Keysight Open RAN Simulators, Cloud Edition 3.0

Troubleshooting Guide

KEYSIGHT

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Table of Contents

CHAPTER 1

Troubleshooting Topics

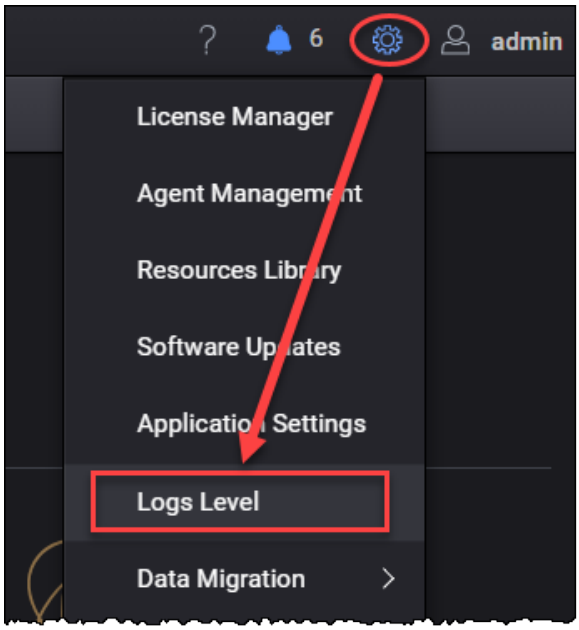
This *Troubleshooting Guide* presents the most common errors or issues and their associated resolution (if available).

Topics:

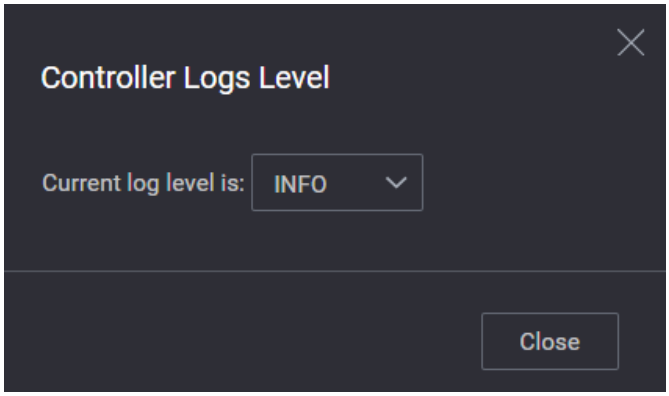
How to collect diagnostics from Middleware, License Server and from specific test results

Middleware diagnostics

From the Middleware UI, before collecting diagnostics, the log level can be checked/changed, by selecting the Settings menu(⚙) on the upper right corner, and then selecting **Logs Level**:



The default log level is set to **Info**.

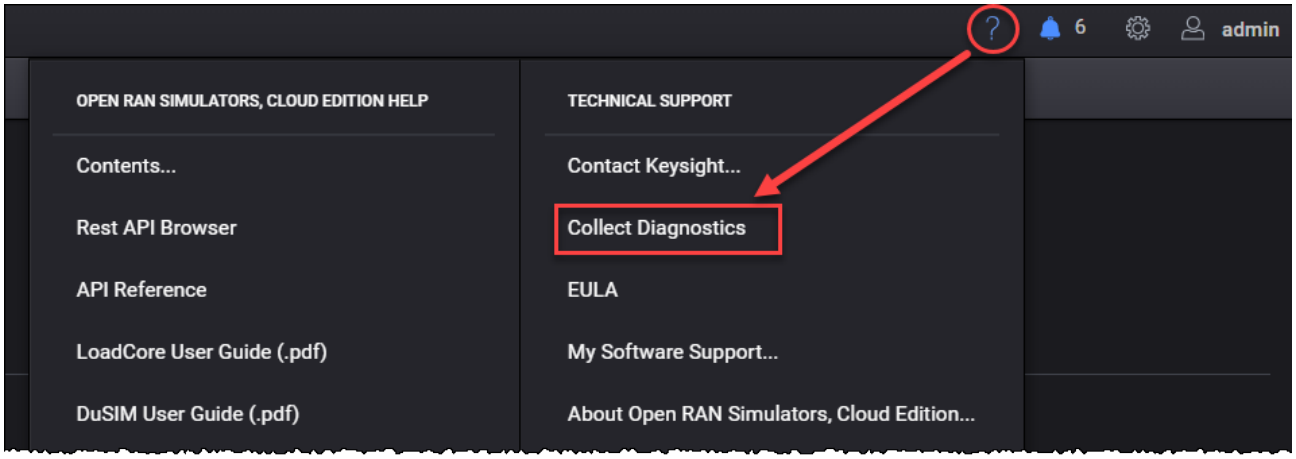


It is recommended to use **Debug** level only if it is needed for detailed troubleshooting, as it consumes more resources on the Middleware.

The log level change takes effect the moment it is applied.

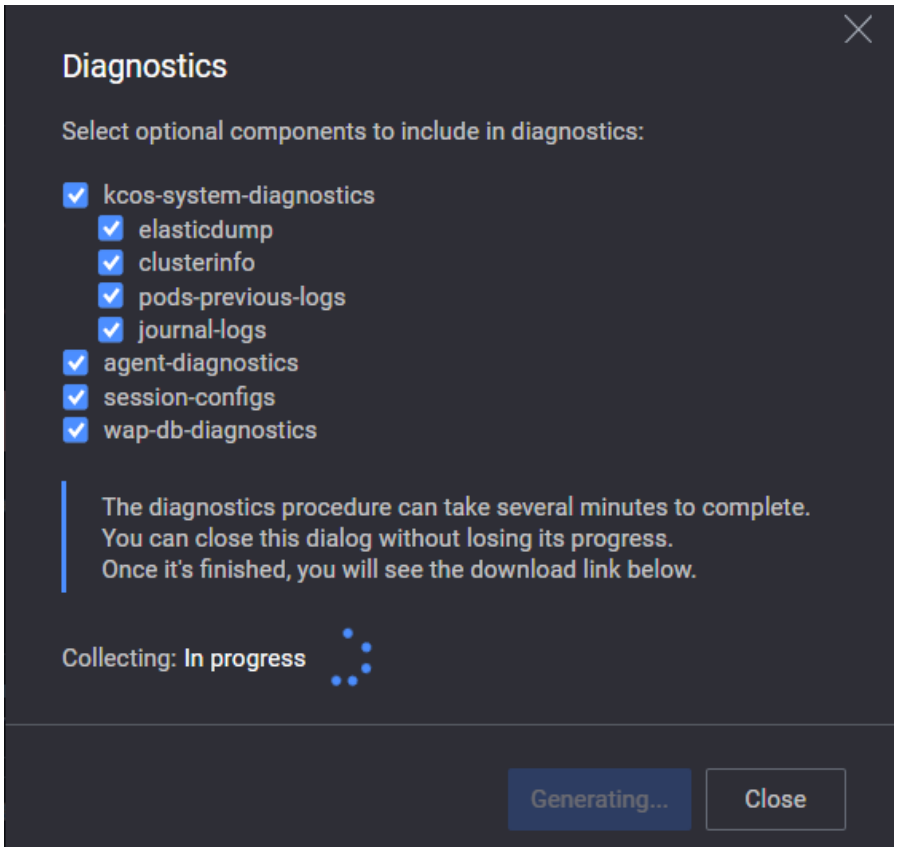
If downloading diagnostics concerning a previously encountered issue, changing log level will not affect the concerning logs.

Select the Help menu (question mark icon) on the upper right corner and select **Collect Diagnostics**:



By default all components will be enabled and included in the diagnostics archive.

Selecting **Generate** will start the collection process which can take a few minutes. After it is complete, a download link will be displayed for the archive (which can be a few hundred MBs in size).



Middleware logs can also be collected by `ssh`-ing to its IP and using `kcos` commands (for details, refer to the *KCOS CLI Reference Guide*).

To start the generation of the diagnostics archive file, issue the command:

```
kcos logs diagnostics collect
```

To show the diagnostics file previously generated, issue the command:

```
kcos logs diagnostics show
```

To download the file, issue the following command with the archive id:

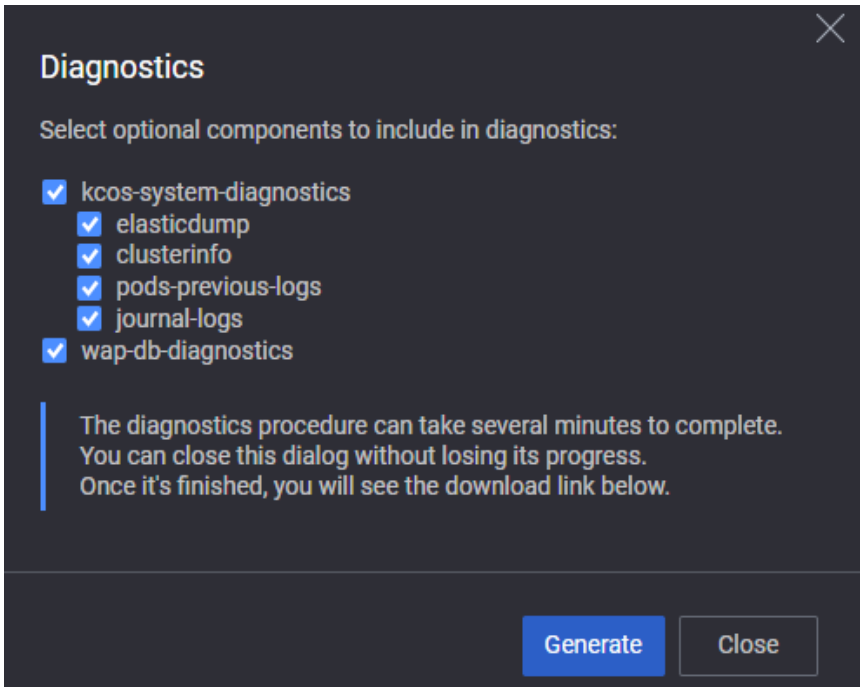
```
kcos logs diagnostics download -i
```

```
admin@kcos-framework-shell-db6c8b97-ltvw2:~$ kcos logs diagnostics show
ID    FILENAME                                TIMESTAMP                                STATE      MESSAGE
--    ------------------------------------    --------------------------------------   -------    ----------------------------
1     system_logs-2023-10-23-07-40-27-1.zip   2023-10-23 07:47:59.478599305 +0000 UTC  SUCCESS    Operation finished succesfully
--    ------------------------------------    --------------------------------------   -------    ----------------------------

admin@kcos-framework-shell-db6c8b97-ltvw2:~$ kcos logs diagnostics download -i 1

Logs downloaded successfully
File Path  /tmp/logs-2023-10-23-07-51-13.zip
scp admin@<machine-ip>:/tmp/logs-2023-10-23-07-51-13.zip <desired-local-folder>
```

License Server diagnostics

For license server the process is almost identical to the one presented in the Middleware section (less components in the archive).

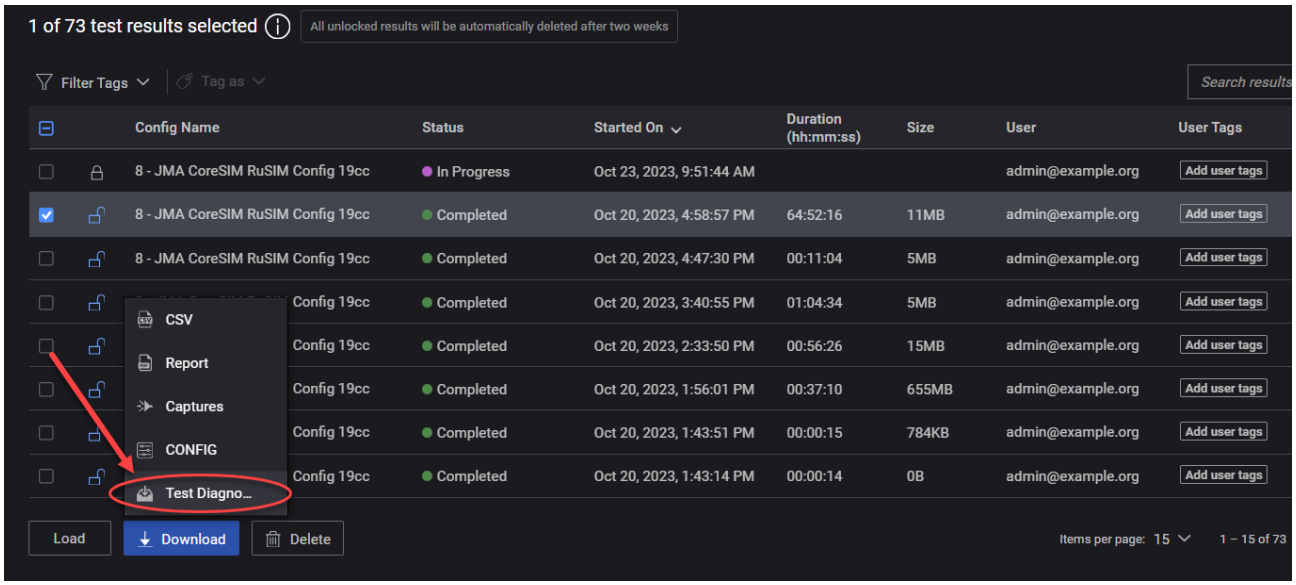
Select the Help menu (question mark icon) on the upper right corner and select **Collect Diagnostics** > **Generate**.



