

128

TECHNOLOGY

HOW-TO GUIDE: SETUP A 4.2.X HA REDUNDANT WAN INBAND MANAGEMENT ROUTER FROM SCRATCH

Abstract

The guide will walk an operator through setting up a typical highly availability branch or headend router with redundant WAN interfaces and inband management using the 128T certified OTP (one touch provisioning) ISO.

19 November 2019

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Introduction

The guide will walk an operator through setting up a typical HA branch or datacenter edge router using the 128T certified OTP (one touch provisioning) ISO.

Intended Audience

This guide is intended to be used by implementation engineers for both internal and external (customer) consumption.

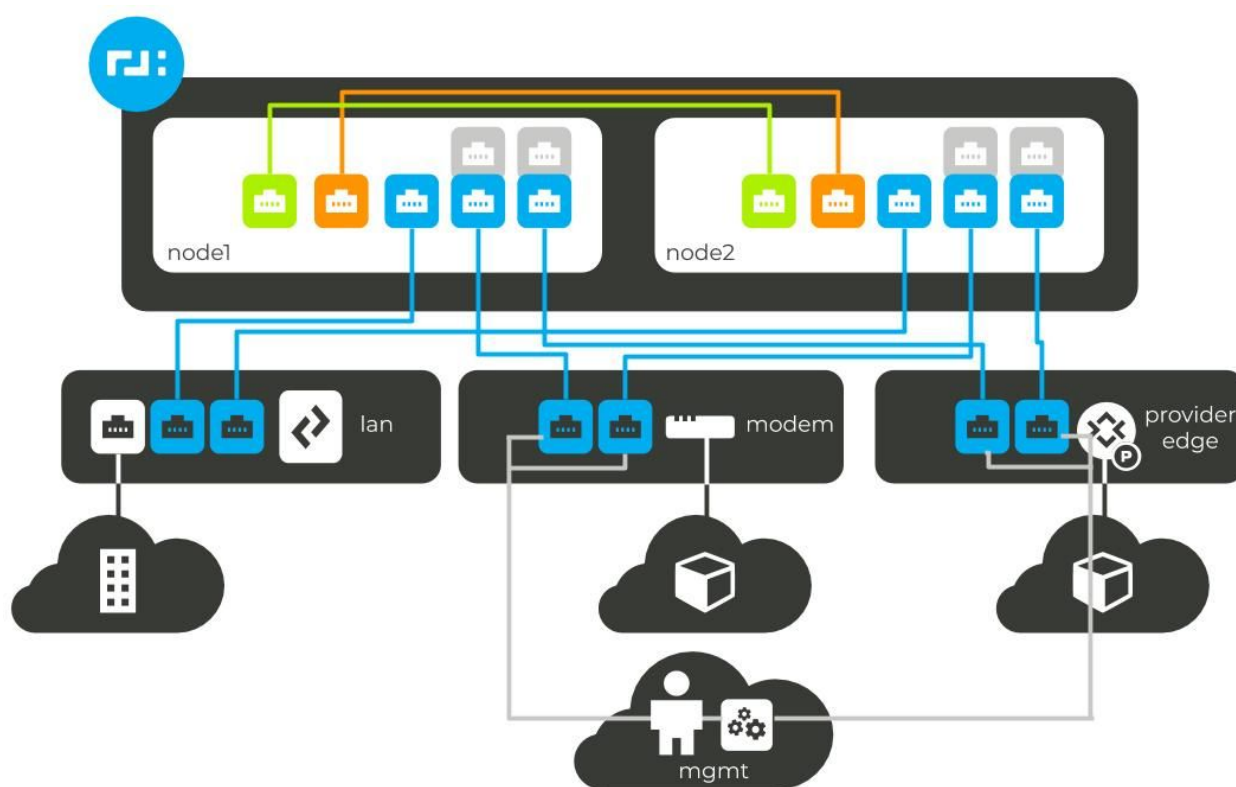
Prerequisites

- Tested on 128T-OTP-4.2.0-2.el7.x86_64.iso OTP ISO with the 128T Conductor running 4.2.0-2.
- Bootable ISO created following this procedure:
<https://community.128technology.com/viewdocument/how-to-create-a-bootable-usb-device-for-the-128t-iso-in-windows?CommunityKey=b11feb44-9c9c-4d2a-bfa2-63e8826d0d0a&tab=librarydocuments>
- BIOS configured to boot off of USB drive first
- Installed system meets minimal 128T hardware requirements
- 128T Router is fully managed by 128T standalone Conductor
- 128T Router deployed as 2 nodes in a highly available pair
- 128T Router has 2 WAN links with each shared across both nodes for redundancy
- Management plane setup to use shared WAN1 and WAN2 connections (e.g. inband) and setup with a static IPv4 address
- If 128T is not running, WAN1 will be used to connect to Conductor from each node. This requires 3 IPs to be used as follows:
 - IP1: shared IP when 128T is running
 - IP2: node1 WAN IP when 128T is not running
 - IP3: node2 WAN IP when 128T is not running
 - VLANs not supported on WAN1
- If 128T is running, WAN1 and WAN2 will be used to connect to the 128T Conductor using equal cost load balancing of each session. The node without

the active WAN link will leverage the fabric link towards the other node for 128T Conductor connectivity.

- Default service called “internet” is created which routes all traffic out WAN1 as primary and WAN2 as backup
- Using a “Conductor” address as a FQDN is not fully supported. Must use an IPv4 address for the Conductor.

Diagram



Procedure

