



## **CPS Release Change Reference, Release 22.1.0**

**First Published:** 2022-03-24

**Last Modified:** 2022-03-24

### **Americas Headquarters**

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
<http://www.cisco.com>  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 527-0883

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

All printed copies and duplicate soft copies of this document are considered uncontrolled. See the current online version for the latest version.

Cisco has more than 200 offices worldwide. Addresses and phone numbers are listed on the Cisco website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).

The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. Exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on standards documentation, or language that is used by a referenced third-party product.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <https://www.cisco.com/c/en/us/about/legal/trademarks.html>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1721R)

© 2022 Cisco Systems, Inc. All rights reserved.



## CONTENTS

---

### PREFACE

<b>Preface</b>	<b>v</b>
About This Guide	v
Audience	v
Additional Support	vi
Conventions (all documentation)	vi
Communications, Services, and Additional Information	vii
Important Notes	viii

---

### CHAPTER 1

<b>22.1.0 Features and Changes</b>	<b>1</b>
22.1.0 Features and Changes	1

---

### CHAPTER 2

<b>Mobile</b>	<b>3</b>
11-Digit MSISDN Support	3
Dynamic Preemption-Capability and Dynamic Preemption-Vulnerability Support for Dedicated Bearers	4
KPI Support for Rx Binding DB Health Check	5

---

### CHAPTER 3

<b>Operations</b>	<b>7</b>
API Additions or Changes	7
MIB Additions or Changes	7
SNMP Alarm Additions or Changes	7
Statistics/KPI Additions or Changes	8

---

### CHAPTER 4

<b>Platform</b>	<b>9</b>
Memcache Memory Size Support on perfcient	9
Upgrade MongoDB from 3.6.17 to 4.0.27	10

Upgrade MongoDB from 3.6.9 to 4.0.27 11

Support for Ubuntu 18.04 LTS Version 13

---

**CHAPTER 5**      **Security Enhancements 15**

Security Enhancements 15

PSB Requirements for 22.1.0 Release 15

---

**CHAPTER 6**      **vDRA 17**

Display Records Count in DRA Peer Monitoring and CRD GUI 17

Exposing Prometheus API on OAM Network 18

Import Custom Reference Data Enhancements 19

Ingress and Egress API Rate limit Configuration 20

Method to Ship Docker, Journalctl, and QNS logs to EFK Stack 22

Regex Wildcard Support for Filtering in Peer Monitoring GUI and CRD 23

Support for Automated Log Collection during Outages 24

WPS Gx/Rx RAR and Rx ASR Messages Fallback to non-WPS Peer 25



## Preface

---

- [About This Guide](#), on page v
- [Audience](#), on page v
- [Additional Support](#), on page vi
- [Conventions \(all documentation\)](#), on page vi
- [Communications, Services, and Additional Information](#), on page vii
- [Important Notes](#), on page viii

## About This Guide



---

**Note** The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. While any existing biased terms are being substituted, exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on RFP documentation, or language that is used by a referenced third-party product.

---

This document is a part of the Cisco Policy Suite documentation set.

For information about available documentation, see the *CPS Documentation Map* for this release at [Cisco.com](https://www.cisco.com).



---

**Note** The PATS/ATS, ANDSF, and MOG products have reached end of life and are not supported in this release. Any references to these products (specific or implied), their components or functions in this document are coincidental and are not supported. Full details on the end of life for these products are available at: <https://www.cisco.com/c/en/us/products/wireless/policy-suite-mobile/eos-eol-notice-listing.html>.

---

## Audience

This guide is best used by these readers:

- Network administrators

- Network engineers
- Network operators
- System administrators

This document assumes a general understanding of network architecture, configuration, and operations.

## Additional Support

For further documentation and support:

- Contact your Cisco Systems, Inc. technical representative.
- Call the Cisco Systems, Inc. technical support number.
- Write to Cisco Systems, Inc. at [support@cisco.com](mailto:support@cisco.com).
- Refer to support matrix at <https://www.cisco.com/c/en/us/support/index.html> and to other documents related to Cisco Policy Suite.

## Conventions (all documentation)

This document uses the following conventions.

