EAGLE® XG Diameter Signaling Router

Feature Notice Release 5.0

910-6830-001 Revision A
October 2013

Diameter Signaling Router (DSR) - Copyright, Notice, Trademarks, and Patents

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RoHS 5/6 - As of July 1, 2006, all products that comprise new installations shipped to European Union member countries will comply with the EU Directive 2002/95/EC "RoHS" (Restriction of Hazardous Substances). The exemption for lead-based solder described in the Annex will be exercised. RoHS 5/6 compliant components will have unique part numbers as reflected in the associated hardware and installation manuals.

WEEE - All products shipped to European Union member countries comply with the EU Directive 2002/96/EC, Waste Electronic and Electrical Equipment. All components that are WEEE compliant will be appropriately marked. For more information regarding Tekelec's WEEE program, contact your sales representative.

Trademarks

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Patents

This product may be covered by one or more of the following U.S. and foreign patents:

U.S. Patent Numbers:

6,795,546; 6,901,262; 6,954,794; 6,967,956; 7,043,000; 7,088,728; 7,123,710; 7,127,057; 7,190,959; 7,286,516; 7,401,360; 7,403,537; 7,406,159; 7,466,807; 7,633,872; 7,650,367; 7,706,343; 7,716,175; 7,743,131; 7,804,789; 7,860,799; 7,916,685; 7,996,541; 8,179,885; 8,224,928; 8,346,944; 8,391,833;

Foreign Patent Numbers:

EP 1314324; EP 1556778; EP 1568203; EP 1846832; EP 1847076; ZL 200780017383.1;

Release Content

Introduction

Diameter Signaling Router (DSR) is a core Diameter signaling and routing solution for operators' LTE, IMS, and 3G networks. This Feature Notice includes feature descriptions, provides the hardware baseline for this release, and explains how to find customer documentation on the Customer Support Site.

Feature notices are distributed to customers with each new release of software.

This Feature Notice includes the following topics concerning DSR Core Routing:

- *160 Peers in a Route Group*
- *Diameter Message Copy*
- *DSR maximum message size of 30,000 byte messages*
- *DSR Ingress Message Coloring*
- *Message Priority and Color-Based DSR Overload Control*
- *DSR Support of Multiple ART*
- *Egress Throttle Group Pending Transaction Limiting*
- *Egress Throttle Group Rate Limiting*
- *Pending Answer Timer by Ingress Peer*
- *IPFE Support for SCTP Multi-homing Connections*
- *IPFE Least Loaded Distribution Algorithm*

This Feature Notice includes the following topics concerning OAM:

- *APDE 15 minute Interval for copying reports to server*
- *APDE Enhancements*
- *DSCP Configuration*
- *Support for DSR 2-Tier to 3-Tier Migration*
- *IPFE Support for Bulk Import/Export of Configuration*
- *SNMP String Configuration*

This Feature Notice includes the following topics concerning Address Resolution Proxy:

- *Database Capacity Increase*
- *FABR Prefix Support*
- *Blacklist Support for FABR*
- *Reserved IMSI MCC filtering for FABR and RBAR*
- *RBAR to support Abandon Request as an exception action*
- *Increase Supported Wildcard Entities from 32 to 100*
- *SDS Subscriber Identity Grouping*

This Feature Notice includes the following topics concerning Roaming Proxy:

- *Diameter path topology hiding*
- *MME/HSS Topology Hiding on RMS*
- *MME/SGSN Topology Hiding*
- *S6a/S6d HSS Topology Hiding*

This Feature Notice includes the following topics concerning Security:

- *Login Expirations*
- *OS Level Login Lock*

160 Peers in a Route Group

This feature enables the DSR to support configuration of 160 peers/connections in a Route Group.

Diameter Message Copy

This feature addresses the ability to forward a copy of the Diameter Request message, and optionally the Answer message, to a Diameter Application Server (a DAS Peer) for a message that was routed through the DSR. Several trigger points, including Diameter Mediation and Peer Routing Rules, can be used to mark messages for copying. Message Copy Configuration Sets define the contents and set conditions on the copy.

DSR maximum message size of 30,000 byte messages

This feature addresses the increase of the maximum Diameter message size that can be handled by a DSR DA-MP to 30,000 bytes.

DSR Ingress Message Coloring

This feature addresses the functionality to assist DSR overload and throttling algorithms in differentiating messages ingressing a DSR Connection whose ingress message rate is above (vs equal to or below) its configured Reserved Ingress MPS.

When a DSR Connection's ingress message rate is equal to or below its configured Reserved Ingress MPS, all messages ingressing the connection are colored Green. When a DSR Connection's ingress message rate is above its configured Reserved Ingress MPS, all messages ingressing the connection are colored Yellow.

