Oracle® Communications Diameter Signaling Router
Network Impact Report

Release 8.6.0.1.0

F60114-02

February 2023

ORACLE®

Contents

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What's New in This Release

Release 8.6.0.1.0 - F60114-02, February 2023

Updated the PMAC version with 6.6.1.2.0-66.13.0 in the following sections:

- Compatibility
- Supported Software

Release 8.6.0.1.0 - F60114-01, July 2022

The following sections were updated in this guide for Release 8.6.0.1.0:

- Added new features in DSR Features and Enhancements
- Updated the Hardware and Software requirements in Hardware and Software Requirements
- Updated the MEALs Delta in MEAL Inserts

List of Tables

1
Introduction

The purpose of this document is to highlight the changes of the product that may have impact on the customer network operations and should be considered by the customer during planning for this release.

This document summarizes Diameter Signaling Router Release 8.6.0.0.0 new and enhancement features as compared to the previous release, and the operations impact of these features at a high level. The Feature Requirements Specification (FRS) documents remain the defining source for the expected behavior of these features.

1.1 Acronyms

The following table provides information about the acronyms and the terminologies used in this document.

Table 1-1   Acronyms

Acronym/Term	Description
APIGW	API Gateway
ASGU	Automated Server Group Upgrade
AS	Application Server
ASU	Automated Site Upgrade
AVP	Attribute Value Pair
BSBR	Binding SBR
CA	Communication Agent
CAF	Customized Application Framework
CLI	Command Line Interface
CLR	Cancel Local Request
DA-MP	Diameter Agent Message Processor
DAL	Diameter Application Layer
DCA	Diameter Custom Application Framework
DCL	Diameter Connection Layer
DEA	Diameter Edge Agent
DPC	Destination Point Code
DPL	Data Processor Library
DRMP	Diameter Routing Message Priority
DPI	Diameter Plug-in
DSA	Diameter Security Application
DoS	Denial of Service
EXGSTACK	Eagle Next Generation Stack
vEIR	Virtual Equipment Identity Register
ECR	Mobile Equipment-Identity-Check-Request

Table 1-1 (Cont.) Acronyms

Acronym/Term	Description
ECA	Mobile Equipment-Identity-Check-Answer
FLOBR	Flexible Link set Optional Based Routing
GUI	Graphical User Interface
GTT	Global title translation
GTA	Global title Address
HSS	Home Subscriber Server
HLR	Home Location Register
iLO	Integrated Lights Out
IMI	Internal Management Interface
IPv4	IPv4 address of the subscriber
IPv6	IPv6 address of the subscriber
IMSI	International Mobile Subscriber Identity
IMPU	IP Multimedia Public Identity
IMPI	IP Multimedia Private Identity
IOT	Interoperability Tests
KPI	Key Performance Indicator
LAI	Location Area Identity
LTE	Long Term Evolution
MAP	Mobile Application Part
MBR	Map Based Routing
MCC	Mobile Country Code
MEAL	Measurements, Events, Alarms, and Logging
MME	Mobility Management Entity
MMI	Man Machine Interface
MP	Message Processor
MPS	Messages per Second
MS	Mobile Station/Handset
MSU	Message signal Unit
MSISDN	Mobile Station International Subscriber Directory Number
MTC	Machine type communication
MTP	Message Transfer Part
MO	Managed Object
NE	Network Element
NGN	Next Generation Networks
NGN-PS	NGN Priority Services
NIDD	Non-IP data delivery [directly through MME/SGSN]
NMS	Network Management System
NOAM	Network Operations Administration and Maintenance
NF	Network Function
NRF	NF Repository Function
OAG	Oracle Accessibility Guidelines
OAM	Operations, Administration, Maintenance