Conventions	Indication
<b>bold font</b>	Commands and keywords and user-entered text appear in <b>bold font</b> .
<i>italic font</i>	Document titles, new or emphasized terms, and arguments for which you supply values are in <i>italic font</i> .
[ ]	Elements in square brackets are optional.
{x   y   z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[ x   y   z ]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
courier font	Terminal sessions and information the system displays appear in courier font.
<>	Nonprinting characters such as passwords are in angle brackets.

Conventions	Indication
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.



**Note** Means reader take note. Notes contain helpful suggestions or references to material not covered in the manual.



**Caution** Means reader be careful. In this situation, you might perform an action that could result in equipment damage or loss of data.



**Warning** IMPORTANT SAFETY INSTRUCTIONS.

Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS



**Note** Regulatory: Provided for additional information and to comply with regulatory and customer requirements.

## Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](#).
- To get the business impact you're looking for with the technologies that matter, visit [Cisco Services](#).
- To submit a service request, visit [Cisco Support](#).
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit [Cisco Marketplace](#).
- To obtain general networking, training, and certification titles, visit [Cisco Press](#).
- To find warranty information for a specific product or product family, access [Cisco Warranty Finder](#).

### Cisco Bug Search Tool

[Cisco Bug Search Tool](#) (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

## Important Notes



---

**Important**

Any feature or GUI functionality that is not documented may not be supported in this release or may be customer specific, and must not be used without consulting your Cisco Account representative.

---





# CHAPTER 1

## 22.1.0 Features and Changes

- [22.1.0 Features and Changes](#), on page 1

### 22.1.0 Features and Changes

*Table 1: 22.1.0 Features and Changes*

Features/Behavior Changes	Applicable Product(s)/ Functional Area	Release Introduced/ Modified
<a href="#">11-Digit MSISDN Support</a> , on page 3	CPS	22.1.0
<a href="#">Display Records Count in DRA Peer Monitoring and CRD GUI</a> , on page 17	vDRA	22.1.0
<a href="#">Dynamic Preemption-Capability and Dynamic Preemption-Vulnerability Support for Dedicated Bearers</a> , on page 4	CPS	22.1.0
<a href="#">Exposing Prometheus API on OAM Network</a> , on page 18	vDRA	22.1.0
<a href="#">Import Custom Reference Data Enhancements</a> , on page 19	vDRA	22.1.0
<a href="#">Ingress and Egress API Rate limit Configuration</a> , on page 20	vDRA	22.1.0
<a href="#">KPI Support for Rx Binding DB Health Check</a> , on page 5	CPS	22.1.0
<a href="#">Memcache Memory Size Support on perfclient</a> , on page 9	CPS	22.1.0
<a href="#">Method to Ship Docker, Journalctl, and QNS logs to EFK Stack</a> , on page 22	vDRA	22.1.0
<a href="#">PSB Requirements for 22.1.0 Release</a> , on page 15	CPS/vDRA	22.1.0

Features/Behavior Changes	Applicable Product(s)/ Functional Area	Release Introduced/ Modified
Regex Wildcard Support for Filtering in Peer Monitoring GUI and CRD, on page 23	vDRA	22.1.0
SNMP Alarm Additions or Changes, on page 7	CPS/vDRA	22.1.0
Statistics/KPI Additions or Changes, on page 8	CPS/vDRA	22.1.0
Support for Automated Log Collection during Outages, on page 24	vDRA	22.1.0
Support for Ubuntu 18.04 LTS Version, on page 13	vDRA	22.1.0
Upgrade MongoDB from 3.6.17 to 4.0.27, on page 10	CPS	22.1.0
Upgrade MongoDB from 3.6.9 to 4.0.27, on page 11	vDRA	22.1.0
WPS Gx/Rx RAR and Rx ASR Messages Fallback to non-WPS Peer, on page 25	vDRA	22.1.0



## CHAPTER 2

# Mobile

- [11-Digit MSISDN Support, on page 3](#)
- [Dynamic Preemption-Capability and Dynamic Preemption-Vulnerability Support for Dedicated Bearers, on page 4](#)
- [KPI Support for Rx Binding DB Health Check, on page 5](#)

## 11-Digit MSISDN Support

### Feature Summary and Revision History

**Table 2: Summary Data**

Applicable Product(s) or Functional Area	CPS
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	Not Applicable

**Table 3: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

The CPS now supports 11-digit MSISDN when it receives Gx\_CCR-I to create the Gx session.

