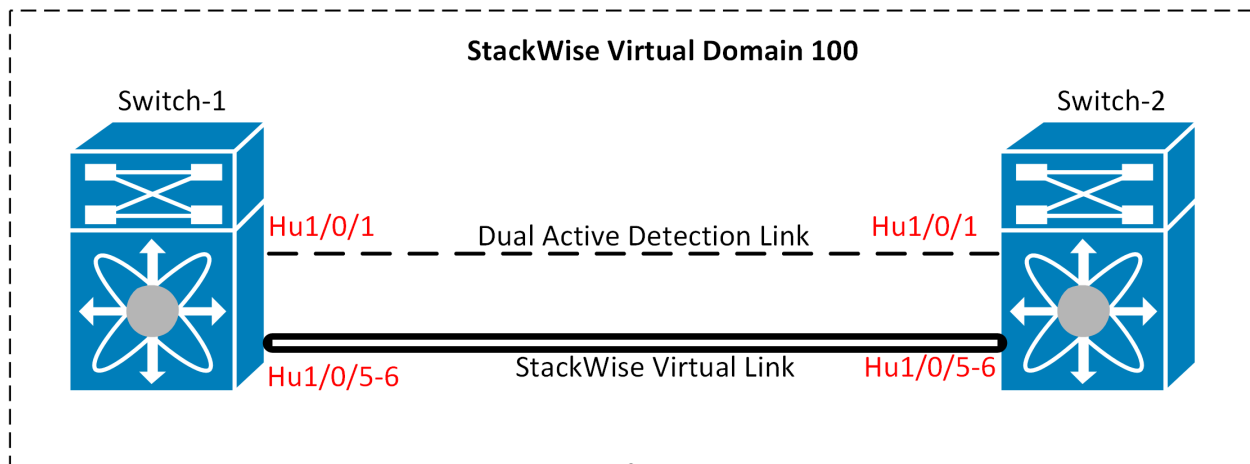
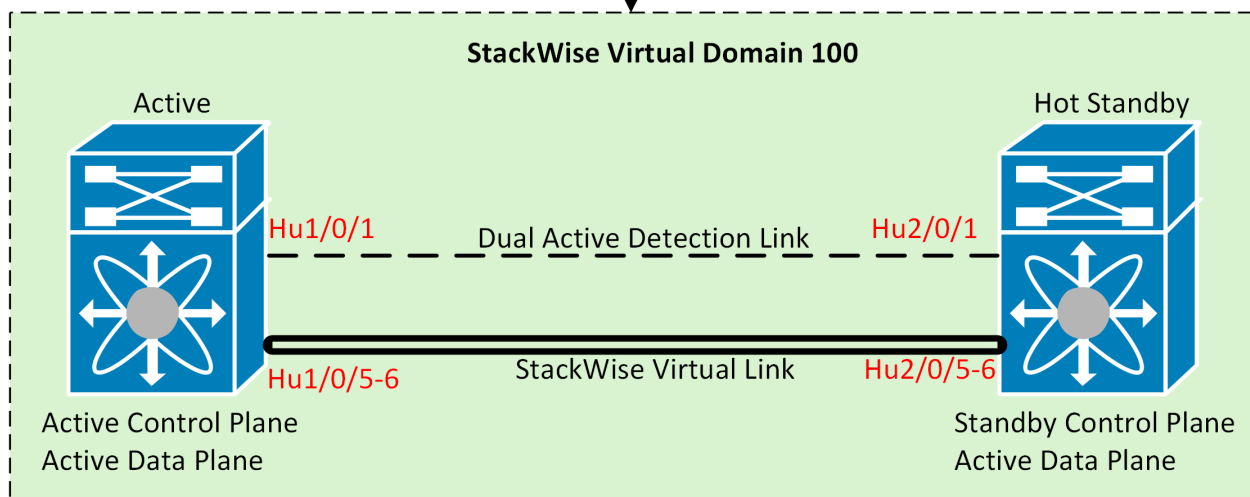


## Cisco C9500 StackWise Virtual (SVL)-Lab



From 2 physical entities to a single logical unit



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The Cisco StackWise Virtual (SVL) technology allows two physical devices to operate as a single logical unit. The devices share the control and management planes, while both devices actively participate in data plane forwarding.

