Oracle® Diameter Signaling Router

DSR Network Impact Report

Release 6.0

E55937-01

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ORACLE®

Oracle Diameter Signaling Router DSR Network Impact Report, Release 6.0

CHANGE HISTORY

TABLE OF CONTENTS

LIST OF TERMS

ACL ……Access Control List
AVP ……Attribute Value Pair
CLI ……..Command Line Interface
DNS ……Domain Name Server
GUI ……Graphical User Interface
HSS .....Home Subscriber Server
iLO ……..Integrated Lights Out
IMI .....Internal Management Interface
IOT ……..Interoperability Tests
KPI ……..Key Performance Indicator
LTE ……Long Term Evolution
MEAL.....Measurements, Events, Alarms, and Logging
MME ……...Mobility Management Entity
MP.....Message Processor
MPS ……Messages per Second
NE ……...Network Element
NMS ……Network Management System
OAM……...Operations, Administration, Maintenance
OAM&P .....Operations, Administration, Maintenance and Provisioning
OCF ……On-line Charging Function
OFCF ……..Off-line Charging Function
PDRA ……..Policy Diameter Relay Agent
PCRF ……..DSR Control and Charging Rules Function
P-CSCF.....Proxy-Call Session Control Function
PDU ……Protocol Data Unit
PM&C ……Platform, Management and Control
S-CSCF .....Session Call Session Control Function
SLF ……Subscriber Locator Function
SPR…….Subscriber Profile Repository
TPD ……ORACLE Platform Distribution
VIP .....Virtual IP Address
XMI.....External Management Interface
XSI.....External Signaling Interface

1 Introduction

1.1 Purpose/Scope

Purpose of this Feature Guide 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.

The scope of this document is limited to the changes between DSR 5.0 and DSR 6.0.

Note: DSR 6.0 supports only the 3-tier network architecture. Any deployments with 2-tier architecture must migrate to 3-tier before upgrade to DSR 6.0.

1.2 Disclaimers

This document summarizes Release 6.0 new and enhancement features as compared to Release 5.0, and the operations impacts of these features, at a high level. The Feature Requirements (FRS) documents remain the defining source for the expected behavior of these features.

Note that feature implementations may change slightly during product test.

2 Overview of DSR 6.0 Features

This section provides an overview of the DSR 6.0 release features that may impact OAM interfaces and activities.

For a list of all feature, please see the following document:

Feature Notice Release 6.0
E53462
Revision 01

2.1 Enhancements to DSR 5.0 functionality, by Category

At the time of upgrade to DSR 6.0, a number of features and enhancements will become visible on the interfaces to the DSR and may change certain existing OAM behaviors of the system. This section will summarize these feature changes as they affect OAM activities.

Note: For information on Upgrade planning and required steps before upgrade, please refer to the DSR 6.0 Software Upgrade Guide (E52511-01).

Note: For information about new Optional Features that may be configured post-upgrade, see the following section on Optional Features.

Note: Feature enhancements that were introduced in DSR 5.1 have a "(DSR 5.1)" notation after the feature name.

2.1.1 Upgrade Enhancements

There are several improvements implemented to the Upgrade activity for DSR 6.0, as compared to DSR 5.0.

Note: Upgrade to DSR 6.0 is supported from DSR 4.0 GA release, or DSR 5.0 GA Release.

Name	Description	Scope

Upgrade Manager GUI form improvements (DSR 5.1) (PR 234548, 228086)	• Redesign of Upgrade Manager form to make it faster and easier to read • Faster access to "server groups" using a Tabbed design	NOAM
Upgrade Barrier (DSR 5.1) (PR 234360, 229950)	Implements a improvement that prevents unwanted data replication from upgraded servers to non-upgraded servers. This simplifies the upgrade, since the "Replication Inhibit" activities required in previous releases are no longer needed. i.e. the user does not need to Inhibit/Allow Replication during upgrade. This feature applies to upgrades from pre-6.0 releases to DSR 6.0.	All servers in the system

2.1.2 Security/Access Changes

There are a number of Security/Access changes provided in DSR 6.0, as described below.

<Restricted information. Internal use only.>

PR 220255

PR 224414

PR 224416

PR 204603

PR 229156

2.1.3 Mediation Enhancements

The optional Mediation feature has several enhancements listed below.

Note: for more detail on Mediation enhancements, please refer to the Mediation User Guide for DSR 6.0.

Name	Description	Scope
Mediation: 5 level Deep AVP support (PR 201489)	Mediation: 5 level Deep AVP support	Mediation Enhancement feature, Optional Use
Mediation Enhancements (PR 209711)	Additional functions in the Mediation Feature.	Mediation Enhancement feature, Optional Use
Mediation: Visited PLMN-ID (MCC and MNC support) (PR 211166)	Mediation: Visited PLMN-ID (MCC and MNC support)	Mediation Enhancement feature, Optional Use
Mediation: TBCD (MSISDN encoding and decoding) (PR 2225179)	Mediation: TBCD (MSISDN encoding and decoding)	Mediation Enhancement feature, Optional Use

Mediation: AND/OR support in Conditions. (PR 2225180)	Mediation: AND/OR support in Conditions.	Mediation Enhancement feature, Optional Use
Mediation: Mark "Actions" as optional (PR 2225181)	Mediation: Mark "Actions" as optional	Mediation Enhancement feature, Optional Use
Mediation: Specifying peer and connections in conditions (PR 2225182)	Mediation: Specifying peer and connections in conditions	Mediation Enhancement feature, Optional Use
Mediation: Setting message priority and route list from Mediation (PR 225183)	Mediation: Setting message priority and route list from Mediation	Mediation Enhancement feature, Optional Use
Mediation Support for Explicit Casting (PR 232354)	Mediation Support for Explicit Casting	Mediation Enhancement feature, Optional Use

2.1.4 RBAR/FABR Enhancements

The optional RBAR/FABR features have several enhancements listed below.

Name	Description	Scope
FABR: Support for identifying MSISDNs in FABR that do not include a + sign in the front. (PR 225627)	Support for identifying MSISDNs in FABR that do not include a + sign in the front. Implementation uses a lookup in a new MCC-MNC configurable table .	FABR
FABR: Expose internal measurements with MeasId 10647 and 10649 (PR 227936)	Add these measurements to the FABR Exception Report: RxFabrSrvNotiDpComAgentErrors (10649) and RxFabrSrvNotiDpCongest (10647). Also, make them Arrayed (Per Diameter Application) to be consistent with other measurements associated with FABR events of similar kinds.	FABR
RBAR: Support for identifying MSISDNs in RBAR that do not include a + sign in the front (PR 225628)	Support for identifying MSISDNs in RBAR that do not include a + sign in the front. Implementation uses a lookup in a new MCC-MNC configurable table .	RBAR

2.1.5 Protocol/Connection Related Enhancements

The are several protocol/connection enhancements listed below.

Name	Description	Scope
SCTP/TCP Measurements (PR 216974)	Adds several measurements for error conditions that can occur on SCTP/TCP connections, to better support trouble reporting.	SCTP/TCP Diameter connections
DSR maximum message size of 60,000 byte messages (PR 223673)	Increases the maximum supported Diameter message size from 30K to 60K.	Diameter message processing
RFC 6733 Result-Code compliancy update (PR 226953)	Diameter message result code changes per RFC 6733: 5018-5021 removed 3001,3008-3010 added	Diameter Protocol
Active-Standby Peer Node Support (PR 225328)	DSR adds two new diameter connection configuration attributes that control the behavior of connections to Standby Peer Nodes. • 'suppress connection unavailable alarm' • 'suppress connect when peer is available'	Connections to Diameter Peers

PDU Pool redesign (also DSR Memory Congestion Controls) (PR 228297, 232768)	Enhancement to the Diameter message handling/queuing on the DA-MP servers, to support the larger Diamater message sizes. This adds several measurements.	Diameter message processing
Dual Path HA Enhancement (PR 229680, 233313)	Enhancement to the High Availablity (HA) functionality of the system, to better manage the election of the Active server of a geo-redundant server group and reduce the posibility of multiple Active servers in the group being elected (aka: split-brain). This adds several new alarms.	Geo-redundant server groups (PDRA SBRs, or geo-redundant SOAMs)

2.1.6 Configuration/Viewing Related Enhancements

The following Configuration/viewing enhancements are provided.

Name	Description	Scope
Configurable Disable of CEx Peer IP Validation (PR 217913)	Configurable option added to support Interoperability with certain peer node vendors. Option disables the validation of the source IP of the CEx message received against the Host-IP-Address AVP in the CEx messge received. Option is configured at the SOAM: Diameter -> Configuration -> Configuration Sets -> Connection Configuration Sets - then click on the Diameter Options tab, scroll to the last field – CEX Host IP Validation Enabled (Yes/No).	Per Connection
DSR GUI Connection "Peer Node Indentification" menu/description is confusing (PR 218530)	SOAM Insert/Edit form for the Connection has a improved descriptive text for the "Peer Node Identification" field.	SOAM GUI
DSR GUI enhancement: OAM filter to default on 'GO' instead of 'RESET' (PR 232806)	On the "View Active Alarms" and "View Alarm History" forms, the filter option is improved so that when the user presses the Enter button on the keyboard, the "Go" option on the form is selected. This is more intuitive.	NOAM and SOAM GUI
Read-only viewing of Enabled Diameter Connection config entries (PR 232805)	The user can open the Connection "edit" form in a "view only" mode, for connections that are enabled. There is a pop-up to notify the user that the form cannot be modified.	SOAM GUI
DSR NOAM/SDS 32 Node Support (PR 231588)	Capacity increase for the NOAM, to increase the max number of servers that can be managed from the NOAM.	NOAM GUI
Duplicate IPs on Non-Routable networks	The NOAM GUI form "Configure → Network" is enhanced allow duplicate non-routable IP networks at different sites (Network elements).	NOAM GUI

2.2 DSR 5.1 PDRA Enhancement Features

DSR 5.1 introduced the following PDRA Enhancement Features, which are carried forward to DSR 6.0. These are included in this document.

Name	Description	Scope
Policy DRA Enhancements from DSR 5.1 (PCRF Pooling) (PR 223872, 213129, 222325, 226130, 226128)	These features support routing to groups of PCRF servers (Pooling) based on certain routing criteria, as well as other enhancements. (Introduced in DSR 5.1)	Enhancement Feature for PDRA
Gateway Location Application (GLA) (PR 226130)	GLA is an additional PDRA feature (specific to PDRA deployments, and optional). There is a separate Activation for this feature. (Introduced in DSR 5.1)	Enhancement Feature for PDRA
PDRA Support for Gx' (PR 222325)	PDRA can support the Gx' (Gx-Lite) interface with this feature. Several Measurements are added. (Introduced in DSR 5.1)	Enhancement Feature for PDRA
CommAgent Bundling	ComAgent bundling is used by P-DRA to improve SBR capacity and performance. It "bundles" SBR data queries between the DA-MPs and the SBR databases, to improve efficientcy. Several measurements are added. (Introduced in DSR 5.1)	Enhancement Feature for PDRA

2.3 DSR 6.0 New Optional Features

DSR 6.0 introduces the following new Optional Features, which may be new installed in DSR 6.0, or activated after upgrade to DSR 6.0, depending on customer need.

These feaures are described in other documents, and not included in this document.

Name	Description	Scope
MAP-Diameter Interworking Function (IWF) (PR166854, 210925, 218260, 222532)	GSM MAP Interface on the DSR, which interworks MAP messages to Diameter messages.	Major feature, Optional Activation
Integrated Diameter Intelligence Hub (iDIH) (PR 221026)	Trace Capture and Viewing of selected message trigger-point processing internal to the DSR. Supports trouble-shooting of DSR routing logic.	Major feature, Optional Activation
DSR RMS Support for Sun Netra Hardware (PR 231584)	Sun Netra Hardware support (Rack Mount)	Major feature, Optional Use

DSR Rack Mount Server Capacity Expansion (PR 221659)	Virtualized DSR Rack Mount server deployments can add additional capacity. Includes a larger number of servers per configuration, and expanded functionality.	Enhancement feature, Optional Use

2.4 Hardware Changes

2.4.1 Hardware Supported

Hardware	Comment
HP BL460 Gen6	c-Class
HP BL620 Gen7	c-Class
HP BL460c Gen8	c-Class
HP DL360/380 Gen6	Rack Mount Server
HP DL360/380 Gen8	Rack Mount Server
Sun Netra X3-2 (New Hardware)	**Rack Mount Server**
HP 6125, 6120	Enclosure Switch
Cisco 3020	Enclosure Switch

Note: Gen 8 v2 hardware (with upgraded processors) are also supported, when purchased by a customer.

Note: mixed Sun/HP deployments are not generally supported.

2.4.2 Hardware Upgrade

No hardware upgrades are required with this release.
Deployment of certain Optional features may require additional hardware.

2.5 Software Changes

Software change include a new release of the software Platform components, and new DSR release.

2.5.1 Platform 6.7

Platform Release 6.7 inherits all the functionality of Release 6.5.

Platform 6.7 Component Versions

Component	Release
TPD 64 Bit	6.7
COMCOL	6.3
PM&C	5.7
TVOE	2.7
AppWorks	5.7
Networking	5.7
Firmware	2.2.6 (minimum)

2.5.2 DSR Release 6.0

DSR Release 6.0 inherits all functionality from DSR 5.0 and 5.1.

DSR Release

Component	Release
DSR Release	6.0

2.5.3 SDS Release Compatability

DSR Release 6.0 is compatible with SDS Release 5.0.

DSR Release

Component	Release
SDS Release	5.0

2.6 Firmware Changes

Below is a summary of the recommended firmware levels provided in the recent FUP Releases.

