Control Loop Flows and Models for Casablanca

Design

Step 1: Design the Control Loop Flow in SDC (DCAE-Design Studio or manually)

Design the Service and deploy it to clamp by logging to the portal:

http://portal.api.simpledemo.onap.org:8989/ONAPPORTAL/login.htm

CLAMP videos#DesignpartinSDC

What will be the scope of control loop flows in Casablanca:

- Which microservices will be used ?
  TCA, Holmes (Can be configured in CLAMP and based on pattern matching in the Blueprint)
- Will flows contain more than one microservice node?
  No
- Will microservices be capable of receiving more than one configuration policy
  None
- Will the singleton vs. dynamically deployed distinction be described in the TOSCA?
  No
- Will collectors be deployed dynamically or statically?
  Statically, the VES collector is deployed in DCAE
- Will DCAE Design Studio allow for the piecing together of flows in Casablanca?
- Which blueprint can be uploaded to SDC ? (Examples)

Blueprint for TCA on OOM

```
#
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tosca_definitions_version: cloudify_dsl_1_3

description: >
  This blueprint deploys/manages the TCA module as a Docker container

imports:
  - http://www.getcloudify.org/spec/cloudify/3.4/types.yaml
  - https://nexus.onap.org/service/local/repositories/raw/content/org.onap.dcaegen2.platform.plugins/R3
/k8splugin/1.4.3/k8splugin_types.yaml
  - https://nexus.onap.org/service/local/repositories/raw/content/org.onap.dcaegen2.platform.plugins/R2
```

```
/dcaepolicyplugin/2.3.0/dcaepolicyplugin_types.yaml

inputs:
  aaiEnrichmentHost:
    type: string
    default: "aai.onap.svc.cluster.local"
  aaiEnrichmentPort:
    type: string
    default: "8443"
  enableAAIEnrichment:
    type: string
    default: true
  dmaap_host:
    type: string
    default: message-router.onap.svc.cluster.local
  dmaap_port:
    type: string
    default: "3904"
  enableRedisCaching:
    type: string
    default: false
  redisHosts:
    type: string
    default: dcae-redis.onap.svc.cluster.local:6379
  tag_version:
    type: string
    default: "nexus3.onap.org:10001/onap/org.onap.dcaegen2.deployments.tca-cdap-container:1.0.0"
  consul_host:
    type: string
    default: consul-server.onap.svc.cluster.local
  consul_port:
    type: string
    default: "8500"
  cbs_host:
    type: string
    default: "config-binding-service.dcae.svc.cluster.local"
  cbs_port:
    type: string
    default: "10000"
  policy_id:
    type: string
    default: "none"
  external_port:
    type: string
    description: Kubernetes node port on which CDAPgui is exposed
    default: "32010"

node_templates:
  tca_k8s:
    type: dcae.nodes.ContainerizedServiceComponent
    relationships:
      - target: tca_policy
        type: cloudify.relationships.depends_on
    properties:
        service_component_type: 'dcaegen2-analytics-tca'
        application_config: {}
        docker_config: {}
        image:
          get_input: tag_version
        log_info:
          log_directory: "/opt/app/TCAnalytics/logs"
        application_config:
            app_config:
                appDescription: DCAE Analytics Threshold Crossing Alert Application
                appName: dcae-tca
                tcaAlertsAbatementTableName: TCAAlertsAbatementTable
                tcaAlertsAbatementTableTTLSeconds: '1728000'
                tcaSubscriberOutputStreamName: TCASubscriberOutputStream
                tcaVESAlertsTableName: TCAVESAlertsTable
                tcaVESAlertsTableTTLSeconds: '1728000'
                tcaVESMessageStatusTableName: TCAVESMessageStatusTable
```

```
                tcaVESMessageStatusTableTTLSeconds: '86400'
                thresholdCalculatorFlowletInstances: '2'
            app_preferences:
                aaiEnrichmentHost:
                    get_input: aaiEnrichmentHost
                aaiEnrichmentIgnoreSSLCertificateErrors: 'true'
                aaiEnrichmentPortNumber: '8443'
                aaiEnrichmentProtocol: https
                aaiEnrichmentUserName: DCAE
                aaiEnrichmentUserPassword: DCAE
                aaiVMEnrichmentAPIPath: /aai/v11/search/nodes-query
                aaiVNFEnrichmentAPIPath: /aai/v11/network/generic-vnfs/generic-vnf
                enableAAIEnrichment:
                    get_input: enableAAIEnrichment
                enableRedisCaching:
                    get_input: enableRedisCaching
