP3.

Signaling End Point (SEP) - A node in an SS7 network that originates or terminates signaling messages. One example is a central office switch.

IP Signaling Point (IPSP) - An SS7 Signaling Point with an IP network connection used for SS7 over IP.
Signaling Gateway (SG) – A signaling agent that receives/sends SCN native signaling at the edge of the IP network [4]. In this context, an SG is an SS7 Signaling Point that has both an IP network connection used for SS7 over IP, and a traditional (non-IP) link to an SS7 network.

Signaling Transfer Point (STP) – A node in an SS7 network that routes signaling messages based on their destination point code in the SS7 network.

Association – An association refers to a SCTP association [5]. The association provides the transport for MTP3 protocol data units and M2PA adaptation layer peer messages.

Network Byte Order – Most significant byte first, also known as "Big Endian".

Stream – A stream refers to a SCTP stream [5].

1.3 Abbreviations

SCN    - Switched Circuit Network
SCTP   - Stream Control Transmission Protocol
SLC    - Signaling Link Code
SS7    - Signaling System 7
SSN    - Stream Sequence Number

1.4 Signaling Transport Architecture

The architecture that has been defined [4] for Switched Circuit Network (SCN) signaling transport over IP uses multiple components, including an IP transport protocol, the Stream Control Transmission Protocol (SCTP), and an adaptation module to support the services expected by a particular SCN signaling protocol from its underlying protocol layer.

Within this framework architecture, this document defines an SCN adaptation module that is suitable for the transport of SS7 MTP3 messages.

Figure 1 shows the seamless interworking at the MTP3 layer. MTP3 is adapted to the SCTP layer using the MTP2 User Peer-to-peer Adaptation Layer (M2PA). All the primitives between MTP3 and MTP2 are supported by M2PA. The SCTP association acts as an SS7 link between the IPSPs.
An IPSP may have SCCP and other SS7 layers above MTP3. Figure 2 shows an example. The Signaling Gateway is an IPSP equipped with both traditional SS7 and IP network connections. In effect, the Signaling Gateway acts as an STP. Any of the nodes in the diagram could have SCCP or other SS7 layers. STPs may or may not be present in the SS7 path between the SEP and the SG.

Figure 1: M2PA Symmetrical Peer-to-Peer Architecture

Figure 2: M2PA in IP Signaling Gateway
Figure 2 is only an example. Other configurations are possible. For example, IPSPs without traditional SS7 links could use the protocol layers MTP3/M2PA/SCTP/IP to route SS7 messages in a network with all IP links.

Another example, related to Figure 2, is that two SGs could be connected over an IP network to form an SG mated pair similar to the way STPs are provisioned in traditional SS7 networks.

1.4.1 Point Code Representation

The MTP specification requires that each node with an MTP3 layer is represented by an SS7 point code.

1.5 Services Provided by M2PA

The SS7 MTP3/MTP2 (MTP2-User) interface is retained at the termination point in the IP network. The M2PA protocol layer is required to provide the equivalent set of services to its user as provided by MTP Level 2 to MTP Level 3.

These services are described in the following subsections.

1.5.1 Support for MTP Level 2 / MTP Level 3 interface boundary

This interface is the same as the MTP2/MTP3 interface described in [2], with the addition of support for larger sequence numbers in [7].

Because SCTP uses larger sequence numbers than MTP, the MTP3 Changeover procedure must use the Extended Changeover Order and Extended Changeover Acknowledgment messages described in [7]. This will allow for use of the SCTP stream sequence numbers in the changeover messages.

1.5.2 Support for peer-to-peer communication

In SS7, MTP Level 2 sends three types of messages, known as signal units: Message Signal Units (MSUs), Link Status Signal Units (LSSUs), and Fill-In Signal Units (FISUs).

MSUs originate at a higher level than MTP2, and are destined for a peer at another node. Likewise, M2PA passes these messages from MTP3 to SCTP as data for transport across a link. These are called User Data messages in M2PA.

