tieto EVRY

Diameter Dictionary

Purpose:

Propose how a high-performance Diameter dictionary component can be created that is able to rapidly validate Diameter protocol messages, and ascertain that they comply with the corresponding specifications. The representation of the specifications in the dictionary component should make it possible to update specifications without having to re-build the component. Also, it is essential that it does not impose significant message delays. The dictionary component should run on a 64-bit, multicore Linux machine.

Background:

Diameter [1] is a next-generation, industry-standard protocol used to exchange authentication, authorization and accounting (AAA) information in cellular networks. Although Diameter is an improvement from SS7, it is subject to the same or even more vulnerabilities. A Diameter firewall gives mobile operators the scalability, flexibility, performance, and control needed to mitigate security attacks. In a Diameter firewall, there is a need to ensure that a received Diameter message adheres to applicable Diameter protocol specifications from IETF , 3GPP, etc. One way of doing this is by using a Diameter dictionary component that features logic that performs the validation against these specifications.

Activities

1. Define an external interface to the Diameter dictionary component.
2. Evaluate different ways to reduce the delay imposed by the dictionary component on Diameter messages.
3. Design a format to represent the Diameter protocol as prescribed by its specifications.
4. Design the validation logic of the Diameter dictionary component.
5. On the basis of previous steps, implement a prototype Diameter dictionary component.
6. Evaluate the Diameter dictionary component in terms of the delay imposed on validated messages.

Qualifications:

You should be a master student in Computer Science or similar.

References:

[1] V. Farjado et al. “Diameter Base Protocol,” Internet Request for Comments, RFC 6733, October 2012, ISSN: 2070-172, RFC Editor.