When `udc.msisdn.digit` parameter is set to 15 in `qns.conf` file and 11-digit MSISDN is sent as a part of the Gx session initiation request, then:

- QNS sends 10 digit MSISDN to UDC.
- Country code is removed in QNS and only 10 digit MSISDN session is stored.

- The removed country code is stored as prefix.
- UDC makes LDAP Query to MIND using 10-digits. MIND always stores the 10-digit MSISDN.

## Dynamic Preemption-Capability and Dynamic Preemption-Vulnerability Support for Dedicated Bearers

### Feature Summary and Revision History

**Table 4: Summary Data**

Applicable Product(s) or Functional Area	CPS
Applicable Platform(s)	Not Applicable
Default Setting	Disabled - Configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	<i>Not Applicable</i>

**Table 5: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

In CPS, with Dynamic Allocation Retention Priority (ARP) Functionality, Dedicated Bearers (Rx rule) QOS ARP Priority-Level (PL) value can be calculated based on the Default Bearer ARP Priority-Level, using the mathematical expression (for example D, D+2 and D-2).

In the CPS 22.1.0 release, the Dynamic ARP functionality is enhanced to support Preemption-Capability (PC) and Preemption-Vulnerability (PV) for dedicated bearers based on the default bearer PC and PV values.

The following new statistics are added:

- rx\_dynamic\_qos\_<Media-Type>\_pc\_<dynamic\_PC>
- gx\_default\_qos\_pc\_<PC>
- rx\_dynamic\_qos\_<Media-Type>\_pv\_<dynamic\_PV>
- gx\_default\_qos\_pv\_<PV>

For more information on statistics, see [Statistics/KPI Additions or Changes, on page 8](#).

# KPI Support for Rx Binding DB Health Check

## Feature Summary and Revision History

**Table 6: Summary Data**

Applicable Product(s) or Functional Area	CPS
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	Not Applicable

**Table 7: Revision History**

Revision Details	Release
First introduced	22.1.0

## Feature Description

In CPS, if an IPv6 binding is not present in the binding-db, the Policy Control Rule Function (PCRF) determines status of IPv6 binding-db to take corrective action for the session. You can now initiate a message that results in querying the binding-db and allow the PCRF to take corrective action based on the response. The following new KPIs are added:

- Rxb AAA\_<errorCode>
- Rxb AAA\_<errorCode>

For more information on statistics, see [Statistics/KPI Additions or Changes](#)





## CHAPTER 3

# Operations

- [API Additions or Changes, on page 7](#)
- [MIB Additions or Changes, on page 7](#)
- [SNMP Alarm Additions or Changes, on page 7](#)
- [Statistics/KPI Additions or Changes, on page 8](#)

## API Additions or Changes

No changes were introduced in this release.

## MIB Additions or Changes

No changes were introduced in this release.

## SNMP Alarm Additions or Changes

The following table provides information on new alarms added in the 22.1.0 release:

**Table 8: Alarm Additions**

New Alarms	Release Introduced	Applicable Product(s)
ELASTICSEARCH_ NOT_REACHABLE	22.1.0	vDRA

For more information, see the following sections:

- *Application Notifications* table in the *CPS vDRA SNMP and Alarms Guide*
- *Sample Alert Rules* table in the *CPS vDRA SNMP and Alarms Guide*

## Statistics/KPI Additions or Changes

The following table provides information on new/modified statistics:

**Table 9: Statistics Additions**

Statistics Name	Description	Applicable Product(s)
rx_dynamic_qos_<Media-Type>_pc_<dynamic_PC>	Displays the number of Rx rule install counts for each Media Type provisioned with dynamic QoS PCI.	CPS
gx_default_qos_pc_<PC>	Displays the number of default bearers per PCI.	CPS
rx_dynamic_qos_<Media-Type>_pv_<dynamic_PV>	Displays the number of Rx rule install counts for each Media Type provisioned with dynamic QoS PVI.	CPS
gx_default_qos_pv_<PV>	Displays the number of default bearers per PVI.	CPS
bindDB_AAA_TimerExpiry_<resultCode>	Displays the number of AAA messages received from PAS with error result codes during Timer expiry.	CPS
bindDB_AAA_CCR-U_<resultCode>	Displays the number of AAA messages received from PAS with error result codes during CCR-U processing.	CPS
elasticsearch_server_status	Displays the status of Elasticsearch server.	vDRA
fluentbit_non_proxy_server_status	Displays the status of the last acknowledgement received time when the non-proxy servers flushed the logs to the proxy server.	vDRA
fluentbit_non_proxy_records_flushed	Displays the number of records last flushed by the non-proxy servers to the proxy server.	vDRA





