H3C SecBlade LB Card Configuration Examples

Keyword: LB

Abstract: This document describes the configuration examples for the H3C SecBlade LB service cards in various applications.

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Overview

H3C SecBlade load balancing (LB) card, a leading LB product, is designed for data centers of carriers, portal websites, large- and medium-sized enterprises, and industries.

The SecBlade LB card can be installed on the H3C S7500E/S9500/S9500E/S12500 series Ethernet switches, operating as a service card to provide load balancing. It is deployed at the distribution layer or core layer together with the switch. The LB card equally distributes clients' access requests to the servers in the data center, ensuring the data center's response speed and service continuity.

The SecBlade LB card perfectly integrates application with switching devices. By using the powerful routing and switching capabilities of the switch, the SecBlade LB card is able to provide load balancing in various complicated networks. The LB card identifies applications on the switch, and performs health and performance monitoring of the data center, making it efficiently distribute various access requests to the servers in the data center based on scheduling algorithms. This improves the access speed of the data center, improves the service continuity, and enhances the capability to accommodate application access requests. The LB card reduces the expense on the device and service maintenance, and enhances the flexibility and extendibility of the data center.

Figure 1, Figure 2, Figure 3, and Figure 4 illustrate the appearance of the LB cards.

Figure 1 An LB card used in an S7500E switch

![Figure 1](image1)

Figure 2 An LB card used in an S9500 switch

![Figure 2](image2)
Application Scenarios

SecBlade LB cards are primarily used to provide service load balancing in data centers.

- For small- and medium-scale data centers of campus networks, which feature small access traffic, one SecBlade LB card is enough.
- For large-scale data centers of carriers and portal websites, which feature large access traffic, you can use one or two SecBlade LB cards to provide stateful failover, improving reliability for the data center.

Application in a Small and Medium Data Centers of Campus Networks

In a campus network, to enhance data center performance, load balancing is used to equally distribute the access requests to the servers in the data center. In this scenario shown in Figure 5, install a SecBlade LB card to the core switch, connect the data center servers to the core switch through the access switch, specify the LB card's IP address as the gateway IP address on each server, and configure the LB card to use the NAT mode to achieve server load balancing.
Application in a Large Data Center of Carriers and Portal Websites

Generally, load balancing is implemented in large data centers, such as the data centers of carriers and portal websites. In such a network shown in Figure 6, you can insert one or two SecBlade LB cards into each stateful failover-capable distribution layer switch. The LB card balance services for the data center servers, and if one switch or LB card fails, traffic can be delivered to another server, ensuring access availability for users.
**Configuration Guidelines**

- Make sure correct routing is configured for the switches and SecBlade LB card.
- The virtual service must be enabled.
- For SecBlade LB card upgrading, see *H3C SecBlade Card Software Upgrade Manual*.
- Examples in this document use S7500E switches as the holding devices for the SecBlade LB cards, and only the configuration related to the SecBlade LB function is provided. These examples are also applicable to the S9500/S9500E/S12500 switches.

**NAT-Mode Load Balancing Configuration Example**

**Network Requirements**

The servers are in the private network and need to provide services for the users in the external network. Configure NAT-mode load balancing on the LB card installed on the S7503E to achieve load balancing between the private servers, which have a public IP address assigned to allow external users to access.
Figure 7 Network diagram for NAT-mode load balancing

![Network diagram for NAT-mode load balancing](image)

**Configuration Considerations**

1) First, configure the S7503E switch—Assign the ports that connect the internal network to VLAN 200, and assign the interface that connects the external network and the 10GE interface that connects the SecBlade LB card to VLAN 110 and VLAN 10.

2) Configure the SecBlade LB card—Configure the 10GE interface that connects the S7503E switch as a Layer 3 interface and configure the routes.

3) Ensure the reachability between the S7503E switch and the SecBlade LB card, the internal servers, and the external network.

**Software Version Used**

This example is configured and verified on R3204P12.

**Configuration Procedures**

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**Note**

The following configurations are made on devices that are using default settings and verified in a lab environment. When using the following configurations on your devices in a live network, make sure they do not conflict with your current configurations to prevent potential negative impact on your network.

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**Configurations on S7503E**

**Configuration procedures**

1) Create VLANs.

   # Create VLAN 10, VLAN 110, and VLAN 200.
2) Create VLAN interfaces and configure IP addresses for the interfaces.

   [Sysname] interface Vlan-interface 10
   [Sysname-Vlan-interface10] ip address 192.168.10.1 255.255.255.252
   [Sysname-Vlan-interface10] interface vlan-interface 110
   [Sysname-Vlan-interface110] ip address 202.38.1.2 255.255.255.0

3) Assign ports to VLAN 110 and VLAN 200.

   [Sysname] interface GigabitEthernet 4/0/16
   [Sysname-GigabitEthernet4/0/16] port access vlan 110
   [Sysname-GigabitEthernet4/0/16] quit
   [Sysname] interface GigabitEthernet 4/0/1
   [Sysname-GigabitEthernet4/0/1] port access vlan 200
   [Sysname-GigabitEthernet4/0/1] quit
   [Sysname] interface GigabitEthernet 4/0/2
   [Sysname-GigabitEthernet4/0/2] port access vlan 200
   [Sysname-GigabitEthernet4/0/2] quit

4) Configure the 10GE interface that connects the SecBlade LB card as a trunk interface.

   [Sysname] interface Ten-GigabitEthernet 2/0/1
   [Sysname-Ten-GigabitEthernet2/0/1] port link-type trunk
   [Sysname-Ten-GigabitEthernet2/0/1] undo port trunk permit vlan 1
   [Sysname-Ten-GigabitEthernet2/0/1] port trunk permit vlan 10
   [Sysname-Ten-GigabitEthernet2/0/1] port trunk permit vlan 200
   [Sysname-Ten-GigabitEthernet2/0/1] quit

5) Add static routes.

