

Adding a LANforge Virtual Machine

Goal: Add a virtual machine running LANforge to a LAN with a physical LANforge manager.

We review the configuration steps necessary to add a virtual LANforge resource. The guest instances will be configured to export MAC-VLAN ports to run traffic on their physical management port. The example here uses VirtualBox 5.2.10 and Fedora 27 Server edition, but our current recommendation for virtual machine platforms is actually libvirtd/kvm.



- 1. Create a new guest instance.
 - A. When creating the guest, we should use 2 GB of RAM:

9	Create Virtual Machine	
	Name and operating system Name: 9134-fedora27s01 Type: Linux	
	Version: Fedora (64-bit)	
	Memory size 4 MB Hard disk Do not add a virtual hard disk Create a virtual hard disk now	2048 ↓ MB 32768 MB
	Use an existing virtual hard disk file 9118-u1604-boot.vdi (Normal, 1.25 GB) Guided Mode	Back Create Cancel

B. 60 GB of disk:

•	Create Virtual Hard Disk	
	File <u>l</u> ocation 9134-fedora27s01 File <u>s</u> ize	
	4.00 MB Hard disk file type	20400 GB 2.00 TB
	VDI (VirtualBox Disk Image)	Dynamically allocated
	VHD (Virtual Hard Disk)	 Fixed size
	O VMDK (Virtual Machine Disk)	Split into files of less than 2GB
	O HDD (Parallels Hard Disk)	
	O QCOW (QEMU Copy-On-Write)	2
	 QED (QEMU enhanced disk) 	
	Guided Mode	< Back Create Cancel

C. Omit a floppy drive, use a USB table as pointing device:

C)		9134-fedora27s01 - Settings	
		General	System	
	E	System	Motherboard Processor Acceleration	
	D	Display	Base Memory:	48 MB
	\bigcirc	Storage	4 MB 32768 MB	110001
		Audio	Boot Order:	
	₽	Network	Hard Disk	
L		Serial Ports	Proppy Network	
	Ø	USB	Chipset: ICH9	
		Shared Folders	Pointing Device: USB Tablet	
5	•	User Interface	Extended Features: 🗹 Enable J/O APIC	
			Enable EFI (special OSes only)	
L			✓ Hardware Clock in <u>U</u> TC Time	
			<u>C</u> ancel	<u>o</u> k
	No. of Concession, Name			and the second

D. Allocate two or more cores and PAE/NX:



E. And the usual virtual processor features:

0		9134-fedora27s01 - Settings	
	General	System	
	System	Motherboard Processor Acceleration	
	Display	Paravirtualization Interface: Default	
\square	Storage	Hardware Virtualization: 🗹 Enable VT-x/AMD-V	
	Audio	✓ Enable Nested Paging	
	Network		
	Serial Ports		
Ø	USB		
	Shared Folders		
	User Interface	N2	
		Cancel O	ĸ

F. We don't need graphics on these nodes, so use minimum graphics memory:

0		9134-fedora27s01 - Settings	
	General	Display	
	System	Screen Remote Display Video Capture	
	Display	Video Memory:	-
	Storage	0 MB 128 MB	
	Audio	Monitor Count: 1	
	Network	Scale Factor: 100%	
	Serial Ports	Acceleration: Carbon Enable <u>3</u> D Acceleration	
	VSB USB	Enable 2D Video Acceleration	
	Shared Folders		
	User Interface		
		<u>Cancel</u> <u>O</u> K	

G. Enable RDP access, that is useful. It might be a good habit to allocate separate RDP ports per host, we'll use 9134 for the first guest, 9135 for the second

6)		9134-fedora27s01 - Settings	
	📃 G	eneral	Display	
	🛒 Sy	ystem	Screen Remote Display Video Capture	
	D	isplay	✓ Enable Server	
	😥 st	torage	Server Port: 9134	
	Þ A	udio	Authentication Method: Null	0
	- N	letwork	Authentication Timeout: 5000	
	🚫 se	erial Ports	Extended Features: 🗹 Allow Multiple Connections	
	Ø U	SB		
	si	hared Folders		
	: U	ser Interface		
			<u>C</u> ancel <u>O</u> K	
			<u>C</u> ancel <u>O</u> K	:

H. Enable Host I/O caching for your SATA device. Specify the Fedora 27 Server ISO image as the DVD:

0		9134-fedora27s01 - Setti	ngs		
	General	Storage			
	System	Storage Devices	Attributes		
	Display	Controller: IDE	<u>N</u> ame:	SATA	
5	Storage	Fedora-Server-netinst-x86_64-27-1	<u>T</u> ype:	AHCI	
	Audio	9134-fedora27s01.vdi	Port Count:	1	^
	Network			Use Host I/O Cache	
	Serial Ports				
Ø	USB				
	Shared Folders			3	
	User Interface				
		🕹 😂 🗔			
				Cancel C	<u>эк</u>

I. Disable Audio

0			9134-fedora27s01 - Settings		
	General	Audio			
	System	Enable Audio			
	Display	Host Audio <u>D</u> river:	PulseAudio		
6	Storage	Audio <u>C</u> ontroller:	ICH AC97		0
	Audio	Extended Features:	Enable Audio Output		
	Network		L Enable Audio Input		
	Serial Ports				
	SB USB				
	Shared Folders				
	User Interface				
				\$	
		1		<u>Cancel</u> <u>O</u> K	

J. Configure the network adapter to:

(3		9134-fedora27s01 - Settings	
		General	Network	
		System	Adapter 1 Adapter 2 Adapter 3 Adapter 4	
1		Display	Enable Network Adapter	
	\bigcirc	Storage	Attached to: Bridged Adapter	
		Audio	Name: br0	
	₽	Network	♥ A <u>d</u> vanced	
		Serial Ports	Adapter Type: Intel PRO/1000 MT Server (82545EM)	•
	Ø	USB	Promiscuous Mode: Allow All	
		Shared Folders	<u>M</u> AC Address: 0800276CA980	😂
	=	User Interface	Cable Connected	
			Port Forwarding	
			<u>C</u> ancel	<u>о</u> к

- A. Use the LAN bridged adapter br0
- B. Use a server adapter driver
- C. Enable Promiscuous Mode to allow sniffing
- K. Start the installation

Fedora 27	
Install Fedora 27 Test this media & install Fedora 27	
Troubleshooting	>
Press Tab for full configuration options on menu i	tems.

L. Under System->Installation Destination please manually partitioning is necessary.



- A. Avoid selecting XFS or BTRFS file systems formats.
- B. Create a 1GB partition for /boot, select ext4 filesystem format.
- C. Use the remainder of the drive space for /
- D. If you want to separate the / and /home partions select 35GB for / partition.

M. Set the root password to lanforge. Click Done twice.

ROOT PASSWORD	*			FEDORA 27 IN:	STALLATION Help!
	The root account is used for admin	The root account is used for administering the system. Enter a password for the root user.			
	Root Password:	•••••	۲		
			Weak		
	Confirm:	•••••	۲		
$\hat{oldsymbol{\Lambda}}$ The password you have provided					

N. Add user LANforge:

CREATE USER		FEDORA 27 INSTALLATION
Full name	LANforge	
User name	lanforge	
	Tip: Keep your user name shorter than 32 characters and do not use spaces. ✓ Make this user administrator ✓ Require a password to use this account	
Password	••••••	
	Weak	
Confirm password	······ •	
	Advanced	
A The password you have provided is weak: The passwo	rd contains the user name in some form. You will have to press Done twice to	confirm it.