## CHAPTER 4

# Platform

- [Memcache Memory Size Support on pcrfclient](#), on page 9
- [Upgrade MongoDB from 3.6.17 to 4.0.27](#), on page 10
- [Upgrade MongoDB from 3.6.9 to 4.0.27](#), on page 11
- [Support for Ubuntu 18.04 LTS Version](#), on page 13

## Memcache Memory Size Support on pcrfclient

### Feature Summary and Revision History

**Table 10: Summary Data**

Applicable Product(s) or Functional Area	CPS
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	<i>CPS Installation Guide for VMware</i>

**Table 11: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

The stale-session-cleaner uses memcached process on pcrfclient VMs. The memory requirements varies based on the deployment size. CPS supports changing the memcached memory size on pcrfclients. To support this, a new parameter `pcrfclient_memcache_memory_size` is added.

This parameter doesn't change memcached memory on other VMs.

For more information, see the *General Configuration Parameters* table in the *CPS Installation Guide for VMware*.

# Upgrade MongoDB from 3.6.17 to 4.0.27

## Feature Summary and Revision History

**Table 12: Summary Data**

Applicable Product(s) or Functional Area	CPS
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	Not Applicable

**Table 13: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

In CPS 22.1.0, MongoDB has been upgraded from 3.6.17 to 4.0.27.

To verify MongoDB version on VMs, execute the following command from Cluster Manager:

```
cat /etc/broadhop/mongoConfig.cfg | grep -e '^MEMBER' -e '^ARBITER=' | cut -d= -f 2 | while
  read hnp; do echo
  $hnp; mongo --quiet $hnp --eval "db.version()"; done
```




---

**Note** Post upgrade all the data members and arbiters for all the replica-sets must show the same MongoDB version.

---

### Configuration and Restrictions

During ISSM, only one new VM and one new replica-set is created with a new MongoDB version.

Table 14: Upgrade, Migration, or Backward Compatibility

Database	Attribute/Class	Description	Upgrade/Migration/Backward Compatibility
MongoDB Server: 4.0.27 MongoDB Client: 3.12.9	NA	Post ISSM, new VM is created with new MongoDB server version 4.0.27 which is not compatible with MongoDB java driver (client) version 3.7.1.  As a prerequisite, MongoDB java driver (client) version 3.12.9 should be installed on the CPS 21.1.0/21.2.0 systems prior to the ISSM to CPS 22.1.0 version.	MongoDB java driver (client) version 3.7.1 is not compatible with MongoDB server version 4.0.27.  As a prerequisite, MongoDB java driver (client) version should be updated to 3.12.9 which is compatible with MongoDB server version 4.0.27.

**Supported Versions**

CPS 19.5.0 and later releases

**Unsupported Versions**

Any CPS version prior to CPS 19.5.0

**Backup/Restore Considerations**

It is recommended to take the backup of critical databases, such as balance, SPR, and audit. For more information on backup and restore, see the *CPS Backup and Restore Guide*.

**Geo/HA Considerations**

During ISSM, a VM and a replica set member is newly created with only new mongo version.

**Troubleshooting:**

- Due to some reason if MongoDB upgrade fails, check the mongo upgrade log in the following log location:  
`/var/log/broadhop/scripts/mongo_upgrade.log`
- Rectify the issue and re-run the **mongo\_upgrade.py** again to successfully upgrade the MongoDB version.

## Upgrade MongoDB from 3.6.9 to 4.0.27

**Feature Summary and Revision History**

Table 15: Summary Data

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable

Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	Not Applicable

**Table 16: Revision History**

Revision Details	Release
First introduced	22.1.0

**Feature Description**

In vDRA, MongoDB has been upgraded from 3.6.9 to 4.0.27.

