

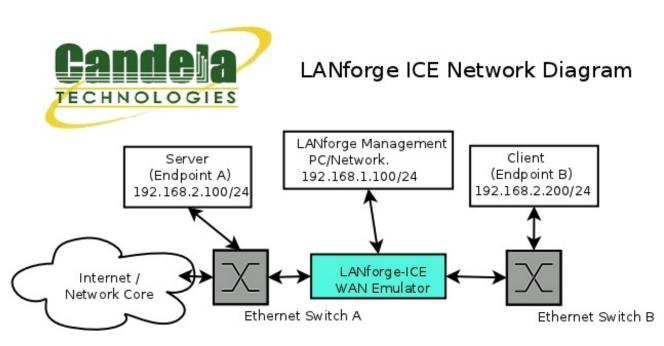
CT964 LANforge-ICE 1Gbps WAN Emulator - 8GB RAM

The CT964 is an excellent choice for a 1U rack-mount network emulator supporting speeds up to 990Mbps (bi-directional) on multiple ports. The CT964 comes standard with 8GB RAM to support multiple seconds of latency. The CT964 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 CT964 is relatively noisy, so it is better for a data center deployment than a desktop environment. The CT964 hardware can support up to 4 WAN emulations with each emulation running at near 1Gbps 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. 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.
- 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 CT964 should now boot. If DHCP is enabled on the Management network, the CT964 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 CT964 server if managing locally, and click the 'Discover' button. It should find the CT964 appliance and add the IP address to the drop-

down box in the Connect widget. Press 'Connect' and you will be connected to the CT964.

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

					LAN forge Ma	inager Vers	sion(5.2.4)					_ □
<u>C</u> ontrol	<u>R</u> eporting	Tear	-Off He	lp								an sh
							Stop All	Resta	t Manager		Refresh	HEL
Layer-	4 Generic	Te	st Mgr	Resource Mg	r Serial Spa	ns PPP-Link	s Event l	Log Alerts	Port Mgr	Message	25	
Status	Layer-	3	L3 Endp	s VolP/I	RTP VoIP/	RTP Endps	Armage	ddon W	anLinks	Collision	-Domains	File-IO
Rpt Ti	Rpt Timer: fast (1 s) Go Test Manager all Select All Start Switch Stop Clear											
				🔲 Hide Sto	pped		Display	Create	Modif	y Bate	ch Modify	Delete
					WanL	inks for Selec	ted Test Ma	nager——				
N	lame E		-M	State En	Idpoints (A <->	B) Pkt Tx A	A->B P	kt Tx A<-B	Rate A-:	B R	ate A<-B	Rpt Timer
VRWL-1	1.000 6.	22 [Run	VR	WL-1.1.000-A.	5	65,080	439,422	1,000,00	0,000 1,0	000,000,000	1,00
VRWL-1	1.001 6.	3	Run	VR	WL-1.1.001-A.	4,0	54,185	3,658,228	1,000,00	0,000 1,0	000,000,000	1,00
VRWL-1	1.002 6.	2	Run	VR	WL-1.1.002-A.		18,632	18,593	44,73	6,000	44,736,000	1,00
VRWL-1	1.003 6.	4	Run	VR	WL-1.1.003-A.	3,6	57,007	4,040,390	1,000,00	0,000 1,0	000,000,000	1,00
		-				-All WanLink	Endpoints-					
WPs	Name	Run				Rx Pkts	Tx Rate	Tx Drop %	Dropped	Tx-Failed	Failed-Late	TX Bytes
	/RWL-1.1.0		Stopped	1,000,00			1,014,228		0	0		653,589,
	/RWL-1.1.0	_	Stopped	1,000,00			1,020,730		0	9		843,838,
	/RWL-1.1.0	~	None	1,000,00			69,677	0	0	0	-	782,190,
	/RWL-1.1.0	~	None	1,000,00			77,642	0	0	0		866,984,
	/RWL-1.1.0		None	44,736,			85,816	0	0	0		3,980,56:
+ \	/RWL-1.1.0	~	None	44,736,	000 18,63	2 18,612	85,849	0	0	0	0	3,988,51
•												•
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Logged	m to: 192.1	.00.10	0.136.40	02 as: Adm								