The following procedure outlines the best configuration practices for installing and configuring a highly available branch or headend router running the 128T Session Smart Router software.

Installation

- Install the 128T software on both using the 128T certified OTP ISO as outlined here:

- <https://community.128technology.com/viewdocument/how-to-guide-downloading-isos?CommunityKey=b11feb44-9c9c-4d2a-bfa2-63e8826d0d0a&tab=librarydocuments>
- Note, this boots to console by default. If the hardware platform has a VGA port, please select that option.
- Post initial installation, the system will turn itself off automatically. Please manually power on system.
- Post first initialization, the system will turn itself off automatically. Please manually power on system.
- After the initial installation and initialization are completed, plug in a computer to any Ethernet based port on the system and verify the computer has an IP address provided via DHCP.

128T Configuration

- Fill out the following fields and input them into the following config router builder:

<https://128tconfigbuilder.reidlab.com/templates/ha-router-red-wan-inband-4-2.html>

- Note: all fields below are required

Parameter	Value
Authority Name	128technology
1st Conductor Address (must be an IP address)	7.7.7.7
Router Name	seattle-site-01-4-2-ha-red-inband-template
Site Address	North Bend, WA
Site Coordinates	+47.447306-121.75806/
NTP Server1 (can be FQDN or IP Address)	0.north-america.pool.ntp.org
NTP Server2 (can be FQDN or IP Address)	1.north-america.pool.ntp.org

Node1 Name (e.g. "node1")	node1
Node2 Name (e.g. "node2")	node2
WAN1 VLAN (0 if no VLAN)	0
Node1 WAN1 Device PCI Address (XXXX:XX:XX.X)	0000:07:00.0
Node2 WAN1 Device PCI Address (XXXX:XX:XX.X)	0000:07:00.0
WAN1 Shared MAC Address (e.g. "00:01:ff:af:06:00")	00:01:ff:af:06:00
WAN1 Topology ("hub", "spoke", or "mesh")	hub
WAN1 Vector Name (e.g. "choice1", "WAN1")	choice1
WAN1 IP Address	192.168.1.5
WAN1 Node1 Management IP	192.168.1.6
WAN1 Node2 Management IP	192.168.1.7
WAN1 Prefix	24
WAN1 Gateway	192.168.1.1
WAN2 VLAN (0 if no VLAN)	0
Node1 WAN2 Device PCI Address (XXXX:XX:XX.X)	0000:0b:00.0
Node2 WAN2 Device PCI Address (XXXX:XX:XX.X)	0000:0b:00.0
WAN2 Shared MAC Address (e.g. "00:01:ff:af:06:00")	00:01:ff:af:16:00
WAN2 Topology ("hub", "spoke", or "mesh")	hub
WAN2 Vector Name (e.g. "choice2", "WAN2")	choice2

