

H3C S6850 & S9850 & S9820-64H GRE with OSPF Configuration Examples

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Introduction

This document provides GRE with OSPF configuration examples.

Prerequisites

The configuration examples in this document were created and verified in a lab environment, and all the devices were started with the factory default configuration. When you are working on a live network, make sure you understand the potential impact of every command on your network.

This document assumes that you have basic knowledge of GRE and OSPF.

Example: Configuring GRE with OSPF

Network configuration

As shown in [Figure 1](#), Device A is the gateway of the headquarters. Device B and Device C are the gateways of Branch 1 and Branch 2, respectively. The gateways have obtained public IP addresses from an ISP and can communicate with one another. Configure GRE with OSPF to meet the following requirements:

- The headquarters and the branches communicate with one another through the GRE tunnels established between the headquarters and the branches.
- The gateways learn the routes reaching the destination networks through the tunnel interfaces.

Figure 1 Network diagram

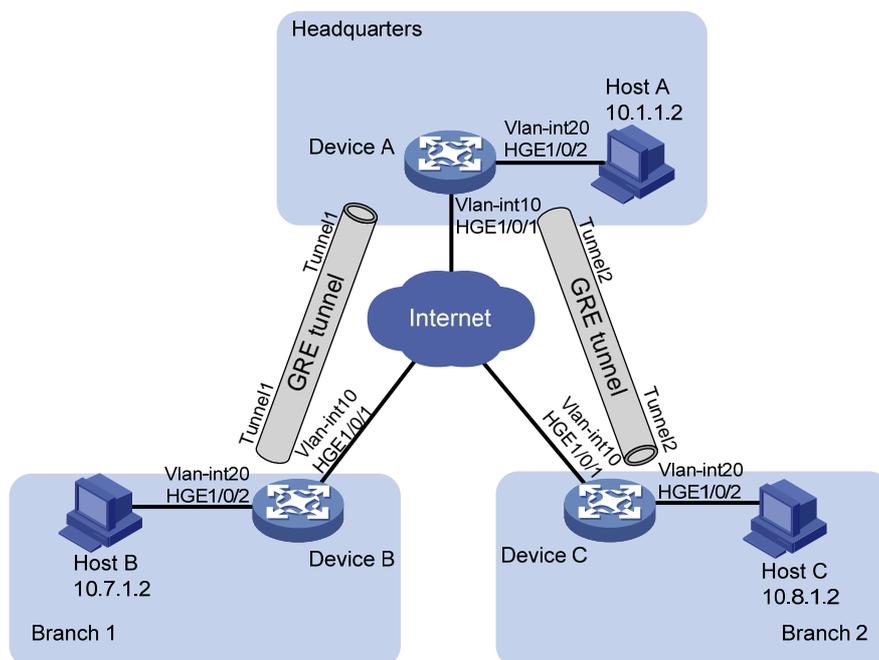


Table 1 Interface and IP address assignment

Device	Interface	IP address	Device	Interface	IP address
Device A	Vlan-int10	191.2.1.1/24	Device B	Vlan-int10	191.3.1.1/24
	Vlan-int20	10.1.1.1/24		Vlan-int20	10.7.1.1/24
	Tunnel1	10.5.1.1/24		Tunnel1	10.5.1.2/24
	Tunnel2	10.6.1.1/24			
Device C	Vlan-int10	191.4.1.1/24			
	Vlan-int20	10.8.1.1/24			
	Tunnel2	10.6.1.2/24			

Applicable hardware and software versions

The following matrix shows the hardware and software versions to which this configuration example is applicable:

Hardware	Software version
S6850 switch series S9850 switch series	Release 6555P01
S9820-64H switch	Release 6555P01

Restrictions and guidelines

Encapsulated packets cannot be forwarded on Layer 3 according to the destination IP addresses and routing tables. You must create a service loopback group of the **tunnel** service type to loop encapsulated packets back to the forwarding module for Layer 3 forwarding.

Procedures

Before configuring GRE and OSPF, configure an IPv4 routing protocol on the gateways so that they can reach one another. (Details not shown.)

