NEWS RELEASE

NTT

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Development of Multicast MPLS for next-generation broadband services

For nationwide video communication service with high-quality and high-reliability point-to-point and point-to-multipoint transmission

Nippon Telegraph and Telephone Corp. (NTT; Head Office: Chiyoda-ku, Tokyo; President: Norio Wada) and Motorola[*1] have succeeded in developing Multicast MPLS[*2] (multiprotocol label switching) protocol and router software for it. These enable multicast streaming service and interactive multimedia communication service with high quality and high reliability.

With current IP (Internet protocol) multicasting, it is hard to configure point-to-point and point-to-multipoint paths simultaneously with such high quality and reliability. Multicast MPLS solves this problem by using functions that provide guaranteed quality-of-service and traffic engineering. It will enable service providers to provide their customers with various high-quality and high-reliability video communication services, which are expected to be next-generation broadband services.

Background for the development

Service providers are in tough competition and need to respond to various customer needs. Their customers require high-quality, high-reliability, fast, and reasonably priced services. In future, such next-generation services will include i) contents streaming services, such as video-on-demand (VOD), IP/TV (TV over Internet protocol), and live streaming; ii) IP-VPN (IP-based virtual private network); and iii) interactive multimedia service, such as high-quality VoIP (voice over IP), TV conferences, and video chatting. (Figs. 1-1 and 1-2)

For these services, multimedia service and quality control for point-to-point and point-to-multipoint traffic are becoming important technical requirements. However IP multicasting forces automatic path changes, so it needs a lot of control traffic between nodes that may cause service quality degradation, and it does not support enough scalability for a nationwide service.

To solve these problems, NTT has researched the core network functions required for next-generation broadband service. NTT has been developing Multicast MPLS as an extension of MPLS in collaboration with Motorola and has succeeded in developing router software using it. NTT plans to demonstrate Multicast MPLS at the international conference "MPLS2003" in Washington D.C. in the USA from Oct. 26th to 28th, 2003. A formal announcement from Motorola will be made in the USA on October 27th.

Features of Multicast MPLS and the router software

(1) Nationwide multicasting

Multicast MPLS is the newest technology supporting multicasting, which is required for next-generation broadband service, and it retains the merits of the current MPLS. It can support multicast streaming such as IP/TV, live streaming, personal broadcasting, and video chatting for nationwide users.

(2) QoS for multiple services

Multicast MPLS supports the provision of QoS according to the needs of users and services, and can provide high-quality and high-reliability broadband service. Users can enjoy watching streamed movies etc. without being disturbed by heavy users.

(3) Simple implementation on router

The router software is an extension of current commercial router software, so multicast MPLS is simple to implement.

(4) Adaptable to next-generation optical network

Multicast MPLS is adaptable to various networks including next-generation optical networks because it is compatible with optical networks implementing GMPLS[*3].

Technological features

(1) Multicast path configuration

Multicast MPLS has good scalability for a growing number of users because each router can configure a point-to-multipoint path with one message.

(2) Guaranteed QoS (Fig. 2)

Multicast MPLS can provide quality-guaranteed and bandwidth-sharing services over point-to-multipoint communication because it can allocate bandwidth on a per-path basis.

(3) Multicast traffic engineering (Fig. 3)

Multicast MPLS helps the ingress router avoid congestion and failure points by configuring point-to-point and point-to-multipoint traffic over the route with guaranteed QoS. This enhances network utility and network reliability by dispersing traffic.

(4) Route calculation considering traffic information (Fig. 4)

Multicast MPLS supports the calculation of suitable routes with guaranteed QoS considering network topology information, link attributes, and residual bandwidth collected by a unicast routing protocol. When route calculation functions are implemented in each node, multicast MPLS will be able to calculate suitable routes independent of the source location.

Future development

To enable the core network to provide various broadband services, NTT is promoting the standardization of multicast MPLS in the Internet Engineering Task Force (IETF). NTT is cooperating with software/protocol and router vendors to enhance this technology to better compete in the broadband market and is considering adapting it for various future networks including the next-generation optical network.

Notes

*1 Motorola is a global company handling communication systems/components and electronic devices. Its head office is in the USA. It provides router software to many companies and has considerable influence in this area.

*2 MPLS: Multiprotocol label switching. Packets are forwarded according to a label in the packet header, instead of according to the IP address. Many large networks use the technology as a basis for supporting the rapid expansion of the broadband Internet.

*3 GMPLS: Generalized multiprotocol label switching. A recent proposed standard that extends MPLS to lower network layers such as optical fiber and wavelength.

- Fig.1 Required services
- Fig.2 QoS functions
- Fig.3 Multicast traffic engineering function
- Fig.4 Route calculation

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