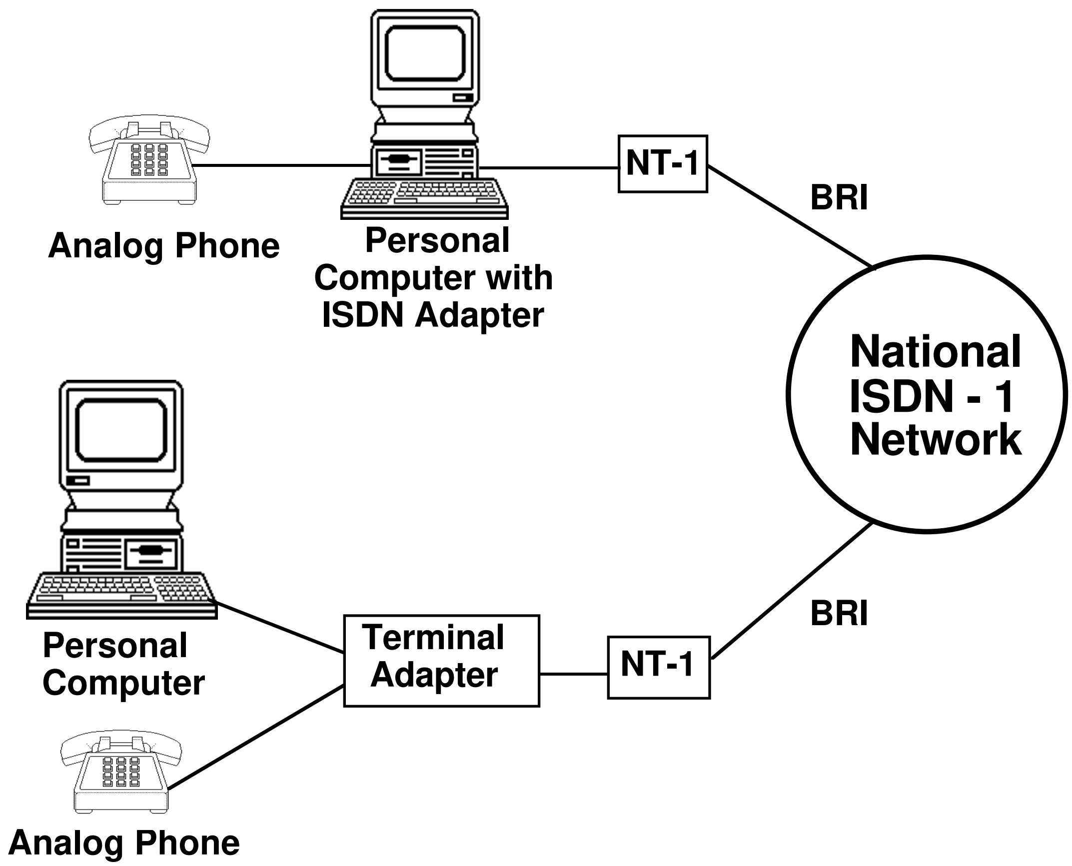
3.1.6 Screen sharing for two users

ISDN can support two users that want to talk while jointly viewing and editing the same files. Either user can modify the file; the copy on the other user's computer is updated appropriately. ISDN gives users voice and data over the same line. The two users carry on a voice conversation during the screen sharing session. Users can work interactively on a memo, presentation, or report for school without concern for distance. ISDN speed and digital reliability help screen sharing performance.

Configuration: (**1**, 2, **3** , 4, 5)



How It Works:

Users have software for screen sharing, or multimedia conferencing . Using their communications software, the first user places a 64 kbps circuit-data call from his/her personal computer to the second user's personal computer. If the call cannot complete, the first user tries again by placing a 56 kbps circuit-data call to the second user's personal computer. The users then bring up their screen sharing program. Depending on the set-up, the end-systems may use rate adaptation and actually transfer data at a slower rate, for example, asynchronously at 38.4 kbps.

