



Cluster Deployment Guide

Version 2.2.2

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Document Revision History

Friday, December 7th, 2018

- Initial release of documentation.

OVA Download

The latest OVA file is available as a secure download hosted on Amazon S3.

Your professional services representative will provide you with a secure link to download the file when it becomes available.

OVA Deployment

Preparations

To set up Band, you must have:

- Band OVA
- Supported virtual infrastructure
- PostgreSQL database credentials
- Nginx compatible SSL certificate and SSL certificate key

OVA Deployment

Network

Port Usage Outside of Cluster Group

Protocol	Port	Direction	Purpose
HTTPS	443	Inbound	Band API
HTTPS	4737	Inbound	IPFS Websockets
SSH	22	Inbound/Outbound	Cluster administration

Port Usage Inside of Cluster Group

Protocol	Port	Direction	Purpose
TCP	13000-14000	Inbound/Outbound	Cluster messaging
HTTPS	443	Inbound/Outbound	Band API
SSH	22	Inbound/Outbound	Cluster administration
TCP	5432*	Outbound	Database

* Subject to change depending on customer's preferred storage implementation.

OVA Deployment

System Requirements

Supported Platforms

VMware ESXI 5.5 and later are supported.

Cluster Size

The recommended size of a Band cluster is 2 nodes.

Virtual Machine Configuration

The requirements for a Band cluster node are:

CPU: 3 GHz dual core or 4 virtual processors

RAM: 8 GB

STORAGE: 80GB

Browsers

The Band interface is supported on the latest versions of Firefox, Internet Explorer, Edge, Chrome, and Safari.

Band OVA Deployment

Deploying the OVA

Deploy the OVA on your platform as you would any other OVA. Refer to your platform's documentation for instructions on deploying OVA files.

Cluster Setup

Clusters are headless and all nodes are functionally identical.

Individual Node DNS Entries

Individual nodes do not require distinct DNS entries but can be assigned one for administrative convenience.

Load Balancing

Nodes do not require session affinity and utilize long-lived websocket connections.

The cluster can operate in two load balancing configurations:

Round-Robin DNS

All node IP addresses are assigned to a single DNS entry.

Hardware (Websocket Enabled)

Nodes can be used with hardware load balancers such as those available from Cisco or F5 for fault-tolerance. Hardware load balancers **must be configured for use with websockets**. Refer to your load balancer's documentation for instructions on enabling websockets.

SSL Certificates

All cluster nodes share a single SSL certificate and certificate key to communicate with external services.

The SSL certificate and certificate key should be Nginx compatible. See - http://nginx.org/en/docs/http/configuring_https_servers.html - for more information.

Node Setup

Network Setup (DHCP)

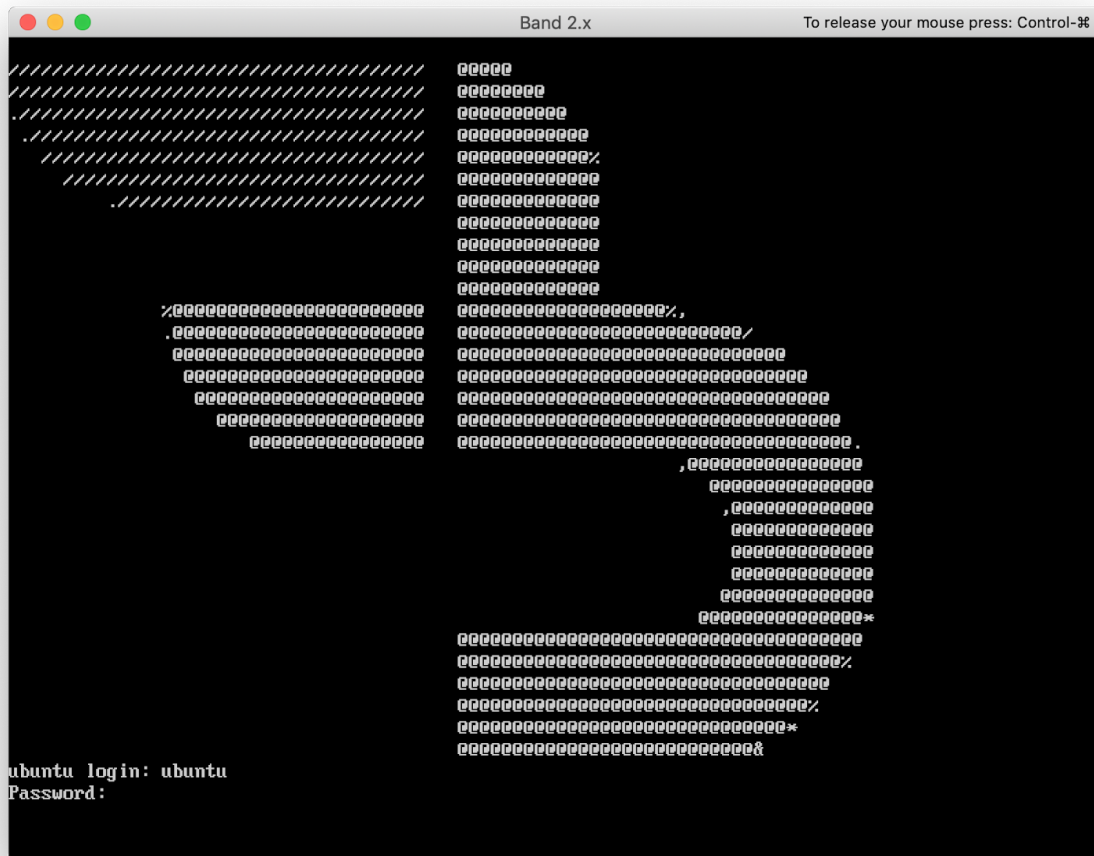
By default, nodes use dynamic host configuration protocol (DHCP) on network device ens32. No additional network setup is required on DHCP systems.

Network Setup (Static IP)

For systems with statically allocated IP addresses:

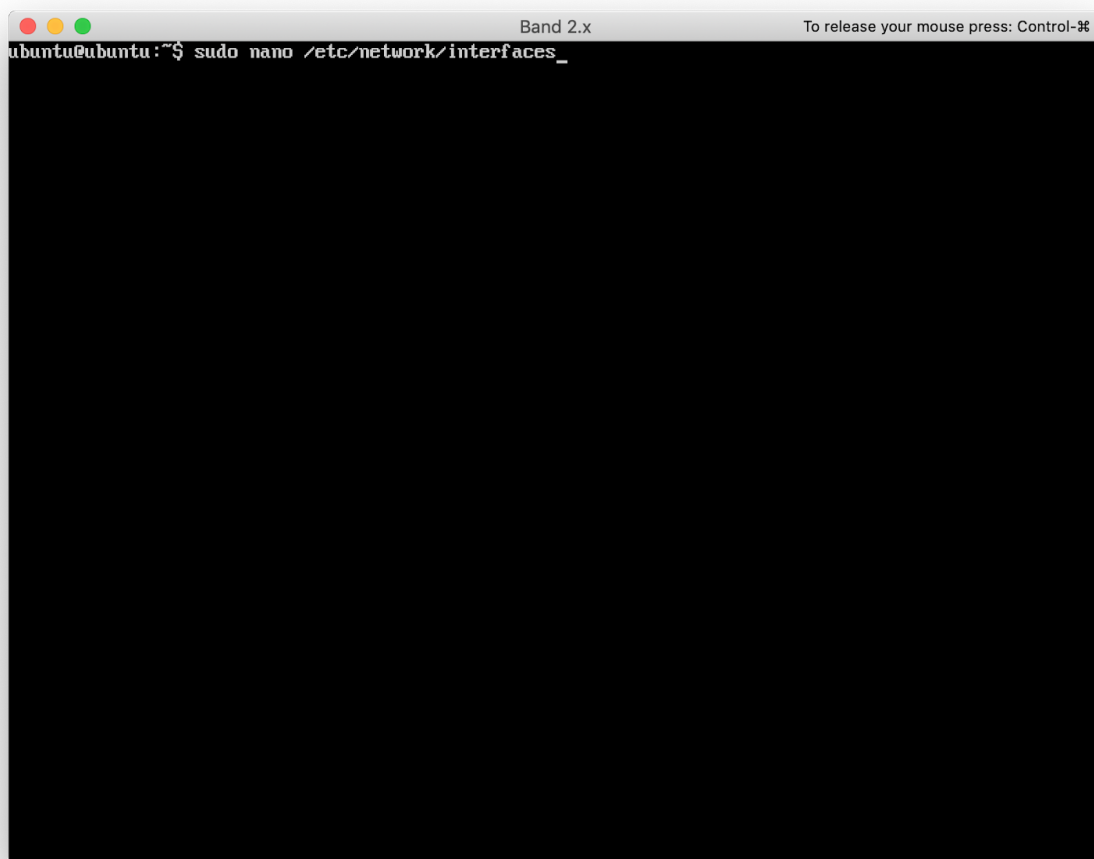
1. Access the virtual machine terminal.
2. At the login prompt, enter:

```
username: ubuntu
password: ubuntu
```

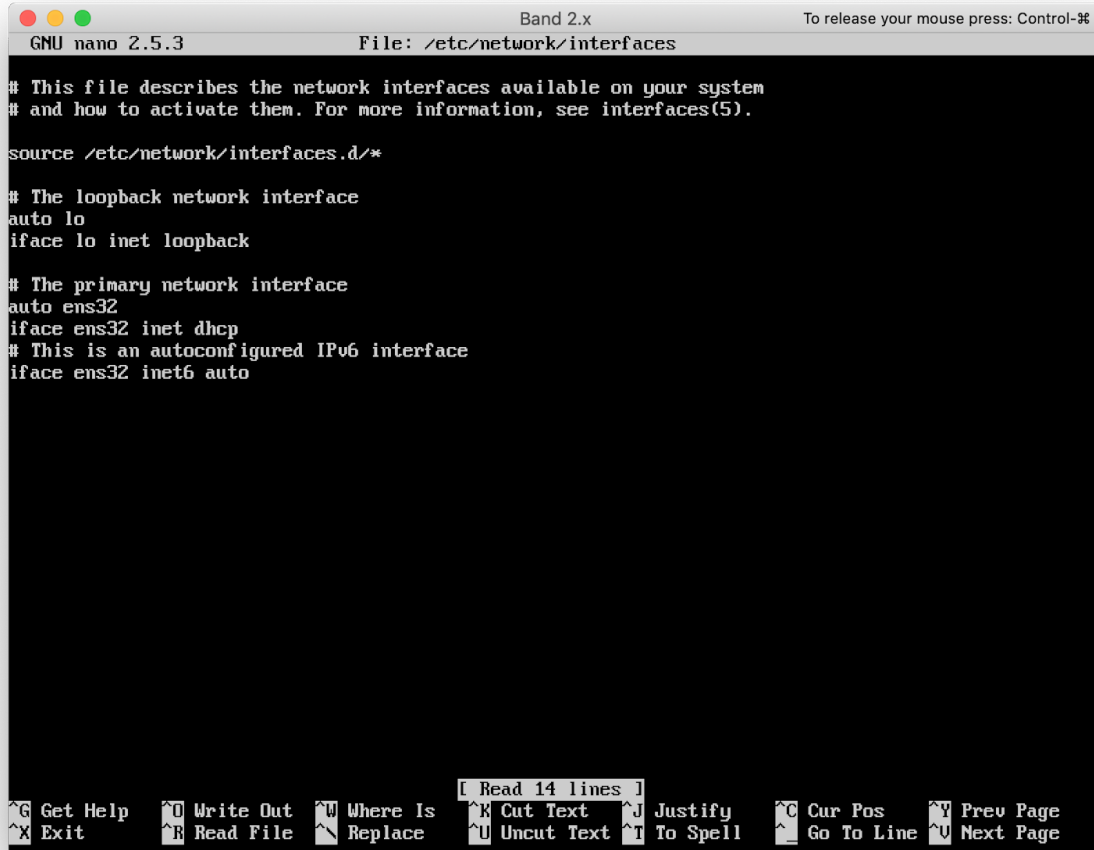


3. Open the network configuration file for editing:

```
sudo nano /etc/network/interfaces
```



4. Review and modify the settings as needed.



```
GNU nano 2.5.3      File: /etc/network/interfaces      To release your mouse press: Control-⌘

# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
auto ens32
iface ens32 inet dhcp
# This is an autoconfigured IPv6 interface
iface ens32 inet6 auto

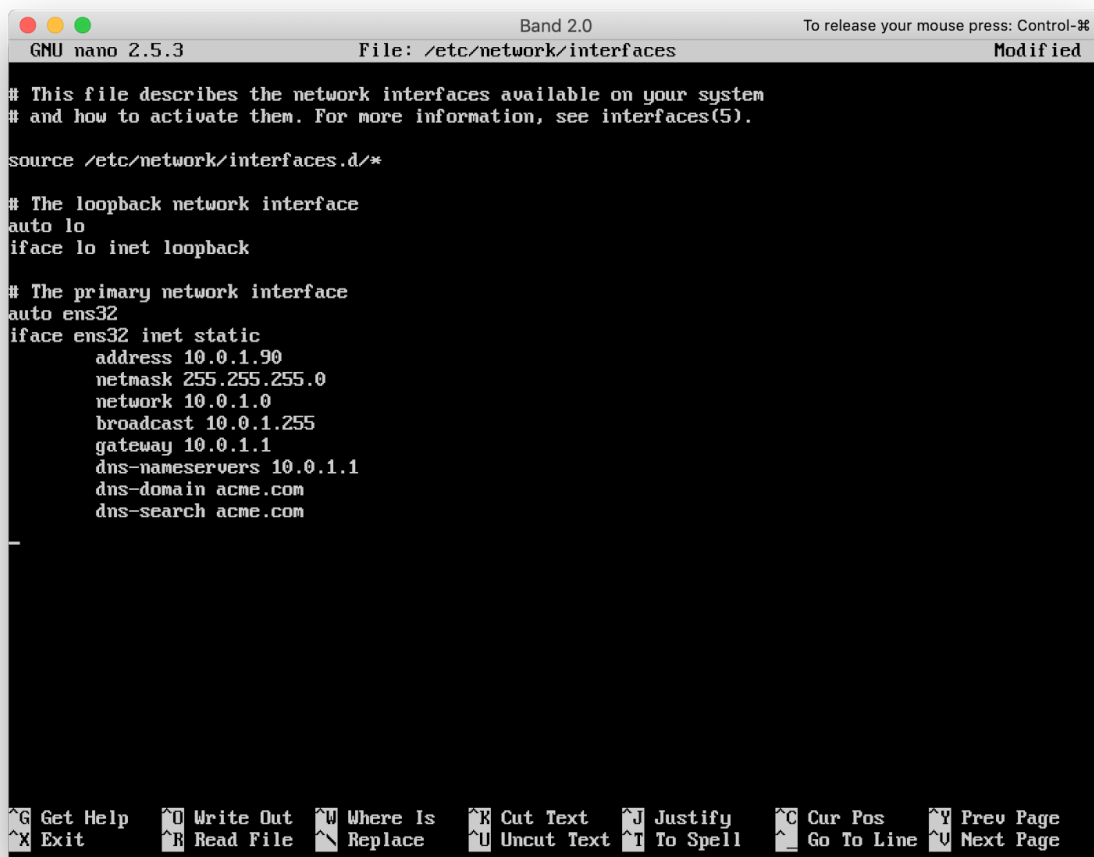
[ Read 14 lines ]
^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify    ^C Cur Pos   ^Y Prev Page
^X Exit      ^R Read File  ^_ Replace   ^U Uncut Text ^T To Spell   ^_ Go To Line ^V Next Page
```

