

The background of the slide is a high-resolution satellite image of Earth from space, showing the curvature of the planet, blue oceans, and green landmasses. The top portion of the image is dark, representing the blackness of space.

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# ONAP: DCAE Transformation

Vijay Venkatesh Kumar ([vv770d@att.com](mailto:vv770d@att.com))

# Agenda

- ❖ Objective
- ❖ Honolulu scope
  - ❖ DCAE Architecture
  - ❖ DCAE Deployment Changes
  - ❖ Cross ONAP-project Impact
- ❖ Istanbul Scope
  - ❖ DCAE Architecture changes
  - ❖ Common Service Template
  - ❖ MS Configuration Management
  - ❖ Cross Project impact
- ❖ Future Roadmap/plan

# Transformation Objective

*Simplify the DCAE architecture by offloading platform functions into generic k8s/cloud native functions to be controlled based on individual Microservice configuration*

- Helm adoption for all DCAE components, to align with the rest of ONAP deployments
- Remove second-level orchestration for DCAE Service components
- Reduce 3<sup>rd</sup> party vendor software dependency

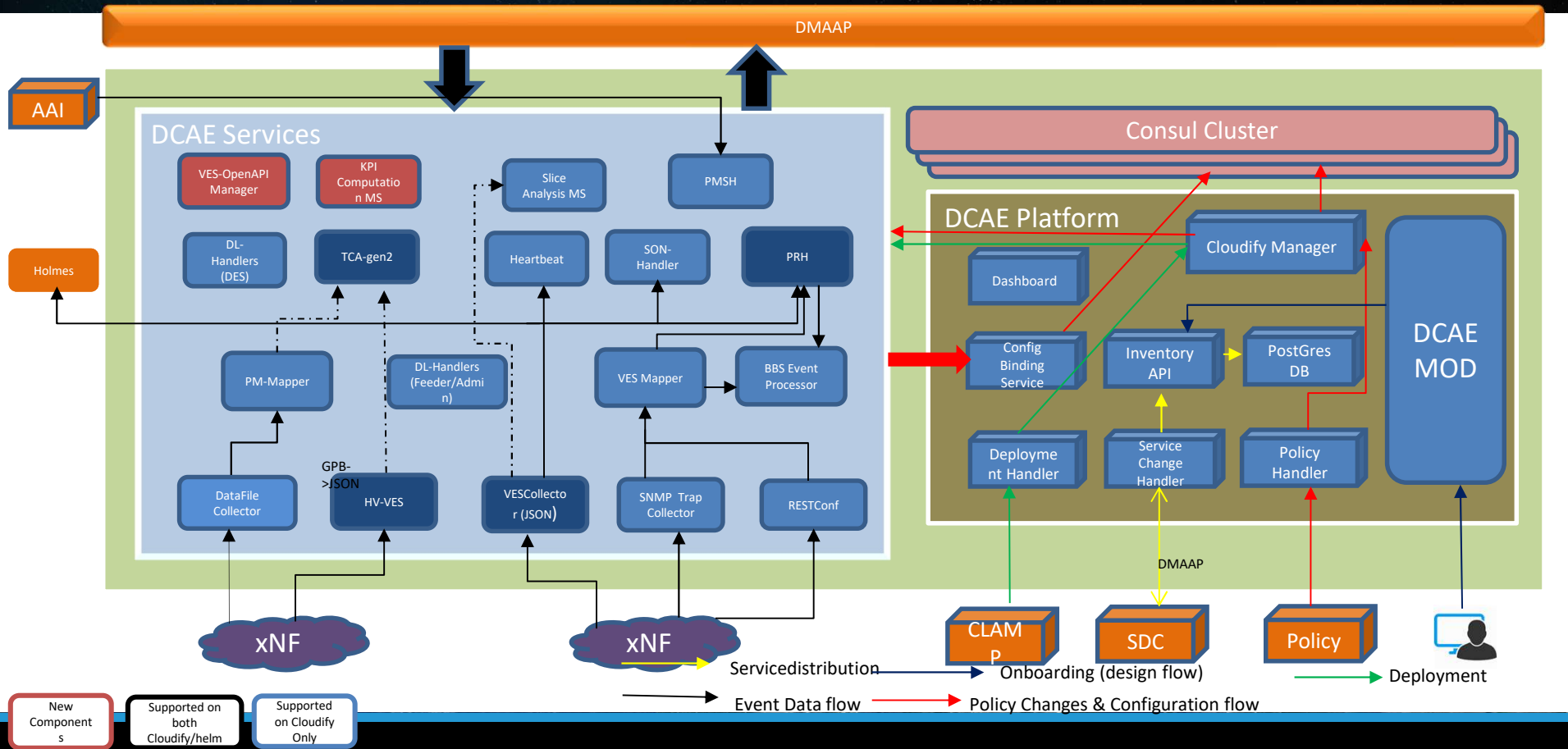
# DCAE Transformation - Honolulu Scope

## REQ-479 DCAE Transformation to support Helm (Phase1)

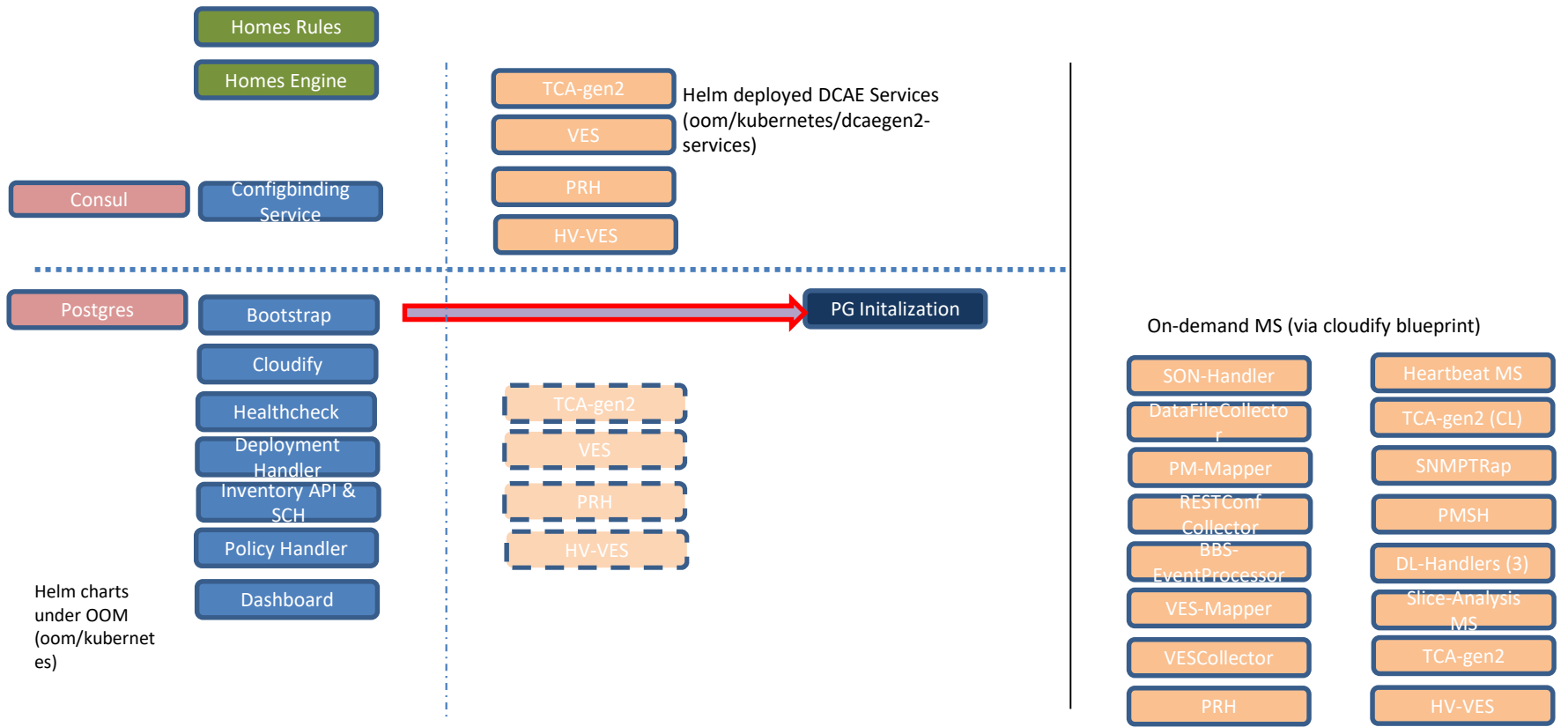
- DCAE
  - Build generic dcae-service helm template
  - Helm charts for VESCollector, TCAgen2, HV-VES, PRH
    - Backward compatibility for migrated services with minimal or no impact under helm migration
  - DCAE-Policy sync sidecar support
  
- OOM
  - Host helm charts for DCAE services
  - Complete Chart Versioning and release in nexus\*
  
- Holmes
  - Migrate from Cloudify/blueprint to Helm based deployment

*Note: Cloudify remained as primary orchestrator for dynamic capabilities/support.*

# DCAE Architecture (Honolulu)



# ONAP DCAE Honolulu Deployment





# **DCAE Transformation (Phase2) Istanbul – REQ-685**



# Istanbul Scope

- Common Template Enhancement
  - CMPv2 Certificate
  - Policy Sidecar
  - PG credentials management through K8S secret
