
SD-WAN CONTROL and DATA PLANE

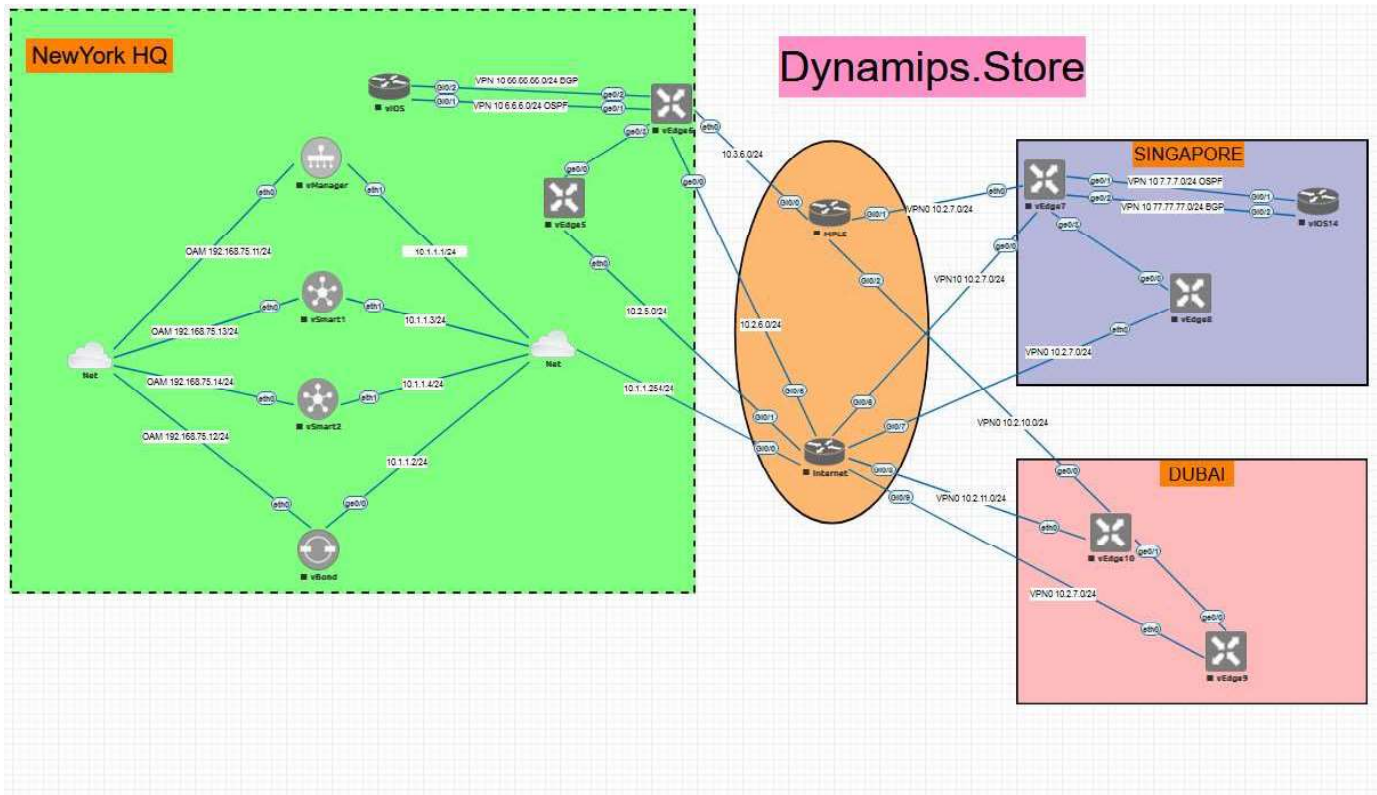
Document Information:

Lab Objective:

This lab is about setting up Control Plane and Data Plane for Sdwan. After the labs, we can see connection control from Vsmart, Vmanage, Vbond and Vedges. For Data Plane, In Vedge, we have IPsec tunnel, BFD session then check the Tlocs info ...