   [Sysname] ip route-static 0.0.0.0 0.0.0.0 202.38.1.1
   [Sysname] ip route-static 172.16.1.0 255.255.255.0 192.168.10.2

Configuration file

```
<vlan 10 //Connects to the SecBlade LB card

<vlan 110 //Connects to the external network client
   description Outside

<vlan 200 //Connects to the internal servers
   description Servers

interface Vlan-interface10
   description to SecBlade_LB
   ip address 192.168.10.1 255.255.255.252
```
interface Vlan-in110
description Outside
ip address 202.38.1.2 255.255.255.0

interface GigabitEthernet4/0/1
port access vlan 200
description Server_1

interface GigabitEthernet4/0/2
port access vlan 200
description Server_2

interface GigabitEthernet4/0/16
port access vlan 110

interface Ten-GigabitEthernet2/0/1
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 10 200

ip route-static 0.0.0.0 0.0.0.0 202.38.1.1
ip route-static 172.16.1.0 255.255.255.0 192.168.1.2

Configurations on the SecBlade LB Card

Pre-configuration

1) Configuration prerequisites
   ● Install the SecBlade LB card(s) into the S12500/S9500E/S9500/S7500E switch. Check that the switch can work normally after installed with the SecBlade LB card(s). For the installation procedure, see H3C S12500 Series Routing Switches Installation Guide, H3C S9500E Series Routing Switches Installation Guide, H3C 9500E Series Routing Switches Installation Guide, or H3C S7500E Series Routing Switches Installation Guide.
   ● Connect a configuration terminal (usually a PC) with the SecBlade LB card. Make sure the terminal PC and LB card can communicate at Layer 3.

2) Set up the configuration environment
   ● Use a console cable to connect the serial interface of a configuration terminal (usually a PC) to the console interface of the SecBlade LB card.
   ● Use a crossover Ethernet cable to connect the Ethernet interface of the PC to GE 0/1, the default management interface of the SecBlade LB card.
3) Configure a terminal emulation program on the PC
   - On the PC, run a terminal emulation program, such as Terminal of Windows 3.X and HyperTerminal of Windows 9X and Windows XP.
   - Set the terminal communication parameters: **Bits per second** to **9600**, **Data bits** to **8**, **Parity** to **none**, **Stop bits** to **1**, and **Flow control** to **none**.
4) Enter the command line interface (CLI) (optional)

Power on the SecBlade LB card. The SecBlade power-on self-test (POST) information will be displayed on the PC. After the POST, press **Enter**. The CLI of the SecBlade LB card appears.

### Logging in to the SecBlade LB card

1) Configure an IP address for the management interface (GigabitEthernet 0/1). Make sure that the IP address of the management interface is in the same network segment of that of the PC. This step is optional. By default, the IP address of the management interface is 192.168.0.1/24.

   ```
   <Sysname> system-view
   [Sysname] interface GigabitEthernet0/1 //Enter management interface view
   [Sysname-GigabitEthernet0/1] ip address 192.168.10.2 255.255.255.0 //Configure the IP address of the management interface as 192.168.10.2
   [Sysname-GigabitEthernet0/1] quit
   <Sysname> save //Save the configuration
   ```

2) Logging in to the web interface

   On the PC, open a browser (IE 6.0 or above is recommended), enter the IP address 192.168.10.2 in the address bar to enter the login page of the LB card web interface. Type the default username **h3c** and password **h3c**, type the verify code, select the language, and then click **Login**.
CLI configuration

1) Configuration procedures

# Create Layer 3 subinterfaces.

```bash
[Sysname] interface Ten-GigabitEthernet 0/0.10
[Sysname-Ten-GigabitEthernet0/0.10] vlan-type dot1q vid 10
[Sysname-Ten-GigabitEthernet0/0.10] ip address 192.168.10.2 255.255.255.252
[Sysname-Ten-GigabitEthernet0/0.10] quit
[Sysname] interface Ten-GigabitEthernet 0/0.200
[Sysname-Ten-GigabitEthernet0/0.200] vlan-type dot1q vid 200
[Sysname-Ten-GigabitEthernet0/0.200] ip address 192.168.1.254 255.255.255.0
[Sysname-Ten-GigabitEthernet0/0.200] quit
```

# Add a static route.

```bash
[Sysname] ip route-static 0.0.0.0 0.0.0.0 192.168.10.1
```

2) Configuration file

```bash
# interface Ten-GigabitEthernet0/0.10
vlan-type dot1q vid 10
description to_S7503E
ip address 192.168.10.2 255.255.255.252
#
interface Ten-GigabitEthernet0/0.200
vlan-type dot1q vid 200
description to Servers
ip address 192.168.1.254 255.255.255.0
#
   ip route-static 0.0.0.0 0.0.0.0 192.168.10.1
```

Configuring NAT-mode load balancing in web interface

1) Create a real service group.

From the navigation tree, select **Load Balance > Server Load Balance**. Click the **Real Service Group** tab.
Click **Add** to enter the real service group configuration page. Type a name for the real service group, select a scheduler algorithm, a health monitoring type, and a real service troubleshooting method.

**Note**

- **Health Monitoring Type** is optional. If you do not select a health monitoring type, the LB card does not perform health monitoring for the real service.
- For information about scheduler algorithms and health monitoring types, see *Load Balancing Configuration* in the *H3C SecBlade LB User Manual*.

2) Create real services and add the real services to the real service group **http**.

From the navigation tree, select **Load Balance > Server Load Balance**. Click the **Real Service** tab.
Click **Add** to enter the real service configuration page.

---

**Note**

- You can use the default values for the port, weight, and connection limit.
- Port 0 represents all ports.

---

**Figure 14 Add a real service**

- Type the real service name **server1**.
- Type the real service IP address **192.168.1.1**.
- Set the port number to **80**, weight to **100**, and connection limit to **0**.
- Select the real service group **http**.
- Click **Apply**.

Follow similar steps to create real service **server2**.

**Figure 15 Real services server1 and server2 created successfully**

3) Create a virtual service.
From the navigation tree, select **Load Balance > Server Load Balance**. Click the **Virtual Service** tab.

**Figure 16 Virtual service page**

Click **Add** to enter the virtual service configuration page.

**Figure 17 Add a virtual service**

- Type **VS** as the virtual service name.
- Type **172.16.1.100** as the virtual service IP address and select mask **32 (255.255.255.255)**.
- Set port number to **0**.
- Select **NAT** as the forwarding mode.
- Select the real service group **http**.
- Select the **Enable Virtual Service** option.
- Click **Apply**.

