



Glossary of Networking Terms

(For Understanding LXI)

Aug 3, 2013 Edition

Notice of Rights/Permissions: All rights reserved. This document is the property of the LXI Consortium and may be reproduced, but unaltered, in whole or in part, provided you retain the LXI copyright on every document page.

Copyright 2013 LXI Consortium, Inc. All rights reserved.

Glossary of Networking Terms

Access Point (WAP – Wireless Access Point)

A Wireless Access Point is a device that allows wireless equipped computers and other devices to communicate with a wired network. It can also used to expand the range of a wireless network.

Auto-MDIX (Medium Dependent Interface Crossover)

Auto-MDIX, or Auto-crossover, is a protocol allowing two Ethernet devices to negotiate their use of the Ethernet TX and RX cable pairs. This allows two Ethernet devices with MDIX or MDI connectors to connect without using a crossover cable, a cable that reverses the TX and DX pairs on one end.

ARP (Address Resolution Protocol)

ARP is a protocol used by the Internet Protocol (IP), specifically IPv4, to map IP network addresses to the hardware addresses used by a data link protocol. IPv4 uses ARP over the Ethernet. The term address resolution refers to the process of finding an address of a computer in a network.

CSMA/CD (Carrier sense multiple access with collision detection)

This is a technique to detect when two or more devices are trying to transmit over the LAN at the same time. Operations are aborted, and each LAN Devices delays retrying to transmit by a random amount of time. CSMA/CD improves CSMA performance by terminating transmission as soon as a collision occurs, thus shortening the time required before retrying.

Default Gateway

In computer networking, a gateway is a node (a router) on a TCP/IP network that serves as an access point to another network. A default gateway is the node on the computer network that the network software uses when an IP address does not match any other routes in the routing table.

DNS (Domain Name System)

The DNS translates Internet domain and host names to IP addresses. DNS automatically converts the names we type in our Web browser address bar to the IP addresses of Web servers hosting those sites.

DNS-SD (Domain Name System - Service Directory)

A protocol to advertise instance service names to enable zero address configuration scenarios for networked devices.

DMZ (Demilitarized Zone)

The DMZ feature allows one LAN Device on the “Ethernet” side exposure to the “Internet” or WAN side. All ports forwarded vs. Port Range Forwarding, which only passes designated port. DMZ avoids having to know which ports to pass through the Router.

DNS Server

A server that maintains information about a portion of the Domain Name System (DNS) database and that responds to and resolves DNS queries.

Domain name

This is the name given by an administrator to a collection of networked computers sharing a common directory. Part of the Domain Name System (DNS) naming structure, domain names consist of a sequence of name labels separated by periods.

DHCP (Dynamic Host Configuration Protocol)

The Dynamic Host Configuration Protocol is a network protocol that is used to configure devices which are connected to a network (known as hosts) so that they can communicate on an IP network. DHCP uses a client/server model where the DHCP server maintains centralized management of IP addresses that are used on the network. DHCP-supporting clients can then request and obtain lease of an IP address from a DHCP server as part of their network boot process.

Firewall

The Firewall screen offers Filters and the option to Block WAN Requests. Filters block specific Internet data types and block anonymous Internet requests. SPI Firewall Protection, Block Anonymous Internet Requests, Filter Multicast, Filter Internal NAT Redirection, and Web Filters make up the typical makeup of a Firewall.

Hostname

A hostname is the unique name, rather than an IP Address, by which a network attached to a device. The hostname identifies a particular host in various forms of electronic communication such as E-mail.

HTML (Hypertext Markup Language)

A simple markup language used to create hypertext documents that are portable from one platform to another. HTML files are simple ASCII text files with codes embedded (indicated by markup tags) to denote formatting and hypertext links.

HTTP (Hypertext Transfer Protocol)

The protocol used to transfer information on the World Wide Web. An HTTP address (one kind of Uniform Resource Locator [URL]) takes the form: *http://www.w3.org*

ICMP (Internet Control Message Protocol)

Internet Control Message Protocol is a required protocol tightly integrated with IP. ICMP messages, delivered in IP packets, provide out-of-band messages related to network operation or improper operation.

ICS (Internet Connection Sharing)

ICS is the use of a device with Internet access or other Internet gateway as an access point for other devices. Microsoft introduced ICS as a feature for sharing a single Internet connection on one computer between other computers on the same local area network. It makes use of DHCP and network address translation (NAT).