For details on FUP release 2.2.6, please reference:

Oracle® Communications

HP Solutions Firmware Upgrade Pack -- Release Notes

Release 2.2.6

E54547 Revision 01

Firmware	**FUP 2.2.4**	**FUP 2.2.5**	**FUP 2.2.6**
G8 Blades	System: ProLiant BL460c Gen8 ROM version: I31 03/01/2013 Disc Cntrler: 3.42 iLo Firmware Revision = 1.20 NIC firmware-version: bc 7.4.22	System: ProLiant BL460c Gen8 ROM version: I31 09/08/2013 Disc Cntrler: 4.68 iLo Firmware Revision = 1.30 NIC firmware-version: bc 7.4.22	System: ProLiant BL460c Gen8 ROM version : I31 12/20/2013 Disc Cntrler: 5.22 iLo Firmware Revision = 1.40 NIC firmware-version: bc 7.8.79
Onboard Administrator	3.71	4.01	4.21
PM&C Server	System: ProLiant DL380p Gen8 ROM version: P70 12/14/2012 Disc Cntrler: 3.42 ILo Firmware Revision = 1.20 NIC firmware-version: 5719-v1.31 System: ProLiant DL380p Gen6 ROM version : P70 12/14/2012 Disc Cntrler: 3.42 ILo Firmware Revision = 1.20 NIC firmware-version: 5719-v1.31	System: ProLiant DL380p Gen8 ROM version: P70 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: 5719-v1.33 System: ProLiant DL380p Gen6 ROM version : P70 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: 5719-v1.33	System: ProLiant DL380p Gen8 ROM version: P70 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: 5719-v1.37 System: ProLiant DL380p Gen6 ROM version : P70 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: 5719-v1.37
RMS Server	System: ProLiant DL380p Gen8 ROM version : P70 12/14/2012 Disc Cntrler: 3.42 ILo Firmware Revision = 1.20 NIC firmware-version: 5719-v1.31	System: ProLiant DL380p Gen8 ROM version : P70 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: 5719-v1.33	System: ProLiant DL380p Gen8 ROM version : P70 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: 5719-v1.37

G7 Blades	System: ProLiant BL460c Gen7 ROM version : I31 03/01/2013 Disc Cntrler: 3.42 ILo Firmware Revision = 1.20 NIC firmware-version: bc 7.4.22	System: ProLiant BL460c Gen7 ROM version : I31 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: bc 7.4.22	System: ProLiant BL460c Gen7 ROM version : I31 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: bc 7.4.22
G6 Blades	System: ProLiant BL460c Gen6 ROM version : I31 03/01/2013 Disc Cntrler: 3.42 ILo Firmware Revision = 1.20 NIC firmware-version: bc 7.4.22	System: ProLiant BL460c Gen6 ROM version : I31 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: bc 7.4.22	System: ProLiant BL460c Gen6 ROM version : I31 09/08/2013 Disc Cntrler: 4.68 ILo Firmware Revision = 1.30 NIC firmware-version: bc 7.4.22

2.7 Upgrade Overview

This section provides an overview of the Upgrade activities for Release 6.0.

2.7.1 Upgrade Path

For this document, the path from 5.0GA → 6.0 is assumed. [Note: Upgrade from 4.0GA, 4.1 and 5.1 to 6.0 are also supported.]

2.7.2 Order of Upgrade

1) Firmware Upgrade
2) Platform components
    a. PM&C upgrades
    b. TVOE Upgrades
3) DSR Upgrade in the following sequence –
    a. NOAM / DR-NOAM
    b. SOAM and site SOAM managed servers (site-at-a-time)
4) Configure for new DSR features

2.7.3 2-Tier OAM not Supported

2-Tier OAM architecture is NOT supported in DSR 6.0. Migration from 2-tier to 3-tier (if needed) must be done before upgrade to DSR 6.0.

2.7.4 Active/Standby DA-MP servers supported

Active/Standby DA-MP server architecture (1+1) continues to be supported in DSR 6.0.

Migration to Multi-active (N+0) DA-MP server architecture is recommended for all customers, and required for activating PDRA functionality.

2.8 Migration of DSR Data

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

3 Changes by Feature

This section describes the OAM changes introduced to the 6.0 product (as compared to the 5.0) organized by feature. OAM changes include: User Interfaces (NO GUI, SO GUI), Measurements Reports, Alarms, and KPIs.

Note: this section covers OAM changes that will be visible after upgrade to the 6.0 release, and does not include changes that will be seen only as new Optional Features are Activated on the system (post-upgrade activity, and customer specific).
Note: Items marked as "DSR 5.1" were new in DSR 5.1 release, and carried forward to DSR 6.0.

3.1 Upgrade Enhancements (DSR 5.1)

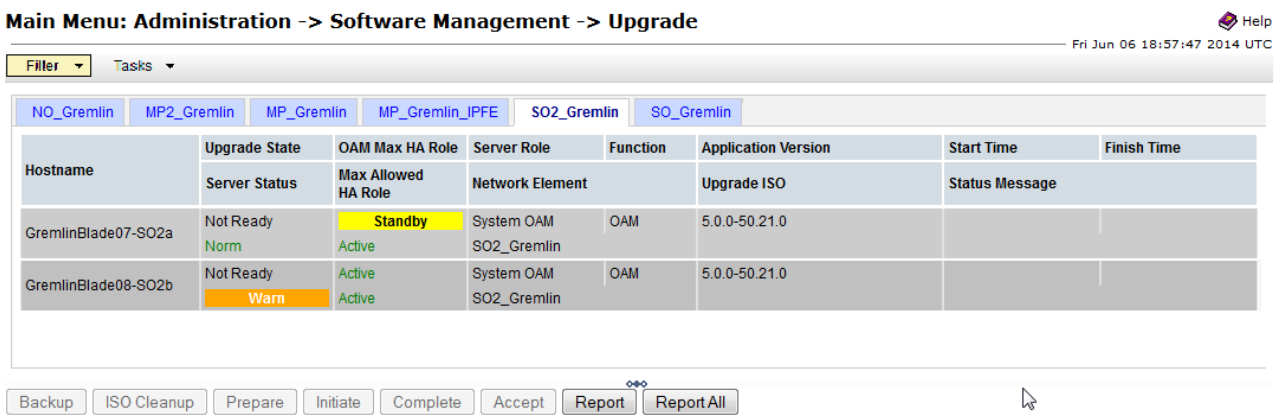
3.1.1 Description

The Upgrade Manager form on the DSR 6.0 NOAM is re-designed, and includes additional functionality.
Command line access is minimized during upgrade execution.
Further, a software improvement called "Upgrade Barrier" manages replication during upgrade so that the user does not need to Inhibit/Allow Replication manually, and to assure that data from upgraded servers is not replicated to non-upgraded servers.

3.1.2 Upgrade Manager GUI Form

The form is re-designed to a tabbed format, tabbed by Server Group, so that the user can see at a glace the status of the servers in the selected server group, and avoid unitentional actions on servers that are not in ther server group.
This also improves form access times.

The form is also re-organized to make it easier to read.
A multi-select function is supported to allow parallel upgrade of servers in a server group.



The Upgrade state progresses through the following states:

- Not Backed up – Backup of the server is required before the server can be upgraded
- Not Ready – Server is Backup, but it is in service and must be removed from service before upgrade
- Ready – The server is not in service (is now "Prepared" for upgrade), and Upgrade can be initiated
- Upgrading – The user has "initiated" the upgrade. A start time is shown, and a status (progress) message.
- Success or Failed – Result of the Upgrade activity. A failed upgrade will typically roll back to the prior release
- Accept/Reject Required – In this state, the upgrade is complete and the user has the option to backout ("reject") the upgrade.
    - Backout Ready – selecting Prepare in the Accept/Reject state causes this state

3.1.3 Dependency

The upgrade of the NOAM servers will initially use the DSR 5.0 Upgrade forms.
However, once the NOAMs are upgraded to 6.0 the new Upgrade Manager form is used for upgrading the remainder of the network.

3.2 Diameter Network Identifiers (MCC/MNC)

3.2.1 Description

Three features in DSR 6.0 have a common need for a mapping of MCC/MNC Network Identifiers.

For this reason, a new "Diameter Common" menu was added to the NOAM GUI, with two configuration menus:

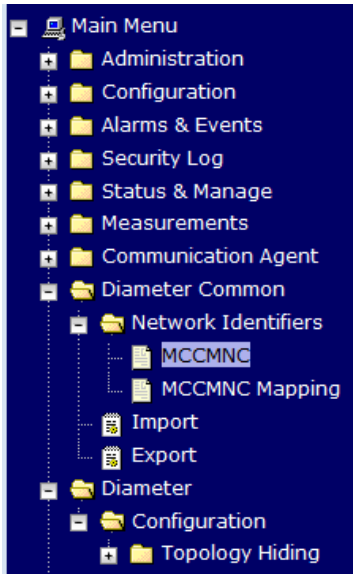
- MCCMNC
- MCCMNC Mapping

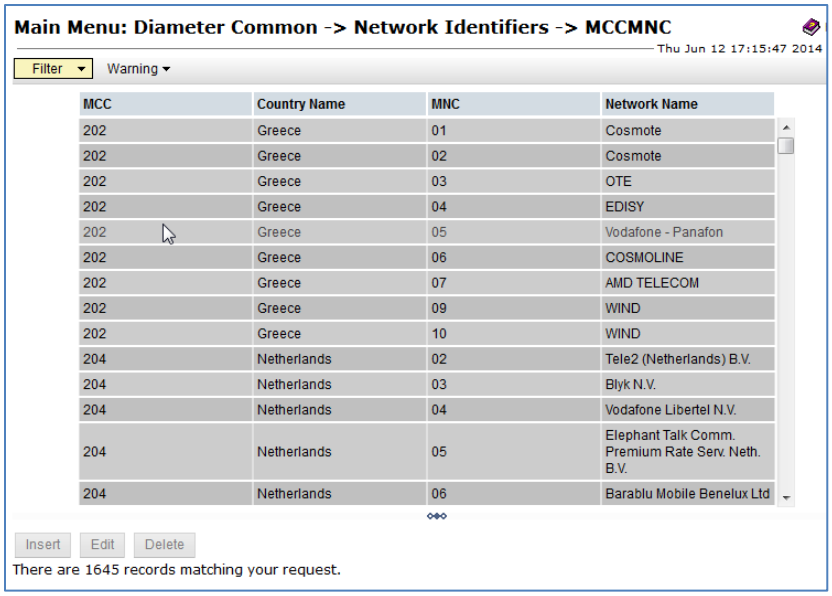
The MCCMNC table is pre-populated at Upgrade to DSR 6.0 with a set of useful data.

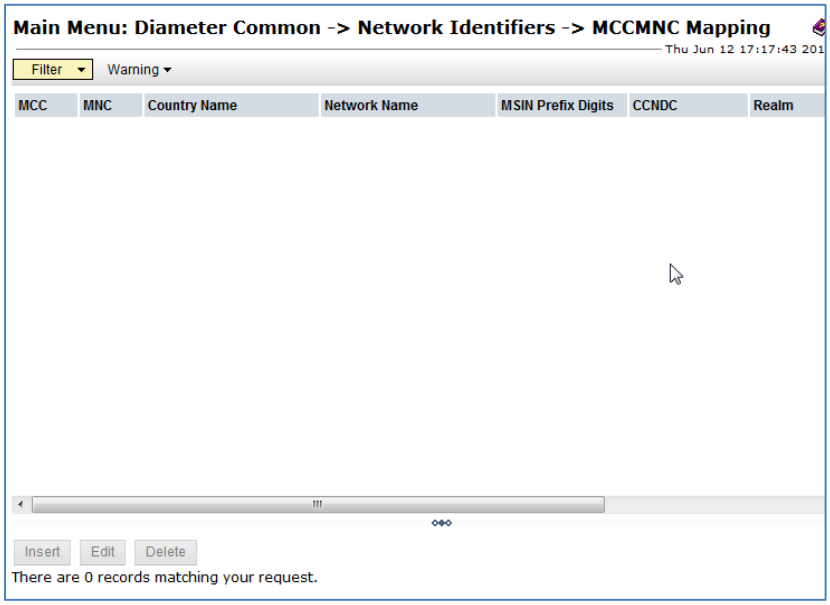
The MCCMNC Mapping table is configured by the user to enable the following features (post-upgrade):

- Support for identifying MSISDNs in FABR that do not include a + sign in the front.
- Support for identifying MSISDNs in RBAR that do not include a + sign in the front.
- MAP-Diameter IWF

3.2.2 NOAM MCC/MNC GUI Forms



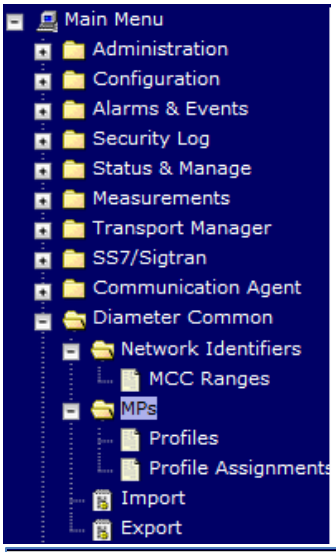


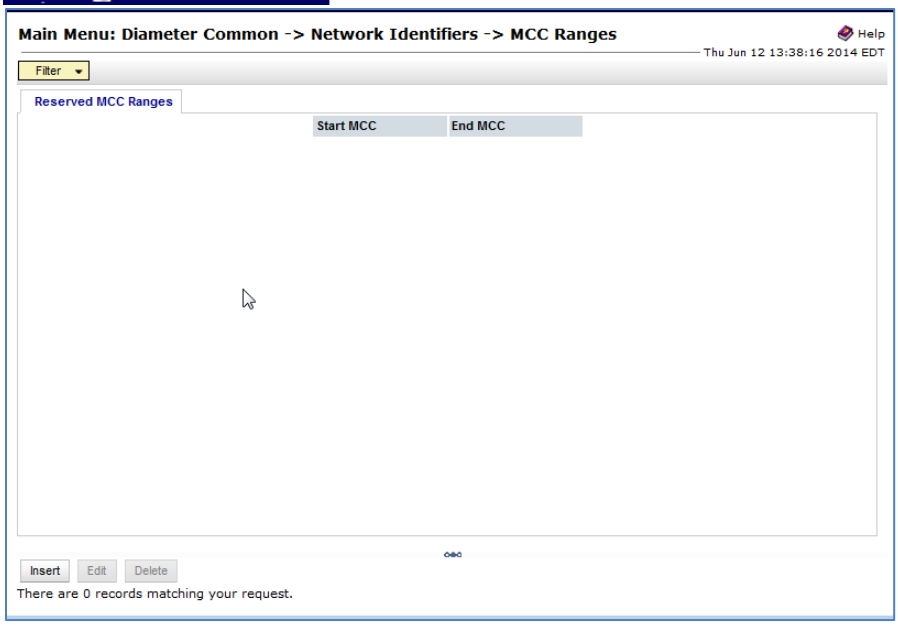


3.2.3 SOAM MCC/MNC GUI Forms

The following forms are seen at the SOAM, for site specific data.

