RSVP over ATM Implementation Guidelines

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Abstract

This note presents specific implementation guidelines for running RSVP over ATM switched virtual circuits (SVCs). It presents requirements and specific guidelines for running over today's ATM networks. The general problem is discussed in [5]. Integrated Services to ATM service mappings are covered in [7].

Author's Note

The postscript version of this document contains figures that are not included in the text version, so it is best to use the postscript version. Figures will be converted to ASCII in a future version.

Contents

1   Introduction

This note discusses running IP over ATM in an environment where SVCs are used to support QoS flows and RSVP is used as the internet level QoS signaling protocol. The general issues related to running RSVP[8] over ATM have been covered in several papers including [5, 4, 6, 11]. This document is intended as a companion to [5] and as a guide to implementers. The reader should be familiar with[5]. This document will define specific baseline requirements for implementations using ATM UNI3.x and 4.0. Some stated requirements must be adhered to by all RSVP over ATM implementations. Other stated requirements provide a baseline set of functionality, while allowing for more sophisticated approaches. We expect some vendors to additionally provide some of the more sophisticated approaches described in [5], and some networks to only make use of such approaches. The baseline set of functionality is defined to ensure predictability and interoperability between different implementations. We expect that the baseline requirements may change in the future, and at such a time this document will be replaced.

The rest of this section will define terms and assumptions used in the document. Section 2 will cover implementation guidelines specific to multicast sessions. Section 3 will cover implementation guidelines common to all RSVP session. Section 5 will conclude with a summary of stated requirements.

1.1   Terms

The terms "reservation" and "flow" are used in many contexts, often with different meaning. These terms are used in this document with the following meaning:

- **Reservation** is used in this document to refer to an RSVP initiated request for resources. RSVP initiates requests for resources based on RESV message processing. RESV messages that simply refresh state do not trigger resource requests. Resource requests may be made based on RSVP sessions and RSVP reservation styles. RSVP styles dictate whether the reserved resources are used by one sender or shared by multiple senders. See [8] for details of each. Each new request is referred to in this document as an RSVP reservation, or simply reservation.

- **Flow** is used to refer to the data traffic associated with a particular reservation. The specific meaning of flow is RSVP style dependent. For shared style reservations, there is one flow per session. For distinct style reservations, there is one flow per sender (per session).

1.2   Assumptions

The following assumptions are made:

- **RSVP** We assume RSVP as the internet signalling protocol which is described in [8]. The reader is assumed to be familiar with [8].

- **IPv4 and IPv6** RSVP support has been defined for both IPv4 and IPv6. The guidelines in this document are intended to be used to support RSVP with either IPv4 or IPv6. This document does not require on version over the other.

- **Best effort service model** The current Internet only supports best effort service. We assume that as additional components of the Integrated Services model that best effort service will continue to be a supported.

- **ATM UNI 3.x and 4.0** We assume ATM service as defined by UNI 3.x and 4.0. ATM provides both point-to-point and point-to-multipoint Virtual Circuits (VCs) with a specified Quality of Service (QoS). ATM provides both Permanent Virtual Circuits (PVCs) and Switched Virtual Circuits (SVCs). In the Permanent Virtual Circuit (PVC) environment, PVCs are typically used as point-to-point link replacements. So the support issues are similar to point-to-point links. This draft assumes that SVCs are used to support RSVP over ATM.

2   Multicast RSVP Session Support

There are several aspects to running RSVP over ATM that are particular to multicast sessions. These issues result from the nature of ATM point-to-multipoint connections. This section addresses multicast end-point identification, multicast data distribution, multicast receiver transitions and next-hops requesting different QoS values (heterogeneity) which includes the handling of multicast best-effort receivers. Handling of best-effort receivers is not strictly an RSVP issues, but needs to be addressed in any RSVP over ATM implementation in order to maintain expected Internet service. Implementation guidelines for issues related to all RSVP sessions are covered in Section 3. Some of these guidelines cover issues that have special interactions for multicast session, these interactions are covered together with the more general issues.