

Fall2019 Cent OS 7 VPN Installation and Operation

The presentation installs a M State OpenVPN client software and configuration file on Cent OS 7. After software installation, the presentation connects to the M State academic network in B150.

Preuss
11/26/2019

Cent OS 7 Settings

40 GB disk
8 GB RAM
2 Processors
NAT Network Settings

Software Install: Server with GUI (no additional software)
Automatic partitioning
No security policy chosen

Post-Installation
Install open-vm-tools
Install updates



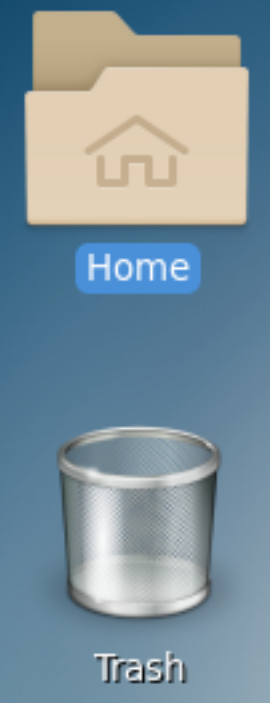
Home



Trash

The presentation logs into Cent OS.





◀ ▶ 🏠 Home ▶ 🔍 ≡ ☰ - □ ×

- 🕒 Recent
- 🏠 Home
- 📁 Documents
- ⬇️ Downloads
- 🎵 Music
- 📷 Pictures
- 🎬 Videos
- 🗑️ Trash
- + Other Locations

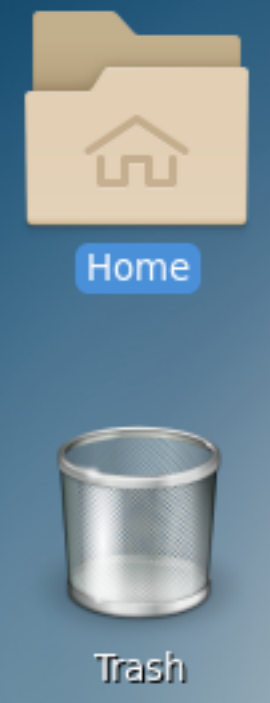
Desktop Documents Downloads Music

Cancel **New Folder** Create

Folder name

The presentation creates a new folder.





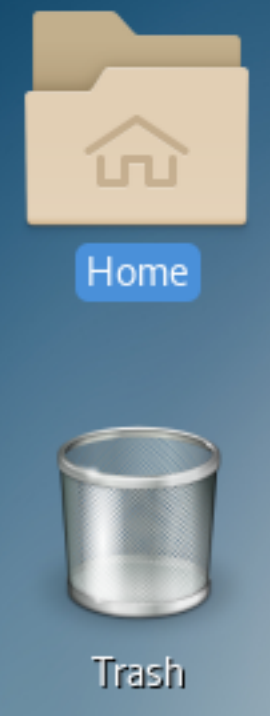
Navigation: < > | 🏠 Home | vpn | 🔍 | 📄 | ☰ | - | □ | ×

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Folder is Empty

The presentation created a folder named "vpn".





🏠 Home vpn

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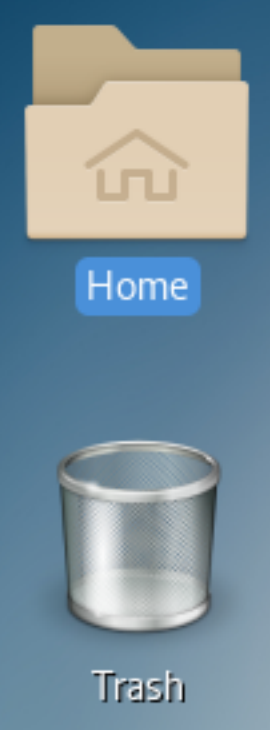
- 🕒 Recent
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class_vpn_fall2019.zip

The presentation either copies or downloads the appropriate class vpn package.

