

Telco & openEDGE Validation of CORD SEBA Reference Design on the OCP Platform

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Agenda

Flex & OCP

- JBOD
- System Integration
- Automation & Lab

Flex OCP Validations

Accomplishments •

SEBA

- POD Architecture
- Test Cases
- **Test Results**





OCP Based Deployment Requires Multiple Area in Cadence



Engage

System Integration

Platform & Product Validation





Implement



Regulatory & Compliance

Supply Chain Management

Global Logistics, Support & Services



Flex is Growing OCP-based Products and Service Offerings





time **Complexity of Solution**



ONF Reference Designs Validation on OCP Platforms at Flex





Trellis: Dev/Test





CORD on OCP Validation

SEBA: Test Plan



SEBA Architecture

Hardware

- **1 GE management switch** to which all OLTs AGG and compute node management ports
- **1** physical AGG switch (Tomahawk)
- **3 compute nodes** connected to AGG switch
- **Up to 16 EdgeCore OLTs with NNI port** connected to the AGG switch
- Up to 64 ONUs on each PON port

Virtualization

- **Gateway VM** instantiated on one of the compute nodes
- Abstract OLT instantiated on one of the compute nodes

External

AT&T External BNG, DHCP Server(RG & POD), Radius Server, External OSS, Public Internet



лими

Up to 64 ONUs per PON port	
ONU+RG	-
ONU+RG	0
ONU+RG	0



Source: <u>https://wiki.opencord.org/pages/viewpage.action?pageId=4982370</u>



SEBA Validation Steps

- 1. Server image test image deployment
- 2. Server validation
- Alet System terventoect Vacid (Airosible) 3.
- B. Firmware version check (Ansible + fw utils)
 4. EBBERGARA ge deployment & Config
- 5. Clouch frastructure deployment B. Memory bandwidth (Stream)
- 6. CORD deployment D. Network throughput (iPerf)
- SEBA Ees an stamped of the second of the sec 7.















SEBA Architecture on OCP Hardware







SEBA Scenario Testing





"SEBA is the residential use case and provides optimizations so that network traffic can run 'fastpath' straight to the backbone without



ONF Jenkins Builds & Results

Deployment

Stage View

	Parse deployment configuration file	Clean up	Add CORD repository	Install CORD Kafka	Install Logging Infrastructure	Install Monitoring Infrastructure	Install etcd- cluster	Install voltha	Install ONOS	Install xos- core	Install seba- services	Install base- kubernetes	Install att workflow	Reinstall OLT software	Restart OLT processes	Configure R-CORD - Fabric and whitelist	Configure R-CORD - Subscriber
Average stage times: (Average <u>full</u> run time: ~18min	4s	1min 7s	3s	48s	2min 36s	1min 45s	11s	30s	9s	19s	3min 14s	2min 0s	1min 46s	1min 34s	1min 52s	1s	1s
#19 53s) Feb 25 No 03:15 Changes	3s	1min 30s	3s	1min 36s	2min 30s	1min 54s	9s	21s	10s	23s	3min 50s	1min 36s	1min 20s	1min 8s	1min 47s	1s	1s
#18 No Feb 24 No 03:15 Changes	3s	1min 20s	3s	1min 33s	2min 32s	1min 38s	9s	15s	8s	20s	2min 43s	2min 9s	2min 5s	1min 4s	1min 59s	1s	1s

Results

Stage View

	Parse deployment configuration file	Download Cord-Tester Repo	Test Configurations	Subscriber Validation and Ping Tests	Publish test results
Average stage times: (Average full run time: ~54min	3s	4s	1s	53min 49s	23s
17s)	2s	3s	857ms	59min 34s	24s
#13 No Feb 24 No 03:33 Changes	2s	3s	951ms	53min 53s	25s
Feb 23 No Changes 03:37	2s	3s	939ms	55min 48s	29s



https://jenkins.opencord.org/view/ATT-Workflow/job/build_att-workflow_flex-<u>ocp-cord-voltha16_cord-6.1/</u>









J ONOS



RG -> **OLT** -> **Fabric** -> **Destination**

RG@ubuntu:~\$ nohup ping 10.8.2.100 > ping_log.txt &



SEBA POD UI: CORD 6.1

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← → C ① Not secure | 10.192.4.241:30120/onos/ui/index.html#/topo

