GRE Configuration Guide

RAPTOR™

Intelligent Cyber Secure Platform

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Contents

INTRODUCTION

1. Purpose and Scope

This document describes how to setup a *GRE* tunnel between two RAPTORs.

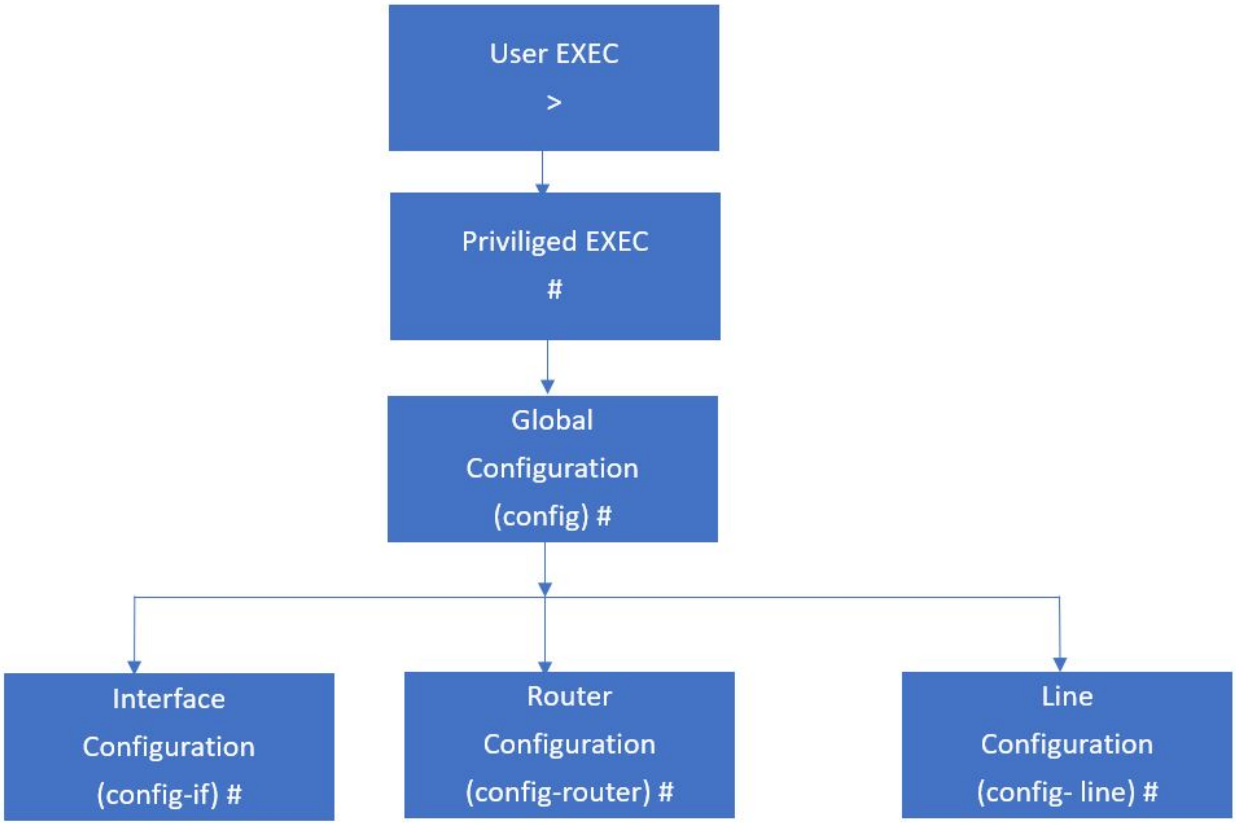
To use the *GRE* functionality, some understanding of the concept and its possible configurations is needed as a prerequisite.

1. CLI Command Modes

The *CLI* Modes are as follows.

The hierarchical structure of the command modes is as shown on the figure below.

Figure 1: CLI Command Modes



1.1. User Exec Mode

Prompt	Access method	Exit Method
iSCom>	This is the initial mode to start a session.	logout

1.2. Privileged Exec Mode

Prompt	Access method	Exit Method
iSCom#	The User EXEC mode command `enable` is used to enter the Privileged EXEC Mode	To return from the Privileged EXEC mode to User EXEC mode, the command `disable` is used.