"class_vpn_fall2019.zip" selected (3.9 MB)





🏠 Home vpn ▶

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- 🕒 Recent
- 🏠 Home
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- 🗑️ Trash
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andriod	class_vpn_fall2019.zip	ios	Linux
mac_viscosity	Windows		

The presentation sees all the files are available.





Home



Trash

preuss@vpn:/home/preuss

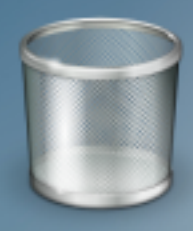
File Edit View Search Terminal Help

```
[preuss@vpn ~]$ su  
Password:  
[root@vpn preuss]#
```

On the command line, the presentation logs into root.



Home



Trash

preuss@vpn:/home/preuss

File Edit View Search Terminal Help

```
[preuss@vpn ~]$ su  
Password:  
[root@vpn preuss]# yum install epel-release
```

The presentation runs "yum install epel-release" as shown.



Home



Trash

preuss@vpn:/home/preuss

File Edit View Search Terminal Help

```
[root@vpn preuss]# yum install epel-release
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
* base: bay.uchicago.edu
* extras: mirror.grid.uchicago.edu
* updates: mirrors.lug.mtu.edu
Resolving Dependencies
--> Running transaction check
---> Package epel-release.noarch 0:7-11 will be installed
--> Finished Dependency Resolution
```

Dependencies Resolved

Package	Arch	Version	Repository	Size
Installing: epel-release	noarch	7-11	extras	15 k

Transaction Summary

Install 1 Package

```
Total download size: 15 k
Installed size: 24 k
Is this ok [y/d/N]: y
Downloading packages:
epel-release-7-11.noarch.rpm
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : epel-release-7-11.noarch
  Verifying  : epel-release-7-11.noarch

Installed:
  epel-release.noarch 0:7-11
```

Complete!

[root@vpn preuss]#

The presentation completes the installation of "epel-release" as shown.

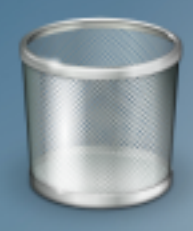
| 15 kB 00:00:00

1/1

1/1



Home



Trash

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File Edit View Search Terminal Help

```
[root@vpn preuss]# yum update
```

The presenstation runs the "yum update" as shown.



Home



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File Edit View Search Terminal Help

```
[root@vpn preuss]# yum update
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
epel/x86_64/metalink | 18 kB 00:00:00
* base: bay.uchicago.edu
* epel: mirror.us-midwest-1.nexcess.net
* extras: mirror.grid.uchicago.edu
* updates: mirrors.lug.mtu.edu
epel | 5.3 kB 00:00:00
(1/3): epel/x86_64/group_gz | 90 kB 00:00:00
(2/3): epel/x86_64/primary_db | 6.9 MB 00:00:01
epel/x86_64/updateinfo FAILED
http://csc.mcs.sdsmt.edu/epel/7/x86_64/repo/30f1adb369e43d147f4eb72ea43ef32d81b72c3c09564a3d5ad0712341b42809-updateinfo.xml.bz2: [Errno 14] curl#56 - "Recv failure: Connection reset by peer"
Trying other mirror.
(3/3): epel/x86_64/updateinfo | 1.0 MB 00:00:00
Resolving Dependencies
--> Running transaction check
---> Package epel-release.noarch 0:7-11 will be updated
---> Package epel-release.noarch 0:7-12 will be an update
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package Arch Version Repository Size
=====
Updating:
epel-release noarch 7-12 epel 15 k

Transaction Summary
=====
Upgrade 1 Package

Total download size: 15 k
Is this ok [y/d/N]: y
```

The presentation agrees to update "epel-release" as shown.



