

Topics

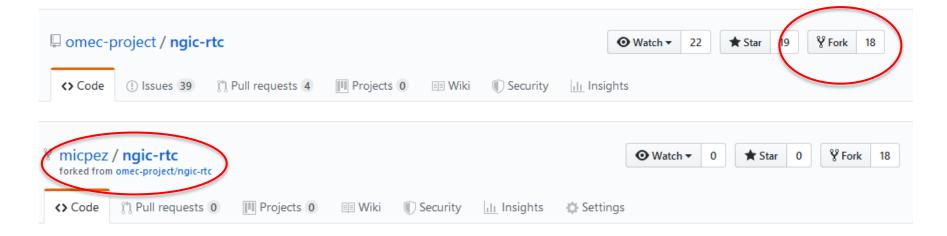
- Submitting a patch to OMEC
- OMEC CI/CD





Pull Request flow

- 1. Create a Pull Request
 - follow github workflow (https://help.github.com/en/articles/creating-a-pull-request)
 - Fork the repo of interest



make changes and then push the change to a branch on your fork

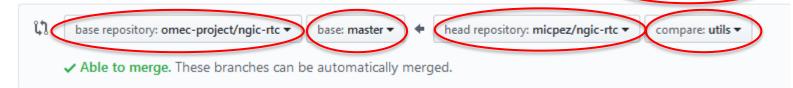




Pull Request flow

- 1. Create a Pull Request as per github workflow [cont'd]
 - Submit a Pull Request from your fork to the original OMEC repo
 (see https://help.github.com/en/articles/creating-a-pull-request-from-a-fork)
 - a. Go to the original repo and click New Pull request
 - b. compare across forks and select your fork / branch

Create a new pull request by comparing changes across two branches. If you need to, you can also compare across forks.



- c. Add title / description(if PR solves an issue, add "resolve #<issue no.> in the description)
- d. Create Pull request



7 47 commits

New pull request

Branch: master



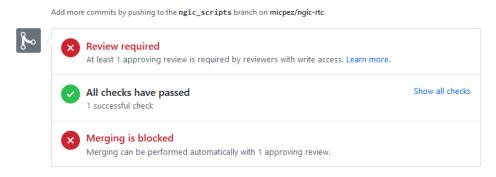


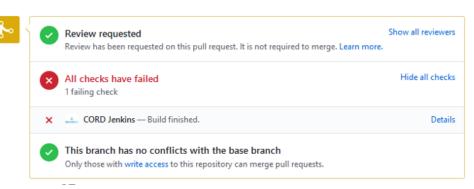
Pull Request flow

One of the OMEC Project maintainers (https://github.com/orgs/omec-project/people)
 will review your patch set.

If it's approved, a comment with `ok to test` will be left on the pull request, and a OMEC Jenkins Job (https://jenkins.opencord.org/view/OMEC) will be started to test your patch set.

- 3. If the patch set passes tests, it can be merged into the project.
- 4. If tests fails, Jenkins can be inspected for details via Console output and log inspection









Topics

- Submitting a patch to OMEC
- OMEC CI/CD





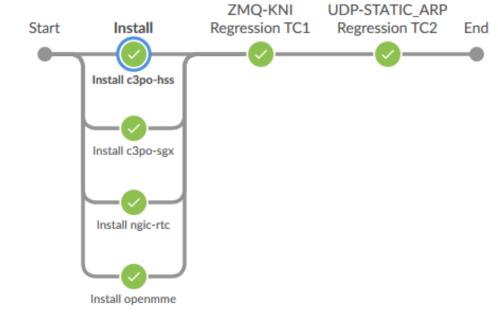
CICD Flow

A Pull Request for one of the three repos:

- c3bo
- ngic-rtc
- openmme

will trigger a Jenkins job (omec_<repo>_combined) that will coordinate:

- VNFs installation (in parallel): (*)
 - omec_c3po-hss_install
 - omec_c3po-sgx_install
 - omec_openmme_install
 - omec_ngic-rtc_install
- and test:
 - omec_tc1 [ZMQ-KNI Regression TC1]
 - omec_tc2 [UDP-STATIC_ARP Regression TC2]



