

# MEASUREnet System Training

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**MEASUREnet**

# Training Schedule

- Tuesday, January 18th, 2000 8:30am - 4:30pm
  - Metrologists and Network Administrators meet in Building 101, Room B-11 for Welcome and System Training.
- Wednesday, January 19th 9:00am – 4:30 pm
  - Metrologists and Network Administrators meet in Building 101, Room B-11 for Continued System Training, Exercises, and Simulations.
- Thursday, January 20th, 9:00am, short day
  - Training and WorkShop Wrap-up and System Packaging
  - Ancillary Issues

# Training Objectives

- Network Administrators
  - MEASUREnet Hardware Overview and Configuration
  - Windows NT Environment and Administration
  - Software Packages (Winnov, NetMeeting, pcAnywhere)
- Metrologists
  - MEASUREnet Testing Procedures
  - PMAP Application Usage
  - NetMeeting
- Both Network Administrators and Metrologists
  - Using MEASUREnet to conduct Collaborative Exercises

# Introductions

- Name
- Organization
- Position/Duties



# Objectives

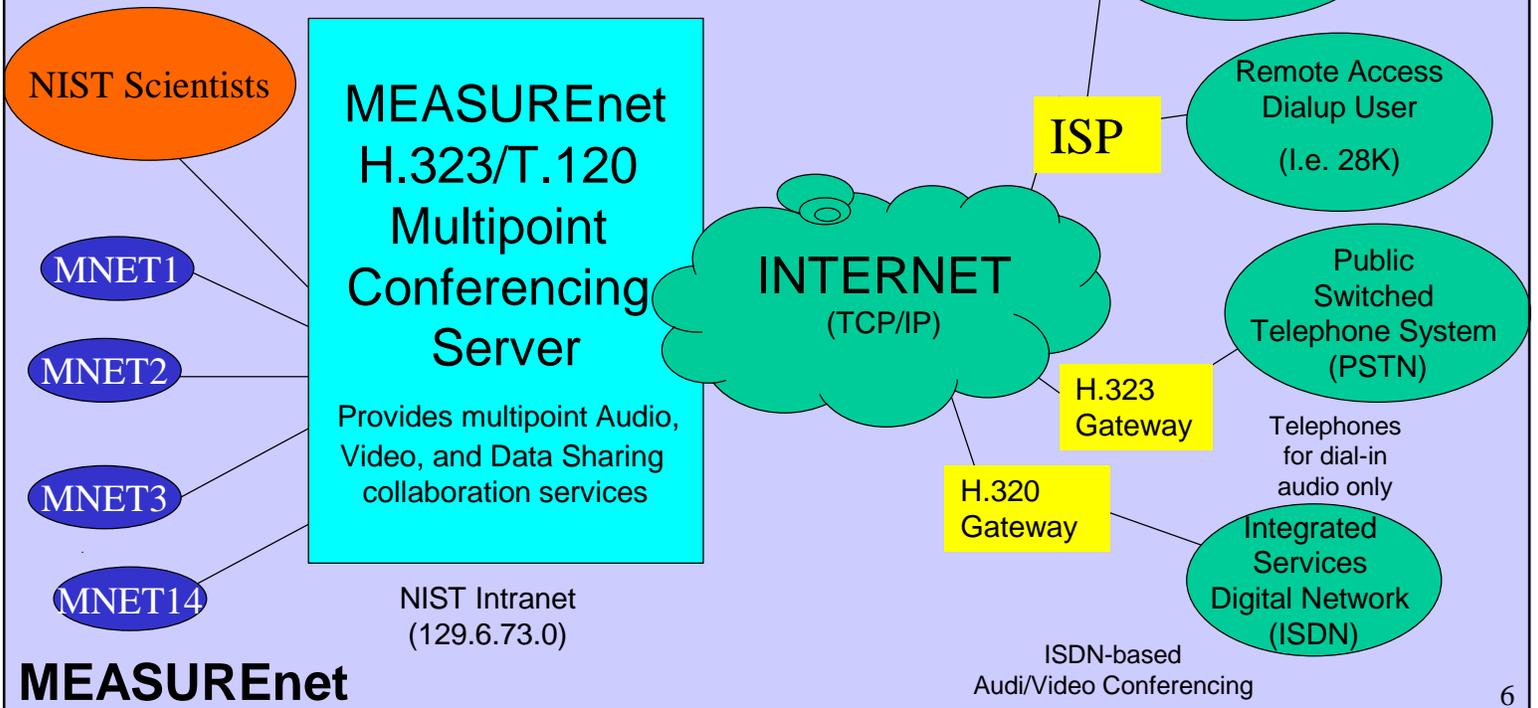
- Introductions
- MEASUREnet Architecture/Overview
- Basic System and Hardware Setup
- Windows NT related Information for MEASUREnet
- Videoconferencing System Configuration
- NetMeeting Configuration and Operation
- Miscellaneous Software Configuration
- Hands-on System Training and Lab Exercises

# MEASUREnet Architecture

(Videoconferencing for the Internet + Standards for Collaboration)

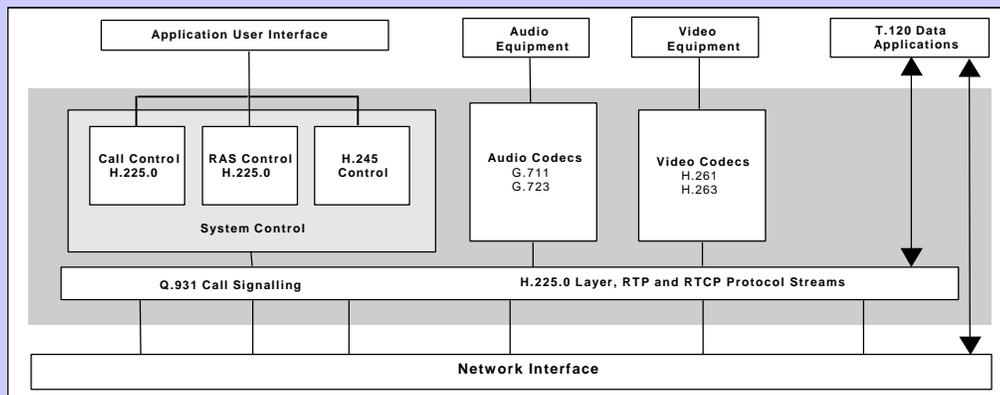
**NIST**

Local Area Network Users



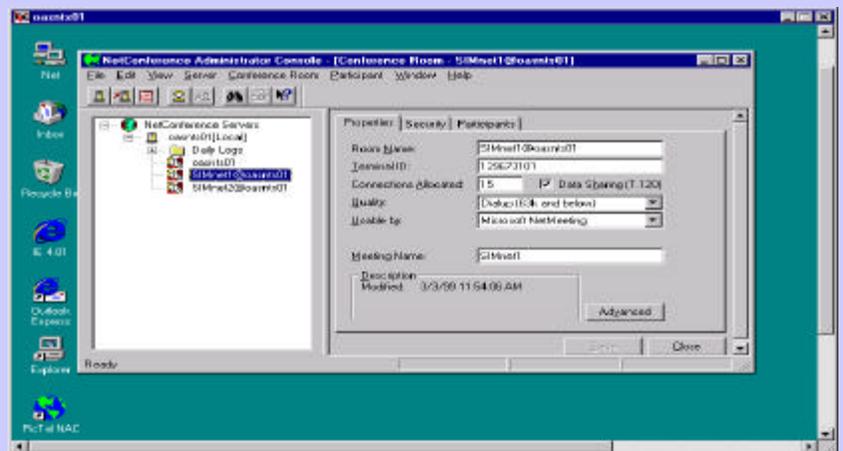
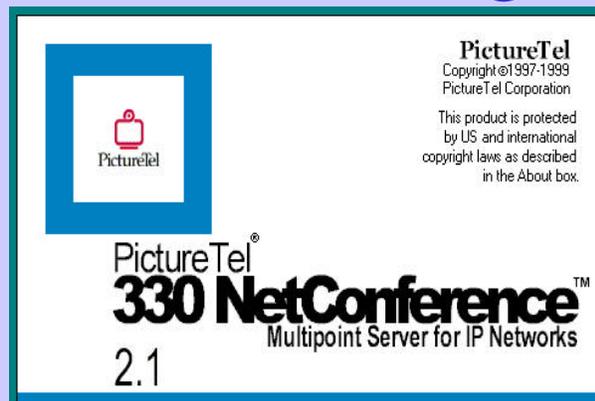
## MEASUREnet Architecture Cont.

- Microsoft NetMeeting 3.01 sp1 used as standard H.323 client
- H.323 Multipoint Conferencing Server
- Standards used by Server:
  - Video Codec Standards: H.261, H.263 (quality, frame rate, size)
  - Audio Codec Standards: G.723, G.711, G.722 (telephony to cd quality audio)
  - Document/application sharing: T.120 (chat, whiteboard, file sharing)
  - Communications: IETF (Internet Engineering Task Force) Realtime Protocol and Control (based on TCP/IP)



# PictureTel Conferencing System

- H.323 Multipoint Conferencing Server
- PictureTel 330 and LiveManager 140 used to realize the H.323 Conferencing Server
  - Clients Connect Point-to-Point to Server (via gatekeeper)
  - Server Switches the “Remote” Video and Audio to the Current Speaker, or broadcaster mode can be selected by administrator



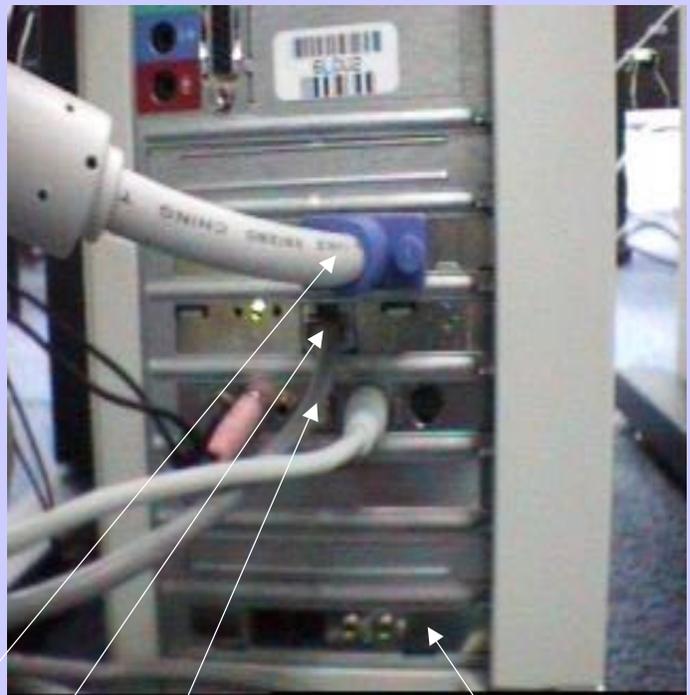
MEASUREnet

## MEASUREnet Hardware Configuration

- Dell Dimension XPS-T 600Mhz Pentium III
- 20GB Hard Disk Drive (Adaptec SCSI target, EIDE currently)
- 1.44MB Floppy
- 100MB Iomega Zip Drive
- 256MB RAM
- 40 X CDROM
- Diamond Supra Express 56Kbps V.90 Internal Modem
- 3COM 3c905C-TX 10/100 Ethernet Adapter
- Winnov Videum AV PCIVideo/Audio system w/Camera
- Harmon Kardon Speakers (not used) w/Plantronics HS-1 Headsets
- 19" DELL Monitor (Sony Trinitron OEM)
- No specific Backup Software installed, Iomega Tools
- No Uninterruptible Power Supply (UPS), recommended

# MEASUREnet Hardware Installation

- All Hardware configurations are identical
- All boards are software configurable; no hardware switches to modify on boards



**MEASUREnet**

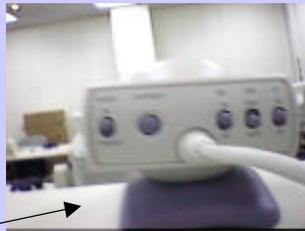
Video 3Com Ethernet

Winnov Videum

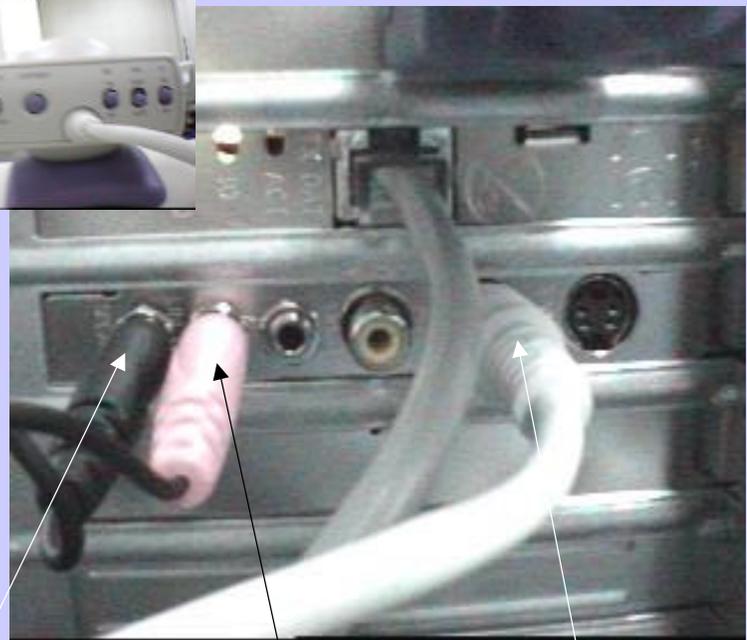
Modem

# MEASUREnet Audio/Video Hardware

- Winnov integrated mic and Camera system



- Camera input to Card
- Headset input/output on Card



Headset Microphone in

Headset Speaker out

Camera Input

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## Power Considerations

- Switch On Power Supply (115V, 220V)
- Discussion: Power requirements/configuration?
- UPS?  
Recommended



# MEASUREnet Hardware Maintenance

- Dell Warranty - DELL Express Service Tag
- NIST Contact for problems:
- Web Site availability???
- Problem Resolution (catastrophic)
  - Replacement PCs Available
  - CD media will be available with original configurations/drivers for easy re-installation.
  - Future versions of system software will be made available on bootable CD media
- Problem Resolution (minor)
  - pcAnywhere connection to PC for minor problems

# BREAK?



coming up ....

