Working Together Across the Continent with Video Conferencing

National Radio Astronomy Observatory

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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
Non-verbal cues
- Gestures
- Facial expression
- Body language

Lack of
Visual aids

Comprehension
Agreement
Attentiveness

Inaccurate sense of meeting dynamics
Conference Room Installation: late 1999
Snapshot beside live video
Polycom 512 ViewStation

- Our requirements
  - IP
    - ISDN availability
  - Cost
  - Appliance
  - Price
  - Ease of use
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
Priority Queuing (QoS)

Internet

T1

10 MB

GB-conf

Switch

Green Bank Router

Workstations

Switch

T1

NRAO frame relay

T1

Socorro Router

Switch

100 MB

Abilene Internet

10 MB

Workstations

Switch

T1

Charlottesville Router

Switch

10 MB

Internet

GB-conf

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Switch
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 bandwidth capacity?
- Baseline your current traffic.
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