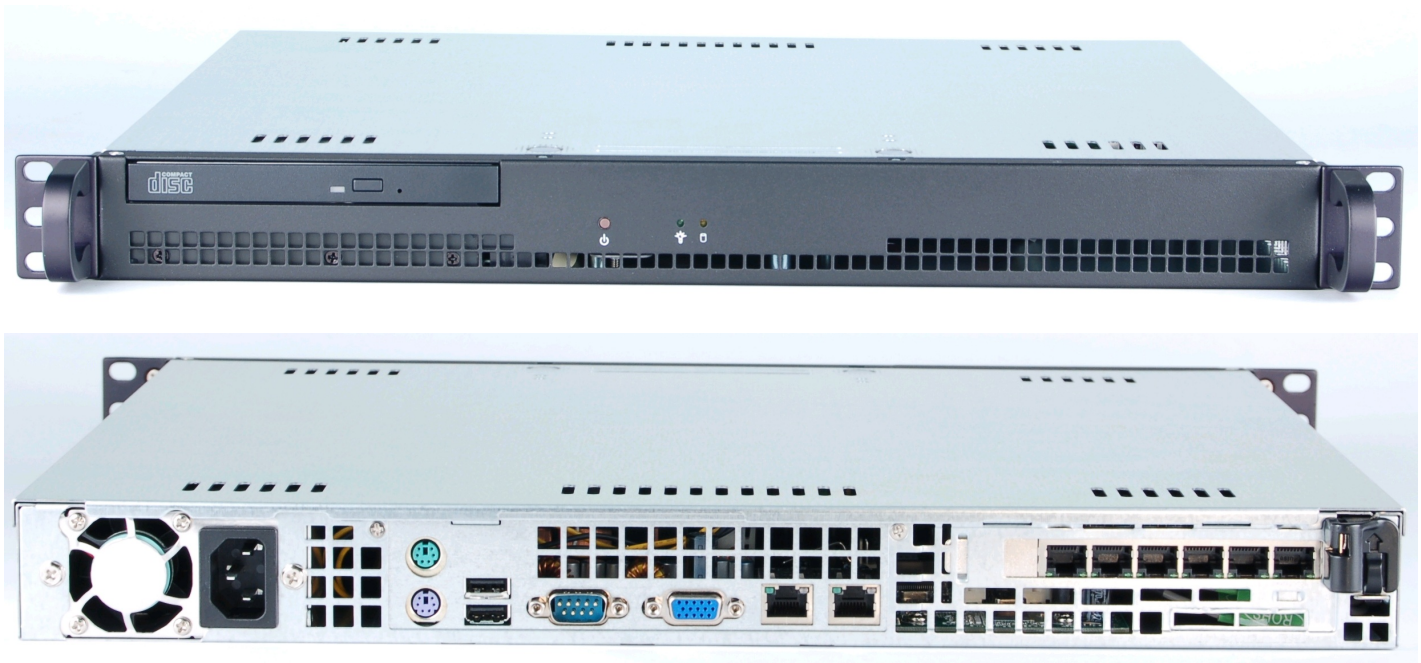


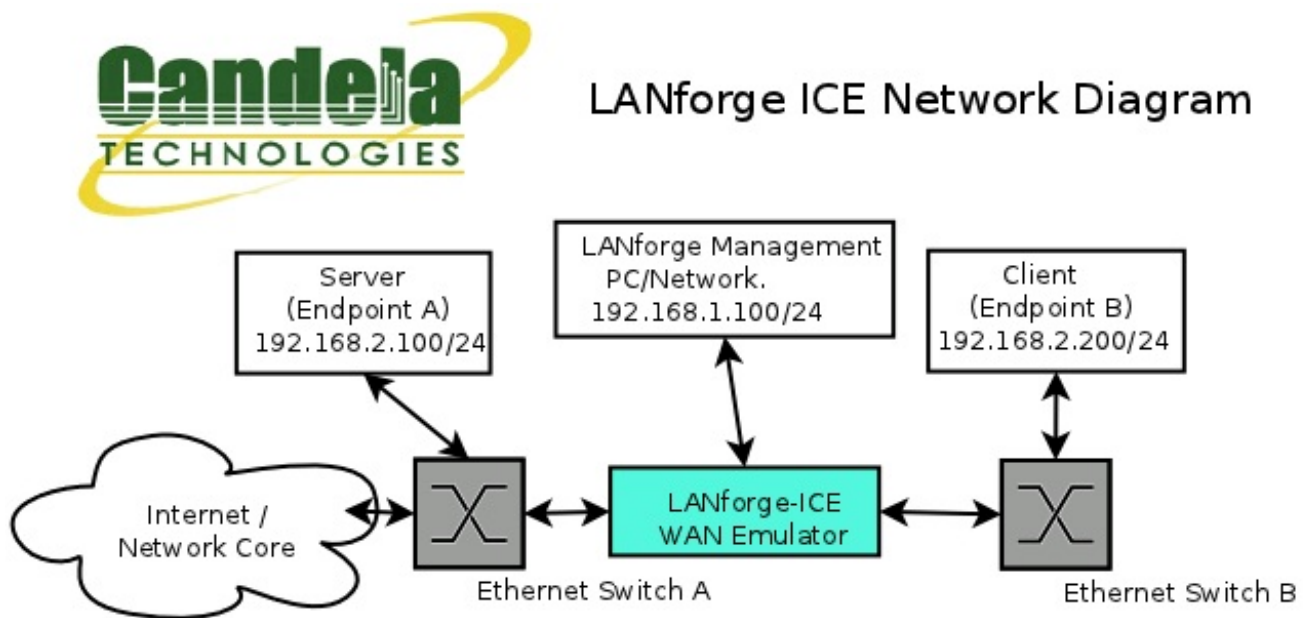
CT963 LANforge-ICE 1Gbps WAN Emulator

The CT963 is an excellent choice for a 1U rack-mount network emulator supporting speeds up to 990Mbps (bi-directional) or 1Gbps when traffic load is not maxed out in both directions. The CT963 fits into a standard rack and is 14 inches deep. It supports standard VGA, Keyboard, and Mouse interfaces for easy console/desktop access to the system. The CT963 is relatively noisy, so it is better for a data center deployment than a desktop environment. The CT963 hardware can support up to 3 WAN emulations with aggregate bandwidth of about 1.6Gbps bi-directional. Contact your sales representative if you prefer more than a single WAN emulation. No additional hardware or software is required, but you may wish to manage the system using the LANforge-GUI on a separate machine.



NOTE: This product may have a different hardware configuration than the system pictured above.
Refer to your official quote for details.

Example Network Diagram



This diagram shows how one might use LANforge ICE to emulate a Wide Area Network between a Server and Client. When the Client communicates with the Server, the traffic will flow through the Ethernet switches and then through LANforge ICE. LANforge ICE will enforce the rate limitation and other network emulation as configured. The Client and Server are on the same subnet. For a simpler configuration, the Client and Server can be directly connected to the LANforge ICE system.

Quick Start Guide

