



Scaling Use Case

Casablanca

June 11, 2018

Auto Scale Out

- Description
 - Dynamically add instances of a VNFC to address increased loads and bottlenecks within the VNF.
- Business Requirement
 - Operators require this use case to achieve the resource efficiencies promised by cloud computing
- Supporting Companies
 - AT&T
- Demo VNFs
 - vDNS
- Impacted Projects
 - AAI, APPC, CLAMP, OOF, POLICY, SDC (Modeling), SDNC, SO, VID

Scaling Use Cases

	Scale Out	Scale In
Manual Scaling	Beijing <i>(In Progress)</i>	Dublin
Auto Scaling	Casablanca	Dublin

Scale In Complexities

- Must not impact service
- Drain/Migrate existing traffic
- Transfer state of old instance
- May need to create VNF state machine and state transitions (Idle/Active)

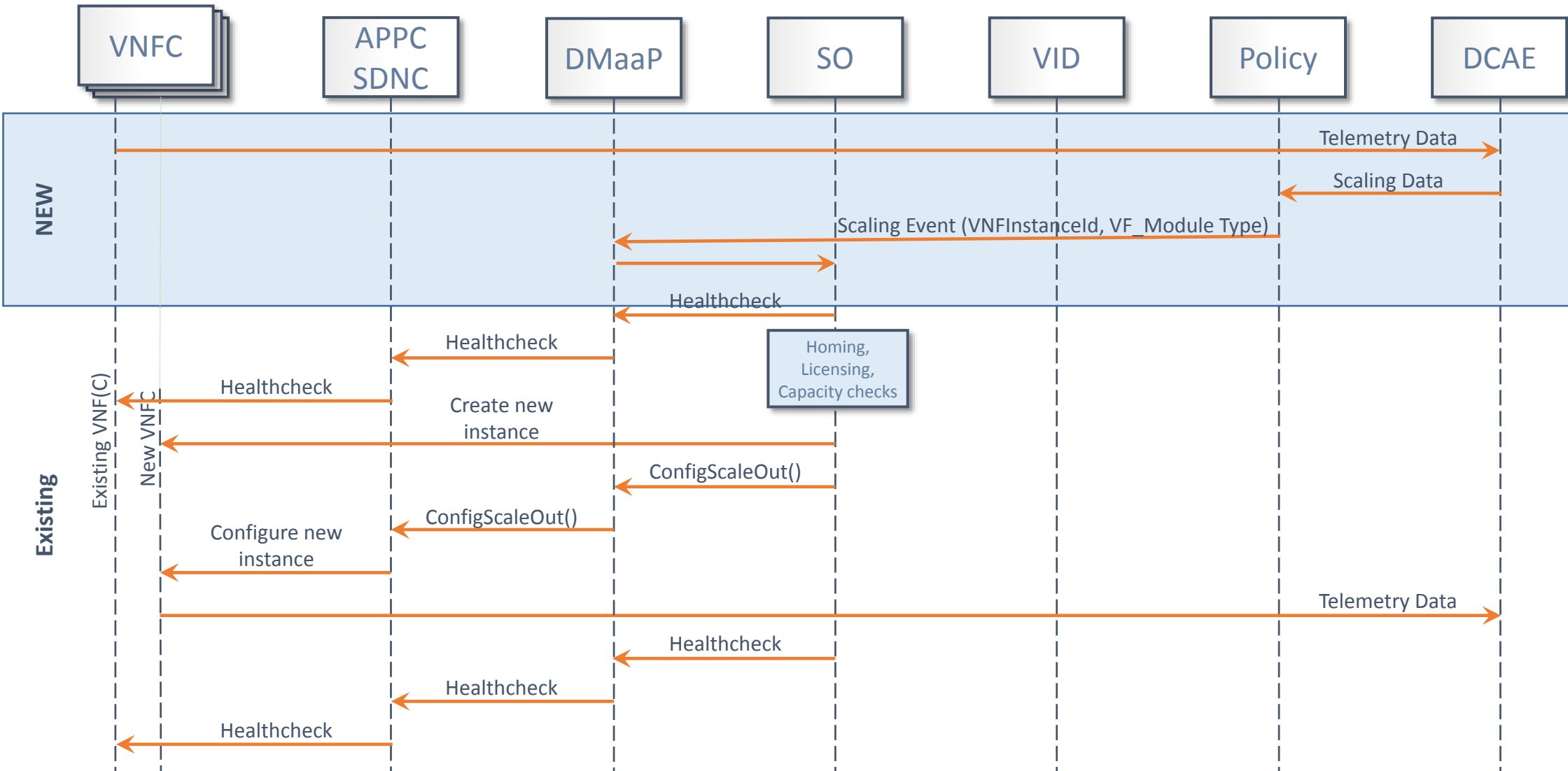
Scaling Features for Future Releases

- Scale In
- Scaling TOSCA-based VNFs (Dublin)
- VNF Level Scaling
- Scaling across Datacenters
- Scaling in reaction to other events such as ordering
- Vertical Scaling
- Integrate use of WorkFlow Designer (Dublin)

Casablanca Scaling Features

- Control (Closed) Loop Triggered Scale Out – This is the highlight feature for Casablanca and will provide a closed loop response to high demand within a VNF.
 - Impacts: Policy, CLAMP, SO, SDC, (Modeling)
- Clean up items from Beijing
 - Configuration Data – When SO tells the Controller (APPC/SDNC) to configure the VNF for the new VNFC instance, the Controller must get the required data from available resources such as AAI. This feature was not completed in Beijing and is required for both Manual and Auto Scaling. Impacts: APPC, SDNC, AAI, SO
 - Healthcheck needs to be fixed so that it can find the correct IP Addresses. Impacts: APPC, SDNC, AAI
 - IP Address Assignment changes: AAI needs to implement a new custom query to make it easy for controllers to find the IP Addresses of the new instances. Impacts: AAI, APPC, SDNC
 - SDNC as VNF Controller: SDNC needs to ingest all the APPC functionality so that it can scale VNFs for which it is responsible: Impacts: SDNC
- Controller Cluster and Channel – In Beijing the operator had to manually select the controller type (SDNC or APPC) within VID. The controller Cluster and Channel should be part of the VNF model and not a run time option.
 - Impacts: Modeling, Policy, SDC, SO, SDNC and APPC
