



GuideBuilder[®] XM
User Guide

triveni
DIGITAL[®]
Better TV

GuideBuilder[®] XM

Release 5.3

User Guide Revision H

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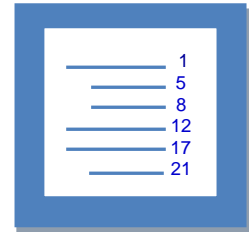
Triveni Digital
777 Alexander Road, Suite 101
Princeton, NJ 08540 USA

Contact

Phone: (609) 716-3500
Fax: (609) 716-3503
Web: www.trivenidigital.com
E-mail technical support: support@trivenidigital.com
E-mail product inquiries and sales: info@trivenidigital.com



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1

Chapter 1: Introduction

1.1 About GuideBuilder XM

GuideBuilder® XM generates and encodes program guide and other metadata for ATSC 1.0, DVB-SI, SCTE-65, and ATSC 3.0 IP streams. Using GuideBuilder, TV engineers and operators can:

- Link schedule providers to automatic inputs
- Configure network, transport, and output settings
- View and edit program schedules, descriptions, and ratings
- Monitor server status, activity, and system health
- Configure redundant servers and automatic notifications
- Download software updates and licensed features
- Manage multiple user access
- Monitor and encode ATSC 3.0 IP streams

GuideBuilder includes a web-based program editor, which can be used to change program schedules. GuideBuilder with ATSC 3.0 licensing includes a ROUTE/MMTP encoder for IP streams.

1.1.1 What's New?

GuideBuilder XM Release 5.3 includes these new features:

- Online and offline software license activation options. See "[Activate a Software License.](#)"
- Service Level Signaling (SLS) details and segments graphs and charts for the ROUTE/MMTP encoder. See "[ROUTE/MMTP Encoder.](#)"

1.1.2 GuideBuilder System Diagram

The core of the GuideBuilder system is the GuideBuilder server and its database. The GuideBuilder server interacts with and controls all the modules. The database stores information related to program events, channels, and interfaces with other systems.

Input interface modules, such as to a listing service or traffic system, bring information into the system to update the information in the GuideBuilder server database.

Output interface modules, such as to a multiplexer, encode program guide metadata from information in the database and deliver them to output devices.

Below is a basic diagram of the network connections and modules of the GuideBuilder system.

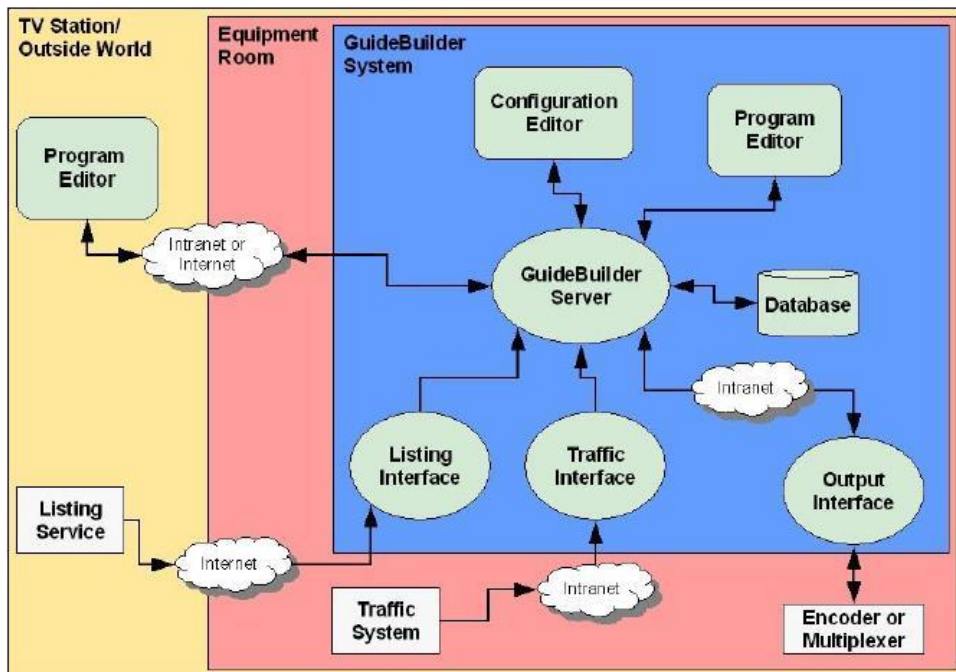


Figure 1-1: GuideBuilder System Diagram

1.1.3 About This User Guide

This user guide describes how to install, configure, and use the GuideBuilder client-server system. Instructions for all standard and licensed features are included.