Table 1-1   (Cont.) Acronyms

Acronym/Term	Description
OAM&P	Operations, Administration, Maintenance and Provisioning
OCUDR	Oracle Communications User Data Repository
OPC	Origin Point Code
PDRA	Policy Diameter Relay Agent
PCRF	Policy Control and Charging Rules Function
PCIMC	Per Connection Ingress Message Control
PDU	Protocol Data Unit
PDN	Packet Data Network
PMAC	Platform, Management and Control
POR	Plan of Record
PS	Priority Service (NGN-PS)
RAN	Radio Access Network
ROS	Routing Option Set
RSA	Reset Answer
RSR	Reset Request
SBR	Session Binding Repository
SSBR	Session SBR
SCEF	Service Capability Exposure Function
ScsAsId	String provided by SCS to identify itself in non-3GPP world
SCEF-MP	Message processing server that will run business login of SCEF/MTC-IWF. (for DSR , it is DA-MP server)
SCEF-DB	U-SBR (database server that stores context of SCEF calls)
SCS	Service Control Server
SOAM	Site Operations Administration and Maintenance
SS7	Signaling System No. 7
STP-MP	Signaling Transfer Point Message Processor
SV	Software Version
TPD	ORACLE Platform Distribution
TCAP	Transaction Capability Part
TLTRI	T8 Long Term Transaction Reference ID
TTRI	T8 Transaction Reference ID
TOBR	TCAP Opcode Based Routing
UE	User Equipment
USBR	Universal SBR
VIP	Virtual IP Address
VNF	Virtual Network Functions
VNFM	Virtual Network Functions Manager
VPLMN	Virtual Public Land Mobile Network
VSTP	Virtual SS7 Signal Transfer Point
VEDSR	Virtualized Engineered DSR
XMI	External Management Interface
XSI	External Signaling Interface

1.2 References

- DSR Release Notice

- DSR Upgrade Guide

- IDIH Release Notice

> ✎ **Note:**
>
> The DSR 8.6.0.0.0 Release Notice and Customer Documentation can be found at Oracle Docs.

- DSR IP Flow Document: CGBU_019284 (ORACLE Internal Document)

- Platform IP Flow Document: CGBU_PM_1112 (ORACLE Internal Document)

1.3 Compatibility

Product Compatibility

- DSR 8.6.0.1.0 is compatible with VNFM 5.4

- DSR 8.6.0.1.0 is compatible with APIGW 8.5.1.0.0_94.11.0

- DSR 8.6.0.1.0 is compatible with TPD 7.8.3.0.0-89.21.0, ComCOL 7.5.0.50.0-14123, AppWorks 9.6.0-96.7.0, EXGSTACK 9.6.0-96.7.0, TVOE 3.8.3.0.0-89.21.0, PMAC 6.6.1.2.0-66.13.0 and 6.6.1.0.0-66.9.0, and UDR 12.7.0.1.0-19.6.0.
  Where, X indicates PI End Cycle and Y indicates Patches within the PI Cycle.

Product Compatibility Matrix

Table 1-2   Product Compatibility Matrix

DSR	PIC	UDR	VNFM	IDIH	ATS
OCDSR Rel 8.0	10.4, 10.4.0.3	N/A			
OCDSR Rel 8.1	10.4, 10.4.0.3	N/A		IDIH 8.1	
OCDSR Rel 8.1.1	Compatibility not tested with MRs and Patch releases	N/A		IDIH 8.1	
OCDSR Rel 8.1.2	Compatibility not tested with MRs and Patch releases	N/A		IDIH 8.1	
OCDSR Rel 8.2	10.4, 10.4.0.3	N/A		IDIH 8.2	
OCDSR Rel 8.2.1	Compatibility not tested with MRs and Patch releases	N/A		IDIH 8.2	