Note that the MP Profiles and Import/Export forms (previously on the Diameter → Configuration menu), are now on the Diameter Common Menu.





3.2.4 Dependency

Must be populated when enabling the new features that depend on this table.

3.3 FABR/RBAR Enhancement (PR 225627, 225628)

3.3.1 Description

This feature relaxes the need for the "+" sign for E.164 numbers, and support differentiating between 15 digit IMSI and 15 digit MSISDN. The implementation uses a lookup in the new MCC-MNC configurable table to identify a MSISDN vs IMSI.

From the requirements: "If the length of the digits falls within the MSISDN range and IMSI range, FABR shall extract the first 5/6 digits and compare it against a list of provisioned 5/6 digit MCC-MNC combinations. If a match occurs, the

digits shall be considered as an IMSI and used for lookup. If a match does not occur, the digits shall be considered as a MSISDN and used for lookup."

3.3.2 Dependency

MCC-MNC configurable table.

3.4 SCTP/TCP Error Statistics (PR 216974)

3.4.1 Description

Customers have identified a need for additional SCTP measurements for troubleshooting connections, beyond what is currently supported on the DSR. This enhancement satisfies some of those requirements and also pro-actively provides equivalent measurements for the TCP protocol.

SCTP Measurements

The following Measurements shall be included in the "Connection Exceptions" measurements report. These counters shall read zero for TCP connections.

- Duplicate TSNs received (RxConnDupTsns)
- Gap acknowledgement blocks received (RxConnGapAckBlocks)
- Retransmit data chunks sent (RxConnRetransDataChunks)

Note: The collection interval for these measurements shall be 5 minutes

The Measurements shall also be included in the "SCTP Statistics" report that can be accessed via Diameter->Maintenance->Connections menu on the DSR GUI.
Note: The measurements are per association and not per path.

The following Measurement shall be included in the "Connection Performance" measurements report. This counter shall read zero for TCP connections.

- Total data chunks sent (TxConnTotalDataChunks)

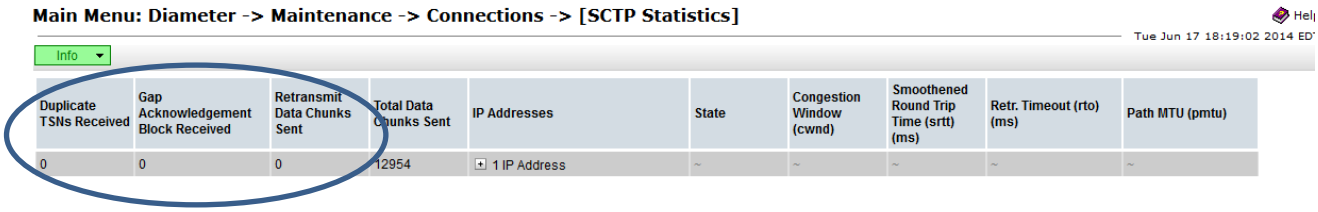
TCP Measurements

The following Measurements shall be included in the "Connection Exceptions" measurements report. These counters shall read zero for SCTP connections.

- Duplicate packets received (RxConnDupPkts)
- Retransmit segments sent (TxConnRetransSegs)

Note: The collection interval for these measurements shall be 5 minutes

3.4.2 Manager GUI Form



3.4.3 Dependency

None

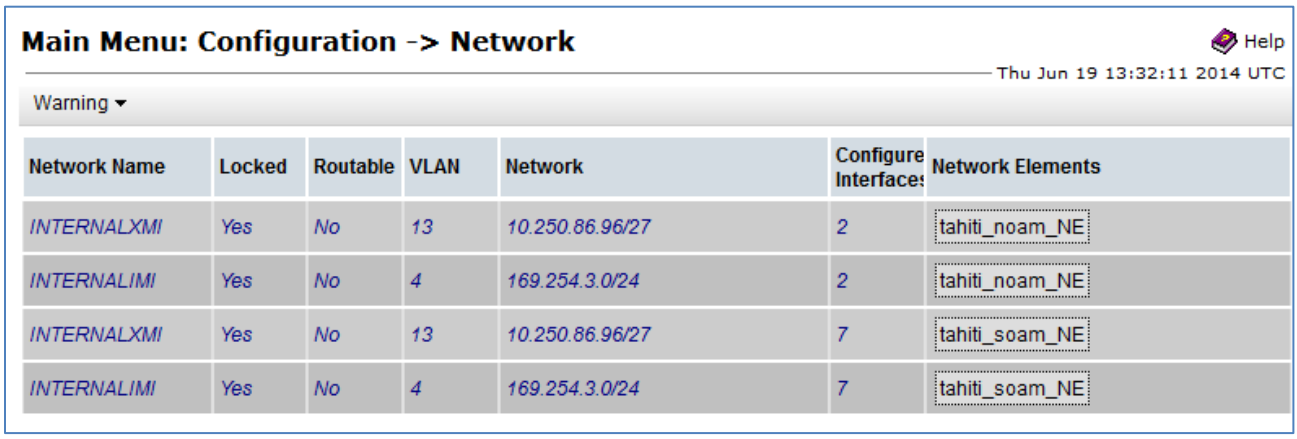
3.5 Duplicate IPs on Non-Routable Networks

3.5.1 Description

The NOAM GUI form "Configure → Network" is enhanced allow non-routable IP networks to be re-used at different sites (Network Elements). Previously, the network configuration forms did not allow this.

When a Network is created, the user will indicate if the network is non-routable (i.e. the network is local to a site and does not extend between sites). If the network is marked as non-routable, then the NOAM will allow the same network to be configured at multiple sites, and will allow duplicate IP addresses at different sites that have the same Network. If the network is marked as routable, then the NOAM will assure that the user does not incorrectly attempt to configure a second site with the same network and ip addresses.

3.5.2 Manager GUI Form



3.5.3 Dependency

None

3.6 Active-Standby Peer Node Support (PR 225328)

3.6.1 Description

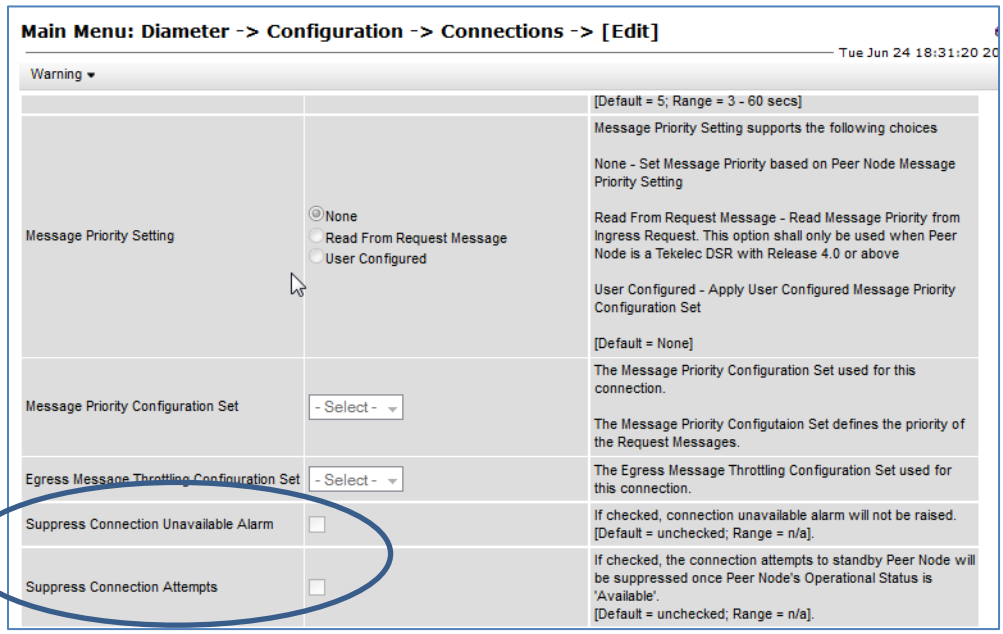
DSR adds two new diameter connection configuration attributes that control the behavior of connections to Standby Peer Nodes.

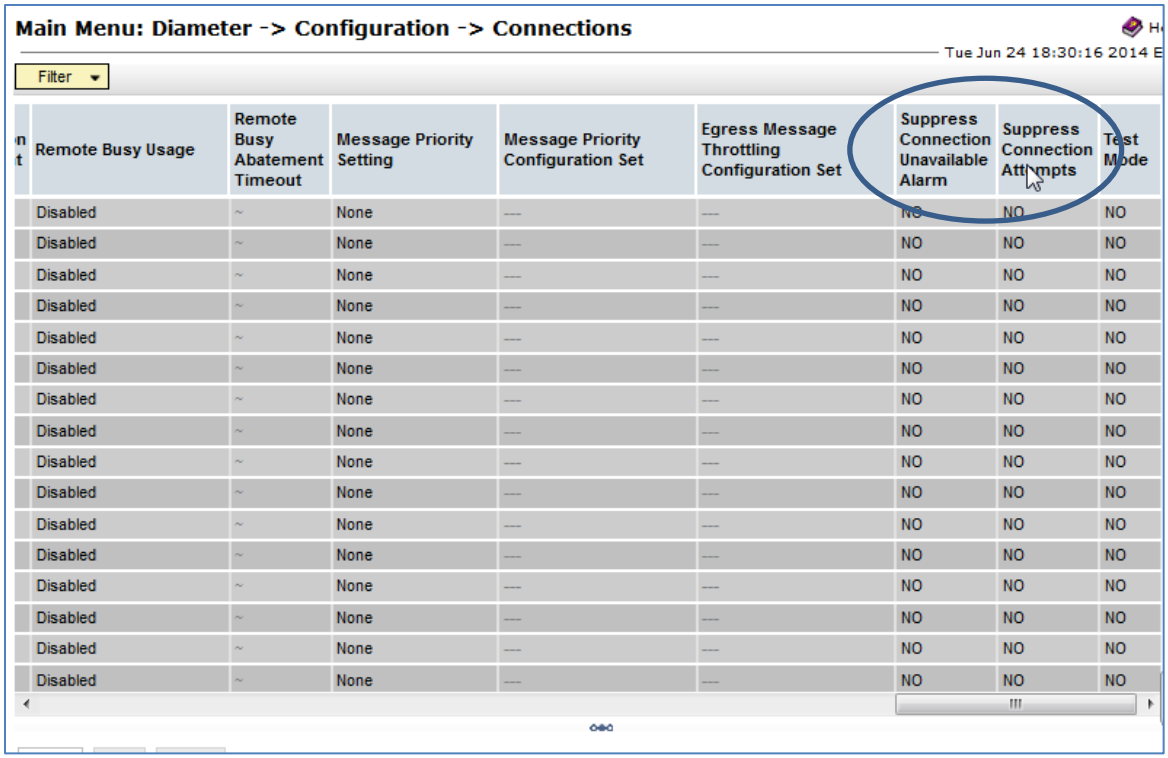
- 'suppress connection unavailable alarm' – Default: OFF; Range {ON, OFF}
- 'suppress connect when peer is available' - Default: OFF; Range: {ON, OFF}

The parameters control behavior for both Initiator and Responder type connections.

This feature also provides for a faster failover of traffic for Active/Standby connections.

3.6.2 SO Manager GUI Form





3.6.3 Dependency

Supported for TCP and SCTP connections.

3.7 PDU Redesign (PR 228297 & PR 232768)

3.7.1 MEAL Delta Spreadsheet

Inserted here is the new MEAL deltas. The MEALs for 6 and 7 include the new column “File Prefix”. This was added to support bug 19120301 (closed in 6) and 19116542 (still open against 7).

Also, TR006845 is the master reference for DSR measurement, alarm and KPI items. This document is hand edited by the development team, but, it contains the FDs the measurement/alarm/kpi IDs map to.

MEAL_dsr-5.0.0-50.
22.0_GA-dsr-6.0.0-6

3.7.2 Description

Enhancement to the Diameter message handling/queuing on the DA-MP servers, to support the larger Diamater message sizes. In general, this feature is internal to the system, however several new Alarms are included to better report message handling fault conditions (and several prior alarms are no longer used).

