Use Case: vFW/vDNS (Approved)

Name of Use Case:

vFW/vDNS

Use Case Authors:

AT&T

Description:

The vFW/vDNS use case as implemented currently and described in the demo configuration here:

Installing and Running the ONAP Demos

UCA-17 - Getting issue details... STATUS

Users and Benefit:

Allows for quick and easy demos without any infrastructure or lab constrains.

Can be easily automated for daily integration testing.

VNF:

vFW

vPacketGenerator

vDataSink

vDNS

vLoadBalancer

all VPP based.

Work Flows:

- Instantiation
- Performance based control loop

In this section we will show the work flows for the vFW and vDNS use case. Two section: one is the reference from the original prototype and the second is the new sequence diagram for Release 1.

0. Original Sequence Diagram (R0)

0.1 Onboarding (Old Flow)

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0.2 Instantiation (old flow)

blocked URL

0.3 Control Loop for vFW (Old Flow)

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```
@startuml
title vFW Closed Loop
participant vPG
participant vFW
participant vSN
vPG -> vFW : traffic
vFW -> vSN : traffic sink
|||
note left: vPG automatically \nincreases traffic based on script
vFW -> DCAE : VES Telemetry
DCAE -> Policy : Threhold Crossing (High)
Policy -> Policy : pattern-match-replace vFW to vPG data
Policy -> APPC : ModifyConfig (lower PG traffic)
APPC -> vPG : Netconf modify config
note right : reduce number of traffic streams
vPG -> vFW : lower traffic
vFW -> DCAE : VES Telemetry
DCAE -> Policy : Event cleared (lower traffic)
@enduml
```

0.4 Control Loop vDNS (Old Flow)

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Release 1 Flows:

The order of flows would not be how CI testing would flow. that would be VNF Certification, Onboarding, CLAMP, Instantiation, Closed Loop vFW , Closed Loop vDNS and then Delete of vFW and vDNS.

Most of the R1 flows will be the same except for the addition of new components that should support the vFW/vDNS regression test.

there is one functional change. We will move the query to AAI for data from Policy to APPC so that we can use the APPC interface to AAI which is the correct flow.

1.1 Onboarding

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```
@startuml
title vFW and vDNS VNF Onboarding (R1)\nvFW and vDNS use the same flows but they are separate VNFs/Services
ONAP_User -> SDC : vFW_vDNS resource onboarding  (HEAT)
note right : vFW ( vpg, vfw, vsn)\nvDNS (vpg, vlb,vdns) + DNSScaling (vdns)\nCLAMP not shown
ONAP_User -> SDC : vFW_vDNS service onboarding
ONAP_User -> SDC : vFW_vDNS distribution
|||
ONAP_User -> SDC : vFW2_vDNS2 resource onboarding (TOSCA)
ONAP_User -> SDC : vFW2_vDNS2 service onboarding
ONAP_User -> SDC : vFW2_vDNS2 distribution
|||
SDC -> SO : artifact distribution
SDC -> AAI : artifact distribution
SDC -> APPC : artifact distribution
SDC -> SDNC : VNF preload data (vFW_vDNS and vFW2_vDNS2) ?
SDC -> DCAE : Telemetry to Collect and CLAMP triggers
SDC -> Policy : Control Loop Policies (see CLAMP flow)
note left: policy may cut through to Policy GUI
@enduml
```

1.2 Instantiation

blocked URL

```
@startuml
title vFW vDNS Instantiation (R1)\nvFW and vDNS use the same flows but they are separate VNFs/Services
participant UseCaseUI
participant ONAP_User
Participant SDC
Participant VID
Participant SO
UseCaseUI -> AAI : populate cloud inventory
ONAP_User -> VID : vFW_vDNS deployment
VID -> SDC : Lookup VNF artifacts
VID -> AAI : Lookup cloud locations, subscriber
VID -> SO : vFW_vDNS instantiation\n(base modules)
SO -> AAI : inventory update
SO -> SDNC : Generic VNF API\n(reserved)
SO -> Multi_VIM : vFW_vDNS Heat template + ENV file
Multi_VIM -> CloudAPI : vFW_vDNS Heat template + ENV file or\n ARM Tempalte + Parameters + LinuxExtensionScripts
CloudAPI -> Hypervisor : vFW_vDNS Infrastructure instantiation
Hypervisor -> vFW_vDNS : Nova/Neutron Instantiation
Hypervisor -> CloudAPI : complete
CloudAPI -> Multi_VIM : complete
Multi_VIM -> SO : complete
note right : SO may poll for completion
SO -> SDNC: Generic VNF API\n(activated)
note right : on failure from Openstack SO issues rollback to SDNC
SDNC -> AAI : L3 Network resource update
SO -> VID : complete
note right : VID will poll for competion
SO -> Multi_VIM : Replaces Robot HEATBridge to pull data from cloud
Multi_VIM -> CloudAPI : VM data from cloud\n(public cloud will be less than if owner operated)
Multi_VIM -> SO : cloud data
SO -> AAI : Update with cloud data
|||
ONAP_User -> VID : vFW2_vDNS2 deployment (TOCA based)
VID -> SDC : Lookup VNF artifacts
VID -> AAI : Lookup cloud locations, subscriber
VID -> SO : vFW2_vDNS2 instantiation\n(base modules)
SO -> AAI : inventory update
SO -> SDNC : Generic VNF API\n(reserved)
SO -> Multi_VIM : vFW2_vDNS2 TOSCA template + ENV file
Multi_VIM -> CloudAPI : vFW_vDNS TOSCA template + ENV file or\n ARM Template + Parameters + LinuxExtensionScripts
CloudAPI -> Hypervisor : vFW2_vDNS2 Infrastructure instantiation
Hypervisor -> vFW2_vDNS2 : Nova/Neutron Instantiation
Hypervisor -> CloudAPI : complete
CloudAPI -> Multi_VIM : complete
Multi_VIM -> SO : complete
note right : SO may poll for completion
SO -> SDNC: Generic VNF API\n(activated)
note right : on failure from Openstack SO issues rollback to SDNC
SDNC -> AAI : L3 Network resource update
SO -> VID : complete
note right : VID will poll for competion
SO -> Multi_VIM : Replaces Robot HEATBridge to pull data from cloud
Multi_VIM -> CloudAPI : VM data from cloud\n(public cloud will be less than if owner operated)
Multi_VIM -> SO : cloud data
SO -> AAI : Update with cloud data
@enduml
```