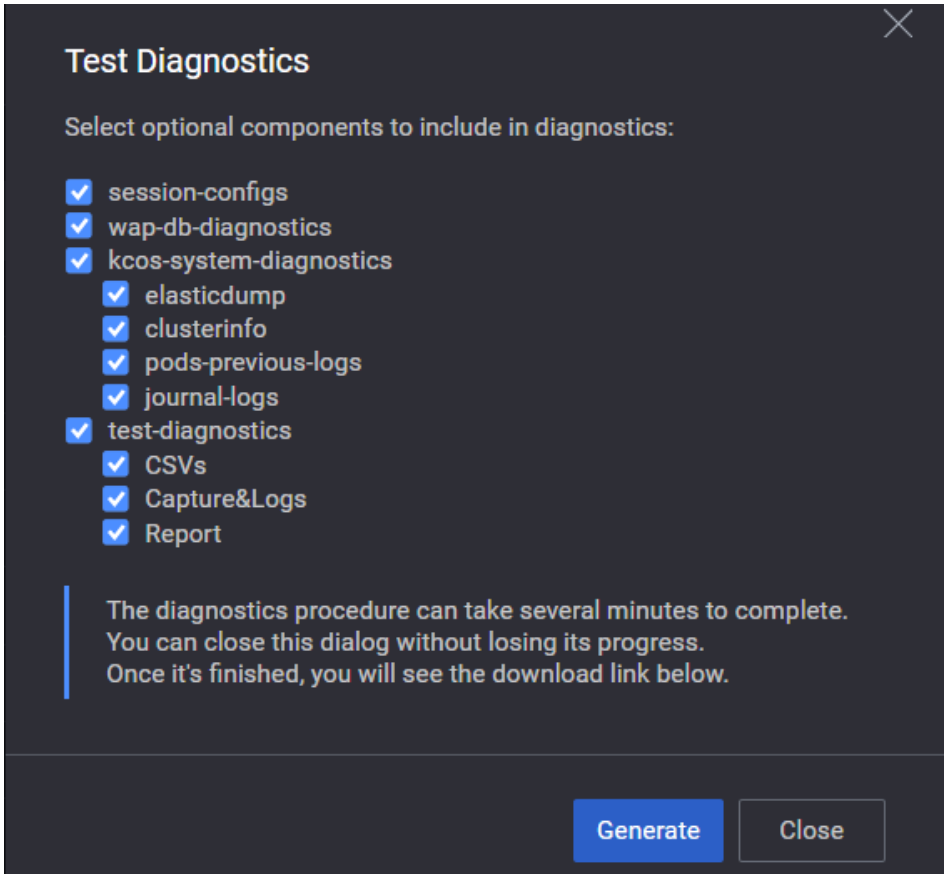
Also `kcos` logs diagnostics commands are the same as for Middleware section.

Specific test diagnostics

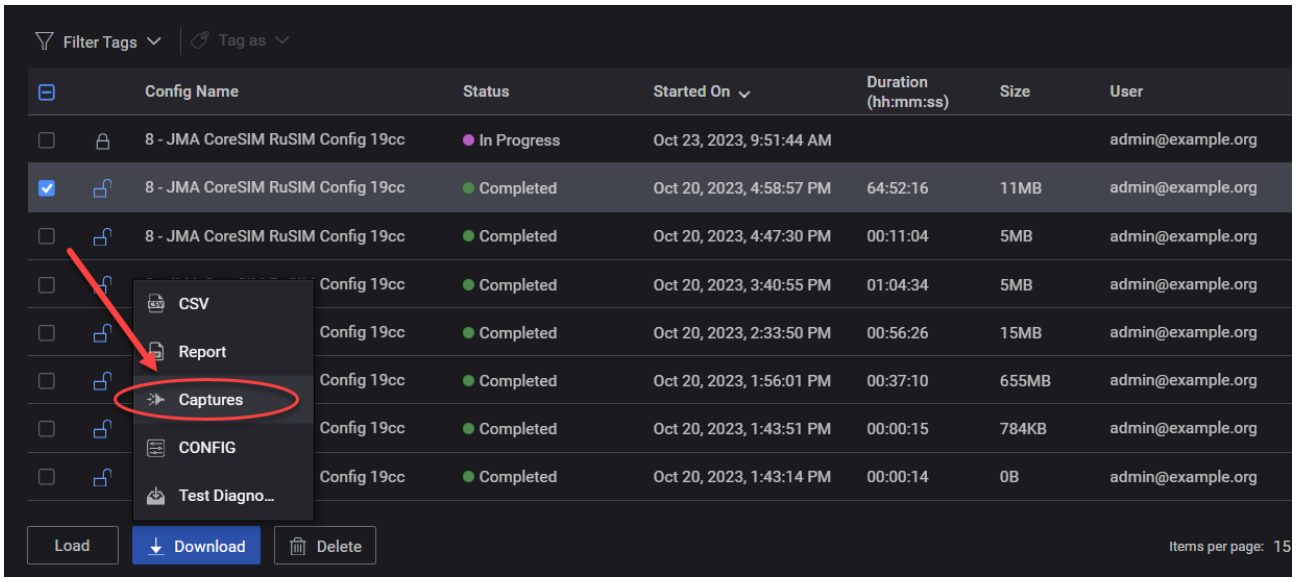
To collect specific test diagnostics, go to Browse Results menu, select the specific test, and select **Test Diagnostics**:



Be aware that the Test Diagnostics archive will include all logs, even from Middleware. The process will take a few minutes to generate and the archive will be a few hundred MBs in size.



Unless it is requested for detailed troubleshooting or it is presumed there is an issue with the Middleware, it is better/faster to collect only captures/logs for a specific test:


Filter Tags
Tag as
Config Name
Status
Started On
Duration (hh:mm:ss)
Size
User
8 - JMA CoreSIM RuSIM Config 19cc
In Progress
Oct 23, 2023, 9:51:44 AM
admin@example.org
8 - JMA CoreSIM RuSIM Config 19cc
Completed
Oct 20, 2023, 4:58:57 PM
64:52:16
11MB
admin@example.org
8 - JMA CoreSIM RuSIM Config 19cc
Completed
Oct 20, 2023, 4:47:30 PM
00:11:04
5MB
admin@example.org
Config 19cc
Completed
Oct 20, 2023, 3:40:55 PM
01:04:34
5MB
admin@example.org
Config 19cc
Completed
Oct 20, 2023, 2:33:50 PM
00:56:26
15MB
admin@example.org
Config 19cc
Completed
Oct 20, 2023, 1:56:01 PM
00:37:10
655MB
admin@example.org
Config 19cc
Completed
Oct 20, 2023, 1:43:51 PM
00:00:15
784KB
admin@example.org
Config 19cc
Completed
Oct 20, 2023, 1:43:14 PM
00:00:14
0B
admin@example.org
CSV
Report
Captures
CONFIG
Test Diagno...
Load
Download
Delete
Items per page: 15

Middleware pods, their roles and useful `kubectl` commands

The Middleware and license server use separate kubernetes pods for their services.

These can be checked only when logged in as `root`.

IMPORTANT The `root` key/procedure is only provided on request and if it is needed to troubleshoot Middleware/license server issues.

Important pods and their roles:

- `kcos-deployment-service` – its logs contain messages related to the Middleware initial start/deployment and upgrade
- `kcos-framework-v1-kcos-eula` – related to the license agreement asked about after the installation of the Middleware
- `kcos-system-diagnostics` – supports the collection of diagnostics, exec command can be used on the pod to collect certain logs
- `kcos-licensing` – is in charge of the integrated License Server on the MW or the license service on an external License Server
- `keycloak-0` – holds the keycloak framework, used for Access Control (authentication and authorization)
- `authproxy-kcos-keycloak` – pod needed for authentication of the users
- `agent-controller` – used for communication, registration and management of the agents
- `agent-diagnostics` – used to access the diagnostics and logs from the agents
- `agent-diagnostics-clean-up-cronjob` – cronjob that cleans upagent diagnostics every 6 hours
- `es-cluster-0` – very important pod, needed for elastic search; holds indexes for other pods
- `grafana` – pod related to the display of the statistics in the LC UI
- `license-service` – in charge of asking for test licenses from the License Server (not to be confused with kcos-licensing)
- `migration-service` – service in charge of migrating data (users, test configs …) from one MW to another
- `nats` – service used for communication between MW and the agents
- `notification-service` – in charge of notifications like test starting, stopping, errors
- `notifications-cleanup-cronjob` – cronjob that deletes old notifications every 3 days
- `pdf-report-generator-service` – in charge of generating the PDF file with the test summary
- `rest-api-browser-v1` – in charge of the REST API browser page, which can be used to access certain tests and session information
- `results-cleanup-cronjob` – cronjob that deletes unpinned test results every 3 days
- `session-manager` – in charge of the test sessions
- `test-results-service` – manages test results (after the test has ended)
- `traffic-controller` – responsible for tests starting/running/completing and also sessions