**Figure 18 Virtual service VS created successfully**
4) Save the configuration

From the navigation tree, select **System > Maintenance**. Click the **Save** tab. Click **Apply** to save the current configuration.

**Figure 19 Save the current configuration**

![Save configuration dialog](image)

**Verification**

**Verification method**

1) Use Avalanche to simulate multiple clients and two web servers.
2) Use the Weighted Round-Robin (WRR) algorithm and configure the weights for the two real services.
3) Use Avalanche to simulate a large number of users to access the servers.

**Verification result**

Access requests of the clients are distributed to the servers in proportions determined by the weights of the real services.

**DR-Mode Load Balancing Configuration Example**

**Network Requirements**

The servers are in the private network and need to provide services for the users in the external network. Configure DR-mode load balancing on the LB card installed on the S7503E to achieve load balancing between the private servers, which have a public IP address assigned to allow external users to access.
Configuration Considerations

- First, configure the S7503E switch. Assign the ports that connect the internal servers and the 10GE interface that connects the SecBlade LB card to VLAN 200, and assign the interface that connects the external network to VLAN 110.
- Configure the 10GE interface and routes for the SecBlade LB card.
- Ensure the reachability between the S7503E switch and the SecBlade LB card, the internal servers, and the external network.

Software Version Used

This example is configured and verified on R3204P12.

Configuration Procedures

---

Note

The following configurations are made on devices that are using default settings and verified in a lab environment. When using the following configurations on your devices in a live network, make sure they do not conflict with your current configurations to prevent potential negative impact on your network.

---

Configurations on S7503E

Configuration procedures

1) Create VLANs.

# Create VLAN 110 and VLAN 200.

```text
<Sysname> Sysname-view
[Sysname] vlan 110
```
2) Create VLAN interfaces and configure IP addresses for the interfaces.

```
[Sysname-vlan110] vlan 200
[Sysname-vlan200] quit
```

3) Assign ports to VLAN 110 and VLAN 200.

```
[Sysname] interface vlan-interface 110
[Sysname-Vlan-interface110] ip address 202.38.1.2 255.255.255.0
[Sysname-Vlan-interface110] quit

[Sysname] interface Vlan-interface 200
[Sysname-Vlan-interface200] ip address 192.168.1.254 255.255.255.0
[Sysname-Vlan-interface200] quit
```

4) Add static routes.

```
[Sysname] ip route-static 0.0.0.0 0.0.0.0 202.38.1.1
[Sysname] ip route-static 172.16.1.0 255.255.255.0 192.168.1.253
```

**Configuration file**

```
# vlan 110
   description Outside

# vlan 200
   description Servers

interface Vlan-interface110
   description Outside
   ip address 202.38.1.2 255.255.255.0

interface Vlan-interface200
   description Servers
   ip address 192.168.1.254 255.255.255.0

interface GigabitEthernet4/0/16
   port access vlan 110

interface Ten-GigabitEthernet2/0/1
   port access vlan 200
```

// Connect to the external network client

// Connects to Server1

// Connects to Server2

// Connected to the SecBlade LB card

//Connects to the external network client
port access vlan 200

interface Ten-GigabitEthernet2/0/2

ip route-static 0.0.0.0 0.0.0.0 202.38.1.1
ip route-static 172.16.1.0 255.255.255.0 192.168.1.253

Configurations on the SecBlade LB Card

Pre-configuration

For the configuration procedure, see Configurations on the SecBlade LB Card.

Logging in to the SecBlade LB card

1) Configure an IP address for the management interface (GigabitEthernet 0/1). Make sure that the IP address of the management interface is in the same network segment of that of the PC. This step is optional. By default, the IP address of the management interface is 192.168.0.1/24.

   <Sysname> system-view
   [Sysname] interface GigabitEthernet0/1 //Enter management interface view
   [Sysname-GigabitEthernet0/1] ip address 192.168.10.2 255.255.255.0 //Configure the IP address of the management interface as 192.168.10.2.
   [Sysname-GigabitEthernet0/1] quit
   <Sysname> save //Save the configuration

2) Logging in to the web interface

Enter http://192.168.10.2 in the IE address bar to enter the login page of the LB card web interface. Type the default username h3c and password h3c, type the verify code, select the language, and then click Login.

Figure 21 SecBlade LB card login page

CLI configuration

1) Configuration procedures

   # Configure an IP address for the 10GE interface.
   
   [Sysname] interface Ten-GigabitEthernet 0/0
   [Sysname-Ten-GigabitEthernet0/0] ip address 192.168.1.253 255.255.255.0
   [Sysname-Ten-GigabitEthernet0/0] quit
# Add a static route.

```plaintext
[Sysname] ip route-static 0.0.0.0 0.0.0.0 192.168.1.254
```

2) Configuration file

```plaintext
interface Ten-GigabitEthernet0/0
  port link-mode route
  ip address 192.168.1.253 255.255.255.0

# ip route-static 0.0.0.0 0.0.0.0 192.168.1.254
```

## Configuring DR-mode load balancing in web interface

1) Create a real service group.

From the navigation tree, select **Load Balance > Server Load Balance**. Click the **Real Service Group** tab.

**Figure 22 Real service group page**

![Real Service Group Table](image)

Click **Add** to enter the real service group configuration page. Type a name for the real service group, select a scheduler, a health monitoring type, and a real service troubleshooting method.

**Figure 23 Add a real service group**

![Add Real Service Group](image)

**Note**

**Health Monitoring Type** is optional. If you do not select a health monitoring type, the LB card does not perform health monitoring for a real service.

Click **Apply**.
2) Create real services and add the real services to the real service group http.

From the navigation tree, select Load Balance > Server Load Balance. Click the Real Service tab.

Figure 25 Real service page

Click Add to enter the real service configuration page.

---

Note

You can use the default values for the port, weight, and connection limit. Port 0 represents all ports.

---

Figure 26 Add real service server1

- Type the real service name server1.
- Type the real service IP address 192.168.1.1.
- Set the port number to 80, weight to 100, and connection limit to 0.
- Select the real service group http.
- Click Apply.