                redisHosts:
                    get_input: redisHosts
                enableAlertCEFFormat: 'false'
                publisherContentType: application/json
                publisherHostName:
                    get_input: dmaap_host
                publisherHostPort:
                    get_input: dmaap_port
                publisherMaxBatchSize: '1'
                publisherMaxRecoveryQueueSize: '100000'
                publisherPollingInterval: '20000'
                publisherProtocol: http
                publisherTopicName: unauthenticated.DCAE_CL_OUTPUT
                subscriberConsumerGroup: OpenDCAE-c12
                subscriberConsumerId: c12
                subscriberContentType: application/json
                subscriberHostName:
                    get_input: dmaap_host
                subscriberHostPort:
                    get_input: dmaap_port
                subscriberMessageLimit: '-1'
                subscriberPollingInterval: '30000'
                subscriberProtocol: http
                subscriberTimeoutMS: '-1'
                subscriberTopicName: unauthenticated.SEC_MEASUREMENT_OUTPUT
                tca_policy: '{"domain":"measurementsForVfScaling","metricsPerEventName":[{"eventName":"
vFirewallBroadcastPackets","controlLoopSchemaType":"VNF","policyScope":"DCAE","policyName":"DCAE.Config_tca-hi-
lo","policyVersion":"v0.0.1","thresholds":[{"closedLoopControlName":"ControlLoop-vFirewall-d0a1dfc6-94f5-4fd4-
a5b5-4630b438850a","version":"1.0.2","fieldPath":"$.event.measurementsForVfScalingFields.vNicUsageArray[*].
receivedTotalPacketsDelta","thresholdValue":300,"direction":"LESS_OR_EQUAL","severity":"MAJOR","
closedLoopEventStatus":"ONSET"},{"closedLoopControlName":"ControlLoop-vFirewall-d0a1dfc6-94f5-4fd4-a5b5-
4630b438850a","version":"1.0.2","fieldPath":"$.event.measurementsForVfScalingFields.vNicUsageArray[*].
receivedTotalPacketsDelta","thresholdValue":700,"direction":"GREATER_OR_EQUAL","severity":"CRITICAL","
closedLoopEventStatus":"ONSET"}]},{"eventName":"vLoadBalancer","controlLoopSchemaType":"VM","policyScope":"
DCAE","policyName":"DCAE.Config_tca-hi-lo","policyVersion":"v0.0.1","thresholds":[{"closedLoopControlName":"
ControlLoop-vDNS-6f37f56d-a87d-4b85-b6a9-cc953cf779b3","version":"1.0.2","fieldPath":"$.event.
measurementsForVfScalingFields.vNicUsageArray[*].receivedTotalPacketsDelta","thresholdValue":300,"direction":"
GREATER_OR_EQUAL","severity":"CRITICAL","closedLoopEventStatus":"ONSET"}]},{"eventName":"Measurement_vGMUX","
controlLoopSchemaType":"VNF","policyScope":"DCAE","policyName":"DCAE.Config_tca-hi-lo","policyVersion":"v0.
0.1","thresholds":[{"closedLoopControlName":"ControlLoop-vCPE-48f0c2c3-a172-4192-9ae3-052274181b6e","version":"
1.0.2","fieldPath":"$.event.measurementsForVfScalingFields.additionalMeasurements[*].arrayOfFields[0].value","
thresholdValue":0,"direction":"EQUAL","severity":"MAJOR","closedLoopEventStatus":"ABATED"},
{"closedLoopControlName":"ControlLoop-vCPE-48f0c2c3-a172-4192-9ae3-052274181b6e","version":"1.0.2","
fieldPath":"$.event.measurementsForVfScalingFields.additionalMeasurements[*].arrayOfFields[0].value","
thresholdValue":0,"direction":"GREATER","severity":"CRITICAL","closedLoopEventStatus":"ONSET"}]}]}'
        service_component_type: dcaegen2-analytics_tca
    interfaces:
      cloudify.interfaces.lifecycle:
        start:
          inputs:
            envs:
                DMAAPHOST:
                    { get_input: dmaap_host }
                DMAAPPORT:
                    { get_input: dmaap_port }
```

```
                DMAAPPUBTOPIC: "unauthenticated.DCAE_CL_OUTPUT"
                DMAAPSUBTOPIC: "unauthenticated.SEC_MEASUREMENT_OUTPUT"
                AAIHOST:
                    { get_input: aaiEnrichmentHost }
                AAIPORT:
                    { get_input: aaiEnrichmentPort }
                CONSUL_HOST:
                    { get_input: consul_host }
                CONSUL_PORT:
                    { get_input: consul_port }
                CBS_HOST:
                    { get_input: cbs_host }
                CBS_PORT:
                    { get_input: cbs_port }
                CONFIG_BINDING_SERVICE: "config_binding_service"
            ports:
              - concat: ["11011:", { get_input: external_port }]
  tca_policy:
    type: dcae.nodes.policy
    properties:
      policy_id:
           get_input: policy_id
```

