



# Anue 3500

## Mobile Backhaul Testing Solution

Validate Sync, Timing and Carrier Ethernet Against Real-World Scenarios



### BENEFITS

- Realistic and repeatable network impairment conditions in your lab
- Industry's most accurate testing solution
- Comprehensive 1GbE and 10GbE Synchronization testing
- Improved productivity and time-to-test
- Increased reliability of your network reduces support costs
- Precisely reproduce and quickly resolve issues occurring in the field

### APPLICATIONS

#### SyncE

- Wander testing to G.8262
- ESMC testing to G.8264

#### IEEE 1588/PTP and CES

- G.8261 and MEF18 testing
- Capture, analyze and replay PDV profiles

#### Ethernet and Link OAM

- Verify Y.1731, 802.1ag, 802.3ah functions
- Ethernet Service ring protection testing

### OVERVIEW

Rapid changes in the wireless network, such as the deployment of LTE, present significant opportunities and challenges to mobile operators and service providers. These changes are driven both by the proliferation of smart phones with bandwidth-hungry multimedia applications and by the adoption of these technologies from a growing subscriber base. These applications depend on a high user quality of experience (QoE), which operators must maintain and improve to gain competitive differentiation.

Since legacy TDM backhaul infrastructure cannot scale to meet demand, the industry has embraced the migration to an all-IP/Ethernet network for scalability and cost effectiveness. This next-generation architecture requires new technologies that support carrier-grade performance on a packet-switched network (PSN).

These promising technologies, which include Synchronous Ethernet, IEEE 1588/PTP, SAToP/CESoPSN, MPLS and Ethernet/Link OAM, require a new way of testing.

**The Anue 3500 is specifically designed to meet these challenges and helps you answer key questions such as:**

- **Can your packet switched network deliver accurate and precise timing and synchronization?**
- **Will Ethernet protection mechanisms provide carrier-grade fail-over performance?**
- **Will your voice and multimedia services provide acceptable QoE?**
- **Can legacy TDM services be maintained over your NGN PSN?**

### REAL-WORLD TESTING AND ANALYSIS

To develop and deploy these promising technologies in a carrier-grade network, it is necessary to prove that they deliver subscriber QoE, under real-world conditions and not just under pristine lab conditions. This validation must occur before the expensive and time-consuming task of deployment.

The Anue 3500 brings accurate real-world network conditions to your lab, either through standards-based test cases or by measuring actual conditions on your live network for playback in the lab. In both cases, conditions are reproduced with the industry's highest level of precision and accuracy to provide maximum repeatability. Testing that is relevant to post-deployment network conditions produces results you can rely on to build a network.



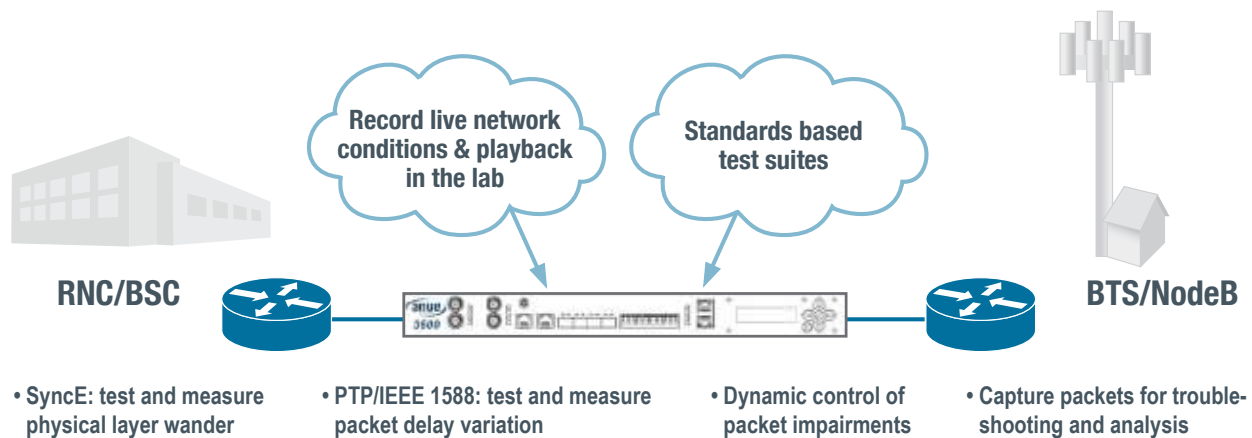
## Real-time graphed analysis and pass/fail results



## Increased Productivity

In today's fast-paced, competitive environment, where engineering resources are limited, learning curves increase expenses and delay time to market. This is true both when dealing with complex technologies, such as Synchronous Ethernet or IEEE 1588, or when using test tools to test those technologies.

You need a test solution that enables engineers of almost any skill level to complete complex testing quickly and efficiently. The Anue 3500 is designed to do just that. An intuitive test-case-driven interface provides a rich set of real-time graphed analysis and pass/fail results, allowing quick characterization and validation of your mobile backhaul solutions. With a single 3500, you can perform simultaneous bidirectional testing of both SyncE and IEEE 1588 functions to optimize your test budget and your test schedule.



## SPECIFICATIONS

### ■ SOLUTION

- Graphed analysis of packet and physical layer synchronization performance
- Intuitive interface and pass/fail indication enables engineering of any skill level to complete complex testing
- Dynamic control of packet-to-packet impairments
- Symmetric and asymmetric impairment control

### ■ SYNCHRONOUS ETHERNET

- Wander Generation, Tolerance and Transfer testing to ITU-T G.8262
- Measure and analyze physical layer Ethernet wander (TIE, MTIE, TDEV) +/-1ns accuracy
- Measure and analyze recovered clock at SyncE slave (2MHz, 10MHz, T1, E1, 1PPS)
- Measure Ethernet frequency offset and drift
- Pass/Fail results per standards masks
- Capture and view SyncE ESMC/SSM packets
- Generate ESMC packets (ITU-T G.8264)
- Modify and impair ESMC packets

### ■ IEEE 1588 PTP AND CIRCUIT EMULATION

- Introduce precise and repeatable packet delay variation (PDV) +/-16ns accuracy
- ITU-T G.8261 and MEF18 testing suites
- Record and playback real-world PDV profiles
- Measure and analyze packet delay variation (TIE, minTDEV) +/-4ns accuracy
- Measure and analyze recovered clock at PTP slave (2MHz, 10MHz, T1, E1, 1PPS)
- Capture and view IEEE 1588 and CES packets
- Modify and impair packets

### ■ ETHERNET OAM AND PROTECTION SWITCHING

- Capture and view Ethernet OAM packets
- Introduce impairments to verify OAM functions
- Induce controlled protection switching events (ITU-T G.8031/8032)
- Modify OAM packets

### ■ ENVIRONMENTAL

- Operating temperature: 0 to 30° C
- Operating humidity: 10 to 85% noncondensing

### ■ ETHERNET TEST INTERFACES

- 100M/1G RJ45
- 1G optical SFP
- 10G optical SFP+

### ■ REFERENCE CLOCKS

#### External

- 2.048MHz BNC, 10MHz BNC
- T1 BITS RJ48C, E1 MTS RJ48C

#### Internal

- Stratum 3 +/-4.6ppm

### ■ SYSTEM SPECIFICATIONS

- 1U rack mountable enclosure
- Dimensions – 17.3W x 19.0D x 1.7H (inches), 44.0W x 48.3D x 4.3H (centimeters)
- Weight: 15.5lb (7kg)
- Regulatory Compliance – CE, FCC, RoHS
- Power – AC 100-240V, 50-60Hz