HPE NFV Director

On-Boarding Guide Operations: Scale Out of a VNF

Release 4.1
Second Edition

Hewlett Packard Enterprise

Notices

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Preface

About this guide

This Guide is intended to explain and guide the user through the Scale Out of a VNF.

Audience

This document is targeting any user level of NFV Director: Domain users, Organization Users, Tenant Users, Group Users and Datacenter users.

Document history

Table 1: Document history

Edition	Date	Description
1.0	1 September 2016	First Edition

Chapter 1 Scale Out of a VNF.

From now on, and to make easier the understanding of the TLDs, we are going to explain the functionality of each set of TASK_LIST_DEFINITION:GENERIC, and the number of TASK_DEFINITION:GENERIC children of the previously mentioned TASK_LIST_DEFINITION:GENERIC.

Basically, the TASK_LIST_DEFINITION:GENERIC connect what we can consider "units of execution", those are the TASK_DEFINITION:GENERIC, that have a WORKFLOW assigned to be executed when the execution of the TLD reach them.

If you like to have a more deep knowledge about the workflows mentioned through this document please refer to the specific document.

✳✳   If in the category FIND, the attribute Path is present, the attribute FIND.ArtifactType will be the starting artifact for the Path, but the FIND.Status attribute refers to the last artifact on the Path.

FIND.ArtifactType ==   VIRTUAL_MACHINE.
FIND.Status==   INSTANTIATED.
FIND.Path==

VIRTUAL_MACHINE>**VIRTUAL_CORE<CORE<CPU<SERVER<AVAILABILITY_ZONE<REGION**

>**COMPUTE**>FLAVOR

In this example, we are looking for a FLAVOR in status INSTANTIATED, we do not expect to get a VIRTUAL_MACHINE, in status INSTANTIATED.

✳✳If during the use of the TLDs, the "Regenerate UUIDs" option is used, the user should check the Id of the tree that brings all the elements of the TLD, this "id" is specific and it will be the same for all the tree groups in all the TLDs.

✳✳ The two modes available are "Default" and "Simulated", the second one is only available if it is configured previously, by defect, and the mode that will be used is "Default".

The Scale Out TLD has some specifications that should be explained, when we open the TLD of the operation , the first we will see is the following:
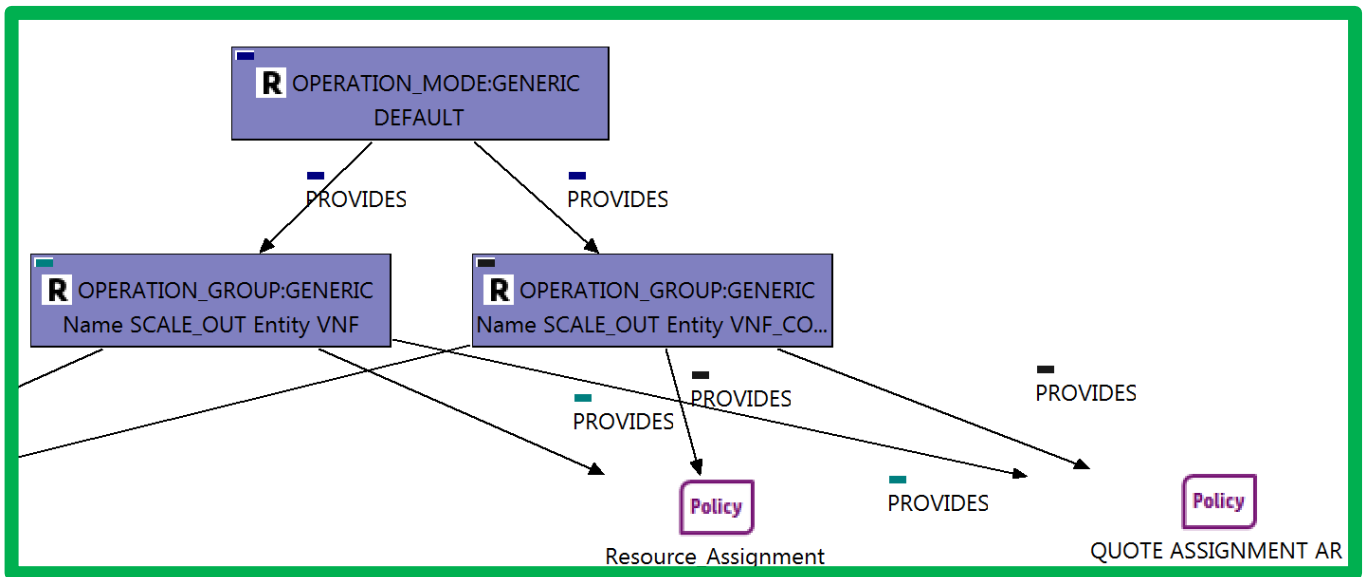
This TLD starts with one Operation_Mode (as usual), but it has two Operation_Group, each one of the elements is "RootArtifact" of its own tree, the assignation of resources and quotas is equal for both of them, this division of groups is justified in order to cover all the possible levels of the escalation policy, one group responds to the policies that has been set between the VNF and the VNF Component, and the second one respond to the policies set it in the level between the VNF Component and the Virtual Machine.

Chapter 2 Specific Elements of the TLD Scale Out of a VNF.

In this chapter the different elements of the specific TLD will be explained conscientiously.

2.1 Scale Out Root TLD: Scale Inventory Task.

This TD is the responsible to list and harvest all the artifacts and realtionships of the Virtual Machine that is going to be escalated, inside this TD another workflow will be thrown," WF_NFVD_CREATE_INSTANCES_FROM_TEMPLATE_ROOT", it will be the responsible of the creation of the new instances related to the new Virtual Machine as from the templates.

Once finished, our Scale should have the template to start the creation and deployment processes of the newly escalated Virtual Machine.

Figure: 1 Scale Inventory Task

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED
GENERAL.Name ==	Scale Inventory Task
FIND.MainArtifact ==	
VNF>POLICY:ENTITY_RANGE, VNF>VNF_COMPONENT>POLICY:ENTITY_RANGE, VNF_COMPONENT>POLICY:ENTITY_RANGE	
EXECUTE.Workflow ==	
"WF_TS_SCALE_OUT_COMPONENT"	
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	false

The Workflow present in EXECUTE.Workflow it is going to seek an ENTITY_RANGE in Status INSTANTIATED in the DDBB, when the WF find it, it will start. This workflow assign all the resources needed by the newly instantiated Virtual Machine to get a successful Deploy, it will check the available resources and decide which one should be assigned.

The creation of instances for the newly created Virutal Machine it uses another WF that it is called from our workflow, "**WF_NFVD_CREATE_INSTANCES_FROM_TEMPLATE_ROOT**".

In case of error during the execution, the workflow jump to the ROLLBACK category, if the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. In this case, the TLD has not assigned a rollback workflow, so in this case the TD will only change the status of the artifact which is being used.

Due to that the value of the attribute DATA.Lock is false, once the TD has finished, no element used in the previous execution will be set as "Locked".

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2.2 TLD QUOTA ASSIGNMENT: Quota Assignment Task.

The TDs that have present in the their names "Assignment", are Task Definitions responsible of the assignation of resources for an specific artifact, in the case of the quotas, the TLD it is going to assign an amount of each resource needed for the correct execution of the deployment.

Once finished, our VNF should have every quota needed for a successful deployment assigned, having taken in consideration all the rules for the assignment. This is crucial, because our component consume quotas during the execution of the TLD.

Targets of the TASK DEFINITION: STATUS of the TD: ENABLED

GENERAL.Name ==	Quota_Assignment Task
FIND.MainArtifact ==	**VNF,VNF_COMPONENT<VNF**
EXECUTE.Workflow ==	
"WF_NFVD_ASSIGNMENT_QUOTA"	
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true
INPUT_MAPPING.MAPPING_LIST ==	
assignmentRelationshipID=Quota_Assignment;	
resourceTreeID=nfvd#quotaResourceID;	
cacheLevel=full	

Figure: 2 Quota Assignment task.

The Workflow present in EXECUTE.Workflow it is going to seek a VNF in Status INSTANTIATED in the DDBB, when the WF find it, it will start. This workflow assign all the resources needed by the VNF to get a successful Deploy, it will check the available resources and decide which one should be assigned.

The Workflow also check the affinity policies , in case our TLD has it, the way the assignation it is going to behave depends also of this policies, once checked, we launch the assignation of resources.

The assignation of resources it uses another WF that it is called from our workflow, "WF_NFVD_ASSIGN_RESOURCES".

In case of error during the execution, the workflow jump to the ROLLBACK category, if the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. In this case, the TLD has not assigned a rollback workflow, so in this case the TD will only change the status of the artifact which is being used.