Obtain Equipment with These Capabilities

Personal Computer with ISDN Adapter

- Application software compatible with communication software and far end.
- B channel capabilities:
  - Simultaneous voice and circuit-data calling.
  - If using NI-1, support for two Directory Numbers (DNs) and Service Profile IDs (SPIDs) will be needed.
  - Support rate adaptation for rates lower than 64 kbps. For example, asynchronous communications may be rate adapted using V.120.
- Physical interfaces:
  - Analog phone jack.
  - RJ-45 connector to NT-1, or integrated NT-1

Personal Computer connected to ISDN Terminal Adapter

- Application software compatible with communications software and far end.
- Serial connection to Terminal Adapter (e.g., RS-232, RS-449, V.35).

ISDN Terminal Adapter

- B channel capabilities:
  - Simultaneous voice and circuit-data calling.
  - For NI-1, support for two Directory Numbers (DNs) and Service Profile IDs (SPIDs) will be needed.
  - Support rate adaptation for rates lower than 64 kbps. For example, asynchronous communications may be rate adapted using V.120.
- Physical interfaces:
  - Analog phone jack.
  - Serial connection to Personal Computer (e.g., RS-232, RS-449, or V.35).
  - RJ-45 connector to NT-1, or integrated NT-1

Request These Capabilities From ISDN Service Provider

Network Interfaces to Personal Computer with ISDN Adapter or ISDN Terminal Adapter

Network Services Required:

- One BRI. (2B)
- One B channel for voice calls, with voice DN and SPID.
- One B channel for circuit-data calls, with circuit-data DN and SPID.
- Voice Features:
  - None required.
- Circuit-Data Features:
  - None required.

Subscription or Ordering Information:

- This interface is configured for simultaneous voice calls and circuit-data calls (NIIG 11). Other NIIGs which have this functionality include 12, 15, 17, 21, 22, 25, and 27.
- Parameter Groups for Voice Features:
  - None required.
- Parameter Groups for Circuit-Data Features:
  - None required.

