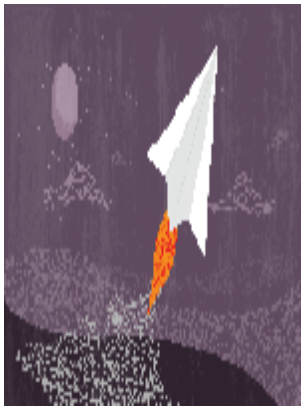
ORACLE

Oracle Communications Diameter Signaling Router



Centralizing Diameter routing with cloud deployable Oracle Communications Diameter Signaling Router creates a secure signaling architecture that reduces the cost and complexity of the core network and enables elastic growth, interoperability and rapid introduction of new services. It also enhances network visibility by providing a centralized monitoring point in the signaling network.

OVERVIEW

Diameter is the protocol used by network elements in LTE and 3G networks to enable and monetize services, such as voice, video and data. Diameter enables revenue-generating data services; including tiered data plans, loyalty programs, application-specific QoS, content provider and Internet of Things (IoT) solutions. There is a direct correlation between Diameter traffic and data revenue. As service providers begin to monetize their networks, the volume of Diameter signaling increases.

Failures in the signaling system result in subscriber churn, lost revenue and opportunity cost. In addition, to succeed in today's communications landscape, mobile operators must focus in offering the best customer experience by enabling a seamless transition from 3G to 4G.

PRODUCT DESCRIPTION

Oracle has created the Oracle Communications Diameter Signaling Router to address these challenges, offer a transition path from 3G to 4G networks and provide a foundation for virtualization. Oracle Communications Diameter Signaling Router is a market-leading cloud deployable Diameter signaling controller solution that centralizes routing, traffic management and load balancing, creating an architecture that enables 3G, IMS and LTE networks to be truly elastic and adapt to increasing service and traffic demands while optimizing the network resources. Oracle Communications Diameter Signaling Router is built drawing on decades of experience as a leader in signaling technology and is aligned with Oracle Communications Network Function Virtualization strategy.

The world's largest LTE deployments rely on Oracle Communications Diameter Signaling Router for:

- Scaling and maintaining a centralized signaling architecture with GUI driven flexible routing and load balancing for mobility management as well as policy and charging
- Protecting the network from signaling storms and preventing network degradation and outages with the most flexible and robust congestion management
- Securing the network at interconnect points against Denial of Service (DoS) attacks through congestion control, message screening, firewall protection and GSMA IR-88 compliant encryption and topology hiding
- Alleviating interworking and interoperability issues in a multi-vendor and multi-protocol environment with the most flexible GUI-driven mediation rules engine and proxy support for MAP and RADIUS
- Enhancing the network visibility by providing context and targeted reporting and with integrated troubleshooting capabilities

COMPONENTS

Custom Application Framework

Oracle Communications Diameter Signaling Router includes a Custom Application Framework (CAF) that allows communications service providers (CSPs) to develop custom new applications to respond more quickly to network and market needs. CSPs can now offer innovative new services to their customers with fast time-to-market. This development environment guides the creation and management of the new applications in Perl language. Examples of applications developed using this framework, which could also be customized are:

- Steering of Roaming, to manage the selection of the roaming partner for roaming subscribers
- Zero Balance Offload, to offload traffic directed to the Online Charging Systems (OCS) during a given time interval when the subscriber reaches zero balance.

Network Security

Multi-layer security protection for Diameter signaling networks is achieved through several layers of security at the transport and the control/applications layers. Oracle Communications Diameter Signaling Router complies with GSMA IR.88 guidelines for LTE/IMS roaming and helps secure the network at interconnect borders against malicious attacks by restricting only allowed traffic at the transport level (Diameter Firewall), and by using encryption (IPSec/TLS/DTLS), access control lists, message screening and topology hiding. Oracle Communications Diameter Signaling Router's unique integrated topology hiding feature ensures that all network topology information is obscured/removed from all AVPs in the request/answer messages. Networks are protected against Denial of Service (DoS) attacks thanks to the congestion control mechanism implemented towards the clients and the servers.