Follow similar steps to create real service server2.
3) Create a virtual service.

From the navigation tree, select **Load Balance > Server Load Balance**. Click the **Virtual Service** tab.

**Figure 28 Virtual service page**

Click **Add** to enter the virtual service configuration page.

**Figure 29 Add a virtual service**

- Type **VS** as the virtual service name.
- Type **172.16.1.100** as the virtual service IP address and select mask **32 (255.255.255.255)**.
- Select protocol **TCP**.
- Set port number to **0**.
- Select **Direct Routing** as the forwarding mode.
- Select the real service group **http**.
- Select the **Enable Virtual Service** option.
- Click **Apply**.
Figure 30 Virtual service VS created successfully

4) Save the configuration

From the navigation tree, select System > Maintenance. Click the Save tab. Click Apply to save the current configuration.

Figure 31 Save the current configuration

Network Adapter Configurations on a Server

In DR-mode load balancing, you need to assign a loopback address on each server. The loopback address must be the same as the virtual service IP address configured on the SecBlade LB card. If the server runs the Windows system, you need to add a loopback network adapter. The gateway address of the physical network adapter on the server is the IP address of the VLAN-interface 200 on the S7503E switch.

1) Loopback network adapter installation procedure

- Connect the loopback network adapter to the server host. Go to Start > Settings > Control Panel, and then double-click the Add Hardware icon.
Figure 32 Control panel

- Click Next.
Figure 33 Add Hardware Wizard step 1

- Select the Yes, I have already connected the hardware option, and click Next.
Figure 34 Add Hardware Wizard step 2

- Select **Add a new hardware device**, and click **Next**.
Figure 35 Add Hardware Wizard step 3

- Select the **Install the hardware that I manually select from a list (Advanced)** option, and click Next.
Figure 36 Add Hardware Wizard step 4

- Select **Network adapters**, and click **Next**.
Figure 37 Add Hardware Wizard step 5

- Select **Microsoft Loopback Adapter** in the **Network Adapter** column, and click **Next**.
Figure 38 Add Hardware Wizard step 6

- Click **Next**.
Figure 39 Add Hardware Wizard step 7

- Click Finish.
2) Assign an IP address to the loopback adapter
3) Modify the loopback adapter attributes in the registry

Open the Windows registry.

Go to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\Interfaces and find the adapter. Modify the value of SubnetMask to 255.255.255.255, disable the adapter, and then enable the adapter again.
Figure 42 Locate SubnetMask in the registry

Figure 43 Modify the value of SubnetMask
Figure 44 Confirm the IP address and subnet mask of the loopback adapter

![Local Area Connection Status]

**Verification**

**Verification method**

1) Prepare two web servers, and configure a loopback network adapter for them.
2) Configure the scheduler algorithm as Round-Robin for the real service group on the SecBlade LB card.
3) Use Avalanche to simulate a large number of clients to access the virtual service.

**Verification result**

The clients can access web services normally. Display the statistics on the SecBlade LB card. You see that traffic destined for the two servers is 1:1.

**Gateway Load Balancing Configuration Example**

**Network Requirements**

In the networks where gateways (such as firewalls) processing capabilities have become the bottleneck, gateway load balancing can be adopted to balance the network traffic among multiple gateway devices.
Configuration Considerations

Configure two real services on the level-1 SecBlade LB card, namely, the SecBlade LB_1 card of the S7503E_1, with the real service IP addresses being the IP addresses of interfaces Ethernet 0/0 on the two firewalls.

Software Version Used

This example is configured and verified on R3204P12.

Configuration Procedures

Note

The following configurations are made on devices that are using default settings and verified in a lab environment. When using the following configurations on your devices in a live network, make sure they do not conflict with your current configurations to prevent potential negative impact on your network.
Caution

On the level-2 SecBlade LB card, namely, SecBlade LB_2, you must select the Keep Last-hop Information option on page Load Balance > Global Setting.

Configurations on S7503E_1

Configuration procedures

1) Create VLANs.

# Create VLAN 10, 23, 24, 30.

```bash
<Sysname> Sysname-view
[Sysname] vlan 10
[Sysname-vlan10] quit
[Sysname] vlan 23 to 24
[Sysname] vlan 30
[Sysname-vlan30] quit
```

2) Create VLAN interfaces and configure IP addresses for the interfaces.

```bash
[Sysname] interface vlan 10
[Sysname-Vlan-interface10] ip address 11.0.0.1 255.0.0.0
[Sysname-Vlan-interface10] quit
[Sysname] interface vlan 30
[Sysname-Vlan-interface30] ip address 5.0.0.1 255.0.0.0
[Sysname-Vlan-interface30] quit
```

3) Assign interfaces to the VLANs.

```bash
[Sysname] interface GigabitEthernet 2/0/1
[Sysname-GigabitEthernet2/0/1] port access vlan 23
[Sysname-GigabitEthernet2/0/1] quit
[Sysname] interface GigabitEthernet 2/0/2
[Sysname-GigabitEthernet2/0/2] port access vlan 24
[Sysname-GigabitEthernet2/0/2] quit
[Sysname] interface GigabitEthernet 2/0/21
[Sysname-GigabitEthernet2/0/21] port access vlan 10
[Sysname-GigabitEthernet2/0/21] quit
```

4) Configure the 10GE interface that connects the SecBlade LB card as a trunk interface, allowing packets of all VLANs to pass.

```bash
[Sysname] interface Ten-GigabitEthernet 3/0/1
[Sysname-Ten-GigabitEthernet3/0/1] port link-type trunk
[Sysname-Ten-GigabitEthernet3/0/1] port trunk permit vlan all
[Sysname-Ten-GigabitEthernet3/0/1] quit
```
5) Add a static route.

[Sysname] ip route-static 192.168.10.0 255.255.255.0 5.0.0.2

**Configuration file**

```
vlan 10
    description Outside Vlan
vlan 23 to 24
vlan 30

interface Vlan-interface10
    ip address 11.0.0.1 255.0.0.0

interface Vlan-interface30
    ip address 5.0.0.1 255.0.0.0

interface GigabitEthernet2/0/1
    port access vlan 23

interface GigabitEthernet2/0/2
    port access vlan 24

interface GigabitEthernet2/0/21
    port access vlan 10

interface Ten-GigabitEthernet3/0/1
    port link-type trunk
    port trunk permit vlan all

interface Ten-GigabitEthernet3/0/2

    ip route-static 192.168.10.0 255.255.255.0 5.0.0.2
```

**Configurations on the SecBlade LB_1 Card**

**Pre-configuration**

For the configuration procedure, see Configurations on the SecBlade LB Card.