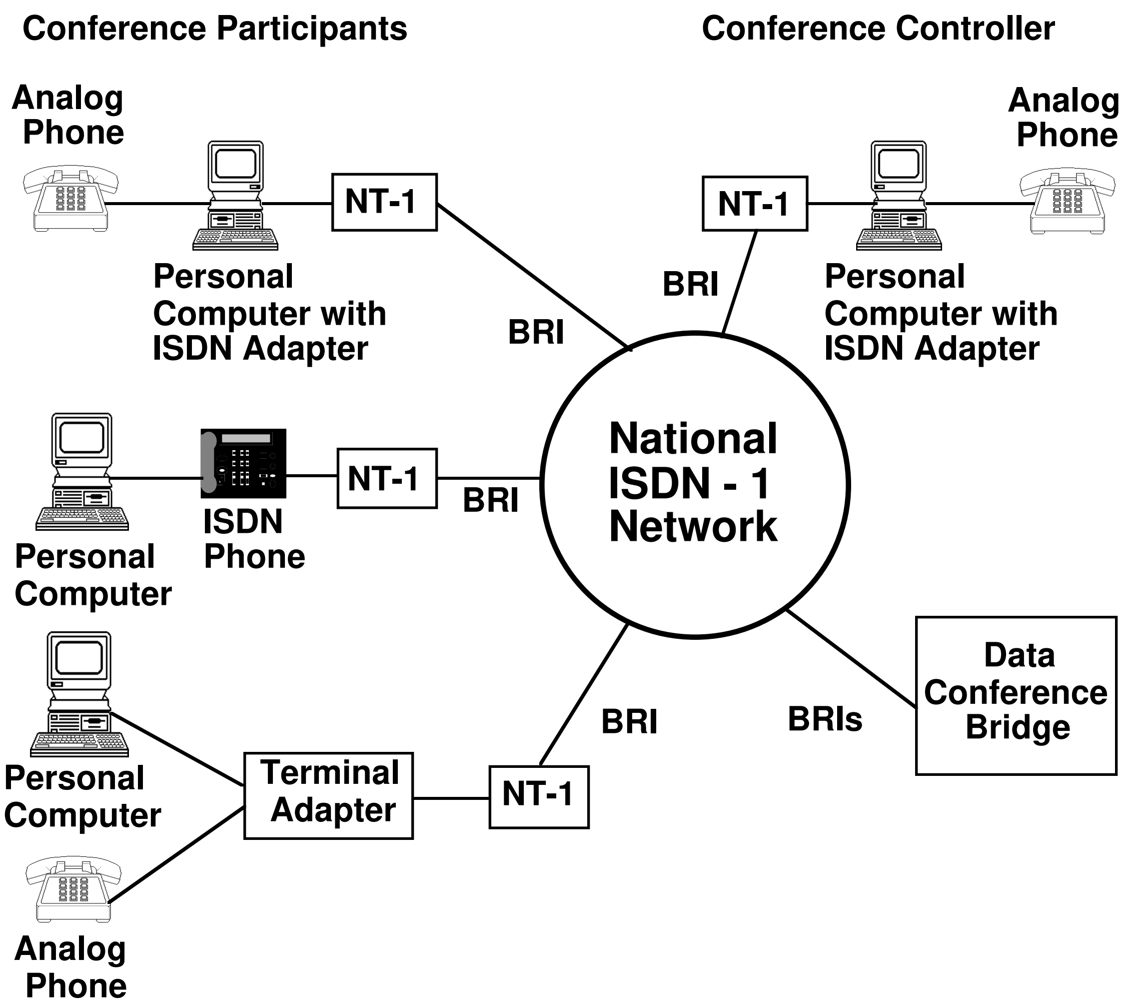
Technical Notes

- The Lower Layer Compatibility Information Element (LLC-IE) can communicate rate-adaptation details end-to-end. For details on V.120 rate adaptation, and the use of the LLC Information Element for circuit-data calls, see Sections 5.1.4 and 5.1.5.
- For details on subscription and ordering information using NIUF ISDN Interface Groups (NIIG) and NIUF Parameter Groups (NIPG) , see Section 5.1.11.
- For detailed Signaling Flow Diagrams for this application, see Sections 5.2.1.4 (Voice Call Setup), 5.2.1.5 (Circuit-data Call Setup) and 5.2.1.6 (Voice and Circuit-data Call Clearing).

3.1.7 Screen sharing for many users

A group of people can use ISDN to speak together and to simultaneously view and edit the same files. The members of the group can use conferencing software in their personal computers to join a conferencing session. Text or graphics files can then be transmitted to all of the participants in the session. All of the participants speak together as in an ordinary teleconference, and they all can modify the files. All modifications to the files are sent to the other members of the session so that all participants see the same file on their screens.

Configuration: (<u>1</u>, <u>2</u>, <u>3</u>, 4, 5)



How It Works:

The Conference Controller first gains control of a six port voice conference bridge located within the network. The controller then places voice calls to all participants and uses the hold and retrieve features to add each participant to the voice conference. Each participant then places a circuit-data call to the Hunt DN of the data conference bridge. The Multiline Hunt Group associated with the data conference bridge will then distribute the incoming calls to individual bridge ports. If an individual 64 kbps circuit-data call does not complete, the initiator attempts to place a 56 kbps circuit-data call. When the controller clears the connections to the voice and data bridges, the other participants are cleared automatically.

Obtain Equipment with These Capabilities

Personal Computer with ISDN Adapter

- Application software compatible with communication software and far end.
- B channel capabilities:
  - Simultaneous voice and circuit-data calling.
  - If using NI-1, support for two Directory Numbers (DNs) and Service Profile IDs (SPIDs) will be needed.
  - Support rate adaptation for rates lower than 64 kbps. For example, asynchronous communications may be rate adapted using V.120.
  - Support for voice features (for Conference Controller only) listed under " Network Interface to Conference Controller".
- Physical interfaces:
  - Analog phone jack.
  - RJ-45 connector to NT-1, or integrated NT-1

Personal Computer connected to ISDN Phone or Terminal Adapter

- Application software compatible with communications software and far end.
- Serial connection to ISDN Phone or Terminal Adapter (e.g., RS-232, RS-449, V.35).