- `wap-ntp-server` – in charge of the NTP service and also acts as NTP server for the agents
- `wap-db-postgresql-0` – database with multiple tables, for sessions, configs and test results; exec and psql commands can be used to check it
- `core-dns` – serves as the Kubernetes cluster DNS
- `weave-net` – responsible for the networking/communication between the pods, inside the kubernetes cluster

```
root@kcos-5254007d7119:~# kubectl get pods -A -o wide
NAMESPACE              NAME                                                READY   STATUS      RESTARTS         AGE     IP              NODE    NOMINATED NODE   READINESS GATES
kcos-deployment        kcos-deployment-service-v1-5c949c8d9b-5brm8         1/1     Running     24 (4d23h ago)   33d     10.32.0.58      mgmt    <none>           <none>
kcos-framework         kcos-framework-shell-configuration-577b858884-hp7wp 1/1     Running     24 (4d23h ago)   33d     10.32.0.30      mgmt    <none>           <none>
kcos-framework         kcos-framework-shell-db6c8b97-ltvw2                 1/1     Running     24 (4d23h ago)   33d     10.32.0.50      mgmt    <none>           <none>
kcos-framework         kcos-framework-v1-kcos-eula-54855b784-8j7nt         1/1     Running     24 (4d23h ago)   33d     10.32.0.35      mgmt    <none>           <none>
kcos-framework         kcos-framework-v1-naas-0                            3/3     Running     72 (4d23h ago)   33d     10.32.0.46      mgmt    <none>           <none>
kcos-framework         kcos-framework-v1-postgresql-0                      1/1     Running     24 (4d23h ago)   33d     10.32.0.33      mgmt    <none>           <none>
kcos-framework         kcos-framework-vital-6b6bd66d86-djk5l               1/1     Running     24 (4d23h ago)   33d     10.32.0.32      mgmt    <none>           <none>
kcos-framework         kcos-ingress-v1-cmm-77444bbb78-wm7j5                1/1     Running     24 (4d23h ago)   33d     10.32.0.12      mgmt    <none>           <none>
kcos-framework         kcos-ingress-v1-ingress-nginx-controller-dgmz7      1/1     Running     24 (4d23h ago)   33d     192.168.99.1    mgmt    <none>           <none>
kcos-framework         kcos-local-storage-v1-6484c5969f-7shdb              1/1     Running     24               33d     10.32.0.53      mgmt    <none>           <none>
kcos-framework         kcos-logging-framework-798cd58948-s9xxz             1/1     Running     24 (4d23h ago)   33d     10.32.0.10      mgmt    <none>           <none>
kcos-framework         kcos-logging-rotate-28khg                           1/1     Running     24 (4d23h ago)   33d     10.32.0.18      mgmt    <none>           <none>
kcos-framework         kcos-system-diagnostics-55c7f886f-cwgpq             1/1     Running     24 (4d23h ago)   33d     10.32.0.7       mgmt    <none>           <none>
kcos-framework         nfs-server-provisioner-v2-0                         1/1     Running     24 (4d23h ago)   33d     10.32.0.52      mgmt    <none>           <none>
kcos-licensing         kcos-licensing-v1-74f4bc4b4b-hrtws                  1/1     Running     24 (4d23h ago)   33d     10.32.0.57      mgmt    <none>           <none>
kcos-metrics-service   kcos-metrics-service-v1-metrics-server-796c568596-t62x7 1/1  Running     24 (4d23h ago)   33d     10.32.0.5       mgmt    <none>           <none>
kcos-sso               authproxy-kcos-keycloak-764db47f85-bcxgr            1/1     Running     1 (4d23h ago)    5d1h    10.32.0.25      mgmt    <none>           <none>
kcos-sso               kcos-licensing-v1-rbac-setup-job--1-csfsp           0/1     Completed   1                5d1h    10.32.0.4       mgmt    <none>           <none>
kcos-sso               keycloak-0                                          1/1     Running     1 (4d23h ago)    5d1h    10.32.0.34      mgmt    <none>           <none>
kcos-sso               keycloak-operator-f7888b8f4-tpgpm                   1/1     Running     1 (4d23h ago)    5d1h    10.32.0.19      mgmt    <none>           <none>
kcos-sso               keycloak-postgresql-56b595d9bf-p6mbz                1/1     Running     1 (4d23h ago)    5d1h    10.32.0.3       mgmt    <none>           <none>
keysight-nimbusmosaic  countersmodule-54fdd96596-9dpdw                     1/1     Running     2 (4d23h ago)    5d      10.32.0.27      mgmt    <none>           <none>
keysight-nimbusmosaic  exec-edit-mob-9d965c795-tqqmj                       3/3     Running     6 (4d23h ago)    5d      10.32.0.29      mgmt    <none>           <none>
keysight-nimbusmosaic  gateway-756bd9f99c-vppmf                            1/1     Running     1 (4d23h ago)    5d      10.32.0.44      mgmt    <none>           <none>
keysight-nimbusmosaic  perspective-5bddf76bc9-wkfhn                        1/1     Running     1 (4d23h ago)    5d      10.32.0.24      mgmt    <none>           <none>
keysight-nimbusmosaic  tstmconnector-5676ff864c-f91bq                      1/1     Running     2 (4d23h ago)    5d      10.32.0.26      mgmt    <none>           <none>
keysight-wap           agent-controller-65966b9767-ld4sg                   1/1     Running     2 (4d23h ago)    5d      10.32.0.6       mgmt    <none>           <none>
keysight-wap           agent-diagnostics-7d69dfd467-lw2bs                  1/1     Running     3 (4d23h ago)    5d      10.32.0.36      mgmt    <none>           <none>
keysight-wap           agent-diagnostics-clean-up-cronjob-28300680--1-jbsw6 0/1    Completed   0                3h14m   10.32.0.63      mgmt    <none>           <none>
keysight-wap           config-service-bf947795-f1mw6                       1/1     Running     1 (4d23h ago)    5d      10.32.0.41      mgmt    <none>           <none>
keysight-wap           dataseq-service-689f89d877-6hs56                    1/1     Running     1 (4d23h ago)    5d      10.32.0.4       mgmt    <none>           <none>
keysight-wap           es-cluster-0                                        1/1     Running     24 (4d23h ago)   33d     10.32.0.62      mgmt    <none>           <none>
keysight-wap           es-curator-cronjob-28300500--1-bkjgw                0/1     Completed   0                6h14m   10.32.0.64      mgmt    <none>           <none>
keysight-wap           fluent-bit-tqhcl                                    1/1     Running     24 (4d23h ago)   33d     10.32.0.43      mgmt    <none>           <none>
keysight-wap           grafana-779f7fbc47-8tsrx                            1/1     Running     24 (4d23h ago)   33d     10.32.0.31      mgmt    <none>           <none>
keysight-wap           license-service-659c7488d8-lq5bz                    1/1     Running     1 (4d23h ago)    5d      10.32.0.39      mgmt    <none>           <none>
keysight-wap           migration-service-5bcff69fbb-v8njb                  1/1     Running     1 (4d23h ago)    5d      10.32.0.22      mgmt    <none>           <none>
keysight-wap           nats-0                                              2/2     Running     48 (4d23h ago)   33d     10.32.0.61      mgmt    <none>           <none>
keysight-wap           nats-1                                              2/2     Running     48 (4d23h ago)   33d     10.32.0.11      mgmt    <none>           <none>
keysight-wap           nats-2                                              2/2     Running     48 (4d23h ago)   33d     10.32.0.54      mgmt    <none>           <none>
keysight-wap           nats-http-proxy-service-7864f69cbc-hd9vf            1/1     Running     1 (4d23h ago)    5d      10.32.0.42      mgmt    <none>           <none>
keysight-wap           notification-service-6f549b5b6d-966pz               1/1     Running     1 (4d23h ago)    5d      10.32.0.15      mgmt    <none>           <none>
keysight-wap           notifications-cleanup-cronjob-28300500--1-5tgp9     0/1     Completed   0                6h14m   10.32.0.63      mgmt    <none>           <none>
keysight-wap           pdf-report-generator-service-d8f6dffbd-tsrpc        1/1     Running     24 (4d23h ago)   33d     10.32.0.38      mgmt    <none>           <none>
keysight-wap           rest-api-browser-helper-7cc679bd5f-tskgd            1/1     Running     1 (4d23h ago)    5d      10.32.0.20      mgmt    <none>           <none>
keysight-wap           rest-api-browser-v1-ui-745bfdddc4-md8dw             1/1     Running     24 (4d23h ago)   33d     10.32.0.8       mgmt    <none>           <none>
keysight-wap           rest-stats-service-7b67d859d9-pcnf5                 1/1     Running     2 (4d23h ago)    5d      10.32.0.59      mgmt    <none>           <none>
keysight-wap           result-service-5c74c7879c-xjf7b                     1/1     Running     1 (4d23h ago)    5d      10.32.0.49      mgmt    <none>           <none>
keysight-wap           results-cleanup-cronjob-28300500--1-ccgmw           0/1     Completed   0                6h14m   10.32.0.65      mgmt    <none>           <none>
keysight-wap           session-manager-64869cf8fc-kfc85                    1/1     Running     1 (4d23h ago)    5d      10.32.0.56      mgmt    <none>           <none>
keysight-wap           stats-55d4bbbfb4-5ht54                              1/1     Running     3 (4d23h ago)    5d      10.32.0.17      mgmt    <none>           <none>
keysight-wap           stats-dashboard-service-856f9dc679-p62gt            1/1     Running     1 (4d23h ago)    5d      10.32.0.23      mgmt    <none>           <none>
keysight-wap           system-monitor-service-bd4f44698-bt5v4              1/1     Running     1 (4d23h ago)    5d      10.32.0.13      mgmt    <none>           <none>
keysight-wap           test-results-service-6658995b76-dwpt5               1/1     Running     1 (4d23h ago)    5d      10.32.0.2       mgmt    <none>           <none>
keysight-wap           traffic-controller-8549574d4c-tkv89                 1/1     Running     1 (4d23h ago)    5d      10.32.0.40      mgmt    <none>           <none>
keysight-wap           wap-appsec-data-model-5698b7f67f-822vp              1/1     Running     1 (4d23h ago)    5d      10.32.0.21      mgmt    <none>           <none>
keysight-wap           wap-appsec-resource-service-557468dfb7-tw29x        1/1     Running     2 (4d23h ago)    5d      10.32.0.48      mgmt    <none>           <none>
keysight-wap           wap-db-diagnostics-6d7b5b7998-5sdmj                 1/1     Running     4 (4d23h ago)    5d      10.32.0.37      mgmt    <none>           <none>
keysight-wap           wap-db-postgresql-0                                 1/1     Running     24 (4d23h ago)   33d     10.32.0.14      mgmt    <none>           <none>
keysight-wap           wap-ntp-server-787d59d9f7-smshq                     1/1     Running     24 (4d23h ago)   33d     10.32.0.16      mgmt    <none>           <none>
keysight-wap           wap-storage-minio-7ff6d64d7d-blksp                  1/1     Running     24 (4d23h ago)   33d     10.32.0.55      mgmt    <none>           <none>
keysight-wap           wap-tunnel-server-fc68f55ff-xjrbh                   1/1     Running     1 (4d23h ago)    5d      10.32.0.51      mgmt    <none>           <none>
keysight-wap           wapui-78769df999-rkprx                              1/1     Running     1                5d      10.32.0.60      mgmt    <none>           <none>
keysight-wap           websocket-service-65c44ccf75-28tqc                  1/1     Running     1 (4d23h ago)    5d      10.32.0.47      mgmt    <none>           <none>
keysight-wap           wireless-data-model-647f9b74f8-7dvxl                1/1     Running     2 (4d23h ago)    5d      10.32.0.45      mgmt    <none>           <none>
kube-system            coredns-55995c9468-9rqh6                            2/2     Running     48 (4d23h ago)   33d     10.32.0.9       mgmt    <none>           <none>
kube-system            coredns-55995c9468-pvp99                            2/2     Running     48 (4d23h ago)   33d     10.32.0.28      mgmt    <none>           <none>
kube-system            etcd-mgmt                                           1/1     Running     25 (4d23h ago)   33d     192.168.99.1    mgmt    <none>           <none>
kube-system            kube-apiserver-mgmt                                 1/1     Running     25 (4d23h ago)   33d     192.168.99.1    mgmt    <none>           <none>
kube-system            kube-controller-manager-mgmt                        1/1     Running     25 (4d23h ago)   33d     192.168.99.1    mgmt    <none>           <none>
kube-system            kube-proxy-qwhmv                                    1/1     Running     24 (4d23h ago)   33d     192.168.99.1    mgmt    <none>           <none>
kube-system            kube-scheduler-mgmt                                 1/1     Running     25 (4d23h ago)   33d     192.168.99.1    mgmt    <none>           <none>
kube-system            weave-net-swk6t                                     3/3     Running     73 (4d23h ago)   33d     192.168.99.1    mgmt    <none>           <none>
```

It can be confirmed that all the pods are working, by checking their statuses, either running and all ready, or in completed status for the pods that are in charge of cronjobs. It is highly recommended after starting the MiddlewareVM , to leave it untouched for aprox. 5 minutes and then try to login to it.

NOTE Even if the login browser page has loaded, it doesn't necessarily mean that all services are running.

Examples of useful kubectl commands:

- `kubectl cluster-info`
- `kubectl get configmaps -n keysight-wap` #displays the configmaps in the namespace
- `helm list --all-namespaces` #displays all helm charts
- `kubectl get pods -A -o wide`
- `kubectl top pod -n keysight-wap` #shows the CPU and RAM usage for the pods in the namespace
- `kubectl get svc -n keysight-wap`
- `kubectl logs -n keysight-wap es-cluster-0`
- `kubectl logs -n kcos-sso keycloack-0 -p` #previous log of the pod
- `kubectl describe pods -n keysight-wap nats-core-1`
- `kubectl get events -n kcos-sso` #displays events concerning the namespace
- `kubectl get pods -A -o custom-columns=NAMESPACE:metadata.namespace,POD:metadata.name,PodIP:status.podIP,READY-true:status.containerStatuses[*].ready`

```
root@kcos-5254007d7119:~# kubectl get pods -A -o custom-columns=NAMESPACE:metadata.namespace,POD:metadata.name,PodIP:status.podIP,READY-true:status.containerStatuses[*].ready
NAMESPACE             POD                                                  PodIP          READY-true
kcos-deployment       kcos-deployment-service-v1-5c949c8d9b-5brm8          10.32.0.58     true
kcos-framework        kcos-framework-shell-configuration-577b858884-hp7wp  10.32.0.30     true
kcos-framework        kcos-framework-shell-db6c8b97-ltvw2                  10.32.0.50     true
kcos-framework        kcos-framework-v1-kcos-eula-54855b784-8j7nt          10.32.0.35     true
kcos-framework        kcos-framework-v1-naas-0                             10.32.0.46     true,true,true
kcos-framework        kcos-framework-v1-postgresql-0                       10.32.0.33     true
kcos-framework        kcos-framework-vital-6b6bd66d86-djk5l                10.32.0.32     true
kcos-framework        kcos-ingress-v1-cmm-7744bbb78-wmfj5                  10.32.0.12     true
kcos-framework        kcos-ingress-v1-ingress-nginx-controller-dgmz7       192.168.99.1   true
kcos-framework        kcos-local-storage-v1-6484c5969f-7shdb               10.32.0.53     true
kcos-framework        kcos-logging-framework-798cd58948-s9xxz              10.32.0.10     true
kcos-framework        kcos-logging-rotate-28khg                            10.32.0.18     true
kcos-framework        kcos-system-diagnostics-55c7f886f-cwgpq              10.32.0.7      true
kcos-framework        nfs-server-provisioner-v2-0                          10.32.0.52     true
kcos-licensing        kcos-licensing-v1-74f4bc4b4b-hrtws                   10.32.0.57     true
kcos-metrics-service  kcos-metrics-service-v1-metrics-server-796c568596-t62x7  10.32.0.5      true
kcos-sso              authproxy-kcos-keycloak-764db47f85-bcxgr             10.32.0.25     true
kcos-sso              kcos-licensing-v1-rbac-setup-job--1-csfsp            10.32.0.4      false
kcos-sso              keycloak-0                                           10.32.0.34     true
kcos-sso              keycloak-operator-f7888b8f4-tpgpm                    10.32.0.19     true
kcos-sso              keycloak-postgresql-56b595d9bf-p6mbz                 10.32.0.3      true
keysight-nimbusmosaic countersmodule-54fdd96596-9dpdw                      10.32.0.27     true
keysight-nimbusmosaic exec-edit-mob-9d965c795-tqqmj                        10.32.0.29     true,true,true
keysight-nimbusmosaic gateway-750d9f99c-vpgmf                              10.32.0.44     true
keysight-nimbusmosaic perspective-5bddf76bc9-wkfhn                         10.32.0.24     true
keysight-nimbusmosaic tstmconnector-5676ff864c-f9lbq                       10.32.0.26     true
keysight-wap          agent-controller-65966b9767-ld4sg                    10.32.0.6      true
keysight-wap          agent-diagnostics-7d69dfd467-lw2bs                   10.32.0.36     true
keysight-wap          agent-diagnostics-clean-up-cronjob-28310760--1-99bmt 10.32.0.63     false
keysight-wap          config-service-bf947795-flmw6                        10.32.0.41     true
keysight-wap          dataseq-service-689f89d877-6hs56                     10.32.0.4      true
keysight-wap          es-cluster-0                                         10.32.0.62     true
keysight-wap          es-curator-cronjob-28310580--1-5j5fg                 10.32.0.63     false
keysight-wap          fluent-bit-tqhcl                                     10.32.0.43     true
keysight-wap          grafana-779f7fbc47-8tsrx                             10.32.0.31     true
keysight-wap          license-service-659c7488d8-lq5bz                     10.32.0.39     true
keysight-wap          migration-service-5bcff69fbb-v8njb                   10.32.0.22     true
keysight-wap          nats-0                                               10.32.0.61     true,true
keysight-wap          nats-1                                               10.32.0.11     true,true
keysight-wap          nats-2                                               10.32.0.54     true,true
keysight-wap          nats-http-proxy-service-7864f69cbc-hd9vf             10.32.0.42     true
keysight-wap          notification-service-6f549b5b6d-966pz                10.32.0.15     true
keysight-wap          notifications-cleanup-cronjob-28310580--1-sthm9      10.32.0.64     false
keysight-wap          pdf-report-generator-service-d8f6dffbd-tsrpc         10.32.0.38     true
keysight-wap          rest-api-browser-helper-7cc679bd5f-tskgd             10.32.0.20     true
keysight-wap          rest-api-browser-v1-ui-745bfdddc4-md8dw              10.32.0.8      true
keysight-wap          rest-stats-service-7b67d859d9-pcnf5                  10.32.0.59     true
keysight-wap          result-service-5c74c7879c-xjf7b                      10.32.0.49     true
keysight-wap          results-cleanup-cronjob-28310580--1-6756f            10.32.0.65     false
keysight-wap          session-manager-64869cf8fc-kfc85                     10.32.0.56     true
keysight-wap          stats-55d4bbbfb4-5ht54                               10.32.0.17     true
keysight-wap          stats-dashboard-service-856f9dc679-p62gt             10.32.0.23     true
keysight-wap          system-monitor-service-bd4f44698-bt5v4               10.32.0.13     true
keysight-wap          test-results-service-6658995b76-dwpt5                10.32.0.2      true
keysight-wap          traffic-controller-8549574d4c-tkv89                  10.32.0.40     true
keysight-wap          wap-appsec-data-model-5698b7f67f-822vp               10.32.0.21     true
keysight-wap          wap-appsec-resource-service-55746d4fb7-tw29x         10.32.0.48     true
keysight-wap          wap-db-diagnostics-6d7b5b7998-5sdmj                  10.32.0.37     true
keysight-wap          wap-db-postgresql-0                                  10.32.0.14     true
keysight-wap          wap-ntp-server-787d59d9f7-smshq                      10.32.0.16     true
keysight-wap          wap-storage-minio-7ff6d64d7d-blksp                   10.32.0.55     true
keysight-wap          wap-tunnel-server-fc68f55f7-xjrbh                    10.32.0.51     true
keysight-wap          wapui-78769df995-rkprx                               10.32.0.60     true
keysight-wap          websocket-service-65c44ccf75-28tqc                   10.32.0.47     true
keysight-wap          wireless-data-model-647f9b74f8-7dvxl                 10.32.0.45     true
kube-system           coredns-55995c9468-9rqh6                             10.32.0.9      true,true
kube-system           coredns-55995c9468-pvp99                             10.32.0.28     true,true
kube-system           etcd-mgmt                                            192.168.99.1   true
kube-system           kube-apiserver-mgmt                                  192.168.99.1   true
kube-system           kube-controller-manager-mgmt                         192.168.99.1   true
kube-system           kube-proxy-qwhmv                                     192.168.99.1   true
kube-system           kube-scheduler-mgmt                                  192.168.99.1   true
kube-system           weave-net-swk6t                                      192.168.99.1   true,true,true
```

