



## Deployment States and Events

ESC deployment lifecycle is represented using various states. The datamodel defines various states the service and VNF will be in during the deployment lifecycle. In general, the deployment or service life cycle is represented in two stages. The service contains one or more different type of vm groups. The vm group represents a group of same type of VM or VNF. After receiving a deployment or service request, ESC validates the request and accepts the request for processing. During processing, ESC deploys the VM or VNF in the underlying VIM using the resources defined in the data model. ESC monitors these VM/VNF based on the kpi and actions defined. As defined by configured policies and actions, ESC triggers auto healing, scale in, scale out and other workflows.

During deployment or any other workflow, the service or deployment's state and VM or VNF state changes and events are sent. The state and events play a key role in identifying the status of the deployment. The current state of the deployment is represented in the operational data. ESC sends the notifications or events when a deployment, or VM or VNF state change that needs to be notified. In the datamodel all the different states and events are defined.

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## Deployment or Service States

The service state represents the state of the full service or deployment. The state of the service also depends on the various VM or VNF states, state of the VM in the vm groups, and the current workflow that is running on the service or the VM or VNF. The service or deployment state is an aggregate summary of the whole deployment.

**Table 1: Deployment or Service States**

Service State	Description
SERVICE_UNDEF_STATE	The initial service state. Service will be in this state until ESC starts processing the deployment.
SERVICE_DEPLOYING_STATE	In this state, VMs are being deployed for this service or deployment.
SERVICE_INERT_STATE	In this state, VMs under this deployment are deployed but are still not active or booted up.

Service State	Description
SERVICE_ACTIVE_STATE	In this state, all the VMs under this deployment are deployed and alive.
SERVICE_ERROR_STATE	Service will be in this state if any error happened during the deployment, recovery, scale in or scale out, or any other workflow.
SERVICE_UNDEPLOYING_STATE	In this state, VM are being undeployed for this service or deployment.
SERVICE_STOPPING_STATE	In this state, the VM or VNF under the service are being stopped due to service action request.
SERVICE_STOPPED_STATE	In this state, the VM or VNF under the service are stopped due to service action request.
SERVICE_STARTING_STATE	In this state, the VM or VNF under the service are starting due to service action request.
SERVICE_REBOOTING_STATE	In this state, the VM or VNF under the service are being rebooted due to service action request.

### VM or VNF States

The VM or VNF state represents the state of the particular VM or VNF in the service or deployment. The VM state is key to identify the current state of a particular VNF and the workflows that are running on this VM or VNF.

**Table 2: VM or VNF States**

VM State	Description
VM_UNDEF_STATE	The initial state of VM or VNF before deployment of this VM.
VM_DEPLOYING_STATE	VM or VNF is being deployed on to the VIM.
VM_MONITOR_UNSET_STATE	VM or VNF is deployed in the VIM but the monitoring rules are not applied.
VM_MONITOR_DISABLED_STATE	Due to a VM action request or recovery workflow, the monitoring or kpi rules applied on the VM or VNFs were not enabled.
VM_STOPPING_STATE	VM or VNF is being stopped.
VM_SHUTOFF_STATE	VM or VNF is in stopped or shutoff state.
VM_STARTING_STATE	VM or VNF is being started.
VM_REBOOTING_STATE	VM or VNF is being rebooted.

VM State	Description
VM_INERT_STATE	VM or VNF is deployed but not alive. The kpi monitor is applied and waiting for the VM to become alive.
VM_ALIVE_STATE	VM or VNF is deployed and successfully booted up or alive as per the monitor or kpi metric.
VM_UNDEPLOYING_STATE	VM or VNF is being undeployed or terminated.
VM_ERROR_STATE	VM or VNF will be in error state if deployment or any other operation is failed.

In ESC, the events play a key role in providing the current status of deployment or any other workflow. For more information, see the [Event Notifications or Callback Events](#).

## Event Notifications or Callback Events

In ESC, the events play a key role in providing the current status of deployment or any other workflow. In the Netconf Interface, ESC sends notifications and in the REST Interface, ESC sends the callback events. This section describes all the notifications or callback events sent by ESC.

### Event Notification or Callback for a Deployment or a VNF

The notifications or callback event type defined below are the event that will be sent to Northbound during the life cycle of a deployment. These events are sent from ESC once the deployment request is received and processing is commenced. ESC sends notification about all stages with the status message that describes the success or failure of the stage.

**Table 3: Event Notification or Callback for a Deployment or a VNF**

Event State	Workflow	Description
VM_DEPLOYED	Deployment	When a VM or VNF is deployed. Success if VM or VNF deployment is successful or failure. It will be sent per VM or VNF
VM_ALIVE	Deployment	When a VM or VNF deployed successfully booted-up or alive as per the monitor\kpi metric. It will be sent per VM or VNF.
SERVICE_ALIVE	Deployment	When the deployment or service is complete and all VMs are alive or any of them failed.
VM_UNDEPLOYED	Undeployment	When a VM or VNF is undeployed. Success if VM or VNF is successfully undeployed, or Failure. It will be sent per VM or VNF.