The MEASUREnet related Windows NT Environment

**MEASUREnet**

# Windows NT Environment

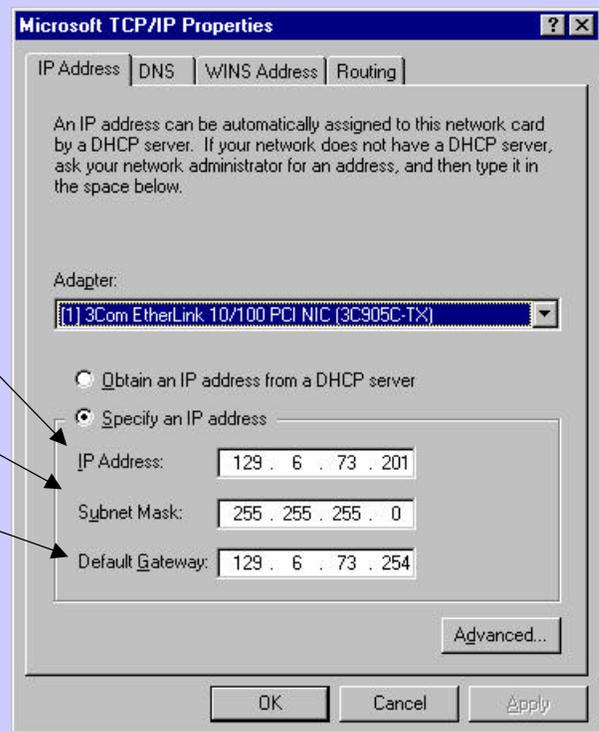
- Accounts and Permissions
  - administrator (false account for security)
    - No password assigned
  - warden (For MEASUREnet Administration)
    - Passwords to be assigned
  - mnet (For MEASUREnet Metrologist Users)
    - Passwords to be assigned
- Desktop Icons
  - NetMeeting 3.01sp1, Internet Explorer 5.01, remote access service (RAS)

# Windows NT Environment (Network Settings)

- For Ethernet Attachment
  - Other than TCP/IP-based Microsoft Networking protocol stacks installed locally not recommended
  - TCP/IP Information: IP Address, Subnet mask, gateway address, Domain Name Service (DNS), Windows Internet Naming Service (WINS)
  - Static Internet Addresses vs Dynamic Host Configuration Protocol (DHCP) assigned addresses

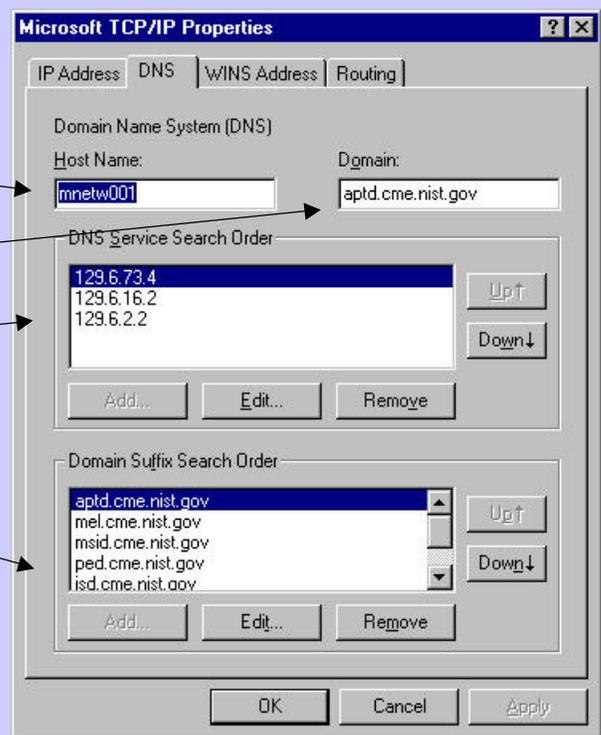
# Windows NT Environment (Network Settings)

- Your LAN IP Address
- Subnet mask
- Default gateway



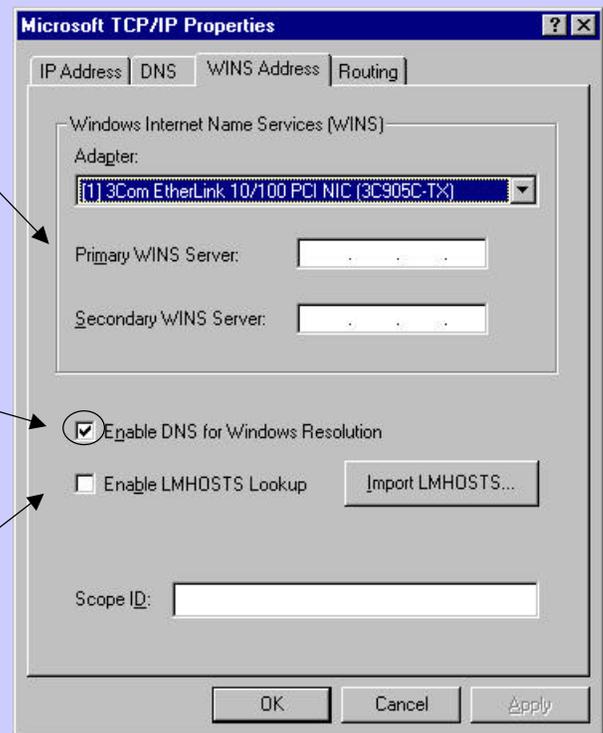
# Windows NT Environment (Network Settings)

- Your Host name
- Your Domain name
- DNS Search
- Suffix



# Windows NT Environment (Network Settings)

- No WINS Information, this is important to allow RAS and the 3Com NIC card to simultaneously co-exist.
- If not connected to any DNS services, then disable DNS lookup for Windows Resolution
- Static lookups should use LMHOSTS

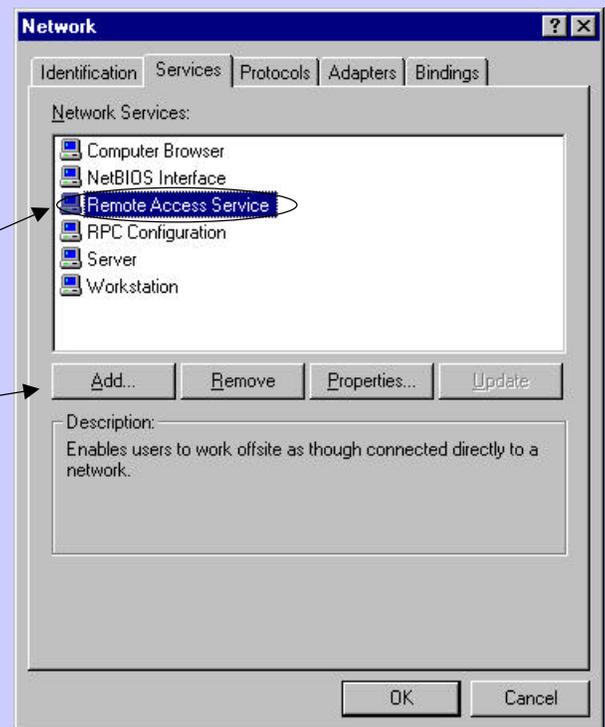


## Windows NT Environment (Network Settings Cont.)

- Supporting Dialup Networking Using a Modem
- Requires Windows NT Remote Access Service (RAS) Installation and Configuration
- Entering Dialup Internet Service Provider (ISP) information to RAS

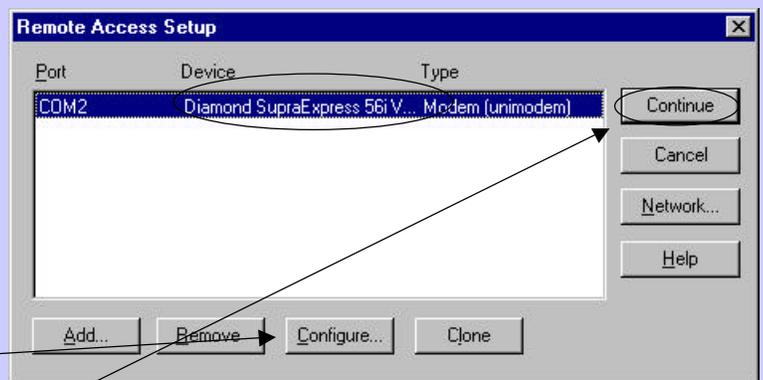
# Windows NT Environment (Network Settings Cont.)

- For Modem Attachment, Configure Remote Access Service (RAS)
- Double click RAS to begin Configuration
- Install RAS if not already installed by adding service
- Modem installation will automatically be invoked if not already installed



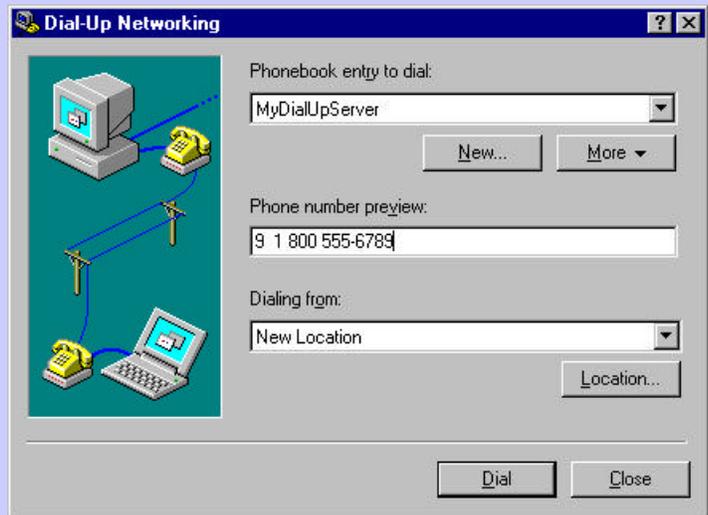
# Windows NT Environment (Network Settings Cont.)