- A. Make user lanforge an Administrator
- B. Set password to lanforge
- C. Click **Done** *twice*

O. When installation finishes, reboot. You will see a login prompt:

	Fedora 27 (Server Edition) Kernel 4.16.5-200.fc27.x86_64 on an x86_64 (tty1)
	Admin Console: https://192.168.100.225:9090/ or https://[fe80::77e1:eb75:c3e8:962b]:9090/ localhost login: _
Ρ.	Login as . Do updates: # dnf update -y - r
Q.	Install perl: # dnf install -y perl
R.	Set guest's hostname: # hostnamectlstatic set-hostname atlas-fedora27s01
S.	Reboot: # shutdown -r now + *

2. Install LANforge on the guest instance. Start by logging in as root:

Fedora 27 (Server Edition) Kernel 4.16.5-200.fc27.x86_64 on an x86_64 (tty1)
Admin Console: https://192.168.100.225:9090/ or https://[fe80::77e1:eb75:c3e8:962b]:9090/
<pre>localhost login: root Password: [root@localhost ~]# which wget /usr/bin/wget [root@localhost ~]# which curl /usr/bin/curl [root@localhost ~]# wget http://www.candelatech.com/lf_kinstall.txt 2018-05-03 15:08:19 http://www.candelatech.com/lf_kinstall.txt Resolving www.candelatech.com (www.candelatech.com) 208.74.158.1711 Commecting to www.candelatech.com (www.candelatech.com) 208.74.158.1711:80 connected. HTTP request sent, awaiting response 200 OK Length: 259852 (254K) [text/plain] Saving to: 'lf_kinstall.txt'</pre>
lf_kinstall.txt 100%[===================================
2018-05-03 15:08:19 (3.02 MB/s) - 'lf_kinstall.txt' saved [259852/259852]
[root@localhost ~]#
A. Use wget (or curl) to download lf_kinstall.txt:
cd /root - ► B.
<pre># wget http://www.candelatech.com/lf_kinstall.txt C. </pre>
<pre># chmod +x lf_kinstall.pl + * D. </pre>
E. You don't need to do a burn in, so turn off the disk check:
touch /home/lanforge/did_cpuburn
Install LANforge: # ./lf_kinstall.pllfver 5.3.7kver 4.13.16+do_all_ct

H. You can disable the VNC Server and Xrdp services on these guests:



3. From your LANforge GUI, configure a MAC-VLAN the on default Ethernet port.

A. In the LANforge GUI, choose the *Port Mgr* tab, and highlight the new enp0s17 port:

4						LAN	orge Manager Versi	on(5.3.8)					
<u>C</u> ontrol	<u>R</u> eport	ting <u>T</u>	ear-Off <u>I</u> nfo <u>P</u> lu	ugins					13				
Stop All Restart Manager Refresh												HELP	
Generic	Tes	t Mgr	Test Group	Resou	rce Mgr	Event L	og Alerts	Port Mgr	vAP Stat	ions Mes	sages		
T Status T Layer-3 L3 Endps T VolP/RTP T VolP/RTP Endps WanLinks Attenuators File-10 L												Layer-4	
Disp	Disp: 192.168.100.51:0.0 Sniff Packets 1 Clear Counters Reset Port Delete												
Rpt	Timer:	mediu	ım (8s) 🔻	A	pply		VRF I	<u>V</u> iew Deta	ils	Cr <u>e</u> ate	Mo <u>d</u> ify	Batch I	Modify
					All Et	hernet I	nterfaces (Po	rts) for all R	esources				
						Doront							
Port	Pha	Down	IP	SEC	Alias	Dev	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX
1 0 00			10.41.14.00		-+-0000	- Co	050.051	2.002		- 1.000	11.040		
1.2.02	<u> </u>	<u> </u>	10.41.14.89	0	stazuuu	wipnyu	258,851	3,963	1	3 1,880	11,340	68	_ _
1.2.03	<u> </u>	<u> </u>	0.0.0.0	0	wipnyu	unin hurd	5,771,040	35,050	1	0 12,074	35,343	460	
1.2.04	<u> </u>		10.41.10.228	0	stazi 00	wipnyi	208,994	3,903	1	2 1,808	24 702	450	
1.2.05	-	-	10 41 9 151	0	eta2200	winbv2	4,275,500	2 050		2 1 007	11 402	439	
1 2 07	-		0 0 0 0	0	winhv2	wipity2	8 320 494	44 160	1	1 15 708	35 295	460	
1 2 08		~	0 0 0 0	0	wlan0	wiphv0	0,020,404	0		0 0	00,200		
1.2.09		V	0.0.0.0	0	wlan1	wiphy1	0	0		0 0	0	0	0
1.2.10		~	0.0.0.0	0	wlan2	wiphy2	0	0		0 0	0	0	0
1.2.11			10.41.0.21	0	b2000	1.02-	215,943	4,152		3 1,740	5,180	62	0
1.3.0			192.168.100.29	0	eth1		151,467	1,489		3 2,485	255,217	552	0
1.3.1			0.0.0.0	0	eth2		74,244	992		2 1,388	1,732	22	0
1.3.2			0.0.0.0	0	eth3		C	0		0 0	1,732	22	0
1.4.0			192.168.100.225	50	enp0s17		303,745	4,019		3 2,034	105,508	337	0 🕶
													•
Logged	n tou	odtact	t 4002 aci Admir	-									
Logged I	n to: j	eutes	1:4002 as: Admin										

