Common Public Radio Interface

CPRI functional decomposition requirements
update
Introduction

• Following table summarizes CPRI requirements expectation
• 802.1CM group feedback is expected over the given requirements values
# Requirements summary

<table>
<thead>
<tr>
<th></th>
<th>Synchronization Stream</th>
<th>IQ data</th>
<th>C&amp;M data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic type repartition</td>
<td>-</td>
<td>&gt; 90%</td>
<td>&lt; 10%</td>
</tr>
<tr>
<td>Traffic pattern</td>
<td>-</td>
<td>Periodic (1~67µs)</td>
<td>Burst</td>
</tr>
<tr>
<td>Traffic QoS type</td>
<td>Very High</td>
<td>High</td>
<td>Best Effort</td>
</tr>
<tr>
<td>Security</td>
<td>Under study</td>
<td>Under study</td>
<td>-</td>
</tr>
<tr>
<td>End-to-End Latency</td>
<td>-</td>
<td>&lt;100µs</td>
<td>-</td>
</tr>
<tr>
<td>FDV</td>
<td>-</td>
<td>Not specify</td>
<td>-</td>
</tr>
<tr>
<td>FLR</td>
<td>-</td>
<td>&lt;10^{-7}</td>
<td>&lt;10^{-6}</td>
</tr>
<tr>
<td>Synchronization timing accuracy</td>
<td>Class A^{1)}: &lt; 10 ns</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Class A^{1)}: &lt; 45 ns</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Class B^{1)}: &lt; 110 ns</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Class C^{2)}: &lt; 1.36 µs</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Synchronization frequency error</td>
<td>-^{3)}</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

- 1) To a common GM (or common TC/BC)
- 2) To any GM
- 3) If SyncE TBD
Synchronization timing

• With timing accuracy we mean that the slave clock can be before or after the GM clock up to the specified value.
  • I.e. the timing error in the slave can be +/- the specified value.
Synchronization timing accuracy

• Class A+: < 10 ns  Nice to have
  – MIMO, Tx-diversity

• Class A:  < 45 ns  Must have
  – CA Intra Contiguous.

• Class B:  < 110 ns  Must have
  – CA Intra Non-Contiguous, CA Inter

• Class C:  < 1.36 µs  Must have
  – LTE TDD
Synchronization timing accuracy

• Class A+, A and B is the timing accuracy of the slave clock in the RE compared to a common GM clock.
  (No REC need to fulfill Class A+, A or B)
• Class C is the timing accuracy of the slave clock in the RE or REC compared to any GM clock.
  • Here we have allocated 100 ns to the accuracy of the GM clock compared to the real absolute time.
Synchronization timing accuracy

- Example there all REs and RECcs need to fulfill Class C and two REs running a feature that require Class B
  - One RE may need to fulfill several Classes, see also following slides for an alternative view on Class A+, A and B.
Synchronization timing accuracy
Class A+, A and B

• Alternative informative definition for Class A+, A and B is the timing accuracy of the slave clock in the RE compared to the nearest common BC or TC (between the REs that running a feature that require the specific Class).
Synchronization timing accuracy
Class A+, A and B

- Two REs running a feature that require Class A but they have a common BC/TC in the first switch
  - This switch is probably located in the same site as the two REs.
- Two other REs are running a feature that requires Class B and have a common BC/TC further down in the network but much closer than the GM.