How to collect logs manually from Middleware (or License Server)

In case the UI is not working, or generating diagnostics does not work, it is possible to collect logs manually.

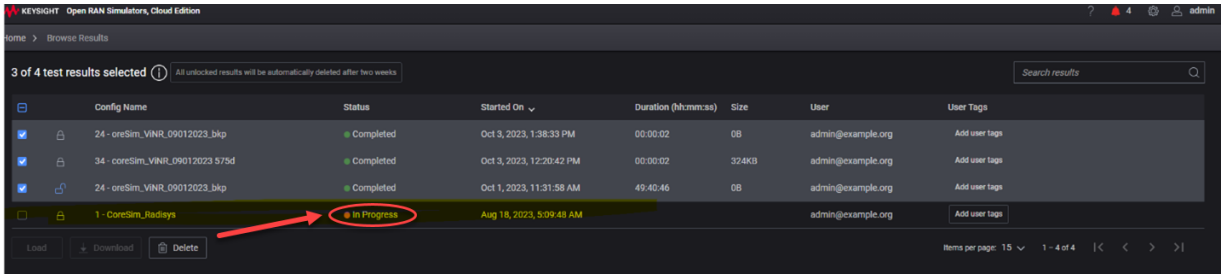
Login as `root` (`root` key/procedure needed), copy/paste the following script (as text) and run it. Make sure enough privileges are given to the script before running it.

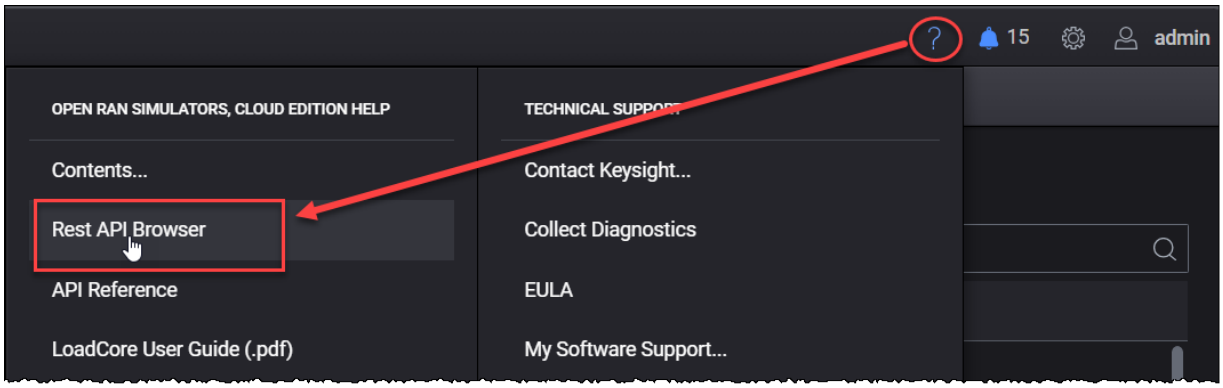
```
#!/bin/bash

kubectl describe nodes mgmt > mgmt.out
kubectl get pods -A -o wide > pods.out
kubectl top pods -A > top_pods.out
helm list -A > helm.out
df -h > df.out
for i in $(kubectl get namespaces | grep -v NAME | awk '{print $1}'); do
  for j in $(kubectl get pods -n $i | grep -v NAME | awk '{print $1}'); do
    kubectl logs -n $i $j > "$j.out"
    kubectl logs -p -n $i $j > "$j.out"
  done
done
for j in $(kubectl get pods -A | awk '{ print $1 }' | uniq | tail -8); do
  for i in $(kubectl get pods -n $j | awk '{ print $1 }' | grep -v NAME); do
    kubectl describe pods -n $j $i | grep 'Image:' >> pod_images.out
  done
done
tar cvzf logs.tar.gz ./* --remove-files
```

An archive file `logs.tar.gz` will result from the script and will contain most of the needed logs. This file can be then downloaded from Middleware with any SCP service.

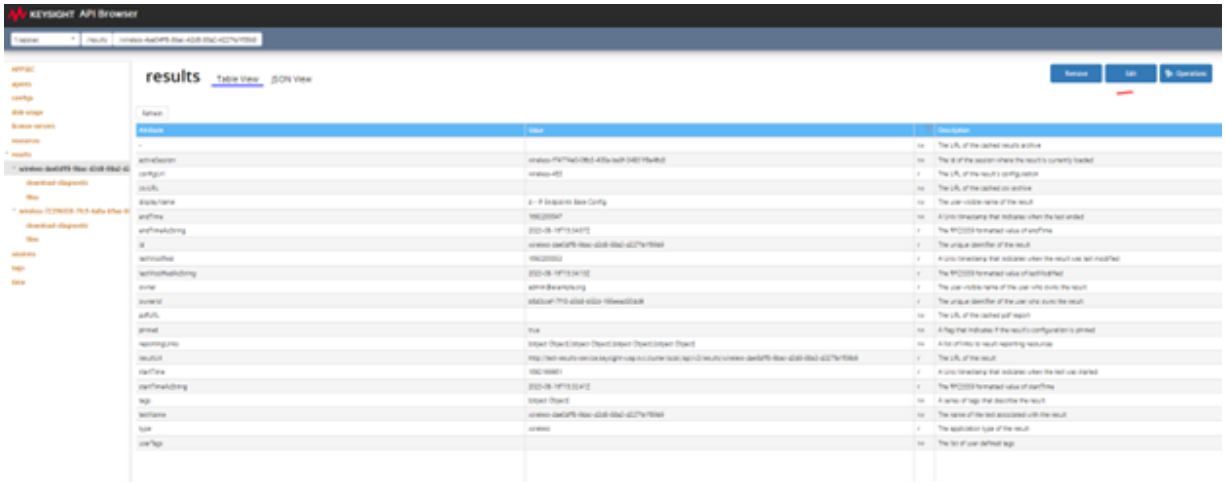
How to remove a test result that was stuck *In Progress*

1. Go to REST API Browser, to results table and click on the one with 0 in `ItemEndTime`, which means it did not end (also in tags still showing *Running*).





2. Edit the test result by changing `activeSession` to "", `pinned` to *False*, `endTime` to a number value higher than `startTime` and modify the tags from *Running* to *Completed*.

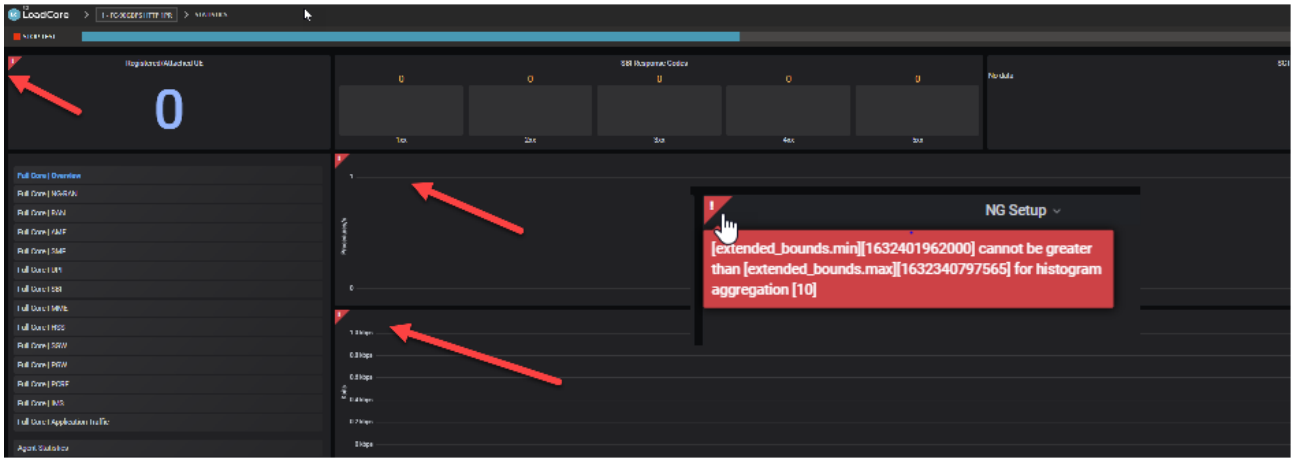


3. Back in Middleware UI, save the config from the session, delete the session and then a new working session can be created from the saved config.

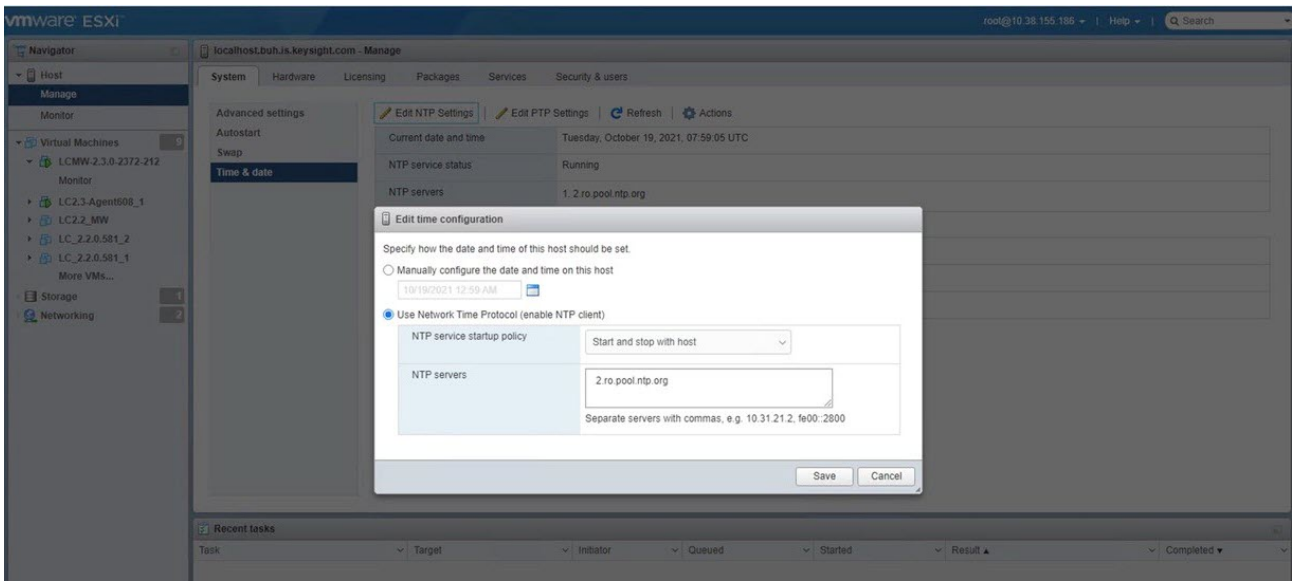
How to troubleshoot statistics not being displayed properly or not at all in Middleware UI

NTP issue

If you are experiencing issues with UI statistics appearing delayed or not showing at all, the cause might be related to NTP.



