



Introduction

This chapter provides an overview of the different components of IP/TV and describes how IP/TV Content Manager, in particular, works. This chapter contains the following sections:

- [About IP/TV, page 1-1](#)
- [IP/TV Components, page 1-2](#)
- [How IP/TV Components Interact, page 1-4](#)
- [IP/TV Features and Functionality, page 1-6](#)
- [New Features in IP/TV Version 3.5, page 1-7](#)
- [About Scheduled and On-Demand Programs, page 1-11](#)
- [Accessing IP/TV Content Manager, page 1-14](#)

About IP/TV

IP/TV is a network-based application that delivers live or prerecorded, on-demand or scheduled programs to an unlimited number of users over any IP-based local- or wide-area network. Synchronized presentations and screen captures are also supported, in addition to a wide range of video management functions.

As part of the Cisco Content Networking family, IP/TV is a turnkey solution that brings movie-quality video over enterprise networks to the desktop of the user, eliminating the need for dedicated video cabling, monitors, or special viewing rooms. Designed with respect to scalability, high-quality broadcasts are delivered safely across large enterprises.

Applications for IP/TV include broadcast TV to the desktop, video on demand, computer-based training, distance learning, corporate communications, manufacturing process monitoring, and surveillance systems.

IP/TV Version 3.5 supports a wide variety of audio and video formats, including Moving Picture Experts Group (MPEG-1), MPEG-2, Microsoft MPEG-4, ISO MPEG-4, Internet Streaming Media Alliance (ISMA) MPEG-4 Advanced Audio Coding-Low Complexity (AAC-LC), and H.261.

To view a 7-minute video that describes IP/TV capabilities, click **Introduction Video** on the Cisco IP/TV Installer CD.

IP/TV Components

IP/TV consists of three separate components: IP/TV Viewer, IP/TV Content Manager, and IP/TV Server.

IP/TV Viewer is the client component and is available as software only. Both IP/TV Content Manager and IP/TV Server components are available either as a software-only option or as a hardware appliance. As a software-only option, these components must be run on third-party PC systems that meet the minimum requirements of the specific IP/TV component.

As a hardware appliance, they are part of the Cisco IP/TV 3400 Series Server hardware. Each 3400 Server type has preinstalled IP/TV software.

- Archive and Broadcast Servers—IP/TV Server software
- Control Server—IP/TV Content Manager software (IP/TV StreamWatch software provided)
- Starter Server—IP/TV Server and IP/TV Content Manager software



Note

Both Archive and Broadcast Servers have IP/TV Server software preinstalled, but only the Broadcast Server has a video capture card for live encoding and serving.

Refer to the *Cisco IP/TV 3400 Series Servers User Guide* for more information on server hardware configuration and setup.

IP/TV Viewer

IP/TV Viewer resides on the client and lets you view programs. A program is an audio, video, or text transmission over the network. IP/TV Viewer has a customizable user interface that displays a list of scheduled and on-demand programs. IP/TV Viewer allows you to subscribe to any of the listed programs, and plays the program at the scheduled or requested time. You can also browse among all currently running programs.

IP/TV Viewer obtains program information from IP/TV Content Manager, and displays programs served by IP/TV Server or other servers. It can also display programs multicast from the Multicast Backbone (MBone) of the Internet or from other servers that transmit in MBone-compatible format.

IP/TV Viewer can run as a standalone application, a helper application activated by a web browser, or a browser plug-in. It is available as software only and runs on Windows 98, Windows 2000, Windows NT 4.0, and Windows XP.

Refer to the *Cisco IP/TV Viewer User Guide* for more information on how to install and use IP/TV Viewer.

IP/TV Content Manager

IP/TV Content Manager is accessed from a browser and is used by the system administrator or broadcast administrator to set up and manage IP/TV scheduled or on-demand programs, channels, recordings, and file transfers among IP/TV Servers.

The IP/TV Content Manager component is available as software only or comes preinstalled on a Cisco IP/TV 3400 Series Server hardware appliance (Control Server).

IP/TV Content Manager runs on Windows 2000 and Windows NT 4.0. You can access IP/TV Content Manager from Netscape 4.5x through 4.7x, or Microsoft Internet Explorer 5.x or later. The browser must have Java and JavaScript enabled.