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File Edit View Search Terminal Help

```

(1/3): epel/x86_64/group_gz | 90 kB 00:00:00
(2/3): epel/x86_64/primary_db | 6.9 MB 00:00:01
epel/x86_64/updateinfo FAILED
http://csc.mcs.sdsmt.edu/epel/7/x86_64/repodata/30f1adb369e43d147f4eb72ea43ef32d81b72c3c09564a3d5ad0712341b42809-updateinfo.xml.bz2: [Errno 14] curl#56 - "Recv failure: Connection reset by peer"
Trying other mirror.
(3/3): epel/x86_64/updateinfo | 1.0 MB 00:00:00
Resolving Dependencies
--> Running transaction check
---> Package epel-release.noarch
---> Package epel-release.noarch
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package                               Repository                               Size
=====
Updating:
epel-release                           epel                                     15 k
=====

Transaction Summary
=====
Upgrade 1 Package

Total download size: 15 k
Is this ok [y/d/N]: y
Downloading packages:
epel/x86_64/prestodelta | 1.3 kB 00:00:00
warning: /var/cache/yum/x86_64/7/epel/packages/epel-release-7-12.noarch.rpm: Header V3 RSA/SHA256 Signature, key ID 352c64e5: NOKEY
Public key for epel-release-7-12.noarch.rpm is not installed
epel-release-7-12.noarch.rpm | 15 kB 00:00:00
Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-EPEL-7
Importing GPG key 0x352C64E5:
  Userid      : "Fedora EPEL (7) <epel@fedoraproject.org>"
  Fingerprint: 91e9 7d7c 4a5e 96f1 7f3e 888f 6a2f aea2 352c 64e5
  Package     : epel-release-7-11.noarch (@extras)
  From        : /etc/pki/rpm-gpg/RPM-GPG-KEY-EPEL-7
Is this ok [y/N]: █

```

The presentation completes the update of "epel-release" as shown.



Home



Trash

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File Edit View Search Terminal Help

```
=====
Package                               Arch                               Version                            Repository                          Size
=====
Updating:
epel-release                           noarch                             7-12                               epel                                  15 k
=====
```

Transaction Summary

Upgrade 1 Package

Total download size: 15 k

Is this ok [y/d/N]: y

Downloading packages:

epel/x86_64/prestodelta | 1.3 kB 00:00:00

warning: /var/cache/yum/x86_64/7/epel/packages/epel-release-7-12.noarch.rpm: Header V3 RSA/SHA256 Signature, key ID 352c64e5: NOKEY

Public key for epel-release-7-12.noarch.rpm is not installed

epel-release-7-12.noarch.rpm | 15 kB 00:00:00

Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-EPEL-7

Importing GPG key 0x352C64E5:

Userid : "Fedora EPEL (7) <epel@fedoraproject.org>"

Fingerprint: 91e9 7d7c 4a5e 96f1 7f3e 888f 6a2f aea2 352c 64e5

Package : epel-release-7-11.noarch (@extras)

From : /etc/pki/rpm-gpg/RPM-GPG-KEY-EPEL-7

Is this ok [y/N]: y

Running transaction check

Running transaction test

Transaction test succeeded

Running transaction

Updating : epel-release-7-12.noarch 1/2

Cleanup : epel-release-7-11.noarch 2/2

Verifying : epel-release-7-12.noarch 1/2

Verifying : epel-release-7-11.noarch 2/2

Updated:

epel-release.noarch 0:7-12

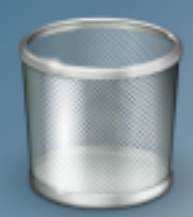
Complete!

[root@vpn preuss]#

The "epel-release" update is complete.



Home



Trash

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File Edit View Search Terminal Help

```
[root@vpn preuss]# yum install openvpn easy-rsa
```

The presentation run "yum install openvpn easy-rsa" command.



