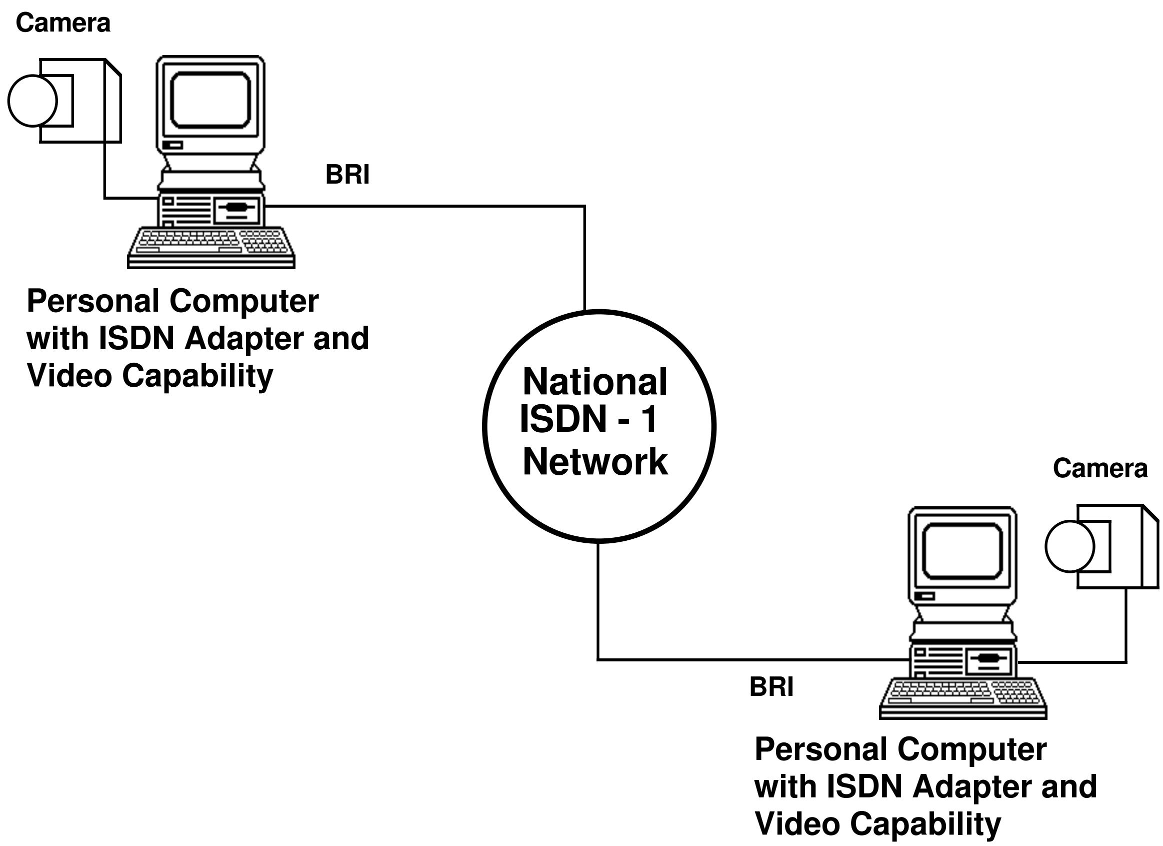
3.1.9 Desktop video conferencing

ISDN can support videoconferencing between personal computers with video capability. Some systems also support sharing documents, graphics, and data.

Configuration:



How It Works:

Users set up a video conference by running the videoconferencing application on their computers. The conferencing systems in this example use two simultaneous circuit-data calls for a 128 kbps video call. Inverse multiplexing is performed by the ISDN Adapters in the computers or by the software. Generally for 128 kbps systems, video and audio are carried over the same channel, multiplexed by the conferencing system. There are 128 kbps products which carry the audio portion of the call in the upper 16 kbps, and the video in the remaining 112 kbps. In some products, voice is carried on one B channel and video is carried on the other as a circuit-data call.

Obtain Equipment with These Capabilities

Personal Computer with ISDN Adapter and Video Capability

- Camera, display, and video codec compatible with far end. Coding standards are H series.
- Speaker and microphone (or handset)
- B channel capabilities:
  - Simultaneous circuit-data calling on two B channels.
  - If using NI-1, support for two Directory Numbers (DNs) and Service Profile IDs (SPIDs) will be needed.
  - Combine two 64 Kbps signals to/from the BRI into 128 signal in a way that is compatible with far end. Standards for videoconferencing are H series.
  - Support for the circuit-data features listed under "Network Interface to ISDN Terminal Adapter".
- Physical interfaces:
  - RJ-45 connector to NT-1, or integrated NT-1.