- Homing and Capacity – When new instances are requested we should do a check to determine placement and license availability. This feature was descoped from Beijing.
 - Impacts: SO, OOF, Policy, SDNC, AAI

Auto Scale Out Work Flow



Project Impacts (*Draft*)

AAI

- Implement and develop a **new** custom query to get the IP Addresses that will be used to communicate to the VF-Module Instance being scaled. The Custom query should be generic so that it can be used for different Configuration actions

APPC

- For L4-L7 VNFs, process a HealthCheck action from SO via DMaaP
- For L4-L7 VNFs, process a ConfigScaleOut action from SO via DMaaP.
 - Receive ConfigScaleOut(VNF_ID, VF_Module_ID)
- Retrieve the IP addresses from A&AI for the ConfigScaleOut action
 - Obtain Configuration information for new instance from A&AI

Project Impacts (*Draft*)

CLAMP

- Ensure CLAMP has access to VF_Module_Type at design time
- Create policies for Scaling of vDNS
- Create Guard policies for Auto Scale Out

OOF

- OOF will process Homing and license placement request from MSO.
- OOF will support additional Policies for Scale Out to check the following:
 - If there is enough capacity in the region or close to the region
 - For the VNF Instance, is the license sufficient to satisfy the configuration requested

Project Impacts (*Draft*)

Modeling

- Need to add Controller Cluster and Channel to the Service Model in SDC

Policy

- Create API call to SO with VNFInstanceID and VF_Module_Type as arguments
- Set up proper Guard Policies
- Compare number of instances to both Min and Max values
- Check Prov_Status = PROV

Project Impacts (*Draft*)

SDC

- Support a Common Controller communication i.e. common Controller architecture to process LCM actions
 - Model new parameters, Controller Cluster and Topic (Channel), in the TOSCA Service Model. The Controller Cluster and Topic can be defined by geography. Note: Controller Type will Not be used in Casablanca release and going forward. The Controller Cluster should be one of: APPC, SDNC, *VF-C*
 - *The Topic (Channel) will be a two (2) way communication*

SDNC

- Import Scaling changes from APPC so that all configuration changes may be done on VNFs controlled by SDNC
- After Resource Assignment for new instance, IP Addresses need to be added to AAI

Project Impacts (*Draft*)

