Quick Install guide for Model Driven Telemetry testing
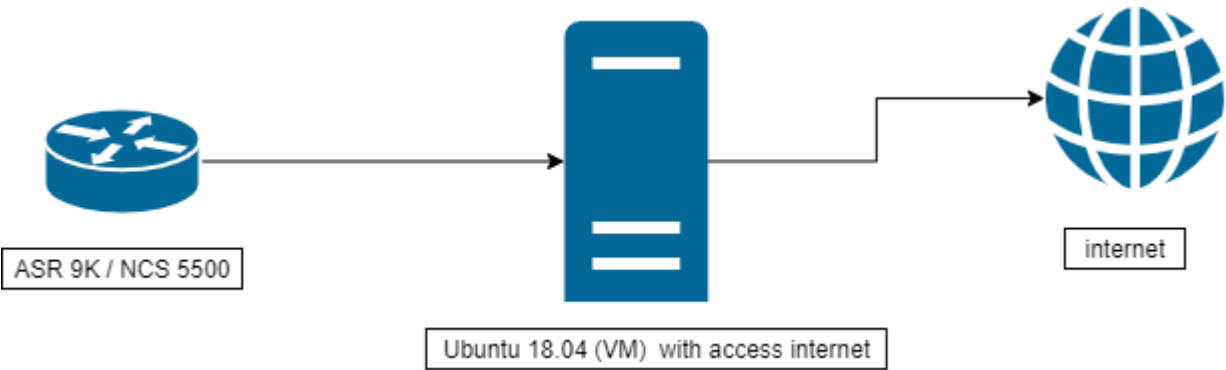
1.Initial Topology

1. Prerequisites

Topology

1.0 Plan

Model Number	Image Name / SW Version	IP1 (ens160)	IP2 (ens192)
ASR-9010-AC-V2	6.6.7	192.168.3.3/24	N/A
Ubuntu	18.04	192.168.3.5/24	10.124.49.133/25

1.1 Request to CALO

Request Calo with below requirement

Jul21guangli2DLCTestbed1637 : [SK TELECOM]ASR-9010-AC-V2/Inquire about Telemetry support for Fabric Error Count Metric

Main Info	Booked Devices	**Requested Equipment**	Update Log	

Click Here to Find Devices for this Testbed.

Excel   CSV

Filter:

Model Number / Search	Image Name / SW Version	Similiar Part OK	Quantity / Instructions	In Shortage
ASR-9010-AC-V2	6.6.7	Yes	1	No
Ubuntu	18.04	Yes	1 / Ubuntu Linux version 18.04(VM) can access internet	No

Request Description

 Require a ASR 9k connected with Ubuntu Linux 18.04 ,And Ubuntu Linux can access the Internet to get software for telemetry

1.2 Check VM

▤ Case Queue › 🏠 View Case ([SK TELECOM]ASR-9010-AC-V2/Inquire about Telemetry support for Fabric Error Count Metric)

🖨   ⟳ | Quick Actions   ▾ | 🖵 Details ▾ | ← Return to Case Queue | ◄◄ Previous Case

Jul21guangli2DLCTestbed1637 : [SK TELECOM]ASR-9010-AC-V2/Inquire about Te

Main Info	Booked Devices	Requested Equipment	**Update Log**

Owner Andrew Li Posted via Web UI: Post Update to a Case ⏱ 16.0 hours ago / Jul 14 - 4:45pm.
Status: Resolved - Normal | Priority: P3
    Guangxiong,

    Topo. sets up, FYI, thank you.

    ASR-9006 -- Lab PC 1/6/1

    dlc-labpc-vc.cisco.com
    vmuser
    vmuser

    VM name
    MachineJul21guangli2DLCTestbed1637

    -Andrew

Go to link https://dlc-labpc-vc.cisco.com/ and click vSphere Client (HTML5) - partial functionality

https://dlc-labpc-vc.cisco.com

o-KB | Cisco-Techzone | Cisco-WIKI | SR_Tools | Refer | Forum | Blog | MS VBA | Topic Search | Tech Zone | Cisco Community

vmware

Getting Started

To access vSphere, log in to:

vSphere Web Client (Flash)

vSphere Client (HTML5) - partial functionality

For help, see:

vSphere Documentation

Supported Functionality in vSphere Client (HTML5)

vCenter Servers

---

vm vSphere Client   Menu ∨   Q Search in all environments   vmuser@VSPHERE.LOCAL ∨

Home
Shortcuts

Hosts and Clusters
VMs and Templates
Storage
Networking
Content Libraries
Global Inventory Lists