This guide provides information on how to create scheduled and on-demand programs. Refer to the *Cisco IP/TV Administration and Configuration Guide* for information on how to install, configure, and administer IP/TV Content Manager.

IP/TV Server

IP/TV Server, which is controlled by IP/TV Content Manager, serves and records programs. It multicasts and records scheduled programs, unicasts on-demand programs, and transfers files according to the schedules defined in IP/TV Content Manager.

The IP/TV Server component is available as software only or comes installed on Cisco IP/TV 3400 Series Server hardware appliances (Archive Server and Broadcast Server).

The IP/TV Server component can function as an Archive Server for scheduled and on-demand programs, or it can be configured with a video capture card and function as a Broadcast Server, that is, with live encoding and serving functionality as well.

IP/TV Server also supports SmallCast for unicast transmission across nonmulticast-enabled routers (or across the Internet) and then multicasting to viewers on the remote network segment.

IP/TV Server runs on Windows 2000 Server and Windows NT 4.0.

Refer to the *Cisco IP/TV Administration and Configuration Guide* for information on how to install, configure, and administer IP/TV Server.

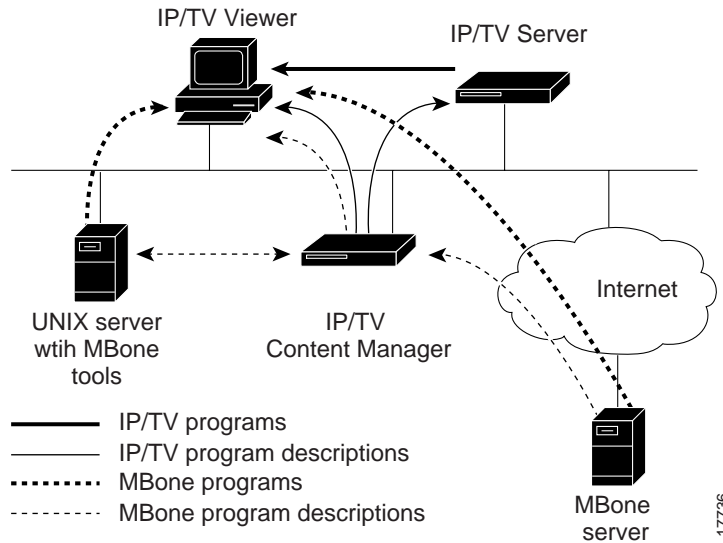
How IP/TV Components Interact

You can use IP/TV for the broadcast of scheduled live or prerecorded programs, on-demand programs, or a combination of the two.

You can use a given server to broadcast both scheduled and on-demand programs.

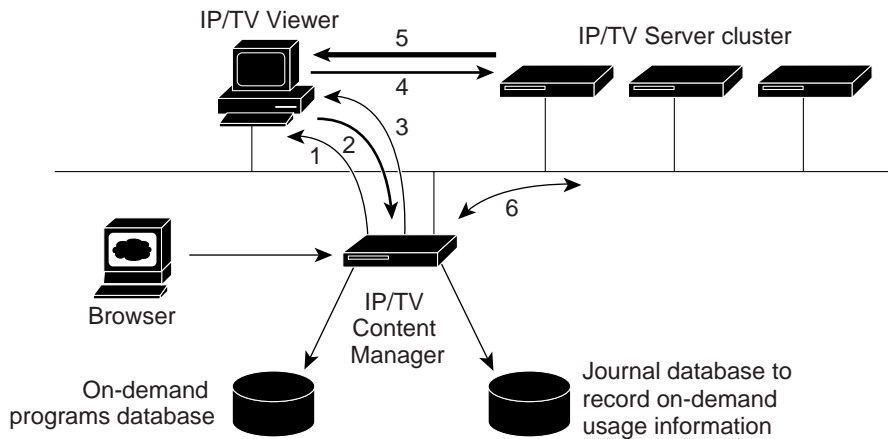
[Figure 1-1](#) shows the interactions between IP/TV components in the case of scheduled programs. Note that although IP/TV Viewer receives program descriptions only from IP/TV Content Manager, the programs are sent to IP/TV Viewer from the various media servers. The media servers may be IP/TV Servers, MBone servers, or other servers that run IP/TV-compatible MBone tools.