(*) all repos will be on master, except <repo>, which will be on pull/<PR number>/head





Highlights [1/3]

- Resources for CI/CD Jobs:
 - Jenkins scripts are hosted @ https://github.com/omec-project/omec-project-ci
 - VNFs configuration for OMEC CI/CD is stored in OMEC VNFs repos (in .ci directory)
 - Migration of installation/test logic from Jenkins scripts to local bash scripts in .ci directories is ongoing
 - Jenkins scripts:
 - written as per pipeline architecture using both Declarative and Scripted pipeline
 - goal is to use only Declarative pipeline
- patch set involving 2 different repos at the same time
 - not manageable under current setup
 - shall be considered a corner case and handled 'manually' one patch at a time
- Pull request from HSS or SGX CDR Dealer/KMS will trigger a build/install job on whole c3po repo





Highlights [2/3]

- ONF set-up is currently running in Intel vLabs, with plans to migrate to ONF
 - VMs that are running in the ONF cluster for OMEC
 - ngic-cp1
 - ngic-dp1
 - c3po-hss1
 - c3po-mme1
 - c3po-dbn1
 - sgx-kms-cdr: SGX CDR Dealer/KMS components is running on bare metal
 - plrs2: polaris load tester is running on bare metal -> to be replaced by ng40
- activity is in progress to migrate from polaris to ng4T test system
 - ilnperf7 has now replaced plrs2
 - CI/CD is currently 'on-hold' to allow this migration to happen
- Prerequisites for Jenkins CI/CD
 - VMs up and running
 - DB VM is left untouched as it is provisioned for 100,000 Ues (to check for the status run this command on DB VM: nodetool status)
 - Ethernet connectivity between the servers and switches in the ONF Cluster environment
- All existing processes of OMEC in ONF Cluster servers are killed on CI/CD execution/job trigger from Jenkins





Highlights [3/3]

- Traffic tests are set to default parameters for Jenkins CI/CD execution as follows:
 - nUE = 32000
 - attachRate = 250
 - detachRate = 250
 - curDataRate = 35000 Kbps
- ZMQ-KNI Regression TC1:
 - traffic test with ZMQ (Push/Pull) enabled in ngic-cp/dp and KNI enabled
- UDP-STATIC_ARP Regression TC2:
 - traffic test with UDP enabled in ngic-cp/dp and STATIC_ARP enabled
- Job stage "Polaris test" result is based on existing Polaris report (Success/Failure), will be updated when ng40 is up and running
- Enclave/ca_bundle.h in SGX CDR Dealer/KMS should maintain the schematic of the Enclave Measurements structure for editing the keys during Jenkins job execution





Concurrency of PRs

If a PR is being tested and a second PR is submitted or retested, Jenkins will queue the 2nd PR until the first one is completed

E.g.:

Job *omec_ngic-rtc-combined #21* will be executed only after *omec_c3po_combined #4* is completed







CICD Flow

In Jenkins https://jenkins.opencord.org/view/OMEC/ results are visible/browsable via:

- the standard interface
 e.g. for a PR on ngic-rtc repo
 https://jenkins.opencord.org/view/OMEC/job/omec_ngic-rtc_combined/
- the Open Blue Ocean interface
 e.g. for a PR on ngic-rtc repo
 https://jenkins.opencord.org/blue/organizations/jenkins/omec_ngic-rtc_combined/activity/

Outputs:

- Build jobs Console Outputs are verbose and provide a step-by-step view, for easier debug in case of failure
- VNFs stdout / stderr consoles during installation and tests are logged to file and available in Jenkins





