



# *Dublin SO → Multicloud Usage Examples and Discussion*

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# Agenda

- Highlight features of MultiCloud in Dublin
- Demonstrate vFW deployment to K8S cloud
- Demonstrate vFW with HPA deployment (e.g. SR-IOV NICs)
- Deeper dive on SO / Multicloud
- Discussion/Work items

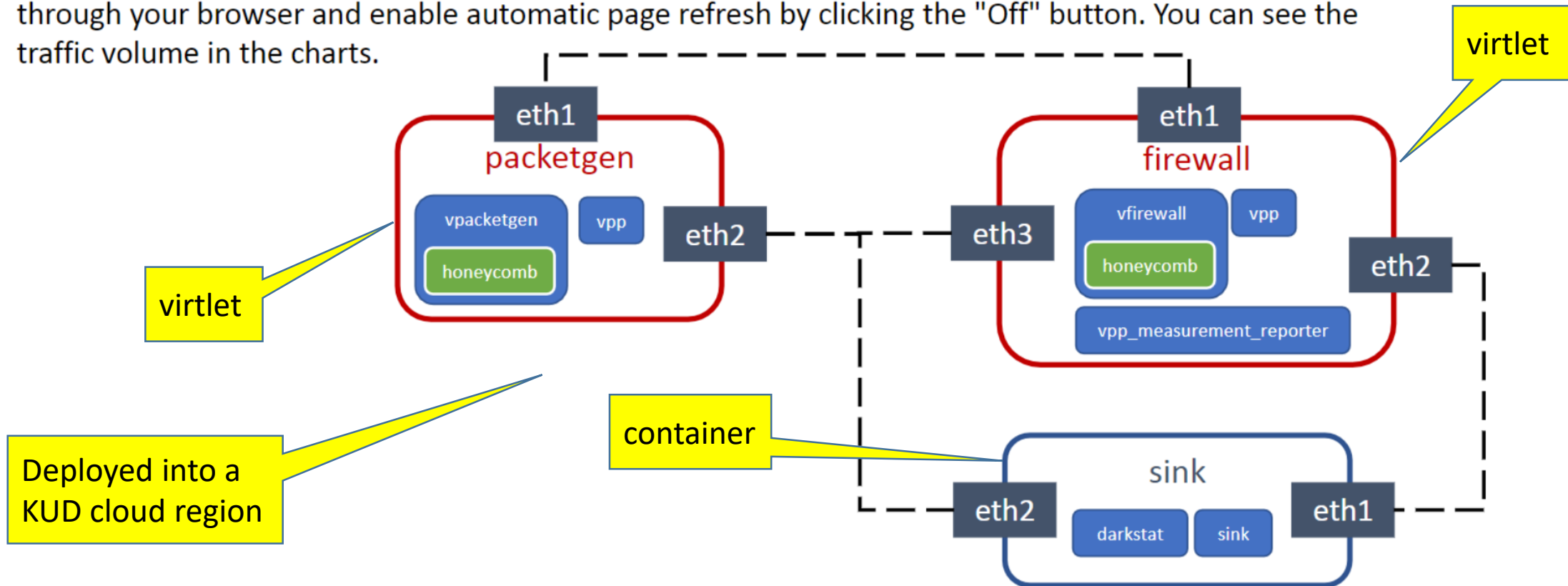
# Highlight features of MultiCloud in Dublin

- Added ArtifactBroker
  - As a SDC client for retrieving artifacts from SDC
- Upgraded the infra\_workload API
  - Optimized for SO/MultiCloud Integration
- Upgraded the Capacity Check API
  - Optimized to support OOF F-GPS requirement
- Added multi-tenancy support to NBI
  - Enhanced the multcloud NBI to support multi-tenant
  - In backward compatible approach
- Added multcloud-fcaps service
  - To Collect, Normalize and Relay Infrastructure's FCAPS to VES collector

# vFW K8S Use Case in ONAP

It is composed of three virtual functions (VFs):

- **Packet generator:** Sends packets to the traffic sink through the firewall. This includes a script that periodically generates different volumes of traffic.
- **Firewall:** Reports the volume of traffic passing through to the ONAP DCAE collector.
- **Traffic sink:** Displays the traffic volume that lands at the sink using the link <http://192.168.20.250:667> through your browser and enable automatic page refresh by clicking the "Off" button. You can see the traffic volume in the charts.



