

FaultLine FAQ

1. What Operating Systems will FaultLine run on?

For the best performance we recommend Windows XP Professional. FaultLine has been tested on the following operating systems: Windows 7, Windows XP Home/Professional (32bit), Windows Vista 32 & 64 bit and MS Server 2003.

2. What Network Adapter Cards you recommend?

A lot depends on your application and where you plan on deploying FaultLine. If you are planning on monitoring a heavily loaded 1 Gig Ethernet you will need a PCIe network adapter card such as a Broadcom NetXtreme Gigabit NIC or an Intel Pro/1000 PT Desktop NIC. We have had good luck with the integrated NICs that come with high performance laptops utilizing the Realtek chipset.

3. Can the FaultLine be run on a server?

Yes. FaultLine will run on any Windows compatible hardware set including dedicated servers and laptops.

4. What is the best way to attach FaultLine to the network?

There are two basic ways to attach FaultLine to a network: passive or active.

In a passive connection, FaultLine must be connected to a switch monitor port or use a tap/optical splitter. This connection type is usually best for long term monitoring.

In an active connection, FaultLine is connected to an unused switch port (with IGMP snooping enabled on the switch). In this connection type, you must configure FaultLine to subscribe to one or more multicast streams. This connection type is best for short term monitoring.

5. I don't want to dedicate a machine to FaultLine.

No problem, FaultLine does not require a dedicated machine; it is a standalone Windows application that you run on demand.

6. Is there a correlation system in place for multiple probes that reside within the same network?

This is on our road map for the future. All correlation between FaultLines today is manual. In the mean time it is possible to run two copies of FaultLine on a PC with multiple NICs.

We understand why correlation is important of course in the pursuit of true end-to-end troubleshooting and fault isolation. We feel that we can make a significant price/performance contribution in the area of video network management, as we have with our initial, dispatched, FaultLine solution.

7. Where in the video distribution network do I hookup FaultLine?

You can hookup FaultLine on any 10/100/1000 Ethernet connection. We recommend that you install one FaultLine near your source of video content (headend) and then deploy a second roving FaultLine on a laptop.

8. I'm running MPEG-4/H.264, FaultLine only does MPEG-2 TS.

To answer this question, it is important to start with some definitions.

- *MPEG-2 Transport Stream (MPEG-2 TS) is a container format for transmitting packetized elementary streams (video, audio and data).*
- *MPEG-2 and MPEG-4/H.264 are standards for compressing audio & video.*

FaultLine analyzes MPEG-2 transport streams that contain video and audio compressed with ANY method. Today, MPEG-2 and MPEG-4/H.264 are the most commonly used compression standards.

9. I want to measure MDI (Media Delay Index)

The first version of FaultLine does not include MDI statistics because they are only valid for constant bit rate (CBR) video streams while we are predominately seeing variable bit rate (VBR) network implementations.

We are very familiar with the MDI measurement, having implemented it in other (OEM) products, and will be happy to add it to FaultLine when the need arises, as we know there are CBR streams in use.

Additional information:

The MDI subset (RFC-4445) is a useful quality indicator for constant bit rate compressed video but is not defined for to variable bit rate stream networks. This is a somewhat contentious topic in the industry, so we are proceeding cautiously. MDI was always touted as a relatively simple measurement to make and scale to hundreds of channels.

The MDI RFC only specifies how to measure MDI for CBR streams. The complexity of the measurement in VBR systems goes up dramatically however--as IneoQuest (RFC sponsor) has acknowledged in their formal publications.

The MDI consists of two components: the Delay Factor (DF) and the Media Loss Rate (MLR). The Delay Factor gives a hint of the minimum size of the buffer required at the next downstream node. Instead of relying upon MDI Delay Factor (and it's inherent problems with VBR streams) to estimate buffer requirements, FaultLine directly measures network induced jitter. This measurement, called packet inter-arrival jitter, is computed identically for both CBR and VBR streams and can be reliably used to calculate buffer requirements, the same purpose as the MDI Delay Factor.

In addition to counting lost packets as specified by the MDI Media Loss Rate, FaultLine uses a proprietary, real-time algorithm that examines the context of the lost packets to identify the source (network or encoder).

10. Is there a way to disable monitoring on selected streams?

Yes. If you have FaultLine hooked through a monitor port or tap, just define a Channel Group for the channels you want to ignore, and then turn off alarms for that channel group. If you have configured FaultLine to pull streams using the Active Test function, just exclude those channels you want to ignore from the channel ranges.

11. How does FaultLine handle audio-only streams (i.e., music channels)?

FaultLine will analyze audio-only streams if they are contained in MPEG2 transport streams. If the traffic is VoIP, those streams will not be analyzed but will show up on Voice dashboard gauge.

