



*Working Together Across the Continent
with Video Conferencing*

National Radio Astronomy Observatory

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SPIE

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Outline

- Background
- Motivation
- Installation
 - Late 1999
- Experience
- Expansion
 - Late 2001
- Summary



NRAO

- Staff of about 550
- Staff concentrated at locations in AZ, NM, VA, & WV
- 18 locations total
- Operate three major instruments
- Two major long term projects underway



Telephone Conferencing

- Extensively used for over 20 years
- Still used
- Drawbacks





Lack of
Visual aids



Comprehension

Agreement

Attentiveness



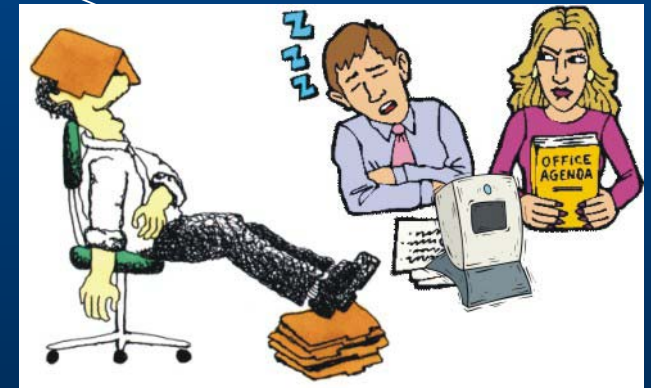
Non-verbal cues

Gestures

Facial expression

Body language

Inaccurate
sense of
meeting
dynamics

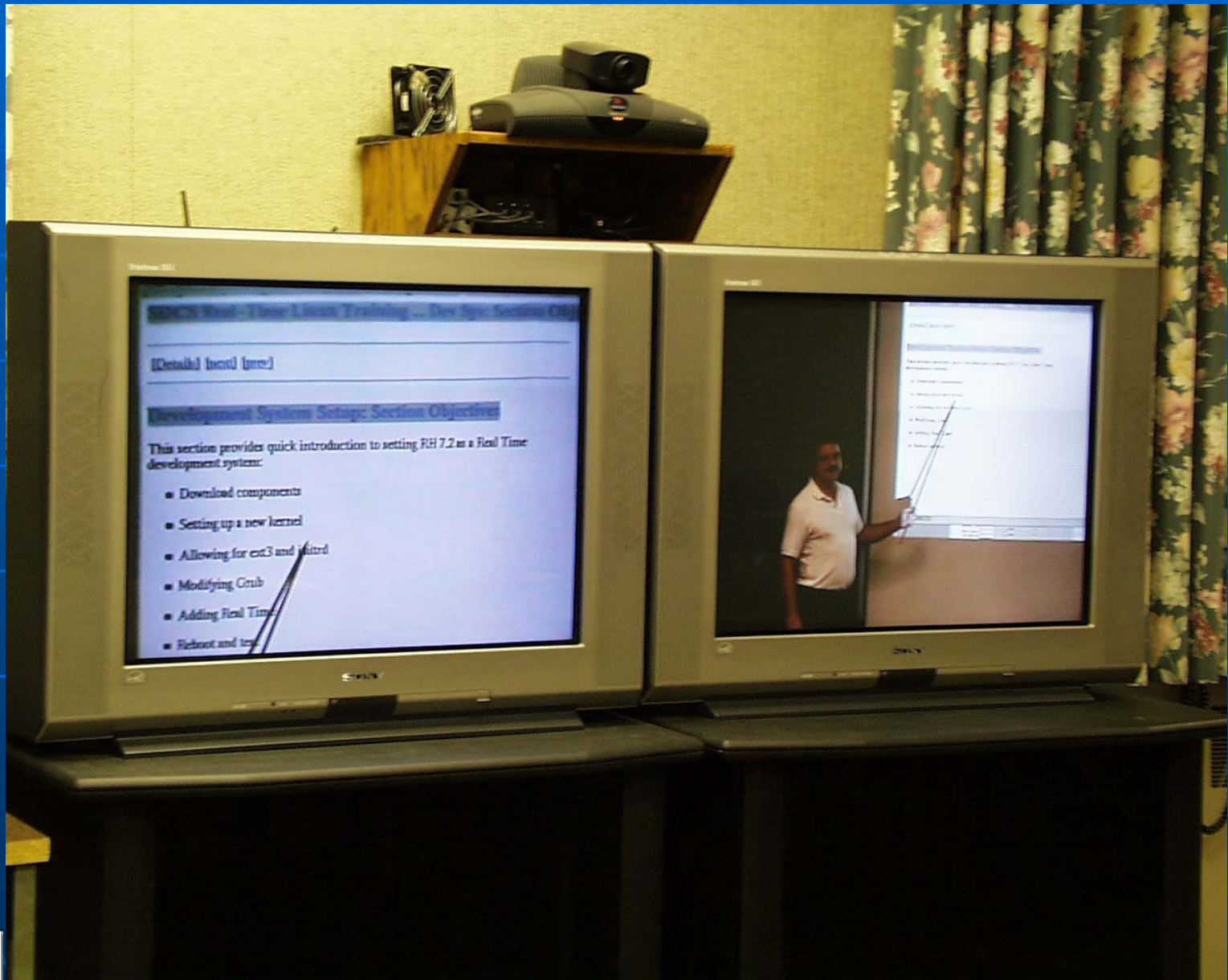






Conference Room Installation: late 1999





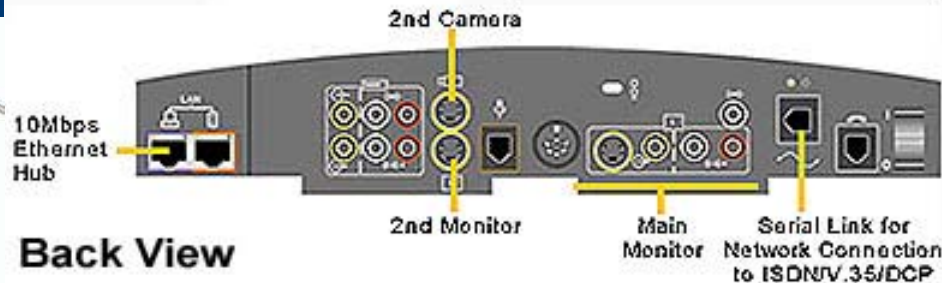
Polycom 512 ViewStation

- Our requirements
 - IP
 - ISDN availability
 - Cost
 - Appliance
 - Price
 - Ease of use



ViewStation

(also 128/ 512/ V.35/ DCP/ H.323)



