



Managing Fabrics

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Maintenance Mode

Following are terms that are helpful to understand when using maintenance mode:

- **Graceful Insertion and Removal (GIR):** The operation used to isolate a switch from user traffic.
- **Maintenance mode:** Used to isolate a switch from user traffic for debugging purposes. You can put a switch in **maintenance mode** by enabling the **Maintenance (GIR)** field in the **Fabric Membership** page in the APIC GUI, located at **Fabric > Inventory > Fabric Membership** (right-click on a switch and choose **Maintenance (GIR)**).

If you put a switch in **maintenance mode**, that switch is not considered as a part of the operational ACI fabric infra and it will not accept regular APIC communications. Therefore, performing a firmware upgrade for a switch in this state is not supported, since it may fail or may get stuck in an incomplete status indefinitely if you attempt to perform a firmware upgrade on it while it is in this state.

The maintenance mode allows you to isolate a switch from the network with minimum service disruption. In the maintenance mode you can perform real-time debugging without affecting traffic.

You can use maintenance mode 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.

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 leaf switch in maintenance mode does not attract traffic from the spine switches. In addition, all front-panel interfaces on the switch are shutdown except for the fabric interfaces. To return the switch to its fully operational (normal) mode after the debugging operations, you must recommission the switch. This operation will trigger a stateless reload of the switch.

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)

Protocol Independent Multicast (PIM) is not supported.

Important Notes

- If a border leaf switch has a static route and is placed in maintenance mode, the route from the border leaf switch might not be removed from the routing table of switches in the ACI fabric, which causes routing issues.

To work around this issue, either:

- Configure the same static route with the same administrative distance on the other border leaf switch, or
 - Use IP SLA or BFD for track reachability to the next hop of the static route
- 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.
 - While the switch is in maintenance mode, CLI 'show' commands on the switch show the front panel ports as being in the up state and the BGP protocol as up and running. The interfaces are actually shut and all other adjacencies for BGP are brought down, but the displayed active states allow for debugging.
 - 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.

Removing a Switch to Maintenance Mode Using the REST API

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

Remove a switch to maintenance mode.

Example:

```
POST
https://<IP address>/api/node/mo/uni/fabric/outofsvc.xml

<fabricOOServicePol
  descr=""
  dn=""
  name="default"
  nameAlias=""
  ownerKey=""
  ownerTag="">
  <fabricRsDecommissionNode
    debug="yes"
    dn=""
    removeFromController="no"
    tDn="topology/pod-1/node-102"/>
</fabricOOServicePol>
```

Inserting a Switch to Operation Mode Using the CLI

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

[no]no debug-switch *node_id or node_name*

Inserts the switch to operational mode.
