




Diameter in Cellular All-IP Networks



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AAA History

- The RADIUS protocol was created as a result of the original NASREQ Working Group in 1991.
 - RADIUS was only designed to offload Network Access Routers with the task of authenticating and authorizing telnet, SLIP and PPP users.
 - After sufficient demand from the ISPs, the primary RADIUS users, the third 'A' (Accounting) was added to the protocol.
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AAA History

- In 1995, the Roaming Operations (ROAMOPS) WG was formed, and looked at the use of RADIUS for inter-domain use.
 - Many flaws within the protocol were documented, and as a result, the WG did not recommend the use of RADIUS in inter-domain networks.
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AAA History

- As a result, the AAA WG was formed.
 - The WG underwent many changes during its chartered lifetime, but recently has been concentrating on providing AAA for both dial-up and Mobile IP network access.
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AAA History

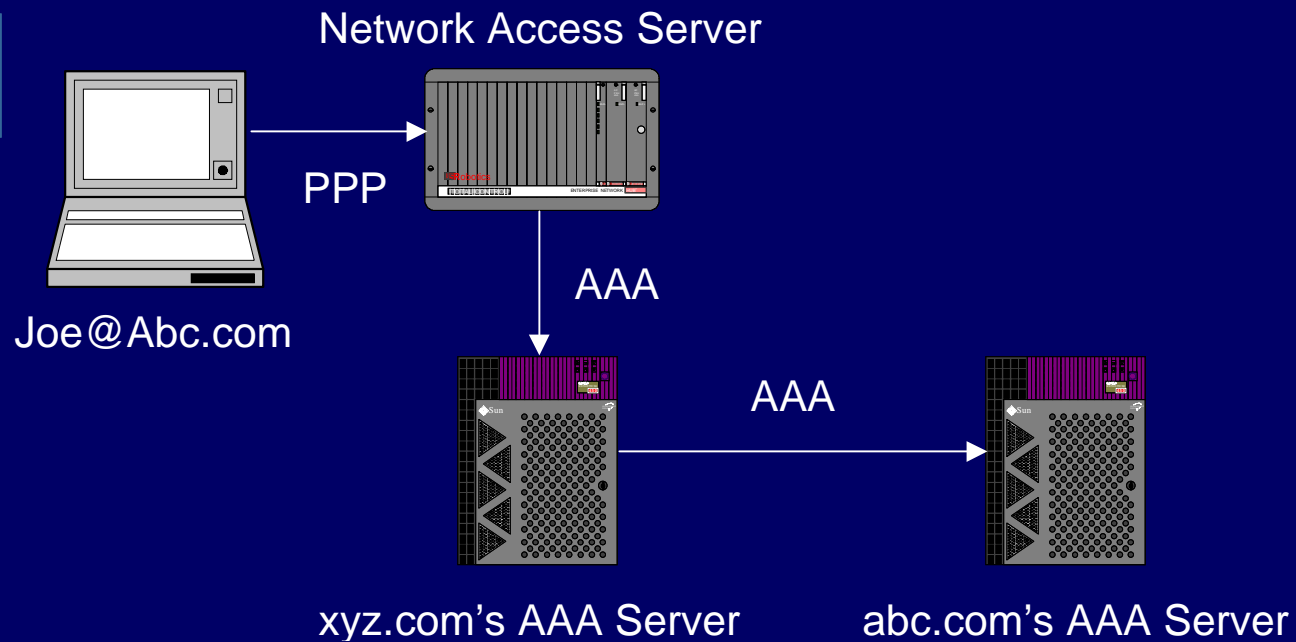
- After a protocol submission and evaluation phase, where 4 protocols were submitted, Diameter was selected as the AAA protocol (of course, after undergoing the necessary WG review and changes).
 - The –00 versions of the protocol were submitted last month, and the –01 were submitted prior to the deadline.
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Diameter and NASREQ


- The Diameter NASREQ extension behaves very much like the RADIUS protocol, with the exception that the protocol does provide much better reliability, fail-over/back and routing procedures, etc.
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Diameter and NASREQ