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Automated SEBA Test Plan

SN	Group	Test	TestCase ID	Results Pass/Fail
test1	Verify End-end ping with ONU in Correct Location	Validates E2E Ping Connectivity and object states for the given scenario: Configure whitelist with correct ONU location Validate successful authentication/DHCP/E2E ping	ATT_Test001	PASS
test2	Test by removing ONU from Whitelist, and re-add ONU to Whitelist for a successful ping	Validates E2E Ping Connectivity and object states for the given scenario: Configure whitelist with correct ONU location Validate successful authentication/DHCP/E2E ping Remove ONU from whitelist Validate failed authentication/DHCP/E2E ping Add ONU to whitelist Validate successful authentication/DHCP/E2E ping	ATT_Test001	PASS
test3	Test with ONU in Wrong Location and re-add ONU in Correct Location for a successful ping	Validates E2E Ping Connectivity and object states for the given scenario: Configure whitelist with correct ONU location Validate successful authentication/DHCP/E2E ping Update whitelist with wrong ONU location Validate failed authentication/DHCP/E2E ping Update whitelist with correct ONU location Validate successful authentication/DHCP/E2E ping	ATT_Test001	PASS
test4	Test by Removing Subscriber and re-creating the Subscriber for a successful ping	Validates E2E Ping Connectivity and object states for the given scenario: Configure whitelist with correct ONU location Validate successful authentication/DHCP/E2E ping Remove subscriber model Validate successful authentication (expected with the ONF pod setup) but failed DHCP/E2E ping Recreate subscriber model Validate successful authentication/DHCP/E2E ping	ATT_Test001	PASS
test5	Test by Skipping Subscriber Provisioning and re- provisioning Subscriber	Validates E2E Ping Connectivity and object states for the given scenario: Configure whitelist with correct ONU location and skip provisioning subscriber Validate successful authentication (expected with the ONF pod setup) but failed DHCP/E2E ping Provision subscriber Validate successful authentication/DHCP/E2E ping	ATT_Test001	PASS



Source: <u>https://wiki.opencord.org/display/CORD/December+Release</u>



Automated SEBA Test Plan

SN	Group	Test	TestCase ID	Results Pass/Fail
test6	Test by skipping Authentication	Validates failed authentication/DHCP/E2E Ping with the following scenario: Configure whitelist with correct ONU location and skip RG authentication Validate failed authentication/DHCP/E2E Ping	ATT_Test001	PASS
test7	Test with ONU not in Whitelist	Validates failed E2E Ping Connectivity and object states for the given scenario: Skip whitelist configuration for ONU Validate failed authentication/DHCP/E2E ping	ATT_Test001	PASS
test8	Test with ONU not in Whitelist and by skipping Subscriber Provisioning	Validates E2E Ping Connectivity and object states for the given scenario: Skip whitelist configuration for ONU and subscriber provisioning Validate successful authentication but failed DHCP/E2E ping Configure whitelist with correct ONU location Validate successful authentication (expected with the ONF pod setup) but failed DHCP/E2E ping Provision subscriber Validate successful authentication/DHCP/E2E ping	ATT_Test001	PASS
test9	Test with ONU in Wrong Location	Validates E2E Ping Connectivity and object states for the given scenario: Configure whitelist with wrong ONU location Validate failed authentication/DHCP/E2E ping	ATT_Test001	PASS
test10	Test with ONU in Wrong Location and Skip Subscriber Provisioning, Then fix ONU in Correct Location and Provision Subscriber	Validates E2E Ping Connectivity and object states for the given scenario: Configure whitelist with wrong ONU location and skip subscriber provisioning Validate failed authentication/DHCP/E2E ping Configure whitelist with correct ONU location Validate successful authentication (expected with the ONF pod setup) but failed DHCP/E2E ping Provision subscriber Validate successful authentication/DHCP/E2E pingI	ATT_Test001	PASS





ONF Jenkins Test Automation for SEBA POD





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Download Cord-Tester Repo	Test Configurations	Test Validation Configurations and Ping Tests			
10s	525ms	1h 1min	19s		
10s	525ms	1h 1min	19s		