Configuring Device A

```
# Configure VLAN-interface 10.
<DeviceA> system-view
[DeviceA] vlan 10
[DeviceA-vlan10] port HundredGigE 1/0/1
[DeviceA-vlan10] quit
[DeviceA] interface vlan-interface 10
[DeviceA-vlan-interface10] ip address 191.2.1.1 255.255.255.0
[DeviceA-vlan-interface10] quit

# Configure other interfaces in the same way VLAN-interface 10 is configured. (Details not shown.)
# Create service loopback group 1, and specify its service type as tunnel.
```

```

[DeviceA] service-loopback group 1 type tunnel
# Add HundredGigE 1/0/3 to service loopback group 1.
[DeviceA] interface HundredGigE 1/0/3
[DeviceA-HundredGigE1/0/3] port service-loopback group 1
[DeviceA-HundredGigE1/0/3] quit
# Create a tunnel interface Tunnel 1, and specify the tunnel mode as GRE/IPv4.
[DeviceA] interface tunnel 1 mode gre
# Configure an IP address for the tunnel interface Tunnel 1.
[DeviceA-Tunnel1] ip address 10.5.1.1 24
# Configure the source interface of the tunnel interface Tunnel 1 as VLAN-interface 10.
[DeviceA-Tunnel1] source vlan-interface 10
# Configure the destination address of the tunnel interface Tunnel 1 as the IP address of
VLAN-interface 10 on Device B.
[DeviceA-Tunnel1] destination 191.3.1.1
[DeviceA-Tunnel1] quit
# Create a tunnel interface Tunnel 2, and specify the tunnel mode as GRE/IPv4.
[DeviceA] interface tunnel 2 mode gre
# Configure an IP address for the tunnel interface Tunnel 2.
[DeviceA-Tunnel2] ip address 10.6.1.1 24
# Configure the source interface of the tunnel interface Tunnel 2 as VLAN-interface 10.
[DeviceA-Tunnel2] source vlan-interface 10
# Configure the destination address of the tunnel interface Tunnel 2 as the IP address of
VLAN-interface 10 on Device C.
[DeviceA-Tunnel2] destination 191.4.1.1
[DeviceA-Tunnel2] quit
# Configure the OSPF router ID as 10.6.1.1.
[DeviceA] router id 10.6.1.1
# Enable OSPF process 1.
[DeviceA] ospf 1
# Create OSPF area 0.
[DeviceA-ospf-1] area 0
# Enable OSPF on interfaces whose primary IP addresses are on network 10.1.1.0/24, 10.5.1.0/24,
or 10.6.1.0/24 in area 0.
[DeviceA-ospf-1-area-0.0.0.0] network 10.1.1.0 0.0.0.255
[DeviceA-ospf-1-area-0.0.0.0] network 10.5.1.0 0.0.0.255
[DeviceA-ospf-1-area-0.0.0.0] network 10.6.1.0 0.0.0.255

```

Configuring Device B

```

# Configure VLAN-interface 10.
<DeviceB> system-view
[DeviceB] vlan 10
[DeviceB-vlan10] port HundredGigE 1/0/1
[DeviceB-vlan10] quit
[DeviceB] interface vlan-interface 10
[DeviceB-vlan-interface10] ip address 191.3.1.1 255.255.255.0

```

```

[DeviceB-vlan-interface10] quit
# Configure other interfaces in the same way VLAN-interface 10 is configured. (Details not shown.)
# Create service loopback group 1, and specify its service type as tunnel.
[DeviceB] service-loopback group 1 type tunnel
# Add HundredGigE 1/0/3 to service loopback group 1.
[DeviceB] interface HundredGigE 1/0/3
[DeviceB-HundredGigE1/0/3] port service-loopback group 1
[DeviceB-HundredGigE1/0/3] quit
# Create a tunnel interface Tunnel 1, and specify the tunnel mode as GRE/IPv4.
[DeviceB] interface tunnel 1 mode gre
# Configure an IP address for the tunnel interface Tunnel 1.
[DeviceB-Tunnel1] ip address 10.5.1.2 24
# Configure the source interface of the tunnel interface Tunnel 1 as VLAN-interface 10.
[DeviceB-Tunnel1] source Vlan-interface 10
# Configure the destination address of the tunnel interface Tunnel 1 as the IP address of
VLAN-interface 10 on Device A.
[DeviceB-Tunnel1] destination 191.2.1.1
[DeviceB-Tunnel1] quit
# Configure the OSPF router ID as 10.7.1.1.
[DeviceB] router id 10.7.1.1
# Enable OSPF process 1.
[DeviceB] ospf 1
# Create OSPF area 0.
[DeviceB-ospf-1] area 0
# Enable OSPF on interfaces whose primary IP addresses are on network 10.7.1.0/24 or 10.5.1.0/24
in area 0.
[DeviceB-ospf-1-area-0.0.0.0] network 10.7.1.0 0.0.0.255
[DeviceB-ospf-1-area-0.0.0.0] network 10.5.1.0 0.0.0.255

