Oracle® Communications Policy Management ATS Guide





Oracle Communications Policy Management ATS Guide, Release 15.0

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What's New in This Guide

This section introduces the documentation updates for release 15.0.

Release 15.0 - F87256-01, November 2023

This is the first version of the document.



1

Introduction

The Automated Test Script (ATS) is a software that is used on the system under test to check if the system is functioning as expected. This software performs testing of the features offered by Policy Charging Rules Function (PCRF) through automation decreasing the manual test effort.

Limitations

Only a single Multiprotocol Routing Agent (MRA) and Multimedia Policy Engine (MPE) cluster can be used in the test environment.

Acronyms

This section lists the acronyms used in the document.

Table 1-1 Acronyms

Term	Definition
API	Application Programming Interface
ATS	Automated Test Suite
KVM	Kernel-based Virtual Machine
MPE	Multimedia Policy Engine
MRA	Multi Protocol Routing Agent
NTP	Network Time Protocol
OS	Operating System
PCRF	Policy Charging Rules Function
SUT	System Under Test
VM	Virtual Machine

Compatibility Matrix

This section lists the releases of OCPM PCRF compatible with vPCRF ATS.

Table 1-2 Compatibility Matrix

ATS Software Release	Compatible OCPM PCRF Releases
15.0	15.x

How to use this document

Read the following instructions before performing any procedure documented in this guide:

- 1. Read the instructional text and all associated procedural Warnings or Notes.
- If a procedural step fails to execute, contact Oracle's Customer Service for assistance before attempting to continue. My Oracle Support for information on contacting Oracle Customer Support.

Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 1-3 Admonishments

Icon	Description
	Danger:
	(This icon and text indicate the possibility of personal injury.)
DANGER	
<u>^</u> .	Warning:
<u>/4</u> \	(This icon and text indicate the possibility of equipment damage.)
WARNING	
	Caution:
! \	(This icon and text indicate the possibility of
CAUTION	service interruption.)

Customer Training

Oracle University offers training for service providers and enterprises. Visit our web site to view, and register for, Oracle Communications training at http://education.oracle.com/communication.

To obtain contact phone numbers for countries or regions, visit the Oracle University Education web site at www.oracle.com/education/contacts.

My Oracle Support

My Oracle Support (https://support.oracle.com) is your initial point of contact for all product support and training needs. A representative at Customer Access Support can assist you with My Oracle Support registration.

Call the Customer Access Support main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html. When calling, make the selections in the sequence shown below on the Support telephone menu:

- 1. Select 2 for New Service Request.
- Select 3 for Hardware, Networking and Solaris Operating System Support.
- 3. Select one of the following options:



- For Technical issues such as creating a new Service Request (SR), select 1.
- For Non-technical issues such as registration or assistance with My Oracle Support, select 2.

You are connected to a live agent who can assist you with My Oracle Support registration and opening a support ticket.

My Oracle Support is available 24 hours a day, 7 days a week, 365 days a year.

Emergency Response

In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at 1-800-223-1711 (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of system ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.



ATS Server Deployment Overview

The ATS server is deployed as a Virtual Machine (VM) using any hypervisors like, KVM. It has features for Rx, Gx, and Sy cases.

Downloading ATS Package

- Download the ATS Image from Oracle Software Delivery Cloud (OSDC).
 Example of an ATS image: ats-9.0.0.0.0-1.0.9.tgz.
- Extract the tgz file to get the gcow2 image.

Deploying ATS VM on OpenStack

This section describes the procedure to deploy ATS VM on OpenStack.

To deploy ATS VM using qcow2:

- Copy the ATS qcow2 image to the OpenStack server.
- 2. Launch Instance from the OpenStack Menu.
- Enter an Instance Name.
- Select Flavor as per recommendation. For reference, see Appendix A- Resource Requirements.
- Select the networks as per your cloud deployment. The networks selected should be compatible with your PCRF setup. For reference, see Appendix B- VM Networking Layout.
- 6. Select the key pair to access the ATS VM.
- 7. Proceed further and launch the instance.
- 8. After the launch of the ATS instance, the ATS server can be accessed using IP and keypair.
- 9. If keypair is not used, access ATS VM with cloud-user/NextGen.



PCRF ATS supports both IPv4 and IPv6 deployments.

