



128T NETWORKING PLATFORM AWS DEPLOYMENT

This document describes the steps necessary to deploy a 128T Conductor and a 128T Router in an Amazon Web Services EC2 instance

CONTENTS

Introductory Material.....	3
Introduction.....	3
Prerequisites and Requirements.....	3
Architecture Diagrams	3
Planning Guidance.....	6
Security.....	6
Costs.....	7
Sizing.....	8
Deployment Guidance.....	9
Conductor Deployment.....	9
Creating a 128T Conductor Instance.....	9
Installing 128T Conductor Software.....	21
Router Deployment	38
Creating a 128T Router Instance	38
Managing a 128T Router Instance.....	47
High Availability (HA) Deployment.....	51
Operational Guidance.....	66
Health Check.....	66
Backup and Recovery.....	67
Routine Maintenance.....	69
Emergency Maintenance	69
Support.....	70
Support Costs.....	70

INTRODUCTORY MATERIAL

INTRODUCTION

The 128T Networking Platform can be used for a wide range of use-cases including public cloud deployments with networking elements inside or outside the public cloud. This document describes the steps necessary to deploy a 128T Conductor and 128T Router in an Amazon Web Services EC2 instance using a 128 Technology AMI (Amazon Machine Image) from the AWS Marketplace.

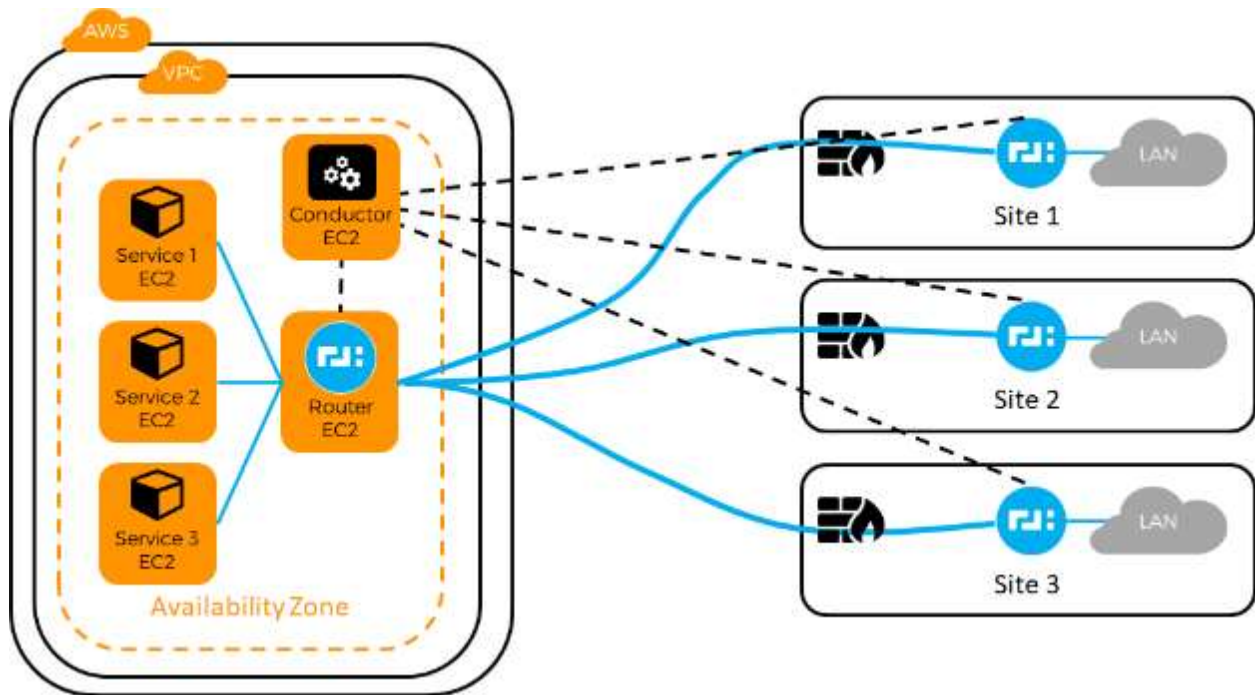
PREREQUISITES AND REQUIREMENTS

Deploying the 128T Networking Platform in AWS requires familiarity with the AWS Management Console and EC2 services. For initial deployment, familiarity with Linux is beneficial. After deployment in AWS, router provisioning requires networking expertise.

A user must have an AWS Management Console account and the ability to launch EC2 instances. On the AWS Marketplace the “128 Technology Network Platform” AMI is BYOL (Bring Your Own License), so to complete the installation, the user must contact 128 Technology for a license and certificate.

ARCHITECTURE DIAGRAMS

Many enterprises have adopted the AWS public cloud for numerous applications. To support these emerging applications, the 128T Networking Platform can be deployed in AWS supporting many different use-cases. The platform consists of 128T Routers which can be deployed both inside and outside the cloud, and the 128T Conductor, which is a management platform to manage all the routers. One of the most common use-cases is providing reliable and encrypted connectivity using Secure Vector Routing (SVR) from multiple remote sites into an AWS Virtual Private Cloud (VPC). Typically, an enterprise first deploys a 128T Conductor, then routers at remote sites, and finally connects to AWS. The final AWS 128T Router launched in a VPC on an EC2 instance provides SVR into the services deployed in AWS. This document outlines a representative process to deploy the 128T Conductor and Router in AWS in scenarios like this.

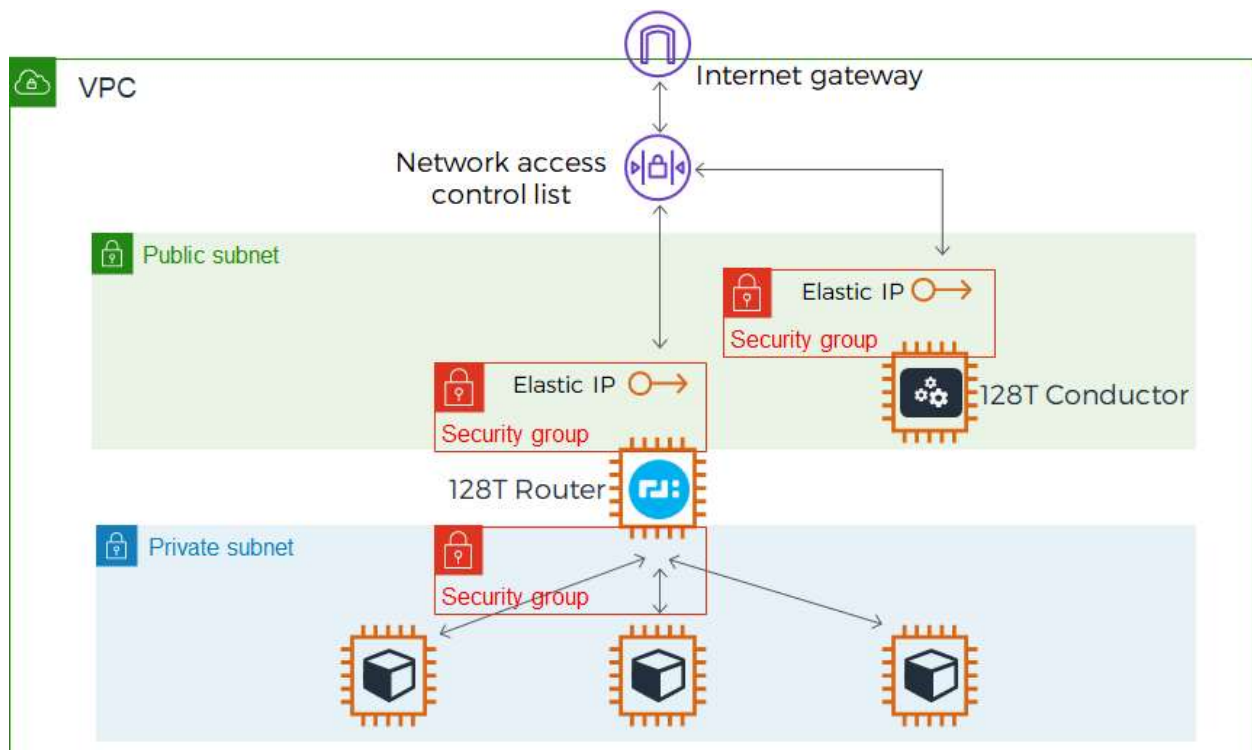


The 128T Router and Conductor function on the Linux Operating System, and 128 Technology has developed an Amazon Machine Image (AMI) available in the AWS Marketplace to simplify 128T deployment in AWS. Amazon Web Services EC2 provides a catalog of AMIs to deploy virtual servers in an automated fashion. This deployment guide will go through the steps of initially launching and access the new 128 Technology instance in AWS.

As shown below in the AWS architecture, the 128T Router and Conductor are deployed within an VPC (Virtual Private Cloud). Both the Router and Conductor are deployed as an AMI in an EC2 instance.

For a typical deployment the Conductor will be deployed with a network interface in a public subnet in a security group, with an associated publicly-reachable Elastic IP address and network access control list, via the Internet gateway.

A 128T Router in a typical deployment will have two network interfaces and sit between a public subnet and a private subnet, where various applications are located. One router interface will be deployed with an associated security group within a public subnet with a network access control list. The network interface has associated a publicly-reachable Elastic IP address that is reachable via an Internet gateway. A second interface will be deployed within a private subnet in a security group, with a private address, with reachability to other EC2 instances where various applications may be deployed.

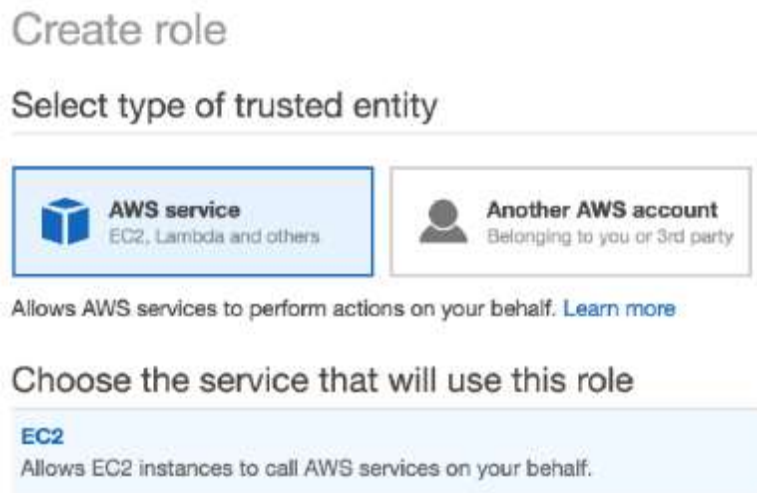


PLANNING GUIDANCE

SECURITY

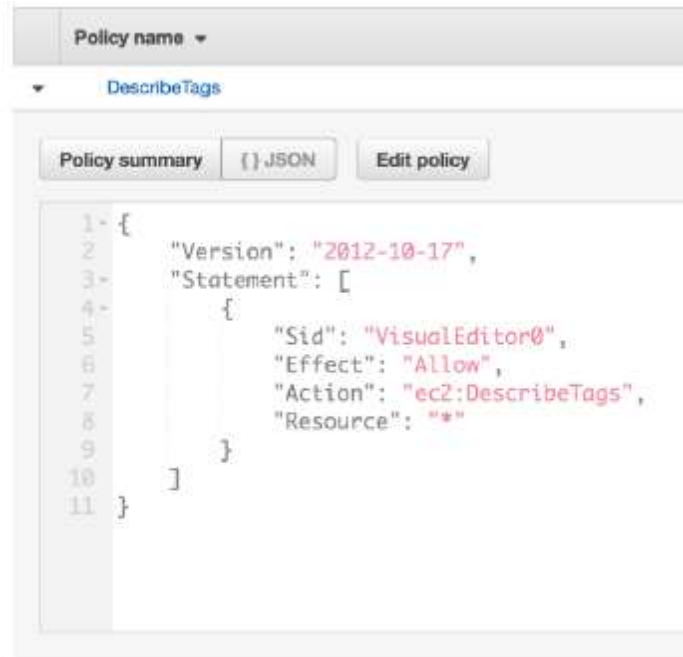
The only keys involved in the architecture are the private key files for SSH access to the EC2 instance. The standard AWS approach is used as part of launching an instance, allowing the user to either generate or use an existing key pair.

When the 128T Conductor is deployed no specific IAM (Identify and Access Management) role is required. The 128T Router does require the user to create an IAM role. This role primarily serves to simplify management connectivity to an existing 128T Conductor. In this document we named this role "128T_ZTP". The role is for an EC2 service.



For this role, in the Permissions section enable "DescribeTags" which is used to automate connectivity to the Conductor, as outlined in the "Router Deployment" section of this document.





COSTS

The 128T Networking Platform on the AWS Marketplace is currently a BYOL offering. The only costs reflected in AWS are those of the instance type:

The table shows current software and infrastructure pricing for services hosted in US East (N. Virginia). Additional taxes or fees may apply.

128 Technology Networking Platform			
EC2 Instance type	Software/hr	EC2/hr	Total/hr
t2.large	\$0	\$0.093	\$0.093
c4.xlarge ★ Vendor Recommended	\$0	\$0.199	\$0.199

The most up-to-date pricing information is in the AWS Marketplace listing at <https://aws.amazon.com/marketplace/pp/B079V72CH7>. The 128 Technology licensing model is subscription-based, scaling in cost with the number of routers and the bandwidth of the routers. For a specific quote, please contact 128 Technology at www.128technology.com, 781.203.8400, or info@128technology.com.

SIZING

The performance of the various 128 Technology products scales with the size of the instance. In the Marketplace listing a wide range of EC2 instances are available.

For the 128T Conductor the number of managed routers roughly scales with the type of instance. Approximate guidelines are t2.large to manage up to 50 routers, r4.2xlarge to manage up to 500 routers, and r4.8xlarge to manage up to 5000 routers.

For the 128T Router the total encrypted throughput of the router roughly scales with the type of instance. Approximate guidelines are c4.xlarge or c5.xlarge for ~300 Mbps, c5.2xlarge for ~900 Mbps, and c5.4xlarge for ~2 Gbps, but results may vary based on many factors. For guidance on a specific application, contact 128 Technology directly.

For both the 128T Conductor and 128T Router the default storage sizes should be sufficient for most applications.

DEPLOYMENT GUIDANCE

This deployment guide provides instructions for two broad scenarios: no 128T Conductor and existing 128T Conductor.

In a case where no 128T Conductor has been deployed, we recommend continuing with through this entire guide in order:

- Creating a 128T Conductor Instance

- Installing a 128T Conductor Instance

- Creating a 128T Router Instance

- Managing a 128T Router Instance

In the case where a 128T Conductor has already been deployed, we recommend skipping several sections of the guide and proceeding with:

- Creating a 128T Router Instance

- Managing a 128T Router Instance

In both scenarios at the end of the guide the user will have both a 128T Conductor and an associated 128T Router.

CONDUCTOR DEPLOYMENT

This section describes how to deploy a 128T Conductor into AWS. The exact time for deployment will vary, but it averages between 15 and 30 minutes.

Creating a 128T Conductor Instance

If you already have a 128T Conductor instance deployed either in AWS or elsewhere, then you can proceed to the next section.

To create the initial 128 Conductor instance, log in into Amazon Web Services console at <https://console.aws.amazon.com> using your account name, username and password.



Account:

User Name:

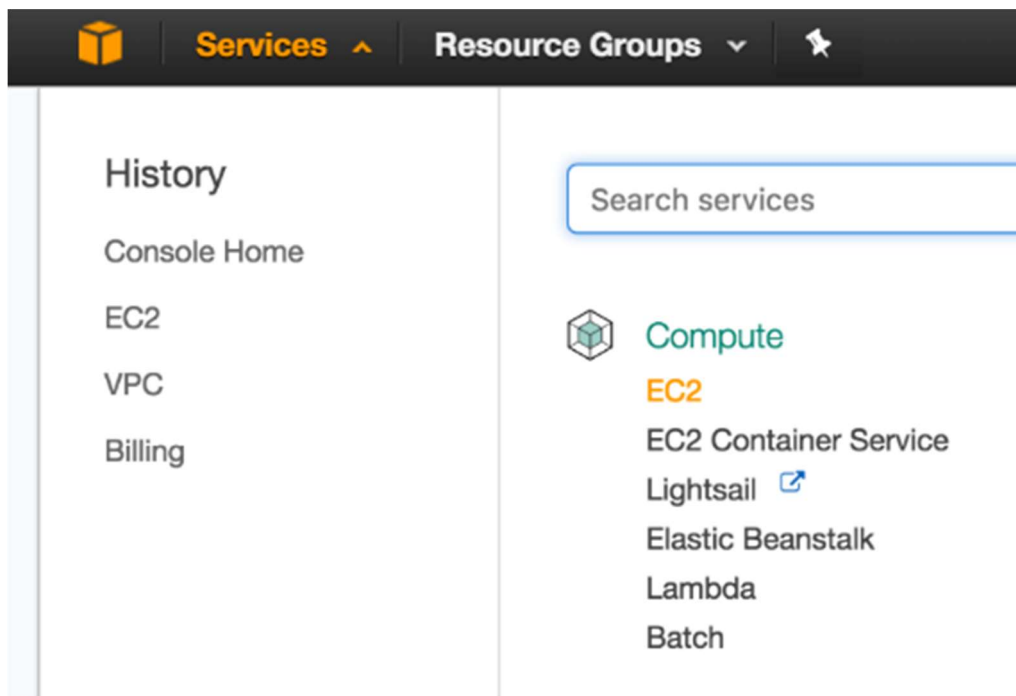
Password:

MFA users, enter your code on the next screen.

Sign In

[Sign in using root account credentials](#)

Once logged into the AWS console, the EC2 service needs to be accessed by clicking on “Services” in the top bar menu, and then selecting “EC2” under the “Compute” category.



In order to deploy a 128T Conductor, an EC2 instance has to be created using the corresponding 128T AMI. From the “EC2 dashboard”, click the “Launch Instance” button to start the process of creating an instance in a region.

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

[Launch Instance](#)

Note: Your instances will launch in the US East (N. Virginia) region

Amazon Web Services EC2 classifies AMIs in several categories. Currently, 128 Technology has created an AMI to deploy a 128T Conductor from the “AWS Marketplace” category. The 128 Technology AMIs can be found by searching for “128T”. Clicking on the “Select” button of the AMI starts the deployment process of the instance.

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 1: Choose an Amazon Machine Image (AMI) [Cancel and Exit](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace, or you can select one of your own AMIs.

Q 128T

Quick Start (0) My AMIs (5)

AWS Marketplace (1)

Community AMIs (1)

Categories

All Categories

Infrastructure Software (1)

Operating System

Clear Filter

All Linux/Unix

CentOS (1)

Software Pricing Plans

Bring Your Own License (1)

Region

Current Region (1)

All Regions (16)

128T Networking Platform

★★★★★ (0) | 128T Networking Platform | CentOS7 | By 128 Technology, Inc.

