Cisco ICFPP Deployment Options

Deployment Options

You can deploy Cisco ICFPP in the service provider data center in the following configurations:

- Standalone—Deployment on a single node.
- Multiple-node cluster—Deployment on multiple nodes including a high-availability (HA) pair and additional service nodes.

Cluster deployments are most effective when they are configured behind a load balancer. After these configurations are deployed, a provider-supplied load balancer is expected to manage cookie-based sessions and direct requests and responses appropriately.

The following topics describe these configuration options in more detail.

Standalone Configuration

In a standalone configuration, Cisco ICFPP is deployed as a single virtual appliance that provides services and acts independently of other Cisco ICFPP nodes. A standalone configuration is appropriate for environments in which redundancy is not a concern.

Cisco ICFPP is installed in OpenStack environments using the Standalone role only. After installation, you can configure the Cisco ICFPP virtual appliance as a primary node or service node as appropriate for your environment.

Cluster Configuration

In a cluster configuration, Cisco ICFPP supports large-scale operations in provider environments by deploying multiple Cisco ICFPP nodes. A provider-supplied load balancer distributes the load across the service nodes.

In a cluster configuration, Cisco ICFPP is deployed on multiple virtual appliances using the Primary Node and Service Node roles, as shown in the following figure.

Figure 1: Cisco ICFPP in a Multiple-Node Cluster Configuration
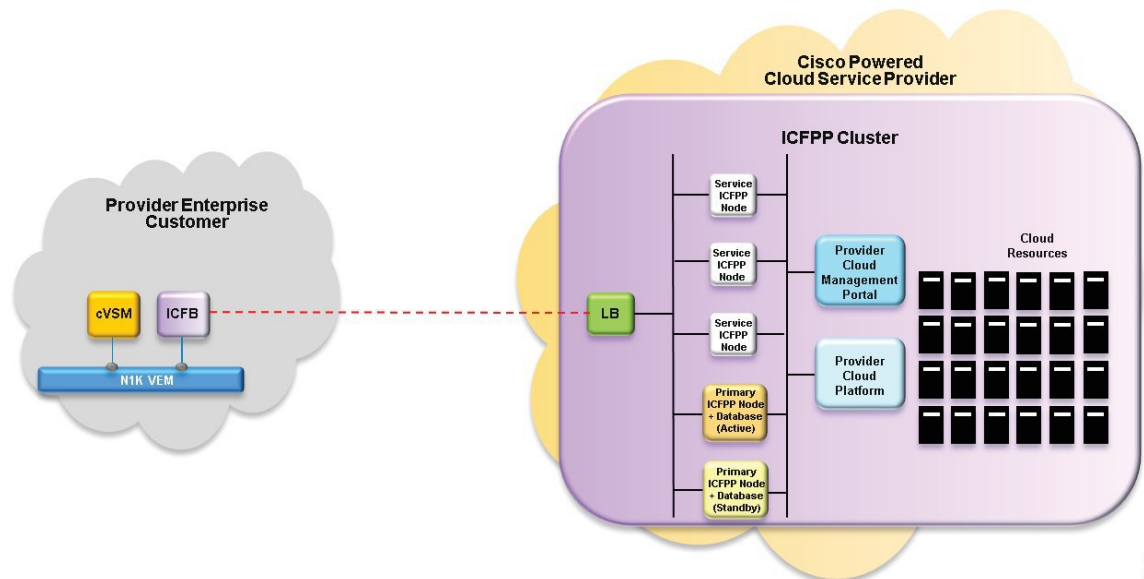
A multiple-node cluster contains the following components:

- Two Cisco ICFPP virtual appliances with the Primary Node role that are deployed in an HA configuration.

- Two or more Cisco ICFPP virtual appliances that are deployed as service nodes.

- A load balancer that forwards incoming traffic only to the service nodes.

