



# Serviceability Diagnostics

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## Feature Summary and Revision History

### Summary Data

Table 1: Summary Data

Applicable Products or Functional Area	PCF
Applicable Platform(s)	SMI
Feature Default Setting	Enabled - Always-on
Related Documentation	Not Applicable

### Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2023.01.0

## Feature Description

The Cisco Policy Control Function (PCF) doesn't offer capabilities for viewing the system of consolidated health such as Policy and Charging Rules Function (PCRF) Diagnostics. PCF relies significantly on numerous Kubernetes commands to determine the system of health.

PCF implements the diagnostics utility to provide the health check consolidated output of different critical services on the PCF namespace. Validates health of pods, services, and ingress points and produces a pass or fail health check status for each service.

The services for the health check:

- Rest-endpoint
- Engine
- Diameter
- Common Data Layer (CDL)
- ETCD
- Database (DB)
- Health check of the Splunk
- Active alarm report

#### Utility Details:

- Critical Pod Service Health Check and other Pods Check : When the status argument is "all", then all pods health check for previous mentioned services gets executed.
- CDL Pods Health Check:
  - When the status argument is "cdl" for the CDL pods health check, then the health check gets executed.
  - When the cdl-ep pods are up and running, then the geo sync functionality gets validated, and the execution status gets displayed.
- Database Pods Health Check:
  - When the status of the argument is "db" for the DB pod of the health check, then the health check gets executed.
  - When the pods are up, then the accessibility of the database gets performed.
- Health check of the Splunk
  - When the status of the argument is "splunk" for the health check of the Splunk, then the logging status gets executed and displays details on the console.
- Active alarm report
  - When the status argument input as "alert", then Active alert summary details get displays on the console.

# Serviceability KPIs Diagnostics Implementation

## Feature Summary and Revision History

### Feature Description

The Cisco Policy Control Function (PCF) doesn't offer capabilities for viewing the messages packet counters at each critical application component. The PCF uses a Key Performance Indicators (KPIs) diagnostics utility to compute and determine the systems behavioral status at a specified time interval. The diagnostics utility also collects the counters from the component and helps to limiting down the issue to a particular area. The utility computes the appropriate KPI counters by querying the prometheus server.

The services to check the counters:

- Rest-endpoint
- Engine
- CDL

## Advanced System Diagnostics with Comprehensive Service Monitoring

*Table 3: Feature History*

Feature Name	Release Information	Description
Enhancement for Service Diagnostics CLI Command	2025.02.0	<p>This feature introduces advanced capabilities to the PCF system diagnostics command by incorporating additional service monitoring functionalities.</p> <p>It provides users with the ability to retrieve detailed information about network repository functions and LDAP server connections directly through the CLI:</p> <p><b>pcf-system diagnostics status nrf/ldap</b></p> <p><b>Default Setting:</b> Disabled - Configuration required to enable</p>

The Comprehensive CLI Enhancements for Service Diagnostics feature significantly expands the diagnostic capabilities of the PCF system by integrating detailed service monitoring functionalities into the existing **pcf-system diagnostics status** CLI command. The key aspects of this feature include:

- Advanced NRF (Network Repository Function) Monitoring:
  - rest-endpoint leader
  - Last registered NRF IP and connection timestamp
  - Previous NRF IP and connection timestamp
- Detailed LDAP (Lightweight Directory Access Protocol) Endpoint Analysis:
  - ldap-endpoint name
  - LDAP server connections IPs per endpoint

## Display NRF Connectivity Diagnostics

The system diagnostics for NRF displays the rest-endpoint leader, last and previously registered NRF IP and connection timestamp.

### Procedure

**Step 1** Login to the Global Configuration mode.

**Step 2** Enter the **pcf-system diagnostics status** with **nrf** to view the rest-endpoint leader, last and previously registered NRF IP and connection timestamp.

```
[unknown] pcf# pcf-system diagnostics status nrf
Fri Mar 7 15:38:32.283 UTC+00:00
diagnosticsInfo :
##### START Diagnostics #####
+-----+
Rest-ep Leader : pcf-rest-ep-57ccc66f55-wp4mb
LastRegistered NRF :
URI:http://192.168.000.0:0000/nnrf-nfm/v1      TimeStamp:2025-03-07T15:37:19.065Z
PreviouslyRegistered NRF :
URI:http://192.168.000.0:0000/nnrf-nfm/v1      TimeStamp:2025-03-07T15:36:37.356Z
+-----+
##### END Diagnostics #####
```

## Display LDAP Endpoint Analysis

The system diagnostics for LDAP endpoint displays the ldap-endpoint name and LDAP server connection IPs per endpoint.

### Procedure

**Step 1** Login to the Global Configuration mode.

**Step 2** Enter the **pcf-system diagnostics status** with **ldap** to view the ldap-endpoint name and LDAP server connection IPs per endpoint.

```
[svi-cndp-tb8-s2/cluster2] pcf# pcf-system diagnostics status ldap
Wed Feb 19 07:50:28.533 UTC+00:00
diagnosticsInfo :
##### START Diagnostics #####
Ldap Connection Details:
+-----+
Ldap Endpoint Pod-name : ldap-pcf-cps-ldap-ep-68f5fb5c78-fsv6x
Server Address : 192.168.000.0#389      Connection Count : 5
Server Address : 192.168.000.0#489      Connection Count : 6
Server Address : 192.168.000.0#589      Connection Count : 7
+-----+
+-----+
Ldap Endpoint Pod-name : ldap-pcf-cps-ldap-ep-68f5fb5c78-zvl2l
Server Address : 192.168.000.0#389      Connection Count : 5
Server Address : 192.168.000.0#489      Connection Count : 6
Server Address : 192.168.000.0#589      Connection Count : 7
+-----+
##### END Diagnostics #####
```

## KPI Counter for LDAP Connectivity

Here is the KPI counter for **ldapconnections\_established** in system diagnostics:

```
ldapconnections_established_total{node_type="unknown",
server_address="192.168.105.150#390",pod_name="ldap-pcf-cluster2-cps-ldap-ep-7688dff8fb-j6xkk",
} 3.0
```