**Logging in to SecBlade LB_1**

1) Configure an IP address for the management interface (GigabitEthernet 0/1). Make sure that the IP address of the management interface is in the same network segment of that of the PC. This step is optional. By default, the IP address of the management interface is 192.168.0.1/24.

<Sysname> system-view

[Sysname] interface GigabitEthernet0/1 //Enter management interface view
2) Enter **http://192.168.254.200** in the IE address bar to enter the login page of the SecBlade LB_1 card web interface. Type the default username **h3c** and password **h3c**, type the verify code, select the language, and then click Login.

**Figure 46 SecBlade LB_1 card login page**

### CLI configuration

1) Configuration procedures

# Create 10GE Layer 3 subinterfaces and configure IP addresses for them.

```bash
[Sysname] interface Ten-GigabitEthernet 0/0.1
[Sysname-Ten-GigabitEthernet0/0.1] vlan-type dot1q vid 30
[Sysname-Ten-GigabitEthernet0/0.1] ip address 5.0.0.2 255.0.0.0
[Sysname-Ten-GigabitEthernet0/0.1] quit
[Sysname] interface Ten-GigabitEthernet 0/0.23
[Sysname-Ten-GigabitEthernet0/0.23] vlan-type dot1q vid 23
[Sysname-Ten-GigabitEthernet0/0.23] ip address 6.0.0.2 255.0.0.0
[Sysname-Ten-GigabitEthernet0/0.23] quit
[Sysname] interface Ten-GigabitEthernet 0/0.24
[Sysname-Ten-GigabitEthernet0/0.24] vlan-type dot1q vid 24
[Sysname-Ten-GigabitEthernet0/0.24] ip address 7.0.0.2 255.0.0.0
[Sysname-Ten-GigabitEthernet0/0.24] quit
```

# Add a static route.

```bash
ip route-static 0.0.0.0 0.0.0.0 5.0.0.1
```

2) Configuration file

```bash

interface GigabitEthernet0/1
port link-mode route
ip address 192.168.254.200 255.255.255.0

interface GigabitEthernet0/2
port link-mode route
```
interface GigabitEthernet0/3
port link-mode route

interface GigabitEthernet0/4
port link-mode route

interface Ten-GigabitEthernet0/0
port link-mode route

interface Ten-GigabitEthernet0/0.1
  vlan-type dot1q vid 30
  ip address 5.0.0.2 255.0.0.0

interface Ten-GigabitEthernet0/0.23
  vlan-type dot1q vid 23
  ip address 6.0.0.2 255.0.0.0

interface Ten-GigabitEthernet0/0.24
  vlan-type dot1q vid 24
  ip address 7.0.0.2 255.0.0.0

ip route-static 0.0.0.0 0.0.0.0 5.0.0.1

Configuring gateway load balancing in the web interface

1) Create a real service group.

From the navigation tree, select Load Balance > Server Load Balance. Click the Real Service Group tab.

Figure 47 Real service group

Click Add to enter the real service group configuration page. Type a name for the real service group, and select a scheduler, a health monitoring type, and a real service troubleshooting method.
Health Monitoring Type is optional. If you do not select a health monitoring type, the LB card does not perform health monitoring for a real service.

**Figure 48 Add a real service group**

<table>
<thead>
<tr>
<th>Real Service Group Name:</th>
<th>http</th>
<th>*Chars(1-31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduler:</td>
<td>Round Robin</td>
<td></td>
</tr>
<tr>
<td>Health Monitoring Type:</td>
<td>ICMP</td>
<td></td>
</tr>
<tr>
<td>Real Service Troubleshooting:</td>
<td>Keep Connection</td>
<td></td>
</tr>
</tbody>
</table>

![Add Real Service Group](image)

Click **Apply**.

**Figure 49 Real service group http created**

![Real Service Group](image)

2) Create real services.

From the navigation tree, select **Load Balance > Server Load Balance**. Click the **Real Service** tab.

**Figure 50 Real service page**

![Real Service Page](image)

Click **Add** to enter the real service configuration page.

**Note**

You can use the default values for the port, weight, and connection limit. Port 0 represents all ports.
**Figure 51** Add a real service

![Add Real Service](image)

- Type the real service name **FWT1**.
- Type the real service IP address **6.0.0.1**.
- Set the port number to **0**, weight to **100**, and connection limit to **1024**.
- Select the real service group **http**.
- Click **Apply**.

Follow similar steps to create real service **FWT2**.

**Figure 52** Real services FWT1 and FWT2 created

![Real Service Table](image)

3) Create a virtual service.

From the navigation tree, select **Load Balance > Server Load Balance**. Click the **Virtual Service** tab.

**Figure 53** Virtual service page

![Virtual Service](image)

Click **Add** to enter the virtual service configuration page.
Figure 54 Add a virtual service

- Type **FWT** as the virtual service name
- Type **192.168.10.0** as the virtual service IP address and select mask **24 (255.255.255.0)**.
- Select **Any** as the protocol type.
- Set port number to 0.
- Select **Firewall Forwarding** as the forwarding mode.
- Select the real service group **http**.
- Select the **Enable Virtual Service** option.
- Click **Apply**.