1.3. Global Configuration Mode

Prompt	Access method	Exit Method
iSCom(config)#	The Privileged EXEC mode command `configure terminal` is used to enter the Global Configuration Mode.	To return from the Global Configuration Mode to Privileged Mode, the command `exit` is used.

1.4. Interface Configuration Mode

Prompt	Access method	Exit Method
iSCom(config-if)#	The Global Configuration mode command `interface <interface-type><interface-id>` is used to enter the Interface Configuration Mode.	To return from the Interface Configuration mode to Global Configuration Mode, the command `exit` is used. To exit from the Interface Configuration mode to Privileged EXEC Mode, the command `end` is used.

1.5. Port Channel Interface Configuration

Prompt	Access method	Exit Method
iSCom(config-if)#	The Global Configuration mode command `interface port <port channel-id>` is used to enter the Port Channel Interface Configuration Mode.	To return from the Port Channel Interface Configuration mode to Global Configuration Mode, the command `exit` is used. To exit from the Port Channel Interface Configuration mode to Privileged EXEC Mode, the command `end` is used.

1.6. VLAN Interface Configuration Mode

Prompt	Access method	Exit Method
iSCom(config-if)#	The Global Configuration mode command `interface vlan <vlan id>` is used to enter the VLAN Interface Configuration Mode.	To return from the VLAN Interface Configuration mode to Global Configuration Mode, the command `exit` is used. To exit from the VLAN Interface Configuration mode to Privileged EXEC Mode, the command `end` is used.

1.7. MRP Interface Configuration Mode

Prompt	Access method	Exit Method
iSCom(config-mrp)#	The Global Configuration mode command `mrp ringid 1`s used to enter the MRP Interface Configuration Mode.	To return from the MRP Interface Configuration mode to Global Configuration Mode, the command `exit` is used. To exit from the MRP Interface Configuration mode to Privileged EXEC Mode, the command `end` is used.

1.8. UFD Configuration Mode

Prompt	Access method	Exit Method
iSCom(config-if)#	The Global Configuration mode command `ufd group <group-id (1-65535)>` is used to enter the UFD Interface Configuration Mode.	To return from the UFD Configuration mode to Global Configuration Mode, the command `exit` is used. To exit from the UFD Configuration mode to Privileged EXEC Mode, the command `end` is used.

1.9. DHCP Pool Configuration Mode

Prompt	Access method	Exit Method
iSCom(dhcp-config)#	The Global Configuration mode command **`iSCom(config)# ip dhcp pool`***`<pool number (1-2147483647)>`* is used to enter the UFD Interface Configuration Mode.	To return from the DHCP Pool Configuration Mode to Global Configuration Mode, the command `exit` is used. To exit from the DHCP Pool Configuration Mode to Privileged EXEC Mode, the command `end` is used.

1.10. Privilege Levels and Command Access

The following table will list out the commands available for the different user levels in Privileged and User Exec levels.

Command	First Param	Guest	Tech	Admin	Description
archive	download-sw		x	x	Downloads software image
clear					Clears the specified parameters
	alarm	x	x	x	Alarm related information
	au-message	x	x	x	Address update messages related information
	cfa	x	x	x	CFA module related information
	interfaces	x	x	x	Protocol specific configuration of the interface
	meter-stats	x	x	x	Specific configuration for meter

Command	First Param	Guest	Tech	Admin	Description
	poe	x	x	x	PoE related configuration
	screen	x	x	x	Screen information
	ip		x	x	IP related configuration
	line		x	x	Configures line information
	logs		x	x	Log information
	protocol		x	x	Clears the specified protocol counters
	spanning-tree		x	x	Spanning tree related configuration
	tcp		x	x	TCP related configuration
clock	set		x	x	Sets the system clock value
config-restore					Configures the restore option
	flash		x	x	File in flash to be used for restoration
	norestore		x	x	No configuration restore
	remote		x	x	Remote location configuration
configure	terminal		x	x	Configures the terminal
copy			x	x	Various copy options
debug					Configures trace for the protocol
	ip	x	x	x	IP related configuration
	show	x	x	x	Show mempool status
	sntp	x	x	x	SNTP related configuration
	crypto		x	x	Crypto related information
	cybsec		x	x	Cybsec related information
	dot1x		x	x	PNAC related configuration
	etherchannel		x	x	Etherchannel related information
	firewall		x	x	Firewall related configuration
	garp		x	x	GARP related configuration
	interface		x	x	Configures trace for the interface management
	lacp		x	x	LACP related configuration

