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Realm-Based Redirection In Diameter
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Abstract

RFC 3588 allows a Diameter redirect agent to specify one or more individual hosts to which a Diameter message may be redirected by an upstream Diameter node. However, in some circumstances an operator may wish to redirect messages to an alternate domain without specifying individual hosts. This document specifies a mechanism by which this can be achieved. New applications may incorporate this capability by reference to the present document.

Status of this Memo

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1. Introduction

The usual redirect indication, as described in Section 6.1.7 and Sections 6.12-6.14 of [RFC3588], returns one or more individual host names to the upstream Diameter node. However, consider the case where an operator has offered a specific service but no longer wishes to do so. The operator has arranged for an alternative domain to provide the service. To aid in the transition to the new arrangement, the original operator maintains a redirect server to indicate the alternative destination to upstream nodes. However, the original operator has no interest in configuring a list of hosts in the alternative operator's domain, and would prefer simply to provide redirect indications to the domain as a whole.

Within this specification, the term "realm-based redirection" is used to refer to a mode of operation where the redirect indication specifies a realm and the upstream Diameter node reroutes the message to the realm rather than an individual host.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

2. Support of Realm-Based Redirection Within Applications

Because realm-based redirection is not part of base Diameter behaviour, support for realm-based redirection by the agent MUST be specified as part of particular applications. In this way, Diameter's capability negotiation mechanism can be used indirectly to indicate support for realm-based redirection by indicating support for the applications concerned. Designers of new applications MAY incorporate the mechanism specified here into their application by reference to this document.

Note that a redirect agent will apply realm-based redirection only for those applications that it recognizes to be eligible for such treatment. In typical usage, where a realm has handed off specific applications to an alternate realm for processing, this is not an issue, since the operator can configure the redirect server for those specific applications.

3. Realm-Based Redirection

This section specifies an extension to [RFC3588] to achieve realm-

based redirection. The elements of this solution are:

- a new result code, DIAMETER_REALM_REDIRECT_INDICATION (3xxx TBD);
- one new attribute-value pair (AVP), Redirect-Realm; and
- associated behaviour at Diameter nodes implementing this specification.

3.1. Behaviour of Diameter Nodes

3.1.1. Behaviour at the Redirect Agent

This specification modifies Section 2.7 of [RFC3588] to permit REDIRECT routing table entries to contain an alternative realm instead of individual home server identities.

This specification modifies Section 6.1.7 of [RFC3588]. If the realm-based routing table for a request contains a realm rather than one or more server identities, the redirect agent MUST proceed as follows:

- If the request contains a Destination-Host AVP or if the request is for an application that does not support realm-based redirection, the redirect agent MUST set the 'E' bit in the answer and set the Result Code to DIAMETER_UNABLE_TO_DELIVER.

  Note that the latter case is actually a matter of misconfiguration at the redirect server.

- Otherwise, if the request is for an application supporting realm-based redirection, the redirect agent MUST set the Result-Code AVP to DIAMETER_REALM_REDIRECT_INDICATION rather than DIAMETER_REDIRECT_INDICATION. Furthermore, the redirect agent MUST include a Redirect-Realm AVP containing the realm from the routing table entry in its answer message instead of one or more Redirect-Host AVPs. All other aspects of Section 6.1.7 remain the same as for host-based redirection.

  The redirect agent MAY include a copy of the Redirect-Host-Usage AVP, which SHOULD be set to REALM_AND_APPLICATION. If this AVP is added, the Redirect-Max-Cache-Time AVP MUST also be included. Note that these AVPs apply to the peer discovered by a node acting on the redirect agent's response, as described in the next section. Sections 6.13 and 6.14 of [RFC3588] are modified to permit the Redirect-Host-Usage and Redirect-Max-Cache-Time AVPs to be used also to specify the persistence of cache entries created by the Redirect-Realm AVP.

3.1.2. Behaviour of Other Diameter Nodes

A Diameter node conforming to this specification which receives an answer with the result code value DIAMETER_REALM_REDIRECT_INDICATION MUST take the following steps:

1. Verify that the new realm is authorized to provide the requested service.

2. If successful, locate and establish a connection to a peer in the realm given by the Redirect-Realm AVP, using normal discovery procedures as described in Section 5.2 of [RFC3588].

3. If again successful:

   * update its cache of routing entries for the realm and application to which the original request was directed, taking into account the Redirect-Host-Usage and Redirect-Max-Cache-Time AVPs, if present in the answer.

   * Remove the Destination-Host (if present) and Destination-Realm AVPs from the original request and add a new Destination-Realm AVP containing the realm identified by the Redirect-Realm AVP in the answer.

   * Forward the modified request.

Note that the implementation of realm-based redirection will disrupt any stateful sessions being served by the given application in the interdicted realm. The transition to realm-based redirection thus needs to be managed to minimize the ensuing disruption.

3.2. The Redirect-Realm AVP

The Redirect-Realm AVP (code TBD) is of type DiameterIdentity. It specifies a realm to which a node receiving a redirect indication containing the result code value DIAMETER_REALM_REDIRECT_INDICATION and the Redirect-Realm AVP SHOULD route the original request. The M flag for the Redirect-Realm AVP MUST be set, and the V flag MUST NOT be set.

4. Security Considerations

Because realm-based redirection implies a change in business relationships, the node acting on the redirect indication SHOULD verify that the new realm is authorized to perform the requested service. Similarly the originator of the request SHOULD perform an

authorization check of the path as described in Section 2.10 of [RFC3588].

5. IANA Considerations

This specification adds a new AVP code [TBD] Redirect-Realm in the AVP Code registry under Authentication, Authorization, and Accounting (AAA) Parameters.

This specification allocates a new Result-Code value DIAMETER_REALM_REDIRECT_INDICATION (3xxx TBD) in the Result-Code AVP Values (code 268) - Protocol Errors registry under Authentication, Authorization, and Accounting (AAA) Parameters.

6. Acknowledgements

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7. Normative References

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[RFC3588] Calhoun, P., Loughney, J., Guttman, E., Zorn, G., and J. Arkko, "Diameter Base Protocol", RFC 3588, September 2003.

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