If you are using ESX make sure the NTP server is set:



To check if the time is in sync on the Middleware and agents, you can run the following commands:

- on agents:
  `date`
  `ntpq -p`
  `sudo systemctl status ntp`

- on middleware:
  `date`
  `kcos date-time time-zone show`
  `kcos date-time ntp-servers show`

You can also try to disable and enable NTP settings on the middleware:

`kcos date-time ntp disable` `kcos date-time ntp enable`

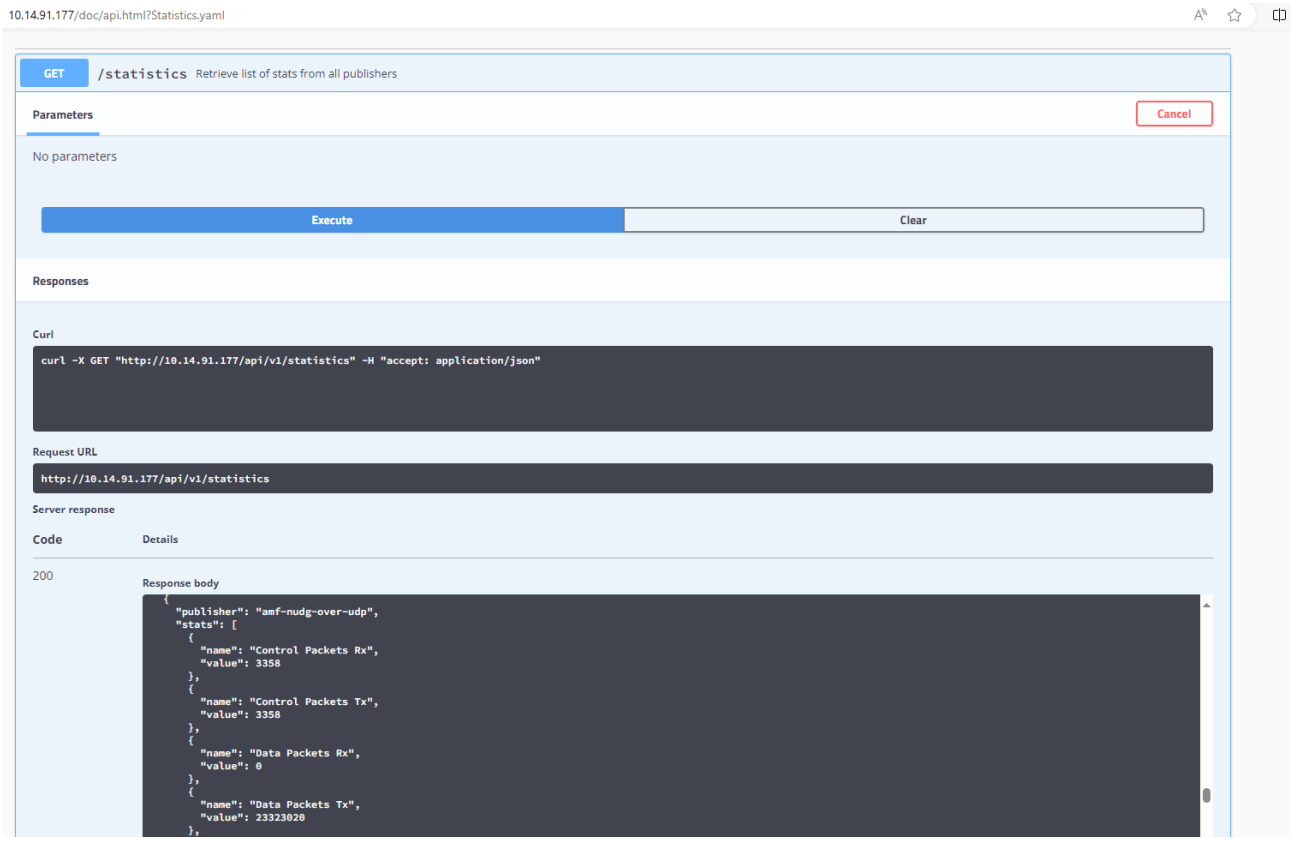
The default NTP for LoadCore Middleware is `ntp.ubuntu.com`. If you are using a local or another NTP server it is best to change it with:

`kcos date-time ntp-servers set` (it should also be the same as the one set in ESX)

IMPORTANT Start the NTP service on the agents (usually done when `agent-setup.sh` is run) only after setting the clock/NTP server on the middleware. Setting the clock on the middleware after the btpservice started on the agents can lead to it panicking (agent side) on big adjustments on sync. Restarting ntp agent side (`sudo systemctl restart ntp`) should fix this.

If NTP was already configured properly and VMs were synchronized, but the statistics are still not displayed while the test is still running,check that the agents are generating statistics.

This can be done by accessing the agent REST API browser page (type the agent IP in the browser window), then select statistics from the menu. Use the first query from the list, GET statistics and click **Execute**. If the response has accurate values it means the problem is not with the agent.



Download the CSVs at the end of the test, and, if these are empty, there is a problem with the statistics service on the Middleware. Collect diagnostics from Middleware and, while no test is running, connect as `root` and delete the stats pod (change the stats pod name accordingly):

```
kubectl delete pods -n keysight-wap stats-55d4bbbfb4-5ht54
```

Once the pod is back up, run a new test and statistics should be showing.

How to generate a certificate in case Middleware UI does not open

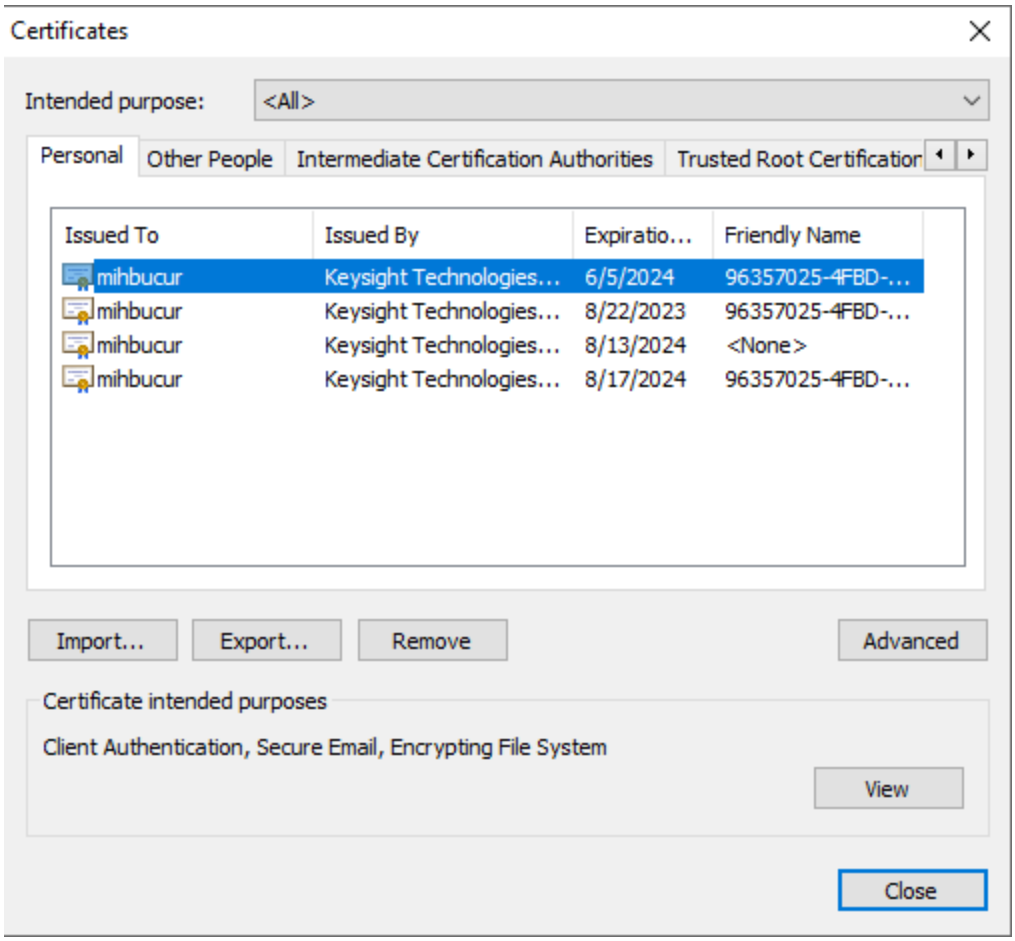
It is a rare occurrence, but sometimes the browser does not accept the certificate from the Middleware.

In this case, logged in as `root`, add the following script in a file and run it.

```
#!/bin/bash

export vital_IP=$(kubectl get svc -A | grep vital | awk '{print $4}')
export TMPHOST=$(curl -s $vital_IP/v1/hostname | jq -r '.name')
openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout ca.key -out ca.crt -
subj "/CN=${TMPHOST}"
export CERT_DATA=$(base64 -w 0 ca.crt)
export KEY_DATA=$(base64 -w 0 ca.key)
curl -v -X POST "$vital_IP/v1/certs/ingress/upload/file" -F "cert=@ca.crt" -F
"key=@ca.key" -H "Content-Type: multipart/form-data"
```

```
root@kcos-5254007d7119:~# ./cert_vital_2.sh
Generating a RSA private key
.....+++++
.....+++++
writing new private key to 'ca.key'
-----
Note: Unnecessary use of -X or --request, POST is already inferred.
*   Trying 192.168.250.2:80...
* TCP_NODELAY set
* Connected to 192.168.250.2 (192.168.250.2) port 80 (#0)
> POST /v1/certs/ingress/upload/file HTTP/1.1
> Host: 192.168.250.2
> User-Agent: curl/7.68.0
> Accept: */*
> Content-Length: 3188
> Content-Type: multipart/form-data; boundary=------------------------cc2d5dda4353086d
> Expect: 100-continue
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 100 Continue
* We are completely uploaded and fine
* Mark bundle as not supporting multiuse
* HTTP 1.0, assume close after body
< HTTP/1.0 201 CREATED
< Content-Type: application/json
< Content-Length: 87
< Server: Werkzeug/1.0.1 Python/3.9.7
< Date: Mon, 30 Oct 2023 14:04:06 GMT
<
{"message":"File <ca.crt> successfully uploaded\nFile <ca.key> successfully uploaded"}
* Closing connection 0
```

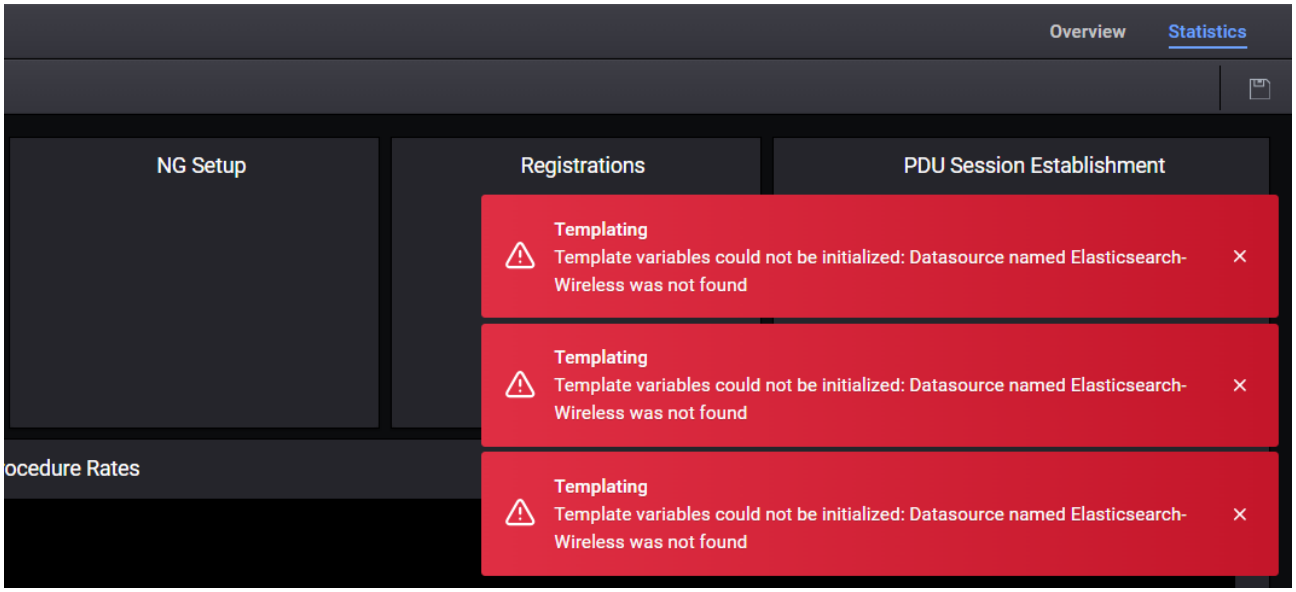
If this still does not solve the problem, download the `ca.crt` file just generated from Middleware (with any SCP program) and upload it to the browser. As shown in the example below, the web browser should have a Manage certificate page and there the `ca.crt` could be imported.