# Demo vFW K8S - Package Preparation, Onboarding through Service Creation and Distribution

- An archive file containing the Helm charts for the vFW K8S workload is packaged with a (minimal) set of Heat files
- Naming convention of the artifact:
  - <arbitrary>\_cloudtech\_k8s\_charts.tgz
  - E.g. “vfw\_cloudtech\_k8s\_charts.tgz”
  - Type: "CLOUD\_TECHNOLOGY\_SPECIFIC\_ARTIFACTS“
- Onboard and create VF and Service
- Distribute Service
  
- Demo recording:  
[https://wiki.onap.org/download/attachments/64006768/vfwk8s\\_package\\_distribute\\_720.mp4](https://wiki.onap.org/download/attachments/64006768/vfwk8s_package_distribute_720.mp4)

# Demo vFW K8S - Cloud Registration

- Register with AAI
  - Add K8S Cloud Region to AAI (cloud type 'k8s')
  - Register with Multicloud
  - ★ - NOTE: Handling of Tenant (using the labs OOF tenant in this demo)
- ★• Add K8S Cloud Region connectivity info to the Multicloud K8S plugin
- ★• Add cloud\_region to SO catalogdb cloud\_sites table
  - Need the cloud\_region and orchestrator == 'multicloud' (use DEFAULT identity)
- Demo recording:  
[https://wiki.onap.org/download/attachments/64006768/vfwk8s\\_cloud\\_registration\\_720.mp4](https://wiki.onap.org/download/attachments/64006768/vfwk8s_cloud_registration_720.mp4)
- Reference links:
  - AAI/Multicloud registration
  - <https://wiki.onap.org/display/DW/MultiCloud+K8s-Plugin-service+API%27s#MultiCloudK8s-Plugin-serviceAPI's-Reachability/ConnectivityInfoAPI's>

# Demo vFW K8S – Deployment / Deletion

- Create Service Instance
- Create VNF
- SDNC Preload – minimal – just the VF Module name
- ★• K8S Profile configuration (override values.yaml of the Definition)
- Create VF Module
- Delete VF Module
- Demo recording:  
[https://wiki.onap.org/download/attachments/64006768/vfwk8s\\_deploy\\_delete\\_720.mp4](https://wiki.onap.org/download/attachments/64006768/vfwk8s_deploy_delete_720.mp4)
- References
  - <https://wiki.onap.org/display/DW/MultiCloud+K8s-Plugin-service+API%27s#MultiCloudK8s-Plugin-serviceAPI's-ProfilesAPI's>

# K8S and vFW on K8S links

Links and presentations:

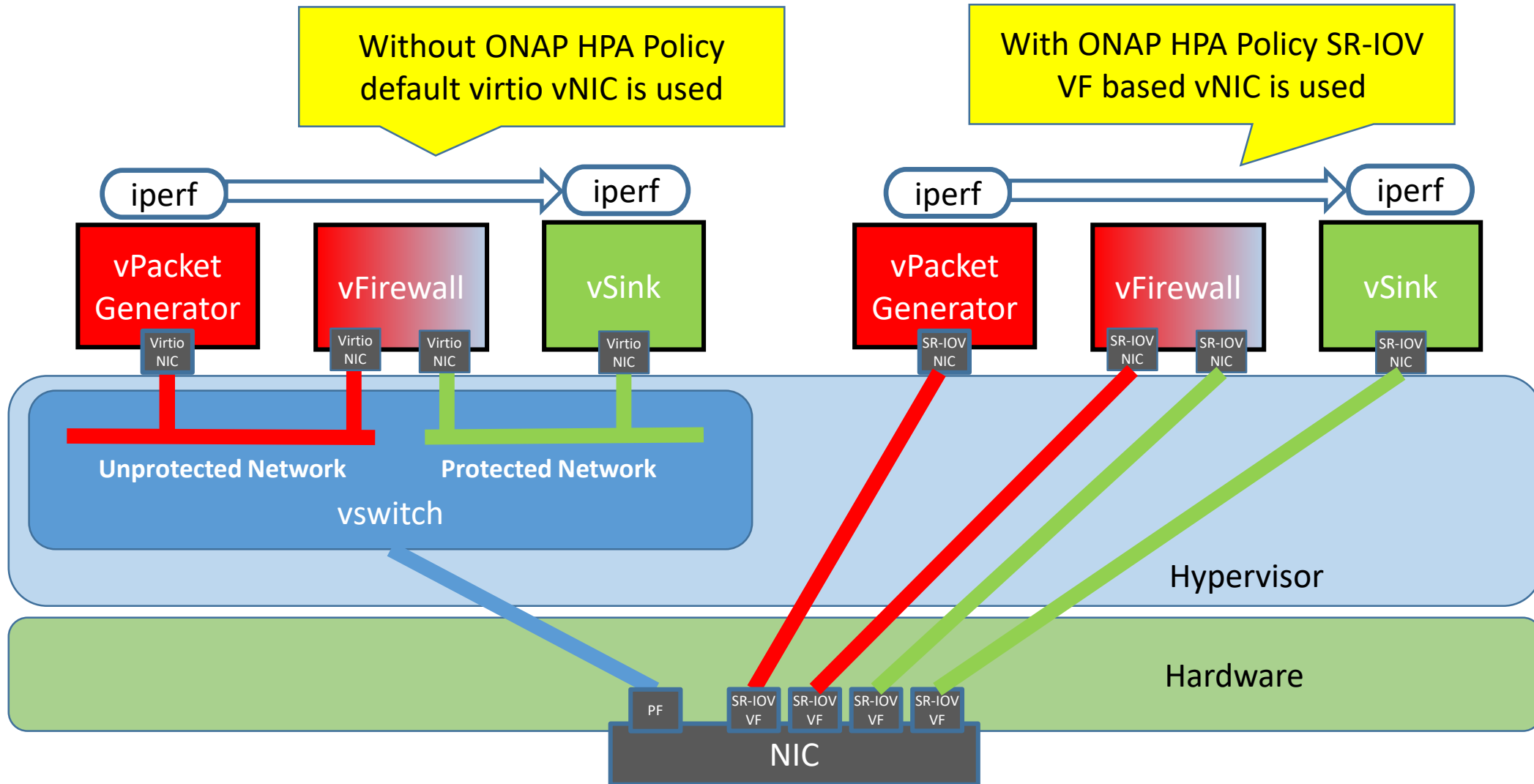
- <https://wiki.onap.org/display/DW/Deploying+vFw+and+EdgeXFoundry+Services+on+Kubernetes+Cluster+with+ONAP>
- <https://wiki.onap.org/display/DW/K8S+based+Cloud+Region+Support>
- [https://wiki.lfnetworking.org/display/LN/OPNFV-ONAP+January+2019+Session+Proposals?preview=/8257582/10551651/ONAP\\_DDF\\_2019\\_K8s\\_v3.pdf](https://wiki.lfnetworking.org/display/LN/OPNFV-ONAP+January+2019+Session+Proposals?preview=/8257582/10551651/ONAP_DDF_2019_K8s_v3.pdf)
- <https://wiki.lfnetworking.org/display/LN/OPNFV-ONAP+January+2019+Session+Proposals?preview=/8257582/10551763/ONAP%20MultiCloudK8s%20Casablanca.pdf>

KUD Information (previously called KRD)