Bring Your Own License - AWS usage fees

Linux/Unix, CentOS 7 | 64-bit (x86) Amazon Machine Image (AMI) | Updated: 10/3/18

The 128T Networking Platform features orchestration and zero touch provisioning, zero trust security, hypersegmentation, load balancing, global policy, failover, app-SLA, VPN.

[More info](#)

[Select](#)

The following results for "128T" were found in other catalogs:

[7 results](#) in My AMIs

My AMIs are AMIs owned by you or shared with you


[1 results](#) in Community AMIs

Community AMIs are AMIs that are shared by the general AWS community

After selection, AWS provides a summary of the AMI. Click “Continue.”

Step 1: Choose an Amazon Machine Image (AMI) Cancel and Exit

128T Networking Platform



128T Networking Platform

The 128T Networking Platform features orchestration and zero touch provisioning, zero trust security, hypersegmentation, load balancing, global policy, failover, app SLA, VPN gateway and bandwidth savings.

[View Additional Details in AWS Marketplace](#)

Product Details

By	128 Technology, Inc.
Customer Rating	***** (0)
Latest Version	128T Networking Platform CentOS7
Base Operating System	Linux/Unix, CentOS 7
Delivery Method	64-bit (x86) Amazon Machine Image (AMI)
License Agreement	End User License Agreement
On Marketplace Since	2/14/18
AWS Services Required	Amazon EC2, Amazon EBS

Highlights

- High performance Session Smart Router with tunnel-free bandwidth savings capabilities.
- Zero-trust security, hypersegmentation, L2-L4 stateful firewall, routing with words, application classification, load balancer, VPN gateway, and dynamic multi-

Pricing Details

Bring Your Own License (BYOL)

Hourly Fees

Instance Type	Software	EC2	Total
t2.large	\$0.00	\$0.093	\$0.093/hr
c5.xlarge	\$0.00	\$0.17	\$0.17/hr
c5.2xlarge	\$0.00	\$0.34	\$0.34/hr
c5.4xlarge	\$0.00	\$0.68	\$0.68/hr
c4.xlarge	\$0.00	\$0.199	\$0.199/hr
r4.2xlarge	\$0.00	\$0.532	\$0.532/hr
r4.8xlarge	\$0.00	\$2.128	\$2.128/hr

EBS General Purpose (SSD) volumes
\$0.10 per GB-month of provisioned storage

You will not be charged until you launch this instance.

Cancel Continue

After clicking “Continue”, Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. While several instance types are possible, the selection defaults to the c4.xlarge instance type recommended by 128 Technology. Select an instance type, click “Next: Configure Instance Details” button to continue.

1 Choose AMI 2. Choose Instance Type 3. Configure Instance 4 Add Storage 5 Add Tags 6. Configure Security Group 7. Review

Step 2: Choose an Instance Type

<input type="radio"/>	Compute optimized	c5.9xlarge	36	72	EBS only	Yes	10 Gigabit	Yes
<input type="radio"/>	Compute optimized	c5.18xlarge	72	144	EBS only	Yes	25 Gigabit	Yes
<input type="radio"/>	Compute optimized	c4.large	2	3.75	EBS only	Yes	Moderate	Yes
<input checked="" type="radio"/>	Compute optimized	c4.xlarge	4	7.5	EBS only	Yes	High	Yes
<input type="radio"/>	Compute optimized	c4.2xlarge	8	15	EBS only	Yes	High	Yes
<input type="radio"/>	Compute optimized	c4.4xlarge	16	30	EBS only	Yes	High	Yes
<input type="radio"/>	Compute optimized	c4.8xlarge	32	60	EBS only	Yes	10 Gigabit	Yes

Cancel Previous Review and Launch Next: Configure Instance Details

The next screen shows a variety of parameters for the instances. Select the existing “Network” and existing “Subnet” where this 128T Conductor instance is to be connected. Typically a 128T Conductor is directly accessed by network administrators from outside of AWS. Therefore the selected or created “Subnet” settings should assign a public (elastic) IP address. In this example, we’ve created a subnet that allows public internet access, so that we can login to the instance after creation. The AMI specifies default storage parameters, so the user can skip step “4. Add Storage”. Instead the user can click on step “5. Add Tags”.

1. Choose AMI 2. Choose Instance Type **3. Configure Instance** 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances ⓘ [Launch into Auto Scaling Group ⓘ](#)

Purchasing option ⓘ ☐ Request Spot instances

Network ⓘ [Create new VPC](#)

Subnet ⓘ [Create new subnet](#)
 8 IP Addresses available

Auto-assign Public IP ⓘ

Placement group ⓘ ☐ Add instance to placement group

Capacity Reservation ⓘ [Create new Capacity Reservation](#)

IAM role ⓘ [Create new IAM role](#)

CPU options ⓘ ☐ Specify CPU options

Shutdown behavior ⓘ

Stop - Hibernate behavior ⓘ ☐ Enable hibernation as an additional stop behavior

Enable termination protection ⓘ ☐ Protect against accidental termination

Monitoring ⓘ ☐ Enable CloudWatch detailed monitoring
[Additional charges apply](#)

EBS-optimized instance ⓘ ☒ Launch as EBS-optimized instance

Tenancy ⓘ
[Additional charges will apply for dedicated tenancy](#)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Storage](#)

In AWS EC2 it is a recommended practice to label all the relevant elements of a deployment accordingly. By doing so, these elements can be easily identified and searched at a later time. In the “Add Tags” menu the user can ‘click to add a Name tag.’

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your Amazon EC2 resources.

Key	Value
(127 characters maximum)	(255 characters maximum)

This resource currently has no tags

Choose the Add tag button or [click to add a Name tag](#).
Make sure your [IAM policy](#) includes permissions to create tags.

Add Tag (Up to 50 tags maximum)

Then the ‘Name’ key can be set to a descriptive value.

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your Amazon EC2 resources.

Key	Value
(127 characters maximum)	(255 characters maximum)
Name	New 128T Conductor v1

Add another tag (Up to 50 tags maximum)

Next select the “Configure Security Group” tab. By default, the AMI generates the following security groups.

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group ☐ Select an existing security group

Security group name: 128 Technology Networking Platform-128T Networking Platform - CentOS 7-Auto

Description: This security group was generated by AWS Marketplace and is based on recomm

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
HTTPS	TCP	443	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule

Warning

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

[Cancel](#) [Previous](#) [Review and Launch](#)

[Feedback](#) [English \(US\)](#) © 2008 - 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved. [Privacy Policy](#) [Terms of Use](#)

For a 128T Conductor deployment, two additional rules must be added to the Security Group to allow the range of ports 4505-4506 and port 930.

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a **new** security group. ☐ Select an **existing** security group.

Security group name: 128-Technology Networking Platform-128T Networking Platform - CentOS7-Auto

Description: This security group was generated by AWS Marketplace and is based on recommendations for CentOS 7.

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
HTTPS	TCP	443	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
Custom TCP	TCP	4505-4506	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
Custom TCP	TCP	930	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule

Warning

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

[Cancel](#)
[Previous](#)
[Review and Launch](#)

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The user could further modify or customize the settings. If no further customization is required, then the “Review and Launch” button can be clicked to complete the deployment.

In the review screen a warning will be present indicating the instance is not from the free tier, which is expected since AWS does not categorize this c4.xlarge instance as free. Additional warnings could be present based on your network and subnet settings. Finally, after reviewing the instance click on the “Launch” button.

1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

Your instance configuration is not eligible for the free usage tier
To launch an instance that's eligible for the free usage tier, check your AMI selection, instance type, configuration options, or storage devices.
Learn more about [free usage tier](#) eligibility and usage restrictions.

[Don't show me this again](#)

▼ AMI Details
Edit AMI

128T Networking Platform
128T Networking Platform - CentOS7
Root Device Type: ebs Virtualization type: hvm

Hourly Software Fees: \$0.00 per hour on c4.xlarge instance. Additional taxes or fees may apply.
Software charges will begin once you launch this AMI and continue until you terminate the instance.

By launching this product, you will be subscribed to this software and agree that your use of this software is subject to the pricing terms and the seller's [End User License Agreement](#).

▼ Instance Type
Edit instance type

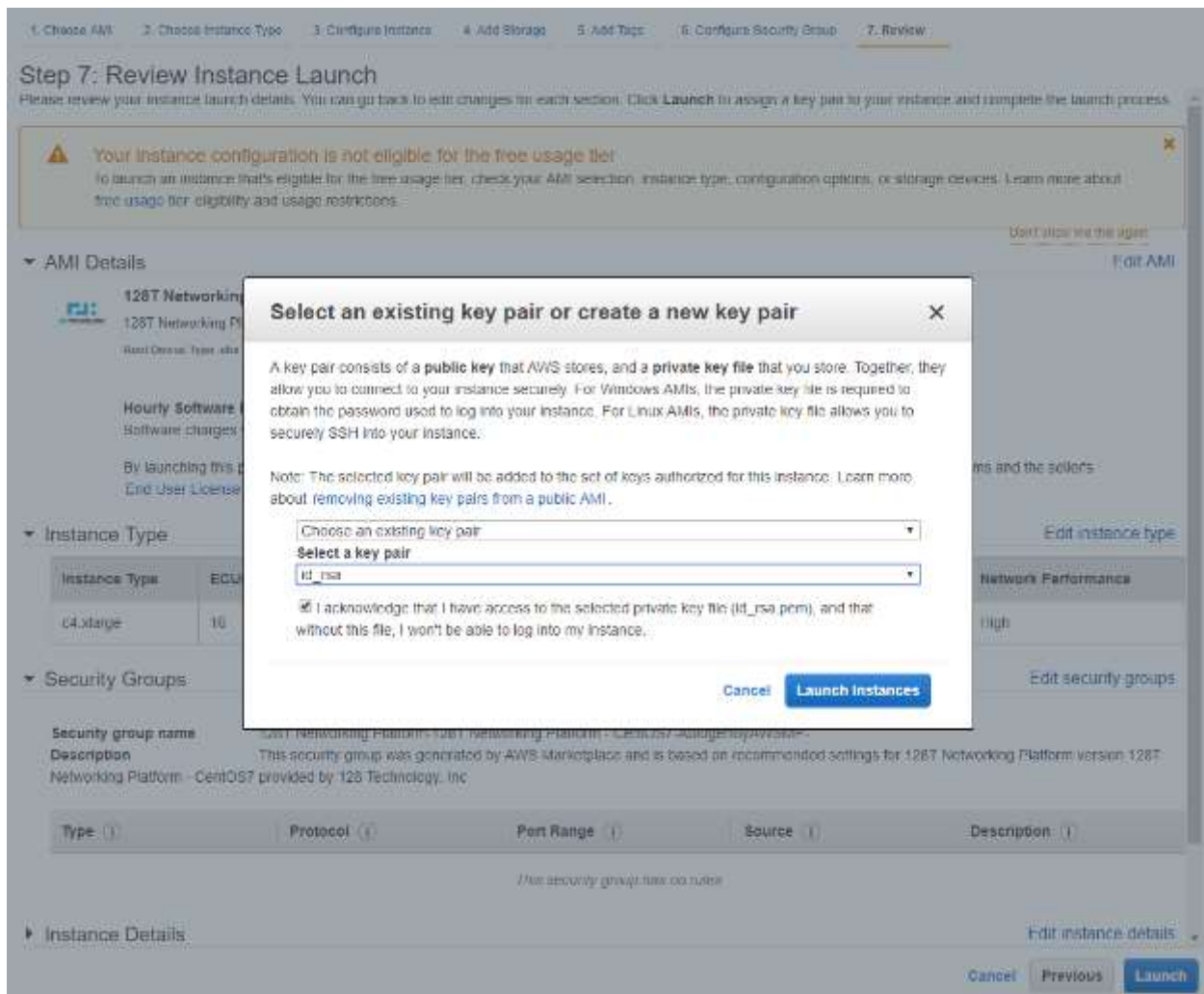
Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
c4.xlarge	16	4	7.5	EBS only	Yes	High

▼ Security Groups
Edit security groups

Security group name 128T Networking Platform-128T Networking Platform - CentOS7-AutogenByAWSMP-7
Description This security group was generated by AWS Marketplace and is based on recommended settings for 128T Networking Platform version 128T Networking Platform - CentOS7 provided by 128 Technology, Inc

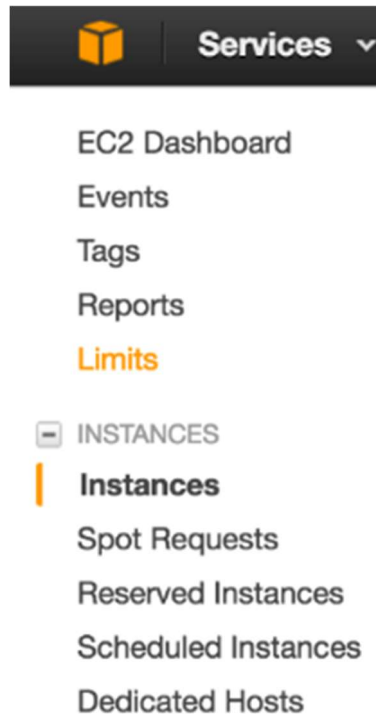
Cancel
Previous
Launch

For future access to the instance you will have to specify a set of key pairs, and then press “Launch Instance”.



Installing 128T Conductor Software

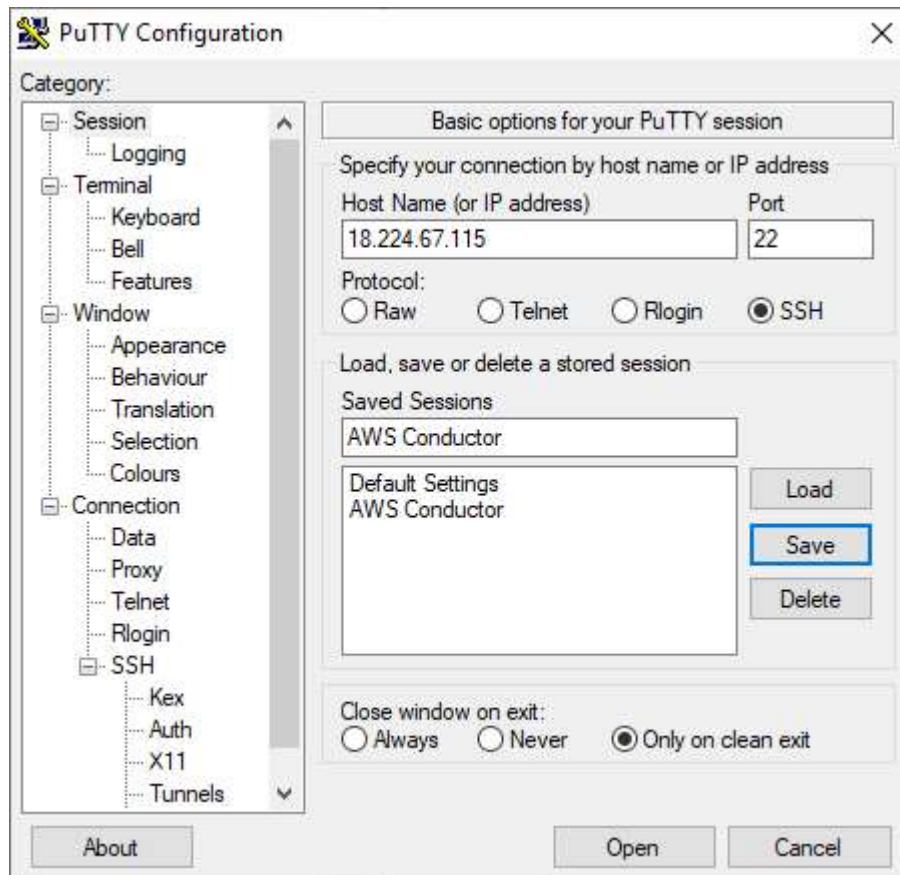
Once launched, the newly deployed 128T instance can be viewed from the “Instances” submenu under the “Instances” category from the EC2 Dashboard.



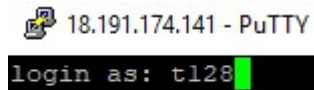
After waiting a few minutes for the instance to boot, the 128T Conductor “Instance State” turns green, indicating that it is “running”. AWS will proceed to validate the instance and eventually “Status Checks” should indicate “2/2 checks passed”. For future reference, the table provides the “Instance ID” and the ‘IPv4 Public IP’ address to reach the instance (since the subnet we used is a public subnet which provides external access).

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
New 128T Conductor v1	i-01tw2b190167b235d7	c4.xlarge	us-east-2a	running	2/2 checks passed	None	ec2-18-191-174-141.us-east-2.amazonaws.com	18.191.174.141

Once the new instance is running you can complete the installation process for the 128T Conductor. The AWS 128T Conductor can be accessed with an SSH client such as PuTTY, using the existing keys selected when launching the AWS instance and the IPv4 Public IP address.

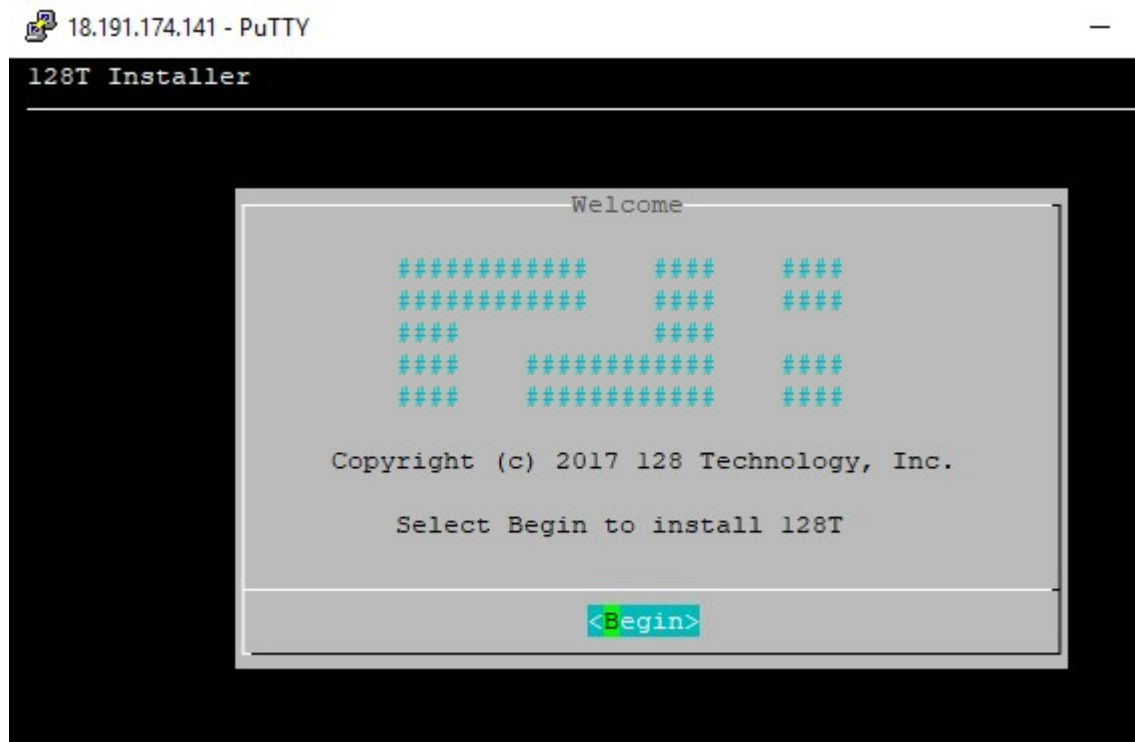


To initiate the installation of the 128T Conductor, after connecting via SSH at the “login as:” prompt enter “t128”.



```
18.191.174.141 - PuTTY
login as: t128
```

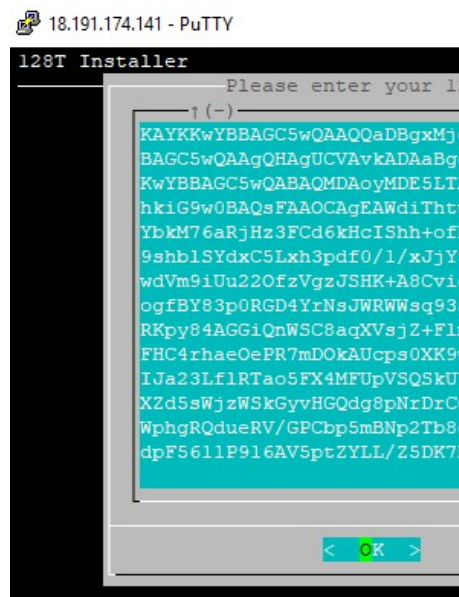
This will automatically start an installation process. The <Begin> option is pre-selected. Press <Enter> to start the installation process.