WAN2 IP Address	192.168.10.101
WAN2 Prefix	24
WAN2 Gateway	192.168.10.1
LAN VLAN (0 if no VLAN)	0
Node1 LAN Device PCI Address	0000:0b:00.1
Node2 LAN Device PCI Address	0000:0b:00.1
LAN Shared MAC Address (e.g. "00:01:ff:af:26:00")	00:01:ff:af:26:00
LAN IP Address	192.168.128.1
LAN Prefix	24
LAN Tenant	guest-wifi
Node1 Fabric Device PCI Address	0000:04:00.0
Node2 Fabric Device PCI Address	0000:04:00.0
Node1 Sync Device PCI Address	0000:08:00.0
Node2 Sync Device PCI Address	0000:08:00.0
Node1 Inband Mgmt/Loopback IP Address (assumes /30)	10.128.128.0
Node2 Inband Mgmt/Loopback Gateway (assumes /30)	10.128.128.1
Management DNS Server IP1	8.8.8.8
Management DNS Server IP2	1.1.1.1

- On Node1, determine which Linux interface name is WAN1. Using the "Node1 WAN1 Device PCI Address" above issue this command:

```
t128@<hostname> ~]$ dmesg | grep <insert-WAN1-PCI-address> | grep
Network -A1
[ 1522.373299] igb <insert-WAN1-PCI-address>: Intel(R) Gigabit
```

Ethernet Network Connection

```
[ 1522.382612] igb <insert-WAN1-PCI-address>: enp0s20f0: PBA No: 001800-000
```

- In this example the WAN1 Linux interface name is “enp0s20f0”

WAN1 Node1 Linux Interface Name	enp0s20f0
---------------------------------	-----------

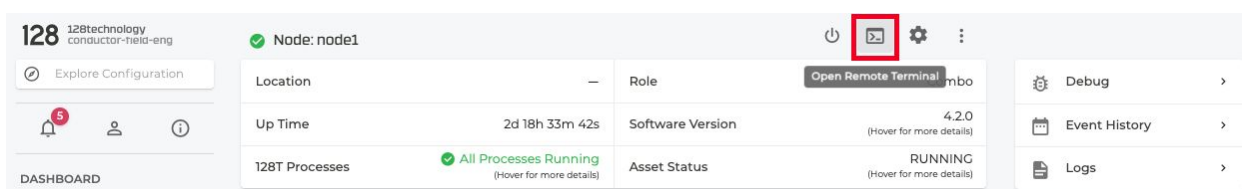
- On Node2, determine which Linux interface name is WAN1. Using the “Node2 WAN1 Device PCI Address” above issue this command:

```
t128@<hostname> ~]$ dmesg | grep <insert-WAN1-PCI-address> | grep Network -A1
[ 1522.373299] igb <insert-WAN1-PCI-address>: Intel(R) Gigabit Ethernet Network Connection
[ 1522.382612] igb <insert-WAN1-PCI-address>: enp0s20f0: PBA No: 001800-000
```

- In this example the WAN1 Linux interface name is “enp0s20f0”

WAN1 Node2 Linux Interface Name	enp0s20f0
---------------------------------	-----------

- Open the PCLI on the 128T Conductor by accessing “Conductor” -> “Open Remote Terminal”



- Copy the config from the config builder tool and paste it into the managed 128T
 - Run “validate” and “commit” the put the config into Running.
- For each of these follow steps, complete the QuickStart process for node1 and then repeat all for node2:
 - Go to the 128T Conductor UI to start the QuickStart process for this newly created 128T Router by accessing “Routers” -> “<Router Name>” -> “QUICKSTART LINK”

Router: seattle-site-01-4-2-ha-red-inband-template

Bandwidth	N/A	Session Count	N/A
Session Arrivals	N/A	Session Departures	N/A
Nodes	2	Device Interfaces	12
Network Interfaces	12	Location	North Bend, WA
Software Version	N/A		

Node: node1 **Node: node2**

QuickStart This Node
This node has been configured but has not yet connected to the conductor. Click the button below to generate a QuickStart link which can be used to connect the node.

QUICKSTART LINK

Looking to accept a pending asset? Click Here.

