

IBM Content
Manager VideoCharger for
Multiplatforms



Planning and Installing VideoCharger

Version 8 Release 2

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Multiplatforms



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Note

Before using this information and the product it supports, read the information in "Notices" on page 205.

Second Edition (March 2003)

This edition applies to Version 8 Release 2 of IBM Content Manager VideoCharger for Multiplatforms (product number 5724-B19) and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this guide

Planning and Installing VideoCharger™ describes how to plan for, install, and initially configure VideoCharger for AIX® and Windows® 32-bit operating systems that include Microsoft® Windows NT® 4.0 and Windows 2000.

Who should use this guide

This guide is for system administrators who are familiar with either AIX or Windows operating systems and know how to manage a network environment.

How to use this guide

The following conventions are used in this guide:

bold	Identifies commands, flags, keywords, files, directories, and other items whose names are predefined by the system.
<i>italics</i>	Identifies parameters with actual names or values that you must supply.
monospace	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write, messages from the system, or information you should actually type.

The general term “Windows” applies to Microsoft Windows NT 4.0 and Windows 2000.

Information in this guide applies to both the VideoCharger Server for AIX and the VideoCharger Server for Windows unless specifically indicated otherwise. Information pertaining only to AIX is entitled “... on AIX” or **For AIX**. Information pertaining only to Windows is entitled “... on Windows” or **For Windows**.

Make sure to examine the VideoCharger readme file for additional information.

- **For AIX:** See `/usr/lpp/avs/README.vc`.
- **For Windows:** See `install-directory/readme.txt` where *install-directory* is the directory in which you installed the VideoCharger.

Product publications

You can view the following documentation from the VideoCharger Web site at <http://www.ibm.com/software/data/videocharger/library.html>:

- *Planning and Installing VideoCharger*
- *Administrator's Guide and Reference*
- *Programmer's Reference*, for those who want to write their own interface to VideoCharger.
- *IBM® VideoCharger 101*

To install the Acrobat Reader, download the appropriate program files for your operating system from <http://www.adobe.com/products/main.html> and follow the provided installation instructions.

Related publications

The following publications contain information related to VideoCharger operating platforms:

For AIX:

- *AIX Installation Guide*
- *AIX System Management Guide: Communications and Networks*
- *AIX System Management Guide: Operating System and Devices*
- *AIX Commands Reference*
- *IBM Internet Connection Secure Server for AIX: Up and Running*, if you are running this product as your Web server
- *NetView® for AIX Administrator's Guide*, for those that wish to manage the network used by the VideoCharger
- *AIX Problem Solving Guide and Reference*, for general information on trace, dump, and other problem-solving tools
- *Performance Tuning Guide*, for information on AIX general performance guidelines and commands
- *IBM HTTP Server V1.3.12.2 powered by Apache User Assistance*

For Windows NT:

- *Windows NT Server Networking Guide*
- *Windows NT Server Internet Guide*
- *Windows NT Server Resources Guide*

For Windows 2000:

- *Windows 2000 Server Networking Guide*
- *Windows 2000 Server Internet Guide*

How to send your comments

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<http://www.ibm.com/software/data/rcf>

You can use the page to enter and send comments.

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Chapter 1. VideoCharger overview

VideoCharger allows you to integrate video and audio files, called *assets*, into your products and services. You can deliver assets in real-time (called *streaming*) from a VideoCharger Server to clients over an Internet, Intranet, or Local Area Network. Streaming from the Server eliminates the need to download the assets first and can spare much of the client's disk space.

Web browsers like Netscape Navigator or Microsoft Internet Explorer can play the assets using software like the VideoCharger or Quicktime Players. Assets can use various encoding formats and range from short clips to full-length films. All assets can stream through Real-Time Transport Protocol (RTP), Transmission Control Protocol (TCP), Hypertext Transfer Protocol (HTTP), or Internet Protocol (IP) multicast. IP multicast can deliver a single stream to multiple recipients. For AIX, ReSerVation Protocol (RSVP) and Path maximum transmission unit (MTU) aid the IP network streaming.

This section overviews the following VideoCharger topics:

- "VideoCharger components"
- "Your VideoCharger Server home pages" on page 7
- "Network support" on page 9

VideoCharger components

In general, VideoCharger uses the following basic components:

VideoCharger Server

Delivers assets to the client and helps store assets. See "VideoCharger Server".

Web server

Coordinates the VideoCharger interaction with a World Wide Web browser. See "Web server" on page 7.

Client Player

Plays the assets. See "Client Players" on page 7.

Multimedia Archive (AIX only)

Stores assets and skips the need to import or recreate them. See "Multimedia Archive" on page 7.

VideoCharger Server

The VideoCharger Server delivers assets to a client and helps store assets. The following three major components comprise the Server:

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Controller

Coordinates asset delivery, data pump selection, and command processing. See “Controller”.

Presentation formatter

Lists assets to play and displays information about them. See “Presentation formatter”.

Data pump

Stores and retrieves assets. See “Data pump” on page 5.

For details on how they interact with each other, see “How the components interact to stream assets” on page 5.

Attention: For AIX, the components can reside on either a single machine or multiple ones. For Windows, all components must be installed onto a single machine.

Controller

The controller coordinates the VideoCharger system. It consists of the control server and the application server:

Control server

Administers the streaming connection between the client and data pump. On AIX, the control server coordinates the data pumps. By controlling the number of audio/video streams, the control server ensures service quality across the system. It provides resource management (for example, admission control and load balancing), to play streams and load content. Finally, it maintains a catalog of all assets stored on the data pump (Windows) or data pumps (AIX).

Application server

Conveys client player commands (for example, play, stop, pause, rewind, forward) to the data pump. It also generates the *metadata file*, which provides computer instructions on streaming the asset.

Presentation formatter

Presentation formatters are Common Gateway Interface (CGI) programs that can search assets, list menus to play assets, and display information on them. They use a Web Server to enable communication between the Web browser and the VideoCharger Server. VideoCharger comes with three predefined presentation formatters:

Video selection

Allows a client to link to specific assets directly from a Web page. When using this method, you must create a page with an explicit link to each video stored on the VideoCharger. This simple approach does not require you to store any additional asset information in the application server. Only basic attributes (for example, encoding type,

frame rate, and play rate) are available, and are supplied on the initial Web page. Use this presentation formatter for a small number of assets that are infrequently added or deleted.

Video-on-demand (VOD)

Allows the client to select an asset from a dynamically generated Web list. This list always stays up-to-date. Your VideoCharger home page uses this presentation formatter to display assets.

Multicast video guide

Allows an administrator to schedule broadcasts to a group of clients. It also lets clients view a list of currently scheduled jobs. Clients can join or leave the multicast session whenever they choose. Your VideoCharger home page uses this presentation formatter to display multicasts.

You can use these formatters, modify them, or write your own using Application Programming Interface (API) calls described in the *VideoCharger Programmer's Reference*.

Data pump

Data pumps can store assets and stream them to the client across a network. Windows can only have one data pump (part of the VideoCharger Server). AIX can utilize multiple data pumps.

For AIX: Each data pump is equipped with its own set of disks and network adapters. Multiple data pumps can stream independently and permit VideoCharger to serve more simultaneous clients. They also provide a higher level of availability.

The AIX control server coordinates multiple data pumps and balances video requests across them. For this load balancing and overall content management to work properly, the data pumps need identical content. VideoCharger automatically replicates content across all data pumps. If you add a new data pump to an existing VideoCharger complex, the system automatically "clones" an old data pump onto the new one. Additionally, content loaded onto the VideoCharger complex replicates across every data pump. This can consume some time depending on the data pump quantity and asset size. If an end user receives error message No asset replica available, the asset needs to be requested at a later time.

How the components interact to stream assets

Figure 1 on page 6 shows how the VideoCharger components interact to deliver an asset. For AIX, the components can reside on either a single machine or multiple ones. For Windows, the data pump, controller, and presentation formatter must be installed on the same machine.

Introduction

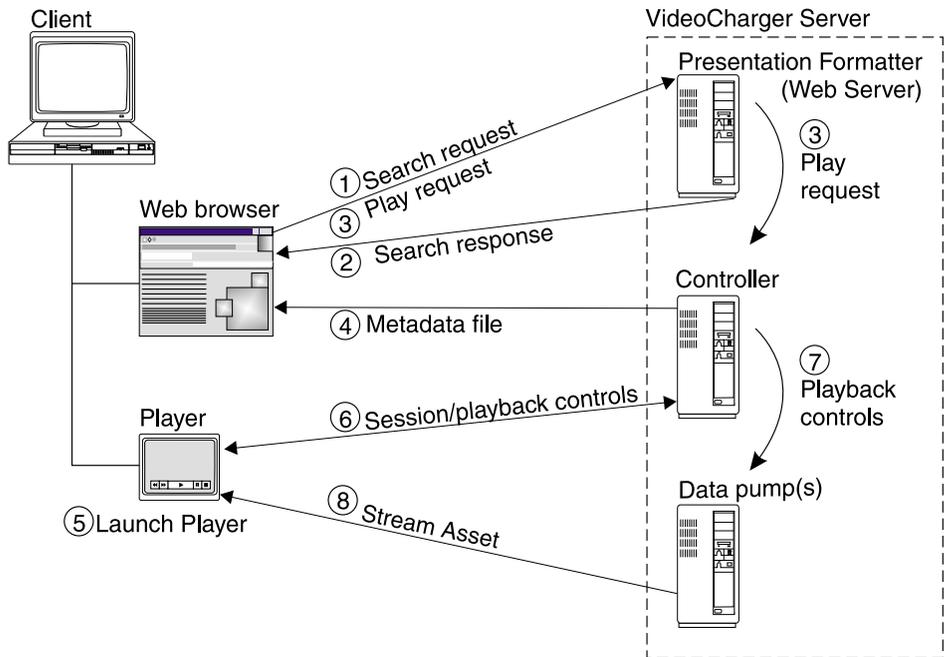


Figure 1. Interaction of the client and components on the VideoCharger Server

The following steps demonstrate how VideoCharger delivers an asset to the client through the video-on-demand presentation formatter. The steps correspond to the numbers in Figure 1.

1. Through a client Web page, the user submits an asset search into the Web server.
2. The VOD presentation formatter searches the data pump or pumps and returns a Web page that lists the corresponding assets.
3. When a user clicks an asset to play, the presentation formatter passes this request onto the controller.
4. The controller creates a metadata file that describes the selected asset, and returns the file to the client through the Web server.
5. Once the client Web browser receives the metadata file, the browser launches a player.
6. The client starts a session with the controller, allowing the user to control playback using the player.
7. The controller contacts the data pump.
8. The data pump streams the asset to the player.

To install and configure the VideoCharger Server, follow the directions in Part 2, “Planning and installing the VideoCharger Server for AIX”, on page 15 and Part 3, “Planning and installing the VideoCharger Server for Windows”, on page 75.

Web server

A Web server assists VideoCharger by calibrating the VideoCharger Server, transferring metadata files, and enabling encoders. Presentation formatters also need the Web server to display asset lists in the Web browser.

VideoCharger supports a variety of Web servers and can automatically configure some of them. “Requirements for the VideoCharger Server” on page 20 (AIX) and “Requirements for the VideoCharger Server” on page 77 (Windows) lists the Web servers that VideoCharger can automatically configure. You must manually configure any other Web server.

Client Players

VideoCharger client code, including the VideoCharger Player (for Windows only), ships with the server and lets the client machine view the assets. VideoCharger also supports QuickTime and Hot Media Players. See Chapter 13, “Integrating the client with the VideoCharger Server”, on page 119 for information on client requirements and “Playing assets in the client Players” on page 119 for details on the various Players.

Multimedia Archive

The *Multimedia Archive* AIX server compliments the VideoCharger Server by storing assets that do not require immediate playing. It lets you access archived assets without importing or recreating them from the original source. See Chapter 14, “Integrating the VideoCharger AIX Multimedia Archive”, on page 125 for details.

Your VideoCharger Server home pages

VideoCharger installs Web forms on your VideoCharger Server that let you administer it easily.

The addresses of the types of default VideoCharger home pages are listed in Table 1 (*hostname* represents the IP host name of the VideoCharger Server)

Table 1. VideoCharger home page addresses

VideoCharger home page	Web address
AIX administrator home page	http://hostname/vs_admin/admin/vs.html
AIX public home page	http://hostname/vs_public/cgi-bin/iscpfhom/
Windows administrator home page	http://hostname/vs_admin/

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Table 1. VideoCharger home page addresses (continued)

VideoCharger home page	Web address
Windows public home page	http://hostname/lantv/

Administrator home page

Using the **admin** Web forms (require an administrator user ID and password), you can perform the following tasks:

Configuration and Administration

Configure and administer your VideoCharger system.

Server status/start/stop

Start, stop, or get status on the VideoCharger Server.

Manage Content

Add, delete, list, modify, and archive assets. You can also revise asset attributes such as encoding type, bit rate, and duration.

Manage Multicast

Broadcast assets to multiple workstations at the same scheduled time. For Windows only, you can use an *encoder card* to record or broadcast live video.

In addition, your VideoCharger admin home page provides the following additional resources:

Resource List

Access Web links and information about VideoCharger, including:

Visit VideoCharger Home Page

Visit the IBM VideoCharger product Web site at <http://www.ibm.com/software/data/videocharger/>.

Download Windows Client From Local Server

Download the VideoCharger Player to your workstation.

VideoCharger Server Sample Code and Sample Content

View a list of sample code (for example, presentation formatters and application server), and sample videos.

Documentation

View VideoCharger documentation in HTML or Adobe Acrobat Portable Document Format (PDF).

Public home page

Using the **public** Web forms on your VideoCharger home page (no administrator authorization necessary), you or anyone else can perform the following tasks:

List Available Assets (Search)

Search, list, and stream the loaded assets from the VideoCharger Server. This displays assets using the VOD presentation formatter.

View Multicast (What's Playing)

List scheduled assets and sign up to receive their stream from the VideoCharger Server. This displays multicast assets using the Multicast Video Guide presentation formatter.

Network support

VideoCharger supports the following network types:

- ATM (through Classic IP or LAN emulation)
- FDDI
- Ethernet
- Token ring

Table 2 summarizes key Internet Protocol support for VideoCharger:

Table 2. IP protocol support

IP Protocol	Request for Comments (RFC)
RTP	1889
IP Multicast	1112
Path MTU (AIX only)	1191
TCP Extensions for High Bandwidth content loading	1323

Using admission control, the system can track bandwidth. This prevents overextending system resources, and minimizes conflict between other applications and new requests.

See “Engineering network capacity” on page 26 (AIX) or “Engineering network capacity” on page 80 (Windows) for information on planning for networks.

Chapter 2. What's new in VideoCharger Version 8.2

This section covers the following topics:

- “Supported video and audio formats in VideoCharger Version 8.2”
- “What's new in VideoCharger Version 8.2 on AIX” on page 12
- “What's new in VideoCharger Version 8.2 on Windows” on page 13

Supported video and audio formats in VideoCharger Version 8.2

VideoCharger Version 8.2 can stream the following media file types (see Table 3):

Table 3. Media formats that VideoCharger can stream

Media format	File extension	Type	VideoCharger Server	VideoCharger Player
MPEG-1	.MPG	Audio and/or video	X	X
MPEG-2	.MPG	Audio and/or video	X	X*
Audio Video Interlaced	.AVI	Audio and/or video	X	X
H.263 + G.723 interleaved	.IBA	Audio and video	X	X
QuickTime (hinted)	.MOV	Audio and/or video	X	
MP3	.MP3	Audio only	X	X*
WAV	.WAV	Audio only	X	X
HotMedia [®]	.MVR	Audio and/or video	X	
MPEG-4	.MP4	Audio and/or video	X	X**

* requires DirectX multimedia hardware and software decoders

** VideoCharger MPEG-4 dynamic Player

MPEG-4 uses a decoder-rendered paradigm (a single object in a collection of objects in a scene) instead of MPEG-2's encoder-rendered paradigm (a frame in a moving sequence of frames). MPEG-4 objects are arbitrarily-shaped rather

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than rectangular, and give the viewer some control on how to render a scene (for example, mixing real and synthetic objects).

MPEG-4 can be carried in any RTP stream over IP, or any byte delivery packaging scheme. MPEG-4 streams do not have the channel restrictions that MPEG-2's transport multiplex has. However, an MPEG-2 multiple transport stream can still carry the MPEG-4 objects.

To eliminate any proprietary restrictions when streaming MPEG-4, VideoCharger Version 8.2 automatically downloads and launches a dynamic Java™ Player to the client workstation—then removes the Player after the streaming session ends. For more details on this "click and play" MPEG-4 Player, see "Storing and playing MPEG-4 assets" on page 122.

What's new in VideoCharger Version 8.2 on AIX

VideoCharger Version 8.2 for AIX adds the following functionality to Version 7.1:

Accessibility features. Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. See the *Administrator's Guide and Reference*, "Accessibility for the MPEG-4 dynamic Player" on page 123, and the VideoCharger Player online help for complete information.

Automatic configurations in the data pump/controller. VideoCharger Version 8.2 now automatically configures the AIX shell inetd subserver (if needed) and creates the .rhosts file whenever you install the data pump on the same machine as the controller. See "Configuring the data pumps" on page 45.

Automatic Distributed Computing Environment remote procedure call (DCE RPC) configuration. VideoCharger Version 8.2 now automatically configures the DCE RPC client. You can customize your own DCE RPC client configuration before or after installing VideoCharger using the directions in the *Administrator's Guide and Reference*.

Bundled controller and data pump. VideoCharger Version 8.2 now automatically installs one data pump with the control server when you install a controller bundle. See "Deciding the best VideoCharger Server configuration" on page 17.

Change stripe group attributes. VideoCharger Version 8.2 now allows you to change stripe group attributes. You can either use the revised content management form or the `chvssg` AIX command. See the *Administrator's Guide and Reference*.

Export an asset. VideoCharger Version 8.2 can now export assets from the VideoCharger Server to any machine with an FTP daemon. You can either use the revised content management form or the `vsexport` AIX command. See the *Administrator's Guide and Reference*.

License VideoCharger during installation. VideoCharger Version 8.2 now lets you accept the VideoCharger license *during* installation instead of before the installation. See “Installing the VideoCharger bundles” on page 31.

MPEG-4 support. VideoCharger Version 8.2 now supports MPEG-4. The Server automatically launches a dynamic Java Player to stream MPEG-4 assets. See “Storing and playing MPEG-4 assets” on page 122.

Multimedia File System (MMFS) dependency eliminated. VideoCharger Version 8.2 can now store assets using any file system, not just MMFS. See “Determining AIX file system requirements” on page 23.

System restart unnecessary. After you install VideoCharger Version 8.2 on your AIX machines, you are not required to restart the machines.

Tivoli® readiness. Tivoli Distributed Monitoring can now help administer and monitor VideoCharger Version 8.2 components. See Chapter 18, “Integrating VideoCharger in a Tivoli environment”, on page 193.

Unicode support. VideoCharger Version 8.2 now supports unicode. See “Migrating asset names to unicode or to another locale” on page 38, “Configuring the Web browser to display unicode” on page 39 and Chapter 7, “Setting up translated VideoCharger supplements on AIX”, on page 63 for details.

What's new in VideoCharger Version 8.2 on Windows

VideoCharger Version 8.2 for **Windows** adds the following functionality to Version 7.1:

Accessibility features. Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. See the *Administrator's Guide and Reference*, “Accessibility for the MPEG-4 dynamic Player” on page 123, and the VideoCharger Player online help for complete information.

Export an asset. VideoCharger Version 8.2 can now export assets from the VideoCharger Server to any machine with an FTP daemon. You can either use the revised content management form or the `vsexport` Windows command. See the *Administrator's Guide and Reference*.

Introduction

| **MPEG-4 support.** VideoCharger Version 8.2 now supports MPEG-4. The
| Server automatically launches a dynamic Java Player to stream MPEG-4
| assets. See “Storing and playing MPEG-4 assets” on page 122.

| **Player Software Development Kit available.** The VideoCharger Version 8.2
| installation launchpad now lets you install the VideoCharger Player Software
| Development Kit. See “Installation from CD-ROM launchpad” on page 85.

| **Tivoli readiness.** Tivoli Distributed Monitoring can now help administer and
| monitor VideoCharger Version 8.2 components. See Chapter 18, “Integrating
| VideoCharger in a Tivoli environment”, on page 193.

| **Unicode support.** VideoCharger Version 8.2 now supports unicode for asset
| names. If you have problems displaying them in your Web browser, see
| “Symptom: VideoCharger Server Web pages do not display unicode properly”
| on page 113

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Chapter 3. Planning for the VideoCharger Server on AIX

Plan the following for your AIX VideoCharger system:

- “Deciding the best VideoCharger Server configuration”
- “Requirements for the VideoCharger Server” on page 20
- “Determining memory requirements for VideoCharger” on page 22
- “Determining AIX file system requirements” on page 23
- “Determining disk bandwidth requirements” on page 24
- “Determining your disk storage requirements” on page 25
- “Engineering network capacity” on page 26

Deciding the best VideoCharger Server configuration

You can set up VideoCharger to best suit your needs. When planning your configuration, consider what configuration provides the best scalability and quality of service within your cost constraints. AIX VideoCharger allows two basic configurations (plus an option to add more data pumps):

- “Option 1: One VideoCharger Server on one machine”
- “Option 2: One VideoCharger Server across two machines” on page 18

Option 1: One VideoCharger Server on one machine

This configuration uses one machine to store and distribute assets, and serves the fewest number of streams. You must dedicate the server to VideoCharger operations to ensure service quality. Figure 2 on page 18 shows this consolidated system and an optional extra data pump. Gray-shaded boxes represent components that are not part of the VideoCharger product.

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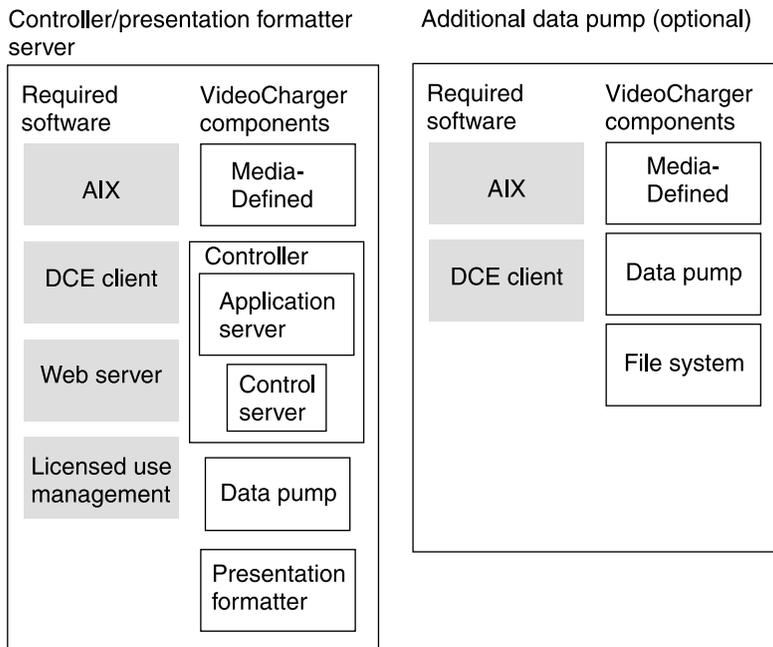


Figure 2. Option 1: One VideoCharger Server and an extra data pump

Option 2: One VideoCharger Server across two machines

This configuration separates the presentation formatter onto a different machine from the one containing both the controller and original data pump. In this scenario, one Web server runs on the presentation formatter server as the main Web interface. The other Web server runs as part of the controller, and primarily administers content loading requests. This approach allows the two components to perform a specialized role. It offers the highest scalability and service quality. Figure 3 on page 19 demonstrates this configuration with an optional extra data pump.

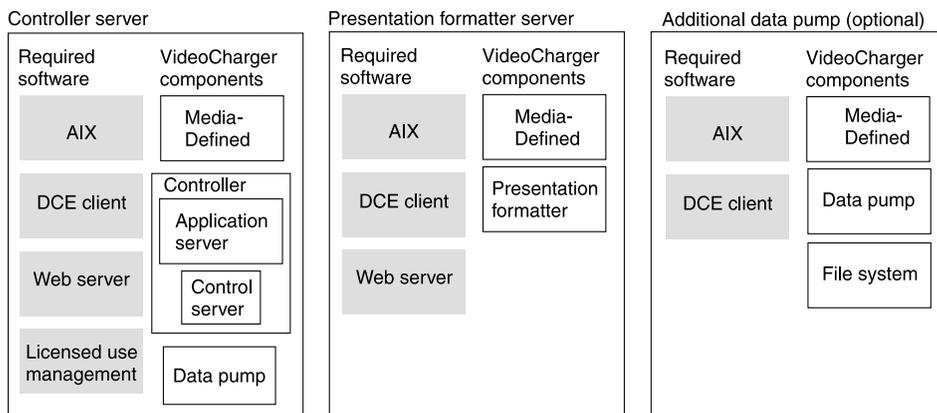


Figure 3. Option 2: One VideoCharger Server across two machines and an extra data pump

Choosing the best configuration for your AIX system depends on many factors, including:

- Number of users to be served simultaneously.
- Level of user interactivity expected or required.
- Cost.
- Content Management requirements.
- Other uses beyond serving video.

Ideally, you should devote the systems to asset serving and avoid running other applications. This offers the highest service quality and the most simultaneous streams. Multiple data pumps also provide a higher level of availability. They can stream independently in order to serve more clients simultaneously.

Option 1 is the least costly. You can use this system configuration as both a Web server and a small video stream server. Special controls allow the system administrator to configure the system for both Web serving and other non-video related service.

Choose option 2 if you anticipate any of the following requirements:

- Additional data pumps
- A high interactivity level
- Heavy non-video Web serving

Also, keeping the control server and presentation formatter on different machines provides the following advantages:

- Each system can handle more transaction throughput than if both servers occupied one machine.

VideoCharger Server for AIX

- The controller can run multiple data pumps to provide a quicker response time.
- The presentation formatter server can process other HTTP requests while the controller and data pump focus on asset delivery.

If you plan to install a performance monitoring tool such as PTX[®] manager, install it on a separate machine for best results. See "Monitoring VideoCharger performance" in the *Administrator's Guide and Reference* for more information.

Understanding additional data pumps

The control server can control multiple data pumps and balance video requests across them. For this load balancing and overall content management to work properly, the data pumps need identical content. Therefore, data pumps need to be configured with the same amount of disk space.

VideoCharger automatically copies content across all data pumps. If you add a new data pump to an existing VideoCharger complex, the system automatically "clones" an old data pump onto the new one. Also, content loaded onto the VideoCharger complex replicates across every data pump. This can consume some time depending on the data pump quantity and asset size.

Requirements for the VideoCharger Server

This section describes the hardware, software, and network requirements for a VideoCharger Server on AIX, as well as a method for determining both memory and bandwidth requirements.

Hardware requirements

Each component of the AIX VideoCharger Server must be installed on one of the following machines:

- RS/6000[®] POWER, POWER2, or PowerPC[®] uniprocessor
- SMP
- SP[™] 233 Mhz system

Each machine requires the following hardware:

- At least 160 MB of memory for the VideoCharger Server.
- At least 128 MB of memory for all VideoCharger applications.
- A disk for the content storage file system: either SCSI or SSA (the disk or disks must be completely unused and not part of any existing volume group). For best performance, use a dedicated disk and disk controller.
- Network adapter cards: either Micro Channel[®] or Peripheral Component Interconnect (PCI).

Software requirements

The VideoCharger Server on AIX requires the following software:

- AIX Version 5.1 or higher with the following required PTFs (program temporary files):
 - U478798 bos.rte.libc 5.1.0.2
 - U477368 bos.mp 5.1.0.1
 - U477367 bos.mp64 5.1.0.1
 - U477366 bos.up 5.1.0.1
 - U476469 bos.sysmgt.smit 5.1.0.10
 - U476362 bos.rte.install 5.1.0.10
- Web server software such as:
 - Apache 1.3.9 or higher (install into /usr/local/apache directory for automatic configuration)
 - IBM HTTP Server 1.3.12.2 or higher
 - IBM Internet Connection Server 4.2.1 or higher
 - IBM Lotus® Domino™ Go Webserver for AIX (ICS)
 - Netscape FastTrack Server

If you use Netscape FastTrack Server or a Web server that is not listed above, you must manually configure it.

- License Use Management as provided in the AIX operating system CD-ROMs as run-time code ifor_ls.base.cli 5.1 or higher, previously known as Network License System (NetLS).
- License Use Management Runtime Libraries bos.rte.ifor_ls 5.1 or higher.
- DCE Client Version 3.1 or higher.

Important: If you chose to divide your VideoCharger Server across two machines, install each of the component's required software according to Figure 2 on page 18 or Figure 3 on page 19.

Optional software

The VideoCharger Server for AIX accommodates the following software:

- AIX Java Developer Kit (JDK) 1.3.0 or higher, if you have the Multimedia ArchiveVideoCharger and are using the IBM-supplied presentation formatter (**iscpfhom**) to play assets directly from the Archive (offline assets).

The AIX JDK is available from the AIX installation CD-ROMs and from the following Web site: <http://www.ibm.com/java/jdk/download>.

- IBM Content Manager Version 7.1 or higher.
- IBM DB2 Universal Database™ Version 6.1 or higher.
- VideoCharger Extender for DB2 Universal Database. For best performance, install on the same machine as your DB2 Universal Database.
- General Parallel File System (GPFS).

VideoCharger Server for AIX

FTP requirements

FTP connections require a valid FTP server, that supports the size command, on the client machines. For example:

- AIX FTP daemon.
- Microsoft FTP for Windows NT 4.0 Server with Service Level 5.
- Microsoft FTP for Windows NT 4.0 Workstation Option Pack Level 3.
- Hummingbird[®]'s FTP service.
- War FTP Daemon (available as Windows freeware from <http://jgaa.com>).
- Microsoft FTP service for Windows 2000.

Attention: Microsoft FTP service for Windows 4.0 *Workstation* with Service Level 5 will *not* work.

Determining memory requirements for VideoCharger

This section provides general information about the memory requirements of each VideoCharger component on AIX. A number of variables, each discussed in the following component subsections, impact the amount of memory required.

If all components are to run on one machine, you must add the requirements together to create a total memory requirement.

Requirement: If you are running the Common Desktop Environment (CDE) on your AIX server, you need between 32 and 48 MB of additional memory.

System-level examples

Table 4 provides conservative examples involving machines that are not memory-constrained. The examples include a graphics console and memory required by AIX. See “Deciding the best VideoCharger Server configuration” on page 17 for a description of the configuration options.

Table 4. Three VideoCharger configuration options

Configuration	Number/Type of streams	Memory required
All components on one AIX Server (RS/6000 43P/C20)	170 at 22.7 Kbps	192 MB
All components on one AIX Server (RS/6000 595)	170 at 384 Kbps 80 at 1.5 Mbps	256 MB
A controller/presentation formatter server on AIX (RS/6000 43P) supporting two data pumps on AIX (two RS/6000 59H)	40 at 22.7 Kbps 60 at 1.5 Mbps	128 MB for the controller/presentation formatter server; 192 MB for each data pump

Controller

The controller software includes both the control server and the application server. For a lightly loaded controller (for example, 10 concurrent streams), allot 15 MB of memory. For a more complex, heavily loaded controller, allot 60 MB of memory.

More than 60 MB might be required for very large, complex systems where one controller serves a large number of data pumps and controls extensive content.

Presentation formatter server

To calculate the memory required for the presentation formatter server, add 10 MB of memory to the base requirement for your Web server (this base requirement depends on the Web server you use, and your use of that server).

Data pump and file system

The data pump memory requirement depends on the number (and bit rate) of streams that would run simultaneously. Allot 20 MB of memory for a lightly loaded system, and 60 MB for a heavily loaded system.

Determining AIX file system requirements

For VideoCharger Version 8.2, the General Parallel File System (GPFS) offers the best performance and scalability. See *AIX System Management Concepts: Operating System & Devices* and *AIX System Management Guide: Operating System & Devices* for information about setting up your AIX file system.

Other file systems include:

Journalled File System (JFS)

Both JFS and enhanced JFS work best for low to medium throughput configurations. A large-file-enabled JFS, such as enhanced JFS, accommodates VideoCharger better than a standard JFS. Because VideoCharger files are typically large, the enhanced JFS's block allocation strategy handles them more appropriately. Do not use compressed JFS because it needlessly slows down VideoCharger performance (because video data is already compressed).

Multimedia File System (MMFS)

Previous versions of VideoCharger exclusively used MMFS because of its ability to handle high throughput configurations. For Version 8.1, VideoCharger can now store assets using any file system, not just MMFS.

Determining disk bandwidth requirements

To determine the amount of disk bandwidth required, use (a) the number and rate of streams to be played at peak times, and (b) any content-loading requirement. For example, to support a stream total of 40 Mbps, you need a disk or disks with a total bandwidth of 5 MBps (40 Mbps divided by 8 bits per byte).

Determine disk subsystem bandwidth as described below:

Disks Vary from 1.2 MBps to 5 MBps. Newer IBM disks—2.2 GB and 4.5 GB disks—have better qualities for playing video. These include shorter, interruptible self-test periods.

Because media files are typically large, you can achieve better performance by using:

- Larger physical partition sizes for volume groups.
- Larger block sizes for file systems.

Using larger partitioned block sizes reduces the number of device I/O operations.

Table 5 shows example disk speeds for a 32 KB block file system and a 256 KB block file system:

Table 5. Sample SCSI disk speeds

SCSI type	32KB block size	256KB block size	Sequential throughput (for reference)
SCSI I 2 GB disks	1.2 MBps	2.8 MBps	3.75 MBps
SCSI II (Fast/Wide), SSA	1.8 MBps	5.0 MBps	6.9 MBps

For higher bit rates, 256 KB block sizes are recommended. Because performance varies, the best way to ascertain available bandwidth is to configure the disk as a stripe group. VideoCharger stores file system bandwidth information in `/var/avs/config/pg.cfg` (except for MMFS, which manages its own bandwidth).

Disk adapter

SCSI Appropriate for low to medium throughput configurations:

- SCSI I and SCSI-2 8-bit maximum: approximately 6 MBps
- SCSI-2 (Fast/Wide) 16-bit maximum: approximately 12 MBps

SSA Appropriate for over 100 Mbps MCA or PCI systems, or when more connectivity is required. The Enhanced SSA adapter can support up to 30 MBps with sufficient disks.

Bus (MCA or PCI)

For MCA machines, a single MicroChannel might become a bottleneck over 100 Mbps with SCSI adapters for disk I/O. If only one MicroChannel bus is available, SSA disk subsystems are recommended.

Redundant Array of Independent Disks (RAID)

SCSI RAID-5 are supported. RAID subsystems provide data loss protection in case of disk failures. This is often highly desirable in a video-serving environment. These subsystems can have glitches when failures occur, and throughput during reconstruction or rebuilding might not be sufficient to sustain all streams. The ability to provide data during reconstruction depends on the RAID hardware and software implementation. Some RAID subsystems can be tuned.

Determining your disk storage requirements

As your storage needs change, you might need to order additional disks, or data pumps. The amount of multimedia content you can store at any given time is determined by the number of disks and the bit rate and length of assets.

Table 6 on page 26 shows the amount of disk storage required for various bit rates versus various video lengths. The rows depict the stream bit rates. The first row is for low bit rate (LBR) audio only. The next five rows are other examples of LBR with the 22.7 Kb rate useful for serving Internet clients with 28.8 baud modems. The next two (1.5 and 2.0 Mbps) are typical MPEG-1 rates (1.5 for USA and 2.0 for European countries).

The columns depict various program lengths with 30 seconds being typical for a commercial, one hour for a prime-time program, and two hours for a film.

For example:

- 30-second commercial at 3 Mbps requires 11.3 MB
- 1-hour program at 384 kilobits per second (Kbps) requires 173 MB
- 2-hour program at 1.536 Mbps requires 1.38 GB

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Table 6. Disk storage requirements

Rate bits per second	Bytes per...				
	1 second	30 seconds	1 minute	1 hour	2 hours
6.4 K	800	24 K	48 K	2.88 M	5.76 M
22.7 K	2.05 K	61.5 K	123 K	7.38 M	14.8 M
64 K	8 K	240 K	480 K	28.8 M	57.6 M
128 K	16 K	480 K	960 K	57.6 M	115 M
256 K	32 K	960 K	1.92 M	115 M	230 M
384 K	48 K	1.44 M	2.88 M	173 M	346 M
1.5 M	192 K	5.76 M	11.5 M	691 M	1.38 G
2.0 M	250 K	7.5 M	15 M	900 M	1.8 G
3.0 M	375 K	11.3 M	22.5 M	1.3 G	2.7 G
4.0 M	500 K	15 M	30 M	1.8 G	3.6 G
6.0 M	750 K	22.5 M	45 M	2.7 G	5.4 G

Notes:

- This table assumes:
 - 1 K bits/bytes = 1,000 bits/bytes
 - 1 M bits/bytes = 1,000,000 bits/bytes
 - 1 G bits/bytes = 1,000,000,000 bits/bytes
- The estimates of disk storage do not include the small fraction of additional space required to store file system metadata.

Engineering network capacity

This section provides information to help you plan your network. A network engineer should handle network capacity planning.

Video serving is a resource-intensive application. Because it uses isochronous workload, data must be fed at a prescribed rate or end users will see glitches in the video. Networks that carry data from the server to the client must be engineered to handle this heavy, isochronous workload. This makes planning a VideoCharger complex and network very important.

Video streams can consume large amounts of bandwidth. Features and capacity of both server and network (including routers, bridges, switches, and interfaces) impact the streams.

Attention: You should not exceed 60% of the maximum interface bandwidth. For example, if using a 10 Mb Ethernet, you should run the interface at 6 Mb.

Admission control

The VideoCharger admission controls (see “Admission control” on page 56) only apply to the multimedia network traffic or the content loading under the direct control of the Server. General TCP/IP network traffic such as electronic mail, telnet, ftp, NFS, and X are not subject to admission control.

The network designer must ensure that general network traffic does not interfere with multimedia delivery. VideoCharger can be configured so that multimedia content only uses a percentage of the network interface. For example, you can designate 3 Mb of a 10 Mb Ethernet for multimedia and leave the remaining interface bandwidth for general network purposes.

Balancing TCP/IP traffic load

The VideoCharger Server uses standard IP routing to determine which network interface serves as a particular multimedia client. The network administrator can use standard IP routing procedures to balance and distribute multimedia networking loads (see detailed information on TCP/IP configuration and routing in *AIX System Management Guide: Communications and Networks*).

The administrator can also use the same tools to manage both multimedia and general IP networking loads. VideoCharger does not override IP routing decisions. For example, if a server has two Ethernet networking interfaces but all of the multimedia clients are routed on one interface, multimedia traffic is transmitted only on this interface. Similarly, a multimedia client can be denied admission to the Server even though some other interface has excess bandwidth. This occurs when the IP route (specified for the Server to communicate with a particular client) has reached its configuration bandwidth limit.

VideoCharger uses the standard TCP/IP routing table to determine which interface video streams are transmitted. For both AIX and Windows Servers, TCP/IP routing tables maintain one entry (route) per destination at most. It is also not dependent on whether static or dynamic routes are used, and, if dynamic routing is enabled, it is not dependent on the routing protocol used.