Policies and Profiles
Auto Deploy
vRealize Operations

Administration
Update Manager

Tasks
Events

Tags & Custom Attributes

Shortcuts

Inventories

Hosts and Clusters | VMs and Templates | Storage | Networking | Content Libraries | Global Inventory Lists

Monitoring

Task Console | Event Console | VM Customization Specifications | VM Storage Policies | Host Profiles | Update Manager

Administration

Licensing

---

vm vSphere Client   Menu ∨   Q Search in all environments   vmuser@VSPHERE.LOCAL ∨

∨ dlc-labpc-vc.cisco.com
  ∨ DLC-DC
    ∨ Testbeds
      0108--Andy--2
      0203--Andy--1 windows server 2012
      Aug20liyxuanDLCTestbed4247--2
      Aug21xiaoyashDLCTestbed205
      Jan21fangniDLCTestbed3010 --1
      Jan21fangniDLCTestbed3010 --2
      Jul21guangli2DLCTestbed1637
      Jul21hajiaDLCTestbed348
      Jun21keluzhaDLCTestbed3212
      Jun21yawang4DLCTestbed1432
      May21dawchuDLCTestbed4081
      May21dawchuDLCTestbed4081--2
      May21guangxiiDLCTestbed575--2

Jul21guangli2DLCTestbed1637   ACTIONS ∨

Summary | Monitor | Configure | Permissions | Datastores | Networks

Guest OS: Ubuntu Linux (64-bit)
Compatibility: ESXi 6.5 and later (VM version 13)
VMware Tools: Installation is in progress
More info
DNS Name:
IP Addresses:
Host:

Powered On

Launch Web Console

Launch Remote Console

CPU USAGE
0 Hz

MEMORY USAGE
8 GB

STORAGE USAGE
80.11 GB

⊘ Virtual machine memory usage   Acknowledge   Reset To Green

⚠ VMware Tools is not installed on this virtual machine.   Install VMware Tools...

VM Hardware
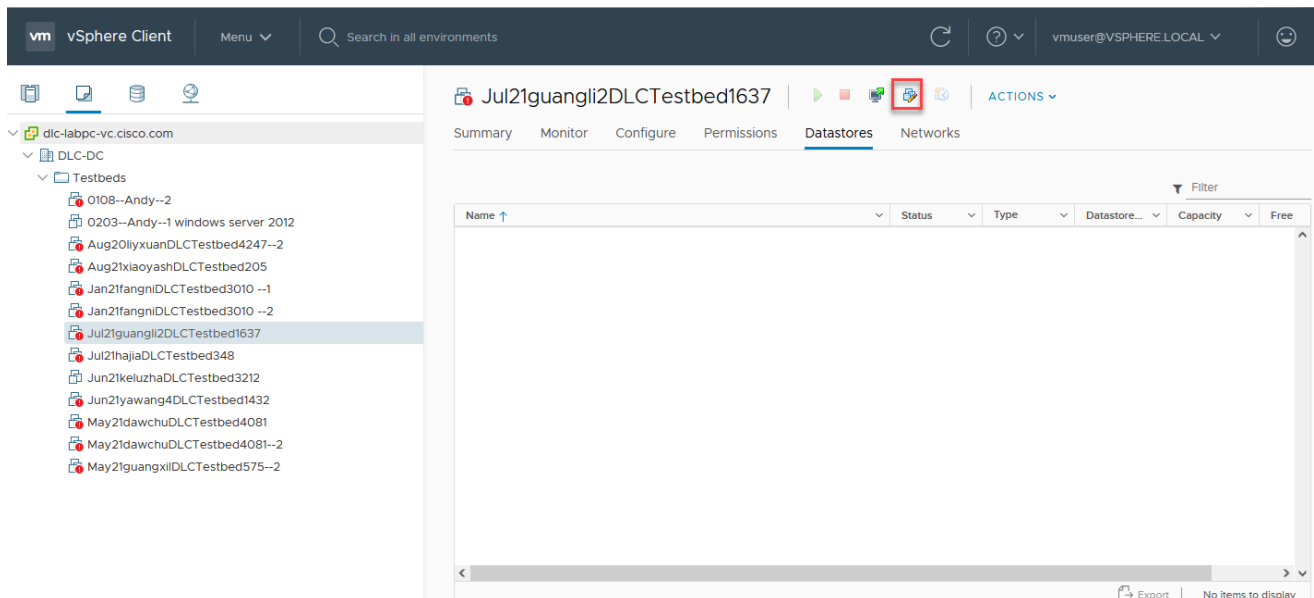
> CPU   2 CPU(s)
> Memory   8 GB, 8 GB memory active
> Hard disk 1 80 GB
> Network   RECREATE-

Notes

Edit Notes...

