

Aspen: Ubiquitous Multicast

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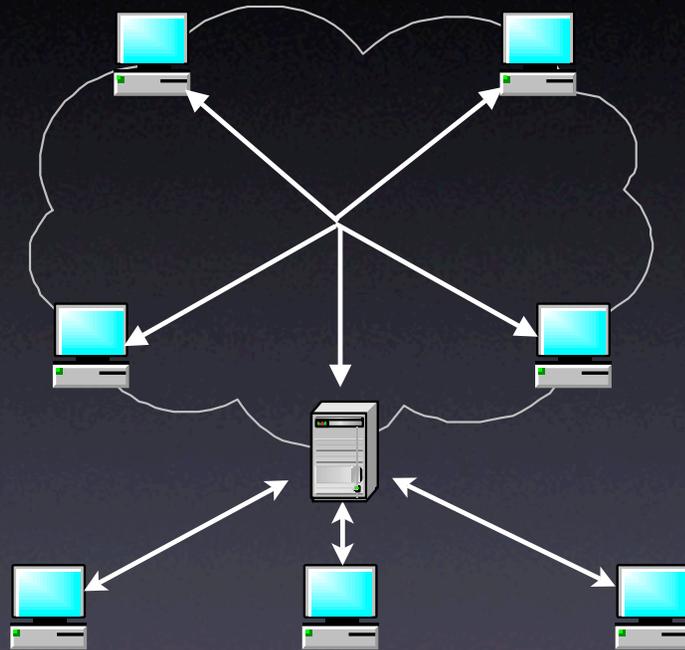
What is Multicast?

- A service that delivers data to multiple recipients.
- IP Multicast is just one implementation of multicast.
- Lots of folks are starting to look at application-level multicast (ALM).

ALM vs IP Multicast

- IP Multicast is efficient but suffers from deployment problems.
- ALM is easily deployable but not efficient.
- How can we combine the efficiency of IP Multicast with the easy deployment of ALM?
 - AG already does it with bridging.

AG Bridging Today

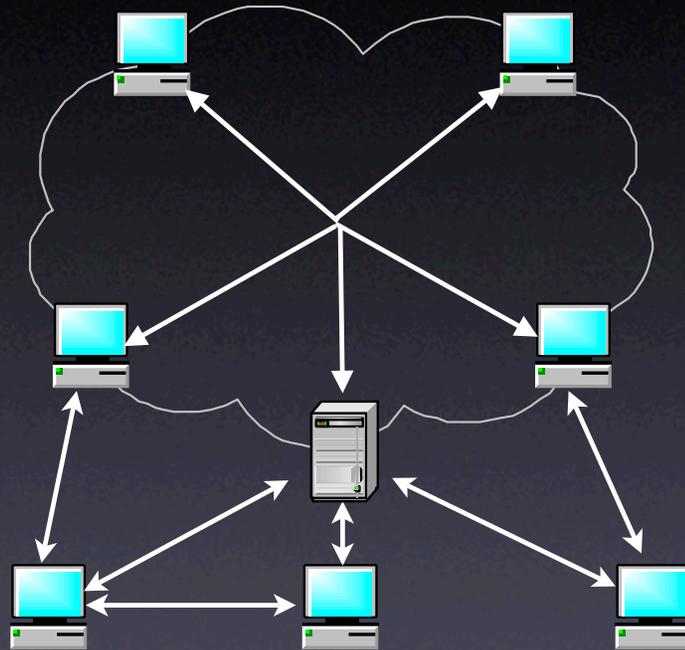


Can we do better?

Bridging Shortcomings

- Requires manual configuration
 - Bridge server must be set up per-venue
 - Client is explicitly configured to use multicast or unicast
- Centralized bridge is:
 - inefficient
 - not robust to failure

