

# Integration Test of Intent-driven Closed-loop Autonomous Networks in R11

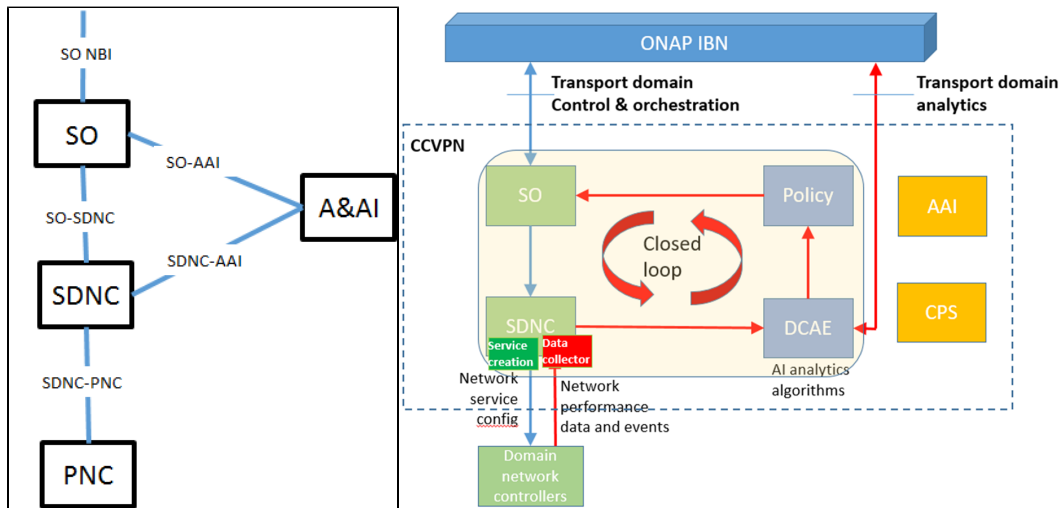
## Test Case Summary

Test Case Number	Test Case	Status	Owner
1	Physical network discovery	PASSED	Hesam
2(a)	Create single CLL instance which accesses single cloud.	PASSED	Hesam
2(b)	Repeat 2(a), and verify closed-loop actions: (1) SDNC establish yang-push SSE session with PNC; (2) SDNC receives bandwidth live updates from PNC; (3) SDNC updates bandwidth in AAI; (3) SDNC sends VES notification to DCAE;	PASSED	Hesam
2(c)	Repeat 2(b), and increase bandwidth and verify: (1) DCAE checks bandwidth received from SDNC against the threshold and calls Policy if needed; (5) Policy calls SO modify-bandwidth API; (6) SO calls SDNC for modify-bandwidth	PASSED	Decheng
2c.1	pm-mock (bandwidth-generator) increases the bandwidth data pushing to PNCs-"performance-monitor", verify that PNC can get latest data. (The bandwidth usage data are expected to exceed the network-policy threshold , so that bandwidth adjustment can be triggered)	PASSED	Decheng
2c.2	Assuming a SSE subscription had been established, SDNC SSE, upon receiving yang-push notification, sends VES msg to DCAE-VES-Collector through publishing msg to VES_NOTIFICATION topic	PASSED	Decheng
2c.3	DCAE-Slice-analysis-ms listened and received the notification, saved the data to in-memory datastore	PASSED	Decheng
2c.4	DCAE-Slice-analysis-ms getting bandwidth data from A&AI network policy object whose network-policy-fqdn equals to cli-Id	PASSED	Decheng
2c.5	DCAE-Slice-analysis-ms triggered periodic service-state check after pre-configured interval, if condition is met, sends request to Policy through publishing msg to DCAE_CL_OUTPUT topic	PASSED	Decheng
2c.6	Policy listened and received DCAE_CL_OUTPUT topic, upon receiving request, calls SO modify-bandwidth API	PASSED	Decheng
2c.7	When SO received request from Policy, calls SDNC for bandwidth adjustment	PASSED	Decheng
2c.8	After SDNC and SO complete bandwidth adjustment, check if DCAE update target ServiceState from UNDER_MAINTENANCE to RUNNING	PASSED	Decheng
2c.9	After SDNC and SO complete bandwidth adjustment, check PNCs, see if eth-svc has new CIR and EIR	PASSED	Decheng
2c.10	Repeat 2c, stopping the pm-mock, and rerun with new baseline parameters, see if another adjustment can be triggered	PASSED	Decheng
2(d)	Delete single CLL instance which accesses single cloud. Verify that E-TRE is deleted on the PNCs.	PASSED	Hesam
2(e)	Repeat 2(d) and verify: SDNC calls terminate-subscription RPC to stop yang-push streaming	PASSED - Need to fix our RESTCONF server to properly handle unsubscribe and terminate SSE connections. Fixed.	Hesam Henry
3(a)	Create single CLL instance which access multiple clouds.	PASSED	Hesam
3(b)	Repeat 3(a), and verify closed-loop actions: (1) SDNC establish yang-push SSE session with PNC; (2) SDNC receives bandwidth live updates from PNC; (3) SDNC updates bandwidth in AAI; (3) SDNC sends VES notification to DCAE;	PASSED	Hesam
3(c)	Repeat 3(b), and increase bandwidth and verify: (1) DCAE checks bandwidth received from SDNC against the threshold and calls Policy if needed; (5) Policy calls SO modify-bandwidth API; (6) SO calls SDNC for modify-bandwidth	PASSED	Decheng
3(d)	Delete single CLL instance which access multiple clouds.	PASSED	Hesam
3(e)	Repeat 3(d) and verify: SDNC calls terminate-subscription RPC to stop yang-push streaming	PASSED	Hesam Henry
4	Create and delete multiple CLL instances which access single cloud, and monitor if the closed-loop call flow is getting triggered.	PASSED	Hesam
5	Create and delete multiple CLL instances which access multiple clouds, and monitor if the closed-loop call flow is getting triggered.	PASSED	Hesam
6	Create a CLL instance which have connection links with different bandwidth, and monitor if the closed-loop call flow is getting triggered.	PASSED	Hesam