  - ConfigMap Support
  - DMAap Config Support (dynamic)
- Helm charts migration for all other DCAE services
  - Bulk PM flow - DataFile, PM-Mapper, PMSH
  - E2E Slicing - KPI-MS, Slice-Analysis, DL Handlers (Feeder, Admin, DES)
  - Son-Handler, Heartbeat, VES-Mapper, RESTCOnf, SNMPTrap, BBS-Ep
- Remove Consul dependency - application config standardization for Helm deployed components (Prototype for VES/HV-VES)
- Helm charts generation through MOD (POC)
- ONAP Internal Helm Registry support















**Contributing Companies: AT&T, Nokia, Ericsson, Wipro, Independent, Orange/Samsung (OOM)**



# DCAE Transformation (Phase2)



## [DCAE GEN2-2630](#)

<a href="#">DCAE GEN2-2617</a>	Remove DCAE service component deployment from bootstrap container		IN PROGRESS
<a href="#">DCAE GEN2-2684</a>	Migrate DCAE services to helm - Bulk PM flow		IN PROGRESS
<a href="#">DCAE GEN2-2685</a>	Migrate DCAE services to helm - E2E Slicing		IN PROGRESS
<a href="#">DCAE GEN2-2686</a>	Migrate DCAE services to helm - misc components		IN PROGRESS
<a href="#">DCAE GEN2-2687</a>	Enhance dcaegen2-common-service template - K8s secrets/env mapping		CLOSED
<a href="#">DCAE GEN2-2688</a>	Enhance dcaegen2-common-service template - CMPv2 cert support		CLOSED
<a href="#">DCAE GEN2-2689</a>	Enhance dcaegen2-common-service template - Policy Sidecar		CLOSED
<a href="#">DCAE GEN2-2690</a>	Enhance dcaegen2-common-service template - Configmap support		CLOSED
<a href="#">DCAE GEN2-2691</a>	Add dcae-service component override for dcaegen2-services		OPEN
<a href="#">DCAE GEN2-2692</a>	Remove Consul dependency - application config standardization for Helm deployed components		IN PROGRESS
<a href="#">DCAE GEN2-2693</a>	Deprecate legacy handlers under cloudify workflow		IN PROGRESS
<a href="#">DCAE GEN2-2694</a>	Helm charts generation through MOD		IN PROGRESS
<a href="#">DCAE GEN2-2734</a>	Enhance dcaegen2-common-service template - dynamic DMAAP config handling		IN PROGRESS
<a href="#">DCAE GEN2-2781</a>	DCAE chart build update		SUBMITTED