Audience

The user guide is intended for engineers and operators responsible for the distribution and management of program guide metadata in DTV networks.

PDFs

A version of this user guide in Adobe® Acrobat® Portable Document Format (PDF) is available on the GuideBuilder user interface welcome page. This PDF can be viewed and printed using Adobe Acrobat Reader. You can download the latest version of Adobe Acrobat Reader at <http://www.adobe.com/products/acrobat/distribute.html>.

1.2 Document Conventions

Page and dialog names are shown in plain type, capitalized as the names appear on screen:

The Configuration Management page opens.

Menu names, commands, buttons, and data entry fields are shown in initial capped bold text:

Click **Ports** on the sidebar menu.

Click **Apply** to save the changes.

Tips about additional advice or better ways of performing a procedure appear like this:

TIP If you do not have a username and password, contact Triveni Digital customer support.

Notes to be aware of are shown like this:

NOTE If there is no user activity for more than 30 minutes, the application enters rest mode.

Cautions about the possible deleterious, but not catastrophic, effects of an action appear like this:

CAUTION Restarting the server while downloading files may prevent their data from being saved.

Warnings about important steps to avoid physical damage, injury, or data loss are shown like this:

WARNING Failing to install a firewall enables external users to access proprietary information.

Text that you type or references to directories and file names are formatted in italics:

Type *service restart*, and then press the **Enter** key.

Cross-references are formatted like this:

Document Conventions

Figure and table captions are formatted like this:

Figure 1-1: Sample Page

1.3 If You Need Help

You can contact Triveni Digital Customer Support:

- Call 1-609-936-3434
- Email support@TriveniDigital.com
- Or send a support request from the Triveni Digital website (<http://www.TriveniDigital.com>)

TIP To view a PDF of the *GuideBuilder User Guide*, click  on the GuideBuilder configuration application user interface.

2

Chapter 2: Installation

2.1 About GuideBuilder Installation

GuideBuilder is available in a variety of deployment options:

- GuideBuilder software preinstalled on a new server from Triveni Digital
- GuideBuilder software for installation on an existing server
- GuideBuilder software for a virtual machine (VM) application
- GuideBuilder Cloud, a cloud-based service hosted by Triveni Digital

New GuideBuilder servers do not require GuideBuilder software installation. Software-only installations, on existing servers or virtual machines, are available on a CD from Triveni Digital or as a download from the GuideBuilder Entitlement Site.

To learn how to install GuideBuilder, choose the appropriate procedure:

- For server installations, see "[Set up the GuideBuilder Server.](#)"
- For software-only installations and software upgrades, see "[Install GuideBuilder Software .](#)"
- For virtual machine installations, contact Triveni Digital Customer Support for details.

NOTE To learn about the GuideBuilder Cloud service, contact Triveni Digital.

2.2 Site Requirements

For GuideBuilder server installations at NOCs, TV stations, and other locations, these are the minimum site requirements:

- A computer facility with a 19-inch server rack
- An Ethernet connection

TIP To order a schedule provider subscription, contact your sales representative.

2.3 Server Requirements

For GuideBuilder software installations, these are the minimum server requirements:

- Intel Sandy Bridge Xenon-E3 based CPU or better
- Intel C200 Series Chipset or better
- Minimum 2 GB memory
- Minimum of two Ethernet ports
- One Free USB Port
- 80 GB or larger hard drive (or partition for VM installations)
- Two cores (for VM installations)
- Ubuntu 12.04 LTS x64 server

NOTE VM installations using VMWare require VMWare version EXXi 5.5 or later.

2.4 Set up the GuideBuilder Server

If you are setting up a server with preinstalled GuideBuilder software, follow these steps to prepare GuideBuilder for operation.

Before you begin

You must have the GuideBuilder USB configuration key (dongle) that comes with the GuideBuilder server. GuideBuilder servers cannot operate without this USB configuration key.

