netinsight

DATASHEET

Zyntai TimeNode

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TimeNodes are used as end-nodes in our Zyntai solution to distribute time synchronization on top of existing network infrastructure. The compact, low-power unit is built to run advanced time algorithms in a performance optimal and efficient way to secure resilient synchronization in large critical networks, including 5G, power and other mission-critical services.

The Zyntai solution is based on the technology Precision TimeNet, developed by Net Insight, that distributes time synchronization across large critical networks. It disaggregates the synchronization function from the hardware, creating a synchronization overlay across the existing IP infrastructure without requiring PTP IEEE1588 hardware support in intermediate nodes. Instead, end-nodes called Zyntai TimeNodes are used to convert and distribute synchronization over the network, also if leased capacity is used. The solution also includes orchestration, Zyntai Director (see separate datasheet), to monitor and manage the synchronization end-to-end.

Zyntai TimeNode is a high-precision, 1U timing and synchronization unit built for networks where accuracy, reliability, and ease of deployment are critical. Distributing time synchronization over Wide Area Networks puts high demands on software functionalities and the TimeNode ensures our advanced time algorithms are run in a performance optimal and efficient way.

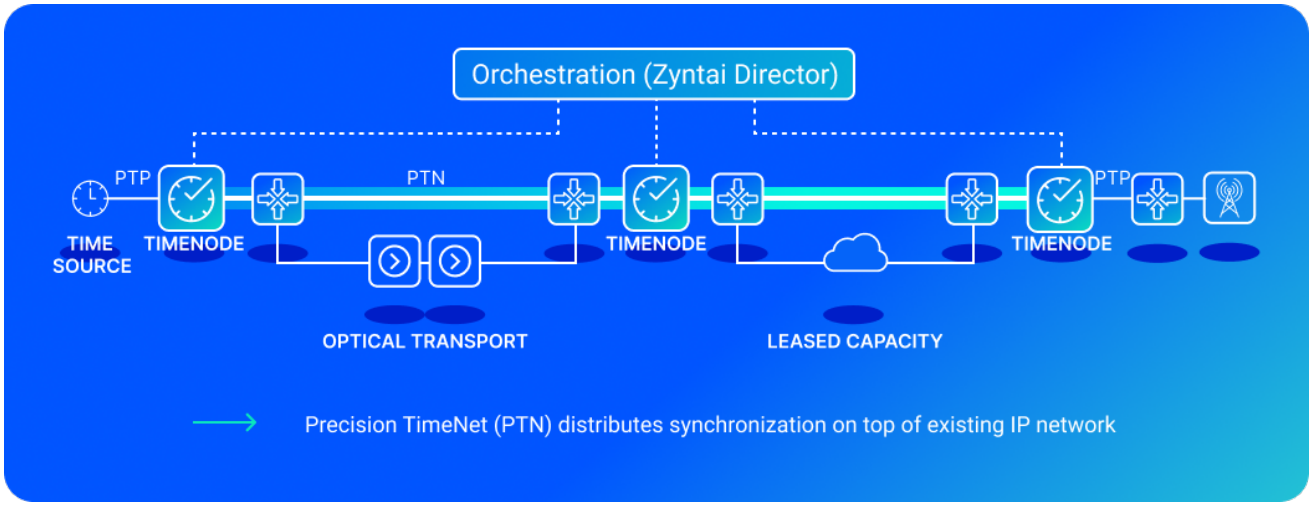
Designed with low power consumption and a compact form factor, it integrates effortlessly into any network architecture. TimeNode comes in three models: TN3040 (access node), TN3100 (core node) and TN3100E (enhanced core node) depending on capacity and where in the network it is placed.

TimeNode supports a versatile range of synchronization input sources and delivers multiple output profiles. With fast installation, integration, and consistent performance, TimeNode ensures robust synchronization across multi-vendor environments and prepares your network for the demands of 5G, power and other mission-critical services.

