



Case studies

Success stories: Diameter signaling control solutions

Learn how Nokia's service provider customers benefit from Diameter signaling control solutions that enable them to improve control plane efficiency, scalability, and security.

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Customer: **A leading service provider in Eastern Europe**

Region: **Europe**

Products and solutions: **Nokia Diameter Control Point***

Enable subscriber location function

Overview

Many IMS elements access specific subscriber records located in the home subscriber server (HSS). For service providers with multiple HSSs in their network, this creates routing challenges.

A service provider in Eastern Europe wanted to use Diameter signaling control to deliver the subscriber location function (SLF) to support multiple HSSs and balance signaling load more effectively.

Results

The Nokia DCP simplifies the customer's network operations by providing SLF-based redirection and load balancing. The DCP also makes it easier to look up subscriber information, provide value-added services, and enforce rules on different messages.

Solution

Nokia addressed the service provider's needs with the Nokia Diameter Control Point (DCP) which offers two key features:

- Redirect mode: All IMS subscribers are populated in the SLF/HSS where subscriber data is stored. The Nokia DCP delivers subscriber data to querying network elements using the Dx or Dh interfaces.
- Proxy mode: The Nokia DCP accesses the applicable HSS directly and delivers the subscriber data to querying network elements using the Cx or Sh interfaces.

* This case study is based on a product which has now been replaced by the Nokia Dynamic Diameter Engine (DDE). The DDE provides the benefits of the previous product.

Customer: **Proximus (Belgacom Group)**

Region: **Europe**

Products and solutions: **Nokia Diameter Control Point***

Improve LTE roaming

Overview

Proximus (Belgacom Group) wanted to improve services for its roaming customers and encourage greater usage. The service provider needed a solution that could secure visited-network traffic using a single entry point, as well as control complex and diverse roaming agreements.

Solution

Nokia used the Nokia Diameter Control Point (DCP) to meet these requirements. It leverages Agile Rules Technology (A.R.T.) to provide Diameter routing and edge agent (DRA/DEA) functions, allowing Proximus to:

- Configure policy rules to secure the exchange of Diameter signaling information across disparate partner networks in a roaming infrastructure
- Create service bundles with individual and soft caps
- Provide dynamic quality of service (QoS) treatment on a per-subscriber or per-bundle basis
- Integrate Diameter signaling capabilities into its existing 3G network and evolve them to 4G.

Results

The Nokia DCP enabled Proximus to simplify Diameter mediation and promote compatibility across vendors and interface versions. Streamlined mediation capabilities and increased compatibility also helped reduce operational costs dramatically, when the service provider deployed new Diameter-based network elements, servers, and respective software loads. Proximus can now provide a better mobile internet experience for subscribers traveling abroad, which generates additional data usage and increased revenue.

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Customer: **A mobile virtual network operator in Western Europe**

Region: **Europe**

Products and solutions: **Nokia Diameter Control Point***

Protect networks, devices, and services in MVNO LTE roaming

Overview

A mobile virtual network operator (MVNO) in Western Europe wanted a secure network interface that would support roaming across partner networks. The system needed to allow the MVNO to:

- Protect sensitive information when communicating with roaming partners
- Prevent overload and service interruptions
- Ensure that Diameter messages were sent to the appropriate destinations.

Solution

Nokia met these needs with the Nokia Diameter Control Point (DCP), which provides three key functions:

- Topology hiding: The service provider can provide a single interface to all interconnected networks, which hides routing information, host names and domain names
- Overload protection: Dynamic monitoring allows the service provider to load-balance Diameter traffic
- Relay/proxy agent: Routing tables provide the basis for forwarding and modifying message content.

Results

Using the Nokia DCP, the service provider was able to improve network security and develop a more efficient approach to inter-network routing and policy decision enforcement. These improvements helped control congestion, bringing stability to its own network and those of its partners. In addition, the service provider no longer had to reconfigure network access servers each time Diameter server changes occur.

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Customer: **A leading mobile service provider in Central America**

Region: **Latin America**

Products and solutions: **Nokia Diameter Control Point***

Reduce Diameter traffic volume and avoid CAPEX

Overview

A mobile service provider in Latin America was experiencing a significant increase in Diameter signaling traffic, as its customer base grew rapidly. This signaling traffic created excessive loads on the existing online charging system (OCS). And the service provider considered investing in additional OCS hardware and software to address the challenge.