Home



Trash

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File Edit View Search Terminal Help

[root@vpn preuss]# yum install openvpn easy-rsa

Loaded plugins: fastestmirror, langpacks

Loading mirror speeds from cached hostfile

* base: bay.uchicago.edu

* epel: muug.ca

* extras: mirror.grid.uchicago.edu

* updates: mirrors.lug.mtu.edu

Resolving Dependencies

--> Running transaction check

---> Package easy-rsa.noarch 0:3.0.6-1.el7 will be installed

---> Package openvpn.x86_64 0:2.4.8-1.el7 will be installed

--> Processing Dependency: libpkcs11-helper.so.1()(64bit) for package: openvpn-2.4.8-1.el7.x86_64

--> Running transaction check

---> Package pkcs11-helper.x86_64 0:1.11-3.el7 will be installed

--> Finished Dependency Resolution

Dependencies Resolved

Package	Arch	Version	Repository	Size
Installing:				
easy-rsa	noarch	3.0.6-1.el7	epel	36 k
openvpn	x86_64	2.4.8-1.el7	epel	523 k
Installing for dependencies:				
pkcs11-helper	x86_64	1.11-3.el7	epel	56 k

Transaction Summary

Install 2 Packages (+1 Dependent package)

Total download size: 615 k

Installed size: 1.4 M

Is this ok [y/d/N]: y

The presentation installs openvpn, easy-rsa and dependencies as shown.



Home



Trash

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- □ ×

File Edit View Search Terminal Help

Package	Arch	Version	Repository	Size
Installing:				
easy-rsa	noarch	3.0.6-1.el7	epel	36 k
openvpn	x86_64	2.4.8-1.el7	epel	523 k
Installing for dependencies:				
pkcs11-helper	x86_64	1.11-3.el7	epel	56 k

Transaction Summary

Install 2 Packages (+1 Dependent package)

Total download size: 615 k

Installed size: 1.4 M

Is this ok [y/d/N]: y

Downloading packages:

(1/3): easy-rsa-3.0.6-1.el7.noarch.rpm	36 kB	00:00:00
(2/3): openvpn-2.4.8-1.el7.x86_64.rpm	523 kB	00:00:00
(3/3): pkcs11-helper-1.11-3.el7.x86_64.rpm	56 kB	00:00:00

Total

751 kB/s | 615 kB 00:00:00

Running transaction check

Running transaction test

Transaction test succeeded

Running transaction

Installing : pkcs11-helper-1.11-3.el7.x86_64	1/3
Installing : openvpn-2.4.8-1.el7.x86_64	2/3
Installing : easy-rsa-3.0.6-1.el7.noarch	3/3
Verifying : openvpn-2.4.8-1.el7.x86_64	1/3
Verifying : easy-rsa-3.0.6-1.el7.noarch	2/3
Verifying : pkcs11-helper-1.11-3.el7.x86_64	3/3

Installed:

easy-rsa.noarch 0:3.0.6-1.el7

openvpn.x86_64 0:2.4.8-1.el7

Dependency Installed:

pkcs11-helper.x86_64 0:1.11-3.el7

Complete!

[root@vpn preuss]#

Openvpn, easy-rsa and dependencies are installed.



Home



Trash

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File Edit View Search Terminal Help

```
[root@vpn preuss]# yum install NetworkManager-openvpn
```

```
Loaded plugins: fastestmirror, langpacks
```

```
Loading mirror speeds from cached hostfile
```

```
* base: bay.uchicago.edu
```

```
* epel: muug.ca
```

```
* extras: mirror.grid.uchicago.edu
```

```
* updates: mirrors.lug.mtu.edu
```

```
Resolving Dependencies
```

```
--> Running transaction check
```

```
---> Package NetworkManager-openvpn.x86_64 1:1.8.10-1.el7 will be installed
```

```
--> Finished Dependency Resolution
```

```
Dependencies Resolved
```

Package	Arch	Version	Repository	Size

Installing:				
NetworkManager-openvpn	x86_64	1:1.8.10-1.el7	epel	256 k

```
Transaction Summary
```

```
-----
```

```
Install 1 Package
```

```
Total download size: 256 k
```

```
Installed size: 1.0 M
```

```
Is this ok [y/d/N]: y
```

The presentation run "yum install NetworkManager-openvpn" as shown.
Yes, the command is case sensitive.