1. Connect Management ethernet port to Management network or management PC. If connecting directly to a PC, an ethernet cross-over cable should be used. Or, connect VGA, Keyboard, and Mouse to the chassis and manage it locally.
2. Connect Client to one WAN emulation port and Server to the other. The two interfaces will be bridged and this bridge will inject the network emulation.
3. Connect power plug to a standard US or European AC power source.
4. If managing remotely, install the LANforge-GUI on a separate management PC or Laptop. Windows and Linux GUIs are supported: Select the correct one from the CDROM or Candela Technologies Download page and install it.
5. The CT963 should now boot. If DHCP is enabled on the Management network, the CT963 will automatically acquire an IP address. If DHCP is not available, the IP address will be set to 192.168.1.101 by the LANforge scripts.
6. Start the LANforge-GUI on the management PC, or the CT963 server if managing locally, and click the 'Discover' button. It should find the CT963 appliance and add the IP address to the drop-down box in the Connect widget. Press 'Connect' and you will be connected to the CT963.
7. Select the WanLinks tab in the GUI. One of the pre-configured tests should already be running. You may double-click the row in the top section to modify the configuration. You can also view a real-time report of the test with the 'Display' button. Any modifications take place immediately after you click 'Submit'.

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LANforge-ICE Related Screen Shots

WanLinks Tab

LANforge Manager Version(5.2.4)