QuickStart

Router Name: seattle-site-02-4-2-branch-templ Node Name: node1

Asset Identification: [REDACTED]

Device Host Address: 192.168.0.128

Password: [REDACTED]

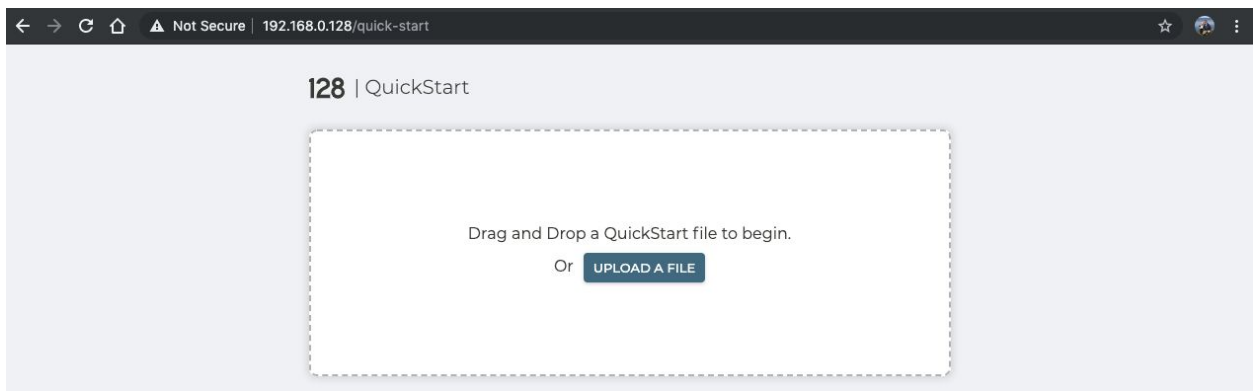
Follow the instructions below to configure a 128T node using the QuickStart file:

1. Click [here](#) to download the QuickStart file.
2. On a computer connected to the target 128T node, open a browser and navigate to: <https://192.168.0.128/quick-start>
3. Drag and drop the QuickStart file into the page and follow the instructions on the screen to complete the QuickStart process.

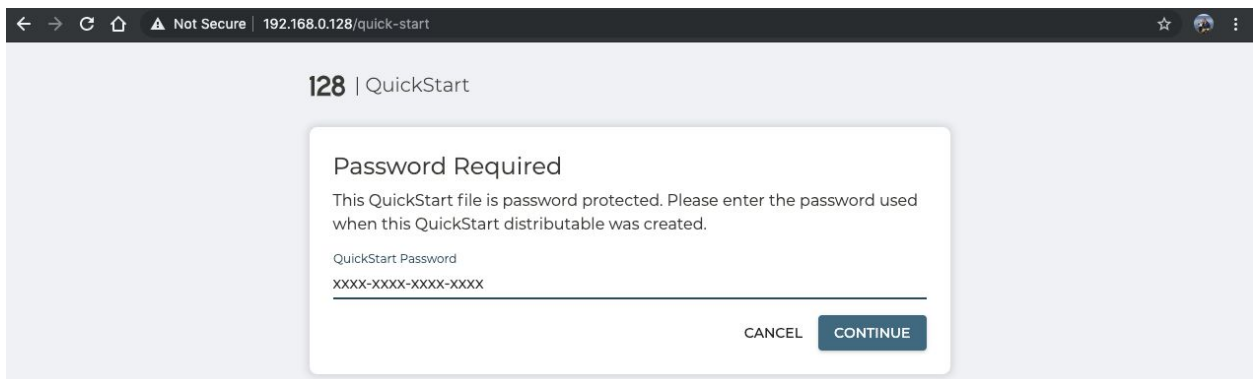
DISMISS

- Copy the “Password” auto generated
- Follow step1 to download the QuickStart file locally by selecting the “Click Here” link

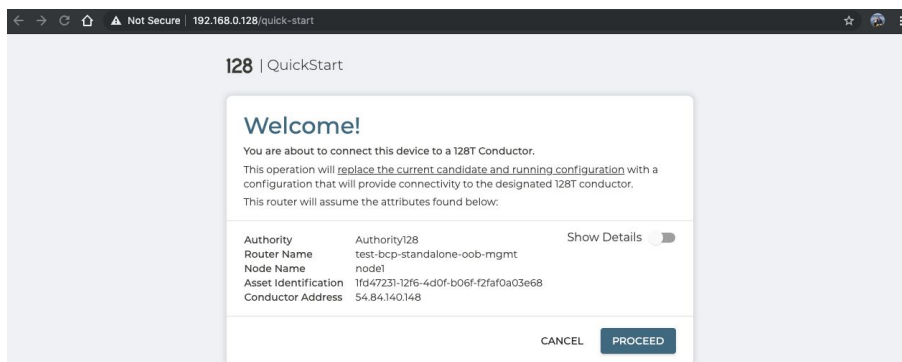
- Plug in a computer to any ethernet port on the new router system and ensure DHCP is enabled on the local computer
- Follow step2 and click the link to start the QuickStart URL process
- Login locally to the new router with the default username “admin” and password “128Tadmin”
- Drag and drop the QuickStart file and click “Proceed”