For in-depth details regarding the StackWise Virtual technology, visit:

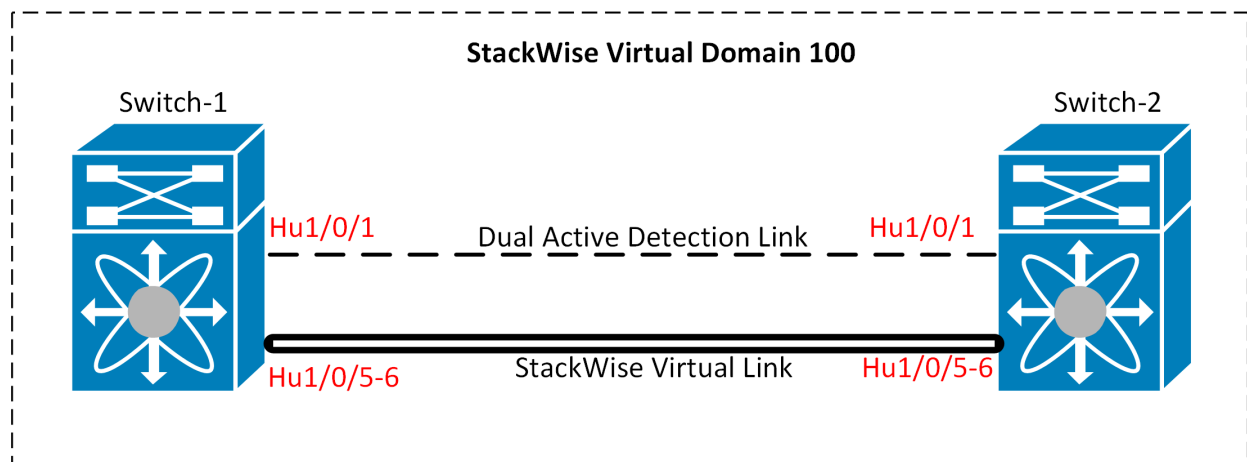
<https://www.cisco.com/c/en/us/products/collateral/switches/catalyst-9000/nb-06-cat-9k-stack-wp-cte-en.html>

This lab explores the required configuration for the Cisco C9500 StackWise Virtual.

#### Note

This lab was conducted in a controlled environment. Any configurations in a production network should be implemented during a designated maintenance window. Additionally, always refer to official Cisco documentation relevant to your specific hardware and software.

## Lab Topology



This lab utilizes Cisco C9500-32C-A switches running Cisco IOS XE Software, Version 17.15.02.

## StackWise Virtual Configuration

Some high-level pre-requisites for configuring the Cisco StackWise Virtual are as follows:

1. Both devices to be configured in the StackWise Virtual domain must be directly connected.
2. Both devices must be of the same switch model and running the same license level.
  - a. The Network Advantage license is required for StackWise Virtual configuration
3. Both switches must be running the same software version.
4. All physical ports that are used to configure a StackWise Virtual Link must share the same speed.

### Initial State

Initially, the devices are in standalone mode:

#### Switch-1:

```

SVL-1#show redundancy
Redundant System Information :
-----
    Available system uptime = 10 hours, 17 minutes
Switchovers system experienced = 0
    Standby failures = 0
    Last switchover reason = none

    Hardware Mode = Simplex
    Configured Redundancy Mode = Non-redundant
    Operating Redundancy Mode = Non-redundant
    Maintenance Mode = Disabled
    Communications = Down      Reason: Failure

Current Processor Information :
-----
    Active Location = slot 1
    Current Software state = ACTIVE
    Uptime in current state = 10 hours, 17 minutes
    Image Version = Cisco IOS Software [IOSXE], Catalyst L3 Switch Software
(CAT9K_IOSXE), Version 17.15.2, RELEASE SOFTWARE (fc3)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2024 by Cisco Systems, Inc.
Compiled Wed 27-Nov-24 23:19 by mcpre
    BOOT = bootflash:packages.conf;
    CONFIG_FILE =
    Fast Switchover = Enabled
    Initial Garp = Enabled

Peer (slot: 1) information is not available because it is in 'DISABLED' state