- Windows NT Remote Access Service (RAS) Configuration
- For additional modem configuration options choose Configure
- Click Continue to accept defaults, recommended



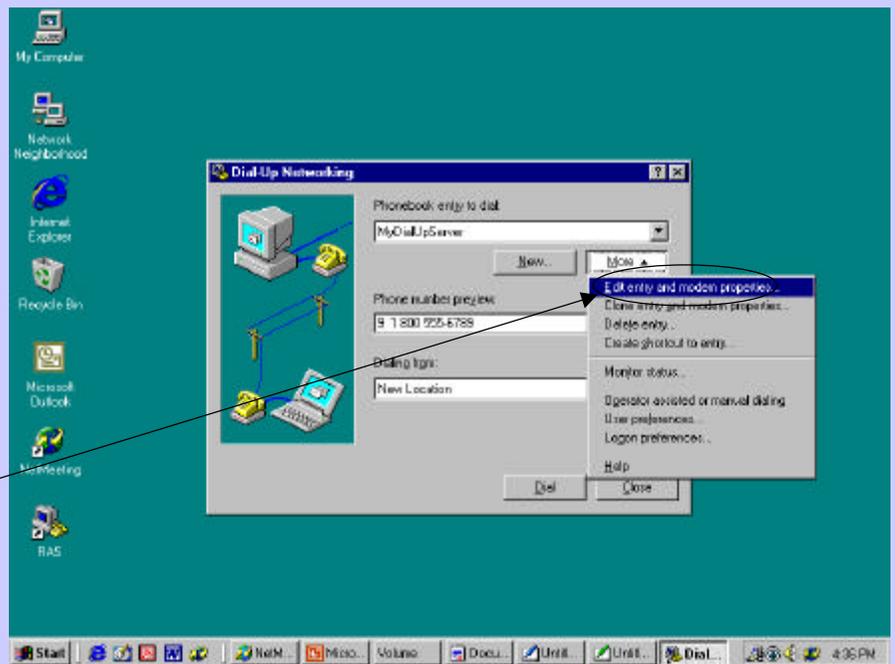
# Windows NT Environment (Dialup Networking)

- Invoke the RAS Icon for accessing, changing, or creating new ISP information
- Change Modem-based Internet Settings to match your ISP Settings
- Basic ISP related settings



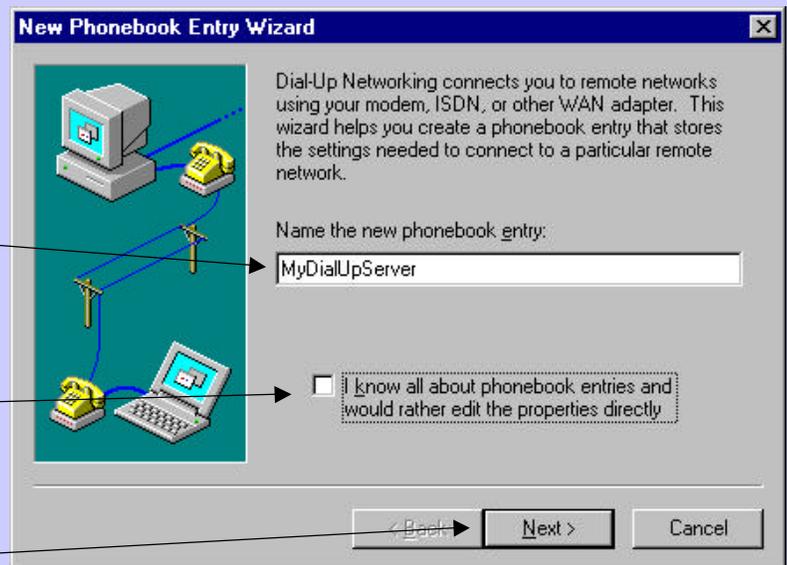
# Windows NT Environment (Dialup Networking)

- Creating/Editing a new Dialup Networking entry for your site
- Use DUN 5 step process
- Invoke More or New Button from DUN screen



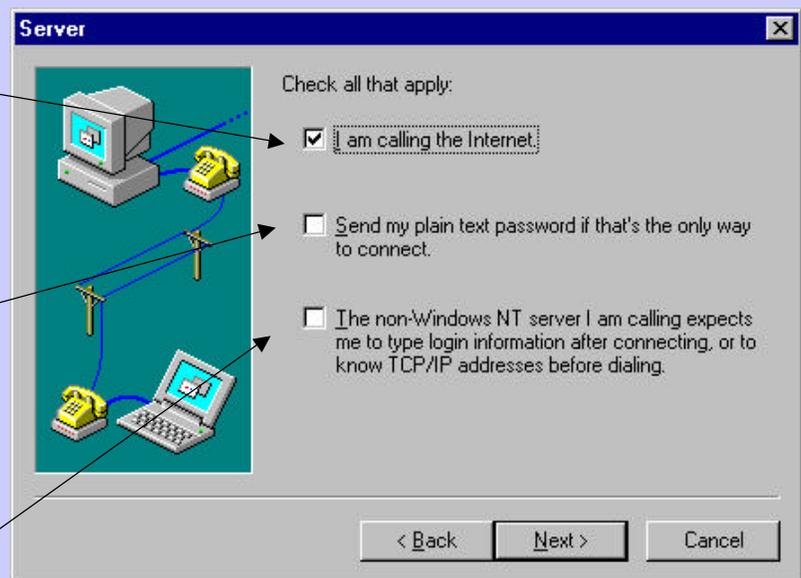
# Windows NT Environment (Dialup Networking)

- New Dialup Networking entry will have the name MyDialUpServer – change
- Advanced users can skip this by checking this box
- Click Next when finished



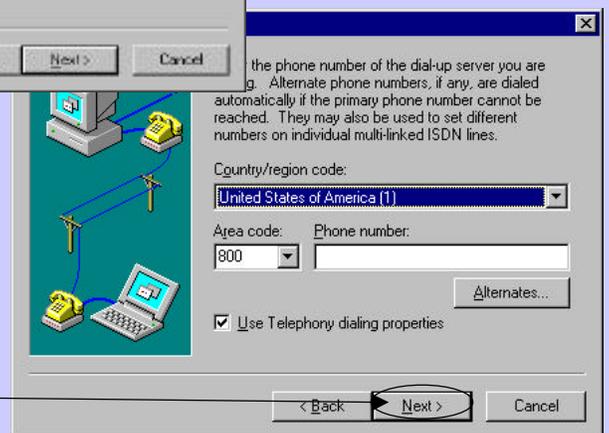
# Windows NT Environment (Dialup Networking)

- In most cases, use “calling the Internet” option
- Some ISP’s cannot accept MS authentication (I.e. chap/pap)
- Non-DHCP servers require scripting information....



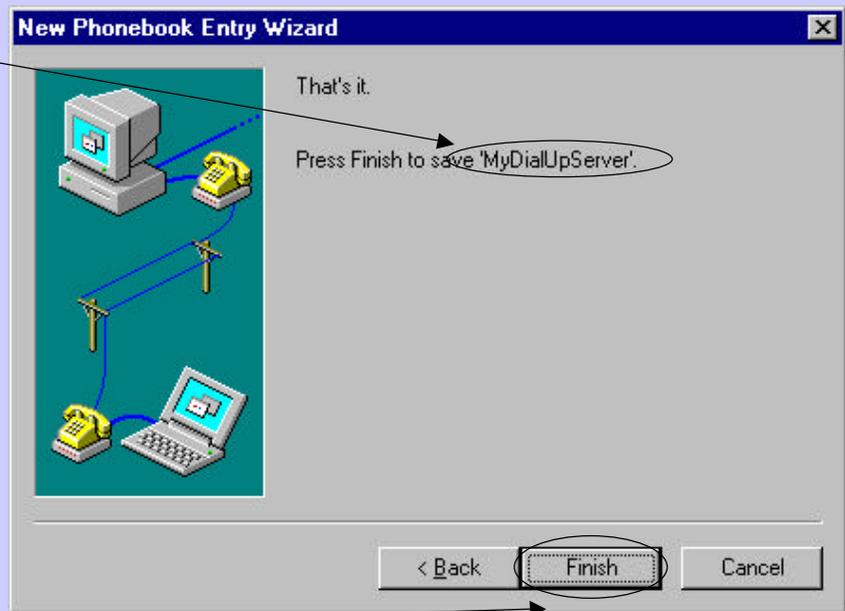
# Windows NT Environment (Dialup Networking)

- Editing the Phone Number of your ISP entry
- Click “Use Telephony” properties for expanded data entry
- Click Next to continue



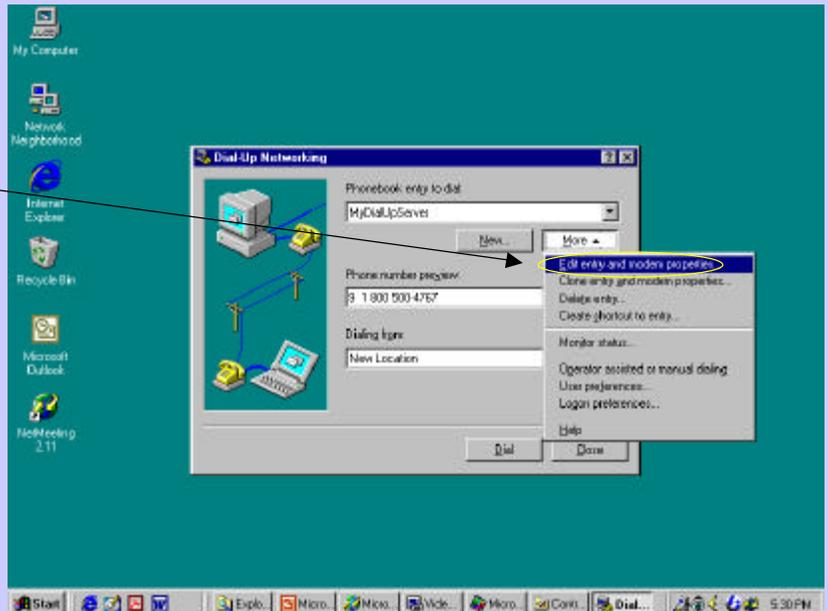
# Windows NT Environment (Dialup Networking)

- A new Phonebook entry has been created for RAS/DUN.
- A new RAS Icon will be created on your desktop by default
- Click Finish to proceed with creation.



# Windows NT Environment (Dialup Networking)

- To Edit an existing PhoneBook entry or other settings, click “Edit entry and modem properties”



# Windows NT Environment (Dialup Networking)

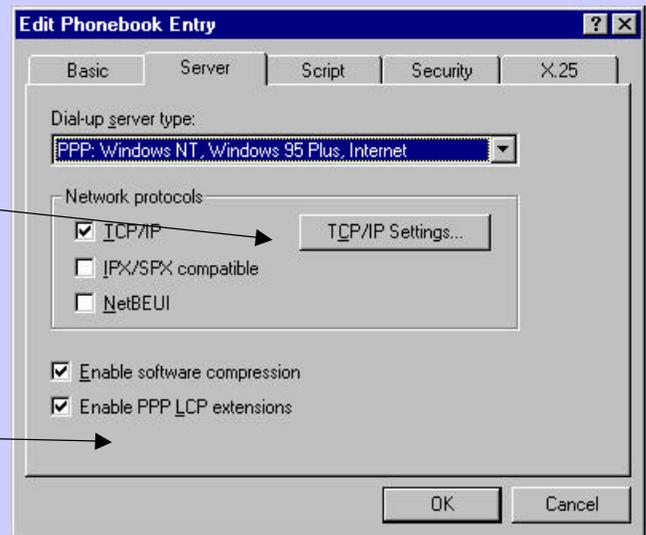
- Enter the ISP phone number
- Check Modem entry

The screenshot shows the 'Edit Phonebook Entry' dialog box with the following details:

- Tab: Basic
- Entry name: FAS
- Comment: (empty)
- Country/region: United States of America (1)
- Area code: 800
- Phone number: 500-4767
- Dial using: Diamond SupraExpress 56i Sp V.90
- Use Telephony dialing properties:
- Use another port if busy:
- Buttons: Alternates..., Configure..., OK, Cancel

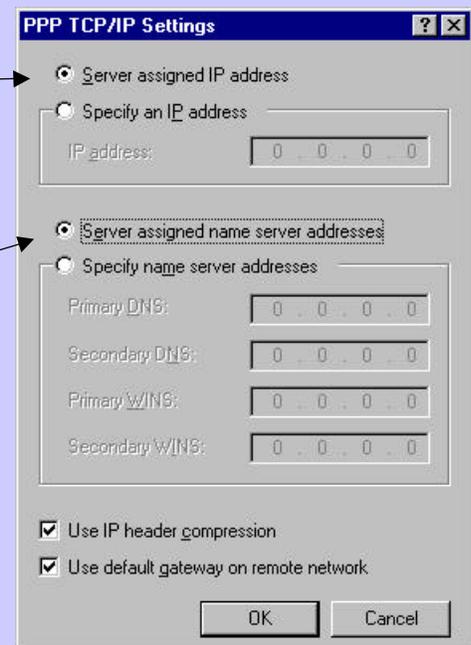
# Windows NT Environment (Dialup Networking)

- Click here to check ISP TCP/IP settings
- Use only TCP/IP



# Windows NT Environment (Dialup Networking)

- If using DHCP then leave this checked
- If DHCP then leave this checked
- If not using DHCP, then ISP must supply this info



# BREAK?



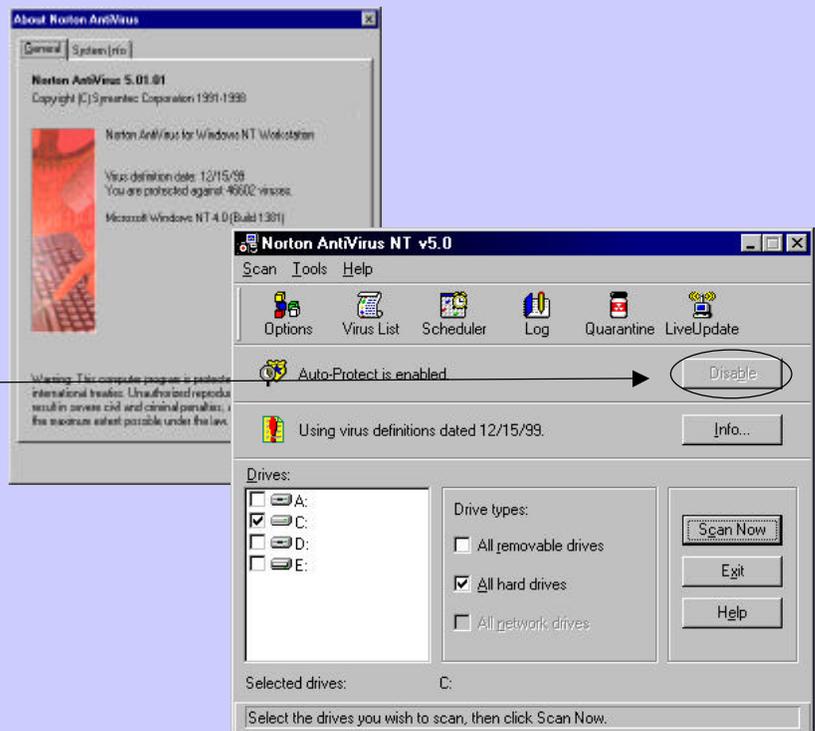
coming up ....

