# Microsoft NetShow 2.0 Player

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## Introduction

Microsoft NetShow is a new product for audio and video streaming over the Internet. It includes both a NetShow server component for stored and real-time broadcast of audio and video over the Internet and a NetShow client component, the NetShow Player, for viewing stored and real-time broadcast audio and video. NetShow claims to support IP multicast, UDP, TCP, and HTTP distribution of streaming audio and video. Associated with NetShow, the Microsoft NBC Business Video channel distributes audio and video over the Internet daily. NetShow uses a new streaming audio and video format known as ASF or ASX, for Active Streaming Format. This format adds error correction, time stamps, and other features helpful for streaming audio and video over the Internet. ASF can encapsulate audio and video compressed with many different compression schemes including Microsoft's MPEG-4, G.723.1 audio, MPEG-1 Layer 3 Audio, and may others.

This evaluation is not an exhaustive review of the product. The evaluation focuses on critical areas for user acceptance and use of a video streaming product: Audio Quality, Video Quality, Ease of Installation, and Ease of Use and Reliability. This evaluation covers only the NetShow Player, not the NetShow server product. Since the MSNBC video was broadcast by a NetShow server, some evaluation of the server is implicitly in the comments.

## Configurations Tested

NOW Pentium PCI Personal Computer

Windows 95 (4.00.950, not OSR2)

FTP Software's OnNet 2.11 TCP/IP

Creative Labs Soundblaster 16

LiveLAN MovieMan audio/video board (two sound cards)

Ethernet Local Area Network with DIX (Digital/Intel/Xerox) Ethernet Frame Type

Netscape Navigator 3.01 (configured to use NetShow Player as Helper Application)

NetShow Player 2.0.0.681

NetShow Control 2.0.0.681

Microsoft NBC (MSNBC) Business Video (MPEG-4 Video/G.723.1 Audio)

## Supported Platforms

- PC/Windows for Workgroups no
- PC/Windows 95 yes
- Macintosh no
- UNIX no

## Supported Networks

**PC TCP/IP Implementations**

- Microsoft TCP/IP for Windows 95
- FTP Inc.'s PC/TCP

*Other TCP/IP implementations probably work*

Although the Microsoft press releases claim IP multicast support, this could not be tested. The application also includes a checkbox in one of the configuration dialog boxes indicating IP multicast support.

NetShow uses UDP for audio/video streaming if possible. If UDP fails, NetShow will try to use TCP for audio/video streaming. If TCP fails, NetShow will try to use HTTP for audio/video streaming. As tested with MSNBC video, either UDP or HTTP was used. HTTP allows the video to penetrate many Firewalls. UDP performance seems slightly better than HTTP, although the difference did not seem that great.

The NetShow documentation does not identify the real-time protocol using UDP, suggesting that it may be a proprietary Microsoft protocol instead of the Internet RTP or RTCP protocols. The URL's reported by the NetShow Player for MSNBC video identify the protocol as MMS. There is an international standard for real-time control of instruments, such as industrial automation equipment, known as MMS. It is possible that Microsoft is using this protocol.

**Streaming Protocols**

- IP Multicast (unconfirmed)
- UDP yes
- TCP (unconfirmed)
- HTTP yes
- RTP (unconfirmed/probably not)
- RTCP (unconfirmed/probably not)

## Audio Quality

Audio quality varies. At times, the audio worked flawlessly, speakers were easily understandable using the G.723.1 audio codec at 6400 bits/second. Sometimes, dropouts and distortion were a problem. In some cases, the audio was too distorted to understand. The NetShow Player did not report any errors to explain this problem. NetShow provides statistics indicating number and percentage of IP packets received without error, recovered successfully, or lost. The audio distortion problems occurred during periods when no packets were recovered or lost. NetShow reported no problems although the audio sounded very poor.

The NetShow Player appears to have some problems reconstructing the audio. This may be errors that it does not detect, although a Cyclic Redundancy Check (CRC) should detect bit errors due to packet corruption. It seems more likely that the application has problems buffering and reassembling the audio packets in real-time.

## Video Quality

NetShow supports many video codecs. The video evaluated was the Microsoft NBC Business Video channel at 56 and 28.8 Kbps. This video uses the new Microsoft MPEG-4 video codec. This is probably closely related to the MPEG-4 Verification Model that Microsoft provided to the MPEG-4 committee. MPEG-4 video is probably very similar to H.263.

The MSNBC video is 176x144 pixels at around 10 fps at either 28.8 or 56 Kbps. The video quality is poor. Many blocking artifacts are visible in most frames. Facial features are blurred and difficult to discern. The extensive blocking and other artifacts are consistent with a motion compensated 8x8 pixel block Discrete Cosine Transform based video codec such as MPEG, H.261, and H.263.

## Ease of Installation

The NetShow 2.0 Player is very easy to install. Download the player installation program from the Microsoft Web site and install. This proceeded flawlessly. Although NetShow appears to be designed to operate with Microsoft's Internet Explorer, the NetShow Player can be configured as a helper application in Netscape Navigator 3.01 without difficulty. This is the configuration tested.

## Ease of Use and Reliability

Once installed and configured successfully, the NetShow 2.0 Player is easy to use and very reliable. The NetShow Player never crashed, no general protection faults. Frequently, the MSNBC video could be viewed for days at a time without restarting. Occasionally, the video stream would be lost, requiring starting the NetShow Player by clicking on the MSNBC links on the Microsoft Web page.

## Conclusions

The low video quality at 28.8 and 56 Kbps limits usefulness of the product. The product is useless during periods when the audio drop-outs and distortion make the speakers incomprehensible. The product probably needs to be run at higher bit rates than 56 Kbps to be useful for most applications.