Diameter and Mobile IP

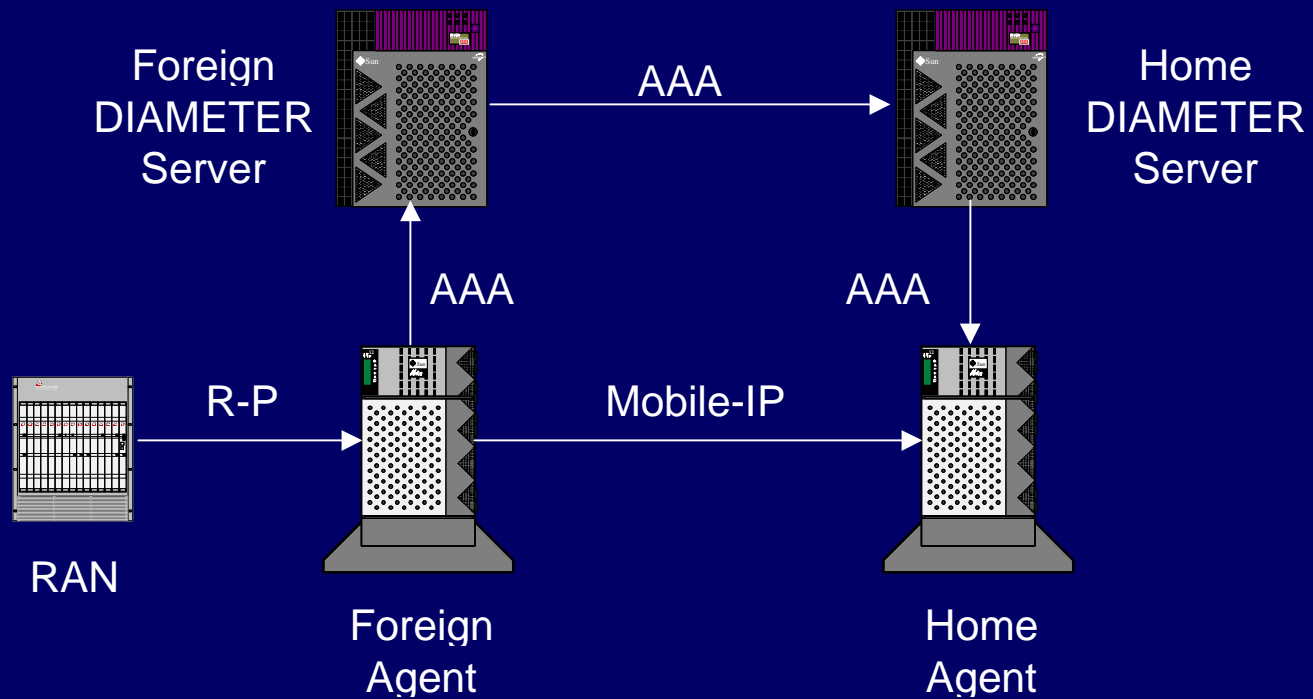
- Although some early versions of CDMA2000 3G networks use RADIUS for Mobile IP, it “emulates” PPP dial-up, and has very limited capabilities.
 - The CDMA2000 standards group (3GPP2) is waiting for Diameter to be RFCed in order to work on their next version.
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Diameter and Mobile IP


- Diameter in the cellular network provides much more than just user authentication and authorization.
 - It also provides Home Agent allocation in either the home and visited network, Mobile IP Key Distribution Center and other important features.
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Diameter and Mobile IP






AAA Today and Beyond

- Diameter does fulfill the AAA WG requirements of providing AAA services for Dial-up and Mobile IP network access, but there are several new services being investigated by the CDMA and GSM All-IP networks where Diameter will also be used.
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Diameter and SIP

- The All-IP networks are also interested in providing voice services, using the Session Initiation Protocol (SIP).
 - In order to scale SIP for inter-domain services, they are looking at using AAA for cross-realm user authentication and service authorization.
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Diameter and SIP

- The work of defining the SIP/AAA interface has just begun, and some requirements have been collected, and submitted as an IETF individual contribution.
 - A mailing list has been created to discuss SIP/AAA, but no Working Group has yet picked up this work.
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Diameter and Air Interfaces

- In the All-IP networks, the traditional HLR will be replaced with AAA.
 - This means that AAA will be used to authenticate, and authorize cell phones when they request Layer 2 (air interface) access to the network.
 - An Internet-Draft was submitted by some folks at Lucent recently to begin the work.
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What's next...

- There are plenty of possible services that require AAA on the backend (see new IETF BURP BOF), and as with any protocol, care must be taken to ensure that using Diameter does not unnecessarily bloat and abuse the protocol for mere convenience.
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