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User-Defined Errors for RSVP

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Abstract

The Resource ReserVation Protocol (RSVP) defines an ERROR_SPEC object for communicating errors. That object has a defined format that permits the definition of 256 error codes. As RSVP has been developed and extended, the convention has been to be conservative in defining new error codes. Further, no provision for user-defined errors exists in RSVP.

This document defines a USER_ERROR_SPEC to be used in addition to the ERROR_SPEC to carry additional user information related to errors.

0. Changes Since Last Revision

[This section to be removed before publication as an RFC.]

- Add names to acknowledgments.
- Clarify that the Error Description String does not contain information critical to network operation.
- Define an Error Value of zero to accompany the Error Code of "User Error Spec".

1. Introduction

The Resource ReserVation Protocol (RSVP) [[RFC2205](#)] defines an ERROR_SPEC object for communicating errors. That object has a defined format that permits the definition of 256 error codes. As RSVP has been developed and extended, the convention has been to be conservative in communicating errors. Further no provision for user defined errors exists in RSVP.

When developing extensions to RSVP, it is often useful for those implementing to define error messages to aid both in the initial debugging and in testing against older versions or other implementations.

This document defines a new RSVP object to permit user-defined errors to be communicated. This will enable organizations to define errors which they can use for internal development. These error values could also be shared with the community at large to aid in promoting interoperability between diverse implementations.

RSVP PathErr and ResvErr messages require the presence of an ERROR_SPEC object ([[RFC2205](#)]). [[RFC3473](#)] defines the Notify message that also requires the presence of an ERROR_SPEC object. In order to not change the mandatory contents of these messages, this document defines a new error code value that indicates that the new object is present and carries a user-defined error code.

Note that the ResvConf message defined in [[RFC2205](#)] also carries an ERROR_SPEC object. But this usage of the object does not carry meaningful Error Codes or Error Values and so the extensions defined in this document are not applicable to that message.

1.1. Conventions

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](#)].

0										1										2										3									
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
Enterprise Number																																							
Sub Org										Err Desc Len										User Error Value																			
Error Description																																							
User-Defined Subobjects																																							

Enterprise Number

A unique identifier of an organization encoded as a 32-bit integer. Enterprise Numbers are assigned by IANA and managed through an IANA registry [[RFC2578](#)].

Sub Org

A unique identifier of an organization encoded as an 8-bit integer. An organization MAY use this field to create independent Error Value spaces. This is intended to facilitate teams which are doing parallel development. If independent spaces are not required, this field SHOULD be set to zero.

Err Desc Len

The length of the error description in the Error Description field in bytes excluding any padding. Zero is a valid length if no error description is supplied.

User Error Value

A 16-bit integer. The meaning is specified by the (sub-)organization indicated by the Enterprise Number and Sub Org fields.

Error Description

A string of characters in US-ASCII padded with nulls (0x00) to a multiple of 4 bytes. If the Err Desc Len is zero then no bytes are supplied.

Note that the content of this field might not be shown to all users in all implementations (because it is limited to US-ASCII). Therefore, it SHOULD be limited to supplementary information and SHOULD NOT contain information critical to operating the network. Critical information is present in the User Error Value field.

User-Defined Subobjects

User-defined subobjects MAY be included. The generic format of subobjects is specified in [Section 3.1](#). The semantics of a subobject is indicated by the Type field, but the semantics, format and contents of the Value field are specified by the (sub-)organization indicated by the Enterprise Number and Sub Org fields of this object.

display of logging in all systems. Implementations capable of interpreting the contents of the USER_ERROR_SPEC object should take further action based on the reported error.

If a message is received containing an ERROR_SPEC object using the "User Error Spec" error code, but not containing a USER_ERROR_SPEC object, the message MUST be treated as malformed and handled according to [\[RFC2205\]](#).

Implementations SHOULD ignore repeated occurrences of USER_ERROR_SPEC objects, and SHOULD forward them unchanged on any messages that they forward. This provides for forward compatibility.

Implementations receiving a USER_ERROR_SPEC object on some message other than a PathErr, ResvErr, or Notify message MUST treat the error as a malformed message and process according to [\[RFC2205\]](#).

[5. IANA Considerations](#)

[5.1. RSVP Error Codes](#)

This document makes the following assignments from the RSVP Error Codes and Globally-Defined Error Value Sub-Codes registry (pending IANA action):

Error Code	Meaning
<tba-xxx>	User Error Spec

One Error Value sub-code is defined for use with this Error Code as follows:

0 = Further details in User Error Spec

[5.2. RSVP Objects](#)

This document makes the following assignments from the RSVP Class Names, Class Numbers, and Class Types registry (pending IANA action):

Number Space	Value	Name
Class Numbers	<tba-yyy>*	User Error Spec
Class Type	1	User-Defined Error

* Assignment is requested from the range 192 through 247

6. Security Considerations

This document makes no changes to the basic message exchanges of [\[RFC2205\]](#) and [\[RFC3473\]](#). It will result in a small increase in the number of error messages sent in cases where messages were previously silently dropped due to the lack of an appropriate error code.

The mechanisms defined in this document may be used by implementations to report additional error conditions and information arising from security issues and attacks on the RSVP network.

7. Acknowledgments

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8. References

8.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2205] Braden, R., Zhang, L., Berson, S., Herzog, S., and S. Jamin, "Resource ReSerVation Protocol (RSVP) -- Version 1 Functional Specification", [RFC 2205](#), September 1997.
- [RFC3473] Berger, L., "Generalized Multi-Protocol Label Switching (GMPLS) Signaling Resource ReserVation Protocol-Traffic Engineering (RSVP-TE) Extensions", [RFC 3473](#), January 2003.

8.1. Informative References

- [RFC2578] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.

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