Deploying ATS VM on KVM host using virt-install

This section describes the procedure to deploy ATS VM on KVM host using virt-install.

To deploy ATS VM on KVM host using virt-install:

1. Extract the gcow2 image from tgz package and upload to KVM host.

- 2. Ensure appropriate networks or bridges are present on KVM host.
- 3. Run the following command:

Change network parameter as per customer's environment.

- 4. Wait for VM creation, it should prompt for login. Log in with cloud-user/NextGen.
- 5. Assign IP address to VM node with following command:

```
ip addr add <Ip address/subnet> dev eth0
ip route add default via <gateway_ip> dev eth0
For example:
ip addr add 10.75.204.158/24 dev eth0
ip route add default via 10.75.204.129 dev eth0
```

6. (optional) Set hostname as needed with hostnamectl set-hostname <name>. Add routes on PCRF to ensure all PCRF IPs are reachable from ATS.

Deploying ATS VM on KVM Host using cockpit GUI

This section describes the procedure to deploy ATS VM on KVM host using cockpit GUI.

To deploy ATS VM on KVM host using cockpit GUI:

 Run below commands on KVM host console to install cockpit GUI and its dependencies:

```
export http proxy=http://www-proxy.us.oracle.com:80
   export https://www-proxy.us.oracle.com:80
   yum install cockpit
   yum install virt-viewer
    yum install virt-manager
   yum install net-tools
   yum install cockpit-machines
   systemctl start cockpit
   systemctl status cockpit
   netstat -pnltu | grep 9090
   systemctl enable --now cockpit.socket
    sudo systemctl start libvirtd
   systemctl status libvirtd.service
    systemctl start firewalld
    firewall-cmd --add-service=cockpit --permanent
    firewall-cmd --reload
```

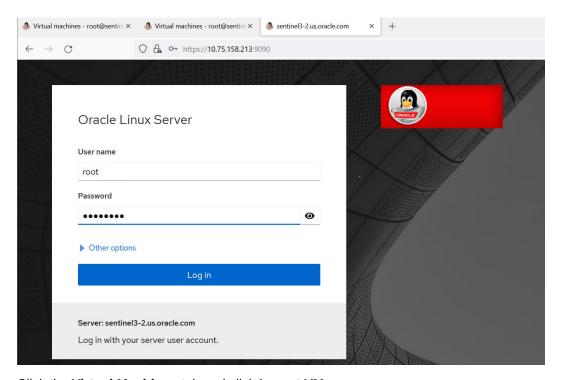


✓ Note:

The above commands need to run for the first time installation of VM on KVM hosts and later on just copy images to the /mnt/data directory in KVM hosts and log in to cockpit GUI \rightarrow Virtual Machines \rightarrow Import V.

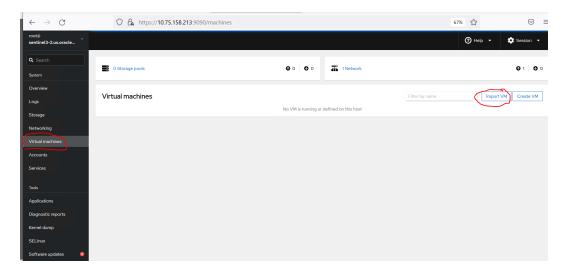
2. Log in to cockpit GUI using url, https://1KVM host ip:/9090/.

Figure 2-1 Cockpit Graphical User Interface



3. Click the Virtual Machines tab and click Import VM.

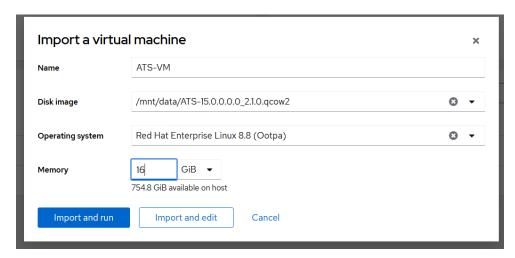
Figure 2-2 Importing Virtual Machine





4. Provide all details in the **Import VM** page as below and click **Import and Edit**. For reference, see Appendix A- Resource Requirements.

Figure 2-3 Importing Virtual Machine



5. Edit no of vcpus, remove default virtual network, and add configured bridge interfaces. For reference, see Appendix B- VM Networking Layout.