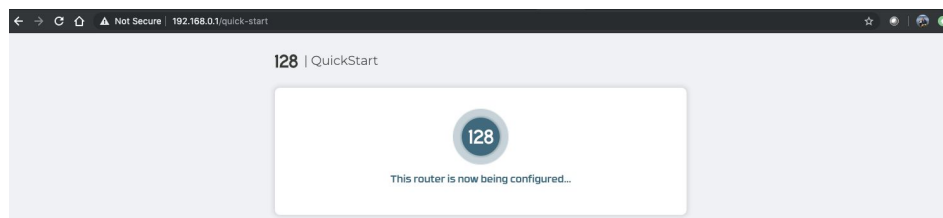
- Paste the “Password” previously copied to unencrypt the QuickStart file and click “Continue”



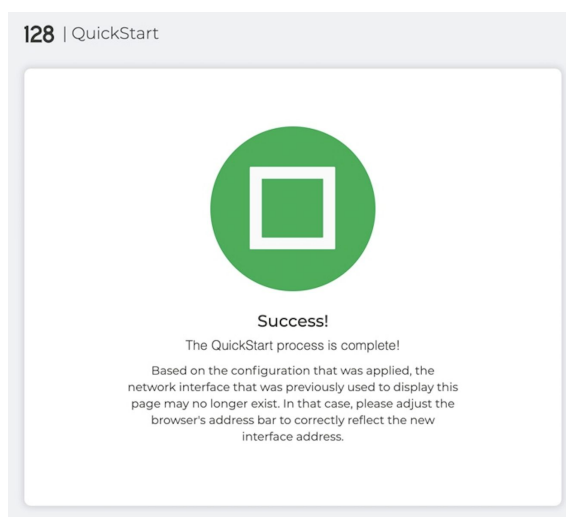
- Click “Proceed” to start this process
 - Optionally, select the “Show Details” slider to view the full config that will be configured



- After around 10 mins, this process will complete and your 128T Router will be fully configured.



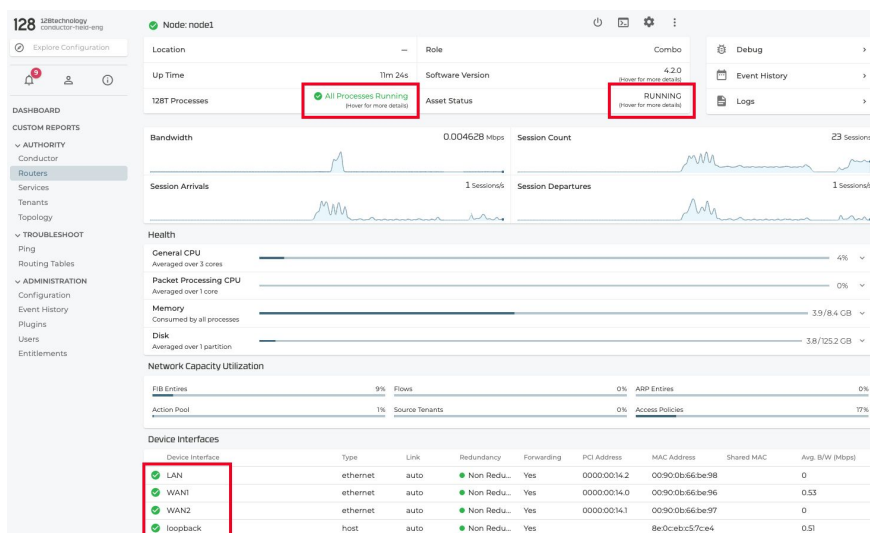
- After around 20 mins, the router QuickStart webpage will show a message that the router was successfully configured.



