



Open Source Telecom Signaling

# PAiCore Diameter Routing Agent

Reigniting telecom innovation and sustainable  
profitability via open source signaling solutions



# Diameter Routing Agent

## Open Source 4G & non-standalone 5G Orchestration

The Diameter Routing Agent (DRA) **orchestrates Diameter signaling in 4G & non-standalone (NSA) 5G** networks, enabling reliable subscriber authentication, seamless session authorization and real-time billing.

PAiCore's DRA acts as an intelligent controller of Diameter traffic, **also serving as a mediation layer that enables advanced routing and message normalization**, offering load balancing, policy enforcement and interoperability for signaling, simplifying network architectures and enabling scalable, **reliable AAA services**.

Developed as an **open source signaling solution**, our DRA offers the flexibility to adapt quickly to new requirements and use cases, while maintaining full interoperability across multiple Diameter protocol references. Its open architecture empowers operators to evolve with industry standards and optimize resources without the constraints of proprietary systems.

## Key Features



Topology hiding capabilities to protect networks



IMSI-based routing, message filtering and NF discovery



Seamless interworking between SS7, Diameter and HTTP/2



Aligned with 3GPP Diameter (Release 19), supporting up to 1,200 TPS

## Recent Success Stories



**019Mobile** relies on **PAiCore's DRA** to reliably handle Diameter AAA traffic across the host mobile networks supporting its operations, ensuring stable and efficient signaling services.



**BillyRonks** is a value-added service aggregator leveraging the **DRA** to integrate its VAS charging solution with **all 4 MNOs in Nigeria**.

# Diameter Routing Agent (DRA)



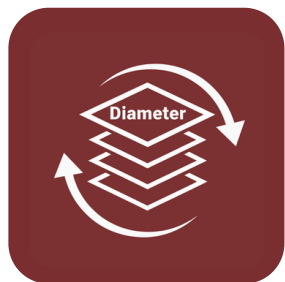
## Multiple Commercial Options

The free Basic Version, publicly available as open source, fosters continuous innovation. PAiCore also offers PT Bundles for professional services, and CT Editions available through OPEX plans with 24/7 technical support and usage rights, or CAPEX models that provide ownership of enhanced, carrier-grade CT products.



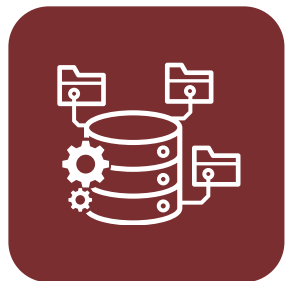
## Simplifies Connections Between the Nodes

Acting as a single point of connection, DRA aids in simplifying the core network's complexity by controlling and managing the Diameter signaling among multiple 4G LTE network elements through a single node that ensures the proper connections and sessions are established.



## Diameter Reference Points

Designed to handle the complexities of modern telecommunications, DRA integrates with essential Diameter reference points including 3GPP's S6a/S6d, Cx/Dx, Gx, Gy, Ro, Rf, Sh, SLh, SLg, S13/S13', S6c, SGd and any extensions built upon the Diameter base protocol as specified by IETF RFC 6733.



## Manages Traffic through Profile Specifications

Traffic that passes through DRA can be routed to the appropriate destination nodes, based on priority and load-balancing mechanisms, subscriber identity ranges, and other predetermined filters.



## High-traffic Capabilities

Thanks to its high TPS capabilities it allows a multi-vendor and multi-node environment, simplifying interconnections within the MNO/MVNO core.



## Message Filtering

Through predefined routing policies, DRA message filtering allows undesired traffic blocking, while maintaining node connectivity and overall stability.



## IMSI Based Routing

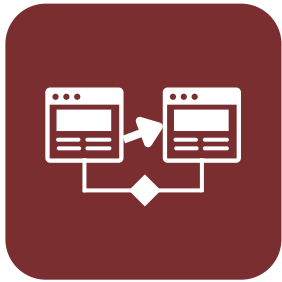
DRA analyzes the IMSI from incoming Diameter requests and routes the traffic according to its routing table.



## Fallback and Drop Policy

**Fallback:** If a message cannot be routed to the destination host, the DRA can redirect it to the next available host.

**Drop:** To avoid unnecessary traffic or undesired messages to be forwarded, the Drop Policy may be set to discard unmatched or failed messages



## Destination Realm Substitution

Destination Host and Destination Realm AVPs can be substituted according to customizable rules.



## Multi-homing

The Diameter stack can be configured as multiple servers, standalone IP, or as a multihomed single server with multiple additional IPs.



