IVR Zones and Zonesets

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Information about IVR Zones and Zonesets

As part of the IVR configuration, you need to configure one or more IVR zones to enable cross-VSAN communication. To achieve this result, you must specify each IVR zone as a set of (pWWN, VSAN) entries. Like zones, several IVR zone sets can be configured to belong to an IVR zone. You can define several IVR zone sets and activate only one of the defined IVR zone sets.

Note The same IVR zone set must be activated on all of the IVR-enabled switches

Table 1: Key Differences Between IVR Zones and Zones

IVR Zones	Zones
IVR zone membership is specified using the VSAN and pWWN combination.	Zone membership is specified using pWWN, fabric WWN, sWWN, or the AFID.
Default zone policy is always deny (not configurable).	Default zone policy is deny (configurable).

As part of the IVR configuration, you need to configure one or more IVR zone to enable cross-VSAN communication. To achieve this, you must specify each IVR zone as a set of (pWWN, VSAN) entries. Different IVR zone sets can contain the same IVR zone, because IVR zones can be members of one or more IVR zone sets.

Related Topics

Configuring IVR Zones, on page 4
Configuring IVR Zone Sets, on page 5
Guidelines and Limitations, on page 3

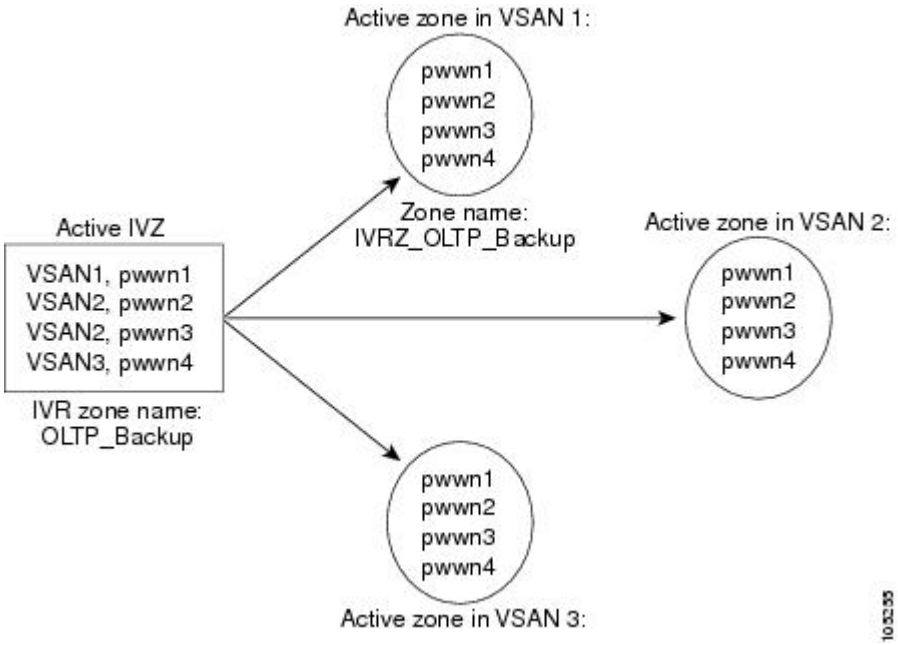
Verifying IVR Configuration

Automatic IVR Zone Creation

To allow pwwn1 to communicate with pwwn2, they must be in the same zone in VSAN 1, as well as in VSAN 2. If they are not in the same zone, then the hard-zoning ACL entries will prohibit pwwn1 from communicating with pwwn2.

A zone corresponding to each active IVR zone is automatically created in each edge VSAN specified in the active IVR zone. All pWWNs in the IVR zone are members of these zones in each VSAN.

Figure 1: Creating Zones Upon IVR Zone Activation



The zones are created automatically by the IVR process when an IVR zone set is activated. They are not stored in a full zone set database and are lost when the switch reboots or when a new zone set is activated. The IVR feature monitors these events and adds the zones corresponding to the active IVR zone set configuration when a new zone set is activated. Like zone sets, IVR zone sets are also activated nondisruptively.

Note If pwwn1 and pwwn2 are in an IVR zone in the current as well as the new IVR zone set, then activation of the new IVR zone set does not cause any traffic disruption between them.

If pwwn1 and pwwn2 are in an IVR zone in the current as well as the new IVR zone set, then activation of the new IVR zone set does not cause any traffic disruption between them.

