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Candela
**TECHNOLOGIES**
Network Testing and Emulation Solutions

LANforge Entity IDs

Goal: Gain a better understanding of LANforge Entity IDs (EIDs)
Every port, radio, virtual port, endpoint and connection in LANforge has an ID known as an EID. These are an internal notation that expresses the hierarchy of the physical and virtual objects managed by LANforge realm.

```
c:\> perl
```
Desktop

LANforge

System
Under Test
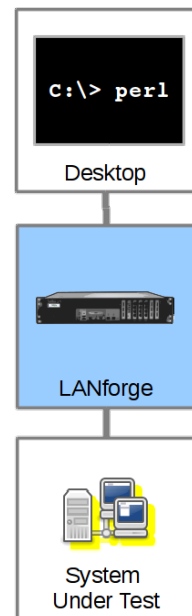
Ports, Endpoints and Connections are Entities

Entity IDs (EIDs) are a dotted-decimal phrase. It expresses the Shelf, Resource Number, Port or Connection number, and if it is an endpoint, it gains a fourth decimal. An example:

```
1.2.8.4  : EID
1        : shelf
  2      : resource
    8    : port
      4  : endpoint
```

LANforge Manager   Version(5.3.3)

Control Reporting Tear-Off Info Plugins

Stop All   Restart Manager   Refresh   HELP

File-IO | Layer-4 | Test Mgr | Test Group | Resource Mgr | Event Log | Alerts | Port Mgr | Messages
Status | Layer-3 | L3 Endps | Armageddon | WanLinks | Attenuators

Disp: 192.168.100.51:0.0   Sniff Packets   Clear Counters   Reset Port   Delete

Rpt Timer: medium (8 s)   Apply   View Details   Create   Modify   Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

Port	Pha...	Down	IP	SEC	Alias	Parent Dev	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX
1.1.00	☐	☐	192.168.100.26	0	eth0		8,331,917,784	14,496,...	23	94,838	12,657,629...	13,882,...	2
1.1.01	☐	☐	10.26.1.2	0	eth1		60,084,186,586	40,031,...	65	792,166	59,768,550...	39,407,...	6
1.1.02	☐	☐	10.26.2.48	0	sta300	wiphy2	59,569,320,101	39,383,...	65	788,094	60,801,796...	40,062,...	6
1.1.03	☐	☐	0.0.0.0	0	wiphy2		72,934,033,707	69,771,...	115	939,847	61,946,091...	40,776,...	6
1.1.04	☐	☐	10.26.2.43	0	sta301	wiphy2	974,452	5,502	0	0	1,124,284	8,722	
1.1.05	☐	☑	0.0.0.0	0	sta302	wiphy2	0	0	0	0	0	0	
1.1.13	☐	☐	0.0.0.0	0	vphy0		0	0	0	0	0	0	
1.1.14	☐	☐	0.0.0.0	0	wiphy0		0	0	0	0	0	0	
1.1.15	☐	☐	0.0.0.0	0	wiphy1		0	0	0	0	0	0	
1.1.16	☐	☐	0.0.0.0	0	wlan0	wiphy0	0	0	0	0	0	0	
1.1.17	☐	☐	0.0.0.0	0	wlan1	wiphy1	0	0	0	0	0	0	
1.1.18	☐	☐	0.0.0.0	0	wlan2	wiphy2	0	0	0	0	0	0	
1.1.19	☐	☐	0.0.0.0	0	hwsim0		0	0	0	0	0	0	
1.2.0	☐	☐	192.168.100.42	0	eth0		1,651,134,987	5,419,636	8	6,678	6,846,252,...	5,580,224	
1.2.1	☐	☐	10.26.1.1	0	eth1		59,777,383,398	39,439,...	65	792,097	60,075,036...	39,998,...	6
1.2.2	☐	☐	0.0.0.0	0	wiphy0		0	0	0	0	0	0	
1.2.3	☐	☐	0.0.0.0	0	wiphy1		0	0	0	0	0	0	
1.2.4	☐	☐	0.0.0.0	0	wiphy2		70,987,511,003	63,077,...	105	903,372	61,170,347...	39,756,...	6
1.2.5	☐	☐	0.0.0.0	0	wlan0	wiphy0	0	0	0	0	0	0	
1.2.6	☐	☐	0.0.0.0	0	wlan1	wiphy1	0	0	0	0	0	0	
1.2.7	☐	☐	0.0.0.0	0	wlan2	wiphy2	0	0	0	0	0	0	
1.2.8	☐	☐	10.26.2.1	0	vap0	wiphy2	59,916,602,410	40,014,...	65	788,665	60,400,686...	39,417,...	6

Logged in to: 192.168.100.26:4002 as: Admin

For now, assume the shelf number will always be 1. The Resource number will refer to the LANforge machine ID as reported on the Status tab. The Port ID is only unique within a LANforge machine. The Port ID also refers to hardware in a machine: radios get a third decimal. The fourth decimal refers to either endpoints or connections.

Only Some LANforge Entities Generate Connection Data

While some items with port numbers, notably radios and ports, do not generate traffic. Endpoints generate traffic, and typically endpoints are transmitting to an opposite endpoint. The exception to this are *multicast endpoints*.