Blueprint for TCA on HEAT

```
tosca_definitions_version: cloudify_dsl_1_3
imports:
  - "http://www.getcloudify.org/spec/cloudify/3.4/types.yaml"
  - https://nexus.onap.org/service/local/repositories/raw/content/org.onap.dcaegen2.platform.plugins/R3
/dockerplugin/3.2.0/dockerplugin_types.yaml
  - https://nexus.onap.org/service/local/repositories/raw/content/org.onap.dcaegen2.platform.plugins/R3
/relationshipplugin/1.0.0/relationshipplugin_types.yaml
  - https://nexus.onap.org/service/local/repositories/raw/content/org.onap.dcaegen2.platform.plugins/R3
/dcaepolicyplugin/2.3.0/dcaepolicyplugin_types.yaml

inputs:
  dh_override:
    type: string
    default: "dockerhost"
  dh_location_id:
    type: string
    default: "zone1"
  aaiEnrichmentHost:
    type: string
    default: "none"
  aaiEnrichmentPort:
    type: string
    default: 8443
  enableAAIEnrichment:
    type: string
    default: false
  dmaap_host:
    type: string
    default: dmaap.onap-message-router
  dmaap_port:
    type: string
    default: 3904
  enableRedisCaching:
    type: string
    default: false
  redisHosts:
    type: string
  tag_version:
    type: string
    default: "nexus3.onap.org:10001/onap/org.onap.dcaegen2.deployments.tca-cdap-container:1.1.0"
  consul_host:
    type: string
    default: consul-server.onap-consul
```

```yaml
  consul_port:
    type: string
    default: "8500"
  cbs_host:
    type: string
    default: "config-binding-service.dcae"
  cbs_port:
    type: string
    default: "10000"
  policy_id:
    type: string
    default: "none"
  external_port:
    type: string
    description: "Port for CDAPgui to be exposed"
    default: "32010"
  scn_name:
    default: dcaegen2-analytics_tca_clampinstance_1
    type: string
node_templates:
  docker_service_host:
    properties:
      docker_host_override:
        get_input: dh_override
      location_id:
        get_input: dh_location_id
    type: dcae.nodes.SelectedDockerHost
  tca_docker:
    relationships:
       - type: dcae.relationships.component_contained_in
         target: docker_service_host
       - target: tca_policy
         type: cloudify.relationships.depends_on
    type: dcae.nodes.DockerContainerForComponentsUsingDmaap
    properties:
        application_config:
            app_config:
                appDescription: DCAE Analytics Threshold Crossing Alert Application
                appName: dcae-tca
                tcaAlertsAbatementTableName: TCAAlertsAbatementTable
                tcaAlertsAbatementTableTTLSeconds: '1728000'
                tcaSubscriberOutputStreamName: TCASubscriberOutputStream
                tcaVESAlertsTableName: TCAVESAlertsTable
                tcaVESAlertsTableTTLSeconds: '1728000'
                tcaVESMessageStatusTableName: TCAVESMessageStatusTable
                tcaVESMessageStatusTableTTLSeconds: '86400'
                thresholdCalculatorFlowletInstances: '2'
            app_preferences:
                aaiEnrichmentHost:
                    get_input: aaiEnrichmentHost
                aaiEnrichmentIgnoreSSLCertificateErrors: 'true'
                aaiEnrichmentPortNumber: '8443'
                aaiEnrichmentProtocol: https
                aaiEnrichmentUserName: DCAE
                aaiEnrichmentUserPassword: DCAE
                aaiVMEnrichmentAPIPath: /aai/v11/search/nodes-query
                aaiVNFEnrichmentAPIPath: /aai/v11/network/generic-vnfs/generic-vnf
                enableAAIEnrichment:
                    get_input: enableAAIEnrichment
                enableRedisCaching:
                    get_input: enableRedisCaching
                redisHosts:
                    get_input: redisHosts
                enableAlertCEFFormat: 'false'
                publisherContentType: application/json
                publisherHostName:
                    get_input: dmaap_host
                publisherHostPort:
                    get_input: dmaap_port
                publisherMaxBatchSize: '1'
                publisherMaxRecoveryQueueSize: '100000'
```

```
                publisherPollingInterval: '20000'
                publisherProtocol: http
                publisherTopicName: unauthenticated.DCAE_CL_OUTPUT
                subscriberConsumerGroup: OpenDCAE-c12