Due to that the value of the attribute DATA.Lock is true, once the TD has finished, the Quota recently assigned, will be blocked.
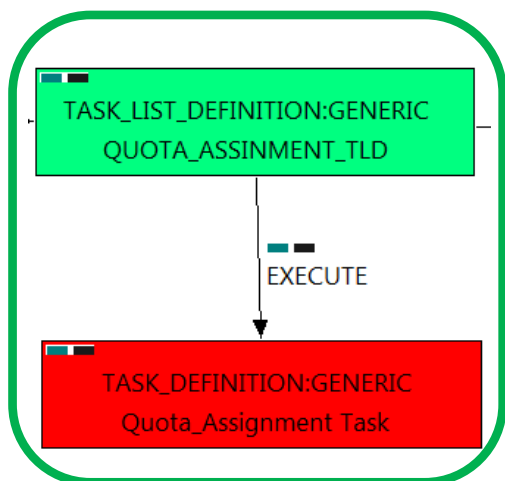
2.3 TLD RESOURCE ASSIGNMENT: Resource_Assignment Task.

The TDs that have present in their names "Assignment", are Task Definitions responsible of the assignation of resources for a specific artifact or deploy, in this case, we are looking for a VNF to assign the resources needed for the future deployment. In order to have a successful assignation we must have in our TLD Deploy VNF an artifact POLICY: ASSIGMENT_RELATIONSHIP, with a GENERAL.Name=="Resource_Assigment", also this artifact must be related with the OPERATION_GROUP: GENERIC of our TLD with a relationship of type PROVIDES and status ENABLED.

Once finished, our VNF should have every resources needed for a successful deployment assigned, having taken in consideration all the rules for the assignment.

Figure: 3 Assignment of the resources

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED
GENERAL.Name ==	RESOURCE_ASSIGNMENT
FIND.MainArtifact **==**	**VNF,VNF_COMPONENT<VNF**.
EXECUTE.Workflow == **"WF_NFVD_ASSIGNMENT_WITHOUTCACHE"**	
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true
INPUT_MAPPING.MAPPING_LIST == **assignmentRelationshipID=Resource_Assignment; resourceTreeID=resourceArtifactID; def_exclusion_list=TENANT:OPENSTACK,NETWORKING, COMPUTE,IMAGE_STORAGE**	

The Workflow present in EXECUTE.Workflow it is going to seek a VNF in the DDBB with the path given by the FIND.MainArtifact attribute, when the WF find it, it will start. This workflow assign all the resources needed by the VNF to get a successful Deploy, it will check the available resources and decide which one should be assigned.

The Workflow also check the affinity policies , in case our TLD has it, the way the assignation it is going to behave depends also of this policies, once checked, we launch the assignation of resources.The assignation of resources it uses another WF that it is called from our workflow, "WF_NFVD_ASSIGN_RESOURCES".

In case of error during the execution, the workflow jump to the ROLLBACK category, if the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. In this case, the TLD has not assigned a rollback workflow, so in this case the TD will only change the status of the artifact which is being used.

Due to that the value of the attribute DATA.Lock is true, once the TD has finished, the artifact recently assigned, will be blocked.

2.4 TLD IMAGE PERMISSION: CHECK_IMAGE_PERMISSION.
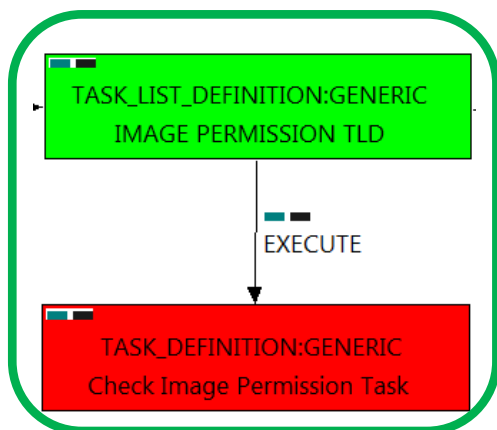
Figure: 4 Checking the image permissions.

The TDs that have present in the their names "Provision", are Task Definitions responsible of the creation and store of an artifact in DDBB, in this case, the artifact that it is going to be provisioned it is an "TENANT:OPENSTACK", this means, when this workflow finish, we will have a new artifact "TENANT:OPENSTACK" in our DDBB, as well, due to the nature of the artifact, the artifact will be prepared to be activated in the platform Openstack when will be required.

Targets of the TASK DEFINITION: STATUS of the TD: ENABLED

GENERAL.Name ==   CHECK_IMAGE_PERMISSION
FIND.MainArtifact **==**
VNF>VNF_COMPONENT>
VIRTUAL_MACHINE@status=INSTANTIATED,
VNF_COMPONENT>
VIRTUAL_MACHINE@status=INSTANTIATED
SET.Running_Status ==   INSTANTIATED.
SET.Status ==   INSTANTIATED.
EXECUTE.Workflow ==
          "WF_TS_CHECK_VM_IMAGE"
EXECUTE.Inactive==   false
ROLLBACK.Behaviour_on_error ==   ROLLBACK
ROLLBACK.Number_of_retries ==   0
DATA.Lock ==   true

The Workflow present in EXECUTE.Workflow it is going to seek a VIRTUAL_MACHINE in Status INSTANTIATED in the DDBB, when the WF find it, it will start. This workflow will start another two more, the one that check the permissions of the IMAGE, "WF_TS_CHECK_IMAGE_PERMISSIONS", and the one that will deploy our IMAGE if it is not deployed, "WF_TS_DEPLOY_IMAGE".

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. If an error take place in this TD , no action will be taken, the execution of the TLD will try to start a rollback workflow but there is not a workflow to be executed in the attribute ROLLBACK.Workflow, so the execution will continue.

Due to that the value of the attribute DATA.Lock is true, once the TD has finished, the artifact recently checked, will be blocked.

Figure: 5 Creation the Keypair element.

2.5 TLD KEYPAIR: Create_pair Task
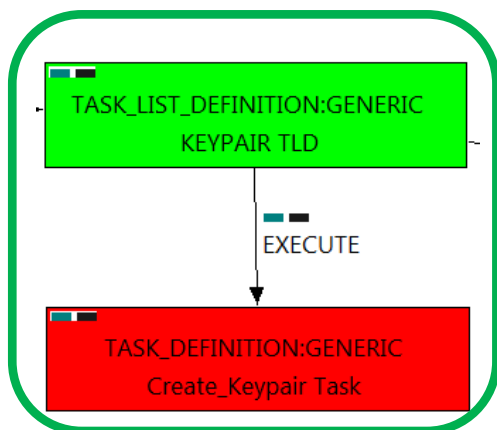
The TDs that have present in the their names "Activate", are Task Definitions responsible of the activation in the platform targeted and the updating of the status in the platform and the DDBB, in this case, the artifact that is going to be activated is a "TENANT:OPENSTACK", this means, when this workflow finish, we will have a TENANT:OPENSTACK with status ACTIVE in our Openstack platform, also the TD will update the status and other attributes of the instance that represents the artifact TENANT:OS in the DDBB and in the platform, creating all the relationships needed for a correct activation.

Targets of the TASK DEFINITION: STATUS of the TD: ENABLED

GENERAL.Name ==   CREATE_KEYPAIR
FIND.MainArtifact ==
VNF>VNF_COMPONENT>VIRTUAL_MACHINE@status=INSTANTIATED,
VNF_COMPONENT>VIRTUAL_MACHINE@status=INSTANTIATED
FIND.Condition ==
        KEYPAIR.Pubkey_Data != null || KEYPAIR.Pubkey_Path != null
SET.Running_Status ==   INSTANTIATED.
SET.Status ==   INSTANTIATED.
EXECUTE.Workflow ==
        "WF_TS_NFVD_CREATE_KEY_PAIR_INVENTORY"
EXECUTE.Inactive==   false
EXECUTE.OrderBy ==
ROLLBACK.Behaviour_on_error ==   ROLLBACK
ROLLBACK.Number_of_retries ==   0
DATA.Lock ==   true

The Workflow present in EXECUTE.Workflow it is going to seek a VIRTUAL_MACHINE in Status INSTANTIATED in the DDBB, also the artifact which we are looking for have to match the FIND.Condition, means, that our VM must have as KEYPAIR.Pubkey_Data a not null value, neither can be null the value in KEYPAIR.Pubkey_Path, if the TD find some artifact that fill all the conditions, the WF will start the creation of the KEY_PAIR.

In case of error during the execution, the workflow jump to the ROLLBACK category. If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts.

In this case, there is not a workflow designated for the Rollback process, so in case of error the TD will change the status of the artifact identified by the specific ID which it is been used during the execution of the Workflow.

The attribute "DATA.Lock" is set with a true value, so when the WF has finished its execution, the TLD will lock the artifact identified by the ID used in the execution of the workflow.

