VIAVI

Simplifying Detection and Resolution of Missing Frame Errors with the Xgig® Load Tester

A critical performance metric for Fibre Channel switches is whether they drop, misdirect, or deliver frames out of order. Traditional network analysis tools fall short of being able to easily detect, monitor, and analyse these types of errors, making this a challenging and time consuming metric for developers to measure accurately. Specifically, the capture of real-time traffic is based upon a single frame while the identification of missing frame events relies on information gathered over a sequence of frames.

The Viavi Xgig Load Tester offers unique capabilities for comprehensively measuring this key performance metric in even the most complex network configurations. Used in conjunction with the Xgig Analyser, the Load Tester utilises proprietary technology to verify data integrity and accelerate development and troubleshooting of network switches, enabling error resolution in minutes.

The Xgig Load Tester

The Load Tester is one of the multi-functional capabilities that can be licensed and enabled on FC and Ethernet Xgig Analysers and Blades. The Load Tester generates traffic streams to pass through switches and, by monitoring both sides of links, developers can ensure that frames both arrive and arrive in the correct sequence. Because the Load Tester generates deterministic/known traffic, it can detect missing frames at their receiving paths and is able to differentiate between dropped frames, out of order frames, and misdirected frames:

The Load Tester combined with the Xgig Analyser provides the capabilities developers need to detect, capture, locate, and debug missing frame errors. Because the Load Tester highlights the exact frame that caused the error and the Analyser captures the erroneous trace in real-time, developers can identify and source errors quickly and easily, eliminating tedious guesswork and time-consuming manual searches through large trace buffers.

Easy Setup and Configuration

In order to detect missing and out-of-order frames, the Load Tester ports are connected to each switch port with Analyser ports placed in-line to capture all traffic (see Figure 1 for a diagram of this test setup configured for a 48-port switch). Note that the Analszer does not participate in data transfers but rather observes them non-intrusively. Developers then set triggers to detect missing, out-of-order, and misdirected frame errors. These trigger signals sent by the Load Tester through the external TTL trigger output on the chassis. For the Analyser to receive these trigger signals and act upon them, the trigger-in ports on the host chassis need to be connected to the trigger signals.

Management of all Load Tester and Analyzer ports, even across multiple Xgig chassis, is consolidated through a single PC running Maestro and Xgig Analyser. Maestro uniquely allows users to also utilise the same GUI to manage other Xgig generation functions such as BERT, Jammer, and Generator, thus eliminating the need to switch between different GUIs when using multiple tools.

The Load Tester provides the flexibility necessary to complete testing as comprehensive or as complicated as needed: developers can create configurations that map every Load Tester port to every other Load Tester port through the switch or fabric, each running different traffic. At the same time, Maestro keeps the process of defining, managing, and executing triggers simple, even with such complex configurations.
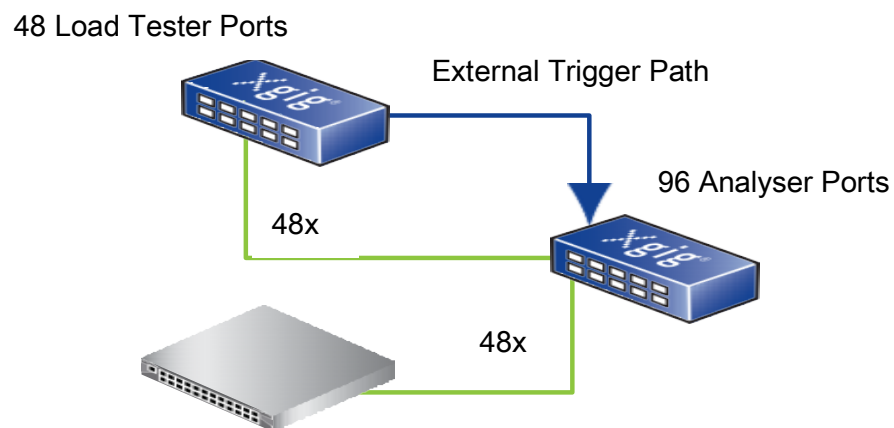

Figure 1: 48-port switch test setup with Xgig Load Tester and Analyser

Setting up triggers in Maestro and Trace Control

Two steps are required when setting capture triggers for error events.First setup the Load Tester
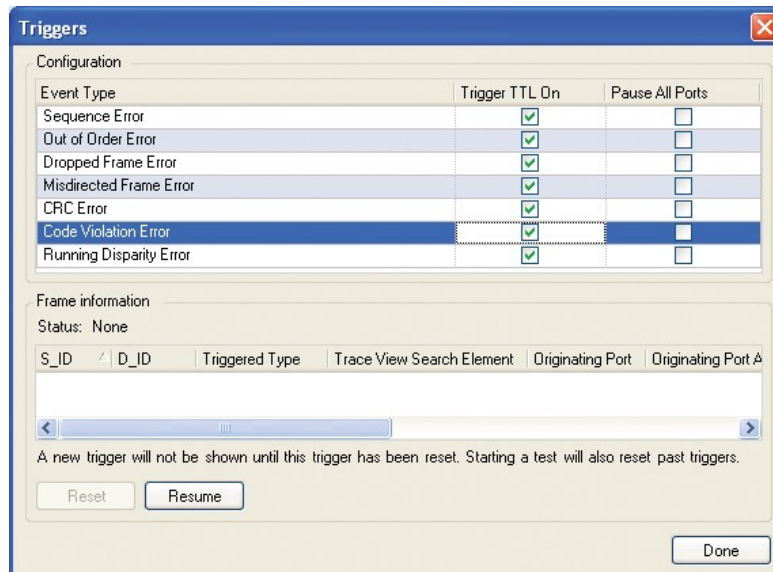(see Figure 2).