- B. Click the Create button
- C. create one MAC-VLAN port

<u>C (</u>			Create VLANs	on Port: 1.4.0				
	MAC-VLAN WIFI STA	○ 802.1Q-VLAN ○ Red ○ WiFi VAP ○ WiFi Moni	direct 🔾 Bridge tor 🔾 WiFi Virtu:	⊖ Bond al Radio	⊖ GRE Tun	nel		
2	Shelf:	1	Resource: 4 (localhost)	-	Port: 0	(enp0s17)(MGT)	-
B	VLAN ID:		DHCP-IPv4					
	Parent MAC:	08:00:27:6c:a9:80	DHCP Client ID:	None	-			
	MAC Addr:	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	IP Address:			Global IPv6:	AUTO	
1	<u>Q</u> uantity:	1	IP <u>M</u> ask or Bits:			Link IPv6:	AUTO	
1			<u>G</u> ateway IP:			IPv6 GW:	AUTO	
1	#1 Redir <u>N</u> ame:		#2 Redir Name:					
1	STA ID:		<u>S</u> SID:				-	
1	WiFi A <u>P</u> :		<u>K</u> ey/Phrase:					
1	WPA	WPA <u>2</u>	WEP					
1								
	Down					3		
	Apply	<u>C</u> ancel			Re	ady		

- A. Select MAC-VLAN
- B. Quantity: 1
- C. Select DHCP-IPv4
- D. Click Apply

D. You will see the new port in the GUI:

			LANforge Managr	er Version(5.3.8)					6	-0
<u>control</u> <u>R</u> eporting	j <u>T</u> ear-Off <u>I</u> nfo <u>P</u> lu	ugins								
				Stop All	Res	start Manag	er	Refre	esh	HELP
	Y				10.01			1		
Generic Test M	gr Test Group	Resource Mgr EV	vent Log Ale	erts Port Mg	r VAP St	ations M	essages	5ilo 10		- 4
Status Lay	yer-3 L3 Enup	S VOIP/RTF	V0IP/K	IP Enaps	Wahuhi	KS A	ttenuaron	S File-iu	Laye	er-4
Disp: 192.168	8.100.51:0.0	Sniff Packets		1 Clear Co	ounters	Reset Po	ort D	ele <u>t</u> e		
Rpt Timer: me	dium (8 s) 🔻	Apply	VRF	I View D	etails	Cr <u>e</u> ate	M	1o <u>d</u> ify <u>B</u> at	tch Modify	
· · · ·		All Ethe	ernet Interface	es (Ports) for a	Il Resource	es. ———				
Port Pha Do	wn IP	SEC Alias	Parent Dev	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	F
1.2.03	0.0.0.0	U WIATT	мірпут	0	0	, ,				
1.2.10	0.0.0.0	0 wlan2	wiphy2	0	0	0	0	0	0	
1.2.11	10.41.0.21	0 b2000		223,925	4,319	2	1,115	5,250	63	
1.3.1	0.0.0.0	0 eth2	+	85,564	1.145	2	1.350	1,732	22	
1.3.2	0.0.0.0	0 eth3	+	0	0	0	0	1,732	22	
1.4.0	192.168.100.225	5 0 enp0s17		419,277	4,767	9	11,796	151,772	411	
1.4.1	192.168.100.18	50 enp0s17#0	enp0s17	3,800	47	2	1,367	1,472	12	1.
		10								
the quest VM	you will also s	the new r	vort # in	· -hr a	show	ne		, vehicle 2004 4 - 11		
the guest VM	, you will also s	see the new p	oort: # ip) -br a	show					