LSSUs allow peer MTP2 layers to exchange status information. Analogous messages are needed for M2PA. The Link Status message serves this purpose.
FISUs are sent when no other signal units are waiting to be sent. This purpose is served by the heartbeat messages in SCTP. FISUs also carry acknowledgment of messages. This function is performed by SCTP. Therefore, it is unnecessary for M2PA to send FISUs.

1.6 Functions Provided by M2PA

1.6.1 Mapping

For each IP link, the M2PA layer must maintain a map of the SS7 link to its SCTP association and its corresponding IP destination.

1.6.2 SCTP Stream Management

SCTP allows a user-specified number of streams to be opened during the initialization. It is the responsibility of the M2PA layer to ensure proper management of the streams allowed within each association.

1.6.3 Retention of MTP3 in the SS7 Network

M2PA allows MTP3 to perform all of its Message Handling and Network Management functions with IPSPs as with other SS7 nodes.

1.7 Definition of the M2PA Boundaries

1.7.1 Definition of the M2PA / MTP Level 3 boundary

The upper layer primitives provided by M2PA are the same as those provided by MTP2 to MTP3 [2].

1.7.2 Definition of the Lower Layer Boundary between M2PA and SCTP

The upper layer primitives provided by SCTP are described in Reference [5] Section 10 "Interface with Upper Layer".

2. Protocol Elements

This section describes the format of various messages used in this protocol.

All fields in an M2PA message must be transmitted in the network byte order, i.e., most significant byte first, unless otherwise stated.

2.1 Common Message Header

The protocol messages for M2PA require a message header structure which contains a version, message type and message length. This message header is common among all SCN adaptation layers. The
header structure is shown in Figure 3.

```
+-----------------+-----------------+-----------------+-----------------+
| Version | Spare | Message Type |
+-----------------+-----------------+-----------------+
| Message Length  |
+-----------------+-----------------+-----------------+
```

Figure 3: Common Message Header

2.1.1 Version

The version field (vers) contains the version of the M2PA adaptation layer. The supported versions are:

01 Release 1.0 of M2PA protocol

2.1.2 Message Type

The valid message types are defined below and the message contents are described in Section 2.2. Each message can contain parameters.

The following list contains the message types for the defined messages.

**MTP2 User Adaptation Messages**

<table>
<thead>
<tr>
<th>Type</th>
<th>Value (Hex)</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Data</td>
<td>0601</td>
</tr>
<tr>
<td>Link Status</td>
<td>0602</td>
</tr>
</tbody>
</table>

2.1.3 Message Length

The Message length defines the length of the message in octets, not including the header.

2.2 M2PA Messages

The following section defines the messages and parameter contents. The M2PA messages will use the command header and the M2PA specific header.
2.2.1 User Data

The User Data parameter is the data sent from the MTP3 in the form of the contiguous SIO and SIF fields of the MSU ([2] Q.703, section 2.2 Signal Unit Format). The format for the Data message is as follows:

```
+----------------------------------+
|                           User Data                           |
|                       ...                  |
+----------------------------------+
```

No padding is added to the MTP3 message.

Note that the User Data field contains only the LI, SIF and SIO octets. The other components of the message transmitted by MTP2 (the Flag, BSN, BIB, FSN, FIB, CK) are not included in M2PA.

2.2.2 Link Status

The MTP2 Link Status message can be sent between M2PA peers to indicate link status. This message performs a function similar to the Link Status Signal Unit in MTP2.

```
+----------------------------------+
|                          Link Status                          |
|                       ...                  |
+----------------------------------+
```

The valid values for State are shown in the following table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In Service</td>
</tr>
<tr>
<td>2</td>
<td>Processor Outage</td>
</tr>
<tr>
<td>3</td>
<td>Processor Outage Ended</td>
</tr>
</tbody>
</table>
3. Procedures

3.1 Procedures to Support MTP2 Features

3.1.1 Signal Unit Format, Delimitation, Acceptance

Messages for transmission across the network must follow the format described in section 2.