Flex SEBA POD: Test Summary

🧕 Jenkins	
Jenkins > ATT-Workflow > build_att-workflow_	flex-ocp-cord-voltha16_cord-6.1_test 🕶 🕖 #12
🛧 Back to Project	
Q Status	Build #12 (Feb 23, 2019 11:37:26 AM)
Changes	
Console Output	
Edit Build Information	Started by upstream project build att-workflow flex-ocp-cord-voltha16_cord-6.1build number 17
🚫 Delete Build	originally caused by:
Rarameters	Started by timer
Timings	
🚸 Git Build Data	This run spent:
Robot Results	 29 sec waiting; 56 min build duration;
Gopen Blue Ocean	 56 min total from scheduled to completion.
🔶 Replay	Revision: 3587d3c88a12282da2211c1371c494f930361fc0
Pipeline Steps	 origin/cord-6.1
The Workspaces	
< Previous Build	Robot Test Summary:
🔶 Next Build	Total Failed Passed Pass %
	Critical tests 10 0 10 100.0
	All tests 10 0 10 100.0
	Browse results

 Open RobotLogs/report*.html Open RobotLogs/log*.html



https://jenkins.opencord.org/view/ATT-Workflow/job/build_att-workflow_flex-ocp-cord-v \rightarrow C

ATT Test001 Test Report

Generated 20190223 04:33:42 GMT-08:00 2 days 8 hours ago

Summary Information

Status:	All tests passed
Documentation:	Test various end-to-end scenarios with ATT workflow
Start Time:	20190223 03:37:57.118
End Time:	20190223 04:33:29.494
Elapsed Time:	00:55:32.376
Log File:	log-ATT_Test001-20190223-043329.html

Test Statistics

←

Total Statistics	÷	Total ≑	Pass ≑	Fail ≑	Elapsed ≑	Pass / Fail
Critical Tests		10	10	0	00:55:30	
All Tests		10	10	0	00:55:30	
Statistics by Tag	÷	Total ≑	Pass ≑	Fail ≑	Elapsed ≑	Pass / Fail
test1		1	1	0	00:02:51	
test10		1	1	0	00:06:39	
test2		1	1	0	00:06:56	
test3		1	1	0	00:07:02	
test4		1	1	0	00:05:49	
test5		1	1	0	00:04:57	
test6		1	1	0	00:04:47	
test7		1	1	0	00:04:59	
test8		1	1	0	00:06:51	
test9		1	1	0	00:04:39	
Statistics by Suite	÷	Total ≑	Pass \$	Fail ≑	Elapsed \$	Pass / Fail
ATT Test001		10	10	0	00:55:32	

Test Details

Totals Tags Suites Search Type: Critical Tests All Tests



End-to-End Scenario Test Logs

Test Execution Log

SUITE ATT Test001					
Full Name:	ATT Test001				
Documentation:	Test various end-to-end scenarios with ATT workflow				
Source:	/var/jenkins/workspace/build_att-workflow_flex-ocp-cord-voltha16_cord-6.1_test/cord-tester/src/test/cord-api/Tests/WorkflowValidations/ATT_Test001.robot				
Start / End / Elapsed:	20190223 03:37:57.118 / 20190223 04:33:29.494 / 00:55:32.376				
Status:	10 critical test, 10 passed, 0 failed 10 test total, 10 passed, 0 failed				
+ SETUP Setup Suite					
TEARDOWN Teardown	Suite				
+ TEST ONU in Correc	t Location				
+ TEST ONU in Correc	t Location -> Remove ONU from Whitelist -> Add ONU to Whitelist				
+ TEST ONU in Correc	t Location -> ONU in Wrong Location -> ONU in Correct Location				
+ TEST ONU in Correc	t Location -> Remove Subscriber -> Create Subscriber				
+ TEST ONU in Correc	t Location (Skip Subscriber Provisioning) -> Provision Subscriber				
+ TEST ONU in Correc	t Location (Skip Authentication)				
TEST ONU not in Wh	nitelist				
+ TEST ONU not in Wh	nitelist (Skip Subscriber Provisioning) -> Add ONU to Whitelist -> Provision Subscriber				
+ TEST ONU in Wrong	+ TEST ONU in Wrong Location				
+ TEST ONU in Wrong	Location (Skip Subscriber Provisioning) -> ONU in Correct Location -> Provision Subscriber				







Customer, Partner & Community Engagement Lab

- Continue working on comprehensive plan to test, validate and certify CORD platform and components using Flex SEBA POD
- Continue collaborating with ONF Certification Brigade to define CORD Certification program (CCP) and its execution
- Extend in house automated test and validation framework to validate CORD platform and components with Flex SEBA POD
- Collaborate with Vendors & Service Providers to demonstrate Telco use-cases and support CORD deployments





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