- The file will look similar to:

```
# The loopback network interface
auto lo
iface lo inet loopback
# The primary network interface
auto ens32
iface ens32 inet dhcp
# This is an autoconfigured IPv6 interface
iface ens32 inet6 auto
```

- Your changes will most likely look similar to:

```
# The loopback network interface
auto lo
iface lo inet loopback
# The primary network interface
auto ens32
iface ens32 inet static
    address 10.0.1.90
    netmask 255.255.255.0
    network 10.0.1.0
    broadcast 10.0.1.255
    gateway 10.0.1.1
    dns-nameservers 10.0.1.1
    dns-domain acme.com
    dns-search acme.com
```



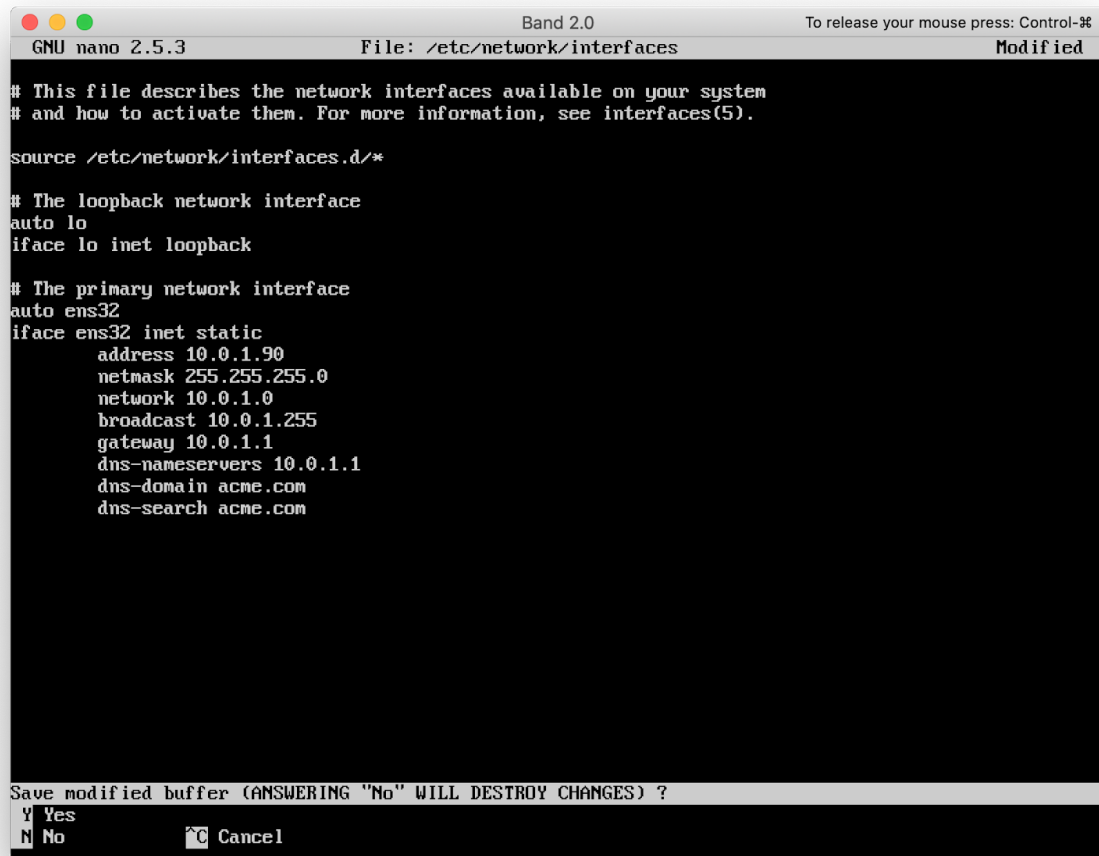
```
GNU nano 2.5.3 File: /etc/network/interfaces Modified
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
auto ens32
iface ens32 inet static
    address 10.0.1.90
    netmask 255.255.255.0
    network 10.0.1.0
    broadcast 10.0.1.255
    gateway 10.0.1.1
    dns-nameservers 10.0.1.1
    dns-domain acme.com
    dns-search acme.com
```

5. When your modifications are completed press **CTRL-X** to exit.
6. Press the **Y** key to save your changes.



```
GNU nano 2.5.3      Band 2.0      To release your mouse press: Control-⌘
File: /etc/network/interfaces      Modified

# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

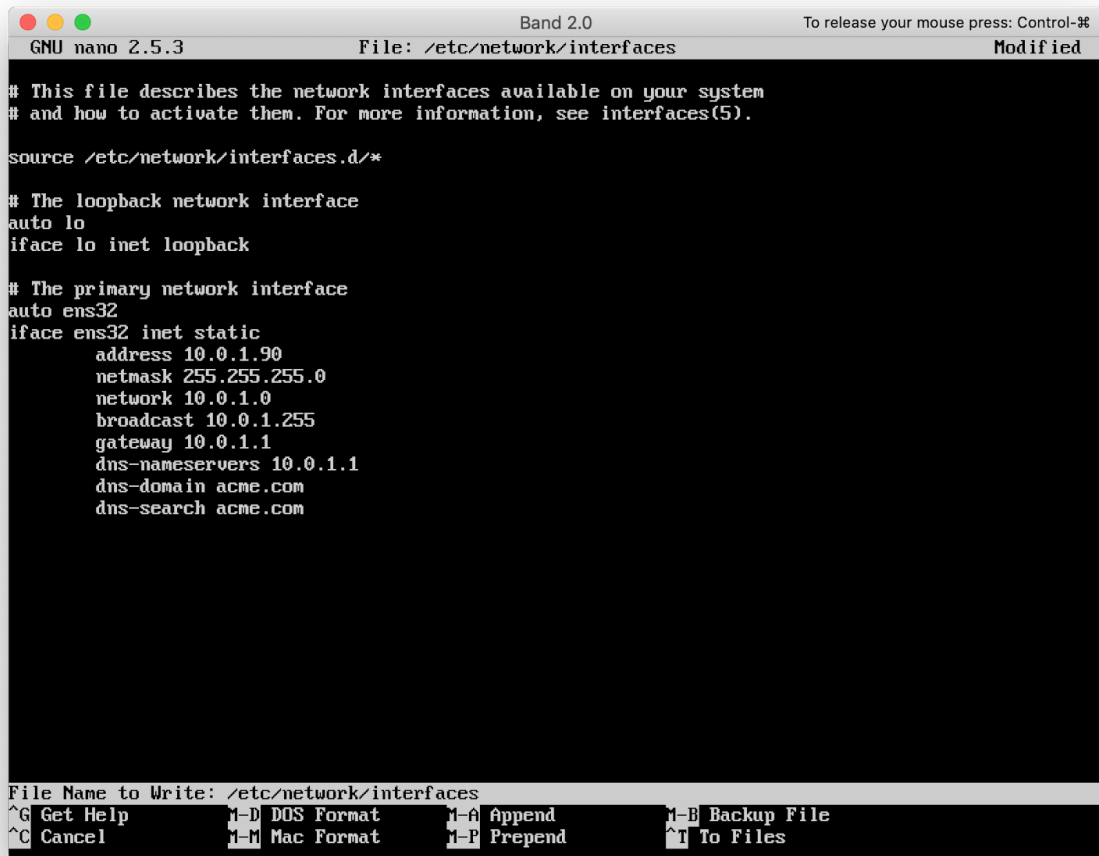
source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
auto ens32
iface ens32 inet static
    address 10.0.1.90
    netmask 255.255.255.0
    network 10.0.1.0
    broadcast 10.0.1.255
    gateway 10.0.1.1
    dns-nameservers 10.0.1.1
    dns-domain acme.com
    dns-search acme.com

Save modified buffer (ANSWERING "No" WILL DESTROY CHANGES) ?
Y Yes
N No      ^C Cancel
```