Bi-directional timing and mesh allow the Zyntai TimeNodes to have complete sync information across the network. This is used to evaluate synchronization options, weight different routes, make real-time decisions to use one or more links to synchronize its time or to detect and correlate for network events.

Advanced time algorithms are run in order to manage Packet Delay Variation, due to traffic interference, statistical effects, buffer handling in routers and QoS mechanisms. They are also there to manage asymmetries, often caused by changes in delay profiles in the underlying transport, most likely the optical layer, or due to protection switching or traffic reroutes. Asymmetry changes can be as small as 100 nanoseconds and up to microseconds or as large as several milliseconds. If not identified and handled, a constant time error is created in the network.

- **Compact, low-power unit for critical networks**
- **Mesh functionality for network-wide synchronization optimizations and stability**
- **Advanced time algorithms for managing packet delay variation and asymmetries**



Time Transfer
TN3040: 4 Time Transfer sessions
TN3100/TN3100E: 32 Time Transfer sessions
Regional Routing and multilink synchronization
1.000 - 32.000 Timestamps/s per Time Transfer session
AES-256 encryption
Differentiated Service Code Points (DSCP)

PTP
ITU-T G.8275.1 Telecom Profile (full timing support)
ITU-T G.8275.2 Telecom Profile (partial timing support)
ITU-T G.8265.1 Telecom Frequency Profile
IEEE 1588 Default Profile
IEC 61850-9-3 and IEEE C.37.238 Power Profiles
SMPTE ST 2059-2 and AES67 Media Profiles
2048 PTP clients with full message rate (256 PTP clients on TN3040)
Support for multiple profiles simultaneously

Interfaces
TN3040: 4x 10G/GbE SFP/SFP+, 2X GbE/FE RJ45
TN3100/TN3100E: 10x 10G/GbE SFP/SFP+, 2X GbE/FE RJ45 BASE-T, BASE-SX/SR (300m), BASE-LX/LR (10km),
BASE-ER (40km), BASE-ZR (80 km DWDM)
Link Layer Discovery Protocol (LLDP)

Synchronization interface
PPS in/out, 2x HDBNC
10MHz in/out, 2x HDBNC
2.048 MHz and 1.544 MHz in/out ITU-T G.703.
ToD/1PPS, RJ45 (NMEA 0183)

Synchronous Ethernet
ITU-T G.8261, G.8262 (EEC) and G.8264 Ethernet Synchronization Messaging Channel (ESMC)

GNSS
TN3040/TN3100: Singleband L1 multi-constellation GPS, Galileo, GLONASS, BeiDou and QZSS.
TN3100E: Multiband L1+L5 multi-constellation GPS, Galileo, BeiDou, QZSS and NavIC
SBAS supported. T-RAIM
Advanced jamming and spoofing detection and mitigation
OSNMA (only TN3100E)

PRTC
G.8272 PRTC-A / PRTC-B compliant
G.8272.1 ePRTC compliant with Cs-assistance

NTP
High-performance NTP Server

Management
Electrical GbE/FE (RJ-45)
Inband management
USB-C port for onboarding

Power
Hot-swappable, modular PSU
2 x -48 VDC (-60 to -40 VDC)
2 x 100-240 VAC.