MEASUREnet related Software

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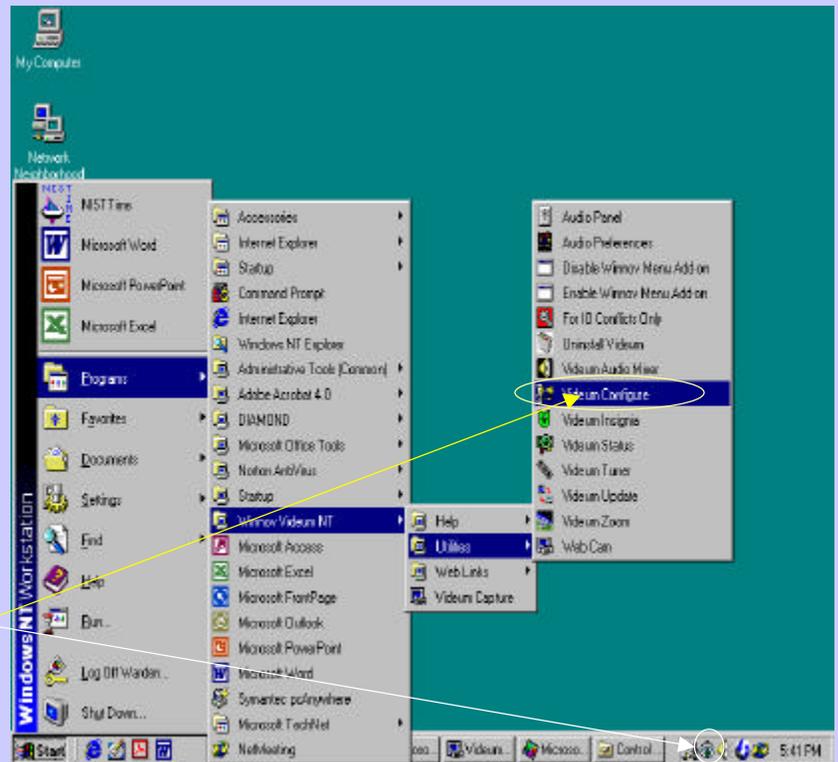
# Windows NT Environment (Anti-Virus Software)

- Norton AntiVirus Software v5.01 Installed
- Norton AutoProtect feature will be disabled for performance reasons
- Administrators may manually run this software periodically



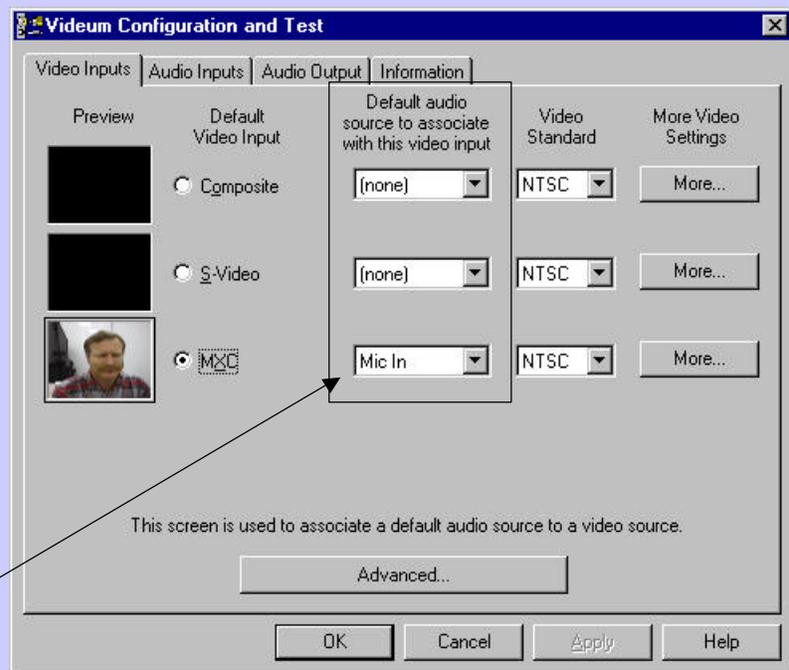
# Windows NT Environment (Winnov Videum Software)

- Provides audio and video support during the Conference
- Audio/Video Settings required for Headset operation
- Settings for using the Integrated Microphone in Camera w/speakers



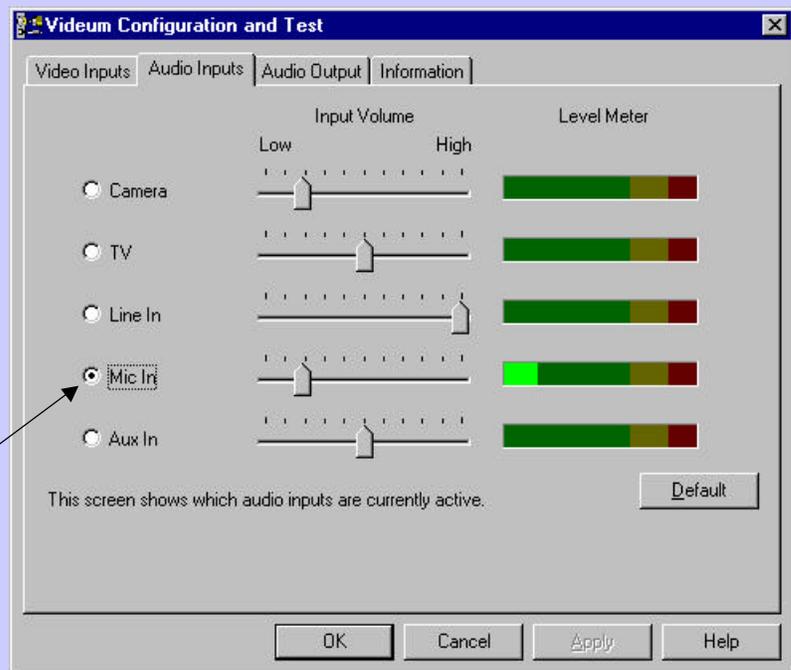
# Windows NT Environment (Winnov Videum Software Cont.)

- Winnov Configure Application
- Important to have Camera video associated with Mic/In



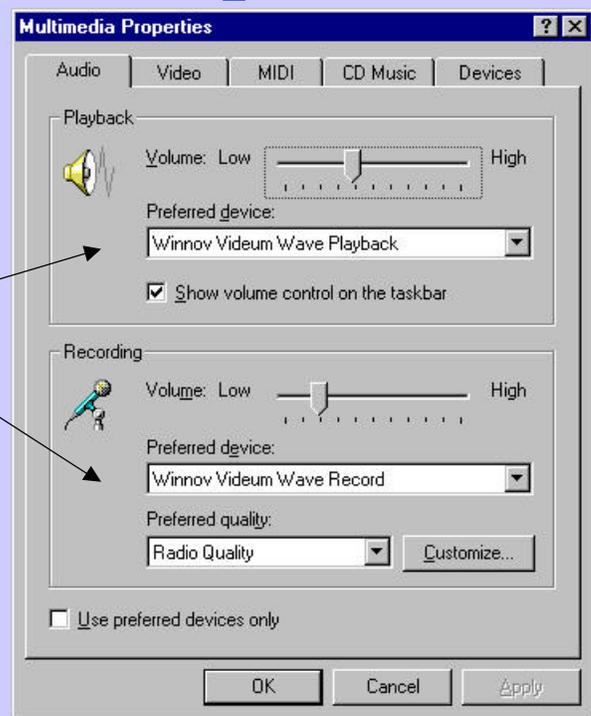
# Windows NT Environment (Winnov Videum Software Cont.)

- Winnov Configure Application
- Important to have Audio Inputs associated with Mic/In



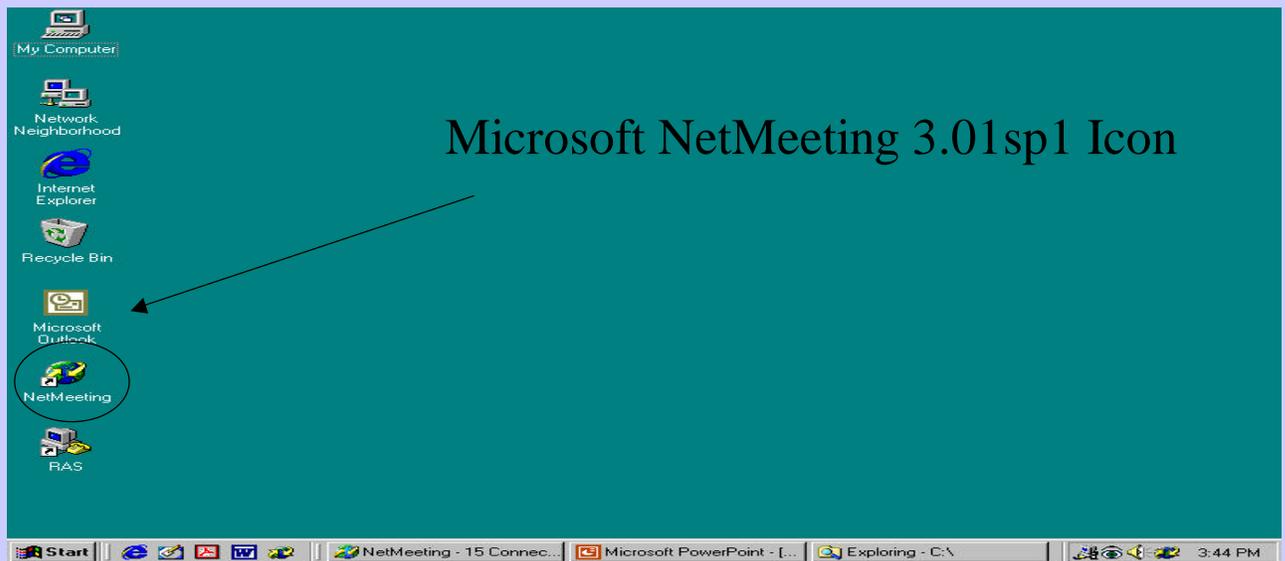
# Windows NT Environment Multimedia Audio Options

- Important to make sure the Multimedia Properties are set to use the Winnov Videum Card
- Important when two or more multimedia subsystems are installed (I.e., internal sound card)



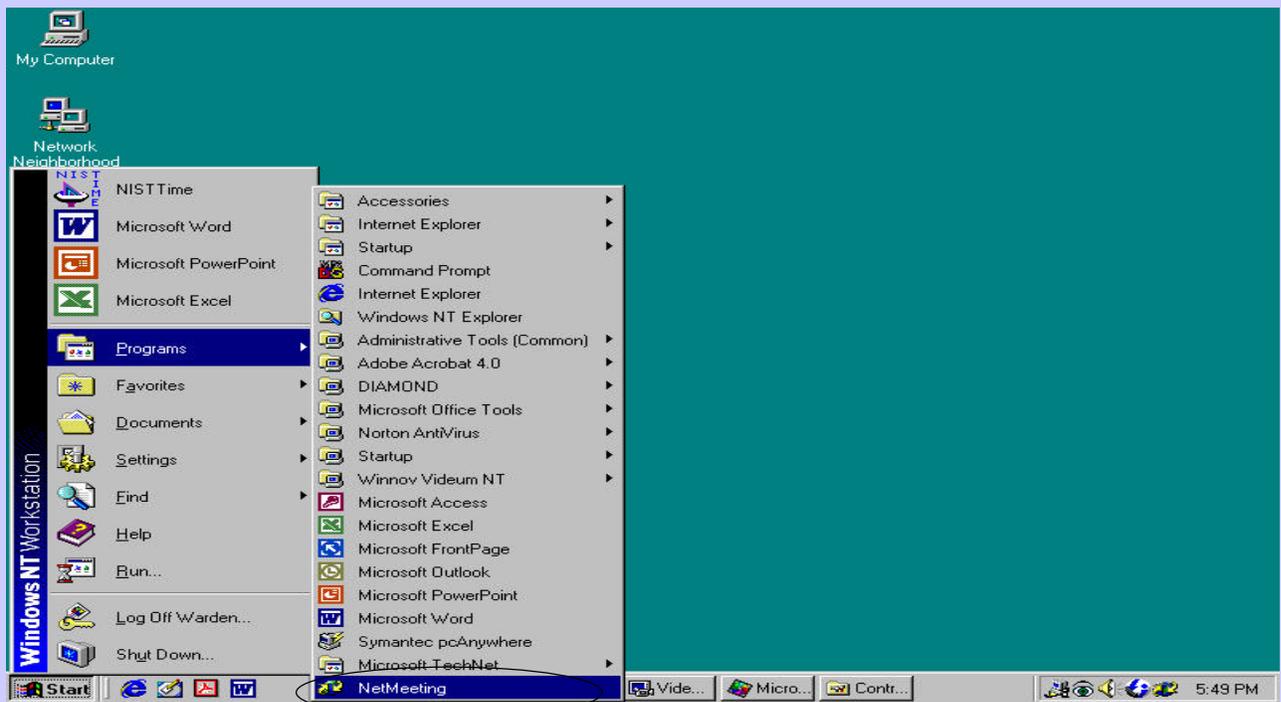
# NetMeeting Software

- Open NetMeeting Application With Icon or use Quick Launch Icon in TaskBar
- *Note:* NetMeeting References: Book (v2.1 not relevant at all w/3.01 and Resource Kit Documentation (both v2.1 and 3.01)



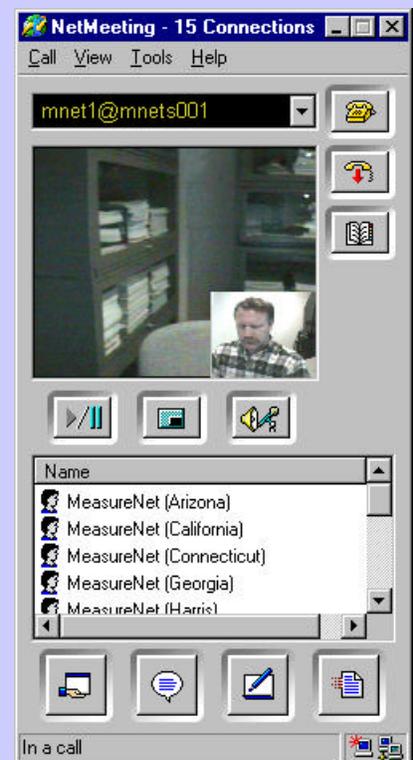
# NetMeeting Software Cont.