Control Reporting Tear-Off Help

Stop All

Restart Manager

Refresh

HELP

Layer-4

Generic

Test Mgr

Resource Mgr

Serial Spans

PPP-Links

Event Log

Alerts

Port Mgr

Messages

Status

Layer-3

L3 Endps

VoIP/RTP

VoIP/RTP Endps

Armageddon

WanLinks

Collision-Domains

File-IO

Rpt Timer: fast (1 s) Go

Test Manager all

Select All

Start

Switch

Stop

Clear

Hide Stopped

Display

Create

Modify

Batch Modify

Delete

WanLinks for Selected Test Manager

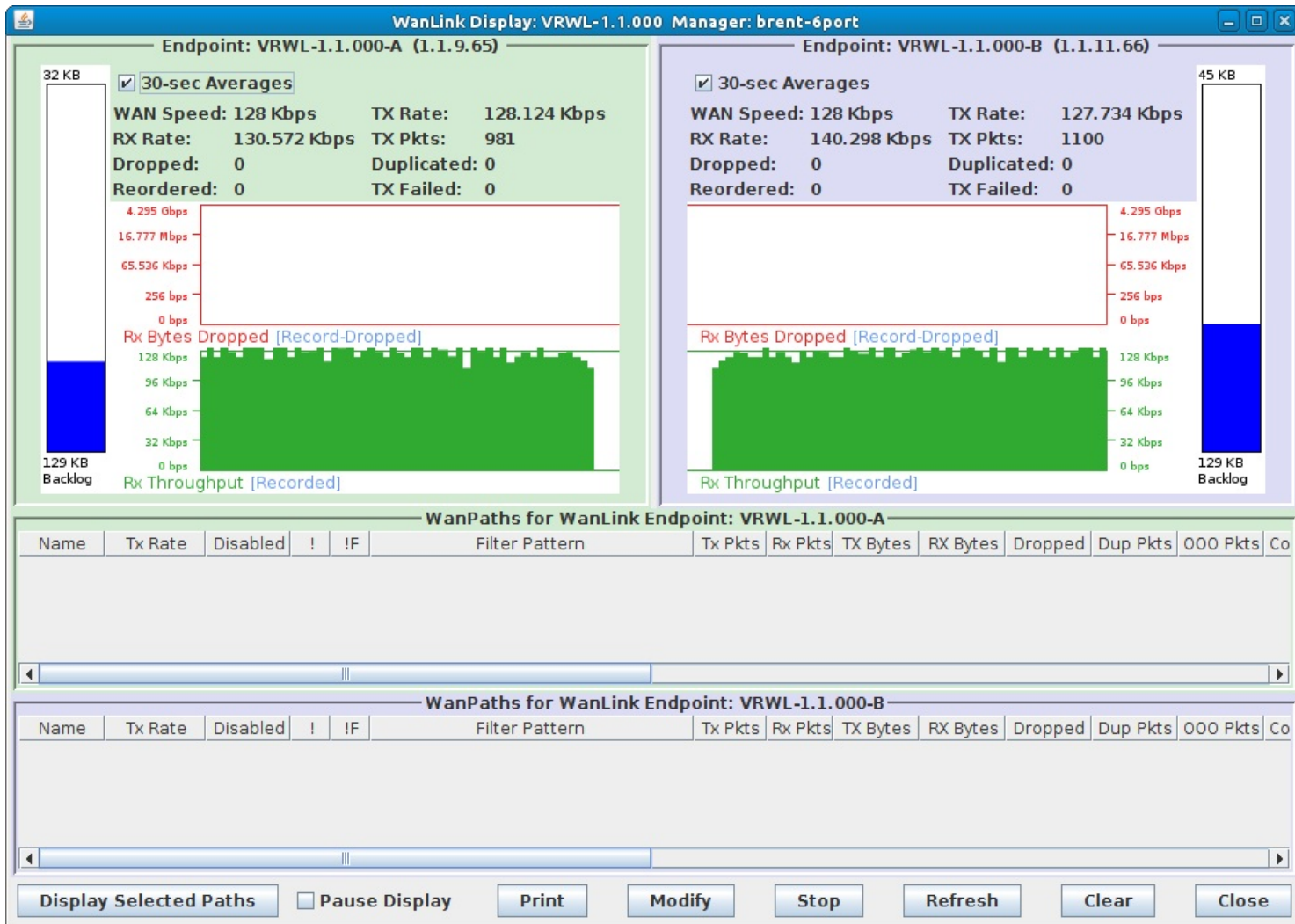
Name	EID	K-M	State	Endpoints (A <-> B)	Pkt Tx A->B	Pkt Tx A<-B	Rate A->B	Rate A<-B	Rpt Timer
VRWL-1.1.000	6.22	✓	Run	VRWL-1.1.000-A ...	565,080	439,422	1,000,000,000	1,000,000,000	1,00
VRWL-1.1.001	6.3	✓	Run	VRWL-1.1.001-A ...	4,054,185	3,658,228	1,000,000,000	1,000,000,000	1,00
VRWL-1.1.002	6.2	✓	Run	VRWL-1.1.002-A ...	18,632	18,593	44,736,000	44,736,000	1,00
VRWL-1.1.003	6.4	✓	Run	VRWL-1.1.003-A ...	3,657,007	4,040,390	1,000,000,000	1,000,000,000	1,00