2.6 TLD INVENTORY: Create_Flavor Task

Figure: 6 Creation of a Flavor.
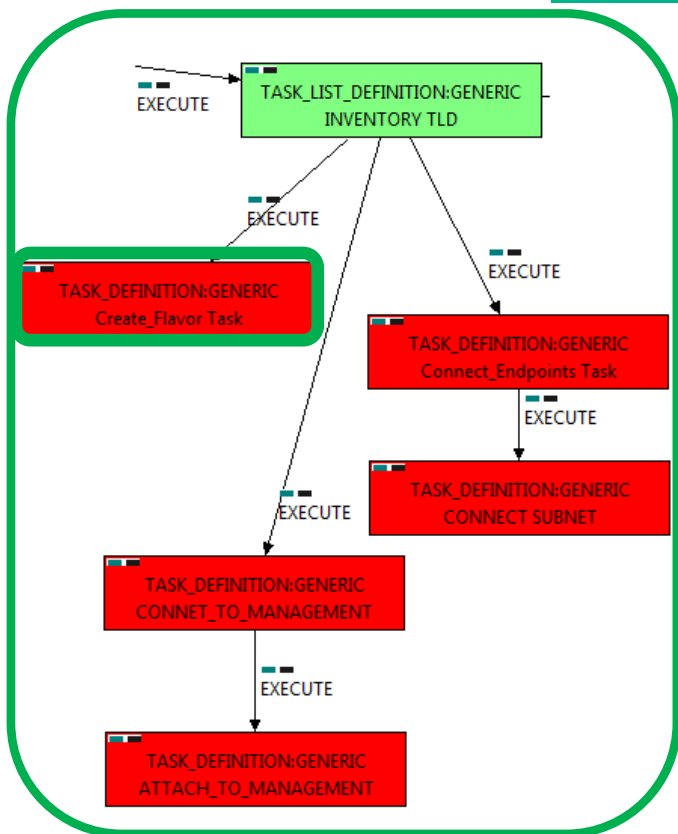
This TD it is going to create the FLAVORS needed for each VMs to be activated later on, this means, the WFs implied in this TLD are going to check each element of our VMs to gather all the information needed to create a specific FLAVOR artifact, during the execution of the TD, the ENTITY_SCALE Policies are going to be consulted, the situation of these policies are required for the correct creation of the FLAVOR.

Once finished, we will have a number of FLAVORS bonded to a VM or VMs, prepare to be activated with these FLAVORS.

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED
GENERAL.Name ==	CREATE_FLAVOR
FIND.MainArtifact == **VNF,VNF_COMPONENT<VNF**	
EXECUTE.Workflow == **"WF_NFVD_CREATE_FLAVOR_INSTANCES"**	
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries==	0
DATA.Lock ==	true

The Workflow present in EXECUTE.Workflow it is going to seek a VNF with Running_Status INSTANTIATED in the DDBB, if the WF find some artifact that fill all the conditions, it will start.

This workflow will start another two more, the one that check if the FLAVOR needs Extra_Specs, a special set of configurations for the FLAVOR, "WF_NFVD_CREATE_FLAVOR_EXTRA_INVENTORY", and the one that will create the Flavor Instance in OPENSTACK platform, "WF_NFVD_CREATE_FLAVOR_OS_INSTANCE".

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. If an error take place in this TD , no action will be taken, the execution of the TLD will try to start a rollback workflow but there is not a workflow to be executed in the attribute ROLLBACK.Workflow, so the execution will continue without error.

Due to that the value of the attribute DATA.Lock is true, once the TD has finished, the artifact recently created, will be blocked.

2.7 TLD INVENTORY: Connect_Endpoints Task

Figure: 7 Connection of the Endpoints.
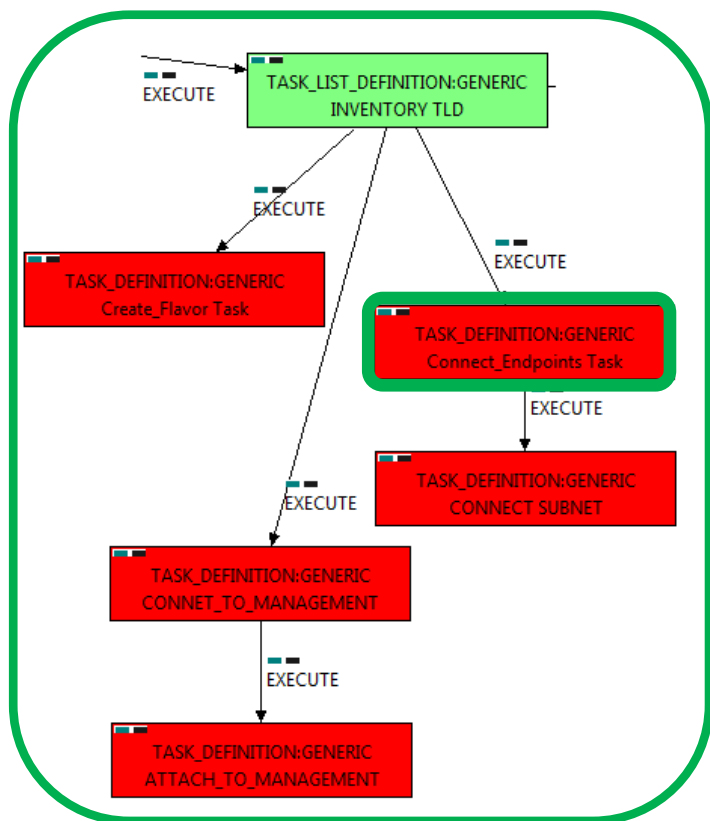
This TD it is going to check and manage all the new EndPoints needed by the newly created Virtual Machine, during the Scale Out Process the Virtual Machine origin will be harvested to know how much End Points exist, and where they are connected. This TD is the responsible of this specific task.

Once finished, we will have a number of End-Points correctly set and connected to the adequate elements and artifacts.

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED
GENERAL.Name ==	Connect_Endpoint
FIND.MainArtifact ==	
VNF,	
VNF_COMPONENT<VNF	
EXECUTE.Workflow ==	
"WF_NFVD_CONNECT_VNF_ENDPOINT"	
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

The Workflow present in EXECUTE.Workflow it is going to take the specific End Point origin in the artifact origin, if the WF find some artifact that fill all the conditions, it will start.

The workflow will check and create all the artifacts and relationship needed in order to make the new Virtual Machien accessible from the other components. Once finished, the Escalated Virtual Machine will have all the Eps of the old machine cloned, properly configurated in the new machine.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. If an error take place in this TD , no action will be taken, the execution of the TLD will try to start a rollback workflow but there is not a workflow to be executed in the attribute ROLLBACK.Workflow, so the execution will continue without error.

Due to that the value of the attribute DATA.Lock is true, once the TD has finished, the artifact recently created, will be blocked.

2.8 TLD INVENTORY: CONNECT_SUBNET

Figure: 8 Connection of the Subnetwork to the VPort.

The TDs that have present in the their names "Connect", are Task Definitions responsible of the connection between artifacts, this means, this TDs will create relationship of specific kind between concrete artifacts, in this case, the WF it is going to query the DDBB looking for all the VIRTUAL_LINK:END_POINTS with Status "TO_BE_CONNECTED", once the WF has the VL:EP, it will query for all the SUBNETWORKS, NETWORKS and IPADDRESS of the VL, when the WF reach this point, it will query for the VPORTS related to these artifacts, after that, it is going to evaluate the relationships between the previously mentioned artifacts and the VPORTS, creating VPORTs and new relationships of type ALLOCATED and USES depending on the artifacts which are going to be related, mainly, SUBNETWORKs and VPORTs. The last thing this WF will do is change the status of the relationship between VL:EPs and the VNF:EP to CONNECTED.

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED
GENERAL.Name ==	CONNECT SUBNET
FIND.MainArtifact ==	
VNF>VNF_ENDPOINT,	
VNF_COMPONENT<VNF>VNF_ENDPOINT	
SET.Running_Status ==	INSTANTIATED.
SET.Status ==	INSTANTIATED.
EXECUTE.Workflow ==	
	"WF_TS_CONNECT_VM_SUBNET"
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

The Workflow present in EXECUTE.Workflow it is going to seek a VNF_ENDPOINT with Running_Status INSTANTIATED in the DDBB, if the WF find some artifact that fill all the conditions, it will start.

In case of error during the execution, the workflow jump to the ROLLBACK category, if the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. If an error take place in this TD, no action will be taken, the execution of the TLD will try to start a rollback workflow but there is not a workflow to be executed in the attribute ROLLBACK.Workflow, so the execution will continue without error.