3.7.3 Alarms

~~Deleted~~	~~22030~~	~~DRL Event Task Queue Utilization~~	~~Major~~	~~The percent utilization of the MP's DRL Event Task Queue is approaching its maximum capacity.~~
~~Deleted~~	~~22031~~	~~DRL Request Task Queue Utilization~~	~~Major~~	~~The percent utilization of the MP's DRL Request Task Queue is approaching its maximum capacity.~~
~~Deleted~~	~~22032~~	~~DRL Answer Task Queue Utilization~~	~~Major~~	~~The percent utilization of the MP's DRL Answer Task Queue is approaching its maximum capacity.~~
~~Deleted~~	~~22033~~	~~DRL Reroute Task Queue Utilization~~	~~Major~~	~~The percent utilization of the MP's DRL Reroute Task Queue is approaching its maximum capacity.~~
Added	22063	Diameter Max Message Size Limit Exceeded	Info	The size of the message encoded by DSR has exceeded its max limits.
~~Deleted~~	~~22100~~	~~DCL Event Task Queue Utilization~~	~~Major~~	~~The percent utilization of the MP's DCL Event Task Queue is approaching its maximum capacity.~~
Added	22223	DA-MP Memory Utilization Limit Exceeded	Critical	DA-MP memory utilization has exceeded its configured limits.
Added	22224	Average Hold Time Limit Exceeded	Critical	The average transaction hold time has exceeded its configured limits.
Added	22225	Average Message Size Limit Exceeded	Critical	The size of the average message processed by DSR has exceeded its configured limits.

3.7.4 Dependency

None

3.8 Dual Path HA Enhancement (PR 229680 & PR 233313)

3.8.1 Description

Enhancement to the High Availablity (HA) functionality of the system, to better manage the election of the Active server of a geo-redundant server group during loss-of-network conditions, and reduce the posibility of multiple Active servers in the group being elected (aka: split-brain).

With this enhancement, the HA election process will consider if there is Active leader heartbeats on either path of the dual path configuration, and will not attempt to take the Active (Leader) role in this case. (In the prior implementation, only the primary path of a dual path configuration was considered in the election process. So a server could be elected as Active even if there were heartbeats on the secondary HA path that indicated a Active (leader) already existed.)

3.8.2 Alarms

The following alarm changes are associated with this feature.

Changed	31232	HA Late Heartbeat Warning	Minor	High availability server has not received a message on specified path within the configured interval
Changed	31233	HA Path Down	Major	High availability path loss of connectivity
Added	31236	HA Link Down	Major	High availability TCP link is down
Added	31285	HA Split Brain Recovery Entry	Info	High availability split brain recovery entered
Added	31286	HA Split Brain Recovery Plan	Info	High availability split brain recovery plan
Added	31287	HA Split Brain Recovery Complete	Info	High availability split brain recovery complete

3.8.3 Dependency

The customer deployment must include two separate network paths (ex: Replication network path and alternate network path) between the servers in the server group for HA heartbeats.

3.9 PCRF Pooling (DSR 5.1)

3.9.1 Description

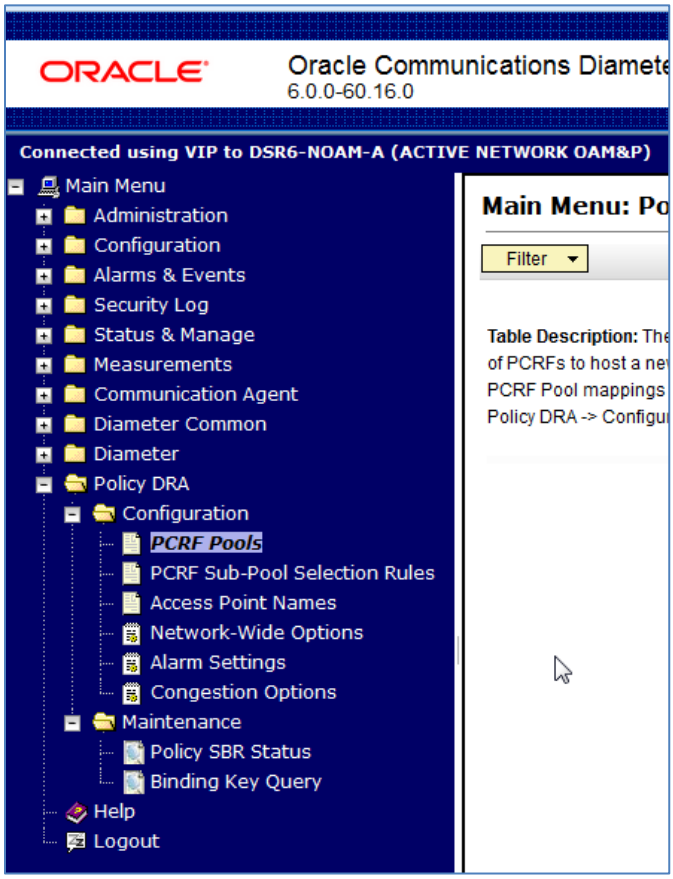
PCRF Pooling provides the capability to divide a large set of PCRF systems into several “pools” and “sub-pools” of PCRF systems. The DSR can then be configured to route Gx session requests to a PCRF pool or sub-pool (i.e. any PCRF in the pool may be selected as the destination for processing the diameter session), based on certain criteria of the Diameter request and the available set of PCRFs in the pool.

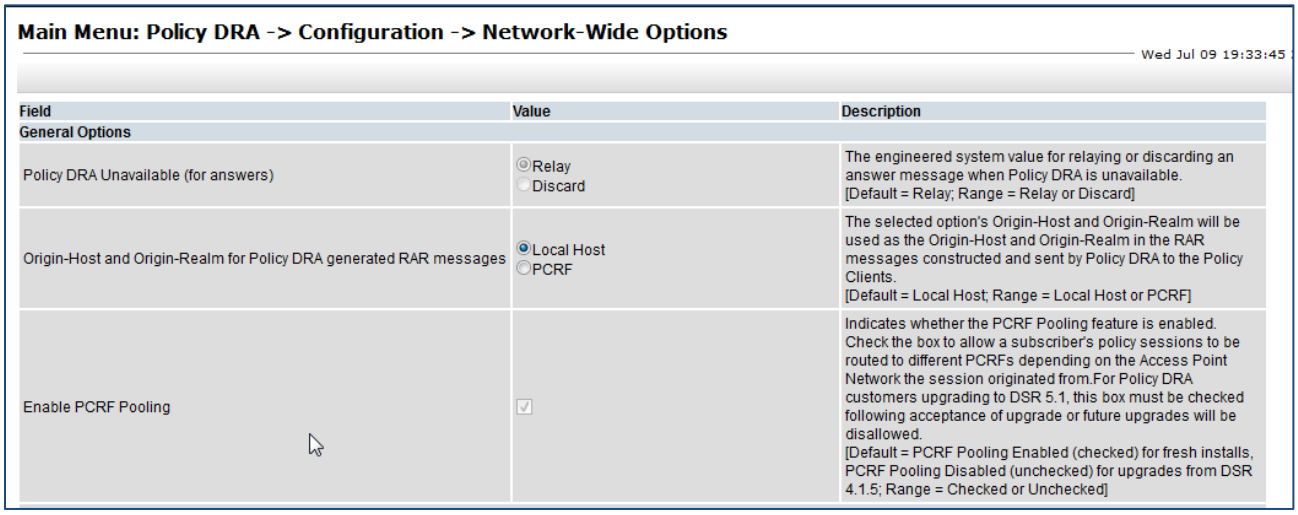
Specifically:

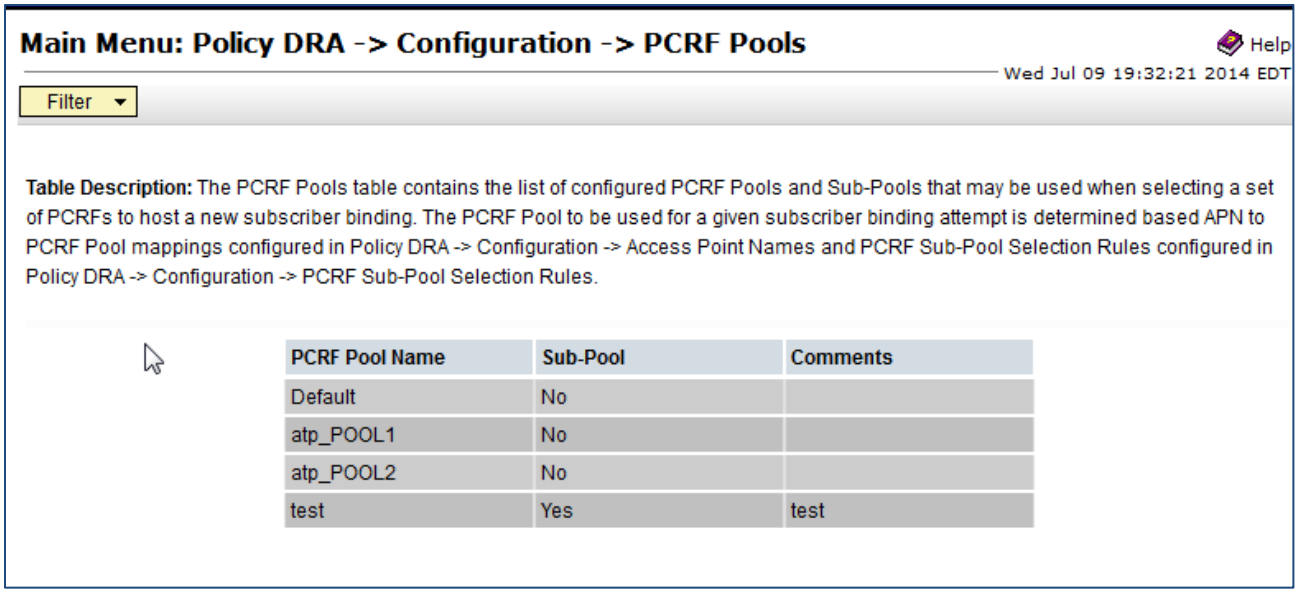
- The PDRA supports the selection of a PCRF Pool for routing of new-binding CCR-I messages based on APN
  - This requires the binding be referenced by a combination of IMSI and APN
- The PDRA supports selection of a PCRF sub-pool based on Origin-Host of the Diameter client sending the CCR-I message
- The PDRA supports the routing of dependent sessions based on correlation keys established as part of the handling of the new-binding CCR-I message
  - This requires that an MsISDN correlation key be referenced by a combination of MsISDN and APN

This feature is only visible on the DSR when the PDRA application is Activated.

3.9.2 NOAM GUI Forms







Main Menu: Policy DRA -> Configuration -> PCRF Pools

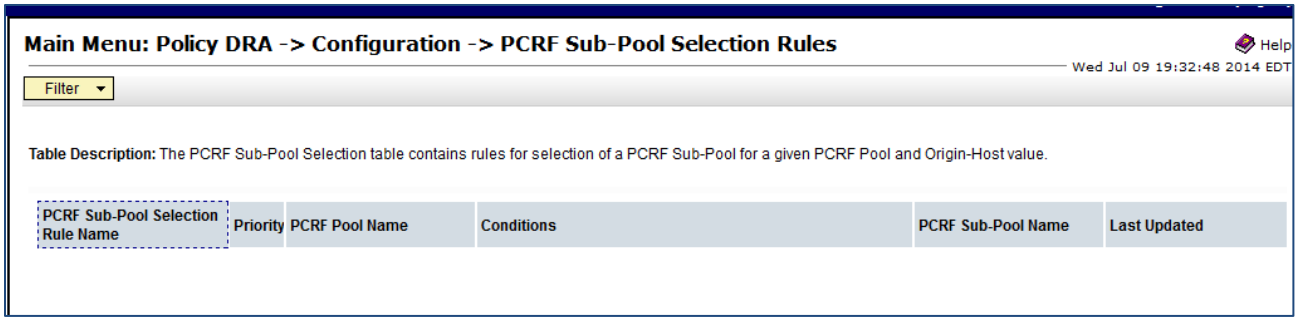
Help

Wed Jul 09 19:32:21 2014 EDT

Filter

Table Description: The PCRF Pools table contains the list of configured PCRF Pools and Sub-Pools that may be used when selecting a set of PCRFs to host a new subscriber binding. The PCRF Pool to be used for a given subscriber binding attempt is determined based APN to PCRF Pool mappings configured in Policy DRA -> Configuration -> Access Point Names and PCRF Sub-Pool Selection Rules configured in Policy DRA -> Configuration -> PCRF Sub-Pool Selection Rules.

PCRF Pool Name	Sub-Pool	Comments
Default	No	
atp_POOL1	No	
atp_POOL2	No	
test	Yes	test



Main Menu: Policy DRA -> Configuration -> PCRF Sub-Pool Selection Rules

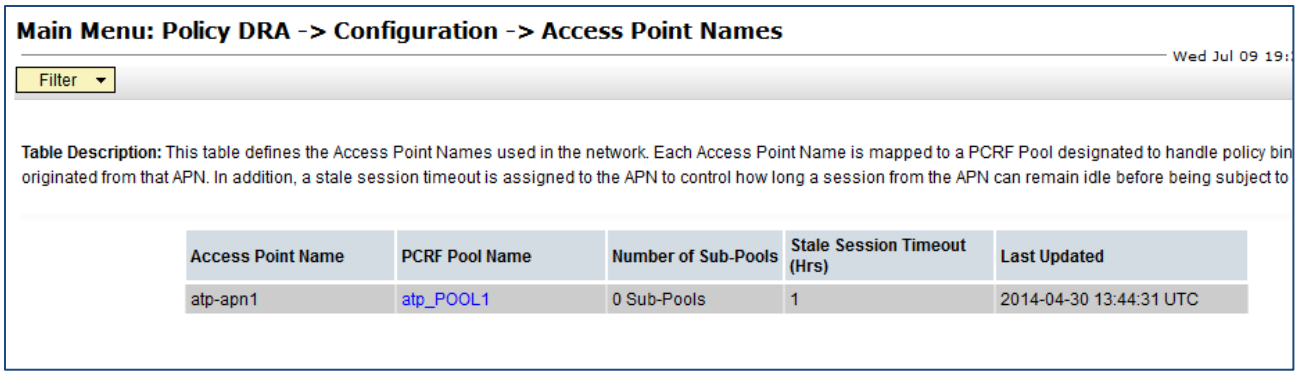
Help

Wed Jul 09 19:32:48 2014 EDT

Filter

Table Description: The PCRF Sub-Pool Selection table contains rules for selection of a PCRF Sub-Pool for a given PCRF Pool and Origin-Host value.