Requirement:

- Software:
 - o eve-nlab version 1.0.2 if eve-nlab still version 1.0.1, let login vm console with account root/eve then run command:
wget -O - https://user.eve-nlab.com/upgrade/1.0.2 | bash
- Hardware requirement:
 - o RAM 24Gb **Lab topology:**



Taks1: Setup vManage web management

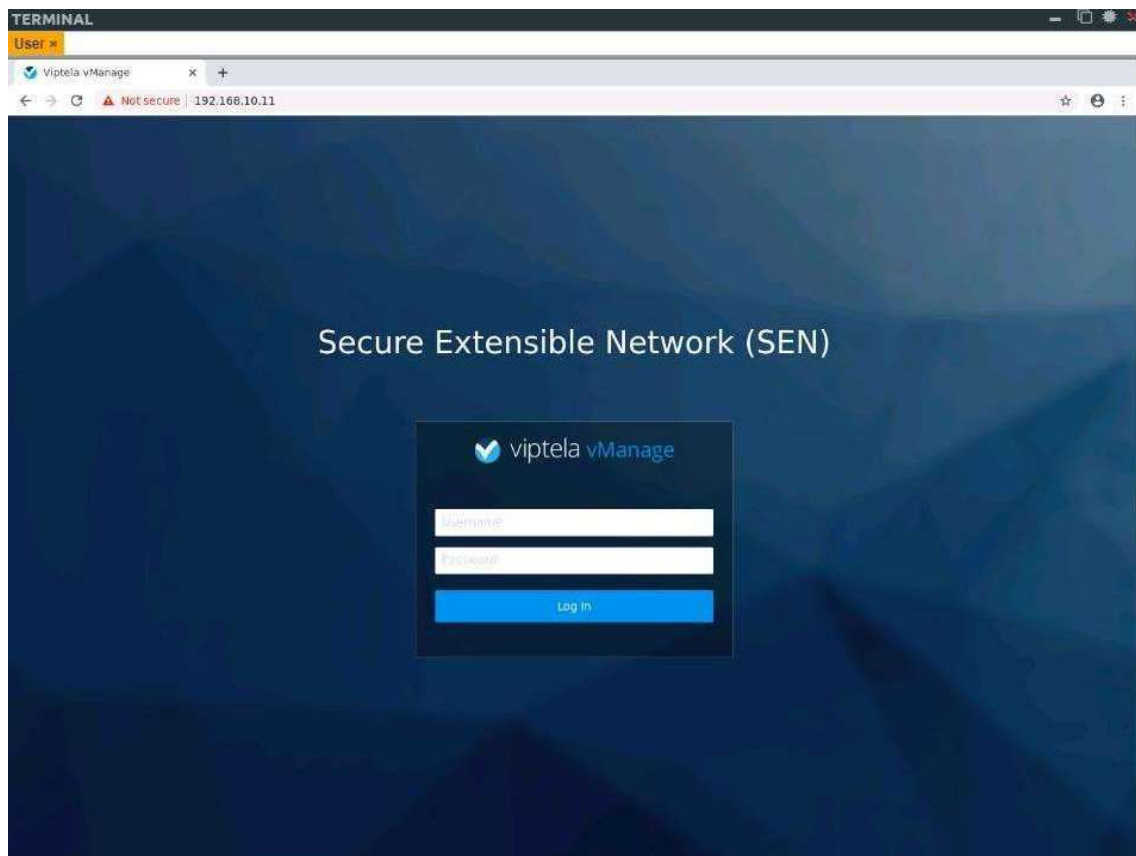
- Setup IP web management for

vManage: Console to vManager

```
config t
vpn 512
interface eth0
ip address 192.168.75.11/24
no shutdown!
ip route 0.0.0.0/0 192.168.75.1
```

Click to User icon -> login vManage web with ip address: 192.168.10.11. Login with

admin/admin



Go to Administration -> Setting

User x

Viptela vManage x +

← → ↻ Not secure | 192.168.10.11/index.html#/app/administration/settings

Settings

Organization Name Not Configured

Domain ID: 1

Organization Name

eve-nglab eve-nglab

Save Cancel

vBond	Not Configured	View Edit
Certificate Authorization	Manual	View Edit
Web Server Certificate	26 Nov 2017 1:19:59 AM	CSR Certificate
Enforce Software Version (ZTP)	Disabled	View Edit
Banner	Disabled	View Edit
Statistics Setting		View Edit

