

# LXI<sup>why</sup>

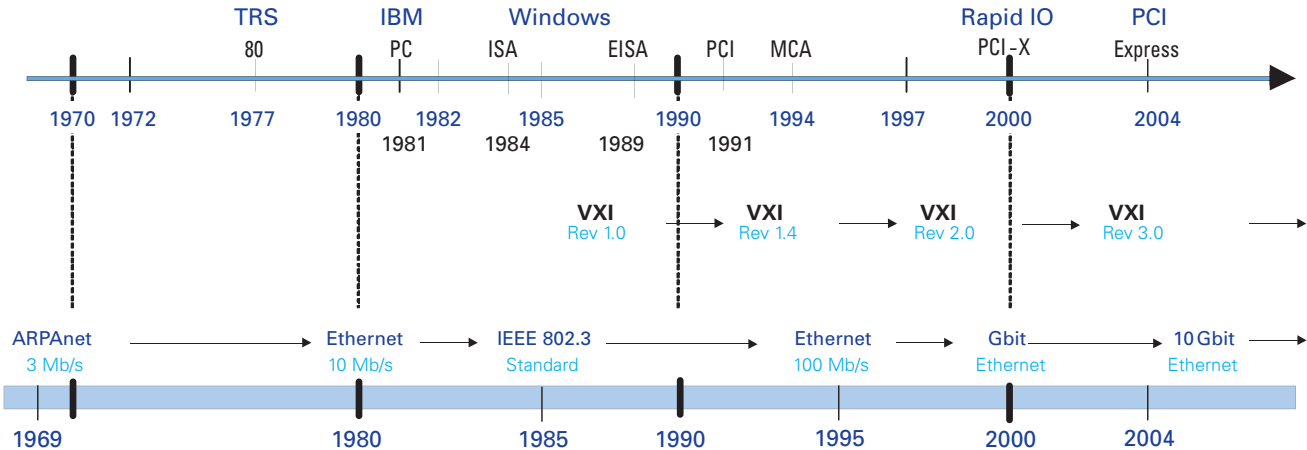
VTI and Agilent Technologies co-founded the LXI Standard in response to customer requests for a common, simplified instrumentation platform ideally suited for small to medium channel density and distributed test applications.

- Ethernet is an established high-speed bus that continues to evolve •
- Increases in data throughput not matched by GPIB and MXI •
- Stable architecture that provides backward compatibility •
  - Computer platform and OS independence •
  - Low-cost interface, cabling and accessories •
  - Unlimited range and nodes •

The LXI consortium was co-founded by VXI Technology (VTI) and Agilent Technologies in 2004 to offer the industry an open-architecture instrumentation bus that would leverage all of the benefits of Ethernet for test and measurement. The intent was to provide 'one' forward looking architecture for small-to-medium density and distributed applications. By leveraging the two most successful instrumentation platforms (VXI and GPIB), LXI has been adopted and carried forward by approximately 50 of the leading manufacturers of test and measurement instrumentation.

LXI's compact, flexible packaging, high-speed I/O, and reliable operation meet the needs of R&D and manufacturing engineers delivering electronics for the aerospace/defense, automotive, industrial, medical, and consumer electronics markets.

The VXIbus is an ideal platform for our customers that require high-channel density in their applications. LXI now allows us to develop leading edge products with the same longevity advantages that VXI has given the industry, for the applications that VXI was not designed to address.



Comparison of ever-changing PC architecture Vs. stability of VXI and LXI (ethernet) platforms

# Instrument Grade Ethernet LXI

VTI has been instrumental in the development of the LXI specification, contributing significant engineering resources to the technical working groups tasked with content generation, test, and validation.

The LXI Specification extends the capabilities of typical Ethernet by addressing key functional areas that are necessary to ensure instrument interoperability, performance, and usability. The primary sections include the following:

- Physical •
- LAN Device Synchronization and LAN-based Triggering •
- Module-to-Module Data Communications •
- Hardware TriggerBus •
- Programmatic Interface •
- LAN Configuration •
- WEB Interface •

The base level of LXI compliance features device discovery, web browser control, and a common application programming interface (API). Web browser functionality provides out-of-the-box operation without the installation of any software or drivers, while device discovery identifies all LXI compliant devices on the network, simplifying startup and configuration.

IEEE 1588 further extends LXI instrument functionality by adding LAN-based synchronization. IEEE-1588 defines a precision clock synchronization protocol for networked measurement instrumentation exclusively over the LAN connection.

Instruments can be synchronized, and activities initiated, using LAN commands with accuracies in the sub-microsecond range. This approach is ideal for distributed measurement applications.

The addition of the TriggerBus Hardware Trigger Interface provides the highest level of synchronization and platform interoperability. This interface is ideal when applications require hardware-level triggering for deterministic command, response and handshaking; system-level clock and trigger distribution is also possible. The TriggerBus interface also provides a convenient mechanism for interfacing to other open-standard platform architectures, such as the VXIbus, thus leveraging current test hardware investments.

LXI test and measurement modules are optimized for use in design validation and manufacturing test systems with LAN connectivity enabling modules to be accessed from anywhere in the world. Unlike a modular cardcage, LXI modules are self-contained with their own processor, LAN connections, power supply and trigger inputs. Signal I/O connections are typically located on the front panel, with LAN and power connections located on the rear. LXI modules eliminate the need for displays, buttons and dials traditionally found on rack-and-stack instrumentation. They use standard web browsers for troubleshooting and implement IVI-COM drivers for communications, thus simplifying system integration.

