Symmetricom

Carrier Class NTP for NGN Telecom Networks

NEXT GENERATION NETWORK READY FUTUREPROOF

Plug-in NTP Server Cards Leverage the TimeHub Building Integrated Timing Supply

CARRIER CLASS NTP APPLICATIONS

- IPTV Content and Delivery
- Digital Rights Management (DRM)
- Billing Record Management
- IP SLA Monitoring
- QoS Measurement Systems/Probes

CARRIER CLASS NTP PERFORMANCE

- Five Nines Availability
- Superior Accuracy – Hardware Time Stamping
- Card Based Scalability
- Security and Authentication
- NEBS Level 3 Certification

CARRIER CLASS NTP:

NTP requirements in telecommunication networks have rapidly evolved from a "best effort" utility, to a mission critical requirement for high QoS content delivery. Carriers have long relied on the Building Integrated Timing Supply (BITS) to meet all physical layer synchronization requirements with five nines availability. With the introduction of high performance NTP servers on a card, the BITS platform can now deliver carrier class NTP to meet demanding NGN PackeTime requirements. Designed to take full advantage of the Building Integrated Timing Supply environment, TimeHub®'s NTP server cards provide the performance, scale, availability and security to assure high QoS delivery of advanced services such as IPTV.

Today, carriers are finding that "best effort" NTP is not sufficient for high QoS packet networks and advanced services. NGN applications such as IPTV are highly dependant on carrier class NTP. Time coordination of massive amounts of digital content in the head end serving locations is reliant on accurate and secure NTP timestamps.

Symmetricom's NTP server cards are fully integrated into the TimeHub Building Integrated Timing Supply system. NTP cards can be installed as single servers or redundant pairs in any available master or expansion shelf output slot. NTP capacity scales up at a rate of up to 1000 fully authenticated transactions per second for each added card. Front-access NTP traffic ports utilize Small Form-factor Pluggable (SFP) modules for flexibility to support 1000 Base-X optical or electrical interfaces. NTP server cards can support independent public and private network domains providing added security and flexibility. All configuration and management is consolidated through TimeHub system management ports to maintain security and isolation from NTP traffic ports.

The new NTP server cards provide superior stability and protection through direct connection to the TimeHub system backplane. NTP Stratum level 1 UTC time traceability is established with a simple connection to the TimeSource PRS Time-of-Day (ToD) output. For offices without a PRS, NTP server cards can be configured with an optional GPS, or can operate at NTP Stratum level 2 with UTC time traceability back to a NTP Stratum 1 card in another office.

NTP Performance	Enterprise Class	Carrier Class
Time Stamping Precision	Software (10µs)	Hardware (10ns)
Scalability	Fixed	Card based
Holdover	✓	✓
Redundancy		✓
TL1 Management		✓
NEBS		✓

Table 1: Carrier class NTP meets high QoS requirements for NGN telecommunication networks