ØЙ

be link/ether 08:00:27:6c:a9:80 brd ff:ff:ff:ff:ff:ff inet 192.168.100.225/24 brd 192.168.100.255 scope global dynamic enp0s17 valid_lft 84783sec preferred_lft 84783sec inet6 fe80::a00:27ff:fe6c:a980/64 scope link valid_lft forever preferred_lft forever 3: enp0s17#00enp0s17: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master _vrf1 state UP group default glen 1000 link/ether 08:00:27:c5:b9:80 brd ff:ff:ff:ff:ff inet 192.168.100.185/24 brd 192.168.100.255 scope global enp0s17#0

valid_lft forever preferred_lft forever inet6 fe80::a00:27ff:fec5:b980/64 scope link valid_Iff forever preferred_Ift forever _vrf1: <NOARP,MASTER,UP,LOWER_UP> mtu 65536 qdisc noqueue state UP group default qlen 1000 link/ether 12:51:bc:d9:ca:a7 brd ff:ff:ff:ff:ff 4: [root@localhost lanforge]#

4. Add a second VM

Shut down the previous VM: # shutdown -r now -▲

Α.

B. clone the VM

A. Select the *Reinitialize MAC addresses* choice, these machine will operate simultaneously.



B. Verify the MAC address of the new guest is set

-owered on	9134-1	edoraz
	9134-fedora27s02 - Settings	
General	Network	
System	Adapter 1 Adapter 2 Adapter 3 Adapter 4	
Display	☑ <u>E</u> nable Network Adapter	
🦻 Storage	Attached to: Bridged Adapter	
🕨 Audio	Name: br0	0
Network	▼ A <u>d</u> vanced	
Serial Ports	Adapter Type: Intel PRO/1000 MT Server (82545EM)	0
🦻 USB		
Shared Folders	MAC Address: 080027DB520D	
User Interface	Port Forwarding	
	Cancel	<u>о</u> к
owered On		

- C. Boot the second guest
- C. Change the hostname of the second guest:

Iroot@localhost ~]# hostnamect1static set-hostname atlas-fedora27s02	#	[root@localhost]#	echo 'atla	as-fedora27s02	' >	/etc/hostname	
[root@localhost ~]# hostnamect1static set-hostname atlas-fedora27s02							
	[r	oot@localhost ~]# hostna	mectlstati	ic set-hostname at	las-f	fedora27s02	

D. Make sure that the MAC address of the second guest is not listed in the ifcfg-enp0s17 file.



A. Compare the adapter to the file:



- D. If it is listed, change it or remove it.
- E. LANforge changes the /etc/udev/rules.d/70-persistent-net.rules file.Edit tht file those as to match the value of your mac address:



F. Stop LANforge and change the resource ID for this guest:



G.

- H. Start up your first guest (resource 4)
- I. In your LANforge GUI, you should see your two VMs.
- J. Create a MAC-VLAN port for the second guest
- 5. Create a VOIP connection between the two guests.

