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Research about a plug-and-play mechanism for ATM video network

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Construction of a video network becomes easy by popularization of computers, or digitization of AV consumer electronics devices. When connect these and it is going to perform a video meeting and remote education in a wide area, it is suitable to use ATM which is a wide area network technology in which it can guarantee QoS, a low delay and an broad band width. However, the ATM is mainly used for the backbone of a common carrier, LAN, or WAN, and special knowledge is needed to utilize this technology.

In this research, the plug-and-play mechanism which can be used even if a user does not have the special knowledge about a computer or a communication system is proposed a device is connected to the ATM video network.

To add a plug-and-play mechanism to the video network built using ATM, the procedure of an automatic address configuration, automatic service discovery and automatic service connection is required.

In this research, it is aimed at input/output devices such as a camera and video, ATM network and a video network constituted by a device (terminal system) converts with video stream and ATM.

First, To build ATM video network, it is necessary to configure an address automatically. To connect service automatically, it is necessary to configure automatically ATM address of ATM device linked to ATM video network. And, it is necessary to configure automatically a IP address of Classical IP over ATM used to transmit control data between device and an address of ATMARP server which converts ATM address to IP address. Furthermore, to make automatic discovery of service, and automatic connection and to use an IP multicast on Classical IP over ATM, it is necessary to also know the address of MARS.

About ATM address, it is determined automatically between ATM switch and ATM device and about ATM address of the server which offers service of ATMARP server,

MARS and etc an address is configured to ATM device using Address Resolution Server. And about an IP address, it is used local address called LINKLOCAL address.

In this research, the function of automatic service discovery and automatic service connection is built to the terminal system in the system construction described above.

To make automatic connection of service, SLP(Service Location Protocol) which is a protocol for service discovery is used. SLP operates by three agents of DA(Directory Agent) which collect service information, UA(User Agent) which performs service discovery, SA(Service Agent) which advertises the position and function of service.

If the device in an output state is connected to a video network, it will exchange between UA and SA in a terminal system, the device which is in an input state at the time will be discovered, even the target terminal system will establish ATM connection, and stream will be transmitted and received. For this reason, in this video network, connection composition changes by the turn to connect.

If an operation terminal is connected to the video network where an operation terminal does not exist, UA in a terminal system will become invalid in a video network. If the transmitted device and received device at an operation terminal is chosen, UA in an operation terminal will give a service request to the target terminal system, ATM connection will be established between terminal systems and stream will be transmitted.

In the video network which was adapted in these mechanisms, if device is connected to a video network, stream will be transmitted automatically.

In future, extension of a video network is considered and it is necessary to give functions, such as authentication and decentralization of management, for a plug-and-play mechanism.