Guidelines for Defining Packet Timestamp Formats

Tal Mizrahi  Marvell
Joachim Fabini  Vienna University of Technology
Al Morton  AT&T Labs

draft-mizrahi-intarea-packet-timestamps-00
IETF 99, Prague, July 2017
Text-based Timestamps

```xml
<rpc-reply message-id="101"
    xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
    <data>
        <netconf xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
            <stream>
                <name>NETCONF</name>
                <description>default NETCONF event stream</description>
                <replaySupport>true</replaySupport>
                <replayLogCreationTime>
                    2007-07-08T00:00:00Z
                </replayLogCreationTime>
            </stream>
        </netconf>
    </data>
</rpc-reply>
```

from [RFC 5277]

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Packet Timestamps

<table>
<thead>
<tr>
<th>LI</th>
<th>VN</th>
<th>Mode</th>
<th>Stratum</th>
<th>Poll</th>
<th>Precision</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

Reference Timestamp (64)

Origin Timestamp (64)

Receive Timestamp (64)

Transmit Timestamp (64)

from [RFC 5905]
Text-based Timestamps

Format defined in [RFC 3339]

Widely used, e.g.:

[RFC 5277] – NETCONF Notifications
[RFC 6991] – YANG Data Types
[RFC 7493] – I-JSON
[RFC 5646] – Language Tags
[RFC 7937] – CDNI Logging

Packet Timestamps

Format defined in ?

Widely used, e.g.:

[RFC 5905] – NTP
[RFC 4656] – OWAMP
[RFC 5357] – TWAMP
[RFC 1323] – TCP
[RFC 6374] – MPLS
Packet Timestamps – The Problem

- No common timestamp format(s).
- No common format for defining a new timestamp.

[RFC 5905] – NTP
[RFC 4656] – OWAMP
[RFC 5357] – TWAMP
[RFC 1323] – TCP
[RFC 6374] – MPLS
[RFC 7456] – TRILL
[RFC 3550] – RTP
...

draft-brockners-inband-oam-data
draft-morton-ippm-mbm-registry
draft-lijo-6lo-expiration-time
draft-foschiano-erspan
draft-ooamdt-rtgwg-ooam-header
draft-mymb-sfc-nsh-allocation-timestamp
draft-browne-sfc-nsh-kpi-stamp
...

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Goals of this Draft

• **Recommended** timestamp formats.

• **Guidelines** for defining new timestamp formats.
## Recommended Timestamp Formats

### NTP 64-bit Timestamp

```
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

### PTP [IEEE 1588] 64-bit Concatenated Timestamp

```
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
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</tr>
</tbody>
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```

### NTP 32-bit Timestamp

```
<table>
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<tr>
<th>0</th>
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<th>2</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

### PTP [IEEE 1588] 32-bit Concatenated Timestamp

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<th>2</th>
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</thead>
<tbody>
<tr>
<td>0 1 2 3 4 5 6 7 8 9 0 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

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Template for Defining a Timestamp Format

- **Timestamp field format**
  - Number of bits.
  - Units.

- **Epoch**

- **Wraparound considerations**

- **Synchronization considerations**
Optional Control Field for Timestamps

Control field includes control information about the timestamp

```
+------------------------------------------+
<table>
<thead>
<tr>
<th>Control Field</th>
</tr>
</thead>
</table>
+------------------------------------------+
| Timestamp                                |
+------------------------------------------+
```

Control field – sub-fields (work in progress):
- Timestamp format
- Precision
- Epoch
- Era
Draft Status and Next Steps

• June 2017 – draft 00 submitted.

• Next steps:
  – Looking for the right working group.
  – Collect requirements for control field.
  – Feedback will be appreciated.
Thanks!

draft-mizrahi-intarea-packet-timestamps@ietf.org
References