Steps

- 1 Mount the GuideBuilder server in a 19-inch server rack.
- 2 Insert the USB configuration key into a USB port on the GuideBuilder server.



Figure 2-1: USB configuration key

WARNING If you pack the GuideBuilder server for shipping or any other reason, remove the USB configuration key. Failure to remove the configuration key may result in damage to the GuideBuilder system and invalidate your warranty.

- 3 Connect one or two Ethernet networks to the appropriate ports on the rear panel of the GuideBuilder server.
Typically, one Ethernet connection is used for retrieving program guide data, and the second is used for a private LAN to MUXes.
- 4 If needed, connect peripherals (mouse, keyboard, KVM) to the GuideBuilder server.
- 5 Connect the power and turn the GuideBuilder server on.

What's next?

Once the GuideBuilder server is installed, its IP settings can be configured for use on an Ethernet local area network. You can also download the GuideBuilder license to enable licenced features.

Related topics

[Configure the IP Settings](#)

[Log on the](#)

[Activate a Software License](#)

2.5 Install GuideBuilder Software from a CD

If you are performing an initial software-only GuideBuilder installation, follow these steps to install the GuideBuilder software on a server.

Before you begin

For initial software-only installations, you must have a GuideBuilder CD from Triveni Digital.

NOTE Virtual machine installation procedures for GuideBuilder software vary according to the VM application in use. For details, contact Triveni Digital Customer Support.

Steps

- 1 If not done so already, power on the GuideBuilder server.
- 2 Insert the GuideBuilder CD into the optical drive on the server.
- 3 Copy the .deb file to a directory on a local computer.
- 4 On a monitor, open an SSH network connection to the GuideBuilder server.
- 5 At the prompt, enter **sudo dpkg -i GuideBuilder_[version_number]_amd64.deb**.
Where *[version_number]* is the GuideBuilder release version number.

NOTE You may need to log in to the GuideBuilder server with an OS-level account. If so, contact your system administrator for assistance.

- 6 [Optional] Enter **sudo apt-get update**.
This command updates the GuideBuilder packages and dependencies.
- 7 If the software installation fails due to dependencies, enter **sudo apt-get -f -y install**.
This command fixes broken packages. After using it, reinstall the GuideBuilder package using the dpkg command.
- 8 Log on the Config App.
For details, see “[Log on the Config App.](#)”

What's next?

After logging into the GuideBuilder configuration application, download and install the GuideBuilder license to enable your licenced features.

Related topics

[Activate a Software License](#)

2.6 Configure the IP Settings

To use a GuideBuilder server on a Ethernet local area network, the static IP address and other Ethernet settings for the GuideBuilder server must be configured.

Before you begin

Obtain this information about the GuideBuilder server from your system administrator:

- Static IP address
- Subnet mask address
- Network gateway address
- DNS server 1 address
- DNS server 2 address

You also need an Ethernet crossover cable to complete this task.

About this task

Configuring a GuideBuilder server for an Ethernet network involves connecting to and logging on the server from a client (setup) computer, preferably a laptop PC.

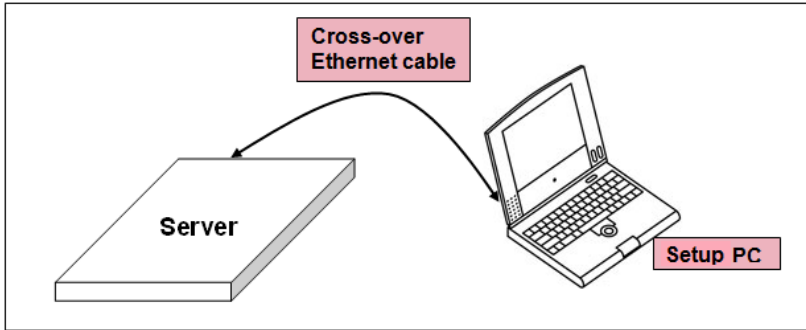


Figure 2-2: GuideBuilder setup diagram

Steps

1 On the setup computer, enter these network settings:

- IP address: 192.168.1.11
- Subnet mask: 255.255.255.0

These temporary settings enable the setup computer to access the GuideBuilder server.

NOTE Leave the default gateway and DNS server settings on the setup computer blank.