Due to that the value of the attribute DATA.Lock is true, once the TD has finished, the artifact recently created, will be blocked.
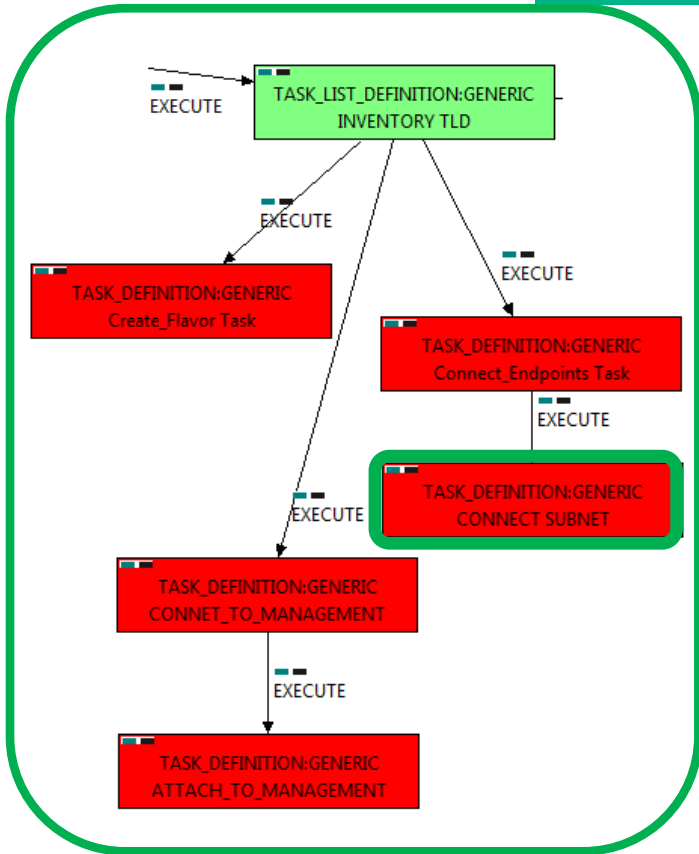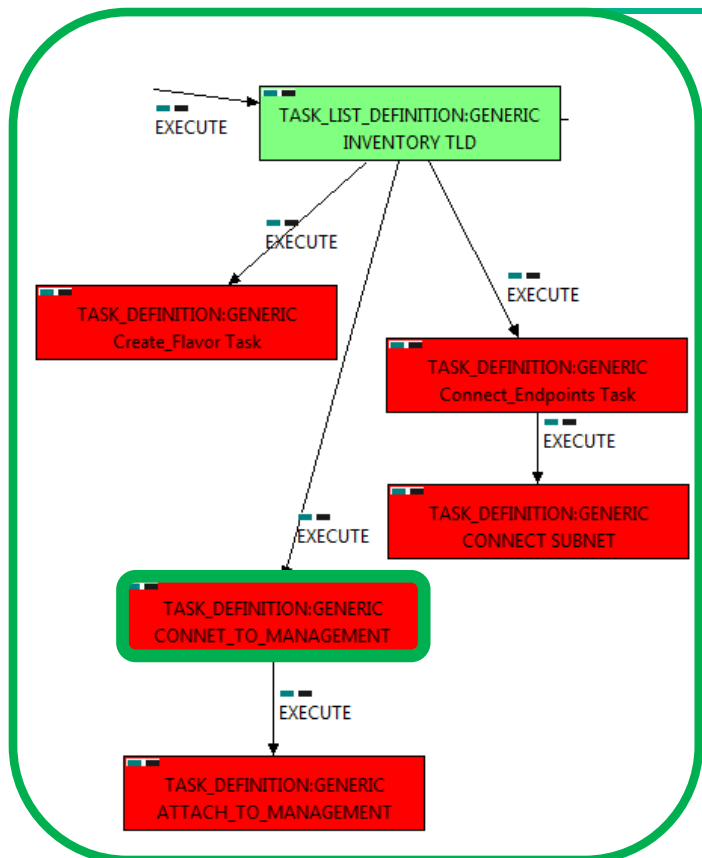
2.9 TLD INVENTORY: CONNECT_TO_MANAGEMENT

Figure: 9 Connection to the management network.

The TDs that have present in the their names "Connect", are Task Definitions responsible of the connection between artifacts, this means, this TDs will create relationship of specific kind between concrete artifacts, in this case, it will create relationships of type USES and status ENABLED between a specific VIRTUAL_PORT, and the SUBNETWORKS (or the subnetworks's IPADDRESS:GENERIC) related as children of our VIRTUAL_LINK:MANAGEMENT that we are using.

Once finished, we should have all SUBNETWORKs related as children of our VL:MANAGEMENT bonded with a relationship of type USES and status ENABLED with the VIRTUAL_PORT found by the conditions of the TD.

Targets of the TASK DEFINITION: STATUS of the TD: ENABLED

GENERAL.Name ==   CONNET_TO_MANAGEMENT
FIND.MainArtifact ==
VNF>VNF_COMPONENT>
VIRTUAL_MACHINE@status=INSTANTIATED>
VIRTUAL_PORT@status=INSTANTIATED#
INFO.NetworkType=MANAGEMENT,
VNF_COMPONENT>
VIRTUAL_MACHINE@status=INSTANTIATED>
VIRTUAL_PORT@status=INSTANTIATED#
INFO.NetworkType=MANAGEMENT
EXECUTE.Workflow ==
"WF_TS_CONNECT_MANAGEMENT_NETWORK"
EXECUTE.Inactive==   false
ROLLBACK.Behaviour_on_error ==   ROLLBACK
ROLLBACK.Number_of_retries =   0
DATA.Lock ==   true

The Workflow present in EXECUTE.Workflow it is going to seek a VIRTUAL_PORT with Running_Status INSTANTIATED in the DDBB, if the WF find some artifact that fill all the conditions, it will start.

This workflow it is going to create a relationship of type USES and status INSTANTIATED between the VIRTUAL_PORT found and each SUBNETWORK of our VL:MANAGEMENT, in case that the SUBNETWORKS have IPADDRESS as children, the relationship would be created between these IPs and the VP.

In case of error during the execution, the workflow jump to the ROLLBACK category, if the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. If an error take place in this TD, no action will be taken, the execution of the TLD will try to start a rollback workflow but there is not a workflow to be executed in the attribute ROLLBACK.Workflow, so the execution will continue without error.

Due to that the value of the attribute DATA.Lock is true, once the TD has finished, the artifact recently created, will be blocked.
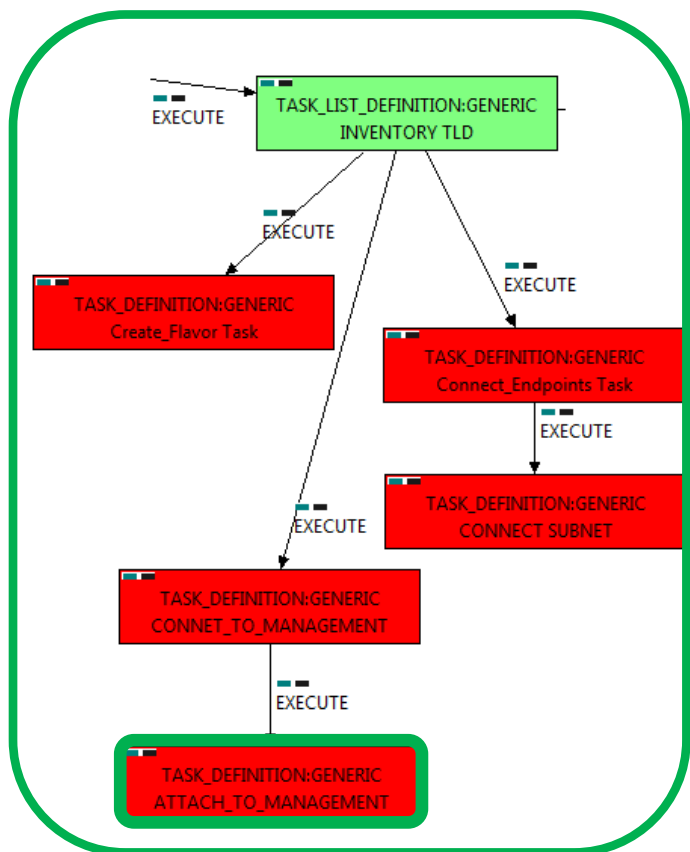
2.10 TLD INVENTORY: ATTACH_TO_MANAGEMENT

Figure: 10 Attaching the Management Network.

The TDs that have present in the their names "Attach", are Task Definitions responsible of the connection between artifacts, this means, this TDs will create relationship of specific kind between concrete artifacts, in this case, it will create relationships of type ALLOCATED and status ENABLED between a specific VIRTUAL_PORT, and the SUBNETWORKS:DCN (or the subnetworks's IPADDRESS:GENERIC) related as children of our NETWORK:DCN that belongs to the VIRTUAL_LINK:MANAGEMENT that we are using, and the SUBNETWORK:OS of Management.

Once finished, we should have all SUBNETWORK: DCN and SUBNETWORK: OS related as children of our VL:MANAGEMENT bonded with a relationship of type ALLOCATED and status ENABLED with the VIRTUAL_PORT found by the conditions of the TD.