```

Configuring Device C

```

# Configure VLAN-interface 10.
<DeviceC> system-view
[DeviceC] vlan 10
[DeviceC-vlan10] port HundredGigE 1/0/1
[DeviceC-vlan10] quit
[DeviceC] interface Vlan-interface 10
[DeviceC-Vlan-interface10] ip address 191.4.1.1 255.255.255.0
[DeviceC-Vlan-interface10] quit
# Configure other interfaces in the same way VLAN-interface 10 is configured. (Details not shown.)
# Create service loopback group 1, and specify its service type as tunnel.
[DeviceC] service-loopback group 1 type tunnel
# Add HundredGigE 1/0/3 to service loopback group 1.
[DeviceC] interface HundredGigE 1/0/3
[DeviceC-HundredGigE1/0/3] port service-loopback group 1

```

```

[DeviceC-HundredGigE1/0/3] quit
# Create a tunnel interface Tunnel 2, and specify the tunnel mode as GRE/IPv4.
[DeviceC] interface tunnel 2 mode gre
# Configure an IP address for the tunnel interface Tunnel 2.
[DeviceC-Tunnel2] ip address 10.6.1.2 24
# Configure the source interface of the tunnel interface Tunnel 2 as VLAN-interface 10.
[DeviceC-Tunnel2] source Vlan-interface 10
# Configure the destination address of the tunnel interface Tunnel 2 as the IP address of
VLAN-interface 10 on Device A.
[DeviceC-Tunnel2] destination 191.2.1.1
[DeviceC-Tunnel2] quit
# Configure the OSPF router ID as 10.8.1.1.
[DeviceC] router id 10.8.1.1
# Enable OSPF process 1.
[DeviceC] ospf 1
# Create OSPF area 0.
[DeviceC-ospf-1] area 0
# Enable OSPF on interfaces whose primary IP addresses are on network 10.8.1.0/24 or 10.6.1.0/24
in area 0.
[DeviceC-ospf-1-area-0.0.0.0] network 10.8.1.0 0.0.0.255
[DeviceC-ospf-1-area-0.0.0.0] network 10.6.1.0 0.0.0.255

```

Verifying the configuration

Verify that Host A can ping Host B successfully.

```
C:\> ping 10.7.1.2
```

```
Pinging 10.7.1.2 with 32 bytes of data:
```

```
Reply from 10.7.1.2: bytes=32 time=19ms TTL=253
```

```
Reply from 10.7.1.2: bytes=32 time<1ms TTL=253
```

```
Reply from 10.7.1.2: bytes=32 time<1ms TTL=253
```

```
Reply from 10.7.1.2: bytes=32 time<1ms TTL=253
```

```
Ping statistics for 10.7.1.2:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 0ms, Maximum = 19ms, Average = 4ms
```

Verify that Host A can ping Host C successfully.

```
C:\> ping 10.8.1.2
```

```
Pinging 10.8.1.2 with 32 bytes of data:
```

```
Reply from 10.8.1.2: bytes=32 time=18ms TTL=253
```

```
Reply from 10.8.1.2: bytes=32 time<1ms TTL=253
```

```
Reply from 10.8.1.2: bytes=32 time<1ms TTL=253
```

```
Reply from 10.8.1.2: bytes=32 time<1ms TTL=253
```

```
Ping statistics for 10.8.1.2:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 0ms, Maximum = 19ms, Average = 4ms
```

```
# Verify that Host B can ping Host C successfully.
```

```
C:\> ping 10.8.1.2
```

```
Pinging 10.8.1.2 with 32 bytes of data:
```

```
Reply from 10.8.1.2: bytes=32 time=20ms TTL=251
```

```
Reply from 10.8.1.2: bytes=32 time<1ms TTL=251
```

```
Reply from 10.8.1.2: bytes=32 time<1ms TTL=251
```

```
Reply from 10.8.1.2: bytes=32 time<1ms TTL=251
```

```
Ping statistics for 10.8.1.2:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 0ms, Maximum = 19ms, Average = 4ms
```