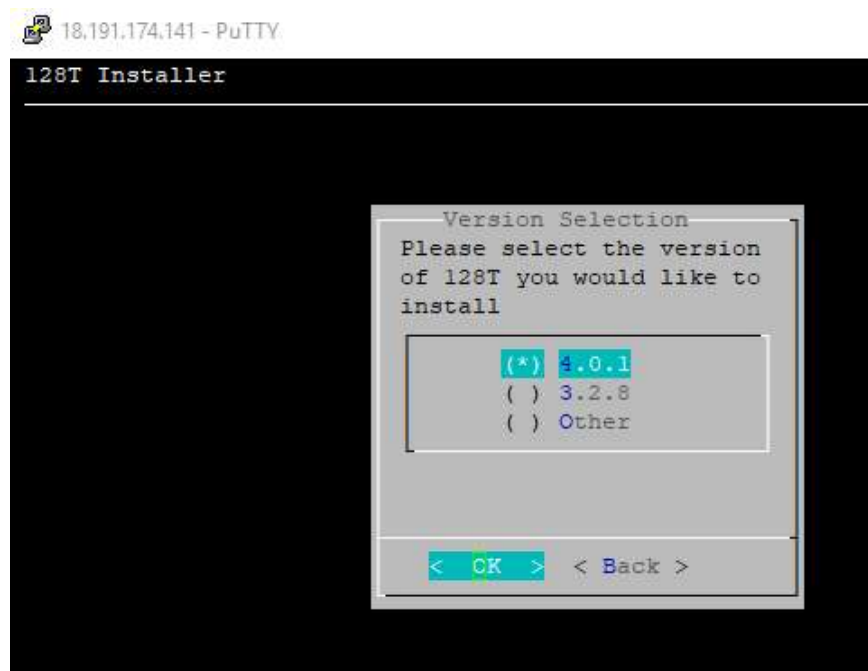
The next prompt will request a certificate. Since this is a BYOL listing, you need to contact 128 Technology to obtain a client certificate. After obtaining the certificate you can paste it into the box. You need to include both the “Certificate” and “RSA Private Key” sections, and you can paste the “-----BEGIN CERTIFICATE-----” and “-----END RSA PRIVATE KEY-----” headers into the box



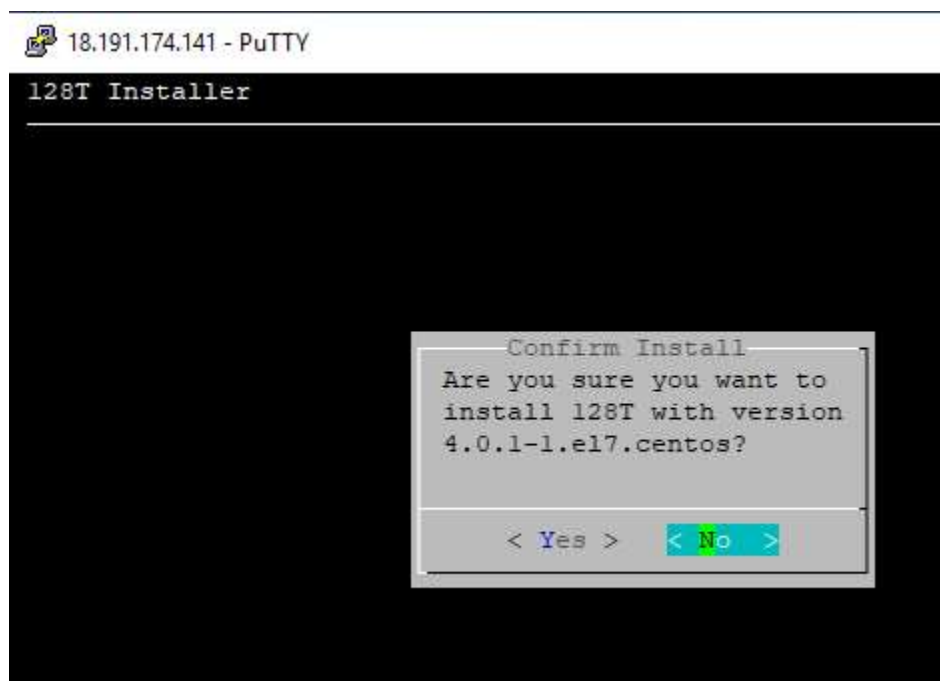
After pasting the certificate into the box, Press <Tab> to select the “< OK >” prompt and press <Enter>.



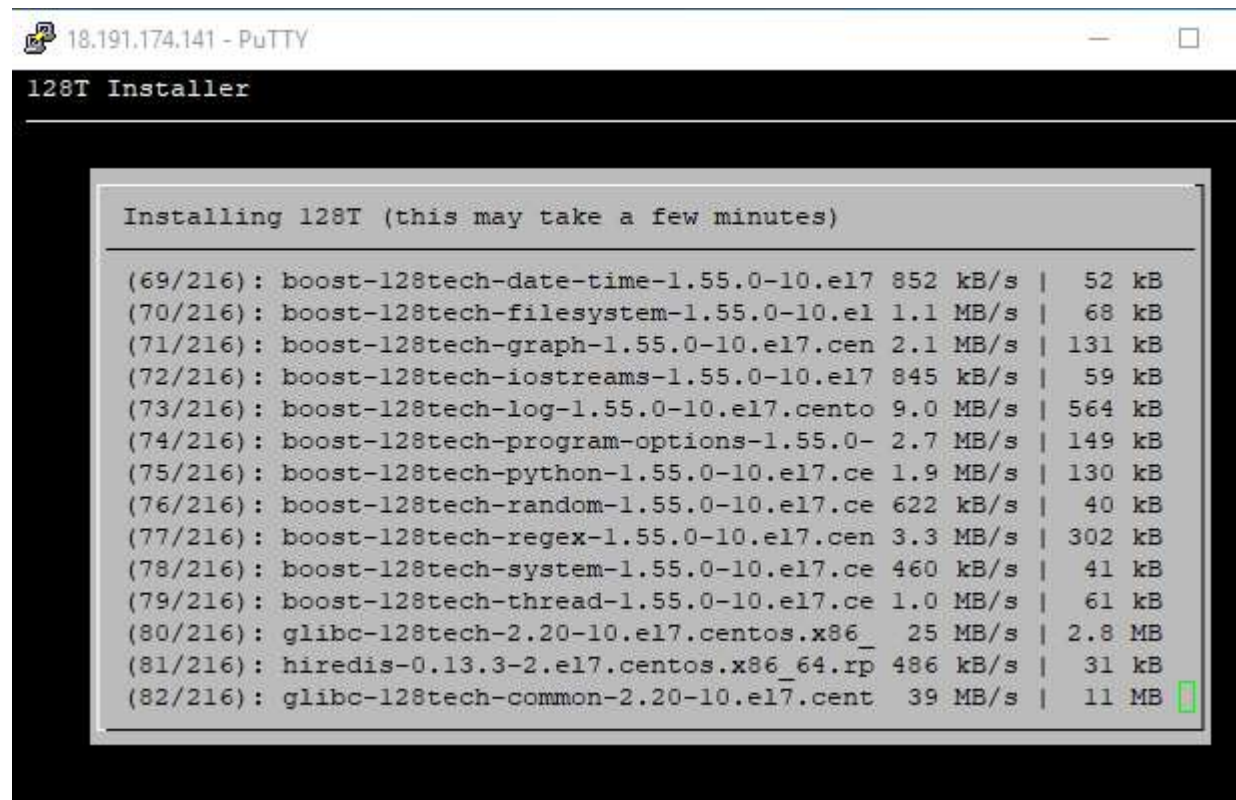
The system will retrieve information about the latest versions. By default, the system will select the latest version, and you can simply hit <Enter> to select the "< OK >" prompt.



You will need to confirm this select by using the <Tab> key to select < Yes> and then pressing <Enter>.



For some time (<15 minutes) the system will proceed to retrieve and install the selected system version.



The screenshot shows a PuTTY terminal window titled "18.191.174.141 - PuTTY". The terminal output displays the "128T Installer" header and a progress list for installing 128T. The list shows 16 items, each with a progress indicator (e.g., 69/216), the package name, the download speed, and the size. The last item, "glibc-128tech-common-2.20-10.el7.cent", is highlighted with a green cursor.

```
128T Installer

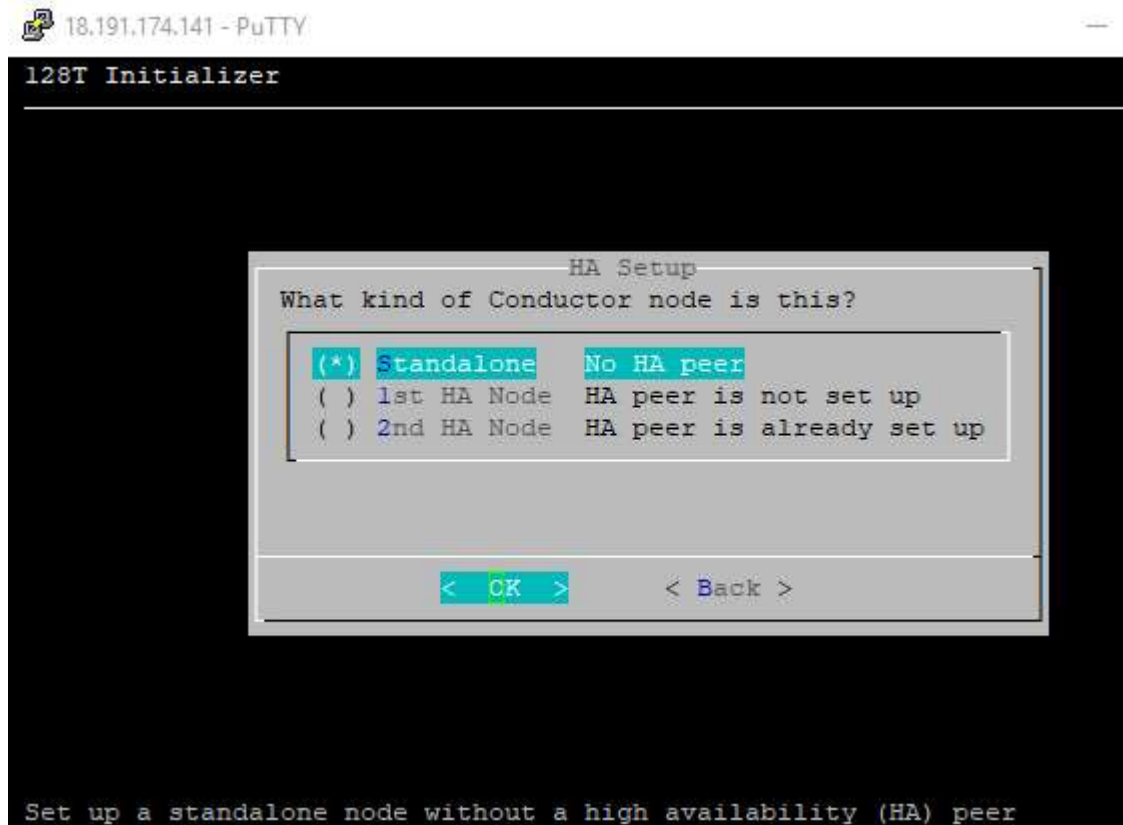
Installing 128T (this may take a few minutes)

(69/216): boost-128tech-date-time-1.55.0-10.el7 852 kB/s | 52 kB
(70/216): boost-128tech-filesystem-1.55.0-10.el 1.1 MB/s | 68 kB
(71/216): boost-128tech-graph-1.55.0-10.el7.cen 2.1 MB/s | 131 kB
(72/216): boost-128tech-iostreams-1.55.0-10.el7 845 kB/s | 59 kB
(73/216): boost-128tech-log-1.55.0-10.el7.cent 9.0 MB/s | 564 kB
(74/216): boost-128tech-program-options-1.55.0- 2.7 MB/s | 149 kB
(75/216): boost-128tech-python-1.55.0-10.el7.ce 1.9 MB/s | 130 kB
(76/216): boost-128tech-random-1.55.0-10.el7.ce 622 kB/s | 40 kB
(77/216): boost-128tech-regex-1.55.0-10.el7.cen 3.3 MB/s | 302 kB
(78/216): boost-128tech-system-1.55.0-10.el7.ce 460 kB/s | 41 kB
(79/216): boost-128tech-thread-1.55.0-10.el7.ce 1.0 MB/s | 61 kB
(80/216): glibc-128tech-2.20-10.el7.centos.x86_ 25 MB/s | 2.8 MB
(81/216): hiredis-0.13.3-2.el7.centos.x86_64.rp 486 kB/s | 31 kB
(82/216): glibc-128tech-common-2.20-10.el7.cent 39 MB/s | 11 MB
```

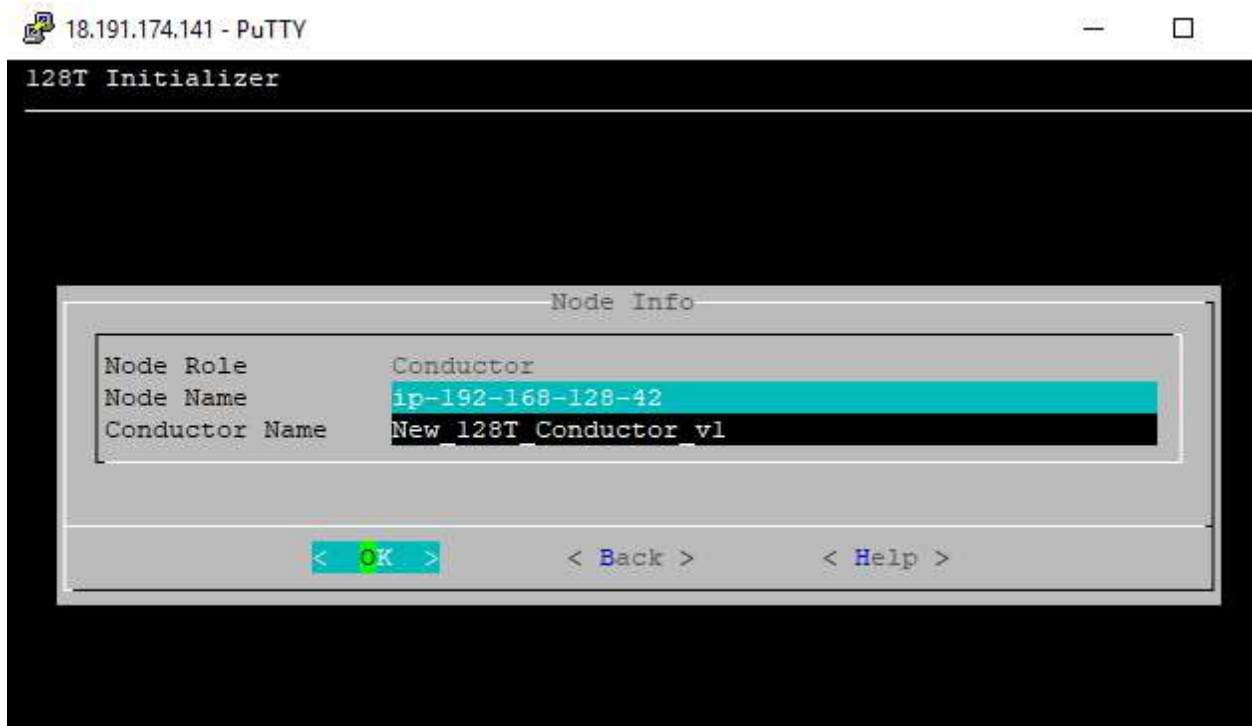
When the installation is complete a few additional parameters need to be set to launch the software. First the “role” of the instance should be set to “Conductor” by using the “C” key or <Up> and <Down> keys to toggle and then <Space> to select. After pressing <space> an “*” should be present for the selected option. Then “< OK>” should be selected by toggling with the <Right> and <Left> keys. After “< OK >” and “Conductor” are selected press <Enter>.



The system can support a variety of High-Availability (HA) modes, but for this example the “Standalone” option can be selected by pressing <Enter>. The section entitled HA Deployment provides an example of how to configure HA. That section requires an initial node, so the section “Installing 128T Conductor Software” creating the initial Conductor node should be completed first.



