Telecommunication Standardization Sector
Study Group 15
Experts Group for Video Coding and Systems in
ATM and Other Network Environments

Document AVC-721
Version 1
January, 1995

SOURCE : JAPAN
TITLE : Protocol Stack for H.24X Negotiation Channel
PURPOSE : Proposal

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1. Introduction

At the Singapore meeting, the protocol configuration for H.24X negotiation information transmission between terminals was shown as in Annex2 to AVC-707R.

In this contribution, we discuss the part in the protocol stack to realize error free transport which is still under consideration as "protocol X", and suggest a desirable protocol stack for H.24X negotiation channel. We propose to send a liaison statement including the protocol stack to SG8 for their advice and achieving commonality with T.120 protocol.

2. Characteristics of SSCOP(Q.2110)+SSCF(Q.2130) and X.224

Two candidates for "protocol X", which are SSCOP+SSCF and X.224[1][2], are compared in their characteristics.

2.1 Functions of SSCOP+SSCF

(1) Support of data transmission with and without confirmation

Broadcasting or uni-directional protocol without transmission cofirmation is provided, in addition to the highly reliable transmission which utilize receive confirmation and retransmission.

(2) Highly efficient transmission by Poll/Stat procedure

The number of times for confirmation and retransmission can be reduced by periodical confirmation using a timer and retransmission of errored PDU only. Therefore, bursty transmission of a large data is very efficient.

(3) Monitoring the state of the physical connection

Existence of the connection can be monitored by exchanging PDU in the fixed cycle, even when there is no data for transmission. This is a very useful self-monitoring function, where the information about the status of the physical network connection cannot be obtained.

2.2 Functions of X.224

(1) Variety of protocol classes

A protocol suitable for the lower layer (characteristics, functions and reliability) can be selected and used. The identical service defined in X.214 is provided for the higher layer by all the protocol classes. Namely, even though the network environment will be changed, it is not necessary to modify the higher layer specification.

For example, when the error retransmission function is realized at the lower layer, X.224 does not perform receive confirmation and retransmission. If there are no such functions at the lower layer, confirmation and retransmission by the window control can be realized by X.224 layer.

(2) Multiplexing connections

Several logical connections can be multiplexed onto one low layer connection. Therefore, information corresponding to several applications, ex. H.24X and T.120 series data, can be transmitted simultaneously.

In addition, the priority transmission function for important data is provided.

3. Requirements for the negotiation channel in AV services

So as to clarify the protocol configuration desirable for H.24X, required functions for the negotiation information transmission are examined.

(1) Highly reliable transmission

It is necesary to provide the highly reliable transmission service, even if transmission error is involved in the physical transmission channel. Especially, ACK/NACK type procedure is desirable to identify the point in time when data is received.

(2) Data transmission efficiency

In H.24X, the amount of transmitted data may be at most 100 bytes, because the control information will be the terminal capability for the negotiation and the communication mode etc. Then, that SDU can be mapped into 1 PDU, and the data transmission will be confirmed in every 1 PDU (window control size = 1). So, a decrease of efficiency by retransmission becomes little worth consideration.

(3) Support of uni-directional transmission

It is necessary to be applied to broadcasting type services, where the transmission of all information including control information is uni-directional. However, it needs further study whether H.24X should cover this type of service.

(4) Application to various network environments

In case of asymmetrical application, it can be assumed that the control information in both terminal-to-server and server-to-terminal directions will be transferred through another channel or another network than that for AV information transmission. Moreover, transmission channels in each direction can also be assumed to be provided on different networks. The protocol should be applicable to all those cases with a minimum change. Particularly, the H.24X protocol had better specify the same procedure independent of the network environment.

4. Possible Protocol Stack

Fig.1 to Fig.3 show three candidate protocol stacks for H.24X control channel in ATM environment. In these figures, multiplexing with AV information is not taken into account, because a separate VC is assumed for the H.24X information transmission (refer to the discussion on H.24X channel in AVC-724[3]). Features and study items of each protocol stacks are as follows.