7	Modify the bandwidth of a connection link of an existing CLL instance, and monitor if the closed-loop call flow is getting triggered.	PASSED	Hesam
8	Modify an existing CLL instance by add a new connection link, and monitor if the closed-loop call flow is getting triggered.	PASSED	Hesam
9	UII actively modifies an existing IBN service-instance, the request is sending to AAI, DCAE, POLICY, SO	PASSED	Decheng
9(a)	UII modify IBN service-instance, verify an AAI-EVENT is published and received by DCAE	PASSED	Decheng
9(b)	When DCAE received AAI-EVENT, it should verify the service bw, if adjustment needed, sending OnSetMessage to Policy	PASSED	Decheng
9(c)	Upon receiving OnSetMessage, Policy invokes predefined operator and sending request to SO	PASSED	Decheng
9(d)	SO sends down request to SDNC to reflect on User's intent.	PASSED	Decheng

## Test Plan

The CCVPN cloud leased line integration tests consist of eight (8) test cases. Each test case is broken down into a sequence of measurable checkpoints. These checkpoints are RESTful APIs, each of which has a specific set of input and output parameters that can be measured against. The checkpoints are illustrated below.



## Test Case Details

The test procedures for the test cases are provided in the following table.

#	Test case	SO-NBI	SO-AAI	SO-SDNC	SDNC-AAI	SDNC-PNC
1	topology discovery	N/A	N/A	N/A	Merge domain topologies and save in AAI	1. Provide sample topology json -- design the topo for demo 2. Test PNC simulator topology against sample 3. Test PNC registration with ONAP and topology discovery
2	test case #2 - #8	1. provide sample Cloud Leased Line Service Intent RESTful API json	1. provide sample SO-AAI restful API (input/output) 2. test CLL instance in AAI against sample	1. provide sample SO-SDNC restful API (input/output) 2. Test SDNC DG input/output against sample	1. provide sample AAI API and (CCVPN /ACTN) model content 2. Test AAI against sample 3. Test SDNC-AAI operation against sample	1. Provide sample ACTN MPI json (input/output) 2. Test PNC simulator against sample 3. Test SDNC against sample  4. Check whether PNC is called to subscribe the user to receive performance monitoring events.  5. Check whether SDNC calls PNC to receive notification events via an SSE connection.  6. Check whether SDNC sends an "unsubscribe" request to PNC upon successful deletion of all CLL instances in a given cloud.

#	Test case	SDNC-DCAE	DCAE-POLICY	POLICY-SO
1	topology discovery	N/A	N/A	N/A
2	test case #2 - #8	1. Check whether SDNC calls DCAE upon receiving a performance monitoring notification event	1. Check whether DCAE calls POLICY to read the notification events data.	1. Check whether POLICY calls SO to adjust the monitored value.

#	Test case	UUI-AAI	AAI-DCAE	DCAE-POLICY	POLICY-SO
3	test case #9	1. When user tries to modify service setup, UUI modify service-instance attributes	1. Upon receiving the AAI-EVENT, DCAE check the service state and start service modification process	1. Upon receiving service modification request, POLICY sends down request to SO.	1. Upon receiving modification request, SO sends down service modification request to downstream controllers.