Event State	Workflow	Description
SERVICE_UNDEPLOYED	Undeployment	When all the VMs or VNFs are undeployed. Success if all the VMs and resources under the deployment are successfully deleted, or Failure.
VM_UPDATED	Deployment Update	In any successful deployment, for each of the VM group details are updated. Success if the update is completed, or Failure. It will be sent per VM\VNF
SERVICE_UPDATED	Deployment Update	In any successful deployment, if all of the update is complete. Success if the update is completed, or Failure.
VM_RECOVERY_INIT	Recovery	The recovery init notification is sent when recovery workflow is triggered
VM_RECOVERY_DEPLOYED	Recovery	The recovery deployed notification is sent when the VM or VNF is deployed as part of the recovery workflow.
VM_RECOVERY_UNDEPLOYED	Recovery	The recovery undeployed notification is sent when the VM or VNF is undeployed as part of the recovery workflow.
VM_RECOVERY_COMPLETE	Recovery	The recovery complete notification is sent when the VM recovery is complete. Success if VM is recovered, else Failure.
VM_RECOVERY_REBOOT	Recovery	The recovery reboot notification is sent when the VM or VNF is rebooted as part of recovery. Success if reboot is successful, else Failure.
VM_RECOVERY_CANCELLED	Recovery	The recovery canceled notification is sent when a recovery was triggered but before the recovery wait time, VM went to active state.
VM_MANUAL_RECOVERY_NEEDED	Manual Recovery	The manual recovery needed notification is sent when a recovery is triggered but manual recovery policy is configured.

Event State	Workflow	Description
VM_MANUAL_RECOVERY_NO_NEED	Manual Recovery	The manual recovery not needed notification is sent when a recovery is triggered with manual recovery policy configured and the VM becomes active again.
VM_SCALE_OUT_INIT	Scale Out	The scale out init notification is sent when a scale out work flow is triggered
VM_SCALE_OUT_DEPLOYED	Scale Out	The scale out deployed notification is sent when a VM is deployed as part of scale out.
VM_SCALE_OUT_COMPLETE	Scale Out	The scale out completed notification is sent when the scale out workflow is complete.
VM_SCALE_IN_INIT	Scale In	The scale in init notification is sent when a scale in workflow is started.
VM_SCALE_IN_COMPLETE	Scale In	The scale in completed notification is sent when the scale in workflow is complete.

#### Event Notifications or Callback Event Types for Deployment or VNF Operation

The notifications or callback event type defined below are the event that will be sent to Northbound during various operation or action performed by the user. These events are sent from ESC once the action request is received and processing is commenced. ESC sends notification about all stages with the status message that describes the success or failure of the stage.

**Table 4: Event Notifications or Callback Event Types for Deployment or VNF Operation**

Event State	Workflow	Description
VM_REBOOTED	VM Action	The event is sent when a VM or VNF is rebooted.
VM_STOPPED	VM Action	The event is sent when a VM or VNF is stopped.
VM_STARTED	VM Action	The event is sent when a VM or VNF is started.
SERVICE_STOPPED	Deployment Action	The service stopped event is sent when a request to stop all the VM/VNF in a service is completed.

Event State	Workflow	Description
SERVICE_STARTED	Deployment Action	The service started event is sent when a request to start all the VM/VNF in a service is completed.
SERVICE_REBOOTED	Deployment Action	The service rebooted event is sent when a request to reboot all the VM or VNF in a service is completed.
HOST_DISABLE	Host Action / Redeploy	(OpenStack Only) The event is sent when the request to disable the host is completed.
HOST_ENABLE	Host Action / Redeploy	(OpenStack Only) The event is sent when the request to enable the host is completed.
VIM_OPERATIONAL_STATE	N/A	This event is sent when ESC detects the VIM operational state was changed.

#### Event Notifications or Callback Event Types for Resources

The notifications or callback event types defined below are the events that will be sent to northbound during resource creation or deletion. These events are sent from ESC once the request is received and processing is commenced. ESC sends notification about all stages with the status message that describes the success or failure of the stage.

**Table 5: Event Notifications or Callback Event Types for Resources**

Event State	Workflow	Description
CREATE_TENANT	Tenant	Tenant created
DELETE_TENANT	Tenant	Tenant deleted
CREATE_NETWORK	Network	Network created
DELETE_NETWORK	Network	Network deleted
CREATE_SUBNET	Subnet	Subnet created
DELETE_SUBNET	Subnet	Subnet deleted
CREATE_IMAGE	Image	Image created
DELETE_IMAGE	Image	Image deleted
CREATE_FLAVOR	Flavor	Flavor created
DELETE_FLAVOR	Flavor	Flavor deleted