Figure 2-4 Adding Virtual Network Interface

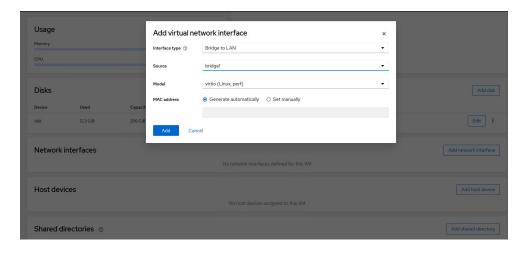


Figure 2-5 Network Interfaces



Start VM by clicking Run and Console will be displayed to check ongoing activities.



Figure 2-6 Starting VM

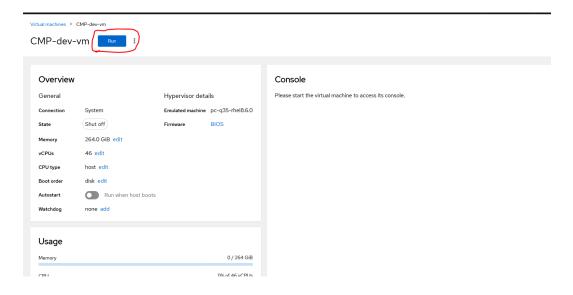


Figure 2-7 Console

```
VNC console

Starting Resets System Activity Logs...

(BY | Started B-Bus System Fersage Bus.

(BY | Started Generate summary of gesterday's process accounting.

(BY | Started Bestore /run/initramfs on shutdown.

(BY | Started Bestore /run/initramfs on shutdown.

(BY | Started DenSSM codes Server Key Generation.

(BY | Started DenSSM codes Generation fer Generation.

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(BY | Started DenSSM service.

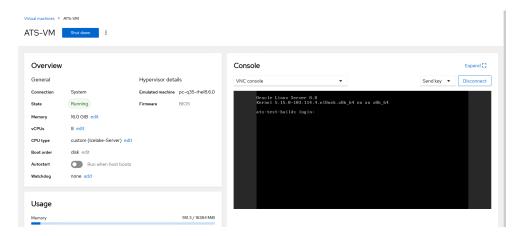
(BY | Started DenSSM service.

(BY | Started DenSSM ras Service Key Generation.

(BY | Started DenSSM ras Service Key Generation.
```

7. Wait for few minutes to install the VM and once installation is done, the **Console** is displayed as below:

Figure 2-8 Console



- 8. Log in with cloud-user/NextGen.
- 9. Run the following commands for assigning an IP address for the ATS VM:

```
ip addr add <Ip address/subnet> dev eth0
ip route add default via <gateway ip> dev eth0
```

For example:

```
ip addr add 10.75.204.158/24 dev eth0
ip route add default via 10.75.204.129 dev eth0
```

Check the IP address and subnet mask of the network interface, and ensure that the gateway IP address is within the same subnet.

Logging into ATS

After the ATS VM is deployed, follow the below steps to log in to the ATS:

- Open a browser and provide the IP address details and port details as http:// <ATS IP>:8080/.
- 2. Enter the log in credentials (Default Username: Oracle, Default Password: Welcome@123). Click **Signin**.

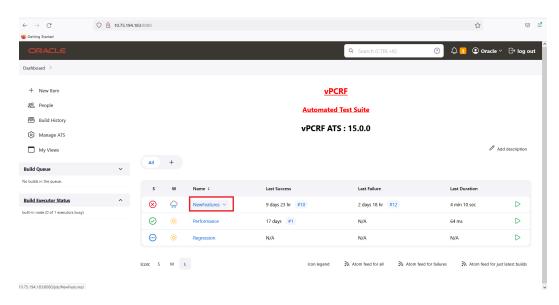


You are required to change the password after the first log in.

The following ATS dashboard is displayed.



Figure 2-9 ATS Dashboard



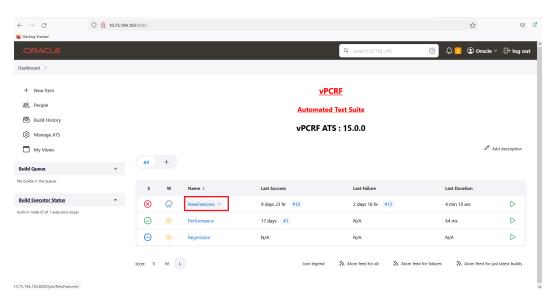
PCRF ATS has three pre-configured pipelines.

