

Internet Engineering Task Force  
Internet-Draft  
Updates: [6733](#) (if approved)  
Intended status: Standards Track  
Expires: December 21, 2013

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June 19, 2013

**Realm-Based Redirection In Diameter**  
**draft-ietf-dime-realm-based-redirect-09**

Abstract

The Diameter protocol allows a Diameter redirect agent to return to the message sender one or more individual hosts as destinations of the redirected message. 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.

This memo updates Sections [6.13](#) and [6.14](#) of [RFC6733](#) with respect to the usage of the Redirect-Host-Usage and Redirect-Max-Cache-Time AVPs.

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## [1.](#) Introduction

The usual redirect indication, as described in [Section 6.1.8](#) and Sections [6.12-6.14](#) of [[RFC6733](#)], returns to the message sender one or more individual hosts as destination of the redirected message. 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 to the message sender the alternative domain to which redirect the request. However, the original operator should be relieved from configuring in the redirect server a list of hosts to contact in the alternative operator's domain, and should



simply be able 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 agent returns a realm rather than an individual host as redirect indication.

### **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 [\[RFC2119\]](#).

## **2. Support of Realm-Based Redirection Within Applications**

Because realm-based redirection is not part of the Diameter base protocol [\[RFC6733\]](#), support of realm-based redirection by a Redirect agent MUST be specified as part of functionality supported by a Diameter application. In this way, support of the considered Diameter application (discovered during capabilities exchange procedures as defined in Diameter base protocol [\[RFC6733\]](#)) indicates implicit support of the realm-based redirection mechanism. Designers of new applications can incorporate the mechanism specified here into their application by normative reference to this document.

The result of making realm-based redirection an application-specific behaviour is that it cannot be performed by a redirect agent, but instead must be performed by a redirect agent as defined in [\[RFC6733\]](#), but instead by an application-aware Diameter node (Diameter server or proxy). However, despite the change in executing role, the behaviour itself is a slight modification of the behaviour of a redirect agent as described in [Section 2.8.3 of \[RFC6733\]](#).

An application can specify that realm-based redirection operates only on the initial message of a session, or on any message of a session. In the former case, existing sessions will not be disrupted by the deployment of realm-based redirection. In the latter case, existing sessions will be disrupted if they are stateful.

## **3. Realm-Based Redirection**

This section specifies an extension of the Diameter base protocol [\[RFC6733\]](#) to achieve realm-based redirection. The elements of this solution are:

- o a new result code, `DIAMETER_REALM_REDIRECT_INDICATION` (3xxx TBD1);
- o a new attribute-value pair (AVP), `Redirect-Realm` (code TBD2); and



- o associated behaviour at Diameter nodes implementing this specification.

This behaviour includes the optional use of the Redirect-Host-Usage and Redirect-Max-Cache-Time AVPs. In this document, these AVPs apply to the peer discovered by a node acting on the server's response, an extension to their normal usage as described in Sections [6.13](#) and 6.14 of [\[RFC6733\]](#).

[Section 3.2.2](#) and [Section 3.2.3](#) describe how a proxy or client may update its routing table for the application and initial realm, as a result of selecting a peer in the new realm after realm-based redirection. Note that as a result, the proxy or client will automatically route subsequent requests for that application to the new realm (with the possible exception of requests within sessions already established with the initial realm) until the cached routing entry expires. This should be borne in mind if the rerouting is intended to be temporary.

### **[3.1.](#) Configuration of the Redirecting Server**

A Diameter node (Diameter server or proxy) acting as realm-based redirect server MUST be configured as follows to execute realm-based redirection:

- o configured with an application that incorporates realm-based redirection;
- o the Local Action field of the routing table described in [Section 2.7 of \[RFC6733\]](#) is set to LOCAL;
- o an application-specific field is set to indicate that the required local action is to perform realm-based redirection;
- o an associated application-specific field is configured with the identities of one or more realms to which the request should be redirected.

### **[3.2.](#) Behaviour of Diameter Nodes**

#### **[3.2.1.](#) Behaviour at the Redirecting Server**

As mentioned in [Section 2](#), an application incorporating realm-based redirection may specify that redirection applies for any request or only for the initial request of a session (i.e., to prevent disruption of established sessions).