Targets of the TASK DEFINITION: STATUS of the TD: ENABLED

GENERAL.Name ==   ATTACH_TO_MANAGEMENT
EXECUTE.Workflow ==
        "WF_TS_CONNECT_MGMT_NET_VPORT"
EXECUTE.Inactive==   false
ROLLBACK.Behaviour_on_error ==   ROLLBACK
ROLLBACK.Number_of_retries ==   0
DATA.Lock ==   true

This TD is going to use the attributes of the previous TD to be executed, if the WF find some artifact that fill the conditions, it will start. If the activation it is successful we set the status of the artifact as the SET.Status attribute dictates.

This workflow it is going to create a relationship of type ALLOCATED and status INSTANTIATED between the VIRTUAL_PORT found and each SUBNETWORK:DCN and SUBNETWORK:OS of our VL:MANAGEMENT, in case that the SUBNETWORKS have IPADDRESS as children, the relationship would be created between these IPs and the VP.

In case of error during the execution, the workflow jump to the ROLLBACK category, if the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, the attribute "number_of_retries" set the number of rollback attempts. If an error take place in this TD, no action will be taken, the execution of the TLD will try to start a rollback workflow but there is not a workflow to be executed in the attribute ROLLBACK.Workflow, so the execution will continue without error.

Due to that the value of the attribute DATA.Lock is true, once the TD has finished, the artifact recently created, will be blocked.

2.11 SCALE OUT PRE TLD : SCALE OUT PRE

This TD is responsible of the provision in the right order of the artifacts referenced by the PreProcessing policies, these policies allow the user to set a number of elements that should be taken in consideration in a certain order, in other case, the execution will fail depending on the event occurred.
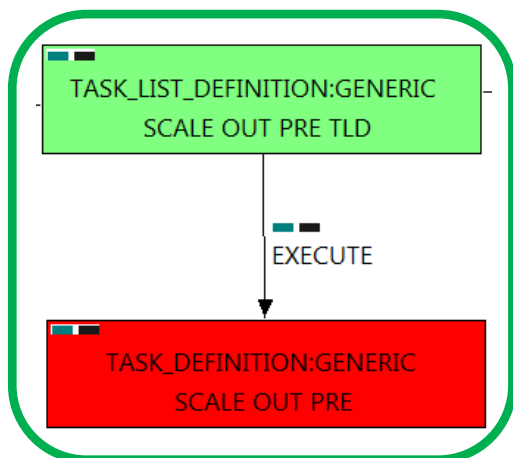
Figure: 11 Deploying Pre-Process policies.

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED
FIND.MainArtifact ==	POLICY:POSTPRE_PROCESSING
FIND.Condition == **PROCESSING_JOB.Job_type==constant:PRE&& PROCESSING_JOB.Operation==constant:SCALEOUT**	
EXECUTE.OrderBy ==	PROCESSING_JOB.OrderBy
ROLLBACK.Behaviour_on_error ==	STOP
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	false

In this TD there is not a workflow to be executed, the target of this TD is process in the correct order the PreProcessing policies present in the VNF, these policies should be executed in a specific order to make the changes or configurations properly, in other case an error will be launched

If the TD ends successfully, the Pre-Processing policies will have been processed adequately.

In case of error during the execution, the TD will jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK,but in this case, we have a "STOP" as value set for behavior, so no Rollback it is going to be initiated, the execution will stop.

Due to that the value of the attribute DATA.Lock is false, when the Task Definition has finished the artifact that was used in the workflow executed will remain unlocked.

2.12 TLD ACTIVATE: Activate_Keypair task.

The TDs that have present in the their names "Activate", are Task Definitions responsible of the activation in the platform targeted and the updating of the status in the platform and the DDBB, in this case, the artifact that is going to be activated is a "KEYPAIR", this means, when this workflow finish, we will have a KEYPAIR with status ACTIVE.

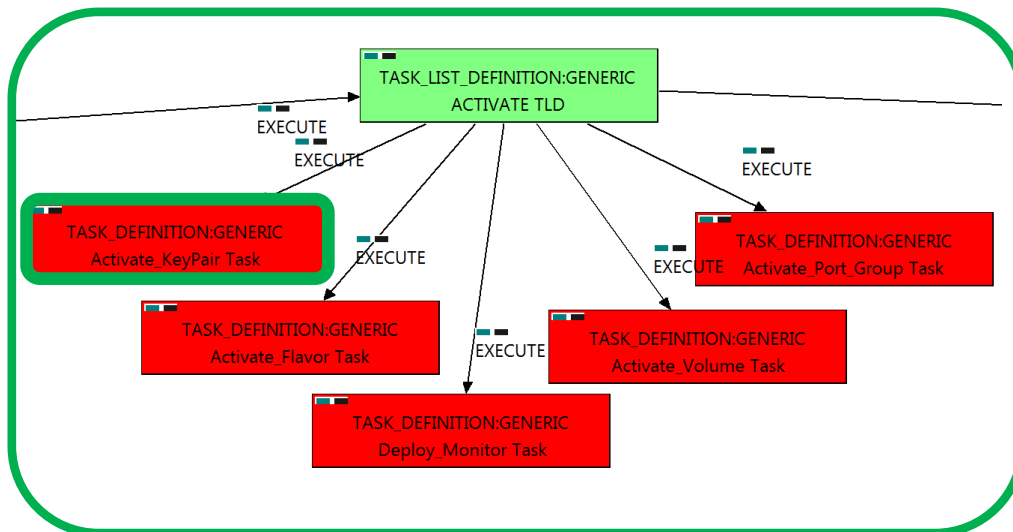Figure: 12 : Activation of the Keypair.

Targets of the TASK DEFINITION: STATUS of the TD: ENABLED

GENERAL.Name ==   Deploy Monitor
FIND.MainArtifact==
VNF>VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_CORE<CORE<CPU<SERVER<AVAILABILITY_ZONE<REGION>COMPUTE>KEY_PAIR,
VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_CORE<CORE<CPU<SERVER<AVAILABILITY_ZONE<REGION>COMPUTE>KEY_PAIR
FIND.Condition==   **status==constant:INSTANTIATED**
SET.Running_Status ==   INSTANTIATED.
SET.Status ==   ACTIVE.
EXECUTE.OrderBy ==   **GENERAL.order**
EXECUTE.Workflow==   **"WF_TS_CREATE_KEY_PAIR"**
EXECUTE.Inactive==   false
ROLLBACK.Behaviour_on_error ==   ROLLBACK
ROLLBACK.Number_of_retries ==   0
DATA.Lock ==   true

The Workflow present in EXECUTE.Workflow attribute is going to seek a KEYPAIR that match the FIND.Condition attribute with value **"KEYPAIR.Pubkey_Data==%GENERAL.Pubkey_Data%"** also given by the path represented by the attribute FIND.Path : "**VNF>VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_CORE<CORE<CPU<SERVER<AVAILABILITY_ZONE<R EGION>COMPUTE>KEY_PAIR@status=INSTANTIATED,VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_CORE <CORE<CPU<SERVER<AVAILABILITY_ZONE<REGION>COMPUTE>KEY_PAIR@status=INSTANTIATED"** in Status INSTANTIATED in the DDBB, notice that we are not trying to get a VNF or VNF_COMPONENT in status INSTANTIATED.

 Once found , the WF will start the activation, if the activation it is successful we set the status of the artifact as the SET.Status attribute dictates. The attribute SET.Running_Status concern about the temporal status that the artifact it is going to maintain until the final change of status that comes from SET.Status.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case, we have a "ROLLBACK" set as behavior, so the rollback process will start when the TD reaches this point, it will throw an error due there is no workflow assigned to be executed during the rollback.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".

2.13 TLD ACTIVATE: ACTIVATE_FLAVOR.

The TDs that have present in the their names "Activate", are Task Definitions responsible of the activation in the platform targeted and the updating of the status in the platform and the DDBB, in this case, the artifact that is going to be activated is a "FLAVOR", this means, when this workflow finish, we will have a FLAVOR with status ACTIVE associated to the VIRTUAL_MACHINE that it is going to use it in the activation.
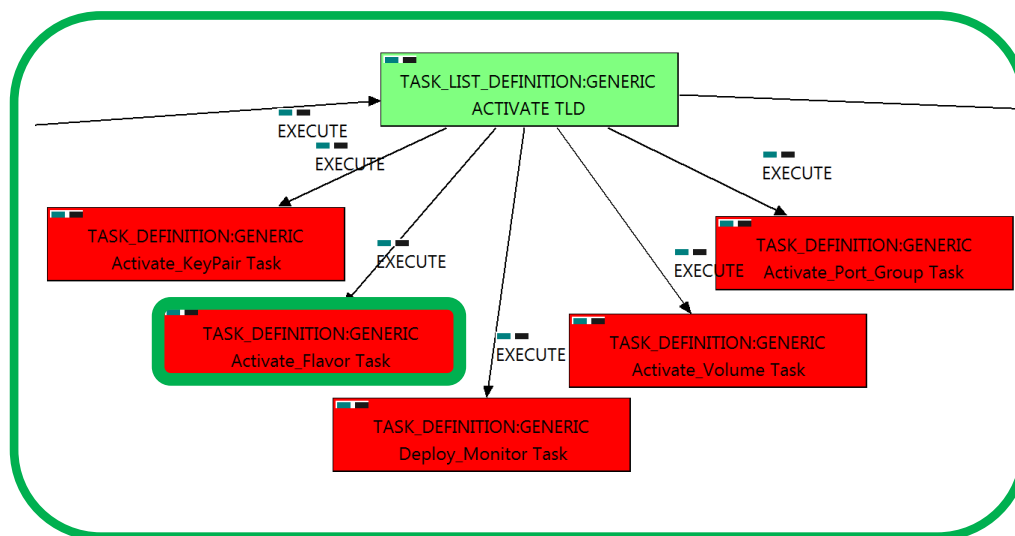