Custom Attributes

Attribute | Value

Install Ubuntu 18.04

```
1  hostname: Telemetry-KRTAC
2  user : stone
3  Password : root
```

1.3 Ubuntu

1. hostname： Telemetry

```
1  root@Telemetry-KRTAC:~/IOSXR-Telemetry-Collection-Stack# hostnamectl set-hostname
   Telemetry-KRTAC
```

2. Configure User

```
1  root@Telemetry-KRTAC:~# passwd root
2  Enter new UNIX password:
3  Retype new UNIX password:
4  passwd: password updated successfully
```

```
1  root@Telemetry-KRTAC:/etc/ssh# vim sshd_config
2
3  PermitRootLogin yes
4  PasswordAuthentication yes
```

3. Configure IP

```
1  root@Telemetry-KRTAC:/etc/netplan# ip a
2  1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group
   default qlen 1000
3      link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
4      inet 127.0.0.1/8 scope host lo
5         valid_lft forever preferred_lft forever
```

```
  6        inet6 ::1/128 scope host
  7            valid_lft forever preferred_lft forever
  8    2: ens192: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group
       default qlen 1000
  9        link/ether 00:50:56:a5:19:1c brd ff:ff:ff:ff:ff:ff
 10        inet 10.124.49.133/25 brd 10.124.49.255 scope global dynamic noprefixroute
       ens192
 11            valid_lft 141928sec preferred_lft 141928sec
 12        inet6 fe80::e365:cfdc:3d6b:b9e8/64 scope link noprefixroute
 13            valid_lft forever preferred_lft forever
 14    3: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group
       default qlen 1000
 15        link/ether b4:96:91:14:37:38 brd ff:ff:ff:ff:ff:ff
 16        inet 192.168.3.3/24 brd 192.168.3.255 scope global noprefixroute ens160
 17            valid_lft forever preferred_lft forever
 18        inet6 fe80::562b:2315:756d:cef0/64 scope link
 19            valid_lft forever preferred_lft forever
 20
```
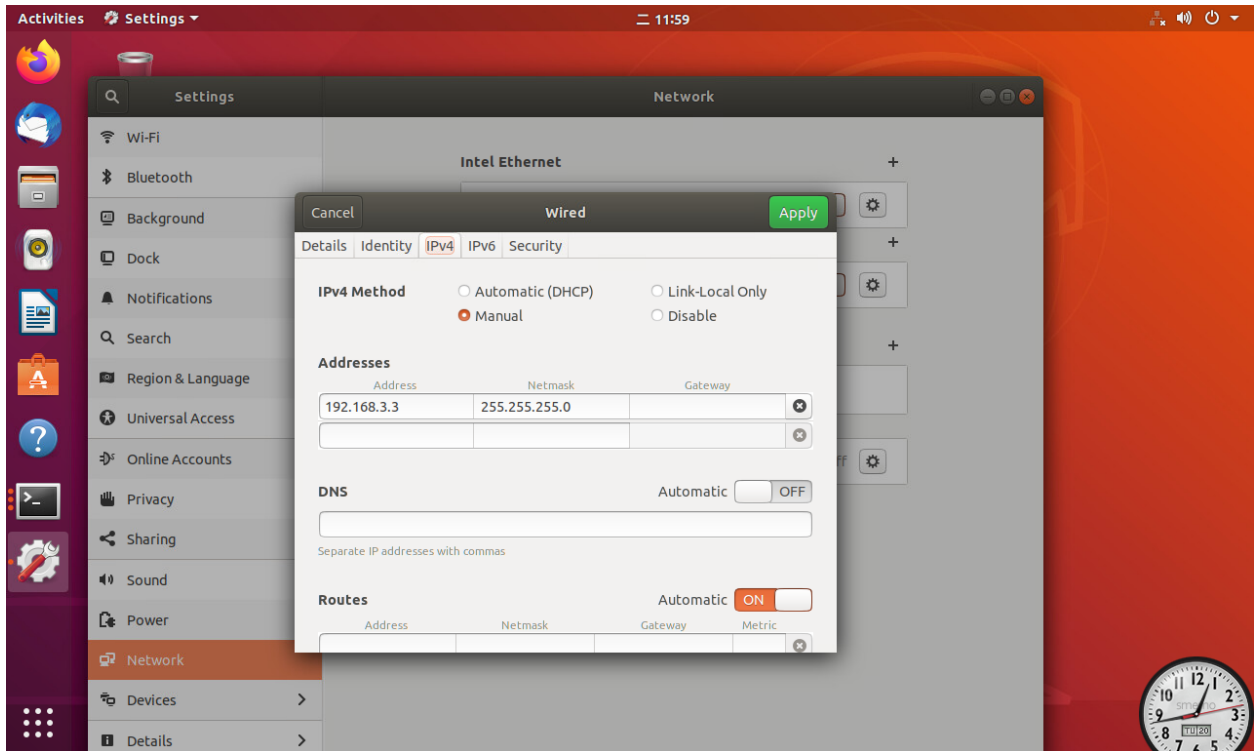