1.3. Closed Loop vFW

There are no changes in the vFW closed loop for R1

blocked URL

```
@startuml
title vFW Closed Loop
participant vPG
participant vFW
participant vSN
vPG -> vFW : traffic
vFW -> vSN : traffic sink
|||
note left: vPG automatically \nincreases traffic based on script
vFW -> DCAE : VES Telemetry
DCAE -> Policy : Threhold Crossing (High)
Policy -> Policy : pattern-match-replace vFW to vPG data
Policy -> APPC : ModifyConfig (lower PG traffic)
APPC -> vPG : Netconf modify config
note right : reduce number of traffic streams
vPG -> vFW : lower traffic
vFW -> DCAE : VES Telemetry
DCAE -> Policy : Event cleared (lower traffic)
@enduml
```

1.4 Close Loop vDNS

~~This flow has the APPC to AAI query which moves the query from Policy to APPC.~~

There are no changes in the vDNS flow for R1. Originally we looked at moving the query from Policy to APPC but there were design details on executing the dnsscaling API call and whether APPC should call SO or MultiVIM directly that were not able to work out in time for R1. So we will continue with the original flow.

vDNS Flow (R1)

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Future Flow to be considered (After R1)

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```
@startuml
title vDNS Closed Loop
participant vPG
participant vLB
participant vDNS1
participant vDNS2
vPG -> vLB : traffic (high)
vLB -> vDNS1 : traffic sink
|||
note left: vPG automatically \nincreases traffic based on script
vLB -> DCAE : VES Telemetry (Traffic/vDNS)
DCAE -> Policy : Threhold Crossing (High)
Policy -> APPC: Scale VNF
APPC -> AAI : Named Query to map vLB to dnsscaling data
APPC -> SO : dnsscaling instantiate
SO -> AAI : inventory update
SO -> SDNC : Generic VNF API\n(reserved)
SO -> Multi_VIM: dnsscaling Heat template + ENV file
Multi_VIM -> OS_Heat : dnsscaling Heat template + ENV file
OS_Heat -> KVM : vDNS Infrastructure instantiation
KVM -> vDNS2 : Nova/Neutron Instantiation
KVM -> OS_Heat : complete
OS_Heat -> Multi_VIM : complete
Multi_VIM -> SO : complete
note right : SO may poll for completion
SO -> SDNC: Generic VNF API\n(activated)
note right : on failure from Openstack SO issues rollback to SDNC
SDNC -> AAI : L3 Network resource update
|||
note right : Alternative with TOSCA based dnsscaling
APPC -> AAI : inventory update
APPC -> SDNC : Generic VNF API\n(reserved)
APPC -> Multi_VIM : scale out request (Need to confirm since vFW/vDNS do not have VNFM)
Multi_VIM -> OS_Heat : dnsscaling Heat template + ENV file
OS_Heat -> KVM : vDNS Infrastructure instantiation
KVM -> vDNS2 : Nova/Neutron Instantiation
KVM -> OS_Heat : complete
OS_Heat -> Multi_VIM : complete
Multi_VIM -> APPC : complete
note right : APPC may poll for completion
APPC -> SDNC: Generic VNF API\n(activated)
note right : on failure from Openstack APPC issues rollback to SDNC
SDNC -> AAI : L3 Network resource update
|||
vLB -> DCAE : VES Telemetry
DCAE -> Policy : Event cleared (lower traffic)
@enduml
```

1.5 CLAMP creation of control loops (new in R1)

blocked URL

```
@startuml
title CLAMP Closed Loop Design for vFW and vDNS \nvFW and vDNS use the same flows but they are separate VNFs/Services
participant ONAP_User
participant CLAMP
participant SDC
ONAP_User -> CLAMP : Create Control Loop from Template
CLAMP -> SDC : Query for Services and VNFs
ONAP_User -> CLAMP : Choose Service and VNF
CLAMP -> SDC : Query for Alarm data from VNFs
ONAP_User -> CLAMP : Create Operational Policy\nChooses Chain of Actions\nSave Policy
ONAP_User -> CLAMP : Select TCA box,\nclicks and creates one or more \nassociated signature rules.\nAssociates them with the operational policy
\ncreated earlier
ONAP_User -> CLAMP : Repeat as Operational Policy/Signature as needed\n(total 1 vFW, 1 vDNS)
CLAMP -> Policy : Create Operational Policies
CLAMP -> Policy : Create String Matcher to Policy association
note right: executed for both vFW and vDNS policies
CLAMP -> SDC : Distribute Blueprint
ONAP_User -> SDC : check in, test, certify, distribute Blueprint
SDC -> DMaaP : Distribute control loop for DCAE
DMaaP -> DCAE : Control Loop Blueprint
CLAMP -> DMaaP : Poll for distribution complete
@enduml
```

1.6 VNF Certification (new in R1)

Control Automation:

See: Installing and Running the ONAP Demos

Override the default ssh key in the env file to be able to ssh to any of the 3 VMs instantiated by the demo.

Project Impact:

No additional work.

Work Commitment:

AT&T