SCTP provides reliable, in-sequence delivery. Therefore the related functionality of MTP2 is not needed. SCTP does not provide functions related to Link State Control in MTP2. These functions must be provided by M2PA.

3.1.2 Link Alignment

Link alignment begins when MTP3 sends the Start command to M2PA.

To begin alignment in M2PA, M2PA sends the ASSOCIATE primitive to SCTP if the SCTP association is not already established.

To prevent duplicate associations from being established, it must be decided in advance which endpoint initiates the establishment of the association. In a pair of endpoints, the endpoint that initiates the establishment of the association is called the client. The other endpoint is the server. An endpoint may be a client in its relationship with one endpoint, and a server in its relationship with another endpoint.

The client initiates the association using the server’s IP address and the M2PA well-known port number as the destination endpoint. In order to allow for multiple links between the two endpoints, the client uses a different local port number for each link. It must be decided in advance which local ports are used by the client. Each of these client ports must be known to the server. Each combination of client IP address/port and server IP address/port must be mapped to the same Signaling Link Code (SLC) in the client and server.

An example of the relationships between the associations and the SLCs is shown in Figure 4 and the following table. Note that a link is an SCTP association identified by two endpoints, in this case a client and server. Each endpoint is identified by an IP address and port number. Each association corresponds to an SLC.
The association shall contain two streams in each direction. Stream 0 is designated for Link Status messages. Stream 1 is designated for User Data messages.

If SCTP fails to establish the association, and M2PA had received a Start command from its MTP3, then M2PA shall report to MTP3 that the link is out of service. If M2PA has an association ID for that association, it should ABORT the association.
Once the association is established, M2PA invokes the GETSRTTREPORT primitive to determine the Smooth Round Trip Time (SRTT) from SCTP. If the SRTT exceeds its maximum allowed value (which is implementation dependent), M2PA should use the ABORT primitive to end the association. If M2PA had received a Start command from its MTP3, then M2PA shall report to MTP3 that the link is out of service.

Once M2PA has received a Start from MTP3, the association is established, the SRTT is determined to be satisfactory, and if MTP3 has not deactivated the link, then:

(a) If there is no local processor outage condition, M2PA sends a Link Status of In Service to its peer.

(b) If there is a local processor outage condition, M2PA sends Link Status Processor Outage to its peer. When MTP3 sends Local Processor Recovered, then M2PA sends Link Status Processor Outage Ended to its peer, followed by Link Status In Service.

If M2PA has not received a Link Status In Service from its peer at the time it sends the Link Status In Service, M2PA starts timer T1. Timer T1 is stopped when M2PA receives Link Status In Service from its peer. If M2PA does not receive Link Status In Service from its peer before T1 expires, then M2PA reports to MTP3 that the link is out of service. Then M2PA uses the ABORT primitive to end the association.

Recommended value of T1 is 5–150 seconds.

When the association is established, M2PA has sent Link Status In Service to its peer, and has received Link Status In Service from its peer, and there is no local processor outage condition, then M2PA sends Link In Service to its MTP3.

If M2PA receives a Link Status of Processor Outage during alignment, and M2PA had received a Start command from its MTP3, M2PA shall report Remote Processor Outage to MTP3.

M2PA shall ignore the Emergency and Emergency Ceases commands from MTP3.
3.1.3 Processor Outage

A processor outage occurs when M2PA cannot transfer messages because of a condition at a higher layer than M2PA.

When M2PA detects a local processor outage, it sends a Link Status message to its peer with status Processor Outage. M2PA discards any messages received.

The peer M2PA, upon receiving the Link Status Processor Outage message, shall report Remote Processor Outage to its MTP3. M2PA ceases sending Data messages.

When the processor outage ceases, MTP3 sends a Local Processor Recovered indication to M2PA. The local M2PA notifies its peer by sending a Link Status message with status Processor Outage Ended. The peer notifies its MTP3 that the remote processor outage has ceased.