12. The data sheet states that you can automatically detect Multicast and VOD streams on the network, how is this achieved?

We inspect every UDP and TCP stream present for video/audio content. The MPEG-2 Transport Stream (MPEG2-TS) format is very specific and easy to detect. This stream format contains the video and the associated audio content, regardless of whether the encoding scheme used is MPEG-2, MPEG-4, H.264, etc., or the addressing (unicast or multicast). VOD is no exception in this regard.

13. When I connect FaultLine to a switch port it does not see my VOD channels. What is going on?

FaultLine can emulate a set top box and request multicast channels to monitor, (eliminating the need for a monitor port), just as a STB would. This emulation capability uses IGMP. VOD on the other hand uses RTSP to set up a unicast stream to the requestor, a capability we may add down the road but do not currently support. To view VOD channels that are passing through a switch you must setup a monitor port or use a tap.

14. Does the probe support 802.1q (VLAN tagging) and can it also support multiple VLANs?

Yes.

15. What is a CC error?

The continuity counter (CC) is a 4 bit sequence number used to identify each MPEG-2 TS packet. A CC error is a break in the sequence numbers (1, 2, 3, 4, X, 6, 7, etc) and indicates a problem with the MPEG-2 transport stream packets themselves caused by any one of the following conditions:

- *lost packet*
- *out of sequence packet*
- *duplicate packet on a per packet identifier (PID) basis*

16. What is the difference between a CC error and a lost packet?

Lost packets are one cause of CC errors.

17. Competing products don't count Encoder Errors. What is FaultLine counting?

An Encoder Error is a type of CC error that FaultLine has determined through a proprietary algorithm to be caused by the video encoder. FaultLine's CC error count includes Encoder errors.

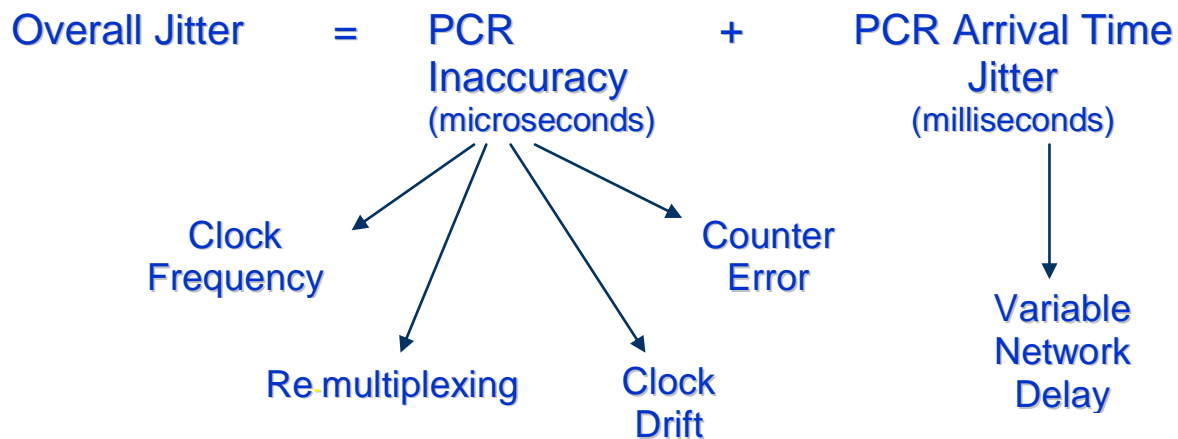
18.I want to see the actual video.

That is a feature being considered for a future release. In the mean time we recommend you use VLC (www.videolan.org) in conjunction with FaultLine to view the desired channel.

19.What is PCR jitter and why is it important?

Timing in the transport stream is based on the 27 MHz system time clock (STC) of the encoder. To ensure proper synchronization during the decoding process, the decoder's clock must be locked to the encoder's clock. In order to achieve this lock, the encoder inserts a 27 MHz time stamp into the transport stream for each program. This time stamp is referred to as the program clock reference (PCR). If excessive PCR jitter is present, the decoder cannot synchronize itself correctly to the data stream. The end result is visual impairments, such as pixelization, frame freezes, and loss of color.

Overall Timing Jitter



*In today's typical video-over-IP networks, PCR jitter should be less than **20 ms**.*

20.What causes Lost Packets and why is it important?

Loss of IP packets may occur for multiple reasons—bandwidth limitations, network congestion, failed links and transmission errors. Packet loss usually presents a bursty behavior, commonly related to periods of network congestion.