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Interworking with IntServ QoS

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Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES).

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Introduction

IP-based services and their users are growing ever more sophisticated, and QoS is a feature which will be increasingly valuable for service differentiation and support. In contrast to wired or optical networks where over-provisioning of capacity is often used to ensure QoS for packet-based transport, satellite systems, as in other wireless networks and access networks in general, allocate capacity carefully according to needs. This requires more sophisticated QoS methods which are closely linked to resource provision and control at lower protocol layers than IP, and which take into account the presence of other non-real time traffic.

There are many potential system mechanisms for providing QoS for real-time services; those which provide implementable and efficient solutions need to be identified.

The general issues concerning Quality of Service (QoS) and architectures in BSM systems are described in ETSI TS 102 462 [1]. ETSI TS 102 357 [2] describes further specific QoS requirements. IETF RFC 2205 [3] describes functional models for QoS concerning IP-over-satellite aspects.

The BSM architecture is characterized by the separation between common Satellite-Independent (SI) protocol layers and alternative lower Satellite-Dependent (SD) layers ETSI TS 102 357 [2]. At the SI layers, several methods of ensuring end-to-end QoS over integrated networks are foreseen, by means of signalling protocols (e.g. based on SIP IETF RFC 3261 [i.4], NSIS IETF RFC 4080 [i.5], etc.) at the session (or application) layers and DiffServ, RSVP/IntServ at the IP layer. The present document focuses on the latter approach.

At the SD Layers, alternative lower protocol layers offer their own QoS characteristics, depending on the satellite system technology adopted, which are closely linked to lower layer resource management and control. The SI-SAP offers an "agnostic" interface to whichever SD layer is used.

End-to-end QoS provision for the user via the BSM architecture is made capable of traversing the SI-SAP interface in a standardized way to enable compatibility between existing SI QoS functions in the IP layer and above, and the SD lower layer QoS capabilities.

1 Scope

The present document defines an open specification for enabling QoS for IP-based multimedia satellite systems, based on the IntServ model, including the use of RSVP for resource allocation and control IETF RFC 2210 [4]. The focus is on the mapping of IP-layer QoS functions, primarily the Guaranteed (GS IETF RFC 2212 [6]) and Controlled Load (CL IETF RFC 2211 [5]) services, to BSM-specific QoS functions across the SI-SAP. This results in specifications for the SI-SAP including its interactions with higher and lower layers.

The present document is based on the findings of the Technical Report on Performance, Availability and Quality of Service ETSI TR 102 157 [i.2] and the Technical Specification on QoS Architecture ETSI TS 102 462 [1]. It is also based on current ETSI BSM architecture document ETSI TS 102 292 [i.3] and is aligned with the relevant IETF standards.

The key to providing real-time multimedia services such as those offered by the IntServ model is the interaction of a resource reservation protocol like RSVP with lower layer (i.e. link layer) resource reservation. For IntServ provision in a BSM network the concept of QIDs (Queue Identifiers) at the SI-SAP is the concept used to provide this interaction with alternative link layers, ETSI TS 102 357 [2]. QIDs represent abstract queues, each with a defined class of service, for transfer of IP packets to the SD layers. The satellite dependent lower layers are responsible for assigning satellite capacity and/or particular forwarding behaviour to these abstract queues according to defined properties.

The present document deals with the QoS issues arising in the management of these QIDs, when IntServ is adopted at IP layer.

A BSM IntServ functional architecture is described and the functions, protocols and primitives needed to ensure QoS provision are specified.

IntServ for unicast services is the primary focus of the present document, although the approach described may also be applicable to multicast.

The use of other IP resource reservation protocols such as NSIS is at present excluded from the present document.

NOTE: RSVP can be used for a number of other functions, apart from IntServ Resource reservation, which are not in the scope of the present document:

- DiffServ resource reservation.
- Policy distribution.
- Traffic engineering.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 102 462: "Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia (BSM); QoS Functional Architecture".

[2] ETSI TS 102 357: "Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia (BSM); Common Air interface specification; Satellite Independent Service Access Point (SI-SAP) interface: Primitives".