ISDN Phone or Terminal Adapter

- B channel capabilities:
  - Simultaneous voice and circuit-data calling.
  - If using NI-1, support for two Directory Numbers (DNs) and Service Profile IDs (SPIDs) will be needed.
  - V.120 rate adaptation for communication at rates less than 56 or 64 kbps.
- Physical interfaces:
  - Analog phone jack. (Terminal Adapter only)
  - Serial connection to Personal Computer (e.g., RS-232, RS-449, or V.35).
  - RJ-45 connector to NT-1, or integrated NT-1

Data Conference Bridge

- Application software for data conferencing, compatible with communication software for remote personal computers. The software should support at least four conference participants, including one designated as the conference controller. The software should clear all participants when the controller hangs up.
- Multiple BRIs to meet network traffic requirements.
- B channel capabilities for each BRI:
  - Simultaneous circuit-data calling on two B channels.
  - For NI-1, support for two Directory Numbers (DNs) and Service Profile IDs (SPIDs) will be needed.
  - Support rate adaptation for rates lower than 64 kbps. For example, asynchronous communications may be rate adapted using V.120.
  - Support for the circuit-data features listed under "Network Interface to Data Conference Bridge".
- Physical interfaces:
  - RJ-45 connector to NT-1, or integrated NT-1

Request These Capabilities From ISDN Service Provider

Network Interface to Conference Participants

Network Services Required:

- One BRI. (2B)
- One B channel for voice calls, with voice DN and SPID.
- One B channel for circuit-data calls, with circuit-data DN and SPID.
- Voice Features:
  - None required.
- Circuit-Data Features:
  - None required.

Subscription or Ordering Information:

- This interface is configured for simultaneous voice calls and circuit-data calls (NIIG 11). Other NIIGs which have this functionality include 12, 15, 17, 21, 22, 25, and 27.
- Parameter Groups for Voice Features:
  - None required.
- Parameter Groups for Circuit-Data Features:
  - None required.

Network Interface to Conference Controller

Network Services Required:

- One BRI. (2B)
- One B channel for voice calls, with voice DN and SPID.
- One B channel for circuit-data calls, with circuit-data DN and SPID.
- Voice Features:
  - Flexible Calling (includes 3-Way Conference Calling, Hold, Transfer, and Drop).
  - Six Party Conference Calling.
- Circuit-Data Features:
  - None required.

Subscription or Ordering Information:

- This interface is configured for simultaneous voice calls and circuit-data calls (NIIG 11). Other NIIGs which have this functionality include 12, 15, 17, 21, 22, 25, and 27.
- Parameter Groups for Voice Features:
  - NIPG 3 - Flexible Calling for Voice.
  - A la carte: Six Party Conference Calling.
- Parameter Groups for Circuit-Data Features:
  - None required.

Network Interface to Data Conference Bridge

Network Services Required:

- Two or more BRI. (2B)

For each BRI:

- Two B channels for circuit-data calls, with circuit-data DNs and SPIDs.
- Circuit-Data Features:
  - Multiline Hunt Group.

Subscription or Ordering Information:

- This interface is configured for two simultaneous circuit-data calls (NIIG 14). Other NIIGs which have this functionality include 15, 17, 24, 25, and 27.
- Parameter Groups for Circuit-Data Features:
  - None required.

