MSRP Protocol Version 0 to Version 1 Interoperability

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November 2014, San Antonio
Interoperability Goals

When new features in MSRP Protocol Version 1 are published they must be architected such that there is a painless incremental upgrade path for existing Version 0 installations. Here are the goals:

1. Version 1 end-stations shall interoperate with Version 0 end-stations with quality of service as good or better than Version 0 provides

2. An intermix of Version 0 and Version 1 Bridges shall be supported while providing a quality of service that is as good or better than a pure Version 0 network

3. Version 0 end-stations shall work equally well with Version 0 and Version 1 Bridges

4. A stream running entirely though Version 1 devices shall support the extended capabilities described in MSRP Protocol Version 1*

* Note: Goal 4 is obvious and not discussed further
A New Version 1 Attribute: LISTENERLATENCY

This presentation introduces a new MSRP AttributeType (Table 35-1, included below): LISTENERLATENCY. This new attribute type will be used to implement the Listener specified ACCEPTABLELATENCY introduced in the presentation: cc-cgunther-acceptable-latency-0314-v01.pdf

Why is this needed? In SRP-2010 (MSRPDU Protocol Version 0) a stream will be stopped if a network reconfiguration occurs even if the resultant latency change is acceptable to the Listener device. Allowing Listeners to specify the maximum acceptable latency will solve this problem and provide the “network” with some guidelines when rerouting existing streams.

<table>
<thead>
<tr>
<th>AttributeType</th>
<th>Value</th>
<th>Supported Protocol Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>TALKER ADVERTISE</td>
<td>1</td>
<td>All</td>
</tr>
<tr>
<td>TALKER FAILED</td>
<td>2</td>
<td>All</td>
</tr>
<tr>
<td>LISTENER</td>
<td>3</td>
<td>All</td>
</tr>
<tr>
<td>DOMAIN</td>
<td>4</td>
<td>All</td>
</tr>
<tr>
<td>LISTENERLATENCY</td>
<td>5</td>
<td>Version 1 and beyond</td>
</tr>
</tbody>
</table>
Meeting our Interoperability Goals

(ListenerLatency example)
Scenario 1: Upgrade Bridge to MSRP Version 1

- [10.8.3.5a] V1 Bridge will interpret Talker’s V0 messages according to SRP-2010

- [10.8.3.5b] V0 Talker will interpret Bridge’s V1 messages according to SRP-2010

  - [10.8.3.5c1] New AttributeTypes (such as LISTENER_LATENCY) are ignored, continuing with the next Message*

  - [10.8.3.5c2] New AttributeEvents (not New, JoinIn, In, JoinMt, Mt or Lv) are ignored, continuing with the next VectorAttribute

- Summary: V0 Talkers and V0 Listeners can communicate through a V1 Bridged network

*Note: Each Message contains only one AttributeType
Scenario 2: Upgrading Listener to Version 1

- Talker sends a **TALKER ADVERTISE** *(type=1)* in a Version 0 MSRPDU

- [10.8.3.5a] Listener receives the **TALKER ADVERTISE** and processes it according to SRP-2010

- [10.8.3.5c1] Listener only transmits Version 1 MSRPDU, however if Listener sends a **LISTENER LATENCY READY** *(type=5)* the Talker will discard it and the Listener would have no indication why this happened

- [10.8.3.5b] If Listener sends a **LISTENER READY** *(type=3)* the Talker will process it according to SRP-2010 and start streaming

**QUESTION:** How can a device know whether to send **LISTENER** *(type=3)* or the new **LISTENER LATENCY** *(type=5)*? It can look at the protocol version in the peer’s MSRP **DOMAIN** message and know if the peer will understand a *type* greater than 4.
Scenario 3: Upgrading Bridge and Listener to Version 1

