802.1AS: 
Problem of Constrained Systems 

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Constrained Systems and 802.1AS

- Some TSN-capable systems are constrained (RFC 7228)
  - E.g. 8-bit microcontroller, 10 KiB RAM
  - Often applies to boot time as well (e.g. < 100ms)

- In the context of 802.1AS, this often means
  - Disable BMCA: Too heavy, too slow
  - Each port’s state is either
    - Pre-configured: Fixed out-of-box
    - Static: Set by management
  - GM’s time is non-traceable (e.g. no GPS): Working clock
The Problem

- Constraints apply to the implementation
- A standard that mandates a non-constrained implementation will be ignored
  - This is proven historically (not theoretical)
- Claim: We want constrained systems to be conformant to 802.1AS
  - Problem: Not true for 802.1AS Rev D1.0
  - E.g.

<table>
<thead>
<tr>
<th>BMC</th>
<th>Does the device implement the best master clock algorithm?</th>
<th>M</th>
<th>10.3</th>
<th>Yes [ ]</th>
</tr>
</thead>
</table>

\[bold A.5 Major capabilities\]
Proposed Solution

• Two distinct conformance categories for 802.1AS
  • ‘Universal’
    • Same mandates as 802.1AS-2011: BMCA, PTP timescale, …
    • If this class is supported, shall use domainNumber 0
  • ‘Working’
    • BMCA optional, ARB timescale, …
    • If ‘Universal’ not supported, may use domainNumber 0
• 802.1AS-2011 products are ‘Universal’ only
• Future 802.1AS products can support one or both