Figure 1-1 IP/TV Components—Scheduled Programs



[Figure 1-2](#) shows the interactions between these components in the case of on-demand programs. IP/TV Content Manager manages a group (cluster) of servers that together form a virtual machine, with an integrated database to keep track of program information. Clustering allows IP/TV Content Manager to balance the server load by routing a user program request to the least-busy server.

Figure 1-2 IP/TV Components—On-Demand Programs



1. IP/TV Viewer receives on-demand program descriptions
2. IP/TV Viewer makes on-demand request
3. Content Manager redirects IP/TV Viewer to least busy server
4. IP/TV Viewer makes on-demand program request of server
5. Server serves on-demand program to IP/TV Viewer
6. Server control and status

17737

IP/TV Features and Functionality

IP/TV has the following turnkey, scalable features for delivering high-quality video over enterprise networks:

- **Codecs**—Supports MPEG-2 for DVD quality, MPEG-1 for TV/VCR quality, and ISO MPEG-4 for high quality at lower bandwidths.

Industry standards for media streaming comply with Internet Streaming Media Alliance (ISMA) specifications to ensure interoperability.

- **IP multicast (with source-specific multicast [SSM])**—Facilitates delivery over multicast networks to minimize bandwidth for live and scheduled video. A single stream is broadcast over the network regardless of the audience size.

- **Quality of Service**—Enables QoS using Resource Reservation Protocol (RSVP) to ensure that bandwidth is allocated for video delivery.
Audio and video streams are delivered independently to minimize the impact of network congestion on the client. Audio has priority.
- **IP/TV StreamWatch**—Allows quality and usage monitoring of clients during video delivery and generates logs for postevent analysis. IP/TV StreamWatch is scalable to large deployments.
- **Question Manager**—Allows clients to send text queries to a moderator during a broadcast delivery. IP/TV Version 3.5 introduces a web-based Question Manager feature for users of the browser plug-ins.
- **SmallCast**—Allows content delivery across one or more nonmulticast-enabled routers (or across the Internet) as a unicast transmission, and then is multicast to clients on the remote network segment.
- **Media synchronization tools**—Provides Web Presenter, ScreenCaster, and SlideCast integrated synchronization tools for the ability to deliver presentations (in the form of HTML windows, screen captures, or .jpg files) with video content.
- **Scheduling**—Allows setup of live or scheduled video delivery through a browser interface.
- **Program listing**—Automatically generates and updates the program listing at the client. The program listing is accessible from either a web browser or an IP/TV client.

New Features in IP/TV Version 3.5

IP/TV Version 3.5 introduces the following new features:

- [MPEG-4 AAC-LC](#)
- [New Hardware](#)
- [QuickTime Plug-In Support for the Web-Based Program Guide](#)
- [MPEG-4 Codec for SlideCast](#)
- [Support for Different Viewers](#)
- [Web-Based Question Manager](#)
- [Playing Media Clips Before a Live Event](#)

MPEG-4 AAC-LC

IP/TV Version 3.5 achieves Internet Streaming Media Alliance (ISMA) compliance by supporting the MPEG-4 Advanced Audio Coding-Low Complexity (AAC-LC) format. This feature provides archiving and streaming of high-quality multimedia content over low-bandwidth Internet links.

ISMA MPEG-4 AAC-LC audio and video streams provide for two-channel audio streams ranging from 16 kbps to 32 kbps. Streams are packetized using Real-Time Transfer Protocol (RTP) on the server per the ISMA 1.0 specification. Streams do not contain Audio Data Transport Stream (ADTS) or Audio Data Interchange Format (ADIF) headers. Decoder configuration is sent out-of-band by Session Description Protocol (SDP) to make it available to the decoder before it starts decoding the stream.