Default Settings

Parameters	Default
IVR feature	Disabled
IVR NAT	Disabled
IVR distribution	Disabled
IVR Autotopology	Disabled
IVR VSANs	Not added to virtual domains
QoS for IVR Zones	Low

Guidelines and Limitations

When interop mode is enabled, consider the following IVR configuration guidelines:

- When a member's native VSAN is in interop mode (for example, when the interop mode is 2, 3, or 4), then ReadOnly, the QoS attribute, and LUN zoning are not permitted
- When a member’s VSAN is already in interop mode and an attempt is made to configure ReadOnly, the QoS attribute, or LUN zoning, a warning message is displayed to indicate that the configuration is not permitted.
- When you configure ReadOnly, the QoS attribute, or LUN zoning first, and then change the member’s VSAN interop mode, a warning message is displayed to indicate the configuration is not permitted. You are then prompted to change the configuration.

This example shows samples of the warning messages that are displayed when configuration changes are made that affect ReadOnly, the QoS attribute, and LUN zoning.

```
switch(config)# vsan database
switch(config-vsan-db)# vsan 2
switch(config-vsan-db)# vsan 2 interop 2
switch(config-vsan-db)# exit

switch(config)# ivr zoneset name ivr_zs1
switch(config-ivr-zoneset)# zone name ivr_z1
switch(config-ivr-zoneset-zone)# member pwwn 21:00:00:14:c3:3d:45:22
lun 0x32 vsan 2
VSAN is in interop mode, and LUN zoning cannot be set.

switch(config)# ivr zoneset name ivr_zs1
switch(config-ivr-zoneset)# zone name ivr_z1
switch(config-ivr-zoneset-zone)# member pwwn 21:00:00:14:c3:3d:45:22 vsan 2
switch(config-ivr-zoneset-zone)# attribute read-only
VSAN is in interop mode and zone member has been configured, zone cannot be set to READ-ONLY.
switch(config-ivr-zoneset-zone)# attribute qos priority medium
VSAN is in interop mode and zone member has been configured,
QoS cannot be assigned to zone.
```

Related Topics

Information about IVR Zones and Zonesets, on page 1
Configuring IVR Zones, on page 4
Configuring IVR Zone Sets, on page 5

Configuring IVR Zones and Zonesets

Configuring IVR Zones

Before you begin

- Ensure you are in the correct storage-based VDC.
- Ensure you have enabled the IVR feature.

SUMMARY STEPS

1. **configure terminal**
2. **ivr zone name** *zonename*
3. **member pwwn** *pwwn* **vsan** *vsan-id*
4. (Optional) **show ivr pending-diff**
5. (Optional) **show ivr zone**
6. (Optional) **ivr commit**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters configuration mode.

Step 2	**ivr zone name** *zonename*
	Example:
	`switch(config)# ivr zone name sample_vsan2-3`
	`switch(config-ivr-zone)#`
		Creates the IVR zone and enters IVR zone configuration mode. The *zonename* can be any case-sensitive, alphanumeric string up to 59 characters.

Step 3	**member pwwn** *pwwn* **vsan** *vsan-id* **Example:** `switch(config-ivr-zone)# member pwwn 21:00:00:20:37:c8:5c:6b vsan 2`	Adds the specified pWWN in VSAN 2 as an IVR zone member. The *pwwn* is in colon-separated hexadecimal format. The *vsan* range is from 1 to 4093.

	Command or Action	Purpose
Step 4	(Optional) **show ivr pending-diff** **Example:** `switch(config-ivr-zone)# show ivr pending-diff`	Displays information about the pending changes to the IVR database. This displays changes that have not been committed yet.
Step 5	(Optional) **show ivr zone** **Example:** `switch(config-ivr-zone)# show ivr zone`	Displays information about the zones in the active zone database.
Step 6	(Optional) **ivr commit** **Example:** `switch(config-ivr-zone)# ivr commit`	Commits all pending changes to IVR to the active IVR database and distributes these changes to all IVR-enabled switches in the fabric.

What to do next

You must commit the IVR changes to make these changes permanent and distribute the changes to all IVR-enabled switches in the fabric.

Related Topics

Information about IVR Zones and Zonesets, on page 1
Guidelines and Limitations, on page 3
Verifying IVR Configuration

Configuring IVR Zone Sets

Before you begin

- Ensure you are in the correct storage-based VDC.
- Ensure you have enabled the IVR feature.

