

APS Performance Testers

APS Time Verification

MP159x

Network Performance Tester



Introduction

This application note demonstrates the Time Verification feature of the Automatic Protection Switch (APS) available on many of Anritsu's network performance testers. This document, written in the context of an MP159x customer demonstration, walks the user through test setup, configuration and execution.

Many other products' time verification features break down switch times into 10 to 100 milliseconds, as does Anritsu's MP159x, but Anritsu's feature also supports a switch time error free period of one millisecond. This unique test capability allows service providers and network equipment manufacturers to characterize and validate the correct APS operation and function of their network equipment quickly and easily.

This application note's instructions apply to the entire family of MP159x products – MP1590B, MP1591A and MP1595A – that address the complete range of SONET/SDH and OTN rates and testing environments.

The unique strengths found only in the MP159x APS Performance Tester include:

- Millisecond switch time resolution for all supported bit rates (1.5 Mb to 40Gb).
- Error free period from 1 ms to 100 ms.
- Log switch times in report format for up to 50 switches.
- The ability to execute APS performance switch measurements for all mapped channels (background and foreground).

Time Verification

Time verification can be described as a measurement during a period of time during an event. A time verification feature measures and records these events. It validates path delays (primary input or storage element to primary output or storage element) to ensure that they are not too long, and checks clock pulses to ensure that they are not too wide or narrow.

- TEST SETUP.** Testing provided an in-depth analysis of this test solution as seen through the customer's eyes. Anritsu MP159x demonstrated the tester's ability to verify APS features without requiring additional third party devices such as scopes and/or additional test equipment.

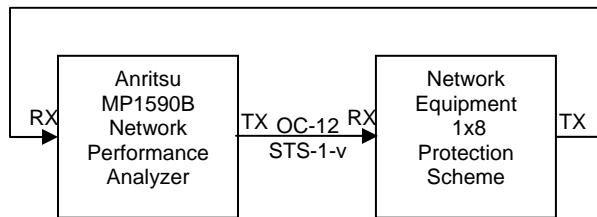


FIGURE 1.

Possible 5500 APS test solution for network equipment manufacturer.

- TEST CONFIGURATION.** The Anritsu MP159x configuration corresponds to the existing SONET cross-connection configuration used in the demonstration. During the demonstration, Anritsu's engineers communicated the following information: The feature eliminates the time and effort required to re-provision a network equipment manufacturer's device. Measurement starts when the selected error or **alarm trigger** detection occurs. It ends when the target trigger is not detected for longer than the time specified in the **Error Free Period**. **Bit Error** is selected as the alarm trigger, allowing for any received error to trigger the beginning of the APS measurement time. In order to generate the bit error required to begin APS measurement, the MP159x **transmits LOF** for one second. However, any bit error received begins the measurement.

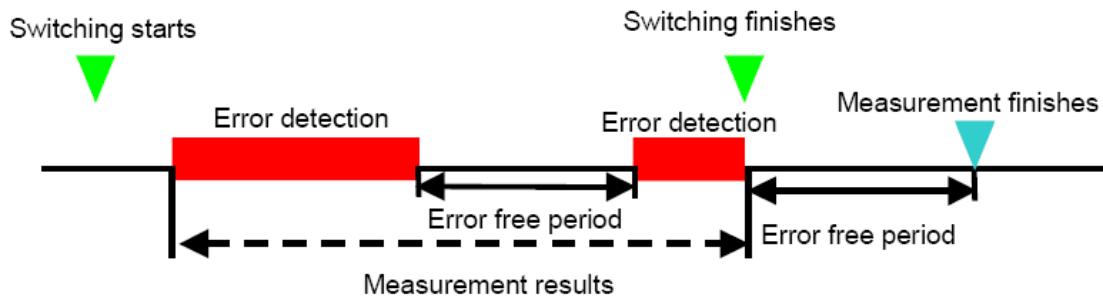


FIGURE 2.

Visual representation of Anritsu's APS feature.

