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OIF 800ZR Plugfest Measurements White Paper OFC 2026

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ABSTRACT: This paper presents the results of the latest interoperability study of 800ZR transceivers conducted during an OFC 2026 Plugfest. Multiple transceivers were cross-connected in a matrix of transmitter-to-receiver combinations using a noise-loaded link to characterize the penalties associated with interoperability between suppliers. Individual transceiver performance was tested using 1x800GE traffic over a shortened optical line system link over a 150 GHz fixed channel grid. Transmitter waveform captures were recorded for the corresponding modules. This data should be used for validation and refinement of a standardized Transmitter Quality Metric (TQM) such as Extended Transmitter Constellation Closure (ETCC), currently in development by IEEE 802.3dj and ITU Q6/15.

1 Introduction

This white paper is like those from previous years, see references and links in section 8. The discussion here is abbreviated in the interest of time.

2 rOSNR Measurement Setup

The noise loaded short link test setup is displayed in Figure 1 (module interop). The test configuration utilizes a reduced set of OLS equipment similar to the previous OIF interoperability testing white papers. The OLS elements, provided by Cisco, ensured a 150 GHz channel was received by the module. The test equipment was provided by EXFO noted below. These test investigations were conducted during an OIF Plugfest hosted by HPE, Sunnyvale CA.

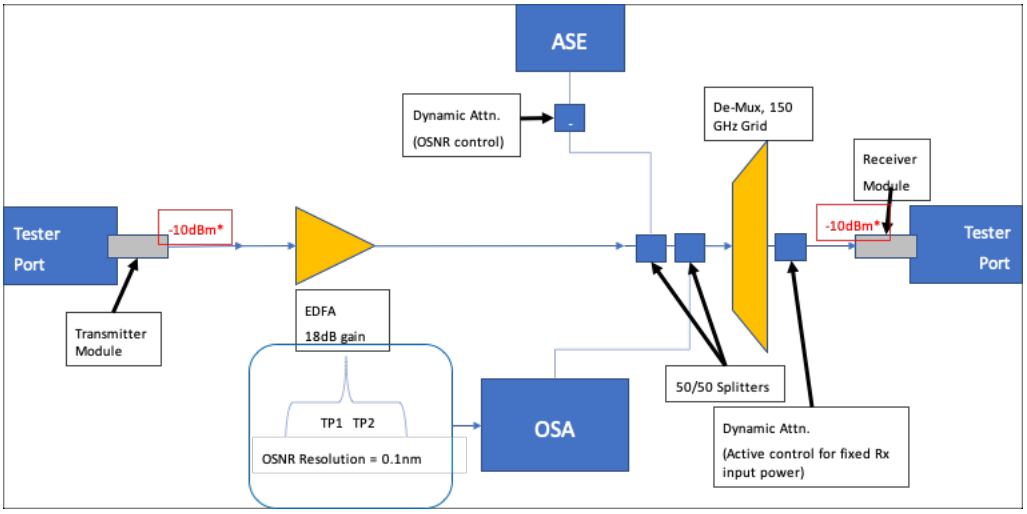

Figure 1: 800ZR plugfest test setup for the noise loaded short link for the rOSNR interop test.

3 Tx Waveform Capture Setup

The waveform captures are taken directly from the Tx output connected via a short fiber patchcord to an optical modulation analyzer (OMA), see Figure 2. The 800ZR modules respectively were inserted into an AresONE Test System for module bring-up and configuration. Besides setting the transmission mode to the standard 800ZR modes, the Tx output power and channel frequency were set to -2 dBm and 193.775 THz for 800ZR. The internal local oscillator of the OMA was tuned prior to waveform recording such that the measured residual frequency offset is within ±100 MHz.