Home



Trash

preuss@vpn:/home/preuss

- □ ×

File Edit View Search Terminal Help

```
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
* base: bay.uchicago.edu
* epel: muug.ca
* extras: mirror.grid.uchicago.edu
* updates: mirrors.lug.mtu.edu
```

Resolving Dependencies

```
--> Running transaction check
---> Package NetworkManager-openvpn.x86_64 1:1.8.10-1.el7 will be installed
--> Finished Dependency Resolution
```

Dependencies Resolved

```
=====
Package                               Arch           Version                               Repository  Size
=====
Installing:
NetworkManager-openvpn                 x86_64         1:1.8.10-1.el7                       epel        256 k
```

Transaction Summary

Install 1 Package

Total download size: 256 k

Installed size: 1.0 M

Is this ok [y/d/N]: y

Downloading packages:

```
NetworkManager-openvpn-1.8.10-1.el7.x86_64.rpm | 256 kB 00:00:00
```

Running transaction check

Running transaction test

Transaction test succeeded

Running transaction

```
Installing : 1:NetworkManager-openvpn-1.8.10-1.el7.x86_64 1/1
Verifying  : 1:NetworkManager-openvpn-1.8.10-1.el7.x86_64 1/1
```

Installed:

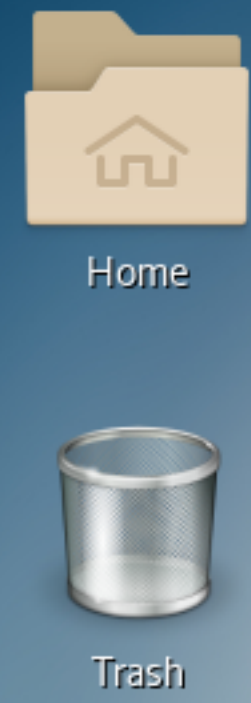
```
NetworkManager-openvpn.x86_64 1:1.8.10-1.el7
```

Complete!

[root@vpn preuss]#

The presentation completes installing "NetworkManager-openvpn" as shown.

```
1/1
1/1
```



Settings

-
□
×

- 📶 Wi-Fi
- 🔗 Bluetooth
- 🖥️ Background
- 🔔 Notifications
- 🔍 Search
- 🌐 Region & Language
- ♿ Universal Access
- 👤 Online Accounts
- 👤 Privacy
- 🔗 Sharing
- 🔊 Sound
- 🔌 Power
- 🌐 Network

Network

Wired +

Connected - 1000 Mb/s

ON

⚙️

VPN +

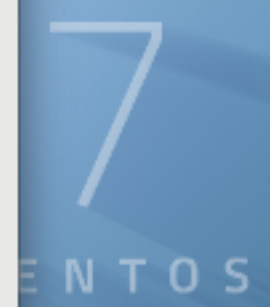
Not set up

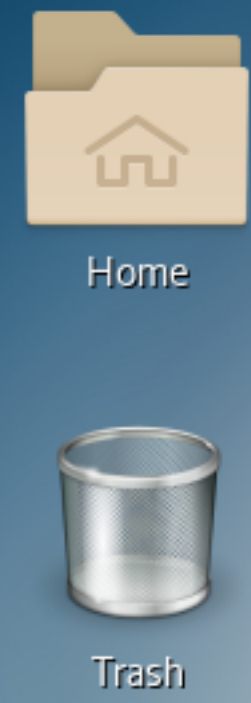
Network Proxy

Off

⚙️

The presentation opens "Network" inside of the settings option.





Settings

- Wi-Fi
- Bluetooth
- Background
- Notifications
- Search
- Region & Language
- Universal Access
- Online Accounts
- Privacy
- Sharing
- Sound
- Power
- Network**

Network

Wired +

Connected - 1000 Mb/s **ON**

+

Off

Add VPN

Cancel

- IPsec based VPN**
IPsec based VPN using IKEv1
- OpenVPN**
Compatible with the OpenVPN server.
- Import from file...**

The presentation selects "Import from file" option under "VPN".