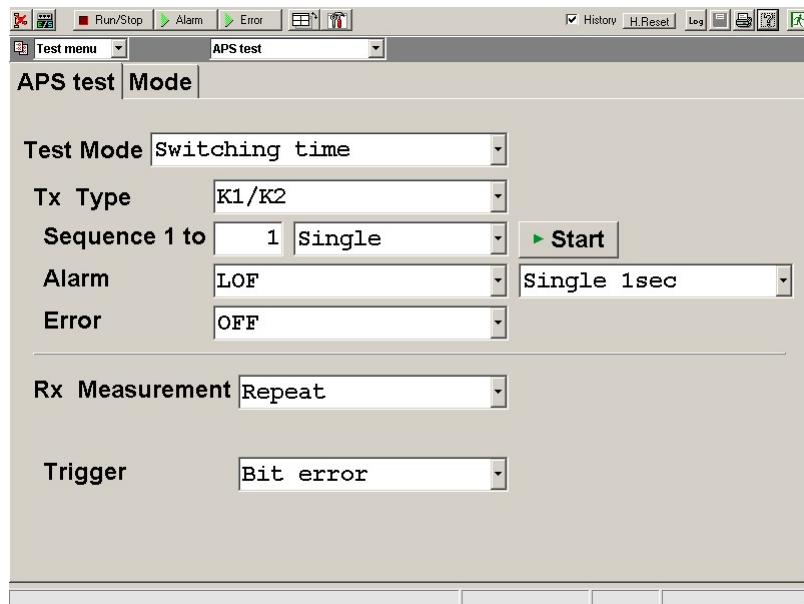


FIGURE 3.

APS test interface on MP 159X.

3. **TEXT EXECUTION.** The demonstration verified feature functionality within a network environment utilizing the MP159x. The testing was conducted for demonstration purposes only and was not based upon documented vendor requirements of TL9001 standards.
- The MP159x transmitted an LOF (Loss of Frame) alarm for one second, triggering the start of the APS measurement. The alarm was identified and recorded in the SONET Error/Results screen.

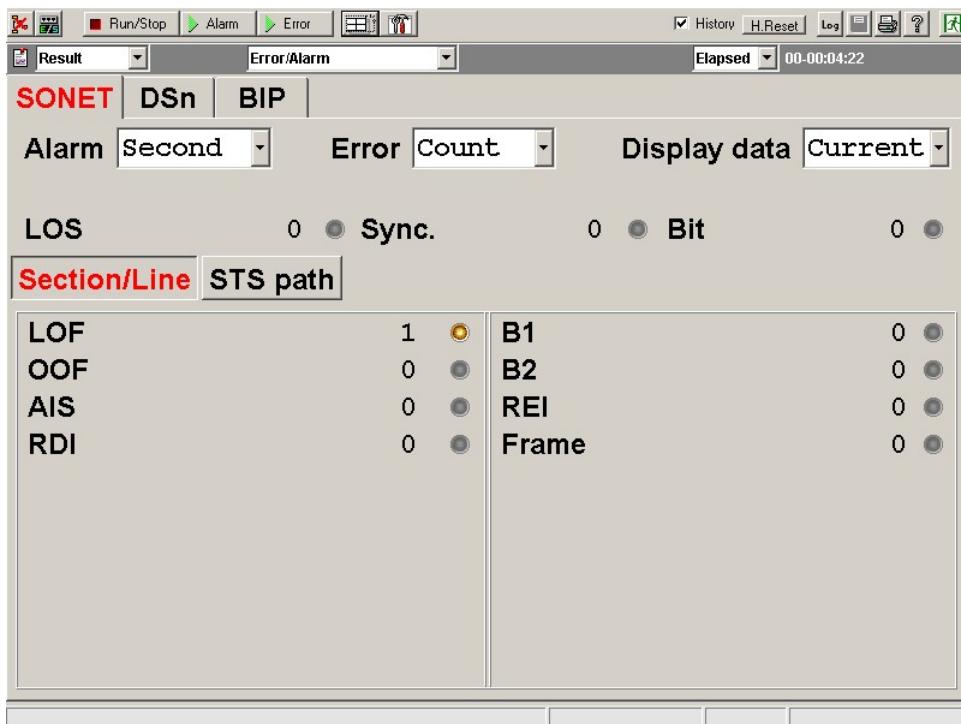


FIGURE 4.

Alarm results on interface screen.

- The recorded measurement switch time reflected the length of the alarm received after subtracting the error free period. In this case, the alarm lasted for one second, plus the amount of time to receive a clean signal.

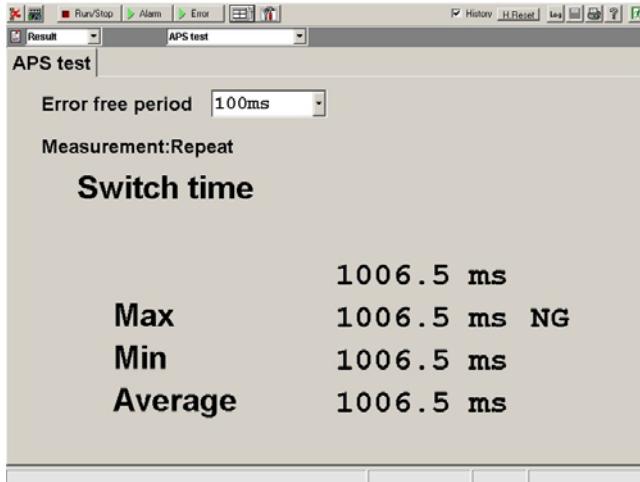


FIGURE 5.

