CCITT SGXV
Working Party XV/1
Experts Group for ATM Video Coding

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TITLE: Network Requirements for Multi-media Inter-working

PURPOSE: Proposal

Abstract

Effective development of flexible multimedia systems depends on the support offered by the Broadband ISDN. Current activity for the support of multi-media multiplexing within CCITT SGXVIII/WP5 is concentrating on Virtual Circuit (VC) based multiplexing. Neither CCITT SGXVIII nor CCITT SGXI have fully recognised the need to support the inter-working of user based signalling (H.230) and 64kbit/s ISDN with Broadband ISDN (B-ISDN) ISCP (Integrated Signalling Control Part) signalling. It is proposed that a liaison be prepared to raise awareness within SGXVIII and SGXI of this requirement.

1. Introduction

Multimedia multiplex has been discussed in some detail within this group. We initially adopted cell or VC based multiplexing as the reference method. This initial adoption has recently been closely examined. Some problems in the support of current user based (H.221) multiplexing have been raised, although as a long term solution VC based multiplexing remains unchallenged.

This contribution proposes that a liaison be sent to SGXVIII and to SGXI to detail the requirements of SGXV for the support of existing and planned multiplex structures.

2. CCITT SGXVIII Standardisation Activities

SGXVIII/WP2 has made significant progress toward Draft Recommendation I.5xx, which describes arrangements for inter-working between B-ISDN and 64kbit/s ISDN. The objective of this initial recommendation is the identification of general arrangements and principles for inter-working. The underlying assumption is that B-ISDN should ensure the continued support of existing interfaces and services. SGXVIII/WP2 is inviting comment on how this recommendation might apply to the inter-working of H.320 based terminals with a B-ISDN.

SGXVIII/WP5 is developing Recommendation I.37y "Network Capabilities to Support Multimedia Services". The purpose of this Recommendation is to address B-ISDN network capabilities to support Multi-media services. Also addressed by this recommendation are issues related to inter-working B-ISDN multi-media services. I.37y is a framework recommendation and, as such, will spawn detailed recommendations as the standardisation activity develops.

The Recommendation covers many aspects that are of concern to the SGXV Experts Group. Treated aspects include capabilities of the target network, media multiplexing options, signalling for multi-media services, multi-point networking, charging techniques, media synchronisation and multi-media inter-working.

The general concepts supported by draft recommendation I.37y include; a common cell-based transfer of all service information, the longer term separation of call and connection control, support of individual media on single virtual channels and multicast switching to complement or replace traditional bridging applications.

Multi-media inter-working remains mostly for further study, indicating that SGXVIII/WP5 is waiting for liaison from interested groups in order to define the network capabilities for multi-media inter-working.

3. Multiplex Requirements

Contributions AVC-136, AVC-129, AVC-91 and AVC-76 have addressed some of the requirements that will be placed on the B-ISDN if VC based multiplex structures are implemented. It is proposed that a liaison be sent to CCITT SGXVIII to draw attention to the requirements that will have to be met by user-user and user-network signalling systems for the B-ISDN.

It must also be made clear to SGXVIII that, if these requirements cannot be met, then the evolution from user-based multiplexing to VC-based multiplexing will be severely prejudiced and probably delayed by the need to provide inter-working with the 64kbit/s ISDN in the shorter term.

4. Inter-working Requirements

4.1. User and Network Signalling

CCITT SGXV has developed recommendations for video communications on the 64kbit/s ISDN. These recommendations define a complete system for video conferencing applications. The recommendations H.221, H.230 and H.242 define a multiplex structure and a method of carrying signalling information between users. User to user signalling of the type defined in H.221 etc. is carried transparently by the 64kbit/s ISDN.

Alongside the user-user signalling defined in H.221 etc., user-network 64kbit/s ISDN signalling (Q.931) is used by terminals complying with H.320.

These two different protocols must be developed into a single B-ISDN protocol capable of providing the necessary facilities of H.221 etc., as well as allowing development of more advanced multi-media applications in the future. Extensions to signalling protocol recommendations as identified by I.37y must ensure that the B-ISDN will support all required types of user-user and user-network signalling.