User x

Viptela vManage x +

← → ↻ Not secure | 192.168.10.11/index.html#/app/administration/settings

Settings

Organization Name eve-nglab View | Edit

vBond Not Configured

vBond DNS/ IP Address : Port

10.1.1.2 12346

Save Cancel

Certificate Authorization	Manual	View Edit
Web Server Certificate	26 Nov 2017 1:19:59 AM	CSR Certificate
Enforce Software Version (ZTP)	Disabled	View Edit
Banner	Disabled	View Edit
Statistics Setting		View Edit

Viptela vManage x +

← → ↻ Not secure | 192.168.10.11/index.html#/app/administration/settings

Settings

Organization Name	eve-nglab	View Edit
vBond	10.1.1.2 : 12346	View Edit
Certificate Authorization	Manual	View Edit
Web Server Certificate	26 Nov 2017 1:19:59 AM	CSR Certificate
Enforce Software Version (ZTP)	Disabled	View Edit
Banner	Disabled	View Edit
Statistics Setting		View Edit

Task2: Lab configuration

- vManage

```
vmanage# conf t
Entering configuration mode terminal
vmanage(config)# system
vmanage(config-system)# system-ip
10.1.1.1
vmanage(config-system)# site-id 1000
vmanage(config-system)# organization-name
"eve-nglab"
vmanage(config-system)# vbond
10.1.1.2 vmanage(config-system)#
!
vmanage(config-system)# vpn 0 int eth1
vmanage(config-interface-eth1)# ip add
10.1.1.1/24
vmanage(config-interface-eth1)#
no shut vmanage(config-interface-
eth1)# exit
vmanage(config-vpn-0)# ip route 0.0.0.0/0 10.1.1.254
vmanage(config-vpn-0)# !
vmanage(config-vpn-0)# commit and-quit
```

- vBond

```
vedge# conf t
Entering configuration mode terminal
vedge(config)# system
vedge(config-system)# host-name vBond
vedge(config-system)# system-ip 10.1.1.2
vedge(config-system)# site-id 1000
vedge(config-system)# organization-name "eve-nglab"
vedge(config-system)# vbond 10.1.1.2 local vbond-only
vedge(config-system)# !
vedge(config-system)# vpn 512 int eth0
vedge(config-interface-eth0)# ip add 192.168.75.12/24
vedge(config-interface-eth0)# no shut
vedge(config-interface-eth0)# exit
vedge(config-vpn-512)# ip route 0.0.0.0/0 192.168.75.1
vedge(config-vpn-0)# interface ge0/0
vedge(config-interface-ge0/0)# vpn 0 int ge0/0
vedge(config-interface-ge0/0)# ip add 10.1.1.2/24
vedge(config-interface-ge0/0)# no shut
vedge(config-interface-ge0/0)# exit
vedge(config-vpn-0)# ip route 0.0.0.0/0 10.1.1.254
vedge(config-vpn-0)# commit and-quit
```

- **vSmart 1**

```
|vsmart(config-vpn-0)# system
|vsmart(config-system)# system-ip
|10.1.1.3
|vsmart(config-system)# site-id 1000
|vsmart(config-system)# organization-name
|"eve-nlab"
|vsmart(config-system)# vbond
10.1.1.2 |vsmart(config-system)# !
|vsmart(config-system)# vpn 512
int eth0
```

```

vsmart(config-interface-eth0)# ip add
192.168.75.13/24 vsmart(config-interface-
eth0)# no shut
vsmart(config-interface-eth0)# exit
vsmart(config-vpn-512)# ip route 0.0.0.0/0
192.168.75.1
vsmart(config-vpn-512)# !
vsmart(config-vpn-512)# vpn 0
int eth1
vsmart(config-interface-eth1)# no int eth0
vsmart(config-interface-eth1)# ip add
10.1.1.3/24
vsmart(config-interface-eth1)#
no shut vsmart(config-interface-
eth1)# exit
vsmart(config-vpn-0)# ip route 0.0.0.0/0
10.1.1.254 vsmart(config-vpn-0)# !
vsmart(config-vpn-0)# commit and-quit
Commit complete.
vsmart#