4. Install Basic Program

```
  1   root@Telemetry-KRTAC:~# apt-get install lrzsz
```

1.4 Router

1.3.1 Configuration Interface

```
  1   RP/0/RSP0/CPU0:ASR9006(config)#interface MgmtEth0/RSP0/CPU0/0
  2   RP/0/RSP0/CPU0:ASR9006(config-if)#ipv4 address 192.168.3.5 255.255.255.0
  3   RP/0/RSP0/CPU0:ASR9006(config-if)#commit
  4
  5
  6   RP/0/RSP0/CPU0:ASR9006#show running-config
  7   Sat Jul 17 23:15:50.124 UTC
```

```
 8  Building configuration...
 9  !! IOS XR Configuration 6.5.3
10  !! Last configuration change at Sat Jul 17 23:15:38 2021 by admin
11  !
12  hostname ASR9006
13  logging console debugging
14  line console
15   exec-timeout 0 0
16   stopbits 1
17  !
18  call-home
19   service active
20   contact smart-licensing
21   profile CiscoTAC-1
22    active
23    destination transport-method http
24   !
25  !
26  interface Loopback0
27   ipv4 address 5.5.5.5 255.255.255.255
28  !
29  interface MgmtEth0/RSP0/CPU0/0
30   ipv4 address 192.168.3.5 255.255.255.0
31  !
32
```

1.3.2 Configuration Clock

```
 1  RP/0/RSP0/CPU0:ASR9006#clock set 10:51:00 july 20 2021
 2  Mon Jul 19 08:20:16.681 Hotel
 3  RP/0/RSP0/CPU0:Jul 20 10:51:00.002 Hotel: iosclock[65794]: %INFRA -INFRA_MSG-5-
    CLOCK_TIME_UPDATE : User admin(con0_RSP0_CPU0) updated clock from Mon Jul 19 08:20:16
    2021  to  Tue Jul 20 10:51:00 2021
 4  10:51:00.009 Hotel Tue Jul 20 2021
 5  RP/0/RSP0/CPU0:ASR9006#commit
 6                               ^
 7  % Invalid input detected at '^' marker.
 8  RP/0/RSP0/CPU0:ASR9006#show clock
 9  Tue Jul 20 10:51:09.135 Hotel
10  10:51:09.166 Hotel Tue Jul 20 2021
```

2. Install The IOS XR Telemetry Collection Stack

1. Telemetry architecture
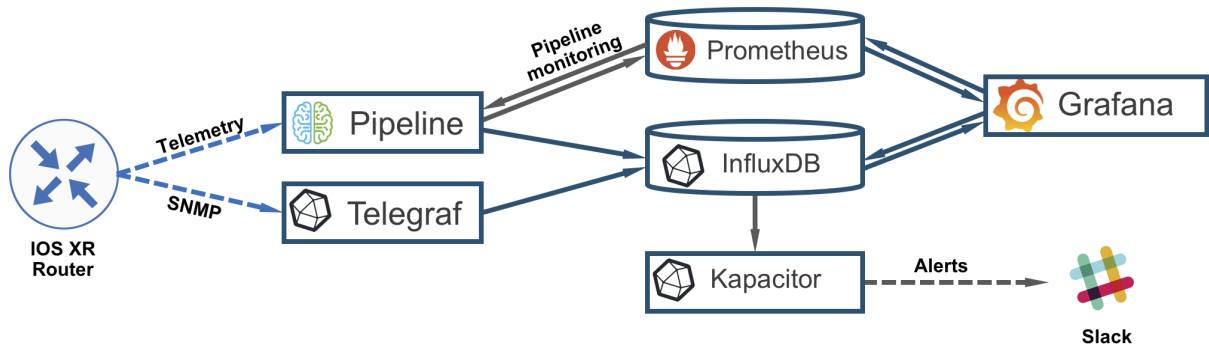
2. Download The IOS XR Telemetry Collection Stack in Github and upload to VM

```
1  # Type rz and check IOS XR Telemetry Collection Stack which is downloaded in
   Github
2
3  root@Telemetry-KRTAC:~# rz
4  rz waiting to receive.
5  Starting zmodem transfer.  Press Ctrl+C to cancel.
6  Transferring Telemetry-main.zip...
7    100%   91079 KB    11384 KB/sec    00:00:08        0 Errors
```

```
root@Telemetry-KRTAC:~# rz
rz waiting to receive.
Starting zmodem transfer.  Press Ctrl+C to cancel.
Transferring Telemetry-main.zip...
  80%  147076 KB    12256 KB/sec    00:00:02 ETA   0 Errors
```