**Note**

- Before you upgrade to vDRA 22.1.0 (MongoDB 4.0), ensure to update the feature compatibility version to 3.6 only on mongo-admin-db. For fresh installation, no changes are required.
- Ensure that no replica set member is in ROLLBACK or RECOVERING state.

**Table 17: Upgrade, Migration, or Backward Compatibility**

Database	Attribute/Class	Description	Upgrade / Migration / Backward Compatibility
Mongo DB Server: 4.0.27 Mongo DB Client: 3.12.9	NA	Post ISSM, new mongo container is created with new mongo server version 4.0.27, which is not compatible with mongo java driver (client) version 3.7.1.  As a prerequisite, MongoDB java driver (client) version 3.12.9 should be installed on the vDRA VNF 21.1.0/21.2.0 systems prior to the ISSM to vDRA 22.1.0 version.	Mongo java driver (client) 3.7.1 is updated to 3.12.9, which is compatible with Mongo server 4.0.27 version.

**Supported Versions**

vDRA 19.4.0 and later releases.

**Unsupported Versions**

Releases earlier than vDRA 19.4.0.

**Supported Storage Engine:** MMAPv1 storage engine is retained with MongoDB 4.0

**Prerequisites:** Run the following command before upgrade (21.1.0 to 22.1.0) and downgrade (22.1.0 to lower version) on all sites:

```
database fcvcheck
```

There are two options for `database fcvcheck` command.

- `set`: It checks and sets fcv only on primary member.
- `check`: It only checks fcv on all members (primary/secondary).



**Note** It is recommended to use set option first and then check to make sure fcv is replicated also on secondary members.

The `database fcvcheck` command will be a part of prerequisite patch. For more information, connect with the Cisco Technical Representative.

Upgrade/downgrade should not be triggered if any errors are found or fcv is not replicated on secondary members. Make sure to resolve the errors and rerun the `database fcvcheck` command. Once all errors are resolved, proceed with MongoDB upgrade/downgrade.

**Mongo Driver Version:** The compatible mongo driver 3.12 version is supported for MongoDB 4.0.

**Troubleshooting:**

- Due to some reason if MongoDB upgrade fails, verify shard status using `show database status` command.
- Verify each replica set member logs in `/data/db/mongo-<port>.log` file under corresponding container.
- Run `mongo --version` command inside `mongo/admin-db/orchestrator` container to confirm 4.0.27 mongo version.

## Support for Ubuntu 18.04 LTS Version

**Table 18: Summary Data**

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	Not Applicable

**Table 19: Revision History**

Revision Details	Release
First introduced	22.1.0

## Feature Description

In CPS vDRA, Ubuntu is upgraded to the latest 18.04 stable version. The following docker, python, and zing package versions are also upgraded.

- Docker - 20.10.8 version
- Python - 3.6.9 version
- Zing - 21.08 version

Use the following latest release and Kernel version in Base VM's:

```
## cat /etc/lsb-release
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=18.04
DISTRIB_CODENAME=bionic
DISTRIB_DESCRIPTION="Ubuntu 18.04.6 LTS"
# uname -a
Linux dral-sys04-master-0 4.15.0-163-generic #171-Ubuntu SMP Fri Nov 5 11:55:11
UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
```



## CHAPTER 5

# Security Enhancements

- [Security Enhancements](#), on page 15

## Security Enhancements

This section lists enhancements introduced to support Cisco Product Security Requirements and the Product Security Baseline (PSB). For more information about Cisco Product Security Requirements, refer to: <https://www.cisco.com/c/en/us/about/security-center/security-programs/secure-development-lifecycle/sdl-process.html>

## PSB Requirements for 22.1.0 Release

### Feature Summary and Revision History

**Table 20: Summary Data**

Applicable Product(s) or Functional Area	CPS/vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	Not Applicable

**Table 21: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

CPS PCRF meets the Cisco security guidelines and is aligned with the security features for 22.1.0 release. CPS now supports the following PSB requirements:

**Table 22: CPS PSB Requirements**

<b>PSB Item</b>	<b>Description</b>
CT2120: SEC-WEB-XSS-4	Prevent cross-site scripting vulnerabilities.
CT2119: SEC-TLS-CURR-6	Support current TLS versions.
CT2107: SEC-CRY-PRIM-7	Use approved cryptographic primitives and parameters.
CT2112: SEC-SW-SIG-5	Digitally sign software and control the keys.
CT1945: SEC-UPS-NOBACK-2	Protect against Supplier backdoors, malware, or known vulnerabilities.