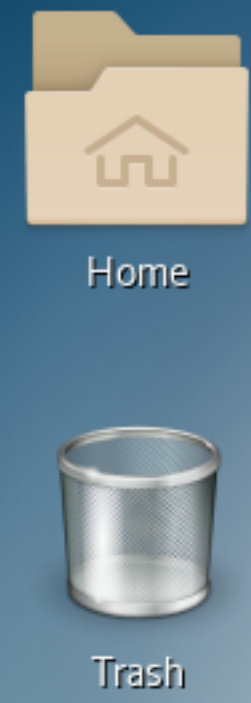
Cancel Select file to import Open

- Recent
- Home
- Documents
- Downloads
- Music
- Pictures
- Videos
- + Other Locations

◀ preuss vpn Linux ▶

Name	Size	Modified
egypt-UDP4-1194-fall2019_student-config.ovpn	8.8 kB	23 May

The presentation selects the appropriate ovpn file.



Settings **Network**

Wi-Fi Bluetooth Background Notifications Search Region & Language Universal Access Online Accounts Privacy Sharing Sound Power **Network**

Wired +

Connected - 1000 Mb/s **ON** ⚙️

+ ⚙️

Add VPN **Add**

Identity IPv4 IPv6

Name

(Error: unable to load VPN connection editor)

The presentation selects "Add" to continue.



Home



Trash



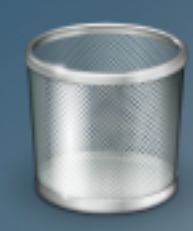
CentOS 7 x86_64

The presentation closes all windows as shown.





Home



Trash



CentOS 7 x86_64

The presentation opens the network configuration by clicking on the network icon.

System status menu:

-
- Wired Connected ▶
- VPN Off ▶
- On ▶
- preuss ▶

System actions:

-
-
-





Home



Trash



CentOS 7 x86_64

The presentation opens the "VPN" option as shown. The presentation selects "Connect" under "VPN".

🔊 🔊

🌐 Wired Connected ▶

🔒 **VPN Off** ▼

 Connect

 VPN Settings

🔗 On ▶

👤 preuss ▶

🔧 🔒 🔌





Home



Trash



CentOS 7 x86_64

Once the connection is complete, a new icon appears showing the VPN connection.



preuss@vpn:~

— □ ×

File Edit View Search Terminal Help

[preuss@vpn ~]\$ /sbin/ip a sh

The presentation uses the "/sbin/ip a sh" command to verify the connection.



Home



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CentOS 7 x86_64

File Edit View Search Terminal Help

```
[preuss@vpn ~]$ arp -a  
gateway (192.168.117.2) at 00:50:56:e8:71:62 [ether] on ens33  
[preuss@vpn ~]$
```



Home



Trash



CentOS 7 x86_64

The presentation checks the the arp table as shown.

preuss@vpn:~

— □ ×

File Edit View Search Terminal Help

```
[preuss@vpn ~]$ arp -a  
gateway (192.168.117.2) at 00:50:56:e8:71:62 [ether] on ens33  
[preuss@vpn ~]$ /sbin/ip neighbor sh
```

The presentation checks the neighbor table as shown.



Home



Trash



CentOS 7 x86_64

preuss@vpn:~

— □ ×

File Edit View Search Terminal Help

[preuss@vpn ~]\$ traceroute sweden.minnesota.edu

traceroute to sweden.minnesota.edu (134.29.228.100), 30 hops max, 60 byte packets

1 gateway (192.168.164.1) 38.769 ms 43.858 ms 43.813 ms

2 * * *

3 * * *

4 * * *

5 * * *

6 sweden.minnesota.edu (134.29.228.100) 43.517 ms 39.596 ms 39.441 ms

[preuss@vpn ~]\$ traceroute6 sweden.minnesota.edu



Home



Trash



CentOS 7 x86_64