Refresh the page after the certificate is loaded.

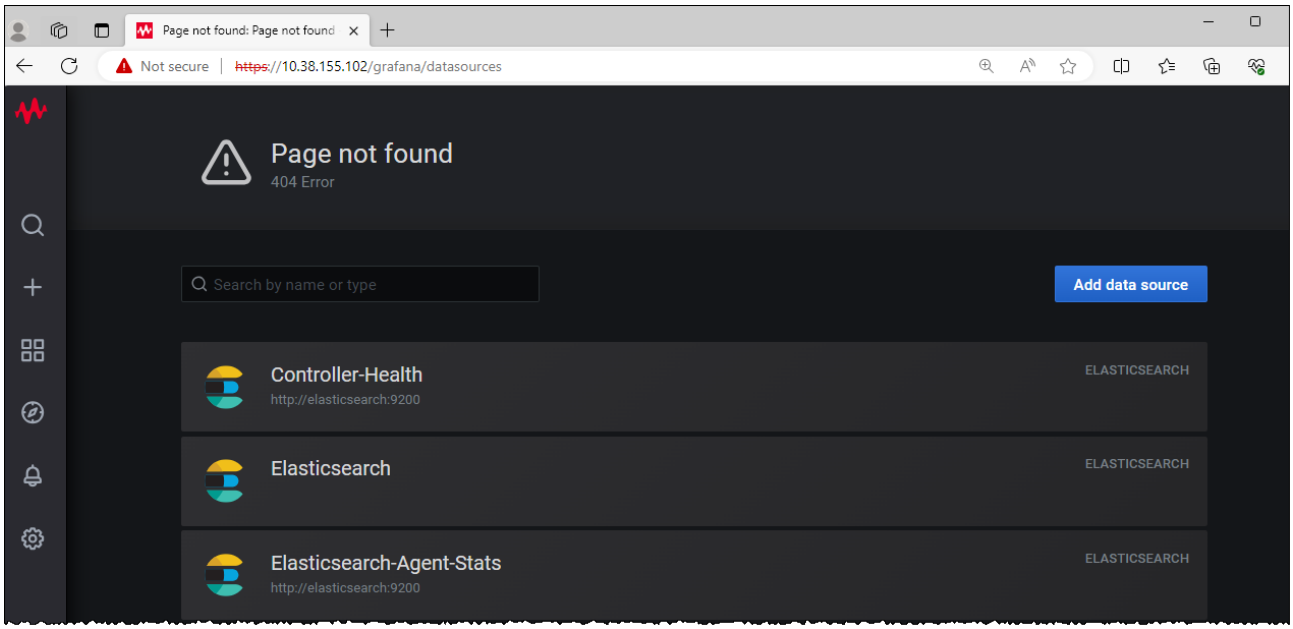
How to solve *"Template variables could not be initialized: Datasource named Elasticsearch-Wireless was not found"* error

It is possible that after an upgrade has been applied to the ORAN SIM CE MW, the following error will be displayed in the UI (statistics screen): *Template variables could not be initialized: Datasource named Elasticsearch-Wireless was not found*.

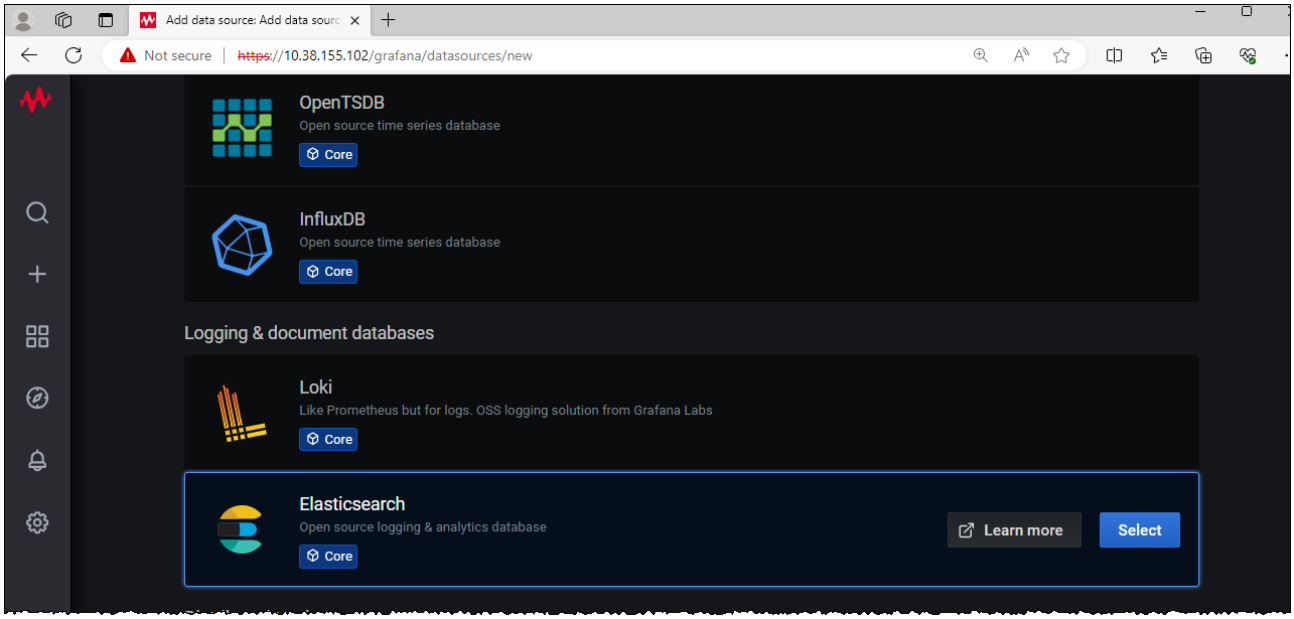


Go to `https://<IP>/grafana/datasources` (replace ***IP*** with the appropriate MW IP address) and select **Add data source**.

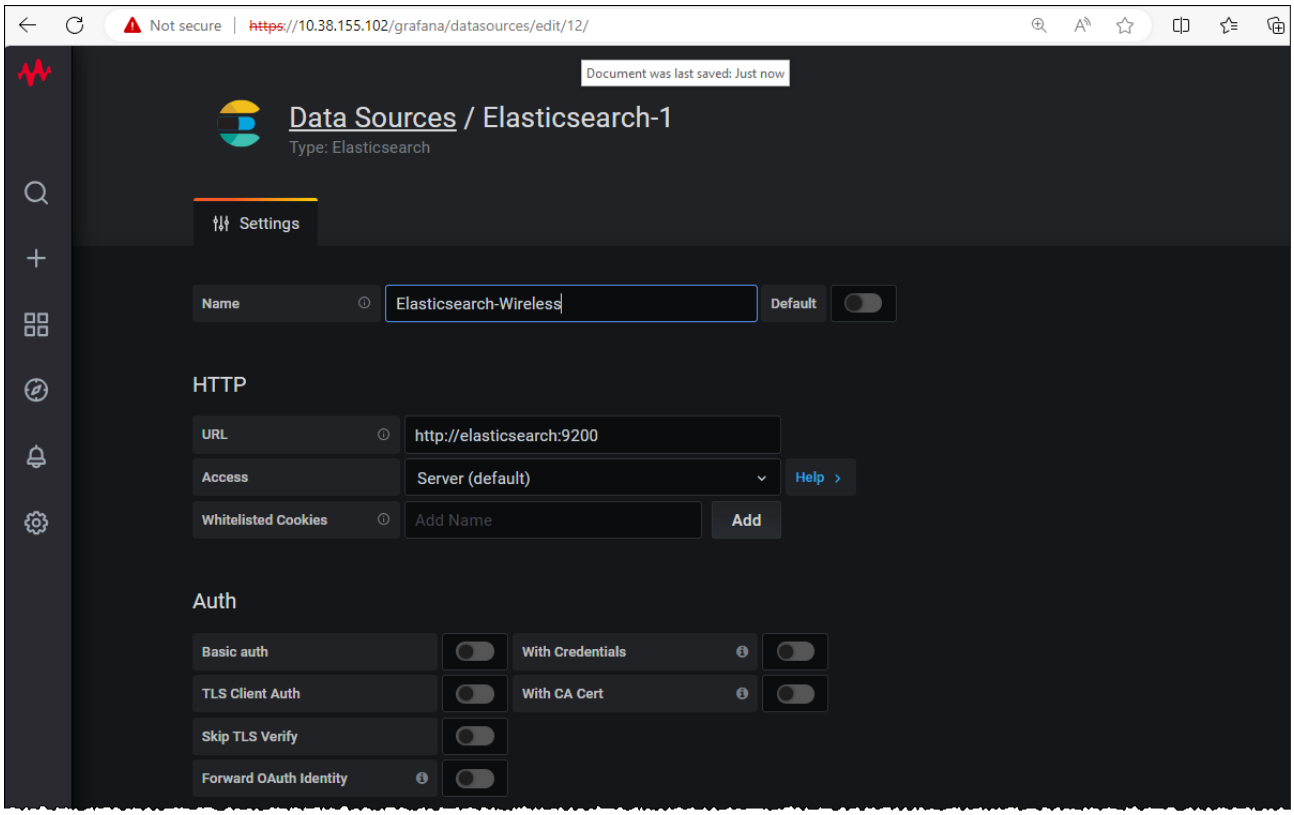
NOTE The user must have *admin* permissions to access this section.



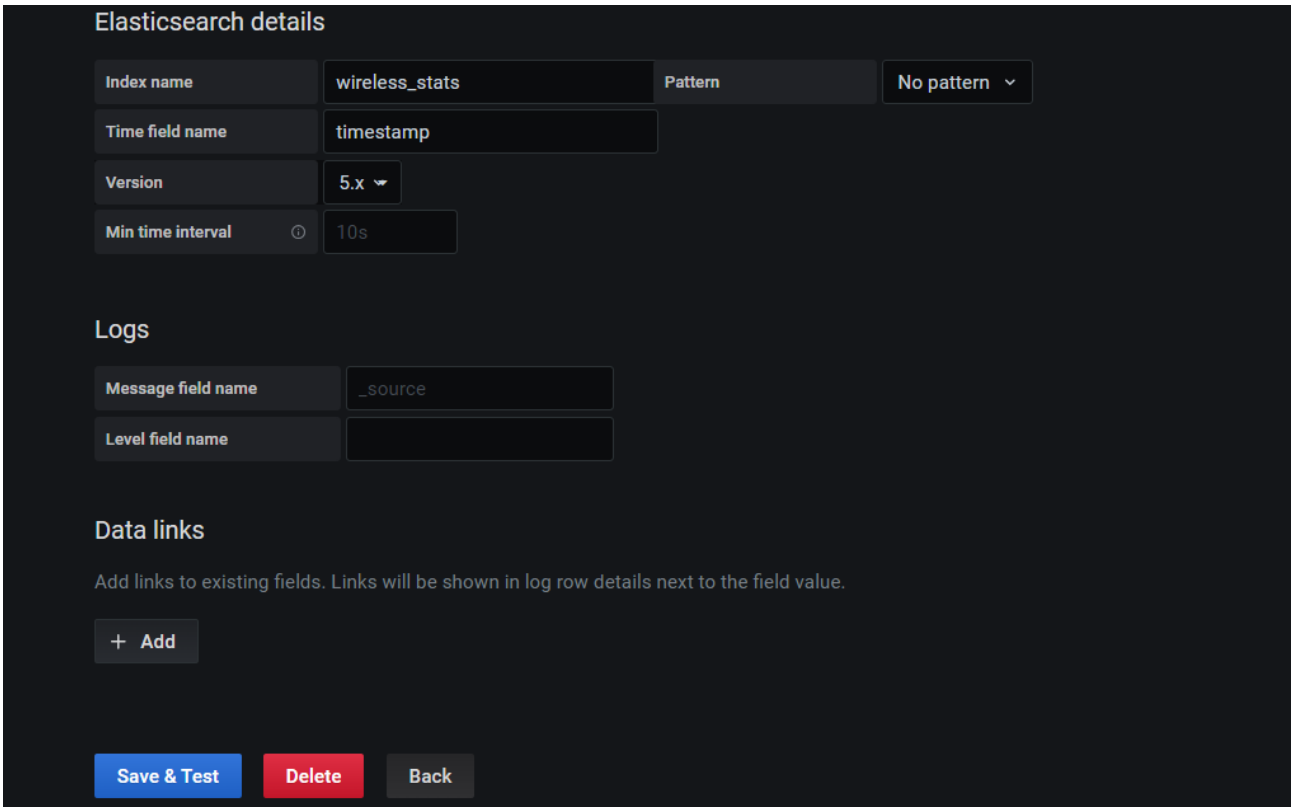
Scroll down and select **Elasticsearch**.