                subscriberConsumerId: c12
                subscriberContentType: application/json
                subscriberHostName:
                    get_input: dmaap_host
                subscriberHostPort:
                    get_input: dmaap_port
                subscriberMessageLimit: '-1'
                subscriberPollingInterval: '30000'
                subscriberProtocol: http
                subscriberTimeoutMS: '-1'
                subscriberTopicName: unauthenticated.SEC_MEASUREMENT_OUTPUT
                tca_policy_default: '{"domain":"measurementsForVfScaling","metricsPerEventName":[{"eventName":"
vFirewallBroadcastPackets","controlLoopSchemaType":"VNF","policyScope":"DCAE","policyName":"DCAE.Config_tca-hi-
lo","policyVersion":"v0.0.1","thresholds":[{"closedLoopControlName":"ControlLoop-vFirewall-d0a1dfc6-94f5-4fd4-
a5b5-4630b438850a","version":"1.0.2","fieldPath":"$.event.measurementsForVfScalingFields.vNicUsageArray[*].
receivedTotalPacketsDelta","thresholdValue":300,"direction":"LESS_OR_EQUAL","severity":"MAJOR","
closedLoopEventStatus":"ONSET"},{"closedLoopControlName":"ControlLoop-vFirewall-d0a1dfc6-94f5-4fd4-a5b5-
4630b438850a","version":"1.0.2","fieldPath":"$.event.measurementsForVfScalingFields.vNicUsageArray[*].
receivedTotalPacketsDelta","thresholdValue":700,"direction":"GREATER_OR_EQUAL","severity":"CRITICAL","
closedLoopEventStatus":"ONSET"}]},{"eventName":"vLoadBalancer","controlLoopSchemaType":"VM","policyScope":"
DCAE","policyName":"DCAE.Config_tca-hi-lo","policyVersion":"v0.0.1","thresholds":[{"closedLoopControlName":"
ControlLoop-vDNS-6f37f56d-a87d-4b85-b6a9-cc953cf779b3","version":"1.0.2","fieldPath":"$.event.
measurementsForVfScalingFields.vNicUsageArray[*].receivedTotalPacketsDelta","thresholdValue":300,"direction":"
GREATER_OR_EQUAL","severity":"CRITICAL","closedLoopEventStatus":"ONSET"}]},{"eventName":"Measurement_vGMUX","
controlLoopSchemaType":"VNF","policyScope":"DCAE","policyName":"DCAE.Config_tca-hi-lo","policyVersion":"v0.
0.1","thresholds":[{"closedLoopControlName":"ControlLoop-vCPE-48f0c2c3-a172-4192-9ae3-052274181b6e","version":"
1.0.2","fieldPath":"$.event.measurementsForVfScalingFields.additionalMeasurements[*].arrayOfFields[0].value","
thresholdValue":0,"direction":"EQUAL","severity":"MAJOR","closedLoopEventStatus":"ABATED"},
{"closedLoopControlName":"ControlLoop-vCPE-48f0c2c3-a172-4192-9ae3-052274181b6e","version":"1.0.2","
fieldPath":"$.event.measurementsForVfScalingFields.additionalMeasurements[*].arrayOfFields[0].value","
thresholdValue":0,"direction":"GREATER","severity":"CRITICAL","closedLoopEventStatus":"ONSET"}]}]}'
        service_component_type: dcaegen2-analytics_tca
        docker_config:
            healthcheck:
               endpoint: /
               interval: 15s
               timeout: 1s
               type: http
        image:
            get_input: tag_version
        service_component_name_override:
            get_input: scn_name
    interfaces:
      cloudify.interfaces.lifecycle:
        start:
          inputs:
            envs:
                DMAAPHOST:
                    { get_input: dmaap_host }
                DMAAPPORT:
                    { get_input: dmaap_port }
                DMAAPPUBTOPIC: "unauthenticated.DCAE_CL_OUTPUT"
                DMAAPSUBTOPIC: "unauthenticated.SEC_MEASUREMENT_OUTPUT"
                AAIHOST:
                    { get_input: aaiEnrichmentHost }
                AAIPORT:
                    { get_input: aaiEnrichmentPort }
                CONSUL_HOST:
                    { get_input: consul_host }
                CONSUL_PORT:
                    { get_input: consul_port }
                CBS_HOST:
                    { get_input: cbs_host }
                CBS_PORT:
                    { get_input: cbs_port }
                CONFIG_BINDING_SERVICE: "config_binding_service"
                SERVICE_11011_NAME:
```

```
                    { get_input: scn_name }
                SERVICE_11015_IGNORE: "true"
            ports:
              - concat: ["11011:", { get_input: external_port }]
        stop:
          inputs:
            cleanup_image: true
  tca_policy:
    type: dcae.nodes.policy
    properties:
      policy_id:
           get_input: policy_id
```