Message Color is used as a means for differentiating Diameter Connections that are under-utilized versus those that are over-utilized with respect to ingress traffic - traffic from under-utilized Connections is marked "green" by the Per-Connection Ingress MPS Control (PCIMC) feature, while traffic from over-utilized Connections is marked "yellow". In the event of (Danger of Congestion or of CPU

congestion and based on the specified discard policy, traffic from over-utilized Connections is considered for discard before traffic from under-utilized Connections. Traffic discarded by PCIMC due to capacity exhaustion (per-Connection or shared) is marked "red" and is not considered for any subsequent processing.

Message Priority and Color-Based DSR Overload Control

This feature addresses the enhancement of DSR internal overload controls to utilize User-Configurable Message priority to prioritize load shedding.

The DSR is able to differentiate by color and by priority of ingress messages and use these ingress message attributes as input to DSR message throttling and shedding decisions.

DSR Support of Multiple ART

This feature addresses the DSR supporting Multiple Application Route Tables.

An Application Route Table contains one or more Application Routing Rule that can be used for routing Request messages to DSR Applications. Up to 128 Application Routing Rules can be configured per Application Route Table. Up to 100 Application Route Tables can be configured per DSR Network Element; a total of 1000 Application Routing Rules can be configured across the Application Route Tables per Network Element.

Egress Throttle Group Pending Transaction Limiting

This feature addresses the management of egress throttle group pending transaction limiting from a DSR to Peer Diameter Nodes on a specified set of Diameter Connections.

An Egress Throttle Group is a collection of Diameter Connections or Peers, or both, that are logically grouped together to monitor Egress Message Rate and Pending Transactions for multiple Peers and Connections across multiple DA-MPs on a DSR Network Element. If a Peer is assigned to the Egress Throttle Group, then all Diameter Connections to that Peer are implicitly part of the Egress Throttle Group.

Egress Pending Transactions controls are used to control the maximum number of Pending Requests that can be sent to a set of Diameter Nodes. This can be used for load-balancing when a network element is not responding at expected rates, and limits the total number of Requests that can be pending to a set of Diameter Nodes. EPT controls are across a set of connections and/or peers, and are cumulative across all DA-MPs.

Egress Throttle Group Rate Limiting

This feature addresses the management of egress message throttle group rate limiting from a DSR to Peer Diameter Nodes on a specified set of Diameter Connections.

An Egress Throttle Group is a collection of Diameter Connections or Peers, or both, that are logically grouped together to monitor Egress Message Rate and Pending Transactions for multiple Peers and Connections across multiple DA-MPs on a DSR Network Element. If a Peer is assigned to the Egress Throttle Group, then all Diameter Connections to that Peer are implicitly part of the Egress Throttle Group.

Egress Message Rate controls are used to throttle traffic levels to a set of Diameter Nodes so that the cumulative rate of traffic is controlled. EMR controls are across a set of configured connections and/or peers. ETG Rate Limiting is only done for Request Messages.

Pending Answer Timer by Ingress Peer

This feature addresses the ability to configure the Pending Answer Timer in the DSR based on the ingress peer node.

A Pending Answer Timer can be associated with:

- The Routing Option Set associated with the Peer Node from which the Request is received
- The Peer Node to which the Request is sent
- The configured Diameter Application ID that is contained in the Request message header

Pending Answer Timers associated with Ingress Peer Nodes (via Routing Option Sets) take precedence over those associated with Egress Peers, and Pending Answer Timers associated with Egress Peer Nodes take precedence over those associated with an Application ID. If the Ingress Peer Node, Egress Peer Node, and the Application ID do not have an associated Pending Answer Timer, then the Default Pending Answer Timer is used.

IPFE Support for SCTP Multi-homing Connections

In DSR 4.x, the IPFE only handled TCP and SCTP uni-homed connections. In DSR 5.0, the IPFE adds support for SCTP multi-homed connections. SCTP multi-homing provides multiple paths for a Diameter connection for high availability in case of failover along the path.

IPFE Least Loaded Distribution Algorithm

In DSR 4.x, the IPFE distributed connections via a hash calculation. In DSR 5.0, the IPFE makes available a new algorithm for distributing connections, which takes into account the number of connections and the amount of traffic each DA-MP handles. The IPFE sends connections to the least-loaded server.

If multiple servers have a similar least load, the IPFE distributes connections among them in a round-robin fashion.

APDE 15 minute Interval for copying reports to server

This feature addresses the addition of a 15 minute interval for ADPE for copying exported reports to servers. Prior to this feature, the shortest interval that APDE supported was one hour.