IP (Internet Protocol)

IP, as the primary protocol in the Internet (or Network layer in the TCP/IP model) of the Internet protocol suite, has the task of delivering packets from the source host to the destination host solely based on the IP addresses. For this purpose, IP defines datagram structures that encapsulate the data delivered. It also defines addressing methods used to label the datagram with source and destination information.

IP address

An address used to identify a node on an IP internetwork. Each node on the IP internetwork uses a unique IP address, made up of the network ID, plus a unique host ID. This address represents with the decimal value of each octet separated by a period (for example, 192.168.7.27, which is an IPv4 address). You can configure the IP address statically or dynamically by using DHCP.

IPv4 Address

Internet Protocol version 4 (IPv4) is the fourth version in the development of the Internet Protocol (IP) and the first version of the protocol to be widely deployed. Together with IPv6, it is at the core of standards-based internetworking methods of the Internet.

IPv4 is the most widely used version of the Internet Protocol. It defines IP addresses in a 32-bit format, which looks like 123.123.123.123. Each three-digit section can include a number from 0 to 255, which means the total number of IPv4 addresses available is 4,294,967,296 ($256 \times 256 \times 256 \times 256$ or 2^{32}).

IPv6 Address

Internet Protocol version 6 (IPv6) is the latest revision of the Internet Protocol (IP), the communications protocol that routes traffic across the Internet. While IPv4 uses 32-bit addresses, IPv6 uses 128-bit addresses, which increases the number of possible addresses by an exponential amount. For example, IPv4 allows 4,294,967,296 addresses. IPv6 allows for over 340,000,000,000,000,000,000,000,000,000,000,000,000,000,000 IP addresses.

IPv6 addresses consist of eight groups of four hexadecimal digits separated by colons, for example “ABCD:EF12:0:0:0:0:3456”. However, there is a short form representation whenever there are consecutive zeros: “ABCD:EF12::3456”.

IVI (Interchangeable Virtual Instrument)

IVI Drivers are sophisticated instrument drivers that feature increased performance and flexibility for more intricate test applications that require interchangeability, state-caching, or simulation of instruments. To achieve interchangeability, the IVI Foundation has defined specifications for the following eight instrument classes: DMM, oscilloscope, arbitrary waveform/function generator, DC power supply, switch, power meter, spectrum analyzer, and RF signal generator.

IVI Foundation

The IVI Foundation is an open consortium founded to promote specifications for programming test instruments that simplify interchangeability, provide better performance, and reduce the cost of program development and maintenance.

LAN Reset – See LCI

LAN Status

Every LXI Device must display its current LAN operating status when powered ON. This status goes further than the LED indicators at the RJ45 connector. Many LXI Devices have a Front Panel LED indicator with a LAN Status label and others have a Utility or System menu on the Front Panel display indicating the status of the LXI Device on LAN. The LXI Standard is very specific about how this status can be displayed. A Red LED indicator or an address of **0.0.0.0** represents a LAN Status fault condition, where the LXI Device is either not connected to the LAN or may have been assigned a duplicate IP Address and has disconnected itself from the LAN.

LCI (LAN Configuration Initialize)

LAN Configuration Initialize is an LXI Devices recessed reset mechanism (e.g., a button) on the rear or front of the LXI Device that when activated places the LXI Device's network settings to a default state. LXI Devices can also use a Front Panel menu button, safeguarded in software to avoid accidental activation.

LAN (Local Area Network)

A communications network connecting a group of computers, printers, and other devices located within a relatively limited area (for example, a building). A LAN allows any connected device to interact with any other on the network.

LXI (LAN eXtensions for Instruments)

LXI is the next generation instrumentation platform based on industry standard Ethernet technology and provides modularity, flexibility and performance to small- and medium-sized systems.

LXI Device

An LXI Device conforms to the LXI Specification and passes third party testing for validation.

LXI Event

An event is an abstraction of a change in the realization of a signal or condition. An LXI Event is an event occurring in an LXI Device or communicated by means of an LXI Event Message.

LXI Event Message

A data packet used for module-to-module communication of LXI Events in an LXI system.

LXI Logo

The LXI Consortium licenses a registered name and logo for use in association with products that are conformant to the standard.

LXI Timing

IEEE 1588 Precision Timing Protocol enables modules to have a sense of time, which allows modules to time stamp actions and initiate triggered events over the LAN interface

LXI WTG (Wired Trigger Bus)

The LXI Device Wired Trigger Bus implements a cabling system to interconnect multiple LXI Devices for precision, nanosecond resolution triggering.

