Oracle® Communications Diameter Signaling Router

Network Impact Report

Release 9.2.0.0.0
G43630-01
September 2025

Oracle Communications Diameter Signaling Router Network Impact Report, Release 9.2.0.0.0

G43630-01

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Preface

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The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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What's New in This Release

This section introduces the documentation updates for Release 9.2.0.0.0.

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- Updated the Compatibility section.
- Updated DSR features in the DSR Features section.
- Updated vSTP features in the vSTP Features section.
- Updated VNFM features in the VNFM Features section.
- Updated IDIH feature in the IDIH Features section.
- Updated Software Requirements section.
- Updated the DSR Upgrade Paths section.
- Updated the IDIH Upgrade Path section.
- Updated the SDS Upgrade Paths section.
- Updated the UDR Upgrade Paths section.
- Updated the MEAL Inserts section.

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 9.2.0.0.0 new and enhancement features as compared to the previous release, and the operations impact of these features at a high level.

1.1 Acronyms

The Table 1-1 provides information about the acronyms and the terminologies used in this document.

Table 1-1 Acronyms

Acronym/Term	Description
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
ECA	Mobile Equipment-Identity-Check-Answer
FLOBR	Flexible Link set Optional Based Routing
GUI	Graphical User Interface

Table 1-1 (Cont.) Acronyms

Acronym/Term	Description
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
OAM&P	Operations, Administration, Maintenance and Provisioning
OCUDR	Oracle Communications User Data Repository
OPC	Origin Point Code
PDRA	Policy Diameter Relay Agent

Table 1-1 (Cont.) Acronyms

Acronym/Term	Description
PCRF	Policy Control and Charging Rules Function
PCIMC	Per Connection Ingress Message Control
PDU	Protocol Data Unit
PDN	Packet Data Network
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
ScsAsId	String provided by SCS to identify itself in non-3GPP world
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 Notes
- DSR Upgrade Guide
- IDIH Release Notes
- 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 9.2.0.0.0 is compatible with IDIH 9.2.0.0.0
- DSR 9.2.0.0.0 is compatible with VNFM 6.2.0.0.0_62.4.5
- DSR 9.2.0.0.0 is compatible with COMCOL 8.1.0.18.0-14256, AppWorks 9.9.2-102.15.0, EXGSTACK 9.9.2-102.15.0, and UDR 14.2.0.0.0_114.43.0

Product Compatibility Matrix

Table 1-2 Product Compatibility Matrix

DSR	PIC	UDR	VNFM	IDIH	ATS
OCDSR Rel 9.0.0.0.0	Compatibility not tested with MRs and Patch releases	OCUDR 14.0.0.0.0	VNFM 6.0.0	IDIH 8.2.3.3	ATS 9.0.0.0.0
OCDSR Rel 9.0.1.0.0	Compatibility not tested with MRs and Patch releases	OCUDR 14.0.1.0.0	VNFM 6.0.1	IDIH 8.2.3.3	ATS 9.0.1.0.0
OCDSR Rel 9.0.2.0.0	Compatibility not tested with MRs and Patch releases	OCUDR 14.0.2.0.0	VNFM 6.0.2.0.0	IDIH 8.2.3.3	ATS 9.0.2.0.0
OCDSR Rel 9.1.0.0.0	Compatibility not tested with MRs and Patch releases	OCUDR 14.1.0.0.0	VNFM 6.1.0.0.0	IDIH 9.1.0.0.0	ATS 9.1.0.0.0
OCDSR Rel 9.2.0.0.0	Compatibility not tested with MRs and Patch releases	OCUDR 14.2.0.0.0	VNFM 6.2.0.0.0	IDIH 9.2.0.0.0	ATS 9.2.0.0.0

Incompatible Software and Features

The SCEF software element is not compatible with DSR 9.0.0.0.0 and later.

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 User Guide with UDR*. 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 (FVRMS) 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

VEDSR networks and associated elements must be migrated to virtual DSR implementation based on KVM with or without OpenStack or VMware prior to DSR 8.3.0 or 8.4.x upgrade or installation.

> **Note**
>
> Only configuration data can be migrated from old release to new release. Refer to *Upgrade* chapter in the *Diameter Security Application User's Guide with UDR* for procedure.

2
Features and Enhancements

This chapter describes the features and enhancements for the 9.2.0.0.0 release.

2.1 DSR Features

This chapter 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 features and enhancements that are introduced in this release.