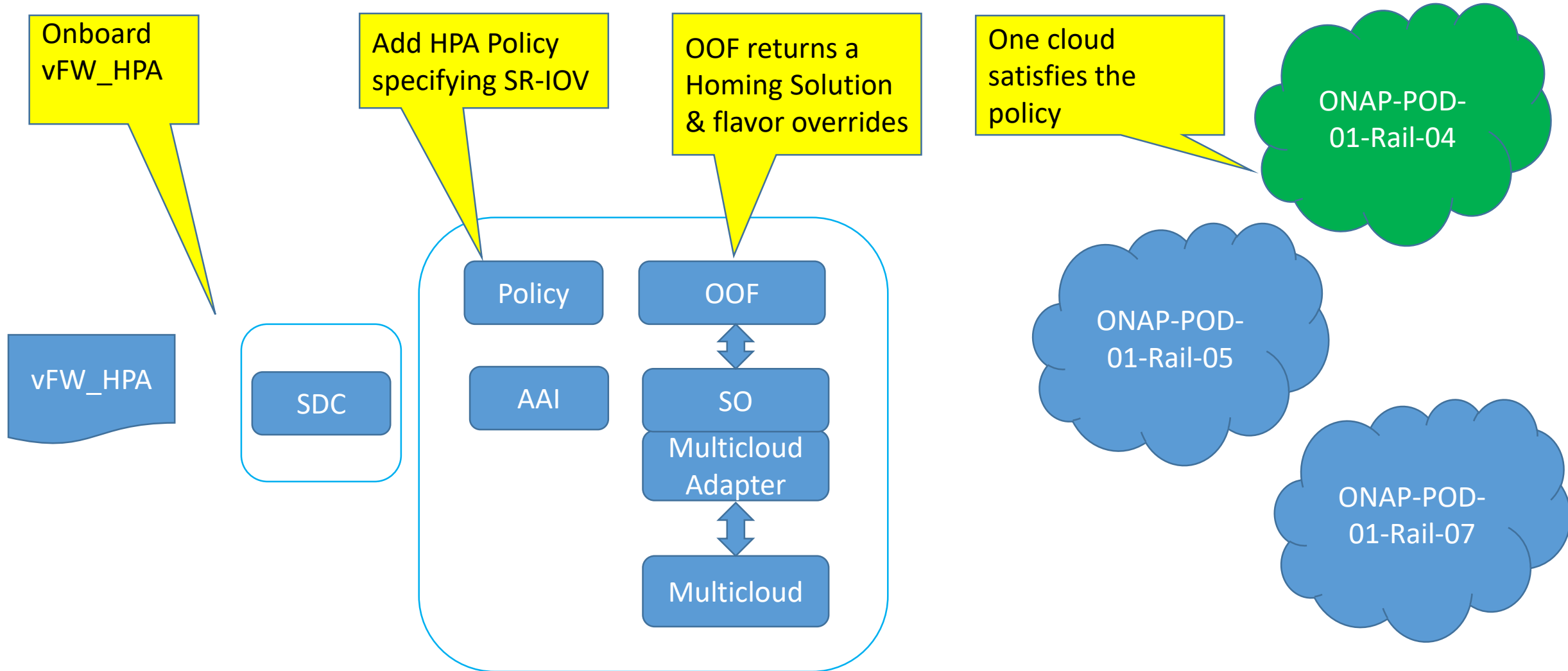
- <https://wiki.onap.org/display/DW/Kubernetes+Baremetal+deployment+setup+instructions>
- <https://github.com/onap/multicloud-k8s/tree/master/kud>