EIDs Express Hierarchy

From the dotted-decimal perspective:

- Physical or virtual ports reside below a resource, except:

- ...for VLANs: A virtual port does not reside below it's physical port

- ...for bridge ports:: A port of a bridge has to exist before the bridge is created

- An endpoint resides below a physical or virtual port.

The formatting of the decimals might or might not be zero-padded. The picture below should convey how a connection (Layer 3) relates to two endpoints, and two ports:

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Rpt Timer: default (5 s) ▼ Go Test Manager all ▼   Select All Start Stop Quiesce Clear

View 0 - 200 ▼ Go   Display Create Modify Delete

Cross Connects for Selected Test Manager

Name	Type	State	EID	Endpoints (A ↔ B)
cx-sta300	LF/UDP	Run	1.2	cx-sta300-A <=> cx-sta300-B
tutorial-cx	LF/UDP	Stopped	1.3	tutorial-cx-A <=> tutorial-cx-B
tutorial2-cx	LF/TCP	Stopped	2.4	tutorial2-cx-A <=> tutorial2-cx-B

Logged in to: 192.168.100.26:4002 as: Admin

L3 Endps

Stop All   Restart Manager   Refresh   HELP

Min PDU Size AUTO ▼ Go Max PDU Size Same ▼ Go   Start Stop Quiesce Clear

MIN Tx Rate New Modem (56 Kbps) ▼ Go MAX Tx Rate Same ▼ Go

View 0 - 400 ▼ Go   Display Create Modify Batch Modify Delete

All Endpoints

Name	EID	Run	Mng	Script	A/B	Source Addr	Destination Addr
cx-sta300-A	1.1.2.1	✔	✔	None	A	10.26.2.48 33009	10.26.1.2 33010
cx-sta300-B	1.1.1.2	✔	✔	None	B	10.26.1.2 33010	10.26.2.48 33009
tutorial-cx-A	1.1.4.3	☐	✔	None	A	10.26.2.43 0	10.26.1.2 0
tutorial-cx-B	1.1.1.4	☐	✔	None	B	10.26.1.2 0	10.26.2.43 0
tutorial2-cx-A	1.1.4.5	☐	✔	None	A	10.26.2.43 0	10.26.1.2 0
tutorial2-cx-B	1.1.1.6	☐	✔	None	B	10.26.1.2 0	10.26.2.43 0

Port Mgr

Stop All   Restart Manager   Refresh   HELP

Disp: 192.168.100.51:0.0   Sniff Packets   Clear Counters   Reset Port   Delete

Rpt Timer: medium (8 s) ▼   Apply   View Details   Create   Modify   Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

Port	Pha...	Down	IP	Alias	Parent Dev	Device	Mask	MAC
1.1.00	☐	☐	192.168.100.26	eth0		eth0	255.255.255.0	00:90:0b:29:06:f8
1.1.01	☐	☐	10.26.1.2	eth1		eth1	255.255.255.0	00:90:0b:29:06:f9
1.1.02	☐	☐	10.26.2.48	sta300	wiphy2	sta300	255.255.255.0	00:0e:8e:61:8f:5b
1.1.03	☐	☐	0.0.0.0	wiphy2		wiphy2	0.0.0.0	00:0e:8e:3e:27:5b
1.1.04	☐	☐	10.26.2.43	sta301	wiphy2	sta301	255.255.255.0	00:0e:8e:24:1f:5b
1.1.05	☐	✔	0.0.0.0	sta302	wiphy2	sta302	0.0.0.0	00:0e:8e:fd:d6:5b
1.1.13	☐	☐	0.0.0.0	vphy0		vphy0	0.0.0.0	02:00:00:00:00:00
1.1.14	☐	☐	0.0.0.0	wiphy0		wiphy0	0.0.0.0	00:0e:8e:4e:5a:56

The exception is connections. Connections are numbered outside of this hierarchy.

Do I use EIDs in Scripts?

Usually not, for these reasons:

1. EIDs are generated at LANforge manager start time, and might depend on the detection order of ports when the PCI bus on the host is enumerated at boot time.

2. New EIDs can be created by appending one database to another on non-conflicting devices

3. New devices can be hot-added to a LANforge resource, like a programmable attenuator or a USB-Ethernet adapter, generating new Port IDs.

In scripts, it *is legal* to reference port numbers, but not advised to store them between sessions. If you reference an EID, it should be from within your present LANforge session. If your resources tend to disappear off the network and return (you had a machine reboot) those EIDs are not guaranteed to return.

> ⓘ For ports, only the first two decimals (shelf and resource id) are actually stable across machine reboots.

If you look into the saved scenarios (in `/home/lanforge/DB/DFLT`) you will notice that ports, endpoints, and connections are refered to by name. Event though in the CLI Users's guide, where it states *port number*, use names in your scripts:

```
CMD
|        SHELF
|        |   RESOURCE
|        |   |   PORT
|        |   |   |
set_port 1   1   eth1 10.26.1.2 255.255.255.0 10.26.1.1 ....
```