Command	First Param	Guest	Tech	Admin	Description
	lldp		x	x	LLDP related configuration
	lns		x	x	LCD notification server
	nat		x	x	Network Address Translation related configuration
	np		x	x	NPAPI configuration
	ptp		x	x	Precision time protocol related configuration
	qos		x	x	QOS related configuration
	security		x	x	Security related configuration
	spanning-tree		x	x	Spanning tree related protocol configuration
	ssh		x	x	SSH related configuration
	tacm		x	x	Transmission and admission control related configuration
	vlan		x	x	VLAN related configuration
display firewall rules				x	Display firewall rules
dot1x	clear	x	x	x	Clear dot1x configuration
	initialize		x	x	State machine and fresh authentication configuration
	re-authenticate		x	x	Re-authentication
dump					Display memory content from the given memory location
	mem		x	x	Dump memory
	que		x	x	Show the queue related information
	sem		x	x	Show the semaphore related information
	task		x	x	Show the task related information
egress bridge			x	x	
end			x	x	Exit to the privileged Exec (#) mode

Command	First Param	Guest	Tech	Admin	Description
erase			x	x	Clears the contents of the startup configuration
exit		x	x	x	Logout
factory reset				x	Reset to factory default configuration
factory reset	users			x	Reset all users on switch
firmware			x	x	Upgrades firmware
generate	tech		x	x	Generate the tech report of various system resources and protocol states for debugging
help		x	x	x	Displays help for commands
ip	igmp snooping clear counters	x	x	x	Clears the IGMP snooping statistics
	clear counters		x	x	Clear operation
	dhcp		x	x	DHCP related configuration
	pim		x	x	PIM related configuration
	ssh		x	x	SSH related information
listuser			x	x	List the user, mode and groups
lock			x	x	Lock the console
logout		x	x	x	Logout
memtrace			x	x	Configures memtrace
no ip					IP related information
	dhcp		x	x	DHCP related configuration
	ssh		x	x	SSH related information
no debug					Configures trace for the module
	ip	x	x	x	Stops debugging on IGMP or PIM
	sntp	x	x	x	Stops debugging on SNTP related configurations
	additional options...		x	x	Stops debugging for other options
ping					

Command	First Param	Guest	Tech	Admin	Description
	A.B.C.D	x	x	x	Ping host
	ip dns host name	x	x	x	Ping host
	ip A.B.C.D	x	x	x	Ping host
	vrf	x	x	x	Ping vrf instance
readarpfromHardware ip	A.B.C.D		x	x	Reads the arp for the given IP
readregister			x	x	Reads the value of the register from the hardware
release dhcp			x	x	Performs release operation
reload			x	x	Restarts the switch
renew dhcp			x	x	Performs renew operation
run script			x	x	Runs CLI commands
shell				x	Shell to Linux prompt
show		x	x	x	Shows configuration or information
sleep		x	x	x	Puts the command prompt to sleep
ssl				x	Configures secure sockets layer related parameters
snmpwalk mib					Allows the user to view Management Information Base related configuration.
	name	x	x	x	
	oid	x	x	x	
traceroute					Traces route to the destination IP
	A.B.C.D		x	x	
write			x	x	Writes the running-config to a flash file
writeregister			x	x	writes in the specified register

1.11. Configuration Terminal Access

The Guest user level does not have access to the configuration terminal.

The Administration level has access to all commands in the configuration terminal.

The Technical level has access to all commands in the configuration terminal with the following exceptions listed below.

- enableuser
- mst
- password
- traffic

1. CLI Document Convention

To provide a consistent user experience, this *CLI* document convention adheres to the Industry Standard *CLI* syntax.

In addition, the font and format are updated to show *DITA* / Structured Framemaker 2019 layout.

Convention	Usage	DESCRIPTION
Italics	User inputs for *CLI* command	`configure terminal`
Font as shown	Syntax of the *CLI* command	`configure terminal`
< >	Parameter inside the brackets < > indicate the Input fields of syntax	`<integer (100-1000)>`
[ ]	Parameter inside [ ] indicate optional fields of syntax	`show split-horizon [all]`
{ }	Grouping parameters in the syntax	`ip address <ip-address> [secondary {node0 | node1}]`
|	Separating grouped parameters in the syntax	`set http authentication-scheme {default| basic| digest}`

Font & format as shown	Example & CLI command outputs	iSCom# show split-horizon interface 1
		`Ingress Port VlanId StorageType Egress List`
		`========== ====== ========== ==========`
		`Gi0/1 - Volatile Gi0/2,Gi0/3,Gi0/6`

Convention	Usage	DESCRIPTION
Note	Notes	**NOTE:** All commands are case-sensitive

2. GRE Configuration

The document outlines how to set up a GRE tunnel between two RAPTORs.