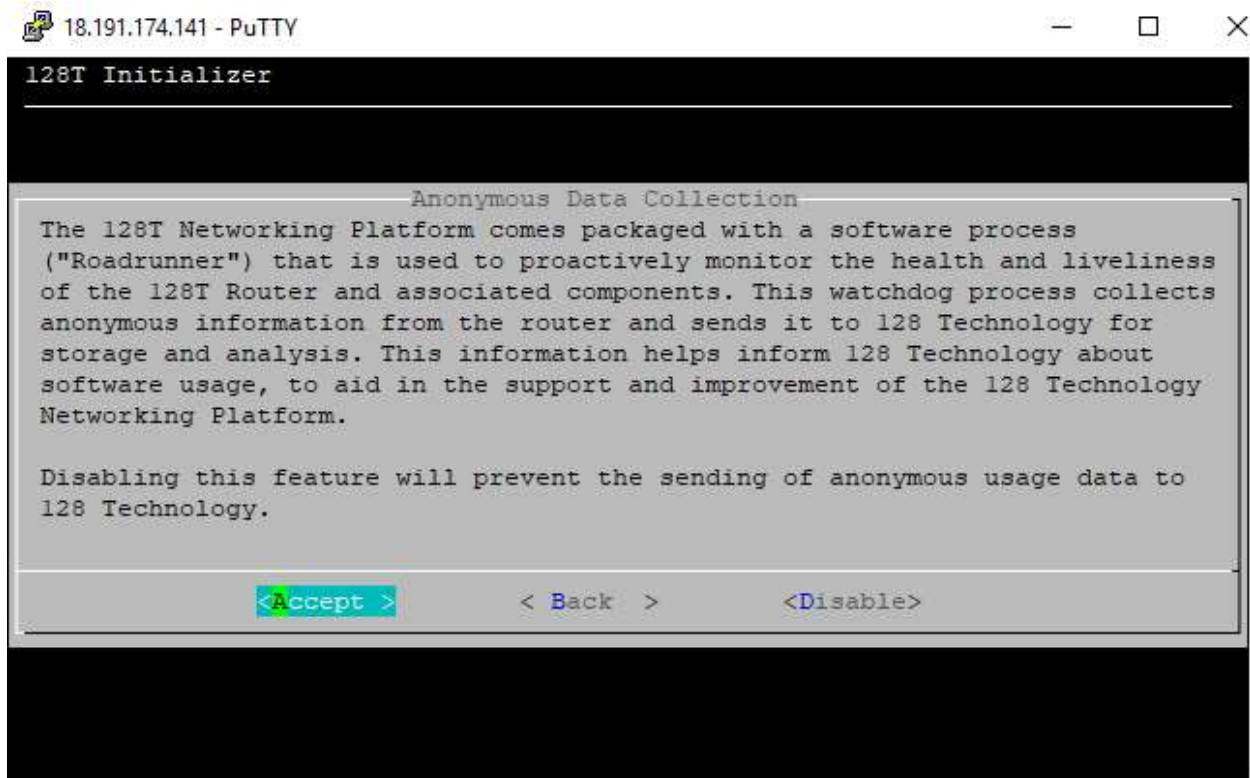
Descriptive node information can be entered. By default, the “Node Name” is populated with the private IP address of the instance. For consistency with the tags used in AWS we recommend entering the “Conductor Name” as the name used in the tag when launching the instance. Since the system doesn’t accept <space> the <_> (underscore) character can be used in place of space. Then use the <Tab> key to select < OK > and then press <Enter>.



You need to enter a new password for the “admin” user and confirm it on a second screen. You need to save this password in a safe place to obtain access to the system.



You can choose to participate in our data collection program



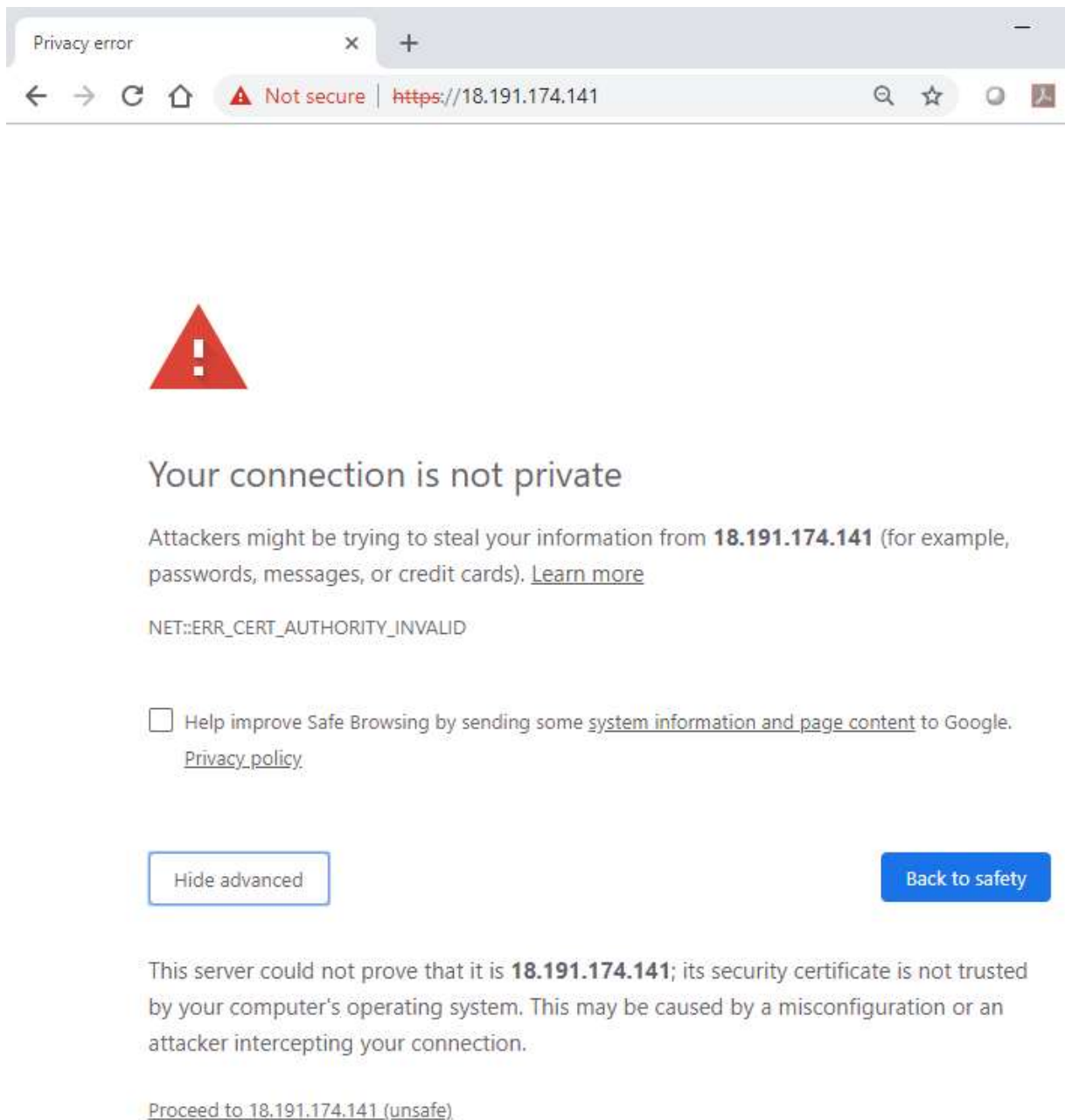
Then the final set up will run, and you'll be prompted to reboot the instance. When the reboot starts, the SSH connection to the instance will end.



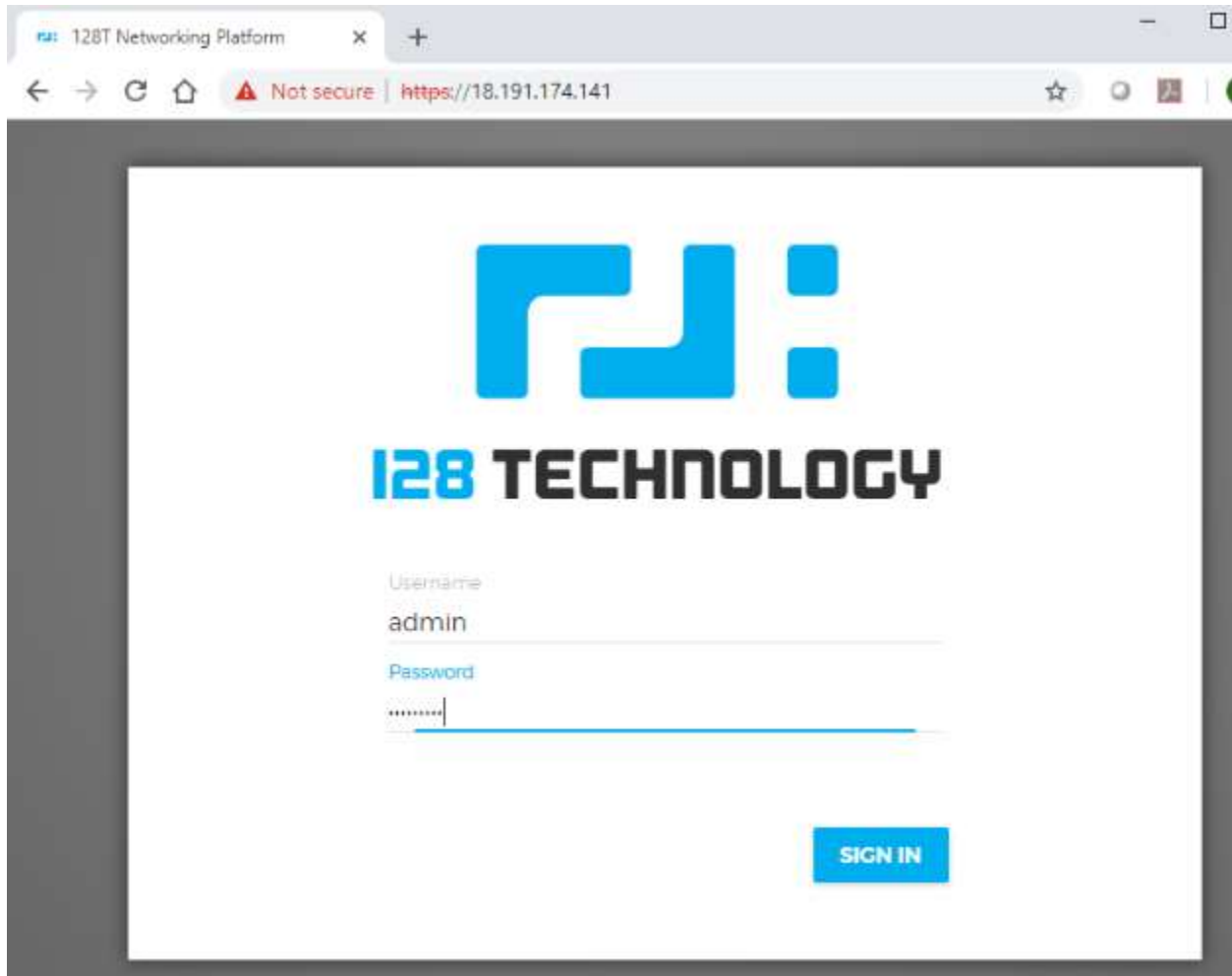
After the reboot, you can now connect to the GUI of the 128T Conductor using a Google Chrome browser and browse to the following URL:

`https://<PublicIPAssignedToTheInstance>`

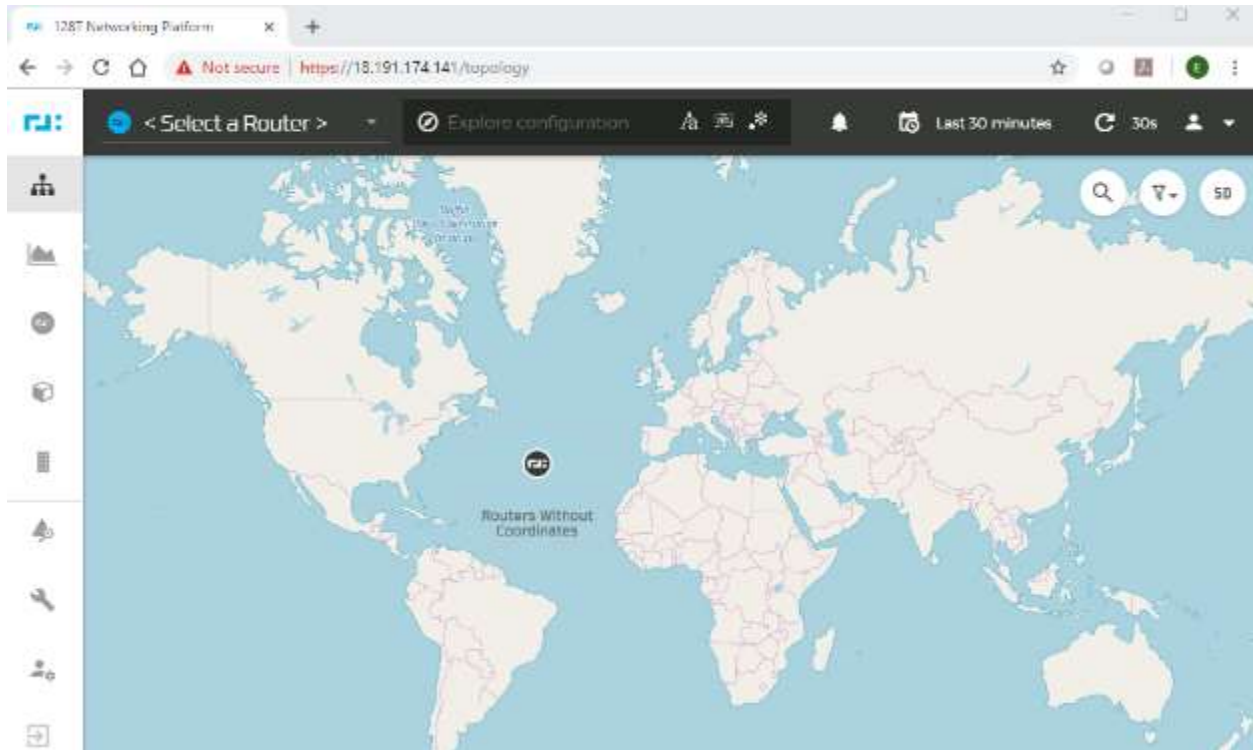
Since the certificate is not known by the browser, initially you'll need to select "Proceed to x.x.x.x (unsafe)" or identify the certificate and trusted in the browser.



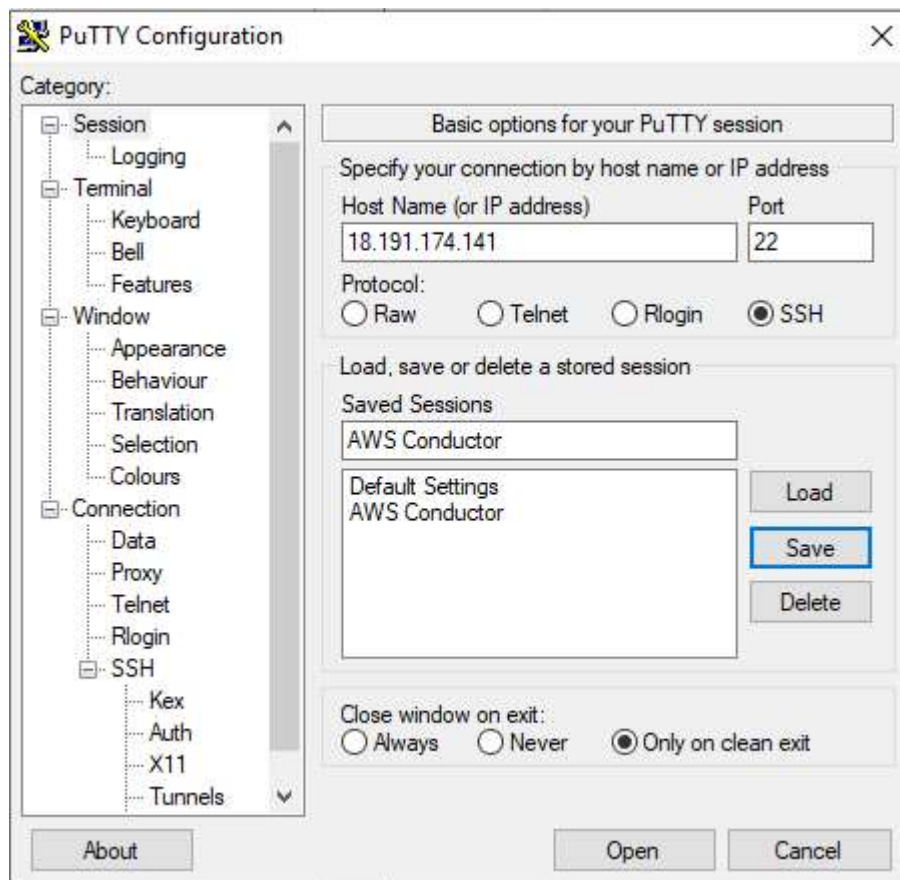
After accepting the browser certificate, a 128T Conductor login prompt is present. The default “Username” is “admin” and the “Password” is the password entered during the installation process.



After logging in the 128T Conductor will open the topology page showing a geographic view of the routers under management. At this point the system can be configured and managed through the 128T Conductor GUI.



In addition, the 128T Conductor application can also be accessed with an SSH client such as PuTTY, using the existing keys selected when launching the AWS instance.



After using the keys and logging in as “t128” you can initiate the PCLI by entering “su admin” and the password specified on installation.

```
New_128T_Conductor_v1 - PCLI
login as: t128
Authenticating with public key "imported-openssh-key"
[t128@ip-192-168-128-42 ~]$ su admin
Password:
Starting the PCLI...
admin@ip-192-168-128-42.New_128T_Conductor_v1# show system
Tue 2019-01-29 21:16:21 UTC

=====
ip-192-168-128-42.New_128T_Conductor_v1
=====

Status:      running
Version:     4.0.1
Uptime:      0 days 1:17:01
Role:        conductor
Alarm Count: 0

Completed in 0.10 seconds
admin@ip-192-168-128-42.New_128T_Conductor_v1# █
```

With the 128T Conductor operational in AWS you can learn more about configuration and operations through our product documentation or online community at <https://community.128technology.com/home>.

ROUTER DEPLOYMENT

This section describes how to deploy a 128T Router in AWS. The exact time for deployment will vary, but it averages between 15 and 30 minutes.

Creating a 128T Router Instance

Log in into Amazon Web Services console at <https://console.aws.amazon.com> using your account name, username and password.



Account:

User Name:

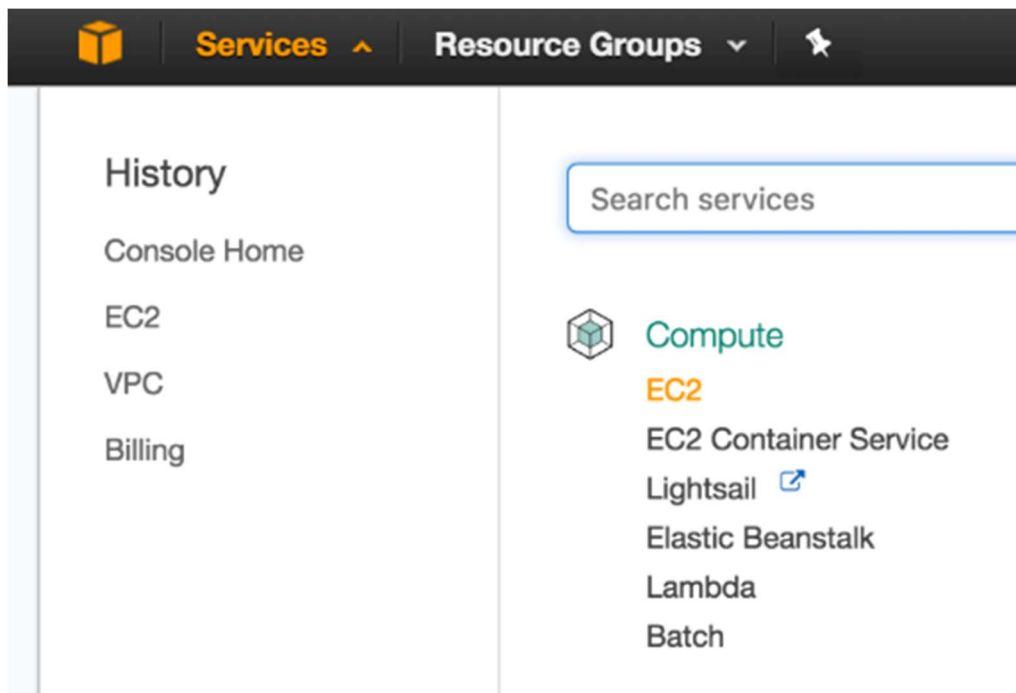
Password:

MFA users, enter your code on the next screen.