2 Using the Ethernet crossover cable, connect the setup computer to the **eth0** port on the GuideBuilder server.

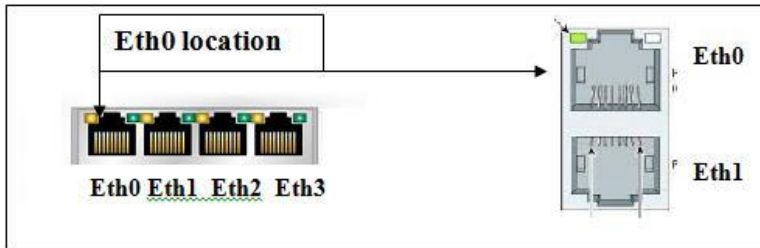


Figure 2-3: Ethernet port locations on GuideBuilder servers

The eth0 port typically is to the left or at the top of the Ethernet ports.

3 In a web browser on the setup computer, enter **http://192.168.1.10**.

This is the default IP address for the preinstalled GuideBuilder server, not the GuideBuilder IP address for your local area network.

4 From the GuideBuilder welcome page, log on the Config App.

To learn how, see ["Log on the Config App."](#)

5 Under Server Settings, click **Networking**.

6 In the Network Settings panel, select the **eth0** interface, and then click **Edit**.

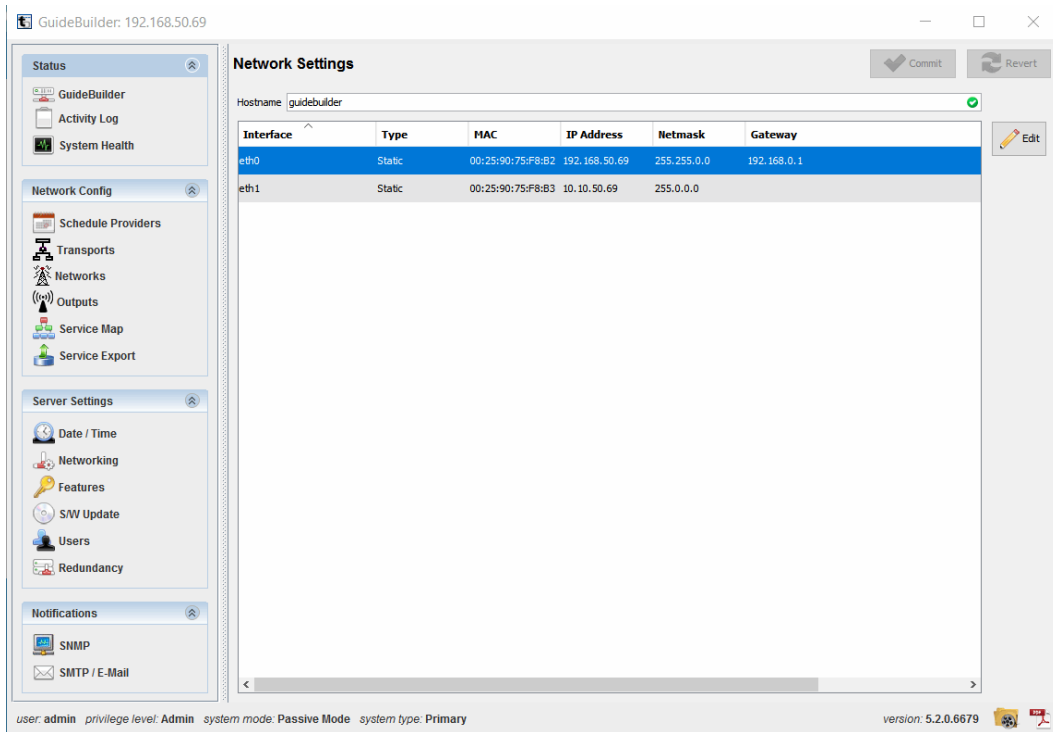


Figure 2-4: Network Settings Panel

- 7 In the Edit IP Settings dialog, enter the settings for the GuideBuilder server.