```

- **vSmart 2**

```

vsmart(config-vpn-0)# system
vsmart(config-system)# system-ip
10.1.1.4
vsmart(config-system)# site-id 1000
vsmart(config-system)# organization-name
"eve-nglab"
vsmart(config-system)# vbond 10.1.1.2
vsmart(config-system)# !
vsmart(config-system)# vpn 512 int eth0
vsmart(config-interface-eth0)# ip add
192.168.75.14/24
vsmart(config-interface-eth0)#
no shut vsmart(config-interface-
eth0)# exit
vsmart(config-vpn-512)# ip route 0.0.0.0/0
192.168.75.1 vsmart(config-vpn-512)# !
vsmart(config-vpn-512)# vpn 0 int
eth1 vsmart(config-interface-eth1)#
no int eth0

```

```
|vsmart(config-interface-eth1)# ip add  
10.1.1.4/24 vsmart(config-interface-eth1)#  
no shut  
|vsmart(config-interface-eth1)# exit  
vsmart(config-vpn-0)# ip route 0.0.0.0/0  
10.1.1.254  
|vsmart(config-vpn-0)# !  
vsmart(config-vpn-0)# commit and-quit  
|Commit complete.  
vsmart#
```

- vEdge 6 Newyork HQ

```
vedge# conf t  
Entering configuration mode terminal  
vedge(config)# system  
vedge(config-system)# system-ip  
10.2.6.1  
vedge(config-system)# site-id 100 |  
vedge(config-system)# organization-name  
eve-nglab |vedge(config-system)# vbond  
10.1.1.2
```



```
vedge(config-system)# vpn 0 int ge0/0
vedge(config-interface-ge0/0)# ip add
10.2.6.1/24
vedge(config-interface-ge0/0)# no
shutdown vedge(config-interface-
ge0/0)# exit
vedge(config-vpn-0)# ip route 0.0.0.0/0
10.2.6.254 vedge(config-vpn-0)# commit
and-quit
```

- vEdge7 Singapore

```
vedge# conf t
Entering configuration mode terminal
vedge(config)# system
vedge(config-system)# system-ip
10.2.7.1
vedge(config-system)# site-id 2
vedge(config-system)# organization-name
eve-nglab
vedge(config-system)# vbond 10.1.1.2
vedge(config-system)# vpn 0 int ge0/0
vedge(config-interface-ge0/0)# ip add
10.2.7.1/24 vedge(config-interface-ge0/0)#
no shutdown
vedge(config-interface-ge0/0)# exit |
vedge(config-vpn-0)# ip route 0.0.0.0/0
10.2.7.254 |vedge(config-vpn-0)# commit and-
quit Commit complete.
```

Task3: Certificate installation

- vManage

Step 1 : Create ROOTCA.key

```
vmmanage# vshell
vmmanage:~$ openssl genrsa -out
ROOTCA.key 2048
Generating RSA private key, 2048 bit long modulus
.....+++
.....+++
e is 65537 (0x10001)
vmmanage:~$
```

Step 2: Created ROOTCA.pem with ROOTCA.key

```
openssl req -x509 -new -nodes -key ROOTCA.key -sha256 -  
days 1024 \ -subj "/C=US/ST=NY/L=NY/O=eve-  
nglab/CN=vmanage.lab" \  
-out ROOTCA.pem
```