A. In the VOIP tab, click Create

🛃 LANforge Manager Version(5.3.8)	\boxtimes
<u>C</u> ontrol <u>R</u> eporting <u>T</u> ear-Off <u>I</u> nfo <u>P</u> lugins	
Stop All Restart Manager Refresh HELF	,
Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr VAP Stations Messages Status Laver-3 L3 Endos VolP/RTP VolP/RTP Fodos WanLinks Attenuators File-10 Laver-4	_
Rpt Timer: fast (1 s) Go Test Manager all Select All Start Stop Quiesce Clear View 0.500 View <td< td=""><td></td></td<>	
Cross Connects for Selected Test Manager	_
Name Type State Pkt Tx A → B Pkt Tx A ← B Bps Rx B Bps Rx A Rx Drop % A Rx Drop % B Delay A → B Delay A ← B J	liti
Logged in to: jedtest:4002 as: Admin	2

B. You configure:

(<u></u>					Create/Mo	odify Cross Connect							800
					Cross C	onnect Informati	on						
	CX Name:	r4r5-cal	100 Rpt	Timer:	fast (1 s)	▼ Test	Manager	default_tm	🖵 C	к Туре	Voice - S	SIP 👻	
	Multi-Call	Oirect	ted Min	Call Du	uration (s) File	Max Ring	Time (s):	20	- C	odec:	G.711u	-	
	Continuous Call	🔾 Use (Gateway Max	Call D	uration (s) File	Min Inter	-Call Gap (s): 3	- S	art De	elay: 3	-	
		🗌 Don'i	Send RTP Num	ber Of	f Calls INFINIT	E 🔻 Max Inte	-Call Gap	(s): 3	- Q	uiesce	: 45 (45 s	ec) 🔻	
					TX End	point (endpoint	Δ)						
Endp Name:	r4r5-call100-A		🗌 UnManageo	1	Bind SIP	UDP Port		AUTO			ſx File	media/female_v	oice_8khz.wav
Shelf:	1	▼	Don't Answe	er [Record	SIP Port		5060			Destination:	AUTO	
Resource:	4 (atlas-fedoraf2/s01	.) 🔻	Rcv Call	Г	Enable PESQ	IP ToS:		Best Effort	(0)	-	Speaker	/dev/audio	-
IP Addr					Play to speaker	Socket Priority		0			· Call Gateway	AUTO	
Phone #	AUTO			·9 L		VAD Dolov(mo)		25.0			Decord File	AUTO	
Display Name:	AUTO			nt L		VAD Delay(ms)		230		_	Record File	AUTO	
Auth User Name:	AUTO		Single Code	ec L	Override SDP	VAD Force Sen	d	3000			PESQ Server:	127.0.0.1:3998	
Reg Expire:	300	-				Jitter Buffer:		8			Quiesce:	45 (45 sec)	-
					BX End	looint (endpoint	R)						
Endp Name:	r4r5-call100-B						07	AUTO					
Shelf:	1	-	Unmanaged	1 <u>1</u>	Bind SIP	UDP Port		AUTO			IX FIIE	media/remaie_v	bice_8knz.wav
Resource:	5 (atlas-fedora27s02)	-	Don't Answe	er [Record	SIP Port		5060			Destination:	AUTO	
Port:	1 (enp0s17#0)	-	Rcv Call	E	Enable PESQ	IP ToS:		Best Effort	(0)	-	Speaker	/dev/audio	-
IP Addr:	AUTO	-	🗌 No Tunnelin	g [Play to speaker	Socket Priority:		0			Call Gateway:		
Phone #	AUTO	\$	🗌 No Fast Sta	rt [VAD	VAD Delay(ms)					Record File		
Display Name:	AUTO		Single Code	ec 🛛	Override SDP	VAD Force Sen	d				ESQ Server:		
Auth User Name:	200					litter Buffer:		8			Duiesce:	45 (45 sec)	-
Reg Expire:	300							I					
			Apply	0	K Refr	esh	Batch-Crea	ate	Cance				
5 1.2: Stazuuu (pny	#U): scan tinisned: 241	LZ Z417 Z4	422 2421 2432 24	57 244	42 2441 2452 2451	2462 5180 524							

- A. Side-A will be resource 3
- B. Side-B will be resource 4
- C. Click Apply
- C. See the newly created connection:

<u>چ</u>	LANforge Manager Version	(5.3.8)	
<u>Control Reporting Tear-Off</u> Info Plugi	าร		
	Stop	All Restart Manager	Refresh HELP
Generic Test Mgr Test Group Re	source Mgr Event Log Alerts I	Port Mgr VAP Stations Messages	
Status Layer-3 L3 Endps	VoIP/RTP VoIP/RTP Endp	s [WanLinks [Attenuators	File-10 [Layer-4
Rpt Timer: fast (1 s)	▼ Go Test Manager all ▼	Select All Start Stop	Quiesce Clear
View 0 - 500	Go	Display Create Mo	dify Delete
	Cross Connects for Select	ed Test Manager	
Name Type State	Pkt Tx A → B Pkt Tx A ← B Bps Rx I	B Bps Rx A Rx Drop % A Rx Drop %	$ B \text{ Delay A} \rightarrow B \text{ Delay A} \leftarrow B \text{ Jit} $
r4r5-call SIP/G.711u Stopped	0 0	0 0 0	0 0 0
			•
Logged in to: jedtest:4002 as: Admin	2		

D. In the VOIP/RPT tab, click Start

E. Monitor traffic on the connection with the Modify->View button

<u>Control Reporting Tear-Off</u>		LAN	forge Manager Version(5.3.			
	nfo <u>P</u> lugins					
				top All Restart Manag	er Refresh	HELP
Layer-4 Generic Test Mg	Test Group Res	ource Mgr Eve	nt Log Alerts	ort Mgr VAP Stations Mess	ages	
Status Layer-3	L3 Endps	VoIP/RTP	VoIP/RTP	Endps WanLinks	Attenuators Fi	ile-I0
Rpt Timer: f	ast (1 s) 🔻 (Go Test Manage	r all 💌	Select All Start Store	p Quiesce Clear	
View	500]	Display	Madify Dalata	
view	- 500	• 00		Display Cieace	Delete	
		Cross Cor	nects for Selected	Fest Manager		
Name Type	State Pkt Tx A -	→ B Pkt Tx A ← B	Bps Rx B Bps F	A Rx Drop % A Rx Drop % B)elay A → B Delay A ← B Jitter A -	→ B Jitte
r4r5-call SIP/G.711u Requ	est Start 1,5	40 1,540	56,887 56	885 0.13 0	0 0	0
· · · · ·		Crore Co	anach staf calling Manager	indbash		
ndp	oint: r4r5-call100-A	(1055.00	mect. 1415-cattroo manager	Endpoi	nt: r4r5-call100-B	
Port Resource: atlas fedoraf27 Port: enp0s17#0 IP: 192.168.100.185 bps TX: 28329 Pps TX: 16 bps RX: 29752 Pps RX: 19 Errors: 0 256 pps - 0 pps 16 pps - 0 pps 256 pps - 0 pps 256 pps - 0 pps 266 pps - 266 pps - 26	EID: 1.4.1.3 RX Rate: 55174 RX Pkts: 1538 TX Pkts: 1540 Type: VOIP	1: 6 Avg:0 2: 0 01 16: 0 01 16: 0 22: 0 4: 0 01 16: 0 22: 0 16: 0 22: 0 16: 0 22: 0 10: 0 22: 0 10: 0 22: 0 10: 0 22: 0 12: 0 0 12: 0 0 12: 0 0 12: 0 22: 0 12: 0 2: 0 12: 0 2: 0 12: 0 2: 0	Packets: 1540 20 15 Dropped: 24 0 Packets: 1538 20 15 Dropped: 24	Port Resource: atlas-fedora27 Port: enp0s17#0 IP: 192.168.100.108 bps TX: 40684 Pps Tx: 23 bps RX: 42172 Pps RX: 26 Errors: 0	EID: 1.5.1.4 RX Rate: 55246 RX Pkts: 1540 TX Pkts: 1540 TX Pkts: 1540 CX Pkt	2^20 -2^15 -1024 -32 0 2vg:0)4

Candela Technologies, Inc., 2417 Main Street, Suite 201, Ferndale, WA 98248, USA www.candelatech.com | sales@candelatech.com | +1.360.380.1618