- NewFeatures: This pipeline has all the test cases delivered as part of the latest build.
- **Performance**: This pipeline is not operational as of now. It is reserved for future releases of ATS where lightweight performance cases will be included.
- **Regression**: This pipeline has all the test cases delivered in older builds of ATS. This pipeline is not operational as of now.

Configure IPs on ATS GUI

1. Click any of the pipelines(New Features/Performance/Regression) where you want to run the test cases.

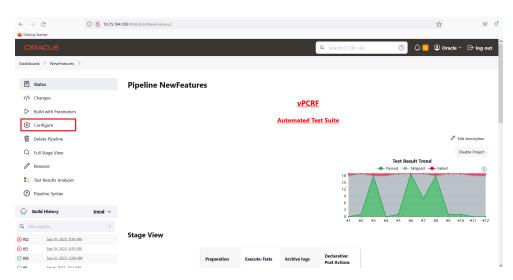
Figure 2-10 Dashboard





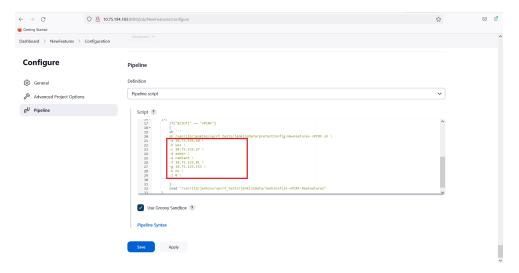
2. Click **Configure** to open the configuration section.

Figure 2-11 Pipeline New Features



3. Click the **Pipeline** tab and modify the script parameters depicted below.

Figure 2-12 Pipeline Script



The parameters are identified by the alphabets which are described in the script. Here is a detailed overview of the parameters:

Table 2-1 Configuration parameters

Parameter	Description
a. MRA_SIGA_IP	SIGA IP of MRA



Table 2-1 (Cont.) Configuration parameters

Parameter	Description
b. UseMRA	options: (yes/no)
	If traffic is to be routed through MRA, then select this option.
c. MPE_SIGA_IP	SIGA IP address of MPE
d. CMP_GUI_Username	user name to log in to CMP GUI
e. CMP_GUI_Password	password to log in to CMP GUI
f. CMP_Host_IP	CMP OAM IP
g. ATS_IP	IP address of current ATS Node
h. CleanupandReconfigure	options:(yes/no)
	This option should be set to yes when ATS is to be run on a new PCRF setup or a PCRF setup with existing configurations.
	This cleans up any existing configurations and add necessary configurations to run ATS. Once run for a setup this can be set to no for subsequent runs.
i. Re-run count	If a test case fails, this parameter decides how many times it should be rerun.

Here is a sample configuration:

- -a 10.75.235.48 \
- -b yes \
- -c 10.75.235.27\
- -d admin \
- -e camiant \
- -f 10.75.235.81 \
- -g 10.75.153.153 \
- -h no \
- -i 0 \



You must provide IPv6 addresses without any square brackets.

4. Click **Save** after making the necessary changes.

Exchange SSH-keys with PCRF

- 1. SSH into the ATS as a cloud-user and navigate to the /home/cloud-user/tools directory.
- Ensure all PCRF IPs (atleast OAM VIP and SIG-A IPs) are reachable from ATS before exchanging SSH keys.



3. Modify the *NodeInfo.yaml* file and provide the IPs for the CMP, MPE, and MRA. If you have multiple MPE or MRA clusters in the PCRF setup, then provide the IPs for the cluster that you wish to use for ATS. If Standby blades are not present on your system, then enter N/A for the Standby nodes.

Sample Configuration:

CMP_OAM_VIP: 10.75.151.185

Active_CMP: 10.75.151.253

Standby CMP: N/A

MPE_SIGA: 10.75.235.32Active_MPE: 10.75.151.142

Standby_MPE: N/A

MRA_SIGA: 10.75.235.108Active_MRA: 10.75.151.145

Standby_MRA: N/A

- **4.** Run the ssh key exchange script as a cloud-user with ./exchange SSH Keys.py.
- **5.** Enter the password of admusr in topology of PCRF system and wait for the script to complete. Try to ssh into the PCRF nodes it should not ask for password.
- 6. If Standby node IPs were configured, then even after the failover to the Standby blades, ATS will run properly. Only if the failover occurs to server-C Spare blades or Secondary CMP site, then the ssh key exchange has to be done again with new the IPs.