4.2. Multiplex Structure

As stated above both the CCITT SGXV/1 Experts Group for ATM Video Coding and CCITT SG XVIII agree that the features offered by cell or VC based multiplexing make it the best long term solution for multi-media multiplexing on the B-ISDN. This decision has been reached based on a full appreciation of the capabilities of the B-ISDN.

It is vital that SGXVIII be made aware that H.221 inter-working will be required of the B-ISDN in the short term and that a method to support inter-working must be provided by the network.

If inter-working requirements are not met, then SGXVIII must be made aware that the necessity to provide these facilities will result in a generation of B-ISDN related standards and terminal equipment that implement dual modes of operation.

5. Conclusion

In this contribution we have described some areas that require action by CCITT SGXVIII and SGXI in order to ensure that our requirements for network support of multi-media connections and for current user signalling recommendations are met.

A liaison to SGXVIII and SGXI on the matters discussed in this document is required. The appendix contains a suggested text for the liaison.

Appendix

Suggested text for Liaison to SGXVIII and SGXI.

1. Introduction

The CCITT SG XV/1 Experts Group for ATM Video Coding is concerned about several aspects of inter-working support for current and future video communications recommendations.

Whilst wishing to ensure that current user based multiplexing as recommended in H.221, H.230, H.242 etc. is supported by the B-ISDN, the Experts Group wish to ensure that the way is clear to develop towards a long term situation where VC based multiplexing is implemented.

Two major areas of concern must be satisfactorily dealt with so that the long term goal is not seriously prejudiced. First, B-ISDN ISCP signalling and VC based multiplexing must be able to provide facilities currently provided by H.221 etc. at a reasonable cost (tariff and resource based cost). Second, network based inter-working must be provided in order to ensure that B-ISDN terminals do not have to emulate 64kbit/s ISDN user based signalling to inter-work with 64kbit/s ISDN terminals.

2. Multiplexing and Signalling Requirements

The Experts Group has communicated several liaisons to SGXVIII requesting information on aspects of the allocation and use of Virtual Circuits (VC). This information is aiding the Experts Group in determining the feasibility of using VC based multiplexing in its development of B-ISDN video communications recommendations.

It is vital that network based service support capabilities requested by SGXV for the support of multi-media VC based multiplexing be provided, otherwise evolution from user based multiplexing to VC-based multiplexing will be prejudiced by the on-going need to maintain user based capabilities lacking in the network.

B-ISDN service support capabilities will need to at least provide the functionality to support user-user signalling to the same level as H.221 etc., if the Experts Group is to consider developing recommendations based on these capabilities.

The CCITT SG XV/1 Experts Group for ATM Video Coding is planning to study B-ISDN service support capabilities further, with the aim of identifying the requirements of ATM video communications, and will provide liaison when more information is available.

3. Inter-working Requirements

The Experts Group has expressed some concern at the complexity of network based inter-working facilities for Q.931 and H.221 etc. to ISCP for 64kbit/s ISDN terminals. Although the result may be complex it is important that inter-working be provided by the B-ISDN otherwise evolution from user-based multiplexing to VC-based multiplexing will be prejudiced and probably delayed by the need to provide in-terminal inter-working for the 64kbit/s ISDN in the short term.

If network based inter-working is not provided, all B-ISDN video communications terminals will have to implement 64kbit/s ISDN user based protocols as long as inter-working is required. This additional functionality in B-ISDN terminals will:

- add unnecessary complexity to terminal design and potentially increase terminal price,
- restrict functionality when working in multi-point with 64kbit/s ISDN terminals.

4. Conclusion

The CCITT SG XV/1 Experts Group for ATM Video Coding has identified the need for B-ISDN service support capabilities to provide facilities currently provided by H.221 etc. in order to enable the use of VC based multiplexing in B-ISDN video communications recommendations. The Experts Group requests early response from SGXVIII on this issue to allow development of suitable migration paths.

Implementation of 64kbit/s ISDN protocols in B-ISDN terminals can only be avoided if Network based Inter-working Units are provided. The CCITT SG XV/1 Experts Group for ATM Video Coding therefore requests that development of standards to fulfil this requirement be commenced within SGXVIII, and SGXI as appropriate.