Overall Jenkins status

														_	
00 - E		API-Tests	ATT-Wor		All Jobs	Coverage	Guide	M-CORL	OMEC	ONOS Apps	Publish	RCORD-Lite	SEBA	-Releases	SIAB
VOLTHA	4-2.X-Te	ests VOLT	HA-Tests	Verify	XOS-Int	egration-Tests	ci-ma	anagement	sonarqube	+					
S	W	Name ↓				Last Suc	cess		Last Failure	е	Last Dur	ation	Fav	Robot Res	sults
	*	docker-publi	sh-github_o	с3ро		N/A			N/A		N/A	Ø)☆		
	*	docker-publi	sh-github_r	ngic-rtc		N/A			N/A		N/A	<u> </u>)☆		
	*	docker-publi	sh-github_o	<u>openmme</u>		N/A			N/A		N/A	<u>S</u>)☆		
	*	docker-publi	sh_omec-c	<u>eni</u>		3 days	1 hr - <u>#3</u>		N/A		4 min 37	7 sec 🔬)☆		
	*	docker-publi	sh_omec-p	ood-init		3 days	1 hr - <u>#3</u>		6 days 0 hr	- <u>#1</u>	53 sec	<u>S</u>)☆		
	*	omec_c3po-	hss_install	Į.		3 days 8	8 hr - <u>#22</u>	<u>8</u>	1 mo 0 day	s - <u>#159</u>	6 min 28	3 sec €)☆		
	*	omec_c3po-	omec_c3po-sgx_install		3 days 8	3 days 8 hr - <u>#193</u>		13 days - <u>#148</u>		6 min 21	l sec 🔬)☆			
	<i>-</i>	omec_c3po	combined			3 mo 11	days - <u>#</u>	<u>23</u>	3 days 8 hr	- <u>#48</u>	26 min	<u> </u>)☆		
	*	omec_ci-tes	t_pipeline			6 mo 6	days - <u>#2</u>	<u>10</u>	6 mo 7 day	s - <u>#14</u>	2 min 19	sec 😥)☆		
	*	omec_ngic-r	tc_combine	<u>ed</u>		6 days 2	21 hr - <u>#2</u>	04	6 days 23 h	nr - <u>#203</u>	28 min	<u>S</u>)☆		
	*	omec_ngic-r	tc_install			3 days 8	8 hr - <u>#34</u>	<u>3</u>	11 days - <u>#:</u>	302	6 min 2	sec ፩)☆		
	9	omec_openi	mme_comb	<u>pined</u>		5 days	2 hr - <u>#7</u>	<u>'2</u>	3 days 14 h	nr - <u>#75</u>	31 min	<u> </u>)☆		
	*	omec_openi	mme_instal	<u>II</u>		3 days 8	8 hr - <u>#35</u>	8	9 days 16 h	nr - <u>#345</u>	37 sec	€ E)☆		
	<i>-</i>	omec_tc1				5 days	2 hr - <u>#4</u>	<u>46</u>	3 days 8 hr	- <u>#456</u>	11 min	€)☆		
Ŏ	*	omec_tc2				5 days	2 hr - <u>#1</u>	<u>81</u>	10 days - <u>#</u>	174	11 min	<u> </u>)☆		