3

ATS Features

This chapter describes PCRF ATS features.

ATS Jenkins Job Queue

The ATS Jenkins Job Queue feature is to queue the second job if the current job is already running from the same or different pipelines to prevent jobs from running in parallel to one another. In Jenkins the total number of executors is one, this makes the jobs wait for resource allocation if the new pipeline is triggered.

Job/build queue status can be viewed in the left navigation pane on the ATS home page.

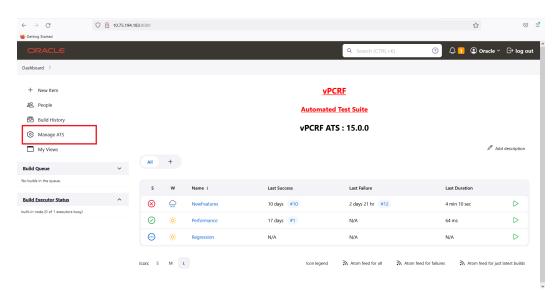
Updating Users and Login Password

Managing Users

To create or delete new users:

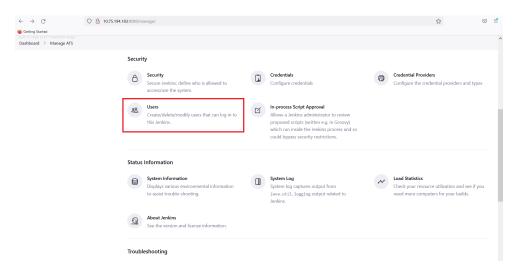
1. On the main dashboard, click Manage ATS.

Figure 3-1 Manage ATS



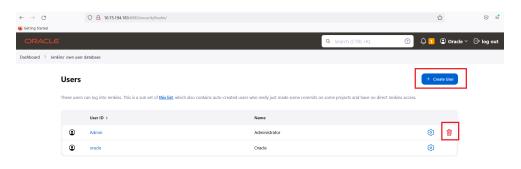
2. Scroll down and click Users.

Figure 3-2 User Menu



3. Click + Create User to create a new user. Enter username, password, name, and email. Any dummy email can be provided. After entering the details, click Save and then the new user can be used to login.

Figure 3-3 Create User



4. Click the Delete icon to delete the existing user.

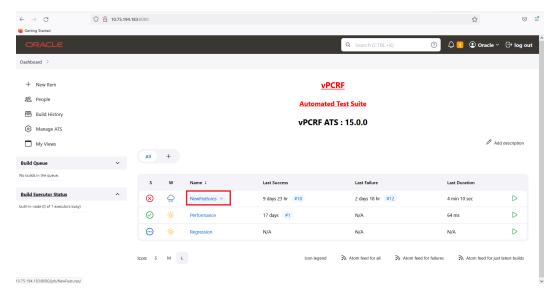
Modifying Login Password

To modify the login password:

1. Log in to the ATS application using the default login credentials. The home page appears with its preconfigured pipelines as follows:

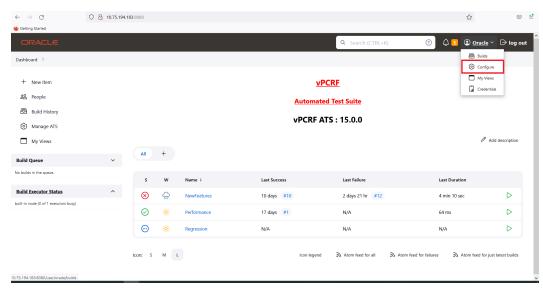


Figure 3-4 ATS Dashboard



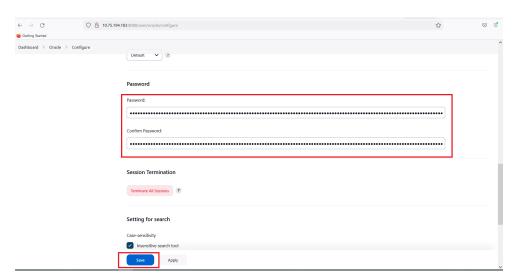
- 2. Hover over the user name and click the down arrow.
- 3. Click Configure.