PCRF Sub-Pool Selection Rule Name	Priority	PCRF Pool Name	Conditions	PCRF Sub-Pool Name	Last Updated



Main Menu: Policy DRA -> Configuration -> Access Point Names

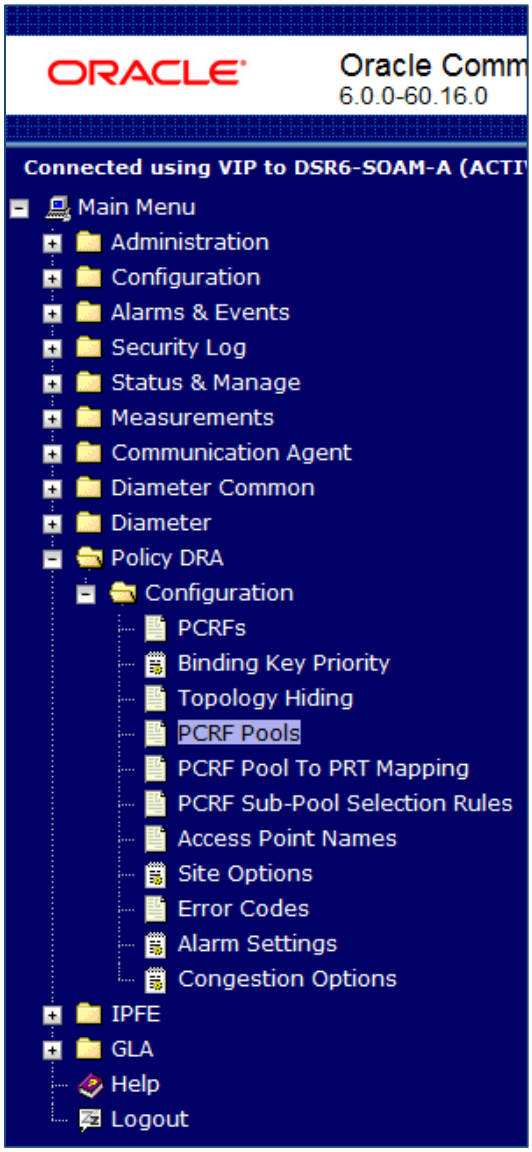
Wed Jul 09 19:

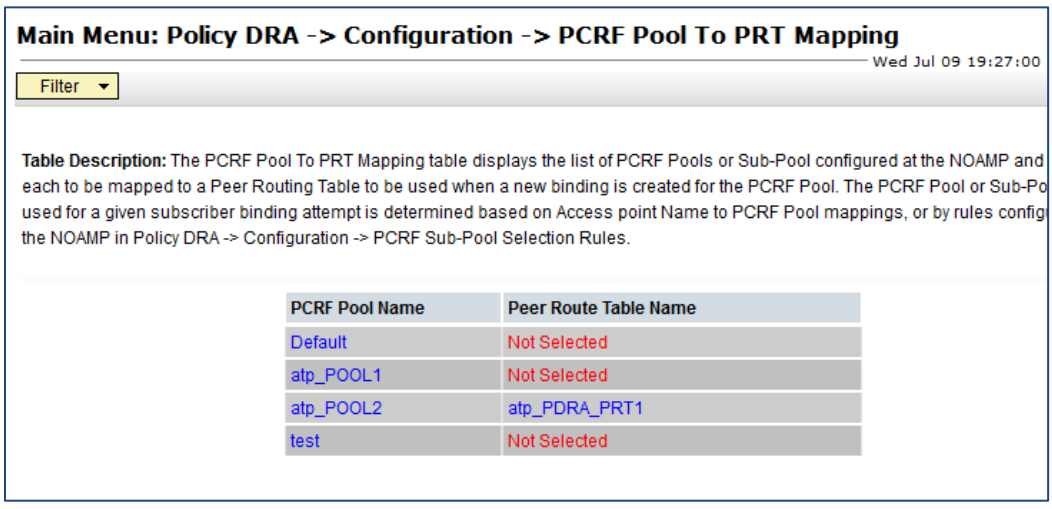
Filter

Table Description: This table defines the Access Point Names used in the network. Each Access Point Name is mapped to a PCRF Pool designated to handle policy bin originated from that APN. In addition, a stale session timeout is assigned to the APN to control how long a session from the APN can remain idle before being subject to

Access Point Name	PCRF Pool Name	Number of Sub-Pools	Stale Session Timeout (Hrs)	Last Updated
atp-apn1	atp_POOL1	0 Sub-Pools	1	2014-04-30 13:44:31 UTC

3.9.3 SOAM GUI Forms





3.9.4 Alarms

The following alarm changes are associated with this feature.

.More info

3.9.5 Dependency

Feature is specific to PDRA deployments.

3.10 Gateway Location Application (GLA) (DSR 5.1)

3.10.1 Description

The GLA is a optional application that provides a query interface to the PDRA Subscriber Binding Repository (SBR) to retrieve the Diameter identity that initiated Gx sessions for a given IMSI or MsISDN.

The PDRA stores the Diameter Identity contained in the Origin-Host AVP of Gx CCR-I messages in the pSBR-B database for all Gx sessions for an IMSI.
The PDRA also stores the APN contained in the Called-Station-ID AVP of Gx CCR-I messages in the pSBR-B database for all Gx sessions for an IMSI.

[The Diameter GLA application query interface uses a unique, vendor proprietary, Diameter application-id.
This application-id supports the following Diameter Command-Codes:

- Get Gateway Request (GGR)
- Get Gateway Answer (GGA)

This feature has a Activation procedure, and is not seen on the system interfaces unless activated. Please reference the Gateway Location User Guide for more information.

3.11 PDRA support for Gx' (Gx-Lite) Interface (DSR 5.1)

3.11.1 Description

Gx-Lite refers to a Tekelec extension to 3GPP Gx standard.
It is used between a non-3GPP Policy Client (e.g. DPI device) and PCRF to provision QoS, policy, and charging information beyond what is available by standard 3GPP Gx. The Gx-Lite interface is binding dependent. PDRA can support the Gx-Lite interface with this feature.

Gx-Lite Interface Uses Diameter Application-Id 16777238 (same as Gx). The only way to distinguish Gx-Lite from Gx is the presence of a Supported-Features AVP in the CCR-I that includes the Camiant Vendor-Id (21274) and the Gx-Lite feature-bit set.
Refer to TR006746 section 6.5 for details.

Gx-Lite is also referred to as Gx' or Gx-prime.

There is a setting on the SOAM Diameter Application Routing Table to designate a interface as Gx', which is all that is required to use this feature (assuming PDRA is Activated).

4 OAM Change Summary

This section will summarize the changes to Alarms, Measurements and KPIs.

4.1 Alarms Delta

In the following table, the Added, changed and Deleted alarms are listed, for the Delta of 5.0 to 6.0.

Alarms for the new Optional features in DSR 6.0 are not listed. Please see the Documentation for these new features for information on the available Alarms.

Scope: An alarm with B scope is reported at the SOAM and NOAM. An alarm with A scope is reported at the NOAM only.

Change Type	Change	Number	Group	Name	Severity	Scope	Description
Added		11500	DIAM	Tracing Suspended	Minor	B	IDIH trace has been suspended due to DA-MP (danger of) CPU congestion
Added		11501	DIAM	Troubleshooting Trace Throttling Active	Minor	B	Troubleshooting trace has been throttled on some MPs due to IDIH TTR bandwidth usage exceeding provisioned limit
Added		11502	DIAM	Troubleshooting Trace Started	Info	B	A troubleshooting trace instance was started
Added		11503	DIAM	Troubleshooting Trace Stopped	Info	B	A troubleshooting trace instance was stopped
Added		11504	DIAM	Invalid DIH IP address	Minor	B	Unable to connect via Comagent to remote DIH server with IP
Added		19863	CAF	Communication Agent Max Connections Limit In Connection Group Reached	Info	A	Max connections per connection group limit is reached.
Added		19864	CAF	ComAgent Successfully Set Host Server Hardware Profile	Info	A	ComAgent Successfully Set Host Server Hardware Profile
Added		19865	CAF	ComAgent Failed to Set Host Server Hardware Profile	Info	A	ComAgent Failed to Set Host Server Hardware Profile

Change Type	Change	Number	Group	Name	Severity	Scope	Description
Changed	Changed - [Description]	22004	DIAM	Maximum pending transactions allowed exceeded	Info	B	Routing attempted to select an egress Diameter Connection to forward a message but the maximum number of allowed pending transactions queued on the Diameter Connection has been reached.
Changed	Changed - [Description]	22009	DIAM	Application Routing Rules with Same Priority	Info	B	An application routing table search with a received Request message found more than one highest priority application routing rule match.
Changed	Changed - [Description]	22010	DIAM	Specified DAS Route List not provisioned	Info	B	The DAS Route List specified by the message copy trigger point is not provisioned or invalid.
Changed	Changed - [Description]	22014	DIAM	No DAS Route List specified	Info	B	No DAS Route List has been specified by the System options, Diameter Mediation rule or local Application.
~~Deleted~~		~~22030~~	~~DIAM~~	~~DRL Event Task Queue Utilization~~	~~Major~~	~~B~~	~~The percent utilization of the MP's DRL Event Task Queue is approaching its maximum capacity.~~
~~Deleted~~		~~22031~~	~~DIAM~~	~~DRL Request Task Queue Utilization~~	~~Major~~	~~B~~	~~The percent utilization of the MP's DRL Request Task Queue is approaching its maximum capacity.~~
~~Deleted~~		~~22032~~	~~DIAM~~	~~DRL Answer Task Queue Utilization~~	~~Major~~	~~B~~	~~The percent utilization of the MP's DRL Answer Task Queue is approaching its maximum capacity.~~
~~Deleted~~		~~22033~~	~~DIAM~~	~~DRL Reroute Task Queue Utilization~~	~~Major~~	~~B~~	~~The percent utilization of the MP's DRL Reroute Task Queue is approaching its maximum capacity.~~
Added		22063	DIAM	Diameter Max Message Size Limit Exceeded	Info	B	The size of the message encoded by DSR has exceeded its max limits.
~~Deleted~~		~~22100~~	~~DIAM~~	~~DCL Event Task Queue Utilization~~	~~Major~~	~~B~~	~~The percent utilization of the MP's DCL Event Task Queue is approaching its maximum capacity.~~
Changed	Changed - [Description]	22106	DIAM	Ingress Message Discarded: DA-MP Ingress Message Rate Control	Major	B	Ingress message discarded due to connection (or DA-MP) ingress message rate exceeding connection (or DA-MP) maximum ingress MPS.

Change Type	Change	Number	Group	Name	Severity	Scope	Description
Added		22223	DSR	MP Memory Utilization Limit Exceeded	Critical	B	MP memory utilization has exceeded its configured limits.
Added		22224	DIAM	Average Hold Time Limit Exceeded	Critical	B	The average transaction hold time has exceeded its configured limits.
Added		22225	DIAM	Average Message Size Limit Exceeded	Critical	B	The size of the average message processed by DSR has exceeded its configured limits.
Changed	Changed - [Description]	22317	DIAM	Connection Rejected: Connection already established	Info	B	Peer initiated connection was rejected because connection has already completed capabilities exchange.
Changed	Changed - [Scope]	22334	DIAM	Unexpected Message Priority in ingress Request	Info	A	Priority value decoded from the incoming message is not correct.
Changed	Changed - [Scope]	22335	DIAM	Peer does not support Message Priority	Info	A	Peer does not support Message Priority feature. Therefore does not encode Message priority in Incoming request.
Changed	Changed - [Description]	22345	DIAM	Connection Priority Level changed	Info	B	The Diameter connection's CPL has transitioned from its current value to a new CPL value based on congestion levels reported by various features
Changed	Changed - [Name]	22347	DIAM	Ingress Message Discarded: DA-MP shared ingress capacity exhausted	Info	B	Ingress message is discarded on a DA-MP due to the ingress message rate on the DA-MP exceeding MP Maximum Ingress MPS.
Changed	Changed - [Name, Scope]	22502	APPL	DSR Application Request Message Queue Utilization	Major	A	The DSR Application Request Message Queue Utilization is approaching its maximum capacity.
Changed	Changed - [Name, Scope]	22503	APPL	DSR Application Answer Message Queue Utilization	Major	A	The DSR Application Answer Message Queue Utilization is approaching its maximum capacity.
Changed	Changed - [Description, Scope]	22611	FABR	FABR Blacklisted Subscriber	Info	A	Message could not be routed because valid User Identity Address extracted from diameter request belongs to blacklisted subscriber

Change Type	Change	Number	Group	Name	Severity	Scope	Description
Changed	Changed - [Description, Group, Name]	22700	Pdra	Protocol errors in Diameter Requests	Info	A	The Diameter request message has protocol errors from the application perspective.
Changed	Changed - [Description, Group, Name]	22701	Pdra	Protocol errors in Diameter Answers	Info	A	The Diameter answer message has protocol errors from the application perspective.
Changed	Changed - [Description, Group, Name]	22702	Pdra	Hashing result does not match configured resource or sub-resource	Info	A	The hashing result does not match configured Resource or sub-resource.
Changed	Changed - [Description, Group, Name]	22703	Pdra	Diameter message routing failure due to DRL queue exhaustion	Info	A	Diameter message routing failure due to DRL queue exhaustion
Changed	Changed - [Description, Group, Name]	22704	Pdra	P-DRA's local ComAgent unavailable	Info	A	Stack events sending failure due to P-DRA's local ComAgent unavailable
Changed	Changed - [Description, Group, Name]	22705	Pdra	pSBR error indications	Info	A	P-DRA receives error indications from pSBR
Changed	Changed - [Description, Group]	22706	Pdra	Binding Key Not Found In Diameter Message	Info	A	Binding key is not found in the received message
Changed	Changed - [autoClearSecs, flags]	22716	pSBR	Policy SBR Audit Statistics Report	Info	A	Policy SBR Audit Statistics Report.
Changed	Changed - [Fatal Severity, Warn Severity]	22717	pSBR	Policy SBR Alternate Key Creation Failure Rate	Info	A	Policy SBR Alternate Key Creation Failure rate exceeds threshold.
Added		22718	PDRA	Binding Not Found for Binding Dependent Session Initiate Request	Info	A	Binding record is not found for the configured binding keys in the binding dependent session-initiation request message.