MAC (Media Access Control)

MAC is a sub-layer of the IEEE 802 specifications that defines network access methods and framing.

MAC Address

MAC represents a unique hardware number that identifies each device on a network. A device can be an Instrument, computer, printer, etc. Represented as 12 hexadecimal bytes in the form: MM:MM:MM:SS:SS:SS, where the M's represent the manufacturer of the LAN device.

mDNS (Multicast Domain Name Service)

mDNS is one of the discovery protocols specified for use in LXI Devices and is a protocol developed by the IETF Zeroconf Working Group. Using mDNS allows a client to determine the IP address of a given host (a hostname) without the direct help of a centralized DNS server. mDNS is used by printers and permits quick identification and status.

Ping

Ping is a utility that verifies connections to one or more remote hosts. The ping command uses the ICMP echo request and echo reply packets to determine whether a particular IP system on a network is functional. Ping is useful for diagnosing IP network or router failures.

PoE (Power Over Ethernet)

IEEE 802.3af Power Over Ethernet is a technology for wired Ethernet LAN that allows the electrical current, necessary for the operation of each device, to be carried by the CAT5 data cables instead of a traditional power cord.

Port Range Forwarding

The Port Range Forwarding opens ports on the Router that you want passed through to the "Ethernet" side of the Router. It is a more secure method of making connections with the "Internet" or WAN side of the Router, since it only opens specific ports. Configure any LAN Device forwarding ports to the "Internet" side for a static IP Address.

Schema

Schema is a document that describes a language or parameters of a language. Thus, XML Schemas provide a means of describing the structure, content, and semantics of XML documents.

SCPI (Standard Commands for Programmable Instrumentation)

SCPI defines a standard set of commands to control programmable test and measurement devices in instrumentation systems. The SCPI Standard builds upon the foundation of IEEE-488.2, Standard Codes and Formats.

SNMP (Simple Network Management Protocol)

A network protocol used to manage TCP/IP networks. In Windows, the SNMP service provides status information about a host on a TCP/IP network.

Subnet

A Subnet is a subdivision of an IP network. Each subnet has its own unique sub netted network ID.

Subnet Mask

For IPv4, a subnet mask is a 32-bit value that enables the recipient of IP packets to distinguish the network ID and host ID portions of the IP address. Typically, subnet masks use the format 255.x.x.x.

TCP/IP (Transmission Control Protocol/Internet Protocol)

A set of networking protocols widely used on the Internet that provides communications across interconnected networks of computers with diverse hardware architectures and various operating systems. TCP/IP includes standards for how computers communicate and conventions for connecting networks and routing traffic.

UDP (User Datagram Protocol)

UDP is one of the core protocols of the Internet protocol suite. Using UDP, programs on networked computers can send short messages known as datagrams to one another.

URL (Uniform Resource Locator)

URL is an address that uniquely identifies a location on the Internet. . Generally, a URL specifies the connection protocol and a file name. The connection protocol can be telnet, ftp, gopher, etc., and for web pages, http is the usual protocol as in the fictitious URL *http://www.example.microsoft.com*.

VPN (Virtual Private Network)

VPN extends a private network across public networks like the Internet. It enables a host computer to send and receive data across shared or public networks as if they were an integral part of the private network with all the functionality, security and management policies of the private network.

VISA (Virtual Instrument Software Architecture)

Most of the instrument drivers communicate to the instrumentation hardware through an I/O Library. The VISA library provides I/O layers for the GPIB, VXI, PXI, Serial, Ethernet, and/or USB interfaces, while other buses can utilize either VISA or another library.

W3C (World Wide Web Consortium)

W3C develops interoperable technologies (specifications, guidelines, software, and tools) to lead the Web to its full potential as a forum for information, commerce, communication, and collective understanding.

WINS (Windows Internet Name Service)

WINS is Microsoft's implementation of NetBIOS Name Service (NBNS), a name server and service for NetBIOS computer names. Effectively, WINS is to NetBIOS names what DNS is to domain names — a central mapping of host names to network addresses.

Wireless Bridge

In common wireless usage, a "bridge" device allows for a wireless connection between two physically isolated wired networks. A wireless LAN bridge can interface an Ethernet network directly to a particular access point or wireless router.