Figure 3-5 Configure User



In the Password section, enter the new password in the Password and Confirm Password fields.

Figure 3-6 Modify Password



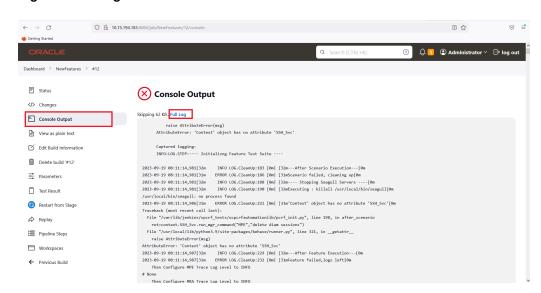
5. Click Save.

A new password is set for the user.

Log Collection

After a test case run is completed, the logs for that execution can be found by clicking the **Build** and then **Console Output**. It is compressed by default, the full log can be viewed by clicking the **Full Log**. It contains a detailed description on all operations performed by ATS during the execution.

Figure 3-7 Log Collection



The logs captured from PCRF can be found at /var/lib/jenkins/vpcrf_tests/Logs. The logs captured from seagull can be found at /home/cloud-user/logs.



Test Results Analyzer

The Test Results Analyzer is a plugin available in ATS to view the pipeline test results based on XML reports. It provides the test results report in a graphical format, which includes consolidated and detailed stack trace results in case of any failures. It allows you to navigate to each and every test.

The test result report shows any one of the following statuses for each test case:

- PASSED: If the test case passes.
- FAILED: If the test case fails.
- **SKIPPED**: If the test case is skipped.
- N/A: If the test cases is not executed in the current build.

To access the test results analyzer feature:

- 1. From the ATS dashboard, click any pipeline where you want to run this plugin.
- 2. In the left navigation pane, click Test Results Analyzer.

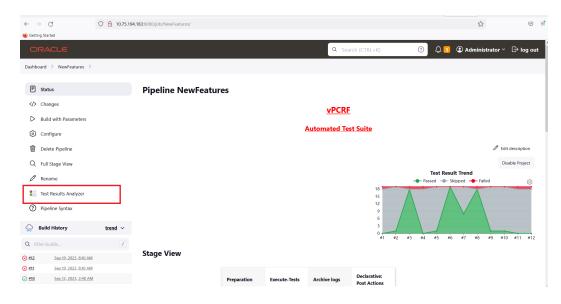
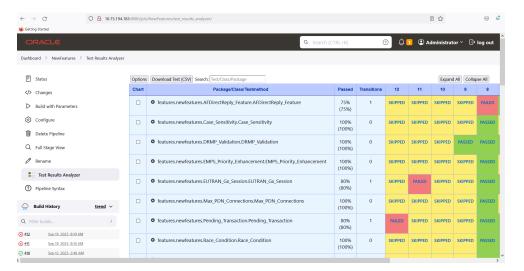


Figure 3-8 Test Results Analyzer

When the build completes, the test result report appears. A sample test result report is shown below:



Figure 3-9 Test Result Report

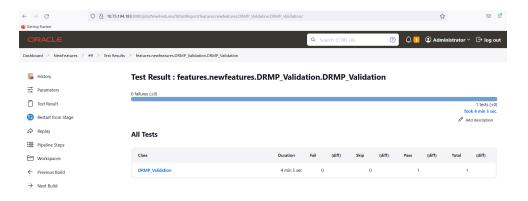


Click any one of the statuses (PASSED, FAILED, SKIPPED) to view respective feature detail status report.

Note:

N/A Status will not show detailed reports.

Figure 3-10 Sample Test Result

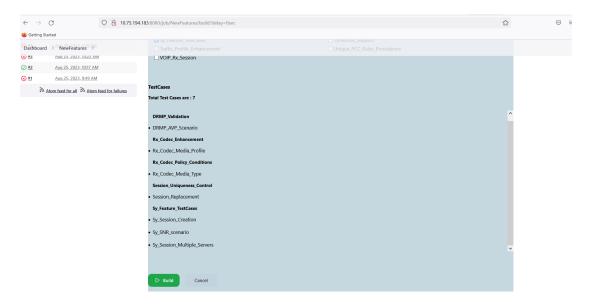


Test Case Mapping and Count

The 'Test Case Mapping and Count' feature displays total number of features, test cases or scenarios and its mapping to each feature in the ATS GUI.