[DMAAP-1561](#) [DMAAP][OOM] Move bc provisioning job to common chart/template

[INT-1895](#) Migrate DCAE testsuite to use helm based component services

[CLAMP-1023](#) DCAE interaction for Helm service deployment (Covered under [REQ-716](#) - Control Loop in TOSCA LCM)

[OOM-2734](#) Support for Helm registry within ONAP

[OOM-2749](#) Enhance ONAP common-service template - add IPv4/IPv6 support

# DCAE Service Helm template



# ONAP DCAE Chart structure

## oom/kubernetes/dcaegen2

```
├── Chart.yaml
├── components
│   ├── dcae-bootstrap
│   ├── dcae-cloudify-manager
│   ├── dcae-config-binding-service
│   ├── dcae-dashboard
│   ├── dcae-deployment-handler
│   ├── dcae-healthcheck
│   ├── dcae-inventory-api
│   ├── dcae-policy-handler
│   ├── dcae-servicechange-handler
│   └── dcae-ves-openapi-manager
├── Makefile
├── requirements.yaml
├── resources
│   └── expected-components.json
├── external
├── templates
│   ├── configmap.yaml
│   └── secrets.yaml
└── values.yaml
```

## oom/kubernetes/dcaegen2-services

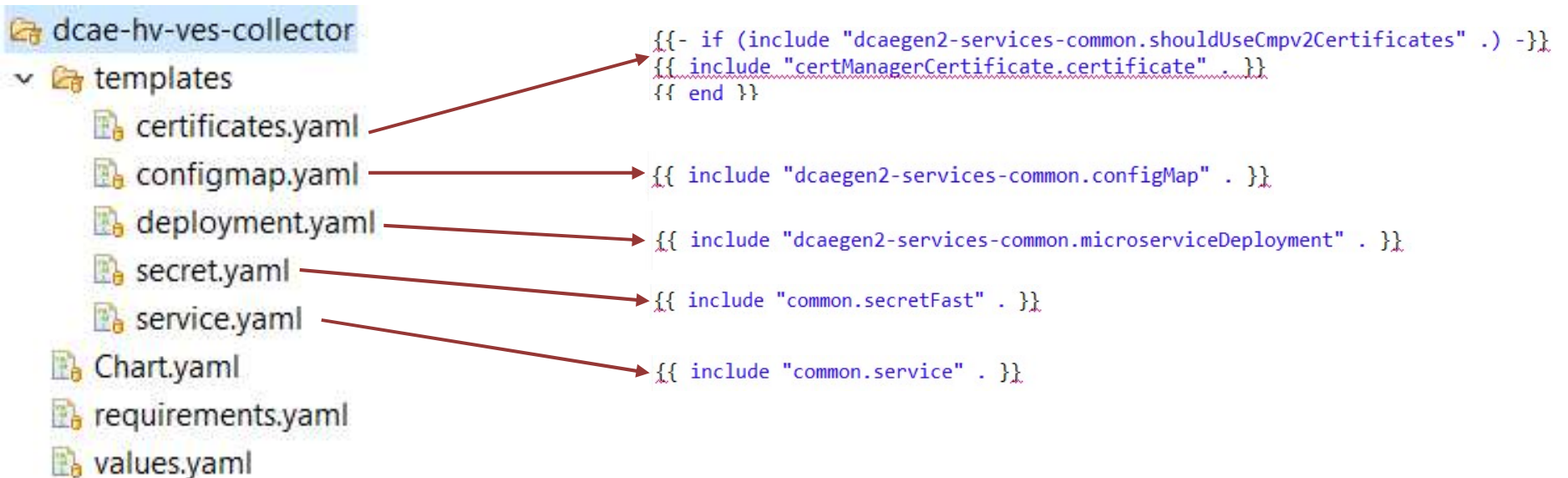
```
├── Chart.yaml
├── common
│   └── dcaegen2-services-common
│       └── Makefile
├── components
│   ├── dcae-hv-ves-collector
│   ├── dcae-ms-healthcheck
│   ├── dcae-prh
│   ├── dcae-tcagen2
│   └── dcae-ves-collector
├── Makefile
├── requirements.yaml
├── resources
│   └── expected-components.json
├── templates
│   └── configmap.yaml
└── values.yaml
```



```
├── dcaegen2-services-common
│   ├── Chart.yaml
│   ├── requirements.yaml
│   └── templates
│       ├── _configmap.tpl
│       ├── _deployment.tpl
│       ├── _filebeat-config.tpl
│       └── _job.tpl
├── values.yaml
└── Makefile
```



# Sample DCAE MS chart



Deployment controlled through overrides from values.yaml

# Common Functions supported via DCAE template (Honolulu)

AAF init Container



```
# TLS role -- set to true if microservice acts as server
# If true, an init container will retrieve a server cert
# and key from AAF and mount them in certDirectory.
tlsServer: true
# directory where TLS certs should be stored
# if absent, no certs will be retrieved and stored
certDirectory: /opt/app/dcae-certificate
```

Consul init Container



```
# initial application configuration
applicationConfig:
  collector.dmaap.streamid: fault=ves-fault|syslog=ves-syslog|heartbeat=ves-heartb
  collector.inputQueue.maxPending: "8096"
```