CONTEXT:

The tunnel traffic is encrypted with IPSEC. The routing table will be learnt automatically with OSPF.

Figure 1: GRE Topology

A sample working configuration of a GRE tunnel between two RAPTORs is as follows.

2.1. RAPTOR #1

1. Configure a link to security application and VPN policy 1.

   FOR EXAMPLE: Type the following:

```
iSCom# configure terminal
iSCom(config)# set security enable
iSCom(config)# vlan 5
iSCom(config-vlan)# vlan active
iSCom(config-vlan)# name "Protected Network"
iSCom(config-vlan)# exit
iSCom(config)# vlan 3
iSCom(config-vlan)# vlan active
iSCom(config-vlan)# name "Protected Network"
iSCom(config-vlan)# exit
iSCom(config)# interface gigabit 0/16
iSCom(config-if)# switchport mode trunk
iSCom(config-if)# description "Connected to Local Network"
iSCom(config-if)# description "Connected to Local Network"
iSCom(config-if)# exit
iSCom(config-if)# interface vlan 5
iSCom(config-if)# ip address 172.16.50.1 255.255.255.0
iSCom(config-if)# no shutdown
iSCom(config-if)# exit
iSCom(config-if)# interface vlan 3
iSCom(config-if)# ip address 172.16.51.1 255.255.255.0
iSCom(config-if)# no shutdown
```

```
iSCom(config-if)# description "Protected Network"
iSCom(config-if)# exit
iSCom(config-if)# interface loop 1
iSCom(config-if)# no shutdown
iSCom(config-if)# ip address 1.1.1.1 255.255.255.255
iSCom(config-if)# description "Router ID"
iSCom(config-if)# exit
iSCom(config)# interface gigabit 0/24
iSCom(config-if)# shutdown
iSCom(config-if)# no switchport
iSCom(config-if)# set wan enable
iSCom(config-if)# ip add 170.50.31.1 255.255.255.0 cybsec
iSCom(config-if)# no shutdown
iSCom(config-if)# description "WAN Port"
iSCom(config-if)# exit
iSCom(config)# vlan 50
iSCom(config-vlan)# vlan active
iSCom(config-vlan)# name "Connect iBiome to Linux"
iSCom(config)# exit
iSCom(config)# interface vlan 50
iSCom(config-if)# ip address 192.168.50.1 255.255.255.0
iSCom(config-if)# ip address 192.168.50.2 255.255.255.0 cybsec
iSCom(config-if)# ip proxy-arp cybsec
iSCom(config-if)# no shutdown
iSCom(config-if)# description "Connect iBiome to Linux"
iSCom (config-if)# exit
```

– Configure GRE Tunnel.

```
iSCom(config)# interface tunnel 1
iSCom(config-if)# tunnel mode gre source 170.50.31.1 dest 180.50.21.2
iSCom(config-if)# ip address 21.21.21.1 255.255.255.0 cybsec
iSCom(config-if)# no shutdown
```

– Configure GRE Over IPSec.

```
iSCom(config)# set vpn enable
iSCom(config)# crypto map VPN-TEST-1
iSCom(config-crypto-map)# set local 170.50.31.1
iSCom(config-crypto-map)# isakmp local identity ipv4 170.50.31.1
iSCom(config-crypto-map)# set peer 180.50.21.2
iSCom(config-crypto-map)# isakmp peer identity ipv4 180.50.21.2
```

```
iSCom(config-crypto-map)# access-list source gre destination gre
iSCom(config-crypto-map)# crypto key mode preshared psk iSCom+
iSCom(config-crypto-map)# isakmp policy encryption aes hash md5 dh group1
exch main lifetime secs 3600
iSCom(config-crypto-map)# crypto ipsec mode tunnel
iSCom(config-crypto-map)# crypto map ipsec encryption esp aes
authentication esp md5 pfs group2 lifetime secs 3600
iSCom(config-crypto-map)# set tunnel enable
iSCom(config-crypto-map)# exit
```