Sign In

[Sign in using root account credentials](#)

Once logged into the AWS console the EC2 service needs to be accessed by clicking on "Services" in the top bar menu, and then selecting "EC2" under the "Compute" category.



In order to deploy a 128T Router, an EC2 instance has to be created using the corresponding 128T AMI. From the “EC2 dashboard”, click the “Launch Instance” button to start the process of creating an instance in a region.

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the US East (N. Virginia) region

Amazon Web Services EC2 classifies AMIs in several categories. Currently, 128 Technology has created an AMI to deploy a 128T Router from the “AWS Marketplace” category. The 128 Technology AMIs can be found by searching for “128T”.

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 1: Choose an Amazon Machine Image (AMI)

[Cancel and Exit](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace, or you can select one of your own AMIs.

Quick Start (0)

My AMIs (5)

AWS Marketplace (1)

Community AMIs (1)

Categories

All Categories

Infrastructure Software (1)

Operating System

Clear Filter

All Linux/Unix

CentOS (1)

Software Pricing Plans

Bring Your Own License (1)

Region

Current Region (1)

All Regions (16)

128T Networking Platform

★★★★★ (0) | 128T Networking Platform | CentOS7 | By 128 Technology, Inc

Bring Your Own License - AWS usage fees

Linux/Unix, CentOS 7 | 64-bit (x86) Amazon Machine Image (AMI) | Updated: 10/3/18

The 128T Networking Platform features orchestration and zero touch provisioning, zero trust security, hyparsegmentation, load balancing, global policy, failover, app-SLA, VPN

[More info](#)

Select

The following results for "128T" were found in other catalogs:

7 results in My AMIs

My AMIs are AMIs owned by you or shared with you


1 results in Community AMIs

Community AMIs are AMIs that are shared by the general AWS community

Clicking on the “Select” button of the AMI starts the deployment process of the instance.

Step 1: Choose an Amazon Machine Image (AMI) Cancel and Exit

128T Networking Platform



128T Networking Platform

The 128T Networking Platform features orchestration and zero touch provisioning, zero trust security, hypersegmentation, load balancing, global policy, failover, app SLA, VPN gateway and bandwidth savings.

[View Additional Details in AWS Marketplace](#)

Product Details

By 128 Technology, Inc.

Customer Rating ★★★★★ (0)

Latest Version 128T Networking Platform | CentOS7

Base Operating System Linux/Unix, CentOS 7

Delivery Method 64-bit (x86) Amazon Machine Image (AMI)

License Agreement [End User License Agreement](#)

On Marketplace Since 2/14/18

AWS Services Required Amazon EC2, Amazon EBS

Pricing Details

Bring Your Own License (BYOL)

Hourly Fees

Instance Type	Software	EC2	Total
t2.large	\$0.00	\$0.093	\$0.093/hr
c5.xlarge	\$0.00	\$0.17	\$0.17/hr
c5.2xlarge	\$0.00	\$0.34	\$0.34/hr
c5.4xlarge	\$0.00	\$0.68	\$0.68/hr
c4.xlarge	\$0.00	\$0.199	\$0.199/hr
r4.2xlarge	\$0.00	\$0.532	\$0.532/hr
r4.8xlarge	\$0.00	\$2.128	\$2.128/hr

EBS General Purpose (SSD) volumes
\$0.10 per GB-month of provisioned storage

You will not be charged until you launch this instance.

Highlights

- High performance Session Smart Router with tunnel free bandwidth savings capabilities.
- Zero-Trust security, hypersegmentation, L2-L4 stateful firewall, routing with words, application classification, load balancer, VPN gateway, and dynamic multi-

Cancel Continue

After clicking “Continue”, Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. While several instance types are possible, the selection defaults to the c4.xlarge instance type recommended by 128 Technology.

1 Choose AMI 2 Choose Instance Type 3 Configure Instance 4 Add Storage 5 Add Tags 6 Configure Security Group 7 Review

Step 2: Choose an Instance Type

<input type="radio"/>	Compute optimized	c5.fxlarge	36	72	EBS only	Yes	10 Gbabit	Yes
<input type="radio"/>	Compute optimized	c5.18xlarge	72	144	EBS only	Yes	25 Gbabit	Yes
<input type="radio"/>	Compute optimized	c4.large	2	3.75	EBS only	Yes	Moderate	Yes
<input checked="" type="radio"/>	Compute optimized	c4.xlarge	4	7.5	EBS only	Yes	High	Yes
<input type="radio"/>	Compute optimized	c4.2xlarge	8	15	EBS only	Yes	High	Yes
<input type="radio"/>	Compute optimized	c4.4xlarge	16	30	EBS only	Yes	High	Yes
<input type="radio"/>	Compute optimized	c4.8xlarge	32	60	EBS only	Yes	10 Gbabit	Yes

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Instance Details](#)

After selecting an instance type, click “Next: Configure Instance Details” button, then select the existing “Network” and existing “Subnet” where this 128T Router instance is to be connected.

While the 128T Router has many deployment configurations, typically a 128T Router deployed in AWS sits between the Internet and applications hosted on EC2 instances within a VPC. Usually the router has one network interface which has a public (Elastic) IP address that is reachable from the Internet and a second interface with a private IP address, with reachability to private subnets where the EC2 instances reside.

In this example, we’ve created a subnet that allows public internet access, so that we can login to the instance after creation, and a private IP address to reach other EC2 instances. As discussed in the introduction, this document assumes a 128T Conductor has already been deployed to manage multiple routers, as is typical in many use-cases. For this scenario you set the “IAM role” to “128T_ZTP”.

1. Choose AMI 2. Choose Instance Type 3. Configure Instance Details 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances [Launch into Auto Scaling Group](#)

Purchasing option ☐ Request Spot instances

Network [Create new VPC](#)

Subnet [Create new subnet](#)
7 IP Addresses available

Auto-assign Public IP

Placement group ☐ Add instance to placement group

Capacity Reservation [Create new Capacity Reservation](#)

IAM role [Create new IAM role](#)

CPU options ☐ Specify CPU options

Shutdown behavior

Stop - Hibernate behavior ☐ Enable hibernation as an additional stop behavior

Enable termination protection ☐ Protect against accidental termination

Monitoring ☐ Enable CloudWatch detailed monitoring
Additional charges apply.

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Storage](#)

The AMI specifies default storage parameters, so the user can skip step “4. Add Storage”. Instead the user can click on step “5. Add Tags”. In AWS EC2 it is a recommended practice to label all the relevant elements of a deployment accordingly. By doing so, these elements can be easily identified and searched at a later time. In the “Add Tags” menu the user can ‘click to add a Name tag.’

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage **5. Add Tags** 6. Configure Security Group

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your Amazon EC2 resources.

Key (127 characters maximum)	Value (255 characters maximum)
<p><i>This resource currently has no tags</i></p> <p>Choose the Add tag button or click to add a Name tag.</p> <p>Make sure your IAM policy includes permissions to create tags.</p>	
<p>Add Tag (Up to 50 tags maximum)</p>	

Then the ‘Name’ key can be set to a descriptive value. Since in this scenario the Marketplace AMI is being used to create a Router after a 128T Conductor has already been deployed, the Conductor greatly simplifies the zero-touch provisioning (ZTP) process. For this scenario a specialized ‘Key’ of ‘conductor-ip-primary’ can be used to designate the reachable IP address of the 128 Conductor.

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your Amazon EC2 resources.

Key (127 characters maximum)	Value (255 characters maximum)
Name	New 128T Router v5
conductor-ip-primary	18.191.133.220
<p>Add another tag (Up to 50 tags maximum)</p>	

By default, the AMI generates security groups, but the user could modify or customize the settings. If no further customization is required, then the “Review and Launch” button can be clicked to complete the deployment. In the review a warning will be present indicating the instance is not from the free tier, which is expected since AWS does not categorize this c4.xlarge instance as free. An additional warning could be present based on your network and subnet settings. Finally, after reviewing the instance click on the “Launch” button.

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

⚠ Your instance configuration is not eligible for the free usage tier

To launch an instance that's eligible for the free usage tier, check your AMI selection, instance type, configuration options, or storage devices. [Learn more about free usage tier eligibility and usage restrictions.](#)

[Don't show me this again](#)

▼ AMI Details [Edit AMI](#)

128T Networking Platform

128T Networking Platform - CentOS7

Root Device Type: ebs Virtualization type: hvm

Hourly Software Fees: \$0.00 per hour on c4.xlarge instance. Additional taxes or fees may apply. Software charges will begin once you launch this AMI and continue until you terminate the instance.

By launching this product, you will be subscribed to this software and agree that your use of this software is subject to the pricing terms and the seller's [End User License Agreement](#).

▼ Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
c4.xlarge	16	4	7.5	EBS only	Yes	High

▼ Security Groups [Edit security groups](#)

Security group name 128T Networking Platform-128T Networking Platform - CentOS-AutogenByAWSMP

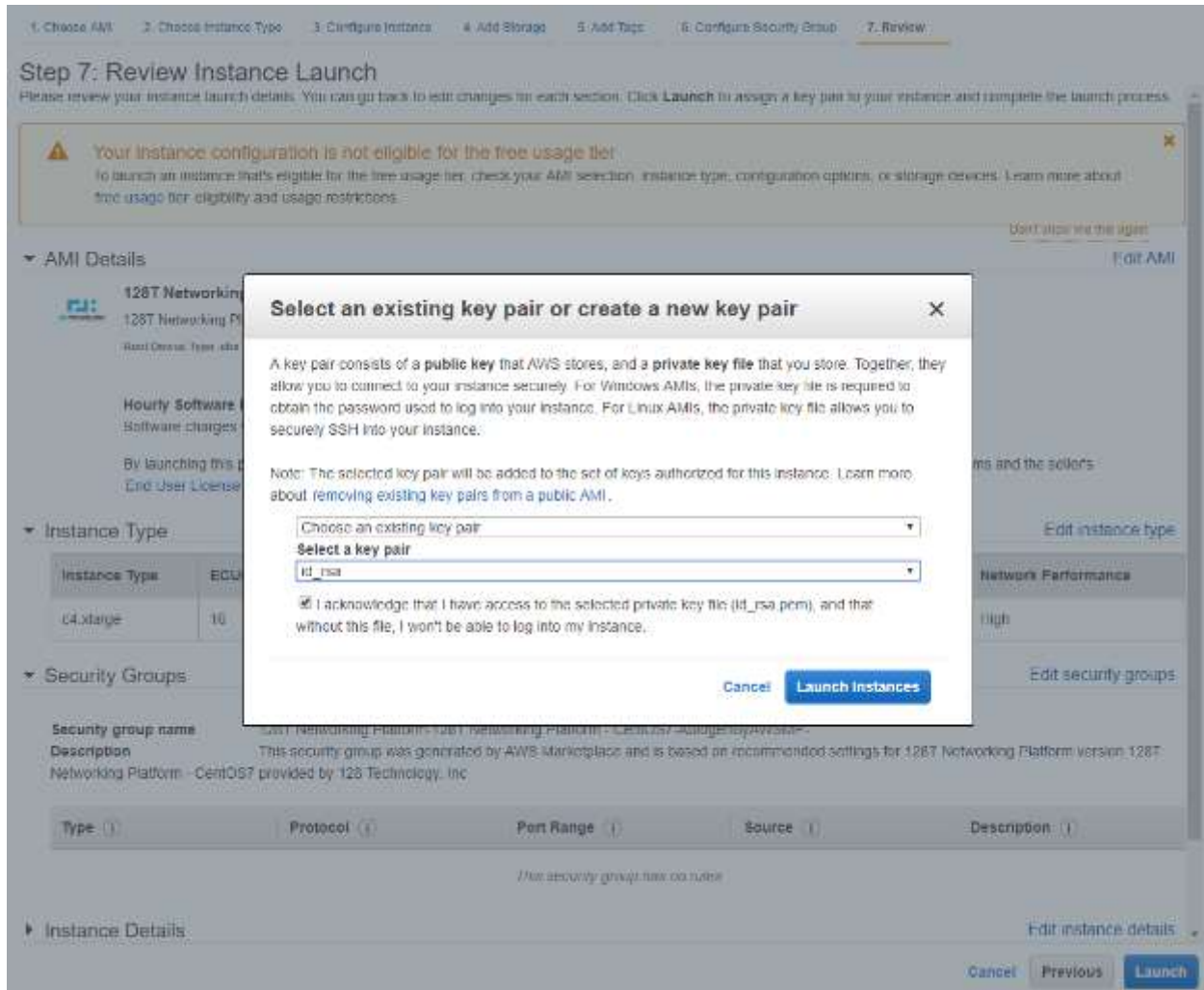
Description This security group was generated by AWS Marketplace and is based on recommended settings for 128T Networking Platform version 128T Networking Platform - CentOS7 provided by 128 Technology, Inc.

Type <small>(i)</small>	Protocol <small>(i)</small>	Port Range <small>(i)</small>	Source <small>(i)</small>	Description <small>(i)</small>
<i>This security group has no rules</i>				

▶ Instance Details [Edit instance details](#)

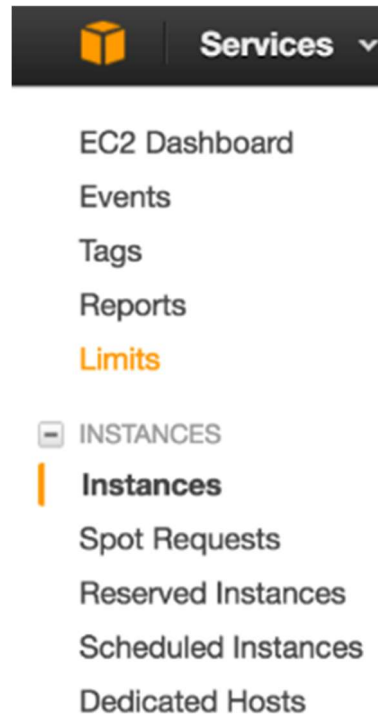
[Cancel](#)
[Previous](#)
[Launch](#)

To access the instance you will have to specify a set of key pairs.



Managing a 128T Router Instance

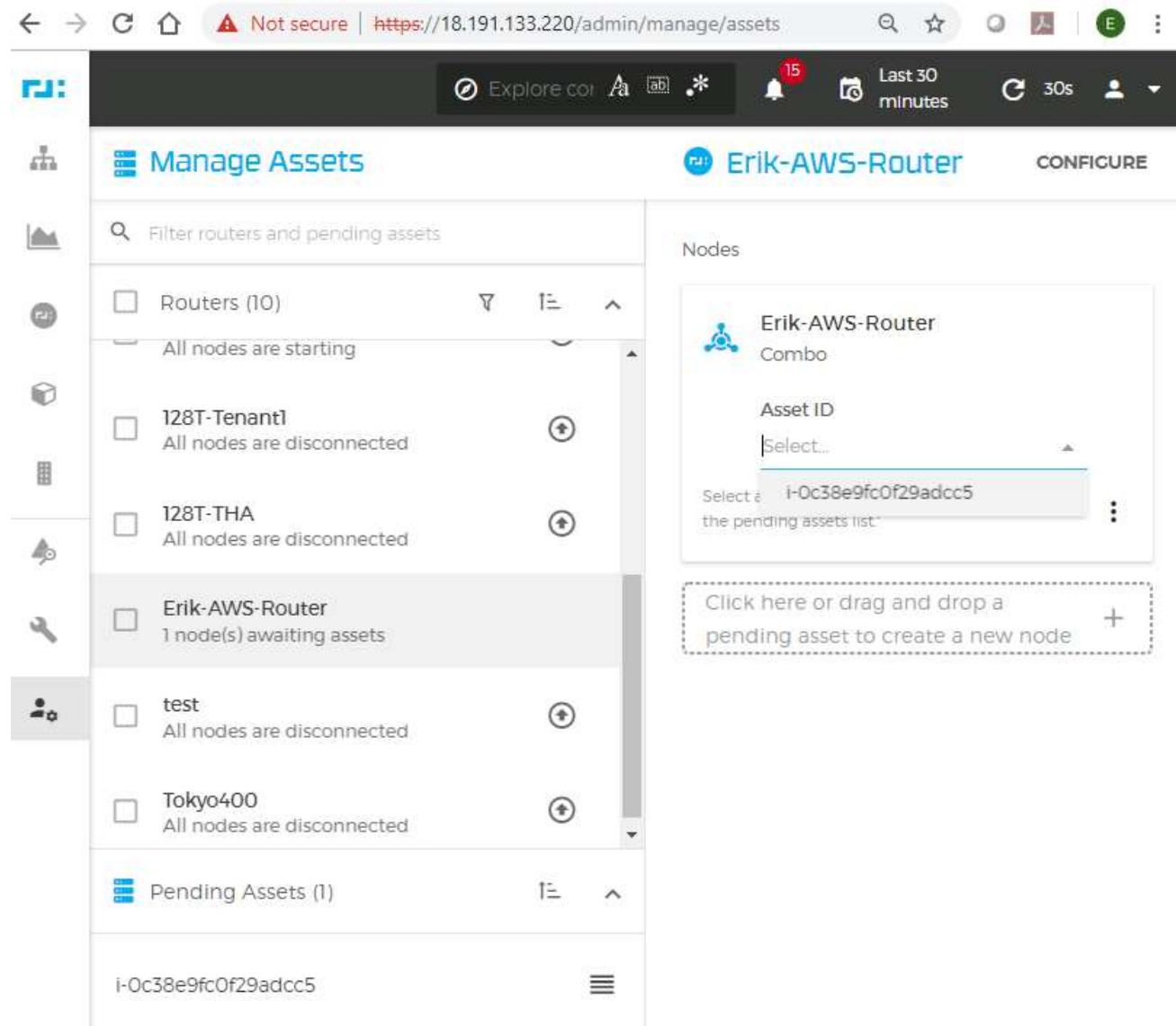
Once launched, the newly deployed 128T instance can be viewed from the “Instances” submenu under the “Instances” category from the EC2 Dashboard.