- Talker sends a **TALKER ADVERTISE** (*type*=1) in a Version 0 MSRPDU
- [10.8.3.5a] Bridge receives the **TALKER ADVERTISE**, then propagates it in a Version 1 MSRPDU
- Listener sends a **LISTENER LATENCY READY** (*type*=5) in a Version 1 MSRPDU
- Bridge receives it and propagates it in a Version 1 MSRPDU:
  - If Bridge propagates the **LISTENER LATENCY READY** (*type*=5) the Talker will discard it and the Listener would have no indication why this happened
  - If the Bridge converts the **LISTENER LATENCY READY** to a **LISTENER READY** (*type*=3) the Talker can process it according to SRP-2010 and start streaming
Scenario 4: Mixture of Version 0 and Version 1 Bridges

- Similar to Scenario 3: Bridge $B_v^1$ receives the TALKER ADVERTISE in a Version 0 MSRPDU from Bridge $B_v^0$ and propagates it in a Version 1 MSRPDU.

- Listener $L_{v1}$ receives the TALKER ADVERTISE with its ACCUMULATED LATENCY and responds with a LISTENER LATENCY READY with ACCEPTABLE LATENCY set greater than or equal to ACCUMULATED LATENCY.

- Bridge $B_v^1$ receives the Version 1 MSRPDU LISTENER LATENCY READY from the Listener and converts it to a Version 1 MSRPDU LISTENER READY, which is then propagated by Bridge $B_v^0$ as a Version 0 MSRPDU LISTENER READY.

  - Bridge $B_v^1$ will change TALKER ADVERTISE to TALKER FAILED if ACCUMULATED LATENCY ever exceeds ACCEPTABLE LATENCY.
  - Bridge $B_v^0$ will change TALKER ADVERTISE to TALKER FAILED if ACCUMULATED LATENCY changed (standard MSRP Version 0 behavior).
Proposal for meeting Goal 1 and 2

Scenarios 2, 3 and 4 demonstrate that a Version 1 device can receive a stream from a Version 0 peer device as long as the Version 1 device converts the \texttt{LISTENERLATENCY} attribute to a \texttt{LISTENER} attribute. This applies to end-stations as well as bridges along the path.

The associated text for the amendment could say something like this:

“A \texttt{ListenerLatency} attribute shall be propagated as a \texttt{Listener} attribute if the peer device implements MSRP Protocol Version 0 (as determined by the Protocol Version used in the peer’s Domain message).”

The end result is that the path from the Version 0 device all the way back to the Talker will behave like an SRP-2010 network, which means the stream will be stopped if the \texttt{ACCUMULATEDLATENCY} changes. However, the path from that device to the Listener \textbf{will} support the \texttt{ACCEPTABLELATENCY} originally requested.

Therefore, the quality of service is as good or better than Version 0 provides.

\checkmark Goal 1 and 2
Interoperability Goals Are Met!
Other Rules For **LISTENER**LATENCY Propagation.
Propagating Listener Attributes

- It is unnecessary to forward a **LISTENER READY** and a **LISTENER LATENCY READY** on the same egress port
  - Convert the **LISTENER READY** to a **LISTENER LATENCY READY** with **ACCEPTABLE LATENCY** set equal to **ACCUMULATED LATENCY**

- Propagated **LISTENER LATENCY READY** shall have the **ACCEPTABLE LATENCY** set to the largest **ACCEPTABLE LATENCY** of all received values
  - This assures the Bridge’s streaming ingress peer will support the most flexible Listener requirement
  - Each of the Bridge’s egress ports can fail the associated **TALKER ADVERTISE** if the individual **ACCEPTABLE LATENCY** requirements cannot be met
Other Thoughts…

- Entire stream path from farthest away Version 0 Bridge back to the Talker will not be able to take advantage of Version 1 ACCEPTABLELATENCY capabilities.

- Version 1 MSRPDU LISTENERLATENCY attributes will likely not pack as well as LISTENER attributes.

- If we introduce new FAILURECODES (Table 35-6) for LISTENERLATENCY then we will not be able to combine LISTENER and LISTENERLATENCY failure responses as shown in slide 10.

- Is there any interest in introducing TLVs into MSRP Version 1 to make future version enhancements easier to implement? If so, we should do it now.

  ➢ If we had done this in Version 0 we would not need to do the LISTENERLATENCY to LISTENER conversion presented here!