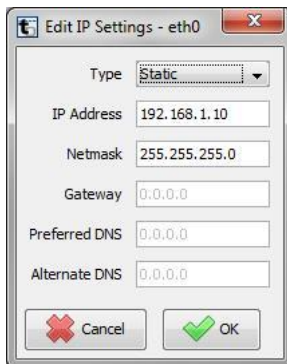


Figure 2-5: Edit IP Settings

The GuideBuilder server requires a static IP address.

- 8 Click **OK**.
- 9 At the top of the Config App window, click **Commit**.
- 10 In the Commit Warning window, click **Yes**.
- 11 In the GuideBuilder Server Restart window, click **OK**.
The Config App closes, and the GuideBuilder server restarts.
- 12 Disconnect the crossover cable from the GuideBuilder server.
- 13 Connect the **eth0** port on the GuideBuilder server to the Ethernet network.

Result

You can log on to the GuideBuilder applications from client computers on your local area network.

2.7 Log on the Config App

Once the GuideBuilder server or server software has been configured, you can log on the GuideBuilder Config App from your local area network.

Before you begin

You need:

- The IP address of the GuideBuilder server. For assistance, ask your system administrator.
- A computer with a compatible web browser and Java v. 1.7 or later installed.

NOTE Triveni Digital recommends using Firefox for viewing the GuideBuilder config app.

About this task

Only one user can be logged into the Config App at a time. When multiple users try to log on the Config App, the login dialog asks if they want to disconnect the active session.

Steps

- 1 Open a web browser on your computer.
- 2 In the browser address bar, enter the IP address for the GuideBuilder server in <https://xxx.xxx.xxx.xxx/> format.

NOTE Triveni Digital recommends using Hypertext Transfer Protocol Secure (HTTPS) for logins to the GuideBuilder config app. However, you can use unsecured the HyperText Transport Protocol (HTTP).

- 3 On the GuideBuilder welcome page, click **Config App**.

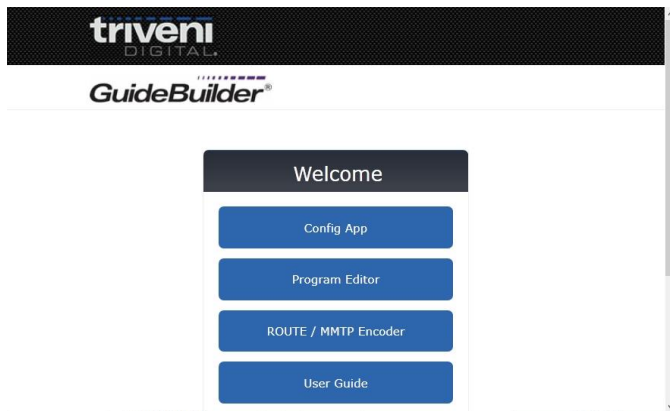


Figure 2-6: GuideBuilder welcome page

- 4 If Java Web Start has not been downloaded to your computer, click **Open** in the JNLP dialog.

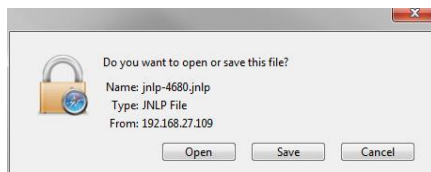


Figure 2-7: JNLP dialog

NOTE If this dialog does not appear, you may need to install a newer version of Java Web Start on the client computer.

- 5 In the Do you want to run this application? dialog, click **Run**.



Figure 2-8: Java Web Start

The Config App will download to the client computer.

- 6 In the GuideBuilder login dialog, type your username and password.



Figure 2-9: GuideBuilder Config App login

The default username and password are *admin*.

- 7 Click **Login**.
- 8 If the End User License Agreement dialog opens:
 - a Read the license agreement.
 - b Select the **If you are...** option.
 - c Click **Accept**.

Result

The GuideBuilder Config App opens.

TIP Unless you click OK in the Application Timeout dialog, the Config App will close after 15 minutes of user inactivity.

Related topics

[Managing User Accounts](#)

2.8 Activate a Software License

2.8.1 About GuideBuilder Software Licenses

After a software update has been installed on a GuideBuilder server, a GuideBuilder software license must be activated so the licensed features can be used by the server.

CAUTION GuideBuilder servers cannot fully operate without a valid activated software license. Trying to operate GuideBuilder without a license may interrupt EPG output. It is recommended that you contact Triveni Digital customer support during business hours to assist you with activating your license.