CPS vDRA meets the Cisco security guidelines and is aligned with the security features for 22.1.0 release. vDRA now supports the following PSB requirements:

**Table 23: vDRA PSB Requirements**

<b>PSB Item</b>	<b>Description</b>
CT2120: SEC-WEB-XSS-4	Prevent cross-site scripting vulnerabilities.
CT2119: SEC-TLS-CURR-6	Support current TLS versions.
CT2107: SEC-CRY-PRIM-7	Use approved cryptographic primitives and parameters.
CT2112: SEC-SW-SIG-5	Digitally sign software and control the keys.
CT2111: SEC-LOG-CONTENT-3	Include identifying information in all log entries.
CT2110: SEC-LOG-ATTACK-2	Log indications of attack or abuse.
CT1570:SEC-LOG-ADMIN	Log administrative access.





# CHAPTER 6

## vDRA

- [Display Records Count in DRA Peer Monitoring and CRD GUI](#), on page 17
- [Exposing Prometheus API on OAM Network](#), on page 18
- [Import Custom Reference Data Enhancements](#), on page 19
- [Ingress and Egress API Rate limit Configuration](#), on page 20
- [Method to Ship Docker, Journalctl, and QNS logs to EFK Stack](#), on page 22
- [Regex Wildcard Support for Filtering in Peer Monitoring GUI and CRD](#), on page 23
- [Support for Automated Log Collection during Outages](#), on page 24
- [WPS Gx/Rx RAR and Rx ASR Messages Fallback to non-WPS Peer](#), on page 25

## Display Records Count in DRA Peer Monitoring and CRD GUI

### Feature Summary and Revision History

**Table 24: Summary Data**

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	<i>CPS vDRA Administration Guide</i>

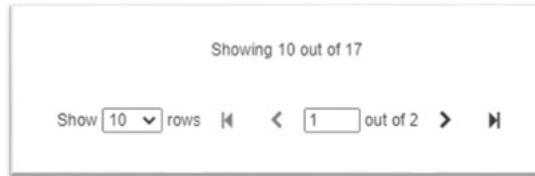
**Table 25: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

In the vDRA Peer Monitoring and CRD GUI, through Pagination, you can view count of records that gets displayed in the webpage link out of total number of records fetched by API. This value changes as per the change in filtering of records through filter toolbar. The following figure shows an example of records count.

**Figure 1: Displaying Records Count**



For more information, see *Peer Monitoring* section in the *CPS vDRA Administration Guide*.

## Exposing Prometheus API on OAM Network

**Table 26: Summary Data**

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	<i>CPS vDRA Operations Guide</i>

### Feature Description

The CPS vDRA supports exposing of Prometheus API queries on OAM network using HAProxy. vDRA allows operators to fetch necessary statistics from the system through the Prometheus API and further analyze in a single consolidated view. The following functions are supported:

- vDRA data gets pulled from Prometheus API and loaded directly into system for visualization. This includes data from the following three data stores:
  - Prometheus Hi-Res
  - Prometheus Trending
  - Prometheus Planning
- GET queries: GET /api/v1/query
- TLS or HTTPS-based authentication



**Note** As per validations, the average number of queries supported without performance impact is approx 70 queries, which are run sequentially at required intervals.

This number varies based on the KPIs used. It is recommended to monitor only critical KPIs.

For more information, see the *Prometheus Queries* section in the *Prometheus and Grafana* chapter of the *CPS vDRA Operations Guide*.

## Import Custom Reference Data Enhancements

**Table 27: Summary Data**

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	<i>CPS Central Administration Guide</i>

### Feature Description

In vDRA, the **Export CRD to Golden Repository** and the **Import CRD to DB** features functioned with two different approaches. To reduce CRD fallback steps export and import processes are merged into one. As shown in the following figure, check the (optional) **Export CRD to Golden Repository** check box to export CRD before Import.