– Configure Default Routes on Linux and iBiome

```
iSCom(config)# ip route 0.0.0.0 0.0.0.0 192.168.50.2
iSCom(config)# ip route 0.0.0.0 0.0.0.0 170.50.31.3 cybsec
```

– Configure OSPF on the Linux

```
iSCom(config)# router ospf cybsec
iSCom(config-router)# router-id 11.11.11.11
iSCom(config-router)# network 21.21.21.1 area 0.0.0.0
iSCom(config-router)# network 192.168.50.2 area 0.0.0.0
```

– Configure OSPF on the iBiome.

```
iSCom(config)# router ospf
iSCom(config-router)# router-id 1.1.1.1
iSCom(config-router)# network 1.1.1.1 area 0.0.0.0
iSCom(config-router)# network 172.16.50.1 area 0.0.0.0
iSCom(config-router)# network 172.16.51.1 area 0.0.0.0
iSCom(config-router)# network 192.168.50.1 area 0.0.0.0
```

2.2. RAPTOR #2

1. Configure a link to security application and VPN policy 1.

   FOR EXAMPLE: Type the following:

```
iSCom# configure terminal
iSCom(config)# set security enable
iSCom(config)# vlan 6
iSCom(config-vlan)# vlan active
iSCom(config-vlan)# name "Protected Network"
iSCom(config-vlan)# exit
```

```
iSCom(config)# vlan 4
iSCom(config-vlan)# vlan active
iSCom(config-vlan)# name "Protected Network"
iSCom(config-vlan)# exit

iSCom(config)# interface gigabit 0/16
iSCom(config-if)# switchport mode trunk
iSCom(config-if)# description "Connected to Local Network"
iSCom(config-if)# exit
iSCom(config-if)# interface vlan 6
iSCom(config-if)# ip address 172.16.60.1 255.255.255.0
iSCom(config-if)# no shutdown
iSCom(config-if)# description "Protected Network"
iSCom(config-if)# exit
iSCom(config-if)# interface vlan 4
iSCom(config-if)# ip address 172.16.61.1 255.255.255.0
iSCom(config-if)# no shutdown
iSCom(config-if)# description "Protected Network"
iSCom(config-if)# exit

iSCom(config-if)# interface loop 1
iSCom(config-if)# no shutdown
iSCom(config-if)# ip address 2.2.2.2 255.255.255.255
iSCom(config-if)# description "Router ID”
iSCom(config-if)# exit
iSCom(config)# interface gigabit 0/24
iSCom(config-if)# shutdown
iSCom(config-if)# no switchport
iSCom(config-if)# set wan enable
iSCom(config-if)# ip add 180.50.21.2 255.255.255.0 cybsec
iSCom(config-if)# no shutdown
iSCom(config-if)# description "WAN Port"
iSCom(config-if)# exit

iSCom(config)# vlan 80
iSCom(config-vlan)# vlan active
iSCom(config-vlan)# name "Connect iBiome to Linux"
iSCom(config)# exit
iSCom(config)# interface vlan 80
iSCom(config-if)# ip address 192.168.80.1 255.255.255.0
```

```
iSCom(config-if)# ip address 192.168.80.2 255.255.255.0 cybsec
iSCom(config-if)# ip proxy-arp cybsec
iSCom(config-if)# no shutdown
iSCom(config-if)# description "Connect iBiome to Linux"
iSCom(config-if)# exit
```

– Configure GRE Tunnel.

```
iSCom(config)# interface tunnel 1
iSCom(config-if)# tunnel mode gre source 180.50.21.2 dest 170.50.31.1
iSCom(config-if)# ip address 21.21.21.2 255.255.255.0 cybsec
iSCom(config-if)# no shutdown
```

– Configure GRE Over IPSec.

```
iSCom(config)# set vpn enable
iSCom(config)# crypto map VPN-TEST-2
iSCom(config-crypto-map)# set local 180.50.21.2
iSCom(config-crypto-map)# isakmp local identity ipv4 180.50.21.2
iSCom(config-crypto-map)# set peer 170.50.31.1
iSCom(config-crypto-map)# isakmp peer identity ipv4 170.50.31.1
iSCom(config-crypto-map)# access-list source gre destination gre
iSCom(config-crypto-map)# crypto key mode preshared psk iSCom+
iSCom(config-crypto-map)# isakmp policy encryption aes hash md5 dh group1
exch main lifetime secs 3600
iSCom(config-crypto-map)# crypto ipsec mode tunnel
iSCom(config-crypto-map)# crypto map ipsec encryption esp aes
authentication esp md5 pfs group2 lifetime secs 3600
iSCom(config-crypto-map)# set tunnel enabl
iSCom(config-crypto-map)# exit
```