APS Results Window.

- Since the demonstration was performed on a loopback signal, the switch time recorded was very close to the LOF generation. A table of the collected samples was available for comparison and analysis as additional samples were recorded.

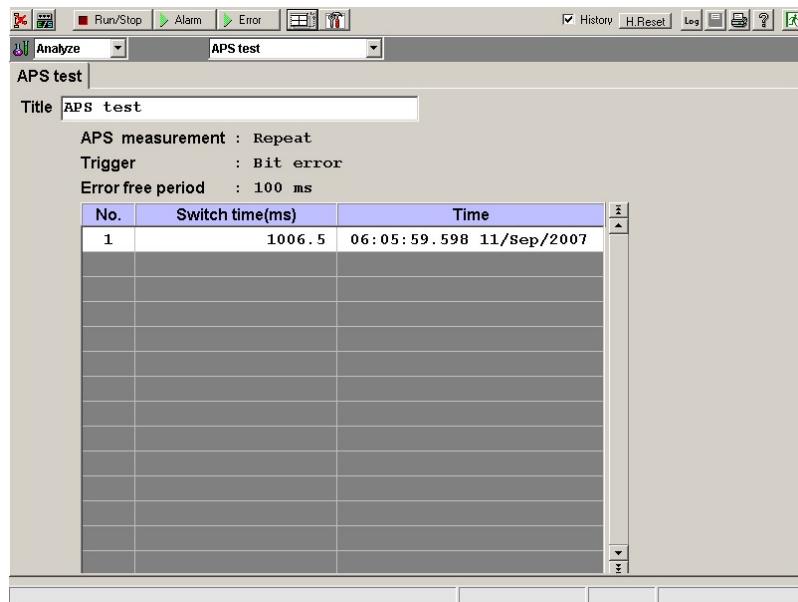


FIGURE 6.

APS analysis screen.

- The user's results were available on one screen for real-time access and for the tester's convenience.

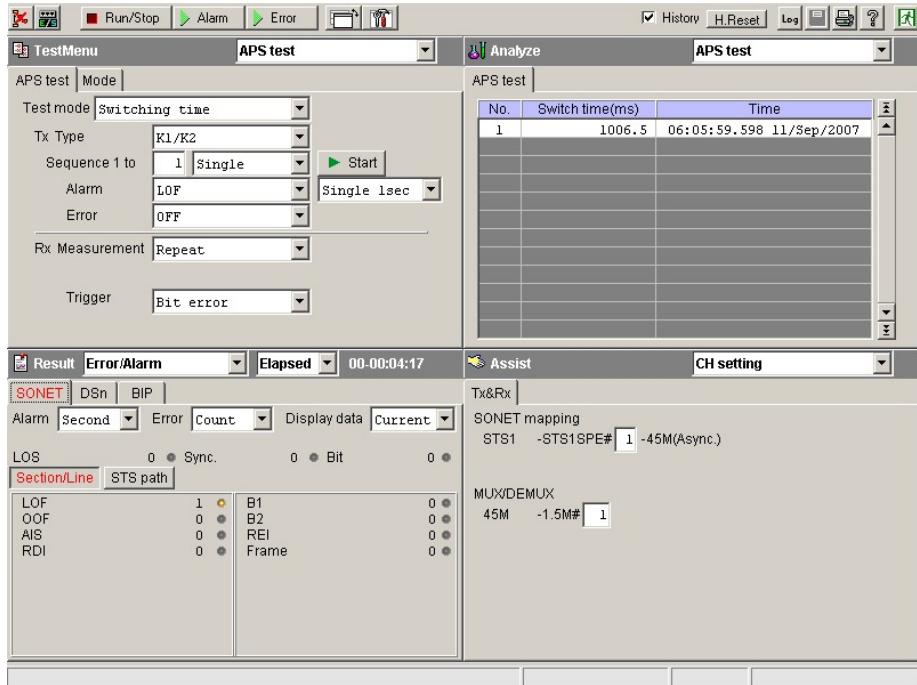


FIGURE 7.

Summary of all previous screens.

Conclusion

Anritsu's time verification feature breaks down switch times into seconds or microseconds, allowing service providers and network equipment manufacturers to characterize and validate the correct APS (Automatic Protection Switch) operation and function of their network equipment quickly and easily. Other strengths of this product include: error free period from 1 ms to 100 ms; log switch times in report format for up to 50 switches and the ability to execute APS performance switch measurements for all mapped channels (background and foreground). This application note explains the necessary steps to demonstrate the entire family of Anritsu's MP159x APS network performance testers. It walks the user through test setup, configuration and execution.



Specifications are subject to change without notice.

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