Change Type	Change	Number	Group	Name	Severity	Scope	Description
Added		22719	PDRA	Maximum Number of Sessions per Binding Exceeded	Info	A	Binding capable session initiation request failed because this subscriber already has the maximum number of sessions per binding.
Changed	Changed - [Name]	22720	PDRA	P-DRA pSBR Response Queue Utilization	Major	A	Policy SBR To Policy DRA Response Queue Utilization Threshold Exceeded. Policy DRA server response queue threshold has been exceeded.
Changed	Changed - [Name]	22721	PDRA	P-DRA Congestion State	Major	A	Policy DRA Server In Congestion. Policy DRA server operating in congestion state.
Changed	Changed - [Name]	22722	PDRA	P-DRA Binding Sub-resource Unavailable	Critical	A	Policy DRA Binding Sub-Resource Unavailable. One or more binding sub-resources are unavailable.
Changed	Changed - [Name]	22723	PDRA	P-DRA Session Sub-resource Unavailable	Critical	A	Policy DRA Session Sub-Resource Unavailable. One or more session sub-resources are unavailable.
Changed	Changed - [Fatal Severity, Warn Severity]	22725	pSBR	Policy SBR Server In Congestion	Major	A	Policy SBR Server In Congestion. Policy SBR server operating in congestion state.
Changed	Changed - [Description, Fatal Severity]	22730	PDRA	Policy DRA Configuration Error	Major	A	Policy DRA Configuration Error.
Changed	Changed - [Fatal Severity]	22731	PDRA	Policy DRA Database Inconsistency	Major	A	Policy DRA Database Inconsistency. Data inconsistency due to internal data error or internal database table error.
Changed	Changed - [Fatal Severity, Warn Severity]	22732	pSBR	Policy SBR Process CPU Utilization Threshold Exceeded	Major	A	Policy SBR Process CPU Utilization Threshold Exceeded. Policy SBR process CPU utilization threshold has been exceeded.
Added		22733	pSBR	Policy SBR failed to free binding memory after PCRF Pooling binding migration	Minor	A	Policy SBR failed to free binding memory after PCRF Pooling binding migration
Added		22734	PDRA	Policy DRA unexpected stack event version	Major	A	Policy DRA unexpected stack event version

Change Type	Change	Number	Group	Name	Severity	Scope	Description
Added		22735	PDRA	Policy DRA session initiation request received with no APN	Info	A	Policy DRA session initiation request received with no APN
Changed	Changed - [Description, Name]	22961	DIAM	Insufficient Memory for Feature Set	Critical	B	Available Memory for Feature Set is less then the Required Memory.
Added		31131	DB	DB Ousted Throttle Behind	Minor	A	DB ousted throttle may be affecting processes.
Changed	Changed - [Description]	31146	SW	DB Mastership Fault	Major	A	DB replication is impaired due to no mastering process (inetrep)
Changed	Changed - [deleters, Description, throttleSecs]	31232	HA	HA Late Heartbeat Warning	Minor	A	High availability server has not received a message on specified path within the configured interval
Changed	Changed - [Description, Name, throttleSecs]	31233	HA	HA Path Down	Major	A	High availability path loss of connectivity
Added		31236	HA	HA Link Down	Major	A	High availability TCP link is down
Changed	Changed - [Description, Name]	31260	SW	SNMP Agent Fault	Minor	A	The SNMP agent (cmsnmpa) is impaired by a s/w fault
Added		31285	HA	HA Split Brain Recovery Entry	Info	A	High availability split brain recovery entered
Added		31286	HA	HA Split Brain Recovery Plan	Info	A	High availability split brain recovery plan
Added		31287	HA	HA Split Brain Recovery Complete	Info	A	High availability split brain recovery complete
Added		32345	PLAT	Server Upgrade snapshot(s) invalid	Major	A	Server Upgrade snapshot(s) invalid
Added		32346	PLAT	Server Hardware Problem	Major	A	Server Hardware Problem
Added		32347	PLAT	Oracle hwmgmtcliStatus	Major	A	Oracle hwmgmtcliStatus Problem

Change Type	Change	Number	Group	Name	Severity	Scope	Description
				Problem			
Added		32536	PLAT	Server Upgrade snapshot(s) warning	Minor	A	Server Upgrade snapshot(s) warning
Changed	Changed - [autoClearSecs, flags]	32700	PLAT	Telco Switch Notification	Info	A	Telco Switch Notification

4.2 Measurements Delta

The Measurements changes for Pre-6.0 features are listed below.

Measuements for the new Optional features in DSR 6.0 are not listed. Please see the Documentation for these new features for information on the available Measurements.

Change	Id	Name	Group	Scope	Interval	Description
Changed - [SubMeasTab]	9867	CARSTxDscrdInternalErr	ComAgent Exception	A	30min	Number of egress events discarded because of other Routed Service internal error
Changed - [Group]	9870	CAHSTxDscrdUnknownSR	ComAgent Exception	A	30min	Number of egress stack events discarded because they referred to a known Resource and an unknown Sub-Resource.
Added	9985	CATxBundled	ComAgent Performance	A	30min	Number of ComAgent Bundled events transmitted by ComAgent
Added	9986	CARxBundled	ComAgent Performance	A	30min	Number of ComAgent Bundled events received by ComAgent
Added	9987	CATxEventsBundled	ComAgent Performance	A	30min	Number of stackevents transmitted through ComAgent Bundled events
Added	9988	CARxEventsBundled	ComAgent Performance	A	30min	Number of stackevents received in ComAgent Bundled events
Added	9993	CATxDscrdBundle	ComAgent Exception	A	30min	Number of egress bundled event discarded during routing.
Added	9994	CARxDscrdBundle	ComAgent Exception	A	30min	Number of ingress bundled event discarded during de-serialization.
Changed - [Description]	10058	DASCopyFailureSizeExceeded	DAS	B	5min	Total number of Message Copy failures because the Copy Message exceeded the system configured message size

Change	Id	Name	Group	Scope	Interval	Description
Changed - [Description]	10089	DASCopyFailureMCCSNotProvisioned	DAS	B	5min	Total number of Message Copy failures because of Invalid MCCS Set.
Changed - [Scope]	10098	EvTransLifetimeExceededMp	Diameter Exception	B	5min	Number of transaction failures because Transaction Lifetime exceeded.
Changed - [Description]	10150	TmConnAvail	Diameter Performance	B	5min	The number of milliseconds the connection was in service during the reporting period. The connection is considered to be in service if the connection status reason is Available.
Changed - [Description]	10182	TmConnEnabledNotAvail	Diameter Exception	B	5min	Total time (in milliseconds) during the reporting period that the connection state was Administratively Enabled and the connection state was not Available. This will appear as an aggregate value retrieved from all DA-MPs in the specified scope.
Changed - [Description]	10183	TmConnDegraded	Diameter Exception	B	5min	Total time (in milliseconds) during the reporting period that the connection state was Degraded.
Changed - [Description]	10205	TmMpCongestion	MP Performance	B	5min	The total time (in milliseconds) the local DA-MP was in CPU congestion. This will appear as an aggregate value retrieved from all DA-MPs in the specified scope (NO for 2-tier setup or SO for 3-tier setup).
Changed - [Description]	10282	TmMpDangerOfCongestion	MP Performance	B	5min	The total time (in milliseconds) the local DA-MP was in danger of CPU congestion. This will appear as an aggregate value retrieved from all DA-MPs in the specified scope (NO for 2-tier setup or SO for 3-tier setup).

Change	Id	Name	Group	Scope	Interval	Description
Changed - [Description]	10283	EvMpDangerOfCongestionEntered	MP Performance	B	5min	The number of times that the local DA-MP entered danger of congestion.
Changed - [Description]	10284	TmMpCongestionLevel1	MP Performance	B	5min	The total time (in milliseconds) the local DA-MP was in CPU congestion level 1. This will appear as an aggregate value retrieved from all DA-MPs in the specified scope (NO for 2-tier setup or SO for 3-tier setup).
Changed - [Description]	10286	TmMpCongestionLevel2	MP Performance	B	5min	The total time (in milliseconds) the local DA-MP was in CPU congestion level 2. This will appear as an aggregate value retrieved from all DA-MPs in the specified scope (NO for 2-tier setup or SO for 3-tier setup).
Changed - [Description]	10288	TmMpCongestionLevel3	MP Performance	B	5min	The total time (in milliseconds) the local DA-MP was in CPU congestion level 3. This will appear as an aggregate value retrieved from all DA-MPs in the specified scope (NO for 2-tier setup or SO for 3-tier setup).
Added	10504	RxConnDupTsns	Connection Exception	B	5min	The number of duplicate TSNs received on the SCTP connection.
Added	10505	RxConnGapAckBlocks	Connection Exception	B	5min	The number of gap acknowledgement blocks received on the SCTP connection.
Added	10506	TxConnRetransDataChunks	Connection Exception	B	5min	The number of retransmitted data chunks sent on the SCTP connection.
Added	10507	TxConnTotalDataChunks	Connection Performance	B	5min	The number of total data chunks sent on the SCTP connection.
Added	10508	RxConnDupPkts	Connection Exception	B	5min	The number of duplicate packets received on the TCP connection.
Added	10509	TxConnRetransSegs	Connection Exception	B	5min	The number of retransmitted segments sent on the TCP connection.

Change	Id	Name	Group	Scope	Interval	Description
Changed - [Description]	10520	TmConnInCL1	Connection Congestion	B	5min	Total amount of time (in milliseconds) the connection experienced CL1.
Changed - [Description]	10521	TmConnInCL2	Connection Congestion	B	5min	Total amount of time (in milliseconds) the connection experienced CL2.
Changed - [Description]	10522	TmConnInCL3	Connection Congestion	B	5min	Total amount of time (in milliseconds) the connection experienced CL3.
Changed - [Description]	10523	TmConnInCL4	Connection Congestion	B	5min	Total amount of time (in milliseconds) the connection experienced CL4.
Added - [Group] Changed - [Description, Dimension, SubMeasTab]	10649	RxFabrSrvNotiDpComAgentErrors	Full Address Resolution Exception	B	5min	Number of failed Database queries received in the service notifications from Com Agent indicating DP/COM Agent errors
Added	10669	RxFabrResolFailDpCongested	Full Address Resolution Exception	B	5min	Number of Database queries that failed to be serviced due to DP/COM Agent errors
Changed - [Group]	10838	PsbrAltKeyCreated	pSBR Session Performance	A	5min	The number of alternate key records created.
Changed - [Group]	10848	PsbrCreateAltKeyDbErr	pSBR Session Exception	A	5min	The number of errors creating an alternate key record.
Changed - [Description]	10868	RxPdra5002FromPcrf	P-DRA Diameter Usage	A	5min	Number of 5002 DIAMETER_UNKNOWN_SESSION_ID responses received from a PCRF.

Change	Id	Name	Group	Scope	Interval	Description
Added	11311	TxPdraAnswersGeneratedConfigErr	P-DRA Diameter Exception	A	5min	Number of Diameter Answers generated by P-DRA due to configuration errors when processing session initiation requests.
Added	11330	RxPdraGxpCcrInitMsgs	P-DRA Diameter Usage	A	5min	Number of Gx-Prime CCR Initial messages processed by PDRA against binding key priorities.
Added	11331	RxPdraGxpCcrUpdateMsgs	P-DRA Diameter Usage	A	5min	Number of Gx-Prime CCR Update messages received by PDRA.
Added	11332	RxPdraGxpCcrTerminateMsgs	P-DRA Diameter Usage	A	5min	Number of Gx-Prime CCR Termination messages received by PDRA.
Added	11333	PdraGxpTopoHidingApplied	P-DRA Diameter Usage	A	5min	Number of Gx-Prime CC Request messages on which topology hiding is applied.
Added	11334	GxpBindingSuccess	P-DRA Diameter Usage	A	5min	Number of Gx-Prime CCR Initial messages processed by PDRA against binding key priorities.
Added	11335	RxPdraRarGxpMsgs	P-DRA Diameter Usage	A	5min	Number of RAR messages received by PDRA for Gx-Prime interface.
Added	11338	TxGxpCcxMsgDiscardedDrlQueueFull	P-DRA Diameter Exception	A	5min	Number of Gx-Prime CCR/CCA messages discarded by P-DRA due to DRL queue being full.
Added	11339	RxGxpCcrMsgDiscardedDueToCongestion	P-DRA Congestion Exception	A	5min	Number of Gx-Prime CCR messages discarded by P-DRA due to P-DRA internal congestion.
Added	11340	RxBindCapApn2PcrfPool	P-DRA Diameter Usage	A	5min	Number of times a given APN is successfully mapped to a PCRF Pool.