7. Press **ENTER** to save the file.



```
GNU nano 2.5.3      Band 2.0      To release your mouse press: Control-⌘
File: /etc/network/interfaces      Modified

# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
auto ens32
iface ens32 inet static
    address 10.0.1.90
    netmask 255.255.255.0
    network 10.0.1.0
    broadcast 10.0.1.255
    gateway 10.0.1.1
    dns-nameservers 10.0.1.1
    dns-domain acme.com
    dns-search acme.com

File Name to Write: /etc/network/interfaces
^G Get Help      ^M-D DOS Format  ^M-A Append      ^M-B Backup File
^C Cancel        ^M-M Mac Format  ^M-P Prepend     ^M-T To Files
```

8. Restart the networking stack:

```
sudo systemctl restart networking
```

9. Reboot the virtual machine:

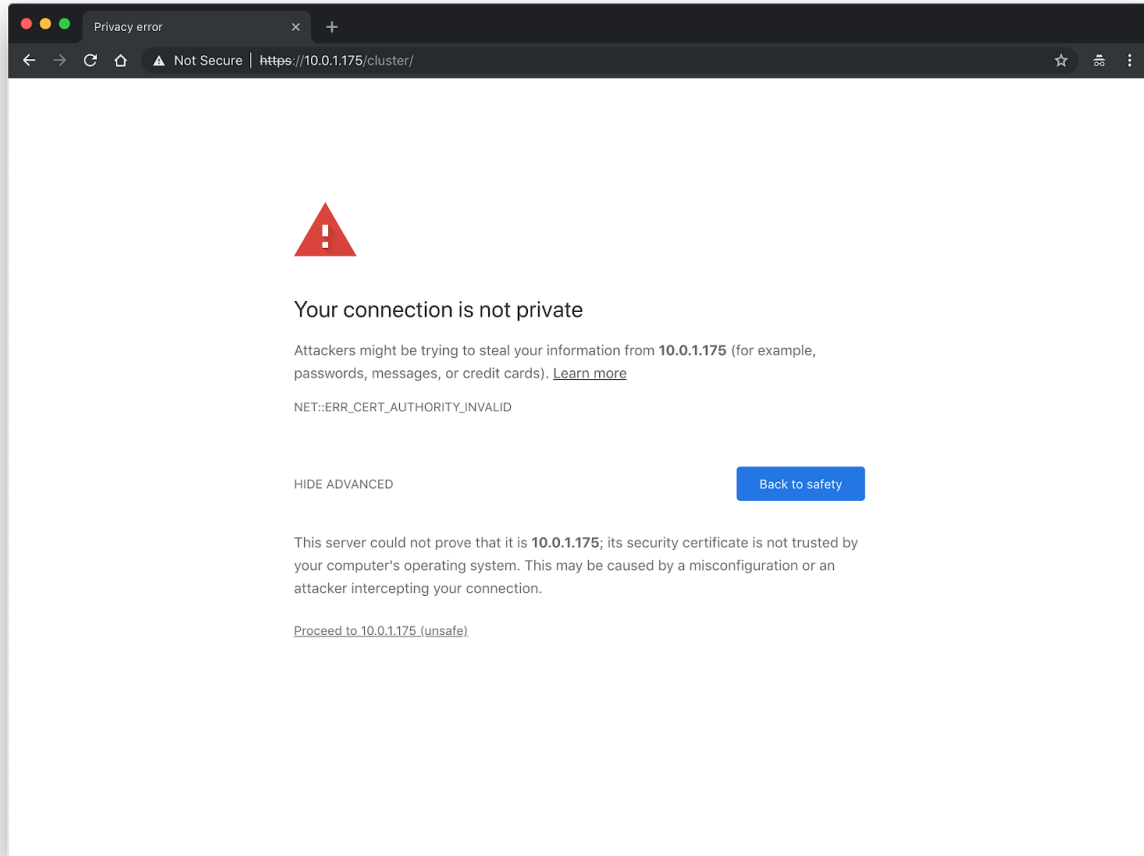
```
sudo reboot
```

10. After the system restarts, confirm that it was configured successfully.

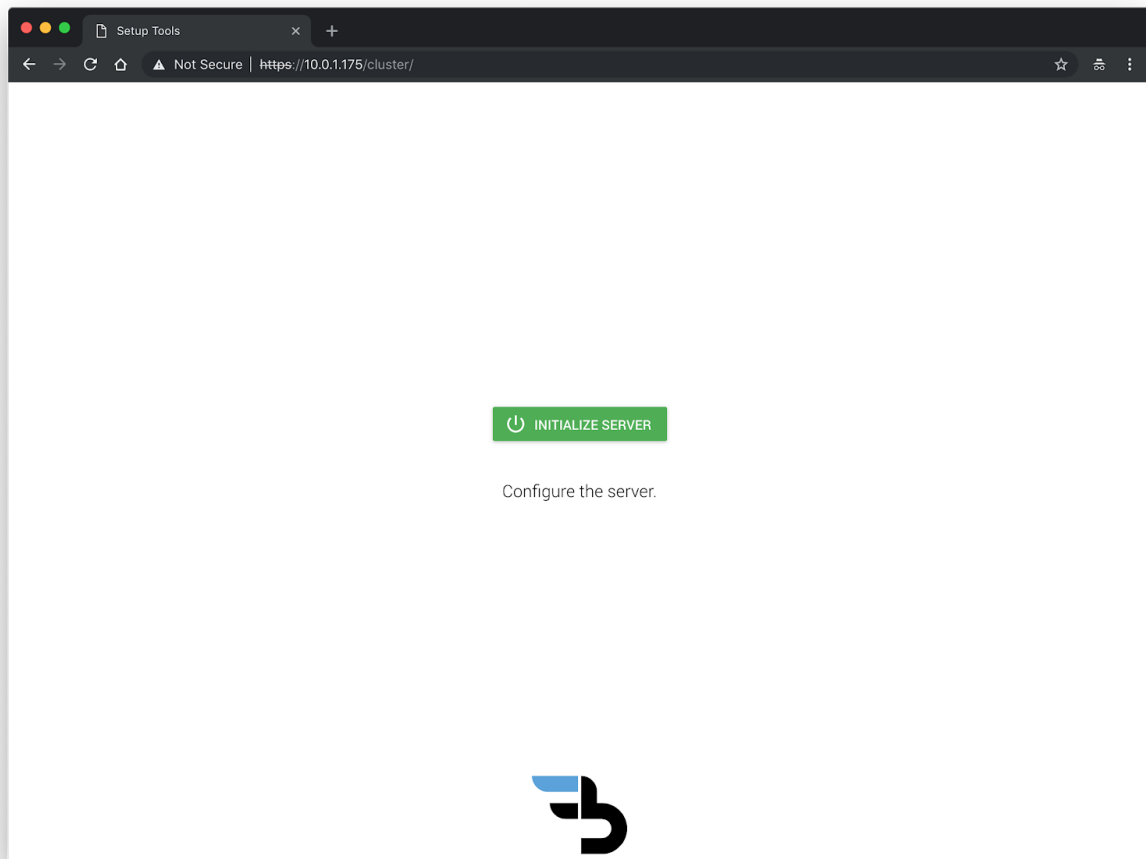
- Ping the configured IP address:
ping [configured IP address]
- Access **https://[configured IP address]/cluster** in a web browser and check for the cluster setup screen.

Initialize Cluster

Visit the HTTPS **/cluster** path of the first node. If the node IP were **10.0.1.175**, the address would be **https://10.0.1.175/cluster**. Proceed through the SSL certificate warnings.



From the landing page, click on **Initialize Server** button.



From **Initialize Server: Setup database**, enter the credentials of a previously set up Postgres database.

Click on the **Select database type** dropdown menu and choose PostgreSQL.

The screenshot shows a web browser window with the title 'Initialize Server' and the URL 'https://10.0.1.175/cluster/initialize'. The page has a dark header bar with navigation icons. The main content area is titled 'Initialize Server' and features a vertical progress bar on the left with six steps: 1. Setup database (highlighted with a green circle), 2. Create account, 3. Configure storage server, 4. Twilio credentials (optional), 5. Stripe credentials (optional), and 6. Configure web server. The 'Setup database' step contains a dropdown menu labeled 'PostgreSQL' with a blue arrow icon. Below the dropdown are four input fields: 'Database Name', 'Database Host Name', 'Database Username', and 'Database Password'. At the bottom of the form are two buttons: 'SAVE DATABASE SETTINGS' and 'GO BACK'.