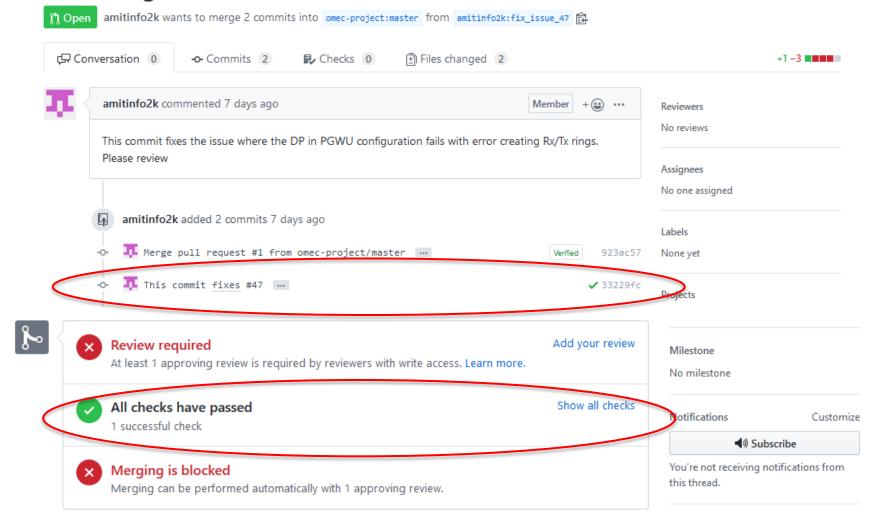




Example of PR -> CICD flow for PR #85 on ngic-rtc

https://github.com/omec-project/ngic-rtc/pull/85

Fix issue #47 PGWU: Not able to launch, failed to create Rx/Tx rings #85







Example of PR -> CICD flow

https://jenkins.opencord.org/view/OMEC/job/omec_ngic-rtc_combined/204/console



```
GitHub pull request #85 of commit 33229fc8e799c6aeb3820e89a4378b8c0009e8f7, no merge conflicts.
```

```
[Install c3po-hss] Scheduling project: omec c3po-hss install
[Pipeline] build (Building omec_c3po-sgx_install)
[Install c3po-sgx] Scheduling project: omec c3po-sgx install
[Pipeline] build (Building omec_ngic-rtc_install)
[Install ngic-rtc] Scheduling project: omec ngic-rtc install
[Pipeline] build (Building omec_openmme_install)
[Install openmme] Scheduling project: omec openmme install

> git rev-parse origin/master^{commit} # timeout=10

> git config core.sparsecheckout # timeout=10

> git checkout -f 43b11c8539ff2f2ld024344b67e6b535bddcb3fc
[Install c3po-hss] Starting building: omec c3po-hss install #220
[Install c3po-sgx] Starting building: omec c3po-sgx install #185
[Install openmme] Starting building: omec openmme install #350
[Install ngic-rtc] Starting building: omec ngic-rtc install #335
```

```
Scheduling project: omec tc1
Starting building: omec tc1 #444
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (UDP-STATIC ARP Regression TC2)
[Pipeline] build (Building omec tc2)
Scheduling project: omec tc2
Starting building: omec tc2 #180
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Setting status of 33229fc8e799c6aeb3820e89a4378b8c0009e8f7 to SUCCESS
rtc combined/204/ and message: 'Build finished. '
Using context: CORD Jenkins
Finished: SUCCESS
```





Pipeline omec_ngic-rtc_combined

https://jenkins.opencord.org/view/OMEC/job/omec_ngic-rtc_combined/

Pipeline omec_ngic-rtc_combined

Created by omec-combined job-template from ci-management/jjb/omec-ci.yaml





Stage View







Pipeline omec_ngic-rtc_install

https://jenkins.opencord.org/job/omec_ngic-rtc_install/335/

Pipeline omec_ngic-rtc_install

Created by omec-install job-template from ci-management/jjb/omec-ci.yaml



Stage View





Build #335 (Aug 26, 2019 11:20:29 AM)



Build Artifacts

 □ cicd_cp1 install.stderr.log
 19.96 KB ■ view

 □ cicd_cp1 install.stdout.log
 182.67 KB ■ view

 □ cicd_dp1 install.stderr.log
 23.09 KB ■ view

 □ cicd_dp1 install.stdout.log
 231.55 KB ■ view



Started by upstream project <u>omec_ngic-rtc_combined</u> build number <u>204</u> originally caused by:

GitHub pull request #85 of commit 33229fc8e799c6aeb3820e89a4378b8c0009e8f7, no merge conflicts.



This run spent:

- · 6.4 sec waiting;
- 7 min 1 sec build duration;
- 7 min 7 sec total from scheduled to completion.



Revision: 43b11c8539ff2f21d024344b67e6b535bddcb3fc

origin/master





Pipeline omec_ngic-rtc_install

https://jenkins.opencord.org/job/omec_ngic-rtc_install/2/console

```
Cloning into 'ngic-rtc'...

From https://github.com/omec-project/ngic-rtc

* [new ref] refs/pull/85/head -> jenkins_test

[Pipeline] echo

First, rewinding head to replay your work on top of it...

Applying: This commit fixes #47

commit 1894e105efc5988afd3e752d681960e7a1717e28
```





Pipeline omec_tc1

https://jenkins.opencord.org/view/OMEC/job/omec_tc1/

Pipeline omec_tc1

Created by omec-tc1 job-template from ci-management/jjb/omec-ci.yaml





Stage View

	VMs check	c3po- ctf/cdf	c3po- router	c3po- sgxcdr	c3po- hss1	c3po- mme1	make CP	make DP	ZMQ [push/pull] start	run ngic- rtc	check processes	test polaris	test sgx-dp
Average stage times (Average <u>full</u> run time: ~10min		10s	12s	27s	18s	36s	4s	12s	11s	38s	9s	7min 33s	2s
#446 Aug 27 Changes Changes	30s	11s	11s	26s	18s	38s	4s	15s	11s	36s	9s	6min 55s	3s