Virtualization

Extreme automation and cloud support are essential to the network of the future. Oracle Communications Diameter Signaling Router delivers higher performance in the network, supports north-bound interface for orchestration and includes RESTfull MMIs that supports configuration and management

Key Features

- Unified signaling for 3G and 4G, supporting integrated virtual STP
- Cloud deployable, integration with common hypervisors and cloud managers
- Custom applications framework to quickly respond to network and market needs
- GUI driven mediation rules for interworking, functionality extension
- Field proven traffic congestion management with Diameter Overload Indication Conveyance (DOIC) and Diameter Routing Message Priority (DMRP)
- Diameter firewall and flexible topology hiding configurations for network protection
- Session binding and network wide correlation with session protection
- Common signaling license that offers investment protection
- Network security addressing both stateful and stateless security cases with clear future path

operations from customer's external management systems, thus allowing for greater automation.

Our solution may be operated in a common and shared infrastructure with other telecommunications applications in private or hosted clouds. Oracle Communications Diameter Signaling Router can be deployed fully virtualized in a variety of commercially available platforms and is fully operable with common hypervisors and virtualization infrastructure managers such as KVM/OpenStack, VMware/vCenter, as well as OVM/EM and TVOE/OVM (TVOE is Oracle's internal hardened KVM implementation).
Virtualized Diameter Signaling Routers can also be deployed with any existing physical Diameter Signaling Router in the network. Such hybrid deployments can be used to augment capacity as required and could be the first step in conversion to an all virtualized network. Cloud deployable Diameter Signaling Router helps CSPs to migrate network elements to virtualized infrastructure. Such migration speeds rollout of new services, reduces OpEx, and accelerates the eventual transition to full adoption of Network Function Virtualization (NFV).

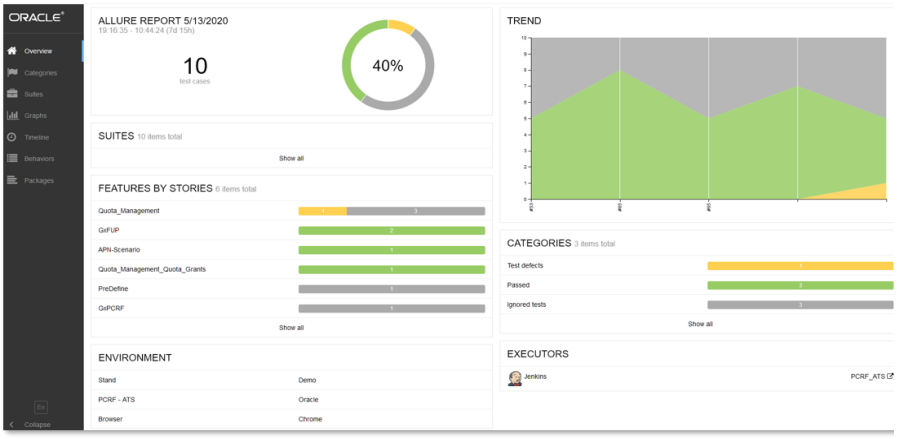
Unified Signaling

The unified signaling solution offers a simple and common infrastructure to manage SS7 and Diameter signaling. The STP VNF facilitates a smooth migration of SS7 applications from legacy systems to datacenters, enables rapid deployment and evolution of partners' interconnection point with secure and easy to turn-around signaling gateways and provides seamless transition from 2G/3G to 4G. SS7 Signal Transfer Point STP VNF is integrated in the DSR application and managed by NOAM/SOAM as "SS7 MP". A SS7 Signal Transfer Point STP VNF can also be installed as standalone.

Automated Test Suite (ATS)

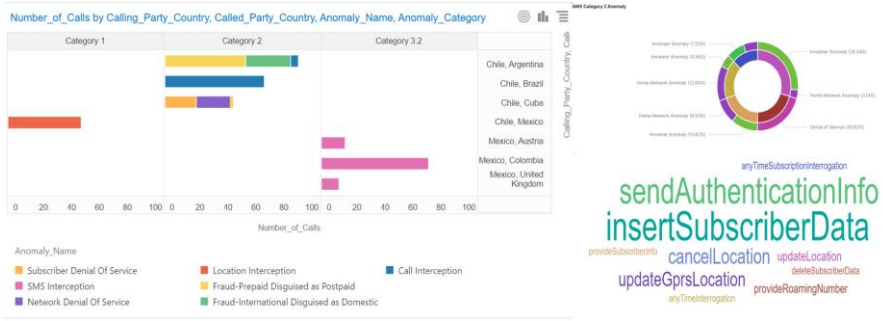
ATS allows you to execute software test cases using an automated testing tool and then, compares the actual results with the expected or predicted results. In this process, there is no intervention from the user.