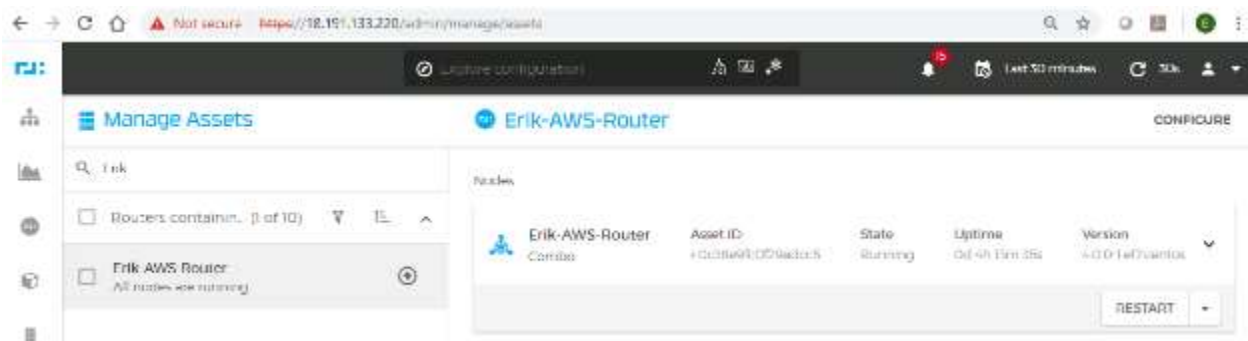
After waiting a few minutes for the instance to boot, the 128T Router “Instance State” turns green, indicating that it is “running”. AWS will proceed to validate the instance and eventually “Status Checks” should indicate “2/2 checks passed”. For future reference, the table provides the “Instance ID” and the ‘IPv4 Public IP’ address to reach the instance (since the subnet we used provided external access).

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
New 128T Router v1	i-0c38e9c29a00d5	c4.xlarge	us-east-2a	running	2/2 checks passed	None	ec2-10-191-173-2.us-e	10.191.173.0

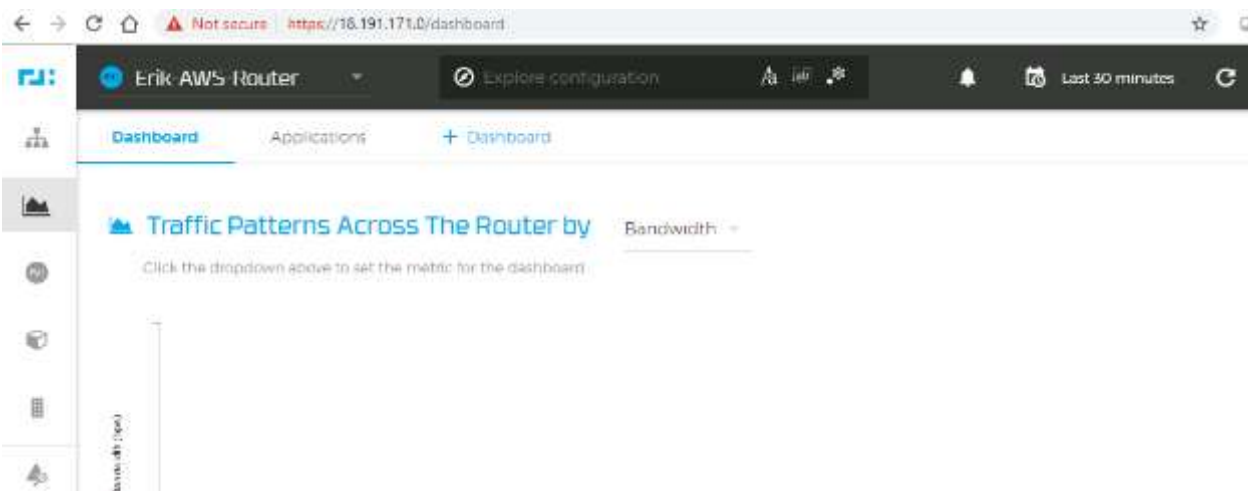
Once the new instance is running the 128 Technology ZTP process will start. The new 128T Router instance will connect to the 128T Conductor IP address specified. After logging into the existing 128T Conductor, the user can see that the new “Instance ID” appears as a “Pending Assets” in the Conductor. In the Conductor GUI the pending Instance ID can be associated with the router configuration through a simple pull-down menu.



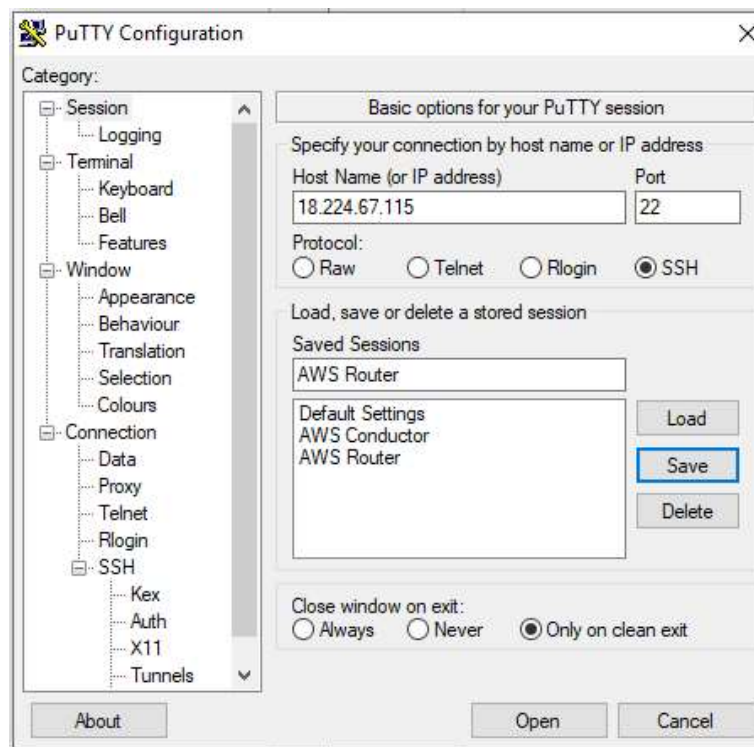
After this association the ZTP process completes the Router installation and initializes the router as shown from the 128T Conductor:



Once the AWS router is running you can log into the router GUI via the public IP address:



The same AWS router can be accessed with an SSH client such as PuTTY, using the existing keys selected when launching the AWS instance.



```
Erik-AWS-Router - PCLI
login as: tl28
Authenticating with public key "imported-openssh-key"
[tl28@ip-192-168-128-44 ~]$ su admin
Password:
Starting the PCLI...
admin@Erik-AWS-Router.Erik-AWS-Router# show system
Thu 2019-01-24 15:50:27 UTC

=====
Erik-AWS-Router
=====

Status:      running
Version:     4.0.0
Uptime:      0 days 0:03:46
Role:        combo
Alarm Count: 0

Completed in 0.06 seconds
admin@Erik-AWS-Router.Erik-AWS-Router#
```

With the 128T Router operational in AWS you can learn more about configuration and operations through our product documentation or online community at <https://community.128technology.com/home>.

HIGH AVAILABILITY (HA) DEPLOYMENT

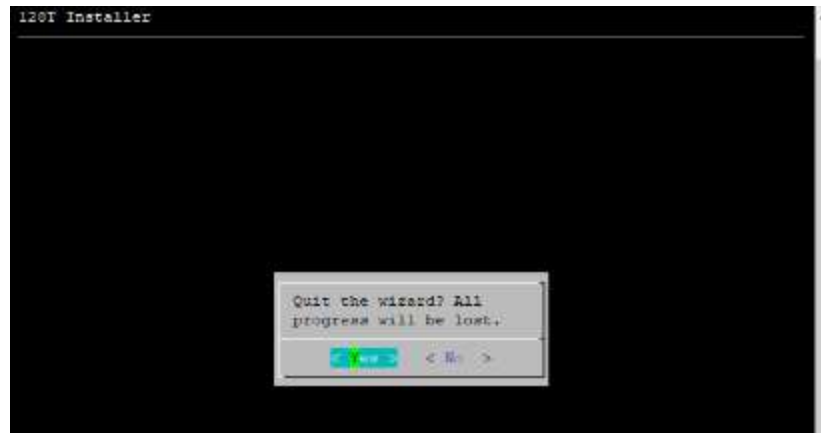
Both the 128T Conductor and 128T Router can be deployed in a High Availability (HA) configuration. The process is the same for both products, but we'll illustrate the steps for a Conductor. The two HA nodes need to communicate with each other securely, so this section will describe how to manually generate and share a public key between the two nodes before the full installation.

Prepare the first Conductor node following the process in the Section "Creating a 128T Conductor Instance". Continue with the process in Section "Installing 128T Conductor Software," until you reach the "Welcome" prompt.



At this point press <ESC> to stop the 128T Installer.

In the follow screen select <Yes> which will then drop you to a Linux prompt.

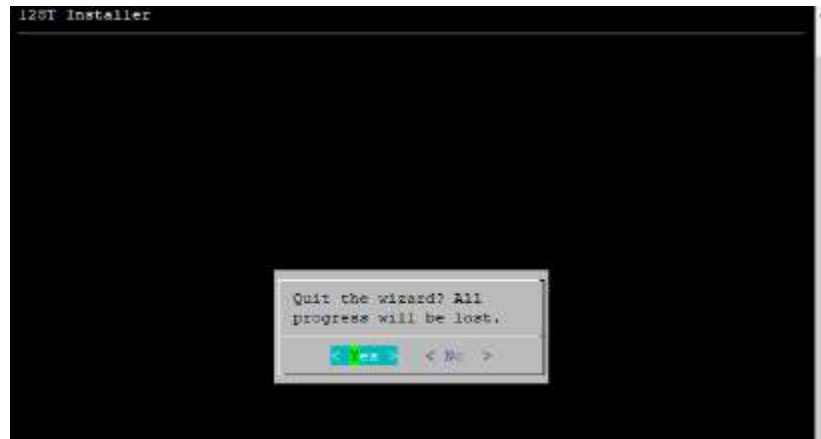


Instead of proceeding with Node 1, launch a second EC2 instance for Node 2 of the Conductor following the steps in the Section "Creating a 128T Conductor Instance". Continue with the process in Section "Installing 128T Conductor Software," until you reach the "Welcome" prompt.



At this point press <ESC> to stop the 128T Installer.

In the follow screen select <Yes> which will then drop you to a Linux prompt.



The two HA nodes need to communicate with each other securely, so a public key needs to be generated and manually shared between the nodes. To generate the key, at the Linux prompt on Node 2 enter:

```
sudo ssh-keygen -t rsa -N "" -f ~/.ssh/t128_id_rsa
```

Next provide the appropriate permissions by entering on Node 2:

```
sudo chmod 600 ~/.ssh/t128_id_rsa
```

Finally display the public key by entering on Node 2:

```
sudo cat ~/.ssh/t128_id_rsa.pub
```

Now copy the text of the key from Node 2 and paste into Node 1.

Switch to the Node 1 SSH window and enter:

```
sudo vi ~/.ssh/authorized_keys
```

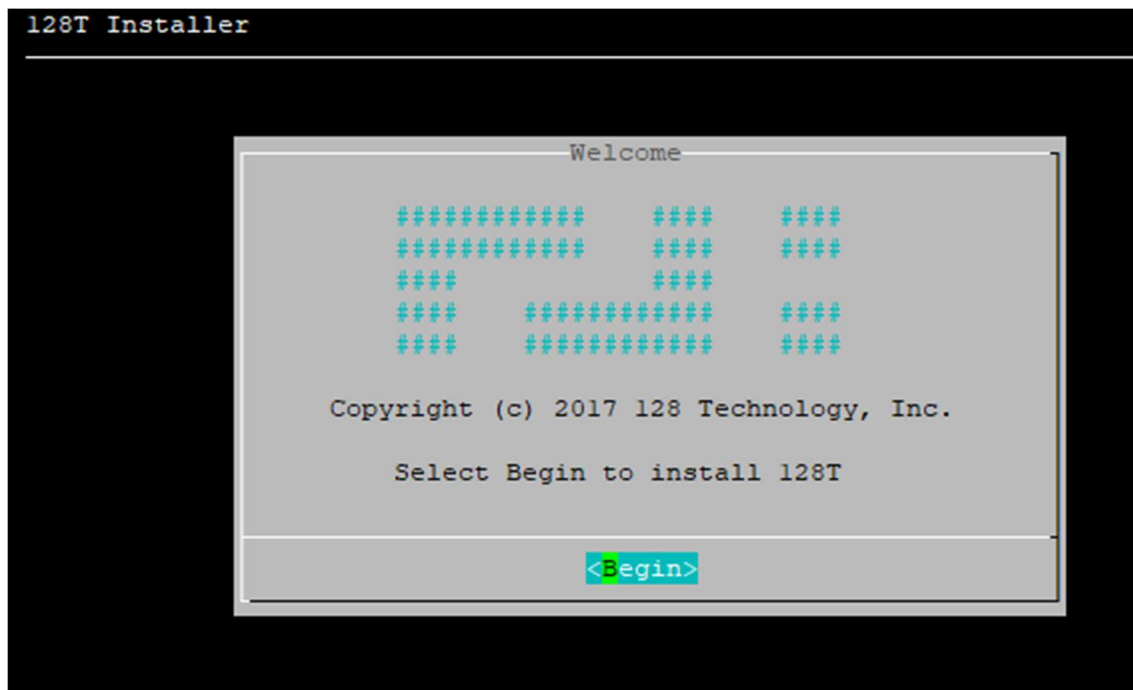
In vi press <A> to insert at the end of the file. Copy the key from the Node 1 window and paste the key from Node 2 into the file. Then press <ESC> and <:wq> to save the file. You can verify that the key has been correctly pasted by entering in Node 1:

```
sudo cat ~/.ssh/authorized_keys
```

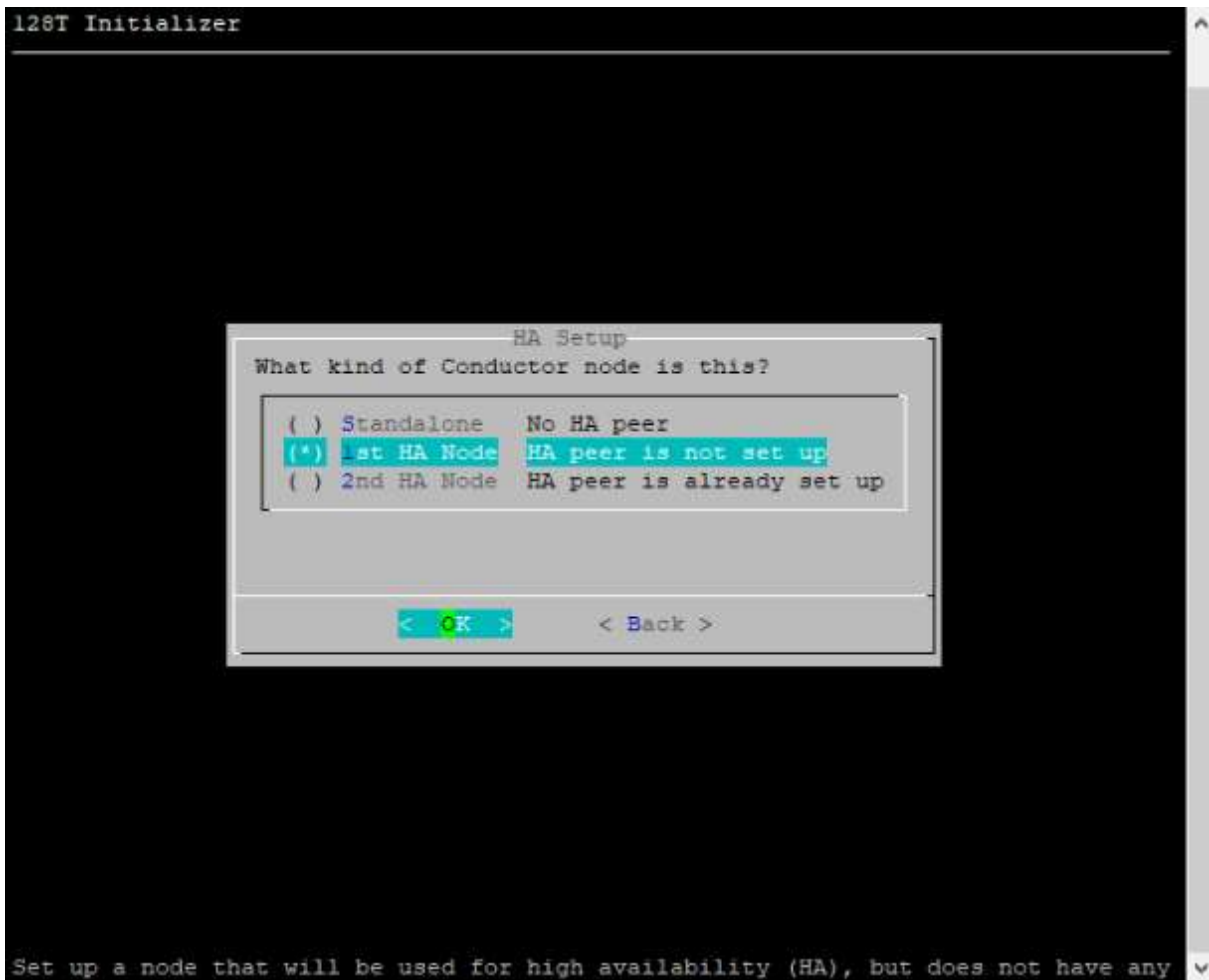
Now that the public key has been manually exchanged, you can proceed with installing the software on Node 1. To restart the installation process enter on Node 1:

```
sudo install128t
```

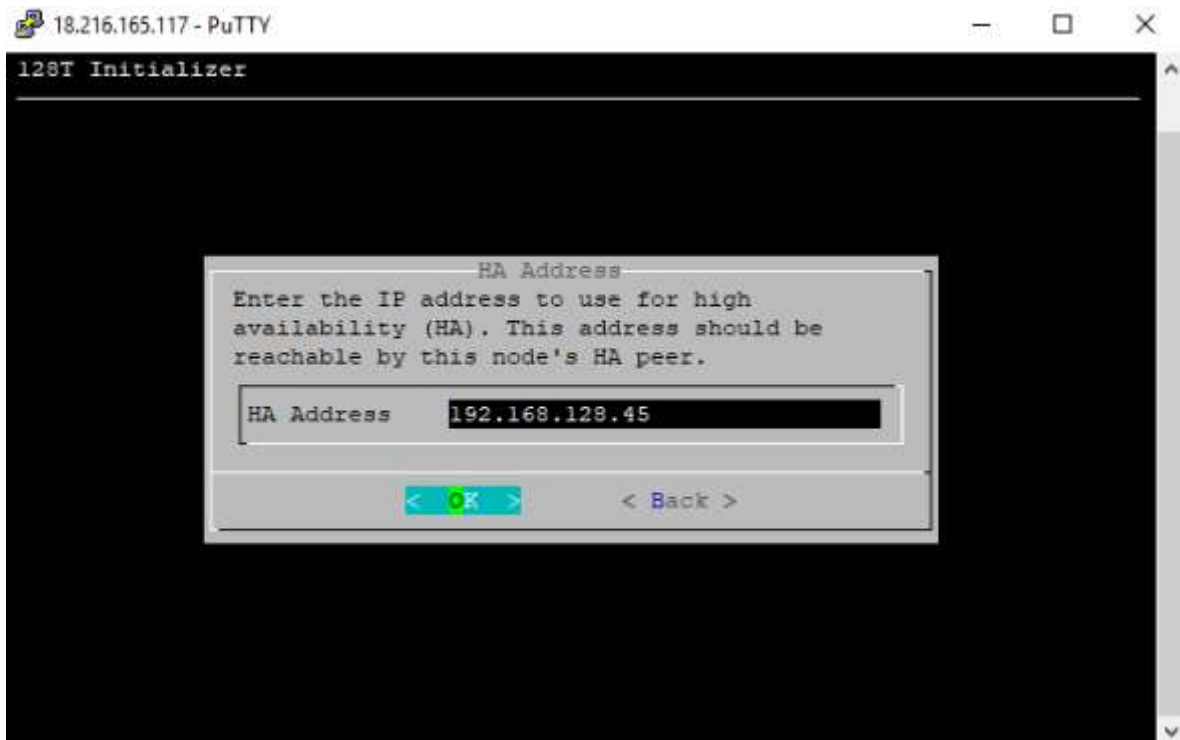
The 128T Installer screen should appear.