Pipeline omec_tc1

https://jenkins.opencord.org/job/omec_tc1/444/console (similar report for tc2)

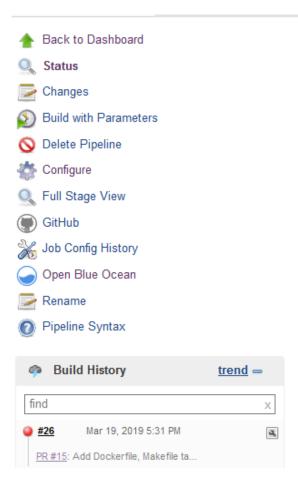
```
+ 6. Total number of tests passed......1 +
+ 1. ./Attach-Detach-wdata.tcl
 No Test Failed.
+ 1. ./Attach-Detach-wdata.tcl
  Results:
  1. Attach: Attempt: 32000, Success: 32000, Completion Time (max/min/avg): 322.13/9.27/55.64 +
  2. Detach: Attempt: 32000, Success: 32000, Completion Time (max/min/avg): 2007.50/3.67/40.23 +
    -----+
```

```
DP log: DP Identify/Filename: 20190826043043
[Pipeline] sh
+ ssh sgx-kms-cdr 'ls /home/jenkins/c3po/sgxcdr/
[Pipeline] echo
cdr directory: identity: 20190826043043
```





Examples of Failures (1/3)



Pipeline omec_ngic-rtc_combined

Created by omec-combined job-template from ci-management/jjb/omec-ci.yaml



Stage View

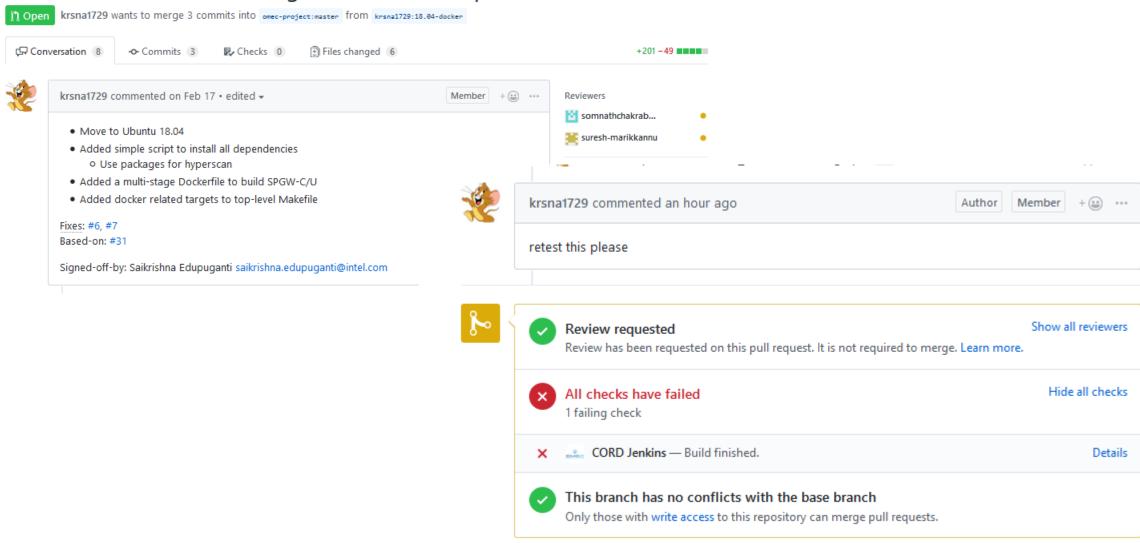
	Declarative: Checkout SCM	Install	Install c3po	Install ngic-rtc	Install openmme	ZMQ-KNI Regression TC1	UDP- STATIC_ARP Regression TC2
Average stage times: (Average <u>full</u> run time:	2s	36ms	9min 53s	13min 14s	40s	5min 33s	1min 38s
~28min 3s) *26 Mar 19 No Changes 18:31	1s	33ms	9min 39s	12min 23s	37s	20ms	22ms





