Signaling storms push Diameter networks to the limit

Smart devices, applications and the Internet of Things are demanding increasing amounts of data, anytime and anywhere, resulting in an overwhelming amount of data traffic on global networks. Last year, mobile data traffic was almost 30 times the size of the entire global Internet in 2000, and grew by 69% in the year alone.

The importance of addressing this user demand and ensuring that the data plane is up to the task to support the networks is obvious, but there is a larger, and potentially more serious problem lurking in the LTE network control plane: signaling storms.

216 million messages per second

78% compound annual growth rate
The reality

The always-on nature of smartphones and social networking “heartbeat” continues to drive the consumption of increasingly larger amounts of data. Furthermore, with the migration of current users and the addition of new ones to all-IP LTE, networks are being pushed to their limits.

This growth in data traffic is resulting in **signaling surges or storms and hence congestion, service degradation, dropped calls and dissatisfied customers.** Carriers need to be prepared to prevent this from happening.

In LTE networks, and increasingly in 3G legacy networks, Diameter was created as an alternative to RADIUS, in the signaling control plane, for **authentication, authorization and accounting (AAA).** It does so very well and includes enhancements such as error handling and message delivery reliability, and is more easily extendible via Diameter Applications.

The flexibility, scalability and simplicity of implementing new Diameter Applications has led to its widespread adoption and use for policy and quota control and mobility signaling. In addition, it is used in mobile data and VoLTE applications to coordinate various network functions and to aid in subscribers continual use of OTT applications.

The management of Diameter allows operators to monetize services and applications, but when Diameter goes down, these signaling storms are a result.

Signaling storms impact on:

- Users’ network access
- Authentication
- Authorization
- Policy & Charging Control
- Setting up and allocating network resources
- Quality of service

As network demand continues to increase, signaling storms will become more frequent, damaging the customers’ experience and the operators’ capacity to realize revenue.
Optimizing Diameter minimizes the occurrence of signaling surges or storms, enabling carriers to satisfy user demand, prevent bad publicity and retain customers.

In addition Diameter can **facilitate carriers to capture significant revenue**, by catering for more users and their actions. All revenue generating data traffic in the LTE network rides on Diameter signaling. However, Diameter needs to be managed properly to enable operators to monetize that traffic. This opportunity to raise revenue will increase substantially as it is predicted that:

- **24 billion**
  - By 2020, 24 billion devices will be connected to the Internet.

- **216 million**
  - By 2018, 216 million messages per second (MPS) for global LTE Diameter.

- **78%**
  - This will relate to a 78% compound annual growth rate (CAGR).

- **88%**
  - LTE Broadcast will take the lead as the fastest growing application for Diameter and will grow beyond 26 million MPS, at a CAGR of 88%.

**The opportunity?** Carriers should act now.

**Spirent Landslide™**

The best solution

**Spirent Landslide™ provides end-to-end testing of the entire Mobile & Wi-Fi eco-system.** This enables you to validate mobile equipment vendor’s claims, test and optimize your network design, whilst checking the impact of changes made to the underlying network architecture and services.

In addition, Spirent Landslide™ ensures you utilize Diameter to help your company deploy services that can generate new revenue as quickly as possible, whilst cost-effectively migrating to a converged network.

Specifically, Landslide Diameter is a comprehensive test system that enables you to ensure efficient and optimized Diameter signaling operation.

Whether your requirement is emulation of specific Diameter Applications or testing of Diameter clients and servers, Landslide Diameter provides the test solution you need. By using it to remove the guesswork out of predicting signaling traffic loads, you can adequately architect your network.

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Landslide™ Diameter

- Stimulates real-world traffic scenarios or call models at scale, and see what happens on a node-by-node basis.
- Tests the limits of control plane scalability and capacity to ensure that the network is robust even under the most demanding restoration scenarios.
- Operates at extreme scales whilst testing network capabilities such as load balancing, resiliency, efficient control performance, domain routing, session binding and topology hiding.
- Provides real-world emulation of millions of authorization and accounting transactions as well as performance characteristics for equipment vendors.
- Enables building call flows for any Diameter Application, even proprietary ones.
- Interworks multiple Diameter Applications and interfaces.
- Measures the performance of service providers’ network and validates new features and services in the lab.
What you can achieve from optimized Diameter

- Reduction of signaling storms
- Vendor interoperability
- Roaming and local breakout
- Policy and quota control
- VoLTE
- Mobile video services
- Trusted and un-trusted non-3GPP access
- Monetized services and applications
- Growth in revenue

Landslide Diameter gives you the operational confidence that your network will perform as designed even under signaling storm surges, congestion scenarios, dropped calls and network degradation.

By ensuring your customers receive the quality of experience they expect, and pay for, you can maximize return on network applications and services.

To learn more about Spirent Landslide™ Diameter visit www.spirent.com/Solutions/Mobile-Networks
Sources