Request These Capabilities From ISDN Service Provider

Network Interface to Personal Computer with ISDN Adapter and Video Capability

Network Services Required:

- One BRI. (2B)
- 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 Optional Circuit-Data Features:
  - NIPG 6 - Advanced Call Forwarding for Circuit Data. -
  - A la carte: Calling Number Identification Services

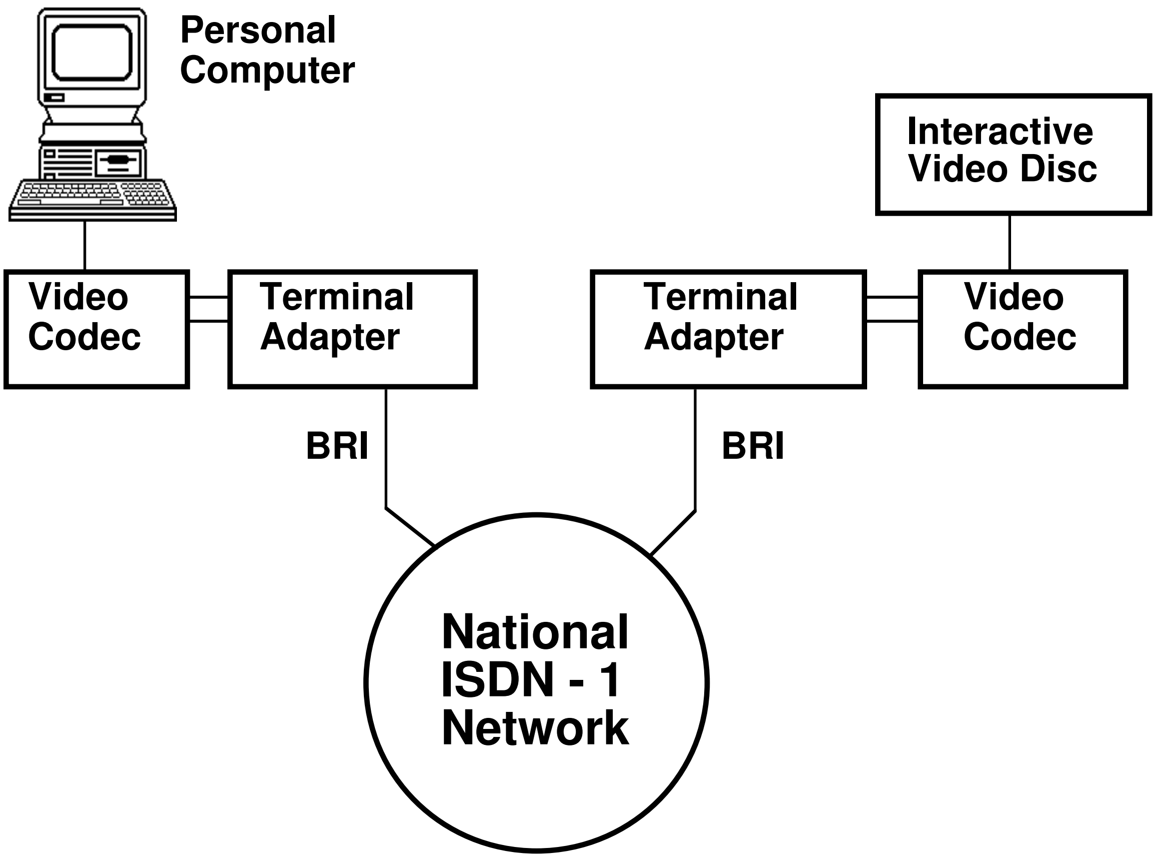
Technical Notes

- The H Series standards describe all aspects of videoconferencing. Principal standards are H.261 for Video coding, which supports a separate 16 channel for Audio that is coded in accordance with G.728, H.221 for multiplexing; and H.321 for system aspects.
- See Section 5.1.5 for Lower Layer Compatibility (LLC-IE) and Higher Layer Compatibility (HLC-IE) Information Element values for H series videoconferencing.
- Though not critical for this application, the Calling & Redirecting Number Delivery capabilities may be useful for coordinating the calling DNs at the one Phone with the called DNs at the other, for both Voice and circuit-data.
- For details on subscription and ordering information using NIUF ISDN Interface Groups (NIIGs) and NIUF ISDN Parameter Groups (NIPGs), 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),

3.1.10 Centralized management of video images

ISDN can support remote access to a centralized interactive video system at speeds of 128 kbps on a single ISDN line. Higher speeds can be achieved using multiple ISDN lines. Interactive video systems can provide travel agents access to electronic brochures or real estate agents access to videos of homes that are for sale.

Configuration:



How It Works:

This example demonstrates a multimedia client/server application accessed remotely over ISDN. The interactive video disk system acts as the server for multimedia applications, for example, instructional material. A personal computer with a high resolution monitor and video card act as a client. The personal computer interacts with the video disk system to run the interactive multimedia program. The codecs encode the high bandwidth multimedia signal for transmission as allow bandwidth signal, then decode upon receipt. Since only one user can access the system at a time, the system shown is useful for demonstrations, or on a reserved basis.

