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## **User Defined Errors for RSVP**

[draft-swallow-rsvp-user-error-spec-01.txt](#)

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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 new RSVP object to permit user defined error values to be communicated.

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## **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. [[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.

### **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](#) [[KEYWORDS](#)].

## **2. User Defined Error**

Error Code = <tba>: User Error Spec

This error code is used to signal the presence of a USER\_ERROR\_SPEC. No subcodes are defined.

When sending this error code, a USER\_ERROR\_SPEC object MUST be included in the PathErr, ResvErr or Notify message.

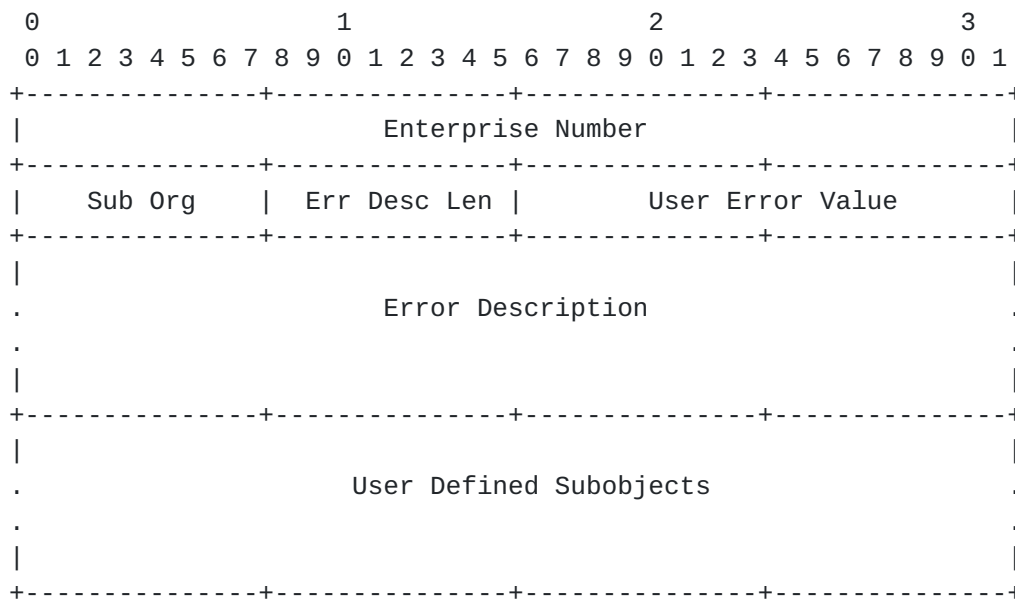
[Editor's note: <tba> = to be assigned by IANA]



### 3. USER\_ERROR\_SPEC Class

A new RSVP object class is defined called the the USER\_ERROR\_SPEC Class. The class number is taken from the range 192 - 247. This is done for backward compatibility. Existing implementations will ignore the object and pass it along.

USER\_ERROR\_SPEC object: Class = <tba>, C-Type = 1



#### Enterprise Number

A unique identifier of an organization encoded as a 32-bit integer. Enterprise Numbers are assigned by IANA.

#### Sub-organization

A unique identifier of an organization encoded as a 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.



### User Error Value

A 16-bit integer The format and contents are 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. While no format is required, it is RECOMMENDED that organizations use a published schema for this string to promote consistent decoding.

### User Defined Subobjects

Optionally, user defined subobjects may be included. The semantics of the Type and the format and contents of the value are specified by the (sub-) organization indicated by the Enterprise Number and Sub Org fields.

## **3.1. Subobjects**

Each subobject is encoded as a TLV in the following format:

```

0                               1
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   Type   |   Length   | (Subobject contents) |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
```

### Type

An 8-bit number assigned by the the (sub-) organization indicated by the Enterprise Number and Sub Org fields.

### Length

The Length contains the total length of the Subobject contents in bytes, including the L, Type and Length fields. The Length MUST be at least 4, and MUST be a multiple of 4.





## **4. Procedures for using the User Error Spec**

### **4.1. Procedures for sending the User Error Spec**

A USER\_ERROR\_SPEC object MAY be included in any PathErr, ResvErr or Notify message. The Enterprise Number MUST be a valid value assigned by IANA. As specified in [[RFC2205](#)] and [[RFC3473](#)], an ERROR\_SPEC object with a valid error code MUST be included in those messages. If no other error code applies, the error code MUST be set to <tba>, Unspecified Error.

### **4.2. Procedures for receiving the User Error Spec**

It is RECOMMENDED that implementations at a minimum log the Enterprise Number Sub-organization, User Error Value, and Error Description. Implementation capable of interpreting the contents of the USER\_ERROR\_SPEC object SHOULD take appropriate action.

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 SHOULD be treated as malformed and handled according to [[RFC2205](#)].

Implementations SHOULD ignore repeated occurrences of USER\_ERROR\_SPEC objects.

## **5. IANA Considerations**

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

Value	Name
<tba>	User Error Spec

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>*	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 silently dropped due to the lack of an appropriate error code.

## **7. Acknowledgments**

The authors would like to thank Elisheva Halevy for motivating this document and Tom Nadeau for his review and comments.

## **8. Normative References**

- [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.
- [KEYWORDS] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.



## **9. Authors' Addresses**

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