Examples of Failures

Add Dockerfile, Makefile targets and install_deps.sh #15







Examples of Failures (2/3)

- PR was submitted to ngic-rtc repo
- Job omec_ngic-rtc_combined #26 failed
- From there, it is possible to navigate to the failing point, in this case omec_ngic-rtc_install
- Pipeline view, Console Output and logs of omec_ngic-rtc_install will provide where the process stopped



Build #26 (Mar 19, 2019 5:31:53 PM)

PR #15: Add Dockerfile, Makefile ta...



GitHub pull request #15 of commit 2c0588e2f53464ec1ccf57b94237e010ca4d4015,



This run spent:

- 9 min 42 sec waiting;
- 12 min build duration;
- · 22 min total from scheduled to completion.

```
[Install openmme] Starting building: omec openmme install #26
[Install ngic-rtc] Starting building: omec ngic-rtc install #24
   [Install c3po] Starting building: omec c3po install #24
                   [Pipeline] }
                   [Pipeline] // stage
                   [Pipeline] }
                   [Pipeline] }
                   [Pipeline] // stage
                   [Pipeline] }
                   [Pipeline] }
                   [Pipeline] // stage
                   Failed in branch Install ngic-rtc
                   [Pipeline] // parallel
                   [Pipeline] // stage
                   [Pipeline] stage
                   [Pipeline] { (ZMQ-KNI Regression TC1)
                   Stage "ZMQ-KNI Regression TC1" skipped due to earlier failure(s)
                   [Pipeline] }
```

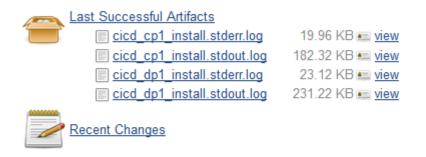




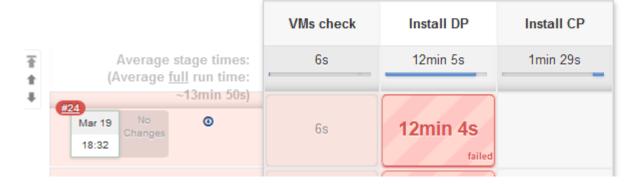
Examples of Failures (3/3)

Pipeline omec_ngic-rtc_install

Created by omec-install job-template from ci-management/jjb/omec-ci.yaml



Stage View





Started by upstream project " $\underline{\text{omec ngic-rtc combined}}$ " build number $\underline{26}$ originally caused by:

GitHub pull request #15 of commit 2c0588e2f53464ec1ccf57b94237e010ca4d4015,

```
CC ddn.o

CC gtpu_echo.o

CC /home/jenkins/ngic-rtc/dp/../interface/udp/vepc_udp.o

CC /home/jenkins/ngic-rtc/dp/../interface/interface.o

CC pipeline/epc_dl.o

CC pipeline/epc_packet_framework.o

CC pipeline/epc_spns_dns.o

CC pipeline/epc_ul.o

LD ngic_dataplane

/nome/jenkins/ngic-rtc/dpdk/mk/rte.app.mk:336: recipe for target 'ngic_dataplane' failed.

/home/jenkins/ngic-rtc/dpdk/mk/rte.extapp.mky:14: recipe for target 'all' failed

[Pipeline] }

[Pipeline] // timeout

[Pipeline] // stage

[Pipeline] sh
```





Migration polaris -> ng40

- CI/CD is currently 'on-hold' to allow migration from polaris to ng40
- if a job is triggered now, an early failure of TC1 will be shown

Pipeline omec_c3po_combined

Created by omec-combined job-template from ci-management/jjb/omec-ci.yaml



Stage View





Additional / backup slides



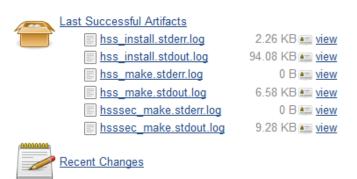


Pipeline omec_c3po_hss_install

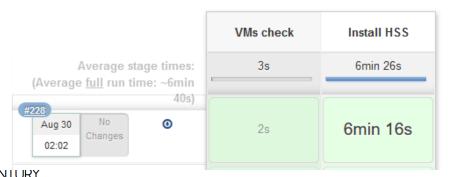
https://jenkins.opencord.org/job/omec_c3po-hss_install/220/