Obtain Equipment with These Capabilities

Personal Computer

- Video display capability and speaker for audio
- Video application software compatible with communications software and with far end
- Compatible video & audio interface to codec

Interactive Video Disc

- Video application software compatible with communications software and with far end
- Compatible video & audio interface to codec

Video Codecs for Imaging System

- Compatible video & audio interface to Personal Computer & Video Disk
- Video and audio signal encoding and decoding compatible with far end, operating at 128 (112) Kbps.
- Audio/Video interface to TA - dual 56/64 ports (V.35 or RS-449).
- Optional control panel interface to TA for dialing (e.g., RS-366)

Terminal Adapter

- B channel capabilities:
  - Simultaneous circuit-data calling on two B channels.
  - If using NI-1, support for two Directory Number (DN) and Service Profile ID (SPID) will be needed.
- Physical interfaces:
  - Dual ports to codec (e.g., RS-449, or V.35).
  - Optional dialing interface
  - RJ-45 connector to NT-1, or integrated NT-1.

Request These Capabilities From ISDN Service Provider

Network Interface to ISDN Terminal Adapter

Network Services Required:

- One BRI. (2B)
- 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:
  - None required.

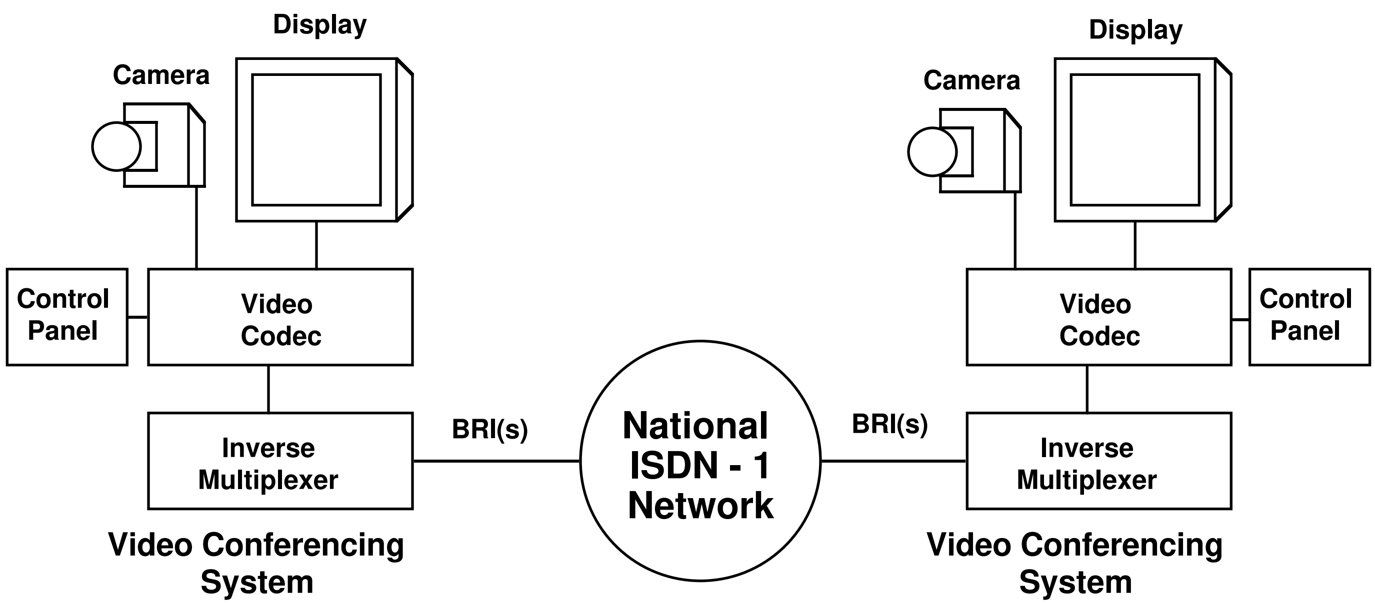
Technical Notes

- The codecs can use H Series standards for this application, The H series describes all aspects of videoconferencing, and can be supported. Principal standards are H.261 for video coding, which supports a separate 16 channel for Audio that is coded in accordance with G.728, H.221 for multiplexing; and H.321 for system aspects.
- See Section 5.1.5 for Lower Layer Compatibility (LLC-IE) and Higher Layer Compatibility (HLC-IE) Information Element values for H series videoconferencing.
- For details on subscription and ordering information using NIUF ISDN Interface Groups (NIIGs) and NIUF ISDN Parameter Groups (NIPGs), see Section 5.1.11.
- For detailed Signaling Flow Diagrams for this application, see Sections 5.2.1.5 (Circuit-Data Call Setup), and 5.2.1.6 (Voice & Circuit-Data Call Clearing),

3.1.11 Videoconferencing facilities

ISDN can be used to link videoconference systems that support motion video, audio, and document communication. People can cut down on travel, while still meeting "face to face." These links are established only as required, saving the cost of leased lines for lower traffic volumes. ISDN also provides the flexibility to roll the video system to any location where there are appropriately configured ISDN access lines.