3. unzip IOS XR Telemetry Collection Stack

```
1  root@Telemetry-KRTAC:~# unzip Telemetry-main.zip
2  root@Telemetry-KRTAC:~# mv Telemetry-main IOSXR-Telemetry-Collection-Stack
```

4. Based on IP,configure the BuildUP-help.doc

```
1  root@Telemetry-KRTAC:~/IOSXR-Telemetry-Collection-Stack# vim BuildUP-help.doc
2
3  #YOUR_PROXY_SERVER:
4  #http://proxy-server.com:80/
5  #YOUR_FIRST_NTP_SERVER:
6  time1.google.com
7  #YOUR_SECOND_NTP_SERVER:
8  time2.google.com
9  #YOUR_THIRD_NTP_SERVER:
10 time3.google.com
11 #MDT_DB_RETENTION_TIME(HOURS)
12 168
13 #MDT_DB_SHARDS(HOURS)
14 6
15 #TELEGRAF_RETENTION_TIME(HOURS)
16 96
17 #TELEGRAF_SHARDS(HOURS)
18 3
19 #ROUTER_ADDRESS_FOR_SNMP
```

```
20   192.168.3.5
21   #SNMP_COMMUNITY
22   public
23   #YOUR_SERVER_IP_ADDRESS
24   192.168.3.3
25   #YOUR_SLACK_TOKEN_ID
26   #T00000000/B00000000/XXXXXXXXXXXXXXXXXXXXXXXX
27   #YOUR_SLACK_CHANNEL
28   #cpu_notifications
29   #YOUR_SLACK_USERNAME
30   #Telemetry_Bot
31   #GRAFANA_USER
32   admin
33   #GRAFANA_PASSWORD
34   admin
```

5. Run the "init.sh" script from that directory

```
1   sudo  ~/IOSXR-Telemetry-Collection-Stack/init.sh
```

6. Run the main script

```
1   sudo  ~/IOSXR-Telemetry-Collection-Stack/IOS-XR-Telemetry-BuildUP-stack.sh  <
    ~/IOSXR-Telemetry-Collection-Stack/BuildUP-help.doc
```

7. The final step, run the "wrappers.sh" script and log off / log in again.

```
1   ./IOSXR-Telemetry-Collection-Stack/wrappers.sh
```

3. Configurate the Router

3.1 Configurate ASR9K / NCS 5500 with the below configuration files

```
1   root@Telemetry-KRTAC:~/IOSXR-Telemetry-Collection-Stack/Routers# vim TCP-ASR9k.config
```