# Demo - vFW with HPA Policy for SR-IOV NICs



# vFW HPA Demo Scenario



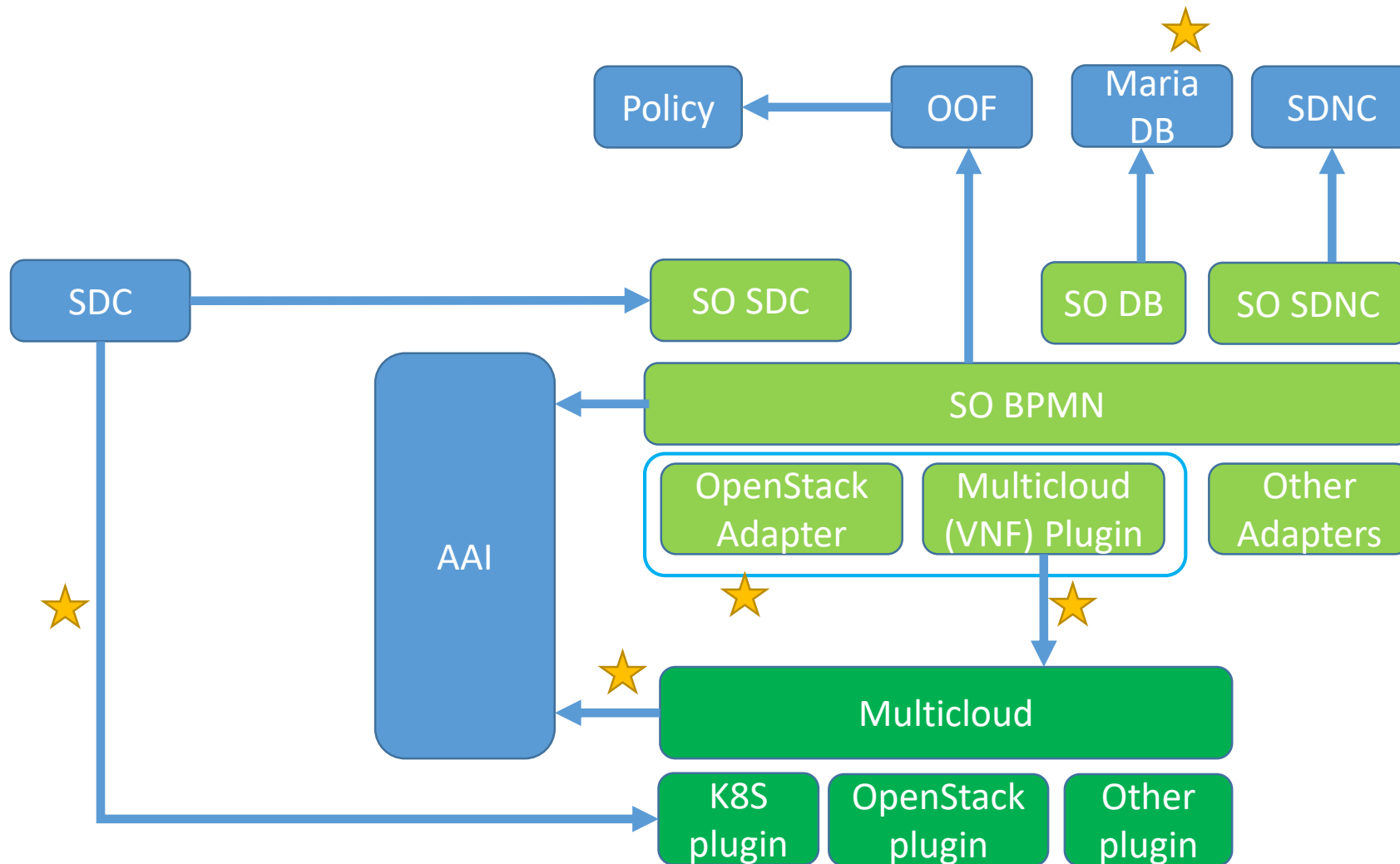
# vFW HPA Demo – End to end via automation script

- Automation script
  - A number of ONAP CLI commands were written to support automation
  - Performs the whole sequence end to end – see the README for details at: [https://github.com/onap/integration/tree/master/test/hpa\\_automation/heat](https://github.com/onap/integration/tree/master/test/hpa_automation/heat)
- Demo Context
  - Script is running in one of the ONAP K8S Nodes (e.g. onap-k8s-01)
- Demo recording: [https://wiki.onap.org/download/attachments/64006768/vfwhpa\\_deploy.mp4](https://wiki.onap.org/download/attachments/64006768/vfwhpa_deploy.mp4)