IP/TV Version 3.5 supports AAC in the following ways:

- Live capture of AAC audio and streaming over RTP simultaneously with MPEG-4 video
- Recording live AAC audio and MPEG-4 video to an MP4 file
- Scheduled rebroadcast of AAC-based MP4 files
- Video-on-demand streaming of AAC-based MP4 files
- Playback of IP/TV AAC streams on the QuickTime 6 player
- Playback of IP/TV AAC streams on IP/TV Viewer Version 3.5
- IP/TV Content Manager support for live capture of AAC audio at various sampling-rate-per-channel combinations

New Hardware

IP/TV Version 3.5 introduces a set of new hardware platforms: the IP/TV 3426, IP/TV 3427-C1, IP/TV 3427-C2, and IP/TV 3427-C3 Broadcast Servers. IP/TV Version 3.5 runs on these platforms as well as on the IP/TV 3412, 3417, 3425, and 3432 Servers.

IP/TV Version 3.5 also supports multiple capture cards on the IP/TV 3426 and IP/TV 3427 Servers.

The IP/TV 3426 Server uses only one capture card, the Videum 4400 AV video capture card, whereas the IP/TV 3427 Server has as many as five ports to hold various combinations of the Videum 4400 AV, Videum 1010 Plus, and Optibase MovieMaker 200S Networker video capture cards. On the new hardware, IP/TV Version 3.5 supports up to eight streams per server.

QuickTime Plug-In Support for the Web-Based Program Guide

IP/TV Version 3.5 supports Apple QuickTime 6.0 as a client application. When you select a program from the web-based program guide, the QuickTime plug-in is launched automatically if your device does not have IP/TV Viewer or an IP/TV plug-in installed.

The QuickTime client supports ISMA MPEG-4, MPEG-2 with MPEG-1 layer 2 audio, MPEG-1, and SlideCast with live video and basic audio and video streaming from IP/TV Server to the QuickTime 6.0 client.

**Note**

To view an MPEG-2 stream using the QuickTime client, you need a decoder from Apple installed on your device.

MPEG-4 Codec for SlideCast

In order to improve the clarity of slides in the SlideCast feature, IP/TV Version 3.5 uses MPEG-4 Simple Profile encoding. Previous versions of IP/TV used H.261 encoding for SlideCast. MPEG-4 supports higher resolutions and better compression than H.261 and ensures quality SlideCast presentations.

Support for Different Viewers

IP/TV Server Version 3.5 and IP/TV Content Manager support both QuickTime and IP/TV Viewer. Support for different viewers allows users of IP/TV Viewer and the QuickTime plug-in to watch the same program simultaneously. QuickTime users can access the program from the web-based program guide of IP/TV Content Manager and play them using the browser plug-in.

Web-Based Question Manager

IP/TV Version 3.5 introduces a web-based Question Manager. This feature allows users to access Question Manager from IP/TV browser plug-in as well as from the QuickTime plug-in window. The Click Here to Ask a Question to the Speaker link in the browser window takes you to the web-based Question Manager.

Playing Media Clips Before a Live Event

Administrators can set up a program of media clips to play before the scheduled broadcast of a live event. This program has the same attributes as the live program and plays before the scheduled broadcast of the live event. The program starts playing at the time set by the administrator and stops playing when the live event starts playing. The live event plays in the same window as the program of media clips. Administrators can use this feature to play programs related to a live event and to keep viewers tuned to the scheduled broadcast of the live event. This feature also helps administrators verify that users can view the scheduled broadcast. If users can view the program of media clips with no difficulty, then they will also be able to view the broadcast of the live event.

ISO MPEG-4 Streaming and Recording

The ISO MPEG-4 Simple Profile (SP) codec takes advantage of improved compression technology that makes it possible to stream higher-quality video at lower bit rates.

The ISO MPEG-4 feature, which is supported through IP/TV software, together with the IP/TV 3426 and IP/TV 3427 Servers, allows users to encode a live video stream using ISO MPEG-4 and an MPEG-4 AAC-LC audio stream simultaneously.

A live ISO MPEG-4 program can be recorded to an MP4 media file on the origin server. The recorded MP4 file can be previewed locally on IP/TV Server using Microsoft Windows Media Player.

The MP4 file can be streamed in both scheduled and on-demand modes.