Figure: 13 Activation of the Flavor

Targets of the TASK DEFINITION:	STATUS of the TD:	ENABLED

GENERAL.Name ==   ACTIVATE_FLAVOR
FIND.MainArtifact==
VNF>VNF_COMPONENT>VIRTUAL_MACHINE>
VIRTUAL_CORE<CORE<CPU<SERVER<AVAILABILITY_ZONE<REGION>COMPUTE>FLAVOR,
VNF_COMPONENT>VIRTUAL_MACHINE>
VIRTUAL_CORE<CORE<CPU<SERVER<AVAILABILITY_ZONE<REGION>COMPUTE>FLAVOR

SET.Running_Status ==	INSTANTIATED.
SET.Status ==	ACTIVE.
EXECUTE.Workflow ==	**"WF_TS_ACTIVATE_FLAVOR"**
EXECUTE.Inactive ==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

The Workflow present in EXECUTE.Workflow attribute it is going to seek a FLAVOR in Status INSTANTIATED in the DDBB . Notice that we are not trying to get a VIRTUAL_MACHINE in status INSTANTIATED. The query it is going to use the Path present in the category FIND. Once found , the WF will start the activation, if the activation it is successful we set the status of the artifact as the SET.Status attribute dictates. The attribute SET.Running_Status concern about the temporal status that the artifact it is going to maintain until the final change of status that comes from SET.Status.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case, we have a "ROLLBACK" set as behavior, so the rollback process will start when the TD reaches this point, it will throw an error due there is no workflow assigned to be executed during the rollback.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".

2.14 TLD ACTIVATE: DEPLOY_MONITOR.

The TDs that have present in the their names "Deploy" are Task Definitions responsible of the deployment in the platform targeted and the updating of the status in the platform and the DDBB , these deployments are slightly different to the ones we launch for our entities, as a rule, they are small components as the MONITORs. In this case, the artifact that is going to be deployed is a "MONITOR", this means, when this workflow finish, we will have a MONITOR deployed with status DEPLOYED.
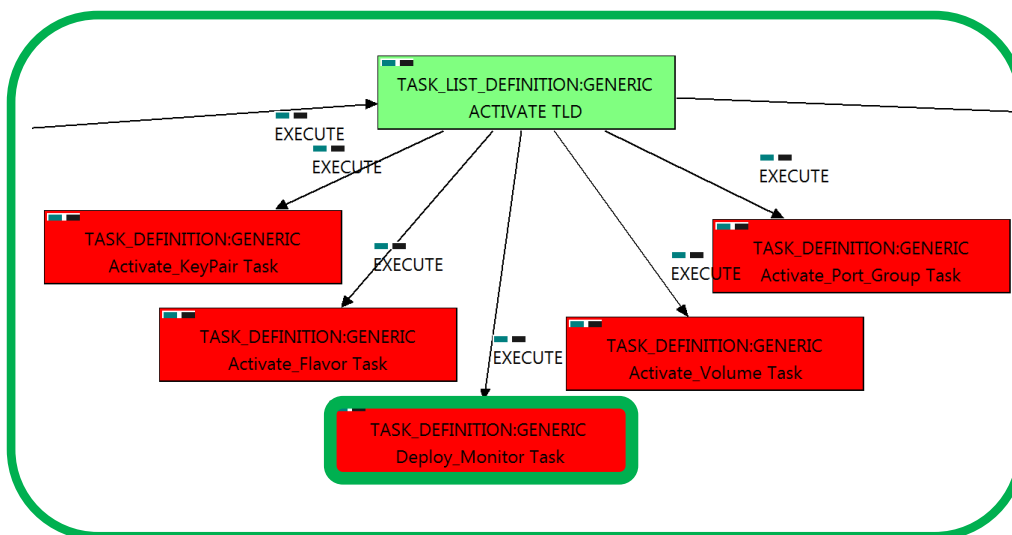

Figure: 14 Deployment of a Monitor

Targets of the TASK DEFINITION: STATUS of the TD: ENABLED

GENERAL.Name ==	Deploy Monitor
FIND.Condition==	**status==constant:INSTANTIATED**
SET.Running_Status ==	INSTANTIATED.
SET.Status ==	DEPLOYED.
EXECUTE.OrderBy ==	**GENERAL.order**
EXECUTE.Workflow==	**"WF_TS_MONITOR_DEPLOY"**
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
ROLLBACK.Workflow ==	**"WF_TS_MONITOR_UNDEPLOY"**
DATA.Lock ==	true

The Workflow present in EXECUTE.Workflow attribute it is going to seek a MONITOR in Status INSTANTIATED in the DDBB . Once found , the WF will start the deployment, if the deployment is successful we set the status of the artifact as the SET.Status attribute dictates. The attribute SET.Running_Status concern about the temporal status that the artifact it is going to maintain until the final change of status that comes from SET.Status.

In case of error during the execution, the TD will jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case the workflow will be **"WF_TS_MONITOR_UNDEPLOY"** the TD will initiate the rollback process launching the previous workflow.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".

2.15 TLD ACTIVATE: Activate_Volume Task.

The TDs that have present in the their names "Activate", are Task Definitions responsible of the activation in the platform targeted and the updating of the status in the platform and the DDBB, in this case, the artifact that is going to be activated is a "FLAVOR", this means, when this workflow finish, we will have a FLAVOR with status ACTIVE associated to the VIRTUAL_MACHINE that it is going to use it in the activation.
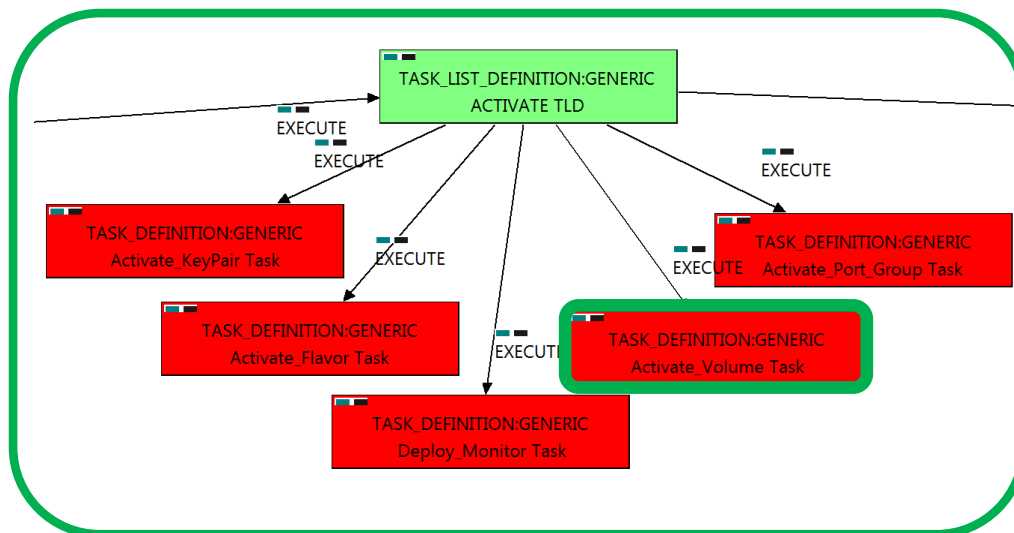

Figure: 15: Activation of the Volume.

Targets of the TASK DEFINITION: STATUS of the TD: ENABLED

GENERAL.Name ==   Activate_Volume Task
FIND.MainArtifact==
VNF>VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_LUN@status=INSTANTIATED,
VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_LUN@status=INSTANTIATED
SET.Running_Status ==   INSTANTIATED.
SET.Status ==   CREATED.
EXECUTE.Workflow ==   **"WF_TS_CREATE_VOLUME"**
EXECUTE.Inactive ==   false
ROLLBACK.Behaviour_on_error ==   ROLLBACK
ROLLBACK.Number_of_retries ==   0
DATA.Lock ==   true

The Workflow present in EXECUTE.Workflow attribute it is going to seek a VIRTUAL_LUN in Status INSTANTIATED in the DDBB . Once found , the WF will start the activation, if the activation it is successful we set the status of the artifact as the SET.Status attribute dictates. The attribute SET.Running_Status concern about the temporal status that the artifact it is going to maintain until the final change of status that comes from SET.Status.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case, we have a "ROLLBACK" set as behavior, so the rollback process will start when the TD reaches this point, it will throw an error due there is no workflow assigned to be executed during the rollback.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".