Final ASR 9k configuration

```
1   RP/0/RSP0/CPU0:ASR9006#show running-config
2   Tue Jul 20 13:14:17.380 Hotel
3   Building configuration...
4   !! IOS XR Configuration 6.5.3
5   !! Last configuration change at Mon Jul 19 08:13:59 2021 by admin
6   !
7   hostname ASR9006
8   clock timezone Hotel 8
9   logging console debugging
10  line console
11   exec-timeout 0 0
12   stopbits 1
13  !
14  call-home
15   service active
```

```
16    contact smart-licensing
17   profile CiscoTAC-1
18     active
19     destination transport-method http
20   !
21  !
22  interface Loopback0
23   ipv4 address 5.5.5.5 255.255.255.255
24  !
25  interface MgmtEth0/RSP0/CPU0/0
26   ipv4 address 192.168.3.5 255.255.255.0
27  !
28  interface MgmtEth0/RSP0/CPU0/1
29   shutdown
30  !
31  interface MgmtEth0/RSP1/CPU0/0
32   shutdown
33  !
34  interface MgmtEth0/RSP1/CPU0/1
35   shutdown
36  !
37  interface TenGigE0/1/0/0
38   ipv4 address 192.168.3.4 255.255.255.0
39  !
40  interface TenGigE0/1/0/1
41   ipv4 address 192.168.3.6 255.255.255.0
42  !
43  interface PTP0/RSP0/CPU0/0
44   shutdown
45  !
46  interface preconfigure GigabitEthernet0/1/1/0
47   ipv4 address 21.0.0.1 255.0.0.0
48  !
49  interface preconfigure GigabitEthernet0/1/1/1
50   ipv4 address 22.0.0.1 255.0.0.0
51  !
52  interface preconfigure GigabitEthernet0/1/1/2
53   ipv4 address 12.0.0.1 255.0.0.0
54   speed 100
55   negotiation auto
56  !
57  interface preconfigure GigabitEthernet0/1/1/3
58   ipv4 address 11.0.0.1 255.0.0.0
59  !
60  router ospf 10
61   area 0
62    interface Loopback0
63    !
64    interface GigabitEthernet0/1/1/0
65    !
66    interface GigabitEthernet0/1/1/1
67    !
68    interface GigabitEthernet0/1/1/2
69    !
70    interface GigabitEthernet0/1/1/3
71    !
```

```
 72   !
 73  !
 74  router bgp 100
 75   bgp router-id 5.5.5.5
 76   address-family l2vpn evpn
 77   !
 78   neighbor-group EVPN
 79    remote-as 100
 80    update-source Loopback0
 81    address-family l2vpn evpn
 82     route-reflector-client
 83    !
 84   !
 85   neighbor 1.1.1.1
 86    use neighbor-group EVPN
 87   !
 88   neighbor 2.2.2.2
 89    use neighbor-group EVPN
 90   !
 91   neighbor 3.3.3.3
 92    use neighbor-group EVPN
 93   !
 94   neighbor 4.4.4.4
 95    use neighbor-group EVPN
 96   !
 97  !
 98  telemetry model-driven
 99   destination-group DGroup1
100    address-family ipv4 192.168.3.3 port 5432
101     encoding self-describing-gpb
102     protocol tcp
103    !
104   !