SUMMARY STEPS

1. **configure terminal**
2. **ivr zoneset name** *zoneset-name*
3. **member** *zonename*
4. (Optional) **show ivr pending-diff**
5. (Optional) **show ivr zoneset**
6. (Optional) **ivr commit**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters configuration mode.

Step 2	**ivr zoneset name** *zoneset-name*
	Example:
	`switch(config)# ivr zoneset name ivrZoneset1`
	`switch(config-ivr-zoneset)#`
		Creates the IVR zone set and enters IVR zone set configuration mode. The *zoneset-name* can be any case-sensitive, alphanumeric string up to 59 characters.

Step 3	**member** *zonename* **Example:** `switch(config-ivr-zoneset)# member sample_vsan2-3`	Adds the specified IVR zone as an IVR zone set member. The *zoneset-name* can be any case-sensitive, alphanumeric string up to 59 characters.
Step 4	(Optional) **show ivr pending-diff** **Example:** `switch(config-ivr-zoneset)# show ivr pending-diff`	Displays information about the pending changes to the IVR database. This displays changes that have not been committed yet.
Step 5	(Optional) **show ivr zoneset** **Example:** `switch(config-ivr-zoneset)# show ivr zoneset`	Displays information about the zone sets in the active zone set database.
Step 6	(Optional) **ivr commit** **Example:** `switch(config-ivr-zoneset)# ivr commit`	Commits all pending changes to IVR to the active IVR database and distributes these changes to all IVR-enabled switches in the fabric.

What to do next

You must commit the IVR changes to make these changes permanent and distribute the changes to all IVR-enabled switches in the fabric. You must also activate the zone set.

Related Topics

Information about IVR Zones and Zonesets, on page 1
Guidelines and Limitations, on page 3
Verifying IVR Configuration

Configuring LUNs in IVR Zoning

LUN zoning can be used between members of active IVR zones. You can configure the service by creating and activating LUN zones between the desired IVR zone members in all relevant edge VSANs using the zoning interface or you can use LUN zoning directly supported by IVR.

Before you begin

- Ensure you are in the correct storage-based VDC.
- Ensure you have enabled the IVR feature.

SUMMARY STEPS

1. **configure terminal**
2. **ivr zone name** *zonename*
3. **member pwwn** *pwwn* **lun** *lun-id* **vsan** *vsan-id* [**autonomous-fabric-id** *afid*]
4. (Optional) **show ivr pending-diff**
5. (Optional) **show ivr zone**
6. (Optional) **ivr commit**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters configuration mode.

Step 2	**ivr zone name** *zonename*
	Example:
	`switch(config)# ivr zone name ivrLunZone`
	`switch(config-ivr-zone)#`
		Creates the IVR zone and enters IVR zone configuration mode. The *zonename* can be any case-sensitive, alphanumeric string up to 59 characters.

Step 3	**member pwwn** *pwwn* **lun** *lun-id* **vsan** *vsan-id* [**autonomous-fabric-id** *afid*]
	Example:
	`switch(config-ivr-zone)# member pwwn 21:00:00:20:37:c8:5c:6b`
	`lun 0x64 vsan 2`
		Configures an IVR zone member based on the specified pWWN and LUN value.
		Note The CLI interprets the LUN identifier value as a hexadecimal value whether or not the 0x prefix is included.
		The *pwwn* is in colon-separated hexadecimal format. The *lun-id* is in hexadecimal notation. The *vsan* range is from 1 to 4093.

Step 4	(Optional) **show ivr pending-diff** **Example:** `switch(config-ivr-zone)# show ivr pending-diff`	Displays information about the pending changes to the IVR database. This displays changes that have not been committed yet.
Step 5	(Optional) **show ivr zone** **Example:** `switch(config-ivr-zone)# show ivr zone`	Displays information about the zones in the active zone database.

	Command or Action	Purpose
Step 6	(Optional) **ivr commit** **Example:** `switch(config-ivr-zone)# ivr commit`	Commits all pending changes to IVR to the active IVR database and distributes these changes to all IVR-enabled switches in the fabric.

Configuring the QoS Attribute

Before you begin

- Ensure you are in the correct storage-based VDC.
- Ensure you have enabled the IVR feature.