Logging sidecar



```
# log directory where logging sidecar should look for log files
# if absent, no sidecar will be deployed
logDirectory: /opt/app/VESCollector/logs
```



# Dcae-service-common Feature enhancement (Istanbul)

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Policy Sidecar



```
# Policy configuration properties
# if present, policy-sync side car will be deployed

dcaePolicySyncImage: onap/org.onap.dcaeagen2.deployments.dcae-services-policy-sync:1.0.1
policies:
  duration: 300
  policyID: |
    ["onap.vfirewall.tca","abc"]'
```

```
Normal Pulling 6m13s kubelet Pulling image "nexus3.onap.org:10001/onap/org.onap.dcaeagen2.deployments.dcae-services-policy-sync:1.0.1"
Normal Pulled 6m12s kubelet Successfully pulled image "nexus3.onap.org:10001/onap/org.onap.dcaeagen2.deployments.dcae-services-policy-sync:1.0.1" in 1.191030087s
```

<https://wiki.onap.org/display/DW/Policy+function+as+Sidecar>

Environment Variable



```
applicationEnv:
  PMSH_PG_URL: &dcaePmshPgPrimary dcae-pmsh-pg-primary
  PMSH_PG_USERNAME:
    secretUid: *pgUserCredsSecretUid
    key: login
  PMSH_PG_PASSWORD:
    secretUid: *pgUserCredsSecretUid
    key: password
```

Parameters and secrets get exposed as ENV to APP container

# Dcae-service-common Feature Enhancement

## - Istanbul (Cont.)

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### CMPv2 Certificate Support



```
useCmpv2Certificates: false
certificates:
- mountPath: /etc/ves-hv/ssl/external
  commonName: dcae-hv-ves-collector
  dnsNames:
  - dcae-hv-ves-collector
  - hv-ves-collector
  - hv-ves
  keystore:
  outputType:
  - jks
  passwordSecretRef:
  name: hv-ves-cmpv2-keystore-password
  key: password
  create: true
```

### ConfigMap Support



```
externalVolumes:
- name: my-example-configmap
  type: configmap
  mountPath: /opt/app/config
- name: '{{ include "common.release" . }}-another-example'
  type: configmap
  mountPath: /opt/app/otherconfig
```

### DMaap Secure Topic/Feed\*

<https://wiki.onap.org/display/DW/DMaap+Bus+Controller+Topic+and+Feed+provisioning+support+via+helm>

\* WIP

# Benefits with DCAE Service template

- Standardization of helm charts across DCAE components
- Common functions (platform) abstraction and managed via config
- Uniform naming of k8s resource and versioning
- Certificate handled via config (AAF or other)
- Use oom/common for database handling
- Consistent K8s Secrets handling
- Sidecar deployment/version controlled via config
- Common logging instrumentation

Helm expertise not required for component owners

# Helm Generator

Boilerplate config enables Charts generations

- Chart.yaml (default; will be common for all components)
- requirement.yaml (default; mostly will be common for all components)
- templates/deployment (include "dcaegen2-services-common.microserviceDeployment")
- templates/configmap.yaml (include "dcaegen2-services-common.configMap")
- templates/services.yaml (include "common.service")
- **values.yaml (unique per MS based on configuration provided in component-spec; to be generated based on syntax expected by [dcaegen2-services-common](#)/oom-common service template)**

Build as separate pluggable tool for Istanbul; Integration with MOD to support helm flows (stretch-goal)

More info : <https://wiki.onap.org/display/DW/Helm+Generator+for+DCAE+MS>

# **DCAE Microservice Configuration Standardization**





# DCAE GEN2-2692 – Remove Consul dependency - application config standardization for Helm deployed components

**Details**

Type: Story  
Priority: Medium  
Affects Version/s: None  
Component/s: dcae-platform  
Labels: DCAE-Istanbul-Stretch DCAE-POC POC dcae-services  
Epic Link: DCAE Helm Transformation (Phase 2)

Status: IN PROGRESS (View Workflow)  
Resolution: Unresolved  
Fix Version/s: Istanbul Release

**Description**

Currently all application configuration are retrieved using CBS api's by MS. These configuration are loaded into Consul by Cloudify/K8s plugin or consul-loader-container under helm deployment.

To simplify DCAE architecture and remove external dependency, need standard way to manage application configuration retrieval for DCAE application though K8S configmap/secrets. CBS (and associated lib) to be extended to support config retrieval from configmap and minimize MS impact.

Changes required in dcaegen2-common-service template/Configbindingservice/SDK - java & python