Table 1-2   (Cont.) Product Compatibility Matrix

DSR	PIC	UDR	VNFM	IDIH	ATS
OCDSR Rel 8.3	Compatibility not tested with MRs and Patch releases	UDR 12.5	VNFM 2.0	IDIH 8.2.1, IDIH 8.2.2	
OCDSR Rel 8.4	10.4, 10.4.0.3	UDR 12.5.1	VNFM 3.0	IDIH 8.2.1, IDIH 8.2.2	ATS 8.4.0.0.0
OCDSR Rel 8.4.0.1	Compatibility not tested with MRs and Patch releases	UDR 12.5.1	VNFM 3.0	IDIH 8.2.1, IDIH 8.2.2	
OCDSR Rel 8.4.0.2	Compatibility not tested with MRs and Patch releases	UDR 12.5.1	VNFM 3.0	IDIH 8.2.1, IDIH 8.2.2	ATS 8.4.0.2.0, 8.4.0.2.1, 8.4.0.2.2, 8.4.0.3.0
OCDSR Rel 8.4.0.3	Compatibility not tested with MRs and Patch releases	UDR 12.5.2	VNFM 4.1.2	IDIH 8.2.1, IDIH 8.2.2	ATS 8.4.0.3.0, 8.4.0.3.1
OCDSR Rel 8.4.0.4	Compatibility not tested with MRs and Patch releases	UDR 12.5.2	VNFM 4.3	IDIH 8.2.1, IDIH 8.2.2	ATS 8.4.0.4.0, 8.4.0.4.1, 8.4.0.4.2
OCDSR Rel 8.4.0.5	Compatibility not tested with MRs and Patch releases	OCUDR 12.6	VNFM 4.4	IDIH 8.2.1, IDIH 8.2.2	ATS 8.4.0.5.0
OCDSR Rel 8.4.0.6	Compatibility not tested with MRs and Patch releases	OCUDR 12.6	VNFM 4.5	IDIH 8.2.1, IDIH 8.2.2	
OCDSR Rel 8.5	10.4.0.3	OCUDR 12.6.1	VNFM 5.0	IDIH 8.2.3	ATS 8.5.0.0.0
OCDSR Rel 8.5.0.1	Compatibility not tested with MRs and Patch releases	OCUDR 12.6.1	VNFM 5.1	IDIH 8.2.3	ATS 8.5.0.1.0
OCDSR Rel 8.5.0.2	Compatibility not tested with MRs and Patch releases	OCUDR 12.6.2	VNFM 5.2	IDIH 8.2.3	ATS 8.5.0.2.0
OCDSR Rel 8.5.1.0.0	Compatibility not tested with MRs and Patch releases	OCUDR 12.6.3	VNFM 5.3	IDIH 8.2.3	ATS 8.5.1.0.0
OCDSR Rel 8.6.0.0.0	Compatibility not tested with MRs and Patch releases	OCUDR 12.7.0	VNFM 5.4	IDIH 8.2.3.1	ATS 8.6.0.0.0
OCDSR Rel 8.6.0.1.0	Compatibility not tested with MRs and Patch releases	OCUDR 12.7.0	VNFM 5.4.1	IDIH 8.2.3.1	ATS 8.6.0.0.0

Incompatible Features

The following features are incompatible with DSR 8.3 and later:

- Active/Standby DA-MP server architecture (1+1) redundancy model
- MAP-IWF
- Radius

- GLA

- Diameter Security Application (DSA) with Universal-SBR (USBR) is an obsolete application. Alternatively, Diameter Security Application (DSA) with UDR is introduced in DSR 8.4.0.5.0. For information about this application, refer to the *Diameter Security Application with UDR User's Guide*. Customers using this application must not upgrade the DSR software to DSR 8.4.0.5.0 and must migrate to the DSA with UDR based application.

- Virtualized Engineered DSR (VEDSR) deployment, which is also known as TVOE based Fully Virtualized Rack Mount Server (FV RMS) Signaling node, is not supported from DSR 8.3 and later. The non-supported network elements of VEDSR are as follows:

  – DSR NOAM

  – DSR SOAM

  – DSR Message Processors (MP)

  – SS7 MP

  – DSR IPFE

  – DSR SBR (Session/Binding/Universal)

  – SDS NOAM

  – SDS SOAM

  – SDS QS

  – SDS DP

> **Note:**
>
> DSR and SDS BareMetal installations with TVOE based NOAM/SOAM are supported.

VEDSR networks and associated elements must be migrated to virtual DSR implementation based on KVM with or without OpenStack or VMware prior to DSR 8.3 or 8.4.x upgrade or install.

2
DSR Features and Enhancements

This section provides a high-level overview of DSR features that may impact OAM interfaces and activities.

For a list of all features, refer to *DSR Release Notes*.

For additional information about various features, refer to the *DSR Feature Guide*.

> ✏ **Note:**
>
> For information about upgrade planning and required procedures before the upgrade, refer to the *DSR Software Upgrade Guide*.

The following table lists the features and enhancements that are introduced in this release.

Table 2-1   DSR Features and Enhancements

Features / Enhancements	Name	Description	Scope
vSTP UDR connection redundancy feature	POR 33883528	Prior to this release, if there is one Connection Group on vSTP NO with default priority set to 10, there was no provision to configure one interface as the priority route and another interface as the secondary (when the primary interface fails). This feature provides redundancy between local site and remote site for Mobile Number Portability (MNP), where the priorities can be set using the the the following three parameters provided in connection group for UDR lookup on vSTP NO GUI. • STPSvcGroup=30 (default value) indicates highest priority • STPSvcBackGroup=20 indicates a lesser priority • STPSvcSpareGroup=10 indicates a much lesser priority For more information, see *Oracle Communications Diameter Signaling Router Mobile Number Portability User Guide*.	New feature