Fill in the **Name** and **URL** as shown below.



Then, fill the **Index name** and **Time field name** and select **Save & Test**.



Now the MW UI should display the statistics without any issues.

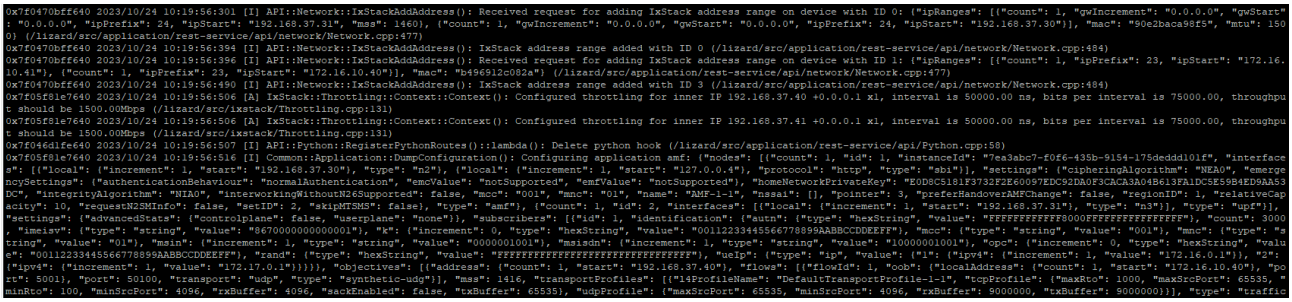
How to check/collect logs directly from the agent

Most important logs on an agent regarding a test run will be found in `/opt/5gc-test-engine/logs`.

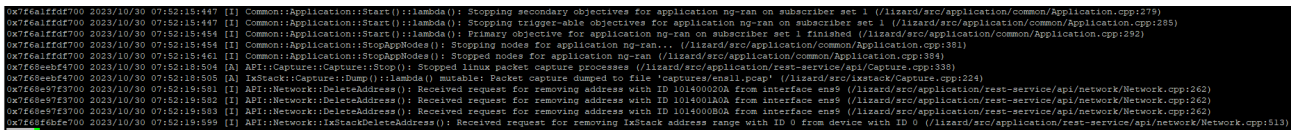
```
root@Agent4:/opt/5gc-test-engine/logs# ls -lh
total 528K
-rw------- 1 root root 467K Oct 24 12:46 lizard-agent.log
lrwxrwxrwx 1 root root   25 Oct 24 09:51 service.log -> service.log-231024-095139
-rw-r--r-- 1 root root  52K Oct 24 12:02 service.log-231024-095139
```

Service log holds the message information regarding the various 4G/5G nodes, their configuration and communication throughout the test. If there were tests that stopped running suddenly, because of various reasons or errors, multiple service log files will be generated. It might be needed to check the previous service log file for the reason of the test crash, and an error or Stack backtrace should appear.

The first line of the service log shows agent version information. After starting the test from the Middleware UI, the service log on the agent will show that, first, the interfaces on the agents are configured, either with Linux stack or with IxStack, then the nodes are getting configured and then the objectives are starting.

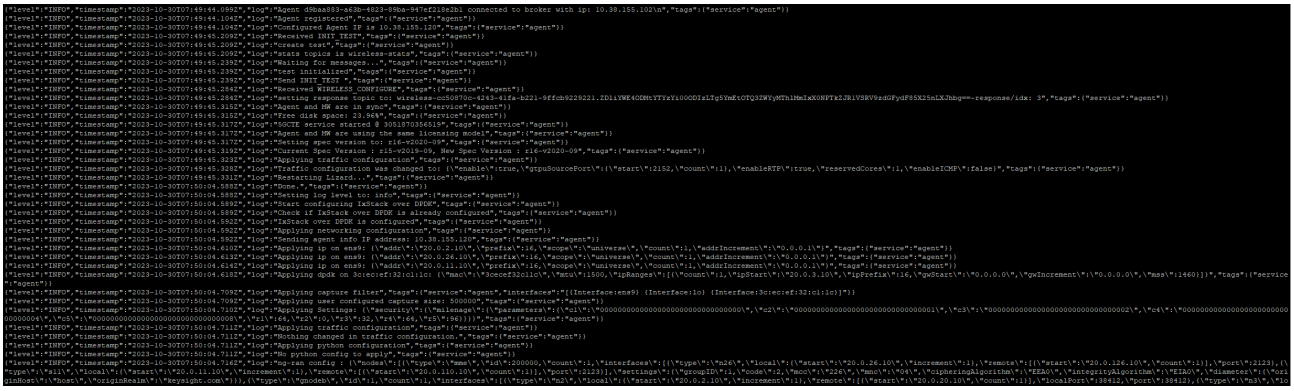


After the duration of the test has reached its end, the objectives will finish, the nodes and packet captures will be stopped, and the IP addresses will be removed.



These are the usual messages that will appear in the `service.log` if the log level was set to **Info** (marked with [I]). If the log level is changed to **Debug** (from **Global Settings** > **Advanced Settings**), the service log will be filled with messages about every node, call flow message, statistics, etc. These will be marked with [D]. This log level is concerning only the agent and is not to be confused with the log level set on the Middleware (mentioned in this chapter).

The `lizard-agent.log` shows similar messages that can be correlated to those in service log, but may include other useful information, for example the percentage of empty disk space on the agent:


{"level":"INFO","timestamp":"2023-10-30T07:49:44.089Z","log":"Agent d9baa883-a63b-4823-89ba-947ef218e2b1 connected to broker with ip: 10.38.155.102\n","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:44.104Z","log":"Agent registered","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:44.104Z","log":"Configured Agent IP is 10.38.155.120","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.209Z","log":"Received INIT_TEST","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.209Z","log":"create test","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.209Z","log":"stats topics is wireless-stats","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.239Z","log":"Waiting for messages...","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.239Z","log":"test initialized","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.239Z","log":"Send INIT_TEST ","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.284Z","log":"Received WIRELESS_CONFIGURE","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.284Z","log":"setting response Topic to: wireless-cc50870c-4243-41fa-b221-9ffcb9229221.ZDliYWE4ODMtYTYzYi00ODIzLTg5YmKtOTQ3ZWYyMThlMmIxX0NPTkZJR1VSRV9zdGFydF85X25nLXJhbg==-response/idx: 3","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.315Z","log":"Agent and HW are in sync","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.315Z","log":"Free disk space: 23.96%","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.317Z","log":"5GCTE service started @ 3051070356919","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.317Z","log":"Agent and HW are using the same licensing model","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.317Z","log":"Setting spec version to: r16-v2020-09","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.319Z","log":"Current Spec Version : r16-v2019-09, New Spec Version : r16-v2020-09","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.323Z","log":"Applying traffic configuration","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.328Z","log":"Traffic configuration was changed to: {\"enable\":true,\"gtpuSourcePort\":{\"start\":2152,\"count\":1},\"enableRTP\":true,\"reservedCores\":1,\"enableICMP\":false}","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:49:45.331Z","log":"Restarting Lizard...","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.588Z","log":"Done.","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.588Z","log":"Setting log level to: info","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.589Z","log":"Start configuring IxStack over DPDK","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.589Z","log":"Check if IxStack over DPDK is already configured","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.592Z","log":"IxStack over DPDK is configured","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.592Z","log":"Applying networking configuration","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.592Z","log":"Sending agent info IP address: 10.38.155.120","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.610Z","log":"Applying ip on ens9: {\"addr\":\"20.0.2.10\",\"prefix\":16,\"scope\":\"universe\",\"count\":1,\"addrIncrement\":\"0.0.0.1\"}","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.613Z","log":"Applying ip on ens9: {\"addr\":\"20.0.26.10\",\"prefix\":16,\"scope\":\"universe\",\"count\":1,\"addrIncrement\":\"0.0.0.1\"}","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.614Z","log":"Applying ip on ens9: {\"addr\":\"20.0.11.10\",\"prefix\":16,\"scope\":\"universe\",\"count\":1,\"addrIncrement\":\"0.0.0.1\"}","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.618Z","log":"Applying dpdk on 3:ec:ef:32:c1:1c: {\"mac\":\"3:ec:ef:32:c1:1c\",\"mtu\":1500,\"ipRanges\":[{\"count\":1,\"ipStart\":\"20.0.3.10\",\"ipPrefix\":16,\"gwStart\":\"0.0.0.0\",\"gwIncrement\":\"0.0.0.0\",\"mss\":1460}]}","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.709Z","log":"Applying capture filter","tags":{"service":"agent","interfaces":"[{Interface:ens9} {Interface:lo} {Interface:3:c:ec:ef:32:c1:1c}]"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.709Z","log":"Applying user configured capture size: 500000","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.710Z","log":"Applying Settings: {\"security\":{\"mimesage\":{\"parameters\":{\"c1\":\"0000000000000000000000000000000001\",\"c2\":\"00000000000000000000000000000002\",\"c4\":\"00000000000000000000000000000004\",\"c5\":\"00000000000000000000000000000008\",\"i1\":64,\"i2\":0,\"i3\":32,\"i4\":64,\"i5\":96}}}}","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.711Z","log":"Applying traffic configuration","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.711Z","log":"Nothing changed in traffic configuration.","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.711Z","log":"Applying python configuration","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.711Z","log":"No python config to apply","tags":{"service":"agent"}}
{"level":"INFO","timestamp":"2023-10-30T07:50:04.716Z","log":"mq-ran config : {\"modes\":[{\"type\":\"mme\",\"id\":200000,\"count\":1,\"interfaces\":[{\"type\":\"n26\",\"local\":{\"start\":\"20.0.26.10\",\"increment\":1},\"remote\":[{\"start\":\"20.0.126.10\",\"count\":1}],\"port\":2123},{\"type\":\"s11\",\"local\":{\"start\":\"20.0.11.10\",\"increment\":1},\"remote\":[{\"start\":\"20.0.110.10\",\"count\":1}],\"port\":2123}],\"settings\":{\"groupID\":1,\"code\":2,\"mcc\":\"226\",\"mnc\":\"06\",\"cipheringAlgorithm\":\"EEA0\",\"integrityAlgorithm\":\"EIA0\",\"diameter\":{\"originRealm\":\"keysight.com\"}},{\"type\":\"gnodeb\",\"id\":1,\"count\":1,\"interfaces\":[{\"type\":\"n3\",\"local\":{\"start\":\"20.0.2.10\",\"increment\":1},\"remote\":[{\"start\":\"20.0.20.10\",\"count\":1}],\"localPort\":38412,\"port\":38412},{\"type\":\"n3\",\"lo

The syslog files are found in `/var/log`. They contain messages concerning *portmanager*, in charge of the agent's connection to the Middleware. Heartbeats are sent to the Middleware every 10 seconds:

```
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]: >>>>>>>>>>---Sent Message Start--->>>>>>>>>>
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]: api: HEARTBEAT
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]: heartbeatFromNode: <
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:   nodeId: "d9baa883-a63b-4823-89ba-947ef218e2b1"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:   nodeSessionId: 1
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:   mgmtInterface: <
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     name: "ens3"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     mac: "52:54:00:9a:55:dd"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     gateway: "10.38.152.1"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     state: UP
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     ipMask: <
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       ip: "10.38.155.120"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       netmask: 22
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     >
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     mtu: 1500
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:   >
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:   agentStatuses: <
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     agentId: 1
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     testStatus: STOPPED
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     testInterfaces: <
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       name: "ens9"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       mac: "52:54:00:a6:15:63"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       state: UP
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       mtu: 1500
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     >
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     testInterfaces: <
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       name: "ens10"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       mac: "52:54:00:2c:27:44"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       state: UP
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       mtu: 1500
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     >
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     testInterfaces: <
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       name: "ens11"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       mac: "3c:ec:ef:32:c1:1c"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       state: UP
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:       mtu: 1500
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:     >
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:   >
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:   ntpInfo: <
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]:   >
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]: >
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]: nodeID: "d9baa883-a63b-4823-89ba-947ef218e2b1"
Oct 30 09:21:34 LC_agent_17_4 portmanager[3047]: >>>>>>>>>>---Sent Message End--->>>>>>>>>>
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]: Heartbeat Timer Fired...
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]: nicmonitor: Number of ARP entries for interface ens9 = 0
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]: nicmonitor: Number of ARP entries for interface lo = 1
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]:   nicmonitor: ARP Entry - IP: 0.0.0.0 MAC: 00:00:00:00:00:00
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]:   nicmonitor: Default Gateway IP 0.0.0.0 MAC is set to: 00:00:00:00:00:00
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]: nicmonitor: Number of ARP entries for interface ens3 = 5
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]:   nicmonitor: ARP Entry - IP: 10.38.155.102 MAC: 52:54:00:03:0c:f3
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]:   nicmonitor: ARP Entry - IP: 10.38.152.1 MAC: ac:78:d1:96:95:e0
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]:   nicmonitor: Default Gateway IP 10.38.152.1 MAC is set to: ac:78:d1:96:95:e0
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]:   nicmonitor: ARP Entry - IP: 10.38.154.175 MAC: 3c:ec:ef:57:09:94
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]:   nicmonitor: ARP Entry - IP: 10.38.153.226 MAC: 3c:ec:ef:57:0d:5c
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]:   nicmonitor: ARP Entry - IP: 10.38.153.48 MAC:
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]: GetNetInterfaceRecord() ens3
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]: nicmonitor.GetNetInterfaceRecord() successful. Found other interface ens10 detail
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]: nicmonitor.GetNetInterfaceRecord() successful. Found other interface ens11 detail
Oct 30 09:21:44 LC_agent_17_4 portmanager[3047]: Failed to fetch network stats about interface  ens11
```