APDE Enhancements

This feature addresses the changes to DSR 5.0 through the Automated Performance Data Export (APDE) Enhancements, specifically:

- Configuring or scheduling Measurement reports from a single screen
- Editing filter criteria using the Scheduled Tasks function
- Automatically exporting configuration backups using Remote Copy
- Changing the Task ID to Task Name
- Displaying filter criteria on the Measurement report
- Auditing duplicate task creation
- Prohibiting the use of spaces in Export Server directory names
- Graying out Measurement reports when they are not available
- Upgrading the Active Task name filter for reports
- Adding a 15 minute interval for reports
- Ability to export MEAL/APDE data via SSH/SFTP

DSCP Configuration

This feature addresses the ability of the network element to support the assignment of DSCP values to messages based on traffic type. The DSCP values for each traffic type are provisioned by the user.

Support for DSR 2-Tier to 3-Tier Migration

This feature enables 2-tier to 3-tier migration.

IPFE Support for Bulk Import/Export of Configuration

The Import/Export function for DSR now covers IPFE configurations.

SNMP String Configuration

This feature addresses the ability for the SNMP community strings to be configurable by the customer.

With this feature, the application OAM components within platform (COMCOL/Appworks) will be responsible for all SNMP community strings on an application server. When the SNMP community string used by COMCOL is changed, the new community string values will also be applied to the TPD community strings on the same server.

Non-application components (infrastructure) which have SNMP community strings will be managed separately from the application. These components include PM&C, TVOE, and network switching elements.

Database Capacity Increase

This feature addresses the increase in the database processor capacity to 140K queries/second on all supported DP HW configurations. This also includes increasing the DP and SDS capacity to 500M entities.

FABR Prefix Support

This feature addresses the ability to perform a Prefix-Based Search in the FABR Address Resolution Table for particular Application Id/Command Code combinations in the Prefix Table. When data is sent to the SDS, a Full Address lookup is attempted using all the digits received. Then, if the Prefix-Based Search is enabled and the Full Address lookup does not find a match, the search will continue to the Prefix Table to check for a match.

Blacklist Support for FABR

This features addresses the enhancement of FABR on DSR to support Blacklists of IMSIs and MSISDNs, specifically the ability to reject Diameter Requests that include a blacklisted IMSI or MSISDN .

Reserved IMSI MCC filtering for FABR and RBAR

MCC (Mobile Country Code) consists of the first 3 digits of an IMSI. ITU-T E.212 specification and complementary annexes specify certain MCCs as "Reserved". This feature allows the operator to configure up to 10 distinct (non-overlapping) MCC ranges as "Reserved". An IMSI that falls within one of these MCC ranges is considered invalid for Address Resolution. The Range Based Address Resolution (RBAR) and Full Address Based Resolution (FABR) DSR Applications shall ignore AVPs

that contain such IMSIs, and shall continue searching other AVPs in the Diameter Request, for a valid address to be used for address resolution.

RBAR to support Abandon Request as an exception action

This feature addresses updating RBAR with the addition of Abandon Request to the list of exception types (making it consistent with FABR).

Increase Supported Wildcard Entities from 32 to 100

This feature addresses the increase of supported Wildcard Entities from 32 to 100.

SDS Subscriber Identity Grouping

This feature addresses the enhancement of the SDS to support grouping of all subscriber identities for a given subscriber together such that they can be referenced as a single entity.

Diameter path topology hiding

This feature addresses hiding a Protected Network's host names as well as the number of hosts in the following AVPs:

1. Route-Record: Sent in Request messages. More than one Route-Record AVP may exist in a Request message.
2. Proxy-Host: An AVP embedded in the Grouped Proxy-Info AVP which is sent in Request and Answer messages. More than one Proxy-Host AVP may exist in a message.
3. Error-Reporting-Host: Sent in Answer messages.

Path topology hiding can be enabled on a per Protected Network basis by assigning a "Path TH Configuration Set" managed object to a "Protected Network" managed object.

MME/HSS Topology Hiding on RMS

This feature addresses the support of the MME/HSS/Path topology hiding on rack-mount servers.

MME/SGSN Topology Hiding

This feature addresses MME/SGSN topology hiding, which hides the identity(s) of a Protected Network's MMEs/SGSNs when it exchanges messages with Untrusted Networks . MME/SGSN host names that are embedded in the Origin-Host and Session-ID AVPs in S6a and S6d messages from the Protected Networks' MME/SGSN are hidden by this feature. MME/SGSN identities are hidden by replacing the host name portion of these AVPs with one MME/SGSN pseudo-host name chosen from multiple possible MME/SGSN pseudo-host names.

MME/SGSN topology hiding can be enabled on a per Protected Network basis by assigning a "MME/SGSN TH Configuration Set" managed object to a "Protected Network" managed object.