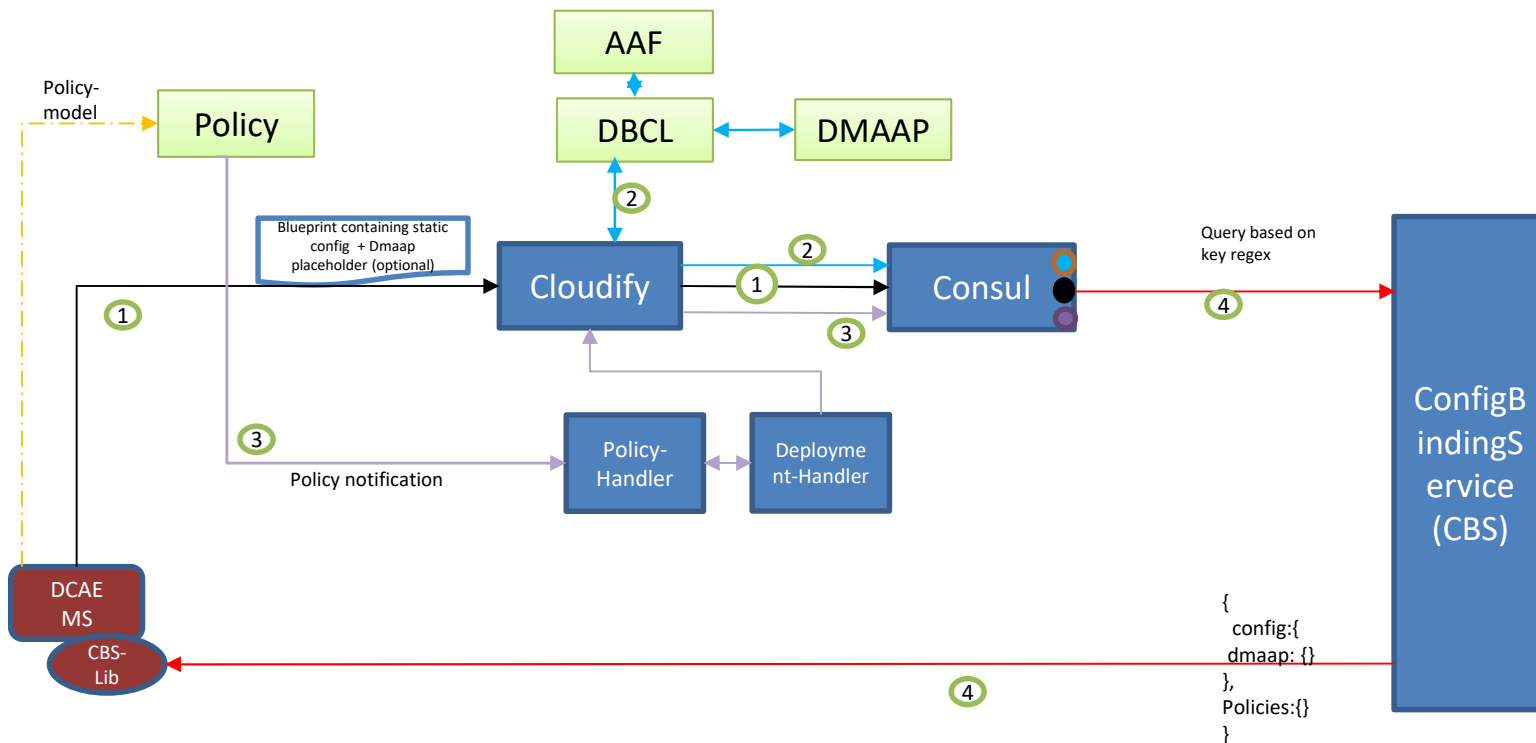
**Attachments**

Drop files to attach, or browse.

**Sub-Tasks**

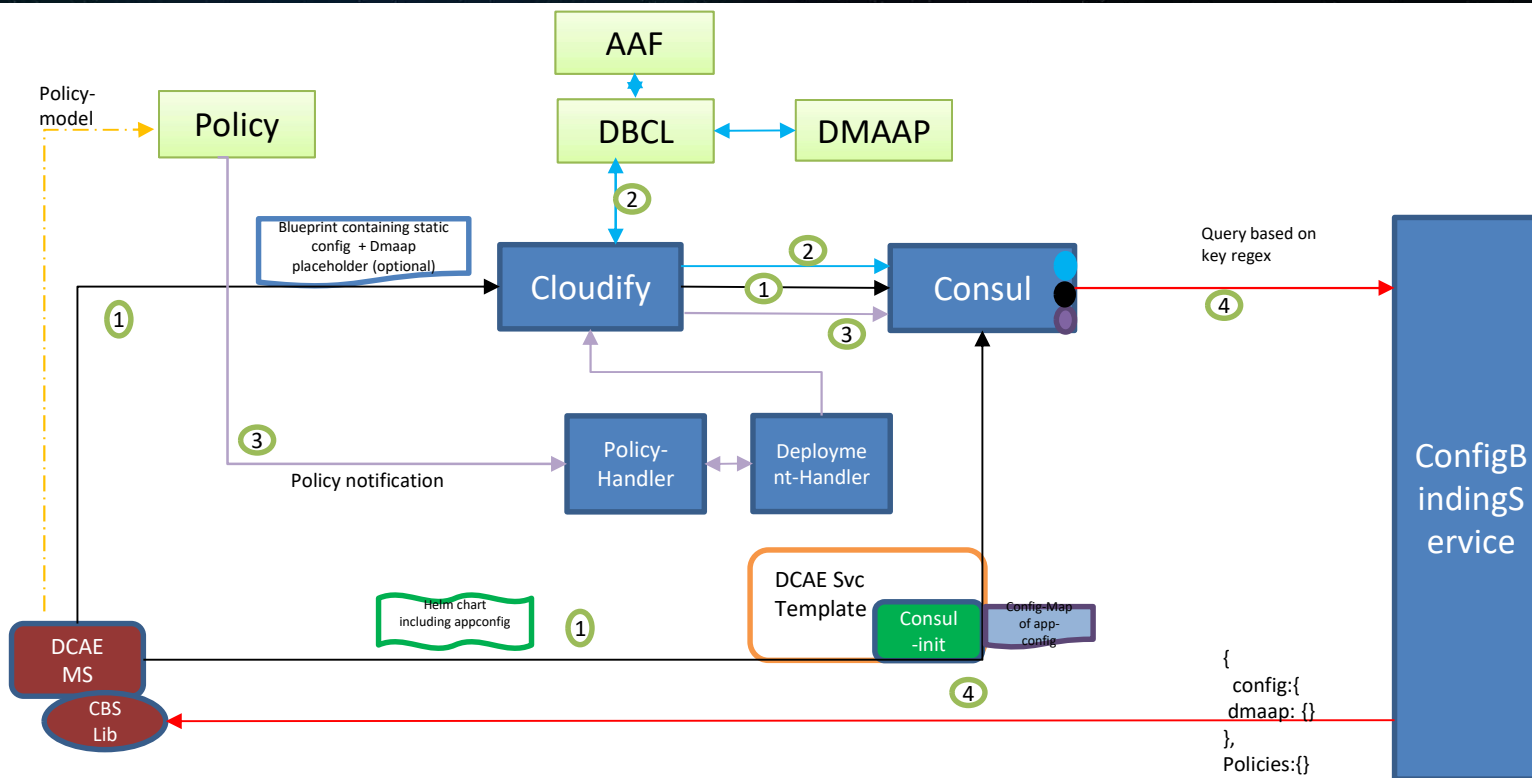
1. Adapt CBS-Client (java) to read configuration from a file exposed in a cfgMap	<span>SUBMITTED</span>	Damian Nowak
2. Refactor DCAE-Services Helm Charts - add application-configuration cfgMap to main application container	<span>SUBMITTED</span>	Damian Nowak
3. CBS-Client supporting configMap - HV-VES integration	<span>OPEN</span>	Damian Nowak
4. CBS-Client supporting configMap - VES integration	<span>OPEN</span>	Damian Nowak
5. Adapt CBS-Client (python) to read configuration from a file exposed in a cfgMap	<span>OPEN</span>	Tony Hansen
6. Adapt CBS-Client (java) to read Policy configuration from a file exposed by sidecar	<span>SUBMITTED</span>	Niranjana Y
7. Adapt CBS-Client (python) to read Policy configuration from a file exposed by sidecar	<span>OPEN</span>	Tony Hansen