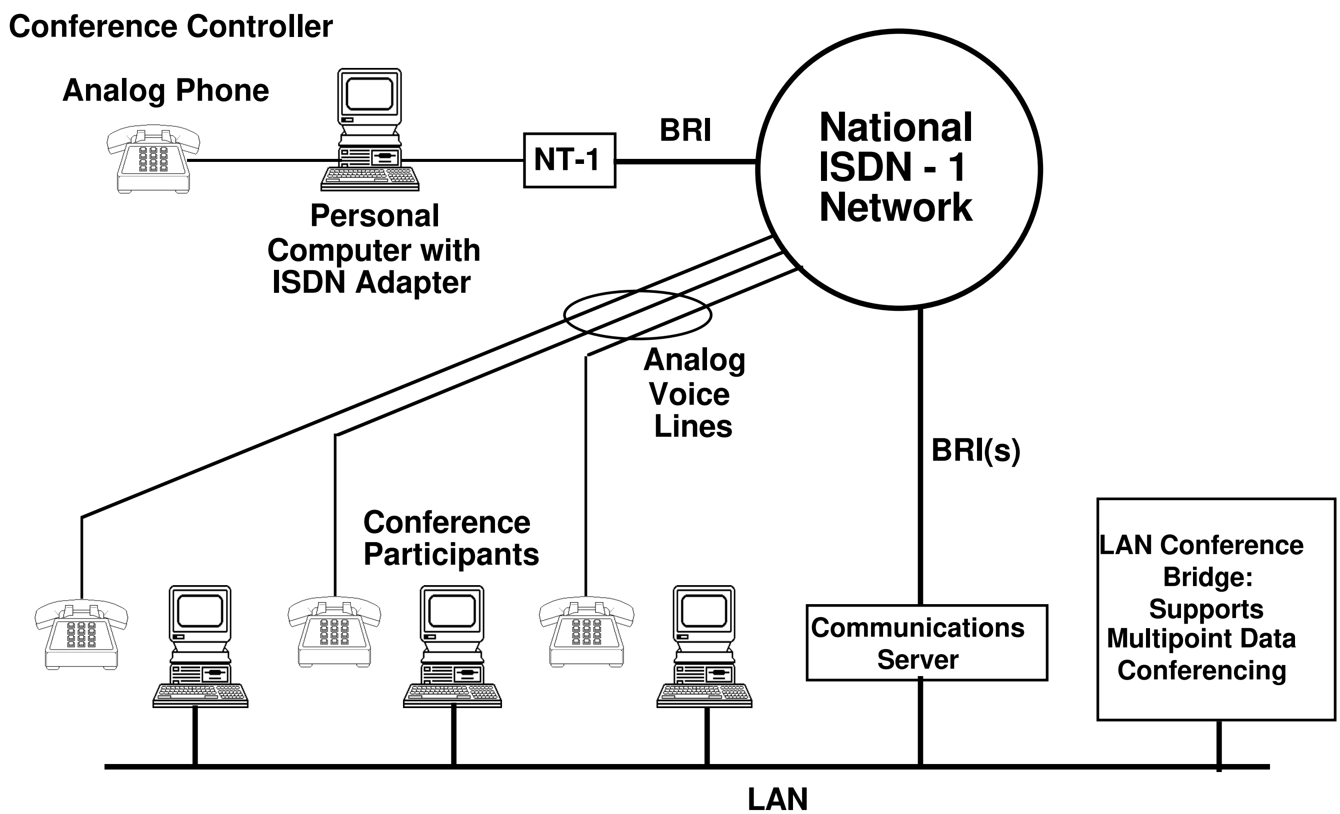
Technical Notes

- The Data Conference Bridge in turn supports an internal bridging function which provides multi-point data conferencing. The Controller's and Participants' personal computers use Circuit-data to access this Data Conferencing Bridge, which connects to the network using a Circuit-data Multiline Hunt Group (MLHG).
- The bridging technique used in the Data Conference Bridge is part of the conferencing application and not specified here.
- The Lower Layer Compatibility Information Element (LLC-IE) can communicate rate-adaptation details end-to-end. For details on V.120 rate adaptation, and the use of the LLC Information Element for circuit-data calls, see Sections 5.1.4 and 5.1.5.
- For additional information on MLHG, see Section 5.1.7.
- For details on subscription and ordering information using NIUF ISDN Interface Groups (NIIG) and NIUF Parameter Groups (NIPG) , see Section 5.1.11.
- For detailed Signaling Flow Diagrams for this application, see Sections 5.2.1.4 (Voice Call Setup), 5.2.1.5 (Circuit-data Call Setup), and 5.2.1.6 (Voice & Circuit-data Call Clearing).

3.1.8 Screen sharing with workstations connected to a remote local-area network

ISDN can support participation by a user at a remote site in a LAN based screen sharing conference at speeds up to 64 kbps. The remote user uses ISDN to connect to a communications server on the LAN that provides access to the screen sharing conference that is supported by the LAN Conference Bridge. The ISDN connection provides performance similar to that seen by the LAN-connected workstations. A normal voice conference bridge is used to support the teleconference.