- Alternatively Open NetMeeting Using Start Menu



## NetMeeting Software Cont.

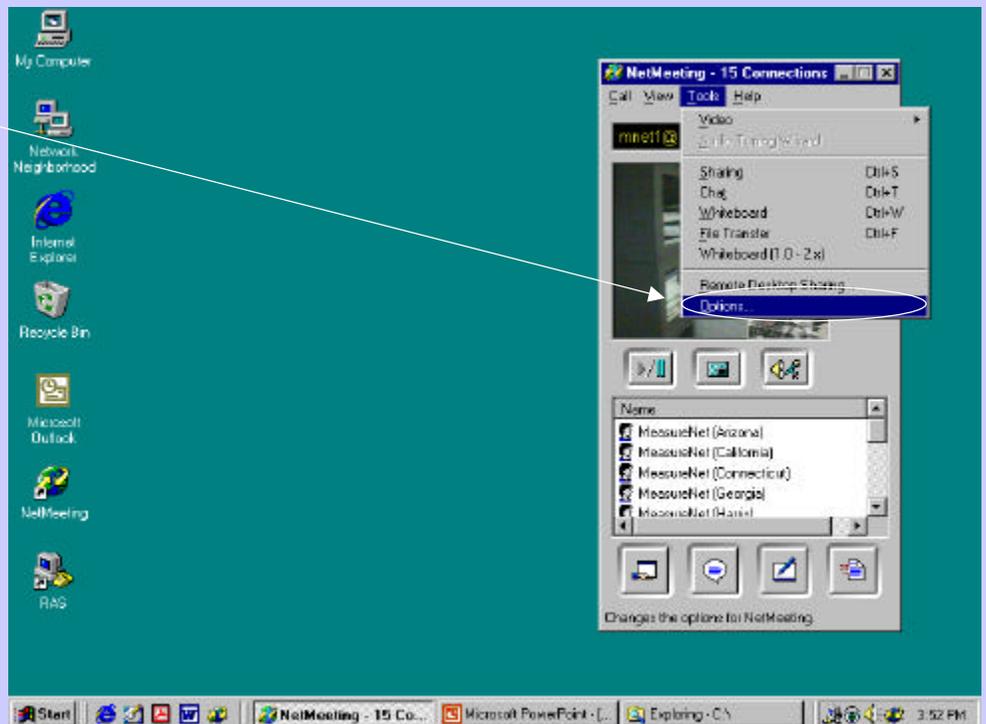
- The user interface of the new NetMeeting version 3.01 Service Pack 1 (sp1) Build 1388.
- Very different from 2.11, more compact, better codec support, security, remote desktop sharing, H.323 support, etc.
- Requires Gatekeeper to connect to H.323 services.



# NetMeeting Software (Tools)

*Options* pull-down supports the core services access areas of NetMeeting

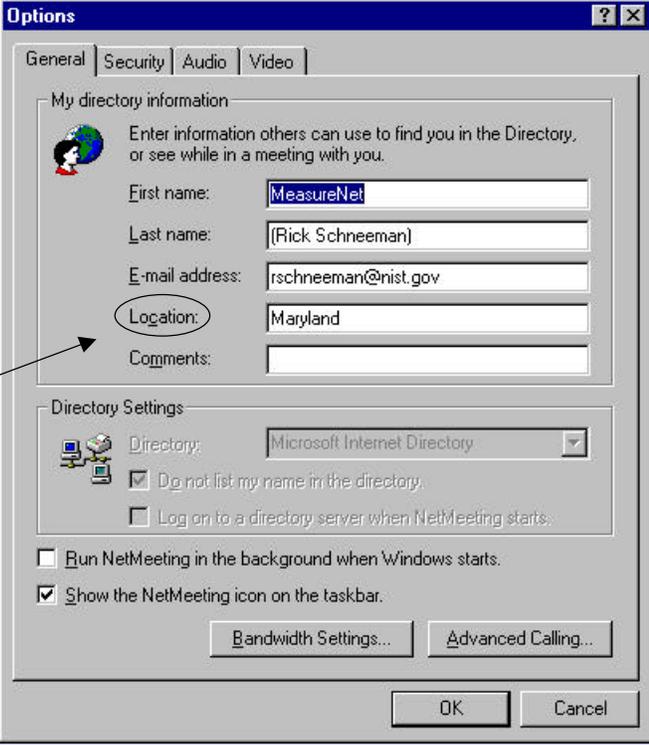
Any updating to NetMeeting can be accomplished using the *Options* area



# NetMeeting Options (My Directory Information)

Currently each user's Information is set to the State that they are from and a temporary email address.

Change your City/State information to include the city your from.



The screenshot shows the 'Options' dialog box with the 'General' tab selected. The 'My directory information' section contains the following fields:

- First name: MeasureNet
- Last name: (Rick Schneeman)
- E-mail address: rschneeman@nist.gov
- Location: Maryland (circled in red with an arrow pointing to it from the text on the left)
- Comments: (empty)

The 'Directory Settings' section contains the following options:

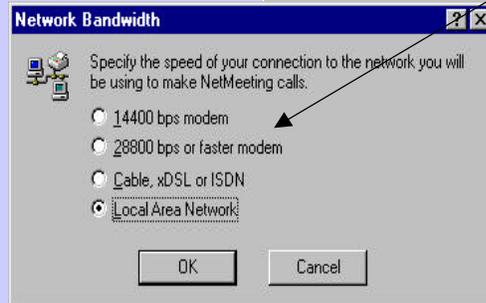
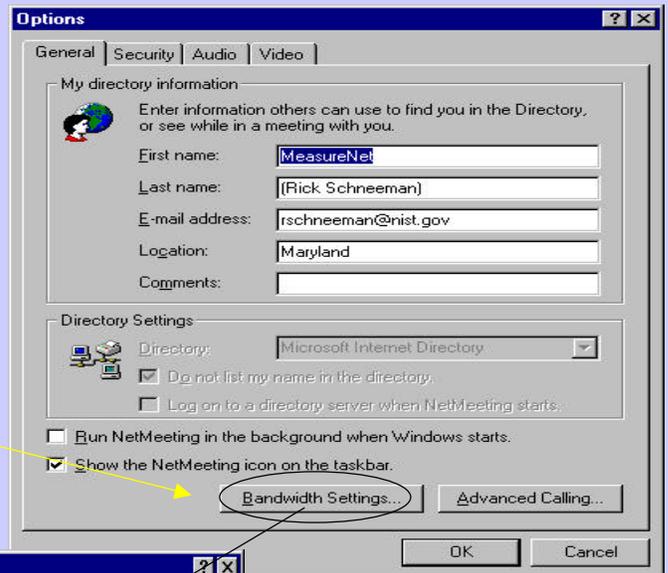
- Directory: Microsoft Internet Directory (dropdown menu)
- Do not list my name in the directory.
- Log on to a directory server when NetMeeting starts.
- Run NetMeeting in the background when Windows starts.
- Show the NetMeeting icon on the taskbar.

Buttons at the bottom include 'Bandwidth Settings...', 'Advanced Calling...', 'OK', and 'Cancel'.

# NetMeeting Options (General)

Bandwidth Settings affect the codecs used and the allowable speed of network.

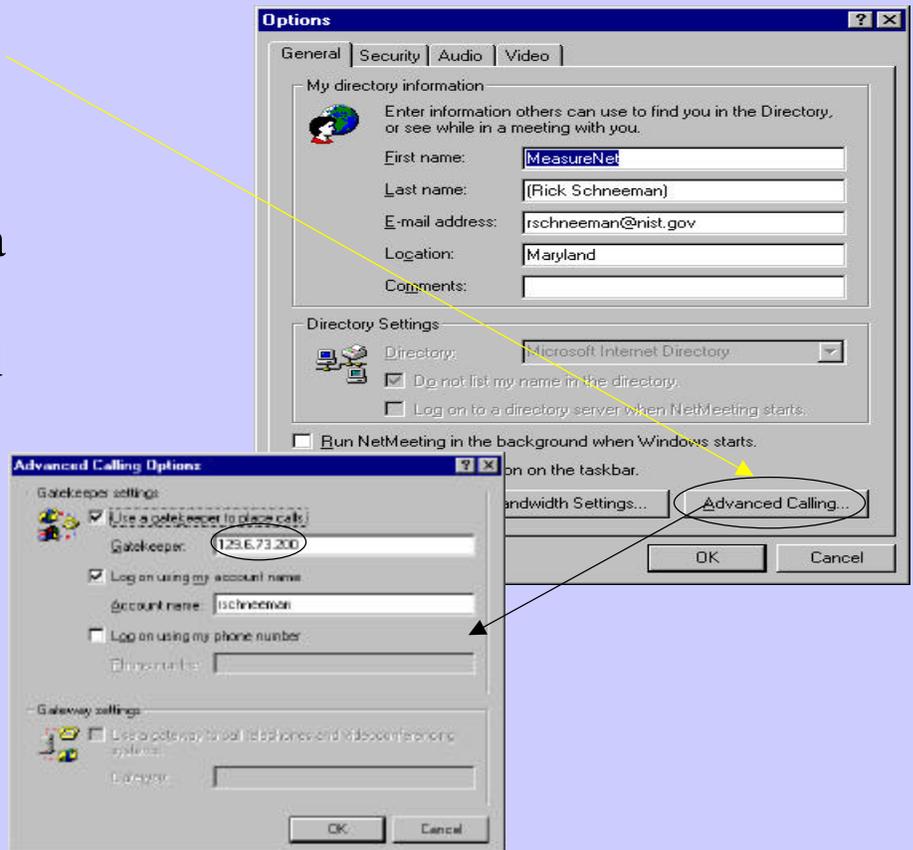
**Note:** The Local Area Network (LAN) network setting is generally the best setting for both dialup and direct LAN connections (I.e., fake-out codecs....)



# NetMeeting Options (General)

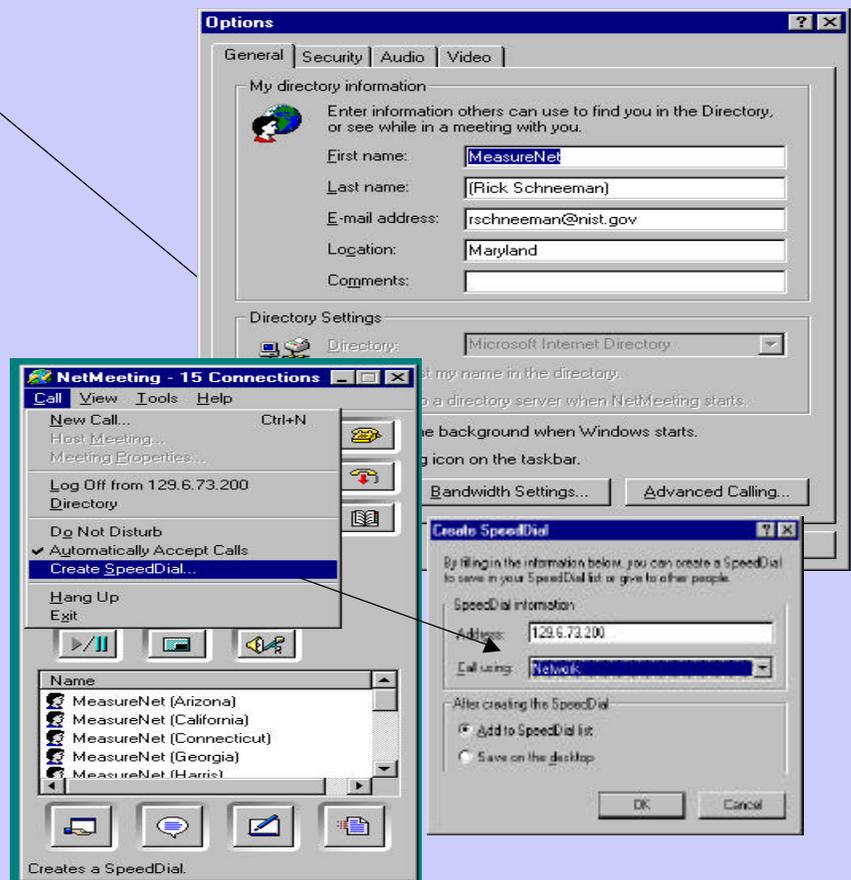
Advanced calling is new to NetMeeting and is used to connect to Conferencing servers via Analog phones or ISDN (via H.320 gateways and H.323 GateKeepers.

