# Error Handling Procedures

VNF Lifecycle Management Error Handling Procedures

ETSI invokes the following error handling procedures for all its ETSI VNF lifecycle management (LCM) operations:

- Retry
- Rollback
- Fail
- Cancel

The image below represents the transitional states of the VNF lifecycle management operational occurrence.

Figure 1: VNF Lifecycle Management Transitional States
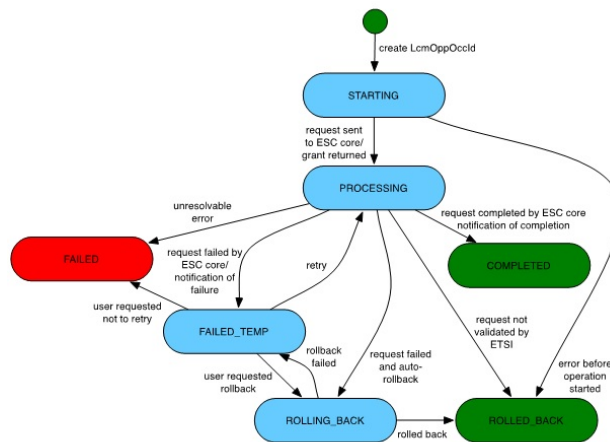
> **Note**
> The *vnfLcmOpOccId* is encoded into the URI, which is the primary key to retrieve the request details.
>
> The retry, rollback and fail requests are rejected if the LCM operation is in any other state other than the FAILED_TEMP state. This error returns HTTP code 409.
>
> The retry, rollback, fail and cancel requests are not supported for the particular VNF LCM operation for the particular VNF. This error returns HTTP code 404.
>
> An error occurs if the *vnfLcmOpOccId* does not exist in the ETSI database. This error returns HTTP code 404.

Retry

A retry request is applicable if there is a possibility of the LCM operation to succeed. The operation should be (pre-condition) in the FAILED_TEMP state for a retry request. You can send several retry requests, as long as the operation is in the FAILED_TEMP state.

Precondition	FAILED_TEMP state
Request	`POST {api_root}/vnf_lcm_op_occs/{vnfLcmOpOccId}/retry()`
Postcondition	PROCESSING state

Upon successful retry, ESC sends a START or PROCESSING notification. If the retry request fails, then ESC sends a notification to the NFVO with the details.

Rollback

A rollback request is made if it is not possible for the operation to succeed even after a retry request.

Set the *rollback_required* flag to true. If this is not set to true, then rollback is not performed.

Precondition	FAILED_TEMP state
Request	`POST {api_root}/vnf_lcm_op_occs/{vnfLcmOpOccId}/rollback()`
Postcondition	ROLLED_BACK

Upon successful rollback, the LCM operation is rolled back. If the rollback request fails, then the LCM operation is back to the failed_temp sate.

Fail

When an LCM operation does not require a retry request, or a clean up, a fail request allows you to free up resources for a subsequent request.

If the *rollback_required* flag is set to true, a fail request cannot be made.

Precondition	FAILED_TEMP state
Request	`POST {api_root}/vnf_lcm_op_occs/{vnfLcmOpOccId}/fail()`
Postcondition	FAILED state

Upon successful execution of this request, the LCM operation is in FAILED state.

Cancel

A cancel request is possible if the operation is in STARTING state.

> **Note** A cancel request is currently possible in the STARTING or PROCESSING state for Instantiate, but only STARTING for all other LCM operations.

Precondition	STARTING state
Request	`POST {api_root}/vnf_lcm_op_occs/{vnfLcmOpOccId}/cancel(CancelMode)`
Postcondition	ROLLED_BACK

The cancel request is Forceful.

> **Note** ETSI supports canceling an LCM operation in starting state only. The cancel request for LCM operations in processing or rolling back states are currently not supported.

Example JSON payload (CancelMode):

```
{
  "cancelMode": "FORCEFUL",
  "action": "cancel"
}
```

Set the *IsCancelPending* attribute of the *VnfLcmOpOcc* to true. This will stop the processing request, and move the LCM operation to ROLLED_BACK state.

Error Handling Procedures for ETSI VNF Lifecycle Operations

If the LCM operation for a VNF instance fails, the operation moves to the FAILED_TEMP state according to the state machine. To complete the intended operation, you must either run the retry or rollback request.

- If creating a VNF identifier fails, then no further action is required. The rollback request is not supported.

- If instantiating the VNF fails, then ESC terminates the request, and sends a new instantiation request.

- If operating the VNF fails, then no further action is required.

- If terminating the VNF fails, you must retry the operation, as rollback is not supported.

- If deleting the VNF operation fails, then no further action is required. Th erollback request is not supported.

> **Note** The error handling requests do not impact the operating VNF lifecycle operation.

For information on VNF lifecycle operations, see VNF Lifecycle Operations.

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