Tree-Based Ordered Multicasting in Computer Networks

Tech ID: 10197 / UC Case 2000-384-0

BACKGROUND

Multicast communication generalizes the unicast (information sent from one point to another point) and broadcast (information sent from one point to all points) communication models in computer networks to multipoint dissemination of messages. A source only needs to send packets once to the network interface to then be transparently replicated on their transmission paths to the receivers. This method is necessary for high-volume data transfer applications such as distributed software updates, newscasts, on-demand video, and telecollaboration systems. However, when the multicasting concept is adapted and deployed with IP multicast protocols in the internet, those systems cannot provide reliable or order-preserving delivery of packets to a multicast group. As a result, there is no guarantee that all of the packets sent from a source to a group of receiving hosts are disseminated without error or that the consistency and coherence of the data has been preserved, which calls for a more reliable multicast system.

TECHNOLOGY DESCRIPTION

Scientists at the University of California, Santa Cruz have developed a novel solution for message ordering services integrated with a tree-based, concurrent, reliable multicast. In this system, ordering is performed on a tree, as opposed to a ring, which has been presented in previous reliable multicast protocols. An advantage to the tree configuration is that it supports ordering of messages from rapidly changing sources for overlapping receiver groups and anonymous hosts.

APPLICATIONS

- Internet networks, especially for situations that require reliability and ordering of message transmissions

ADVANTAGES

- Improved resiliency, scalability, and efficiency of concurrent transmissions
- Allows for the integrated provision of reliability and ordering in the same topology and delivery process in contrast to other solutions that perform ordering in a separate delivery phase
- Permits ordered concurrent transmissions from rapidly changing sources on the same tree unlike other methods that are only suitable for single-source long-lived transmissions
- Supports ordered delivery to anonymous hosts and overlapping receiver groups in shared trees

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,031,308	04/18/2006	2000-384

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Queue-Sharing Multiple Access Protocol

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OTHER INFORMATION

KEYWORDS

Multicasting, computer networks, multicast communication, tree-based multicasting, Internet networks, ordered transmission, network transmission, Cat3

CATEGORIZED AS

- **Communications**
  - Internet
  - Networking
  - Other
- **Computer**
  - Other

RELATED CASES

2000-384-0

- Differentiating Congestion Vs. Random Loss: A Method For Improving TCP Performance Over Wireless Links
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- Carrier Sense Multiple Access With Collision Avoidance And Pilots (CSMA/CAP)
- Interference Management for Concurrent Transmission in Downlink Wireless Communications

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