Exception: If dynamic routing is enabled and OSPF is the routing protocol, a route for each Type of Service can be maintained. With OSPF, multiple routes to the same destination network or host can be maintained for different types of service. However the VideoCharger does not manipulate the Type of Service (TOS) field of the IP header and therefore all traffic is sent as normal service.

Example: TCP/IP routing behavior

Suppose that a client with address 9.2.35.123 requests a stream from a Server that has 2 interfaces with TCP/IP addresses 9.2.30.234 and 9.2.50.15.

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You can display the Server's routing table by typing the command `netstat -rn`. Suppose the routing table on the Server looks like this:

Route Table

Active Routes:

Network Address	Netmask	Gateway Address	Interface	Metric
0.0.0.0	0.0.0.0	9.2.50.2	9.2.50.15	1
9.2.30.0	255.255.255.128	9.2.30.2	9.2.30.2	1
9.2.30.234	255.255.255.255	127.0.0.1	127.0.0.1	1
9.2.30.255	255.255.255.255	9.2.30.234	9.2.30.234	1
9.2.50.0	255.255.255.128	9.2.50.15	9.2.50.15	1
9.2.50.15	255.255.255.255	127.0.0.1	127.0.0.1	1
9.2.50.255	255.255.255.255	9.2.50.15	9.2.50.15	1
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
255.255.255.255	255.255.255.255	9.2.50.2	9.2.50.2	1

According to this configuration, clients that use 9.2.30 as the first three octets of the TCP/IP address would route over 9.2.30.234. Clients that use 9.2.50 as the first 3 octets of the TCP/IP address would route over 9.2.50.15. Clients whose address did not fall into either of these categories would be routed over the default route, which in this example would be 9.2.50.15. This would apply even for a fully-connected network where either interface could actually reach the client.

If this behavior is not desired, static routes can be configured to specify how traffic should be routed. However, note that all TCP/IP traffic will be routed according to the routing tables, not just VideoCharger traffic.

Example: Balancing TCP/IP traffic load for evenly distributed client requests

Suppose the clients who will be streaming the video are on subnets 9.2.30.0, 9.2.50.0, 9.2.35.0, and 9.2.40.0. Also, suppose that, at any one time, the client requests will likely distribute evenly among clients who are on each of these subnets. The following command can add a route so that requests from clients on 9.2.35.0 will also be routed through the 9.2.30.234 interface:

```
route add -host 9.2.35.0 -netmask 255.255.255.0 -interface 9.2.30.234
```

Since 9.2.50.15 is the default route, you do not need to add a route for clients on the 9.2.55.0 subnet.

Attention: If you reboot, you must issue the command again.

Example: Balancing TCP/IP traffic load for unevenly distributed client requests

Suppose that the clients on subnets 9.2.30.0, 9.2.35.0, 9.2.50.0 and 9.2.55.0 get distributed as follows: 25% of the traffic on 9.2.35.123, 25% on the 9.2.30.0 subnet, and the remaining 50% of the traffic evenly distributed among the

other clients. In this case, adding a route for the subnet 9.2.35.0 would not evenly distribute the load. Instead, the route should specify only traffic which was destined for 9.2.35.123. The command to add a route for a specific host is:

```
route add -host 9.2.35.123 -interface 9.2.30.234
```

In this command, the mask is not specified and therefore defaults to 255.255.255.255 which indicates the entire address must be matched if this route entry is to be applied. In other words, this is a route for a specific host.

Attention: If you reboot, you must issue the command again.

For additional details on the route command, enter `route ?`.

Dynamic path maximum transmission unit discovery

Dynamic Path maximum transmission unit (MTU) Discovery ensures the use of the largest MTU size (or packet size) that can be sent without fragmentation between the Server and client. This feature relieves network equipment of the burden of video packet fragmentation. For example, an asynchronous transfer mode (ATM) can use up to 9180 bytes per packet. If the ATM is used to connect a VideoCharger to a switch (which in turn connects to an ATM client), the VideoCharger efficiently uses an MTU size of 9180 bytes per packet.

However, if the ATM communicates with a router that then connects to Ethernet-based clients, the Dynamic path MTU Discovery feature detects the MTU size of 1500 bytes per packet. The server then sends only 1500-byte packets, thus saving the router from fragmenting the video packets.

Although the MTU size of 1500 bytes versus 9180 bytes consumes approximately double the amount of CPU on the data pump, having the correct packet size sent from the server has a positive effect on the network.

Figure 4 on page 30 reflects the example described above, and shows how path MTU ensures that the data pump generates the correct packet size.

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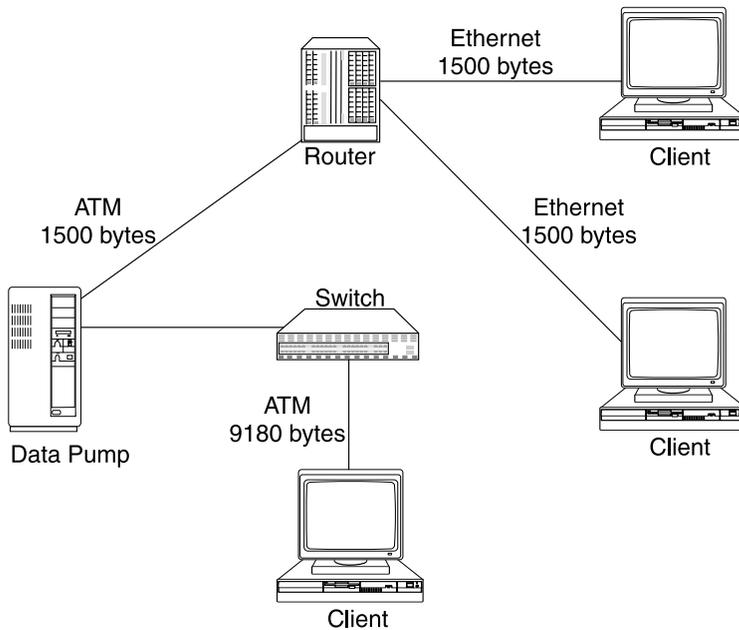


Figure 4. Using MTU to ensure the correct packet size

Enabled by default, path MTU can be disabled using the `no` command (see the "no command" in the *Administrator's Guide and Reference*). If the routers and other network equipment can efficiently handle fragmentation themselves, you can maximize data pump efficiency by disabling path MTU.

Chapter 4. Installing VideoCharger on AIX

VideoCharger for AIX installs from *bundles*, allowing you to install the main VideoCharger Server components (presentation formatter, controller, data pump) onto either one AIX machine or separate ones.

Apache users only: To automatically configure the Apache Web Server in VideoCharger, install Apache into the `/usr/local/apache` directory before installing VideoCharger. If you plan to install the presentation formatter and controller onto separate machines, install Apache into the `/usr/local/apache` directories of both machines.

To install VideoCharger, complete the following steps:

1. "Installing the VideoCharger bundles"
2. "Adding more data pumps" on page 35 (if applicable)
3. "Registering VideoCharger on AIX" on page 35 (optional)

To upgrade to a new release of VideoCharger, skip to Chapter 5, "Upgrading to a new VideoCharger version on AIX", on page 37. To update VideoCharger, see "Updating VideoCharger on AIX" on page 39.

Installing the VideoCharger bundles

This section describes how to use the System Management Interface Tool (SMIT) to install VideoCharger bundles. You can also use the Visual System Management application, which you invoke by entering `xinstallm -ez` from within AIX windows or the AIX Common Desktop Environment. For more information about either of these tools, see *AIX System Management Guide: Operating System and Devices*.

Attention: `smit install_all` and equivalent commands cause the error: missing requisite "install.using.bundles.instead 20.15.4.4" and blocks the installation of the VideoCharger Server and Multimedia Archive on the same machine. If you get this error, remove VideoCharger and then re-install using bundles.

Complete the following steps to install the VideoCharger Server on an AIX machine. If you want to divide the VideoCharger components across multiple machines (options 2 or 3), repeat these steps for each machine:

1. "Installing the Media-Defined bundle" on page 32
2. "Installing a VideoCharger component bundle" on page 33
3. "Verifying the VideoCharger installation" on page 34

VideoCharger Server for AIX

Installing the Media-Defined bundle

After installing all required software from “Software requirements” on page 20, you must install a Media-Defined bundle on your AIX machine by completing the following steps:

1. Log in to your AIX system as root.
2. Enter `locale` at the command line to verify that VideoCharger supports your language. The variable `LANG` must equal one of the following supported languages (mixed case important): `en_US`, `Ja_JP`, `ko_KR`, `Zh_TW`, `zh_CN`, `pt_BR`. If the variable does not match, see “Solving international language problems” on page 71.
3. Enter `smit install` at the command line. The Software Installation and Maintenance menu opens.
4. Select **Install and Update Software**. The Install and Update Software menu opens.
5. Select **Install Software Bundle**. The Install Software menu opens.
6. Press **List**. The INPUT device/directory for software menu opens and lists your available input devices or directories.
The input device is the CD-ROM drive that you are using to install the software. The input directory would be the directory on your system containing software for installation (for example, the `/usr/sys/inst.images` directory).
7. Select an input device or directory. The device or directory that you select then appears in the **INPUT device/directory for software** field.
8. Press **OK**. The Select a Fileset Bundle menu opens.
Tip: If you are installing from CD-ROM, the CD-ROM device must be mounted to a CD-ROM file system. SMIT automatically creates this mount point for you. If you install from the command line using the `installp` command, however, you must specify the directory on which the CD-ROM is mounted using the `installp -d cd_mountpoint` command. For example, `installp -d /cd`.
9. Select **Media-Defined**. The Install Software menu opens.
Caution: If the PTF requirements (from “Software requirements” on page 20) are not installed prior to completing this step, the install will fail unpredictably.
10. Toggle **ACCEPT new license agreements** to **yes**. If you want to view the VideoCharger license first, toggle **Preview new LICENSE agreements** to **yes**.
11. Press **OK** twice. The Command Status window opens and displays installation progress.
12. Check that your **Command: status** indicates OK and press **Done**.

13. Press **Back** twice to return to the Install and Update Software menu. If the **Command: status** indicated failed, repeat the steps in this section to re-install.

Installing a VideoCharger component bundle

After installing the Media-Defined bundle, pick which VideoCharger component bundle that you need to install according to the type of machine in your configuration. Table 7 displays the types of bundles available.

Table 7. Installation bundles

Bundle	Install when using:
Video-Server-All (all components except Video Archive, which you must install on a separate AIX machine)	Option 1 (one machine)
Video-Pres-Formatter	Option 2 (machine 1)
Video-Controller	Option 2 (machine 2)
Video-Data-Pump	Either option (for additional storage)
Video-Archive	Multimedia Archive feature (separate machine)

To install the VideoCharger bundle or bundles that you selected:

1. From the Install and Update Software menu, select **Install Software Bundle**. The Install Software menu opens.
2. Select an input device or directory. The device or directory you select then appears in the **INPUT device/directory for software** field.
3. Press **OK**. The Select a Fileset Bundle menu opens.
4. Select the bundle or bundles that you want (you can press Page Up, Page Down, or the arrow keys to scroll through the list). The Install Software menu opens.

If installing the Video-Archive bundle, dedicate a separate AIX machine to it. See Chapter 14, “Integrating the VideoCharger AIX Multimedia Archive”, on page 125.

5. Toggle **ACCEPT new license agreements** to **yes**. If you want to view the VideoCharger license first, toggle **Preview new LICENSE agreements** to **yes**.
6. Verify whether you want to keep the remaining default installation settings. You can access SMIT online help for each individual field. To toggle a setting between **yes** or **no**, press **List**.

To preview the results of the installation before actually installing the software (strongly recommended), toggle **PREVIEW only? (install operation will NOT occur)** to **yes**. The preview information indicates any software that is required for the software that you are installing.

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7. When you are satisfied with all of the settings, press **OK** twice. The Command Status window opens and displays installation progress.

If you set the preview function to **yes**, then the installation does not actually occur. In this case, press **Back** once to return to the Install Software menu and repeat this procedure with the preview function set to **no** when you want to install the software.

Verifying the VideoCharger installation

As SMIT installs the VideoCharger bundle, a Command Status window displays progress messages. When the installation finishes, the **Command: status** field in the Command Status window indicates either OK or failed.

OK means that the installation completed, though some filesets might not have installed successfully. Failed means that everything you requested was not installed. A preview installation always finishes with an OK status.

Review the message list for error messages, software products, and service updates that were not successfully installed. You can press the following keys to review the system message list:

Page Down

Shows the next window of text.

Page Up

Shows the previous window of text.

Up and down arrow keys

Moves through the message list line by line.

Tip: To review the list of messages at a later time, you can exit SMIT and review the `smit.log` file (`/smit.log` or `/home/user_id/smit.log`).

You can use the following procedure to correct any installation errors:

1. Look at the pre- and post-installation summaries at the end of the message list for any installation failures.

Requirement: You must re-install any bundle that is marked as FAILED, BROKEN, or CANCELLED.

2. Use the message list to determine problems and find what software products or service updates were involved. A common cause of failure is not meeting the requirements in "Software requirements" on page 20. Also, space limits might have been exceeded or the requirements might not have been met for some software. The system lists how much extra space is needed and what required software products or service updates to install.

3. If you need to re-install, see “Installing a VideoCharger component bundle” on page 33 and change the installation settings as appropriate. If there was not enough space to complete the installation, toggle **EXTEND file systems if space needed?** to **yes**.

When VideoCharger has installed successfully, remove the installation media from the directory or CD-ROM drive.

Adding more data pumps

To add another data pump, install the Media-Defined and Video-Data-Pump bundle on another AIX machine (that meets the requirements) using the directions in “Installing the VideoCharger bundles” on page 31. Repeat for each additional data pump that you want.

Then, you must license the additional data pumps (during installation, the concurrent nodelocked license only authorizes the data pump on the control server). To increase the number of licenses, enter this command from the controller machine:

```
/var/iform/i4b1t -U -v "IBM Corporation" -p "Content  
Manager VideoCharger" '8.1' -T #licenses
```

where *#licenses* represents the number of licenses.

If you configure an additional data pump without increasing the number of licenses, one of two errors occurs depending on what your VideoCharger policy is set to.

A soft stop VideoCharger policy (the default License Use Management configuration) will log a license error to `/var/adm/ras/avscs.log`, and allow the Server to continue operating. A hard stop VideoCharger policy will log a licensing error and then prevent the Server from starting (this is the only LUM error that will cause the Server to fail). To toggle between a hard and soft stop, enter this command:

```
/var/iform/i4b1t -U -v "IBM Corporation" -p "Content  
Manager VideoCharger" '8.1' -H yes|no
```

where *yes* is a hard stop and *no* is a soft stop.

Registering VideoCharger on AIX

After installing VideoCharger, you can register with IBM to learn about special offerings in the future. This is optional and requires a graphics capable terminal. To register, complete the following steps at the controller AIX command line:

1. Enter `/usr/lpp/avs/register/register.sh` to run the registration script.

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2. Enter your contact information.

The registration tool then sends your contact information to IBM.

Chapter 5. Upgrading to a new VideoCharger version on AIX

To upgrade to a new version of the VideoCharger Server for AIX, use the following recommended procedure:

1. Stop the VideoCharger Server by entering `stopsrc -g vs.`
2. Insert the CD-ROM into the drive.
3. Install VideoCharger using bundles (to get new filesets) as described in "Installing the VideoCharger bundles" on page 31.
4. Enter `smitty update_all` to upgrade any other optional filesets. The Update Installed Software to Latest Level (Update All) window displays.
5. Press F4 to select the CD-ROM drive.
6. Press Enter twice to confirm the update.

Using this procedure will ensure that you install all the new filesets and upgrade all the Version 7.1 optional filesets. Otherwise, `SMIT update_all` will not install new Version 8 bundles or optional filesets (if excluded from Version 7.1). If you decide to use only `SMIT update_all`, you can install the filesets from the CD-ROM. You can also install the Player from the `player` subdirectory on the CD-ROM or from <http://www.ibm.com/software/data/videocharger>.

Fileset packaging changes include `avs.lic` (license agreement files). This must be present to install, but is never installed itself. The obsolete filesets include:

- `avs.de.rsvp`
- `avs.html.<LANG>.ivs.client`

Moving from a Multimedia File System (MMFS) to a General Parallel File System (GPFS)

Although VideoCharger Version 8.1 still supports MMFS (even though it no longer ships with the product), it is recommended that you move your file system to GPFS (compatible with AIX Version 5.1) for better performance and scalability than MMFS. GPFS will be supported in future VideoCharger releases.

Warning: In order to preserve your assets, do not just upgrade MMFS to GPFS. You must either:

- Move your assets to a system that has GPFS.

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- Temporarily move your assets to another server (such as the AIX Multimedia Archive) and then replace MMFS with GPFS on the current VideoCharger Server.

If you decide to archive your assets to move to GPFS, you can use the following procedure:

1. Archive all your assets to the Multimedia Archive and then delete them from the VideoCharger Server. See Chapter 14, “Integrating the VideoCharger AIX Multimedia Archive”, on page 125 for information.
Important: do not use the `tstar` command.
2. Enter `smitty mmcs` on the VideoCharger Server to remove MMFS.
3. Uninstall MMFS and install GPFS. Create a GPFS file system in the same directory path as MMFS. See the GPFS documentation for information.
4. Stage all your assets back to the VideoCharger Server. See “Managing content in the Multimedia Archive” on page 133 for information.

Migrating asset names to unicode or to another locale

If you already have assets stored on the VideoCharger Server, you can migrate the asset names to unicode or another locale by completing the following steps:

1. Use the `vsupdate` command to rename your assets to names that only contain characters within the following sets: a-z, A-Z, 0-9, and punctuation characters (these character sets are common to all locales).
2. Enter `smiit` at the AIX command line and install the new AIX locale and messages from **System Environments** → **Manage Language Environment** → **Add Additional Language Environments**. Refer to Table 8 for locales codes.

Table 8. International Locale Code List

Locale Code	Unicode	Language
pt_BR	PT_BR	Brazilian Portuguese
Ja_JP	JA_JP	Japanese
ko_KR	KO_KR	Korean
zh_CN	ZH_CN	Simplified Chinese
Zh_TW	ZH_TW	Traditional Chinese

3. Enter `smiit install` at the command line and install the new VideoCharger locale and messages from **Install and Update Software** → **Install Software**. Refer to Table 8 for the locale codes.
4. Use the `vsupdate` command to rename your assets with locale-specific characters.

Configuring the Web browser to display unicode

Microsoft Internet Explorer automatically downloads the fonts necessary to display unicode correctly.

To enable the display of unicode Web pages in the Netscape Navigator browser, complete the following steps from the browser window:

1. Click **Edit** → **Preferences**. The Preferences window opens.
2. Expand **Appearance** and click **Fonts**.
3. In the **For the Encoding** list, select **Unicode**.
4. In both the **Variable Width Font** and **Fixed Width Font** lists, select or install a unicode font. For example, Arial Unicode MS which can be downloaded from Microsoft.
5. Click **OK** to save changes and close the window.

Updating VideoCharger on AIX

To keep VideoCharger up to date, make sure to download the most current fixes and drivers from:

<http://www.ibm.com/software/data/videocharger/support.html>

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Chapter 6. Initially configuring VideoCharger on AIX

The following sections describe the configuration process shown in Table 9 on page 42:

- “Introducing the VideoCharger user IDs”
- “Configuring the VideoCharger components” on page 42
- “Configuring VideoCharger for a firewall (if applicable)” on page 57
- “Testing your VideoCharger system” on page 58

Attention: VideoChargerVersion 8.1 will not function properly if your system uses a BSD style configuration on any of its networking subsystems.

Introducing the VideoCharger user IDs

During installation, VideoCharger creates four types of administrative user IDs:

vsadmin (AIX administration)

Authorizes all configuration, administration, and content loading tasks for any AIX machine that has VideoCharger installed on it. Because this user ID has no default password, you will have to set one as explained in “Configuring the VideoCharger components” on page 42.

vsloader (AIX administration)

Authorizes content loading tasks only, for any AIX machine that has VideoCharger installed on it. Because this user ID has no default password, you will have to set one as explained in “Configuring the VideoCharger components” on page 42.

vsadmin (Web server administration)

Authorizes all configuration, administration, and content loading tasks for your Web server. This user ID has a default password (for example, vsibm for the IBM Internet Connection Server). If you use a Web server other than one of those listed in “Software requirements” on page 20, you will have to create this user ID yourself using the directions in “Manually configuring the Web server (if applicable)” on page 46.

vsloader (Web server administration)

Authorizes content loading tasks only, for your Web server. This user ID has a default password (for example, vsibm for the IBM Internet Connection Server). If you use a Web server other than one of those listed in “Software requirements” on page 20, you will have to create

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this user ID yourself using the directions in “Manually configuring the Web server (if applicable)” on page 46.

Recommendation: To minimize confusion, set the *same* vsadmin and vsloader passwords for both your Web and AIX administration user IDs.

Configuring the VideoCharger components

As outlined in Table 9, initially configuring for AIX VideoCharger varies depending on how you installed the components.

Attention: VideoCharger Version 8.1 now automatically configures the DCE RPC client. You can customize the DCE RPC client configuration before or after installing VideoCharger by using the directions in “Configuring the DCE RPC client” in the *Administrator’s Guide and Reference*.

Table 9. Initially configuring for VideoCharger

Type of VideoCharger installation	Follow these configuration steps:
Option 1: One VideoCharger Server plus additional data pumps (if applicable)	For the VideoCharger Server, complete these steps: <ol style="list-style-type: none">1. “Configuring AIX” on page 432. “Creating the file system to hold your content” on page 463. “Configuring the Web server” on page 464. “Initially configuring the VideoCharger Server” on page 53 For each additional data pump (if applicable), complete these steps: <ol style="list-style-type: none">1. “Configuring AIX” on page 432. “Configuring the data pumps” on page 453. “Creating the file system to hold your content” on page 46

Table 9. Initially configuring for VideoCharger (continued)

Type of VideoCharger installation	Follow these configuration steps:
Option 2: Presentation formatter (Web server) and controller on two different servers plus additional data pumps (if applicable)	<p>For the presentation formatter, complete these steps:</p> <ol style="list-style-type: none"> 1. "Configuring AIX" 2. "Configuring the Web server" on page 46 3. "Initially configuring the VideoCharger Server" on page 53 <p>Then for the control server (with original data pump), complete these steps:</p> <ol style="list-style-type: none"> 1. "Configuring AIX" 2. "Configuring the Web server" on page 46 3. "Configuring the data pumps" on page 45 4. "Creating the file system to hold your content" on page 46 <p>For each additional data pump (if applicable), complete these steps:</p> <ol style="list-style-type: none"> 1. "Configuring AIX" 2. "Configuring the data pumps" on page 45 3. "Creating the file system to hold your content" on page 46

Configuring AIX

To support the VideoCharger software, make sure your AIX configuration has:

- Paging space that totals twice the amount of random access memory (RAM) on your system. To determine your current paging space, and change it if necessary, use the `smit pgspace` fast path to access the Paging Space menu. See the *AIX System Management Guide: Operating System and Devices* for more information about adding paging space.
- TCP/IP configured and running.
- An active "shell" `inetd` subserver (`/usr/sbin/rshd`) to configure VideoCharger.

Attention: You must have root authority to configure these AIX settings.

Setting passwords for the AIX user IDs

To set (or change) passwords for the AIX user IDs:

1. Log in as root.
2. Enter the following command:

```
pwdadm vsadmin
```
3. At the password prompt, enter a password for `vsadmin`.

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4. At the password verification prompt, enter the password again.
5. Enter the following command:

```
pwdadm -c vsadmin
```

-c indicates that the next user to log in with that user ID should not be prompted to change the password.

6. Enter the following command:

```
pwdadm vsloader
```

7. At the password prompt, enter a password for vsloader.
8. At the password verification prompt, enter the password again.
9. Enter the following command:

```
pwdadm -c vsloader
```

-c indicates that the next user to log in with that user ID should not be prompted to change the password.

Attention: If you change the password for vsloader after the data pump has been configured, you must change the vsloader password set in the data pump configuration. For example, to change the password for data pump dp0, enter:

```
chvsdp -l dp0 -w newpassword
```

Configuring VideoCharger on SP: To configure VideoCharger on an SP node that uses a Control Workstation to manage its user IDs, complete the following extra steps:

1. Create the vsadmin and vsloader users on the Control Workstation.
2. Set passwords for vsadmin and vsloader on the Control Workstation using the pwdadm command and then the pwdadm -c command.
3. Create rcmd.vsadmin and rcmd.vsloader kerberos principals on the Control Workstation with the kadmin program.
4. Create a .klogin file for vsadmin and vsloader users on the VideoCharger Server node.
5. Update password and group files on all nodes using the command:

```
dsh -av /var/sysman/supper update
```

Check <http://www.ibm.com/software/data/videocharger/support.html> for updates to this procedure.

Enabling multicast for AIX

To enable multicast for AIX, enter the command:

```
no -o ie5_old_multicast_mapping = 1
```

Configuring the data pumps

If you installed additional data pumps, you must create and edit an `.rhosts` file to allow the data pumps and controller to communicate. You must create this file on each data pump. VideoCharger automatically completes this step for the original data pump (on the control server).

To create and edit the `.rhosts` file:

1. Log in as `vsadmin` at the data pump.

Important: If you are already logged in as `root`, do not use `su vsadmin`. Instead, log off `root`.

2. Enter the following commands:

```
echo ControllerName root>> $HOME/.rhosts
echo ControllerName vsadmin>> $HOME/.rhosts
echo ControllerName.domain_name root>> $HOME/.rhosts
echo ControllerName.domain_name vsadmin>> $HOME/.rhosts
chmod 640 $HOME/.rhosts
```

where *ControllerName* is the fully qualified host name of the controller without the domain (you can determine this fully qualified host name by entering the `hostname` command at the controller) and *ControllerName.domain_name* is the host name with the addition of the domain name (if any). If no domain exists, you do not have to enter the two lines with *ControllerName.domain_name*.

3. Exit `vsadmin`.

Important: You must ensure that `rsh` properly works before proceeding any further. To verify the proper configuration of `rsh`, login to your controller using user ID: `vsadmin`, and enter:

```
rsh DataPumpHostname -l vsadmin ls
```

where *DataPumpHostname* represents your data pump host name (if all VideoCharger components are installed on a single machine, the *DataPumpHostname* will usually be the same as the controller host name). If this command returns any error, the subsequent VideoCharger configuration will fail.

If the `rsh` command fails, open the `$HOME/.rhosts` file to verify that the fully qualified host name of the controller is correct.

During installation, VideoCharger automatically inserts `DISABLE_AUTO_LRPC=1` into the `/etc/environment` file to disable the UNIX[®] stream socket communication for local remote procedural calls (RPC). This does not significantly impact DCE communication performance.

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Creating the file system to hold your content

VideoCharger version 8.1 still supports MMFS even though it no longer ships with the product. **Recommendation:** Move your file system to GPFS (compatible with AIX 5.1) for better performance and scalability than MMFS. GPFS will be supported in future VideoCharger releases.

For scalability, create a separate volume group and logical volume for your file system. For best performance, use a dedicated disk. See *AIX System Management Concepts: Operating System and Devices* and *AIX System Management Guide: Operating System and Devices* for more information.

After creating the file system, you must set the file permissions by entering the following commands:

```
chown root:vsasset content_mountpoint
chmod 2775 content_mountpoint
```

where *content_mountpoint* represents the mount point to store assets in. For example, /content. If permissions are not set correctly, VideoCharger will fail to create the stripe group and display the error message: Unable to access *content_mountpoint/filetotestVCpermissions*.

Configuring the Web server

VideoCharger automatically configures the following Web servers during the install process:

- Apache 1.3.9 or higher. **Attention:** VideoCharger can only configure Apache once it is installed in the /usr/local/apache directory.
- IBM HTTP Server 1.3.6.2 or higher
- IBM Internet Connection Server 4.2.1 or higher
- IBM Lotus Domino Go Webserver for AIX (ICS)

If you use any other Web server, you must manually configure it as described in “Manually configuring the Web server (if applicable)”.

To start (and stop) your Web server, see “Starting and stopping the Web server” on page 50. In addition, you might want to perform the following Web server configuration tasks:

- “Changing passwords for the Web administration IDs” on page 50
- “Making the VideoCharger home page your home page” on page 51

Manually configuring the Web server (if applicable)

This section describes the following tasks:

- “Manually configuring Netscape FastTrack server” on page 47
- “Manually configuring Apache” on page 48
- “Manually configuring any other Web servers” on page 49

Manually configuring Netscape FastTrack server: Requirement: You must have Netscape Navigator (or another browser) installed to complete configuration of the Netscape server.

Before running the configuration program, make sure that your mask is set to 022.

To configure the server, login as the root user and run the program `/usr/lpp/netscapeServer/fasttrack-us/ns-setup`. The product install into the `/usr/lpp/netscapeServer/fasttrack-us` directory. This directory also contains a short readme file.

The `ns-setup` program gathers basic information from you, then starts the Netscape Navigator browser so that you can configure the FastTrack Server.

In the Netscape Navigator browser, log in using the ID and password that you specified during initial setup for `ns-setup`. The Netscape Server Selector menu opens.

1. Select **Install a New Netscape FastTrack Server**.
2. Click **OK** at the bottom of the **Install a New Netscape FastTrack Server** menu. A message similar to the following message displays:

```
Success!  
Created new server jacob.siren.com, listening to port 80, serving  
documents from the /usr/ns-home/docs directory.
```

3. Select **Configure More about Your New Server** from the menu.
4. From the main menu bar, click **Access Control**. The Create User menu opens. Enter the following information:

```
Login Name: vsadmin  
Full Name: Video Server Administrator  
Password: vsibm  
Again: vsibm  
Group: (No groups have been created.)
```

```
Database: default
```

5. Click **OK**.
6. Repeat the previous two steps to create another user, using Login Name `vsloader`, with the same information. The full name for `vsloader` should be Video Server Content Loader.
7. From the main menu bar, click **Programs** → **CGI Directory** → **Add another CGI Directory**.
8. Enter the following information:

```
Web address prefix: http://hostname/vs_admin/cgi-bin  
CGI directory: /usr/lpp/avs/html/cgi-bin
```
9. Click **OK**, then click **Save and Apply**.

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10. Repeat the previous three steps to add `vs_public` as a CGI directory, with the following information:
Web address prefix: `http://hostname/vs_public/cgi-bin`
CGI directory: `/usr/lpp/avs/public/cgi-bin`
11. From the command line, change to either the `/usr/ns-home/docs` directory, or the directory that you have designated as the primary document directory.
12. Create the following two links:

```
ln -s /usr/lpp/avs/html vs_admin
ln -s /usr/lpp/avs/public vs_public
```
13. From the main menu bar, click **Access Control** → **Restrict Access** → **Wildcard**.
14. Enter `/usr/lpp/avs/html/cgi-bin/` and click **OK**.
15. Click **Turn on access control**.
16. In the **Restrict Access** menu, select **Read** → **Deny**, then click **Edit Permissions**.
17. In the **Allow Access to a Resource** menu, click **Allow Everyone in this User Database**, and then click **Done**.
18. Select **Browse**.
19. Select **Java**.
20. Click **Turn on access control**.
21. On the **Restrict Access** menu, select **Read** → **Deny**, then click **Edit Permissions**.
22. On the **Allow Access to a Resource** menu, click **Allow Everyone in this User Database**, and then click **Done**.
23. Click **Apply** in the top right corner of the form.
24. Click **Save And Apply**.
25. From the command line, stop the Netscape administration daemon by issuing:

```
cd /usr/ns-home
stop-admin
```

Recommendation: To accommodate time-consuming CGI-BIN routines, increase the timeout value in the Netscape FastTrack Server by appending `Init fn=init-cgi timeout=3600` in the `server_root/config/obj.conf` file.

For further information about installation and configuration, see the *Netscape FastTrack Server Administrator's Guide Unix*.

Manually configuring Apache: VideoCharger automatically configures any Apache 1.3.9 files installed into `/usr/local/apache`. If you install Apache 1.3.9 in any other directory, you must manually configure the files with these steps:

1. Execute these commands at the prompt to set authorization for Web server and create the password files:

```

/usr/bin/chgrpmem -m + nobody vsadmin
/usr/bin/chgrpmem -m + nobody vsasset
htpasswd -bc /var/avs/config/vspasswd vsadmin vsibm
htpasswd -b /var/avs/config/vspasswd vsloader vsibm
chmod 664 /var/avs/config/vspasswd
ln -s /usr/lpp/avs/html apachedir/htdocs/vs_admin
ln -s /usr/lpp/avs/public apachedir/htdocs/vs_public

```

where *apachedir* indicates the directory where Apache is installed.

2. Add the following directives to the end of httpd.conf:

```

<Files "vscfg_cgi">
  AuthType Basic
  AuthName Administrator
  AllowOverride None
  Order allow,deny
  Allow from all
  <Limit GET>
    require user vsadmin vsloader
  AuthUserFile /var/avs/config/vspasswd
  </Limit>
  <Limit POST>
    require user vsadmin
  AuthUserFile /var/avs/config/vspasswd
  </Limit>
</Files>

ScriptAlias /vs_admin/cgi-bin/ "/usr/lpp/avs/html/cgi-bin/"
ScriptAlias /vs_public/cgi-bin/ "/usr/lpp/avs/public/cgi-bin/"
Timeout 3600

SetEnv LANG language

```

where *language* is your language code such as en_US

3. Execute these commands to make the changes take effect:

```

apachectl stop
apachectl start

```

Manually configuring any other Web servers: To configure any other Web server, you would manually complete the following actions:

- Creating administration and content-loading IDs for the Web server (vsadmin and vsloader, respectively).
- Adding links to the CGI programs that provide access to the VideoCharger Configuration Web forms and the presentation formatters.
- Identifying the CGI program directories.
- Adding protection for the directories containing the CGI programs.

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- Changing the time-out value to 60 minutes to accommodate loading of large assets.

Normally, Web servers run under the user ID nobody. The Web server must belong to both vsadmin and vsasset groups to access VideoCharger programs. When VideoCharger configures a Web server, it automatically issues the following commands:

```
/usr/bin/chgrpmem -m + nobody vsadmin  
/usr/bin/chgrpmem -m + nobody vsasset
```

If you run your Web server under a different user ID or have a Web server that VideoCharger does not auto-configure, you must run chgrpmem to ensure that the user ID can access vsadmin and vsasset groups.

Additional information on Web server configuration is available on the World Wide Web:

- Internet Connection: <http://www.networking.ibm.com/icserver>
- Apache Web server: <http://www.apache.org>

Starting and stopping the Web server

Web Server Commands

	Lotus Domino Go and IBM ICS	Apache and IBM HTTP
start the Web Server	startsrc -s httpd	apachectl start
stop the Web Server	stopsrc -s httpd	apachectl stop
check status (see if server is running)	lssrc -s httpd	apachectl status

Changing passwords for the Web administration IDs

For all supported Web servers, VideoCharger creates default Web administration passwords for vsadmin and vsloader. It is a good idea to change these passwords so that they match with the AIX vsadmin and vsloader passwords (in order to minimize confusion).

Also consider changing the default Web administration passwords if:

- Your system is attached to a public network.
- You want to restrict certain roles to certain individuals.

Setting Web administration passwords for the IBM HTTP server: To create the password file vspasswd for your IBM HTTP server, log in as root and complete the following commands:

1. Enter:

```
/usr/HTTPServer/bin/htpasswd -c /var/avs/config/vspasswd vsadmin
```

to create the password file and prompt for your vsadmin password.

2. Enter:

```
/usr/HTTPServer/bin/htpasswd /var/avs/config/vspasswd vsloader
```

to prompt for your vsloader password.

3. Enter:

```
chmod 664 /var/avs/config/vspasswd
```

to set the permissions on the password file.

Setting Web administration passwords for Apache: To create a password file vspasswd for Apache, use the following commands at the AIX prompt:

1. Enter `htpasswd -bc /var/avs/config/vspasswd vsadmin password` to specify your vsadmin password.
2. Enter `htpasswd -b /var/avs/config/vspasswd vsloader password` to specify your vsloader password.

Setting Web administration passwords for the IBM Internet Connection Server and IBM Lotus Domino Go: To create a mandatory password file vspasswd for IBM Internet Connection Server and IBM , use the following commands at the AIX prompt:

1. Enter `/usr/sbin/htadm -passwd /var/avs/config/vspasswd vsadmin password` to specify your vsadmin password.
2. Enter `/usr/sbin/htadm -passwd /var/avs/config/vspasswd vsloader password` to specify your vsloader password.

Setting passwords for the Netscape FastTrack server: On the Netscape FastTrack Server, both vsadmin and vsloader can perform configuration, administration, and content-loading tasks. You can set and change passwords and user IDs for the Netscape FastTrack Server through **Access Control** on the Netscape Server Selector main menu. See “Manually configuring Netscape FastTrack server” on page 47 to set up initial password and IDs.

Making the VideoCharger home page your home page

If the VideoCharger runs on a dedicated machine, you might want to default your Web server home page to the configuration and administration forms. Your Web server displays the home page document whenever a client requests a Web address that does not point to a specific directory or file. For example, the Web server will return the default home page for a Web address of:

```
http://your-server-name/
```

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Because Web servers attempt to serve unspecific requests from the document root directory, you need to place your home page in this directory. At the default directory, the Web server seeks your home page file by matching the welcome pages (listed in the Web server configuration file) to the directory files. The Web server searches these welcome pages from top to bottom.

Typical names for default welcome pages include:

1. Welcome.html
2. welcome.html
3. index.html
4. Frntpage.html
5. home.html

To specify the VideoCharger admin page as your home page, add `vs_admin/admin/vs.html` to the top of your default welcome page list. To specify the VideoCharger public search pages as your home page, add `vs_public/cgi-bin/iscpfhom` to the top of your default welcome page list. Consult your Web server documentation for the proper syntax and configuration file to update.

For Netscape FastTrack Server, the default welcome page file names in their default order are:

1. index.html
2. home.html

For example, using Lotus Domino Go Webserver, the `index.html` file is used as your home page if you are using the default configuration and your document root directory does not contain a file named `Welcome.html` or `welcome.html`, but does contain files named `index.html` and `Frntpage.html`.

To change the default home page using Internet Connection Server as your Web server:

1. Open the `/etc/httpd.conf` file.
Requirement: If you are not using English as your language, edit the file found in `/etc/http/config/LANG/httpd.conf`, where *LANG* is your language.
2. Add the following line to the top of the list of welcome page file names:
`Welcome vs_admin/admin/vs.html`

This ensures that the `vs.html` file appears as the default home page.

Important: Restart your system before accessing the Configuration Web forms described in the following section.

Initially configuring the VideoCharger Server

After you complete the previous tasks described in Table 9 on page 42, you can access the online configuration interface on the VideoCharger home page.

This section describes the tasks that you must perform to get your VideoCharger software up and running. Although only the forms are discussed in this section, you can also configure the software using commands. See "System management commands" in the *Administrator's Guide and Reference* for information about these commands and the order in which they must be used for configuration.

Use the following Web address to view the forms:

`http://hostname/vs_admin/admin/vs.html`

where *hostname* is the IP host name of the VideoCharger. You are prompted for your ID and password.

After logging in, the VideoCharger Server graphic appears. Click it to open the main VideoCharger window.

1. Click **CONFIGURATION AND ADMINISTRATION**. The Configuration and Administration page opens the page in Figure 5 on page 54.