All WanLink Endpoints

WPs	Name	Run	Script	Max Rate	Tx Pkts	Rx Pkts	Tx Rate	Tx Drop %	Dropped	Tx-Failed	Failed-Late	TX Bytes
+	VRWL-1.1.0...	✓	Stopped	1,000,000,...	439,422	565,088	1,014,228	0	0	0	0	653,589,...
+	VRWL-1.1.0...	✓	Stopped	1,000,000,...	565,080	439,434	1,020,730	0	0	9	0	843,838,...
+	VRWL-1.1.0...	✓	None	1,000,000,...	3,658,228	4,054,215	69,677	0	0	0	0	782,190,...
+	VRWL-1.1.0...	✓	None	1,000,000,...	4,054,185	3,658,203	77,642	0	0	0	0	866,984,...
+	VRWL-1.1.0...	✓	None	44,736,000	18,593	18,613	85,816	0	0	0	0	3,980,56...
+	VRWL-1.1.0...	✓	None	44,736,000	18,632	18,612	85,849	0	0	0	0	3,988,51...

Logged in to: 192.168.100.138:4002 as: Admin

WanLink Display



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Create/Modify WanLink Window

+ - All		Apply OK Display WanLink & WanPaths Cancel																							
1	WanLink Information			2	WanLink Information																				
	Name:	VRWL-1.1.009			<input type="checkbox"/> Pass-Through <input type="checkbox"/> HW Pass-Through																				
	Presets:	CUSTOM			<input type="checkbox"/> Coupled-Mode <input type="checkbox"/> Kernel-Mode																				
	Port:	Endpoint A: 25 (rddVR14b)	Endpoint B: 27 (rddVR15b)		Resource:	1 (ec2010-ath9k-1)																			
	Transfer Rate:	f1 (1.544 Mbps)	f1 (1.544 Mbps)		Rpt Timer:	fast (1 s)																			
	Delay:	zero (0 us)	zero (0 us)		Reorder-Freq:	zero (0%)																			
	Drop-Freq:	zero (0%)	zero (0%)		Dup-Freq:	zero (0%)																			
	Jitter:	zero (0 us)	zero (0 us)		Drop Burst:	min 1 max 1 min 1 max 1																			
Jitter-Freq:	zero (0%)	zero (0%)	Reorder Amt:	min 1 max 20 min 1 max 20																					
		Script				Script																			
3	Endpoint A WAN Paths				Endpoint B WAN Paths																				
	<div style="display: flex; justify-content: space-around;"> Create-WP Modify-WP Delete-WP </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Name</th> <th>Tx Rate</th> <th>Disabled</th> <th>I</th> <th>Filter Pattern</th> <th>Delay</th> </tr> </thead> <tbody> <tr> <td>wp1</td> <td>1.544 M</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Src: 0.0.0.0/0 Dest: 0.0.0.0/0</td> <td>50</td> </tr> </tbody> </table>				Name	Tx Rate	Disabled	I	Filter Pattern	Delay	wp1	1.544 M	<input type="checkbox"/>	<input type="checkbox"/>	Src: 0.0.0.0/0 Dest: 0.0.0.0/0	50	<div style="display: flex; justify-content: space-around;"> Create-WP Modify-WP Delete-WP </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Name</th> <th>Tx Rate</th> <th>Disabled</th> <th>I</th> <th>Filter Pattern</th> <th>Delay</th> </tr> </thead> <tbody> </tbody> </table>				Name	Tx Rate	Disabled	I	Filter Pattern
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Name	Tx Rate	Disabled	I	Filter Pattern	Delay																				
4	WanLink Information			5	WanLink Information																				
	CPU-ID:	0			Test Manager:	default_tm																			
	Replay File:	Endpoint A: <input type="checkbox"/> ICEcap Replay	Endpoint B: <input type="checkbox"/> ICEcap Replay		Dump File:	Endpoint A: <input type="checkbox"/> Dump Packets																			
		Dir: <input type="text"/>	Dir: <input type="text"/>			Endpoint B: <input type="checkbox"/> Dump Packets																			
		<input checked="" type="checkbox"/> Loop Replay <input checked="" type="checkbox"/> Replay Latency <input checked="" type="checkbox"/> Replay Loss <input checked="" type="checkbox"/> Replay Dup <input checked="" type="checkbox"/> Replay Bandwidth	<input checked="" type="checkbox"/> Loop Replay <input checked="" type="checkbox"/> Replay Latency <input checked="" type="checkbox"/> Replay Loss <input checked="" type="checkbox"/> Replay Dup <input checked="" type="checkbox"/> Replay Bandwidth			<input type="checkbox"/> Force Packet Gap <input type="checkbox"/> Drop-Xth <input type="checkbox"/> Reorder-Xth																			
					QDisc:	FIFO																			
					Max Lateness:	AUTO																			
					Backlog Buffer:	AUTO																			
6	Corruption: 1			7	Corruption: 4																				
	Rate:	0			Rate:	0																			
	Corruption:	Random Write			Corruption:	Random Write																			
	Byte-to-Write:	0			Byte-to-Write:	0																			
	Range Offset:	min 0 max 0			Range Offset:	min 0 max 0																			
		<input type="checkbox"/> Chain-to-Next <input type="checkbox"/> Checksum				<input type="checkbox"/> Chain-to-Next <input type="checkbox"/> Checksum																			