Figure 2: Setting up triggering conditions in Maestro

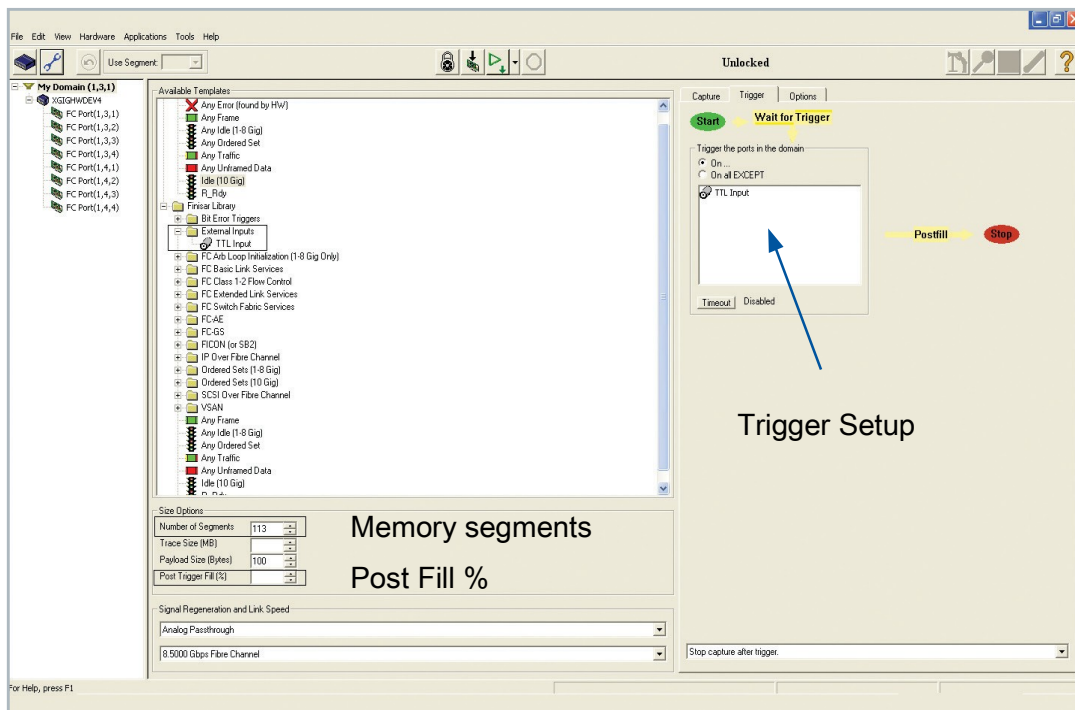The second step is to set the trigger condition in TraceControl (see Figure 3).

Figure 3: Setting Analyser Trace Control to configure the trigger condition and trace memory

Developers also have access to a variety of useful features:

- With the 'Create Added Tag' in the Load Tester, developers can easily configure similar traffic links and triggers all at one time

- The "Post Fill" field in the Trace Control Configuration pane controls how much post-trigger traffic to collect, making it possible to determine where misdirected frames actually ended up.

- With its multiple memory segments, the Xgig Analyser can capture traces for multiple errors without needing to reset the trace memory.

Fast Error Identification and Resolution

Once the Load Tester determines that an error has occurred, it will trigger the Analyser. As the Analyser has been collecting traffic the entire time the system has been running, this trigger actually stops traffic collection. Developers can then locate the frame that caused the error within the trace buffer.

Using traditional tools, developers have to search through the trace buffer manually since they don't know which frame caused the error. The Load Tester simplifies this process by displaying key frame characteristics that can be found with Xgig's unique and powerful Quick Search capabilities in Trace View to quickly filter through the trace buffer and locate the trigger frame. Using other filters supported by the Analyser, developers can easily determine which of the three scenarios applies and identify related frames to help in debugging the problem.

About Xgig

The Viavi Xgig Testing and Analysis platform is the industry's leading storage networking troubleshooting and debugging tool. Xgig's unique cross-triggering capabilities between the Load Tester and the Analyser enable the test and capture of sophisticated network problems that would be otherwise too difficult to pursue with an analyser alone and guarantees the accurate measurement of events such as missing frames to accelerate the troubleshooting process. With the powerful combination of the Load Tester and the Analyser, backed by the Viavi intuitive GUI control application, you can guarantee switch robustness with the greatest speed and highest confidence.