Minimum requirements for ISO MPEG-4 streaming and recording include a 1.6-GHz Pentium 4 processor, 512 MB of memory, and one free PCI slot for the capture card.

Because of performance limitations, the Cisco IP/TV 3424 Broadcast Server is not recommended for use with the ISO MPEG-4 codec.

Incremental Installer for IP/TV Viewer

The incremental installer feature allows users to upgrade IP/TV Viewer by updating only those files that have changed from the version already installed. Since the incremental installer image contains only upgrade files, the image size is smaller and easier to use.

This utility is run at the client and it automatically detects the IP/TV Viewer version installed. If the detected version is 3.x, then it will be automatically upgraded to Version 3.5.

Third-Party Server Software Upgrades

Upgrades to third-party server software include the following:

- Apache Web Server v1.3.27
- Sun Microsystems Java Runtime Environment (JRE) v1.1.8
- Windows 2000 Service Pack 2
- Windows NT Service Pack 6.0a

About Scheduled and On-Demand Programs

IP/TV Content Manager can manage both scheduled and on-demand programs. A scheduled program consists of either live or prerecorded content that is multicast over the network at a set time. An on-demand program consists of prerecorded content that is unicast to a single client whenever it is requested.

The uses, advantages, and limitations of scheduled and on-demand programs are discussed in the sections that follow.

Scheduled Programs

Scheduled programs are either live or prerecorded programs that are available to viewers at times defined by IP/TV Content Manager, and are delivered by one multicast data stream per media type (video, audio, Web Presenter, or SlideCast). Using multicast technology, scheduled programs can reach unlimited numbers of viewers simultaneously without overloading the network (refer to Chapter 1 of the *Cisco IP/TV Administration and Configuration Guide*).

Scheduled programs can be live content sent to viewers in real time, or prerecorded content that can be played repeatedly at scheduled times. Typical uses of scheduled programs include employee communications, group training, and distance learning.

How Scheduled Programs Work

In IP/TV Content Manager, you define a list of scheduled programs and assign them to one or more specified servers. The list of programs is automatically sent to IP/TV Viewer, and the programs can be watched by users at the scheduled time.

Programs and Channels

When you define scheduled programs, it is important to understand the relationship between programs and channels. In the IP/TV context, channels and programs are nearly identical to their network television equivalents, but there are a few differences. Understanding these differences will help you create the best model for your organization and manage IP/TV scheduled programming most effectively.

On network television, a channel carries either a single, continuous program (such as a 24-hour news channel) or a series of noncontinuous, back-to-back programs. Programs cannot exist without channels. All programs must be carried by a channel in order to be viewable. To view a program, the user tunes to its channel. The channel itself constitutes the address of all programs on that channel.

In IP/TV, a channel can carry either a single, continuous program, a series of noncontinuous, back-to-back programs, or both.

A noncontinuous program can overlap a continuous program. It is defined as a separate entity that can be tuned in by the user.

An example of a continuous program that has a noncontinuous program overlapping it is a 24-hour news service. The news program is always on, and users can tune in whenever they want to get a news update. Suppose, though, that the financial news is always discussed for one-half hour starting at 3:00 p.m., and some users want to subscribe only to the financial news so that IP/TV automatically launches the program for them. You can define a noncontinuous program that begins at 3:00 p.m. and runs for 30 minutes. The noncontinuous program is a subset of the 24-hour news program, and overlaps it for that 30-minute interval. This is a mechanism to allow the user to subscribe to a small portion of the continuous program.

A channel constitutes a template for programs. The programs on that channel share the channel address and a variety of common characteristics such as passwords.

Unlike network television, an IP/TV program need not be assigned to a channel. It can exist independently. In this case, the program simply has its own address. Thus, if you prefer, you can omit the channel mechanism altogether. However, a channel is useful if you want to create programs with similar characteristics.

**Note**

Channels are invisible to users of IP/TV Viewer. To view a program, the user can either subscribe to the program explicitly, or select the program spontaneously. The resulting address belongs either to a channel or to an independent program. Either way, the actual address is invisible to the user.