Verifying Operation

Go to the 128T Conductor UI to verify the process completed for this newly created Node on the 128T Router by accessing “Routers” -> “<Router Name>” -> “<Node Name>”

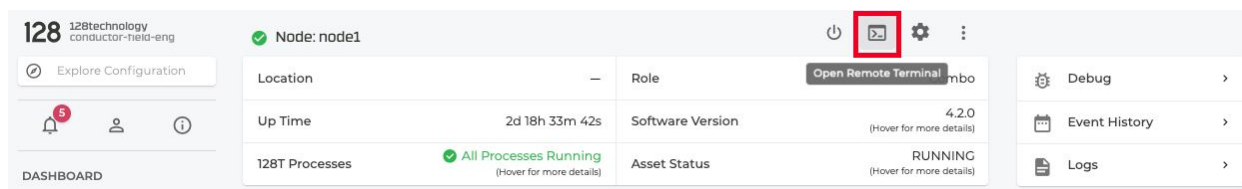
- Verify “128T Processes” -> “All Processes Running”
- Verify “Asset Status” -> “RUNNING”
 - Verify all 4 interfaces are “Up”



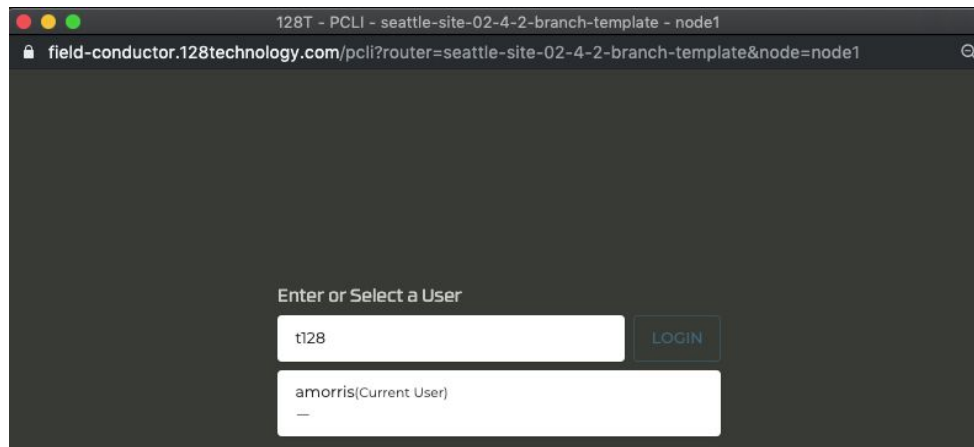
- Repeat these verification steps for Node2.

128T Post Software Setup

- Post installation and 128T setup, use the Conductor UI to login to the console of the configured Node1 128T Router to start by navigating to “Routers” -> “<Router-Name>” -> “<Node-Name>” -> “Open Remote Terminal”



- Enter user “t128” and click “LOGIN” button



- Enter default ISO password “128tRoutes”
- Steps to manually configure Node1 WAN1 in Linux to connect to the 128T Conductor when 128T is not running.
 - Using the following inputs from the template above and and input them into the following interface builder tool:

WAN1 Node1 Linux Interface Name	enp0s20f0
WAN1 Node1 Management IP	192.168.1.6
WAN1 Prefix	24
WAN1 Gateway	192.168.1.1
Management DNS Server IP1	8.8.8.8
Management DNS Server IP2	8.8.4.4

- <https://128tconfigbuilder.reidlab.com/templates/4-2-linux-interface.html>

- Create the Node1 Linux WAN1 interface:

```
t128@<hostname> ~]$ sudo bash -c "cat >
/etc/sysconfig/network-scripts/ifcfg-<Linux-int-name> << EOF
```

- Paste the contents from the interface builder tool into the remote router terminal

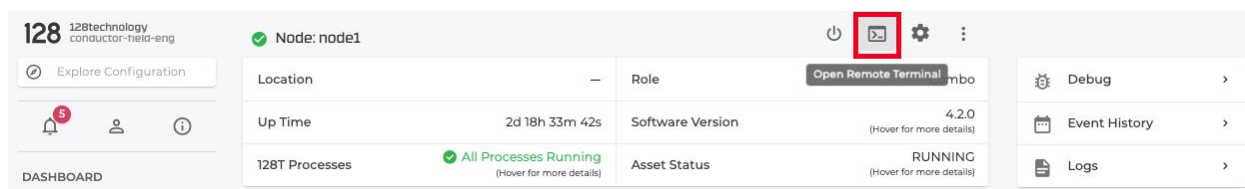
```
> <paste line1>
> <paste line2>
> ...
```

```
> <paste lineX>
```