```

## Switch-2:

```

SVL-2#show redundancy
Redundant System Information :
-----
    Available system uptime = 10 hours, 17 minutes
Switchovers system experienced = 0
    Standby failures = 0
    Last switchover reason = none

    Hardware Mode = Simplex
    Configured Redundancy Mode = Non-redundant
    Operating Redundancy Mode = Non-redundant
    Maintenance Mode = Disabled
    Communications = Down      Reason: Failure

Current Processor Information :
-----
    Active Location = slot 1
    Current Software state = ACTIVE
    Uptime in current state = 10 hours, 17 minutes
    Image Version = Cisco IOS Software [IOSXE], Catalyst L3 Switch Software
(CAT9K_IOSXE), Version 17.15.2, RELEASE SOFTWARE (fc3)

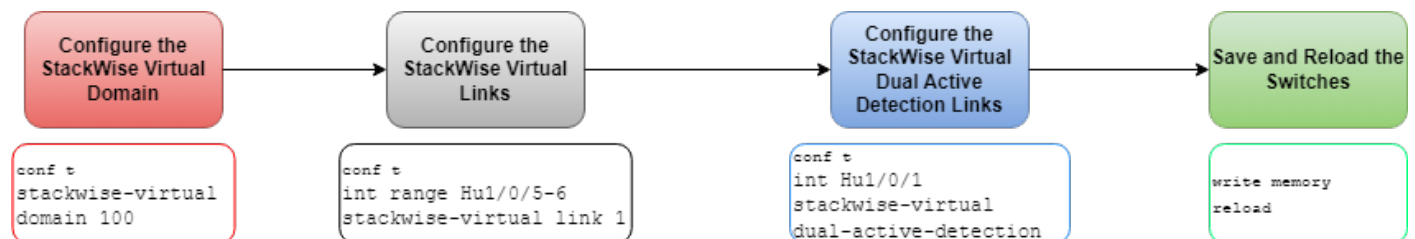
```

```
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2024 by Cisco Systems, Inc.
Compiled Wed 27-Nov-24 23:19 by mcpre
        BOOT = bootflash:packages.conf;
        CONFIG_FILE =
Fast Switchover   = Enabled
Initial Garp      = Enabled

Peer (slot: 1) information is not available because it is in 'DISABLED' state
```

## Standalone-to-StackWise Virtual Configuration

The StackWise Virtual configuration is a 4-step process as follows:



### 1. Configure the StackWise Virtual Domain

```
Switch 1:
SVL-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SVL-1(config)#stackwise-virtual
Please reload the switch for Stackwise Virtual configuration to take effect
Upon reboot, the config will be part of running config but not part of start up config.
SVL-1(config-stackwise-virtual)#
SVL-1(config-stackwise-virtual)#
SVL-1(config-stackwise-virtual)#domain 100
SVL-1(config-stackwise-virtual)#
SVL-1(config-stackwise-virtual)#
SVL-1(config-stackwise-virtual)#exit

Switch 2:
SVL-2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SVL-2(config)#stackwise-virtual
Please reload the switch for Stackwise Virtual configuration to take effect
Upon reboot, the config will be part of running config but not part of start up config.
SVL-2(config-stackwise-virtual)#
SVL-2(config-stackwise-virtual)#
SVL-2(config-stackwise-virtual)#domain 100
SVL-2(config-stackwise-virtual)#
SVL-2(config-stackwise-virtual)#
SVL-2(config-stackwise-virtual)#exit
```

