



Solution Paper

Advanced Control of DIAMETER storm

Background

The DIAMETER signaling protocol plays a central role in the management of fast growing IP based 4G LTE and IMS network, enabling Authentication, Authorization, Charging, Mobility Management and QoS control. Extreme demands in terms of both data and bandwidth for end-user services are resulting in an explosion of signaling traffic at the network control plane, forecasting an exponential growth in near future.

With fast introduction of 4G LTE technology, the mobile core is becoming more complex with more network elements incorporating multiple signaling interfaces as they evolve. Amidst all, service providers are facing uphill challenges for cost-effective data delivery, mitigating network congestion frequencies and severities while attaining highest possible connectivity speeds for enhanced user experience.

Challenges

As maximizing mobile network utilization becomes the critical factor for service providers' infrastructure, network operators are trying to mitigate most intricate challenges for their core network, which includes:

- **OPERATIONAL OVERHEADS AND SCALABILITY ISSUES**

With numerous DIAMETER connected end-points, inter-connected directly for signaling connections operators have to provision and manage all end-points explicitly to route DIAMETER messages. A fully meshed connection will intensify all service critical risks related to congestion, availability and scalability along with operational hazards. Any introduction, transfer or withdrawal (for maintenance etc.) of services or network elements will require insurmountable tasks of re-connection, re-provisioning and verification of entire network.

- **NO CENTRALIZED ROUTING CONTROL**

In a meshed inter-connected environment every end-points need to be provisioned with routing and reach-ability status of all other connected nodes. This increases the operational overheads significantly while sacrificing routing control and thus increasing availability and security risks.

- **UNAVAILABILITY OF NETWORK MONITORING INFORMATION**

As new network elements and services are introduced into carriers 4G LTE networks, traffic rates and pattern are changing constantly. Determination of positive/negative impacts for those changes become more complicated with a meshed inter-connection. Also troubleshooting of any network or service issue(s) becomes cumbersome due to lack of centralized control and consolidated traffic data unavailability.

- **ABSENCE OF CONGESTION CONTROL**

Fault or Overload on any network node as well as congestion triggered from a single node in a meshed network can have cascading effect in the network as a whole, with the chance of complete network outages.

- **SECURITY RISKS**

Lack of centralized control brings in security risks for the traffic from un-trusted sources as well as from external networks. Topology hiding and protection against denial-of-service (DoS) attacks are one of the topmost priority element of the network operators for both operational and security reasons.

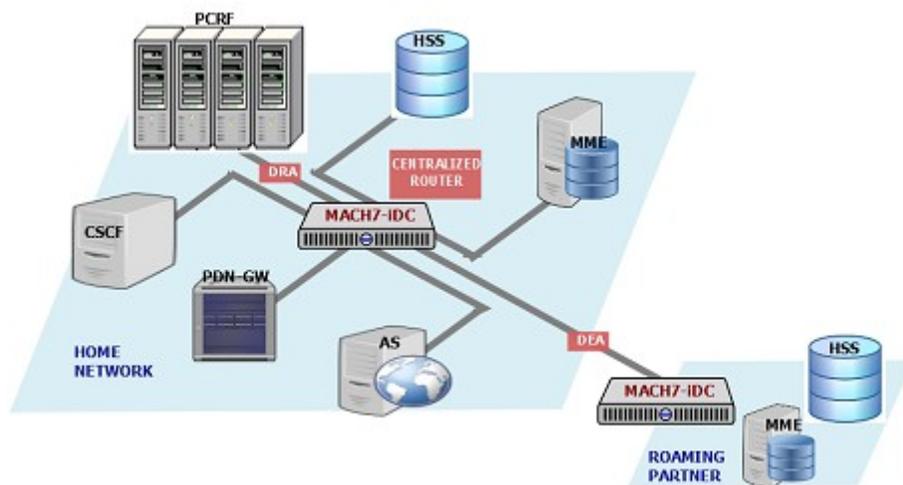
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• INTEROPERABILITY ISSUES

Fast introduction of 4G LTE services brings in deployment of several network elements from different vendors. With continuously evolving standards, vendor implementations for DIAMETER signaling are varying due of difference in interpretation of already established standards and also for introducing enhanced features to gain a competitive edge. This brings in tremendous challenges with high demands of technical resources from all concerned vendors repetitively, to perform interoperability between all network elements during every upgrades and new implementation performed within the network to minimize implementation incompatibilities which can trigger severe service issues.

Solution

As network operators are in quest of mitigating identified challenges urgently to handle impending DIAMETER signaling storm, teleSys' MACH7-iDC perfectly fits their solution needs while exceeding their expectations with advanced routing, traffic control and mediation capabilities. It facilitates a fully managed signaling network architecture cost-effectively, providing flexibility to scale incrementally to meet upsurging service and traffic requirements.



This carrier-grade high-available solution facilitates CORE network deployment for centralized routing, while enabling several operational benefits which includes:

- Intelligent routing, traffic management and load-balancing tasks for all connected nodes including **Subscriber Location Function (SLF)** capabilities.
- Seamless network expansion capability by aggregating connections to all DIAMETER network elements eliminating meshed network inter-connections between them.
- Key Performance Indicators (KPI) information generation to manage network growth.
- **DIAMETER Routing Agent (DRA)** capability, to allow multi-node PCRF deployment confirming IP-CAN session stickiness routing.
- A common inter-connect point for all **roaming traffic** as a **DIAMETER Edge Agent (DEA)** ensuring network security and hiding network topologies.
- Provides DIAMETER signaling normalization capability between vendors, elements and networks, to mitigate interoperability challenges.
- Accelerates introduction of next-generation services with ease-of-interoperability and re-use of legacy infrastructures.
- Enhances service availability by enabling centralized signaling overload and congestion control and protection against denial-of-service (DoS) attack.

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teleSys is the premier provider of advanced Telecommunications solutions for the next generation LTE Signaling Networks, providing open systems hardware and software.

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