

## ViDe Thoughts on Multicast / H.323 Gateway



In September 2000, ViDe was invited by SURA to send representatives to discuss a possible Mbone/H.323 Gateway. This report reflects the opinions of the [ViDe organization](#).

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### Prolog: ViDe Definition of Terms

**IP Multicast** is a standard for Ethernet Group broadcasts, and is the network transport used by the Mbone applications VIC/VAT/RAT etc. The destination IP address represents no physical device but instead represents a Group membership “channel”. To join an IP multicast group, the end-user station announces it would like to join an advertised group IP address (the “channel”). What it wants to connect to is not a physical device, but a subset of network flows. Rather than receiving a single video/audio pair, the IP multicast end-user can receive video/audio pairs for every other end-user participating in the group.

**H.323** is a standard for Internet (packet switched) video/voice communications. The standard “ports” an approach developed in the H.320 (telephone circuit) world; therefore, H.323 systems employ extensive end-to-end call setup and signaling. The network transport for H.323 is usually implemented as unicast, meaning the destination IP address in each packet is the address of one particular network-attached device (computer, MCU). To join an H.323 session, an end-user connects to another H.323 end station, or to a multipoint control unit (a physical hardware destination). Low end systems switch a single (active speaker) video window; higher end systems switch what appears to be a “quadra” window, but is actually a video-mixed single window with a single, active voice track. An H.323 session could conceivably use IP multicast group addressing as its network transport for multipoint conferencing (VCON has an IP multicast transport component), but most H.323 systems available today rely on an MCU

### Collaborative Videoconferencing Technology:

- (1) *Summarize your organization’s position/focus on collaborative conferencing and the technology that you use.*

ViDe is interested in universities’ use of emerging video technologies for research and instruction. ViDe is especially interested in human-communication technologies that are network intensive, or that require new network functionality. We have focused our initial interest on collaborative videoconferencing (mainly H.323, but with some focus on IP multicast) and video on demand technologies.

ViDe’s opinion is that the discussion between AccessGrid, VRVS and Radvision developers was a positive contribution to the research video community, and we commend SURA in taking the initiative to organize this important discussion.

### “Technical Feasibility”

- (2) *Discuss your organization’s views on the “technical feasibility” of developing an Mbone-H.323 conferencing gateway.*

We observed a bit of "apples and oranges" problem: the Access Grid is mainly a technology for immersive, multi-location environments and its multicast transport is an "implementation detail". Asking if it possible to reduce 20 video/audio streams into any kind of single stream overlooks the main purpose of their project. Anyone tackling an H.323-Access Grid gateway would need a clear definition of the problem they are trying to solve, and we are not convinced that one would want to attempt stuffing the entire 18' wide Access Grid environment onto a PC screen.

We were very interested to hear that none of the developers were very keen on T.120 technology as a reliable base for data sharing, and we plan to explore some of the suggested alternative directions (Mary T. to fill in more here).

Everyone at the meeting agreed that the VRVS solution was "elegant". The VRVS backbone was designed as a series of VRVS servers that are networked in order to bridge (tunnel) sections of network where there no IP multicast support exists. This was a practical architectural departure from the "no server" multicast model, and this design happens to work well for incorporating H.323 users by the addition of a call setup server. The VRVS design handles the case where an H.323 client wishes to connect into the VRVS backbone.

Radvision mentioned some preliminary investigations into a "gateway" that would allow a single IP multicast client to connect into an H.323 conference through a gatekeeper.

What ViDe took away from the conference was that it would be "not difficult" to handle a single multicast user coming into a gatekeeper, or a single H.323 user coming into a VRVS multicast server. Perhaps handling end users one-by-one would solve the problem of unattached islands of videoconferencing end-users. Technology to connect a multicast backbone such as VRVS with an H.323 "backbone" such as ViDeNet would go beyond this approach, and we believe that two types of gateway would be required: one for multicast coming into an H.323 world, and one for H.323 coming into a type of multicast world. It should be noted that the VRVS world is a subset of the IP multicast world, in that native IP multicast employs no servers at all; to introduce multicast servers into the mix is changing the native IP multicast architecture.

ViDe observes that open source H.323 is critical to the success of any effort to create a multicast-H.323 gateway and strongly advocates the Open H.323 effort. We expect that commercial H.323/SIP communications systems will develop rapidly and we believe commercial vendors should focus on the value they add to standards-based systems, rather than attempts to capture the standard.

### **Gateway "Necessity/Practicality"**

#### *(3) Discuss your organization's views on the \*necessity and/or practicality\* of developing the gateway*

Because of the different technologies, different histories and cultures of the end-user communities, and past lack of interoperability, ViDe finds it difficult to predict who would really need or want to use a multicast/H.323 gateway, but we already appreciate the desire for a single end-user with one kind of technology on their desktop to be able to participate in videoconferences that happen to take place in the other type of technology.

ViDe is strongly committed to exploring ways of effectively informing our constituents of the range of options, differences, and compatibilities between the various conferencing solutions.

If there were a VRVS/H.323 freely available to ViDeNet, ViDe would use it; we would expect VRVS and/or the H.323 developer to support development of such a gateway. If there were an IP Multicast/H.323 gateway available to ViDeNet, ViDe would use it; we believe that it would be appropriate for anyone seeking to do this to go after research dollars (SURA/NSF/private) to fund its development.