**Note:** We are using a H.323 Gatekeeper. The IP address and logon of the Gatekeeper server must be entered here.



# NetMeeting Options (General)

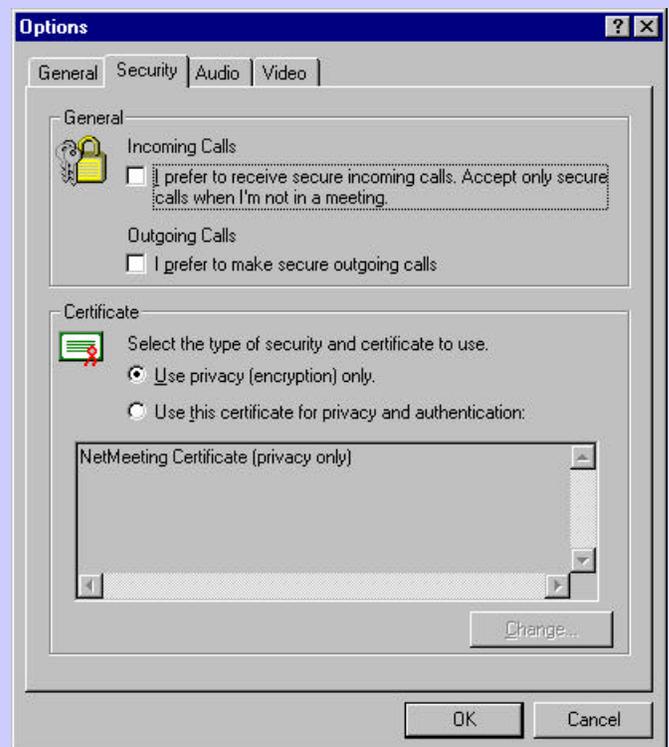
Under the Directory area, do not use a service for performance, security, and privacy issues. These areas are pre-configured during the installation of NetMeeting 3.01 sp1. You can change these later using Call->Create SpeedDial from the top level toolbar



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# NetMeeting Options (Security)

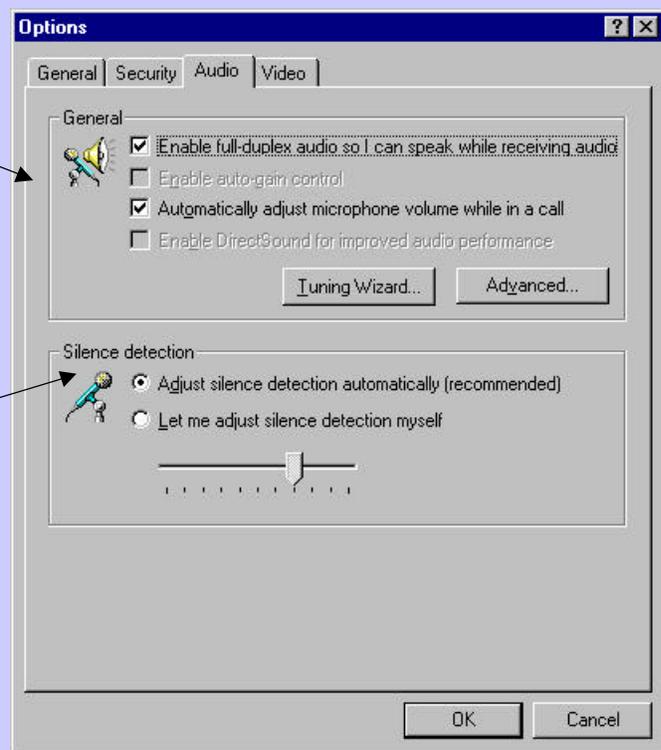
- Security is much improved in NetMeeting 3.01 sp1.
- Incoming and Outgoing calls can use encryption methods such as secure sockets layer (SSL), rsa, or dss.
- Not currently using security



# NetMeeting Options (Audio)

We are currently using full-duplex. On the Internet, this would not be used (half-duplex). Performance issue with Norton AntiVirus....

Mic sensitivity should generally be set to automatically set.

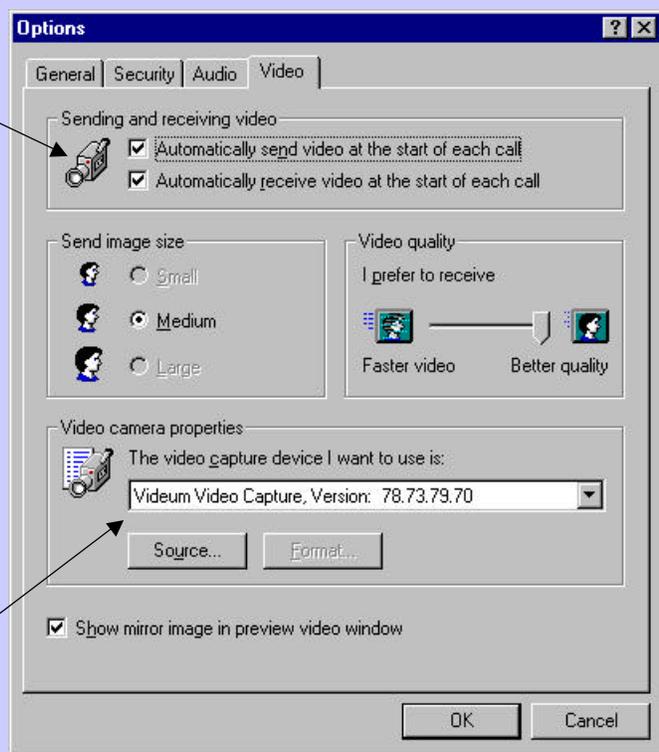


# NetMeeting Options (Video)

Automatically send....

Size of video image can be changed, but will ultimately be determined by the server codec capabilities.

Displays the type of video subsystem drivers that are in use.



## NetMeeting Connection Methods

- NetMeeting clients connect to the NIST conferencing server (via the GateKeeper) using an Internet Address via several methods:
- LAN (Automatic at Bootup) or Direct connection to the Internet, or
- Modem
  - Dial ISP using RAS and Dialup Networking to Connect to the Internet
  - Once on the Internet, connect to the Conferencing Server just as before using IP address

# NetMeeting Operational Settings

- Prior to connecting to the meeting make sure the following settings and selections have been made, including:
  - Select Current Call Icon
  - Make sure Current Call Screen is chosen
  - Start Video Output or previewing prior to connecting to the meeting by clicking on the not receiving button in the video picture
  - Execute Audio Tuning Wizard prior to the Call

# NetMeeting Operation Cont.

(2)

Click here  
to preview/pause

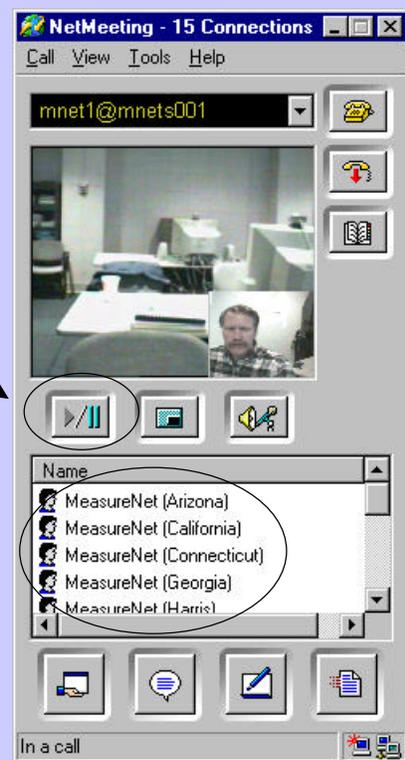
video during the meeting

(1)

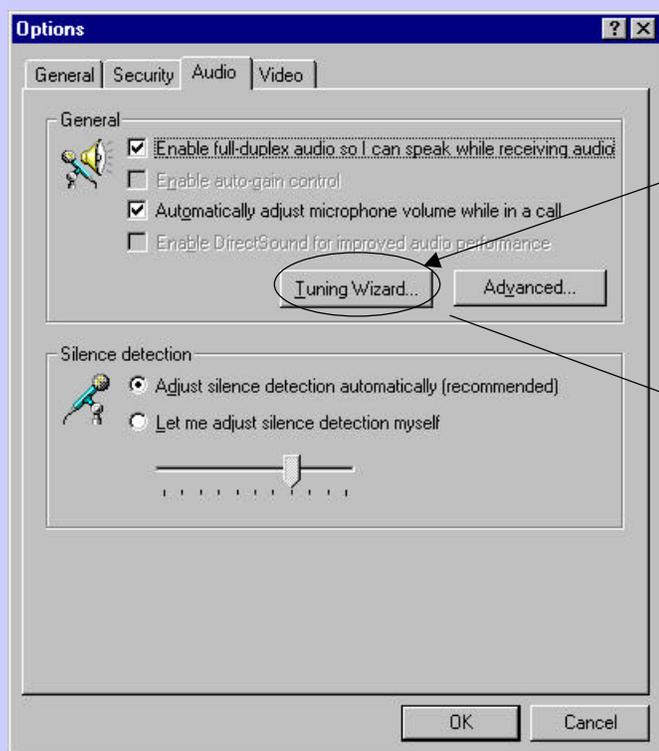
Getting to know the  
NetMeeting user  
interface

(3)

Current Call  
Screen



# NetMeeting Operation Cont. (Audio Tuning Wizard)



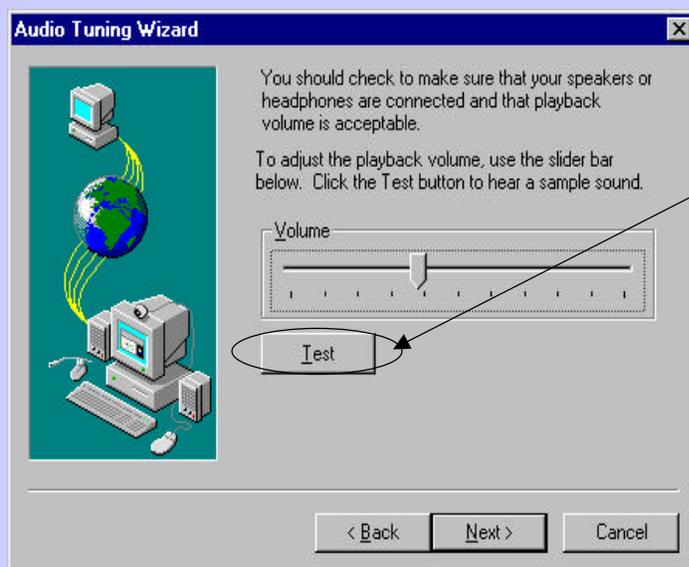
Executes the  
Audio Tuning  
Wizard



This screen  
pops up

# NetMeeting Operation Cont. (Audio Tuning Wizard)

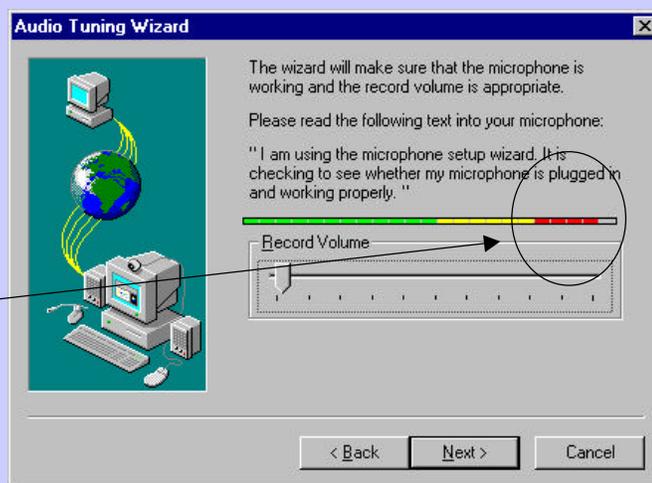
Execute the Audio Tuning Wizard from the Options menu.