S6a/S6d HSS Topology Hiding

This feature addresses HSS topology hiding, which hides the identity(s) of a Protected Network's HSS when it exchanges S6a/S6d messages with Untrusted Networks. An HSS's host name is embedded in the Origin-Host and Session-Id AVPs sent in Request messages and the Origin-Host AVP sent in Answer messages. HSS identities are hidden by replacing the host name portion of the Origin-Host and Session-ID AVPs with an operator-defined HSS pseudo-host name which is assigned to the Protected Network.

HSS identities are hidden by replacing the host name portion of the Origin-Host and Session-ID AVPs with a single operator-defined HSS pseudo-host name which is assigned to all of the Protected Network's HSSs.

S6a/S6d topology hiding can be enabled on a per Protected Network basis by assigning a "S6a/S6d TH Configuration Set" managed object to a "Protected Network" managed object.

Login Expirations

This feature addresses the ability to configure login expiration times.

OS Level Login Lock

This feature addresses the ability to lock out an account after multiple consecutive failed login attempts within a specific period of time. The default is six attempts.

An account remains locked out (due to repeated failed login attempts) for a default of 15 minutes. This is configurable and can be set to an indefinite time period. Indefinitely locked accounts require administrator action to unlock.

Tekelec Resources and Services

Customer Care Center

The Tekelec Customer Care Center is your initial point of contact for all product support needs. A representative takes your call or email, creates a Customer Service Request (CSR) and directs your requests to the Tekelec Technical Assistance Center (TAC). Each CSR includes an individual tracking number. Together with TAC Engineers, the representative will help you resolve your request.

The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

Tekelec TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Tekelec Technical Assistance Centers are located around the globe in the following locations:

Tekelec - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

  Phone:

  1-888-FOR-TKLC or 1-888-367-8552 (toll-free, within continental USA and Canada)

  1-919-460-2150 (outside continental USA and Canada)

  TAC Regional Support Office Hours:

  8:00 a.m. through 5:00 p.m. (GMT minus 5 hours), Monday through Friday, excluding holidays

- **Caribbean and Latin America (CALA)**

  Phone:

  +1-919-460-2150

  TAC Regional Support Office Hours (except Brazil):

  10:00 a.m. through 7:00 p.m. (GMT minus 6 hours), Monday through Friday, excluding holidays

  - **Argentina**

    Phone:

    0-800-555-5246 (toll-free)

  - **Brazil**

Phone:

0-800-891-4341 (toll-free)

TAC Regional Support Office Hours:

8:00 a.m. through 5:48 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

- **Chile**

  Phone:

  1230-020-555-5468

- **Colombia**

  Phone:

  01-800-912-0537

- **Dominican Republic**

  Phone:

  1-888-367-8552

- **Mexico**

  Phone:

  001-888-367-8552

- **Peru**

  Phone:

  0800-53-087

- **Puerto Rico**

  Phone:

  1-888-367-8552 (1-888-FOR-TKLC)

- **Venezuela**

  Phone:

  0800-176-6497

- **Europe, Middle East, and Africa**

  Regional Office Hours:

  8:30 a.m. through 5:00 p.m. (GMT), Monday through Friday, excluding holidays

  - **Signaling**

    Phone:

    +44 1784 467 804 (within UK)

  - **Software Solutions**

    Phone:

+33 3 89 33 54 00

- **Asia**
  - **India**

    Phone:

    +91-124-465-5098 or +1-919-460-2150

    TAC Regional Support Office Hours:

    10:00 a.m. through 7:00 p.m. (GMT plus 5 1/2 hours), Monday through Saturday, excluding holidays
  - **Singapore**

    Phone:

    +65 6796 2288

    TAC Regional Support Office Hours:

    9:00 a.m. through 6:00 p.m. (GMT plus 8 hours), Monday through Friday, excluding holidays

Emergency Response

In the event of a critical service situation, emergency response is offered by the Tekelec Customer Care Center 24 hours a day, 7 days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with the Tekelec Customer Care Center.

Customer Training

Tekelec offers a variety of technical training courses designed to provide the knowledge and experience required to properly provision, administer, operate, and maintain Tekelec products. To enroll in any

of the courses or for schedule information, contact the Tekelec Training Center at (919) 460-3064 or E-mail `training@tekelec.com`.

A complete list and schedule of open enrollment can be found at `www.tekelec.com`.

Locate Product Documentation on the Customer Support Site

Access to Tekelec's Customer Support site is restricted to current Tekelec customers only. This section describes how to log into the Tekelec Customer Support site and locate a document. Viewing the document requires Adobe Acrobat Reader, which can be downloaded at www.adobe.com.

1. Log into the *Tekelec Customer Support* site.

   Note: If you have not registered for this new site, click the **Register Here** link. Have your customer number available. The response time for registration requests is 24 to 48 hours.

2. Click the **Product Support** tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.