– Configure Default Routes on Linux and iBiome

```
iSCom(config)# ip route 0.0.0.0 0.0.0.0 192.168.80.2
iSCom(config)# ip route 0.0.0.0 0.0.0.0 180.50.21.3 cybsec
```

– Configure OSPF on the Linux

```
iSCom(config)# router ospf cybsec
iSCom(config-router)# router-id 22.22.22.22
iSCom(config-router)# network 21.21.21.2 area 0.0.0.0
iSCom(config-router)# network 192.168.50.2 area 0.0.0.0
```

– Configure OSPF on the iBiome.

```
iSCom(config)# router ospf
iSCom(config-router)# router-id 2.2.2.2
iSCom(config-router)# network 2.2.2.2 area 0.0.0.0
iSCom(config-router)# network 172.16.60.1 area 0.0.0.
iSCom(config-router)# network 172.16.61.1 area 0.0.0.
iSCom(config-router)# network 192.168.80.1 area 0.0.0.0
```

2.3. GRE Over IPsec with Certificate

1. Configure GRE Over IPsec with Certificate

FOR EXAMPLE: Perform the following

```
RAPTOR 1:
#Create Private Key On the RAPTOR
crypto pki keygen client rsa4096 CA ON MISSISSAUGA iSCom DOC 1.1.1.1

#Create a CSR on the RAPTOR
crypto pki csrgen client

#Importing Signed Certificate to the RAPTOR
crypto pki import cert clientSingedCert.pem private-key clientKey.pem

#Importing CA Certificate to the RAPTOR
crypto pki import ca-cert CA.pem

iSCom#show crypto pki
-------------------------------------------------------------
Name                            Type
-------------------------------------------------------------
clientKey.pem                   Private Key
clientCert.pem                  Certificate
clientSingedCert.pem            Certificate
CA.pem                          CA Certificate
clientCsr.pem                   CSR
-------------------------------------------------------------

en
conf t
set security enable
```

```
vlan 5
vlan active
Name "Protected Network"
exit
vlan 3
vlan active
Name "Protected Network"
exit
inter gig 0/16
sw mo trunk
description "Connected to Local Network"
exit
inter vlan 5
ip address 172.16.50.1 255.255.255.0
no shut
description "Protected Network"
exit
inter vlan 3
ip address 172.16.51.1 255.255.255.0
no shut
description "Protected Network"
exit
inter loop 1
no shut
ip add 1.1.1.1 255.255.255.255
description "Router ID"
exit
inter gig 0/24
shu
no sw
set wan enable
ip add 170.50.31.1 255.255.255.0 cybsec
no shut
description "WAN Port"
exit
vlan 50
vlan active
name "Connect iBiome to Linux"
exit
int vlan 50
```

```
ip addr 192.168.50.1 255.255.255.0
ip addr 192.168.50.2 255.255.255.0 cybsec
ip proxy-arp cybsec
no shut
description "Connect iBiome to Linux"
exit
!
#Configuring GRE Tunnel
interface tunnel 1
tunnel mode gre source 170.50.31.1 dest 180.50.21.2
ip address  21.21.21.1 255.255.255.0 cybsec
 no shutdown
!
#configuring GRE Over IPSec
set vpn enable

crypto map VPN-TEST-1
set local 170.50.31.1
isakmp Local identity ipv4 "C=CA, ST=ON, L=MISSISSAUGA, O=iSCom, OU=DOC,
CN=1.1.1.1"
set peer 180.50.21.2
isakmp peer identity ipv4 "C=CA, ST=ON, L=MISSISSAUGA, O=iSCom, OU=DOC,
CN=2.2.2.2"
access-list source gre destination gre
crypto key mode cert certificate-File clientSingedCert.pem
PrivateKey-File clientKey.pem
isakmp policy encryption aes hash md5 dh group1 exch main lifetime secs
3600
crypto ipsec mode tunnel
crypto map ipsec encryption esp aes authentication esp md5 pfs group2
lifetime secs 3600
set Tunnel enable
exit
!
#Configuring Default Routes on Linux and iBiome