If a redirecting server configured as described in [Section 3.1](#) receives a request to which realm-based redirection applies, the redirecting server MUST reply with an answer message with the 'E' bit set, while maintaining the Hop-by-Hop Identifier in the header. The redirecting server MUST include the Result-Code AVP set to DIAMETER\_REALM\_REDIRECT\_INDICATION. The redirecting server MUST also include the alternate realm identifier(s) with which it has been configured, each in a separate Redirect-Realm AVP instance.

The redirecting server 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 redirecting server's response, as described in the next section. This is an extension of their normal usage as described by Sections 6.13 and 6.14 of [\[RFC6733\]](#).

If the redirected request contained a Destination-Host AVP, that AVP is ignored by the redirecting server.

### **[3.2.2.](#) Proxy Behaviour**

A proxy conforming to this specification that receives an answer message with the Result-Code AVP set to DIAMETER\_REALM\_REDIRECT\_INDICATION MAY attempt to reroute the original request to a server in a realm identified by a Redirect-Realm AVP instance in the answer message, or MAY simply forward the message toward the client. If it chooses to reroute the request, it MUST take the following actions:

1. Select a specific realm from amongst those identified in instances of the Redirect-Realm AVP in the answer message.
2. If successful, locate and establish a route to a peer in the realm given by the Redirect-Realm AVP, using normal discovery procedures as described in [Section 5.2 of \[RFC6733\]](#).
3. If again successful:
  - a. 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.
  - b. Remove the Destination-Host (if present) and Destination-Realm AVPs from the original request and add a new Destination-Realm AVP containing the realm selected in the initial step.





- c. Forward the modified request.
4. If either of the preceding steps 2-3 fail and additional realms have been identified in the original answer, select another instance of the Redirect-Realm AVP in that answer and repeat steps 2-3 for the realm that it identifies.

### **3.2.3. Client Behaviour**

A client conforming to this specification **MUST** be prepared to receive either an answer message containing a Result-Code AVP set to `DIAMETER_REALM_REDIRECT_INDICATION`, or, as the result of proxy action, some other result from a realm differing from the one to which it sent the original request. In the case where it receives `DIAMETER_REALM_REDIRECT_INDICATION`, the client **SHOULD** follow the same steps prescribed in the previous section for a proxy, in order both to update its routing table and to obtain service for the original request.

### **3.3. The Redirect-Realm AVP**

The Redirect-Realm AVP (code TBD2) 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.

### **3.4. `DIAMETER_REDIRECT_INDICATION` Protocol Error Code**

The `DIAMETER_REDIRECT_INDICATION` (3xxx TBD1) Protocol error code indicates that a server has determined that the request within an application supporting realm-based redirection could not be satisfied locally and the initiator of the request **SHOULD** direct the request directly to a peer within a realm that has been identified in the response. When set, the Redirect-Realm AVP **MUST** be present.

## **4. Security Considerations**

Realm-based redirection implies a change of the business relationships between organizations. Before redirecting a request towards a realm different to the initial realm, the client or proxy **MUST** ensure that the authorization checks have been performed at each connection along the path toward the realm identified in the realm-based redirect indication. To perform these authorization checks, recommendations given in [section 13](#) of the Diameter base protocol [[RFC6733](#)] apply.



## 5. IANA Considerations

This specification adds a new AVP code [TBD2] 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 TBD1) in the Result-Code AVP Values (code 268) - Protocol Errors registry under Authentication, Authorization, and Accounting (AAA) Parameters.

## 6. Acknowledgements

Glen Zorn, Sebastien Decugis, Wolfgang Steigerwald, Mark Jones, Victor Fajardo, Jouni Korhonen, Avi Lior, and Lionel Morand contributed comments that helped to shape this document. As shepherd, Lionel contributed a second set of comments that added polish to the document before it was submitted to the IESG.

## 7. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC6733] Fajardo, V., Arkko, J., Loughney, J., and G. Zorn, "Diameter Base Protocol", [RFC 6733](#), October 2012.

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