

Testing O-RAN Synchronization

Network Master Pro MT1000A

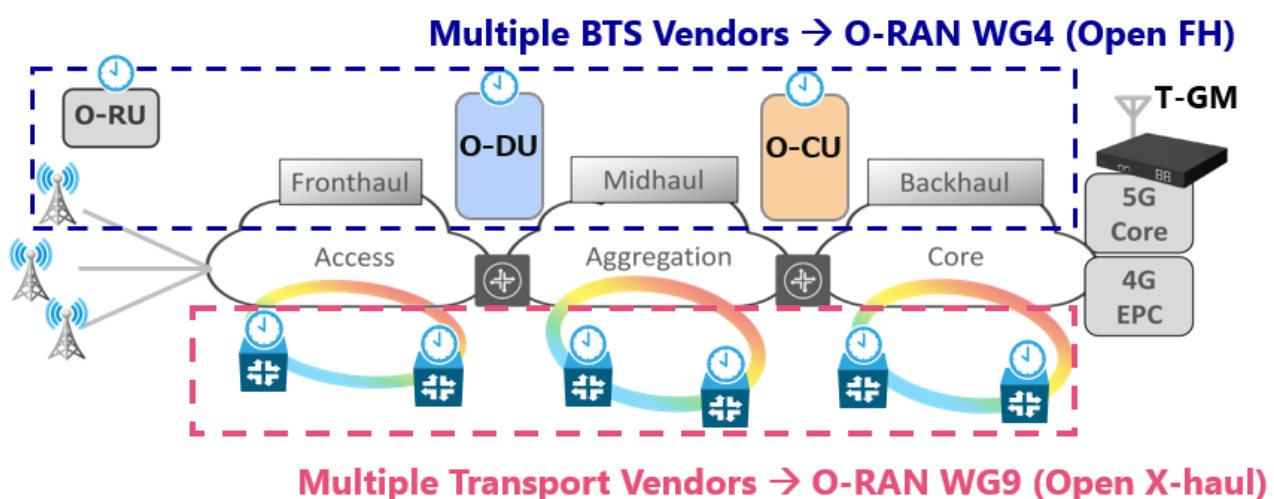
High Performance GNSS Disciplined Oscillator MU100090B

100G Multirate Module MU100011A

Traditionally, RAN (Radio Access Network) equipment vendors have optimized performance by combining and tuning the multiple system elements, resulting in locking of mobile operators to one vendor when constructing a RAN. To meet the challenges of 5G, such as wider coverage and lower costs, mobile operators and their eco-system are organizing open specifications that supplement the 3GPP standards.

The O-RAN ALLIANCE is a global organization with a mission to “re-shape the RAN towards more intelligent, open, virtualized, and fully interoperable mobile networks” by publishing standards and specified authorized interfaces and functions, supporting a more flexible ecosystem of RAN equipment suppliers.

Synchronization is a big challenge for O-RAN, because timing information passes across equipment from multiple vendors from the T-GM (Telecom Grandmaster) to the radio with tighter criteria. The O-RAN WG4 is discussing assured interoperability between the O-DU (O-RAN Distributed Unit) and O-RU (O-RAN Radio Unit) by defining functional and performance tests. Also, WG9 is discussing a transport network via mobile X-haul, supporting accurate timing distribution to the O-RU.



Anritsu's Network Master Pro MT1000A supports PTP/SyncE tests in the Synchronization plane (S-plane) and covers solutions for O-DU and O-RU fronthaul S-plane conformance tests as well as transport network test cases described in the WG4 and WG9 documents.

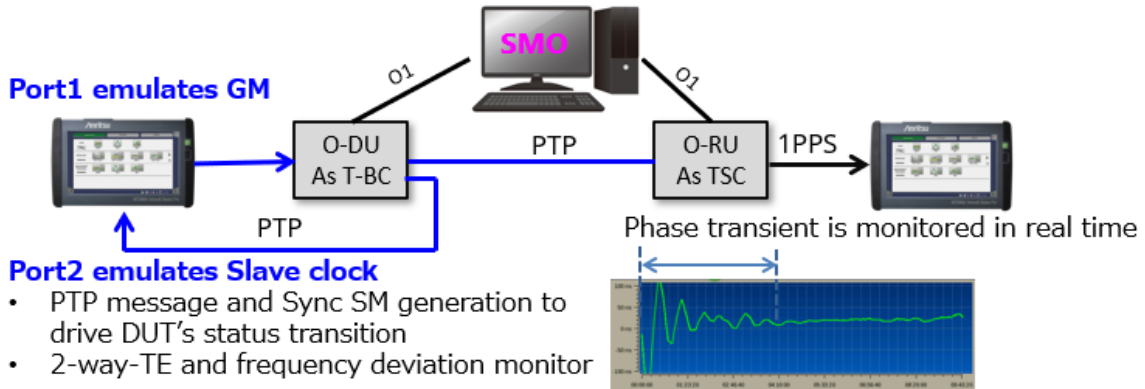
Functional Test Cases

IEEE 1588v2 (PTP) Grand Master/Slave Emulation

The MT1000A emulates IEEE 1588v2 Grand Master and Slave clocks independently at each port with a dual-port measurement interface and supports the G8275.1 and G.8275.2 profiles.

SyncE EEC Emulation

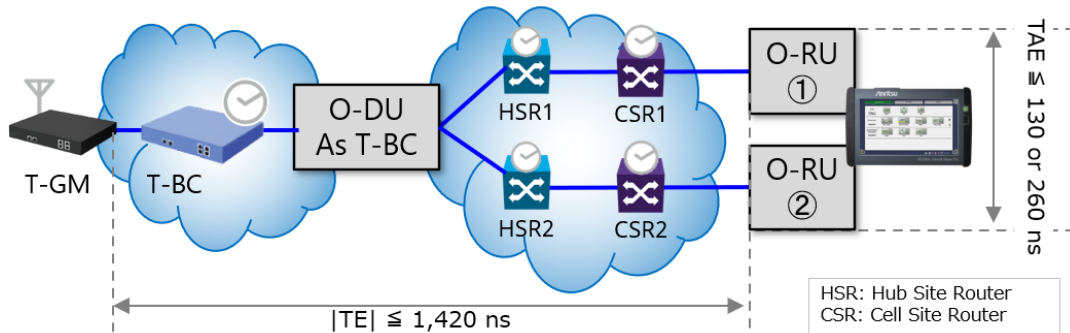
The MT1000A evaluates SyncE with the following functions: Ethernet Sync Message Channel (ESMC) Packet Sending, SSM/QL Monitoring, SSM/QL Statistics Monitoring.



Performance Test Cases

Time Error/Wander Measurement

The MT1000A emulates the PTP slave clock and EEC. It has an internal GNSS-synchronized reference atomic clock for measuring time errors, PDV, FPP and Wander (MTIE, TDEV) in compliance with ITU-T G.8261, G.8261.1, G.8271.1, and G.8271.2.



Configuration example for SyncE/PTP application

Model	Name	Qty	Note
MT1000A	Network Master Pro	1	Main unit
MT1000A-005	AUX I/O	1	
MU100011A	100G Multirate Module	1	Test card for GbE, 10GbE, 25GbE and 40/100GbE
MU100011A-003	Up to 10G Dual Channel	1	
MU100011A-017	Ethernet 25G Single Channel	1	
MU100011A-021	SyncE Wander	1	
MU100090B	High Performance GNSS Disciplined Oscillator	1	
MU100090B-001	High Stability/Multi-Band	1	
MU100090B-002	Multi-GNSS	1	Galileo, GLONASS, Beidou, QZSS