3.1.4 Level 2 Flow Control

Notification of receive congestion from M2PA to MTP3 is implementation dependent.

3.1.5 Error monitoring

If M2PA loses the SCTP association for a link, M2PA shall report to MTP3 that the link is out of service.

3.1.6 Transmission Priorities

In MTP, Link Status messages have priority over User Data messages ([2] Q.703, section 11.2). To achieve this in M2PA, Link Status and User Data messages shall be sent via SCTP on separate streams. All messages are sent using the ordered delivery option.

M2PA should give higher priority to reading the Link Status stream over the User Data stream.

3.2 Procedures to Support the MTP3/MTP2 Interface

3.2.1 Sending/receiving messages

When MTP3 sends a message for transmission to M2PA, M2PA adds the M2PA header to the message, then passes the message to SCTP using the SEND primitive.

When M2PA receives a Data message from SCTP, M2PA removes the M2PA header and passes the message to MTP3.

Link Status and User Data messages shall be sent via SCTP on separate streams.
3.2.2 Link activation and restoration

When MTP3 requests that M2PA activate or restore a link by a Start command, M2PA shall follow the alignment procedure in section 3.1.2.

3.2.3 Link deactivation

When MTP3 requests that M2PA deactivate a link by a Stop command, M2PA shall send an ABORT primitive to SCTP.

3.2.4 Flush buffers

Processing of the Flush Buffers request from MTP3 is implementation dependent.

3.2.5 Signaling Link Congestion

Notification of transmit congestion from SCTP to its upper layer (M2PA) is implementation dependent. Nevertheless, M2PA should receive notification from SCTP adequate to allow MTP3 to meet its requirements for signaling link transmit congestion in [2] Q.704, section 3.8.

The US National version of SS7 has congestion levels. For US National SS7, the Indication primitive for Congestion Onset should report the congestion level.

3.2.6 Changeover

The objective of the changeover is to ensure that signaling traffic carried by the unavailable signaling link is diverted to the alternative signaling link as quickly as possible while avoiding message loss, duplication, or mis-sequencing. For this purpose, the changeover procedure includes data retrieval, which is performed before opening the alternative signaling links to the diverted traffic. Data retrieval consists of these steps:

(1) buffer updating, i.e., identifying all those User Data messages in the retransmission buffer of the unavailable signaling link which have not been received by the far end SCTP, as well as untransmitted messages, and

(2) transferring those messages to the transmission buffers of the alternate links.

Note that only User Data messages are retrieved and transmitted over the alternate links. Link Status messages shall not be transmitted over the alternate links. References to stream sequence numbers in this section refer only to the User Data stream’s stream sequence numbers.
In order to support changeover in M2PA, the SCTP Stream Sequence Numbers must be used in place of the Forward and Backward Sequence Numbers (FSN/BSN) of SS7.

Stream Sequence Numbers used by SCTP are 16 bits long. MTP2’s Forward and Backward Sequence Numbers are only seven bits long. Hence it is necessary for MTP3 to accommodate the larger SSNs. This is done through the use of the Extended Changeover Order (XCO) and Extended Changeover Acknowledgement (XCA) messages instead of the Changeover Order (COO) and Changeover Acknowledgement (COA) messages. The XCO and XCA messages are specified in Reference [7] section 9.8.1. Only the XCO and XCA messages from [7] are used. These messages have a 24-bit field for the sequence number. The upper 8 bits of the 24 bit field should be set to 0, and the SSN placed in the lower 16 bits. (Note that the Stream Sequence Numbers are used instead of the Transmission Sequence Numbers. The Transmission Sequence Numbers are 32 bits long, and therefore would not fit in the XCO and XCA messages.)