2.16 TLD ACTIVATE: Activate_Port_Group Task.

The TDs that have present in the their names "Activate", are Task Definitions responsible of the activation in the platform targeted and the updating of the status in the platform and the DDBB, in this case, the artifact that is going to be activated is a "PORT_GROUP:VCENTER", this means, when this workflow finish, we will have a PORT_GROUP with status ACTIVE associated to the VSWITCH:VCENTER that it is going to be used in the activation.
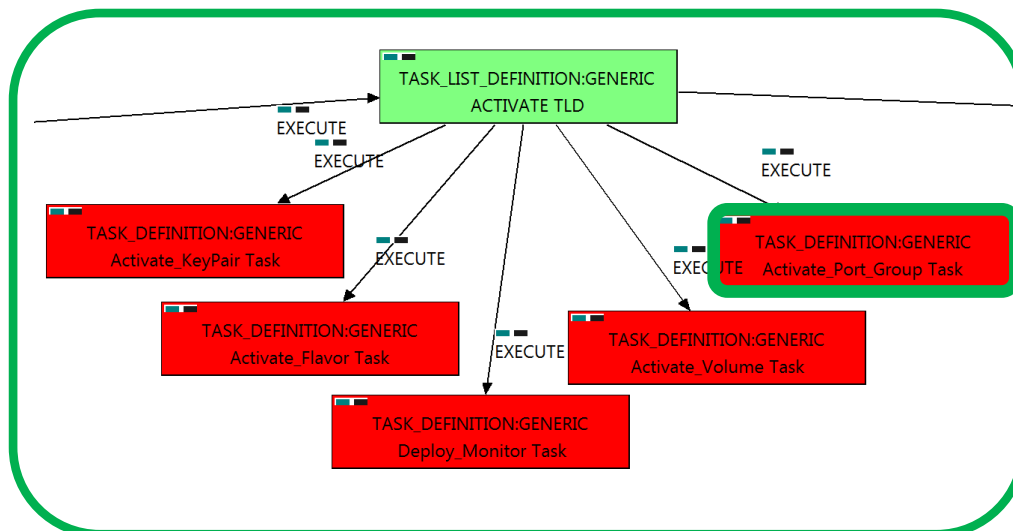
Figure: 16 Activation of the Port Group associated.

Targets of the TASK DEFINITION:	STATUS of the TD:	ENABLED

GENERAL.Name ==	ACTIVATE_FLAVOR
FIND.MainArtifact==	
VNF>VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_PORT<PORT_GROUP,	
VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_PORT<PORT_GROUP	
SET.Status ==	ACTIVE.
EXECUTE.Workflow ==	**"WF_TS_ACTIVATE_PORT_GROUP_VCENTER"**
EXECUTE.Inactive ==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

The Workflow present in EXECUTE.Workflow attribute it is going to find a PORT_GROUP in Status INSTANTIATED in the DDBB. Notice that we are not trying to get a VNF in status INSTANTIATED. The query it is going to use the Path present in the category FIND.MainArtifact. Once found , the WF will start the activation, if the activation it is successful we set the status of the artifact as the SET.Status attribute dictates. If the TD ends properly the user will have a fully activated PORT_GROUP, related to a VSWITCH:VCENTER as children.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case, we have a "ROLLBACK" set as behavior, so the rollback process will start when the TD reaches this point, it will throw an error due there is no workflow assigned to be executed during the rollback.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".
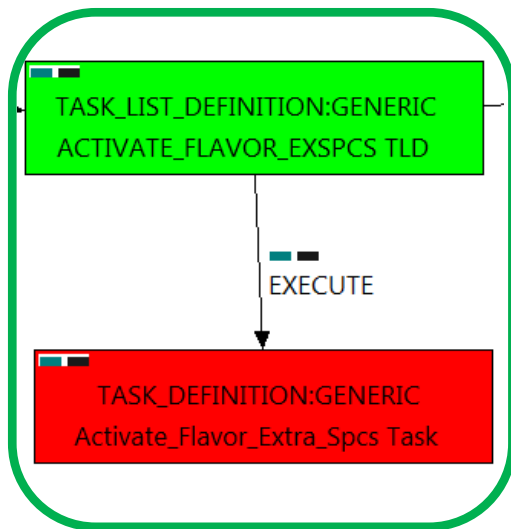
Figure: 17: Activation of the Flavor Extra Specs.

2.17 TLD ACTIVATE Flavor ES: ACTIVATE_FLAVOR_EXTRA_SPECS.

The TDs that have present in the their names "Activate", are Task Definitions responsible of the activation in the platform targeted and the updating of the status in the platform and the DDBB, in this case, the artifact that is going to be activated is a "FLAVOR" with EXTRA_SPECS, this means, when this workflow finish, we will have a FLAVOR with EXTRA_SPECS with status ACTIVE associate to the VIRTUAL_MACHINE that it is going to use it in the activation.

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED

GENERAL.Name ==	ACTIVATE_FLAVOR_EXTRA_SPECS
FIND.MainArtifact == **VNF>VNF_COMPONENT>VIRTUAL_MACHINE> VIRTUAL_CORE<CORE<CPU<SERVER<AVAILABILITY_ZONE<REGION> COMPUTE>FLAVOR>EXTRA_SPECS:HELION_CG@status=INSTANTIATED, VNF_COMPONENT>VIRTUAL_MACHINE>VIRTUAL_CORE<CORE <CPU<SERVER<AVAILABILITY_ZONE<REGION>COMPUTE> FLAVOR>EXTRA_SPECS:HELION_CG@status=INSTANTIATED**	
SET.Running_Status ==	INSTANTIATED.
Set.Status ==	ACTIVE.
EXECUTE.Workflow ==	**"WF_TS_ACTIVATE_ATTACH_EXTRA_SPECS"**
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

The Workflow present in EXECUTE.Workflow attribute it is going to seek a "HELION_CG" in Status INSTANTIATED in the DDBB . Notice that we are not trying to get a VIRTUAL_MACHINE in status INSTANTIATED. The query it is going to use the Path present in the attribute FIND.MainArtifact. Once found , the WF will start the activation, if the activation it is successful we set the status of the artifact as the SET.Status attribute dictates. The attribute SET.Running_Status concern about the temporal status that the artifact it is going to maintain until the final change of status that comes from SET.Status.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case, we have a "ROLLBACK" set as behavior, so the rollback process will start when the TD reaches this point, it will throw an error due there is no workflow assigned to be executed during the rollback.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".
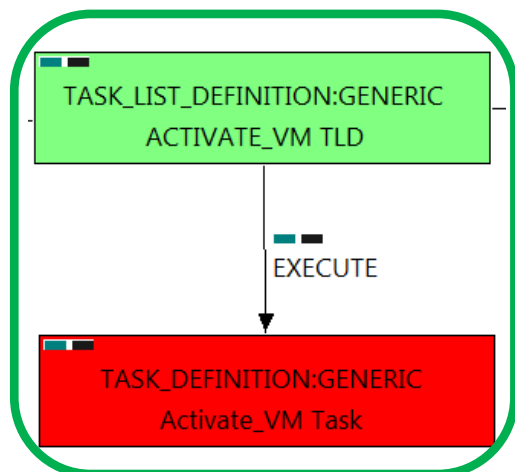
2.18 TLD ACTIVATE VM: ACTIVATE_VM

The TDs that have present in the their names "Activate", are Task Definitions responsible of the activation in the platform targeted and the updating of the status in the platform and the DDBB, in this case, the artifact that is going to be activated is a "VIRTUAL_MACHINE, this means, when this workflow finish, we will have a VIRTUAL_MACNIHE with status ACTIVE.

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED
GENERAL.Name ==	ACTIVATE_VM
FIND.MainArtifact==	
VNF>VNF_COMPONENT>	
VIRTUAL_MACHINE@status=INSTANTIATED,	
VNF_COMPONENT>	
VIRTUAL_MACHINE@status=INSTANTIATED	
SET.Running_Status ==	INSTANTIATED.
Set.Status ==	ACTIVE.
EXECUTE.OrderBy ==	**GENERAL.order**
EXECUTE.Workflow ==	
	"WF_TS_ACTIVATE_VM"
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

Figure: 18: Activation of Virtual Machine related to the VNF.

The Workflow present in EXECUTE.Workflow attribute it is going to seek a "VIRTUAL_MACHINE" in Status INSTANTIATED in the DDBB. Once found, the WF will start the activation of the Virtual Machine, if the activation it is successful we set the status of the artifact as the SET.Status attribute dictates. The attribute SET.Running_Status concern about the temporal status that the artifact it is going to maintain until the final change of status that comes from SET.Status.