## 2. Configure the StackWise Virtual Link

### Switch-1:

```
SVL-1(config)#interface range Hun 1/0/5-6
SVL-1(config-if-range)#stackwise-virtual link 1
WARNING: SVL configuration will be ignored on lower (1G) speed.
WARNING: All the extraneous configurations will be removed for HundredGigE1/0/5 on reboot
INFO: Upon reboot, the config will be part of running config but not part of start up config.
WARNING: SVL configuration will be ignored on lower (1G) speed.
WARNING: All the extraneous configurations will be removed for HundredGigE1/0/6 on reboot
INFO: Upon reboot, the config will be part of running config but not part of start up config.
SVL-1(config-if-range)#
SVL-1(config-if-range)#
SVL-1(config-if-range)#exit
```

### Switch-2:

```
SVL-2(config)#interface range Hun 1/0/5-6
SVL-2(config-if-range)#stackwise-virtual link 1
WARNING: SVL configuration will be ignored on lower (1G) speed.
WARNING: All the extraneous configurations will be removed for HundredGigE1/0/5 on reboot
INFO: Upon reboot, the config will be part of running config but not part of start up config.
WARNING: SVL configuration will be ignored on lower (1G) speed.
WARNING: All the extraneous configurations will be removed for HundredGigE1/0/6 on reboot
INFO: Upon reboot, the config will be part of running config but not part of start up config.
SVL-2(config-if-range)#
SVL-2(config-if-range)#exit
```

## 3. Configure the StackWise Virtual dual-active detection.

### Switch-1:

```
SVL-1(config)#int h1/0/1
SVL-1(config-if)#stackwise-virtual dual-active-detection
WARNING: All the extraneous configurations will be removed for HundredGigE1/0/1 on reboot.
INFO: Upon reboot, the config will be part of running config but not part of start up config.
SVL-1(config-if)#
SVL-1(config-if)#end
```

### Switch-2:

```
SVL-2(config)#int h1/0/1
SVL-2(config-if)#stackwise-virtual dual-active-detection
WARNING: All the extraneous configurations will be removed for HundredGigE1/0/1 on reboot.
INFO: Upon reboot, the config will be part of running config but not part of start up config.
SVL-2(config-if)#
SVL-2(config-if)#
SVL-2(config-if)#end
```

#### 4. Save the configuration and restart both devices.

```
Apply the configuration on both Switch-1 & Switch-2
SVL-1 and SVL-2
SVL-1#wr mem
Building configuration...
[OK]
SVL-1#reload
```

During the reload process, the startup and running configuration of both devices are combined. The first switch to boot up is assigned Switch ID 1 and it will be the active switch in the StackWise Virtual domain. The second switch to reboot becomes the standby switch and is assigned Switch ID 2.

In this lab Switch SVL-1 is the active switch which was rebooted first, and SVL-2 is the standby device.

The console logs display each device being given a switch ID based on its role in the SVL domain.

##### SVL-1 Console log:

```
Waiting for remote chassis to join
#####
Chassis number is 1
!
```

##### SVL-2 Console log:

```
Waiting for remote chassis to join
#####
Chassis number is 2
All chassis in the stack have been discovered. Accelerating discovery
```

After the StackWise domain is active, the devices can only be managed from the console of the active device. The system is now managed as a single unit, not separate physical entities.

##### SVL-1 Console:

```
Press RETURN to get started!

SVL-1>
SVL-1>en
Password:
SVL-1#
```

##### SVL-2 Console (Now SVL-1-Standby)

```
Press RETURN to get started!

SVL-1-stby>
Standby console disabled

SVL-1-stby>
Standby console disabled
```

## Verifications

1. Verify that the switches are no longer operating as individual units but rather in an Active/Standby state.

```
SVL-1#show switch
Switch/Stack Mac Address : bcd2.959d.b4xy - Local Mac Address
Mac persistency wait time: Indefinite
```

Switch#	Role	Mac Address	Priority	H/W Version	Current State
*1	Active	bcd2.959d.b4xy	15	V02	Ready
2	Standby	bcd2.959d.blyx	1	V02	Ready

The MAC address of the Active Switch is used as the MAC address of the logical unit. This is the system (virtual) MAC address that is used for LACP, ARP etc. The Stack MAC address remains persistent even if Switch-2 was to become the Active Switch as shown below.

```
SVL-1#show switch
Switch/Stack Mac Address : bcd2.959d.b4xy - Local Mac Address
Mac persistency wait time: Indefinite
```