For data retrieval, MTP3 requests Backward Sequence Number (BSN) from M2PA. This is the sequence number of the last message received by the local end. Normally, SCTP delivers ordered messages to the application. However, during congestion or failure condition, the sequence numbers of the acknowledged messages may have gaps. In particular, the SACK (selective acknowledgement message) message can have several of these gaps. Hence, it is important to scan through these gaps and find the sequence number before the first gap. This is the number from which the remote end has to transmit the messages. So this is the number considered as the Backward Sequence Number and communicated to the remote end. In a similar way, the remote end also detects the BSN and indicates to the local end. As soon as the MTP3 of the local end receives this BSN, MTP3 retrieves all the unacknowledged messages starting from BSN. This is accomplished through a Retrieval Request and FSNC request. After all the messages are sent from M2PA to MTP3, a Retrieval Complete indication is sent.

Note that the sequence numbers and messages requested by MTP3 may be obtained by M2PA from SCTP via the Communication Lost primitive [5]. Retrieval of messages is an optional feature in SCTP. To perform data retrieval, it is necessary that this option be implemented, and that the SSNs of the messages are identified. SCTP must retain the messages for retrieval by MTP3/M2PA whenever an association is aborted. SCTP must be able to return messages to its upper layer by stream, and based on SSNs.

If M2PA receives a Retrieve BSNT request from MTP3, M2PA responds with the BSNT indication. The BSNT value is the SCTP stream sequence number of the last message received by SCTP User Data stream before any gaps in the stream sequence numbers.
(Note that any messages with stream sequence number greater than this BSNT value have been acknowledged by SCTP, but have not been passed up to M2PA. Therefore these messages should be retransmitted by the far end on the alternate link.)

If M2PA receives a Retrieval Request and FSNC request from MTP3, M2PA retrieves from SCTP:

(a) any transmitted messages beginning with the first unacknowledged message with stream sequence number greater than FSNC, and

(b) any untransmitted messages in SCTP.

Each of these messages is sent to MTP3, first (a), then (b). Then M2PA sends the Retrieval Complete indication to MTP3.

Note: The changeover procedure makes it impossible for M2PA to have multiple User Data streams in a direction for one link. Buffer updating would have to be done for each User Data stream separately to avoid duplication of messages. But MTP3 provides for only one XCO message for sending the last-received SSN.

4. Examples of M2PA Procedures

In general, messages passed between MTP3 and M2PA are the same as those passed between MTP3 and MTP2. M2PA interprets messages from MTP3 and sends the appropriate message to SCTP. Likewise, messages from SCTP are used to generate a meaningful message to MTP3.

Note that throughout this section, the primitives between MTP3 and M2PA are named using the MTP terminology [1][2]. Communications between M2PA and SCTP are named using SCTP terminology.

4.1 Link Initialization (Alignment)

An example of the message flow to bring an SS7 link in service is shown below. Proving is done by both ends of the link. To simplify the diagram, proving is shown on one end only. It is assumed in this example that SCTP has been initialized.
Even though the SCTP association is established, it is important that M2PA not send MTP3 data at this point. It must be confirmed that both ends of the link are ready for traffic. Otherwise, messages could be lost. The endpoints must exchange In Service messages.

At this point, MTP3 may begin sending data messages.
4.2 Message Transmission and Reception

Messages are transmitted using the Data Request primitive from MTP3 to M2PA. The diagram shows the case where the Link is In Service. The message is passed from MTP3 of the source to MTP3 of the destination.

\[
\begin{array}{cccccc}
\text{MTP3} & \text{M2PA} & \text{SCTP} & \text{SCTP} & \text{M2PA} & \text{MTP3} \\
\text{----} & \text{----} & \text{----} & \text{----} & \text{----} & \text{----} \\
\end{array}
\]

Message for transmission

\[
\begin{array}{c}
\text{Send} \\
(\text{Data Message}) \\
\end{array}
\]

\[
\begin{array}{c}
(\text{SCTP sends message}) \\
\end{array}
\]

Receive

\[
\begin{array}{c}
\text{Received message} \\
\end{array}
\]

4.3 Link Status Indication

If SCTP sends a Communication Lost primitive to M2PA, M2PA notifies MTP3 that the link is out of service. MTP3 responds in its usual way.