# HPA related links Links

- Demo is based on Test 2 here:  
<https://wiki.onap.org/pages/viewpage.action?pageId=41421112>
- <https://wiki.onap.org/display/DW/HPA+Policies+and+Mappings>
- <https://wiki.onap.org/display/DW/HPA+--+SR-IOV+NIC+design>
- [https://docs.onap.org/en/latest/submodules/integration.git/docs/docs\\_vfwHPA.html](https://docs.onap.org/en/latest/submodules/integration.git/docs/docs_vfwHPA.html)

# SO / Multicloud overview



# SO→Multicloud infra\_workload API

- Instantiate workload (e.g. Heat stack, Helm charts)  
`POST msb.onap.org:80/api/multicloud/v1/{cloud-owner}/{cloud-region-id}/infra_workload`
- Query  
`GET msb.onap.org:80/api/multicloud/v1/{cloud-owner}/{cloud-region-id}/infra_workload/{workload-id}`  
`GET msb.onap.org:80/api/multicloud/v1/{cloud-owner}/{cloud-region-id}/infra_workload?name={workload-name}`  
`GET msb.onap.org:80/api/multicloud/v1/{cloud-owner}/{cloud-region-id}/infra_workload?id={workload-id}`
- Delete  
`DELETE msb.onap.org:80/api/multicloud/v1/{cloud-owner}/{cloud-region-id}/infra_workload/{workload-id}`
- Update AAI (PoC)  
`POST msb.onap.org:80/api/multicloud/v1/{cloud-owner}/{cloud-region-id}/infra_workload/{workload-id}`
- <https://docs.onap.org/en/latest/submodules/multicloud/framework.git/docs/MultiCloud-APIv1-Specification.html#infrastructure-workload-lcm>

# POST msb.onap.org:80/api/multicloud/v1/{cloud-owner}/{cloud-region-id}/infra\_workload

```
{  
  "generic-vnf-id": "2115b07a-0c45-46ab-929a-0e98764a6ff3",  
  "vf-module-id": "86d30674-e096-4957-8ec0-7e0aef68868c",  
  "vf-module-model-invariant-id": "aa83cd86-a6f2-4b97-90d4-46bd7cd874",  
  "vf-module-model-version-id": "9e4386fb-8cdb-45b8-9b01-ae37bc0ba452",  
  "vf-module-model-customization-id": "a9e47763-adb7-4689-8dad-f5b780bf1af4",  
  "oof_directives": {...},  
  "sdnc_directives": {...},  
  "user_directives": {...},  
  "template_type": "heat",  
  "template_data": {{  
    "files": { },  
    "disable_rollback": true,  
    "parameters": {  
      "flavor": "m1.heat"  
    },  
    "stack_name": "teststack",  
    "template": "<escaped template file content>",  
    "timeout_mins": 60  
  }}  
}
```

Instance  
Info – e.g.  
AAI update

Model  
identifiers

Flavor  
information

SDNC Parameter list -  
e.g. Heat parameters

User Params

Template data  
E.g. Heat

# Discussion topics

- API enhancements / improvements
  - Remove redundancy (e.g. Heat parameters, template)
  - Virtual Link support
  - Volume support (?)
- Co-existence of SO Multicloud Plugin with SO Openstack Adapter
  - Currently a deployment configuration, VNF Adapter API v2 is used instead of v1
  - Openstack Adapter uses VNF Adapter API v1
  - VNF Plugin Adapter (e.g. Multicloud plugin) uses VNF Adapter API v2
- Use of cloud\_sites in catalogdb – try not to require it
  - Using cloud\_site ‘orchestrator = multicloud’ column for Multicloud adapter select
  - Multicloud adapter just needs to know cloud-owner, cloud-region and tenant
- AAI Update – i.e. Heatbridge
  - <https://wiki.onap.org/pages/viewpage.action?pageId=58228881>



# Thank You

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