Figure 55 Virtual service FWT created

**Configurations on FW_1**

**Configuration procedures**

1) Configure a packet filtering firewall policy
   
   [Sysname] firewall packet-filter enable
   [Sysname] firewall packet-filter default permit

2) Configure IP addresses for interfaces
   
   [Sysname] interface Ethernet0/0
   [Sysname-Ethernet0/0] ip address 6.0.0.1 255.0.0.0
   [Sysname-Ethernet0/0] quit
   [Sysname] interface Ethernet0/1
3) Add the interfaces to security zones.
[Gsysname-Ethernet0/1] ip address 8.0.0.1 255.0.0.0
[Gsysname-Ethernet0/1] quit

[sysname] firewall zone trust
[Gsysname-zone-trust] add interface Ethernet0/0
[Gsysname-zone-trust] quit
[Gsysname] firewall zone untrust
[Gsysname-zone-untrust] add interface Ethernet0/1
[Gsysname-zone-untrust] quit

4) Add static routes.
[Gsysname] ip route-static 11.0.0.0 255.0.0.0 6.0.0.2
[Gsysname] ip route-static 192.168.10.0 255.255.255.0 8.0.0.2

Configuration file

```
firewall packet-filter enable
firewall packet-filter default permit

interface Ethernet0/0
 ip address 6.0.0.1 255.0.0.0

interface Ethernet0/1
 ip address 8.0.0.1 255.0.0.0

firewall zone local
 set priority 100

firewall zone trust
 add interface Ethernet0/0
 set priority 85

firewall zone untrust
 add interface Ethernet0/1
 set priority 5

firewall zone DMZ
 set priority 50

firewall interzone local trust

firewall interzone local untrust

firewall interzone local DMZ

firewall interzone trust untrust
```
firewall interzone trust DMZ

firewall interzone DMZ untrust

ip route-static 11.0.0.0 255.0.0.0 6.0.0.2 preference 60
ip route-static 192.168.10.0 255.255.255.0 8.0.0.2 preference 60

Configurations on FW_2

Configuration procedures

1) Configure a packet filtering firewall policy

[Sysname] firewall packet-filter enable
[Sysname] firewall packet-filter default permit

2) Configure IP addresses for interfaces

[Sysname] interface Ethernet0/0
[Sysname-Ethernet0/0] ip address 7.0.0.1 255.0.0.0
[Sysname-Ethernet0/0] quit

[Sysname] interface Ethernet0/1
[Sysname-Ethernet0/1] ip address 9.0.0.1 255.0.0.0
[Sysname-Ethernet0/1] quit

3) Add the interfaces to security zones.

[Sysname] firewall zone local
[Sysname-zone-local] set priority 100
[Sysname-zone-local] quit

[Sysname] firewall zone trust
[Sysname-zone-trust] add interface Ethernet0/0
[Sysname-zone-trust] quit

[Sysname] firewall zone untrust
[Sysname-zone-untrust] add interface Ethernet0/1
[Sysname-zone-untrust] quit

4) Add static routes.

[Sysname] ip route-static 11.0.0.0 255.0.0.0 7.0.0.2
[Sysname] ip route-static 192.168.10.0 255.255.255.0 9.0.0.2

Configuration file

firewall packet-filter enable
firewall packet-filter default permit

interface Ethernet0/0
ip address 7.0.0.1 255.0.0.0

interface Ethernet0/1
ip address 9.0.0.1 255.0.0.0

firewall zone local
set priority 100

firewall zone trust
add interface Ethernet0/0
set priority 85

firewall zone untrust
add interface Ethernet0/1
set priority 5

firewall zone DMZ
set priority 50

firewall interzone local trust
firewall interzone local untrust
firewall interzone local DMZ
firewall interzone trust untrust
firewall interzone trust DMZ
firewall interzone DMZ untrust

ip route-static 11.0.0.0 255.0.0.0 7.0.0.2 preference 60
ip route-static 192.168.10.0 255.255.255.0 9.0.0.2 preference 60

Configurations on S7503E_2

Configuration procedures

1) Create VLANs.

# Create VLAN 23, 24, 100.
<Sysname> Sysname-view
[Sysname] vlan 23 to 24
[Sysname] vlan 100
[Sysname-vlan100] quit

2) Assign interfaces to the VLANs.

[Sysname] interface GigabitEthernet 4/0/1
[Sysname-GigabitEthernet4/0/1] port access vlan 100
[Sysname-GigabitEthernet4/0/1] quit
[Sysname] interface GigabitEthernet 4/0/23
[Sysname-GigabitEthernet4/0/23] port access vlan 23
[Sysname-GigabitEthernet4/0/23] quit
[Sysname] interface GigabitEthernet 4/0/24
[Sysname-GigabitEthernet4/0/24] port access vlan 24
[Sysname-GigabitEthernet4/0/24] quit

3) Configure the 10GE interface that connects the SecBlade LB card as a trunk interface, allowing packets of VLAN 23, 24, and 100 to pass.
[Sysname] interface Ten-GigabitEthernet 3/0/1
[Sysname-Ten-GigabitEthernet3/0/1] port link-type trunk
[Sysname-Ten-GigabitEthernet3/0/1] undo port trunk permit vlan 1
[Sysname-Ten-GigabitEthernet3/0/1] port trunk permit vlan 23 to 24 100
[Sysname-Ten-GigabitEthernet3/0/1] quit

Configuration file

```
vlan 23 to 24
vlan 100
interface GigabitEthernet4/0/1
  port access vlan 100
interface GigabitEthernet4/0/23
  port access vlan 23
interface GigabitEthernet4/0/24
  port access vlan 24
interface M-Ethernet0/0/0
  ip address 192.168.254.153 255.255.255.0
interface Ten-GigabitEthernet3/0/1
  port link-type trunk
  undo port trunk permit vlan 1
  port trunk permit vlan 23 to 24 100
```

Configurations on the SecBlade LB_2 Card

Pre-configuration

For the configuration procedure, see Configurations on the SecBlade LB Card.

Logging in to SecBlade LB_2

1) Configure an IP address for the management interface (GigabitEthernet 0/1). Make sure that the IP address of the management interface is in the same network segment of that of the PC. This step is optional. By default, the IP address of the management interface is 192.168.0.1/24.

```
<Sysname> system-view
[Sysname] interface GigabitEthernet0/1 //Enter management interface view
[Sysname-GigabitEthernet0/1] ip address 192.168.254.152 255.255.255.0 //Configure the IP address of the management interface as 192.168.254.152
[Sysname-GigabitEthernet0/1] quit
<Sysname> save //Save the configuration
```
2) Enter **http://192.168.254.152** in the IE address bar to enter the login page of the SecBlade LB_2 card web interface. Type the default username **h3c** and password **h3c**, type the verify code, select the language, and then click **Login**.