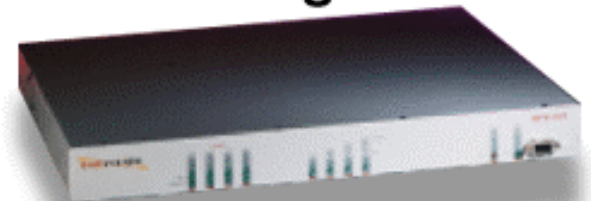


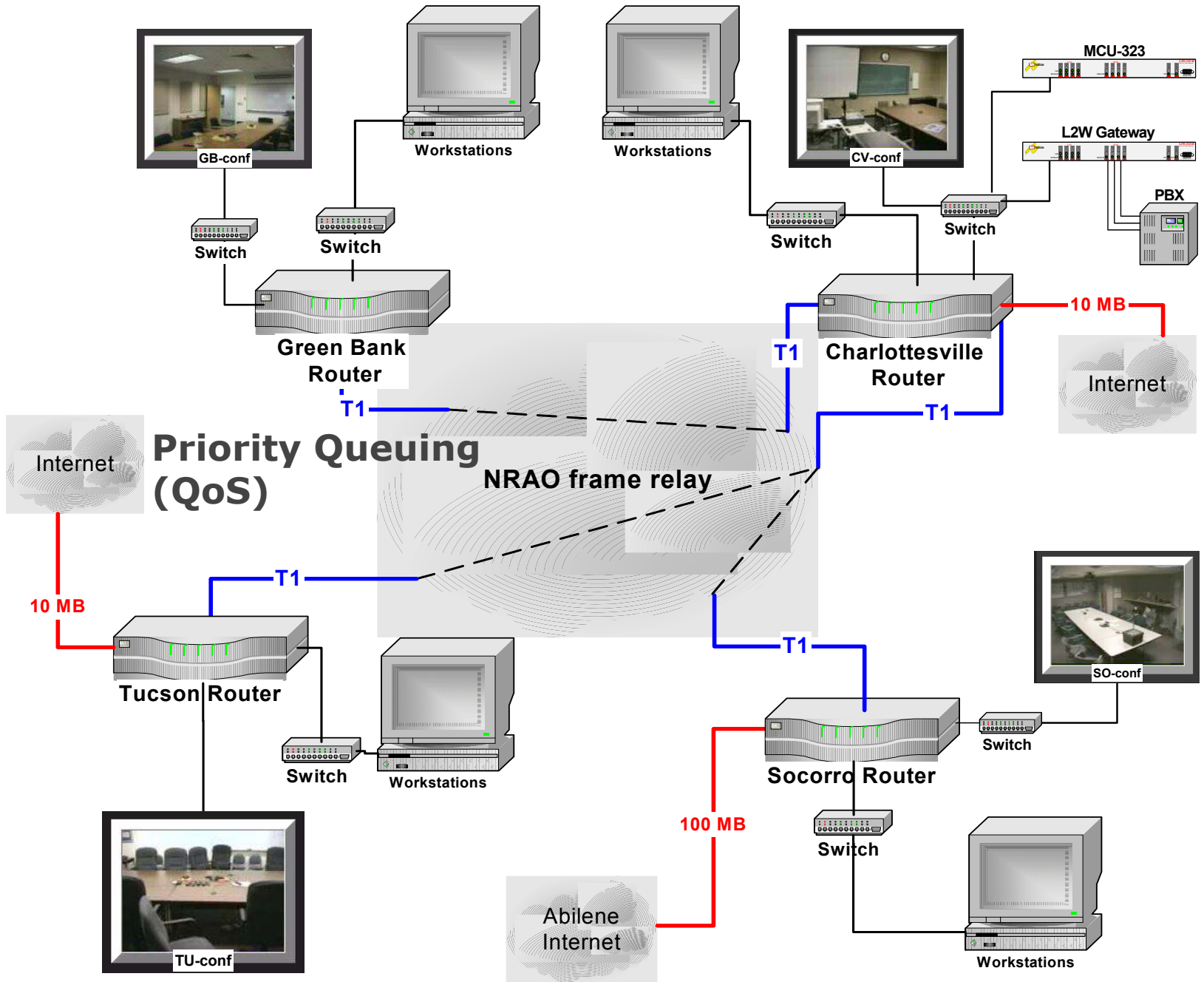
Document camera

Additional Requirements - Equipment

- Multipoint conference capability, IP
 - Radvision MCU-323
 - No other choice in our price range
 - Significant part of the total cost
- IP to ISDN gateway
 - Radvision L2W gateway