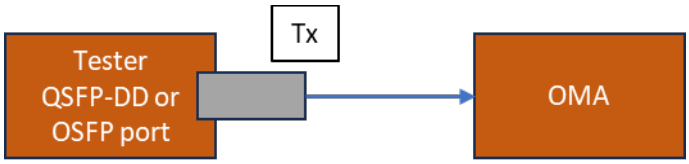

Figure 2: Test setup for direct Tx output captures with an optical modulation analyzer (OMA).

For each transmitter under test (TUT), a total of 100,000 symbols were captured and stored as .mat file. The samples are stored in two complex vectors called "Y1" and "Y2", where the respective real and imaginary parts correspond to the I and Q paths of the dual-polarization coherent receiver connected to a pair of digitizers after applying the front-end correction factors and resampling. The variable "XDelta" gives the time difference between the samples and thus 1/XDelta corresponds to the sampling rate. In addition, a capture of receiver noise without a signal at the OMA input was taken to allow ETCC calculation according to the latest IEEE 802.3dj draft [6].

4 Test results

Table 1 displays the interop rOSNR threshold for each Tx paired with each Rx from the test. The data in Table 1 was measured by the OSA after the 30 second period of error-free traffic. The highlighted cells are the self-loopback test results from each vendor. As always, vendor letter does not correlate with any previous anonymized results.

Table 1: 800ZR Interop rOSNR

EXFO OSA 193.700 THz		Tx							Average ROSNR for this Rx⇩
		Vendor A	Vendor B	Vendor C	Vendor D	Vendor E	Vendor F	Vendor G	
Rx	A	24.2	23.7	24.3	24.4	25.2	24.9	25.5	24.6
	B	24.6	24.3	24.6	25.3	26.9	25.0	25.8	25.2
	C	24.7	24.1	24.6	25.1	26.6	25.5	26.4	25.3
	D	25.0	24.3	24.8	25.0	26.5	25.0	25.7	25.2
	E	24.0	23.5	24.0	24.3	25.4	24.8	25.6	24.5
	F	25.9	24.8	25.3	25.7	27.5	25.8	26.6	25.9
	G	27.5	24.8	25.3	25.5	28.0	25.5	25.8	26.1
Average ROSNR for this Tx @ 193.700 THz ⇨		25.1	24.2	24.7	25.0	26.6	25.2	25.9	Single Vendor rOSNR of Rx

800ZR waveform captures should be found in an attached or nearby .zip file. It can be noted that all captured waveforms can be demodulated, which serves as a preliminary proof of the validity of the recording. Furthermore, it gives a good indication of the relative transmitter signal quality.

5 Summary

This white paper briefly describes the capturing of 800ZR Tx waveforms as well as the interoperability matric (rOSNR) from a number of pluggables that participated in the OFC 2026 800ZR interoperability Plugfest.

The recoding files, which are available for download as *800ZR_Tx_Waveforms_2026.zip*, are expected to be instrumental for further development, refinement and validation of ETCC methodology and the definition of the associated reference receiver.

6 Acknowledgement

The OIF appreciates all demo partners for their participation in the Plugfest.

7 Participating Module Vendors

Accelink
Adtran
Ciena
Cisco
Coherent
HPE
Marvell
Nokia
O-Net

8 References

1. OIF, "OIF-400ZR-03.0 – Implementation Agreement 400ZR", *October 2024*
2. OIF, "OIF-800ZR-01.0 – Implementation Agreement 800ZR", *October 2024*
3. OIF, "OIF 400ZR Interoperability White Paper OFC 2025 Plugfest", *April 2025*
4. OIF, "OIF 800ZR Interoperability White Paper OFC 2025 Plugfest", *April 2025*
5. OIF, "OIF 400ZR and 800ZR Transmitter Quality Metric Measurements White Paper – OFC 2025 Plugfest", *April 2025*
6. IEEE 802.3dj, D3.0 "Draft Standard for Ethernet Amendment 13: Media Access Control Parameters for 1.6 Tb/s and Physical Layers and Management Parameters for 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Operation", 2026

Additional OIF White Papers and supporting data can be found at Educational/Demo White Papers.

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