105   sensor-group health
106    sensor-path Cisco-IOS-XR-shellutil-oper:system-time/uptime
107    sensor-path Cisco-IOS-XR-wdsysmon-fd-oper:system-monitoring/cpu-utilization
108    sensor-path Cisco-IOS-XR-nto-misc-shmem-oper:memory-summary/nodes/node/summary
109   !
110   sensor-group optics
111    sensor-path Cisco-IOS-XR-controller-optics-oper:optics-oper/optics-ports/optics-
      port/optics-info
112   !
113   sensor-group mpls-te
114    sensor-path Cisco-IOS-XR-mpls-te-oper:mpls-te/tunnels/summary
115    sensor-path Cisco-IOS-XR-ip-rsvp-oper:rsvp/interface-briefs/interface-brief
116    sensor-path Cisco-IOS-XR-ip-rsvp-oper:rsvp/counters/interface-messages/interface-
      message
117   !
118   sensor-group routing
119    sensor-path Cisco-IOS-XR-clns-isis-oper:isis/instances/instance/statistics-global
120    sensor-path Cisco-IOS-XR-clns-isis-
      oper:isis/instances/instance/levels/level/adjacencies/adjacency
121    sensor-path Cisco-IOS-XR-ipv4-bgp-oper:bgp/instances/instance/instance-
      active/default-vrf/process-info
122    sensor-path Cisco-IOS-XR-ip-rib-ipv4-oper:rib/vrfs/vrf/afs/af/safs/saf/ip-rib-
      route-table-names/ip-rib-route-table-name/protocol/isis/as/information
```

```
123    !
124     sensor-group interfaces
125      sensor-path Cisco-IOS-XR-pfi-im-cmd-oper:interfaces/interface-summary
126      sensor-path Cisco-IOS-XR-infra-statsd-oper:infra-
        statistics/interfaces/interface/latest/generic-counters
127     !
128     subscription health
129      sensor-group-id health strict-timer
130      sensor-group-id health sample-interval 30000
131      destination-id DGroup1
132     !
133     subscription optics
134      sensor-group-id optics strict-timer
135      sensor-group-id optics sample-interval 30000
136      destination-id DGroup1
137     !
138     subscription mpls-te
139      sensor-group-id mpls-te strict-timer
140      sensor-group-id mpls-te sample-interval 30000
141      destination-id DGroup1
142     !
143     subscription routing
144      sensor-group-id routing strict-timer
145      sensor-group-id routing sample-interval 30000
146      destination-id DGroup1
147     !
148     subscription interfaces
149      sensor-group-id interfaces strict-timer
150      sensor-group-id interfaces sample-interval 30000
151      destination-id DGroup1
152     !
153    !
154    end
```
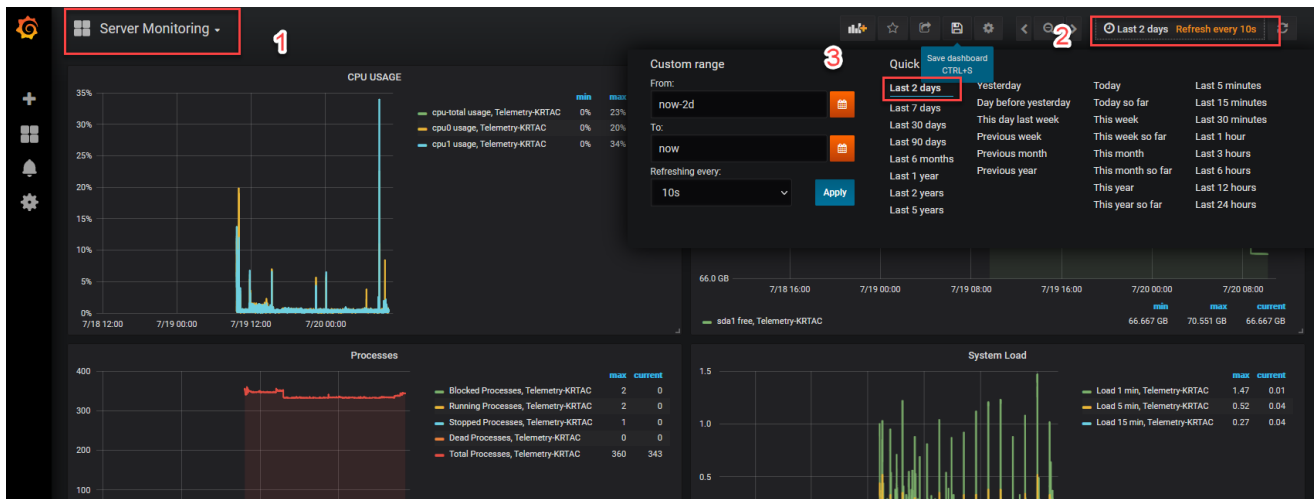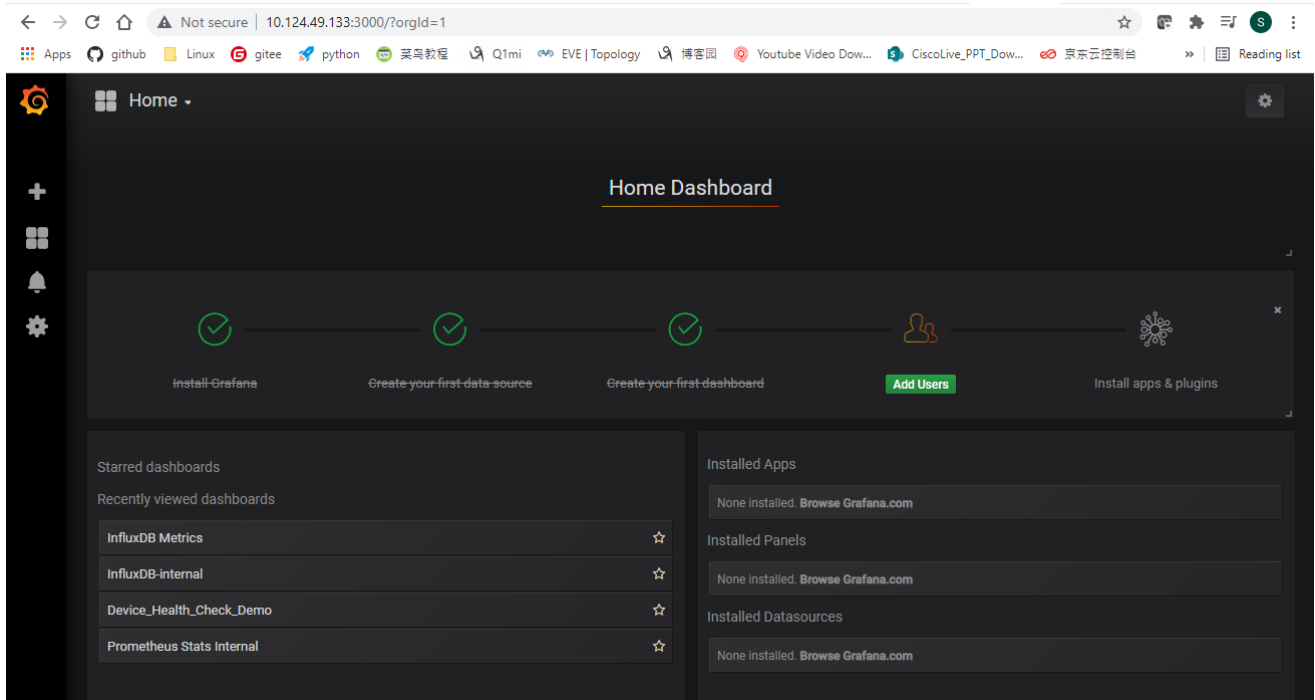
4. Start Grafana