2.8.2 Activate a License Online

This procedure requires a GuideBuilder server with access to the Internet. If you do not have a license ID and activation password, contact Triveni Digital Customer Support.

Steps

- 1 Log on the Config App.
- 2 Under Server Settings, click **Features**.
- 3 Under Licensed Features, click **Activate/Refresh Online**.

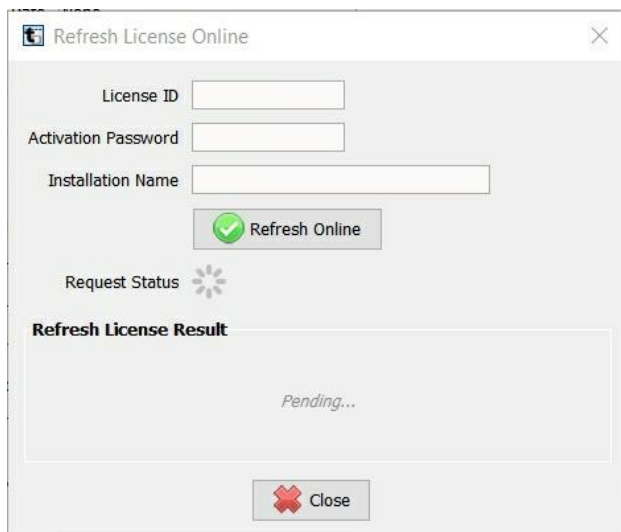


Figure 2-10: Refresh License Online dialog

- 4 Enter a software license ID and activation password.
- 5 Enter the name of the GuideBuilder installation.
For example, a company name or station call letters.
- 6 Click **Refresh Online**.
GuideBuilder activates the license.
- 7 Click **Close**.
- 8 Relaunch the Config App.

2.8.3 Activate a License Offline (Manual Request)

This procedure requires a client PC that has Internet access and access to the GuideBuilder server via a web browser. If you do not have a license ID and activation password, contact Triveni Digital Customer Support.

Steps

- 1 In a browser on the client PC, log on the Config App.
- 2 Under Server Settings, click **Features**.
- 3 Under Licensed Features, click **Activate/Refresh Offline (Manual Request)**.

Figure 2-11: Refresh License Offline dialog

- 4 Enter a license ID and activation password.
- 5 Enter the name of the GuideBuilder installation.
For example, a company name or station call letters.
- 6 Click **Refresh Offline**.

Figure 2-12: Refresh License Result

GuideBuilder saves an HTML file to the Documents folder on the client PC.

- 7 On the client PC, double-click the *license-request-id-XXXXXX.html* file.
- 8 In the Triveni Digital Manual Request web page, click **Download**.

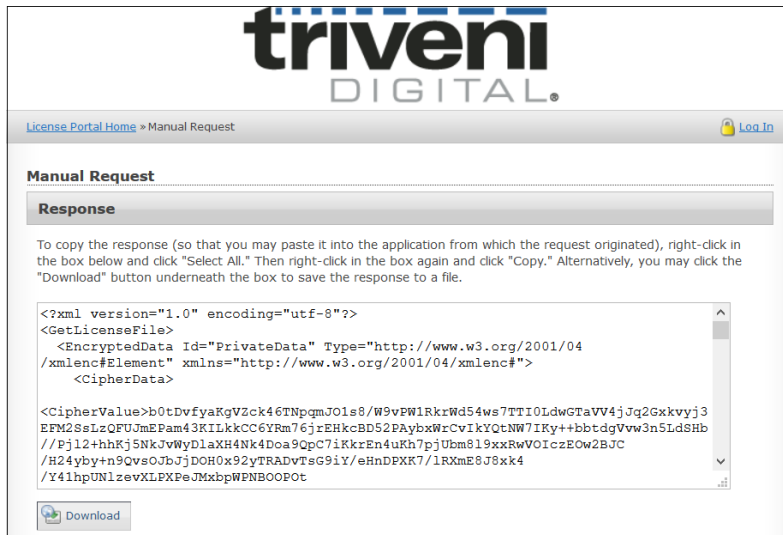


Figure 2-13: Triveni Digital Manual Request web page

A response XML file is saved to the Downloads folder on the client PC.