\[
\begin{array}{cccccc}
\text{MTP3} & \text{M2PA} & \text{SCTP} & \text{SCTP} & \text{M2PA} & \text{MTP3} \\
\text{----} & \text{----} & \text{----} & \text{----} & \text{----} & \text{----} \\
\end{array}
\]

Communication Lost

\[
\begin{array}{c}
\text{Out of Service} \\
\end{array}
\]
4.4 Link Status Message (Processor Outage)

This example shows how M2PA responds to a local processor outage. M2PA sends a Link Status message to its peer. The peer M2PA notifies MTP3 of the outage. MTP3 can then follow the processor outage procedures in [2].

```
MTP3  M2PA  SCTP  SCTP  M2PA  MTP3
----  ----  ----  ----  ----  ----
M2PA detects
Local Processor
Outage

Link Status
Processor Outage
------------>

(SCTP sends message)

Receive
------------>

Remote Processor
Outage
------------>

Link Status
Processor Outage
Ended
------------>

(SCTP sends message)

Receive
------------>

Remote Processor
Outage Ceases
------------>
```
4.5 Congestion Notification to Upper layer

MTP3 expects notification of link congestion. In this example, it is assumed that SCTP notifies M2PA of congestion onset and abatement.

If the congestion condition should continue long enough, MTP3 takes the link out of service. In this case, it is possible to start the link changeover procedure.

<table>
<thead>
<tr>
<th>MTP3</th>
<th>M2PA</th>
<th>SCTP</th>
<th>SCTP</th>
<th>M2PA</th>
<th>MTP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

Implementation dependent indication of congestion onset

<----------

Congestion Onset

<--------

Implementation dependent indication of congestion abatement

<--------

Congestion Abatement

<--------
4.6 Link Deactivation

The MTP3 can request that a SS7-IP link be taken out-of-service. M2PA uses the Abort message as shown below.

\[
\begin{array}{cccccc}
\text{MTP3} & \text{M2PA} & \text{SCTP} & \text{SCTP} & \text{M2PA} & \text{MTP3} \\
---- & ---- & ---- & ---- & ---- & ---- \\
\text{Stop} & & & & & \text{Abort} \\
\text{-------------} & & & & & \text{-------------} \\
\text{(SCTP performs its} & & & & & \text{communication procedure)} \\
\text{termination procedure)} & & & & & \\
\text{Communication Lost} & & & & & \text{Out of Service} \\
\text{<-------------} & & & & & \text{<-------------} \\
\end{array}
\]
4.7 Link Changeover

In this example, MTP3 performs a changeover because the link went out of service. MTP3 selects a different link for retransmitting the unacknowledged messages.

Note that in this example, the sequence numbers and messages requested by MTP3 are sent from SCTP to M2PA in the Communication Lost primitive. In general, the retrieval of sequence numbers and messages is implementation-dependent.
Communication Lost

Out of Service

Retrieve BSN

(M2PA locates
first gap in
received messages)

Indicate BSN

XCO (BSN) on another link

Retrieve BSN

Indicate BSN

XCA (BSN)

Retrieval Request
and FSNC (FSNC =
BSN from XCA message)

(M2PA locates
first gap in
acknowledgements)

Retrieved Message

Retrieved Message

Retrieval Complete

Send messages on another link.
5. Security

SCN adaptation layers rely on SCTP to provide security.

6. IANA Considerations

The SCTP (and UDP/TCP) Registered User Port Number Assignment for M2PA is TBD.

The value assigned by IANA for the Payload Protocol Identifier in the SCTP Payload Data chunk is

M2PA TBD

The SCTP Payload Protocol Identifier is included in each SCTP Data chunk, to indicate which protocol the SCTP is carrying. This Payload Protocol Identifier is not directly used by SCTP but may be used by certain network entities to identify the type of information being carried in a Data chunk.

The User Adaptation peer may use the Payload Protocol Identifier as a way of determining additional information about the data being presented to it by SCTP.

7. Acknowledgements

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8. References


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