PACKETIME™ by Symmetricom

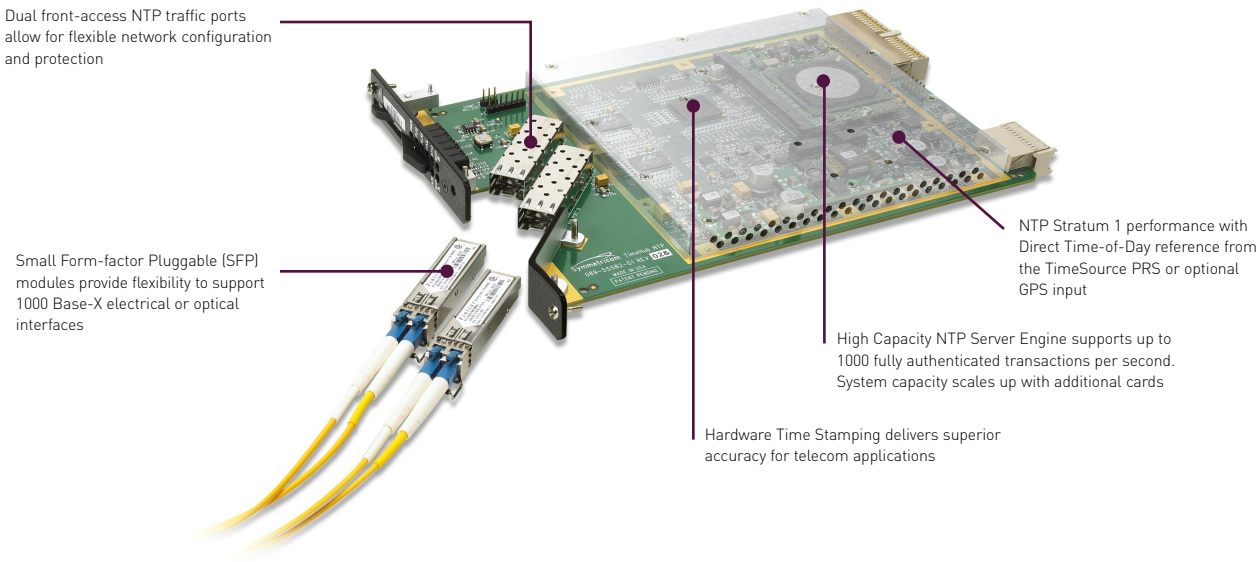


Figure 1: Carrier class NTP server — system on a card

Specifications

- Network Protocol: NTP v3 - RFC1305 compliant
  IPv4
- Time stamping: Hardware Time Stamping
- Server precision: 10 ns rms typical (See graph 1)
- Inputs
  - Stratum 1: Time-of-Day feed from TimeSource
    - Type: Cisco ToD
    - Connector: RJ45
    - Format: RS-422 (1000 ft range)

    Optional GPS input (12 channel, 50ns rms)
    - Connector: TNC (L1 Antenna)
  - Stratum 2: Full NTP client
- NTP Traffic ports: 2 Ethernet Small Form-factor Pluggable (SFP)
  - Optical: 1000 Base-X
  - Electrical: 1000 Base-T
- NTP Transaction rate: 1000/s fully authenticated
  (up to 1500/s unauthenticated))
- Authentication: MD5 (RFC1321)
- Protection: 1:1 protection
- Management: TL1- Integrated into TimeHub system management
  (physical isolation from NTP traffic ports)

Please refer to TimeHub 5500 data sheet for full system specifications.

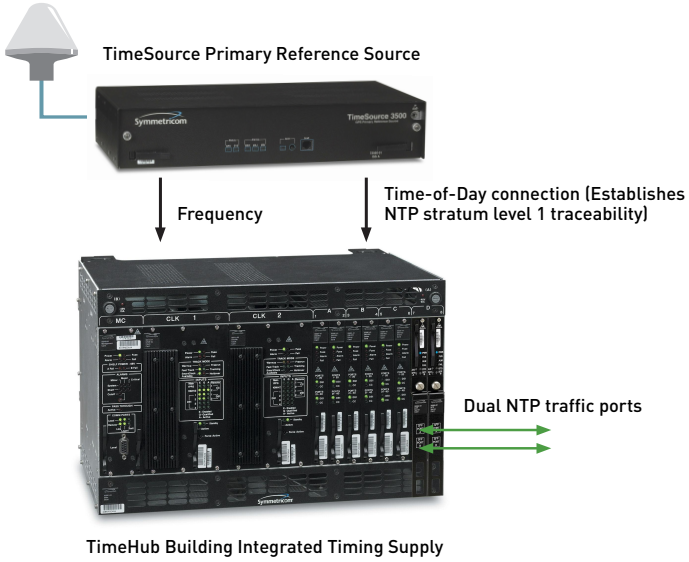
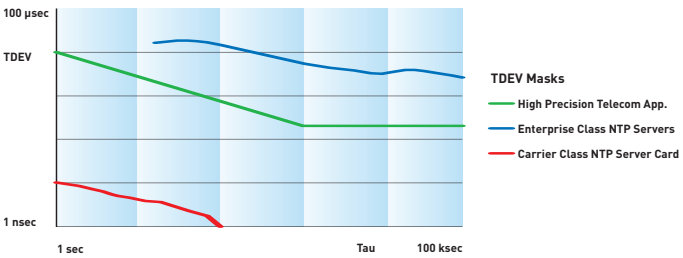


Figure 2: NTP server cards leverage carrier class synchronization infrastructure



Graph 1: TDEV: Carrier Class NTP Server Card meets high precision telecom requirements

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