Continue the with the process in Section “Installing 128T Conductor Software” on Node 1 until you reach the step for “HA Setup.” At this point select the “1st HA Node.”



In the next step enter the “HA Address.”

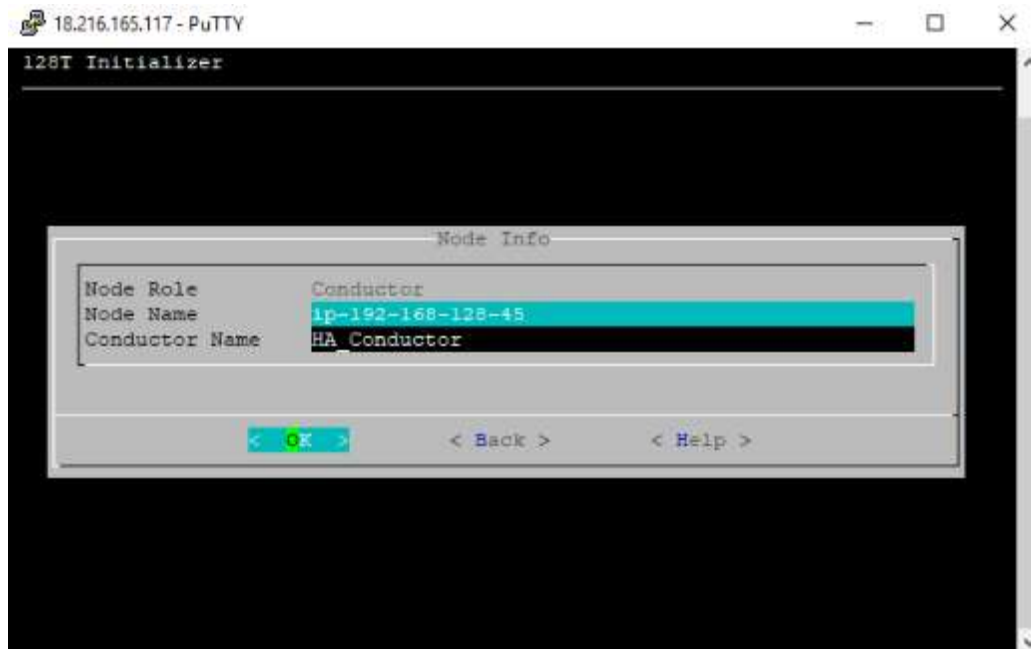


The address to enter is listed under the “Private IPs” in the EC2 instance console.

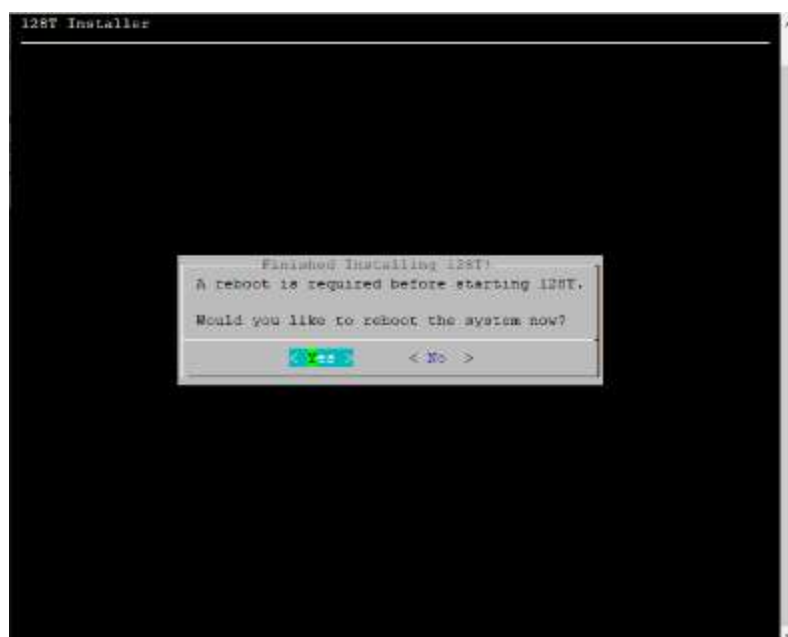
Instance: **i-039897e741cb98544 (HA_Conductor_Node_1A)** Public DNS: **ec2-18-216-165-117.us-east-2.compute.amazonaws.com**

Description	Status Checks	Monitoring	Tags	Usage Instructions
Instance ID	i-039897e741cb98544	Public DNS (IPv4)	ec2-18-216-165-117.us-east-2.compute.amazonaws.com	
Instance state	running	IPv4 Public IP	18.216.165.117	
Instance type	c4.xlarge	IPv6 IPs	-	
Elastic IPs		Private DNS	ip-192-168-128-45.us-east-2.compute.internal	
Availability zone	us-east-2a	Private IPs	192.168.128.45	
Security groups	128 Technology Networking Platform-128T Networking Platform - CentOS7-	Secondary private IPs		

Next provide a Conductor Name, which will be reflected in the configuration after installation.



After selecting <OK>, continue through the prompts as Section "Installing 128T Conductor Software." The final screen will prompt for a reboot, but **do not proceed** selecting <Yes> at this point.



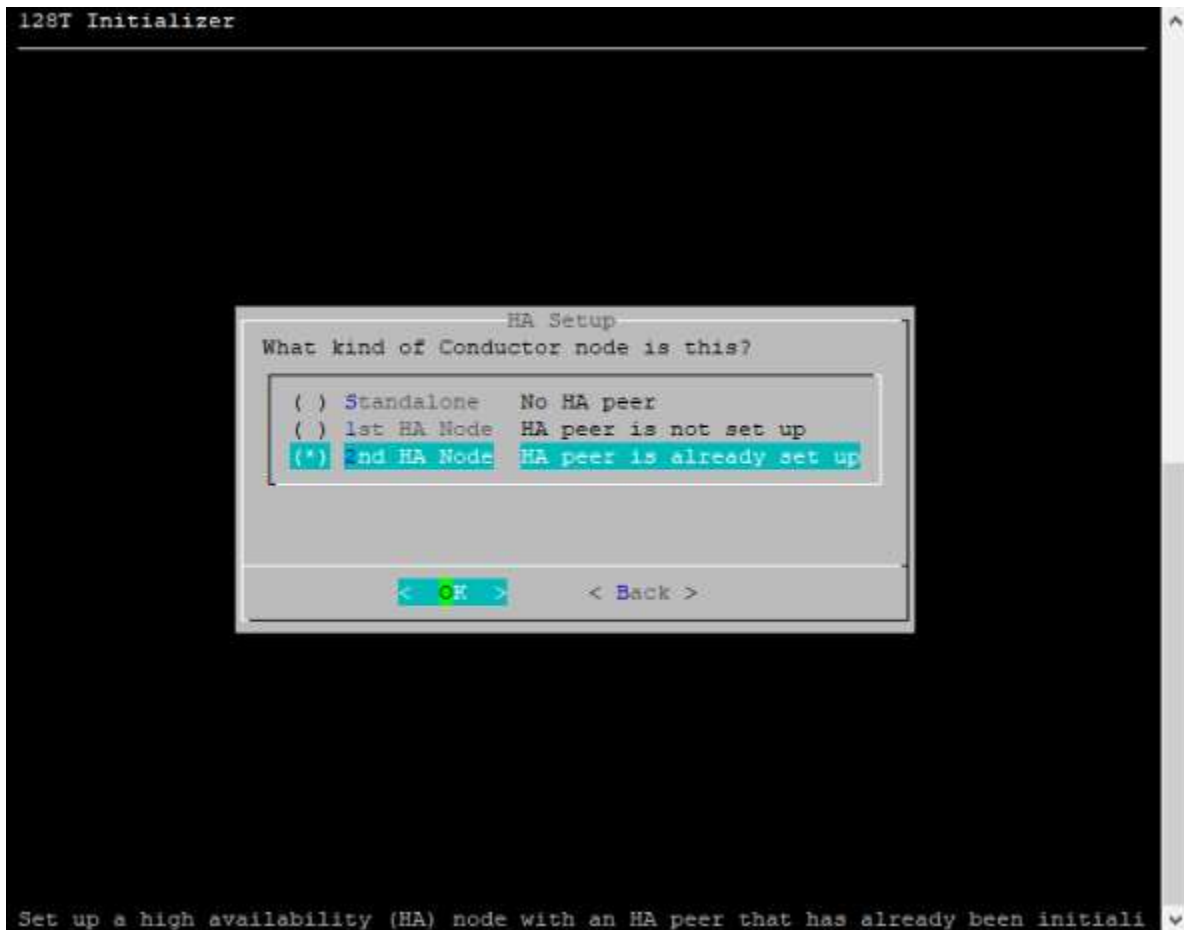
Instead of proceeding with Node 1, switch to the Node 2 SSH window and enter:

```
sudo install128t
```

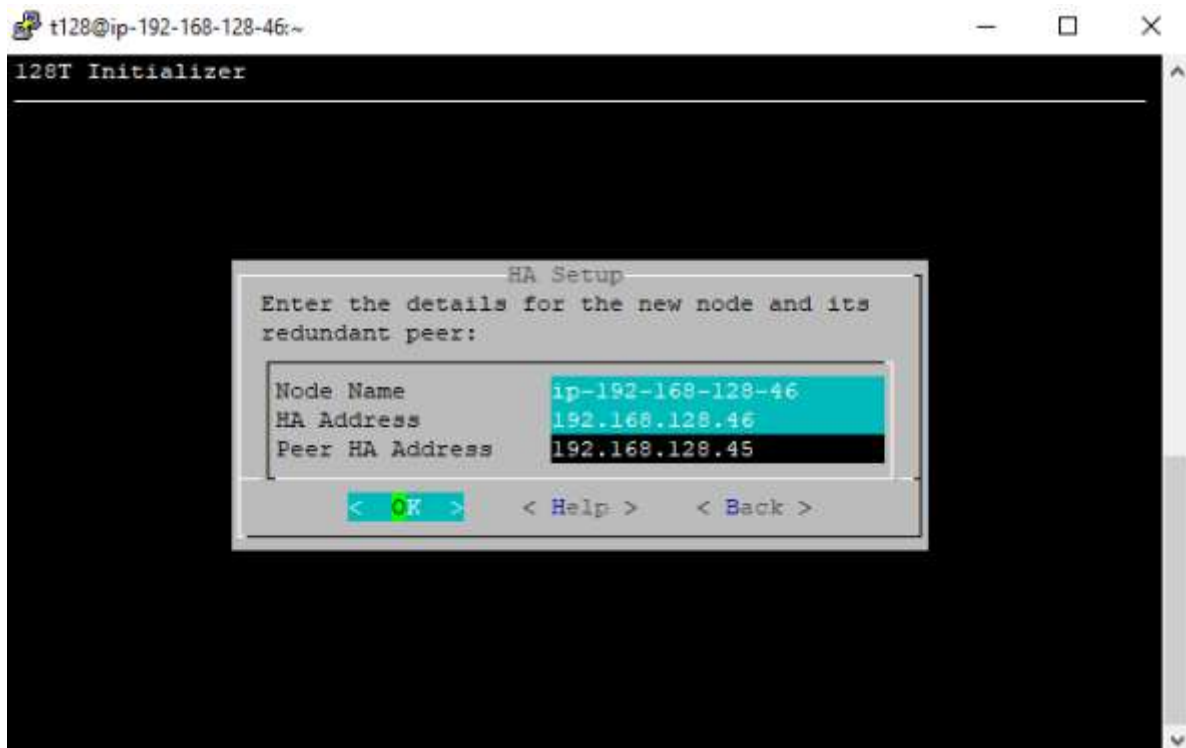
The 128T Installer screen should appear.



Continue the with the process in Section “Installing 128T Conductor Software” on Node 2 until you reach the step for “HA Setup.” At this point select the “2nd HA Node.”



In the next step enter addresses associated with both nodes.



The "HA Address" is the address associated with Node 2 listed as "Private IPs" in the EC2 console.

Instance: **i-0f55803dd2213c263 (HA_Conductor_Node_1B)** Public DNS: **ec2-18-218-187-199.us-east-**

2.compute.amazonaws.com

Description

Status Checks

Monitoring

Tags

Usage Instructions

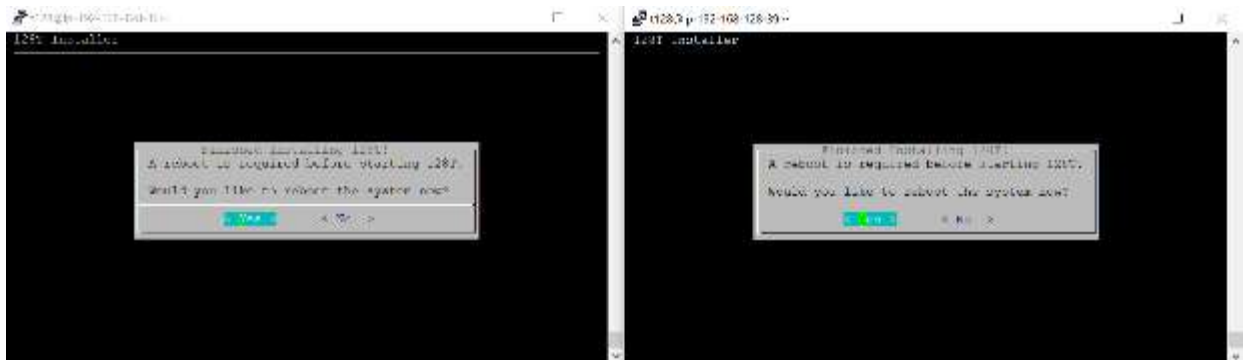
Instance ID	i-0f55803dd2213c263	Public DNS (IPv4)	ec2-18-218-187-199.us-east-2.compute.amazonaws.com
Instance state	running	IPv4 Public IP	18.218.187.199
Instance type	c4.xlarge	IPv6 IPs	-
Elastic IPs		Private DNS	ip-192-168-128-46.us-east-2.compute.internal
Availability zone	us-east-2a	Private IPs	192.168.128.46
Security groups	128 Technology Networking Platform-128T Networking Platform - CentOS7-AutogenByAWSMP-14 view		
		Secondary private IPs	

The "Peer HA address" is the private IP address from Node 1, which should be in the same subnet.

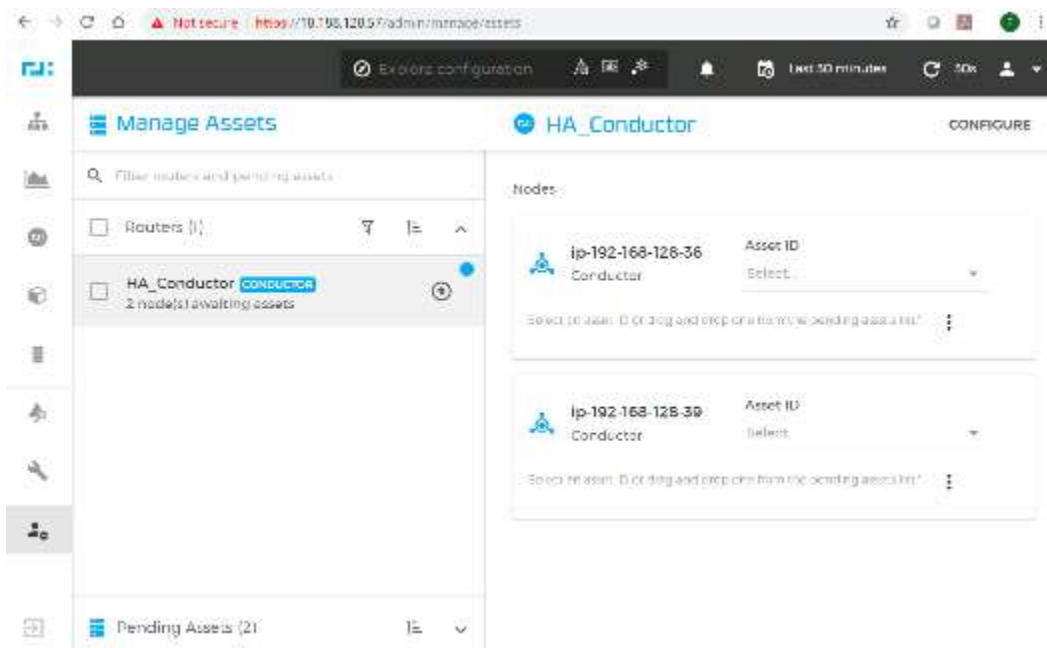
Continue the installation process until the initialization prompt.



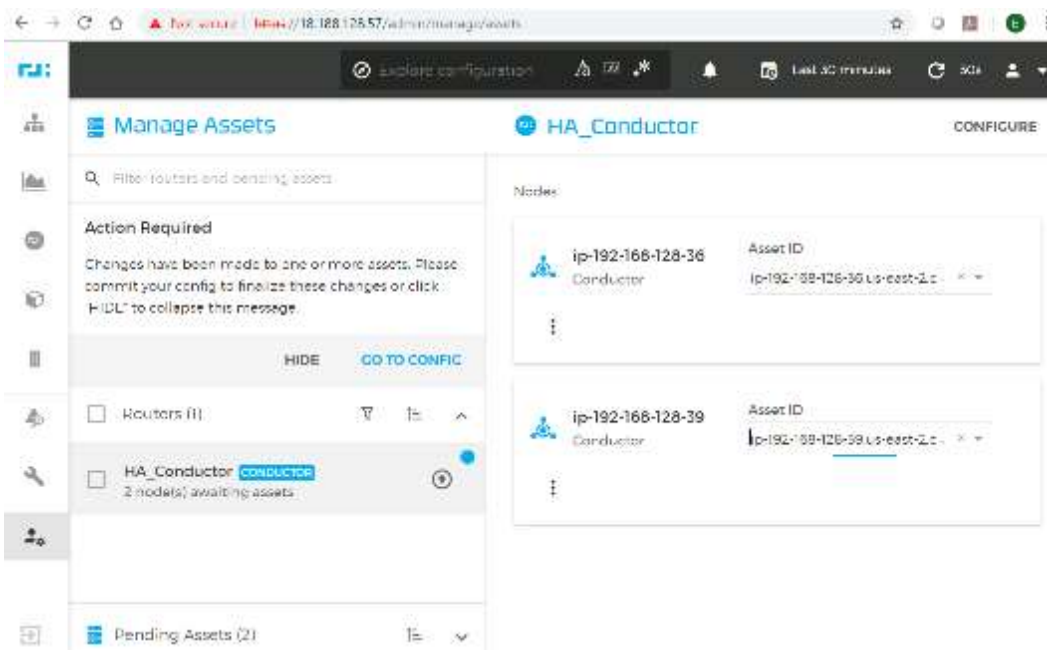
After selecting <Got it!>, you should see the reboot screen for both Node 1 and Node 2 windows. The reboot order is important. Select <Yes> in the Node 1 window first and then select <Yes> in the Node 2 window.



