



IETF Update

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What is IETF?

- IETF – Internet Engineering Task Force
 - International standards organization responsible for all Internet Protocol related standards
 - Organized into areas (e.g. Internet area) and working groups (e.g. NTP WG)
- Produce standards documents as RFCs with varying status:
 - Standards Track
 - Draft Standard
 - Proposed Standard
 - Full Standard
 - Informational
 - Experimental
- Volunteer driven
- Open process



IETF Publication Steps

- Publication Requested (by WG)
- AD (Area Director) Evaluation
- IETF Last Call
- IESG Evaluation
- Approved (several states on the way to actual publication)

IETF “Timing” WGs

■ NTP WG

- NTP WG is closing down with the finishing up of NTPv4 work

■ TICTOC WG

- **T**iming over **I**P **C**onnections and **T**ransfer of **C**lock
- TICTOC is responsible for all new timing related work in IETF

NTP WG History

- NTP initially developed outside the structure of the IETF
 - Current definitive documents (RFC 1305 and RFC 4330) were independent submissions from Dr. Mills

- The Internet Engineering Task Force (IETF) NTP WG was chartered in March 2005 to develop an NTPv4 specification to include:
 - Updated NTPv4 algorithms, IPv6 support, Enhanced Security
 - SNTP (Simple Network Time Protocol)
 - An NTP MIB (for monitoring and management via SNMP)

NTP WG – Standardization Status

- The four drafts completed by the NTP WG and submitted to the IESG.
- As “Proposed Standard”
 - Protocol and Algorithms (draft-ietf-ntp-ntp4-proto-13*)
 - MIB (draft-ietf-ntp-ntp4-mib-06*)
 - DHCPv6 (draft-ietf-ntp-dhcpv6-ntp-opt-05*)
- As “Informational”
 - Autokey (draft-ietf-ntp-autokey-06*)

*As of October 30th, 2009, no objection or comment on latest I-D

NTP WG – Next Steps

- Potential NTP related future work items to be addressed in the IETF TICTOC WG
 - Faster polling intervals
 - Follow-up message capabilities
 - Alternative local clock algorithms

TICTOC WG History

- IETF recognizes that a next generation timing over IP (and potentially MPLS) is required.
 - Where timing means both frequency and time
- TICTOC is an IETF WG since March 2008.
- Charter
 - Develop IEEE 1588-2008 profile(s) for time and frequency distribution for network infrastructures with primary focus on well-engineered SP and private networks
 - Develop extensions to NTPv4 with a primary focus on individual hosts and devices on the public Internet requiring functionality or performance not currently available in NTP.

IETF TICTOC WG Status

- The Requirements draft is now an official WG draft
- Need to progress on the following documents:
 - *Problem statement*
 - Modularization
 - Architecture
 - Definitions (new document)
- TICTOC objectives need to be re-assessed to complement the work on synchronization at ITU-T Q13/15

Requirements Draft

- draft-ietf-tictoc-requirements
 - Informational WG document (Internet Draft)
- TICTOC collected requirements for various applications
 - Cellular backhauling
 - Circuit Emulation
 - Test and Measurement
 - *Industrial Automation*
 - ToD/Internet
 - *Networking*
 - Legal Uses of Time
 - Metrology
 - Sensor networks

Specific Requirements Terms

- Synchronization type
- Frequency stability
- Frequency accuracy
- Time Stability
- Time Accuracy
- Stabilization Time
- Jitter
- Wander
- Network Characteristics
- Security
- Reliability
- Traceability
- Holdover Time
- Cost
- Auto-configuration
- Manageability
- Scalability

Types of on-path support

- Link support, for instance:
 - a SyncE link
 - a POS path with frequency available to user
 - a DSL link with NTR
 - a PON link
- Network node support, for instance:
 - a network element with local frequency (e.g. atomic clock)
 - a network element with local time (e.g. GPS)
 - a boundary clock or equivalent (e.g. NTP stratum server)
 - a transparent clock or equivalent
 - ➔ Hardware assistance at the network interface

Timing and Transport Discrepancy

- Today transport solutions tend to simplify and optimize data distribution, supporting disparate data services.
- This lead to virtualization, creating layers independency...
- ... which is the opposite for timing distribution engineering.
- Need better coordination between transport designer and timing designer when going to packet based work.

Other work items

TICTOC would also look into :

- media mappings for IETF network technologies
- coexistence of NTP and 1588
- security issues
- management (MIBs)
- discovery of “on-path support” elements
- optimizing path selection for performance
- traversal of NATs and firewalls
- layer violation

References

- <http://www.ietf.org/about/standards-process.html>
- <http://www.ietf.org/html.charters/tictoc-charter.html>
- <http://www.ietf.org/html.charters/ntp-charter.html>
- <http://www.ietf.org/meeting/proceedings.html>
 - Past meetings material