Configuration: (1, 2, 3, 4, 5)



How It Works:

The voice conference is established using an existing non-ISDN conference bridge (not shown above). The LAN-connected participants then establish screen sharing sessions with the LAN Conference Bridge. Because the LAN Conference Bridge handles all multipoint conferencing functions, the software on each participant's computer only needs to set up a point-to-point conference with the bridge. The remote participant calling in, using ISDN, establishes a circuit-data connection to the Communications Server which makes the computer appear to be on the LAN. The remote participant then runs the same software as the others to set up a conference with the LAN Conference Bridge. The LAN conference bridge can be the personal computer of one of the participants on the LAN.

Obtain Equipment with These Capabilities

Personal Computer with ISDN Adapter

- Application software compatible with communication software and far end.
- B channel capabilities:
  - Simultaneous voice and circuit-data calling.
  - If using NI-1, support for two Directory Numbers (DNs) and Service Profile IDs (SPIDs) will be needed.
  - Support rate adaptation for rates lower than 64 kbps. For example, asynchronous communications may be rate adapted using V.120.
- Physical interfaces:
  - Analog phone jack.
  - RJ-45 connector to NT-1, or integrated NT-1

Communications Server

- Application software compatible with communication software and with far end.
- Multiple BRIs to meet network traffic requirements
- B channel capabilities for each BRI:
  - Simultaneous circuit-data calling on two B channels.
  - For NI-1, support for two Directory Numbers (DNs) and Service Profile IDs (SPIDs) will be needed.
  - Support rate adaptation for rates lower than 64 kbps. For example, asynchronous communications may be rate adapted using V.120.
- Physical interfaces:
  - Local LAN (e.g., Ethernet or Token Ring).
  - RJ-45 connector to NT-1, or integrated NT-1

LAN Conference Bridge and Personal Computers with LAN Interfaces

- Application software compatible with communication software and LAN devices.
- LAN interface (e.g., Ethernet, Token Ring) compatible with local LAN.
- Bridge only: multipoint conferencing functions in application to support four or more users.

Request These Capabilities From ISDN Service Provider

Network Interface to Personal Computer with ISDN Adapter

Network Services Required:

- One or more BRI. (2B)
- One B channel for voice calls, with voice DN and SPID.
- One B channel for circuit-data calls, with circuit-data DN and SPID.
- Voice Features:
  - None required.
- Circuit-Data Features:
  - None required.

Subscription or Ordering Information:

- This interface is configured for simultaneous voice calls and circuit-data calls (NIIG 11). Other NIIGs which have this functionality include 12, 15, 17, 21, 22, 25, and 27.
- Parameter Groups for Voice Features:
  - None required.
- Parameter Groups for Circuit-Data Features:
  - None required.

Network Interface to Communications Server

Network Services Required:

- One or more BRI. (2B)

For each BRI:

- Two B channels for circuit-data calls, with circuit-data DNs and SPIDs.
- Circuit-Data Features:
  - None required.

Subscription or Ordering Information:

- This interface is configured for two simultaneous circuit-data calls (NIIG 14). Other NIIGs which have this functionality include 15, 17, 24, 25, and 27.
- Parameter Groups for Circuit-Data Features:
  - A la carte: Multiline Hunt Group.

Technical Notes

- An existing communications server (dial-up router, or terminal server) can be adapted to support ISDN access. Change out modems or CSU/DSUs for Terminal Adapters as selected from Section 4.
- The Lower Layer Compatibility Information Element (LLC-IE) can communicate rate-adaptation details end-to-end. For details on V.120 rate adaptation, and the use of the LLC Information Element for circuit-data calls, see Sections 5.1.4 and 5.1.5.
- Although this solution does not require it, the Communications Server could have its DNs assigned to a Multiline Hunt Group (MLHG) so that those calling in remotely only have to remember one number. More details of MLHG may be found in Section 5.1.7.
- For details on subscription and ordering information using NIUF ISDN Interface Groups (NIIG) and NIUF Parameter Groups (NIPG) , see Section 5.1.11.
- For detailed Signaling Flow Diagrams for this application, see Sections 5.2.1.4 (Voice Call Setup), 5.2.1.5 (Circuit-data Call Setup) and 5.2.1.6 (Voice & Circuit-data Call Clearing).