Figure 2: Export CRD to Golden Repository

**Import Custom Reference Data**

*Warning: This will overwrite or add into CRD data.*

**Import the tables:**

File to Import...

Relax CRD schema validation.

\*Please make sure to push existing crd data into Golden CRD repository before performing Import All (by selecting "Export CRD to Golden Repository" checkbox).

Export CRD to Golden Repository. When system experiences errors importing new crd data the crd cache will be built by using golden-crd data.

\*Please enter valid SVN server Hostname or IP

+

**Import**

464629

The **Import CRD** feature allows you to first export CRD to golden repository and then go for the existing Import CRD process to DB. This feature is supported only for bulk CRD import and export.

For more information, see the *Import Custom Reference Data* procedure in the *CPS Central Administration Guide*.

## Ingress and Egress API Rate limit Configuration

### Feature Summary and Revision History

Table 28: Summary Data

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable

Related Documentation	<i>CPS vDRA Configuration Guide</i> <i>CPS vDRA Operations Guide</i>
-----------------------	---

**Table 29: Revision History**

Revision Details	Release
First introduced	22.1.0

**Feature Description**

The vDRA uses PCRF session query to query SRK from PCRF to route the request and then recreates the binding entry. There is no rate limit for a PCRF session query triggered from vDRA. Similarly, Ingress APIs (Binding/Session/SLF/CRD/SVN/Topology/Grafana/Prometheus) does not have an overload protection mechanism.

In the CPS 22.1.0 and later releases, vDRA supports a configurable option to rate-limit the incoming traffic and outgoing traffic on the API interface at director level. This rate limiting process protects the system when acting as a client or server. Also, to prevent any back pressure and working on stale messages, vDRA supports configurable queue size and length message SLAs.

For more information, see the *Ingress and Egress Rate Limit Configuration* section in the *CPS vDRA Configuration Guide* and the following *CLI Commands* in the *CPS vDRA Operations Guide*.

- *dra set-ratelimit binding-api-imsi-apn*
- *dra set-ratelimit topology-api*
- *dra set-ratelimit binding-api-ipv6*
- *dra set-ratelimit oam-api*
- *dra set-ratelimit slf-api*
- *dra set-ratelimit session-api*
- *dra set-ratelimit binding-api-msisdn*
- *dra set-ratelimit binding-api-msisdn-apn*
- *dra remove-ratelimit binding-api-imsi*
- *dra remove-ratelimit binding-api-imsi-apn*
- *dra remove-ratelimit binding-api-ipv6*
- *dra remove-ratelimit binding-api-msisdn-apn*
- *dra remove-ratelimit binding-api-msisdn*
- *dra remove-ratelimit binding-api*
- *dra remove-ratelimit oam-api*
- *dra remove-ratelimit session-api*
- *dra remove-ratelimit slf-api*

- *dra show-ratelimit topology-api*
- *dra show-ratelimit binding-api-imsi-apn*
- *dra show-ratelimit binding-api-ipv6*
- *dra show-ratelimit binding-api-imsi*
- *dra show-ratelimit binding-api-msisdn-apn*
- *dra show-ratelimit binding-api-msisdn*
- *dra show-ratelimit binding-api*
- *dra show-ratelimit oam-api*
- *dra show-ratelimit session-api*
- *dra show-ratelimit slf-api*

## Method to Ship Docker, Journalctl, and QNS logs to EFK Stack

**Table 30: Summary Data**

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Disabled configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	<i>CPS vDRA Operations Guide</i> <i>CPS vDRA SNMP and Alarms Guide</i>

**Table 31: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

vDRA supports a unified method to forward all required logs such as journalctl, consolidated-qns logs, mongo logs to elasticsearch. You can have a consolidated view of all the logs with Elasticsearch Fluentbit Kibana (EFK) stack. In addition, using Kibana you can visualize and filter required logs for analysis.