# Config Management under Cloudify Workflow



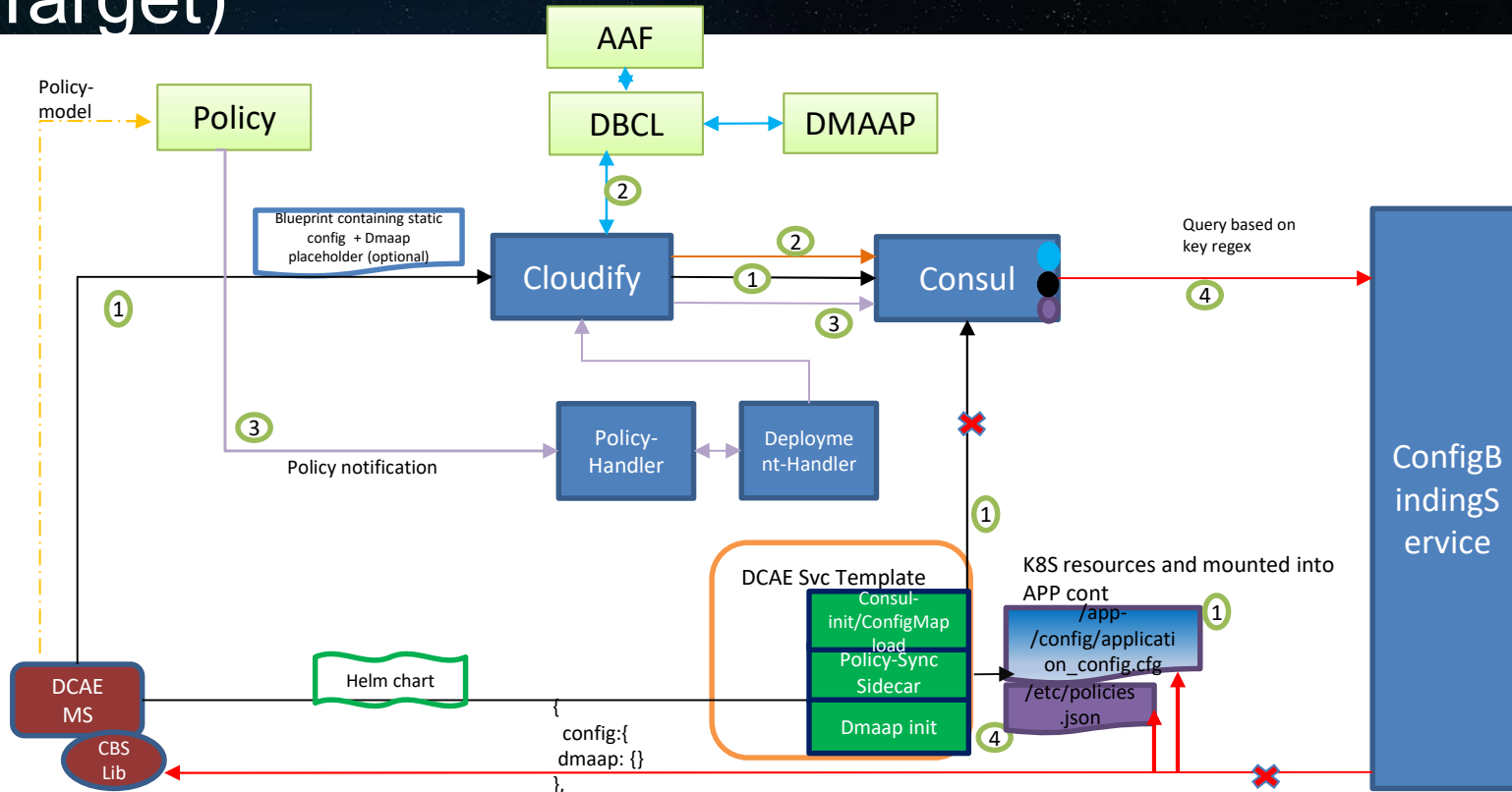
CBS was streamlining and consolidating config into single payload