Step 2: Distribute artifacts

CLAMP videos#DistributiontoCLAMP

The artifact distribution must be done from SDC to CLAMP, in order to distribute the Blueprint and service/VF associated.

This will create Closed Loops associated to VF and Service in Clamp database

Step 3: CLAMP Processes artifact

Parsing of the SDC notification is done by CLAMP and is based on string patterns found in the Blueprint.

Only Holmes and TCA are currently supported by default, but this can be customized by the Clamp config files.

The default config file is bundled in the JAR: **src/main/resources/clds/templates/blueprint-parser-mapping.json**

But this can be overridden by specifying the spring config "clamp.config.sdc.blueprint.parser.mapping" in clamp.env for docker-compose (set by default to " classpath:/clds/blueprint-parser-mapping.json")

Configure

Configure the Closed Loop in the CLAMP UI

- OOM: https://<Slave-IP>:30258/designer/index.html
- HEAT: https://<VM-IP>:8443/designer/index.html
- Local: https://localhost:8443/designer/index.html

A Certificate must be added in the browser and is required to login properly

org.onap.clamp.p12 (from master) (Password: "China in the Spring")

The Closed loop created by the SDC distribution can be opened in the CLAMP UI . The Guard/Operational and configuration policies must be configured in the UI.

CLAMP videos#ConfigureClosedloopinCLAMPUI

Once done, the closed loop can be submitted to Policy by clicking on Manage Submit

CLAMP videos#SubmitConfigurationandOperationalPoliciestoPolicyEngine

Deploy

The micro-service deployment can be done on DCAE from CLAMP

In this case, a query is sent from CLAMP to DCAE with the deployment parameters configured in CLAMP.

CLAMP videos#Deploy/ControltheClosedLooponDCAE

Update / Suspend

The policies can be updated at runtime, microservice "Stopped/Undeployed"

CLAMP videos#Deploy/ControltheClosedLooponDCAE