This feature can be utilized while selecting test cases to be run, the details of features and scenarios selected are listed appropriately with the total test case scenario count:

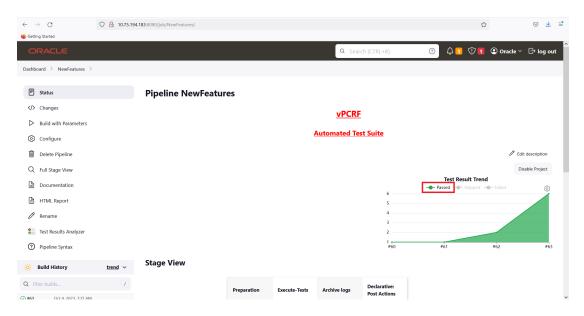
Figure 3-11 Test Case Mapping and Count



Test Result Graph

The graph on the Pipeline dashboard displays the history of passed, skipped, and failed test cases for the previous runs. User can select any one option (Passed, Skipped, and Failed) at a time by clicking on it to view the results of the previous runs in graphical format. Below is a sample screen capture of test result graph:

Figure 3-12 Test Result Graph





ATS Documentation

This section describes the documentation for all the pipelines.



Documentation is generated only after running the test cases.

To view the documentation for any of the pipelines:

- 1. On the ATS Dashboard, click any one of the pipelines.
- 2. Click **Documentation** in the left navigation pane. On clicking Documentation, the following page opens with the list of the features.

Figure 3-13 PCRF NewFeatures-Documentation

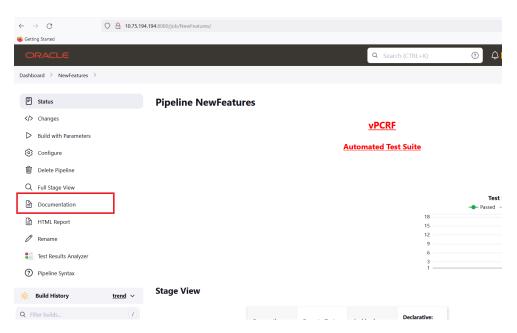
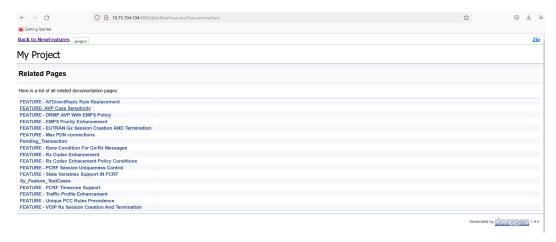




Figure 3-14 NewFeatures-Documentation



3. Click any feature or scenario to open documentation for that feature and scenario.



Running Test Cases

This chapter describes how to run PCRF test cases using ATS 15.0.

Prerequisites for Test Case Execution

This section provides information about the prerequisites that must be achieved in the following sequence before running test cases:

- Ensure PCRF setup contains atleast one CMP, MPE and MRA cluster defined under topology settings.
- 2. PCRF's CMP, MPE, MRA IPs should be pingable from ATS, that is, they should be on same network.
- 3. Enable the CleanupandReconfigure option when running test cases on a new setup or an existing setup with existing configurations.
- 4. Ensure there are no active alarms present.
- 5. SUT Requirements

Table 4-1 Minimum SUT Requirements

Server	Quantity
OCPM MPE Active	1
OCPM MRA Active	1
OCPM CMP Active	1

These are the minimum requirements, ATS will also work if Standby, Spare nodes are added in the MPE,MRA, and CMP clusters.

- 6. Ensure proper feature mode is selected when configuring CMP. Minimum requirement is Diameter 3GPP. When running specific features, ensure that the proper mode is selected.
 - Navigate to Help → About → Click on Hidden button left side → Change Mode to select appropriate mode.
- Ensure all firewalls allow connection between PCRF and ATS. If there are any firewall options configured on the PCRF, then rules should be added to permit ATS connections.



WARNING:

Running ATS on any PCRF setup will cause the MPE/MRA configuration and data to be deleted. Please export the system configurations and take a system backup and server backup to restore system configuration after ATS runs are done.