- 9 On the Licensed Features panel, click **Apply Response Offline (Manual Request)**.
- 10 Click **Select Response File**.

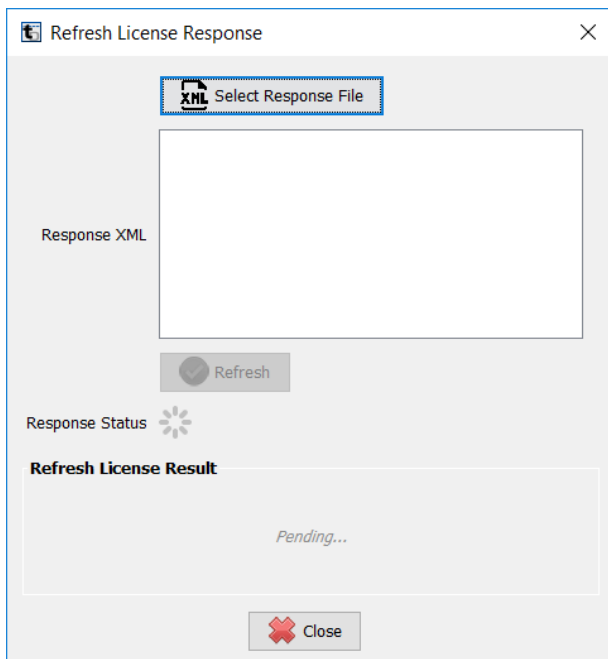


Figure 2-14: Refresh License Response dialog

- 11 Browse to the downloaded Response XML file.
- 12 Click **Select Response File**.
The Response XML file appears.
- 13 Click **Refresh**.
The software license is activated.
- 14 Click **Yes** to restart the GuideBuilder software.
- 15 Relaunch the Config App

2.8.4 View the Licensed Features

You can view the license ID, licensed features, license creation and expiration dates, and other data about the software currently installed on the GuideBuilder server.

Steps

- 1 Log on the Config App.
- 2 Under Server Settings, click **Features**.

The License Features panel opens.