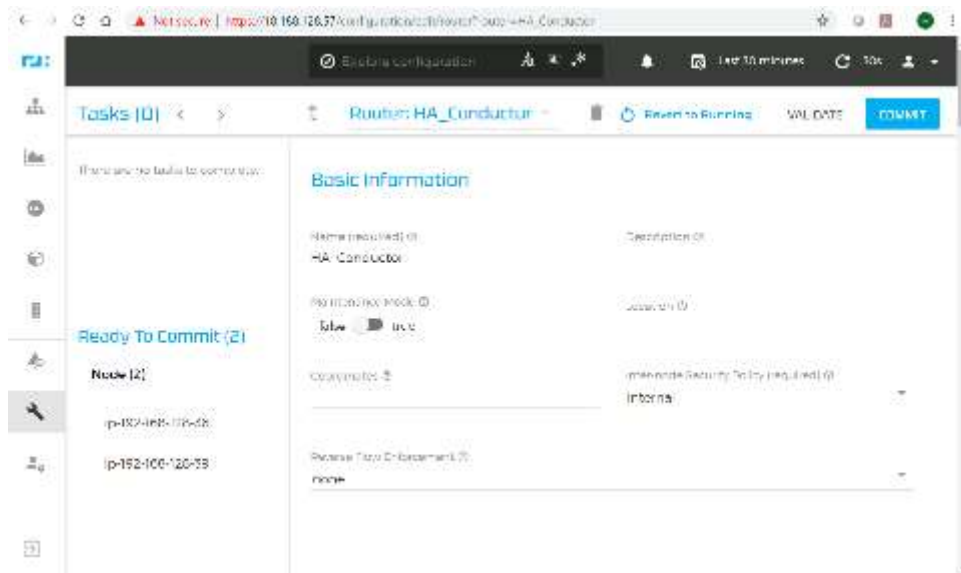
After the reboot completes in ~1-2 minutes, you can access the Conductor GUI through the public IP address of either Node 1 or Node 2. On the “Manage Assets” page you can select the Conductor and see the two nodes.



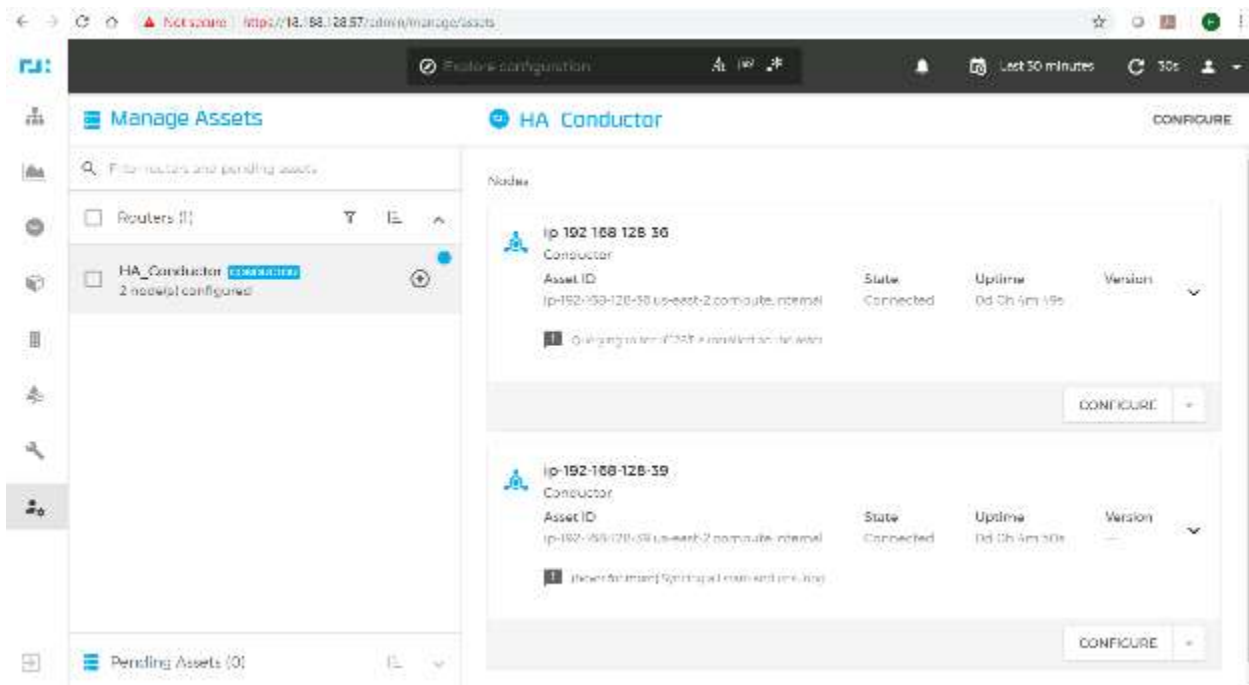
You can select the appropriate “Asset ID” for each node from the drop-down and then select “Configure.”



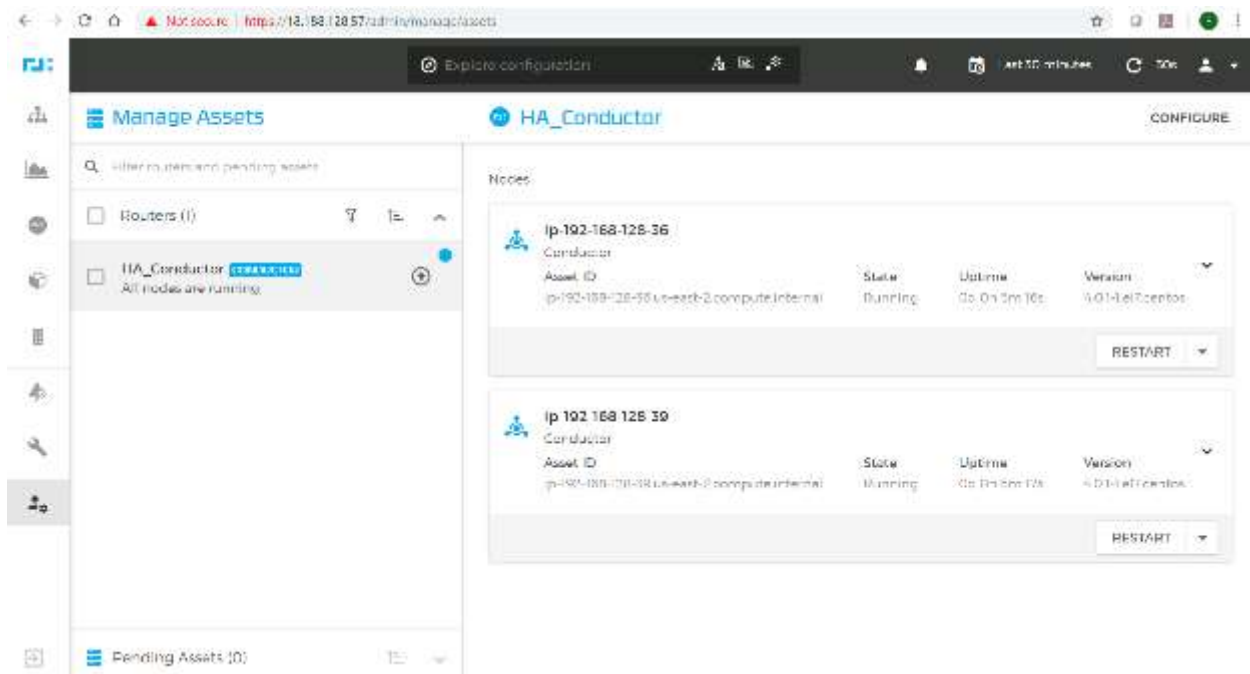
This will take you to the configuration page where you can “Commit” the changes.



If you return to the “Manage Assets” page the assets may be various states of initialization and synchronization initially.



Eventually both nodes of the HA Conductor should be in a “Running” state.



At this point the HA Conductor is ready for operations.

OPERATIONAL GUIDANCE

HEALTH CHECK

By default, the 128T Conductor provides many tools with a single pane of glass interface to assess the health of itself and the managed 128T Routers.



The following faults for a 128T Router are automatically identified using the 128 Conductor:

- AZ fault – Alarm: No connectivity, Action: restart from AWS Console
- Instance fault – Alarm: No connectivity, Action: restart from AWS Console
- Application fault – Alarm: No connectivity, Action: attempt router restart from 128T Conductor
- Storage capacity – Alarm: Disk space, Action: resize instance
- Security certificate expiration – Not applicable

The 128T Conductor can identify some faults associated with itself, but others must be inferred based on reachability. Since the Conductor does not affect packet forwarding of routers, the Conductor instance can be restarted to resolve many issues.

- AZ fault – Conductor unreachable, Action: restart from AWS Console
- Instance fault – Conductor unreachable, Action: restart from AWS Console
- Application fault – Conductor unreachable, Action: restart from AWS Console

- Storage capacity – Alarm: Disk space, Action: resize instance
- Security certificate expiration – Not applicable

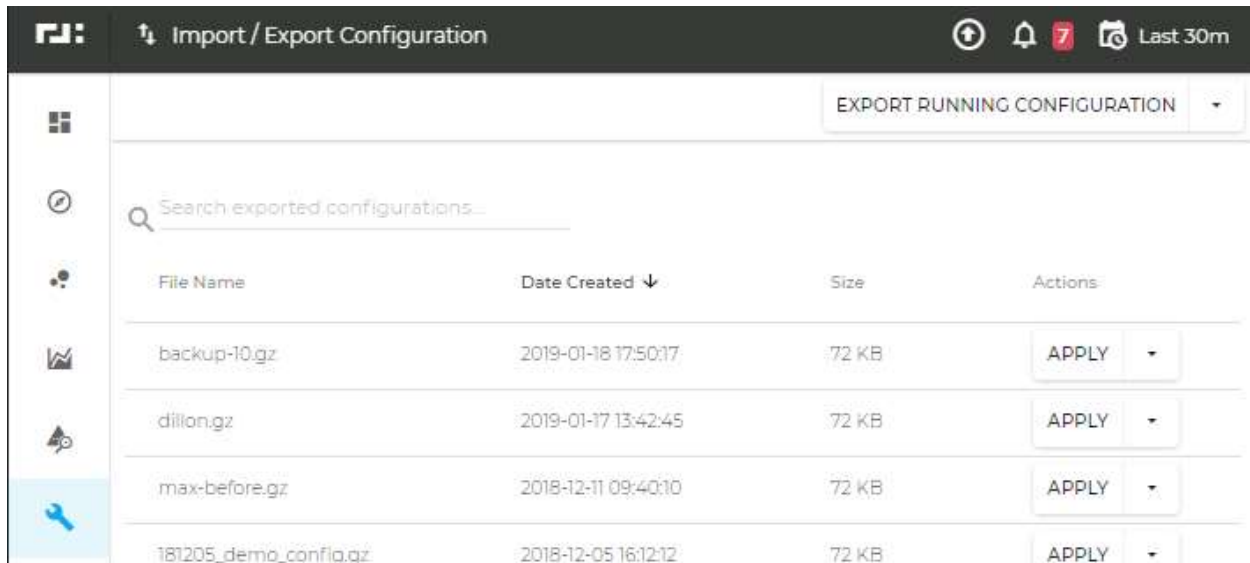
Both the 128T Router and Conductor can be operated in a High-Availability (HA) configuration as outlined in Section “High Availability (HA) Deployment.” When HA is configured, two instances in different availability zones can be used to ensure continuous operation in the case of AZ fault, instance fault, application fault, or storage fault in one of the two instances.

BACKUP AND RECOVERY

In the 128T Networking Platform architecture the 128T Conductor is the central point for management, and it automatically maintains the master configuration for all routers in the network (each router maintains a local copy as well). For example, if a Conductor is unreachable, the Router will operate with a local configuration, and when the Conductor becomes reachable, the Conductor will automatically re-synchronize configuration with the Router.

For mission-critical applications the Conductor or Router can be deployed in an HA configuration which makes backup and recovery automatic. The procedure in section “High Availability (HA) Deployment,” can be used either when the system is initially deployed or at a later date, if the administrator decides to make an existing standalone deployment of Router or Conductor Highly Available by adding a second node. In HA, the configuration is maintained and synchronized between both nodes, so if one of the nodes fails, the other node will maintain the configuration. When a failed node starts back up, it will reconnect with the operating node and the full configuration will be restored. If the failing node must be completely replaced, then the procedure in Section “High Availability (HA) Deployment,” can be repeated. Once the new node reconnects with the running node, the full configuration will be resynchronized. Finally, for lifecycle maintenance, the product makes the software upgrade process seamless and hitless. In the GUI Assets page, you simply select the target Router or Conductor and the available release version, and the product will then hitlessly upgrade both nodes.

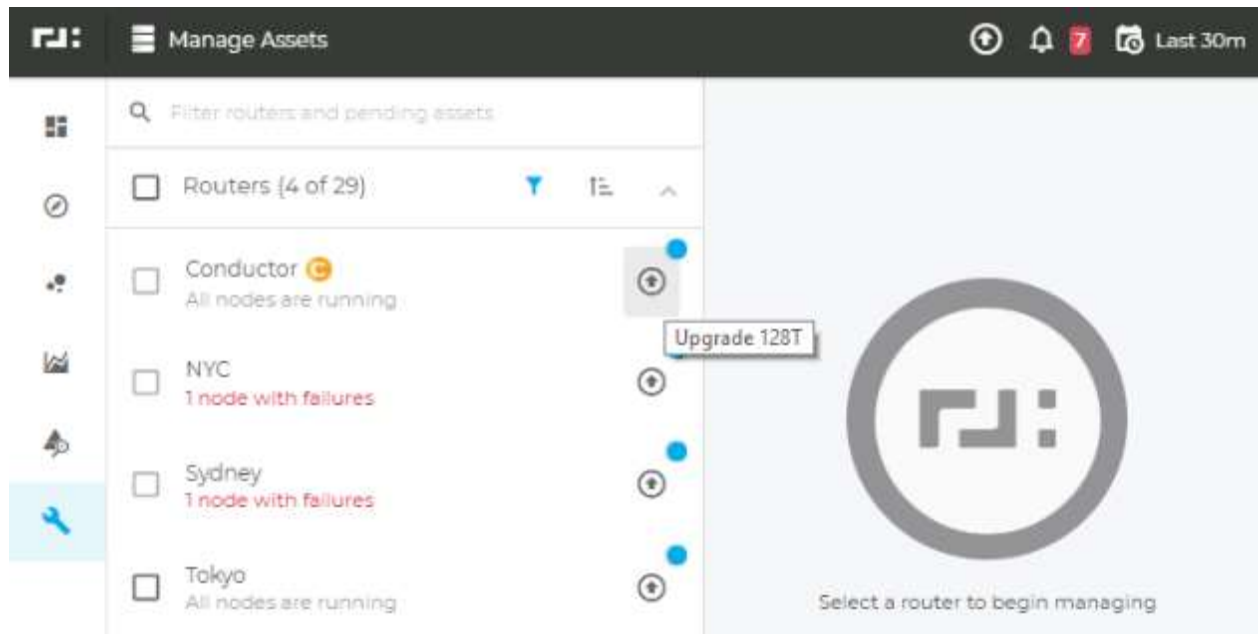
For deployments which are not configured for HA, the Conductor GUI includes features to maintain configuration backups locally or to import or export the configuration. In general, we also recommend producing backups of the configuration before major changes, exporting to external, secure, resilient storage (such as S3), and ideally including the 128T configuration in broader IT version control system. In the case of failures in a region, availability zone, or instance, the configuration can be imported from the external backup to the Conductor and then the entire network platform would be restored to its previous state.



Import / Export Configuration			
EXPORT RUNNING CONFIGURATION			
Search exported configurations...			
File Name	Date Created	Size	Actions
backup-10.gz	2019-01-18 17:50:17	72 KB	APPLY
dillon.gz	2019-01-17 13:42:45	72 KB	APPLY
max-before.gz	2018-12-11 09:40:10	72 KB	APPLY
181205_demo_config.gz	2018-12-05 16:12:12	72 KB	APPLY

ROUTINE MAINTENANCE

Once operational, the 128T Networking Platform requires almost no routine maintenance. To ensure compliance with best security practices occasionally the 128T Networking System requires a software upgrade. This can be performed centrally from the 128T Conductor. The Conductor GUI includes a “Manage Assets” page which notifies the user of optional available upgrades and highlights when a critical update is available.



EMERGENCY MAINTENANCE

The architecture of the 128T Networking Platform is highly distributed, resilient, and natively multi-path, so few failures can completely disrupt the platform. Many of the failure cases and remediation for a single 128T Router or Conductor are covered in the “Health Check” section.

For more permanent or unrecoverable failures in AWS, a completely new EC2 instance can be created. If a 128T Router has completely failed, the 128T Conductor will continue to maintain that Router’s configuration, and so a new 128T Routing instance can be created, connect to the existing Conductor, and the configuration will be restored. If a 128T Conductor has completely failed, a new 128T Conductor instance will need to be recreated and then the backup configuration discussion in the “Backup and Recovery” section can be imported into the new Conductor.

Since many failure scenarios are possible, 128 Technology can also assist with diagnosis and recovery as discussed in the “Support” section.

SUPPORT

A wide variety of documentation, release notes, tips, community answers and self-help videos are available through the 128T Interchange portal at <https://community.128technology.com/interchange/login>. For specific issues users can submit a support request to 128 Technology at <https://128technology.atlassian.net/servicedesk/customer/portals>. Technical support can also be reached by sending an email to support@128technology.com or calling 1-781-203-8400.

SUPPORT COSTS

128 Technology provides a Support Services Program for our End Users. It is designed to deliver comprehensive support through all stages of deployment, including design and planning, lab testing, and full production support. Costs for the Support Services are included in all Service Subscription Pricing plans.

The Support Services plan provides the following coverage features and informational services at no additional charge:

- 7x24x365 technical support for deployed production software
- Software release upgrades
- Defect fixes for supported software releases
- Web access to the Support Portal, providing access to:
 - User documentation
 - Knowledge base articles
 - Cases (trouble ticketing system)