SUMMARY STEPS

1. **configure terminal**
2. **ivr zone name** *zonename*
3. **attribute qos priority** { **low** | **medium** | **high** }
4. (Optional) **show ivr pending-diff**
5. (Optional) **show ivr zone**
6. (Optional) **ivr commit**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters configuration mode.

Step 2	**ivr zone name** *zonename*
	Example:
	`switch(config)# ivr zone name sample_vsan2-3`
	`switch(config-ivr-zone)#`
		Creates the IVR zone and enters IVR zone configuration mode. The *zonename* can be any case-sensitive, alphanumeric string up to 59 characters.

Step 3	**attribute qos priority** { **low**	**medium**	**high** } **Example:** `switch(config-ivr-zone)# attribute qos priority medium`	Configures the QoS for IVR zone traffic.
Step 4	(Optional) **show ivr pending-diff** **Example:** `switch(config-ivr-zone)# show ivr pending-diff`	Displays information about the pending changes to the IVR database. This displays changes that have not been committed yet.

	Command or Action	Purpose
Step 5	(Optional) **show ivr zone** **Example:** `switch(config-ivr-zone)# show ivr zone`	Displays information about the zones in the active zone database.
Step 6	(Optional) **ivr commit** **Example:** `switch(config-ivr-zone)# ivr commit`	Commits all pending changes to IVR to the active IVR database and distributes these changes to all IVR-enabled switches in the fabric.

Example

Configuring Read-only Zoning

Read-only zoning (with or without LUNs) can be used between members of active IVR zones. To configure this service, you must create and activate read-only zones between the desired IVR zone members in all relevant edge VSANs using the zoning interface.

Note Read-only zoning cannot be configured in an IVR zone set setup.

Before you begin

- Ensure you are in the correct storage-based VDC.
- Ensure you have enabled the IVR feature.

SUMMARY STEPS

1. **configure terminal**
2. **ivr zone name** *zonename*
3. **attribute read-only**
4. (Optional) **show ivr pending-diff**
5. (Optional) **show ivr zone**
6. (Optional) **ivr commit**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:**	Enters configuration mode.

	Command or Action	Purpose
	`switch# configure terminal` `switch(config)#`	

Step 2	**ivr zone name** *zonename*
	Example:
	`switch(config)# ivr zone name sample_vsan2-3`
	`switch(config-ivr-zone)#`
		Enters IVR zone configuration mode. The *zonename* can be any case-sensitive, alphanumeric string up to 59 characters.

Step 3	**attribute read-only** **Example:** `switch(config-ivr-zone)# attribute read-only`	Configures the QoS for IVR zone traffic.
Step 4	(Optional) **show ivr pending-diff** **Example:** `switch(config-ivr-zone)# show ivr pending-diff`	Displays information about the pending changes to the IVR database. This displays changes that have not been committed yet.
Step 5	(Optional) **show ivr zone** **Example:** `switch(config-ivr-zone)# show ivr zone`	Displays information about the zones in the active zone database.
Step 6	(Optional) **ivr commit** **Example:** `switch(config-ivr-zone)# ivr commit`	Commits all pending changes to IVR to the active IVR database and distributes these changes to all IVR-enabled switches in the fabric.

Verifying IVR Configuration

To display the IVR configuration, perform one of the following tasks:

Command	Purpose
show ivr	Displays the status for the IVR configuration.
show ivr diagnostics	Displays information about IVR diagnostics.
show ivr merge status	Displays information the last IVR merge event.
show ivr pending	Displays information about the IVR pending database.
show ivr pending-diff	Displays the differences between the pending database and the config database.
show ivr vsan-topology [**active** | **configured**]	Displays the IVR VSAN topology.

Command	Purpose
show ivr session status	Displays information about IVR CFS session.
show ivr virtual-domains	Displays information about IVR virtual domains for all local VSANs.
show ivr zone	Displays information about IVR zones.
show ivr zoneset	Displays information about IVR zone sets.
show ivr service-group active	Displays information about the active service group.
show ivr service-group configured	Displays information about the configured service group.
show autonomous-fabric-id database	Displays information about the AFIDs.
show ivr virtual-fcdomain-add-status	Displays the status of the IVR virtual domain configuration.

Related Topics

Information about IVR Zones and Zonesets, on page 1
Configuring IVR Zones, on page 4
Configuring IVR Zone Sets, on page 5

Feature History

Table 2: Feature History IVR

Feature Name	Releases	Feature Information
IVR	5.2(1)	This feature was introduced.