Initialize Server

1 Setup database

PostgreSQL Database Name

Database Host Name Database Username

Database Port Number Database Password

SAVE DATABASE SETTINGS GO BACK

2 Create account

3 Configure storage server

4 Twilio credentials (optional)

5 Stripe credentials (optional)

6 Configure web server

Enter the database credentials and click on **Save Database Settings** button.

The screenshot shows a web browser window with the title 'Initialize Server' and the URL 'https://10.0.1.175/cluster/initialize'. The page has a dark header bar with navigation icons. The main content area is titled 'Initialize Server' and features a vertical progress bar on the left with six steps: 1. Setup database (active), 2. Create account, 3. Configure storage server, 4. Twilio credentials (optional), 5. Stripe credentials (optional), and 6. Configure web server. The 'Setup database' step is expanded, showing a form with the following fields: 'Select database type...' (PostgreSQL), 'Database Name' (band), 'Database Host Name' (10.0.1.28), 'Database Username' (user), 'Database Port Number' (5432), and 'Database Password' (masked with dots). Below the form are two buttons: 'SAVE DATABASE SETTINGS' (green) and 'GO BACK' (black).

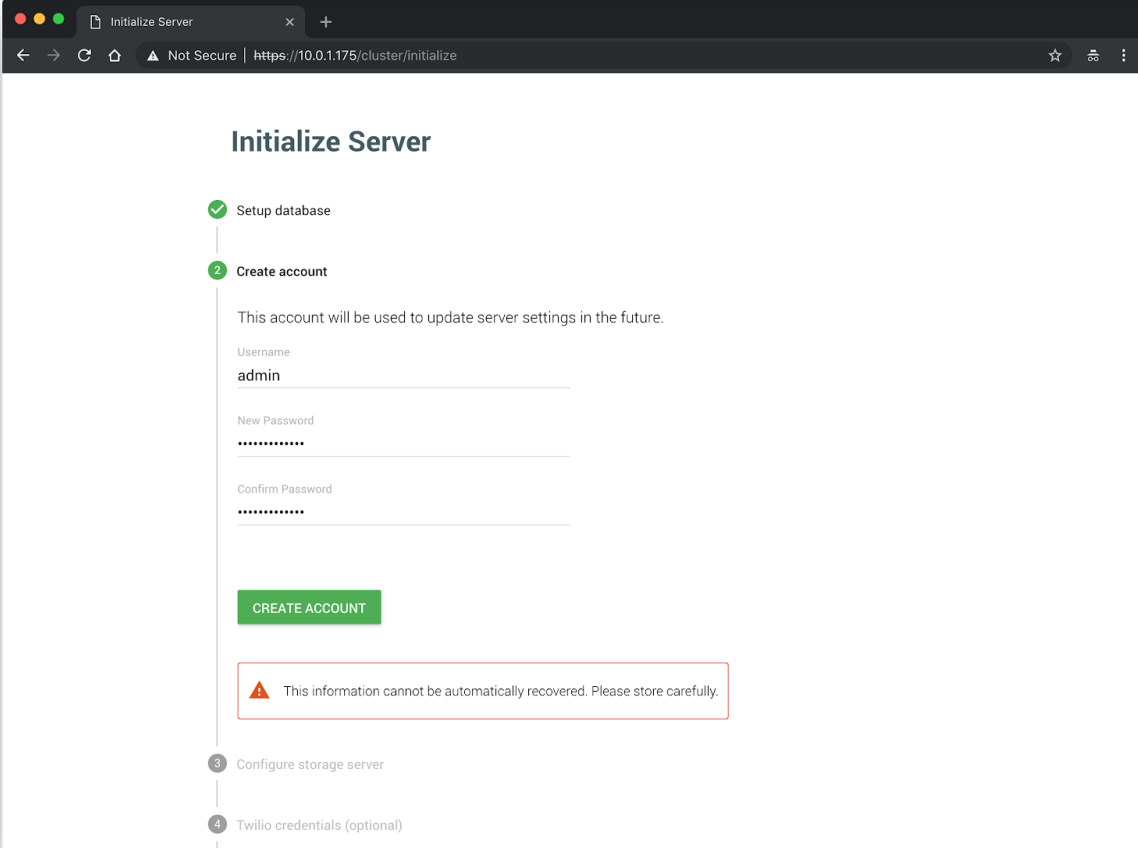
Initialize Server

- Setup database**
 - Select database type...
PostgreSQL
 - Database Name
band
 - Database Host Name
10.0.1.28
 - Database Username
user
 - Database Port Number
5432
 - Database Password

 - [SAVE DATABASE SETTINGS](#) [GO BACK](#)
- Create account
- Configure storage server
- Twilio credentials (optional)
- Stripe credentials (optional)
- Configure web server

From **Initialize Server: Create account**, enter a username and enter the same password under both **New Password** and **Confirm Password** fields and click on **Create Account** in order to create cluster administrative account. Make a note of these credentials since they are required to access the cluster administration page.