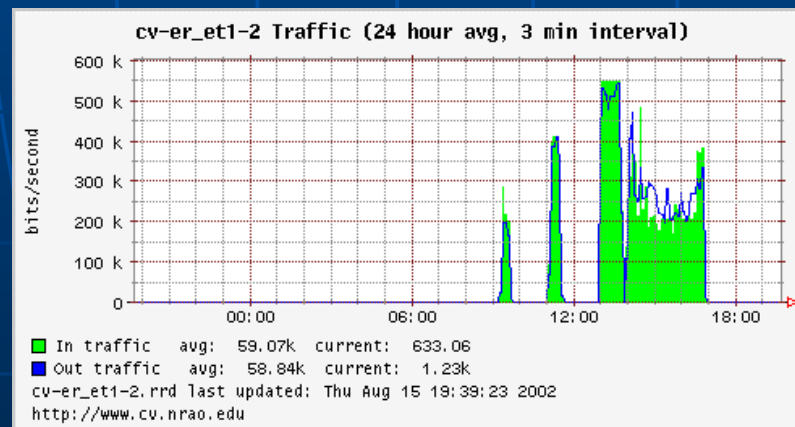
MCU-323
Multipoint
Conferencing Unit





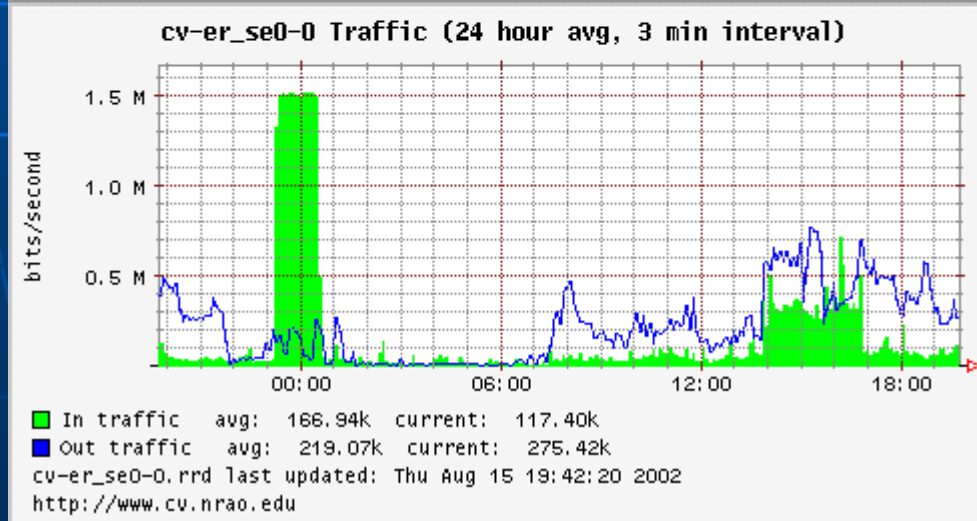
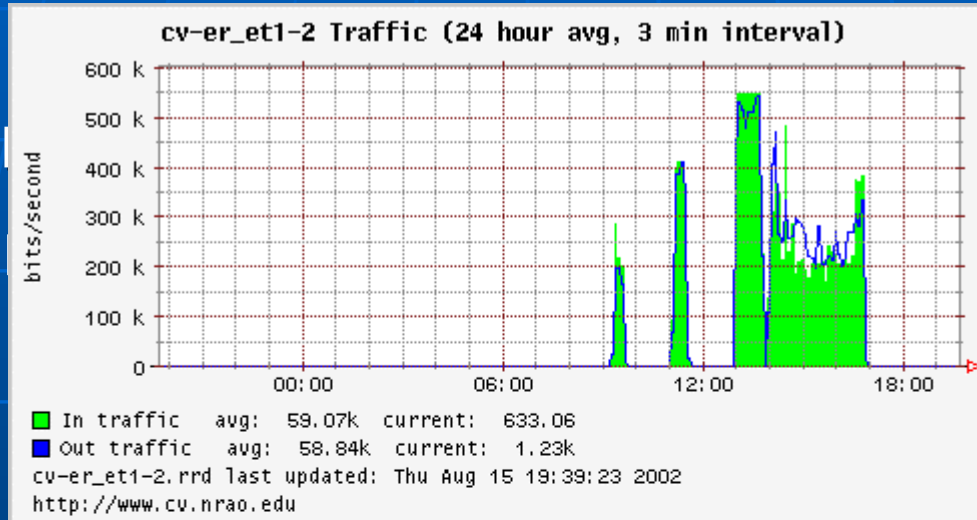
Installation Tip 1

- Understand video traffic requirements
 - Jitter is bad
 - Packet loss is devastating
 - QoS policy for WAN is necessary
 - Video call generates 200 – 500 kbps of traffic



Installation Tip 2

- Is there...
- Baseline...



Installation Tip 3

- Good room lighting
 - Avoid bright reflective walls
 - Avoid bright reflective table tops
- Good audio is imperative
 - Good room acoustics
 - Attention to microphone placement
 - Wireless microphone for speaker(s)
 - Coverage for large groups is difficult



Installation Tip 4

- Room setup
 - Neat installation
 - Quick reference guide for users
 - Flexible arrangement
 - Discussion
 - Presenting
 - Receiving
 - Use a LCD projector for large audience



Participants' Initial Reaction

- Camera shy
- The remote control syndrome
 - Those who want to push all the buttons
 - Those who won't touch it
- Guru is needed
 - Exploit the capabilities
 - Hand holding



Point-to-point Call Experience



- Placing the video call is straightforward
- Good interaction
- Benefits of video are quickly apparent
- Sense of being in a real meeting



Multipoint Call Experience

- The MCU adds delay
 - Discussion
 - Harder to interrupt (delays over 150 ms)
 - Adapting to the delay requires both experience and discipline
 - Good chair control needed
 - Presentation
 - MCU delay has negligible effect



