

If At First You Don't Succeed...

Unreliability Hampers VHP Demonstrations

A Case Study for E2Epi

What is the Visible Human Project® (VHP)? The VHP is the creation of complete, anatomically detailed, 3-D representations of normal human bodies. Acquisition of transverse CT, MR, and cryo-section images of representative male and female cadavers has been completed.

The long-term goal of the VHP is to produce a system of knowledge structures that will transparently link visual knowledge forms to symbolic knowledge forms, such as the names of body parts. For more information, see: http://www.nlm.nih.gov/research/visible/visible_human.html

For the past several years, Parvati has been setting up technically complex demonstrations for the Visible Human Project® (VHP) using one server at the University of Wisconsin, one at Stanford, and one at the National Library of Medicine (NLM) in DC. While she has had many successes with videoconferencing and data streaming demonstrations, she often runs into such difficulties as these:

CASE 1: When a major demonstration of the VHP was scheduled at the NLM auditorium; she and her team arrived 2 days before the event, set up the projection system, and tested all the clients and connections to ensure there would be no problems. The presentation was to begin at 9:30 a.m. but, at 9:05, the network connection, without which they could not run the demonstration, disappeared! Because the auditorium was full for this event, Parvati went ahead with preparations for her presentation, not knowing for more than 20 minutes if she could demonstrate the VHP, as planned.

As it turned out, a network engineer across campus saw that a DHCP server had been started that *he* hadn't heard was authorized – the network folks working with the conference were aware and helping, but this particular individual wasn't on the team and, therefore, wasn't in the information loop – so he walked in at 8:45 a.m.,

saw what he thought was an unauthorized server running, and pulled the plug. Fortunately, the network team working on the demonstration found the problem quickly and the demonstration went on, as scheduled. It took 20 minutes to track down what had happened and fix it – Parvati was 5 minutes from beginning her talk by this time, still not knowing if she could run her demonstration before she got word that the network was functioning again.

CASE 2: For a demonstration at Hewlett Packard in Palo Alto, CA, Parvati and her team arrived two days early, set up the projection system, and tested all the clients and connections to ensure there would be no problems. This time, they lost the connection 5 minutes before the demonstration. When the connection disappeared, Parvati had already begun her presentation, so it was obvious to the audience that there were technical problems. In this case, the cause of the lost connection was that someone was installing a patch at that exact moment. Parvati was 10 minutes into her talk before the patch was completed and she could continue with the demonstration.

CASE 3: When conducting a demonstration in India, Parvati was using a Polycom at each end. The

latency between the two sites was enormous; the Polycom turns itself off when it doesn't see a packet coming in. This is a major issue for videoconferencing over long distances – as Parvati says, “the latency kills you.” This problem proved insoluble but, because of the preparatory work her team had done, they identified the problem in mere minutes. She thought the Internet2 community could develop guidelines for Polycom equipment for use with non-high-speed Internet connections. Note: Polycom endorses the use of the **H.323 Beacon** as a troubleshooting tool.

Recommendations

Parvati learned that unexpected problems occur to the best laid paths. To minimize the number of problems encountered and make solution of them quicker and easier, she has an experienced setup team. In these reported cases, the preparatory work ensured a clean path; this is crucial to the success of her demonstrations, especially when something goes wrong at the last minute. Because her team has already identified the path:

- They were familiar with the places where problems might arise,
- They were in touch with network personnel on site and at connected locations, and, thus,
- They eliminated the two foremost problems faced by end-users: finding someone who can help and convincing them that the problem is real and within their domain.

The preparatory work ensures a clean delivery of demonstrations on most

occasions and, when such problems as these arise, allows the team to locate and, in most cases, eliminate the problem in very a very short time frame so that the demonstration can stay on schedule.

Parvati comments that, without such preparatory work, it is hard to know who to contact about problems – at this time, there is no way to arrange for certain pathways to be protected at certain times, due to the distributed nature of the Internet. She reiterates that she is not having any problem with running the demonstration or using images – the technology works fine! From her point of view, most problems appear to be linked to communication difficulties – a user may carefully test specific paths and inform all the network administrators along those paths about their planned usage but that does not guarantee success.

Parvati recommends that end-users prepare well in advance, identify their path (where possible), and work with onsite networking staff. She also suggests that anyone working at network facilities whose work could affect performance (intentionally or unintentionally) needs to:

- Be alerted about demonstrations on their network,
- Understand what can affect the demonstrations, and
- Check with the network administrator who is supporting the demonstration before making any changes, however slight, that could affect the network during the demonstration period.

What is the H.323 Beacon? The H.323 Beacon is a tool one can use to: monitor and measure the performance of H.323 videoconferences; identify and troubleshoot performance problems; test call quality and media capabilities of H.323 sessions; and assist an end-user or ISP in debugging. The H.323 Beacon helps network administrators, end-users, and conference operators using H.323-based applications; it also collects data that network researchers could use in H.323 traffic measurement and modeling research. For more information about the H.323 Beacon tool, please visit:

<http://e2epi.internet2.edu/Beacon/overview.html> (overview) or <http://www.itecoho.org/beacon/> (documentation and source code).

What is E2Epi? E2Epi is Internet2's End-to-End Performance Initiative. For more information about us, see our website at: <http://e2epi.internet2.edu/>. There you'll find links to recent projects (like **E2E piPEs**) and presentations, as well as other information related to end-to-end performance issues, measurement tools, upcoming events, and related activities.