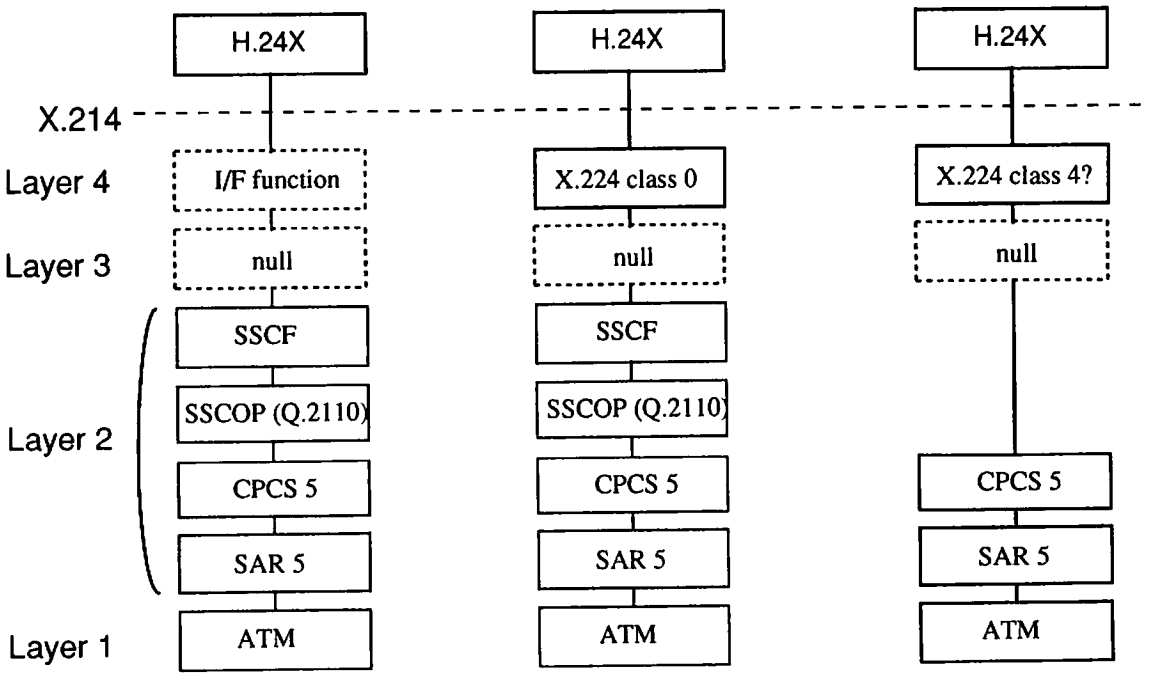

Fig.1 Method 1.

Fig.2 Method 2.

Fig.3 Method 3.

(1) Method 1: only SSCOP+SSCF and X.214 as higher layer I/F (Fig.1)

X.214 transport service is introduced to H.24X interface with the lower layer. H.24X can use X.224 in environments other than ATM. In case of ATM networks, the service conversion function between X.214 and SSCF is required. This function "I/F function" needs to be specified in H.24X. This specification becomes ATM specific. It should be decided what particular protocol is used as SSCF (SSCF.COTS is still under study).

(2) Method 2: X.224 class 0 on SSCOP+SSCF (Fig.2)

SSCOP+SSCF is responsible for the functions of receive confirmation and error retransmission etc. X.224 class 0 protocol, which is the simplest class, is used to provide X.214 service. Samely as above (1), it should be decided what protocol is used as SSCF, and how to interface between X.224 and SSCF (SSCF.COTS is still under study).

(3) Method 3: X.224 class 4? on AAL CPCS (Fig.3)

Not expecting the function for highly reliable transmission in AAL, receive confirmation, error detection and retransmission are realized within X.224 protocol. X.224 class 4 may be applicable, but further considerations are required.

In this contribution, method 2 protocol stack is suggested for H.24X channel by the following reasons.

- Protocol stack of T.120 in N-ISDN environment is equivalent to method 2.
- In some cases, layer 2 will be terminated at the network gateway, the end-to-end protocol should be necessary.
- It is desirable to be extendable to connection multiplexing and an application to other network environments for the future use.

However, the commonality with T.120 protocol stack is also important considering the service integration in B-ISDN[4][5]. It had better to ask an advice of SG8, where there are many experts for protocol design, prior to making the decision of H.24X protocol stack. Therefore, we propose to send SG8 the liaison statement describing that the method 2 is going to be adopted as H.24X negotiation information transmission protocol.

5. Conclusions

This document has discussed the protocol stack to realize the error free transport for H.24X information. We have suggested X.224 class 0 protocol on SSCOP+SSCF, because of the commonality with T.120 series protocol and the necessity of end-to-end protocol. This document have also proposed to send a liaison statement to SG8 describing that X.224 class 0 on SSCOP+SSCF is the most promising protocol for H.24X negotiation channel.

Reference

[1]AVC-707R "Report of the seventeenth experts group meeting in Singapore", Rapporteur, November 1994.
[2]AVC-699 "Protocol model for H.32X terminal", JAPAN, November 1994.
[3]AVC-724 "H.24X channel", JAPAN,January 1994.
[4]AVC-640 "Correspondence between rapportuers for Q.10/8 and Q.2/15", Rapporteur, May 1994.
[5]AVC-675 "Liaison statement to Study Group 15 (Q.2/15) on B-ISDN audiographic and audiovisual conferencing on ATM", SG8 (Q.10/8), June 1994.

END