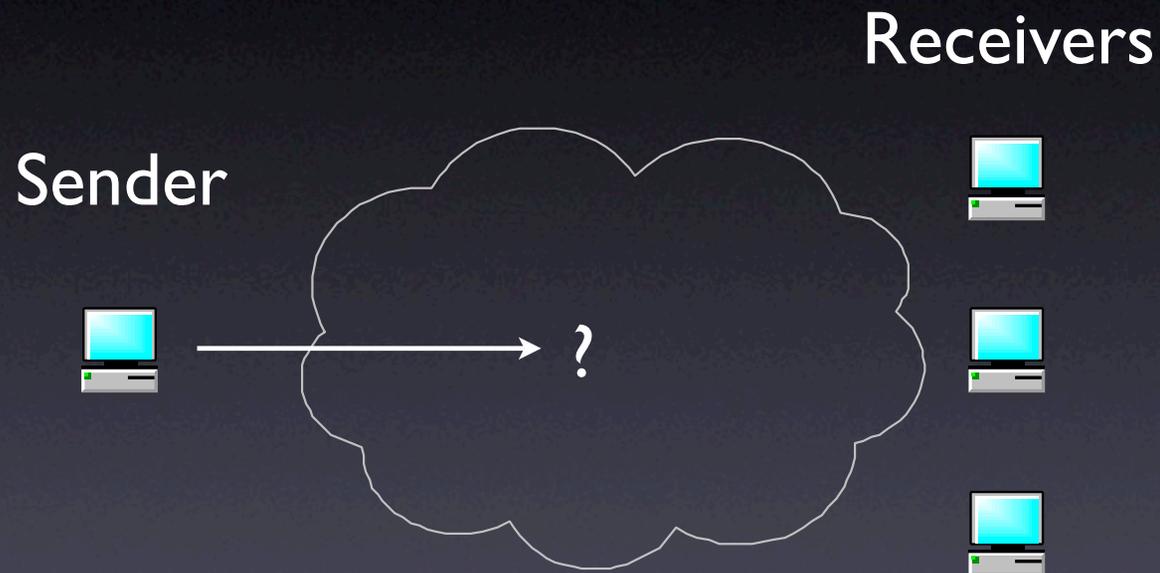
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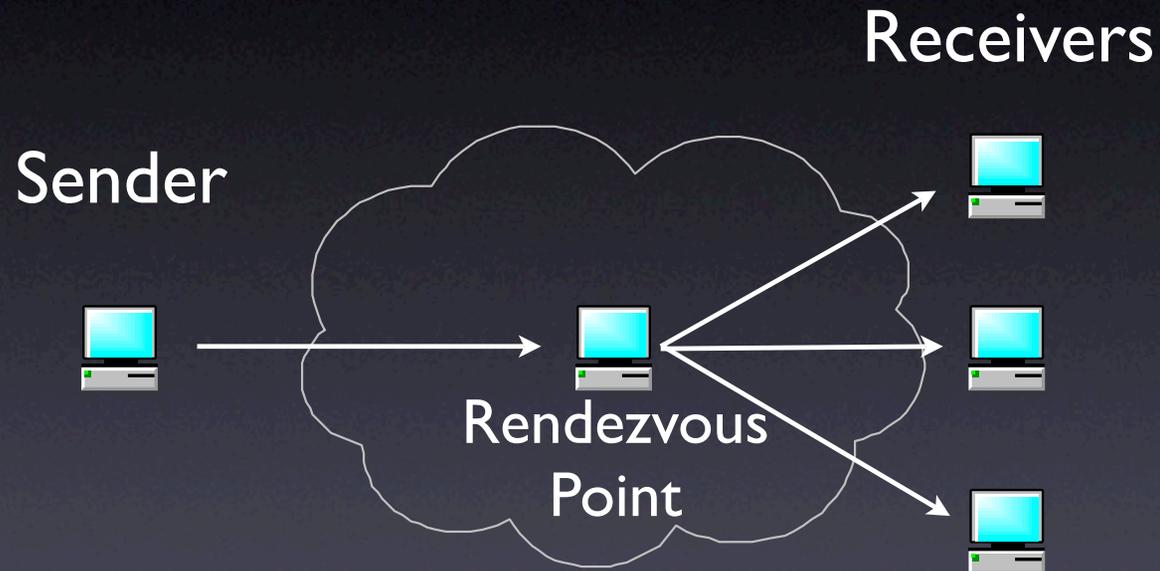
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- Applications already in the session forward data to those that don't have multicast.
- No separate bridge process!
- Clients automatically figure out if they have multicast or not -- no client configuration.

The IP Multicast Problem



The IP Multicast Problem



But where should the
Rendezvous Point be placed?

Fixing IP Multicast

- Single-Source Multicast (SSM)
 - Explicitly identify the source
 - No RP needed
- Embedded-RP Addressing
 - Embed the RP address directly in the multicast address (IPv6 only)

SSM and Embedded-RP

- Promising for deployable network-level multicast
- Push complexity from network to hosts
- Instead of pushing complexity all the way to applications, Aspen manages that complexity

AG Integration (1/2)

- Need support in media tools and AG services
- Complete for Unix and Mac OSX, partially complete for Windows

AG Integration

- Need support in within Venue{Server,Client,Management}
- NetworkLocation needs to be generalized
 - Currently hard-coded to IP Address / UDP port, Aspen sessions described by URLs
 - Useful for other applications?

Status

- AG toolkit support done, media tools nearly there
- Look for an announcement soon on ag-tech
- Or, contact me directly:

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