NOTE Credentials entered in this step cannot be recovered automatically.



The screenshot shows a web browser window with the title 'Initialize Server' and the URL 'https://10.0.1.175/cluster/initialize'. The page has a dark header bar with navigation icons. The main content area is white and titled 'Initialize Server'. A vertical progress bar on the left indicates four steps: 1. Setup database (completed, green checkmark), 2. Create account (active, green circle), 3. Configure storage server (grey circle), and 4. Twilio credentials (optional) (grey circle). The 'Create account' step includes a text prompt: 'This account will be used to update server settings in the future.' Below this are three input fields: 'Username' with the value 'admin', 'New Password' with masked characters '*****', and 'Confirm Password' with masked characters '*****'. A green 'CREATE ACCOUNT' button is positioned below the password fields. A red-bordered warning box at the bottom of the form contains a warning icon and the text: 'This information cannot be automatically recovered. Please store carefully.'

From **Initialize Server: Configure storage server**, enter the URL of the bolt cluster and click on **Configure Storage Server** button. For example, if bolt is hosted on **bolt.example.com** then the URL would be **https://bolt.example.com**.

The screenshot shows a web browser window titled "Initialize Server" with the address bar displaying "https://10.0.1.175/cluster/initialize". The page content includes a vertical progress bar on the left with six steps: "Setup database" (checked), "Create account" (checked), "Configure storage server" (active, highlighted with a green circle), "Twilio credentials (optional)" (disabled), "Stripe credentials (optional)" (disabled), and "Configure web server" (disabled). To the right of the progress bar, the "Configure storage server" step is expanded, showing a label "Storage Server URL" above a text input field containing "https://bolt.example.com". Below the input field are two buttons: a green "CONFIGURE STORAGE SERVER" button and a grey "GO BACK" button.

From **Initialize Server: Twilio credentials**, configure a Twilio account with Band in order to allow users to log in using their mobile numbers by default. However, team administrator can disable this feature on Bridge by configuring alternative authentication mechanism.

The screenshot shows a web browser window with the title 'Initialize Server' and the URL 'https://10.0.1.175/cluster/initialize'. The page displays a progress bar with five steps: 'Setup database', 'Create account', 'Configure storage server', 'Twilio credentials (optional)', and 'Stripe credentials (optional)'. The fourth step, 'Twilio credentials (optional)', is currently active. It includes a section for 'Default Twilio SMS adapter' with three input fields: 'Twilio SID' (containing 'AC178707ea22b7268723cea76d79126ac2'), 'Twilio Token' (containing '9343af0a6cc9a11c45ebae749822daf5'), and 'Twilio Number' (containing '+18003419910'). Below these fields are three buttons: 'SAVE CREDENTIALS' (highlighted in green), 'GO BACK', and 'SKIP'. The fifth step, 'Stripe credentials (optional)', is partially visible at the bottom of the screen.

From **Initialize Server: Stripe credentials**, this step is not required, click on **Skip** button to skip this step.

The screenshot shows a web browser window titled "Initialize Server" with the URL `https://10.0.1.175/cluster/initialize`. The page displays a vertical progress bar with six steps:

- ✓ Setup database
- ✓ Create account
- ✓ Configure storage server
- ✓ Twilio credentials (optional)
- 5 Stripe credentials (optional)
- 6 Configure web server

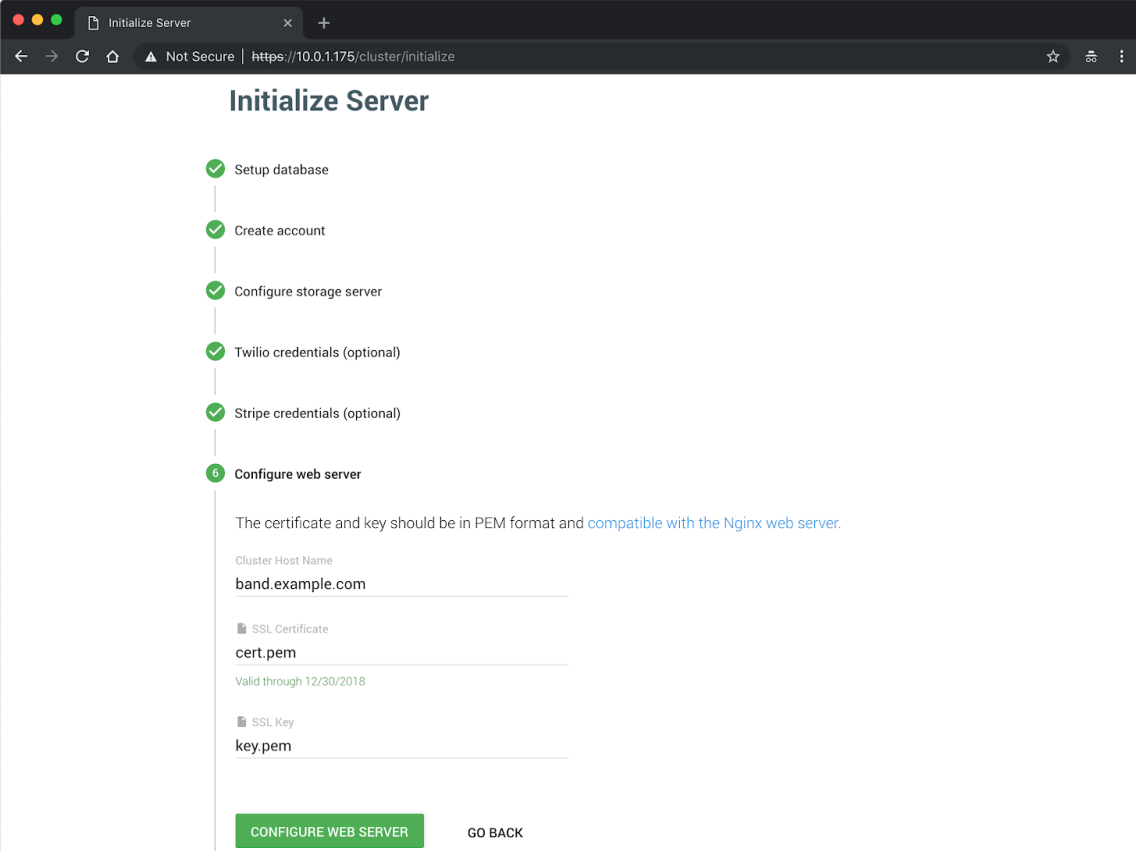
The "Stripe credentials (optional)" step is the current active step. It contains two input fields:

- Stripe Public Key
- Stripe Private Key

Below the input fields are three buttons:

- SAVE CREDENTIALS (green button)
- GO BACK (grey button)
- SKIP (grey button)

From **Initialize Server: Configure web server**, enter the cluster hostname and associated SSL certificate and keys. These files should be [compatible with the Nginx web server](#).