This TD could launch different workflows depending on the type of the VM that it is going to be activated, the main kinds of our VIRTUAL_MACHINEs are CG and HELION, and so two of the WFs that are going to be used in this activation are: "WF_TS_ACTIVATE_VM_CARRIER_GRADE" and "WF_TS_ACTIVATE_VM_HELION". In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case, we have a "ROLLBACK" set as behavior, so the rollback process will start when the TD reaches this point, it will throw an error due there is no workflow assigned to be executed during the rollback.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".
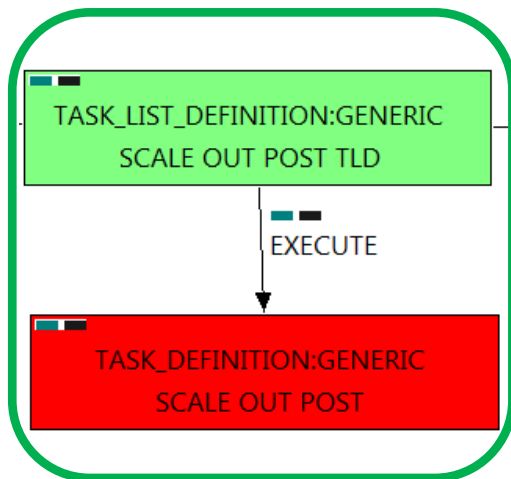
2.19 TLD DEPLOY POST: DEPLOY POST.

Figure: 19: Deploying Post-Processing policies.

This TD is responsible of the provision in the right order of the artifacts referenced by the Post-Processing policies, these policies allow the user to treat a number of elements that should be taken in consideration after the execution of some TD in a specific order, in other case, the execution will fail depending on the event occurred.

Targets of the TASK DEFINITION: STATUS of the TD:
 ENABLED

FIND.MainArtifact ==   POLICY:POSTPRE_PROCESSING
FIND.Condition ==
PROCESSING_JOB.Job_type==constant:POST&&
PROCESSING_JOB.Operation==constant:SCALEOUT
EXECUTE.OrderBy ==   PROCESSING_JOB.OrderBy
ROLLBACK.Number_of_retries ==   0
DATA.Lock ==   false

In this TD there is not a workflow to be executed, the target of this TD is process in the correct order the PostProcessing policies present in the VNF, these policies should be executed in a specific order to make the changes or configurations properly, in other case an error will be launched

If the TD ends successfully, the Post-Processing policies will have been applied adequately.

In case of error during the execution, the TD will jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK.

Due to that the value of the attribute DATA.Lock is fase, when the Task Definition has finished the artifact that was used in the workflow executed will remain unlocked.
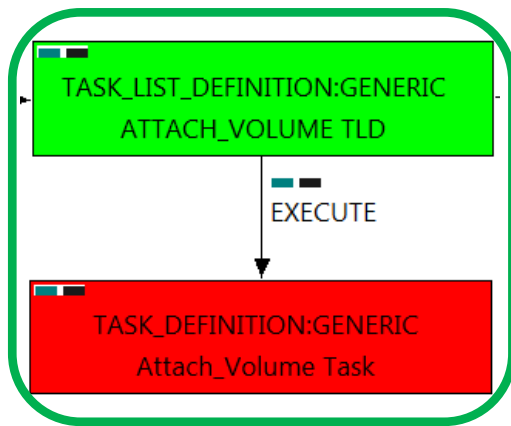
2.20 TLD ACTIVATE Attach Volumen: ATTACH_VOLUME

The TDs that have present in the their names "Attach", are Task Definitions responsible of the connection between artifacts, this means, this TDs will attach a VOLUME to a specific VIM, this specific VIM could change, so the workflow implied in this TD it will launch a custom WF for each kind of VIM. The VOLUMEs that are activated by this TD have two final uses, directly linked with a VIM, or used as External Storage.

Once finished, we should have a number of VOLUMEs activated, liable to a VIM or acting as external Storage.

Targets of the TASK DEFINITION:	STATUS of the TD: ENABLED
GENERAL.Name ==	ATTACH_VOLUME
FIND.MainArtifact== **VNF>VNF_COMPONENT>VIRTUAL_MACHINE> VIRTUAL_LUN@status=CREATED,VNF_COMPONENT> VIRTUAL_MACHINE>VIRTUAL_LUN@status=CREATED**	
SET.Running_Status ==	ACTIVE.
Set.Status ==	ACTIVE.
EXECUTE.Workflow ==	**"WF_TS_ATTACH_VOLUME"**
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

Figure: 20: Attaching of the Volume used.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case, we have a "ROLLBACK" set as behavior, so the rollback process will start when the TD reaches this point, it will throw an error due there is no workflow assigned to be executed during the rollback.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".
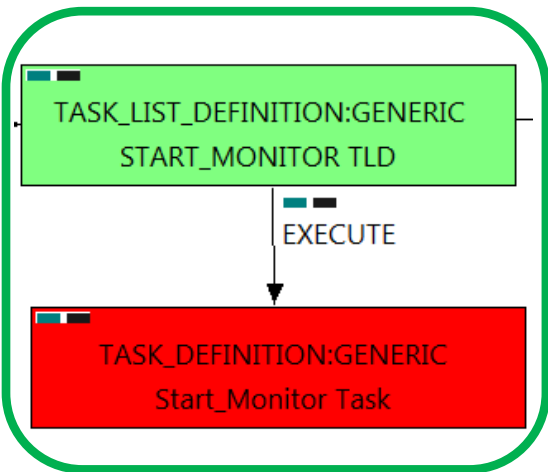
Figure: 21: Starting Monitor.

2.21 . TLD START MONITORS: START_MONITOR.

The TDs that have present in the their names "Start" are Task Definitions responsible of the launching of the component in the platform targeted and the updating of the status in the platform and the DDBB , these deployments are slightly different to the ones we launch for our entities, as a rule, they are small components as the MONITORs. In this case, the artifact that is going to be deployed is a "MONITOR", this means, when this workflow finish, we will have a MONITOR deployed with status STARTED ready to monitories.

Targets of the TASK DEFINITION:	STATUS of the TD:
	ENABLED

GENERAL.Name ==	START_MONITOR
FIND.MainArtifact ==	**MONITOR**
FIND.Condition ==	**status==constant:DEPLOYED**
SET.Running_Status ==	DEPLOYED
SET.Status ==	STARTED.
EXECUTE.OrderBy ==	**GENERAL.order**
EXECUTE.Workflow ==	
	"WF_TS_MONITOR_START"
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	ROLLBACK
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

The Workflow present in EXECUTE.Workflow attribute it is going to seek a MONITOR with Status DEPLOYED.

Once found , the WF will start the activation, if the activation it is successful we set the status of the artifact as the SET.Status attribute dictates. The attribute SET.Running_Status concern about the temporal status that the artifact it is going to maintain until the final change of status that comes from SET.Status.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, in this case, we have a "ROLLBACK" set as behavior, so the rollback process will start when the TD reaches this point, it will throw an error due there is no workflow assigned to be executed during the rollback.

Due to that the value of the attribute DATA.Lock is true, when the Task Definition has finished the artifact that was used in the workflow executed will be set as "Locked".
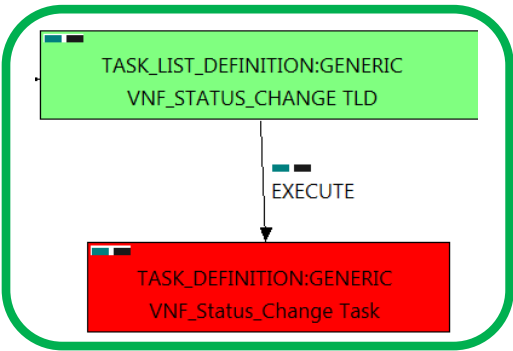
Figure: 22: Changing the status of the VNF.

2.22 . TLD VNF STATUS CHANGE: VNF_STATUS_CHANGE.

The TDs that have present in their names "Status Change", are Task Definitions responsible of the change in the status of the entity associated, in this case a VNF. When the WF has finished we will have an VNF with status ACTIVE in case of successful execution, or status ERROR in case of error, or simply not any change in the status because a ROLLBACK during the execution.

Targets of the TASK DEFINITION: ENABLED	STATUS of the TD:
GENERAL.Name ==	VNF STATUS CHANGE
SET.Running_Status ==	INSTANTIATED.
SET.Status ==	ACTIVE.
EXECUTE.Inactive==	false
ROLLBACK.Behaviour_on_error ==	STOP
ROLLBACK.Number_of_retries ==	0
DATA.Lock ==	true

The TASK_DEFINITION do not execute any workflow, with the attributes present in the categories it is enough to change the status of the entity.

In case of error during the execution, the workflow jump to the ROLLBACK category, If the "Behaviour_on_error" attribute its set on "ROLLBACK" the WF will start the execution of the Workflow present in the attribute with the same name in the category ROLLBACK, but in this case, we have a "STOP" set as behavior, so no Rollback it is going to be initiated, so the execution it is going to end here in case of error.

The TLD will finish correctly once the execution reaches this point, the VNF will change its status to "ACTIVE".