**Prerequisite:** Before enabling this feature or running any CLIs, add the pem key with the name "cps.pem" to the location on master and control VMs at the path: `/data/orchestrator/pemKey`

The following new alarm is added for this feature:

- ELASTICSEARCH\_NOT\_REACHABLE

The following new commands are added for this feature:

- log-forward fluentbit local-forward
- log-forward fluentbit elasticsearch elastic-ip
- log-forward fluentbit filter key
- log-forward fluentbit filter-clear
- log-forward fluentbit tune flush\_interval
- show fluent-bit configurations

For more information, see the following sections:

- *Method to Ship Docker, Journalctl, and QNS Logs to EFK Stack* and *CLI Commands* chapters in the *CPS vDRA Operations Guide*
- *Application Notification* and *Sample Alert Rules* sections in the *CPS vDRA SNMP and Alarms Guide*

The following KPIs are added:

- elasticsearch\_server\_status
- fluentbit\_non\_proxy\_server\_status
- fluentbit\_non\_proxy\_records\_flushed

For more information on statistics, see [Statistics/KPI Additions or Changes](#)

## Regex Wildcard Support for Filtering in Peer Monitoring GUI and CRD

### Feature Summary and Revision History

**Table 32: Summary Data**

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	<i>CPS vDRA Administration Guide</i>

**Table 33: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

In vDRA, you can use Regex/Wildcard values in the Search field when you filter active and inactive peer endpoints or when you view filtered Custom Reference Data (CRD).

In the Peer Monitoring window, you can enter a search value in the Search field, and click either the **Search** icon or press **Enter** to view details. Based on inputs the vDRA searches the entry and displays the output.

In the Custom Reference Data Tables view, open a CRD table and in the search box you can enter Regex/Wildcard expression to view the displayed results according to the expression.

For example, if the input value is "ndc2c\*" then the search results displayed are ndc2c.gx.xom,ndc2c.gxx.com and so on.

For more information, see *View Filtered Data* section in the *CPS vDRA Administration Guide*.

## Support for Automated Log Collection during Outages

**Table 34: Summary Data**

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	<i>CPS vDRA Operations Guide</i>

### Feature Description

The Cisco Policy Suite (CPS) supports a single script to collect the orchestrator, various docker, journalctl, and qns logs during outages. Through a single orchestrator CLI command you can collect heapdump and threaddump outputs of application containers.

- All docker container logs from VMs for all containers



**Note** Before enabling this feature or running any CLIs, add the pem key with the name "cps.pem" to the location on master and control VMs at the path: /data/orchestrator/pemKey. You can use a global command **log collect all** to collect all required logs.

- Top outputs from all VMs.
  - All Mongo logs from Database VMs.
  - The logs based on input. You can identify whether the logs are from all VMs or any specific VMs.
- All journalctl logs from all VMs.
- All qns logs.



- Logs that do not impact disk storage. During mongo logs collection when logs exceed the maximum storage capacity, script hard stops the log collection.

Collected logs gets stored as *.tar.gz* files and will be copied to external server.

*Tar.gz* file contains all logs from respective containers and under respective container names.

- heapdump and threaddump outputs from the application containers.

During implementation of binding VNF and Application VNF, CPS collects:

For more information, see the following sections in the *CPS vDRA Operations Guide*:

- *debug log collect*
- *log collect config*
- *log collect all*

## WPS Gx/Rx RAR and Rx ASR Messages Fallback to non-WPS Peer

**Table 35: Summary Data**

Applicable Product(s) or Functional Area	vDRA
Applicable Platform(s)	Not Applicable
Default Setting	Enabled - Always-on
Related Changes in This Release	Not Applicable
Related Documentation	<i>CPS vDRA Configuration Guide</i>

**Table 36: Revision History**

Revision Details	Release
First introduced	22.1.0

### Feature Description

vDRA always routes Gx RAR, Rx RAR, and Rx ASR messages using destination host routing. vDRA uses peer mentioned in the **destination-host** AVP to route Gx RAR, Rx RAR, and Rx ASR messages. Thus, WPS Gx RAR, Rx RAR, and Rx ASR messages gets routed to WPS peer and non-WPS Gx RAR, Rx RAR, and Rx ASR messages gets routed to non-WPS peer.

In this CPS 22.1.0 release, vDRA supports fallback of WPS Gx RAR, Rx RAR, and Rx ASR messages to non-WPS peer using Suffix-Based Destination Host routing when there is no active WPS peer available locally or globally.

For more information, see the *Supporting Fallback of WPS Gx RAR, Rx RAR, and Rx ASR Messages to non-WPS Peer* section in the *CPS vDRA Configuration Guide*.