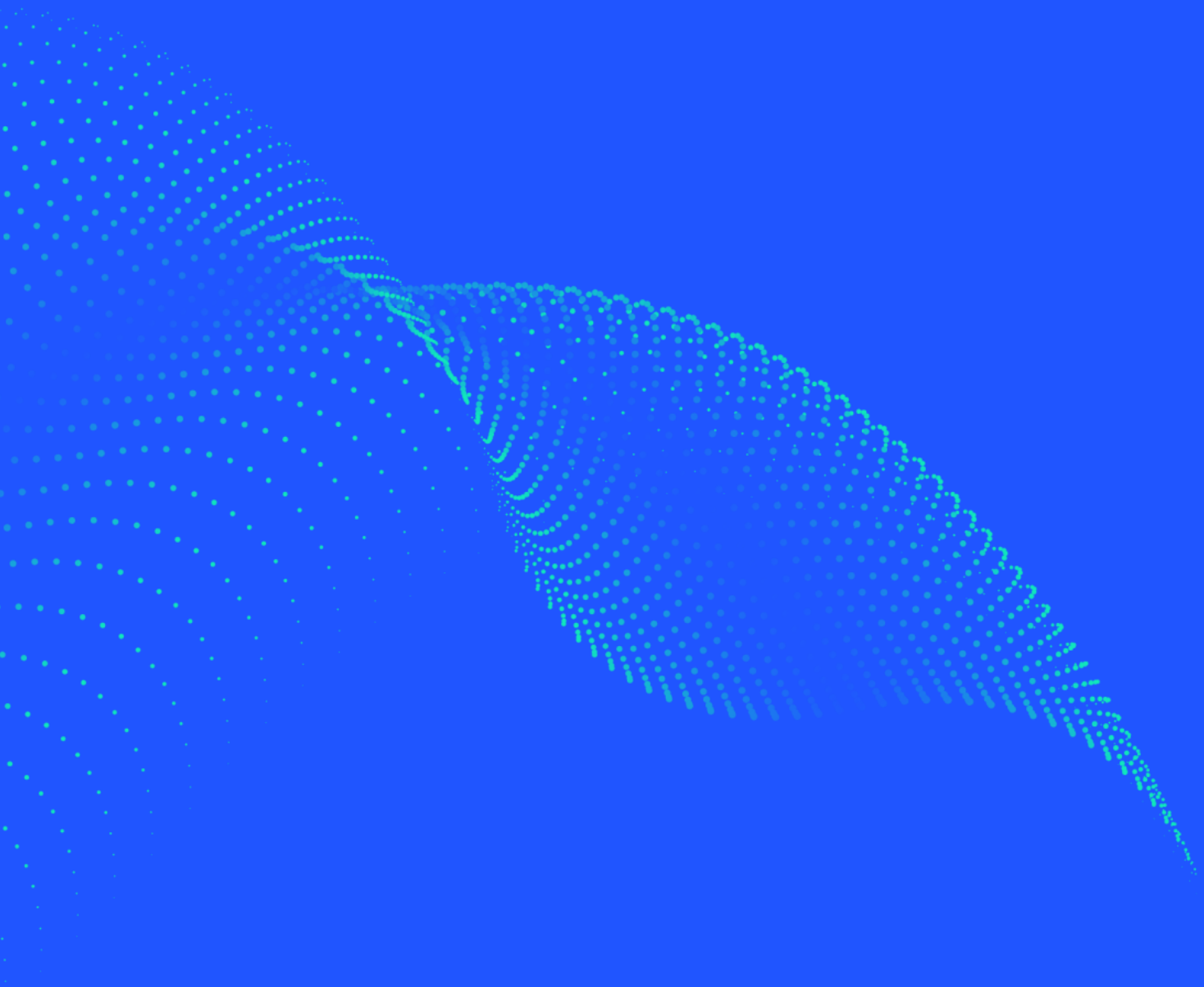
Environmental cond.

Operating temp.	TN3040: -40 to 65 °C (-40 to 149 °F) EN 300 019-1-3 Class 3.3 Not temp-controlled TN3100/TN3100E: 5 to 40 °C (41 to 104 °F)
Storage temp.	EN 300 019-1-3 Class 3.1 Temp-controlled -40 to 70 °C (-40 to 156 °F)

Regulatory compliance

	CB Scheme International Safety
Safety	CE EU Safety IEC 62368-1 EN 62368-1 FCC Part 15 (Class A)
ERM/EMC	ETSI EN 300 386
NEBS	NEBS Level 3
EU Directive	2014/30/EU Low Voltage Directive 2014/30/EU EMC Directive 2011/65/EU RoHS Directive 2014/53/EU Spectrum Directive

Dimensions
43.5 mm (1.75'' / 1RU) x 444 mm (17.5'') x 302 mm (11.9'')
5.8 kg (with dual power supply units)



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NID 5695 A6