Press the Test button to hear the speaker output through your headsets.

# NetMeeting Operation Cont. (Audio Tuning Wizard)

This recording level screen will automatically adjust the mic sensitivity to your speaking voice. Note: try to avoid the red zone when speaking....



**NOTE:**  
Please make sure **ALL** volume controls are lowered prior to testing!!!

# NetMeeting Operation Cont. (Audio Tuning Wizard)

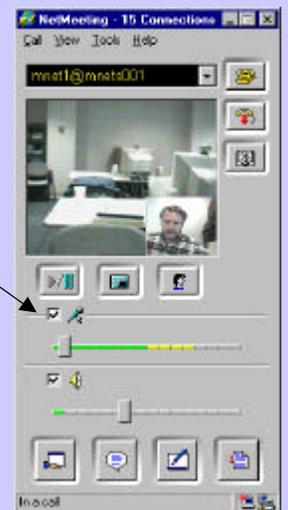
Finished  
setting up the  
mic by  
pressing Finish  
to exit the  
Tuning  
Wizard!



# NetMeeting Operation Cont.

## Muting the Microphone

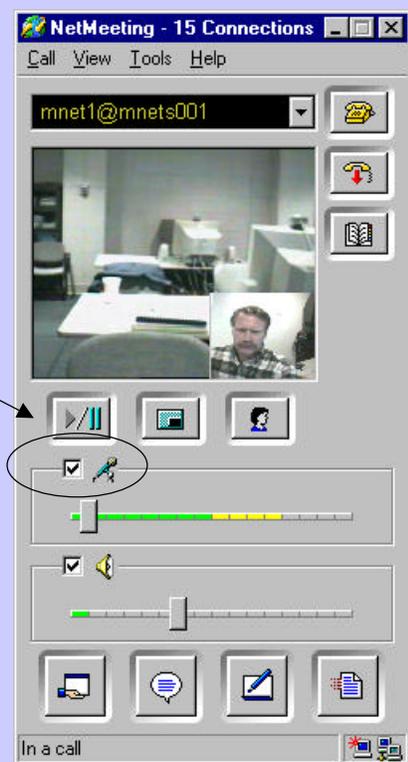
- It is recommended that observers mute their Microphones during Internet-based conferences
- This is done by unchecking the Audio box after connecting to the meeting, or annually using mic switch
- Non-audio communication during the meeting may take place using Chat/Whiteboard
- Rules and protocols have been established for orderly communication between non-active participants and the active measurement participants



# NetMeeting Operation Cont.

## Muting the Mic cont.

In extremely noisy environments or when following “Robert’s Rules”, then simply uncheck the Audio Box or mute the headset.



# NetMeeting Operation Cont.

## Adjusting Microphone Sensitivity

- Adjusting Microphone Volume
  - through tools->options->audio, or
  - using the slider bar from NetMeeting menu
- Setting sensitivity to adjust automatically is in most situations the best setting.
- Only re-adjust if the Audio Tuning Wizard fails to set your system settings correctly

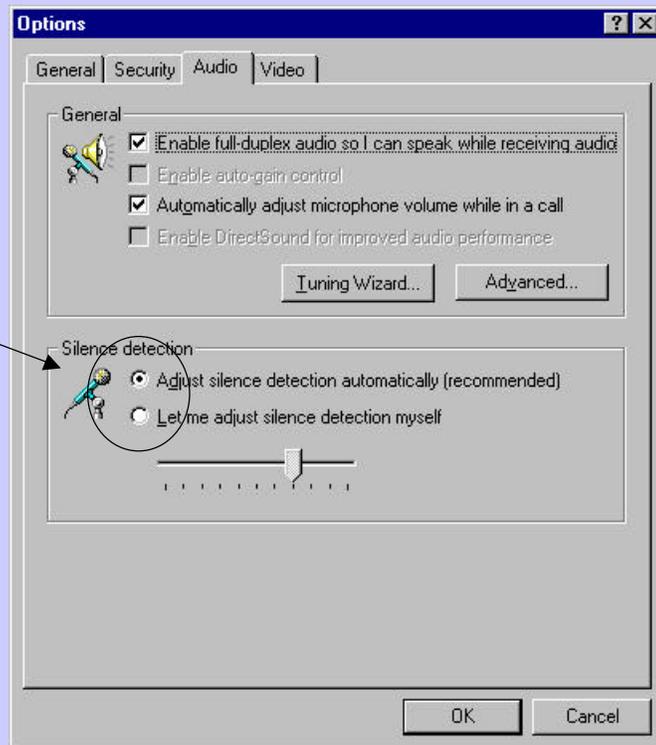
# NetMeeting Operation Cont.

## Adjusting Microphone Sensitivity

Adjust Microphone Sensitivity

This is not recommended during a conference

Note: many options should not be changed once the conference is in session. Modify operational parameters prior to connecting....



## NetMeeting Operation Cont. More Audio Options....

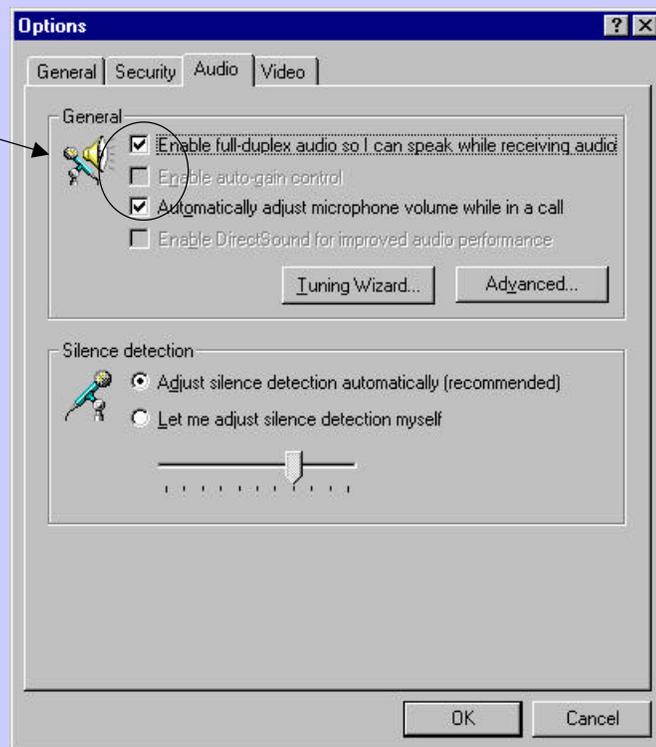
- Adjusting Full Duplex 
- Most situations (i.e., bandwidth constrained) will require half-duplex  operation.
  - Go to tools->options->audio and uncheck enable full-duplex operation and auto gain options if they are checked
  - Performance issues with other software (I.e. Norton) dictates the use of half-duplex.

# NetMeeting Operation Cont.

## More Audio Options cont.

Leave these alone if they are not already checked.

When using the Internet, the full-duplex audio option will NOT be used



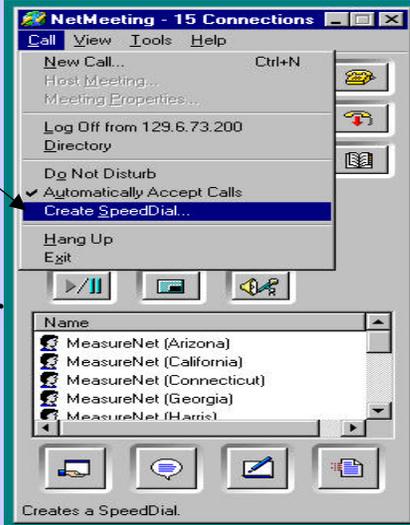
## NetMeeting Operation Cont. Creating a SpeedDial Entry

- Creating a Speed Dialer Entry for the Server
  - Click the SpeedDial Button Menu
  - Enter Internet Address of the NIST MEASUREnet Multipoint Server (i.e., in this case 129.6.73.200)
  - Change Directory Server entry to Network TCP/IP
  - Click OK to Save

# NetMeeting Operation Cont.

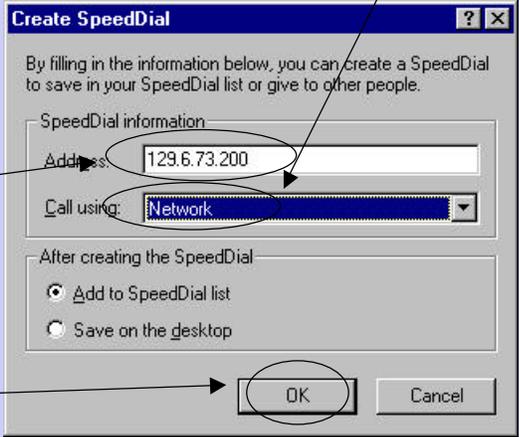
## Creating a SpeedDial Entry cont.

(1) Click the SpeedDial Button on the NetMeeting Toolbar



(2) Enter the NIST MEASUREnet Server IP Address into the Edit Box

(3) Select Network Setting



(4) Click OK to Save

**MEASUREnet**

# NetMeeting Operation Cont. Connecting to the Server

- Dialing into the NIST MEASUREnet Server
  - Select the SpeedDial Icon at left
  - Double-click the NIST Internet Address

# NetMeeting Operation Cont.

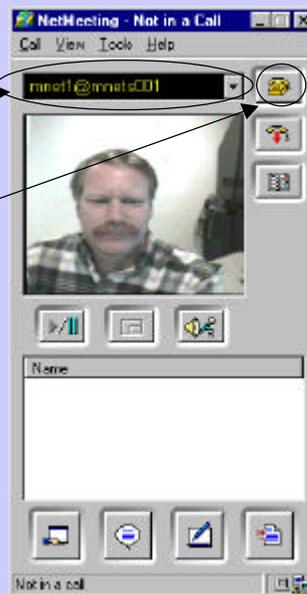
## Connecting to the Server cont.

(1)

Select the correct SpeedDial Icon by using the drop-down menu, or creating one

(2)

This is the first virtual conference room on the NIST MEASUREnet Multipoint Server, click Call button



Note: mnet1 is the MEASUREnet meeting room #1 on the Conferencing Server mnets001. Room #2 (mnet2) is currently used for testing....

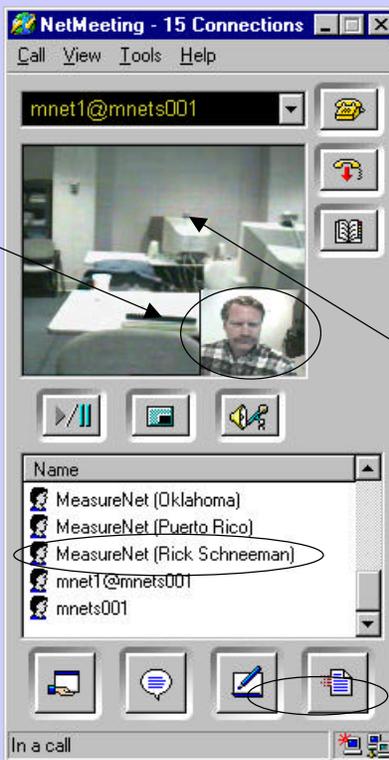
**MEASUREnet**

# NetMeeting Operation Cont.

## Connecting to the Server cont.

This is my  
sending video  
image

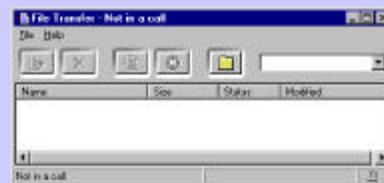
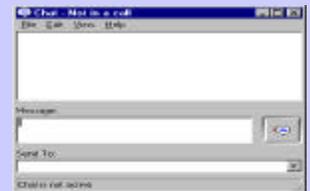
This is me  
in the  
Conference



This is the  
receiving video  
image of  
whomever is  
currently  
speaking.

# Other NetMeeting Tools

- Share / Collaborate with Applications
  - allows participants in the conference to view and interact with any Windows-based executing application (I.e., this PowerPoint presentation)
- Chat
  - useful when non-audio communication is required during the conference
- File sharing
  - cut and paste video graphics during measurements for an electronic “notebook” capability
- Whiteboard



# BREAK?



coming up ....

Hands-On Lab Exercises

## Lab Exercises: Lessons Learned

- Lab Exercises revealed several lessons about how to conduct conferences with large groups
  - All preliminary settings and configurations to NetMeeting and the audio/video subsystem should be in place prior to server connection
  - An orderly connection process is required for successful connection of all participants
  - NetMeeting and its associated audio/video software is extremely processor intensive; therefore applications other than NetMeeting cannot be running on these machines
  - We will be reviewing the pre-connection setup material once again
  - Remember: this is state-of-the-art technology
  - We at NIST have expended every effort to accommodate the “glitches” in this technology by developing rigid standard operating procedures.