- **Diameter End-To-End Security**: The Diameter protocol plays a crucial role in modern telecommunications networks for Authentication, Authorization, and Accounting (AAA) functions. To enhance the security of Diameter messages, oracle introduces Diameter End-to-End Security (DESS) feature, allowing the signing and verification of messages exchanged between network nodes. For more information, see *Oracle Communications Diameter Security Application User Guide with UDR*.
- **Enhanced Address Resolution**: Enhanced Address Resolution is an advanced networking protocol designed to improve the efficiency and reliability of address resolution processes in modern networks. For more information, see *Oracle Communications Diameter Signaling Router Range Based Address Resolution User Guide*.
- **DSR Routing list changes**: Routing rules and rule actions are used to implement the routing behavior required by the operator. Routing rules are defined using combinations of the following data elements Destination-Realm, Destination-Host, Origin-Host, and Origin-Realm. For more information, see *Oracle Communications Diameter Signaling Router Feature Guide*.
- **LDAP Authentication**: This enhancement allows operators to connect to their centralized user management systems for SSH users through LDAP, there by avoiding the need to create explicit users on DSR and simplifying the operations at customer. For more information, see *Oracle Communications Diameter Signaling Router Operations, Administration, and Maintenance Guide*.
- **DSR Traffic Throttle Points and Groups Table Size Increase**: The capacity for traffic management is enhanced by increasing the maximum number of Traffic Throttle Points and Traffic Throttle Groups per network element from 500 to 1500, and raising the maximum number of Shared Traffic Throttle Groups that can be marked as shared under the control of a single NOAM from 1000 to 3000. For more information, see *Oracle Communications Diameter Signaling Router Diameter User Guide*.

2.2 vSTP Features

The following vSTP features are implemented in release 9.2.0.0.0:

- **Cluster Routing Support**: The Cluster Routing feature eliminates the need for a FPC (Full Point Code) entry in the routing table to route to every signaling point in every network. The Cluster Routing feature allows the vSTP to configure one routeset to a entire cluster of destinations. This feature also allows the vSTP to manage and switch traffic to more end nodes. For more information, see *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point User Guide*.
- **Nested Cluster Routing**: The Nested Cluster Routing feature provides a mechanism that allows both cluster and member routes to be provisioned in the same cluster. For more information, see *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point User Guide*.
- **Network Routing** : Network Routing allows the user to provision a single routeset which can be used for all MSUs destined to members of that specific network. For more information, see *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point User Guide*.
- **Calling Name Conversion Facility (CNCF)** : The CNCF (Calling Name Conversion Feature) simplifies the way calling name information is delivered in telecommunications. It converts ISUP IAM messages (used in traditional telephony) between using a proprietary PIP (Party Information Parameter) and standard GN (Generic Name Parameter). For more information, see *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point User Guide*.
- **Support for Applying GTT Action from intermediate GTT Sets** : The Intermediate GTT Action Application feature enhances the flexibility of Global Title Translation (GTT) actions in your network. Previously, certain actions were restricted to the last GTT set only. With this feature, user can apply GTT actions from intermediate GTT sets for all actions. For more information, see *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point SS7 Security Guide*.
- **SFAPP ATIGTT Set** : The SFAPP ATIGttset feature is designed to optimize the routing of ATI (Any Time Interrogation) messages in the network. When enabled, it ensures that ATI messages are directly routed to their corresponding destinations without the need for a selector lookup. This feature is useful only when the GTT Action (Global Title Translation Action) is set to SFAPP (Specific Forwarding Application). For more information, see *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point SS7 Security Guide*.
- **G-Port SRI Query for Prepaid**: The G-Port SRI Prepaid Feature enhances standard G-Port functionality by ensuring that all Send Routing Information (SRI) queries from the Prepaid Service Control Point (SCP) receive a direct response with portability routing information. This feature simplifies tariff determination and routing for prepaid subscribers, whether they are ported or not, by providing a meaningful G-Port response for every query. For more information, see *Oracle Communications Diameter Signaling Router Mobile Number Portability User Guide*.
- **Gateway Screening Enhancement**: vSTP now supports screening of SCMG (SCCP Management) messages on the basis of scmg message type, affected Point code and affected SSN (subsystem number) by configuring required MTP Screening rule and Screen Groups. For more information, see *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point User Guide* and *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point SS7 Security Guide*.

- **Group Code is extended to ITU-International Linksets**: The Group Code concept, traditionally applied within national signaling networks, can be extended to ITU–International Linksets to provide a structured and efficient method for managing international signaling connections. This feature will allow vSTP to route traffic for two or more destinations or countries that may have overlapping point code values. For more information, see *Oracle Communications Diameter Signaling Router Virtual Signaling Transfer Point User Guide*.
- **vSTP Measurement Reports must contain only the servers or links being used**: The measurement (indexed by link or connection) must be pegged only on the MP server hosting that link or connection. Previously, measurement reports showed pegging of measurements on other servers, in addition to the MP server hosting the link or connection. For more information, see *Oracle Communications Diameter Signaling Router Measurement Reference Guide*

2.3 VNFM Features

The following VNFM features are implemented in release 9.2.0.0.0:

- **MTU Support in Scale**: MTU Support in Scale allows users to specify Maximum Transmission Unit (MTU) values for all networks within additional parameters in (V1) or within configurable properties in (V2). if an MTU value is provided for the Signaling network, MTU values must also be provided for all other networks. For more information, see *Oracle Communications Virtual Network Functions Manager Installation and User Guide*.
- **MTU Support for Signaling** : MTU Support in Scale allows users to specify Maximum Transmission Unit (MTU) values for all networks within additional parameters in (V1) or within configurable properties in (V2). If an MTU value is provided for the Signaling network, MTU values must also be provided for all other networks. For more information, see *Oracle Communications Virtual Network Functions Manager Installation and User Guide*.
- **MTU Support for NOAM**: MTU Support in Scale allows users to specify Maximum Transmission Unit (MTU) values for all networks within additional parameters in (V1) or within configurable properties in (V2). If MTU is provided for NOAM, both xmiNetwork and imiNetwork values must be included. For more information, see *Oracle Communications Virtual Network Functions Manager Installation and User Guide*.
- **MTU Support for DR NOAM** : MTU Support in Scale allows users to specify Maximum Transmission Unit (MTU) values for all networks within additional parameters in (V1) or within configurable properties in (V2). if MTU is provided for DR NOAM, both xmiNetwork and imiNetwork values must be included. For more information, see *Oracle Communications Virtual Network Functions Manager Installation and User Guide*.
- **Multiple NTP Server Ip support in DSR and SDS VNFs** : VNFM supports multiple NTP server IP addresses, which can be specified during the instantiation of DSR and SDS VNFs. This supports both IPv4 and IPv6 NTP server IP addresses. For more information, see *Oracle Communications Virtual Network Functions Manager Installation and User Guide*.

2.4 IDIH Features

Enhanced IDIH 9.2 provides a refresh to the architecture of old version while retaining all of its core feature functionality. The architecture brings in latest technology and also provides enhanced User Experience.

3
Software Requirements

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

Supported Software

Table 3-1 Software Platform Components Details for DSR 9.2.0.0.0

Component	Release
SDS Release	9.2.0.0.0-102.16.0
TPD	8.10.1.6.0_150.17.0
COMCOL	8.1.0.18.0-14256
AppWorks	9.9.2-102.15.0
EXGSTACK	9.9.2-102.15.0
DSR	9.2.0.0.0
ATS	9.2.0.0.0-1.0.15
UDR	14.2.0.0.0_114.43.0
VNFM	6.2.0.0.0_62.4.5

> **Note**
>
> It is recommended to upgrade SDS before DSR.

4
Upgrade Overview

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

4.1 DSR Upgrade Paths

The supported upgrade Paths for DSR 9.2.0.0.0 are listed in the following table:

Table 4-1 DSR Upgrade Paths

Source Release	Target Release
9.0.1.0.0	9.2.0.0.0
9.0.2.0.0	9.2.0.0.0
9.0.2.1.0	9.2.0.0.0
9.1.0.0.0	9.2.0.0.0

> **Note**
>
> For further information on upgrading DSR, see *DSR Cloud Software Upgrade Guide*.

4.2 IDIH Upgrade Path

The supported upgrade paths for IDIH 9.2.0.0.0 are listed in the following table:

Table 4-2 IDIH Upgrade Paths

Source Release	Target Release
NA	9.2.0.0.0

> **Note**
>
> - IDIH 9.2.0.0.0 supports only fresh installation.
> - IDIH 9.2 needs different flavour VMs and require additional resources as compared to the older architecture (IDIH 8.x).

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 Paths

The supported upgrade paths for SDS 9.2.0.0.0 are listed in the following table:

Table 4-3 SDS Upgrade Paths

Source Release	Target Release
9.0.1.0.0	9.2.0.0.0
9.0.2.0.0	9.2.0.0.0
9.0.2.1.0	9.2.0.0.0
9.1.0.0.0	9.2.0.0.0

Note

For further information on upgrading SDS, see *SDS Software Upgrade Guide*.

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, it is recommended to upgrade the DSR nodes before upgrading the SDS nodes.

4.4 UDR Upgrade Paths

The supported upgrade paths for UDR 9.2.0.0.0 are listed in the following table:

Table 4-4 UDR Upgrade Paths

Source Release	Target Release
14.0.0.0.0	14.2.0.0.0
14.0.1.0.0	14.2.0.0.0
14.0.1.0.1	14.2.0.0.0
14.0.2.0.0	14.2.0.0.0
14.1.0.0.0	14.2.0.0.0

4.5 Upgrade Execution

In DSR, there are multiple methods available for upgrading a site. The most efficient way to upgrade a site is the Automated Site Upgrade (ASU) 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 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 resolves this issue. The user is now instructed to rearrange or add cycles to create a suitable upgrade plan.

4.6 Limitations

When `AppEventLog` file is full, then SOAM or 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.

4.7 Migration of DSR Data

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

5
MEAL Inserts

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

The following inserts pertain to DSR Release 9.2.0.0.0 MEAL snapshot and deltas to earlier releases:

- MEAL_DELTA_DSR-9.2.0.0.0-102.16.0-9.0.0.0.0-97.16.0
- MEAL_DELTA_DSR-9.2.0.0.0-102.16.0-9.0.1.0.0-98.15.0
- MEAL_DELTA_DSR-9.2.0.0.0-102.16.0-9.0.2.0.0-99.9.0
- MEAL_DELTA_DSR-9.2.0.0.0-102.16.0-9.1.0.0.0-100.9.0
- MEAL_REPORT_DSR-9.2.0.0.0-102.16.0

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