Table 2-1   (Cont.) DSR Features and Enhancements

Features / Enhancements	Name	Description	Scope
vSTP ITUI-S/ITUN-S support for MTP Screening feature	POR 32948876	Starting with this release, vSTP uses the TCAP Opcode Tag Based Routing to find Operation Code Tag in all supported ITU TCAP messages except ABORT. If messages have Opcode Tag value anything other than **Local(0x02)** or **Global(0x06)**, then it is considered as **Invalid**. For more information, see *Oracle Communications Diameter Signaling Router vSTP User Guide*.	New feature

3
Hardware and Software Requirements

This chapter provides information on the hardware and software platform component changes in the this release.

3.1 Supported Hardware

Table 3-1 Supported Hardware Details

Hardware	Comment
HP BL460c Gen8, Gen8_v2	c-Class
HP BL460c Gen9, Gen9_v2	c-Class
HP DL360/380 Gen8, Gen8_v2	Rack Mount Server
HP DL380 Gen9, Gen9_v2	Rack Mount Server
Oracle Server X5-2	Rack Mount Server
Oracle Server X6-2	Rack Mount Server
Oracle Server X7-2	Rack Mount Server
Netra X5-2	Rack Mount Server
HP 6125XLG, 6125G, 6120XG	Enclosure Switch
Cisco 3020	Enclosure Switch
Cisco 4948E-F	Rack Switch
Cisco 4948E	Rack Switch

> **Note:**
>
> Gen9, Gen9 v2, and Gen 8 v2 hardware are supported when purchased by a customer.
>
> Mixed Sun/HP deployments are not supported.

Hardware Upgrade
The VEDSR 8.6.0.1.0 release builds on top of the RMS and supports the newer and higher capacity X7-2 RMS hardware.

3.2 Supported Software

Table 3-2   Software Platform Components Details for DSR 8.6.0.1.0

Component	Release
SDS Release	8.6.0.1.0_96.15.0 ✎ **Note:** DSR 8.6.0.1.0 is compatible with SDS 8.1.2, 8.2.1, 8.3, 8.3.X, 8.4, 8.4.0.X.Y, 8.5.X.Y, and 8.6.0.0.0.
TPD	7.8.3.0.0-89.21.0
COMCOL	7.5.0.50.0-14123
PMAC	6.6.1.2.0-66.13.0 and 6.6.1.0.0-66.9.0
TVOE	3.8.3.0.0-89.21.0
AppWorks	9.6.0-96.7.0
EXGSTACK	9.6.0-96.7.0
HP Firmware FUP	2.2.11
Oracle Firmware	8.2.1

> ✎ **Note:**
>
> It is recommended for SDS to be upgraded before the DSR. SDS release 8.6.0.0.0 is compatible with DSR releases 8.1.2, 8.2.1, 8.3, 8.3.X, 8.4, 8.4.0.X.Y, and 8.5.X.Y.
>
> Where, X indicates PI End Cycle and Y indicates Patches within the PI Cycle.

Firmware Components

Firmware release guidance is provided through DSR Release Notice at Oracle Docs for DSR and then by navigating to the Release 8.6.0.0.0 link.

4

Upgrade Overview

This chapter provides an overview of the upgrade activities for DSR this release.

4.1 DSR Upgrade Path

The supported upgrade paths for DSR 8.6.0.1.0 are listed in the following table:

Table 4-1   DSR Upgrade Paths

Source Release	Target Release
8.5.0.X	8.6.0.1.0
8.4.0.5.X	8.6.0.1.0
8.5.1.X	8.6.0.1.0
8.6.0.0.0	8.6.0.1.0

> **Note:**
>
> The above table refers to the available releases and all of its maintenance releases. Here, X indicates PI End Cycle and Y indicates Patches within the PI Cycle.

4.2 IDIH Upgrade Path

The supported upgrade paths for IDIH 8.2.3 are listed in the following table:

Table 4-2   IDIH Upgrade Paths

Source Release	Target Release
8.2.1	8.2.3
8.2.2	8.2.3

> **Note:**
>
> The above table refers to the available releases and all of its maintenance releases.

IDIH upgrade can be scheduled prior to or by following the DSR upgrade. If IDIH upgrade is deferred until after DSR upgrades, then any newly captured elements existing within the upgraded DSR is not decoded by IDIH until after the IDIH upgrade.