Switch#	Role	Mac Address	Priority	H/W Version	Current State
1	Standby	bcd2.959d.b4xy	15	V02	Ready
*2	Active	bcd2.959d.blyx	1	V02	Ready

2. Verify the redundancy state.

```
SVL-1#show redundancy
Redundant System Information :
-----
    Available system uptime = 23 minutes
Switchovers system experienced = 0
    Standby failures = 0
    Last switchover reason = none

    Hardware Mode = Duplex
    Configured Redundancy Mode = sso
    Operating Redundancy Mode = sso
    Maintenance Mode = Disabled
    Communications = Up

Current Processor Information :
-----
    Active Location = slot 1
    Current Software state = ACTIVE
    Uptime in current state = 22 minutes
    Image Version = Cisco IOS Software [IOSXE], Catalyst L3 Switch
Software (CAT9K_IOSXE), Version 17.15.2, RELEASE SOFTWARE (fc3)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2024 by Cisco Systems, Inc.
```

```

Compiled Wed 27-Nov-24 23:19 by mcpre
      BOOT = bootflash:packages.conf;
      CONFIG_FILE =
Fast Switchover   = Enabled
Initial Garp     = Enabled

Peer Processor Information :
-----
      Standby Location = slot 2
      Current Software state = STANDBY HOT
      Uptime in current state = 19 minutes
      Image Version = Cisco IOS Software [IOSXE], Catalyst L3 Switch
      Software (CAT9K_IOSXE), Version 17.15.2, RELEASE SOFTWARE (fc3)
      Technical Support: http://www.cisco.com/techsupport
      Copyright (c) 1986-2024 by Cisco Systems, Inc.
Compiled Wed 27-Nov-24 23:19 by mcpre
      BOOT = bootflash:packages.conf;
      CONFIG_FILE =

```

The output indicates that Switch-1 is ACTIVE and Switch-2 is STANDBY HOT, ready to take over operations in case of Active device failure. The redundant mode changed from Non-redundant to SSO.

### 3. Verify that the StackWise Virtual links are all operational

```

SVL-1#show stackwise-virtual link
Stackwise Virtual Link(SVL) Information:
-----
Flags:
-----
Link Status
-----
U-Up D-Down
Protocol Status
-----
S-Suspended P-Pending E-Error T-Timeout R-Ready
-----

```

Switch	SVL	Ports	Link-Status	Protocol-Status
1	1	HundredGigE1/0/5	U	R
		HundredGigE1/0/6	U	R
2	1	HundredGigE2/0/5	U	R
		HundredGigE2/0/6	U	R

```

SVL-1#

```

### 4. Verify that the status of StackWise Virtual dual active detection links is “up”

```

SVL-1#show stackwise-virtual dual-active-detection
In dual-active recovery mode: No
Recovery Reload: Enabled
Dual-Active-Detection Configuration:
-----

```

Switch	Dad port	Status
1	HundredGigE1/0/1	up
2	HundredGigE2/0/1	up



## 5. Verify the StackWise Virtual Neighbors.

```
SVL-1#show stackwise-virtual neighbors
Stackwise Virtual Link(SVL) Neighbors Information:
-----
Switch  SVL      Local Port                               Remote Port
-----  ---  -----
1        1      HundredGigE1/0/5                         HundredGigE2/0/5
        1      HundredGigE1/0/6                         HundredGigE2/0/6
2        1      HundredGigE2/0/5                         HundredGigE1/0/5
        1      HundredGigE2/0/6                         HundredGigE1/0/6
```

## References:

<https://www.cisco.com/c/en/us/products/collateral/switches/catalyst-9000/nb-06-cat-9k-stack-wp-cte-en.html>

[https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst9500/software/release/17-9/configuration\\_guide/ha/b\\_179\\_ha\\_9500\\_cg/configuring\\_cisco\\_stackwise\\_virtual.html](https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst9500/software/release/17-9/configuration_guide/ha/b_179_ha_9500_cg/configuring_cisco_stackwise_virtual.html)