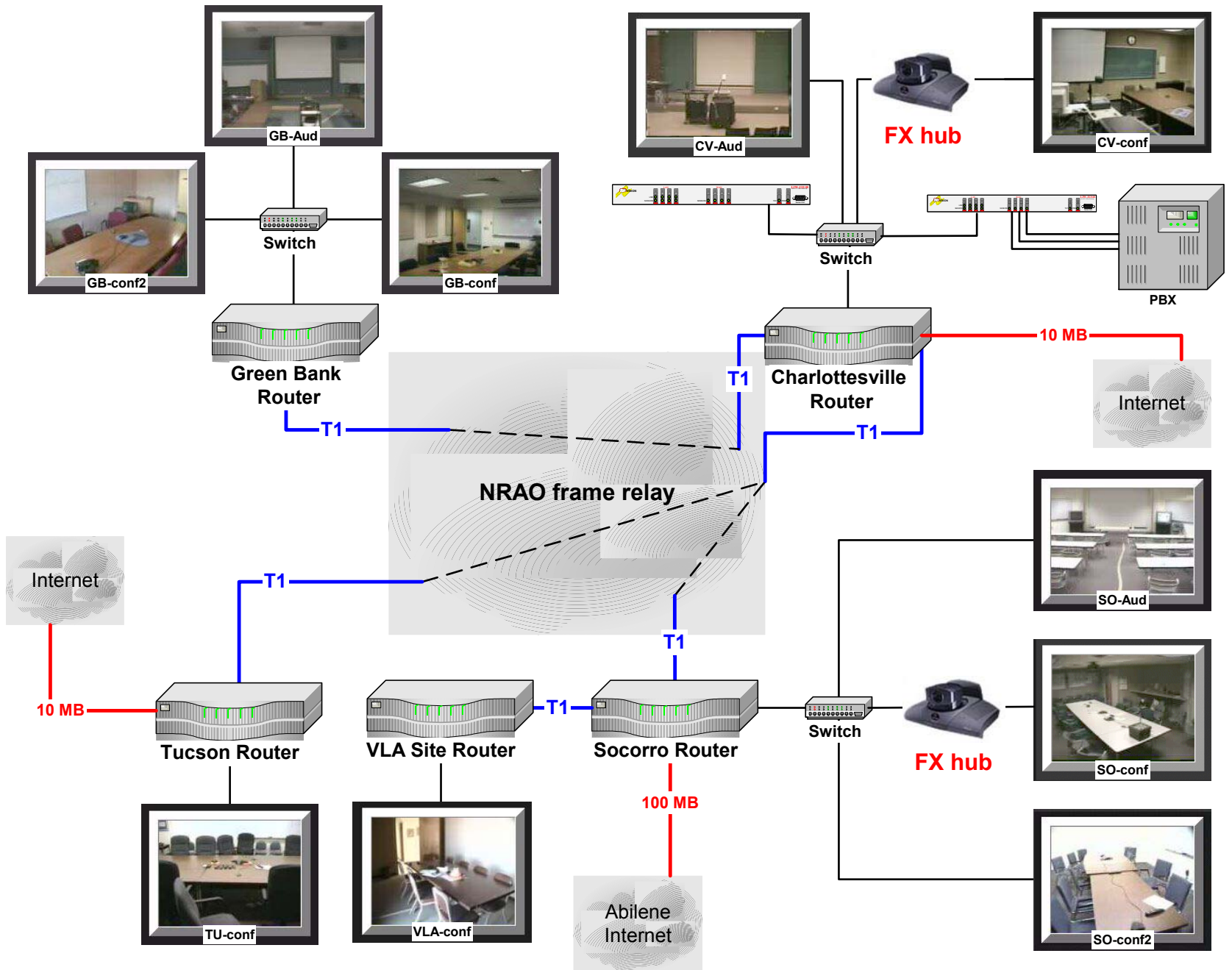
User Acceptance



Expansion

- Two years later
- Six additional systems (significant price drop)
 - Three auditoriums
 - Two conference rooms
 - Additional operations site (VLA)
- Two of six new units have built-in "FX" MCU
 - Better audio
 - Simultaneous multipoint conferences
- System management software





Benefits

- Sense of “being there”
- Improved communication between sites
- Increase in productivity
- Video conferences are less fatiguing
- Travel overhead reduced (not eliminated)



Current Usage

150 site-hours per month



Ballpark Costs

- Polycom 128, single TV monitor
\$4,000
- Polycom FX MCU, secondary camera,
twin large-screen TV's \$12,000 -
\$15,000
- Document camera \$2,000
- Stand-alone MCU's & gatekeepers
\$10,000 - \$20,000