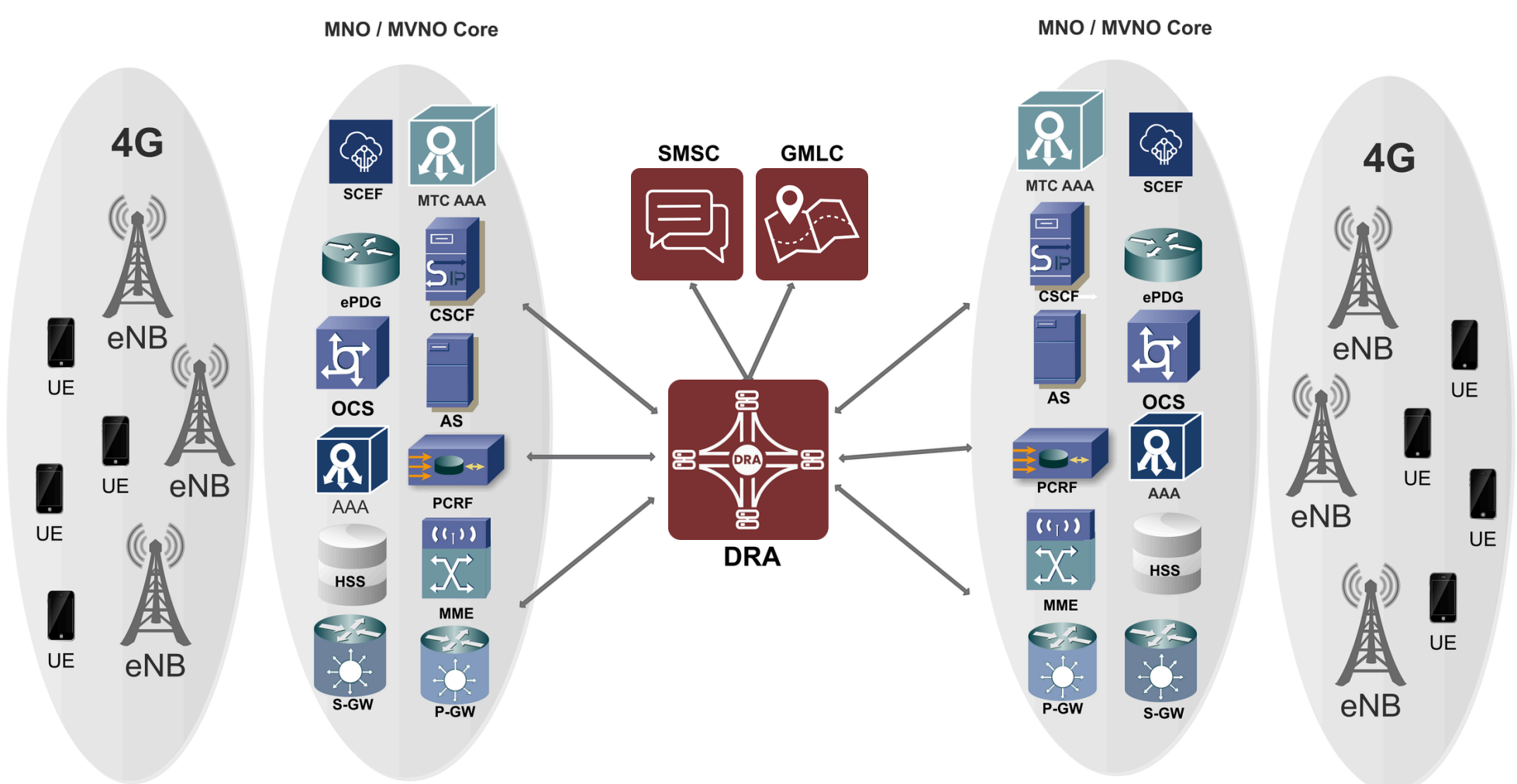
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# Appendix – Technical Information