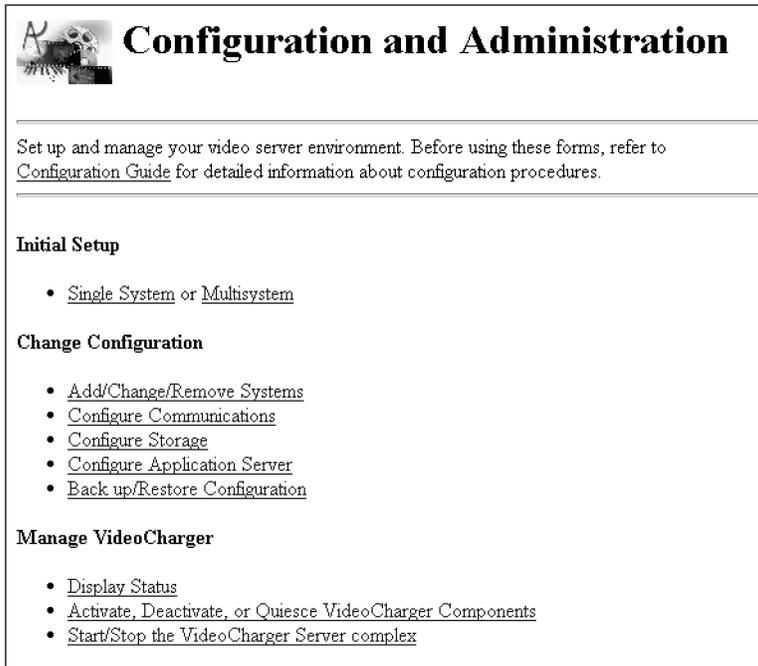


Figure 5. Configuration and Administration page

Attention: If you have additional data pumps (more than one), make sure you licensed them as instructed in “Adding more data pumps” on page 35.

2. Under **Initial Setup**, select the type of configuration that you have:

- If you installed all components on one system (Option 1, see “Deciding the best VideoCharger Server configuration” on page 17), click **Single System**. The host name of the controller then appears in the first field. Click **Continue**.
- If you have multiple systems in the complex, click **Multisystem**. Enter the appropriate host names for both the controller and the presentation formatter server (these names are assumed to be the same). You can enter a host name for an Archive if you are using an Archive system. This form does not configure the Archive system. Instead, see Chapter 14, “Integrating the VideoCharger AIX Multimedia Archive”, on page 125. Click **OK**.

Also, add the host name for each data pump to the system definition list. You must also enter the Content Management user ID and password.

If you have changed either the user ID or password that was set during the installation process for content loading, or are using another content-loading ID, enter the correct information in the fields provided.

3. In the **Content Storage Filesystem** list (single system) or field (multisystem), select or enter the file system path where you will store your VideoCharger assets.
4. Click **OK** to start configuration of all the components. Note that the "shell" inetd subserver (/usr/sbin/rshd) must be properly configured for this step to succeed.

For the data pumps, automatic configuration includes:

- a. Definition of the port group, which contains all the available ports.
- b. Creation of ports that comprise the port groups.
- c. Creation of an asset group, which contains the assets loaded on the Data Pumps. There can be one asset group for each VideoCharger complex.
- d. Creation of stripe groups, one per data pump. A stripe group is a container that defines the data pump on which an asset is stored.

Figure 6 shows a configured data pump, which is ready to have content loaded onto it.

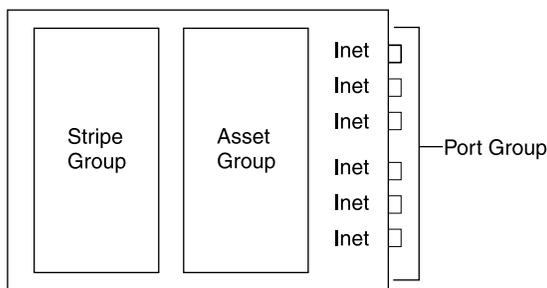


Figure 6. Configured data pump

Notes:

1. If the controller and presentation formatter server are on different machines, copy the ISC.INI file from /var/avs/config on the controller to the same directory on the presentation formatter server.
2. Restart the controller and presentation formatter server by selecting **Start/Stop the VideoCharger Server complex**, which is an option in the Configuration and Administration page.
3. Back up the configuration, which is an option in the Configuration and Administration page.

After the initial configuration is done, you can test the server using the client code to watch a sample video. See "Testing your VideoCharger system" on page 58 for more information.

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Configuring for optimal bandwidth

Bandwidth is set as part of the configuration of the data pump. During initial setup, default values are assigned for bandwidth. For the initial set up, accept the defaults. You can change them later if you find that they do not fit the needs of your environment.

To determine the bandwidth for your configuration, see “Determining disk bandwidth requirements” on page 24. Your system type and memory can also influence bandwidth.

Tip: Back up your configuration settings before adjusting your bandwidth.

Admission control

The controller performs admission control for three types of resources: ports, data pumps, and stripe groups. Admission control is based on the rate of real-time stream movement. With admission control, the system manages the available resources to maximize efficiency of the system.

Multiple interfaces (multi-home network connections) allow a single data pump to serve clients from multiple networks. If multiple data pumps are available, stream delivery is load-balanced across the configured data pumps.

For stripe groups, bandwidth is dynamically measured when you configure the file system. The more disks and disk controllers that you have, the higher the bandwidth. The stripe group’s bandwidth settings are kept in a performance group.

A common situation where you might choose to change the established limit is if you are doing extensive content loading and need not worry about the impact on the simultaneous serving of assets.

You can set a bandwidth limit at both the data pump and port level.

For each data pump, bandwidth limit is the maximum amount of CPU resources that you want dedicated to the delivery of assets. Requests that exceed a given port’s maximum, or the data pump’s maximum, are rejected.

For each port, the bandwidth limit represents the maximum bandwidth that all streams over the network interface can use. Setting such a limit helps the system avoid both overrunning and overcommitting the capacity of the network adapter or downstream network capabilities. You can set bandwidth differently for each port, based on that port’s function. For example, you might set the limit lower for a port that handles content loading and playing. You might also set this as a temporary limit under unusual circumstances.

If no data pump bandwidth limit is set, bandwidth limit is essentially turned off. However, other admission control factors (such as the stripe group or port bandwidth) take over at that point, so that the system is never without some form of admission control. If no port bandwidth limit is set, the bandwidth limit for the port is set to the maximum bandwidth (for example, for 10BaseT Ethernet, this is approximately 10 Mbps).

There are two main scenarios under which you would modify your bandwidth limit:

- If the complex is serving more than multimedia, you can use bandwidth to dedicate a certain percentage of the Server's processor to serving multimedia (as opposed to general Web serving). For example, if your system, configured as Option 1, were capable of delivering 60 Mbps of video at maximum capacity, you might want to set the data pump bandwidth limit to 30 Mbps. This would allow the system to serve 20 streams of 1.5 Mbps MPEG-1, but still allow enough CPU cycles for other non-video related service (such as general purpose Web serving).
- The second scenario involves determining bandwidth for a VideoCharger in a complex environment. For example, while a data pump can be capable of streaming data at 10 Mbps, the data pump might connect to a router that is capable of only 1.5 Mbps. In this case, you'll want to either take the lowest common denominator or experiment to determine the maximum throughput of your configuration.

Figure 7 shows a complex configuration. In this configuration, you might set the port bandwidth limit to 3 Mbps (or less) to prevent the outgoing video from overwhelming the two T1 interfaces.

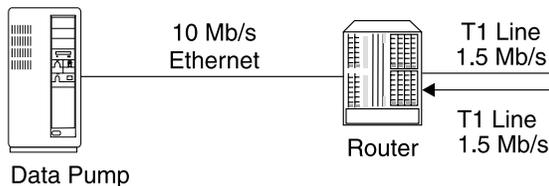


Figure 7. Determining bandwidth in a complex environment

Configuring VideoCharger for a firewall (if applicable)

To enable video streaming through a firewall, open the following port numbers:

Port numbers	Protocol	Affected component	Usage
80	TCP	Presentation formatter and controller	Web browsing, HTTP streaming

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Port numbers	Protocol	Affected component	Usage
8500	TCP	Controller	Non-QuickTime streaming session setup and control
554	RTSP	Controller	QuickTime streaming session setup and control
5000–65535	UDP	Data pump	UDP streaming (randomly selected port pairs, one pair per video stream)
5000–65535	TCP	Data pump	TCP streaming (randomly selected port pairs, one pair per video stream)
4324	TCP	Data pump	Video content loading (can be changed)

In AIX, you can restrict the UDP/TCP port range using the `no -o` command. For example, to limit start and end port values to 5000 and 5500 respectively, enter these commands:

```
no -o tcp_ephemeral_low=5000
no -o tcp_ephemeral_high=5500
no -o udp_ephemeral_low=5000
no -o udp_ephemeral_high=5500
```

To list these port value limits, enter:

```
no -a | more
```

These settings will disappear whenever the machine is restarted, so insert these commands in a startup script to preserve the settings.

Configuring VideoCharger to support Network Address Translation (NAT) (if applicable)

If you use NAT, you must configure VideoCharger to use a real client IP address rather than the altered one that NAT provides. To configure VideoCharger to support NAT:

1. Open `/var/avs/config/ISC.INI` and at the bottom of the file, change `APP_SERVER_NAT=OFF` to `APP_SERVER_NAT=ON`. Save the file and exit.
2. Stop the VideoCharger Server by entering `stopsrc -cg vs.`
3. Restart the VideoCharger Server by entering `startsrc -cg vs.`

Testing your VideoCharger system

To test your new VideoCharger system, add a sample video from your `/usr/samples/avs/content` directory into the Server and then stream the video into the VideoCharger Player by completing the following steps:

- “Adding a sample asset into the VideoCharger Server” on page 59
- “Streaming a sample video to the VideoCharger Player” on page 61

Adding a sample asset into the VideoCharger Server

To load a video asset onto the data pump:

1. Log in to your admin Web page at `http://hostname/vs_admin/admin/vs.html` in your Web browser, where *hostname* represents the host name of your VideoCharger Server.
2. Click **CONTENT MANAGEMENT**. The Content Management page opens.
3. Click **Manage Content**. The Manage Content page opens. opens (see Figure 8). **Add a new asset** is the default operation.

Content Management

Select the function to perform, enter the required information, then click on the Continue button to proceed.

Add a new asset
 Modify information for an existing asset
 Delete an asset
 Stage an asset
 Export existing asset
 List existing assets

Ignore errors and continue processing. (USE WITH EXTREME CAUTION)

Asset Name:

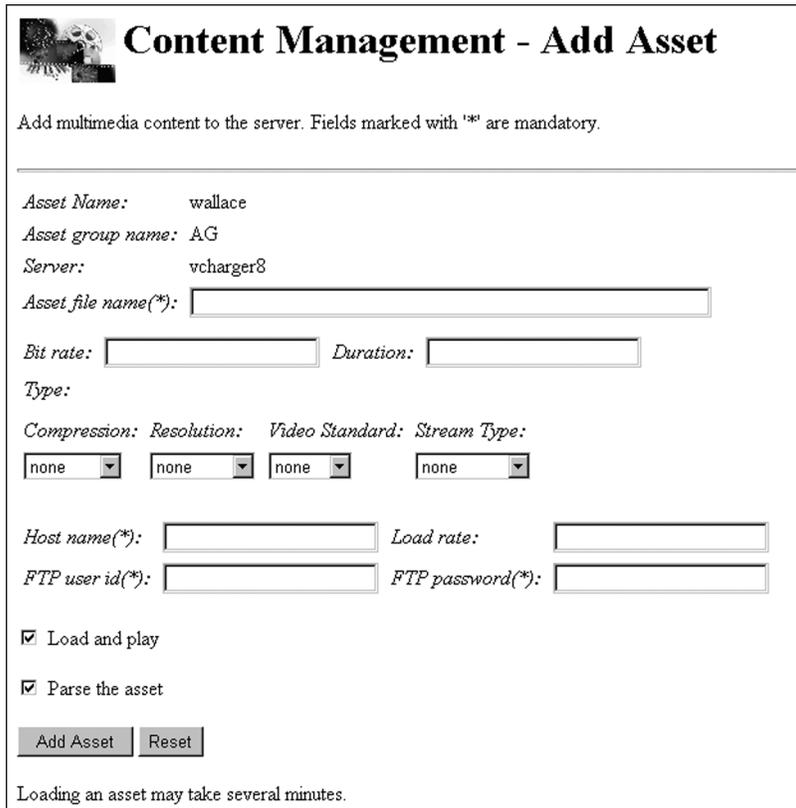
Continue Reset

Figure 8. Content Management form on AIX

4. In the **Asset Name** field, type in what you want to name the newly loaded asset. For example `sample_mpg`.

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- Click **Continue**. The Content Management - Add Asset page opens (see Figure 9).



Content Management - Add Asset

Add multimedia content to the server. Fields marked with '*' are mandatory.

Asset Name: wallace
Asset group name: AG
Server: vcharger8
Asset file name(*):
Bit rate: Duration:
Type:
Compression: Resolution: Video Standard: Stream Type:

Host name(*): Load rate:
FTP user id(*): FTP password(*):
 Load and play
 Parse the asset

Loading an asset may take several minutes.

Figure 9. Add Asset Page for AIX

- Complete the fields marked with an asterisk (*). For the **Asset file name** field, type a video path from your /usr/samples/avs/content directory such as /usr/samples/avs/content/sample11.mpg.
- You can also select the following options:

Load and play

This option simultaneously streams the asset while it loads into the data pump. It is recommended for large media files.

Parse the asset

This option automatically sets the asset attributes. For example: bit rate, duration, compression, resolution, video standard, and stream type.

- Click **Add Asset** to add the asset to the data pump. The controller's catalog is updated with the information associated with the asset.

Streaming a sample video to the VideoCharger Player

To stream a sample video from the VideoCharger Server to the Player, complete the following steps:

1. Install the VideoCharger Player from the VideoCharger CD-ROM. Requirements for the Player are listed at Chapter 13, “Integrating the client with the VideoCharger Server”, on page 119.
2. Open `http://hostname/vs_public/cgi-bin/iscpfhcm/` where *hostname* is the host name where you installed the VideoCharger Server.
3. Click **Search**. The Title Search page opens.
4. Click the **Search** button. The Search Results page opens.
5. Click on the sample video. This should automatically launch the VideoCharger Player and play the video.

You can also directly stream the video by entering `http://hostname/vs_public/cgi-bin/iscpfsel?video=assetname` in your Web browser (where *hostname* is the IP host name where you installed the VideoCharger Server and *assetname* is the name of the video you loaded into the data pump). This should automatically launch the VideoCharger Player and play the video.

For more information on client players, see Chapter 13, “Integrating the client with the VideoCharger Server”, on page 119.

Chapter 7. Setting up translated VideoCharger supplements on AIX

This chapter explains how to set up translated manpages, publications, and Web pages for AIX. Use the following locale codes in Table 10 for all sections in this chapter:

Table 10. International Locale Code List

Locale Code	Unicode	Language
pt_BR	PT_BR	Brazilian Portuguese
Ja_JP	JA_JP	Japanese
ko_KR	KO_KR	Korean
zh_CN	ZH_CN	Simplified Chinese
Zh_TW	ZH_TW	Traditional Chinese

To troubleshoot general VideoCharger system translation problems, consult “Solving international language problems” on page 71.

Setting up translated manpages on AIX

If your system was set up as English, English-only manpages installed into the `/usr/share/man/cat1` directory. For languages other than English, type the follow command to set up your locale-specific manpages:

- **For a Korn shell (ksh):** `export MANPATH=/usr/share/man/locale:/usr/share/man`
- **For a C shell (csh):** `setenv MANPATH=/usr/share/man/locale:/usr/share/man`

where *locale* represents your locale code from Table 10.

To install English manpages along with your own language, do this during VideoCharger installation:

1. Select the English man page filesets (`avs.man.en_US.sysmgt.data`, `avs.man.en_US.sysmgt.ivs.data`, `avs.man.en_US.sysmgt.ms.data`, and `avs.man.en_US.mmrc.data`)
2. Select your desired language filesets (`avs.man.locale.sysmgt.data` and `avs.man.locale.sysmgt.ivs.data`) where *locale* represents your locale code from Table 10.
3. Enter the command

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```
installp -qacgXd . avs.man.locale.sysmgt.ivs.data  
\ avs.man.locale.sysmgt.data
```

to install the manpages.

When completed, your own language manpages should install into `/usr/share/man/locale/cat1` while the English manpages install into `/usr/share/man/cat1`.

Setting up translated Web pages on AIX

VideoCharger uses Common Gateway Interface (CGI) programs to display most of the Web pages on the Server using message files. You must ensure that your Web server runs in the desired locale. Otherwise, English Web pages will display by default.

Also, the VideoCharger installation configures the Web server through locale-specific `avs.loc...sysmgt.html.ivs` filesets. If you wish to run your web server in a specific locale, make sure that the proper `avs.loc...sysmgt.html.ivs` fileset is installed.

To start the IBM Internet Connection Server in a specific locale, type the command:

```
startsrc -s httpd -e "LC_ALL=locale"
```

where *locale* represents your locale code from Table 10 on page 63.

Setting up translated publications on AIX

Some countries translated the softcopy publications and included them in the Server product documentation panel.

The *IBM VideoCharger Administrator's Guide and Reference* has the following translated filesets:

avs.html.Ja_JP.ivs.admin

Japanese

avs.html.ko_KR.ivs.admin

Korean

avs.html.zh_CN.ivs.admin

Simplified Chinese

avs.html.Zh_TW.ivs.admin

Traditional Chinese

To install the fileset, type the command `installp -qacgXd . avs.html.locale.sysmgt.ivs.admin` where *locale* represents your locale code.

The documentation installs into the
`/usr/share/man/info/locale/avs/ivs/admin` directory.

The *IBM VideoCharger Programmer's Reference* has no translated versions.

Chapter 8. Troubleshooting VideoCharger on AIX

Consult the following sections to help solve VideoCharger problems:

- “Solving installation problems” on page 70
- “Solving configuration problems” on page 70
- “Solving international language problems” on page 71
- “Solving NetView for AIX problems” on page 73

General debugging techniques

In addition to the problem diagnosis topics discussed in this chapter, you can use several debugging tools to determine the source of problems. Debugging tools for AIX include:

Consulting error logs

Errors are entered into the system error log. VideoCharger error messages and recovery information are in the *Administrator's Guide and Reference*. You can also view the service log as described below.

Issuing the trace command

This helps you to isolate system problems by monitoring selected system events.

Printing a system dump

This creates a picture of your system's memory contents and can help the service personnel debug your system.

Reporting the problem to your service representative

See “VideoCharger problem reporting” on page 203.

General information about these tools is in the latest *AIX Problem Solving Guide and Reference*.

Viewing service logs

VideoCharger outputs various service logs to pinpoint errors, including a system log, component trace logs, a content management log, and return code logs.

Viewing the general system error log

Type `errpt -a | more` to view the error messages in the general system error log.

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Viewing the component trace logs

VideoCharger keeps trace logs in the `/var/adm/ras` directory that can contain error information on specific components. The trace logs are:

isc.log Application Requestor/Server log. Type `more isc.log` to view.

avscs.log

Control server log. Type `more avscs.log` to view. These messages are very useful.

avsas.log

Application server log. Type `more avsas.log` to view. To extend application server logging, type `chvssy` and `lsvssy` to modify the settings. You can enable **ERROR** (severe), **WARNING** (mild), and **INFO *trace*** (informational) messages.

avsdex.log

Data exporter log. Type `more avsdex.log` to view. These messages might be hard to read but could provide useful information.

avsmm.log

Media manager log. Type `more avsmm.log` to view.

avslog All components log. Type `alog -f avslog -o | more` to view.

The VideoCharger logging subsystem `vssy` manages logging for the application requestor, application server, and presentation formatters. The `chvssy` command (insert ref) controls this log. The VideoCharger controller can trace API calls input and output using the script commands `csstrc`, `csetrc`, and `csgrtc` found in the `/urs/lpp/avs/ras` directory.

Creating a content management service log

VideoCharger can log content management-related service messages into the `/etc/syslog.conf` file. To determine if the logging is enabled, type:

```
grep daemon.debug /etc/syslog.conf
```

If the following line is shown (and not commented out), content management service logging is specified.

```
daemon.debug    ...
```

Note the path and file name. This is where content management service messages are sent. If this line does not appear, enter the following command to specify service logging:

```
echo "daemon.debug /var/adm/ras/syslog.debug" >> \
/etc/syslog.conf
```

Create the content management service log and refresh the **syslog** daemon as follows:

```
touch /var/adm/ras/syslog.debug
refresh -s syslogd
```

Looking up return codes

Return codes that can be decoded with the 0x00800000 offset (for example, 1800008) can be looked up in `/usr/include/avs/merror.h` (for example, `MS_NO_RESOURCES`), which is installed if you install the client development kit `avs.cs.client.adt`.

Return codes with the 0x00900000 offset (for example, 1900005) are from the application server and can be found in `iscerror.h` (for example, `AI_INVALIDVIDEONAME`).

Report any return codes that cannot be decoded this way to IBM technical support.

Starting and stopping VideoCharger components

You can start and stop VideoCharger components by (a) using your VideoCharger home page, or (b) using the System Resource Controller (SRC) as described below.

The SRC names for the key VideoCharger components are listed in Table 11.

Table 11. SRC names for VideoCharger components

Component	SRC name
Control server	vscs
Application server requestor (handles communications with Control Server)	vsasreq
Application server socket handler (handles communications with client)	vsascom
Application server logging daemon	vssy
Data pump	vsdex
RTSP Daemon	vrtspd
Media manager	vsmm
Video hub media manager	vhmm

Tips:

- The application server components are interdependent; stopping one will stop the application server from functioning.
- It can take several minutes to stop these components.

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Recommendation: Start and stop components as a group. If all of the VideoCharger Server components are installed on one machine, you can start and stop all components by entering the following command on the server:

```
stopsrc -g vs
```

To stop one component, for example the Control Server, type from any AIX command prompt on the controller:

```
stopsrc -s vscs
```

To restart one or all components, use the following three scripts. If you are restarting the entire system, run them in the order that they are listed:

/etc/rc.vsdp	Data pump
/etc/rc.vscs	Control server
/etc/rc.vsas	Application server (all daemons)
/etc/rc.vsmm	Media manager
/etc/rc.vsrtspd	RTSP Daemon

Solving installation problems

Symptom: Missing requisite install.using.bundles.instead 20.15.4.4

The `smit install_all` and equivalent commands cause an error, missing requisite `install.using.bundles.instead 20.15.4.4`, to block the installation of the VideoCharger Server and Multimedia Archive on the same machine. If you get this error, remove VideoCharger and then re-install using bundles as explained in Chapter 4, "Installing VideoCharger on AIX", on page 31.

Solving configuration problems

Symptom: System management Web forms stop working after installing IBM Internet Connection

To fix this problem, complete the following steps:

1. Use your preferred editor to open the `httpd` configuration file `/etc/httpd.conf`. For example, type `vi httpd.conf`.
2. Search for the following statement:

```
Exec /software/admin-bin/* /usr/lpp/internet/server_root/admin-bin/*
```

and add the following two statements after it:

```
Exec /vs_public/cgi-bin/* /usr/lpp/avs/public/cgi-bin/*  
Exec /vs_admin/cgi-bin/* /usr/lp/avs/html/cgi-bin/*
```

3. Save the `httpd.conf` file and exit.

4. Locate the `/var/avs/config/vspasswd` file in your Server. If it does not exist, type in the following commands under root user ID:

```
c/usr/sbin/htadm -create /var/avs/config/vspasswd
/usr/sbin/htadm -adduser /var/avs/config/vspasswd vsadmin vsibm "Video Server Administrator"
/usr/sbin/htadm -adduser /var/avs/config/vspasswd vsloader vsibm "Video Server Content Loader"
/usr/bin/chmod 664 /var/avs/config/vspasswd
```

5. Type refresh `-s httpd`.

Note that the `htadm` command has moved from `/usr/lpp/internet/server_root/cgi-bin` to `/usr/sbin/htadm` in IBM Internet Connection.

Solving international language problems

Consult the international locale codes in Table 12 for the troubleshooting strategies below:

Table 12. International Locale Code List

Locale Code	Unicode	Language
pt_BR	PT_BR	Brazilian Portuguese
Ja_JP	JA_JP	Japanese
ko_KR	KO_KR	Korean
zh_CN	ZH_CN	Simplified Chinese
Zh_TW	ZH_TW	Traditional Chinese

Symptom: VideoCharger product not in desired language

If the VideoCharger does not show up in your desired language, the last four lines in `/var/adm/ras/bosinst.data` might differ in locale settings. You can resolve this in a couple ways.

Option 1: edit bosinst.data for your desired language

Before installing VideoCharger, change the last four lines in the `/var/adm/ras/bosinst.data` file to the desired locale codes. Substitute the locale codes (from Table 12) with your desired language:

For example, substituting the codes with Japanese would look like this:

```
BOSINST_LANG=Ja_JP
CULTURAL_CONVENTION=Ja_JP
MESSAGES=Ja_JP
KEYBOARD=Ja_JP
```

Option 2: install messages for your desired language

After installing VideoCharger, perform the following steps to install messages for the desired language:

1. Insert the VideoCharger CD-ROM into your CD-ROM drive.

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2. Create a CD-ROM file system:
 - a. Type command: `smitty cdrfs`
 - b. Select **Add CDROM**
 - c. In DEVICE Name field, type: `cd0`
 - d. In MOUNT POINT field, type: `/cdrom`
3. Type `mount /cdrom` to mount the CD-ROM file system.
4. Type `cd /cdrom/usr/sys/inst.images` to go to the CD-ROM mount point.
5. Type `installp -qacgXd . avs.loc.locale avs.msg.locale mmfs.msg.locale` where *locale* represents the locale code from Table 12 on page 71.

Symptom: Web pages do not display language properly

If a Web page does not display your language properly, set your Web browser to the correct encoding by completing the following steps:

For Microsoft Internet Explorer only:

1. From the browser window, click **View** → **Encoding** → **More**.
2. Select your language.
3. Click **OK**.

If that language is not installed, visit the Microsoft Windows Update site at <http://windowsupdate.microsoft.com>, click **Product Updates**, and download your language from the "International Language Support" section. Then repeat the steps above.

For Netscape only:

1. From the browser window, click **Edit** → **Preferences**.
2. Under **Category**, click **Navigator** → **Languages**.
3. In the Languages window, click **Add**.
4. Select your language.
5. Click **OK**.
6. Under **Category**, click **Appearance** → **Fonts**.
7. From the **For the Encoding** menu, select your language.
8. Click **OK**.

Symptom: Problems occur after changing VideoCharger locale

Problems can occur if you change the system locale after installing VideoCharger. To resolve this, edit the `/etc/environment` file and change:

```
LC_MESSAGES=C@1ft
export LC_MESSAGES
```

to the following:

```
LC_MESSAGES=locale  
export LC_MESSAGES
```

where *locale* represents the locale code (from Table 12 on page 71) to which the system was changed.

Recommendation: do not change this option for Japanese (Ja_JP).

Symptom: Unable to access assets in unicode or a new locale

If your asset names contain locale-specific characters and you need to move them to unicode or a new locale, follow the migration instructions in “Migrating asset names to unicode or to another locale” on page 38. Otherwise, you will have problems accessing the assets.

Solving NetView for AIX problems

If you plan to use NetView for AIX and you encounter problems installing, configuring, or running it, or have general problems with discovery or display, refer to *NetView for AIX Installation and Configuration Guide* or *NetView for AIX User's Guide*.

If you are having problems getting a response from the agent on VideoCharger, complete the following steps:

1. Enter:

```
lssrc -g tcpip
```

Verify that the following subsystems are running by verifying they are in the active state:

```
SNMP: snmpd  
Data pump: desd  
Controller: cssd  
DPI/SMUX: dpid2
```

2. If any of the subsystems listed in the previous step are not running (listed in the inactive state), start the subsystem using one or more of the following commands:

```
startsrc -s snmpd  
startsrc -s cssd  
startsrc -s desd  
startsrc -s dpid2
```

3. After restarting any of the components in the previous steps, enter:

```
refresh -s snmpd
```

If you still are unable to get a response from the agent after completing this procedure, contact your service representative.

Part 3. Planning and installing the VideoCharger Server for Windows

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Chapter 9. Planning for the VideoCharger Server on Windows

Plan the following for your Windows VideoCharger system:

- “Requirements for the VideoCharger Server”
- “Determining memory requirements for Windows” on page 79
- “Determining your disk storage requirements” on page 79
- “Engineering network capacity” on page 80

Requirements for the VideoCharger Server

This section describes the hardware, software, and network requirements for a VideoCharger server on Windows, as well as a method for determining memory requirements.

Hardware requirements

The VideoCharger Server for Windows must be installed on a PC-compatible system with:

- 200 Mhz or faster Intel Pentium[®] Processor (or equivalent).
- At least 64 MB of system memory for basic functions. Add 32 MB of memory for each additional MPEG encoder card (if used).
- Dedicated Windows NT File System (NTFS) disk or disks.
Recommendation: SCSI disks and a dedicated disk controller are recommended. IDE can be used for a small number of streams.
- Network adapter cards.

Attention: For best performance, use a dedicated machine for the VideoCharger Server.

Optional hardware

The VideoCharger Server supports the following encoder cards:

- FutureTel PrimeView Solo MPEG-1 encoder card (PVS-51 or PVS-53 depending on input source)
- FutureTel PrimeView Duet MPEG-2 encoder card (PVH-55 or PVH-73)
- FutureTel PrimeView NS320/325
- FutureTel PVH-55 and PVH-73
- Optibase Forge (MPEG-2 half resolution and MPEG-1)
- Optibase Fusion (MPEG-2 half resolution and MPEG-1)
- Optibase MovieMaker Xpress (MPEG-1)

VideoCharger Server for Windows

- Optibase MovieMaker Plus (MPEG-1)
- Optibase MovieMaker 200

Encoder cards allow the VideoCharger Server to broadcast and record live video. VideoCharger ships with Optibase Runtime Driver 3.0.1 and can support any corresponding Optibase card. For information on using an encoder card, refer to “Configuring an encoder port” on page 99.

Software requirements

The VideoCharger Server on Windows requires the following software:

- Windows NT Server or Workstation Version 4.0 with Service pack 6 (or higher) *or* Windows 2000 Server or Advanced Server.
- Web Server. **Recommendation:** For automatic Web server configuration during the VideoCharger install, use Internet Information Server (IIS Version 3 or higher for Windows NT); for Windows NT Workstation, use Microsoft Personal Web Server Version 3.02. Any other Web server must be manually configured. **Attention:** Log in as the Windows administrator to install Personal Web Server or IIS. Using another user ID (even one that belongs to the administrator group) can result in incomplete or incorrect Web servers.
- Installed and configured TCP/IP.
- Web Browser. **Recommendation:** Microsoft Internet Explorer Version 3.02 or higher; Netscape Navigator Version 4.0 or higher.
- Windows NT File System (NTFS) formatted disk or disks to store VideoCharger and assets.

Important: Do not install any screen savers or other background applications on your Windows machine.

Optional software

The VideoCharger Server accommodates the following software (on separate machines):

- IBM Content Manager Version 7.1 or higher
- IBM DB2 Universal Database Version 6.1 or higher
- VideoCharger Extender for DB2 Universal Database

The VideoCharger Server supports the following encoder software:

- FutureTel PrimeWare Version 4.0.1 or higher (for FutureTel NS320/325 encoders)
- FutureTel PrimeView MPEG System Driver 3.4 or higher (for other FutureTel encoder cards)

FTP requirements

FTP connections require a valid FTP server, that supports the size command, on the client machines. For example:

- AIX FTP daemon.
- Microsoft FTP for Windows NT 4.0 Server with Service Level 5.
- Microsoft FTP for Windows NT 4.0 Workstation Option Pack Level 3.
- Hummingbird's FTP service.
- War FTP Daemon (available as Windows freeware from <http://jgaa.com>).
- Microsoft FTP service for Windows 2000.

Attention: Microsoft FTP service for Windows 4.0 *Workstation* with Service Level 5 will *not* work.

Determining memory requirements for Windows

A sample system supporting either: 170 streams at 384 Kbps or 80 streams at 1.5 Mbps requires 256 MB of memory. This conservative estimate includes a graphics console and Windows-required memory, and applies to machines that have no memory constraints.

Recommendation: Assign 64 MB for one encoder and add 32 MB for each additional encoder.

Determining your disk storage requirements

As your storage needs change, you might need to order additional disks. The amount of multimedia content you can store at any given time is determined by the number of disks and the bit rate and length of assets.

Table 13 on page 80 shows the amount of disk storage required for various bit rates versus various video lengths. The rows depict the stream bit rates. The first row is for low bit rate (LBR) audio only. The next four rows are other examples of LBR with the 22.7 Kb rate useful for serving Internet clients with 28.8 baud modems. The next two (1.5 and 2.0 Mbps) are typical MPEG-1 rates (1.5 for USA and 2.0 for European countries).

The columns depict various program lengths with 30 seconds being typical for a commercial, 1 hour for a prime-time program, and 2 hours for a film.

For example:

- 30-second commercial at 3 Mbps requires 11.3 MB.
- 1-hour program at 384 kilobits per second (Kbps) requires 173 MB.
- 2-hour program at 1536 Mbps requires 1.38 GB.

VideoCharger Server for Windows

Table 13. Disk storage requirements

Rate Bits Per Second	Bytes Per				
	1 second	30 seconds	1 minute	1 hour	2 hours
6.4 K	800	24 K	48 K	2.88 M	5.76 M
22.7 K	2.05 K	61.5 K	123 K	7.38 M	14.8 M
64 K	8 K	240 K	480 K	28.8 M	57.6 M
128 K	16 K	480 K	960 K	57.6 M	115 M
256 K	32 K	960 K	1.92 M	115 M	230 M
384 K	48 K	1.44 M	2.88 M	173 M	346 M
1.5 M	192 K	5.76 M	11.5 M	691 M	1.38 G
2.0 M	250 K	7.5 M	15 M	900 M	1.8 G
3.0 M	375 K	11.3 M	22.5 M	1.3 G	2.7 G
4.0 M	500 K	15 M	30 M	1.8 G	3.6 G
6.0 M	750 K	22.5 M	45 M	2.7 G	5.4 G

Notes:

- This table assumes:
 - 1 K bits/Bytes = 1,000 bits/Bytes
 - 1 M bits/Bytes = 1,000,000 bits/Bytes
 - 1 G bits/Bytes = 1,000,000,000 bits/Bytes
- The estimates of disk storage do not include the small fraction of additional space required to store file system metadata.

Engineering network capacity

This section provides information to help you plan your network. A network engineer should handle network capacity planning.

Video serving represents a resource-intensive application. Because it uses isochronous workload, data must be fed at a prescribed rate or end users will see glitches in the video. Networks that carry data from the server to the client must be engineered to handle this heavy, isochronous workload. This makes planning a VideoCharger complex and network very important.

Video streams can consume large amounts of bandwidth. Features and capacity of both server and network (including routers, bridges, switches, and interfaces) impact the streams.

Attention: You should not exceed 60% of the maximum interface bandwidth. For example, using a 10 Mb Ethernet, you should run the interface at 6 Mb.

Balancing TCP/IP traffic load

The VideoCharger Server uses standard IP routing to determine which network interface will serve as a particular multimedia client. This design allows the network administrator to use standard IP routing procedures to balance and distribute multimedia networking loads. Also, this permits the administrator to use the same tools to manage both multimedia and general IP networking loads. The VideoCharger does not override IP routing decisions. For example, if a server has two Ethernet networking interfaces but all of the multimedia clients are routed out one interface, multimedia traffic will be transmitted only on this interface. Also, it is possible for a multimedia client to be denied admission to the Server even though some interface on the Server has excess bandwidth. This occurs when the IP route (specified for the Server to communicate with a particular client) has reached its configuration bandwidth limit.

VideoCharger uses the standard TCP/IP routing table to determine which interface video streams are transmitted. For both AIX and Windows Servers, TCP/IP routing tables maintain one entry (route) per destination at most. It is also not dependent on whether static or dynamic routes are used, and, if dynamic routing is enabled, it is not dependent on the routing protocol used.

Exception: If dynamic routing is enabled and OSPF is the routing protocol, a route for each Type of Service can be maintained. With OSPF, multiple routes to the same destination network or host can be maintained for different types of service. However the VideoCharger does not manipulate the Type of Service (TOS) field of the IP header and therefore all traffic is sent as normal service.

Example: TCP/IP routing behavior

Suppose that a client with address 9.2.35.123 requests a stream from a Server that has 2 interfaces with TCP/IP addresses 9.2.30.234 and 9.2.50.15.

You can display the Server's routing table by typing the command `netstat -rn`. Suppose the routing table on the Server looks like this:

Route Table

Active Routes:

Network Address	Netmask	Gateway Address	Interface	Metric
0.0.0.0	0.0.0.0	9.2.50.2	9.2.50.15	1
9.2.30.0	255.255.255.128	9.2.30.2	9.2.30.2	1
9.2.30.234	255.255.255.255	127.0.0.1	127.0.0.1	1
9.2.30.255	255.255.255.255	9.2.30.234	9.2.30.234	1
9.2.50.0	255.255.255.128	9.2.50.15	9.2.50.15	1
9.2.50.15	255.255.255.255	127.0.0.1	127.0.0.1	1
9.2.50.255	255.255.255.255	9.2.50.15	9.2.50.15	1
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
255.255.255.255	255.255.255.255	9.2.50.2	9.2.50.2	1

VideoCharger Server for Windows

According to this configuration, clients that use 9.2.30 as the first three octets of the TCP/IP address would route over 9.2.30.234. Clients that use 9.2.50 as the first 3 octets of the TCP/IP address would route over 9.2.50.15. Clients whose address did not fall into either of these categories would be routed over the default route, which in this example would be 9.2.50.15. This would apply even for a fully-connected network where either interface could actually reach the client.

If this behavior is not desired, static routes can be configured to specify how traffic should be routed. However, note that all TCP/IP traffic will be routed according to the routing tables, not just VideoCharger traffic.

Example: Balancing TCP/IP traffic load for evenly distributed client requests

Suppose the clients who will be streaming the video are on subnets 9.2.30.0, 9.2.50.0, 9.2.35.0, and 9.2.40.0. Also, suppose that, at any one time, the client requests will likely distribute evenly among clients who are on each of these subnets. The following command can add a route so that requests from clients on 9.2.35.0 will also be routed through the 9.2.30.234 interface:

```
route -p add 9.2.35.0 MASK 255.255.255.0 9.2.30.234
```

This command also states that the route should be persistent (-p) across reboots. Since 9.2.50.15 is the default route, you do not need to add a route for clients on the 9.2.55.0 subnet.

Example: Balancing TCP/IP traffic load for unevenly distributed client requests

Suppose that the clients on subnets 9.2.30.0, 9.2.35.0, 9.2.50.0 and 9.2.55.0 get distributed as follows: 25% of the traffic on 9.2.35.123, 25% on the 9.2.30.0 subnet, and the remaining 50% of the traffic evenly distributed among the other clients. In this case, adding a route for the subnet 9.2.35.0 would not evenly distribute the load. Instead, the route should specify only traffic which was destined for 9.2.35.123. The command to add a route for a specific host is:

```
route -p add 9.2.35.123 9.2.30.234
```

In this command, the mask is not specified and therefore defaults to 255.255.255.255 which indicates the entire address must be matched if this route entry is to be applied. In other words, this is a route for a specific host.

For additional details on the route command, enter `route ?`.

Path maximum transmission units

Unlike the VideoCharger for AIX, the VideoCharger for Windows does not discover the optimal path maximum transmission units (MTU) between the Server and client. If the network MTU of the network equipment on the path between the server and client is smaller than the MTU supported by the client

and server, the equipment fragments the packets. To avoid fragmentation, set the MTU size for the network interface according to what MTU is supported on intervening network equipment.

Important: Setting the MTU size for the network interface affects all clients connected through the network interface. Setting the MTU size is not recommended when both of the following conditions are true:

- Most of the clients are connected through a network that supports a smaller MTU size than the server.
- The network does not handle fragmentation efficiently.

If the client and Server are connected to the same physical network and there is no intervening network, the MTU size of the server must be set to a size that all of the clients on the local network can support.

Chapter 10. Installing VideoCharger on Windows

To install VideoCharger on Windows, you must first complete the following steps:

1. Meet the planning requirements specified in Chapter 9, “Planning for the VideoCharger Server on Windows”, on page 77.
2. Log into Windows as a system administrator.
3. Insert the VideoCharger CD-ROM.
4. Install the License software from the installation launchpad (License Use Management).

Using the VideoCharger CD-ROM, you can install components from it in these different ways:

- “Installation from CD-ROM launchpad”
- “Silent installation” on page 88
- “Administrative installation” on page 89

To update VideoCharger, see “Updating VideoCharger on Windows” on page 90.

| Restriction: Disable firewall before installing VideoCharger on the same
| machine. If you plan to install VideoCharger on the same machine as your
| firewall software, disable the firewall first. If you do not disable the firewall
| first, the firewall can block VideoCharger’s check for the TCP/IP requirement
| (using a host ping). After you install VideoCharger, you can re-enable the
| firewall software.

Installation from CD-ROM launchpad

Use the VideoCharger installation launchpad to install the following components:

VideoCharger Server

The core VideoCharger component that stores and manages assets (audio and video files). It can stream these files in real-time to clients over an Internet, intranet, or local area network (LAN). For best performance, install this Server on its own dedicated Windows machine. You can install the VideoCharger Server in three ways:

- “Typical installation of the VideoCharger Server” on page 86
- “Custom installation” on page 87
- “Upgrade” on page 87

VideoCharger Server for Windows

VideoCharger Software Development Kit

A programming kit that you can use to program your own custom VideoCharger Server applications.

DB2[®] VideoCharger Extender

A DB2 Universal Database component that you can use to store assets in the VideoCharger Server while managing them from the IBM DB2 Universal Database. For best performance, install it on your DB2 Universal Database machine. For more information about the VideoCharger Extender, see Chapter 17, "Integrating the VideoCharger Extender for DB2 Universal Database", on page 169.

VideoCharger Player

A client application for playing media streams from the VideoCharger Server. It can also play a variety of local media files. For best performance, install the Player on a separate machine from the Server.

VideoCharger Player Software Development Kit

A programming kit that you can use to program your own custom Player applications.

Typical installation of the VideoCharger Server

A typical installation of the VideoCharger Server installs the following basic components onto the same Windows server:

- Presentation formatter
- Controller
- Data pump
- Sample videos

Recommendation: Install the VideoCharger components on an NTFS-formatted drive on a dedicated machine to store VideoCharger components to improve performance. Also, try to specify a different drive for the default asset location. See "Managing space for your VideoCharger assets on Windows" in the *Administrator's Guide and Reference* for additional information.

To start a typical installation, select **VideoCharger Server** and then **Typical** in the CD-ROM installation launchpad. Follow the installation program directions.

Automatically configuring the Web server

The VideoCharger installation program can detect and automatically configure the following Web servers:

- Microsoft Internet Information Server (IIS)
- Microsoft Peer Web Services
- Microsoft Personal Web Server

You must manually configure any other Web server after installing VideoCharger. Also, you must manually configure your Web server if you install it after installing VideoCharger. See “Manually configuring the Web server” on page 91 for details.

Requirement: Log in as the Windows administrator to install Peer Web Services or IIS. Using another user ID (even one that belongs to the administrator group) can result in incomplete or incorrect Web servers.

Automatic Web configuration defines your VideoCharger administrator user ID as `vsadmin`, and by default, allows anyone to play assets without entering a password. Keep in mind, however, that only the VideoCharger administrator can configure the system and load content.

Custom installation

A custom installation installs specific VideoCharger features. To start a custom installation, select **VideoCharger Server** from the CD-ROM installation launchpad. Then select **Custom**. You can then install the following two components:

VideoCharger Server

Same as in the typical installation.

Network Address Translation (NAT) Support

Install only if you use NAT. This support feature permits the VideoCharger to use the real client IP address rather than the altered one that NAT provides.

Upgrade

An upgrade removes the previous VideoCharger version and installs VideoCharger Version 8.1 in its place. To upgrade your VideoCharger Server to Version 8.1, insert the CD-ROM and select **VideoCharger Server** in the CD-ROM installation launchpad.

When upgrading VideoCharger from Version 7.1 to Version 8.1, restart the machine to make sure that the installation takes effect.

If you specify **Typical** for Setup Type, the previous Server’s configuration will carry over to become the Version 8.1 Server’s default settings. (**exception:** calibration values do not carry over). Follow the installation program directions. At some point, the program asks if you want to upgrade. Agreeing to this will remove the previous VideoCharger Server and install the new version. Also,

Requirement: If you change your VideoCharger Server location and do not use an automatically configurable Web server (as listed in “Automatically configuring the Web server” on page 86), make sure to manually re-configure

VideoCharger Server for Windows

your Web server as explained in "Managing space for your VideoCharger assets on Windows" in the *Administrator's Guide and Reference*. In addition, move the contents of the data\catalog directory from its old location to the new location. Otherwise, you will lose your VideoCharger's asset definitions and would have to add all of your assets over again.

Silent installation

A silent installation lets you install the VideoCharger Server through a single command. To start a silent installation, insert the VideoCharger CD-ROM and enter your CD-ROM drive at a Windows command prompt (for example, e:).

For Windows NT only: To minimize the chance of a silent installation restarting your NT system, install the Microsoft Windows Installer from Serv\instmsiw.exe, located on the root directory of the installation CD.

Enter the following single command:

```
msiexec.exe -I "e:\en_US\Serv\VCSErv820.msi"  
INSTALLDIR="directory_path"  
ASSETDIR="directory_path"  
ADMIN_USERNAME="userID"  
ADMIN_PASSWORD="password"  
CONFIGUREWEBSERVER="no|yes"  
-q -L*v c:\log_name.txt
```

e: Specifies the CD-ROM drive.

en_US Specifies your locale code: can be en_US, Ja_JP, ko_KR, Zh_TW, zh_CN, pt_BR.

VCSErv820.msi

Specifies the VideoCharger component to install. You can choose:

VCSErv820.msi
VideoCharger Server

VCDEXT820.msi
VideoCharger Extender

VCSSDK820.msi
VideoCharger Software Development Kit (SDK)

INSTALLDIR="directory_path"

Specifies the directory to store VideoCharger program files. This parameter is required. **Example:** c:\Program Files\IBM\IBM VideoCharger Server.

ASSETDIR="directory_path"

Species the directory to store assets into. This parameter is required. **Example:** d:\content.

ADMIN_USERNAME="*userID*"

Specifies the VideoCharger Administrator's user name. This parameter is required. **Example:** vsadmin.

ADMIN_PASSWORD="*password*"

Specifies the VideoCharger Administrator's password. This parameter is required. **Example:** vsibm.

CONFIGUREWEBSERVER="*no | yes*"

This parameter is optional.

no Does not automatically configure your Web server. This is the default. If you select this option, you must manually configure the Web server after installing VideoCharger.

yes Automatically configures your Web server. This is strongly recommended.

c:\log_name.txt

Specifies the name and location to store the VideoCharger Server installation log. This parameter is optional, but recommended.

Example:

```
msiexec.exe -I "e:\en_US\Serv\VCSErv820.msi" INSTALLDIR="c:\Program
Files\IBM\IBM VideoCharger Server" ASSETDIR="F:\VideoCharger\content" ADMIN_USERNAME=
"vsadmin" ADMIN_PASSWORD="vsibm" CONFIGUREWEBSERVER="yes" -q -L*v c:\vcserver_log.txt
```

Refer to Microsoft Windows Installer online help for details on command line options.

Administrative installation

An administrative installation places a VideoCharger install image on one network drive for multiple workstations to access. This saves the time of re-installing VideoCharger on each individual machine. To start the administrative installation program, insert the VideoCharger CD-ROM and open a Windows command prompt.

For Windows NT only: To minimize the chance of an administrative installation restarting your NT system, install the Microsoft Windows Installer from Serv\instmsiw.exe.

Enter the following command at a Windows command prompt:

```
msiexec.exe -a "e:\en_US\Serv\VCSErv820.msi"
```

where *e:* represents the drive letter of your CD-ROM drive and *en_US* represents your locale code (en_US, Ja_JP, ko_KR, Zh_TW, zh_CN, pt_BR).

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Refer to Microsoft Windows Installer online help for details on command line options.

For Windows NT only: After the command installs VideoCharger, the Windows Installer might automatically restart your machine.

Updating VideoCharger on Windows

To keep VideoCharger updated, make sure to download the most current fixes and drivers from:

<http://www.ibm.com/software/data/videocharger/support.html>

Chapter 11. Initially configuring VideoCharger on Windows

This chapter covers the following ways to initially configure VideoCharger:

- “Manually configuring the Web server” (only if applicable)
- “Configuring VideoCharger for a firewall” on page 97 (if applicable)
- “Configuring Windows 2000 for multicast” on page 98 (if applicable)
- “Making the VideoCharger home page your home page” on page 98

When your Web server has been configured (automatically or manually), you can access the online configuration interface on your VideoCharger home page. If you have not made the VideoCharger home page your default home page, log into the following Web address to view the forms:

`http://hostname/vs_admin/`

where *hostname* is the host name of the VideoCharger Server (enter *hostname* at an MS-DOS command prompt to determine). Otherwise, log in to the following Web address:

`http://hostname/`

From the Configuration and Administration Web page, you can perform the following configurations:

- “Changing the administration user ID or password” on page 99
- “Configuring an encoder port” on page 99 (if applicable)
- “Updating FutureTel encoder drivers” on page 105 (if applicable)

You can test your installed VideoCharger system by following the directions in “Testing your VideoCharger system” on page 105.

Manually configuring the Web server

You must manually configure your Web server in the following situations:

- You use a Web server not listed in “Automatically configuring the Web server” on page 86.
- You installed the Web server after you installed VideoCharger.
- You use multiple instances of the same Web server.

This section covers:

- “Manually configuring the IBM HTTP Web server” on page 92

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- “Manually configuring other Web servers” on page 93

Manually configuring the IBM HTTP Web server

Important: The following instructions assume that you have installed the IBM HTTP server into the default directory of C:\Program Files\IBM HTTP Server. If you installed the server into a different directory, you must modify each default directory accordingly.

Create the administration and content loading user ID (vsadmin) for the IBM HTTP server by entering this command:

```
"C:\Program Files\IBM HTTP Server\htpasswd" -c "C:\Program Files\IBM HTTP Server\conf\vc.passwd" vsadmin
```

and enter a vsadmin password when prompted.

Open the file C:\Program Files\IBM HTTP Server\conf\httpd.conf. Before you append the following lines to the file, you must change some of the directory references if you did not accept the default VideoCharger on Windows installation directory. Read the comments in the following lines and you should know how to change them accordingly.

```
# Start of VideoCharger for NT configuration
DirectoryIndex default.htm
# Passing environment of VC, these environment variables are very
# important to the CGI programs
PassEnv LANTV_DIR
PassEnv LANTV_SDK_DIR
# You must not reverse the order of the following 2 directives.
# ScriptAlias must go before Alias in order to make the CGI work.
# Use forward slash for path separator and double quote to quote
# directory with space
# ***** Important *****
# Modify the directory value of both ScriptAlias and Alias if you do not
# accept the default VideoCharger for NT installation directory
# ****WARNING*** if any of the following single lines is incorrectly entered as two lines
# in the httpd.conf file the IBM HTTP Server may not start.
ScriptAlias /lantv/cgi-bin/ "c:/Program Files/IBM/IBM VideoCharger Server/Data/public/cgi-bin/"
ScriptAlias /vs_admin/cgi-bin/ "c:/Program Files/IBM/IBM VideoCharger Server/Data/admin/cgi-bin/"
Alias /lantv "C:/Program Files/IBM/IBM VideoCharger Server/Data/public"
Alias /vs_admin "C:/Program Files/IBM/IBM VideoCharger Server/Data/admin"
# Add protection to the CGI-bin directory
# ***** Important *****
# Change the directory reference of if you do not accept the
# default VideoCharger for NT installation directory
<Directory "C:/Program Files/IBM/IBM VideoCharger Server/Data/admin/html">
AuthType Basic
AuthUserFile "C:\Program Files\IBM HTTP Server\conf\vc.passwd"
AuthName "VideoCharger Admin"
require valid-user
</Directory>
# Disable directory listing
# ***** Important *****
# Change the directory reference of if you do not accept the
# default VideoCharger for NT installation directory
IndexOptions FancyIndexing
<Directory "c:/Program Files/IBM/IBM VideoCharger Server/Data/public">
IndexIgnore *
</Directory>
```

```
<Directory "C:/Program Files/IBM/IBM VideoCharger Server/Data/admin">  
IndexIgnore *  
</Directory>  
# End of VideoCharger for NT configuration
```

After saving the file, you can try starting the server by double-clicking the start server icon from the program group.

Configuring the IBM HTTP Web Server to download the .MSI version of the VideoCharger Player

To configure the IBM HTTP Web Server to read MSI file types (the VideoCharger Player download file that does not use Windows Installer), you must open IBM HTTP Server\conf\mime.types and append 'msi' to 'application/octet-stream'.

For example:

```
application/octet-stream bin dms lha lzh exe class msi
```

Then you must stop and restart the IBM HTTP Server.

Manually configuring other Web servers

To manually configure the Web server, complete the steps below:

1. "Adding a directory alias for the user Web interface"
2. "Adding a directory alias for the administrative Web interface" on page 94
3. "Configuring user access" on page 94

Adding a directory alias for the user Web interface

Use the administrative interface for your Web server to configure a directory alias for the user interface to the VideoCharger. Assign the following attributes to the alias:

- Set the directory alias to `lantv`
- Set the directory path to the `data\public` subdirectory of the VideoCharger installation directory. For example, if the VideoCharger was installed in `C:\Program Files\IBM\lantv`, then you would set the directory path to `C:\Program Files\IBM\lantv\data\public`

- Set the security to Read and Execute
- Set the default document to `default.htm`

Some Web servers require that the default document name be the same for all directory aliases. If your Web server is configured to use a name other than `default.htm` for the default document, rename the file `default.htm` in the `data\public` subdirectory to the configured name.

- Set the authentication type to allow anonymous users.

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Adding a directory alias for the administrative Web interface

Use the administrative interface for the Web server to configure a directory alias (also called a virtual root directory) for the administrative interface to the VideoCharger. Assign the following attributes to the alias:

- Set the directory alias to `vs_admin`
- Set the directory path to the `data\admin` subdirectory of the VideoCharger installation directory. For example, if the VideoCharger was installed in `C:\Program Files\IBM\lantv`, then you would set the directory path to `C:\Program Files\IBM\lantv\data\admin`
- Set the security to Read and Execute
- Set the default document to `default.htm`

Some Web servers require that the default document name be the same for all directory aliases. If your Web server is configured to use a name other than `default.htm` for the default document, rename the file `default.htm` in the `data\admin` subdirectory.

- Set the authentication type to Basic or Clear Text logon and Challenge-Response.

Requirement: If your Web server allows the authentication type to be set at the server level rather than for each alias, you must set the authentication type at the server.

Configuring user access

Only the system administrator, whose user ID you specified during VideoCharger installation, can configure the system and load content. To configure user access, complete the following steps:

1. “Granting administrator permission to the administration subdirectory”
2. “Granting user permission to the user subdirectory” on page 95
3. “Granting access to end users” on page 96
4. “Assigning content management privileges” on page 96

Granting administrator permission to the administration subdirectory:

Administrators must have permission to access the administrative subdirectory set up in “Adding a directory alias for the administrative Web interface”. Use the Windows Explorer to set the permissions for the subdirectory:

1. Click **Start** on the Windows taskbar.
2. Click **Programs** → **Windows Explorer**. The Explorer Window opens.
3. Select the administration subdirectory where you installed VideoCharger.
4. Click **File** → **Properties** from the menu bar. The Properties notebook opens.
5. Click the **Security** tab.
6. **Windows NT only:** Click **Permissions**.

7. Click **Add** on the Directory Permissions window.
8. **Windows NT only:** Click **Show Users** on the Add Users and Groups window.
9. From the **Names** list, select the administrator user ID to which you want to grant permission.
10. Click **Add**.
The user ID is added to the **Add Names** list box.
11. Select **Full Control** from either the **Type of Access** (Windows NT) or **Permission** (Windows 2000) list box.
12. Click **OK** to save the permission and close the Add Users and Groups window.
13. **Windows NT:** Select **Replace Permissions on Subdirectories** and **Replace Permissions on Existing Files** in the Directory Permissions window; **Windows 2000:** Click **Advanced** and select both **Allow inheritable permissions from parent to propagate to this object** and **Reset permissions on all child objects and unable propagation of inheritable permissions**.
14. Click **OK** to replace the permissions and close the Directory Permissions Window.
15. Click **Yes** when prompted to confirm the replacement of security information.
16. Click **OK** to close the Properties notebook.

Granting user permission to the user subdirectory: Users must have permission to access the user subdirectory set up in “Adding a directory alias for the user Web interface” on page 93. Use the Windows Explorer to set the permissions for the subdirectory:

1. Click **Start** on the Windows taskbar.
2. Click **Programs** → **Windows Explorer**. The Explorer Window opens.
3. Select the public subdirectory where you installed VideoCharger.
4. Click **File** → **Properties** from the menu bar. The Properties notebook opens.
5. Click the **Security** tab.
6. **Windows NT only:** Click **Permissions**.
7. Click **Add** on the Directory Permissions window.
8. **Windows NT only:** Click **Show Users** on the Add Users and Groups window.
9. From the **Names** list, select the administrator user ID to which you want to grant permission.
10. Click **Add**.
The user ID is added to the **Add Names** list box.

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11. Select **Full Control** from either the **Type of Access** (Windows NT) or **Permission** (Windows 2000) list box.
12. Click **OK** to save the permission and close the Add Users and Groups window.
13. **Windows NT:** Select **Replace Permissions on Subdirectories** and **Replace Permissions on Existing Files** in the Directory Permissions window; **Windows 2000:** Click **Advanced** and select both **Allow inheritable permissions from parent to propagate to this object** and **Reset permissions on all child objects and unable propagation of inheritable permissions**.
14. Click **OK** to replace the permissions and close the Directory Permissions Window.
15. Click **Yes** when prompted to confirm the replacement of security information.
16. Click **OK** to close the Properties notebook.

Granting access to end users: The default configuration allows all users to play the VideoCharger assets. Optionally, you can limit access to your assets by requiring specific users or user groups to enter a user ID and password to gain access.

To create a group:

1. Click **Start** on the Windows taskbar.
2. **Windows NT:** Click **Programs** → **Administrative Tools** → **User Manager**; **Windows 2000:** Click **Programs** → **Administrative Tools** → **Computer Management**.
3. **Windows NT:** Click **User** → **New Local Group** from the menu bar on the User Manager window; **Windows 2000:** Double-click on **Local Users and Groups** and select **Actions** → **New Group**.
4. Set **Group Name** on the New Local Group window to the name that you want to use for the group.
5. Click **OK**.

Assigning content management privileges: Users who are assigned as content managers must have access to the administrative subdirectory. Their access is limited to specific administration files, however. To assign content management privileges:

1. Grant the group of content manager IDs permission to the administrative subdirectory (see “Granting administrator permission to the administration subdirectory” on page 94).
2. Remove access to administration files in the \html subdirectory:
 - a. In the Exploring window, select the **html** folder of the administrative subdirectory.

- The files in the selected subdirectory are displayed in the right pane.
- b. Select `config1.html` and `iscvprt.html` in the right pane of the Exploring window.
 - c. Click **File** → **Properties**. The Properties notebook opens.
 - d. Click the **Security** tab.
 - e. **Windows NT only:** Click **Permissions**. The File Permissions window opens.
 - f. Select the content manager group from the **Name** list .
 - g. Click **Remove**.
 - h. Click **OK** to save the permission change and close the File Permissions window.
 - i. Click **OK** to close the Properties notebook.
3. Repeat step 2 on page 96 to remove access to administration files in the `\cgi-bin` subdirectory.

Configuring VideoCharger for a firewall

To enable video streaming through a firewall, open the following port numbers:

Port numbers	Protocol	Usage
80	TCP	Web browsing, HTTP streaming
8500	TCP	Non-QuickTime streaming session setup and control
554	RTSP	QuickTime streaming session setup and control
5000–65535	UDP	UDP streaming (randomly selected port pairs, one pair per video stream)
5000–65535	TCP	TCP streaming (randomly selected port pairs, one pair per video stream)
4324	TCP	Video content loading (cannot be changed)

You can limit the UDP/TCP port range using the `vsconfig -F` command. For example, to limit start and end registry values to 1000 and 1220 respectively, enter:

```
vsconfig -F 1000:1220
```

To list the registry value limit, enter:

```
vsconfig -L
```

To remove the registry values, enter:

```
vsconfig -Y
```

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Configuring Windows 2000 for multicast

To enable multicasting from a token ring on a Windows 2000 machine to any Windows 98/NT machines, set the `TrFunctionalMcastAddress` parameter to 0 in the Windows 2000 registry by completing the following steps:

1. Click **Start** → **Run** on the Windows 2000 taskbar.
2. In the **Open** field, select or type `REGEDIT`.
3. Click **OK**. The Registry Editor window opens.
4. Click `HKEY_LOCAL_MACHINE` → `SYSTEM` → `CurrentControlSet` → `Services` → `Tcpip` → `Parameters`.
5. Right-click `TrFunctionalMcastAddress` and click **Modify**. The Edit DWORD Value window opens.
6. In the **Value data** field, type 0.
7. Click **OK** to save changes and exit.
8. Close the Registry Editor.

Making the VideoCharger home page your home page

The home page is the document that your Server returns when a client sends a request that does not point to a specific directory or file. When a client sends a Web address in the form of:

`http://your-server-name/`

your server responds by sending back the default home page. When the server receives requests that do not point to a specific directory, the server tries to serve the request from the document root directory. Your home page must be in the document root directory.

The default home directory for Microsoft Internet Information Server and Microsoft Personal Web Server is `\inetpub\wwwroot`. To set the default home directory for the `vs_admin` directory:

1. Select the `vs_admin` directory from the **Internet Server Manager** menu.
2. Click **Edit Properties**.
3. Select **Home Directory**.
4. Click **OK**.

Changing the administration user ID or password

For security reasons, you should always change the default VideoCharger administrator ID password. To do this, open your Configuration and Administration Web page, click **Configure Video Server**, and enter the new password in the **VideoCharger Administrator Password** field. You can also modify your user ID in the **VideoCharger Administrator Username** field.

Restriction: Always use `vsconfig` to change your administration password. You must use `vsconfig` to change the password. Do not use Windows user management or both your `vsload` and `vsconfig` commands could stop working. If that happens, reinstall VideoCharger.

As an alternative method, you can change the administrator's user ID or password using the `vsconfig` command:

```
vsconfig -U new_userID -P new_password -r
```

where *new_userID* represents the renamed administrator's user ID and *new_password* represents the new password.

You can also use `vsconfig` to manually grant permission to a component's Windows services, although installation automatically sets this.

Configuring an encoder port

VideoCharger supports one Optibase card and one FutureTel Encoder in a single server. VideoCharger does *not* support two Optibase cards or two FutureTel encoders in a single server. For the FutureTel encoder, you must install FutureTel's encoder card and driver. For the Optibase encoders, just install the encoder card. VideoCharger installs the driver. For more information about installing an encoder, consult FutureTel or Optibase instructions.

After installing the encoder and its drivers, you must define an encoder port to the VideoCharger Server. To configure the encoder port:

1. From your Configuration and Administration page, click **Configure Encoder Port**.
2. Click **Define Port**.

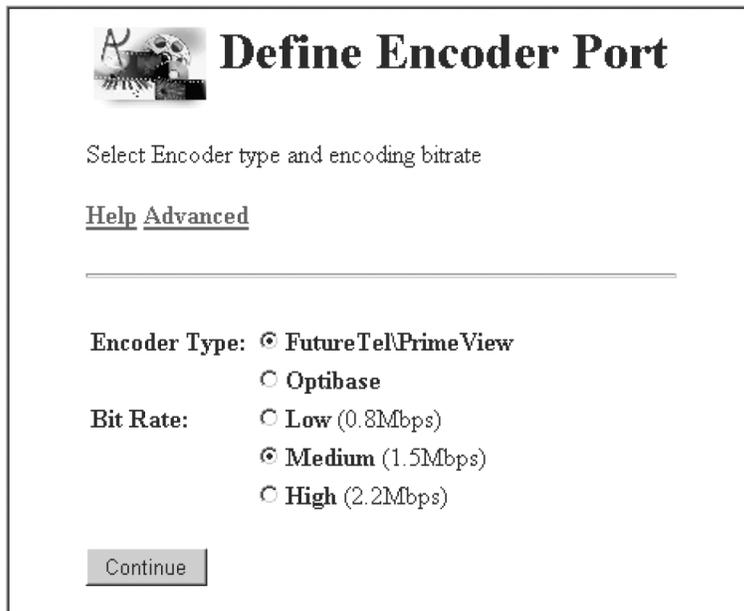


Figure 10. Define Encoder Port page

You can also click **Advanced** to configure the following settings:

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experiment with this form's bit and frame rate settings, or stop the Server and try to play the video using the software that came with your encoder.

Logical Port Name

This field specifies the name of the encoder port. For example, enco0.

Port Descriptor

This pull-down menu specifies what brand of encoder port you have.

Video Type

This pull-down menu specifies what format your encoder will convert the video signal into. To configure your encoder for MPEG-2 (MPEG-2 capable encoders only), define the port and then use the Modify Encoder Port form to specify MPEG-2.

Mux Mode

This pull-down menu specifies what multiplex mode (mixture of audio and video packets) to output your stream in. The supported types are:

system

MPEG-1 stream for audio and video combined. Outputs an .mpg file. This is the default.

program

MPEG-2 stream for audio and video combined. Outputs an .mpg file.

transport

MPEG-2 stream for audio, video, and additional transport packets that enable noise correction, encryption, and high speed network protocol. Outputs an .mpg file.

video_only

MPEG-1 stream for video only. Outputs an .mpv file.

audio_only

MPEG-1 stream for audio only. Outputs an .mpa file.

Video Source

This pull-down menu specifies the input source type for the encoder. The supported types are:

composite

Input is one cable that combines all components into one signal.

RGB

Input is three video cables (one for each red, green, and blue signal).

svideo1

Input is S-video (one multi-pronged cable that carries separate luma and chrominance signals) in the first connector.

svideo2

Input is S-video (one multi-pronged cable that carries separate luma and chrominance signals) in the second connector.

GOPs Between Sequence Hdrs

This field specifies how many sequence headers to insert between two Groups of Pictures (GOP). Sequence headers facilitate editing, improve playback control functions, and initialize remote players. The higher you set this value, the better you can edit and control your video. Consequently, sequence headers increase the video file size and require higher bit rate.

Video Color System

This pull-down menu specifies what color system standard to use (NTSC or PAL[®]). The default is NTSC.

Video Frame Rate

This bullet specifies how many frames per second to stream the video in. You must reduce the frames per second in order to accommodate lower bit rate streaming. Consequently, the lower you set the frame rate, the choppy the video appears.

Video frame rate	NTSC rate	PAL rate
Full	30 frames per second	25 frames per second
Half	15 frames per second	12.5 frames per second
Third	10 frames per second	8.33 frames per second
Quarter	7.5 frames per second	6.25 frames per second
Fifth	6 frames per second	5 frames per second
Tenth	3 frames per second	2.5 frames per second
Fifteenth	2 frames per second	1.67 frames per second

Attention: Some encoder cards might not support this option.

Bit Rate Setting

This pull-down menu specifies which two of the three bit rate values you plan to set. The mux bit rate is the total of the video and audio bit rates. If you specify Set Mux Bit Rate, you can only set the **Mux Bit Rate** field and the **Audio Bit Rate** pull-down menu (VideoCharger would calculate the video bit rate automatically). If you specify Set Video&Audio Bit Rate, you can only set the **Video Bit Rate** field and the **Audio Bit Rate** pull-down menu (VideoCharger would calculate the mux bit rate automatically).

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Mux Bit Rate

This field specifies how many bits per second to stream the combined audio and video at. The higher you set the bit rate, the more the streaming quality improves.

Video Bit Rate

This field specifies how many bits per second to stream the video at. The higher you set the bit rate, the more the video quality improves.

Audio Bit Rate

This pull-down menu specifies how many bits per second to stream the audio at. The higher you set the bit rate, the more the audio quality improves. Specify DEFAULT to automatically set the encoder card to its default audio bit rate (default settings vary by encoder card).

Audio bit rate (bits per second)	Allowed audio mode
32000	Mono
48000	Mono
56000	Mono
64000	All Modes
80000	Mono
96000	All Modes
112000	All Modes
128000	All Modes
160000	All Modes
192000	All Modes
224000	Stereo, Intensity Stereo, Dual Mono
256000	Stereo, Intensity Stereo, Dual Mono
320000	Stereo, Intensity Stereo, Dual Mono
384000	Stereo, Intensity Stereo, Dual Mono

Horizontal Resolution (MPEG-2 only)

This pull-down menu specifies the amount of detail in the stream. It also determines the default dimensions of the video. For example, a value of 720 projects the video on a full screen window. A value of 352 projects the video on a quarter screen window. Expanding the video window past its original default causes the detail to decrease accordingly.

Transport Program Map PID (MPEG-2 only)

The Transport Program Map Table (PMT) contains system information

for random access into the transport stream and for data loss recovery. This field can assign a program ID tag (PID) to the PMT packets (possibly useful for advanced applications, like in a custom-written client player). The default PID is automatically generated.

Transport Video PID (MPEG-2 only)

This field can assign a program ID tag (PID) to each program in the transport stream (possibly useful for specialized applications, like in a custom-written client player). The default PID is automatically generated.

Transport Audio PID (MPEG-2 only)

This field can assign a program ID tag (PID) to each program in the transport stream (possibly useful for specialized applications, like in a custom-written client player). The default PID is automatically generated.

Updating FutureTel encoder drivers

If you already configured a FutureTel Encoder Port with the PrimeView MPEG System Stream Driver Version 3.4 and want to upgrade to FutureTel PrimeWare Recorder 4.0.1, complete the following steps to ensure that direct multicasting works properly:

1. Install the new encoder driver.
2. From your Configuration and Administration page, click **Configure Encoder Port**.
3. Click **Refresh Port Definition**.
4. Select your **Logical Port Name**.
5. Click **Continue**.
6. Click **Modify Port**.
7. Select your **Logical Port Name**.
8. Click **Continue**.

Testing your VideoCharger system

To test your VideoCharger system, add sample videos from your data\public\samples\content directory into the Server and then stream the video into the VideoCharger Player by completing the following steps:

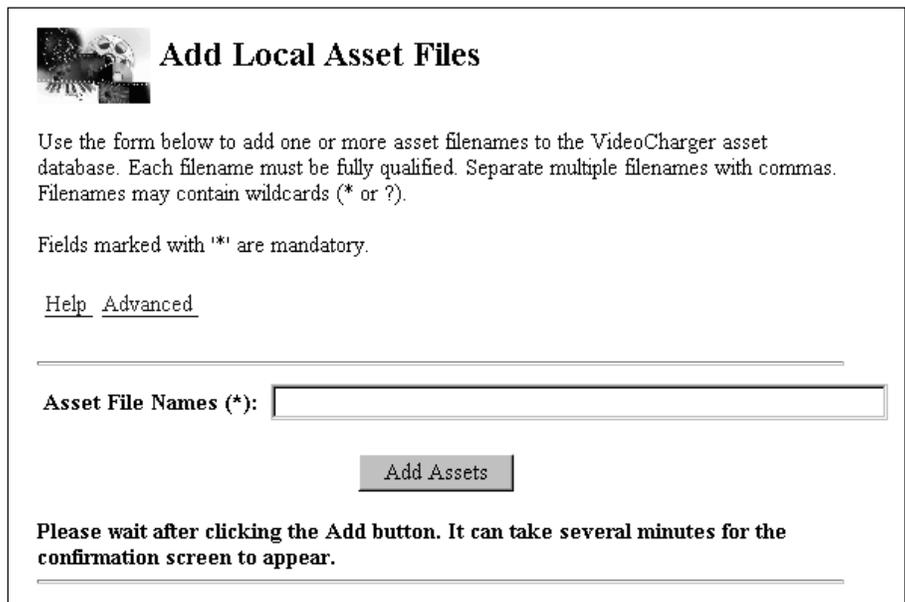
- “Adding sample videos into the VideoCharger Server”
- “Streaming a sample video into the VideoCharger Player” on page 107

Adding sample videos into the VideoCharger Server

To load a sample video into the VideoCharger Server:

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1. Open `http://hostname/vs_admin/` in your Web browser and click the logo (you can determine the *hostname* by entering *hostname* at your VideoCharger Server's MS-DOS command prompt).
2. Click **CONTENT MANAGEMENT**. The Content Management page opens.
3. Click **Manage Content**. The Manage Content page opens.
4. Select **Add Local Asset Files** and click **Continue**.
5. If prompted, enter your user name (default is `vsibm`) and password (default is `vsadmin`). The Add Local Asset Files page opens (see Figure 12).



Add Local Asset Files

Use the form below to add one or more asset filenames to the VideoCharger asset database. Each filename must be fully qualified. Separate multiple filenames with commas. Filenames may contain wildcards (* or ?). Fields marked with "*" are mandatory.

[Help](#) [Advanced](#)

Asset File Names (*):

Please wait after clicking the Add button. It can take several minutes for the confirmation screen to appear.

Figure 12. Add local asset files page for Windows

6. Type the file name of the video that you want to load into the **Asset File Names** field. To load all sample videos from the VideoChargerServer, type the following in this field:

```
c:\Program Files\IBM\IBM VideoCharger Server\data\public\samples\content\sample*
```

Whenever an asset contains a space, surround everything in quotation marks (").

7. Click **Add Assets**.
8. If the page displays Operation Completed Successfully, then the videos loaded. Click **Continue** to return to the Manage Content page.

When you use the Web forms to load an asset, VideoCharger automatically determines bit rate, duration, and type. If VideoCharger cannot determine the information, the Server notifies you that the asset has loaded but unsuccessfully parsed. You can specify attributes to assets that were loaded, but not parsed, in the Modify Existing Assets page.

Streaming a sample video into the VideoCharger Player

To stream a sample video from the VideoCharger Server to the Player, complete the following steps:

1. Install the VideoCharger Player from the VideoCharger CD-ROM. Requirements for the Player are listed at Chapter 13, "Integrating the client with the VideoCharger Server", on page 119.
2. Open `http://hostname/1antv/` in your Web browser and click the logo (you can determine the *hostname* by entering *hostname* at your VideoCharger Server's MS-DOS command prompt).
3. Click **List Available Assets**. The List Available Assets Results page opens.
4. Click on a sample mpg video. This should automatically launch the VideoCharger Player and stream the video.

For more information on client players, see "Playing assets in the client Players" on page 119.

If the sample video streams successfully, your VideoCharger system works properly. If the sample video does not stream successfully, consult Chapter 12, "Troubleshooting VideoCharger on Windows", on page 109.

Chapter 12. Troubleshooting VideoCharger on Windows

Consult the following sections to help solve VideoCharger problems:

- “General debugging techniques”
- “Solving installation problems” on page 110
- “Solving configuration problems” on page 111
- “Solving international language problems” on page 112

General debugging techniques

In addition to the problem diagnosis topics discussed in this chapter, there are several debugging tools that you can use to determine the source of problems:

- Viewing the application event log through the Windows event viewer. VideoCharger writes error messages, recovery information, and events (system, application, security) into this event log.
- Reporting the problem to your service representative. See “VideoCharger problem reporting” on page 203.

Viewing the application event log

To view the event log:

1. Click **Start** on the Windows taskbar.
2. Click **Programs** → **Administrative Tools** → **Event Viewer**. The Event Viewer window opens.
3. From the **Log** menu, select the log that you want to display.

By default, only fatal errors from VideoCharger are written to the application event log. To enable detailed VideoCharger logging, set the trace level parameter as described in “Changing your VideoCharger configurations on Windows” in the *Administrator’s Guide and Reference*. You can also consult trace logs stored in %LANTV_DIR%\log.

Starting and stopping VideoCharger components on Windows

You can start and stop VideoCharger components by:

- Using your VideoCharger home page.
- Getting status with the Windows service manager (see the *Administrator’s Guide and Reference*).
- Using the Service Manager as described below.

The Service Manager names for the key VideoCharger components (and the proper order to start them) are:

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- lantv_de (Data exporter)
- lantv_cs (Control server)
- lantv_sc (Scheduler)
- lantv_ar (Application requestor)
- lantv_vi (Video input)
- lantv_mm (Media manager)
- lantv_vhmm (Video hub media manager)
- lantv_rt (RTSP Daemon)

The proper order to stop the components is the reverse of how they were started.

Tip: It can take several minutes to stop components.

Recommendation: Start and stop components as a group. You can start all of the VideoCharger components by entering the following command on the server:

```
vsstart
```

You can stop all VideoCharger components by entering the following command on the server:

```
vsstop
```

To stop the Scheduler, enter:

```
vsstop -s
```

To stop the Control Server, enter:

```
vsstop -c
```

To stop the Data Exporter, enter:

```
vsstop -d
```

Solving installation problems

Creating an installation log file

To launch an installation while creating an installation log file, insert the VideoCharger CD-ROM. and type the following at the command line at the Windows command prompt:

```
msiexec -I "e:\en_US\Server\package.msi" -L*v c:\log_name.txt
```

where *e*: represents the drive letter of your CD-ROM drive, *en_US* represents your locale code (en_US, Ja_JP, ko_KR, Zh_TW, zh_CN, pt_BR), *package*

represents the package you want to log, and `c:\log_name.txt` represents your desired name and location for the text log file.

For Windows NT only: To minimize the chance of this command rebooting your NT system, first install the Microsoft Windows Installer from `Serv\instmsiw.exe`, which is located on the root directory of the installation CD.

The package names are:

VCSErv820.msi
VideoCharger Server install package

VCDEXT820.msi
VideoCharger DB2 Extender install package

VCSSDK820.msi
VideoCharger Software Development Kit package

Example:

```
msiexec -I "e:\en_US\Server\VCSErv820.msi" -L*v c:\vcserver_log.txt
```

For a more complete VideoCharger Server log, implement the silent installation command at “Silent installation” on page 88. Refer to Microsoft Windows Installer online help for details on command line options.

Solving configuration problems

Symptom: Unable to define VideoCharger administrator account

The minimum password length is probably set too high for your password. To change the minimum password length, complete the following steps:

1. Click **Start** → **Programs** → **Administrative Tools** → **User Manager**.
2. Highlight **Administrator**.
3. From the task bar, click **Policies** → **Account**.
4. Click **OK**.
5. Under **Minimum Password Length**, decrease the minimum to match your password length.
6. Re-run `vsconfig` with the new user ID and password.

Symptom: Configuring an encoder through the VideoCharger advanced pages causes errors

The encoding board might not support some of the settings you chose in the advanced page. For example, the board might support a half or quarter frame rate for a low bit rate MPEG video, but not full frame.

VideoCharger Server for Windows

Try different settings for the bit and frame rate. If the problem persists, try the following steps:

1. Stop the VideoCharger Server.
2. Load the MPEG encoding software that came with your encoder board.
3. Attempt the same combination of settings that failed on the VideoCharger Server to determine which settings your board supports. Or, consult the documentation that came with your encoder board.

Symptom: Control server no longer starts in Windows 2000

Check that your network cable is connected to the network adapter. If the cable is not connected, Windows 2000 sometimes turns off the adapter and hides any IP addresses, even if a static IP is configured.

Solving international language problems

For international language problems, locate the corresponding symptom below.

Symptom: VideoCharger Server Web pages do not display language properly

If a Web page does not display your language properly, set your Web browser to the correct encoding by completing the following steps:

For Microsoft Internet Explorer only:

1. From the browser window, click **View** → **Encoding** → **More**.
2. Select your language.
3. Click **OK**.

If that language is not installed, visit the Microsoft Windows Update site at <http://windowsupdate.microsoft.com>, click **Product Updates**, and download your language from the "International Language Support" section. Then repeat the steps above.

For Netscape only:

1. From the browser window, click **Edit** → **Preferences**.
2. Under **Category**, click **Navigator** → **Languages**.
3. In the Languages window, click **Add**.
4. Select your language.
5. Click **OK**.
6. Under **Category**, click **Appearance** → **Fonts**.
7. From the **For the Encoding** menu, select your language.
8. Click **OK**.

Symptom: VideoCharger Server Web pages do not display unicode properly

If you have a Netscape Web browser, you need to enable it for unicode (Microsoft Internet Explorer automatically downloads the fonts necessary to display unicode correctly).

To enable the display of unicode Web pages in the Netscape browser, complete the following steps from the browser window:

1. Click **Edit** → **Preferences**. The Preferences window opens.
2. Expand **Appearance** and click **Fonts**.
3. In the **For the Encoding** list, select **Unicode**.
4. In both the **Variable Width Font** and **Fixed Width Font** lists, select or install a unicode font. For example, Arial Unicode MS which can be downloaded from Microsoft.
5. Click **OK** to save changes and close the window.

VideoCharger Server for Windows

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Chapter 13. Integrating the client with the VideoCharger Server

The client workstation must be an IBM PC-compatible workstation with at least:

- A 133 MHz Intel Pentium Processor (or equivalent).
- 32 MB of system memory.
- 6 MB of disk space over other system requirements.
- An audio adapter that is supported by Microsoft's DirectX.
- A network adapter with Microsoft Winsock support or a modem with 28.8 Kbps (handles low bit rate streams only) or higher.
- Windows 98, Windows NT, Windows 2000, or Windows Millennium Edition.
- Web Browser:
 - Netscape Navigator Version 3.0 or higher.
 - Microsoft Internet Explorer 5.5 or higher.

Attention: Installing a Player on the same machine as the VideoCharger Server may impact performance. **Recommendation:** For optimal performance on a system with the minimum client hardware configuration, limit video playing to less than 1Mbps.

Playing assets in the client Players

Currently, the VideoCharger Server can stream the following types of Players:

- VideoCharger Player (see "Playing assets in the Windows VideoCharger Player").
- QuickTime Player (see "Loading and playing assets in the QuickTime Player" on page 120).
- Hot Media Player (see "Storing and playing IBM HotMedia assets" on page 121).
- MPEG-4 dynamic Player (see "Storing and playing MPEG-4 assets" on page 122).

Each Player varies in the file formats it supports.

Playing assets in the Windows VideoCharger Player

The VideoCharger Player can play a variety of audio or video formats through local, network, and Internet sources. It can monitor network

Integrating VideoCharger features

conditions and automatically adjust itself for optimal playback quality. You can customize your own controls and set your own video specifications.

The VideoCharger Player supports the following media formats:

- Moving Pictures Experts Group (MPEG1, MPEG2)
- Video Files (.AVI)
- Apple QuickTime Version 3 (.MOV)
- IBM Bamba Low-Bitrate Video Files (.IBA)
- Audio Files (.WAV)

If your PC features DirectX multimedia hardware/software decoders that can handle other media formats (for example, MPEG2 or MP3), the Player can support those media types also.

You can install the VideoCharger Player from one of the following locations:

- The Resource List on your VideoCharger Server admin home page .
- The IBM Content Manager VideoCharger for Windows CD-ROM.
- The VideoCharger product Web site at <http://www.ibm.com/software/data/videocharger>.

The VideoCharger CD-ROM and product Web site provide two types of executables to install the Player:

vcplayer_xx.msi (3 MB)

Requires Windows Installer Service on your Windows machine. Download this program if you use Windows 2000, previously installed Player version 7 or higher, or already installed other applications through the Windows Installer.

vcplayer_xx.exe (6 MB)

Installs both Windows Installer Service and the Player.

where *xx* is the language abbreviation (br=Brazilian Portuguese, cn=simplified Chinese, de=German, en=English, fr=French, ja=Japanese, ko=Korean, tw=traditional Chinese). For details on the VideoCharger Player, consult the Player online help.

Loading and playing assets in the QuickTime Player

To load QuickTime movies into the VideoCharger Server, you must first hint them in QuickTime Pro Player Version 4 or higher (you must register your QuickTime Player to enable the Pro features). You can download the QuickTime Player from <http://www.apple.com/quicktime>.

To hint a QuickTime movie, complete the following steps:

1. In the QuickTime Prop Player Version 4 or higher, click **File** → **Open**. Open the file that you want to hint. For example, `quicktime.mov`.
2. Click **File** → **Export**. The Save exported file as window opens.
3. From the **Export** list, select **Movie to Hinted Movie**.
4. From the **Use** list, select **Default settings**.
5. Click **Options**. The Hint Explorer Settings window opens.
6. Select **Make Movie Self-Contained**.
7. De-select **Optimize Hints for Server (creates larger file)**.
8. Click **Save**.
9. Save the file with as another name. For example, `hquicktime.mov`.
10. Load the hinted file into your VideoCharger Server.

To stream assets into a QuickTime Player, you must first disable disk cache by completing the following steps:

1. **From QuickTime Player Version 4:** Click **Edit** → **Preferences** → **Streaming Transport**; **from QuickTime Player Version 5:** Click **Edit** → **Preferences** → **QuickTime Preferences**. The QuickTime Settings window opens.
2. From the **QuickTime Settings** list, select **Browser Plug-in**.
3. Clear the **Save movies in disk cache** check box.
4. Close the QuickTime Settings window.

You can then play the QuickTime asset in one of two ways:

- Invoking the Video Selection presentation formatter from its hypertext link on the VOD presentation formatter Web page.
- Using RTSP:
 1. Determine the asset name as listed in the presentation formatter web pages or under **vslist**.
 2. In the QuickTime client, select **File** → **Open URL**.
 3. Enter `rtsp://hostname/movienamemov`. For example, if you are playing an asset named `quicktimep.mov`, then the RTSP Web address would be `rtsp://hostname/quicktimep.mov`.

Tip: If an error with a number above 10000 occurs, see "Symptom: QuickTime asset displays a 10000 error" in the *Administrator's Guide and Reference*.

For details on QuickTime Player specifications, refer to <http://www.apple.com/quicktime/specifications.html>.

Storing and playing IBM HotMedia assets

You can load HotMedia assets (extension `.mvr`) into the VideoCharger Server as you would normal assets (see "Adding a sample asset into the

Integrating VideoCharger features

VideoCharger Server” on page 59 (AIX) or “Adding sample videos into the VideoCharger Server” on page 105 (Windows) for instructions). MVR files play without any client installations or plug-ins because the files automatically download the software they need from the VideoCharger Server. To create MVR content, download the HotMedia Assembly Tool from <http://www.ibm.com/hotmedia> and follow its instructions.

Attention: The HotMedia format can only stream over HTTP protocol.

Apple Macintosh machines only: If video quality degrades while playing HotMedia MVR files, try the following actions:

- Increase the application memory for Netscape Navigator and the restart Netscape. The recommended application memory: 20MB minimum and 40MB maximum.
- Close all other applications that are not needed.

If MVR quality still degrades, experiment with re-encoding the video to a lower bit-rate.

Refer to <http://www.ibm.com/hotmedia> for the latest information, including:

- English and international versions of the Toolkit
- Documentation and online help
- Announcements and product news
- Developer resources

For support on the HotMedia product, refer to <http://www.ibm.com/software/net.media/support>.

Storing and playing MPEG-4 assets

You can load MPEG-4 assets (extension .mp4) into the VideoCharger Server as you would normal assets (see the *Administrator’s Guide and Reference*).

MPEG-4 assets require no client installations or plug-ins. The VideoCharger Server automatically downloads a Java MPEG-4 dynamic Player from the Server to stream MPEG-4 assets.

Recommendation: Keep only one MPEG-4 dynamic Player open at a time for best performance.

Requirements for the MPEG-4 dynamic Player

The VideoCharger MPEG-4 dynamic Player supports the following Web browsers:

- Netscape Navigator Version 4.7 or higher.

- Microsoft Internet Explorer Version 5.5 or higher (with the latest Java Virtual Machine (JVM) Version 5.00.3802 or higher from <http://www.microsoft.com/java/>).

You can determine your current JVM level by entering the `jview` command.

For Internet Explorer Version 6 only: Configure the Web browser using the following steps:

1. Click **Tools** → **Internet Options**.
2. Click the **Advanced** tab.
3. For Java (Sun), clear the **Use Java 2...for...(requires restart)** checkbox.

Accessibility for the MPEG-4 dynamic Player

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in the VideoCharger MPEG-4 dynamic Player are:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen.
- You can also use voice recognition software, such as IBM ViaVoice[®], to enter data and to navigate the user interface.
- You can operate all features using the keyboard instead of the mouse.

Accessibility features

The Player includes a number of features that make the product more accessible for people with disabilities. These features include:

- Features that allow you to use the keyboard instead of the mouse.
- Compatibility with assistive technologies.
- Compatibility with accessibility features of the operating system.
- Accessible documentation formats.

Keyboard input

You can use the keyboard to operate the VideoCharger MPEG-4 dynamic Player. Press the Tab or arrow keys to move from item to item. Press Enter to select the item.

Keyboard focus

In Windows-based systems, the position of the keyboard focus is highlighted, indicating which area of the window is active and where your keystrokes will have an effect.

For the latest readings of the dynamic **Status** and **Timecode** fields, press the arrow keys to toggle focus back to them.

High-contrast mode

The Player supports the high-contrast mode option that is provided by the operating system. This feature supports a higher contrast between background and foreground colors.

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Font settings

In Web browsers, you can specify display settings that determine the color, size, and font for the text in menus and dialog windows.

Non-dependence on color

You do not need to distinguish between colors in order to use any function of this product.

Alternative alert cues

In Windows-based systems, the SoundSentry feature can be used to provide visual feedback for general application and system alerts such as warning beeps. You can also adjust the volume of sound alerts.

Compatibility with assistive technologies

The Player is compatible with screen reader applications such as Home Page Reader. The clients have properties required for these accessibility applications to make on-screen information available to visually impaired users.

Chapter 14. Integrating the VideoCharger AIX Multimedia Archive

The VideoCharger AIX Multimedia Archive is a fully integrated server that complements the VideoCharger Server by archiving large amounts of multimedia content using the Tivoli Storage Manager (TSM). Using the Multimedia Archive, you can access assets without importing or recreating them from the original source. Both AIX and Windows VideoCharger Servers can use the Archive for mass storage. Figure 13 shows how the VideoCharger Server, Archive, and TSM stage (copy) assets to each other.

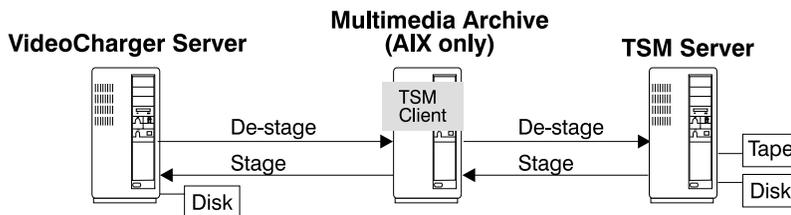


Figure 13. VideoCharger/Multimedia Archive process flow

To configure Content Manager to recognize the AIX Multimedia Archive, refer to “Configuring Content Manager to accommodate the AIX Multimedia Archive” on page 147.

Important: The Archive logs TSM errors into `/var/avs/config/dsierror.log`.

This describes:

- “Requirements for the Multimedia Archive” on page 126
- “Installing the Multimedia Archive” on page 127
- “Upgrading the Multimedia Archive from Version 7.1 to Version 8” on page 127
- “Configuring the Multimedia Archive for Netstore machines” on page 128
- “Configuring the Multimedia Archive for AIX machines other than Netstore” on page 128
- “Performing setup tasks for the Multimedia Archive” on page 130
- “Starting and stopping the Multimedia Archive” on page 132
- “Managing content in the Multimedia Archive” on page 133
- “Scheduling for the Multimedia Archive” on page 135

Requirements for the Multimedia Archive

Hardware requirements

The Multimedia Archive is optimized to run on an IBM 3466 Network Storage Manager models C10, C20, or C30 (Netstore) machine, but you can also install it on any RS/6000 capable of running AIX 5.1 and Tivoli Storage Manager (TSM) 4.2 or higher. In addition, the Archive requires a network adapter and at least 128 MB of system memory.

For more information on Netstore, consult *IBM 3466 Network Storage Manager Start-Up Guide* (order number GA32-0386) and *IBM 3466 Network Storage Introduction and Planning Guide* (order number GA32-0385).

If you install the Multimedia Archive onto any AIX system other than Netstore, the Archive becomes a TSM API client application. This client can interoperate with the TSM API client 4.2. You can install the TSM server on the same as the Archive or a different machine.

Software requirements

The Multimedia Archive requires the following software:

- AIX Version 5.1 or higher with the following PTF requirements:
 - U478798 bos.rte.libc 5.1.0.2
 - U477368 bos.mp 5.1.0.1
 - U477367 bos.mp64 5.1.0.1
 - U477366 bos.up 5.1.0.1
 - U476469 bos.sysmgt.smit 5.1.0.10
 - U476362 bos.rte.install 5.1.0.10
- Web server software such as:
 - IBM HTTP Server 1.3.6.2 or higher.
 - IBM Lotus Domino Go Webserver for AIX (ICS).
 - Netscape FastTrack Server.
 - IBM Internet Connection Server 4.2.1 or higher.
 - Apache 1.3.9 or higher.
- Tivoli Storage Manager (TSM) Application Programming Interface 4.2.0.0 or higher, fileset `tivoli.tsm.client.api.aix43.32bit`.
- DCE client 3.1 or higher.
- Tivoli Storage Manager Server (optional).

Optional software

The VideoCharger Server for AIX accommodates the AIX Java Development Kit (JDK) version 1.3.0 or higher if you have a VideoCharger Archive in your

configuration and are using the IBM-supplied Presentation Formatter (**iscpfhom**) to play assets directly from the Archive (offline assets).

The AIX JDK is available from the following Web site:

<http://www.ibm.com/java/jdk/download>

FTP requirements

FTP connections require a valid AIX FTP daemon, that supports the size command, on the client machines. For example:

- AIX FTP daemon.
- Microsoft FTP for Windows NT 4.0 Server with Service Level 5.
- Microsoft FTP for Windows NT 4.0 Workstation Option Pack Level 3.
- Hummingbird's FTP service.
- War FTP Daemon (available as Windows freeware from <http://jgaa.com>).
- Microsoft FTP service for Windows 2000.

Attention: Microsoft FTP service for Windows 4.0 *Workstation* with Service Level 5 will *not* work.

Installing the Multimedia Archive

Requirement: you *must* install the Multimedia Archive on a separate AIX machine from the VideoCharger Server. Installing the Archive and Server on the same machine can corrupt the Server configuration.

If installing on Netstore, make sure that the administration password in TSM is set to default value admin.

Follow the directions in "Installing the VideoCharger bundles" on page 31 in order to install the Media-Defined and Video-Archive bundle.

Upgrading the Multimedia Archive from Version 7.1 to Version 8

To upgrade to a new version of the Multimedia Archive, use the following recommended procedure:

1. Stop the Multimedia Archive by entering `stopsrc -g vs`.
2. Insert the CD-ROM into the drive.
3. Install the Media-Defined and Video-Archive bundle as described in "Installing the VideoCharger bundles" on page 31.
4. Enter `smitty update_all` to upgrade any other optional filesets. The Update Installed Software to Latest Level (Update All) window displays.
5. Press F4 to select the CD-ROM drive.
6. Press Enter twice to confirm the update.

Integrating VideoCharger features

Configuring the Multimedia Archive for Netstore machines

The Multimedia Archive automatically configures Netstore according to predefined Tivoli Storage Manager (TSM) requirements. You can open both administration clients and consoles from the Multimedia Archive if necessary.

The Archive sets the following TSM configuration options, which deviate from basic Netstore default options:

- All client schedules are disabled.
- All administrator schedules are inactivated, *except* for the following:

Schedule name	Operation
DBBACKUP_FULL	A full database backup begins daily between 4:00 am and 6:00 am.
EXPIRE_INVENTORY	Expiration processing of deleted video or audio assets starts on a Monday between 3:00 am and 5:00 am and is done at the same time every other day.
DELETE_VOL_HIST	Deletes the volume history file daily at 2:00 am.
DELETE_DBVOLHIST	Deletes the database volume history file daily at 1:00 am. (Schedule is for Digital Linear Tape Netstore versions only.)

- All archived video assets go first to disk before tape.
- Migration of data from disk to tape is immediate.
- Hardware compression is turned off.
- Node **videoArchive** is registered with the password N51593V4 and associated with the file space /archive/ARsg.
- Password expiration is set to the maximum number of days.
- The TSM client and server share memory communication.
- The user IDs vsadmin and vsloader are created with the default password vsibm.

Configuring the Multimedia Archive for AIX machines other than Netstore

If you are using an AIX machine other than Netstore, you must manually configure the Tivoli Storage Manager (TSM) server. This typically involves two or three steps:

1. Define your storage devices.
2. Register the VideoCharger Archive as a client node to your TSM server.
3. **Optional:** Define the policy domains for specific nodes.

The three sample TSM command macros described in this section (in the /var/avs/config directory) are provided to help with these tasks.

Requirement: You must have some experience working with TSM to modify the sample macro files. Use the three sample TSM command macros as a guide, and modify each one according to the specific storage device attached to your TSM server at your installation. The TSM documentation library will help explain the three sample TSM command macros in more detail.

tsmdevice.mac

Defines your storage devices. Provides sample definitions for an automated tape library. Your definitions differ depending on what kind of storage device is attached to your TSM server. You might need to define devices to the TSM server's operating system.

Recommendations for defining your storage device:

- Disable hardware compression if your storage device supports it. VideoCharger multimedia data is already compressed, so further compression can affect performance.
- For tape device storage pools, set the COLLOCATE parameter to FILESPACE to minimize VideoCharger data to the fewest tape volumes possible. This improves video retrieval time.
- Define a DASD storage pool as a cache: set HIGHMIG and LOWMIG parameters to 0, and set CACHE to YES to immediately copy data to the next storage pool (typically associated with a tape device) while retaining a disk copy for faster access.

tsmnode.mac

Registers the VideoCharger Archive as a client node to your TSM server. The default node name is `videoArchive`. If you want to use a different node name, you must update `/var/avs/config/dsm.opt`. The VideoCharger Archive uses a password of `N51593V4` to login to the TSM server.

Recommendation: Set the node's password expiration interval to the maximum. This will preserve the password.

tsmpolicy.mac

Optionally defines the policy domain for specific nodes. This macro helps if multiple applications use the same TSM server as the VideoCharger Archive for data backup and archiving. You can use this macro to isolate the storage devices and/or storage policies to use with the VideoCharger Archive.

You can invoke these macros by typing this command on a TSM server command line:

```
dsmadmc -id=admin -pa=admin -server=server macro macrofile
```

The VideoCharger Multimedia Archive is a TSM API client application. Configuring the TSM API client involves two options files: `dsm.sys` and `dsm.opt`. The `dsm.sys` file should be in `/usr/tivoli/tsm/client/api/bin` or in

Integrating VideoCharger features

a directory defined in the system environment variable `DSMI_DIR`. TSM provides a sample file `dsm.sys.smp` in this directory. VideoCharger provides and only uses the `dsm.opt` file in the `/var/avs/config` directory. You must update the `dsm.opt` file to properly identify your TSM server.

If you prefer a different TSM nodename from the default Archive nodename, insert a `dsm.opt` file into `/usr/tivoli/tsm/client/api/bin`. Edit this file appropriately. You can copy this file from `/var/avs/config/dsm.opt`.

After you install the Multimedia Archive code on the server and follow the steps in this section and in “Performing setup tasks for the Multimedia Archive”, you can manage content either from the Multimedia Archive’s home page, or from the VideoCharger Server’s Administration Content Management page. On the Manage Content web page, you can stage videos to or from servers, including the Multimedia Archive by specifying the Archive’s name as a server.

See the *Tivoli Storage Manager Quick Start*, *Tivoli Storage Manager Administration Guide*, and *Tivoli Storage Manager Administration Reference* documentation for the proper steps to customize your TSM system.

Performing setup tasks for the Multimedia Archive

The following setup tasks are necessary after installing the Multimedia Archive:

1. “Configuring network communications”
2. “Setting passwords for the user IDs” on page 131
3. “Updating the Multimedia Archive” on page 131

Important: Before performing these setup tasks, log in as root and enter the following commands to stop the Multimedia Archive control server, and the DCE (Distributed Computing Environment) daemons:

```
stopsrc -g vs
/etc/dce/dce.clean all
```

Configuring network communications

The Multimedia Archive must be set to communicate with other systems, such as content providers or VideoCharger Servers. To configure network communications, enter: `smit mktcpip`.

Add access to other host systems

Add access to other host systems using the `smit mkhostent` fast path. It is not necessary to perform this task if both of the following conditions apply:

- You use a domain name server and have already specified it when you configured TCP/IP.

- Your domain name server lists all of the machines that you want to communicate with.

Figure 14 shows sample values.

INTERNET ADDRESS (dotted decimal)	[9.3.153.88]
HOST NAME	[ms7b020]
ALIAS(ES) (if any - separated by blank space)	[]
COMMENT (if any - for the host entry)	[VideoCharger in Room 7B-020, Bldg 905]

Figure 14. Access to other hosts

Setting passwords for the user IDs

The Multimedia Archive uses the same user IDs (*vsadmin* and *vsloader*) as the VideoCharger Server. The Archive defaults both user ID passwords to *vsibm*, and configures the Archive (using *mkvsar*) with this password. If your system password rules do not allow this password, you must (a) update the passwords to an acceptable value (by following the directions in “Setting passwords for the AIX user IDs” on page 43), and (b) issue *chvsar* to update the Archive configuration (before you can load or stage content).

Updating the Multimedia Archive

The Multimedia Archive control server requires a host name, content management user ID, and user ID password. If you change any of these items, you must log in as root and run the following command:

```
chvsar -l arname
      -h arhost
      -i cmid
      -w cmpw
```

arname

ARCHIVE (the name for Multimedia Archive)

arhost

The fully qualified host name of the Multimedia Archive

cmid

The user ID that performs Content Management tasks, such as adding, deleting, and staging video assets

cmpw

The password for *cmid*

For example, as root,

```
chvsar -l ARCHIVE -h mmarchive.avs.stl.ibm.com -i vsloader -w vsibm
```

causes the Multimedia Archive to perform content management tasks with a user ID of *vsloader* and a password of *vsibm* on the ARCHIVE machine *mmarchive.avs.stl.ibm.com*.

Integrating VideoCharger features

Restriction: Cross-domain content management of Multimedia Archive assets is possible only if you specify a fully-qualified host name for **arhost**.

Configuring DCE RPC client

The Multimedia Archive installation automatically configures the DCE RPC client.

Starting and stopping the Multimedia Archive

After setting up the Multimedia Archive, you can start the servers. You can do this the fastest by shutting down and restarting the system as root user:

```
shutdown -Fr
```

If you don't restart, you must start the TSM server, DCE daemons, Web server, and Multimedia Archive control server manually. To do this, use the following commands as root user:

1. Start the TSM server by entering:

Netstore only:

```
startadsm
```

Other AIX machines:

```
dsmserv
```

2. Start the DCE daemons by entering:

```
/etc/rc.dce all
```

3. Start the Web server by entering:

Lotus Domino Go and IBM ICS only:

```
startsrc -s httpd
```

Apache only:

```
apachectl start
```

4. Start the Multimedia Archive control server by entering:

```
startsrc -g vs
```

To stop the Multimedia Archive, enter `stopsrc -g vs`.

Starting and stopping the Web servers

Web server commands

Action	Lotus Domino Go and IBM ICS command	Apache and IBM HTTP command
start the Web Server	<code>startsrc -s httpd</code>	<code>apachectl start</code>
stop the Web Server	<code>stopsrc -s httpd</code>	<code>apachectl stop</code>

Web server commands

Action	Lotus Domino Go and IBM ICS command	Apache and IBM HTTP command
check status (see if server is running)	lssrc -s httpd	apachectl status

Managing content in the Multimedia Archive

Although VideoCharger provides interfaces for copying data between Server and Archive, VideoCharger does not automatically archive the assets for you. For that, Content Manager provides Hierarchical Storage Management (HSM) policies that can manage a Server's limited DASD space, stage assets to the Archive, and de-stage assets from the Archive.

To use the Archive with VideoCharger but without Content Manager, you or your application must:

- Determine which assets to move.
- Determine when to move them.
- Initiate the movement between Server and Archive.

VideoCharger moves content *to* the Archive using Best Effort mode, meaning that VideoCharger uses all available network bandwidth to transfer an asset from a VideoCharger Server to the Archive. VideoCharger can move content *from* the Archive using Paced mode if you specify a copy rate. If you do not specify a copy rate, VideoCharger defaults to Best Effort mode.

You can load Multimedia Archive content in four ways:

- "Managing content from your VideoCharger home page"
- "Managing content with commands" on page 135
- "Managing content with the FTP command" on page 135
- "Managing content with Content Manager" on page 135

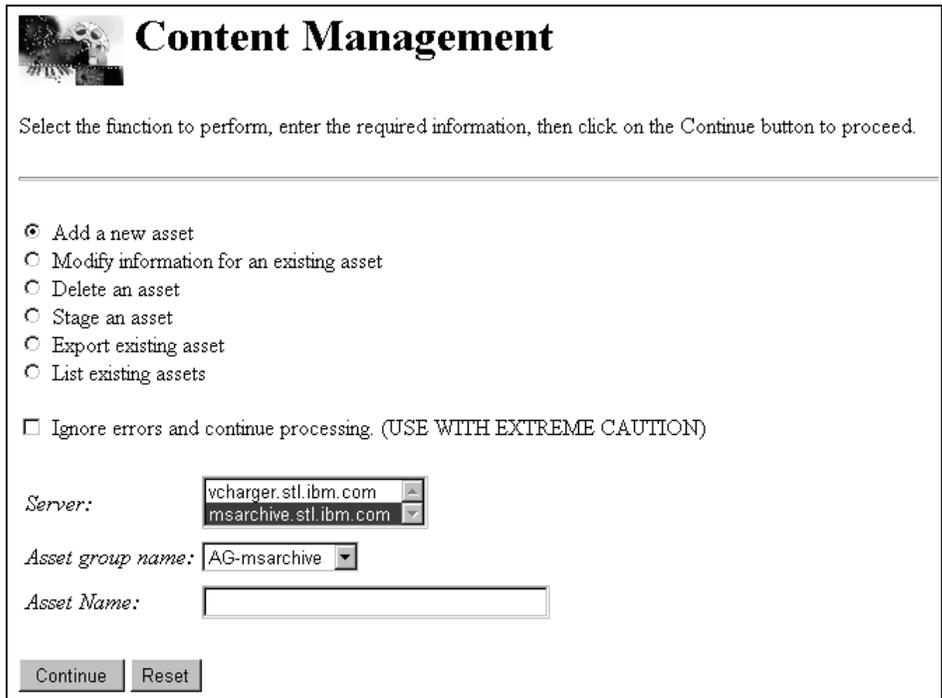
Managing content from your VideoCharger home page

If you installed a Web server on your Multimedia Archive server, you can manage archived content from `http://hostname` where *hostname* represents the Multimedia Archive server hostname.

From the Multimedia Archive home page, access Content Management by clicking **Content Management**. The first time that you select the Multimedia Archive Content Management page during a session, it prompts you for a user ID and password. Use `vsadmin` for the user ID and `vsibm` for the password (unless you changed it).

Integrating VideoCharger features

Or, if you have an AIX VideoCharger Server and have defined the Archive hostname in “Initially configuring the VideoCharger Server” on page 53, you can manage assets on the Archive by clicking **manage content** from either the VideoCharger Admin or CONTENT MANAGEMENT page, and then selecting your Multimedia Archive hostname for the Server (instead of your VideoCharger Server hostname). See Figure 15 If you did not define an Archive hostname during installation, see “Adding an archive server after installation”.



Content Management

Select the function to perform, enter the required information, then click on the Continue button to proceed.

Add a new asset

Modify information for an existing asset

Delete an asset

Stage an asset

Export existing asset

List existing assets

Ignore errors and continue processing. (USE WITH EXTREME CAUTION)

Server: vcharger.stl.ibm.com
msarchive.stl.ibm.com

Asset group name: AG-msarchive

Asset Name:

Continue Reset

Figure 15. Multimedia Archive Content Management page

Adding an archive server after installation

First Paragraph

If you did not define the archive during initial configuration, follow the steps below to add an archive server:

1. Navigate to the VideoCharger server administrator’s web page.
2. Click Configuration and Administration.
3. Click **Add/Change/Remove Systems**.
4. Type the archive server name in the Archive Server field and click OK.

5. Stop and start the server. To stop and start the server using the command line, See “Starting and stopping the Web servers” on page 132. To stop and start the server using the web page:
 - a. click the browser’s Back button to return to the Configuration and Administration page
 - b. Click Start/Stop the VideoCharger Server Complex
 - c. Click the Stop radio button and click OK.
 - d. Click the Start radio button, and click OK to restart the server.

For details on each operation of this content management page, see “Managing assets” in the *Administrator’s Guide and Reference*.

Managing content with commands

The Multimedia Archive uses all the same commands as the VideoCharger Server. They are described in “Managing content with commands” (for AIX) in the *Administrator’s Guide and Reference*.

Managing content with the FTP command

To connect to the Multi Media Content Transfer server on the Multimedia Archive, enter:

```
ftp hostname 4324
```

For detailed information, see “Managing content with FTP” in the *Administrator’s Guide and Reference*.

Managing content with Content Manager

Content Manager can use the VideoCharger Server to store content (staging) and use the Multimedia Archive to archive.

To integrate Content Manager with the Multimedia Archive, see “Configuring Content Manager to accommodate the AIX Multimedia Archive” on page 147 and “Archiving media objects from Content Manager to the AIX Multimedia Archive” on page 148.

Scheduling for the Multimedia Archive

The Multimedia Archive’s content creation processes often compete with content retrieval processes for system resources such as CPU, bandwidth, and network bandwidth. Therefore, a scheduling policy where creation and retrieval do not *unnecessarily* conflict can help maximize performance.

You can use the Load and Play mode to minimize the wait. Load and Play lets you play a tape-stored asset while the data moves from the Archive to the VideoCharger Server.

Integrating VideoCharger features

An asset retrieval request always pre-empts the archiving process if they both need the same tape, tape drive, or disk. If an asset is requested while TSM is archiving assets, the two processes work in parallel. If these two processes ever require the same tape resources, TSM grants higher priority to retrieval.

Chapter 15. Integrating Content Manager Version 7.1 with VideoCharger

This chapter explains how to integrate VideoCharger with both the AIX and Windows versions of IBM Content Manager 7.1. It covers these topics:

- “Introduction”
- “Requirements for a VideoCharger/Content Manager integration” on page 140
- “Installing Content Manager on AIX to accommodate VideoCharger” on page 140
- “Installing Content Manager on Windows to accommodate VideoCharger” on page 142
- “Configuring an existing Content Manager to accommodate VideoCharger” on page 144
- “Streaming media objects from Content Manager” on page 144
- “Configuring Content Manager to accommodate the AIX Multimedia Archive” on page 147
- “Archiving media objects from Content Manager to the AIX Multimedia Archive” on page 148
- “Switching VideoCharger Server platforms within Content Manager” on page 149
- “Troubleshooting” on page 151
- “Content Manager media specific tables” on page 151

Introduction

IBM Content Manager is a type of database that can manage multimedia *objects* like scanned documents, images, text, and presentation files. Content Manager can also manage audio and video files (called *media objects* in Content Manager and *assets* in VideoCharger) by integrating with VideoCharger. This chapter describes how.

Content Manager consists of:

- One or more object servers to store the multimedia into
- One library server to administer the object servers
- One or more client machines to request the multimedia.

Content Manager can manage media files by storing them on the VideoCharger Server as assets. In Content Manager, the VideoCharger Server

Integrating VideoCharger features

can bond with the object server as a *Media Server* or *Media Object Server*. The default name for this server is MMSRVRX (AIX) and MMSRVRN (Windows). Figure 16 shows supported and unsupported configurations.

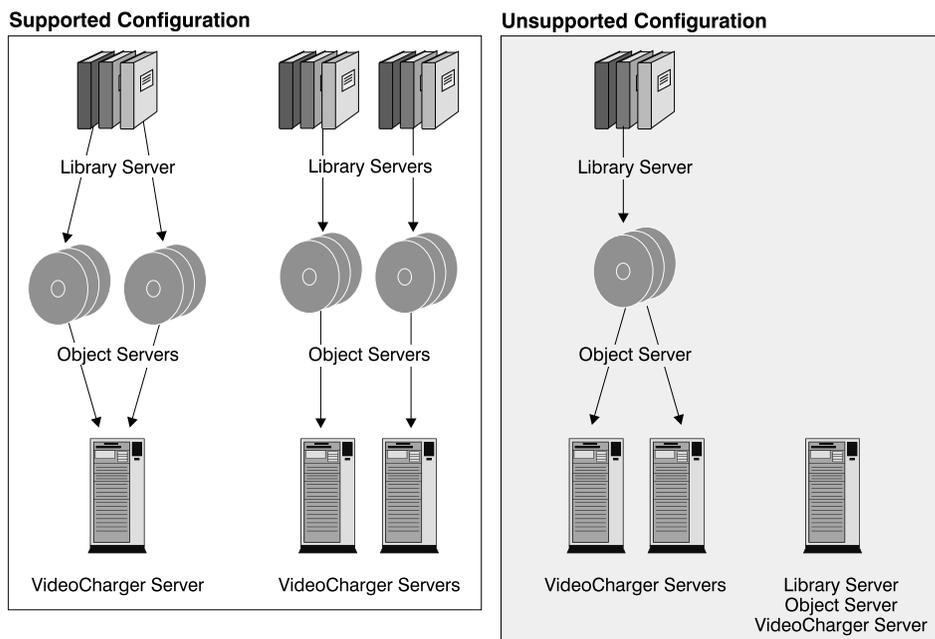


Figure 16. Supported VideoCharger and Content Manager configurations

Although a object server can only bond to one VideoCharger Server at a time, you can either bond every object server to its own VideoCharger Server or bond several object servers to one VideoCharger Server. Your best configuration depends on environment, asset location, and expected streams and rates.

Understanding how VideoCharger and Content Manager processes media object requests

As shown in Figure 17 on page 139, the following steps occur when a client requests a media object through Content Manager:

1. Client requests a media object from the library server.
2. Library server requests the media object from the object server.
3. Object server requests the media object from the Media Server (VideoCharger Server).
4. Programming application loads media object onto the VideoCharger Server. The media object appears in VideoCharger as an uppercase, 16-character-named asset. The programming application tells the VideoCharger Server to start a stream.

5. VideoCharger Server sends a temporary metadata file to the client, containing system instructions on streaming the media object.
6. Based on the MIME type of the metadata file, the client opens the appropriate video player and initiates a streaming session with the VideoCharger Server. The VideoCharger streams the media object to the Player.

For details, see “Streaming media objects from Content Manager” on page 144.

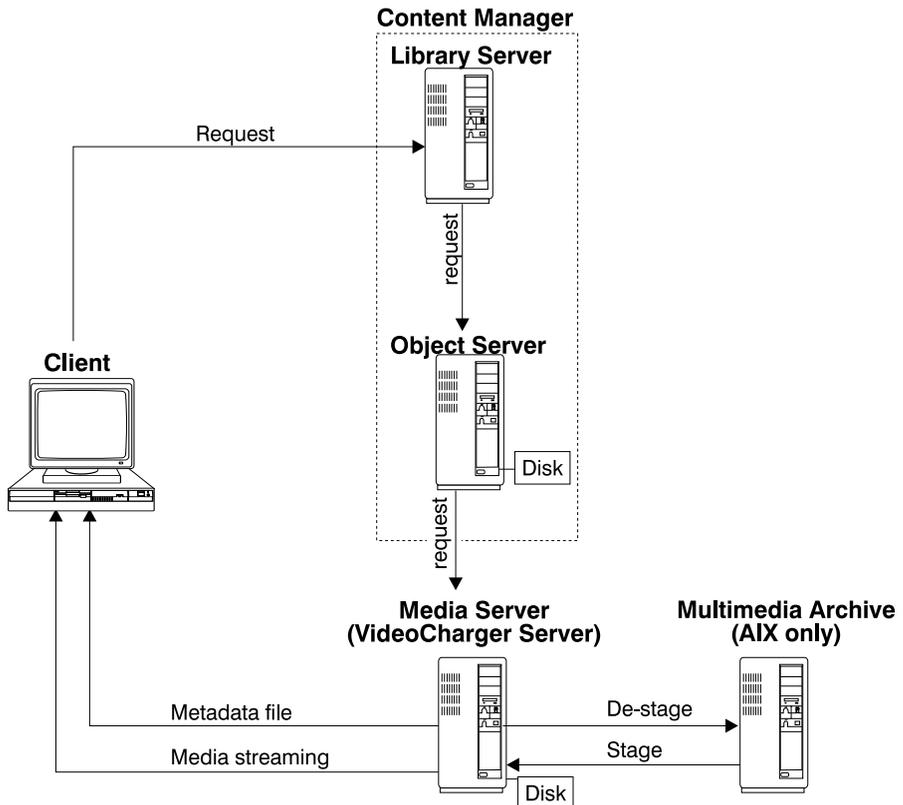


Figure 17. VideoCharger/Content Manager process flow

You can also *destage*, or archive, media objects into an AIX Multimedia Archive. When you configure Content Manager to accommodate it, Content Manager adds the Archive as a object server called the *Media Archiver*. To retrieve archived media objects, you would stage them back to the VideoCharger Server. For details, see “Configuring Content Manager to accommodate the AIX Multimedia Archive” on page 147 and “Archiving media objects from Content Manager to the AIX Multimedia Archive” on page 148.

Integrating VideoCharger features

Requirements for a VideoCharger/Content Manager integration

To integrate Content Manager and a VideoCharger Server, you need the following software:

- Installed and configured VideoCharger Server.
- Installed and configured client Player.
- Content Manager 7.1 or higher.
- Hardware and software requirements for Content Manager as detailed in *Planning and Installing Content Manager*.

Installing Content Manager on AIX to accommodate VideoCharger

When first installing Content Manager, you can configure it to accommodate the VideoCharger Server you installed. To do so, install the Content Manager system (library server, object server, client, system administration) as described in the *Planning and Installing Content Manager*. Make sure to do the following during the Content Manager installation:

- Install Content Manager on a different machine from the VideoCharger Server.
- Select the **Do you want to enable the Media Object Server feature?** checkbox.
- Do not install the QBIC[®] server or the text search features (until later).

Then, add the media manager stanza to Content Manager.

Requirement: Make sure that you are logged in as an AIX root administrator when performing the tasks.

Adding the media manager stanza to Content Manager

After installing Content Manager and restarting the system, you must manually add the media manager stanza to the Content Manager network table. Enter the `frnx1inc` command and enter the following responses at the prompts:

1. Select 1 - Add Server Entry to add a new server entry.
2. Assuming that you installed the VideoCharger Server on a different machine, enter 2 - Remote Server.
3. Select 3 - Media Manager.
4. Select 2 - AIX.
5. For Enter name of server, enter MMSRVRX.
6. For Enter Port number, enter 23793, assuming that 23793 is the default port and AG is the default asset group port. Check the Media Server data in System Administration to confirm.
7. For Enter hostname/IP address, enter your VideoCharger host name.

8. Select 1 - Save (or 99 to cancel).

You do not need to restart the servers.

Attention: If the port assigned to media manager is already in use, you can change the port number by completing the following steps:

1. Edit the `/usr/bin/startmm` file and find the following sentence: `exec /usr/bin/mediamgr`.
2. On the same line, append `-p new_portnumber` where `new_portnumber` is the new port number in decimal form. Example: `exec /usr/bin/mediamgr -p 23000`.

Starting the servers

You can start the VideoCharger Server by opening a VideoCharger machine command line prompt and entering:

```
startsrc -g vs
```

Because you enabled the object server for media, the VideoCharger Server must start before you can start Content Manager's object server. After the VideoCharger Server starts, it automatically starts media manager.

Start the Content Manager library server by entering:

```
frnstart.lib
```

at a Content Manager command line. Double-click to open a Java GUI window. If the server has started, an Accepting Requests message displays. This might take several minutes. Minimize this window.

Start the Content Manager object server by entering:

```
frnstart.obj
```

Check for the Accepting Requests message to verify that the server started. If the window closes, then the process failed and you must consult the error log.

Consulting error logs

Content Manager stores error logs on the drive where the library server is installed. Check either (a) `/$FRNROOT/log` or (b) `/home/libserverID/frn/log` for the library server and `/home/objserverID/frn/log` for the object server.

Open the file named `frndiag.log`. This file contains errors from all of the Content Manager components. The latest errors append to the bottom of the file. Use the timestamps to identify the errors associated with the object server failure. Error codes begin with `FRNxxxx`.

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Common failures include starting the object server before starting the VideoCharger Server, or not adding the media manager stanza to the network table. For other errors, look up the error code in the Content Manager *Messages and Codes*.

Installing Content Manager on Windows to accommodate VideoCharger

When first installing Content Manager 7.1 or higher, you can configure it to accommodate the VideoCharger Server you installed. To do so, install the Content Manager system (library server, object server, client, system administration) as described in the *Planning and Installing Content Manager*. Make sure to do the following during the Content Manager installation:

- Install Content Manager on a different machine from the VideoCharger Server.
- Select the **Do you want to enable the Media Object Server feature?** checkbox.
- Do not install the QBIC server or the text search features (until later).

Then, add the media manager stanza to Content Manager and start the servers.

Important: Make sure you are logged in as a Windows administrator when performing the tasks.

Adding the media manager stanza to Content Manager

After installing Content Manager and restarting the system, you must manually add the media manager stanza to the Content Manager network table. Select **Start** → **Programs** → **IBM Content Manager** → **Utilities** → **Network Table Generation** (or enter `frnnlinc`) and enter these responses at the command prompts:

1. Select 1 - Add Server Entry to add a new server entry.
2. Assuming that you installed the VideoCharger Server on a different machine, enter 2 - Remote Server.
3. Select 3 - Media Manager.
4. Select 3 - NT.
5. For Enter name of server, enter `MMSRVN`.
6. For Enter Port number, enter 23793, assuming that 23793 is the default port and AG is the default asset group port. Check **Object Server** → **Media Server** to confirm.
7. For Enter hostname/IP address, enter your VideoCharger host name.
8. Select 1 - Save (or 99 to cancel).

Attention: If the port assigned to media manager is already in use, you can change the port number in the Windows registry by completing the following steps:

1. Click **Start** → **Run**. The Run window opens.
2. In the **Open** field, type **REGEDIT**.
3. Click **OK**. The Registry Editor opens.
4. Double-click **HKEY_LOCAL_MACHINE** → **SOFTWARE** → **IBM** → **LANTV** → **Current Version** → **MediaManagerPort**. The value set window opens.
5. Click on the **Decimal Base**.
6. Type in the new port number value.
7. Click **OK** to save changes and exit.

Starting the servers

You can start the VideoCharger Server by opening a VideoCharger machine command line prompt and entering:

```
vsstart
```

or by selecting **Configuration and Administration** and then **Start Video Server** from http://server_name/vs_admin. Because you enabled the object server for media, the VideoCharger Server must start before you can start Content Manager's object server. After the VideoCharger Server starts, it automatically starts media manager.

You can start the Content Manager library server by selecting **Start** → **Programs** → **IBM Content Manager** → **Library Server**. Double-click to open a Java GUI window. If the server has started, an **Accepting Requests** message displays. This might take several minutes. Minimize this window.

You can start the Content Manager object server by selecting **Start** → **Programs** → **IBM Content Manager** → **Object Server**. Check for the **Accepting Requests** message to verify that the server started. If the window closes, then the process failed and you must consult the error log.

Consulting error logs

Content Manager stores error logs on the drive where the library server is installed. Check the `%FRNROOT%\log` directory.

Open the file named `frndiag.log`. This file contains errors from all of the Content Manager components. The latest errors append to the bottom of the file. Use the timestamps to identify the errors associated with the object server failure. Error codes begin with `FRNxXXX`.

Integrating VideoCharger features

Common failures include starting the object server before starting the VideoCharger Server, or not adding the media manager stanza to the network table. For other errors, look up the error code in the Content Manager *Messages and Codes*.

Configuring an existing Content Manager to accommodate VideoCharger

If Content Manager is already installed and you want to use it with VideoCharger, you must:

1. Enable the media manager in the object server
2. Add the media manager stanza to Content Manager (see “Adding the media manager stanza to Content Manager” on page 140 for AIX or “Adding the media manager stanza to Content Manager” on page 142 for Windows)
3. Start or restart the servers

Enabling the media object server feature

For AIX: The utilities to add VideoCharger to an operational object server are:

frnmedobj.db2

For AIX object servers running DB2

frnmedobj.ora

For AIX object servers running Oracle

Refer to the *Planning and Installing Content Manager* for information about how to use these utilities.

For Windows: From the `\%FRNR00T%` subdirectory on your object server, enter:

```
DB2CMD
```

to open a DB2 command Window. In this window, enter:

```
FRNMEDB2 objectserver_name
```

A message displays when the DB2 connection succeeds.

Streaming media objects from Content Manager

To stream media objects from Content Manager, you must first load them onto the VideoCharger Server. You can then stream the object by clicking on its 16-character filename in the public VideoCharger **Search** page, or by playing the metadata file directly from the client. Content Manager provides a sample application called Media Client in Content Manager 7.1 (with the latest service pack) and Content Manager 8. Their locations are:

For AIX: /win/samples/mclient/mclientx.c

For Windows: \win\samples\mclient\mclientn.c

Compiling Media Client

First, insert the Content Manager CD-ROM and copy `readme.txt`, `load.txt`, `mclient.h`, `mclient.in`, and `mclientx.c` (AIX) or `mclientn.c` (Windows) from `win\samples\mclient\` into a local directory on your Content Manager client.

Make sure to define the operating system in your compiler settings. Define `FRN_WINNT` for Windows; and `FRN_AIX` and `AIX` for AIX. For example, in the Microsoft Visual C++ compiler, you would select **Project** → **Settings** → **C/C++** and add `,FRN_WINNT` in the Preprocessor definitions field.

Finally, Media Client requires header and library files from Content Manager. You can either set your path to specify `%FRNROOT%\INCLUDE` and `%FRNROOT%\LIB`, or copy the following files to the directory where you stored `mclient`:

Table 14.

<code>frnolmla.h</code>	<code>frnperr.h</code>	<code>frnpfo.h</code>	<code>frnplldf.h</code>	<code>frnwfi.lib</code>
<code>frnp.h</code>	<code>frnphi.h</code>	<code>frnplcli.h</code>	<code>frnptype.h</code>	<code>frnwfi2.lib</code>
<code>frnpcapi.h</code>	<code>frnphi2.h</code>	<code>frnplibc.h</code>	<code>frnpvars.h</code>	<code>frnwfo.lib</code>

Configuring Media Client

After compiling Media Client, you must configure it to match your VideoCharger system specifications:

1. From the Content Manager CD-ROM, copy `readme.txt`, `load.txt`, `mclient.h`, `mclient.in`, and `mclientx.c` (AIX) or `mclientn.c` (Windows) into a local directory on your Content Manager client.
2. Compile the `mclientx.c` (AIX) or `mclientn.c` (Windows) file.
3. Open `mclient.in` and edit the default text to match your VideoCharger system configuration:

```
UserId PASSWORD 0 load.txt 2 asset1 MPEG1 SIF NTSC SYSTEM
0 20 30 46 2900 1536000 1 FTPhostname FTPuserid FTPpassword
```

You only need to specify `UserId` (Library server user ID), `PASSWORD` (Library server user's password), `FTPhostname` (host name where media file exists for FTP), `FTPuserid` (FTP user ID for host name), and `FTPpassword` (FTP user password). Leave the other values at their defaults.

Streaming media objects using Media Client

To stream media objects using `mclient`:

1. Start the VideoCharger Server.
2. Start the library and object servers (as described in "Starting the servers" on page 141 and "Starting the servers" on page 143).

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3. Login to the System Administration Client application using default user ID `frnadmin` and password `password`.
4. Run `mclientnx.exe` for AIX or `mclientn.exe` for Windows.
5. At a command prompt, enter `connect libsrvn` to connect to the library server.
6. Open `load.txt` and specify the location of the assets you want to play. For example,

```
videos\goodtime.mpg
\topgun.mpg
d:\zorrotailer.mpg
```

7. Enter `ms` (Media Store) to store a media object in VideoCharger. For a successful storage, the following message outputs:

```
***** Create Item *****
.....
Create successful!
New ItemID                = DH6LN05SKCHX0PQ1
New FRN$MEDIA ItemID      = U02G9KSAMZIY1QR2
Item ID: is stored :::>>> 1 in .\document.lst file
.....
```

In addition, output appears in local file `document.lst` that looks like this:

INDEX#:	ITEM_ID	MEDIA_ITEM_ID	TIME_STAMP
-----	-----	-----	-----
1	DH6LN05SKCHX0PQ1	U02G9KSAMZIY1QR2	

If you specified multiple assets in `load.txt`, `mclient` groups them into one continuous stream and assigns one item ID for them. To store another asset group, edit `load.txt` again and enter `ms`. `Mclient` then creates an item ID for the new asset group and appends it to `document.lst`:

INDEX#:	ITEM_ID	MEDIA_ITEM_ID	TIME_STAMP
-----	-----	-----	-----
1	DH6LN05SKCHX0PQ1	U02G9KSAMZIY1QR2	
2	FYA#L8U6DQI48T5C	MNK3AUD2JNJ59U6D	

8. To verify whether the load completed, enter `mq INDEX#` (Media Query) where `INDEX#` represents the index number that corresponds with the asset in the Media Store output. If `lMediaState` reads 2, the load completed and you can continue to the next step. If `lMediaState` reads 1 (load in process), then wait a few more minutes for the FTP to finish. If `lMediaState` reads 3 (load failed), then consult the server logs for error messages.
9. You can play the asset in one of two ways:
 - Locate the 16-character `item_id` in your public VideoCharger **Search** Web page and click on the asset to automatically play it in the VideoCharger Player. Remember that you must have a Player installed for this to work.

- Enter `mr INDEX#` to create a local metadata file (default is `view.tmp`). Select one of the following:

GET_IT

Saves a metadata file locally to stream from the VideoCharger Server.

STAGE_IT

Stages asset from the Multimedia Archive if the asset is not on the VideoCharger Server, and saves a metadata file locally to stream from the VideoCharger Server.

STAGE_IT_PREFETCH

Stages asset from the Multimedia Archive if the asset is not on the VideoCharger Server.

Play the asset by opening the newly created metadata file in the Player. The metadata file tells the Player how to locate and play the asset or asset group.

You can create your own client loader application to store and play assets through Content Manager. You can find code samples for adding media parts in the `$FRNROOT/SAMPLES` or `%FRNROOT%\SAMPLES` (Windows) directory of any machine where you installed the CM client toolkit. For example, the file `JAVA\txdoAddVs.java` shows how to add a media part using the Java API; `ACTIVEVEX\txdoMedia.frm` shows how to add a media part using the ActiveX API. For more guidance, consult the *VideoCharger Programmer's Reference*.

Configuring Content Manager to accommodate the AIX Multimedia Archive

To configure AIX or Windows Content Manager to recognize the AIX Multimedia Archive:

1. Start the library and SMS servers.
2. Login to the System Administration Client application using default user ID `frnadmin` and password `password`.
3. In the Sysadmin Client Window, right click on **Users** and select **New**.
4. Set **Userid** to `mos1`, **Password** to `password`, **Default Object Server** to `OBJSRVRN`, **Default Collection** to `Media.Collectn.Archive`, and **Privilege Set Name** to `ADMINPRIVS`. Click **OK**.
5. Click **Object Servers** → **OBJSRVRN** → **Storage Systems** → **Media Archiver** and double-click on **MSARCHIV**.
6. In the Properties window, enter the host name of your Multimedia Archive in the **Media Manager Name** field.
7. Under Media archiver, select **Unassigned**.
8. Click **Apply**.

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9. Select Assigned
10. Click OK.

Archiving media objects from Content Manager to the AIX Multimedia Archive

You can archive Content Manager media objects to the AIX Multimedia Archive in the following ways:

Destaging Media Objects

Copying all Media Server objects (that have not yet been archived yet) to the Multimedia Archive.

Purging Media Objects

Deleting any Media Server objects that have already been archived.

Staging Media Objects

Copying archived media objects back to the Media Server (see “Managing content in the Multimedia Archive” on page 133 for details).

This section explains “Destaging and purging Media Server objects in Regular Intervals” and “Purging Media Server objects by percent full” on page 149.

Destaging and purging Media Server objects in Regular Intervals

To configure how often to destage and purge Media Server objects to the Multimedia Archive (by regular intervals), complete the following steps:

1. Start the SMS and library server.
2. Login to the library server as frnadmin.
3. Click **Object Servers** → **Configuration**.
4. Double-click **IBMCONFIG**. The IBMCONFIG – Properties window opens.
5. Click the **Cycles** tab.
6. In Cycles, select **Enabled** for Purger and Destager.
7. Set how often to purge and destage by type in the corresponding **Hours** and **Minutes**.
8. In Batches (files), set how many files you want to destage (simultaneously) by typing a number into the **Stager** field under the Streamed Data column. Default is 10 files.
9. Click **OK** to save changes and close the window.

Content Manager then automatically starts, enables, and stops both MediaPurger and MediaDestager during the intervals you specified.

You can also start, enable, and disable either purging or destaging using the following AIX commands:

mp [status | start | enable | disable]

Gets status, starts, enables, or disables MediaPurger using default values or the ones you specified.

md [status | start | enable | disable]

Gets status, starts, enables, or disables MediaDestager using default values or the ones you specified.

Purging Media Server objects by percent full

To configure how often to purge Media Server objects (by percent full), complete the following steps:

1. Start the SMS and library server.
2. Login to the library server as frnadmin.
3. Click **Object Servers** → **OBJSRVRN**.
4. Double-click **Media Server**. The Media Server – Properties window opens.
5. In Purge rate, set how often to purge Media Server objects by typing a percentage in the **Start purge when size equals** field. Default is 80%.
6. In Purge rate, set how often to stop purging Media Server objects by typing a percentage in the **Stop purge when size equals** field. Default is 80%.
7. Click **OK** to save changes and close the window.

Content Manager then automatically starts, enables, and stops MediaPurger when the Media Server reaches the percentage of space that you specified.

Switching VideoCharger Server platforms within Content Manager

Although one Content Manager object server can only communicate with one VideoCharger Server, one VideoCharger can share more than one object server. To change your VideoCharger Server (perhaps to obtain more streaming capacity), you need to configure Content Manager to use the new VideoCharger Server.

Switching VideoCharger Servers from Windows to AIX

1. Migrate your assets to the new VideoCharger system by entering :

```
vsstage -s oldserver -S newserver -a assetname
```

Refer to the "vsstage command" in the *Administrator's Guide and Reference* for more information. If you have a lot of assets to move, you might want to consider writing a script file to move them.

2. Switch media manager servers in Content Manager by typing the following SQL commands at a DB2 command line on your object server machine:

```
connect to resource_manager_name  
update base_staging_media set mst_servername = 'mmsrvrx'
```

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mmsrvrx is the default name for the AIX media manager server—use the actual name if it differs.

3. Alter the network table with the correct media manager specifications in one of the following ways:
 - Edit the network table manually in %FRNROOT%\frnolint.tbl; look for the stanza that begins with SERVER: MMSRVRN REMOTE SOCKETS and change the name, host name, and server type (Windows to AIX). Validate the port number and save the file.
 - In the Network Table Generation utility for Content Manager, delete the current media manager entry. Then create a new one to change the server name, host name, and server type from Windows to AIX (for directions, see “Adding the media manager stanza to Content Manager” on page 140 in the new install, or “Enabling the media object server feature” on page 144 in the adding VideoCharger server install).

Validate the data by opening Content Manager **System administration client** → **Object Server** → **Media Server**. To test that you have successfully switched, play an existing video file through Content Manager and then load a new video file in your new VideoCharger.

Switching VideoCharger Servers from AIX to Windows

1. Migrate your assets to the VideoCharger system by entering:

```
vsstage -s oldserver -S newserver -a assetname
```

Refer to “vsstage command” in the *Administrator’s Guide and Reference* for more information. If you have a lot of assets to move, you might want to consider writing a script file to move them.

2. Switch media manager servers in Content Manager by typing the following SQL commands at a DB2 command line on your object server machine:

```
connect to resource_manager_name  
update base_staging_media set mst_servername = 'mmsrvrn'
```

mmsrvrn is the default name for the Windows media manager server—use the actual name if it differs.

3. Alter the network table with the correct media manager specifications in one of the following ways:
 - Edit the network table manually in \$FRNROOT/frnolint.tbl; look for the stanza that begins with SERVER: MMSRVRX REMOTE SOCKETS and change the name, host name, and server type (AIX to Windows). Validate the port number and save the file.
 - In the Network Table Generation utility for Content Manager, delete the current media manager entry. Then create a new one to change the server name, host name, and server type from AIX to Windows (for directions, see “Adding the media manager stanza to Content Manager” on page 142

on page 142 in the new install, or “Enabling the media object server feature” on page 144 in the adding VideoCharger server install).

Validate the data by opening Content Manager **Start** → **Programs** → **IBM Content Manager** → **System Administration Client** → **Object Server** → **Media Server**. To test that you have successfully switched, play an existing video file through Content Manager and then load a new video file in your new VideoCharger.

Troubleshooting

For easier troubleshooting, install and validate *one* product at a time instead of both. First, validate VideoCharger by loading and viewing streamed assets. Then validate the Content Manager system by creating index classes and loading objects.

Make sure you start *all* of the servers before validation. After defining the VideoCharger Server to a Content Manager object server, remember to run the VideoCharger Server *before* you first start the object server.

Although you cannot modify Content Manager’s default configuration IBMCONFIG, you can create a custom configuration file to optimize performance:

1. Copy the IBMCONFIG file and save it under a unique name.
2. Stop the library server.
3. Right-click the library server icon and click **Properties**.
4. Click the **Shortcut** tab.
5. Change the configuration file name to the new file name.
6. Click **OK**.

To avoid delays when objects or clients access other data while the assets are loading, you can increase the allowable child processes from 5 (the default) to 10 or 15 on the Performance page of this custom configuration file (Content Manager System Administration Client Component). Also, you can maximize the number of object server processes to a more ideal 3:2 ratio (library to server object processes).

Content Manager media specific tables

Content Manager has updated and added several database tables to accommodate streaming. Two media specific tables, the library server’s FRN\$MEDIA (Table 15 on page 152) and the object server’s base_objects_media (Table 16 on page 153), store information about streamed objects only.

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Table 15. AVT00009 (FRN\$Media) table in library server

Column name	Definition	Acceptable values
ITEMID	Media reference item ID	16 characters, not null
ATTRIBUTE47	Media item ID	Item ID of media asset
ATTRIBUTE48	FRN\$MEDIAREpType	Default is FRN\$NULL
ATTRIBUTE49	FRN\$MEDIAPartNo	Part number of media asset
ATTRIBUTE50	FRN\$MEDIATimestamp	Timestamp when object was stored
ATTRIBUTE51	FRN\$MEDIAMediaState	<ol style="list-style-type: none"> 1. Pending, load in progress 2. Load completed successfully 3. Load failed
ATTRIBUTE52	FRN\$MEDIAInvalidCmds	Invalid commands for video player control mask
ATTRIBUTE53	FRN\$MEDIAMediaType	Describes file format of the media asset. Value is alphanumeric and up to 16 characters. Current values include: MPEG1(default), MPEG2, AVI, WAV, LBR, QT, MJPEG, H263, H273, G723
ATTRIBUTE54	FRN\$MEDIAResolution	Value is alphanumeric and up to 16 characters. Current values: SIF(default), HHR, CCIR601
ATTRIBUTE55	FRN\$MEDIASstandard	Value is alphanumeric and up to 16 characters. Current values: NTSC(default), PAL
ATTRIBUTE56	FRN\$MEDIASFormat	Streaming type of video file. Current values: System (default), Program, transport
ATTRIBUTE57	FRN\$MEDIADurationSeconds	Asset duration in seconds
ATTRIBUTE58	FRN\$MEDIADurationFrames	Asset duration in frames
ATTRIBUTE59	FRN\$MEDIASFrameRate	Frame rate per second multiplied by 100. Value is stored at 100 times the actual value.
ATTRIBUTE60	FRN\$MEDIASBitRate	Total multiplexed bit rate per second
ATTRIBUTE61	FRN\$MEDIASCopyRate	Copy rate (bits per second) at which to transfer data.
ATTRIBUTE62	FRN\$MEDIASNumberUsers	Number of users allowed to stream an asset concurrently. Default is 1, but value is not used by VideoCharger.
ATTRIBUTE63	FRN\$MEDIASAssetGroup	Value is alphanumeric up to 120 characters. Default is AG.

Table 16. Base_objects_media table in object server

Column name	Definition	Acceptable values
MOB_OBJECTNAME	Correlates with FRN\$MEDIAItemID/RepType	Primary Key
MOB_COLLECTIONID	Collection identifier	smallint, not null
MOB_MGTCLASSID	Management class identifier	smallint, not null
MOB_STGCLASSID	Storage class identifier	smallint, not null
MOB_VOLUMEID	Volume identifier	integer, not null
MOB_PATH	Identifier which correlates to volume directory structure	integer, not null
MOB_FILENAME		
MOB_ATTRIBUTES	Value to interpret path (value indicates source of object). Thirty-two was added to indicate media object.	integer, not null
MOB_PLAYSTATUS		Streaming availability: T Temporary V Valid object I Invalid object
MOB_STAGINGSTATUS		Media object status on VideoCharger: P Load operation pending B Load successfully (staged, but not archived) N Not on VideoCharger staging area X Object can be purged

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Table 16. *Base_objects_media* table in object server (continued)

Column name	Definition	Acceptable values
MOB_VOLSTATUS		Media object status on archiver: P Destage operation pending V Valid object I Invalid object N Not on archiver X Object can be purged R Retry (used during media destage)
MOB_SIZE		float, not null
MOB_CREATEDATE	Date object was stored	date
MOB_REFERENCEDATE	Date object last referenced	date
MOB_ACTIONDATE	Migration action date	date
MOB_MGTCLASSDATE	Date object entered storage class	date
MOB_STGCLASSDATE	Date object entered storage class	date
MOB_RETENTION	Date object to be deleted	integer, not used
MOB_LIBRARYID	Library with index of object	small integer

Other tables are modified as well when media is enabled for a particular object server, include the following tables:

BASE_CNTL

Information about the object server configuration.

BASE_STAGING_MEDIA

Information about the media server.

BASE_VOLUMES

Archive information.

BASE_DEVMGR

Device manager information regarding whether the archive is enabled/disabled.

BASE_COLLECTIONS

Added two default collection IDs: `media.collectn.archive` and `media.collectn.noarchiv`.

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Chapter 16. Integrating Content Manager Version 8 with VideoCharger

This chapter explains how to integrate VideoCharger with both the AIX and Windows versions of IBM Content Manager 8. It covers these topics:

- “Introduction”
- “Requirements for a VideoCharger and Content Manager integration” on page 160
- “Adding VideoCharger Servers and AIX Multimedia Archives to Content Manager” on page 160
- “Archiving media objects from Content Manager to the AIX Multimedia Archive” on page 167

Introduction

IBM Content Manager is a type of database that can manage multimedia objects like scanned documents, images, text, and presentation files. Content Manager can also manage audio and video files (called *media objects* in Content Manager and *assets* in VideoCharger) by integrating with VideoCharger.

Content Manager consists of:

- One or more resource managers to store the media files into.
- One library server to administer the resource managers.
- One or more client machines to request the media files.

Content Manager can manage media files by storing them on the VideoCharger Server as assets. To set this up in Content Manager Version 8, you can add one or more VideoCharger Servers to one or more resource managers. Figure 18 on page 158 shows examples of supported configurations.

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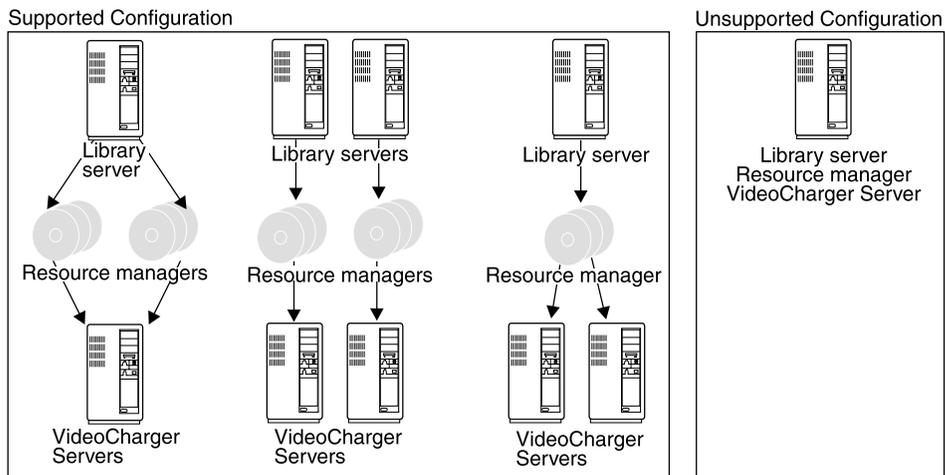


Figure 18. Supported VideoCharger and Content Manager configurations

Your best configuration depends on environment, asset location, and expected streams and rates.

Understanding how VideoCharger/Content Manager processes media object requests

As shown in Figure 19 on page 159, the following steps occur when a client requests a media object through Content Manager:

1. Client requests a media object from the library server.
2. Library server passes security token to client.
3. Client requests the media object from the resource manager.
4. Resource manager requests the media object from the VideoCharger Server.
5. Depending on the request, the following occurs:

Load request

The media object loads onto the VideoCharger Server with an asset name of:

$Lx.ABCDEFGHIJKLMNOPQRSTUVWXYZ.Vy$

where x represents the library server number, $ABCDEFGHIJKLMNOPQRSTUVWXYZ$ represents a 26-character asset name, and y represents the version control number. If you replace this asset, the name becomes:

$Lx.ABCDEFGHIJKLMNOPQRSTUVWXYZ.Vy.zzz$

where zzz represents a random string of characters.

Retrieve request

The VideoCharger Server exports the media object to an FTP site.

Play request

The VideoCharger Server sends a temporary metadata file to the client, containing system instructions on streaming the media object. Based on the MIME type of the metadata file, the client opens the appropriate video player and initiates a streaming session with the VideoCharger Server. The VideoCharger streams the media object to the Player.

- Resource manager tells the client that the request finished. If request was asynchronous, then the resource manager also tells the library server that the request finished.

For details, see Figure 19 on page 159.

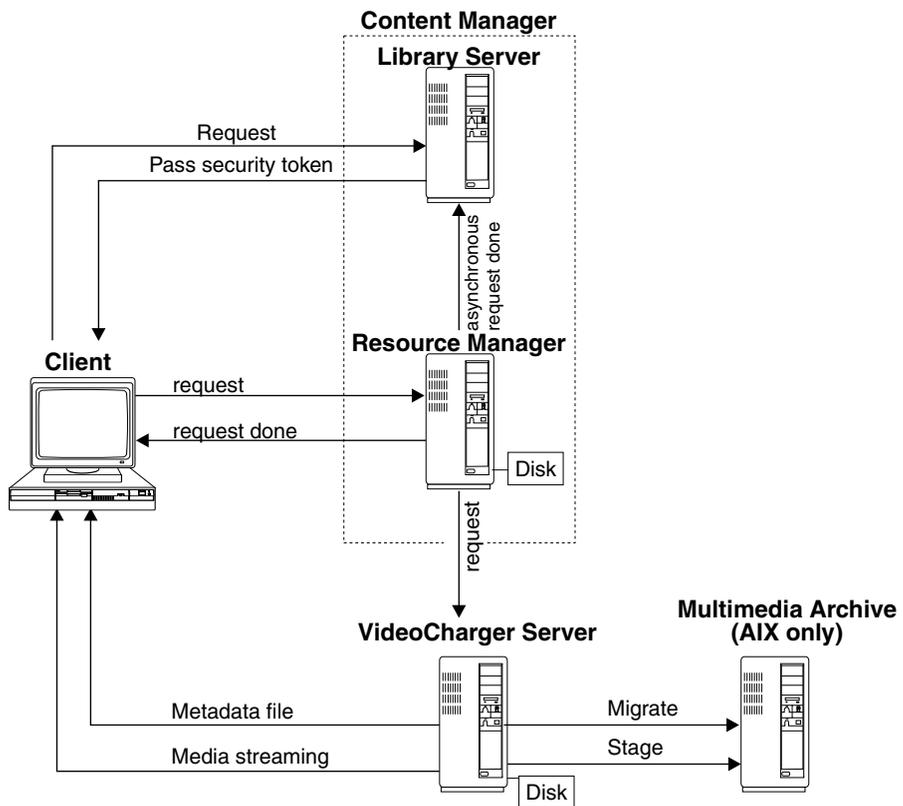


Figure 19. VideoCharger/Content Manager Process Flow

You can also archive media objects into the AIX Multimedia Archive by adding the Archive into one or more of the resource managers. Then, to retrieve archived media objects, you can *stage* them back to the VideoCharger

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Server. For details, see “Adding VideoCharger Servers and AIX Multimedia Archives to Content Manager” and “Archiving media objects from Content Manager to the AIX Multimedia Archive” on page 167.

Requirements for a VideoCharger and Content Manager integration

To integrate Content Manager and a VideoCharger Server or Multimedia Archive, you need the following software:

- Installed and configured VideoCharger Server.
- Installed and configured client Player.
- Installed and configured Multimedia Archive (if applicable).
- Installed and configured Content Manager Version 8.

Adding VideoCharger Servers and AIX Multimedia Archives to Content Manager

After installing Content Manager and defining a resource manager in the library server, you can add media servers (such as VideoCharger Server or AIX Multimedia Archive) to the resource manager by completing the following steps:

1. Start the VideoCharger Servers, Multimedia Archives (if applicable), and Websphere resource manager.
2. Log in to the Content Manager System Administration application as an administrator. The Content Management Administration window opens.
3. Define each VideoCharger Server and Multimedia Archive that you want to add as explained in “Defining a media server in a resource manager” on page 161.
4. Enable one device manager for all VideoCharger Servers and one device manager for all Multimedia Archives (if applicable) as explained in “Enabling a device manager for media servers” on page 161.
5. Create one storage class for all VideoCharger Servers and one storage class for all Multimedia Archives (if applicable) as explained in “Creating a new storage class for media servers” on page 162.
6. Create one storage group for all VideoCharger Servers and one storage group for all Multimedia Archives (if applicable) as explained in “Creating a new storage group for media servers” on page 162.
7. Define each VideoCharger Server and Multimedia Archive as a storage system volume in “Defining a media server as a new volume in the storage systems list” on page 162.

When you complete these steps, your VideoCharger Server or Multimedia Archive appears as a new volume in the resource manager’s **Storage Systems**

list. You can click on **VideoCharger Volumes** or **Media Archive Volumes** to see them. Then you can use Content Manager controls to store and manage assets in these volumes.

Defining a media server in a resource manager

To define a VideoCharger Server or Multimedia Archive in a resource manager, complete the following steps:

1. Expand **Resource Managers**.
2. Expand the resource manager that you want to add the media server to.
3. Right-click the **Server Definitions** node and select **New**. The New Server Definition window opens.
4. In the **Name** field, type in your preferred name for the media server. For example, VCSERVER1 or MARCHIVE1.
5. From the **Server type** list, select **VideoCharger** for a VideoCharger Server or **Media Archive** for a Multimedia Archive.
6. In the **Hostname** field, type the media server host name or IP address.
7. In the **User ID** field, type your content loading user ID. For example, vsadmin for VideoCharger server on Windows, or vsloader for VideoCharger server on AIX.
8. In the **Password** field, type your media server administrator password. For example, vsibm.
9. In the **Protocol** field, select **HTTP**.
10. In the **Port number** field, type 12322 (assuming that 12322 is the default port and AG is the default asset group port).
11. Leave the **Schema** and **Path** fields blank.
12. Click **OK** to save changes and close the window.

Repeat the steps for any other VideoCharger Servers or Multimedia Archives that you want to define.

Enabling a device manager for media servers

To interface the resource manager and media server together, you must enable a device manager for all VideoCharger Servers, or all Multimedia Archives, by completing the following steps:

1. Expand the resource manager that holds your media servers.
2. Right-click the **Device Managers** node and select **Explore**.
3. Right click ICMVCDM for VideoCharger Servers, or ICMMADM for the Multimedia Archives and then select Properties.
4. Select **Enable**.
5. Click **OK** to save changes and close the window.

You only need to enable one device manager for all of the VideoCharger Servers and one device manager for all of the Multimedia Archives.

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Creating a new storage class for media servers

To create a class for all of your VideoCharger Servers or for all of your Multimedia Archives, complete the following steps:

1. Expand the resource manager that holds your media servers.
2. Right-click the **Storage Classes** node and select **New**. The Storage Class Properties window opens.
3. In the **Name** field, type in your preferred name for your new media storage class. For example, VCCLASS for VideoCharger Servers or MACCLASS for Multimedia Archives.
4. Click **Local destination**.
5. In the **Device Manager** list, select ICMVCDM for VideoCharger Servers or ICMMADM for Multimedia Archives.
6. Click **OK** to save changes and close the window.

You only need to create one storage class for all of the VideoCharger Servers and one storage class for all of the Multimedia Archives.

Creating a new storage group for media servers

To create a storage group for all of your VideoCharger Servers or all of your Multimedia Archives together, you can complete the following steps:

1. Expand the resource manager that holds your media servers.
2. Right-click the **Storage Groups** node and select **New**. The New Storage Group window opens.
3. In the **Name** field, type in your preferred name for your new media storage group. For example, VCGROUP for VideoCharger Server or MAGROUP for Multimedia Archives.
4. Click **OK** to save changes and close the window.

You only need to create one storage group for all of the VideoCharger Servers and one storage group for all of the Multimedia Archives.

Defining a media server as a new volume in the storage systems list

To add a VideoCharger Server to a list of VideoCharger volumes, or to add a Multimedia Archive to a list of Media Archive volumes, complete the following steps:

1. Expand the resource manager that holds your media servers.
2. Expand **Storage Systems**.
3. Right-click the **VideoCharger Volumes** node for a VideoCharger Server, or **Media Archive Volumes** for a Multimedia Archive, and select **New**. The New VideoCharger volume window or New Media Archive volume window opens.

4. In the Asset Group field for VideoCharger, or **Name** field for Multimedia Archive, type in your preferred name for your new media volume. For example, VCVOLUME1 for a VideoCharger Server or MAVOLUME1 for a Multimedia Archive.
5. **For VideoCharger Server only:** In the **Threshold** field, type in the percentage of total volume that indicates when the VideoCharger Server is filled to capacity. For example, 80%. When your assets reach this threshold, Content Manager can automatically migrate the least recently used assets from this volume until the percentage decreases back below threshold--also, if a recently staged asset exceeds this threshold, Content Manager can purge the least recently used staged assets until the percentage decreases back below threshold. See "Archiving media objects from Content Manager to the AIX Multimedia Archive" on page 167 for directions on setting this up.
6. In the **Storage class** list, select your media storage class(es). For example, VCCLASS or MACCLASS.
7. If you created a media storage group, you can optionally select one of the following automated functions:

Unassigned

Keeps this volume inactive.

Overflow

Restricts this volume to store overflowing assets. If a volume in the same class exceeds its threshold, Content Manager automatically assigns this volume to the same group as the full volume. Then Content Manager stores the additional assets in this newly-assigned volume.

Assigned

Adds this volume to one of the storage groups that you select (for example, VCGROUP or MAGROUP). You must select a storage group to activate this volume. If this volume becomes full and you specified Overflow for another server, Content Manager stores all additional assets in the overflow server instead.

Suspend storage

Write-protects this volume so that no assets can be stored in it.

8. Click **OK** to save changes and close the window.

Repeat the steps for any other VideoCharger Servers or Multimedia Archives that you defined.

Defining a migration policy

Scheduling a migration policy is now mandatory, whether you have a Multimedia Archive or not.

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After defining a media server as a new volume in the storage systems list, follow the instructions in “Scheduling a migration policy” on page 168. If you do not have a Multimedia Archive, skip steps 9-11 of that section.

Defining a collection

After defining your migration policy, you must create a VideoCharger collection. To create a collection, complete the following steps:

1. Expand the resource manager that holds your media servers.
2. Right-click Workstation collections and select New. The New Workstation Collection window opens.
3. In the Name field, type in your preferred name for your new VideoCharger collection. For example, VCCOLLECTION.
4. In the Migration policy list, select your VideoCharger migration policy for the collection. For example, VCMIGRATE.
5. In the Storage group field, select your VideoCharger storage group. For example, VCGROUP for VideoCharger Server or MAGROUP for Multimedia Archives.
6. If you have enabled administrative domains, select a domain from the list in the Domain field.
7. Click OK to save changes and close the window.

Defining a VideoCharger attribute and item type

After defining your VideoCharger collection, you must define a VideoCharger item type and a new attribute for the item type. To create a new attribute, complete the following steps:

1. In the Content Management Administration window, expand Data Modeling.
2. Right-click Attributes and select New. The New Attribute definition window opens.
3. In the Name field, type in your preferred name for your new VideoCharger attribute. For example, ViewVideoName.
4. In the Attribute Type section, select Variable Character.
5. In the Character Type section, select Extended alphanumeric.
6. In the Character Length section, type in the minimum and maximum lengths. For example, 1 and 20.
7. Click OK to save changes and close the window.

To create a VideoCharger item type, complete the following steps:

1. In the Content Management Administration window, expand Data Modeling.
2. Right-click Item Types and select New. The New Item Type definition window opens.

3. Click the Definition tab.
4. In the Name field, type in your preferred name for your new VideoCharger item type. For example, VC.
5. In the Item type classification list, select Document.
6. Click the Document Management tab.
7. Click the Add button. The Define Document Management Relations window opens.
8. In the Part type field, select ICMBASESTREAM.
9. In the Collection field, select your VideoCharger collection. For example, VCCOLLECTION.
10. Click OK to save changes and close the window.
11. Click the Attributes tab.
12. In Available attributes or groups section, click ViewVideoName.
13. Click the Add button.
14. Click OK to add the item type.
15. Click OK to save changes and close the window.

Streaming VideoCharger content

This section explains how to stream VideoCharger content using eClient and using the Client for Windows.

Streaming VideoCharger content using eClient

To stream VideoCharger using eClient, you must first configure the eClient IDM.properties file. Then you can import VideoCharger media files into the eClient. To configure the eClient, complete the following steps:

1. In the directory where you installed eClient, and open the IDM.properties file in a text editor. For example, in the directory path: c:\Program Files\CMeClient\IDM.properties.
2. Append three zeroes to max_import_file_size=2000000 so that it instead reads: max_import_file_size=2000000000. . This maximizes the import file size from 2 MB to 2 GB.
3. Change importSupported=false to importSupported=true.
4. Save changes and close the file.

To import a media file using the eClient, complete the following steps:

1. Log into your library server at your eClient login screen. For example, ICMNLSDB (CM8).
2. Click Import. The Import Document window opens.
3. In the Item type list, select your VideoCharger item type. For example, VC.
4. In the File field, type in the media file that you want to import.

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5. In the File type list, select video/x-ibm-ivs for MPEG1, MPEG2, MP3, AVI, and WAV files; select video/quicktime for Quicktime MOVs.
6. In the ViewVideoName attribute field, type in a short name for the media file.
7. Click Import. This imports the media file into Content Manager.

To stream the media file using eClient, click Search. In the item type list, click VC and search for the media file. Click the media file to automatically stream it.

Streaming VideoCharger content using Client for Windows

To use the Client for Windows to import and view video you must first configure it to use the VideoCharger player as the "viewing application". Then you can import VideoCharger media files using the Client for Windows.

Note: The VideoCharger player must be installed before proceeding.

To configure the Client for Windows, complete the following steps:

1. Start your IBM Content Manager Client for Windows from the shortcut in the Windows Start Programs.
2. Log into your library server at your Client for Windows login screen. For example, ICMNLSDB (CM8).
3. Click Options.
4. Click Preferences.
5. Click Helper Applications tab.
6. Under the File Type column heading, click MPEG Video.
7. Under Helper Applications details, type the desired extension into the extension box. Tip: Any extension can be used, for example, mpg for MPEG or mov for Quicktime and so forth.
8. Click the Launch Application button.
9. Click the Browse button. The Open window launches.
10. In the Look In list, find and select the VideoCharger player application, `iscview.exe`, (the default location is `C:\Program Files\IBM\IBM VideoCharger Player\iscview.exe`), then click the Open button.
11. Repeat steps 6-10 for the File Types: MPEG Audio, AVI Video, WAV Audio.
12. If you have installed and will be using the QuickTime player to play QuickTime video, then repeat steps 6-10. But for step 10 choose the QuickTime player application `QuickTimePlayer.exe` (the default location is `C:\Program Files\QuickTime\QuickTimePlayer.exe`).
13. Click OK to save changes and close the window.

Hint: If you want to use a single media type for all MPEG1, MPEG2, AVI, MP3 and WAV content, you can use File Type VideoCharger Stream, instead of MPEG Video, MPEG Audio and so forth.

To import a media file using the Client for Windows, complete the following steps:

1. Start your IBM Content Manager Client for Windows from the shortcut in the Windows Start Programs list.
2. Log in to your library server at your Client for Windows login screen. For example, ICMNLSDB (CM8).
3. Click Import. The Import window opens.
4. Click on the Add Files to Import button to select the media file that you want to import, then click the Open button.
5. In the File type list, select the appropriate media file type. For example, select MPEG Video for MPEG1, MPEG2, MPEG Audio for MP3, AVI Video for AVI or WAV Audio for WAV files. Select Quicktime Movie for Quicktime MOVs. If you configured the client for the type VideoCharger Stream, then you can select that type instead.
6. In the Item Type list, select the VideoCharger item type for example, VC.
7. In the ViewVideoName attribute field, type a short name for the media file.
8. Click Import to import the media file into Content Manager.
9. After import finishes, click Cancel to close the Import window.

To stream the media file using Client for Windows:

1. Click Search and select Basic.
2. In the item type list, select VC and search for the media file.
3. Click the media file to automatically stream it. The VideoCharger player will open and play the video automatically. Hint: If you imported only one video, the search will launch the player automatically.

Archiving media objects from Content Manager to the AIX Multimedia Archive

After adding at least one VideoCharger Server and one AIX Multimedia Archive to a resource manager, you can perform the following Archive-related operations on Content Manager media objects:

Migrating media objects

Moving the least recently used assets (that have not yet been archived yet) to the Multimedia Archive whenever the VideoCharger Server exceeds threshold.

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Purging media objects

Deleting the least recently used staged assets (that have already been archived) whenever the VideoCharger Server exceeds threshold.

Staging media objects

Copying an asset from the Archive to the VideoCharger Server for viewing (see “Managing content in the Multimedia Archive” on page 133 for details).

This section explains “Scheduling a migration policy”.

Scheduling a migration policy

You can schedule a migration policy to automatically migrate any assets (that are x number of days old) from your VideoCharger storage class to the Media Archive storage class. If a VideoCharger storage class exceeds threshold before x number of days elapses, then the least recently used assets are migrated immediately until the volume decreases back below threshold. To set this up, complete the following steps:

1. Expand the resource manager that holds your VideoCharger Servers.
2. Right-click the **Migration Policies** node and select **New**. The New Migration Policy window opens.
3. In the **Name** field, type in your preferred name for your new VideoCharger migration policy. For example, VCMIGRATE.
4. Click the **Add** button. The New Migration Policy Entry window opens.
5. In the **Storage class** list, select your VideoCharger storage class. For example, VCCLASS.
6. For **Retention period**, click one of the following choices:

For x days

Moves any asset (that is x number of days old) from a VideoCharger storage class to the next class on the list.

Forever

Disables *all* migration from this class.

7. Click **OK** to save changes and close the window.
8. Click the **Add** button. The New Migration Policy Entry window opens.
9. In the **Storage class** list, select your Media Archive storage class. For example, MACCLASS.
10. Click **Forever**.
11. Click **OK** to save changes and close the window.
12. Click **OK** to save changes and close the window.

Content Manager will now automatically migrate any assets (that are x number of days old) from your VideoCharger storage class to the Media Archive storage class unless an exceeded threshold expedites the migration.

Chapter 17. Integrating the VideoCharger Extender for DB2 Universal Database

This chapter explains how to integrate VideoCharger with both the AIX and Windows versions of IBM DB2 Universal Database 6.1 and higher. It covers these topics:

- “Introduction”
- “Requirements for the VideoCharger Extender” on page 172
- “Installing the VideoCharger Extender” on page 173
- “Enabling and disabling data objects for the VideoCharger Extender” on page 174
- “Enabling your VideoCharger Server for the VideoCharger Extender” on page 177
- “Configuring DB2 VideoCharger Extender for AIX” on page 178
- “Configuring DB2 VideoCharger Extender for Windows” on page 179
- “UDTs for the DB2 VideoCharger Extender” on page 182
- “UDFs for the DB2 VideoCharger Extender” on page 183
- “Synchronizing objects” on page 186
- “Messages issued by the DB2 VideoCharger Extender” on page 188

Introduction

The IBM VideoCharger Extender for DB2 Universal Database enables you to manage your video and audio objects through your DB2 database while using your VideoCharger Server to store and retrieve the objects. The extender provides you with the full power of DB2 for managing your data, and the advantages of scalability and data streaming provided by VideoCharger.

The VideoCharger Extender operates with the AIX and Windows versions of DB2 6.1 and higher. For storing objects on the VideoCharger Server and querying the database, your client can reside on any platform supported by DB2. For playing objects stored on the VideoCharger Server, your client must be using an operating system supported by the VideoCharger Player—either Windows 98, Windows NT, Windows 2000, or Windows Millennium Edition. Your DB2 server must be on AIX or Windows NT/2000.

The information in this section assumes that you are familiar with IBM VideoCharger and DB2 Universal Database.

Integrating VideoCharger features

For additional information about DB2 Universal Database, see the following Version 6.1 (or higher) publications:

DB2 Universal Database Quick Beginnings

DB2 Universal Database Administration Guide

DB2 Universal Database Embedded SQL Programming Guide

DB2 extenders extend the capability of DB2 by defining distinct data types and special functions for manipulating those types. By doing this, the extenders save you the time and effort of defining these data types and functions in your applications. The data types and functions are available through SQL, giving your applications a single point of access to the data supported by the extender as well as traditional numeric and character data.

For additional information about DB2 extenders, see:

DB2 Universal Database Image, Audio, and Video Extenders Administration and Programming

DB2 Universal Database Text Extender Administration and Programming

User-defined types (UDTs)

A *user-defined type* (UDT) provides a way to differentiate data used by the VideoCharger Extender. You can use UDTs in the same way as SQL built-in types to describe the data stored in columns of tables. The VideoCharger Extender provides the following UDTs:

vcobjfilename

The fully qualified name of a workstation file

vcobjmetadata

Metadata that describes an object stored on the VideoCharger Server

vcobjref

Object reference information that identifies an object stored on the VideoCharger Server

vcobjsize

The size of an object stored on the VideoCharger Server

vcobjstatus

The status of an object stored on the VideoCharger Server

User-defined functions (UDFs)

A *user-defined function* (UDF) is a way to create SQL functions, adding to the set of built-in functions supplied with DB2. You can use UDFs in an SQL statement in the same way that you use built-in functions. The VideoCharger Extender provides the following UDFs:

vcGetObjMetaData

Returns the metadata for an object on the VideoCharger Server

vcGetObjSize

Returns the size of an object stored on the VideoCharger Server

vcGetObjStatus

Returns the status of an object stored on the VideoCharger Server

vcInsertObjRef

Loads an object onto the VideoCharger Server and stores information about it in the database

UDF and UDT names

The full name of a DB2 function is *schema-name.function-name*, where *schema-name* is an identifier that provides a logical grouping for SQL objects. The schema name for the VideoCharger Extender UDFs is vcdbadm. The vcdbadm schema name is also the qualifier for the VideoCharger Extender UDTs.

You can use the full name anywhere you see a UDF or a UDT. For example, vcdbadm.vcInsertObjRef identifies the UDF whose schema name is vcdbadm and whose function name is vcInsertObjRef. vcdbadm.vcobjref identifies a UDT whose schema name is vcdbadm and whose distinct-type name is vcobjref. You can also omit the schema name when you see a UDF or UDT; in this case, DB2 uses the function path to determine the function or distinct data type that you want.

Function path

The function path is an ordered list of schema names. DB2 uses the order of schema names in the list to resolve references to functions and distinct data types. You can specify the function path by specifying the SQL statement SET CURRENT FUNCTION PATH. This sets the function path in the CURRENT FUNCTION PATH special register.

Recommendation: If you do not log on as vcdbadm, add the vcdbadm schema to the function path. This allows you to enter VideoCharger Extender UDF and UDT names without having to prefix them with vcdbadm. Use the following command to add the vcdbadm schema to the function path:

```
SET CURRENT FUNCTION PATH = CURRENT FUNCTION PATH, vcdbadm
```

Overloaded functions

Function names can be overloaded. *Overloaded* means that multiple UDFs, even in the same schema, can have the same name. However, two functions cannot have the same signature. A *signature* is the qualified function name concatenated with the defined data types of all the function parameters.

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Triggers

A *trigger* defines a set of actions that are activated by a change to a table. The VideoCharger Extender uses a trigger to remove an object from the VideoCharger Server when a row containing a reference to that object is deleted.

Administrative support tables

Administrative support tables contain the information that an extender needs to process user requests. Some administrative support tables identify tables that are enabled for an extender. Other administrative support tables contain attribute information about objects in enabled tables. The VideoCharger Extender creates the following tables for its own use:

vc_server

Contains information on the VideoCharger Servers where objects referenced by the tables in the database are stored

vc_object

Contains information on the objects stored on the VideoCharger Server and information on the tables in the database that reference those objects

vc_objview

Contains all views of the `vc_object` table, however, users can access only those views for which they are authorized

Security and recovery

The information stored in the database tables enabled for the VideoCharger Extender and in the administrative support tables are afforded the same security and recovery protection as traditional numeric and character data. Users must have the required privilege to select, insert, or update objects. The objects stored on the VideoCharger Server are protected by VideoCharger.

The tables enabled for the VideoCharger Extender and the administrative support tables can be backed up and recovered in the same way as other data in DB2. The synchronization utility can be used to synchronize the objects stored on the VideoCharger Server with the references to those objects by the tables in the database. See “Synchronizing objects” on page 186.

Requirements for the VideoCharger Extender

You must have the following software installed:

- On the workstation that is to be your DB2 server:
 - DB2 Universal Database Enterprise Edition version 6.1 or higher
 - DB2 Universal Database Workgroup Edition version 6.1 or higher
- VideoCharger 8 on another machine

Installing the VideoCharger Extender

Install the VideoCharger Extender on your DB2 server as described in the following sections.

Installing the VideoCharger Extender on AIX

For the VideoCharger Server to access your databases, the media manager subsystem of VideoCharger must run in the DB2 instance environment. The DB2 instance is determined by the `$INSTHOME` and `$DB2INSTANCE` environment variables set by a `db2profile` script. When the fileset `avs.mm` applies to your VideoCharger Server on AIX, a shell script called `/usr/bin/mm.sh` is created. This script invokes a `db2profile` script when the media manager is started to ensure that the media manager runs in the DB2 instance environment. If you executed a `db2profile` script prior to applying `avs.mm`, the script `/usr/bin/mm.sh` executes that `db2profile` script. If you have not executed a `db2profile` script prior to applying `avs.mm`, you must edit the script `/usr/bin/mm.sh` to invoke the proper `db2profile` script.

You can get the VideoCharger Extender for AIX from the `avs.db` fileset in the `/usr/sys/inst.images` directory. This fileset includes:

- `avs.db.db2`, which contains the extender
- `avs.db.sample`, which contains sample code

To install the extender:

1. Execute the `db2profile` script provided by DB2, if it hasn't been executed previously. Enter:


```
. db2profile
```

This script defines the following environment variables used by the extender:

```
$INSTHOME
$DB2INSTANCE
```

2. Enter `smitty` to install the VideoCharger Extender.

The extender is installed in the `/usr/lpp/avs/database/db2` directory as `db2vcxfn.o`. If either the `$INSTHOME` or `$DB2INSTANCE` environment variable is defined, a link is created in the DB2 Instance home directory under the `sqllib/function` directories. If you have multiple DB2 instances that you want to enable for the VideoCharger Extender, you need to create the link manually for the additional instances.

To create a link manually, enter:

```
link -sf /usr/lpp/avs/database/db2/db2vcxfn.o $INSTHOME/sqllib/function/db2vcxfn.o
```

See "Enabling tables and columns" on page 175 for additional information on creating a link.

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3. Create a password for the administrator ID created during the installation of the extender:
 - a. Enter: `pwdadm vcdbadm` to create the password.
 - b. Enter: `pwdadm -c vcdbadm` to indicate that the password does not need to be changed at the next login.
4. If the `$DB2INSTANCE` variable is not set before you install the extender, you must manually add the administrator user ID, `vcdbadm`, to the DB2 instance group. Enter:

```
chgrp mem -m + vcdbadm db2iadml
```

Installing the VideoCharger Extender on Windows

To install the VideoCharger Extender on Windows, insert the VideoCharger CD-ROM, click **Install Components**, and select **VideoCharger DB2 Extender**.

Enabling and disabling data objects for the VideoCharger Extender

You prepare databases, tables, and columns to hold extender data by enabling them. First enable the database. Then enable a table and any of its columns in the database. When you no longer want extender data in your data objects, you can disable the objects.

The following sections describe how to:

- Enable your database
- Enable tables and columns in your database
- Disable your database

The scripts used to enable and disable data objects are located on your DB2 server in the following directories:

For AIX: `/usr/lpp/avs/database/db2`

For Windows: The `...\IBM VideoCharger\bin` directory where you installed the VideoCharger Extender. The default is `\Program Files\IBM\IBM VideoCharger Server\bin`.

Tip: To allow users on client workstations to access the scripts, copy the scripts on a network drive.

Enabling databases

When you enable a database, the VideoCharger Extender:

- Creates the UDTs associated with the extender.
- Creates the administrative support tables. These tables are used by the extender to manage extender data. Do not manually edit these tables.

Use the administration user ID `vcdbadm`, created when you installed the VideoCharger Extender, to enable your database for the VideoCharger Extender. To enable your database:

1. Create your database, if you don't already have one.

For example, the following command creates a database named `vcdb`. Enter the command from the command prompt:

```
db2 create database vcdb
```

2. Connect to your new database.

For example, the following command connects to the database named `vcdb`. Enter the command from the system prompt:

```
db2 connect to vcdb
```

3. Define the UDTs, UDFs, and administrative support tables using the `db2vccr.ddl` script provided with the VideoCharger Extender for both AIX and Windows.

For example, the following command enables the database that you connected to in step 2. Enter the command from the command prompt:

```
db2 -tvf db2vccr.ddl
```

Enabling tables and columns

Any user can create a table to contain VideoCharger objects. At least one column should be defined with the UDT `vcobjref`. The database must be enabled before you can enable a table within it. To enable a table and its columns:

1. Create a table.

For example, the following command creates a table named `video_preview` with a column named `preview` that contains the reference information for VideoCharger objects. Enter the command from the command prompt:

```
db2 "create table video_preview(  
    video_id char(5)      not null,  
    title   varchar(30)  not null,  
    preview vcobjref,  
    primary key(video_id))"
```

2. Create the trigger for your table using the scripts provided with the VideoCharger Extender. The trigger is used when an object is deleted from the table.

On AIX, the script also creates the link needed by the VideoCharger Extender program `db2vcxfn.o` for the current DB2 instance. See "Installing the VideoCharger Extender on AIX" on page 173 for additional information.

Tip: You must have the authority to delete rows from `vc_objview` to create a trigger for your table.

For AIX: From the script directory:

```
./tblvccr.sh database-name userid table-name column-names
```

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For Windows:

```
tblvccr table-name column-names
```

where:

database-name

The name of the database that contains the table that you want to enable for the extender.

On Windows, the database that you are connected to is used.

userid The user ID used to connect to the database.

On Windows, the user ID that you used to connect to *database-name* is used.

table-name

The name of the table that you want to enable for the extender.

column-names

The names of the columns in *table-name* that are defined with the type *vcobjref*. It is recommended that only one column per table be enabled.

For example, the following commands create the trigger for the column named *preview* in the table named *video_preview* in the database named *vcdb*. Enter the command from the command prompt:

For AIX: `./tblvccr.sh VCDB VCDBADM VIDEO_PREVIEW PREVIEW`

For Windows: `tblvccr VIDEO_PREVIEW PREVIEW`

Disabling a database

To remove support for the VideoCharger Extender:

1. Delete all references to VideoCharger objects from the tables in the database. See “Deleting an object” on page 182.
2. Drop the trigger from each table enabled for the VideoCharger Extender using the scripts provided.

For AIX: From the script directory:

```
./tblvcdcr.sh database-name userid table-name
```

For Windows:

```
tblvcdcr table-name
```

where:

database-name

The name of the database that contains the table that you want to enable for the extender.

On Windows, the database that you are connected to is used.

userid The user ID used to connect to the database.

On Windows, the user ID that you used to connect to *database-name* is used.

table-name

The name of the table that contains the trigger.

For example, the following command drops the trigger from the table named `video_preview`. Enter the command from the command prompt:

For AIX: `./tblvcdcr.sh VCDB VCDBADM VIDEO_PREVIEW`

For Windows: `tblvcdcr VIDEO_PREVIEW`

- Drop the administrative support tables using the `db2vcdrp.ddl` script provided for both AIX and Windows. For example:

```
db2 -tvf db2vcdrp.ddl
```

Important: You must disable support for tables enabled for the VideoCharger Extender before you drop a database that is enabled for the VideoCharger Extender.

Enabling your VideoCharger Server for the VideoCharger Extender

For your VideoCharger Server to access the database on your DB2 server, you must edit the `db2cli.ini` file on your VideoCharger Server. The `db2cli.ini` file is located in the `/home/$DB2INSTANCE/sqllib/cfg` directory on AIX or in the `%DB2PATH%` directory on Windows. Set the following parameters:

`[data-source-name]`

The name that denotes the section header in the `db2cli.ini` file.

Typically, this is the database alias name. The name must be enclosed in square brackets.

DBALIAS

The name of your database

UID The administrator user ID created for the VideoCharger Extender, `vcdbadm`

PWD The password for `vcdbadm`, `ibmvc`

The following example shows an entry in the `db2cli.ini` file for the database named `vcdb`:

```
[VCDB]
DBALIAS=VCDB
UID=vcdbadm
PWD=ibmvc
```

Configuring DB2 VideoCharger Extender for AIX

You must perform the following configuration for DB2 to detect the VideoCharger Extender. To configure the DB2 Universal Database Server using TCP/IP:

1. From an AIX VideoCharger Server on which the DB2 VideoCharger Extender is installed, update the database configuration manager by entering the command:

```
db2 "update dbm cfg using svcename db2cDB2"
```

where *db2cDB2* is the service name.

2. Include the service name to your services file in the etc directory:

```
db2cDB2 50000/tcp  
db2iDB2 50001/tcp
```

where *db2CDB2* and *db2iDB2* are your service names, *50000* and *50001* are your port numbers, and *tcp* is your protocol.

3. Add the hostname and IP address to your hosts file in the etc directory:

```
9.112.17.249 wollo
```

where *9.112.18.249* is your IP address and *wollo* is your VideoCharger machine's hostname.

To configure the DB2 Universal Database CAE Client using TCP/IP:

1. Include the service name to your services file in the etc directory:

```
db2cDB2 50000/tcp  
db2iDB2 50001/tcp
```

where *db2CDB2* and *db2iDB2* are your service names, *50000* and *50001* are your port numbers, and *tcp* is your protocol.

2. Catalog the database node by entering the command:

```
db2 "catalog tcpip node db2ntcp remote wollo server db2cDB2"
```

where *db2ntcp* is your VideoCharger machine's node name, *wollo* is your VideoCharger machine's host name, and *db2cDB2* is the service name.

3. Catalog the database by entering the command:

```
db2 "catalog database vcndb at node db2ntcp"
```

where *vcndb* is the remote database name and *db2ntcp* is your VideoCharger machine's node name.

4. You need to register the database *vcdemo* for ODBC.

To specify the VideoCharger user ID and password for DB2, edit the `/home/$DB2INSTANCE/sqllib/cfg/db2cli.ini` file and customize the sample below:

```
[VCNDB]
DBALIAS=VCNDB
uid=vcbadm
pwd=ibmvc
```

Configuring DB2 VideoCharger Extender for Windows

You must perform the following configuration for DB2 to detect the VideoCharger Extender. To connect to the DB2 database from a VideoCharger Server with DB2 Extender installed:

1. From a VideoCharger Server with DB2 installed, click **Start** → **Programs** → **IBM DB2** → **Client Configuration Assistant**. The Client Configuration Assistant window opens.
2. Click **Add**. The Add Database Wizard window opens.
3. Click **Manually configure a connection to a database**. Click the **Next**. The Add Database SmartGuide Protocol page opens.
4. Click **TCP/IP** and **LAN-based**. Click **Next**. The TCP/IP page opens.
5. In the **Host name** field, type in the host name of your workstation. In the **Port number** field, type 50000. Click **Next**. The Database page opens.
6. In the **Location name** and **Database alias name** fields, type `VCDB`. Click **Next**. The ODBC page opens.
7. Select **Register this database for ODBC**. Click **As a system data source**. Click **Done** to save and exit.

Managing media objects with the VideoCharger Extender

You can use the VideoCharger Extender to enable DB2 to manage the information about video and audio objects stored on your VideoCharger Server. Descriptive information for an object (such as the title of a video, the director, the plot summary) can be stored in your table in columns defined with the standard numeric and character data types. The reference information used by the VideoCharger Extender is stored in the same table in the column defined with the UDT `vcobjref`. The object itself is stored on the VideoCharger Server along with metadata needed by the VideoCharger Server to access the object.

SQL statements containing references to VideoCharger Extender UDFs are used to manage the VideoCharger objects. These statements can be included in an application program or entered from the DB2 command line.

You can use standard SQL statements to query your database when searching for objects with similar attributes. For example, you can search for all video

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objects that were directed by the same person. You can then use the SQL SELECT statement with the `vcGetObjMetaData` UDF to retrieve the information needed to play the video that you are interested in. Use the VideoCharger Player to view the video stored on the VideoCharger Server.

The following sections describe how to use the UDFs to manage your audio and video objects. A sample program, called `vcsample.sqc`, is provided with the VideoCharger Extender and shows how each of the UDFs can be used.

For AIX: The sample program and its makefile are in the `/usr/samples/avs/database` directory.

For Windows: The sample program and its makefile are in the `\sample` subdirectory of the directory where you installed the VideoCharger Extender, the default is `\program files\ibm\ibm videocharger server\sample`.

The sample program uses a database named `sample`, which you must create before compiling the program. To use a different database, you must change the `vcsample.sqc` and `vcsample.mak` files to See your database. The database that you use for the sample must be enabled for the VideoCharger Extender. See “Enabling databases” on page 174.

Storing an object

Use the `vcInsertObjRef` UDF in an SQL INSERT statement to store a video or audio object. `vcInsertObjRef` performs the following actions:

- Stores the reference information and descriptive information in your database
- Updates the administrative support tables with the information about the VideoCharger Server and the object being stored
- Transfers the object to your VideoCharger Server using FTP

For example, the following statement stores information about a video in a table named `video_preview` and loads an object onto the VideoCharger Server from a host named `videol`:

```
insert into video_preview values ('00001','Topgun',
vcInsertObjRef('videol',      --ftp host name
'userid',                    --ftp user ID
'password',                  --ftp password
'9.111.22.333:23793',        --VideoCharger Server IP address
'AG',                        --VideoCharger Server asset group
'c:\topgun.mpg, c:\icing.mpg')); --file list
```

The VideoCharger Server automatically creates and stores the metadata needed to access the object. The metadata is stored on the VideoCharger Server.

Retrieving information about an object

You can use UDFs to retrieve the size or the status of an object. The size and status are stored on the VideoCharger Server.

Retrieving the size of an object

Use the `vcGetObjSize` UDF in an SQL `SELECT` statement to retrieve the size (in bytes) of a video or audio object. The UDF retrieves the information from the VideoCharger Server.

For example, the following statement retrieves the size of the object with the title *Topgun* in the table named `video_preview`:

```
select video_id,title,vcGetObjSize(preview)
  from video_preview
  where title='Topgun'
```

Retrieving the status of an object

Use the `vcGetObjStatus` UDF in an SQL `SELECT` statement to retrieve the status of a video or audio object. The status is either invalid, pending, or valid. The UDF retrieves the information from the VideoCharger Server.

For example, the following statement retrieves the status of the object with the title *Topgun* in the table named `video_preview`:

```
select video_id,title,vcGetObjStatus(preview)
  from video_preview
  where title='Topgun'
```

Retrieving an object

Use the `vcGetObjMetaData` UDF in an SQL `SELECT` statement to retrieve the metadata for a video or audio object. The UDF retrieves the information from the VideoCharger Server. You can store the metadata in a file for later use by specifying a file name when you call `vcGetObjMetaData`.

Use the metadata to invoke the VideoCharger Player to view the object. See the sample program, `vcsample.sqc`, for an example of invoking the VideoCharger Player.

The following statement retrieves the metadata for the object with the title *Topgun* in the table named `video_preview` and stores it in a file named `c:\vcobjmet.ivs`:

```
select video_id,title,vcGetObjMetaData(preview,'c:\vcobjmet.ivs')
  from video_preview
  where title='Topgun'
```

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Deleting an object

Use an SQL DELETE statement to delete an object. Deleting the information from your table activates the trigger that removes the object from the VideoCharger Server. For example, the following command deletes a row from the table named `video_preview`:

```
delete from video_preview
  where video_id='00001'
```

Important: Before dropping a table that contains object references to objects on a VideoCharger Server, you must delete all rows from the table. Deleting the row from the table triggers the VideoCharger Server to delete the object from the VideoCharger Server. If you drop a table without deleting the rows, the associated objects remain on the VideoCharger Server and are inaccessible.

UDTs for the DB2 VideoCharger Extender

Table 17 describes the UDTs created by the DB2 VideoCharger Extender. The table also lists the DB2 source data type for each distinct data type.

Table 17. UDTs defined by the VideoCharger Extender

UDT	Source data type	Description
<code>vcobjfilename</code>	<code>VARCHAR(128)</code>	Fully qualified name of a workstation file
<code>vcobjmetadata</code>	<code>VARCHAR(8196)</code>	The metadata that describes an object The metadata is set by and stored on the VideoCharger Server.
<code>vcobjref</code>	<code>VARCHAR(128)</code>	The object reference information stored in the database in the format: <i>server-ip-address:port-number/asset-group/object-name</i> where: <i>server-ip-address:port-number</i> The IP address and port number for the VideoCharger Server If you don't provide a port number, the default port number for the VideoCharger media manager, 23793, is used. <i>asset-group</i> The VideoCharger asset group <i>object-name</i> The name of the object stored on the VideoCharger Server

Table 17. UDTs defined by the VideoCharger Extender (continued)

UDT	Source data type	Description						
vcobjsize	DOUBLE	The size of the object in kilobytes (KBs) The size is stored on the VideoCharger Server.						
vcobjstatus	CHAR(1)	The status of the object The status can be: <table border="0"> <tr> <td style="padding-right: 20px;">I</td> <td>Invalid. The store failed and the object cannot be used.</td> </tr> <tr> <td>P</td> <td>Pending. The object is being loaded onto the VideoCharger Server.</td> </tr> <tr> <td>V</td> <td>Valid. The object is available for use.</td> </tr> </table> The status is stored in the <code>vc_object</code> table in your database.	I	Invalid. The store failed and the object cannot be used.	P	Pending. The object is being loaded onto the VideoCharger Server.	V	Valid. The object is available for use.
I	Invalid. The store failed and the object cannot be used.							
P	Pending. The object is being loaded onto the VideoCharger Server.							
V	Valid. The object is available for use.							

UDFs for the DB2 VideoCharger Extender

This section provides reference information for the UDFs created by the DB2 VideoCharger Extender. The UDFs are listed in alphabetical order.

vcGetObjMetaData

Returns the metadata for the object. The metadata is retrieved from the VideoCharger Server. If a file name is specified, the metadata is stored in the file.

Syntax

Retrieve reference information

```
▶▶—vcGetObjMetaData—(—object-reference—)—————▶▶
```

Retrieve reference information to a file

```
▶▶—vcGetObjMetaData—(—object-reference—,—file-name—)—————▶▶
```

Parameters

object-reference

The reference information used to identify the object on the VideoCharger Server. The data type for this parameter is `vcobjref`.

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file-name

The name of the file where the returned metadata is stored. The data type for this parameter is `vcobjfilename`.

Return value

The metadata for the object. The data type for this value is `vcobjmetadata`. The value returned contains the content-type information used to identify the object to a browser. When you pass this value to a browser, the browser launches the VideoCharger Player. The content-type information is not stored when a file name is provided.

Example

See the sample program, `vcsample.sqc`, provided with the VideoCharger Extender for an example of using this UDF.

vcGetObjSize

Returns the size of the object. The size is retrieved from the VideoCharger Server.

Syntax

▶—`vcGetObjSize`—(*—object-reference—*)————▶

Parameters

object-reference

The reference information used to identify the object on the VideoCharger Server. The data type for this parameter is `vcobjref`.

Return value

The size of the object. The data type for this value is `vcobjsize`.

Example

See the sample program, `vcsample.sqc`, provided with the VideoCharger Extender for an example of using this UDF.

vcGetObjStatus

Returns the status of the object. The status is retrieved from the VideoCharger Server.

Syntax

▶—`vcGetObjStatus`—(*—object-reference—*)————▶

Parameters*object-reference*

The reference information used to identify the object on the VideoCharger Server. The data type for this parameter is `vcobjref`.

Return value

The status of the object. The data type for this value is `vcobjstatus`.

Example

See the sample program, `vcsample.sqc`, provided with the VideoCharger Extender for an example of using this UDF.

vcInsertObjRef

Loads an object onto the VideoCharger Server and stores the reference information in the database table.

Syntax

```
▶▶—vcInsertObjRef—(—ftp-host—,—ftp-userid—,—ftp-password—,——————▶
▶—server-name—,—asset-group—,—file-list—)——————▶▶
```

Parameters*ftp-host*

Host name of the server where the object is located. The data type for this parameter is `VARCHAR(64)`.

ftp-userid

User ID used to access the object using FTP. The data type for this parameter is `VARCHAR(18)`.

ftp-password

Password associated with *ftp-userid*. The data type for this parameter is `VARCHAR(18)`.

server-name

The IP address and port number for the VideoCharger Server. The data type for this parameter is `VARCHAR(64)`.

If you don't provide a port number, the default port number for the VideoCharger media manager, 23793, is used.

asset-group

The VideoCharger Server asset group. The data type for this parameter is `VARCHAR(64)`.

If a null string is entered (""), the default asset group is used.

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file-list

The list of files to be loaded. File names must be separated by a comma (.). If more than one file is listed, the files are concatenated in the specified order and a single file is stored on the VideoCharger Server. The data type for this parameter is VARCHAR(255).

Return value

The reference information used to identify the object on the VideoCharger Server. The data type for this value is vcobjref.

Example

The following statement stores information about a video in a table named video_preview and loads an object onto the VideoCharger Server from a host named videol:

```
EXEC SQL insert into video_preview values ('00001','Topgun',
vcInsertObjRef('videol',          --ftp host name
              'userid',          --ftp user ID
              'password',        --ftp password
              '9.111.22.333:23793', --VideoCharger Server IP address
              'AG',              --VideoCharger Server asset group
              'c:\topgun.mpg, c:\icing.mpg')); --file list
```

Synchronizing objects

Use the synchronization utility to synchronize the objects on your VideoCharger Server with the tables that reference those objects. This utility uses the information in the administrative support tables to:

- Identify objects on the VideoCharger Server that are no longer referenced by your tables
- Identify objects that were not successfully loaded onto the VideoCharger Server
- Remove invalid objects from the VideoCharger Server and delete the corresponding row from your table
- Remove pending objects from the VideoCharger Server and delete the corresponding row from your table
- Remove objects from the VideoCharger Server that are no longer referenced

Run the synchronization utility from a command prompt on your VideoCharger Server. Objects found to be out of synchronization with the tables are displayed. Depending on the options specified, the objects are also removed. You should run the utility for each table that is enabled for the VideoCharger Extender.

Restriction: For tables that have more than one column defined with the type vcobjref, the utility only displays objects with the status of pending or

invalid. The deletion flags `-i`, `-p`, and `-o` are ignored, and no objects are deleted. You must determine the appropriate action to take to correct the tables.

Syntax

For AIX:

```
▶▶—db2vcsyn.sh—database—userid—password—schema—table—_i—_p—_o—▶▶
```

For Windows:

```
▶▶—db2vcsyn—database—userid—password—schema—table—_i—_p—_o—▶▶
```

Parameters

database

The name of your database.

userid

The administrator user ID used to connect to the database.

password

The password for *userid*.

schema

The schema of the database table used for synchronization. The value must be entered in uppercase.

table

The name of the database table used for synchronization. The value must be entered in uppercase.

-i

Removes invalid objects from the VideoCharger Server and deletes the corresponding rows from the table

If this option is omitted, candidates for removal are displayed, but not removed.

-p

Removes pending objects from the VideoCharger Server and deletes the corresponding rows from the table.

If this option is omitted, candidates for removal are displayed, but not removed.

Important: Objects that are in the pending state might be in the process of loading at the time this utility is run. Determine the state of the object on the VideoCharger Server before specifying that these objects should be removed from the table.

-o

Removes objects from the VideoCharger Server that are not referenced

If this option is omitted, candidates for removal are displayed, but not removed.

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Messages issued by the DB2 VideoCharger Extender

The VideoCharger Extender UDFs return a code in the SQLSTATE field of the SQLCA structure. Some messages are also logged to the log directory on the DB2 server:

For AIX: The log directory is in the /var/adm/ras directory

For Windows: The log directory is in the registry

Messages in the log can be mapped to a return code by replacing the prefix AVS with the number three (3). For example, message AVS8705E maps to return code 38705.

The following codes are returned by the UDFs:

38705

Problem: The VideoCharger media manager was unable to perform database operation on video-type tables.

User action: Verify that the VideoCharger system is properly configured for database operation.

38706

Problem: An error condition was detected while performing the operation, the operation could not be completed.

User action: Verify that the VideoCharger system is properly configured. See your IBM Service representative for further assistance.

38707

Problem: Received a corrupt order from a VideoCharger UDF.

User action: Retry the operation. If the problem persists, contact your IBM Service representative for further assistance.

38708

Problem: Internal error in VideoCharger media manager.

User action: The VideoCharger media manager installation is incorrect, re-install the media

manager. If the problem persists, contact your IBM Service representative for further assistance.

38709

Problem: Insert operation failed, no file was specified to load.

User action: Correct the command and retry the operation. If the problem persists, contact your IBM Service representative for further assistance.

38727

Problem: The VideoCharger media manager was unable to perform database operation on video-type tables.

User action: Verify that the VideoCharger system is properly configured for database operation.

38728

Problem: The VideoCharger UDF is unable to communicate with the VideoCharger subsystem.

User action: Verify that the VideoCharger system is properly configured and running.

38729

Problem: An error occurred while attempting to receive a response from the VideoCharger subsystem.

User action: Verify that the VideoCharger system is properly configured and running.

38730

Problem: An insert operation failed.

User action: Verify that the VideoCharger system is properly configured and running.

38770

Problem: Delete object failed.

User action: Verify that the VideoCharger system is properly configured and running.

38771

Problem: Delete object failed.

User action: Verify that the VideoCharger system is properly configured and running.

38772

Problem: Get object metadata failed.

User action: Verify that the VideoCharger system is properly configured and running.

38773

Problem: Get object metadata failed.

User action: Verify that the VideoCharger system is properly configured and running.

38774

Problem: Get object metadata failed.

User action: Verify that the VideoCharger system is properly configured and running.

38775

Problem: Get object metadata failed.

User action: Verify that the VideoCharger system is properly configured and running.

38776

Problem: Get object reference failed.

User action: Verify that the VideoCharger system is properly configured and running.

38777

Problem: Get object size failed.

User action: Verify that the VideoCharger system is properly configured and running.

38778

Problem: Get object size failed.

User action: Verify that the VideoCharger system is properly configured and running.

38779

Problem: Get object status failed.

User action: Verify that the VideoCharger system is properly configured and running.

38780

Problem: Get object status failed.

User action: Verify that the VideoCharger system is properly configured and running.

38781

Problem: An invalid parameter was detected.

User action: A null parameter was specified where non-null should be used.

38782

Problem: An insert operation failed.

User action: Verify that the VideoCharger system is properly configured and running.

Integrating VideoCharger features

38783

Problem: An insert operation failed.

User action: Verify that the VideoCharger system is properly configured and running.

38805

Problem: Internal system error.

User action: Verify that the VideoCharger system is properly configured and running.

38806

Problem: Initialization is not done.

User action: Verify that the VideoCharger system is properly configured and running.

38808

Problem: Invalid number of files.

User action: Change the number of files and run the command.

38809

Problem: Service not available.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38812

Problem: Resource is temporarily unavailable.

User action: Try again later. If problem persists, contact your service representative.

38813

Problem: Invalid event type.

User action: Get a trace of the failure (follow instructions in “General debugging techniques” on page 109).

38816

Problem: Bad flag.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38818

Problem: Bad argument.

User action: If the problem resulted from using the **csdiag** command, verify that the argument is specified correctly.

38819

Problem: Invalid asset group.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38820

Problem: Invalid mode.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38821

Problem: Invalid SMPTE time.

User action: Perform disk maintenance procedures. If the problem persists, contact your service representative.

38822

Problem: Session limit exceeded.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38825

Problem: RPC system error.

User action: **For AIX:** Verify that the DCE daemon (**dced**) is running. If the daemon is not running, start it. If the daemon is running, you might need to stop and restart it. Use SMIT to stop and restart the DCE daemon. Enter:

```
smit dce
```

For Windows: Verify that the RPC service (**rpcss**) is running. If the service is not running, start it. If the service is running, you might need to stop and restart it.

38829

Problem: Invalid bit rate.

User action: Change the bit rate and run the command.

38830

Problem: Inconsistent resource.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38839

Problem: Asset bit rate is required.

User action: Specify a bit rate for the asset and run the command.

38885

Problem: Bad name existed.

User action: Choose a different name and run the command.

38898

Problem: Video file already exists.

User action: Choose a different name and run the command.

38899

Problem: Name already exists.

User action: Choose a different name and run the command.

38901

Problem: Name not found.

User action: Choose a different name and run the command.

38902

Problem: Number of locations/files is < 1.

User action: Specify one or more locations and run the command.

38903

Problem: More info/entries available.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38905

Problem: Insufficient resources.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38907

Problem: Insufficient disk space.

User action: **For AIX:** See “General debugging techniques” on page 67.

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For Windows: See “General debugging techniques” on page 109

38910

Problem: Max users > 0 is required.

User action: Raise the number of max users and run the command.

38913

Problem: Asset is already in use.

User action: Choose a different asset and run the command.

38915

Problem: Asset exists in asset group.

User action: Choose a different asset and run the command.

38916

Problem: Unable to open catalog.

User action: **For AIX:** See “General debugging techniques” on page 67.

For Windows: See “General debugging techniques” on page 109.

38993

Problem: No asset replica available.

User action: Wait a few minutes and request the asset again. If you receive the same message, restart the data pumps on AIX or the data exporter on Windows, and request the asset again.

Chapter 18. Integrating VideoCharger in a Tivoli environment

VideoChargerVersion 8.1 is Tivoli-Ready for monitoring. Using resource models, you can monitor the status of VideoCharger components from a Tivoli Event Console or from the Tivoli Distributed Monitoring Health Console. By reporting this information, the system administrator can then determine whether or not an action needs to be taken.

For Windows only: When a VideoCharger service stops or fails, Tivoli generates an event and attempts to restart the service.

For AIX only: When a VideoCharger process stops or fails, the administrator must manually restart the server through the VideoCharger Web pages or by accessing the machine directly.

The administrator can determine when a component has stopped by checking its status on the Tivoli Event Console or by viewing the Distributed Monitoring Health Console. The components that Tivoli can monitor are listed in Table 18.

Table 18. VideoCharger components that Tivoli can monitor

VideoCharger components	AIX	Windows
Control server	vscs	lantv_cs
Data exporter	vsdex	lantv_de
Application server requester	vsasreq	lantv_ar
Application server socket handler	vsascom	lantv_vi
Application server logging daemon	vssy	lantv_sc
Media manager	vsmm	lantv_mm
RTSP daemon	vsrtspd	lantv_rt
Video hub media manager	vsvhmm	lantv_vhmm

This section assumes that the administrator has had experience working in a Tivoli environment and is familiar with the Tivoli products Framework, Tivoli Event Console, and Tivoli Distributed Monitoring.

This section covers the following topics:

- “Requirements for a VideoCharger integration in a Tivoli environment” on page 194

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- “Setting up the Tivoli resource models”
- “Verifying the VideoCharger integration in the Tivoli environment” on page 196

Requirements for a VideoCharger integration in a Tivoli environment

Before beginning, the following products need to be installed and functioning within the network:

- VideoCharger Version 8.1.
- Tivoli Management Framework (Advanced Edition) 3.7B or higher.
- Tivoli Enterprise Console® 3.7.1.
- Tivoli Distributed Monitoring 4.1 or higher.

Setting up the Tivoli resource models

The Tivoli resource models enable the integration with VideoCharger. To set them up, complete the following steps in this exact order:

1. **Locate the resource models on the VideoCharger CD-ROM.** The resource models can be found in the /Tivoli directory on the VideoCharger CD-ROM:

```
TMW_VCServices.baroc
TMW_VCServices.tar (resource model for Windows)
DMXVCProcess.baroc
DMXVCProcess.tar (resource model for AIX)
```

2. **Add the resource model to the Tivoli management region server or managed node/gateway.** Open a bash shell on the Tivoli management region server or managed node/gateway. Go to the /Tivoli directory on the VideoCharger CD-ROM. Issue the following command in the bash shell for the resource model you wish to add:

```
wdmrm -add resource_model_tarfile
```

where *resource_model_tarfile* represents the tar file to distribute. Distribute TMW_VCServices.tar for Window endpoints and DMXVCProcess.tar for AIX machines.

3. **Create a rule base.** Open up the TME Desktop and click **EventServer**. The Event Server Rule Bases opens. Click **Create** → **Rule Base** from the menu bar and insert a name (for example, VCRules) and a directory (for example, C:\Tivoli). Click **Create & Close** to save changes and exit.
4. **Configure the rule base.** Right-click on the Default rule base and select **Copy**. Select the rule base you have just created (for example, VCRules) and checkmark **Copy rules** and **Copy classes**. Close the window.
5. **Add BAROC files into the rule base.** Right-click on your rule base and select **Import**. Under Position to insert imported class file, a list of

BAROC files are already defined in this rule base. Import the following four files so that they appear on the bottom of the list in the following order:

```
Tmw2k.baroc  
TMW_Services.baroc  
TMW_VCServices.baroc  
DMXVCPProcess.baroc
```

If these files are not in this order, you will receive an error when you compile the rule base.

To import these files in the right order, select the **Import Class Definitions** option. Under the Directory Path, click **File** and locate the Tmw2k.baroc file. In the bottom section, click **Insert After** and highlight the last .baroc file in the list. Click the **Import** button. The Tmw2k.baroc file should then appear at the very end.

Repeat these steps for the remaining three files in the order listed above. When finished, click **Import & Close**.

6. **Compile the rule base.** Right-click on the rule base that you created and select **Compile**. When the window pops up, click the **Compile** button. Make sure that the compiler output contains no errors.
7. **Load the rule base.** Right-click on the rule base that you created and select **Load**. When the window pops up, checkmark **Load and activate the rule base** and click **Load & Close**.
8. **Restart the Tivoli Event Console.** Open up a bash shell. Shutdown and restart the Tivoli Event Console (TEC) by entering the following Tivoli commands:

wstopesvr	(stops the TEC)
wstartesvr	(restarts the TEC)
wstatesvr	(displays the status of the event server)
wrb -lcurr	(shows that the new rule base has been loaded)
9. **Configure management region.** In a previous step, you added the VideoCharger resource model to existing regions in the Tivoli environment. Right-click on your managed region and select **Managed Resources**. In the field under Current Resources, you should see a list of resources that includes Tmw2kProfile. If not, select the item from the list of **Available Resources** and add it by clicking the left arrow button. Click **Set & Close**.
10. **Create profiles.** If you already have a Distributed Monitoring Profile, skip to the next step. Double click on your region in the Tivoli Desktop and open up one of your defined policy regions. Click **Create → Profile**. Insert a name and highlight the Tmw2kProfile type. Click **Create & Close**.
11. **Configure profiles.** Open up your profile in Profile Manager. Insert a profile name. Click **Add with Defaults**.

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For an AIX profile: In the **Category** pull-down menu, select **UNIX - LINUX**. In the list of resource models, select **DMXVCProcess**. Click **Add & Close**. In the Distributed Monitoring Profile window, click **Edit → Properties**. Checkmark **Send TEC Events**. Select **TME (Secure) delivery**. When asked to choose a TEC Server, select **EventServer** from the pull-down menu. Click **OK** and close the Distributed Monitoring Profile window.

For a Windows profile: In the **Category** pull-down menu, select **Windows**. In the list of resource models, select **VCProcess**. Click **Add & Close**. In the Distributed Monitoring Profile window, click **Edit → Properties**. Checkmark **Send TEC Events**. Select **TME (Secure) delivery**. When asked to choose a TEC Server, select **EventServer** from the pull-down menu. Click **OK** and select close the Distributed Monitoring Profile window.

12. **Distribute profile.** In the Profile Manager window, click on the profile that you just modified and select the endpoint containing the VideoCharger Server. Click **Profile Manager → Distribute**. Select **Distribute Now** to send the profile to you endpoint
13. **Check profile.** To verify whether the profile was successfully distributed to the endpoint, enter the following command from a bash shell:

```
wdm|seng -e endpoint
```

If the results show that the profile currently stopped, start up the engine with this follow-up command:

```
wdmeng -e endpoint -p profile#region -start
```

Verifying the VideoCharger integration in the Tivoli environment

To test that the integration worked, complete the following steps:

1. **Start the systems.** Start up the Tivoli Event Console (TEC), the Distributed Monitoring (DM) Health Console, and the VideoCharger Server.
2. **Pull up the appropriate views.** For the Tivoli Event Console, go into the Event Viewer so that you can monitor events in detail. For the Tivoli Distributed Monitoring Health Console, add the endpoint that contains the VideoCharger Server. Click **File → Add Endpoint** and enter the name of the machine. For the VideoCharger Server, launch the VideoCharger Web pages. Check on the status of VideoCharger components and make sure that they are active.
3. **Stop the VideoCharger Server.** Go to the Configuration and Administration Web page on VideoCharger. **For AIX:** click **Start/Stop the VideoCharger Server complex**. **For Windows:** click **Stop VideoCharger Server**.
4. **Observe the results.** Depending on the refresh rate of the Tivoli Event and Distributed Monitoring Health Consoles, each program should begin to

report that the VideoCharger Server has stopped. If you do see anything after a while, refresh the Health Console and click **Retrieve Events** in the Tivoli Event Viewer.

For Windows only: When a server goes down, Tivoli sends a signal which reactivates the server so that it will be up and running again. If you do not want Tivoli to automatically restart the server, you can stop the engine by going to the Health Console, right-clicking on the endpoint, and clicking **Stop Engine**. This can also be achieved by issuing the following command from a bash window:

```
wdmeng -e endpoint -p profile#region -stop
```

For AIX only: To reactive a server, you need to go to the Configuration and Administration Web page or telnet into the machine to reactivate the server. From the Web page, click **Start/Stop the VideoCharger Server complex**. If you choose to telnet into the machine, you can enter the following command to restart the Server:

```
startsrc -g vs
```

Part 5. Appendixes

Removing VideoCharger

Removing VideoCharger on AIX

VideoCharger follows the standard AIX removal process, but you should keep the following information in mind:

- The vsadmin and vsloader IDs will be deleted.
- The content storage file system must be explicitly deleted.

Given these considerations, remove VideoCharger as follows:

1. Remove the file system on the data pump.
2. Using SMIT, remove files whose names begin with avs.
3. To remove the asset catalog, enter the command `rm -rf /var/avs/catalog`.

Removing VideoCharger on Windows

To remove VideoCharger, simply insert the CD-ROM and select **Remove** in the install launchpad. You can also use the Windows utility:

1. Click **Start** → **Settings** → **Control Panel**.
2. Double-click **Add/Remove Programs**.
3. Select **IBM VideoCharger Server**.
4. Click **Add/Remove**.
5. Remove the files from the content directory that was defined during the installation process.
6. Delete the catalog: *install-directory*\data\catalog\AG where *install-directory* represents the directory path where you installed the VideoCharger.

Attention: The VideoCharger uninstallation does not remove your asset directory. It also does not remove the Windows License Use Management (LUM) tool. You must remove that separately.

VideoCharger problem reporting

Background information

1. Record the Current Date and Time _____
2. Record the System Date and Time (if available) _____
3. Record the Symptom _____
4. Record the Service Request Number (SRN) or error codes

5. Record the Three-Digit Codes (if available)
__ __ - __ __ - __ __ - __ __
6. Record the Location Codes
First FRU __ __ - __ __ - __ __ - __ __
Second FRU __ __ - __ __ - __ __ - __ __
Third FRU __ __ - __ __ - __ __ - __ __
Fourth FRU __ __ - __ __ - __ __ - __ __

Problem description

Data captured

(Describe data captured, such as system dumps, core dumps, error IDs, error logs, or messages, that need to be examined by your service organization.)

(After completing this form, copy it and keep it on hand for future problem solving reference. Check the VideoCharger Web site at <http://www.ibm.com/software/data/videocharger/> for updates to problem reporting.)

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Glossary

This glossary defines terms and abbreviations specific to this system. Terms shown in *italics* are defined elsewhere in this glossary.

A

accessory script. A *CGI script* that processes SEARCH, POST, PUT, or DELETE requests. The accessory scripts process requests that are not explicitly mapped to a CGI script named on an EXEC directive.

address. The unique code assigned to each device or workstation connected to a network. See also *IP address*.

admission control. The process used by the server to ensure that its bandwidth needs are not compromised by new asset requests.

aggregate bandwidth. Total throughput, in megabits per second, that moves through a server or server subsystem.

alias. In the *Internet*, a name assigned to a server that makes the server independent of the name of its host machine. The alias must be defined in the *domain name server*.

American National Standard Code for Information Interchange (ASCII). The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), that is used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters.

analog video. Video in which the information that represents images is in a continuous-scale electrical signal for amplitude and time.

API. See *application programming interface*.

application programming interface (API). A software interface that enables applications to communicate with each other. An API is the set of programming language constructs or statements that can be coded in an application program to obtain the specific functions and services provided by the underlying licensed program.

application server. Software that handles communication with the client requesting an asset and queries of the Content Manager.

ASCII. See *American National Standard Code for Information Interchange*.

asset. A digital multimedia resource that is stored for later retrieval as requested by an application. An example of such a resource is a digitized video or audio file. An asset is stored as a file in a multimedia file system supported by the *data pump*.

asset group. An organizational grouping within the multimedia file system with similar characteristics. You can use an asset group to allocate resources of a *data pump*. For example, you could establish two asset groups representing distinct departments whose assets should be kept separate for security or billing purposes.

asymmetric video compression. In multimedia applications, the use of a powerful computer to compress a video so that a less powerful system can decompress it.

asynchronous transfer mode (ATM). A transfer mode in which the information is organized into cells; it is asynchronous in the sense that the recurrence of cells containing information from an individual user is not necessarily periodic. ATM is specified in international standards such as ATM Forum UNI 3.1.

attribute. A unit of data that describes a certain characteristic or property (for example, name, address, age, and so forth) of an item, and which can be used to locate that item. An attribute has a type, which indicates the range of information stored by that attribute, and a value, which is within that range. For example, information about a file in a multimedia file system, such as title, running time, or encoding type (MPEG1, H.263, and so forth).

audio. The sound portion of a video signal.

Audio/Video Interleaved (AVI). A RIFF (*Resource Interchange File Format*) file specification that permits audio and video data to be interleaved in a file. The separate tracks can be accessed in alternate chunks for playback or recording while maintaining sequential access on the file device.

Audio-Video Subsystem (AVS). File format for files that can contain video and audio data, video-only data, audio-only data, or image data (a single still image). The Audio-Video Subsystem format is supported by the ActionMedia II MPPM/2 Media Control interface.

AVI. See *Audio/Video Interleaved*.

AVS. See *Audio-Video Subsystem*.

B

background. The conditions under which low priority, non-interactive programs are run.

bandwidth. (1) The difference, expressed in *Hertz*, between the highest and the lowest frequencies of a range of frequencies. (2) In *asynchronous transfer mode* (ATM), the capacity of a virtual channel, expressed in terms of peak cell rate (PCR), sustainable cell rate (SCR), and maximum burst size (MBS). (3) A measure of the capacity of a communication transport medium (such as a TV cable) to convey data.

baseband. A frequency band that uses the complete bandwidth of a transmission.

batch. (1) An accumulation of data to be processed. (2) A group of records or data processing jobs brought together for processing or transmission.

bitmap. (1) A representation of an image by an array of bits. (2) A pix map with a depth of one bit plane.

block. A string of data elements recorded or transmitted as a unit. The elements can be characters, words, or physical records. Disk device drivers currently use a block size of 32 KB or 256 KB to write to the disk.

broadband. A frequency band divisible into several narrower bands so that different kinds of transmissions (such as voice, video, and data) can occur at the same time. See *baseband*.

bus. A facility for transferring data between several devices located between two end points, only one device being able to transmit at a given moment.

C

cache. A special-purpose buffer, smaller and faster than main storage, used to hold a copy of data that can be accessed frequently. Use of a cache reduces access time, but might increase memory requirements.

caching proxy server. A proxy server that can store the documents it retrieves from other servers in a local *cache*. The catching proxy server can then respond to subsequent requests for these documents without retrieving them from other servers, a process that can improve response time.

cardinality. The number of rows in a database table.

CGI. See *Common Gateway Interface*.

CGI script. A computer program that runs on a Web server and uses the *Common Gateway Interface* (CGI) to perform tasks that are not usually done by a Web server (for example, database access and form processing). A CGI

script is a CGI program that is written in a scripting language such as Perl.

client. A computer system or process that requests a service of another computer system or process that is typically referred to as a server. Multiple clients can share access to a common server.

client/server. In communications, the model of interaction in distributed data processing in which a program at one site sends a request to a program at another site and awaits a response. The requesting program is called a client; the answering program is called a server.

codec. A processor that can code analog audio or video information in digital form for transmission, and decode digital data back to analog form.

Common Gateway Interface (CGI). A standard for the exchange of information between a Web server and programs that are external to it. The external programs can be written in any programming language that is supported by the operating system on which the Web server is running. See *CGI script*.

compressed audio. A method of digitally encoding and decoding several seconds of voice quality audio per single videodisc frame. This increases the storage capability to several hours of audio per videodisc. Sometimes referred to as still frame audio or sound over still.

compressed video. A video resulting from the process of digitally encoding and decoding a video image or segment using a variety of computer techniques to reduce the amount of data required to represent the content accurately.

compression. The process of eliminating gaps, empty fields, redundancies, and unnecessary data to shorten the length of records or blocks.

controller. The functional component responsible for resource management (load balancing and admission control). The controller communicates with one or more *data pumps* to initiate and terminate connections to clients.

D

data pump. The combination of the disks that hold the data and the networking hardware and software required to deliver assets to clients.

data rate. The rate at which data is transmitted or received from a device. Interactive applications tend to require a high data rate, while batch applications can usually tolerate lower data rates.

data striping. Storage process in which information is split into blocks (a fixed amount of data) and the blocks are written to (or read from) a series of disks in parallel.

data transfer rate. The average number of bits, characters, or blocks per unit time passing between corresponding equipment in a data transmission system.

Notes:

1. The rate is expressed in bits, characters, or blocks per second, minute, or hour.
2. Corresponding equipment should be indicated; for example, modems, intermediate equipment, or source and sink.

DCE. See *Distributed Computing Environment*.

decode. To convert data by reversing the effect of some previous encoding.

decompression. Process of restoring compressed data to its original state, so that it can be used again.

device driver. Software used to manage a specific device. Other software uses the device driver as the interface to the device for reading, writing, and control functions.

digital. Pertaining to data in the form of digits.

digital audio. Audio tones represented by machine-readable binary numbers rather than by analog recording techniques.

digital video. Video in which the information (usually including audio) is encoded as a sequence of binary digits. The information is

usually compressed. It can be stored and transported just as any other digital information. Viewing digital video involves decompressing the video data, converting it to an analog form, displaying the video on a monitor, and playing the sound through an amplifier and speakers.

digitize. To convert analog video and audio signals into digital format.

digitized image. An image derived from a scanning device or a digitizing card with a camera.

Distributed Computing Environment (DCE). The Open Software Foundation (OSF) specification (or a product derived from this specification) that assists in networking. DCE provides such functions as authentication, directory service (DS), and remote procedure call (RPC).

document root directory. The primary directory where a Web server stores accessible documents. When the server receives requests that do not point to a specific directory, it tries to serve the request from this directory.

domain. That part of a computer network in which the data processing resources are under common control.

domain name. In the *Internet* suite of *protocols*, a name of a host system. A domain name consists of a sequence of subnames separated by a delimiter character.

domain name server. In the *Internet* suite of *protocols*, a server that responds to queries from clients for name-to-address and address-to-name mappings as well as for other information.

dotted decimal notation. The syntactical representation of an IP address. The 4 bytes of the address are written as four decimal numbers separated by periods (dots), for example, 9.37.83.123.

E

encode. To convert data by using a code in such a manner that reconversion to the original form is possible.

Ethernet. A 10-Mbps baseband local area network that allows multiple stations to access the transmission medium at will without prior coordination, avoids contention by using carrier sense and deference, and resolves contention by using collision detection and transmission.

Extensible Markup Language (XML). A standard metalanguage for defining markup languages that was derived from, and is a subset of, SGML. XML omits the more complex and less-used parts of SGML and makes it much easier to write applications to handle document types, author and manage structured information, and transmit and share structured information across diverse computing systems. The use of XML does not require the robust applications and processing that is necessary for SGML. XML is being developed under the auspices of the World Wide Web Consortium (W3C).

External Data Representation (XDR). A standard, developed by Sun Microsystems, Incorporated, for representing data in machine-independent format.

F

F-Coupler (frequency coupler). A physical device that merges broadband analog signals with digital data on an IBM Cabling System using shielded twisted-pair wiring. The IBM F-Coupler separates analog signals and sends them from the IBM Cabling System to the workstation. The F-Coupler allows the IBM Cabling System to accommodate simultaneous analog video with data traffic on a token-ring network.

FDDI. See *Fiber Distributed Data Interface*.

Fiber Distributed Data Interface. An American National Standards Institute (ANSI) standard for a 100-Mbps LAN using optical fiber cables.

file name extension. An addition to a file name that identifies the file type (for example, text file or program file).

file system. In AIX, the method of partitioning a hard drive for storage. See also *multimedia file system*.

file system manager. The component that manages the multimedia file system.

File Transfer Protocol (FTP). In the *Internet suite of protocols*, an application layer protocol that uses *Transmission Control Protocol (TCP)* and Telnet services to transfer bulk-data files between machines or hosts.

firewall. (1) In communication, a functional unit that protects and controls the connection of one network to other networks. The firewall (a) prevents unwanted or unauthorized communication traffic from entering the protected network and (b) allows only selected communication traffic to leave the protected network. (2) In equipment, a partition used to control the spread of fire.

fps. Frames per second. The number of frames displayed per second.

fragment. The smallest unit of file system disk space allocation. A fragment can be 512, 1024, 2048, or 4096 bytes in size. The fragment size is defined when a file system is created.

frequency coupler. See *F-coupler*.

FTP. See *File Transfer Protocol*.

full-motion video. Video reproduction at 30 frames per second (*fps*) for *NTSC* signals or 25 *fps* for *PAL* signals.

G

gateway. A functional unit that interconnects two computer networks with different network architectures. A gateway connects networks or

systems of different architectures. A bridge interconnects networks or systems with the same or similar architectures.

GB. See *gigabyte*.

gigabyte (GB). (1) For processor storage, real and virtual storage, and channel volume, 2^{30} , or 1 073 741 824 bytes. (2) For disk storage capacity and communications volume, 1 000 000 000 bytes.

H

Hertz (Hz). A unit of frequency equal to one cycle per second. In the United States, line frequency is 60 Hz or a change in voltage polarity 120 times per second; in Europe, line frequency is 50 Hz or a change in voltage polarity 100 times per second.

home page. The initial Web page that is returned by a Web site when you enter the address for the Web site in a Web browser. For example, if a user specifies the address for the IBM Web site, which is <http://www.ibm.com>, the Web page that is returned is the IBM home page. Essentially, the home page is the entry point for accessing the contents of the Web site.

host. A computer, connected to a network, which provides an access point to that network. A host can be a client, a server, or a client and a server simultaneously.

host name. In the *Internet suite of protocols*, the name given to a computer. Sometimes, host name refers to the fully qualified domain name; other times, it is used to mean the most specific subname of a fully qualified domain name. For example, if mycomputer.city.company.com is the fully qualified domain name, either of the following might be considered the host name:

- mycomputer.city.company.com
- mycomputer

HTML. See *Hypertext Markup Language*.

HTTP (Hypertext Transfer Protocol). In the *Internet suite of protocols*, the protocol that is used to transfer and display hypertext documents

HTTpd. See *HTTP daemon*.

HTTP daemon. A multithreaded Web server that receives incoming *Hypertext Transfer Protocol (HTTP)* requests.

HTTP method. An action used by the *Hypertext Transfer Protocol (HTTP)*. HTTP methods include GET, POST, and PUT.

Hypertext Markup Language (HTML). A markup language that conforms to the SGML standard and was designed primarily to support the online display of textual and graphical information that includes hypertext links.

Hz. See *Hertz*.

I

I frame (information frame). In video compression a frame that has been compressed independently of any other frames. Also referred to as a reference frame, intra frame, or still frame.

i-node. In the AIX operating system, the internal structure that describes the individual files in the operating system; there is one i-node for each file. An i-node contains the node, type, owner, and location of a file. A table of i-nodes is stored near the beginning of a *file system*.

interactive video. Combining video and computer technology so the user's actions determine the sequence and direction the application takes.

Internet. The worldwide collection of interconnected networks that use the Internet suite of *protocols* and permit public access.

Internet Protocol (IP). In the *Internet* suite of *protocols*, a connectionless protocol that routes data through a network or interconnected networks and acts as an intermediary between the higher protocol layers and the physical network.

intranet. A private network that integrates *Internet* standards and applications (such as Web

browsers) with an organization's existing computer networking infrastructure.

IP. See *Internet Protocol*.

IP address. The unique 32-bit address that specifies the actual location of each device or workstation on the *Internet*. The address field contains two parts: the first part is the network address; the second part is the host number. For example, 9.67.97.103 is an IP address.

IP multicast. Transmission of an *Internet Protocol (IP)* datagram to a set of systems that form a single multicast group. See *multicast*.

ISO-9660. Format used for files on CD-ROM. Used with DOS.

isochronous. A communications capability that delivers a signal at a specified, bounded rate, which is desirable for continuous data such as voice and full-motion video.

J

Joint Photographic Experts Group (JPEG). (1) A group that worked to establish the standard for the compression of digitized continuous-tone images. (2) The standard for still pictures developed by this group.

JPEG. See *Joint Photographic Experts Group*.

K

Kb. See *Kilobit*.

KB. See *Kilobyte*.

Kbps. *Kilobits* per second.

kilobit (Kb). (1) For processor storage, real and virtual storage, and channel volume, 210 or 1024 bits. (2) For disk storage capacity and communications volume, 1000 bits.

kilobyte (KB). (1) For processor storage, real and virtual storage, and channel volume, 210 or 1024 bytes. (2) For disk storage capacity and communications volume, 1000 bytes.

L

LAN. See *local area network*.

latency. The time interval between the instant at which an instruction control unit initiates a call for data and the instant at which the actual transfer of the data starts.

LBR. See *low bit rate*.

local area network (LAN). A network in which a set of devices are connected to one another for communication and that can be connected to a larger network.

low bit rate (LBR). A generic term for an interleaved H.263/G.723 stream. Low bit rate streams range from 6.4 Kbps up to 384 Kbps.

M

Management Information Base (MIB). A collection of objects that can be accessed by means of a network management *protocol*.

maximum transmission unit (MTU). In *LANs*, the largest possible unit of data that can be sent on a given physical medium in a single frame. For example, the MTU for *Ethernet* is 1500 bytes.

Mb. See *megabit*.

MB. See *megabyte*.

Mbps. *Megabits per second*.

MCA. See *Micro Channel architecture*.

megabit (Mb). (1) For processor storage, real and virtual storage, and channel volume, 220 or 1 048 576 bits. (2) For disk storage capacity and communications volume, 1 000 000 bits.

megabyte (MB). (1) For processor storage, real and virtual storage, and channel volume, 220 or 1 048 576 bytes. (2) For disk storage capacity and communications volume, 1 000 000 bytes.

method. In Java design or programming, the software that implements the behavior specified by an operation. Synonymous with member function in C++.

MIB. See *Management Information Base*.

MIB variable. A managed object that is defined in the *Management Information Base (MIB)*. The managed object is defined by a textual name and a corresponding object identifier, a syntax, an access mode, a status, and a description of the semantics of the managed object. The MIB Variable contains pertinent management information that is accessible as defined by the access mode.

Micro Channel Architecture (MCA). The rules that define how subsystems and adapters use the Micro Channel *bus* in a computer. The architecture defines the services that each subsystem can or must provide.

MIDI. See *Musical Instrument Digital Interface*.

MIME type. An Internet standard for identifying the type of object being transferred across the Internet. MIME types include several variants of audio, image, and video. Each object has a MIME type.

M-JPEG. See *Motion JPEG*.

Motion JPEG (M-JPEG) . Used for animation.

Moving Pictures Expert Group (MPEG). (1) A group that is working to establish a standard for compressing and storing motion video and animation in digital form. (2) The standard under development by this group.

MPEG. See *Moving Pictures Expert Group*.

MTU. See *maximum transmission unit*.

multicast. Transmission of the same data to a selected group of destinations.

multimedia. Combining different media elements (text, graphics, audio, still image, video, animation) for display and control from a computer.

multimedia file system. A *file system* that is optimized for the storage and delivery of video and audio.

Multipurpose Internet Mail Extensions (MIME)
. See *MIME type*.

Musical Instrument Digital Interface (MIDI).
A *protocol* that allows a synthesizer to send signals to another synthesizer or to a computer, or a computer to a musical instrument, or a computer to another computer.

N

name server. See *domain name server*.

National Television Standard Committee (NTSC). (1) A committee that sets the standard for color television broadcasting and video in the United States (currently in use also in Japan). (2) The standard set by the NTSC committee.

NTSC. See *National Television Standard Committee*.

P

page pool. The area in the shared memory segment from which buffers are allocated for data that is read from or written to disk. Page pool size is one of the file manager startup configuration parameters.

PAL. See *Phase Alternation Line*.

pattern-matching character. See *wildcard character*.

PCI. See *Peripheral Component Interconnect*.

peak rate. The maximum rate encountered over a given period of time.

performance group. A group of file systems sharing system resources that can affect file system performance.

Peripheral Component Interconnect (PCI). A type of *bus* architecture.

Phase Alternation Line (PAL). The television broadcast standard for European video outside of France and the countries of the former Soviet Union.

pin. Keeping the program from being paged out after it is loaded into memory.

port. A system or network access point for data entry or exit. In the *Internet* suite of *protocols*, a specific logical connector between the *Transmission Control Protocol (TCP)* or the *User Datagram Protocol (UDP)* and a higher-level protocol or application.

port group. A logical name used to group one or more ports (network devices or interfaces) of the same network type that can be used to reach a given end-user destination. For example, if multiple *ATM* adapters in the VideoCharger Server complex are connected to the same *ATM* networks, these adapters can be configured under the same port group. The controller selects ports as necessary to balance the load.

presentation formatter. A *CGI* program that defines the forms used to select and present assets to clients.

protocol. The meanings of, and the sequencing rules for, requests and responses used for managing a network, transferring data, and synchronizing the states of network components.

protocol gateway. A type of *firewall* that protects computers in a business network from access by users outside that network.

proxy server. A server that receives requests intended for another server and that acts on the client's behalf (as the client's proxy) to obtain the requested service. A proxy server is often used when the client and the server are incompatible for direct connection (for example, when the client is unable to meet the security authentication requirements of the server but should be permitted some services).

Q

quality of service (Do's). For an *asynchronous transfer mode (ATM)* virtual channel or a Networking BroadBand Services (NBBS) network connection, a set of communication characteristics such as end-to-end delay, jitter, and packet loss ratio.

R

RAID. See *Redundant Array of Independent Disks*.

README file. A file that should be viewed before the program associated with it is installed or run. A README file typically contains last-minute product information, installation information, or tips for using the product.

real time. The processing of information that returns a result so rapidly that the interaction appears to be instantaneous.

Real-Time Transport Protocol (RTP). A *protocol* that provides end-to-end network transport functions suitable for applications transmitting real-time data, such as audio, video or simulation data, over *multicast* or unicast network services.

rebalance. Restriping and redistributing data across the available hard disks after a disk or disks have been removed from a *file system*.

Redundant Array of Independent Disks

(RAID). A collection of two or more disk drives that present the image of a single disk drive to the system. In the event of a single device failure, the data can be read or regenerated from the other disk drives in the array.

remote procedure call (RPC). (1) A facility that a *client* uses to request the execution of a procedure call from a server. This facility includes a library of procedures and an external data representation. (2) A client request to a service provider located in another node.

request. The part of a Web address that follows the *protocol* and server *host name*. For example, in the *address*

<http://www.server.com/rfoul/sched.htm>, the request is */rfoul/sched.html*.

ReSerVation Protocol (RSVP). A resource reservation setup *protocol* designed for an integrated services *Internet*. The protocol provides receiver-initiated setup of resource reservations for *multicast* and unicast data flows.

Resource Interchange File Format (RIFF)

Used for storing sound or graphics for playback on different types of computer equipment.

restriping. Redistributing and rebalancing data across all available and defined disks in a *multimedia file system*. This is typically done when a disk is removed from a file system for repair or when a new disk is added to a *file system*.

RIFF. See *Resource Interchange File Format*.

RLE. See *Run-Length Encoding*.

RPC. See *remote procedure call*.

RSVP. See *ReSerVation Protocol*.

RTP. See *Real-Time Transport Protocol*.

Run-Length Encoding (RLE). A type of *compression* that is based on strings of repeated, adjacent characters or symbols, which are called "runs."

S

SCSI. See *small computer system interface*.

server. A functional unit that provides services to one or more clients over a network. Examples include a file server, a print server, and a mail server.

Simple Network Management Protocol

(SNMP). In the *Internet* suite of *protocols*, a network management protocol that is used to monitor routers and attached networks. SNMP is an application layer protocol. Information on devices managed is defined and stored in the application's *Management Information Base (MIB)*.

small computer system interface (SCSI). A standard hardware interface that enables a variety of peripheral devices to communicate with one another.

SMIT. See *System Management Interface Tool*.

SNMP. See *Simple Network Management Protocol*.

sticky pool. The part of the *page pool* that is made available to cache the first block of frequently used interactive files. Sticky pool size is one of the file manager startup configuration parameters.

streamed data. Any data sent over a network connection at a specified rate. A stream can be one data type or a combination of types. Data rates, which are expressed in bits per second, vary for different types of streams and networks.

stripe group. A collection of disks that are grouped together for serving media streams. The *multimedia file system* uses stripe groups to optimize delivery of multimedia *assets*.

stripe width. The size of the block that data is split into for *striping*.

striping. Splitting data to be written into equal blocks and writing blocks simultaneously to separate disk drives. Striping maximizes performance to the disks. Reading the data back is also scheduled in parallel, with a block being read concurrently from each disk then reassembled at the host.

System Management Interface Tool (SMIT). An interface tool of the AIX operating system for installing, maintaining, configuring, and diagnosing tasks.

T

Tagged Image File Format (TIFF). A file format for storing high-quality graphics.

TCP. See *Transmission Control Protocol*.

TCP/IP. See *Transmission Control Protocol/Internet Protocol*.

throughput. A measure of the amount of information transmitted over a network in a given period of time. For example, a network's data transfer rate is usually measured in bits per second. Throughput is a measure of performance. It is also measured in *Kbps* or *Mbps*.

TIFF. See *Tagged Image File Format*.

token ring. According to IEEE 802.5, network technology that controls media access by passing a token (special packet or frame) between media-attached stations.

token-ring network. A network that uses a ring topology, in which tokens are passed in a circuit from node to node. A node that is ready to send can capture the token and insert data for transmission.

topology. In communications, the physical or logical arrangement of nodes in a network, especially the relationships among nodes and the links between them.

Transmission Control Protocol (TCP). A communications *protocol* used in the *Internet* and in any network that follows the Internet Engineering Task Force (IETF) standards for internetwork protocol. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It uses the *Internet Protocol (IP)* as the underlying protocol.

Transmission Control Protocol/Internet Protocol (TCP/IP). The suite of transport and application *protocols* that run over the Internet Protocol.

U

UDP. See *User Datagram Protocol*.

uniform resource locator (URL). A sequence of characters that represent information resources on a computer or in a network such as the Internet. This sequence of characters includes the abbreviated name of the protocol used to access the information resource and the information used by the protocol to locate the information

resource. For example, in the context of the Internet, these are abbreviated names of some protocols used to access various information resources: http, ftp, gopher, telnet, and news.

User Datagram Protocol (UDP). In the *Internet suite of protocols*, a protocol that provides unreliable, connectionless datagram service. It enables an application program on one machine or process to send a datagram to an application program on another machine or process. UDP uses the *Internet Protocol (IP)* to deliver datagrams.

V

video mixing. The process of dynamically inserting or combining multiple *video objects* into a single object for distribution. An example would be the mixing of commercials and broadcast programs for satellite distribution.

video object. The data file containing a program recorded for playback on a computer or television set.

video-on-demand (VOD). A service for providing consumers with movies and other programming almost immediately, per request.

video stream. The path data follows when read from the VideoCharger Server system to the display unit.

VOD. See *Video-on-demand*.

W

WAIS. See *Wide Area Information Service*.

WAV. A format to store digitally recorded sound.

Web server. A server that is connected to the *Internet* and is dedicated to serving Web pages.

Wide Area Information Service (WAIS). A network information system that enables clients to search documents on the World Wide Web.

wildcard character. A special character such as an asterisk (*) or a question mark (?) that can be used to represent one or more characters. Any character or set of characters can replace a wildcard character.

World Wide Web (WWW). A network of servers that contain programs and files. Many of the files contain hypertext links to other documents available through the network.

WWW. See *World Wide Web*.

X

XML. See *Extensible Markup Language*.

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