On-Demand Programs

On-demand programs are available to individual users to watch at the time of their choosing. Because on-demand programs use unicast technology, multiple requests for an on-demand program require more network bandwidth than for a scheduled program (refer to the “Unicast Traffic” section in Chapter 1 of the *Cisco IP/TV Administration and Configuration Guide*). We recommend that you use the on-demand mode for programs that are accessed less frequently, such as individualized corporate training and video archives, and use scheduled mode for group viewing.

IP/TV Content Manager manages a cluster of servers that together form one larger server, with an integrated database to keep track of server and program information. IP/TV Content Manager automatically collects a list of available

media files from the cluster and, using the Cisco FTP server, can also schedule distribution of files from one server to another or from an outside source to one or more of the servers.

The administrator then defines these files as programs in IP/TV Content Manager, using a hierarchical tree of program categories. A top-level category can contain subcategories, which you navigate to by clicking links. This hierarchical structure allows you to manage and make available a large library of programs. Unlike on-demand programs, scheduled programs do not have a tree structure, but their program listing on the client can be easily sorted by name, start time, end time, media type, or program description.

IP/TV Viewers receive on-demand programs only from their local cluster. One or more subnets can be defined as a proximity group, and one or more proximity groups are associated with a given server cluster. This allows the administrator to localize network traffic by ensuring that IP/TV Viewers receive on-demand programs only from their local cluster.

IP/TV Content Manager distributes a list of available on-demand programs to IP/TV Viewers, and this list is displayed on the program listing screen. When a user requests a program, IP/TV Content Manager uses information from the database to assign the least-busy server in the cluster to meet the request, and then directs IP/TV Viewer to that server. If one of the servers fails, or needs to be taken out of service, IP/TV Content Manager balances the request load among the remaining servers.

Channels do not apply to on-demand programs.

Accessing IP/TV Content Manager

IP/TV Content Manager is accessed remotely using a browser. The computer used to access IP/TV Content Manager Version 3.5 must run Netscape Navigator 4.5x through 4.7x, or Microsoft Internet Explorer 5.x or later. The browser must have Java and JavaScript enabled. Check the browser Options or Preferences menu to be sure that these features are enabled.



Note

For IP/TV Content Manager installation instructions, refer to Chapter 3 of the *Cisco IP/TV Administration and Configuration Guide*.

To access IP/TV Content Manager, go to the following URL:

`http://contentmanagerhost/`

where *contentmanagerhost* is the DNS name or IP address of IP/TV Content Manager.

Enter the administrative username and password for the IP/TV Restricted Zone and then click **OK**.

**Note**

If your IP/TV Content Manager is running on Cisco IP/TV 3400 Series Server hardware, the default username for the administrative account is set to `admin`, and the default password is set to `default`. To change the default password, access the command line and change directory to `C:\Program Files\Cisco Systems\IPTV Content Manager\Apache\bin`. Enter the following command:

```
htpasswd -b passwd admin new_password
```

The change takes effect when you stop and restart the Apache service from **Settings > Control Panel > Administrative Services > Component Services**.