HA Configuration in a Cluster

In an HA configuration, Cisco ICFPP is deployed on two virtual appliances, both using the Primary Node role. Each virtual appliance in an HA pair includes a database for replication purposes. After both Cisco ICFPP appliances are deployed, you specify which node is active and which node is standby.

The following concepts apply when Cisco ICFPP is deployed in an HA configuration:

- The Cisco ICFPP appliances in an HA pair have different management IP addresses.

- A single virtual IP address (VIP) is assigned to the active node.

- If the active node fails, the VIP is transferred to the standby node.

- When the original active node recovers, the VIP remains with the original standby node until that node fails.

Database replication works as follows:

- The active and standby nodes replicate each other's databases.

- At any time, only the database on the node with the VIP is used.

- When the database is updated on one node, the changes are replicated on the other node.

Communications in a Cluster

In a cluster configuration, Cisco ICFPP manages communications as follows:

- Each service node establishes a connection with the database on the active node in the HA pair by using the virtual IP address for the HA pair.

- The load balancer accepts requests from Cisco Intercloud Fabric Director.

- The load balancer distributes the requests to the service nodes using a round-robin algorithm.

- Each new user session is directed to a different service node.

- Subsequent requests from the same session are sent to the same service node.

- The service node responds via the load balancer.

Session Persistence

Session persistence is managed by means of a PERSISTICFPP cookie that Cisco ICFPP issues. The cookie is generated when a user logs in and it ensures that all requests from that user session are directed to the same node. If a service node fails, the load balancer forwards requests for that service node to a different service node. The new receiving node first requires Cisco Intercloud Fabric Director to log in and then accepts new requests.

Note The service provider load balancer must be configured to persist sessions based on the PERSISTICFPP cookie.

Deployment Workflows

The deployment workflow that you use depends on whether Cisco ICFPP is deployed on VMware or OpenStack.

The following table describes the high-level tasks required to deploy Cisco ICFPP in a multiple-node cluster in a VMware environment.

Table 1: Configuration Workflow for a Multiple-Node Cluster on VMware

Step	Task	Related Information
1.	Install two Cisco ICFPP virtual appliances using the Primary Node role.	Installing Cisco ICFPP on VMware
2.	Install two or more Cisco ICFPP virtual appliances using the Service Node role.	Installing Cisco ICFPP on VMware

Step	Task	Related Information
3.	Configure additional storage.	Configuring NFS
4.	Configure HA on the appliances with the Primary Node role.	Configuring HA
5.	Configure a load balancer for all service nodes in the cluster. **Note** The load balancer must be configured to persist sessions based on the PERSISTICFPP cookie that Cisco ICFPP issues.	Your load balancer documentation
6.	Configure communications for the cluster with Cisco Intercloud Fabric Director.	*Cisco Intercloud Fabric Getting Started Guide*

The following table describes the high-level tasks required to deploy Cisco ICFPP in a multiple-node cluster in an OpenStack environment.

Table 2: Configuration Workflow for a Multiple-Node Cluster on OpenStack

Step	Task	Related Information
1.	Install four or more Cisco ICFPP virtual appliances using the Standalone Node role.	Installing Cisco ICFPP on OpenStack
2.	Configure two appliances with the Primary Node role.	Configuring a Primary Node
3.	Configure the remaining appliances with the Service Node role.	Configuring a Service Node
4.	Configure additional storage.	Configuring a Cinder Volume
5.	Configure HA on the appliances with the Primary Node role.	Configuring HA
6.	Configure the HA nodes to permit network traffic via the VIP address.	Configuring VIP Access for HA in OpenStack
7.	Configure a load balancer for the service nodes in the cluster. **Note** The load balancer must be configured to persist sessions based on the PERSISTICFPP cookie that Cisco ICFPP issues.	Your load balancer documentation
8.	Configure communications for the cluster with Cisco Intercloud Fabric Director.	*Cisco Intercloud Fabric Getting Started Guide*