Running Test Cases

To run the test cases:

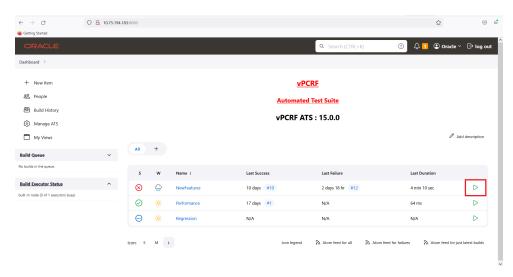


It is recommended to not use the CMP GUI while ATS is running. It can lead to unexpected behavior on CMP.

Complete the tasks described in the Prerequisites section before running the test cases using ATS.

- Go to http://<ATS IP>:8080/.
- 2. Log in to the Jenkins GUI using your login credentials. The system displays the Jenkins GUI.
- On the ATS Dashboard, select one of the pipelines to run the test cases. Click Start for the respective pipeline or click the pipeline name and then select Build With Parameters.

Figure 4-1 Dashboard



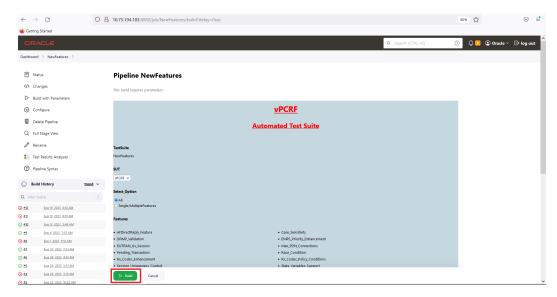
4. The test case selection screen appears, either select the All option to run all the test cases in the pipeline or use the Single/MultipleFeatures option to select a few test cases to run.

For the **Select_Option** field, select any of the following values:

- All: By default, all the Policy test cases are selected for execution.
- Single/MultipleFeatures: This option allows you to select any number of test
 cases you want to run from the list of total test cases. Select the checkbox for
 each feature you want to run. Based on your selection, related test cases
 appear on the page.

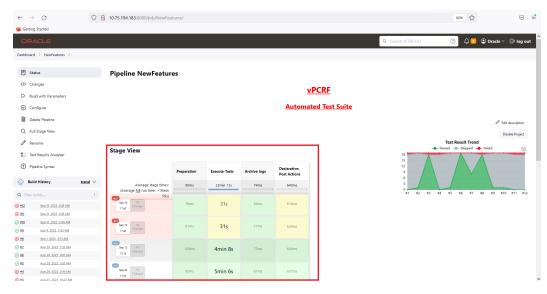


Figure 4-2 Pipeline New Features



5. Once test cases are selected, click **Build** to start the execution, the progress can be monitored on the pipeline dashboard.

Figure 4-3 Stage View



6. Once the run is finished then the build will come with a



or

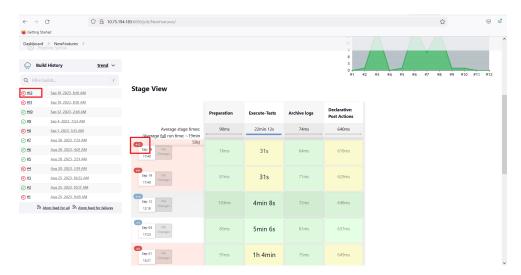


symbol depicting if all test cases selected have passed or failed.

To get more detailed information, click on the build number and it will open the build details page.

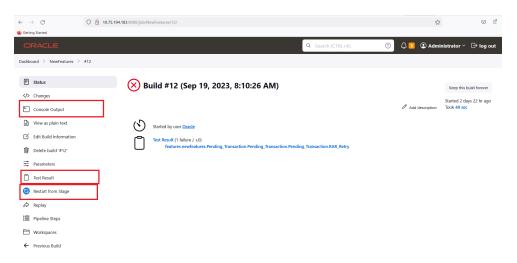


Figure 4-4 Stage View Details



8. On the Build details page, the user can view the logs for the execution, see the test results to check which features have failed and passed and also restart the execution.

Figure 4-5 Build Status





Appendix A- Resource Requirements

Table 2 Resource Requirements

Component	vCPU	RAM (GB)	Storage (GB)	vNIC
ATS	8	16	256	1



Appendix B- VM Networking Layout

Table 3 VM Networking Layout

Networking Name/ Function	VM vNIC	
OAM	eth0	