Solution

After analyzing the issue, Nokia proposed a different approach to meeting the challenge. Using the Nokia Diameter Control Point (DCP), the service provider could:

- Ensure that Diameter messages were relayed, proxied, or redirected, as required by different applications
- Remove unnecessary Diameter messages for zero-rated traffic from data usage reports
- Provide load balancing between two OCS instances.

Results

The Nokia DCP solution has allowed the service provider to:

- Reduce Diameter message traffic volume to the OCS by up to 25 percent
- Avoid expenditures for additional OCS hardware and software licenses (a saving of several hundreds of thousands of US dollars)
- Enable future network extension, which would include subscription-management functionality.

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Customer: **A service provider in South America**

Region: **Latin America**

Products and solutions: **Nokia Diameter Control Point***

Reduce LTE roaming cost and complexity

Overview

A South American service provider wanted to implement a single point of entry for visiting network control plane traffic. One important goal was to ensure that partner networks could exchange LTE routing and signaling information in a secure environment — without the complexity typically associated with multiple roaming agreements.

Solution

Nokia addressed these needs with the Nokia Diameter Control Point (DCP), which supports Diameter routing agent (DRA) and Diameter edge agent (DEA) capabilities. Leveraging Agile Rules Technology (A.R.T), the Nokia DCP allows the service provider to configure policy rules that are designed to secure the Diameter signaling information exchanged across different partner networks in a roaming infrastructure. It also connects to the service provider's mobility management entity (MME), home subscriber server (HSS), and external Diameter agents.

Results

The service provider used the Nokia DCP to reduce cost and complexity from LTE roaming, by:

- Ensuring compatibility across multiple vendors and interface versions
- Reducing mediation costs by leveraging Diameter capabilities.

* This case study is based on a product which has now been replaced by the Nokia Dynamic Diameter Engine (DDE). The DDE provides the benefits of the previous product.

Customer: **Tier 1 service provider**

Region: **North America**

Products and solutions: **Nokia Dynamic Diameter Engine**

Secure third-party interoperability

Overview

A leading North American mobile service provider wanted to secure communication with external IMS application providers. The operator was looking for a Diameter signaling control solution that could:

- Enable higher application QoS on demand
- Protect its control plane from various threats that may originate as a result of dealing with external partners
- Provide the entire solution as a virtual network function (VNF) in a cloud deployment.

Solution

The Nokia Dynamic Diameter Engine (DDE) provides the customer with a highly scalable Diameter signaling control solution. It enables third parties to connect over an Rx interface and offers security features such as white lists, preventing unauthorized access, throttling, overload protection, and topology hiding. The Nokia DDE is also used for Diameter routing functions and is deployed as a virtualized solution in an OpenStack environment.

Results

Opening the network to third-party applications provides increased opportunities for monetization. With the Nokia DDE, the service provider can secure communication with external partners more effectively and protect its infrastructure and its customers. The VNF-based deployment also provides cloud benefits, such as faster rollout and simplified monitoring of service availability, as well as quicker healing when required.

Customer: **Tier 1 service provider**

Region: **North America**

Products and solutions: **Nokia Dynamic Diameter Engine**

Simplify inter-region Diameter routing

Overview

A North American Tier 1 mobile service provider wanted to deploy an easy-to-maintain solution for inter-region routing of Diameter messages. The plan was to roll out Diameter signaling capabilities as a VNF in a cloud deployment, with a dedicated VNF manager for monitoring and orchestration.

Solution

The Nokia Dynamic Diameter Engine (DDE) met these requirements by providing a full mesh inter-region Dynamic routing agent (DRA) solution. Its geo-redundant protection includes auto-discovery capabilities for routes across regions, and it leverages Agile Rules Technology (A.R.T.) to provide flexible route-consolidation mechanisms for routing tables. Along with the VNF Manager, the solution offered ease of integration with cloud orchestration.

Results

Using the Nokia DDE in a geo-redundant configuration with no single point of failure, this operator can expect to see improved security and reliability. Operating costs can be reduced as a result of low provisioning overhead for inter-regional DRAs — and because the simplified interconnect architecture decreases the need for complex provisioning on existing regional DRAs. Finally, deployment as a VNF offers a whole range of virtualization benefits, such as CAPEX and OPEX savings.