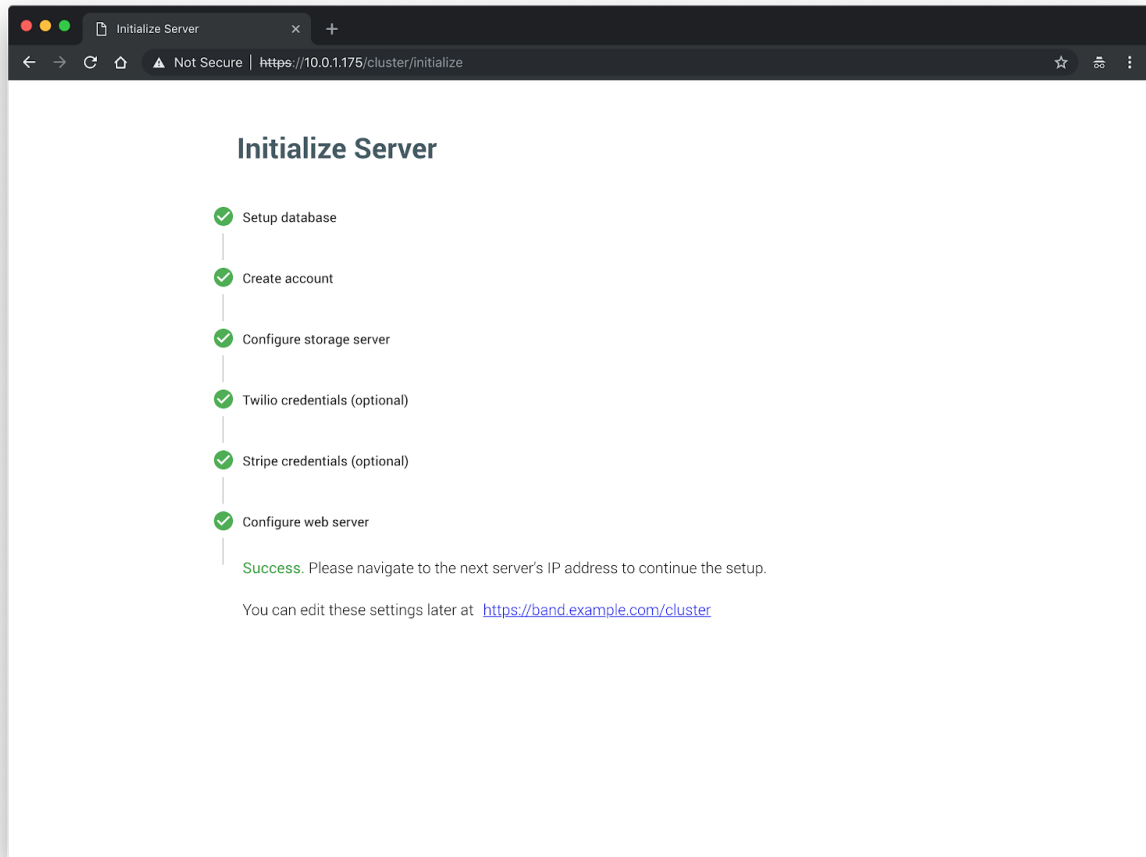


The screenshot shows a web browser window with the title "Initialize Server". The address bar shows "https://10.0.1.175/cluster/initialize". The page has a dark header with the title "Initialize Server". Below the header is a progress list with six items, each with a green checkmark icon:

- Setup database
- Create account
- Configure storage server
- Twilio credentials (optional)
- Stripe credentials (optional)
- 6 Configure web server**

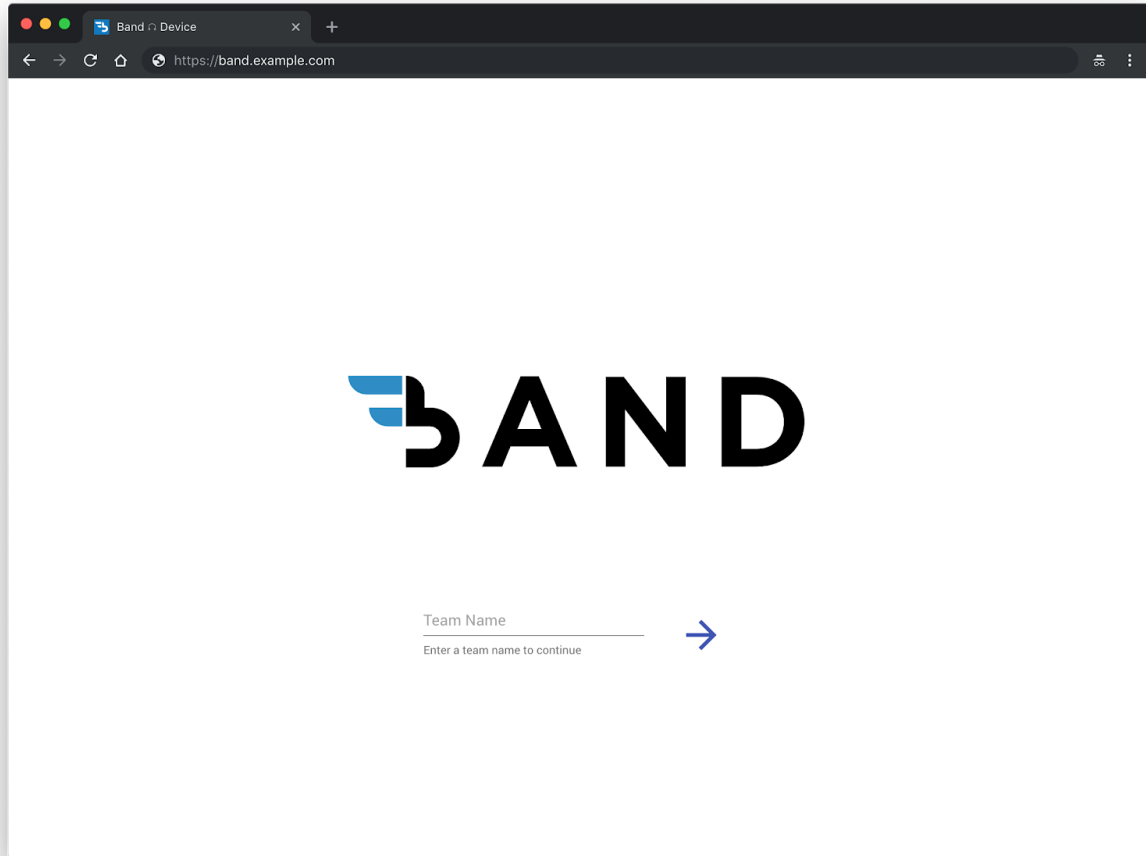
Below the progress list, there is a text input field for "Cluster Host Name" with the value "band.example.com". Below that is a section for "SSL Certificate" with a file icon, the text "cert.pem", and "Valid through 12/30/2018". Below that is a section for "SSL Key" with a file icon and the text "key.pem". At the bottom, there are two buttons: "CONFIGURE WEB SERVER" (green) and "GO BACK" (grey).

After completion, navigate to the next server's IP address to continue the setup. You can also click the link to navigate to server settings.



