New IEEE 1588 Revision

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Agenda

- IEEE-1588™ Revision
- Project Authorization Request (PAR)
- PAR Items
- Sub Committees

IEEE 1588 Revision

- Working Group to revise IEEE 1588 was formed
- Project Authorization Request (PAR) was approved in June 2013
- Officers
  - Kang Lee (NIST), Sponsor, Project Manager
  - John Eidson, (Calnex Solutions): Co-Chair
  - Doug Arnold (Meinberg): Co-Chair
  - Hans Weibel (ZHAW), Vice-Chair
  - Silvana Rodrigues (IDT): Secretary
  - John Mackay (Progeny Systems): Editor

Scope of the PAR

- Several items have been included in the Scope of the PAR
  - Correct known technical and editorial errors
  - Precision and accuracy improvements
  - SNMP-compliant MIB
  - Security
  - Clarification of layering, interfaces, and protocol of the standard
  - **Backwards compatibility with version 2 is a must**
- Some proposals are not explicitly stated in the Scope of the PAR, as they were covered by other proposals

Working Group technical work

- Five sub committees have been created to focus on several aspects of the technical work
  - Architecture
  - High Accuracy
  - Maintenance
  - Management
  - Security
- Each sub committee meets once or twice a month via conference call
  - A charter and a requirements document were the first task for each sub-committee

Architecture

- Charter
  - "It needs to clarify the layering, interfaces, and protocol of the standard, including the behavior of systems that deploy different protocol options"
- Requirements document is under discussion within the sub committee
- Needs clarification in IEEE 1588
  - Guidelines on the interaction of different profiles
  - Support of multiple profiles on the same network
  - Revise the description of the IEEE 1588 architecture and layering of the protocol
  - Make it easier to make future modifications in IEEE 1588
  - Reduce duplication between SDOs (ex. IEEE 802.1AS and IEEE 1588)
  - Mixed mode multicast (sync/Announce) and unicast delay_req/delay_resp)

High Accuracy

- Charter
  - "The protocol enhances support for synchronization to better than 1 nanosecond"
- Proposal includes the option to use Synchronous Ethernet for frequency synchronization at the physical layer
- Add clause(s) and/or informative annex to clearly describe the steps when a PTP link is being established for high accuracy
  - Definitions of dataset fields and TLVs
  - High Accuracy state machine
  - Mechanism to perform measurements and calibration
- Example on how to use the mechanism to achieve high accuracy
- The requirements document has been finalized

Maintenance

- Charter
  - "Incorporate official IEEE interpretations and other known errors or needed clarifications into 1588-2008 in order to provide a clean version as a basis for modifications of the current P1588 working group.
  - Once this is done serve as a 'quality control' function for any modifications proposed by other committees to ensure freedom from inconsistencies and backward compatibility issues."
- Working on proposals to correct known technical and editorial errors
- Items dealt at the IEEE 1588 Interpretations Committee will be addressed
  - A proposal to clarify Transparent Clock Source Address has been accepted
    - Text to clarify that all PTP messages, shall be transmitted and received in conformance to the standards governing the transport, network, link, and physical layers (e.g. 802.1Q requirements on the Ethernet header must be met)
  - Working on proposals for clarity throughout the standard
    - Ex. ClockIdentity, Announce Receipt Timeout, Unicast

Management

- Charter
  - "The management SC will consider the management of IEEE 1588 clocks, e.g. MIB, related management protocols (SNMP and native management protocol), and OAM mechanisms."
- The proposal is to create a single IEEE 1588 MIB
- IEEE C37.238 (Power profile) and IEEE 802.1AS have defined their own MIB
- They are also looking for a mechanism to allow in-service monitoring of synchronization quality

Security

- Charter
  - "To specify a security capability for PTP. This capability is expected to be optional"
- The requirements document is based on the IETF document "draft-ietf-tictoc-security-requirements"
- Potential technologies that could be use as basis
  - MACSec – link (MAC) based has been proposed
  - Ipsec
  - Can use same mechanisms as other time transfer protocols (e.g. NTP security mechanism)
- Annex K is to be deprecated

Other Proposals

- Several working items have been proposed such as
  - Mapping of IEEE 1588 to 802.11 using 802.11v
  - Multiple time sources and multiple time distribution methods
  - Review IPv6 mapping
  - Multilane Ethernet (e.g. 40 and 100 Gigabit)

Working Group working process

- Plenary conference calls are scheduled once a month
  - Third Wednesday of each month at 11AM Eastern Time
- Sub committees meets once or twice a month via conference call
  - Calendar for the conference calls are available for members at IEEE Central Desktop
- Two face-to-face plenary meetings (Spring and Fall)

P1588 Working Group

- Public web site
  https://ieee-sa.centraldesktop.com/1588public/
- To join the IEEE P1588 WG
  - Create an email (subject line: IEEE P1588 WG participation)
  - Include your name, organization, email, & phone number, and submit to:
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    IEEE P1588 Working Group Secretary
    silvana.rodrigues@idt.com

THANK YOU!