Managing Fabrics

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Graceful Insertion and Removal (GIR) Mode

The Graceful Insertion and Removal (GIR) mode, or maintenance mode, allows you to isolate a switch from the network with minimum service disruption. In the GIR mode you can perform real-time debugging without affecting traffic.

You can use graceful insertion and removal to gracefully remove a switch and isolate it from the network in order to perform debugging operations. The switch is removed from the regular forwarding path with minimal traffic disruption. When you are finished performing the debugging operations, you can use graceful insertion to return the switch to its fully operational (normal) mode. In graceful removal, all external protocols are gracefully brought down except the fabric protocol (IS-IS) and the switch is isolated from the network. During maintenance mode, the maximum metric is advertised in IS-IS within the Cisco Application Centric Infrastructure (Cisco ACI) fabric and therefore the maintenance mode TOR does not attract traffic from the spine switches. In addition, all the front-panel interfaces are shutdown on the switch except the fabric interfaces. In graceful insertion, the switch is automatically decommissioned, rebooted, and recommissioned. When recommissioning is completed, all external protocols are restored and maximum metric in IS-IS is reset after 10 minutes.

The following protocols are supported:
- Border Gateway Protocol (BGP)
- Enhanced Interior Gateway Routing Protocol (EIGRP)
- Intermediate System-to-Intermediate System (IS-IS)
- Open Shortest Path First (OSPF)
- Link Aggregation Control Protocol (LACP)

Important Notes
- Upgrading or downgrading a switch in maintenance mode is not supported.
• While the switch is in maintenance mode, the Ethernet port module stops propagating the interface related notifications. As a result, if the remote switch is rebooted or the fabric link is flapped during this time, the fabric link will not come up afterward unless the switch is manually rebooted (using the `acidiag touch clean` command), decommissioned, and recommissioned.

• For multi-pod, **IS-IS metric for redistributed routes** should be set to less than 63. To set the **IS-IS metric for redistributed routes**, choose **Fabric > Fabric Policies > Pod Policies > IS-IS Policy**.

• Existing GIR supports all Layer 3 traffic diversion. With LACP, all the Layer 2 traffic is also diverted to the redundant node. Once a node goes into maintenance mode, LACP running on the node immediately informs neighbors that it can no longer be aggregated as part of port-channel. All traffic is then diverted to the vPC peer node.

• For a GIR upgrade, Cisco Application Policy Infrastructure Controller (Cisco APIC)-connected leaf switches must be put into different maintenance groups such that the Cisco APIC-connected leaf switches get upgraded one at a time.

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**Removing a Switch to Maintenance Mode Using the REST API**

Use this procedure to remove a switch to maintenance mode using the REST API.

**Procedure**

Remove a switch to maintenance mode.

**Example:**

```bash
POST https://<IP address>/api/node/mo/uni/fabric/outofsvc
<fabricOOServicePol descr="" dn="" name="default" nameAlias="" ownerKey="" ownerTag="">  
<fabricRsDecommissionNode debug="yes" dn="" removeFromController="no" tDn="topology/pod-1/node-102"/>
</fabricOOServicePol>
```

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**Inserting a Switch to Operation Mode Using CLI**

Use this procedure to insert a switch to operational mode using the CLI.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 <code>no debug-switch node_id or node_name</code></td>
<td>Inserts the switch to operational mode.</td>
</tr>
</tbody>
</table>