4.3 SDS Upgrade Path

The supported upgrade paths for SDS 8.6.0.1.0 are listed in the following table:

Table 4-3   SDS Upgrade Paths

Source Release	Target Release
8.5.0.X	8.6.0.1.0
8.4.0.5.X	8.6.0.1.0
8.5.1.X	8.6.0.1.0
8.6.0.0.0	8.6.0.1.0

> **Note:**
>
> The above table refers to the available releases and all of its maintenance releases. Here, X indicates PI End Cycle and Y indicates Patches within the PI Cycle.

> **Caution:**
>
> During SDS Upgrade:
>
> - If the customer deployment has only FABR features enabled, it is recommended to upgrade the SDS nodes before upgrading the DSR nodes.
>
> - If the customer deployment has both the FABR and PCA features enabled, then upgrade the DSR nodes before upgrading the SDS nodes.

4.4 Upgrade Execution

With DSR 8.5.0.0.0, there are multiple methods available for upgrading a site. The newest and most efficient way to upgrade a site is the Automated Site Upgrade feature. As the name implies, this feature upgrades an entire site (SOAMs and all C-level servers) with a minimum of user interaction. Once the upgrade is initiated, the upgrade automatically prepares the server(s), performs the upgrade, and then sequences to the next server or group of servers until all servers in the site are upgraded. The server upgrades are sequenced in a manner that preserves data integrity and processing capacity.

Automated Site Upgrade can be used to upgrade the DSR/SDS servers. However, Auto Site Upgrade cannot be used to upgrade PMAC, TVOE, or IDIH servers at a site.

Additionally, there are separate procedures described in the upgrade procedures to support either a manual or automated approach to upgrade any particular server group. When planning upgrades the *Site Upgrade Methodology Selection* section of the upgrade procedure should be carefully reviewed. The use of the automated methods (Auto Site or Auto Server Group) for DA-MP server groups should be

carefully considered regarding potential negative traffic impacts. The ASU enhancement in DSR 8.5.0.0.0 resolves this issue. The user is now instructed to rearrange or add cycles to create a suitable upgrade plan.

4.5 Limitations

When `AppEventLog` file is full, then SOAM/NOAM becomes unstable and shows undefined behavior, such as:

- Replication and merging stops.
- GUI access stops working.

> **Note:**
>
> Upgrade fails if utilization of `/var/TKLC/rundb` partition is more than 70%, which may be true in case of larger `AppEventLog` file size (~5.5 GB in size).
> To prevent the above listed issues, we need to assign or allocate `/var/TKLC/rundb` size and `AppEventLog` file size in sync. That is the `AppEventLog` file size (plus some delta for other files like MeasStat) should be always less than 70 % of `/var/TKLC/rundb` partition size.

4.6 Migration of DSR Data

As in prior releases, the existing DSR Data is preserved during the upgrade.

5
MEAL Inserts

This section summarizes the changes to Alarms, Measurements, KPIs and MIBs.

The following inserts pertain to DSR Release 8.6.0.1.0 MEAL snapshot and deltas to earlier releases:

- DSR/SDS 8.1.2.0.0 GA Release is DSR/SDS 8.1.2.0.0-81.25.0
- DSR/SDS 8.2.1.0.0 GA Release is DSR/SDS 8.2.1.0.0_82.17.0
- DSR/SDS 8.3.0.0.0 GA Release is DSR/SDS 8.3.0.0.0-83.15.0
- DSR/SDS 8.4.0.0.0 GA Release is DSR/SDS 8.4.0.0.0-84.15.0
- DSR/SDS 8.4.0.3.0 GA Release is DSR/SDS 8.4.0.3.0-85.17.0
- DSR/SDS 8.4.0.5.0 GA Release is DSR/SDS 8.4.0.5.0-88.9.1
- DSR/SDS 8.5.0.0.0 GA Release is DSR/SDS 8.5.0.0.0-90.11.0
- DSR/SDS 8.5.0.2.0 GA Release is DSR/SDS 8.5.0.2.0_92.7.0
- DSR/SDS 8.5.1.0.0 GA Release is DSR/SDS 8.5.1.0.0-94.10.0
- DSR/SDS 8.6.0.0.0 GA Release is DSR/SDS 8.6.0.0.0-95.0.0
- DSR/SDS 8.6.0.1.0 GA Release is DSR/SDS 8.6.0.1.0_96.15.0

> **✎ Note:**
>
> Download MEAL delta files for the above releases, from MEAL DELTA.