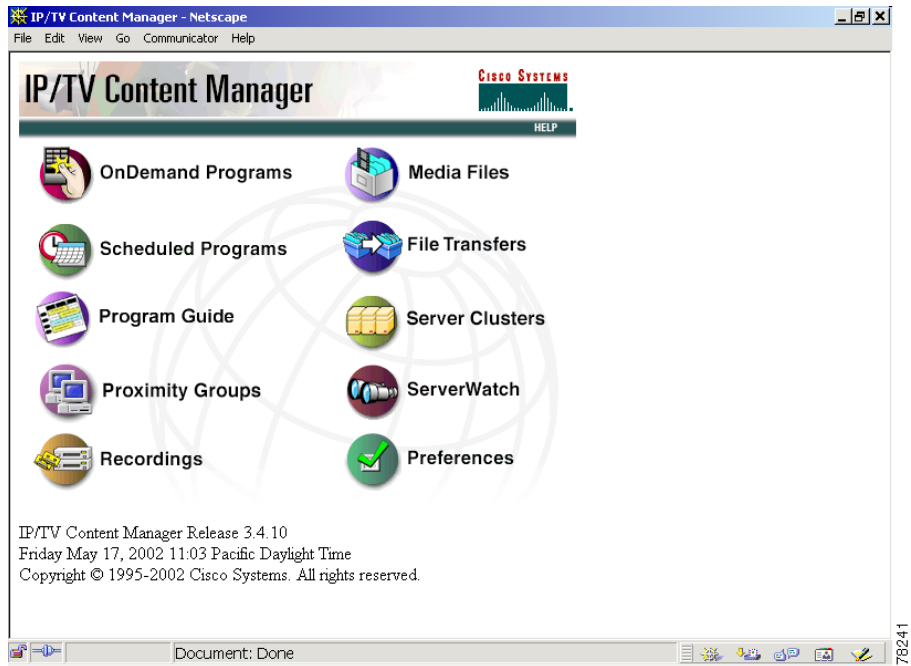
**Note**

If your IP/TV Content Manager is a software-only version running on a Windows-based PC, use the password that you configured for the `admin` account while installing IP/TV Content Manager on your device.

When you access IP/TV Content Manager for the first time, store the URL in the frequently visited sites list of your web browser. The actual mechanism you use varies depending on which browser you use. Refer to your browser documentation or help system for more information.

When you access IP/TV Content Manager, the first window that appears is the IP/TV Content Manager main window. (See [Figure 1-3](#).)

Figure 1-3 IP/TV Content Manager Main Window



The IP/TV Content Manager main window contains multiple links for setup and configuration, including on-demand and scheduled programs creation, proximity group and server cluster configuration, recordings and file transfer setup, and server status monitoring.

- The **OnDemand Programs** link takes you to the OnDemand Programs window, which displays information about existing on-demand programs and allows you to define new on-demand categories or programs. You can also search for an on-demand category or program by program name, category, keywords, or description. See Chapter 2, “[Managing On-Demand Programs](#),” for information.
- The **Scheduled Programs** link takes you to the Scheduled Programs window, which displays information about existing scheduled programs and allows you to define new scheduled programs. See Chapter 3, “[Managing Scheduled Programs](#),” for information.

- The **Program Guide** link takes you to the IP/TV Program Guide (also known as Web-Based Program Guide, or WBPG) window, which allows you to search for programs matching specific criteria. Refer to the *Cisco IP/TV Viewer User Guide* for more information.
- The **Proximity Groups** link takes you to the Proximity Groups window, which displays information about existing proximity groups, and allows you to define new proximity groups and subnets. A proximity group is a collection of subnets in which client viewers reside. Refer to the *Cisco IP/TV Administration and Configuration Guide* for information.
- The **Recordings** link takes you to the Recordings window, which displays information about existing recordings, and allows you to define new recordings. See the “[Recording Scheduled Programs](#)” section in Chapter 3 for information.
- The **Media Files** link takes you to Media Files window, in which you can view media files and edit their metadata. A link is provided to allow you to create new on-demand programs. See the “[Using Media Files](#)” section in Chapter 2 for information.
- The **File Transfers** link takes you to the File Transfers window, which displays information about existing scheduled file transfers among IP/TV Servers, and allows you to define new file transfers, display the results of a file transfer, and view or clear the file transfer log. Refer to the *Cisco IP/TV Administration and Configuration Guide* for information.
- The **Server Clusters** link takes you to the Server Clusters window, which displays a list of server clusters and allows you to define a new cluster or server. Refer to the *Cisco IP/TV Administration and Configuration Guide* for information.
- The **ServerWatch** link takes you to the ServerWatch window, where you can monitor the current status of servers. In the ServerWatch window you can also go to the ServerWatch applet window, where information about servers is dynamically updated. Refer to the *Cisco IP/TV Administration and Configuration Guide* for information.

- The **Preferences** link takes you to the Preferences window, where you can set IP/TV Content Manager options. In general, preferences should be changed only by the system administrator or network manager who installed IP/TV Content Manager. Refer to the *Cisco IP/TV Administration and Configuration Guide* for information.
- The **Help** link launches the IP/TV Content Manager online help utility. See the “[Using Online Help](#)” section in the preface of this guide for a description of online help.