Category:	Liaison
From:	3GPP SA5
To:	IETF AAA
Cc:	SA2, 3GPP/IETF (Ileana Leuca)
Title:	LS to clarify protocol requirement differences identified in December 2000 AAA meeting presentation.
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1. Introduction

The 3GPP SA5 Charging Rapporteur group is currently engaged in preparing charging technical specifications for IP based wireless networks. Because it is advantageous to re-use existing protocols, it is our desire to liase with the AAA in developing a protocol(s) suitable for conveying charging information in IP based wireless networks.

A presentation relating to charging protocol requirements was made at your December 2000 meeting. The presentation cited protocol requirements differences between the AAA document <draft-ietf-aaa-na-reqts-07.txt> and the 3G.IP document "Charging and Billing (C&B) Requirements" (Version 1.0.0 / 2000-11-03). The 3GPP SA5 Charging Rapporteur group has now taken ownership of the 3G.IP C&B requirements document.

Following the December presentation, an e-mail correspondence was received that summarised the AAA members' comments. (See the attachment.) The 3GPP SA5 Charging Rapporteur group reviewed this correspondence and this liaison provides a summary of their commentary. A principal point of the commentary is to clarify certain potential ambiguities.

Please present this liaison to the AAA members for their comments. We look forward to and are grateful for your responses.

2. Preamble to commentary

There exist several underlying needs that prompted many of the 3G.IP protocol requirements. Three salient charging needs are as follows:

- There exists zero tolerance for storage, processing, and communication errors. That is, once obtained from the network, the charging information is to be thereafter unaltered.

- Prepaid services will be an important future revenue source. This implies the need for the charging network to reliably and quickly determine (and respond) when a subscriber reaches a revenue limit.

- Rapid growth is anticipated for the wireless communication business. To accommodate this business growth, incremental charging network growth should be convenient and facile. "Tear down" of the charging network, whenever its expansion is to take place, is unacceptable.

3. Charging Rapporteur group commentary

The following enumeration corresponds to the differences cited in the attachment:

Difference 2. – There exists full agreement with the AAA response to this difference. However, scenarios exist for which a node failure requires the attention and reaction of the application protocol. Hence, failure information should be provided by the transport protocol for these scenarios.

Difference 3. – Congestion and consequential re-routing can have a deleterious impact on prepaid services. Knowledge of this activity cannot be exclusively within the transport protocol, but needs to brought to the attention of the charging application.

Difference 5. – "Nodes" are considered to be logical entities (e.g., application processes) by the 3GPP SA5 Charging Rapporteur group. Because the AAA views nodes as hardware (e.g., servers), there may be a problematic issue for the requirements. Please discuss this difference of these two perspectives, as it relates to your protocol development, to determine the consequences and reply about your conclusions.

Difference 6. - A study of DIAMETER will be made to determine if it adequately satisfies this requirement. The results of this study will be communicated at a later date.

Difference 7. - There exists a dynamic aspect to expediting the delivery of charging information. That is, the charging information will indicate whether it is to be expedited or can be treated as "batch" (non-severe time constraints). Will the transport protocol be able to deal with this?

Difference 8. - The two perspectives of "nodes" appear to play a role here. This was intended to mean that multiple copies of an application exist. Hence, the application protocol must be able to carry address information to determine which application copy is to be the destination.

Difference 9. - The matter of negotiating to the most recent commonly understood version is significant to this requirement. Also, a study of DIAMETER will be made to determine if it adequately satisfies this requirement. The results of this study will be communicated at a later date.

Difference 12. - A study of DIAMETER will be made to determine if it adequately satisfies this requirement. The results of this study will be communicated at a later date.

ATTACHMENT

Here are some thoughts on the requirements in your
presentation and how we plan to address them:

1. "The AAA protocol should be capable of communicating at various
time-outs, throughputs, and packet sizes."

We agree with you that this is an important issue. In fact,
we are forming a transport team to examine the aspect of AAA
transport behavior in more detail. In particular, we are
looking into expected behavior with TCP and SCTP with and
without the presence of various proxy types. As you may know,
SCTP adds additional timeout control, and TCP and SCTP have
been shown to self-clock, thus enabling these transports to
probe for the maximum available bandwidth. AAA can also leverage
path MTU discovery, and nagle algorithm to appropriate choose
the correct packet size.

2. "AAA protocol must support early detection of communication link/node
failures, other network failures, and network reconfiguration for the
purpose of re-routing. (The purpose of this requirement is to support
successful recovery from errors.)"

We agree with you that this is an important issue and have asked
the transport team to investigate it further. As you may know,
SCTP offers enhanced failover capabilities as compared with TCP,
and we hope to leverage these capabilities.

3. "Congestion re-routing - should support early detection of congestion for
the purpose of re-routing."

One of the issues that the transport team will investigate is
congestion avoidance behavior of TCP and SCTP transport with
and without proxies. The interaction of transport and application
layer failover is also a concern. We believe that we will be able

to address this concern in part by leveraging existing TCP and SCTP
congestion avoidance behavior, which has been proven to be
effective.

4. "Link/node recovery - must support the detection of link recovery for
instituting routing of accounting information."

We agree with you that this is a conern. As a result, we have asked the
transport team to address the failback issue. Solutions to this issue
have been included in the AAA solutions draft, and the transport team
will continue to look at this issue both at the transport and application
layer.

5. "New link/nodes - should support the detection of new link/nodes for
instituting routing of accounting information."

As you may know, the RSERPOOL WG in IETF is investigating the issue of
server pools within the transport area of IETF. Thus the AAA protocol
may be able to leverage this capability in order to address your
concern.

6. "Suggest adding - "must not prevent the determination of duplicated
accounting information. However, the protocol may assist in the
determination of duplicated accounting information."
Also - "must permit the inclusion of error information and diagnostic
information, for signaling and user plane (payload) frames, and protocol
response codes, in the event of communication problems."

We agree with you that this is a concern, and believe that the DIAMETER
specification addresses this issue. Your comments are solicited.

7. Suggest adding - "must facilitate the determination of (near) real time
demand or batch response time latitude; e.g., via a multi-colored flag**.in
the protocol header (or trailer)."
Also - "should support scheduling and prioritization of accounting
information content transfer."

The AAA protocol offers considerable flexibility in addressing these
needs. It is amenable to use of Differentiated Services, as well
as potentially SCTP multi-plexing mechanisms. The Nagle algorithm also
makes it possible to support transport layer batching both within TCP
and SCTP. Thus we believe that the AAA protocol will be able to support
both real-time performance (e.g. TCP_NODELAY) as well as batching
behavior.

8. Connection multiplexing - "should be able to support connection multiplexing and load balancing."

As you may know, the RSERPOOL WG is addressing this very concern. By supporting SCTP transport we will be able to leverage their work.

9. Protocol longevity - "must include version information and its automatic detection for negotiating compatibility."

We agree that this is an important issue. The DIAMETER protocol already includes support for some of these capabilities. Your comments are solicited.

10. Payload encoding - "must be able to support various payload encoding to permit future growth."

DIAMETER AVPs provide extreme flexibility in transporting of opaque payloads. We believe that it will be possible to satisfy this concern within the specification.

11. Multiple payload structures - "must be able to support multiple payload structures to permit future growth; e.g., ASN.1 and XML

Since DIAMETER AVPs provide the flexibility to transport diverse payloads, we believe that the specification can address this concern.

12. No interfacing protocol layers - "should not require special protocol layers to interface with an accounting application."

A DIAMETER API has been developed to allow applications to leverage DIAMETER functionality in a convenient way. Your comments on this specification are solicited.