# Lab Exercises: Lessons Learned

- Lab Exercises Continued
  - Review the settings, procedures, and configurations for pre-server connection
  - Perform an orderly one-at-a-time connection process with all participants
  - During the connection procedures, all non-active participants should be attentive

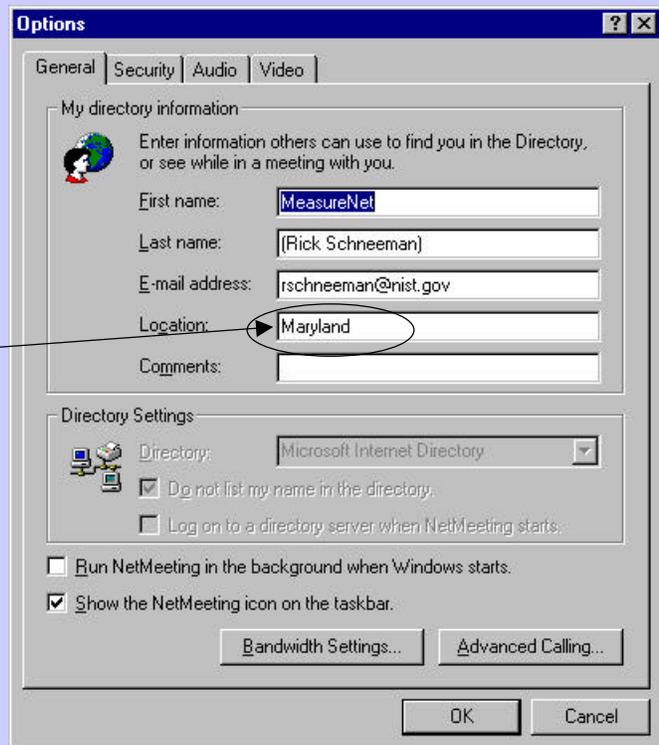
## Lab Exercises

- Change Information Settings
- Getting Connected (LAN or Modem)
- Moderated Round Robin Conversations
- Chat Tool
- Whiteboard Tool
- Share/Collaborate Tool
- pcAnywhere Session
- Demonstration Preparation

# Lab Exercise (1)

## Changing My Information

- Change My Directory Information Settings
  - Change State name field to include your City of origin.



## Lab Exercise (2)

### Connecting to the Conference

- Getting Connected (LAN or Modem)
- Use the procedures in this tutorial to connect with the server
- Note the important pre-setup settings that must be in place prior to connecting (i.e., tune audio wizard and preview video mode)
- Note the post-connection settings (i.e., disable audio upon connecting if passive participant)

# Lab Exercise (3)

## Participating in the Conference

- Moderated Round Robin Conversations
- Each participant will become familiar with turning on and off the microphone in order to participate in this exercise
- When prompted, the participant will turn on the microphone and say hello and their country of origin into the headset microphone.
- The speakers video and audio will be switched to the current video window

## Lab Exercise (4)

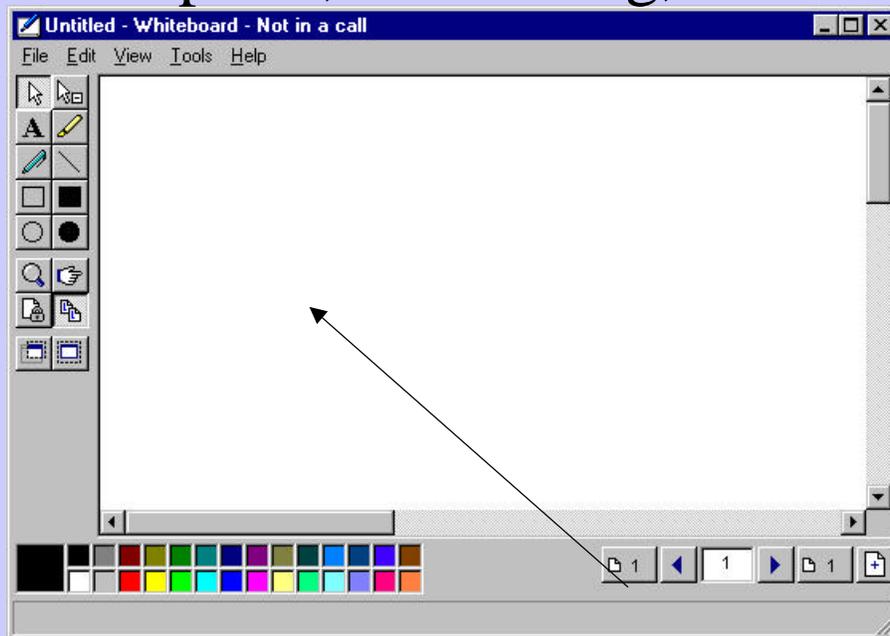
### Working with Chat Tool

- Bring up the chat window if not already up
- Each participant when prompted will type in “hello” in the chat window
- Note that the chat window attaches the name of the sender to each message.
- Useful for non-audio based communication (i.e., a passive participant in the meeting would like to make a request but is not using the audio)

# Lab Exercise (5)

## Working with the Whiteboard Tool

- Screen capture, text editing, and drawing



Choose select  
area to capture  
a portion of the screen

# Lab Exercise (6)

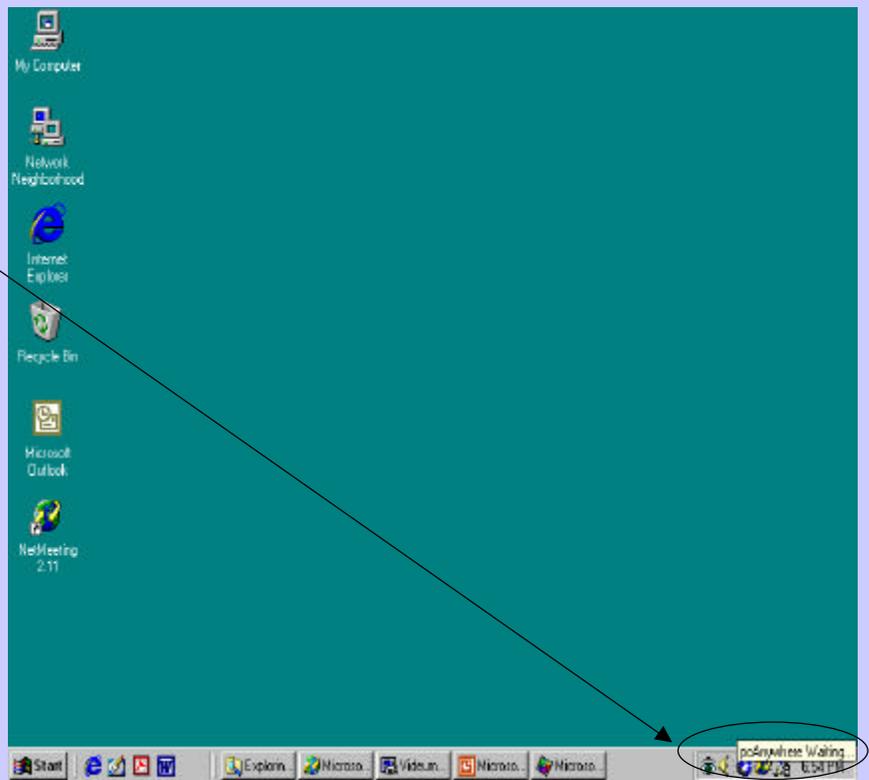
## Sharing and Collaborating

- Participants will be able to:
  - Select and execute an application that will be shared
  - Click on Share and pick the application selected.
  - If time permits we will also collaborate with each other using an application.

# Lab Exercise (7)

## Executing a pcAnywhere Session

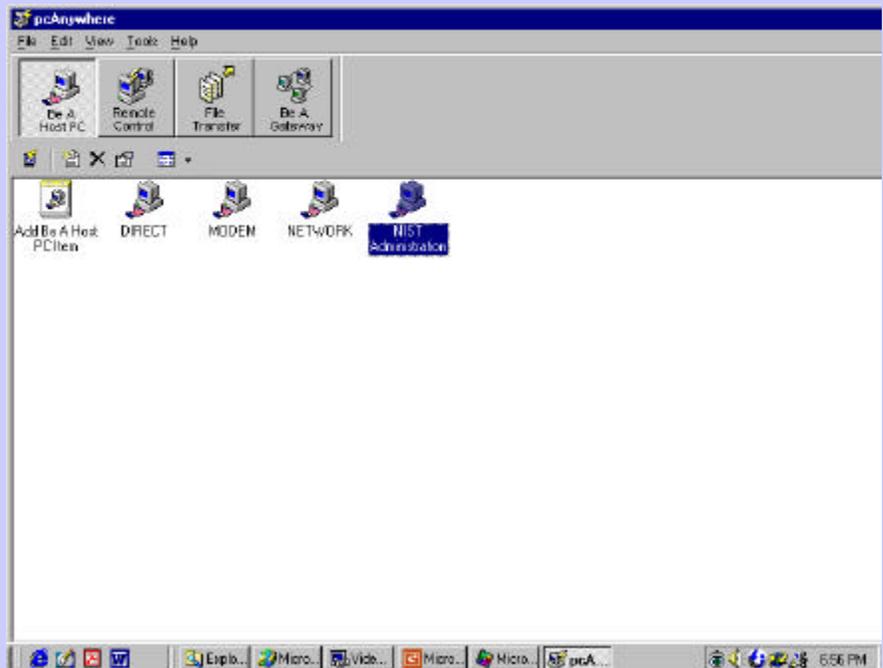
- Left Click the pcAnywhere icon to check the status of the incoming connections



# Lab Exercise (7)

## Executing a PCAnywhere Session

- Select Modem or Network depending on your capability



# Lab Exercise (8)

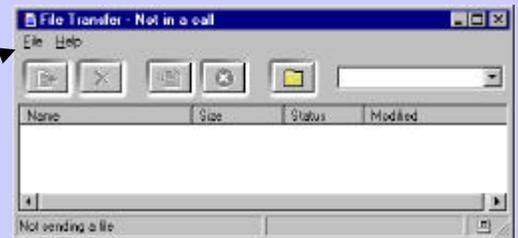
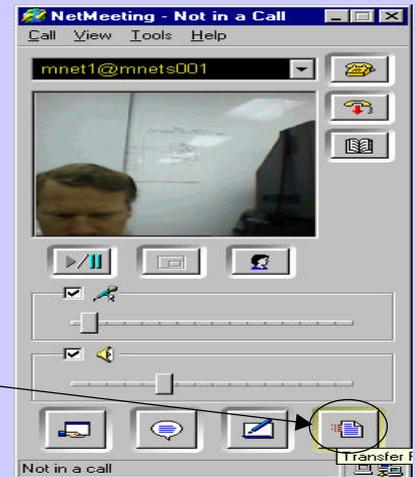
## Preparing for the Demonstration

- MEASUREnet Demonstration Scenario, similar to Exercise (3)
- Participant when prompted will turn their microphone on and say his/her name and the country of origin into the microphone.
- Upon finishing your greeting, please disable the audio once again.
- Participants will then listen in on the interaction between Georgia Harris and myself as we present MEASUREnet.

## Exercise (9) File Transfer

Prepare for the File Transfer capability by clicking on the File Transfer button

Change the file receive directory to the Zip directory (Removeable Disk D:) Click on File->Change Folder.



This screen will appear.

## Additional Notes

- Network settings: TCP/IP, RAS, and ISP
- Bandwidth requirements: minimum for audio, video, and data sharing.
- Related reading material: NetMeeting Book, and the NetMeeting Resource Kit document. SIMnet NISTIR document and Training PowerPoint presentation slide book.
- Peripheral questions: printers, headsets, speakers, UPS, etc.
- Product discussion: PictureTel, Microsoft, Winnov, etc....

# NetMeeting/Videum Tuning Issues

- Videum Mixer application is useful for visually showing the state of the audio system.
- Start NetMeeting and verify all automatic settings are set. (Note: we will not be using the Audio Tuning Wizard of NetMeeting)
- Make sure Mute switch on headset cord is in the unmuted position.
- Make sure the headset volume setting is set to the highest position.
- All modifications to the headset volume and muting control should be done using the NetMeeting interface.
- Connect to the Conference as usual

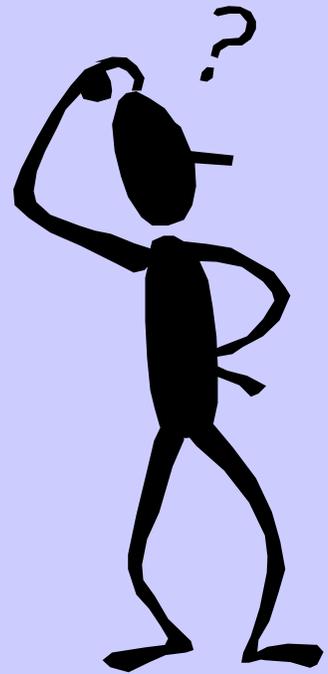


Make sure mic slider is initially set to 1/2



## Question and Answer Period

- Please ask any questions you may have regarding the hardware/software or configuration issues.
- A Great deal of information has been presented in a very short amount of time.
- Good Luck!



## Reference Material/URLS

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18. DataBeam Corporation. “A Primer on the H.323 Series Standard, Version 2”. Web Address: <http://www.databeam.com/h323/h323primer.html>. This document is also available as an Adobe PDF file.