Wireless Stealth Multicast

Abstract
Rich streaming multimedia and other real-time applications place tremendous demand on wireless networks. In order to help alleviate this problem we introduce wireless stealth multicast. Wireless stealth multicast dynamically creates multicast groups from redundant network traffic in order to conserve bandwidth. The detection of redundant packets is done without modification to the applications and without requiring global multicast support. These features allow for simple deployment of wireless stealth multicast and provide a higher quality of service (QoS), due to more efficient use of bandwidth.

Benefits:
- Efficient use of wireless bandwidth
  - No Changes to:
    - Client Applications
    - Server Applications
    - External Internet
  - QoS Benefit
    - Reduction in contention for wireless medium
    - No impact to non-redundant packet sources

Virtual Group Detection Manager (VGDM)

Wireless Stealth Client Application

Analysis:
- Loss rate does not increase with the number of clients.
- End-to-end delay is decreased when compared to unicast.
- Less contention for the medium
- If no packets are amenable to unicast then performance is the same as unicast.

1. The server generates the data packets and sends them to the wireless clients via separate unicasts.
2. As packets are passed through the VGDM they are checked to see if they could possibly form a virtual group. If multiple clients are detected then the next time packets arriving from a designated source IP and port will be queued into a virtual group. Otherwise the packet is transmitted normally.
3. Once specified settings have been reached the stealth packet is broadcasted to the clients. These setting are used to keep the impact on QoS that wireless stealth multicast has to a minimum.
4. The stealth packet arrives at the client. The client then uses the stored state information to reconstruct the original packet that will be delivered to the application.

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