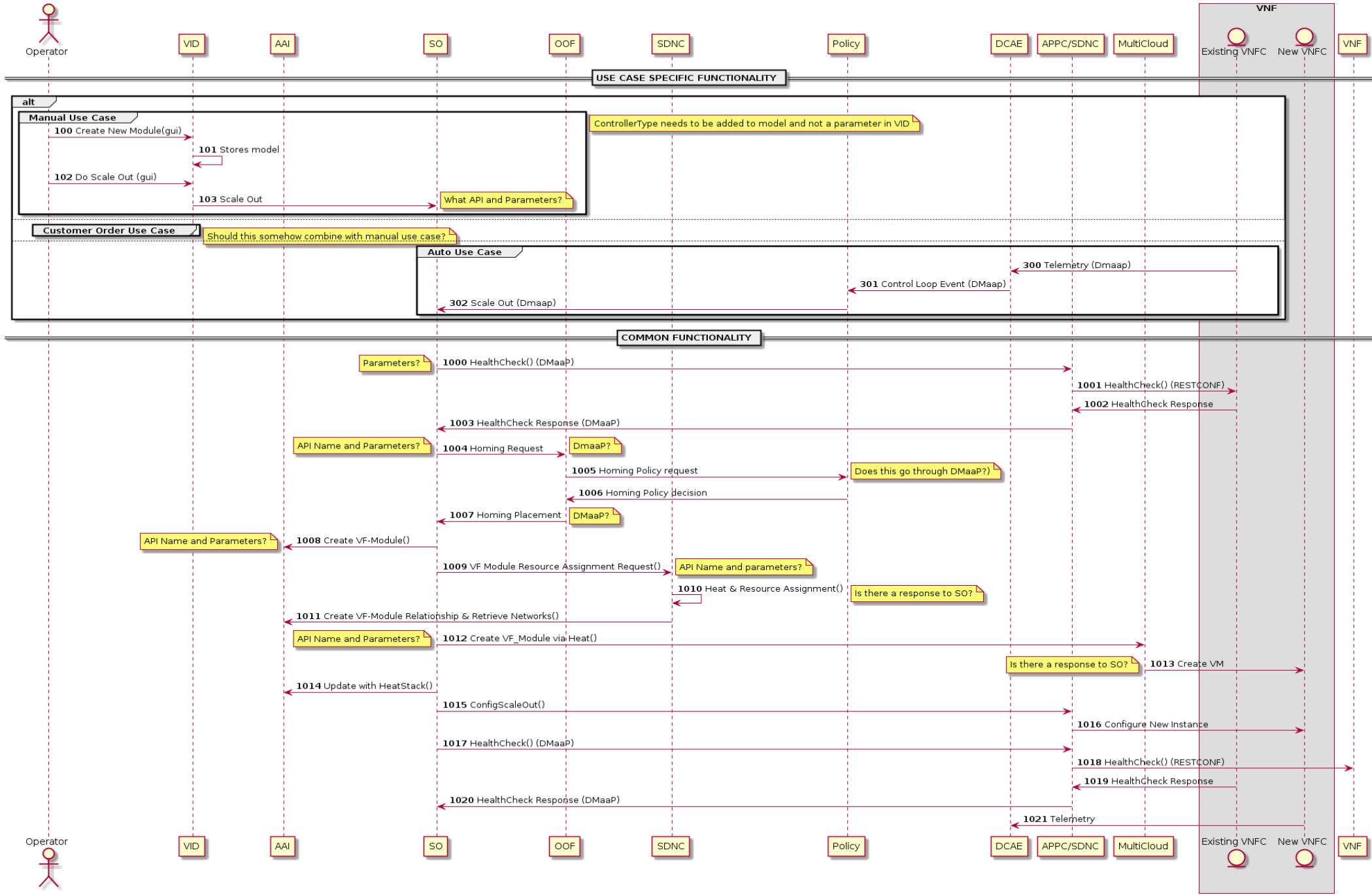
SO

- Create API for VID and Policy to call that will allow SO to scale a VNFC
- Create work flow to get all needed information to Scale a VNFC
- Call API for Homing and Licensing checks

VID

- Change Manual Scaling Use Case to use the same SO API that Policy is using in Auto Scaling Use Case (Common Actor API)
- Remove Controller Type from the VID GUI and from the request sent to SO

ONAP Scaling Use Cases



Homing and License Flow Diagram