Pipeline omec_c3po-hss_install

Created by omec-install job-template from ci-management/jjb/omec-ci.yaml



Stage View





Build #220 (Aug 26, 2019 11:20:29 AM)



Build Artifacts

hss_install.stderr.log	2.26 KB <u> view</u>
hss_install.stdout.log	94.08 KB <u> view</u>
hss_make.stderr.log	0 B <u>■ view</u>
hss_make.stdout.log	6.58 KB <u>■ view</u>
hsssec_make.stderr.log	0 B <u>■ view</u>
hsssec_make.stdout.log	9.28 KB <u>€</u> <u>view</u>



Started by upstream project <u>omec_ngic-rtc_combined</u> build number <u>204</u> originally caused by:

GitHub pull request #85 of commit 33229fc8e799c6aeb3820e89a4378b8c0009e8f7, no merge conflicts.



This run spent:

- · 6.4 sec waiting;
- . 6 min 42 sec build duration;
- 6 min 48 sec total from scheduled to completion.



Revision: 43b11c8539ff2f21d024344b67e6b535bddcb3fc

origin/master



Pipeline omec_c3po_sgx_install

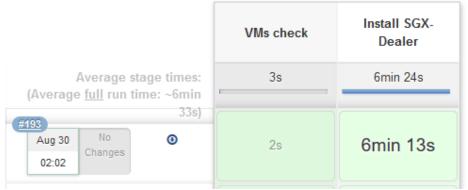
https://jenkins.opencord.org/job/omec_c3po-sgx_install/185/

Pipeline omec_c3po-sgx_install

Created by omec-install job-template from ci-management/jjb/omec-ci.yaml



Stage View





Build #185 (Aug 26, 2019 11:20:29 AM)





Started by upstream project <u>omec_ngic-rtc_combined</u> build number <u>204</u> originally caused by:



Pipeline omec_openmme_install

https://jenkins.opencord.org/job/omec_openmme_install/350/

Pipeline omec_openmme_install

Created by omec-install job-template from ci-management/jjb/omec-ci.yaml



Build #350 (Aug 26, 2019 11:20:29 AM)



Stage View





Build Artifacts

 cicd openmme install.stderr.log
 0 B ■ view

 cicd openmme install.stdout.log
 3.33 KB ■ view

 cicd openmme make.stderr.log
 0 B ■ view

 cicd openmme make.stdout.log
 26.79 KB ■ view



Started by upstream project <u>omec_ngic-rtc_combined</u> build number <u>204</u> originally caused by:

GitHub pull request #85 of commit 33229fc8e799c6aeb3820e89a4378b8c0009e8f7, no merge conflicts.



This run spent:

- · 6.4 sec waiting;
- · 37 sec build duration;
- · 43 sec total from scheduled to completion.



Revision: 43b11c8539ff2f21d024344b67e6b535bddcb3fc

origin/master



Pipeline omec_tc2

https://jenkins.opencord.org/view/OMEC/job/omec_tc2/

Pipeline omec_tc2

Created by omec-tc2 job-template from ci-management/jjb/omec-ci.yaml





Stage View

	VMs check	c3po- ctf/cdf	c3po- router	c3po- sgxcdr	c3po- hss1	c3po- mme1	ZMQ [push/pull] stop	make CP	make DP	run ngic- rtc	check processes	test polaris	test sgx-dp
Average stage times: (Average <u>full</u> run time: ~10min		11s	11s	28s	19s	36s	7s	5s	14s	27s	9s	6min 22s	3s
#181 No Changes	34s	15s	17s	35s	24s	41s	8s	6s	18s	28s	11s	6min 56s	4s
#180 No Changes 13:38	14s	9s	10s	25s	18s	35s	6s	5s	12s	28s	9s	6min 50s	3s





Thank You Q & A