**Figure 56 SecBlade LB_2 login page**

### CLI configuration

1) Configuration Procedures

```plaintext
# Configure Layer 3 subinterfaces for the 10GE interface.

[Sysname] interface Ten-GigabitEthernet 0/0.23
[Sysname-Ten-GigabitEthernet0/0.23] vlan-type dot1q vid 23
[Sysname-Ten-GigabitEthernet0/0.23] ip address 8.0.0.2 255.0.0.0
[Sysname-Ten-GigabitEthernet0/0.23] quit

[Sysname] interface Ten-GigabitEthernet 0/0.24
[Sysname-Ten-GigabitEthernet0/0.24] vlan-type dot1q vid 24
[Sysname-Ten-GigabitEthernet0/0.24] ip address 9.0.0.2 255.0.0.0
[Sysname-Ten-GigabitEthernet0/0.24] quit

[Sysname] int Ten-GigabitEthernet 0/0.100
[Sysname-Ten-GigabitEthernet0/0.100] vlan-type dot1q vid 100
[Sysname-Ten-GigabitEthernet0/0.100] ip address 192.168.10.207 255.255.255.0
[Sysname-Ten-GigabitEthernet0/0.100] quit

2) Configuration file

```
interface GigabitEthernet0/4
  port link-mode route

interface Ten-GigabitEthernet0/0
  port link-mode route

interface Ten-GigabitEthernet0/0.23
  vlan-type dot1q vid 23
  ip address 8.0.0.2 255.0.0.0

interface Ten-GigabitEthernet0/0.24
  vlan-type dot1q vid 24
  ip address 9.0.0.2 255.0.0.0

interface Ten-GigabitEthernet0/0.100
  vlan-type dot1q vid 100
  ip address 192.168.10.207 255.255.255.0

Configure gateway load balancing in web interface

1) Save the last hop information

   From the navigation tree, select Load Balance > Global Configuration. Select the Keep Last-hop Information option and click Apply.

   Figure 57 Save the last-hop information

   ![Global Configuration](image)

Configurations on a Client and a Server

1) On the client, configure a route, with the destination address being the virtual IP 192.168.10.0/24 and the next hop address being 11.0.0.1.

2) On the server, specify the gateway address as 192.168.10.207, the IP address of a subinterface on the SecBlade LB card.

Verification

Verification method

   Use the PC as a client to access the web server.
Verification result

The client can access the server normally.

Server Load Balancing Stateful Failover Configuration Example

Network Requirements

Configure NAT-mode load balancing on the LB card installed on the S7503E to achieve load balancing between the private servers, which have a public IP address assigned to allow external users to access. When access demand and traffic to the servers are large, you can configure stateful failover to improve network reliability, ensuring that users can access the servers.

**Figure 58** Network diagram for stateful failover

![Network Diagram](image)

Configuration Considerations

Configure two VRRP groups between the two S7503E switches. Use VRID 15 as the gateway from the client to the SecBlade LB cards and VRID 192 as the gateway from the SecBlade LB cards to the client. Configure a VRRP group (VRID 191) between the two SecBlade LB cards, and use VRID 191 as the gateway to servers.

Software Version Used

This example is configured and verified on R3204P12.
Configuration Procedures

Configurations on S7503E_1

Configuration procedures

1) Create VLANs.

# Create VLAN 15 and VLAN 192.

```bash
<Sysname> Sysname-view
[Sysname] vlan 15 192
[Sysname] quit
```

2) Create VLAN interfaces and configure IP addresses for the interfaces, and then configure VRRP groups.

```bash
[Sysname] interface Vlan-interface 15
[Sysname-Vlan-interface15] ip address 15.0.0.2 255.255.255.0
[Sysname-Vlan-interface15] vrrp vrid 15 virtual-ip 15.0.0.4
[Sysname-Vlan-interface15] vrrp vrid 15 priority 105
[Sysname-Vlan-interface15] quit

[Sysname] interface Vlan-interface 192
[Sysname-Vlan-interface192] ip address 192.168.102.106 255.255.252.0
[Sysname-Vlan-interface192] vrrp vrid 192 virtual-ip 192.168.102.123
[Sysname-Vlan-interface192] vrrp vrid 192 priority 105
[Sysname-Vlan-interface192] quit
```

3) Assign interfaces to the VLANs.

```bash
[Sysname] interface GigabitEthernet 2/0/7
[Sysname-GigabitEthernet2/0/7] port access vlan 15 //Connects to the client
[Sysname-GigabitEthernet2/0/7] quit

[Sysname] interface GigabitEthernet 2/0/9
[Sysname-GigabitEthernet2/0/9] port access vlan 192 //Connects to servers
[Sysname-GigabitEthernet2/0/9] quit
```

4) Configure the interface as a trunk interface.

```bash
[Sysname] interface GigabitEthernet 2/0/17
[Sysname-GigabitEthernet2/0/17] port link-type trunk //Connects to the client
[Sysname-GigabitEthernet2/0/17] undo port trunk permit vlan 1
[Sysname-GigabitEthernet2/0/17] port trunk permit vlan 192 //Connecting interface of the two S7503E switches, used to create VRRP group 192 and VRRP group 191
[Sysname-GigabitEthernet2/0/17] quit

[Sysname] interface Ten-GigabitEthernet 4/0/1
[Sysname-Ten-GigabitEthernet4/0/1] port link-type trunk //10GE interface used by the S7503E switch to connect the SecBlade LB card
[Sysname-Ten-GigabitEthernet4/0/1] undo port trunk permit vlan 1
[Sysname-Ten-GigabitEthernet4/0/1] port trunk permit vlan 192
[Sysname-Ten-GigabitEthernet4/0/1] quit
```