ATS diagnosis reports for test execution



The ATS advantage

ELK integration with Security Dashboard and Monitoring, logging for Security Analytics Enhancements.
Sample Dashboard:



Multi Use Case

The Oracle Communications Diameter Signaling Router provides routing proxies for many applications eliminating vulnerabilities introduced through provisioning in multiple network elements. Additionally, all Diameter interfaces are available “out-of-box” and don’t require additional services to be activated.

Common Use Cases

- Use Case 1: Core Centralized Routing

In a mesh type logical network, the addition of new nodes is costly and doesn’t scale over time. Ineffectively managed traffic can result in network degradation or outage. Oracle Communications Diameter Signaling Router optimizes the utilization of network resources with centralized intelligent routing and robust congestion control and traffic prioritization.

- Use Case 2: 2G/3G-to-LTE, LTE-to-LTE and WIFI Roaming

In a mesh-type network, operators do not have a way to effectively secure the network against malicious attacks. Oracle Communications Diameter Signaling Router provides a centralized vantage point to defend against potential attacks using topology hiding and encryption mechanisms. Additionally, it allows seamless LTE to 2G/3G roaming with Mobile Application Part (MAP) to Diameter interworking function as well as WIFI roaming with RADIUS proxy and RADIUS to Diameter interworking function.

- Use Case 3: HSS/PCRF/OCS Address Resolution

Unlike IMS networks, there is no subscriber location function in the LTE architecture. Oracle Communications Diameter Signaling Router provides mapping between subscriber identities and destination servers and improves the utilization of the network resources by optimizing traffic distribution.

- Use Case 4: Policy and Charging Binding (VoLTE support)

In networks with multiple PCRF/OCS elements, operators need to bind subscribers’ sessions to the correct policy/charging server. Oracle Communications Diameter Signaling Router provides dynamic session binding and network-wide session correlation across sites to ensure correct billing and proper application of policy.

Key Benefits

- Enables creation and personalization of custom applications to offer new services with faster time to market
- Improves signaling network scalability, congestion and failover management with a centralized routing architecture
- Reduces provisioning, maintenance and interoperability testing costs
- Secures your network against signaling storms and DoS attacks
- Enhances visibility with integrated trouble shooting and ELK dashboards for better diagnosis
- Offers all deployment options including engineered, virtual, cloud or hybrid

- Use Case 5: Interoperability in a multi-vendor environment

Managing systems in a multi-vendor environment can be extremely difficult; frequently resulting in delaying the implementation of new offerings. Oracle Communications Diameter Signaling Router's powerful field-proven mediation capabilities have solved complex and multiple multi-vendor interoperability issues quickly without impacting performance. The mediation GUI and "formatting value wizard' simplify the creation of the new mediation rules guiding the user through the steps. The result is a faster time to market ensuring revenue and customer satisfaction.

SUMMARY

Oracle Communications solutions enable service providers to securely manage and monetize the explosive growth in mobile data traffic and multimedia applications. They help service providers protect their network and customer data, analyze subscribers' quality of service, set policies to improve customer experience and optimize network performance.

Oracle Communications helps billions of people, devices and machines intelligently connect and engage over any network. With proven capabilities, scalable solutions, network security, common intelligent signaling platform, Oracle Communications solutions guarantees, security, high availability and continued support.

Oracle Communication Signaling and Policy Solutions

- Oracle Communications EAGLE
- Oracle Communications Virtual Signal Transfer Point (vSTP)
- Oracle Communications Policy Control Function (PCF)
- Oracle Communications Common Signaling, Security and Edge Protection Proxy (SEPP)
- Oracle Communications Common Signaling, Network Repository Function (NRF)
- Oracle Communications Common Signaling, Service Communication Proxy (SCP)