WanLinks Tab

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<u></u>	WanLink Display: VRWL-1.1.00)0 Manager: brent-6port	_ O X
	Endpoint: VRWL-1.1.000-A (1.1.9.65)	Endpoint: VRWL-1.1.000-B (1.1.11.66)	
32 KB	☑ 30-sec Averages	☑ 30-sec Averages	45 KB
	WAN Speed: 128 Kbps TX Rate: 128.124 Kbps	WAN Speed: 128 Kbps TX Rate: 127.734 Kbps	
	RX Rate: 130.572 Kbps TX Pkts: 981	RX Rate: 140.298 Kbps TX Pkts: 1100	
	Dropped: 0 Duplicated: 0	Dropped: 0 Duplicated: 0	
	Reordered: 0 TX Failed: 0	Reordered: 0 TX Failed: 0	
	4.295 Gbps	4.295 Gbps	
	16.777 Mbps -	- 16.777 Mbps	
	65.536 Kbps -	— 65.536 Kbps	
	256 bps -	- 256 bps	
	0 bps	0 bps	
	Rx Bytes Dropped [Record-Dropped]	Rx Bytes Dropped [Record-Dropped]	
	128 Kbps	128 Кbps	
	96 Kbps —	— 96 Kbps	
	64 Kbps —	— 64 Кbpз	
	32 Kbps —	— 32 Kbps	
129 KB Backlog	⁰ыря Rx Throughput [Recorded]	Rx Throughput [Recorded]	129 KB Backlog
		Endpoint: VRWL-1.1.000-A	
Name	Tx Rate Disabled ! !F Filter Pattern	Tx Pkts Rx Pkts TX Bytes RX Bytes Dropped Dup Pkts 0	00 Pkts Co
			•
		Endpoint: VRWL-1.1.000-B	
Name	Tx Rate Disabled ! !F Filter Pattern	Tx Pkts Rx Pkts TX Bytes RX Bytes Dropped Dup Pkts 0	00 Pkts Co
			•
Displa	y Selected Paths Pause Display Print	Modify Stop Refresh Clear	Close

WanLink Display

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Create/Modify WanLink Window

			VRWL-1.1.009 - Crea	te/Modify WanLin	к			_ □
+ - All				А	pply OK Displ	ay W	anLink & WanPaths	Cance
Name: Presets:	WanLink Information VRWL-1.1.009 CUSTOM			2	WanLink Information Pass-Through Coupled-Mode		HW Pass-Throug	h
				Resource:	1 (lec2010-ath9k-1)			-
Port:	Endpoint A 25 (rddVR14b)		Endpoint B 27 (rddVR15b)	Rpt Timer:	fast (1 s)			-
Transfer Rate:	Г1 (1.544 Mbps)		Г1 (1.544 Mbps) ▼		Endpoint A		Endpoint B	
Delay:	zero (O us)	-	zero (O us) 💌	Reorder-Freq:	zero (0%)	-	zero (0%)	-
Drop-Freq:	zero (0%)	-	zero (0%) 💌	Dup-Freq:	zero (0%)	-	zero (0%)	-
Jitter:	zero (O us)	-	zero (O 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	0
					Script		Script	
8	Endpoint A		Paths		Endpoint B V			
			D D J J J J J J J J J J J J J J J J J J					
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Name T	x Rate Disabled !		Filter Pattern Dela	ay Name Tx				
Name T wp1 1.5	x Rate Disabled !		Filter Pattern Dela	ay Name Tx	Rate Disabled !			Delay
Name T	x Rate Disabled ! i44 M Disabled Src		Filter Pattern Dela	ay Name Tx	Rate Disabled !			
Name T wp1 1.5	x Rate Disabled ! i44 M Disabled Src	:: 0.0.	Filter Pattern Del: .0.0/0 Dest: 0.0.0.0/0 Endpoint B ICEcap Replay	Ay Name Tx	Rate Disabled !			Delay
Name T wp1 1.5	x Rate Disabled ! i44 M Src wanLink Information src 0 Src Endpoint A ICEcap Replay Dir Dir Vancence Dir	:: 0.0.	Filter Pattern Del: .0.0/0 Dest: 0.0.0.0/0 Endpoint B ICEcap Replay U Dir Loop Replay	ay Name Tx	Rate Disabled WanLink Information default_tm Endpoint A Dump Packets Force Packet Gap Drop-Xth		Filter Pattern Endpoint B Dump Packets Force Packet Gap Drop-Xth	Delay
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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.
- 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. High-End Intel Multi-Core 1U rackmount server.
- 2. Operating System: Fedora 64-bit Linux with customized Linux kernel.
- 3. 4 built-in 10/100/1000 Ethernet interfaces, one of which should be used for management.
- 4. 1 IPMI port.
- 5. High-availability Ethernet hardware bypass option available.

- 6. One Quad-Core Intel E3 v2 processor, 3.6+Ghz
- 7. 1 PCIe x16 slot (2-6 port 10/100/1000, 1-2 port 10G fibre, etc)
- 8. 8 GB or more RAM.
- 9. 40 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. Power Supply: Fixed 350W AC
- 15. Estimated Power Usage: 1.4 Amps @ 120 VAC under load, 0.7 Amps idle.
- 16. ROHS compliant.

List Price: \$9,290 List Price with 1 Year support (17%): \$10,869

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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