Step 3: Install ROOTCA.pem

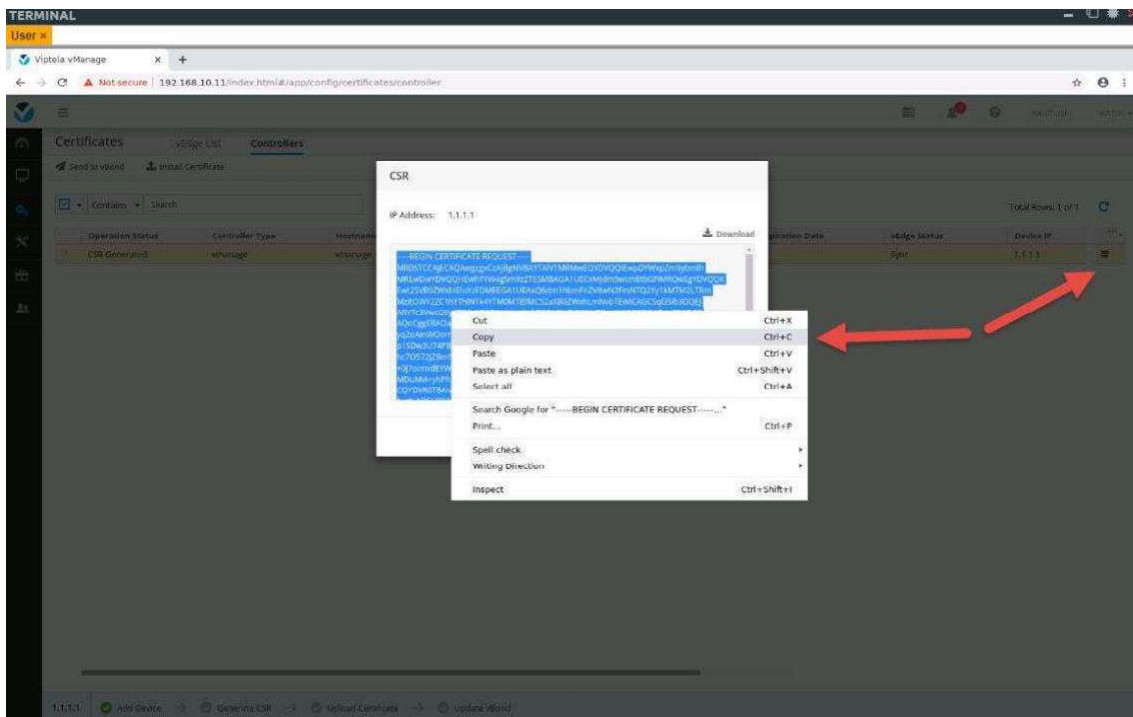
```
exit  
vmanage# request root-cert-chain  
install |/home/admin/ROOTCA.pem
```

```
Uploading root-ca-cert-chain via VPN
0 Copying ... /home/admin/ROOTCA.pem
via VPN 0
```

Successfully installed the root certificate chain

Step 4 : Login vManage to create certificate request

Configuration → Certificates → Controllers → vManage → Generate CSR then copy



Step 5: In the vshell use vim to create a file named vmanage.csr with the text from the popup.

Create vmanage.csr with CSR code copy above.

Use vim editor to create this file in Vshell mode of Vmanage.

Vi vmanage.csr

:qw! To exit the vim file.

Step 6: And create vmanage.crt with ROOTCA.key

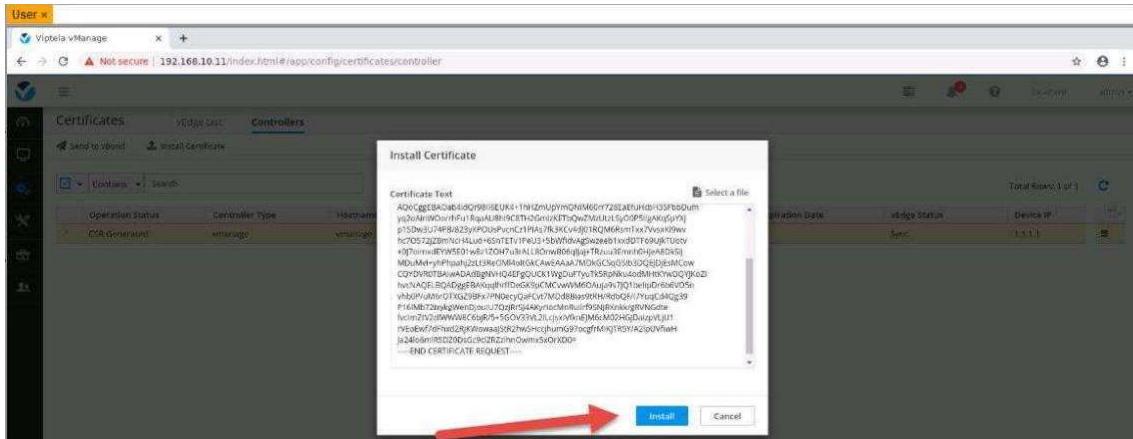
```
openssl x509 -req -in vmanage.csr \  
-CA ROOTCA.pem -CAkey ROOTCA.key -  
CAcreateserial \ -out vmanage.crt -days 500  
-sha256
```