In case a test keeps failing because of an agent, and the above logs do not display the cause, it is also worth checking (`systemctl status 5GCTE`) or restarting the 5GCTE service (`systemctl restart 5GCTE`). This is the service responsible for running the tests on the agent.

```
root@LC_agent_17_4:/var/log# systemctl status 5GCTE
● 5GCTE.service - 5G Core Test Engine Service
   Loaded: loaded (/etc/systemd/system/5GCTE.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-10-30 07:49:47 UTC; 5h 58min ago
 Main PID: 2214 (5GTestEngineSer)
    Tasks: 144 (limit: 4915)
   CGroup: /system.slice/5GCTE.service
           └─2214 /opt/5gc-test-engine/5GTestEngineService /http-port=80 /https-port=443

Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: len = 1
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: kmem_cache_flags: 0 total_size 1392 base_size 208
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: __appsim2_l4_start
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: Skip calling ixstack_l4_init from tiger/activity when running with external controller or internal control plane
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: ixtcp_init: RETURNED
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: Tput Constrained? 0
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: kmem_cache_flags: 0 total_size 1232 base_size 208
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: Tput Constrained? 0
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: IN [kone_activity_reset] activity [range-0-traffic-0-dnn-1]
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: [kone_activity_reset] achieve_cc_first_flag 0
```

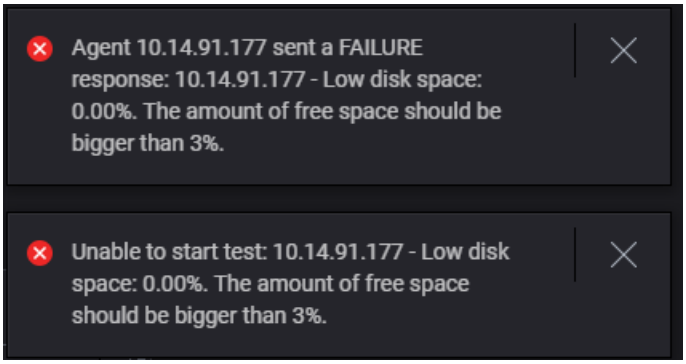
Detailed information about 5GCTE status can be found with `journalctl` command:

```
root@LC_agent_17_4:/var/log# journalctl -u 5GCTE | tail -20
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: setting TigerProcessUserIoEventsCb since ssl_async event flag is always true
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: appsim2_tcp_get_group
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: appsim2_tcp_get_group: calling appsim2_tcp_config_update
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: setting TigerProcessUserIoEventsCb since ssl_async event flag is always true
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: appsim2_tcp_get_group
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: appsim2_tcp_get_group: calling appsim2_tcp_config_update
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: setting TigerProcessUserIoEventsCb since ssl_async event flag is always true
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: num_segments = 2
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: len = 1
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: num_segments = 2
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: len = 1
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: kmem_cache_flags: 0 total_size 1392 base_size 208
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: >>> DEBUG: __appsim2_l4_start
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: Skip calling ixstack_l4_init from tiger/activity when running with external controller or internal control plane
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: ixtcp_init: RETURNED
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: Tput Constrained? 0
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: kmem_cache_flags: 0 total_size 1232 base_size 208
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: Tput Constrained? 0
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: IN [kone_activity_reset] activity [range-0-traffic-0-dnn-1]
Oct 30 10:00:33 LC_agent_17_4.0 5GTestEngineService[2214]: [kone_activity_reset] achieve_cc_first_flag 0
```

All files on the agent can be downloaded manually with an SCP service. Agent log files can also be downloaded from the Middleware UI (from Browse Results or Collect Diagnostics menus).

How to free and increase disk space on the agent

In case at the start or during a test errors about low disk space or offline agents are encountered, it is worth checking the space on the agents and clearing it.



First it is worth to check and disable from the test any debug log or capture.

Then, check and delete any big files from:

- `/opt/5gc-test-engine/logs`
- `/opt/5gc-test-engine/logs-backup`
- `/opt/5gc-test-engine/captures`

Delete extra syslog files from:

- `/var/log`

If you want to increase the disk space on the agent, from ESXi, Edit Virtual Machine settings, then select the storage and expand it, for example from 16 GB (default for agent) to 64 GB.

After the VM space is increased from ESXi, login on the LC agent and do the following commands.

- `lsblk` shows the disk and partition size.
- `growpart` increases the partition size to occupy the disk.
- `resize2fs` increases the filesystem size to occupy the partition.

```
lsblk
```

```
sudo growpart /dev/vda 1
```

```
lsblk df -hT
```

```
sudo resize2fs /dev/vda1
```

```
df -hT
```

IMPORTANT `growpart` command has a space between `vda` and `1` and `resize2fs` is issued without this space (`/dev/vda1` in a single line).

When increasing agent storage size on a KVM setup, turn off the VM, `ssh` to the hypervisor and issue the below commands. This will show the location of the LC_agent VM:

```
virsh domblklist --domain LC_agent
```

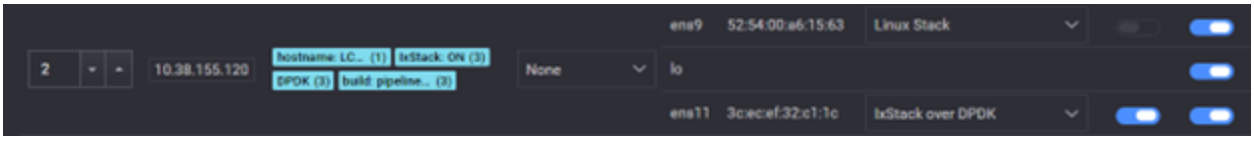
The following command will increase the size of the VM agent, by 48GB, so from 16GB to 64GB:

```
qemu-img resize /home/admin/Downloads/LoadCore-Agent-3.2.0.6-eb1d63b274-
20220419T172201Z.qcow2 +48G
```

After this is done, start the agent the next commands are the same as for the ESXi setup.

How to ping from and check an IxStack interface

An interface is configured to be used with IxStack during the test from the Network Management section.



While the test is running, that interface will no longer appear with normal linux networking commands.

```
root@LC_agent_17_4:/var/log# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:a6:15:63 brd ff:ff:ff:ff:ff:ff
    inet 20.0.2.10/16 scope global ens9
       valid_lft forever preferred_lft forever
    inet 20.0.26.10/16 scope global secondary ens9
       valid_lft forever preferred_lft forever
    inet 20.0.11.10/16 scope global secondary ens9
       valid_lft forever preferred_lft forever
    inet6 fe80::5054:ff:fea6:1563/64 scope link
       valid_lft forever preferred_lft forever
4: ens3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:9a:55:dd brd ff:ff:ff:ff:ff:ff
    inet 10.38.155.120/22 brd 10.38.155.255 scope global dynamic ens3
       valid_lft 25184sec preferred_lft 25184sec
    inet6 fe80::5054:ff:fe9a:55dd/64 scope link
       valid_lft forever preferred_lft forever
8: ens10: <BROADCAST,MULTICAST,ALLMULTI,PROMISC,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:2c:27:44 brd ff:ff:ff:ff:ff:ff
    inet6 fe80::5054:ff:fe2c:2744/64 scope link
       valid_lft forever preferred_lft forever
```

Instead, the IxStack can be accessed by first typing `telnet localhost`. Then to show the interfaces and the assigned IPs type:

`cat /proc/net/ixstack/subnets`

```
root@LC_agent_17_4:/var/log# telnet localhost
Trying ::1...
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
# # # # # ixrte  shell # # # # #
# cat /proc/net/ixstack/subnets
subnet=0, port=0, parser="ixstack:eth-range"
start=3c:ec:ef:32:c1:1c, incr=00:00:00:00:00:01, count=1, MTU=1500, eth_flags=0x0
--------------------
 subnet=1, port=0, parser="ixstack:ip-range"
 ipver=IPv4, ip_start=20.0.3.10, ip_incr=0.0.0.1, net_mask=16, count=1, gw_start=0.0.0.0, gw_incr=0.0.0.0, MSS=1460, ip_flags=0x1
 --------------------
  subnet=2, port=0, parser="lizard:udp"
  --------------------
   subnet=3, port=0, parser="ixstack:udp-lite"
   --------------------
    subnet=4, port=0, parser="lizard:gtpu"
    --------------------
     subnet=6, port=0, parser="ixstack:ipsec"
     --------------------
      subnet=5, port=0, parser="ixstack:ip-map"
      ipver=IPv4, count=2, max_vlans=0, ip_flags=0x0
      --------------------
       subnet=7, port=0, parser="tiger:rtp"
       --------------------
Pre RX hooks: { name="lizard_capture", priority=UNFILT_PCAP_PRIO(-20) }
Post RX hooks: <None>
TX hooks: { name="lizard_capture", priority=UNFILT_PCAP_PRIO(-20) }
```

Here *subnet 1* will be seen, which has IP *20.0.3.10*. You can ping by typing the destination IP and the source subnet id, in this case 1.

```
# ping 20.0.30.10 1
ping 20.0.3.10 => 20.0.30.10: sending 59(87) bytes of data
[ press Enter to stop ]
59 bytes from 20.0.30.10: icmp_seq=0 ttl=64 time=0ms
59 bytes from 20.0.30.10: icmp_seq=1 ttl=64 time=0ms
59 bytes from 20.0.30.10: icmp_seq=2 ttl=64 time=0ms
59 bytes from 20.0.30.10: icmp_seq=3 ttl=64 time=0ms
```

Some extra info regarding the IPs assigned to the IxStack interfaces (in this case *172.16.0.11* and *172.16.0.21* are UE IPs) can be found with the command:

`cat /proc/net/ixstack/ifaces`

```
# cat /proc/net/ixstack/ifaces
subnet=0, port=0, parser="ixstack:eth-range"
start=3c:ec:ef:32:c1:1c, incr=00:00:00:00:00:01, count=1, MTU=1500, eth_flags=0x0
--------------------
iface=0, mac=3c:ec:ef:32:c1:1c
====================
 subnet=1, port=0, parser="ixstack:ip-range"
 ipver=IPv4, ip_start=20.0.3.10, ip_incr=0.0.0.1, net_mask=16, count=1, gw_start=0.0.0.0, gw_incr=0.0.0.0, MSS=1460, ip_flags=0x1
 --------------------
 iface=0, parent_iface=0, IP=20.0.3.10, GW=0.0.0.0
 ====================
  subnet=2, port=0, parser="lizard:udp"
  --------------------
   subnet=3, port=0, parser="ixstack:udp-lite"
   --------------------
    subnet=4, port=0, parser="lizard:gtpu"
    --------------------
     subnet=6, port=0, parser="ixstack:ipsec"
     --------------------
      subnet=5, port=0, parser="ixstack:ip-map"
      ipver=IPv4, count=2, max_vlans=0, ip_flags=0x0
      --------------------
      iface=0, parent_iface=0, bound_iface=0, IP=172.16.0.11, state=0x3, net_mask=32, MSS=1416
      iface=1, parent_iface=1, bound_iface=0, IP=172.16.0.21, state=0x3, net_mask=32, MSS=1416
      ====================
       subnet=7, port=0, parser="tiger:rtp"
       --------------------
Pre RX hooks: { name="lizard_capture", priority=UNFILT_PCAP_PRIO(-20) }
Post RX hooks: <None>
TX hooks: { name="lizard_capture", priority=UNFILT_PCAP_PRIO(-20) }
```

Information regarding the interface, like the driver, and the number of packets received can be found using the command:

`cat /proc/net/ixnam/<if-name>`

```
# cat /proc/net/ixnam/ens11
Device name          : ens11                    Port ID             : 0
Dev info             : 8086:1583                Driver              : net_i40e
MTU                  : 1500                     Caps                : 0x30000009f
RX queues            : 15                       TX queues           : 16
RX packets           : 2538                     TX packets          : 2533
RX packet rate       : 0                        TX packet rate      : 0
RX bytes             : 408774                   TX bytes            : 408659
RX bit rate          : 0                        TX bit rate         : 0
KNI RX packets       : 0                        KNI TX packets      : 0
KNI RX errors        : 0
ierrors              : 0                        oerrors             : 0
imissed              : 0                        rx_nombuf           : 0
```

To quit the IxStack command line, type `exit`.

How to avoid duplicate node id problems caused by cloning an agent VM

On some setups it is easier to deploy the first agent VM and make clones out of it, instead of defining the VM configuration/parameters each time. This is specifically useful in case that more than a few agents are needed, and they all have the same resource/network configuration.

However, all the agents will have the same node id and will lead to agent reservation errors or other conflicts when tests are initiated from the Middleware.

To solve this, `ssh` to each of the cloned agents, and rename the `node_id.txt` (or remove it since it is the same on all clones):

```
sudo mv /etc/portmanager/node_id.txt /etc/portmanager/node_id_old.txt
```

Then, restart the *portmanager* service and the `node_id.txt` file will be generated with a new id:

```
sudo systemctl restart port-manager
```

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