5) Add static routes.

```bash
[Sysname] ip route-static 11.0.0.0 255.255.255.0 192.168.102.125
[Sysname] ip route-static 200.0.0.0 255.255.255.0 15.0.0.1
```
Configuration file

```
vlan 15
```

```
vlan 192
```

```
interface Vlan-interface15
  ip address 15.0.0.2 255.255.255.0
  vrrp vrid 15 virtual-ip 15.0.0.4
  vrrp vrid 15 priority 105

interface Vlan-interface192
  ip address 192.168.102.106 255.255.252.0
  vrrp vrid 192 virtual-ip 192.168.102.123
  vrrp vrid 192 priority 105

interface GigabitEthernet2/0/7
  port access vlan 15

interface GigabitEthernet2/0/9
  port access vlan 192
  //Interface connected to the servers

interface GigabitEthernet2/0/17
  port link-type trunk
  undo port trunk permit vlan 1
  port trunk permit vlan 192
  //Connecting interface of the two S7503E switches, used to create VRRP group 192 and VRRP group 191

interface Ten-GigabitEthernet4/0/1
  port link-type trunk
  undo port trunk permit vlan 1
  port trunk permit vlan 192

  ip route-static 11.0.0.0 255.255.255.0 192.168.102.125
  ip route-static 200.0.0.0 255.255.255.0 15.0.0.1
```

Configurations on S7503E_2

Configurations on S7503_2 are the same as those on S7503_1. See Configuration Procedures for reference.

Configurations on the SecBlade LB_1 Card

Pre-configuration

For the configuration procedure, see Configurations on the SecBlade LB Card.
Logging in to SecBlade LB_1

1) Configure an IP address for the management interface (GigabitEthernet 0/1). Make sure that the IP address of the management interface is in the same network segment of that of the PC. This step is optional. By default, the IP address of the management interface is 192.168.0.1/24.

```
<Sysname> system-view
<Sysname> interface GigabitEthernet0/1  //Enter management interface view
<Sysname-GigabitEthernet0/1> ip address 192.168.0.1 255.255.255.0  //Configure the IP address of the management interface as 192.168.0.1
<Sysname-GigabitEthernet0/1> quit
<Sysname> save  //Save the configuration
```

2) Log in to the web interface

Enter \textbf{http://192.168.0.1} in the IE address bar to enter the login page of the SecBlade LB_1 card web interface. Type the default username \textbf{h3c} and password \textbf{h3c}, type the verify code, select the language, and then click Login.

\textbf{Figure 59 SecBlade LB_1 card login page}

CLI configurations for the SecBlade LB_1 card

1) Configuration procedures

```
# Create a subinterface for the 10GE Layer 3 interface and configure VRRP group 191 on the subinterface.

<Sysname> system-view
<Sysname> interface Ten-GigabitEthernet 0/0.192
<Sysname-Ten-GigabitEthernet0/0.192> vlan-type dot1q vid 192
<Sysname-Ten-GigabitEthernet0/0.192> ip address 192.168.102.103 255.255.252.0
<Sysname-Ten-GigabitEthernet0/0.192> vrrp vrid 191 virtual-ip 192.168.102.125
<Sysname-Ten-GigabitEthernet0/0.192> vrrp vrid 191 priority 105
<Sysname-Ten-GigabitEthernet0/0.192> quit
```

# Add a static route.

```
ip route-static 0.0.0.0 0.0.0.0 192.168.102.123
```

2) Configuration file

```
interface GigabitEthernet0/1
port link-mode route
```
ip address 192.168.0.1 255.255.255.0

interface Ten-GigabitEthernet0/0.192
vlan-type dot1q vid 192
ip address 192.168.102.103 255.255.252.0
vrrp vrid 191 virtual-ip 192.168.102.125
vrrp vrid 191 priority 105

ip route-static 0.0.0.0 0.0.0.0 192.168.102.123

Configuring stateful failover in the web interface

For information about load balancing configuration, see Configurations on the SecBlade LB Card.

1) Create a real service group.

From the navigation tree, select Load Balance > Server Load Balance. Click the Real Service Group tab.

Figure 60 Real service group page

Click Add to enter the real service group configuration page.

Figure 61 Add a real service group

- Type the real service group name telnet.
- Select Round Robin as the scheduler algorithm.
- Select ICMP as the health monitoring type.
- Select Keep Connection as the real service troubleshooting method.
- Click Apply.
2) Create real services.

From the navigation tree, select Load Balance > Server Load Balance. Click the Real Service tab.

**Figure 63 Real service page**

Click Add to enter the real service configuration page.

**Figure 64 Add a real service**

- Type the real service name **Server1**.
- Type the real service IP **192.168.102.110**.
- Select the real service group **telnet**.
- Click **Apply**.

Follow similar steps to create real service **Server2** and **Server3**.
3) Create a virtual service.

From the navigation tree, select **Load Balance > Server Load Balance**. Click the **Virtual Service** tab.

**Figure 66 Virtual service page**

Click **Add** to enter the virtual service configuration page.

**Figure 67 Add virtual service telnet**

- Type **telnet** as the virtual service name
- Type **11.0.0.1** as the virtual service IP address and select mask **32 (255.255.255.255)**.
- Set port number to **0**.
- Select **NAT** as the forwarding mode.
- Select the real service group **telnet**.
- Select the **Enable Virtual Service** option.
- Click **Apply**.

**Figure 68** Virtual service **telnet** created

4) Configure the stateful failover function.

From the navigation tree, select **High Availability > Stateful Failover**. Select the **Enable Stateful Failover** option and select a backup type. Click the **Modify Backup Interface** button and select the backup interface(s).

**Figure 69** Configure the backup interface(s)

Click **Apply**.

**Figure 70** Configure the stateful failover status
Caution

- After you configure stateful failover, save the configuration and then reboot the device to validate the stateful failover configuration.
- After the stateful failover function takes effect on both SecBlade LB cards, the stateful failover status changes to **Synchronization**.

---

**Configurations on the SecBlade LB_2 Card**

Configurations on SecBlade LB_2 are the same as those on SecBlade LB_1. See [Configurations on the SecBlade LB_1 Card](#) for reference.

**Verification**

**Verification method**

Construct a network according to [Figure 58](#). Use the client to access the servers through the SecBlade LB card. During user access, bring down the S7503E switch.

**Verification result**

The client can access the server through the main SecBlade LB card. After the main switch is down, the backup SecBlade LB card takes over the access traffic, and the client can still access the servers normally.

---

**References**

**Protocols and Standards**

None

**Related Documentation**

*H3C SecBlade LB Card  User Manual*