Result:

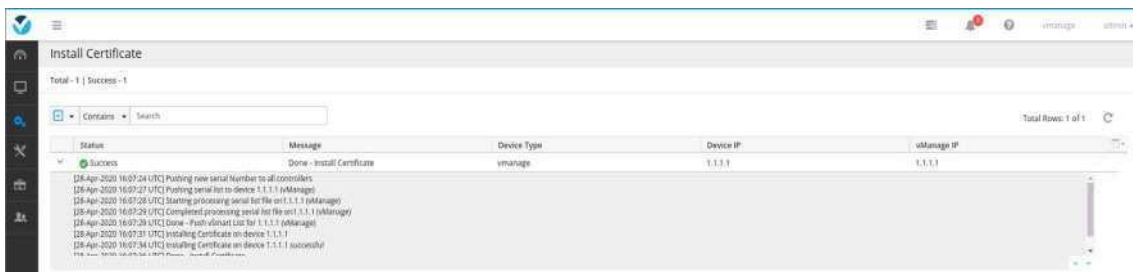
Signature ok

subject=/C=US/ST=California/L=San Jose/OU=vnpro-lab/O=vIPtela
|Inc/CN=vmanage_07af546c-d136-4f32-9f6d-
aa8e598a3410_0.viptela.com/emailAddress=support@viptela.com
Getting CA Private Key

Step 7 : Copy content vmanage.crt file by using “cat vmanage.crt” then install certificate on vManage



Configuration → Certificates → Controllers → Install Certificate



- vBon

d: Step 1:

```
vBond# request root-cert-chain install
scp://admin@192.168.75.11:/home/admin/ROOTCA.pem
vpn 512 Result:
Uploading root-ca-cert-chain via VPN 512
Copying ... admin@192.168.10.11:/home/admin/ROOTCA.pem via
VPN 512
Warning: Permanently added '192.168.10.11' (ECDSA) to the
list of
known hosts.
viptela 16.2.11
admin@192.168.10.11's
password
100% 1265
```

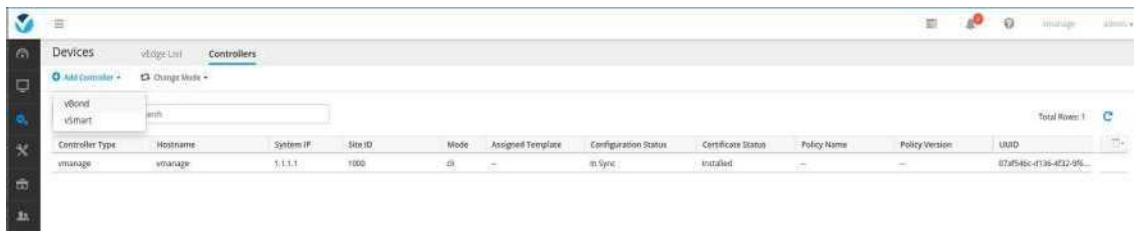
ROOTCA.p

em

1.2KB/s 00:00

Successfully installed the root certificate chain

Step 2: Add vBond to vmanage:
 And Vbond IP here is IP in VPN0, not VPN 512



Configuration → Certificates → Controllers → Add Controller:

Add vBond

vBond Management IP Address

Username

Password

Generate CSR

Step 3 : If vbond adding unsuccessful, lets no tunnel-interface as bellow:

```
vBond# conf t
Entering configuration mode terminal
vBond(config)# vpn 0
vBond(config-vpn-0)# interface ge0/0
vBond(config-interface-ge0/0)# no tunnel-
interface vBond(config-interface-ge0/0)#
commit
```

Commit complete.
 vBond(config-interface-ge0/0)#