To start, please, type in your browser of choice: http://<server_ip_addr>:3000 and you will be on the home page of Grafana.

Type your login and password ("admin/admin", if you left the default values in the document with variables).

   1. Go To http://10.124.49.133:3000/ with username: admin / password: admin

Configuration File

```
1  root@Telemetry-KRTAC:~/IOSXR-Telemetry-Collection-Stack/analytics/bigmuddy-network-
   telemetry-pipeline-final# vim pipeline.conf
2  root@Telemetry-KRTAC:~/IOSXR-Telemetry-Collection-Stack/analytics/pipeline# vim
   pipeline.conf
```

```
 1    Welcome to IOS XR Telemetry Consumption Stack
 2    The system is ready for you.
 3    Here is a short reminder of commands for your convenience
 4    Please use next CLI to work with your Telemetry Stack
 5   show influxdb                          - to check the current state of InfluxDB
 6   start influxdb &                       - to start InfluxDB
 7   stop influxdb                          - to stop InfluxDB
 8
 9   show telegraf                          - to check the current state of Telegraf
10   start telegraf &                       - to start Telegraf
11   stop telegraf                          - to stop Telegraf
12
13   show kapacitor                         - to check the current state of Kapacitor
14   start kapacitor &                      - to start Kapacitor
15   stop kapacitor                         - to stop Kapacitor
16
17   show prometheus                        - to check the current state of Prometheus
18   start prometheus &                     - to start Prometheus
19   stop prometheus                        - to stop Prometheus
20
21   show grafana                           - to check the current state of Grafana
22   start grafana &                        - to start Grafana
23   stop grafana                           - to stop Grafana
24
25   show pipeline                          - to check the current state of Pipeline
26   start pipeline &                       - to start Pipeline
27   stop pipeline                          - to stop Pipeline
28
29   pipeline troubleshooting start         - to start dumping data into 'dump.txt' (an
     empty 'dump.txt' each time)
30   pipeline troubleshooting stop          - to start dumping data into 'dump.txt'
31
32
33    Here is the list of helpful InfluxDB  SHOW commands  you might want to use in your
     testings
34   influx -execute "show databases"
      - to see all current databases
35   influx -execute "show diagnostics"
      - to see diagnostic information
36   influx -execute "show measurements" -database="mdt_db"
      - to see all measurements(or sensor-paths) in a specified database (mdt_db, as an
      example)
37   influx -execute "show retention policies" -database="mdt_db"
      - to see retention policies in a specified database (mdt_db, as an example)
```

```
38   influx -execute "show tag values with key=Producer" -database="mdt_db"
       - to see active routers per every measurement (sensor path), per database (mdt_db,
     as an example)

39

40    Use the command below to check stats under a specific measurement and a specific
     field, time frame:

41   influx -execute "SELECT \"bytes-received\" FROM \"Cisco-IOS-XR-infra-statsd-
     oper:infra-statistics/interfaces/interface/latest/generic-counters\" WHERE
     (\"Producer\" = 'NCS5501_top' AND \"interface-name\" = 'Bundle-Ether12' AND time >
     now() - 1m)" -database="mdt_db"

42    In that command all "bytes-received" stats from "Bundle-Ether12" interface from
     "NCS5501-top" router from Interface Counters sensor-path for the last minute were
     collected

43

44

45    Here is the list of helpful InfluxDB  DataBase Management   commands  you might want
     to use in your testings

46   influx -execute "create database XR with duration 48h shard duration 6h"
       - to create a database (XR) with retention time (48h) and shard duration (6h)

47   influx -execute "alter retention policy \"autogen\" on \"XR\" duration 96h"
      - to modify retention policy (autogen) of the database (XR) to a new time (96h)

48   influx -execute "alter retention policy \"autogen\" on \"XR\" shard duration 12h"
      - to modify shard retention policy (autogen) of the database (XR) to a new time (12h)

49   influx -execute "drop database XR"
       - to delete a specific database (XR, in example)

50   influx -execute "drop series from /.*/" -database="XR"
       - to drop all counters from all measurements on a specific database (XR, in example)

51

52

53    Here is the list of helpful Kapacitor commands you might want to use in your
     testings

54   kapacitor list tasks
       - to see all current tick scripts within Kapacitor

55   kapacitor define CPU-ALERT-ROUTERS -tick ~/analytics/kapacitor/CPU-ALERT-ROUTERS.tick
      - to define a tick policy script within Kapacitor

56   kapacitor enable CPU-ALERT-ROUTERS
       - to activate the defined tick script
```

5. Manage Grafana

User:

- admin / admin

6. Reference

[Telemetry Configuration Guide for Cisco NCS 5000 Series Routers, IOS XR Release 7.2.x](#)

[The IOS XR Telemetry Collection Stack Overview](#)

[Quick startup guide for Model Driven Telemetry testing](#)

[stonelee2005 /Telemetry](#)