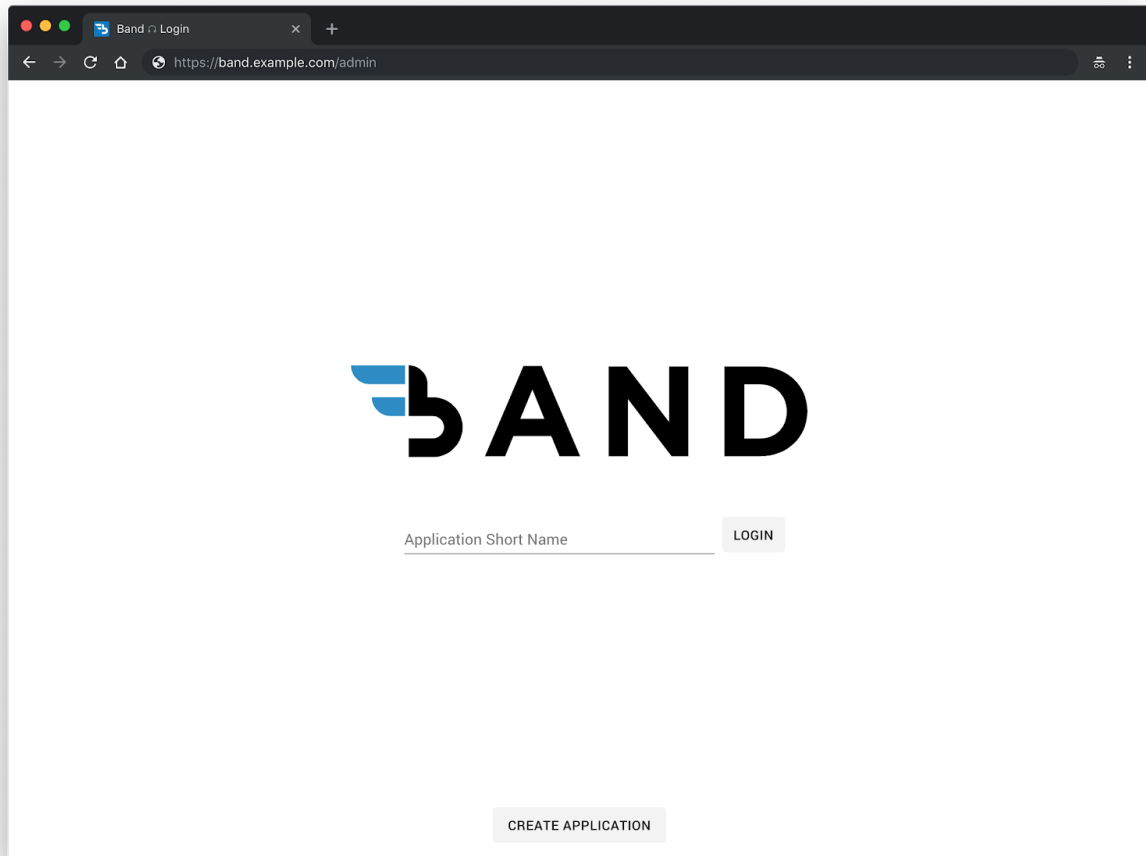
Verify DNS and SSL

Navigate to the HTTPS designated cluster hostname to verify setup. If the cluster hostname were **band.example.com**, the address would be **https://band.example.com**.



Client Administration

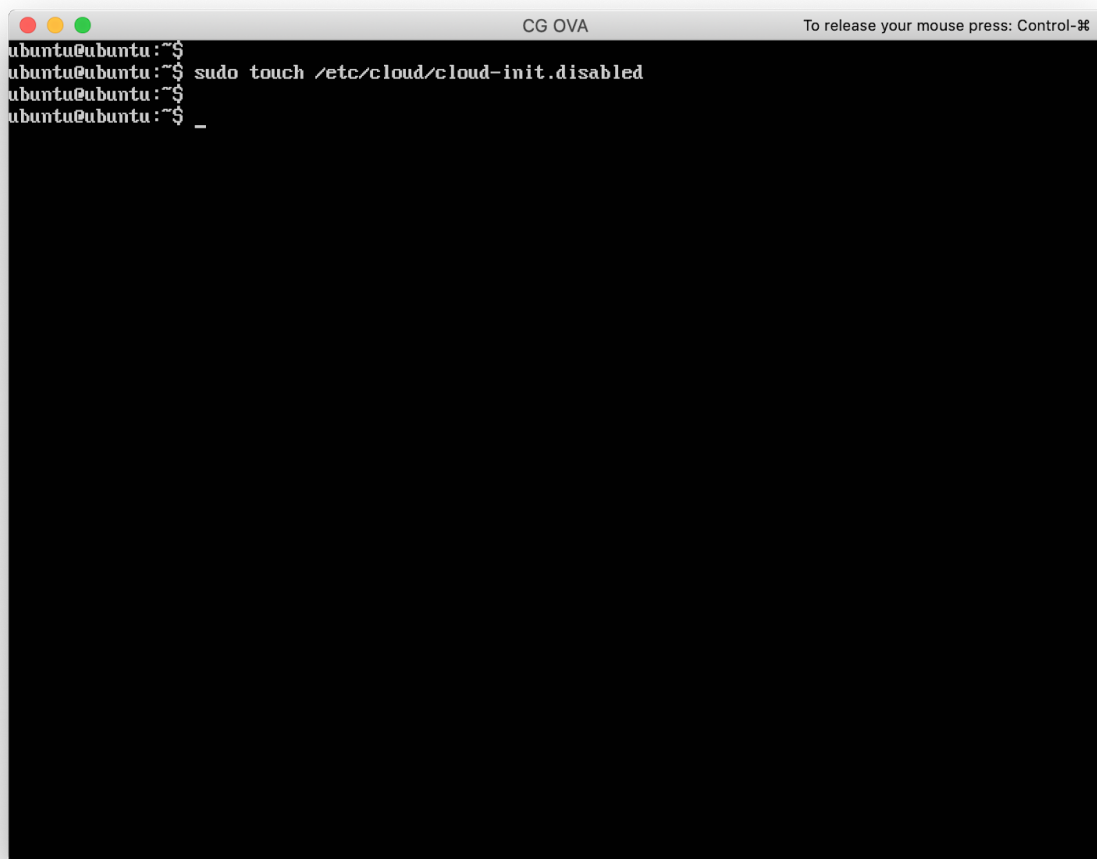
To access the client site, navigate to the **/admin** route. If the cluster hostname were **band.example.com**, the address would be <https://band.example.com/admin>.



Disable Cloud-Init

Cloud-init is the service that initializes cloud images on EC2. However, it is not required when running the server on-premise. Disable cloud-init by running the following command,

```
sudo touch /etc/cloud/cloud-init.disabled
```

A terminal window titled "CG OVA" with a subtitle "To release your mouse press: Control-⌘". The terminal shows a series of commands and prompts: "ubuntu@ubuntu:~\$", "ubuntu@ubuntu:~\$ sudo touch /etc/cloud/cloud-init.disabled", "ubuntu@ubuntu:~\$", and "ubuntu@ubuntu:~\$ _". The terminal background is black, and the text is white.

```
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ sudo touch /etc/cloud/cloud-init.disabled  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ _
```