ip route 0.0.0.0 0.0.0.0 192.168.50.2
ip route 0.0.0.0 0.0.0.0 170.50.31.3 cybsec
!
#Configuring OSPF on the Linux
router ospf cybsec
 router-id 11.11.11.11
network 21.21.21.1 area 0.0.0.0
```

```
network 192.168.50.2 area 0.0.0.0
!
#Configuring OSPF on the iBiome
router ospf
 router-id 1.1.1.1
network 1.1.1.1 area 0.0.0.0
network 172.16.50.1 area 0.0.0.0
network 172.16.51.1 area 0.0.0.0
network 192.168.50.1 area 0.0.0.0
!
RAPTOR 2:
#Create Private Key On the RAPTOR
crypto pki keygen client rsa4096 CA ON MISSISSAUGA iSCom DOC 2.2.2.2

#Create a CSR on the RAPTOR
crypto pki csrgen client

#Importing Signed Certificate to the RAPTOR
crypto pki import cert clientSingedCert.pem private-key clientKey.pem

#Importing CA Certificate to the RAPTOR
crypto pki import ca-cert CA.pem

iSCom#show crypto pki
-------------------------------------------------------------

 Name                              Type

-------------------------------------------------------------
clientKey.pem                    Private Key
 clientCert.pem                   Certificate
 clientSingedCert.pem             Certificate
 CA.pem                           CA Certificate
 clientCsr.pem                    CSR
-------------------------------------------------------------
en
conf t
set security enable
vlan 6
vlan active
```

```
Name "Protected Network"
exit
vlan 4
vlan active
Name "Protected Network"
exit
inter gig 0/16
sw mo trunk
description "Connected to Local Network"
exit
inter vlan 6
ip address 172.16.60.1 255.255.255.0
no shut
description "Protected Network"
exit
inter vlan 4
ip address 172.16.61.1 255.255.255.0
no shut
description "Protected Network"
exit
inter loop 1
no shut
ip add 2.2.2.2 255.255.255.255
description "Router ID"
exit
inter gig 0/24
shu
no sw
set wan enable
ip add 180.50.21.2 255.255.255.0 cybsec
no shut
description "WAN Port"
exit
vlan 80
vlan active
name "Connect iBiome to Linux"
exit
int vlan 80
ip addr 192.168.80.1 255.255.255.0
ip addr 192.168.80.2 255.255.255.0 cybsec
```

```
ip proxy-arp cybsec
no shut
description "Connect iBiome to Linux"
exit
!
#Configuring GRE Tunnel
interface tunnel 1
 tunnel mode gre source 180.50.21.2 dest 170.50.31.1
 ip address  21.21.21.2 255.255.255.0 cybsec
no shutdown
!
#configuring GRE Over IPSec
set vpn enable

crypto map VPN-TEST-2
set local 180.50.21.2
isakmp local identity ipv4 "C=CA, ST=ON, L=MISSISSAUGA, O=iSCom, OU=DOC,
CN=2.2.2.2"
set peer 170.50.31.1
isakmp peer identity ipv4 "C=CA, ST=ON, L=MISSISSAUGA, O=iSCom, OU=DOC,
CN=1.1.1.1"
access-list source gre destination gre
crypto key mode cert certificate-File clientSingedCert.pem
PrivateKey-File clientKey.pem
isakmp policy encryption aes hash md5 dh group1 exch main lifetime secs
3600
crypto ipsec mode tunnel
crypto map ipsec encryption esp aes authentication esp md5 pfs group2
lifetime secs 3600
set Tunnel enable
exit
!
#Configuring Default Routes on Linux and iBiome
ip route 0.0.0.0 0.0.0.0 192.168.80.2
ip route 0.0.0.0 0.0.0.0 180.50.21.3 cybsec
!
#Configuring OSPF on the Linux
router ospf cybsec
 router-id 22.22.22.22
network 21.21.21.2 area 0.0.0.0
network 192.168.80.2 area 0.0.0.0
```

```
!
#Configuring OSPF on the iBiome
router ospf
 router-id 2.2.2.2
network 2.2.2.2 area 0.0.0.0
network 172.16.60.1 area 0.0.0.0
network 172.16.61.1 area 0.0.0.0
network 192.168.80.1 area 0.0.0.0
!
```