Configuration files

- Device A

```
#
service-loopback group 1 type tunnel
#
vlan 10
#
vlan 20
#
interface Vlan-interface10
 ip address 191.2.1.1 255.255.255.0
#
interface Vlan-interface20
 ip address 10.1.1.1 255.255.255.0
#
interface HundredGigE1/0/1
 port link-mode bridge
 port access vlan 10
#
interface HundredGigE1/0/2
 port link-mode bridge
 port access vlan 20
#
interface HundredGigE1/0/3
 port link-mode bridge
```

```

port service-loopback group 1
#
interface Tunnel1 mode gre
source vlan-interface10
destination 191.3.1.1
ip address 10.5.1.1 255.255.255.0
#
interface Tunnel2 mode gre
source vlan-interface10
destination 191.4.1.1
ip address 10.6.1.1 255.255.255.0
#
router id 10.6.1.1
#
ospf 1
area 0.0.0.0
network 10.1.1.0 0.0.0.255
network 10.5.1.0 0.0.0.255
network 10.6.1.0 0.0.0.255
#

```

- **Device B**

```

#
service-loopback group 1 type tunnel
#
vlan 10
#
vlan 20
#
interface Vlan-interface10
ip address 191.3.1.1 255.255.255.0
#
interface Vlan-interface20
ip address 10.7.1.1 255.255.255.0
#
interface HundredGigE1/0/1
port link-mode bridge
port access vlan 10
#
interface HundredGigE1/0/2
port link-mode bridge
port access vlan 20
#
interface HundredGigE1/0/3
port link-mode bridge
port service-loopback group 1
#
interface Tunnel1 mode gre
source Vlan-interface10

```

```

destination 191.2.1.1
ip address 10.5.1.2 255.255.255.0
#
router id 10.7.1.1
#
ospf 1
area 0.0.0.0
network 10.7.1.0 0.0.0.255
network 10.5.1.0 0.0.0.255
#

```

- **Device C**

```

#
service-loopback group 1 type tunnel
#
vlan 10
#
vlan 20
#
interface Vlan-interface10
ip address 191.4.1.1 255.255.255.0
#
interface Vlan-interface20
ip address 10.8.1.1 255.255.255.0
#
interface HundredGigE1/0/1
port link-mode bridge
port access vlan 10
#
interface HundredGigE1/0/2
port link-mode bridge
port access vlan 20
#
interface HundredGigE1/0/3
port link-mode bridge
port service-loopback group 1
#
interface Tunnel2 mode gre
source Vlan-interface10
destination 191.2.1.1
ip address 10.6.1.2 255.255.255.0
#
router id 10.8.1.1
#
ospf 1
area 0.0.0.0
network 10.8.1.0 0.0.0.255
network 10.6.1.0 0.0.0.255
#

```

Related documentation

- *H3C S6850 & S9850 Switch Series Layer 3—IP Services Configuration Guide-Release 655x*
- *H3C S6850 & S9850 Switch Series Layer 3—IP Services Command Reference-Release 655x*
- *H3C S9820-64H Switch Layer 3—IP Services Configuration Guide-Release 655x*
- *H3C S9820-64H Switch Layer 3—IP Services Command Reference-Release 655x*
- *H3C S6850 & S9850 Switch Series Layer 3—IP Routing Configuration Guide-Release 655x*
- *H3C S6850 & S9850 Switch Series Layer 3—IP Routing Command Reference-Release 655x*
- *H3C S9820-64H Switch Layer 3—IP Routing Configuration Guide-Release 655x*
- *H3C S9820-64H Switch Layer 3—IP Routing Command Reference-Release 655x*