# Config Management via Helm (Honolulu Release)



VES, HV-VES, PRH, TCA deployment supported on both Helm and Cloudify  
No impact to application for config retrieval

# Config Management via Helm – Istanbul Release (Target)



- Support for ConfigMap and Secrets
- Configuration returned as single payload containing static, dmaap, policy

# DCAE Common Helm template Enhancement for APP-Config standardization

- ConfigMap creation and file mount to application pod
  - Defaulted for all applications deployment
- Standardize Policy-Side car deployment and file mount
  - Enabled through values.yaml override config
- Standardize K8S Secrets handling
  - Enabled through values.yaml override config
- DMAAP Init standardization
  - Enabled through values.yaml override config



# Library/SDK Enhancement design

- Support READ for app-config mounted via K8S configMap
  - CBS-Client checks configuration from the file on the container FS (default: /app-config/application\_config.cfg) mounted via configMap
  - Perform substitution of sensitive configuration (retrieved from K8S secret)
  - CBS-Client falls back to the CBS REST interface, in the absence of a configuration file in given location.
- Support READ for Policy json/config
  - CBS-Client checks for policy json on the container FS (default) /etc/policies/policies.json
  - If file not found or empty, skip policy retrieval
- Configuration source fallback is implemented:
  - CBS-Client falls back to the built-in container file configuration, if the CBS REST interface doesn't respond
- CBS-Client is reading the file periodically and updates the application config immediately after a read is completed.

*Both Python & Java CBS SDK library updates for file lookup/READ are under DEV*

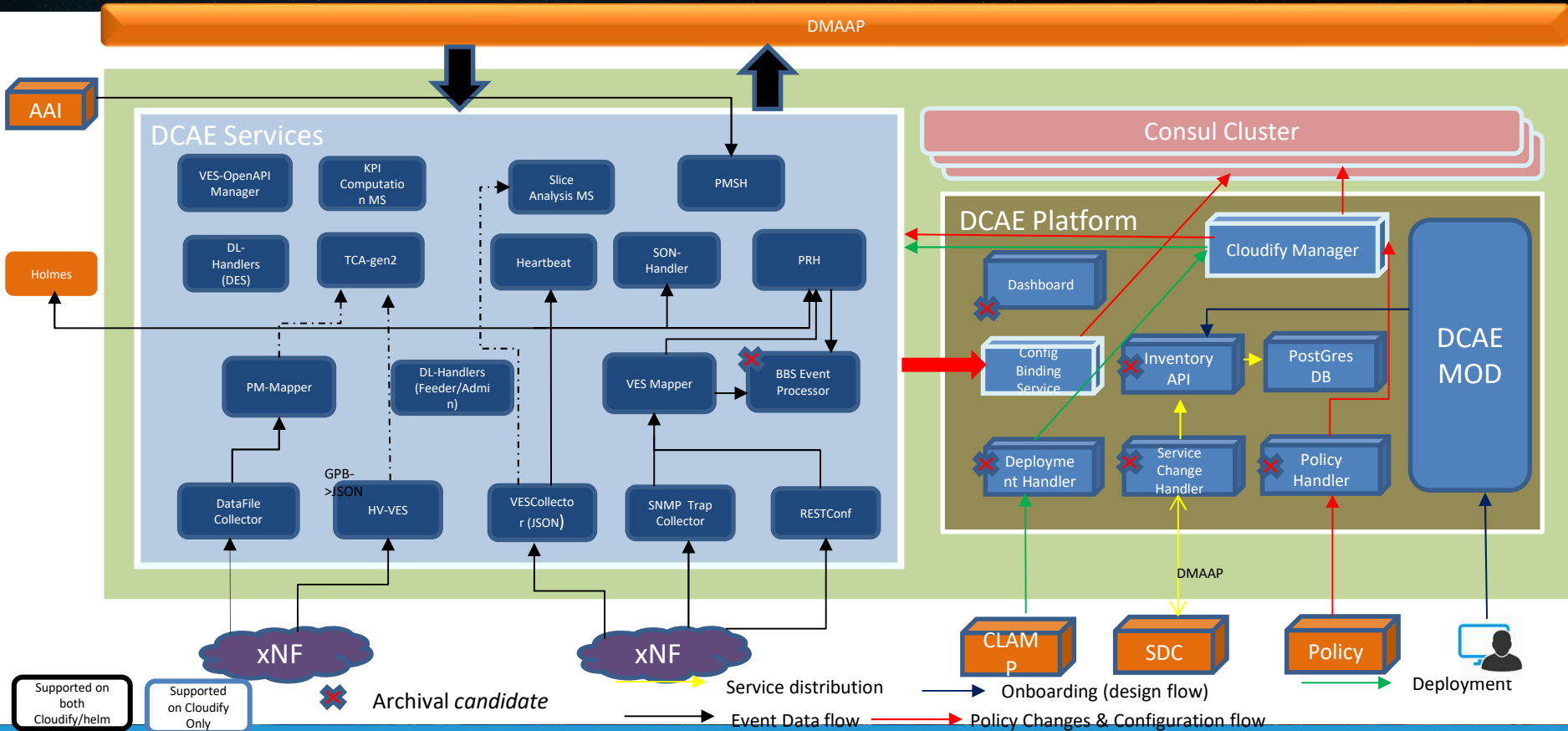
# Benefits with Library/SDK update

- Minimal impact to MS with migration to Helm; limited to library version change
- Abstracts how configuration is sourced behind the scene.
- All configuration locally available within POD
- Policy, Dmaap, App config are handled as single json object (using same function/api invocation)
- Same container version can be installed via both cloudfy and helm deployment; complete backward compatibility
- Day0 and DayN config flows handled consistently