Software Features

1. General purpose WAN and Network impairment emulator.
2. Able to simulate DS1, DS3, OC3, OC12, DSL, CableModem, Satellite links and other rate-limited networks, from 10bps up to 1Gbps (full duplex).
3. Can modify various network attributes including: network-speed, latency, jitter, packet-loss, packet-reordering, and packet-duplication.
4. Supports Packet corruptions, including bit-flips, bit-transposes and byte-overwrites.
5. Supports WanPath feature to allow configuration of specific behavior between different IP subnets, MAC addresses or other packet filters using a single pair of physical interfaces. WanPath support may require purchase of additional WanPath licenses, please ask your sales contact for more information.
6. Supports routed and bridged mode for more flexibility in how you configure your network and LANforge-ICE.
7. Supports WAN emulation across virtual 802.1Q VLAN interfaces more efficient use of limited physical network interfaces.
8. Supports 'WAN-Playback' allowing one to capture the characteristics of a live WAN and later have LANforge-ICE emulate those captured characteristics. The playback file is in XML format, and can be easily created by hand or with scripts. The free LANforge-ICEcap tool can be used to probe networks and automatically create the XML playback file.
9. Allows packet sniffing and network protocol decoding with the integrated [Wireshark](#) protocol sniffer.
10. Includes comprehensive management information detailing all aspects of the LANforge system including processor statistics, test cases, and Ethernet port statistics.
11. GUI runs as Java application on Linux, MAC and Microsoft Operating Systems (among others).
12. GUI can run remotely, even over low-bandwidth links to accommodate the needs of the users.
13. Central management application can manage multiple units, tests, and testers simultaneously.
14. Includes easy built-in scripting to automatically iterate through bandwidth, latency and other settings. Advanced programatic scripting over a TCP socket also supported and example perl libraries and scripts are included.
15. Automatic discovery of LANforge resources simplifies maintenance and configuration of LANforge test equipment.

Hardware Specification

1. Gigabit-class Intel Multi-Core 1U rackmount server.
2. Operating System: Fedora Linux with customized Linux kernel.
3. Up to 6 PCIe Intel Pro/1000 10/100/1000 Ethernet ports. Additional 10/100/1000 Ethernet interface for management.
4. High-availability Ethernet hardware bypass option available.

5. 2-port 10G fiber or copper CX4 option available.
6. Multi-Core Intel processor.
7. One PCIe slot.
8. 2 GB or more RAM.
9. 80 GB or larger Hard Drive.
10. Solid State Drive option available.
11. Standard US or European power supply (automatically detects EU v/s US power).
12. Weight: 18 lbs or 8.2 kg.
13. Dimensions: 17 x 14 x 1.75 inches (14-inch deep 1U rackmount server) Metric: 432 x 356 x 44 mm.
14. ROHS compliant.

List Price: \$7,995 List Price with 1 Year support (17%): \$9,354

Additional Feature Upgrades

Unless otherwise noted in the product description, these features usually cost extra:

- WanPaths (LANforge-ICE feature set)
- Virtual Interfaces: MAC-VLANs, 802.1Q VLANs, WiFi stations, etc
- LANforge FIRE traffic generation.
- VOIP: Each concurrent call over the included package requires a license.
- Armageddon: Each pair of ports requires a license if not already included.
- External battery pack: 12+ hours for CT520, CT523, CT92X and other platforms.

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