Configuration:



How It Works:

To set up a video conference, one user calls another by dialing with their Inverse Multiplexer or conferencing system control panel. Depending on the number of BRIs used at each end, either two, four, or six circuit-data calls are placed for bandwidth of 128 kbps, 256 kbps, or 384 kbps respectively. Generally, the quality of the picture and sound improve with more bandwidth.

The video conferencing system consists of a display and camera; microphone and speakers; control panel, video codec, and Inverse Multiplexer. Some systems support options for fax, imaging, and overhead display capabilities for sharing text and graphics. The codec processes the wideband video signal to (and from) a narrow band signal for transmission (and reception). As part of the conferencing system, the Inverse Multiplexer combines and splits the narrowband video I/O signal onto individual 64/56 kbps channels. The Inverse Multiplexer also permits interworking with Switched 56 lines. The Inverse Multiplexer may be integrated into the codec or in a separate box.

This implementation uses the Call Forwarding - Interface Busy feature to allow callers to place multiple circuit-data calls to a single number on an NI-1 BRI.

Obtain Equipment with These Capabilities

Video Codec for Conferencing System

- Display, speaker, camera, microphone, & control panel.
- Video and audio signal encoding and decoding compatible with far end. Standards are H.261 (sometimes called "P x 64").
- Interface compatible with Inverse Multiplexer.
- Dialing interface from control panel to Inverse Multiplexer.

Inverse Multiplexer

- Split and combine n x 64/56 kbps signals from up to three BRIs, in a way that is compatible with the far end. (BONDING (Modes 0 or 1), or H.221.)
- Call control for BRI with ability to dial two, four, or six simultaneous circuit-data calls. With NI-1, a separate Directory Number (DN) and Service Profile ID (SPID) are needed for each call.
- Optional calling number display.
- Support circuit-data at 56 and 64 kbps.
- Interface compatible with Codec.
- RJ-45 connector to NT-1, or integrated NT-1.

Request These Capabilities From ISDN Service Provider

Network Interfaces to Inverse Multiplexers

Network Services Required:

- One , two, or three BRI. (2B)

For each BRI:

- Two B channels for circuit-data calls, with circuit-data DNs and SPIDs.
- Circuit-Data Features:
  - Call Forwarding - Interface Busy

    For each DN x across 1, 2, or 3 BRIs:

    Forward to Number (DN x) = DN x+1

    Disable Call Forwarding - Variable and Call Forwarding - Don't Answer

    Disable Additional Call Offering

    Increase Multiple Forwarding Limits to allow forwarding to last DN in sequence

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:
  - NIPG 6 - Advanced Call Forwarding for Circuit Data. -
  - Call Forwarding - Interface Busy

    For each DN x across 1, 2, or 3 BRIs:

    Forward to Number (DN x) = DN x+1

    Disable Call Forwarding - Variable and Call Forwarding - Don't Answer

    Disable Additional Call Offering

    Increase Multiple Forwarding Limits to allow forwarding to last DN in sequence

Technical Notes

- Video conferencing systems can support either the BONDING agreement or the H.221 standard for inverse multiplexing. BONDING is commonly supported by Inverse Multiplexers for 4x64 and 6x64 transmission. See Section 5.1.9 for a detailed discussion on Inverse Multiplexers.
- The H Series standards describe all aspects of videoconferencing. Principal standards are H.261 for Video coding, which supports a separate 16 kbps channel for Audio that is coded in accordance with G.728, H.221 for multiplexing; and H.321 for system aspects.
- Existing Video Conferencing solutions can be modified to work with ISDN by adding Terminal Adapters to them. If the existing solution already contains an Inverse Multiplexer, then the TA only needs to support basic ISDN signaling and physical layer functions.
- If calls do not go through at 64 kbps, the user may try to place 56 kbps calls. This may be a feature of some terminal equipment.
- See Section 5.1.5 for Lower Layer Compatibility (LLC-IE) and Higher Layer Compatibility (HLC-IE) Information Element values for H series videoconferencing.
- For details on subscription and ordering information using NIUF ISDN Interface Groups (NIIGs) and NIUF ISDN Parameter Groups (NIPGs), see Section 5.1.11.
- For detailed signaling flow diagrams for this application, see Sections 5.2.1.5 (Circuit-Data Call Setup) and 5.2.1.6 (Voice & Circuit-Data Call Clearing).