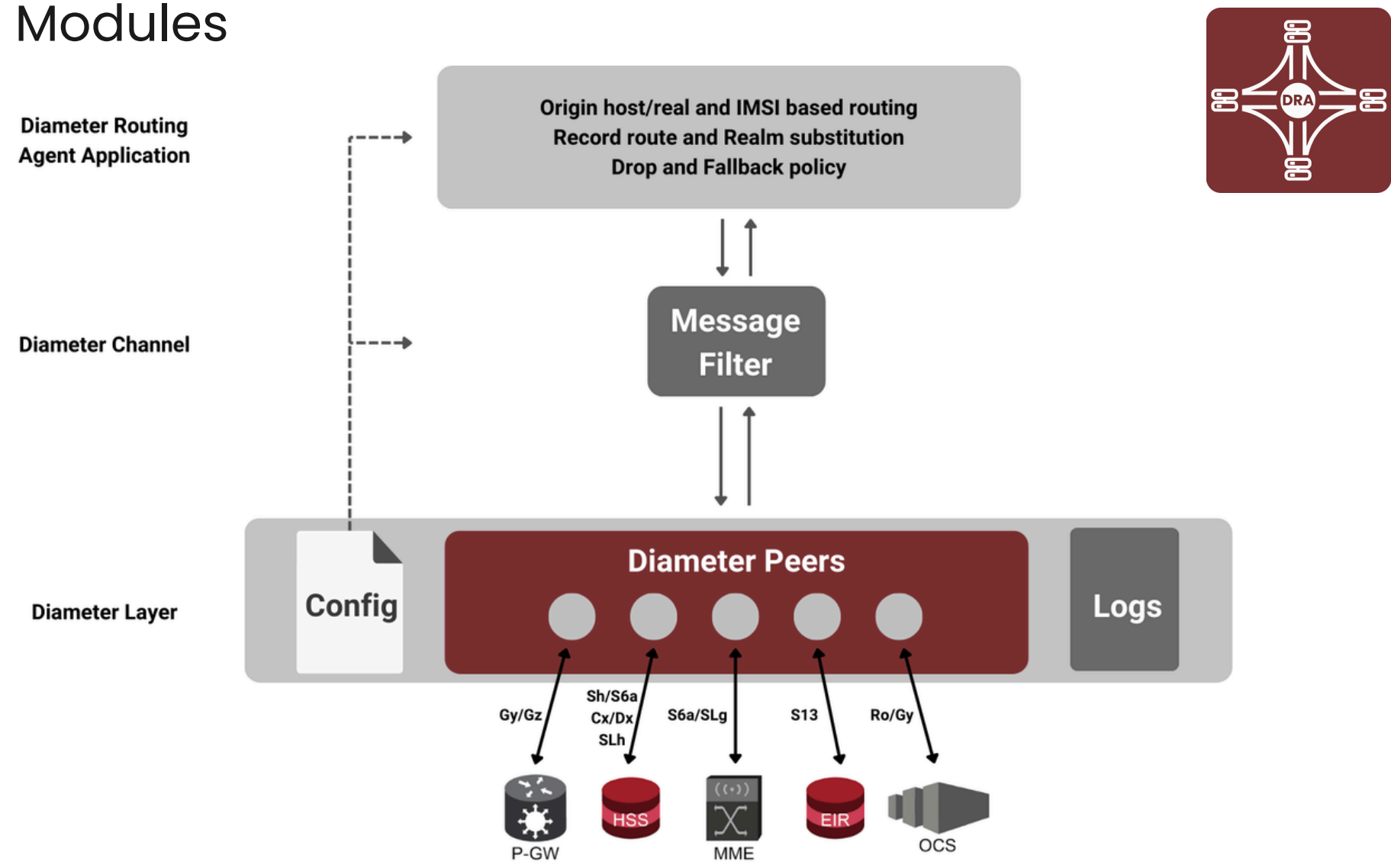


# Architecture

## Interconnection Points



## Internal Modules



# Connectivity Requirements

## TPS & Recommended HW

| TPS Range       | RAM   | Core | Disk       | Network | Sample AWS Instance |
|-----------------|-------|------|------------|---------|---------------------|
| Up to 1,200 TPS | 16 GB | 8    | 250 GB SSD | 1Gbps   | m5.2xlarge          |

**Note:** Our software products are fully tested and optimized for deployment in AWS EC2 instances, ensuring peak performance and reliability. While they are compatible with any Linux-based virtual environment, performance may vary depending on the underlying infrastructure and configuration.

For the following interconnection tables, the displayed values must be taken as examples.

## For Diameter interconnection

| No | Description     | Value                                       | Comments                                                                                                                                                             |
|----|-----------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Host IP         | 1.1.1.1                                     | Diameter IP address(es) assigned to the PAiCore Technology platform (SMSC, GMLC, DRA, etc.).                                                                         |
| 2  | Host Port       | 3868                                        | Diameter port number(s) assigned to the PAiCore Technology platform (SMSC, GMLC, DRA, etc.).                                                                         |
| 3  | Host Realm      | epc.mcc748.mnc012.3gppnetwork.org           | The string(s) in the Network Access Identifier (NAI) that immediately follows the "@" character assigned to the PAiCore Technology platform (SMSC, GMLC, DRA, etc.). |
| 4  | Host User Name  | host_name.epc.mcc748.mnc012.3gppnetwork.org | The string(s) which contains the User-Name in a format consistent with the NAI specification assigned to the PAiCore Technology platform (SMSC, GMLC, DRA, etc.).    |
| 5  | Host Number     | 861684684                                   | ISDN (E.164) number assigned to the PAiCore Technology platform (SMSC, GMLC, DRA, etc.).                                                                             |
| 6  | Peer IP(s)      | 2.2.2.2                                     | Diameter IP address(es) of the peer side (DSC or DRA or DEA or IWF).                                                                                                 |
| 7  | Peer Port(s)    | 3869                                        | Diameter port number(s) of the peer side (DSC or DRA or DEA or IWF).                                                                                                 |
| 8  | Peer Port Range | 3868-3869                                   | Port range to use for establishing SCTP associations.                                                                                                                |
| 9  | Peer Realm      | epc.mcc748.mnc01.3gppnetwork.org            | The string in the DSC/DRA/DEA/IWF Network Access Identifier (NAI) that immediately follows the "@" character.                                                        |
| 10 | Peer User Name  | peer_name.epc.mcc748.mnc01.3gppnetwork.org  | The string which contains the DSC/DRA/DEA/IWF User-Name in a format consistent with the NAI specification.                                                           |