Change	Id	Name	Group	Scope	Interval	Description
Added	11341	RxBindCap2PcrfSubPool	P-DRA Diameter Usage	A	5min	Number of binding capable session initiation requests that were mapped to a PCRF Sub-Pool by a given PCRF Sub-Pool Selection Rule.
Added	11342	RxBindCapPcrfPool2Prt	P-DRA Diameter Usage	A	5min	Number of binding capable session initiation requests that are routed using a PRT table chosen as a result of PCRF Pool or PCRF Sub-Pool mapping to the PRT.
Added	11343	RxBindCapPcrfPoolNotMapped	P-DRA Diameter Exception	A	5min	Number of binding capable session initiation requests that were destined for a PCRF Pool or Sub-Pool for which no PRT table was configured.
Added	11344	RxBindCapUnknownApn	P-DRA Diameter Exception	A	5min	Number of binding capable session initiation requests containing an unconfigured APN.
Added	11345	RxBindCapMissingApn	P-DRA Diameter Exception	A	5min	Number of binding capable session initiation requests containing no APN.
Added	11346	RxBindDepUnknownApn	P-DRA Diameter Exception	A	5min	Number of attempts to correlate a binding dependent session initiation request using a non-specific binding correlation key (i.e. IMSI or MSISDN), but containing an unconfigured APN.
Added	11347	RxBindDepMissingApn	P-DRA Diameter Exception	A	5min	Number of attempts to correlate a binding dependent session initiation request using a non-specific binding correlation key (i.e. IMSI or MSISDN), but containing no APN.
Added	11348	RxBindCapUnknownPcrf	P-DRA Diameter Exception	A	5min	Number of binding capable session initiation answers coming from an unconfigured PCRF.

Change	Id	Name	Group	Scope	Interval	Description
Added	11349	PsbrEarlySlaveBindingsCreated	pSBR Binding Performance	A	5min	A count of the number of binding capable session initiation requests that were treated as slaves of an existing early binding. This gives an indication of the frequency at which the early binding logic is being executed.
Added	11350	PsbrEarlyTooLongSrRemoved	pSBR Binding Exception	A	5min	A count of the number of sessionRefs found to be in the EarlyMaster or EarlySlave state for longer than the Maximum Early Binding Lifetime.
Added	11351	PsbrFinalBindingsFollowed	pSBR Binding Performance	A	5min	A count of the number of binding capable session initiation requests that matched a final binding and were routed using the bound PCRF.
Added	11352	PsbrSlavePollingFail	pSBR Binding Exception	A	5min	A count of the number of binding capable session initiation requests that were not routed due to polling failures.
Added	11353	PsbrSuspectSrRemoved	pSBR Binding Exception	A	5min	A count of the number of binding sessionRefs removed as a result of the Suspect Binding mechanism.
Added	11354	PsbrImsiSrRemovedByAudit	pSBR Audit	A	5min	A count of the number of IMSI binding sessionRefs removed by the binding audit.
Added	11355	PsbrSlavePollingContinue	pSBR Binding Performance	A	5min	A count of the number of early binding polling attempts for which the poller was instructed to continue polling.
Added	11356	PsbrSlavePollingRouteToPcrf	pSBR Binding Performance	A	5min	A count of the number of early binding polling attempts for which the poller was instructed to route the request to a bound PCRF.
Added	11357	PsbrMsisdnSrRemovedByAudit	pSBR Audit	A	5min	A count of the number of MSISDN binding sessionRefs removed by the binding audit.

Change	Id	Name	Group	Scope	Interval	Description
Changed - [Description]	14104	EvIdihNumTtrsSent	IDIH	B	5min	The number of TTRs that were sent from DSR to IDIH
Changed - [Description]	14105	EvIdihNumTtrsDeliveryFailed	IDIH	B	5min	The number of TTRs that could not be sent from DSR to IDIH due to the failure of the ComAgent link
Changed - [Name]	14106	TmIdihTraceSuspendedTime	IDIH	B	5min	The amount of time that trace limiting is active
Added	15600	RxDmiwfRequestMsgQueuePeak	DSR Application Performance	B	5min	The peak DSR Application's Request Message Queue utilization (0-100%) measured during the collection interval
Added	15601	RxDmiwfRequestMsgQueueAvg	DSR Application Performance	B	5min	The average Request Message Queue utilization (0-100%) measured during the collection interval.
Added	15602	RxDmiwfAnswerMsgQueuePeak	DSR Application Performance	B	5min	The peak DSR Application's Answer Message Queue utilization (0-100%) measured during the collection interval
Added	15603	RxDmiwfAnswerMsgQueueAvg	DSR Application Performance	B	5min	The average Answer Message Queue utilization (0-100%) measured during the collection interval.
Added	15604	TxDmiwfFullDRLRequestReject	DSR Application Exception	B	5min	The number of egress Diameter Request messages that were rejected because the DRL's Request Queue was full
Added	15605	TxDmiwfFullDRLAnswerDiscard	DSR Application Exception	B	5min	The number of egress Diameter Answer messages that were discarded because the DRL's Answer Queue was full
Added	15606	RxDmiwfMsgRatePeak	DSR Application Performance	B	5min	The peak DSR Application's Message Processing rate measured during the collection interval

Change	Id	Name	Group	Scope	Interval	Description
Added	15607	RxDmiwfMsgRateAvg	DSR Application Performance	B	5min	The average DSR Application's Message Processing rate measured during the collection interval
Added	15608	RxDmiwfRequestProcessed	DSR Application Performance	B	5min	The number of Requests processed by a DSR Application during the collection interval
Added	15609	RxDmiwfAnswerProcessed	DSR Application Performance	B	5min	The number of Answers processed by a DSR Application during the collection interval
Added	16601	CAPM_RxRejectWithErrorAnswer	CAPM	B	5min	Number of Request messages from a downstream peer rejected by a Local Node when an indication from mediation is received to send back an error answer.
Added	16602	CAPM_RxSilentDiscard	CAPM	B	5min	Number of Request messages from a downstream peer silently discarded by a Local Node when an indication from mediation is received to discard the request.

4.3 NEW Measurements "File" Prefix affecting file names

NEW "File Prefix" field for Measurements affects the file names of the generated Measurement Reports. Exported report filenames will be prefixed with the values listed in the "File Prefix" column of the table below.

Examples of exported files for the group "IPFE Performance"

IpfeMpServer_20150202-161546-EST_IPFE_Performance_Hour_153.csv
IpfeTotal_20150202-161542-EST_IPFE_Performance_Hour_153.csv
IpfeTsa_20150202-161537-EST_IPFE_Performance_Hour_153.csv

Name	Group	Description	File Prefix
RxTsaPackets	IPFE Performance	TCP packets received for each TSA.	IpfeTsa
RxTsaBytes	IPFE Performance	TCP bytes received for each TSA.	IpfeTsa
RxIpfePackets	IPFE Performance	Packets received by the IPFE.	IpfeTotal
RxIpfeBytes	IPFE Performance	Bytes received by the IPFE.	IpfeTotal
AsNewAssociations	IPFE Performance	New TCP associations for each server.	IpfeMpServer
TsaNewAssociations	IPFE Performance	New TCP associations for each TSA.	IpfeTsa
IpfeNewAssociations	IPFE Performance	New TCP associations for the IPFE.	IpfeTotal
TxAsPackets	IPFE Performance	TCP packets sent for each server.	IpfeMpServer
TxAsBytes	IPFE Performance	TCP Bytes sent for each server.	IpfeMpServer
TxReject	IPFE Exception	New TCP associations rejected.	IpfeTsa
PcapDroppedPackets	IPFE Exception	ARP/ICMP/ICMPv6 control packets dropped.	IpfeTotal
RxTsaPacketsSctp	IPFE Performance	SCTP packets received for each TSA.	IpfeTsa
RxTsaBytesSctp	IPFE Performance	SCTP bytes received for each TSA.	IpfeTsa
AsNewAssociationsSctp	IPFE Performance	New SCTP associations for each server.	IpfeMpServer
TsaNewAssociationsSctp	IPFE Performance	New SCTP associations for each TSA.	IpfeTsa
IpfeNewAssociationsSctp	IPFE Performance	New SCTP associations for the IPFE.	IpfeTotal
TxAsPacketsSctp	IPFE Performance	SCTP packets sent for each server.	IpfeMpServer

TxAsBytesSctp	IPFE Performance	SCTP bytes sent for each server.	IpfeMpServer
TxRejectSctp	IPFE Exception	New SCTP associations rejected.	IpfeTsa
TsaUnexpctedTcp	IPFE Exception	TCP packets rejected by SCTP-only TSA.	IpfeTsa
TsaUnexpctedSctp	IPFE Exception	SCTP packets rejected by TCP-only TSA.	IpfeTsa
ThrottledPackets	IPFE Exception	Dropped packets due to throttling.	IpfeTotal
CATx	ComAgent Performance	Number of User Data egress events received on ComAgent task queue from local stacks to deliver it to a peer server	ComAgentMeasPerformanceSingle
CATxSuccess	ComAgent Performance	Number of User Data egress events successfully delivered to a peer server	ComAgentMeasPerformanceSingle
CATxDscrdConnUnAvail	ComAgent Exception	Number of User Data egress events discarded because connection was not in-service(down/blocked/not aligned)	ComAgentMeasExceptionSingle
CATxDscrdDestUserIncmpat	ComAgent Exception	Number of User Data egress events discarded because the remote does not support requested capabilities (either it does not support stack or event library or event library version is incompatible)	ComAgentMeasExceptionSingle
CATxDscrdEncodeFail	ComAgent Exception	Number of User Data egress events discarded because of serialization failures	ComAgentMeasExceptionSingle
CATxDscrdMxSendFail	ComAgent Exception	Number of egress events discarded because of failure reported by MxEndpoint	ComAgentMeasExceptionSingle
CARx	ComAgent Performance	Number of User Data ingress events received from a peer server	ComAgentMeasPerformanceSingle
CARxSuccess	ComAgent Performance	Number of User Data ingress events successfully routed to local layers	ComAgentMeasPerformanceSingle

CARxDscrdMsgLenErr	ComAgent Exception	Number of ingress events discarded as it does not contain enough bytes (less than event header bytes)	ComAgentMeasExceptionSingle
CARxMsgUnknown	ComAgent Exception	Number of ingress events discarded because stack event was unknown	ComAgentMeasExceptionSingle
CARxDscrdDecodeFailed	ComAgent Exception	Number of ingress events discarded because failed to deserialize (event not part of stack service language)	ComAgentMeasExceptionSingle
CARxDscrdUnkStkLyr	ComAgent Exception	Number of User Data ingress events discarded because stack layer is not known	ComAgentMeasExceptionSingle
CARxDscrdLayerSendFail	ComAgent Exception	Number of User Data ingress events discarded because layer sendTo failed	ComAgentMeasExceptionSingle
CADSTx	ComAgent Performance	Number of User Data egress events specifically for the default Direct Service	ComAgentMeasPerformanceSingle
CAPeakTxStackEvents	ComAgent Performance	Maximum Number of User Data egress events received from stacks to deliver it to remote	ComAgentMeasPerformanceSingle
CAAvgTxStackEvents	ComAgent Performance	Average Number of User egress events received from stacks to deliver it to remote	ComAgentMeasPerformanceSingle
CATxDscrdInternalErr	ComAgent Exception	Number of egress events discarded because of other unexpected internal processing error	ComAgentMeasExceptionSingle
CARxDscrdInternalErr	ComAgent Exception	Number of ingress events discarded because of other unexpected internal processing error	ComAgentMeasExceptionSingle

CATxDscrdUnkServer	ComAgent Exception	Number of egress events discarded because the destination server was unknown/not configured	ComAgentMeasExceptionSingle
CARxDscrdUnkServer	ComAgent Exception	Number of ingress events discarded because the origination server was unknown/not configured	ComAgentMeasExceptionSingle
CAPeakRxStackEvents	ComAgent Performance	Maximum Number of User Data ingress events received	ComAgentMeasPerformanceSingle
CAAvgRxStackEvents	ComAgent Performance	Average Number of User Data ingress events received	ComAgentMeasPerformanceSingle
CARxDscrdIncompat	ComAgent Exception	Number of ingress events discarded because an Incompatible header version is received	ComAgentMeasExceptionSingle
CARxDiscUnexpEvent	ComAgent Exception	Number of ingress events discarded because it was unexpected in the connection operational state	ComAgentMeasExceptionSingle
CAPeakQueueUtil	ComAgent Performance	Maximum percentage of Queue Utilization	ComAgentMeasPerformanceArrayed
CAAvgQueueUtil	ComAgent Performance	Average percentage of Queue Utilization	ComAgentMeasPerformanceArrayed
CAStackQueueFul	ComAgent Exception	StackEvents discarded due to ComAgent task queue full condition	ComAgentMeasExceptionArrayed
CARSTxDscrdSvcUnavail	ComAgent Exception	Number of stack events discarded because they were submitted to an Unavailable Routed Service.	ComAgentRoutedServiceExceptionArrayed
CATransRetx	ComAgent Exception	Number of times stack events were retransmitted.	ComAgentRoutedServiceExceptionArrayed

CATransDscrdInvCorrId	ComAgent Exception	Number of received stack events that were received and discarded because they did not correlate with a pending transaction.	ComAgentMeasExceptionSingle
CATransDscrdStaleErrRsp	ComAgent Exception	Number of times that an error response was discarded because it contained a valid correlation ID value but its originating server was not the last server to which the request was sent.	ComAgentRoutedServiceExceptionArrayed
CATransEndAbnorm	ComAgent Exception	Number of reliable transactions that terminated abnormally.	ComAgentRoutedServiceExceptionArrayed
CATransStarted	ComAgent Performance	Number of reliable transactions initiated by local User Layers.	ComAgentRoutedServicePerformanceArrayed
CATransEndNorm	ComAgent Performance	Number of reliable transactions initiated by local User Layers that ended normally with a response from a destination server.	ComAgentRoutedServicePerformanceArrayed
CATransPendingMax	ComAgent Performance	Maximum number of allocated pending transaction records.	ComAgentRoutedServicePerformanceArrayed
CATransPendingAvg	ComAgent Performance	Average number of allocated pending transaction records over the collection interval.	ComAgentRoutedServicePerformanceArrayed
CATransTimeMax	ComAgent Performance	Maximum transaction life-time in milliseconds.	ComAgentRoutedServicePerformanceArrayed
CATransTimeAvg	ComAgent Performance	Average transaction life-time in milliseconds.	ComAgentRoutedServicePerformanceArrayed
CADSTxDscrdCong	ComAgent Exception	Egress stack event discarded because its priority was less than the congestion level of the connection chosen for it.	ComAgentMeasExceptionSingle