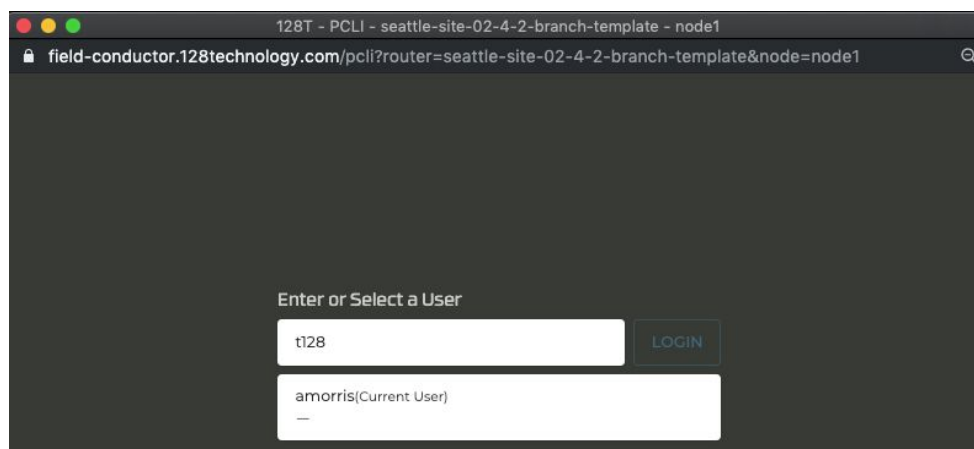
- Use “EOF” to finish creating the Linux interface configuration file followed by the default “t128” password “128tRoutes”

```
> EOF"
[sudo] password for t128:
```

- Use the Conductor UI to login to the console of the configured Node2 128T Router to start by navigating to “Routers” -> “<Router-Name>” -> “<Node-Name>” -> “Open Remote Terminal”



- Enter user “t128” and click “LOGIN” button



- Enter default ISO password “128tRoutes”
- Steps to manually configure Node2 WAN1 in Linux to connect to the 128T Conductor when 128T is not running.
 - Using the following inputs from the template above and and input them into the following interface builder tool:

WAN1 Node2 Linux Interface Name	enp0s20f0
---------------------------------	-----------

WAN1 Node2 Management IP	192.168.1.7
WAN1 Prefix	24
WAN1 Gateway	192.168.1.1
Management DNS Server IP1	8.8.8.8
Management DNS Server IP2	8.8.4.4

- <https://128tconfigbuilder.reidlab.com/templates/4-2-linux-interface.html>

- Create the Node2 Linux WAN1 interface:

```
t128@<hostname> ~]$ sudo bash -c "cat >
/etc/sysconfig/network-scripts/ifcfg-<Linux-int-name> << EOF
```

- Paste the contents from the interface builder tool into the remote router terminal

```
> <paste line1>
> <paste line2>
> ...
> <paste lineX>
```

- Use “EOF” to finish creating the Linux interface configuration file followed by the default “t128” password “128tRoutes”

```
> EOF"
[sudo] password for t128:
```

- Steps to change default passwords for all 128T created Linux users (“t128” and “root”):

```
t128@<hostname> ~]$ passwd
Changing password for user t128.
Changing password for t128.
(current) UNIX password:
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
t128@<hostname> ~]$ sudo passwd
Changing password for user root.
```

```
New password:  
Retype new password:  
passwd: all authentication tokens updated successfully.
```

Further Resources

Additional technical resources can be found on the 128 Technology customer community - Interchange: <https://community.128technology.com/>.

Known Issues

I95-31279 - Salt timeout issues occasionally occur post QuickStart URL install. The work around is a manual restart of the 128T software.

I95-31985 - NTP client takes a long time to attempt to connect post 4.2.0 OTP install. A NTP alarm may be present until NTP can connect to sync system time.