# DCAE Architecture



# DCAE Istanbul Architecture



# DCAE Platform Features

Features	Classic deployment (Cloudify)	Helm Deployment (Honolulu)	Helm Deployment (Istanbul)
Consul KV store (via CBS)	Yes (Run-time)	Yes (Run-time)	Yes
Standardized Configuration Management without Consul	N/A	No	Yes*
CMPv2 Certificate	Yes (Deployment)	No	Yes
ConfigMap Support	Yes (Deployment)	No	Yes
DMAap Topic/Feed provisioning	Yes (Deployment)	No	Yes
Dynamic MS onboarding and deployment artifact generation (MOD)	Yes (Run-time)	No	Yes* (partially)
REST endpoint for deployment	Yes (Run-time)	N/A	N/A
Postgress Initialization	Yes (Deployment)	Yes	Yes
CLAMP/SDC Interface	Yes (Runtime)	N/A	N/A

\* Targeted scope



# Future Roadmap – DCAE Transformation



# DCAE Transformation - Future Roadmap items

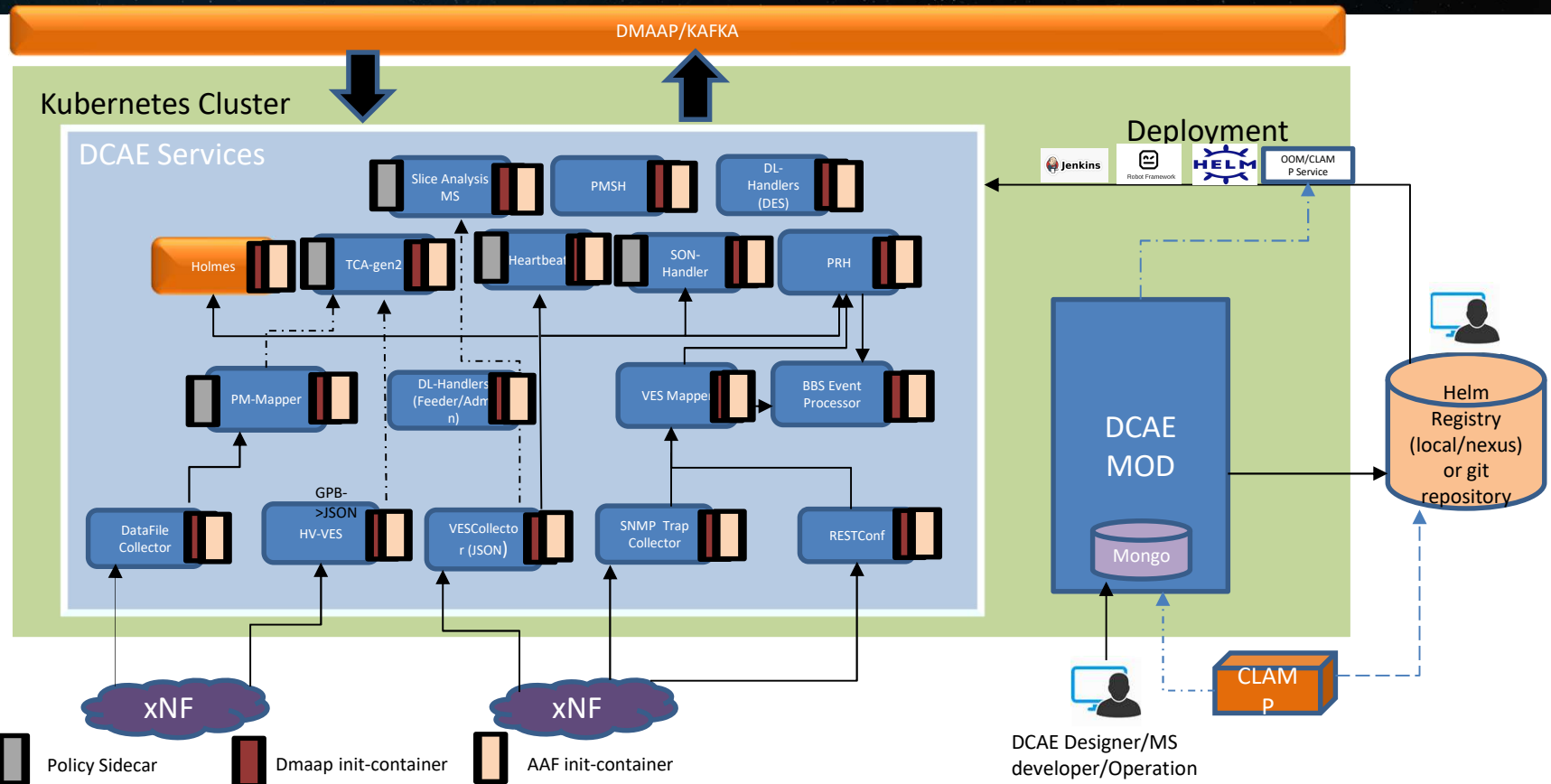
## EPIC - [DCAE GEN2-2773](#) DCAE Helm Transformation (Phase 3)

- ❖ DCAE MOD: Support for Helm flow (onboarding and chart generation\*)
- ❖ DCAE/OOM: Remove consul dependency after all DCAE service are migrated to the latest SDK
- ❖ Policy/CLAMP: Continue integration for Control Loop design for Helm-based deployment of DCAE Services\*
- ❖ DCAE: Chart migration from OOM repo to DCAE & ONAP CI/CD integration for helm chart builds
- ❖ Integration: Robot test suites migration to support helm services\*
- ❖ DCAE: Archive Cloudify and associated handlers/plugins and disable under ONAP deployment

Priority to be assessed based by ONAP Community feedback & support

\* Partially addressed in Istanbul

# ONAP DCAE Architecture (FMO)



**Questions ?**





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