CATransEndUnkwnSvc	ComAgent Exception	Number of reliable transactions initiated by local User Layers that ended abnormally because they referred to an unknown service.	ComAgentMeasExceptionSingle
CARSTxDscrdCong	ComAgent Exception	Number of stack events discarded due to Routed Service congestion.	ComAgentRoutedServiceExceptionArrayed
CARSTx	ComAgent Performance	Number of stack events submitted to a Routed Service for routing.	ComAgentRoutedServicePerformanceArrayed
CATransEndAnsErr	ComAgent Exception	Number of reliable transactions initiated by local User Layers that ended with an error response from a destination server.	ComAgentRoutedServiceExceptionArrayed
CATransEndErr	ComAgent Exception	Number of reliable transactions initiated by local User Layers that ended abnormally with an error response from a destination server.	ComAgentRoutedServiceExceptionArrayed
CATransEndNoResponse	ComAgent Exception	Number of reliable transactions initiated by local User Layers that ended abnormally due to a timeout waiting for a response.	ComAgentRoutedServiceExceptionArrayed
CATransEndNoResources	ComAgent Exception	Number of reliable transactions initiated by local User Layers that ended abnormally due to lack of resources.	ComAgentRoutedServiceExceptionArrayed
CATxDscrdUnknownSvc	ComAgent Exception	Number of non-reliable and non-request (G=0 or R=0) egress stack events discarded because they refer to an unknown service.	ComAgentMeasExceptionSingle
CAPeakRsrcPoolUtil	ComAgent Performance	Maximum percentage of internal resource pool utilization	ComAgentMeasPerformanceSingle

CAAvgRsrcPoolUtil	ComAgent Performance	Average percentage of internal resource pool utilization	ComAgentMeasPerformanceSingle
CARsrcPoolFul	ComAgent Exception	ComAgent internal resource pool exhaustion condition	ComAgentMeasExceptionSingle
CATxDscrdUnregSvc	ComAgent Exception	Number of egress stack events discarded because they reference a known service that has no registered User Layer.	ComAgentRoutedServiceExceptionArrayed
CATransEndUnregSvc	ComAgent Exception	Number of reliable transactions initiated by local User Layers that ended abnormally because they referred to a known service that lacked a registered User Layer.	ComAgentMeasExceptionSingle
CATransStaleSuccessRsp	ComAgent Exception	Number of times that a success response was received from an unexpected server and was accepted to end a transaction.	ComAgentRoutedServiceExceptionArrayed
CATransRateAvg	ComAgent Performance	Average rate per second that ComAgent transactions were started during the collection interval.	ComAgentRoutedServicePerformanceArrayed
CATransRateMax	ComAgent Performance	Maximum rate per second that ComAgent transactions were started during the collection interval.	ComAgentRoutedServicePerformanceArrayed
CATransEndAbnormRateAvg	ComAgent Exception	Average rate per second that ComAgent transactions ended abnormally during the collection interval.	ComAgentRoutedServiceExceptionArrayed
CATransEndAbnormRateMax	ComAgent Exception	Maximum rate per second that ComAgent transactions ended abnormally during the collection interval.	ComAgentRoutedServiceExceptionArrayed

CARSTxDscrdInternalErr	ComAgent Exception	Number of egress events discarded because of other Routed Service internal error	ComAgentRoutedServiceExceptionArrayed
CAHSTxDscrdUnknownSR	ComAgent Exception	Number of egress stack events discarded because they referred to a known Resource and an unknown Sub-Resource.	ComAgentHAServiceExceptionArrayed
CAHSTxDscrdUnavailSR	ComAgent Exception	Number of stack events discarded because they were submitted to an Unavailable Sub-Resource of a given Resource.	ComAgentHAServiceExceptionArrayed
CAHSTxDscrdCongSR	ComAgent Exception	Number of stack events discarded due to HA Service Sub-Resource congestion.	ComAgentHAServiceExceptionArrayed
CAHSTxDscrdUnkwnRsrc	ComAgent Exception	Number of egress stack events discarded because they referred to an unknown Resource.	ComAgentHAServiceExceptionSingle
CAHSTxDscrdIntErrSR	ComAgent Exception	Number of egress stack events destined to a known Sub-Resource that were discarded due to a ComAgent internal error.	ComAgentHAServiceExceptionArrayed
CAHSRsrcErr	ComAgent Exception	Number of times that ComAgent receives in a heartbeat stack event status concerning a known Resource but an unknown Sub-Resource.	ComAgentHAServiceExceptionArrayed
CAHSTxRsrc	ComAgent Exception	Number of egress stack events that were routed to a known Resource.	ComAgentHAServiceExceptionArrayed
CAHSTxRsrcRateAvg	ComAgent Performance	Average rate per second of egress stack events routed to a known Resource.	ComAgentHAServicePerformanceArrayed
CAHSTxRsrcRateMax	ComAgent Performance	Maximum rate per second of egress stack events routed to a known Resource.	ComAgentHAServicePerformanceArrayed

CATransTTLExceeded	ComAgent Exception	Number of reliable transactions abnormally ended because of Max Time to live exceeded.	ComAgentRoutedServiceExceptionArrayed
CATransReTxExceeded	ComAgent Exception	Number of reliable transactions abnormally ended because of Max number of Retries exceeded.	ComAgentRoutedServiceExceptionArrayed
CATransNoReTxMaxTTL	ComAgent Exception	Number of reliable transactions abnormally ended because of Max Time to live exceeded without any retransmits.	ComAgentRoutedServiceExceptionArrayed
TmResponseTimeDownstream	Diameter Performance	Average time (in milliseconds) from when routing receives a Request message from a downstream peer to the time that an Answer response is sent to that downstream peer.	MeasConnectionId
TmResponseTimeUpstream	Diameter Performance	Average upstream successful transaction response time.	MeasConnectionId
RxRequestNoErrors	Diameter Performance	Number of transactions successfully processed on one routing attempt.	MeasConnectionId
RxArtSelected	Application Routing Rules	Number of times that an application routing rule from ART-X was selected for routing a Request message.	MeasARTId
RxPrtSelected	Peer Routing Rules	Number of times that a peer routing rule from PRT-X was selected for routing a Request message	MeasPRTId
RxRuleSelected	Peer Routing Rules	Number of times that the routing rule was selected for routing a Request message.	MeasPeerRoutingRuleId

RxRuleFwdFailAll	Peer Routing Rules	Number of times that the routing rule was selected for routing a Request message and the message was not successfully routed for any reason.	MeasPeerRoutingRuleId
RxRuleFwdFailActionSendAns	Peer Routing Rules	Number of times that the routing rule was selected for routing a Request message and the message was not successfully routed because the Action in Rule is "Send error response".	MeasPeerRoutingRuleId
RxRuleDuplicatePriority	Peer Routing Rules	Number of times that the routing rule was selected for routing a Request message, but another rule had the same priority and was ignored.	MeasPeerRoutingRuleId
RxApplRuleSelected	Application Routing Rules	Number of times that the application routing rule was selected for routing a Request message.	MeasApplRoutingRuleId
RxApplRuleFwdFailAll	Application Routing Rules	Number of times that the application routing rule was selected for routing a Request message and the message was not successfully routed for any reason.	MeasApplRoutingRuleId
RxApplRuleFwdFailUnavail	Application Routing Rules	Number of times that the application routing rule was selected for routing a Request message and the message was not successfully routed because DSR Application's Operational Status was not "Available".	MeasApplRoutingRuleId
RxApplRuleDuplicatePriority	Application Routing Rules	Number of times that the application routing rule was selected for routing a Request message, but another rule had the same priority and was ignored.	MeasApplRoutingRuleId

RxMsgSize	Diameter Performance	The ingress message size. Buckets are 1-511 bytes, 512-1023, 1024-1535, 1536-2047, 2048-2559, 2560-3071, 3072-3583, 3584-4095, 4096 bytes or more.	MeasBucketSize
TmConnAvail	Diameter Performance	The number of milliseconds the connection was in service during the reporting period. The connection is considered to be in service if the connection status reason is Available.	MeasConnectionId
RxConnAnswerMsgs	Diameter Performance	The number of routable answer messages received on the connection.	MeasConnectionId
RxConnOtherNonRoutable	Diameter Performance	The number of non-routable messages received on the connection that were not CEx, DPx, or DWx. Includes messages where the header P(roxy) bit is not set and messages where the application ID is 0.	MeasConnectionId
TxConnCer	Diameter Performance	The number of CER messages sent on the connection.	MeasConnectionId
RxConnCea	Diameter Performance	The number of CEA messages received on the connection.	MeasConnectionId
RxConnCer	Diameter Performance	The number of CER messages received on the connection.	MeasConnectionId
TxConnCea	Diameter Performance	The number of CEA messages sent on the connection.	MeasConnectionId
TxConnDwr	Diameter Performance	The number of DWR messages sent on the connection.	MeasConnectionId
RxConnDwa	Diameter Performance	The number of DWA messages received on the connection.	MeasConnectionId

RxConnDwr	Diameter Performance	The number of DWR messages received on the connection.	MeasConnectionId
TxConnDwa	Diameter Performance	The number of DWA messages sent on the connection.	MeasConnectionId
TmConnPrvRspAvg	Diameter Performance	The average time (in microseconds) between sending a DWR and receiving a DWA for any proving periods in the reportng period. If the proving period fails, no measurement is recorded.	MeasConnectionId
TxConnDpr	Diameter Performance	The number of DPR messages sent on the connection.	MeasConnectionId
RxConnDpa	Diameter Performance	The number of DPA messages received on the connection.	MeasConnectionId
RxConnDpr	Diameter Performance	The number of DPR messages received on the connection.	MeasConnectionId
TxConnDpa	Diameter Performance	The number of DPA messages sent on the connection.	MeasConnectionId
EvConnPrvSuccess	Diameter Performance	The number of times the connection successfully completed the proving phase.	MeasConnectionId
RxConnRoutableMsgs	Diameter Performance	The number of routable messages received on the connection.	MeasConnectionId
EvPerConnPtrQueuePeak	Diameter Performance	The maximum depth of the PTR queue for each connection during the collection interval.	MeasConnectionId
EvPerConnPtrQueueAvg	Diameter Performance	The average depth of the PTR queue for each connection during the collection interval.	MeasConnectionId

PsbrAltKeyCreated	pSBR Binding Performance	The number of alternate key records created.	MeasAltKeys
PsbrLockCollisions	pSBR Binding Performance	The number of collisions occured periodically while acquiring a lock.	MeasBuckets
TmPsbrProcessingTime	pSBR Binding Performance	Time (in microsecond) to process the Event on Psbr. The measurement is to measure the average time (us) taken for pSBR to process the stack event received from P-DRA and send back the stack event response to P-DRA.	MeasBuckets
PsbrPendingRarLockCollisions	pSBR Session Performance	The number of collisions occured periodically while acquiring a lock to update PendingRar table.	MeasBuckets
CAPM_Temp_Invoked	CAPM	Indicates the number of times a Rule Template has been invoked. This counter is incremented on a per Rule Template basis every time the Rule Template is processed.	MeasCapmDefId
CAPM_CondSet_True	CAPM	Indicates the number of times a condition set has been evaluated to True. This counter is incremented on a per Rule Template basis every time all the conditions of the condition set match.	MeasCapmDefId
CAPM_Action_Set_Fails	CAPM	Indicates the number of times a failure has occurred while executing the action set. This counter is incremented on a per Rule Template basis every time some of the actions fails.Note: This counter is incremented only once even if several actions within a	MeasCapmDefId

CAPM_MsgCopyTriggered	CAPM	Indicates the number of times the MessageCopy action has been invoked successfully.This counter is incremented on a per Rule Template basis every time MessageCopy action has been invoked successfully.	MeasCapmDefId

4.4 KPIs

The KPI changes for Pre-6.0 features are listed below.

KPIs for the new Optional features in DSR 6.0 are not listed. Please see the User Documentation for these new Optional features for information on the available KPIs.

Change Type	Change	Number	Description	Is Default	Name	Group
~~Deleted~~		~~10099~~	~~Percentage of transactions successfully routed on first attempt.~~	~~Y~~	~~Routing Success Rate~~	~~Diameter~~

4.5 IP Port changes

None required.

5 Reference List

DSR 6.0 User Guides for DSR (see customer documentation)

http://www.oracle.com/technetwork/indexes/documentation/oracle-comms-tekelec-2136003.html

- *DSR 6.0 Release Notice*
- *Feature Notice*
- *Operation, Administration, and Maintenance (OAM) Guide*
- *Communication Agent User Guide*
- *Roadmap to Hardware Documentation (Gen8)*
- *Policy DRA (P-DRA) User Guide*
- *Diameter User Guide*
- *Mediation User Guide*
- *Gateway Location Application (GLA) User Guide*
- *Range Based Address Resolution (RBAR) User Guide*
- *Full Address Based Resolution (FABR) User Guide*
- *Charging Proxy Application (CPA) and Offline Charging Solution User Guide*
- *IP Front End (IPFE) User Guide*
- *DSR Alarms, KPIs, and Measurements*
- *DSR Administration Guide*

Installation, Upgrade, and Disaster Recovery

- *PM&C 6.0 Incremental Upgrade*
- *DSR RMS Productization Installation Procedure*
- *DSR Software Installation and Configuration Procedure Part 2/2*
- *DSR 6.0 Base Hardware and Software Installation Procedure*
- *DSR Software Upgrade Procedure*
- *DSR 6.0 Disaster Recovery Guide*
- *RMS Productization Disaster Recovery Guide*