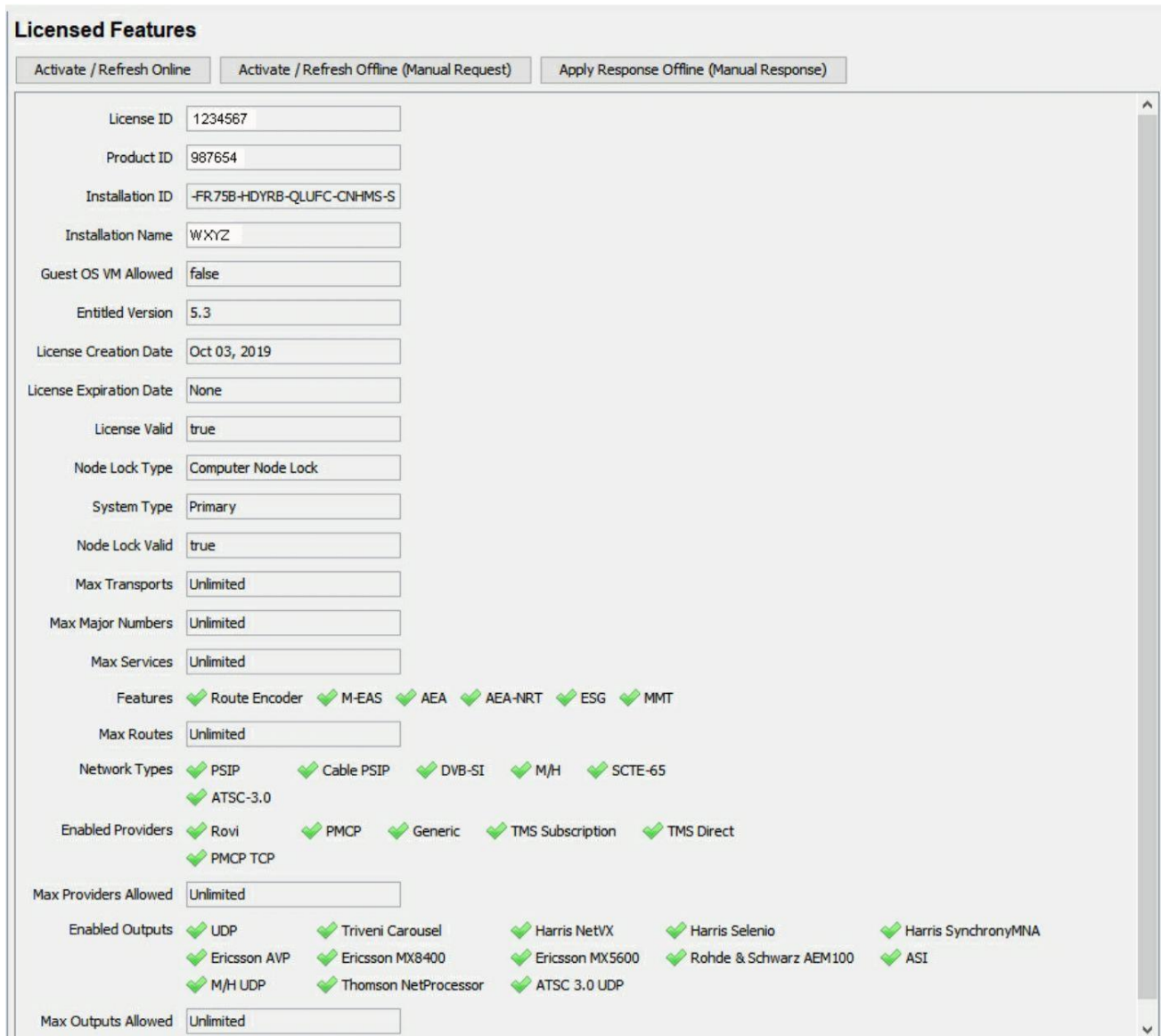


Figure 2-15: Licensed Features panel

The green checkmarks indicate the networks, features, providers, and outputs supported by activated software license. For details, see “[Licensed Features Fields](#).”

- 3 To change the license settings, activate a new license.

To learn how, see “[Activate a License Online](#)” or “[Activate a License Offline \(Manual Request\)](#).”

2.8.4.1 Licensed Features Fields

Table 2-1: Licensed Features Fields

Field	Description
License ID	Identifies the currently installed GuideBuilder software license.
Product ID	Identifies the GuideBuilder server on which the software is installed.
Installation ID	Identifies the most recent GuideBuilder software installation.
Installation Name	User-assigned installation name for the GuideBuilder server.
Guest OS VM Allowed	Indicates if GuideBuilder can be a Virtual Machine (true) or not (false).
Entitled Version	Version number of the software release installed on the GuideBuilder server.
License Creation Date	Date the license file was created.
License Expiration Date	Date the software license expires.
License Valid	Indicates if the installed license is valid (true) or not (false).
Node Lock Type	The type of node to which the GuideBuilder server is assigned and locked.
System Type	Primary or Redundant. For details, see "Using Redundant GuideBuilder Servers."
Node Lock Valid	Indicates if node lock for the installed license is valid (true) or not (false).
Max Transports	Maximum number of transport streams that can be configured in GuideBuilder.
Max Major Numbers	Maximum number of services supported with major numbers.
Max Services	Maximum number of services (virtual channels) that can be configured in GuideBuilder.
Features	The GuideBuilder features enabled in this installation.
Max Routes	Maximum number of encoded ATSC 3.0 routes that can be configured in GuideBuilder.
Network Types	Types of DTV networks that can be configured.
Enabled Providers	Types of schedule providers that can be configured for inputs.
Max Providers Allowed	Maximum number of schedule providers that can be configured for inputs.
Enabled Outputs	Types of devices and routes that can be configured for outputs.
Max Outputs Allowed	Maximum number of outputs that can be configured.

3

Chapter 3: Config App

3.1 About the Config App

Using the GuideBuilder Config App, you can configure and link schedule providers, logical networks, transport streams, and outputs for for signaling and program guide generation and management. Once your DTV networks are configured in Config App, and listings have been downloaded from schedule providers, event schedules can be viewed and changed in the GuideBuilder Program Editor.

3.1.1 Config App Workflow

Due to the dependencies of DTV signaling and program guide metadata, configuration in the Config App normally follows this workflow.

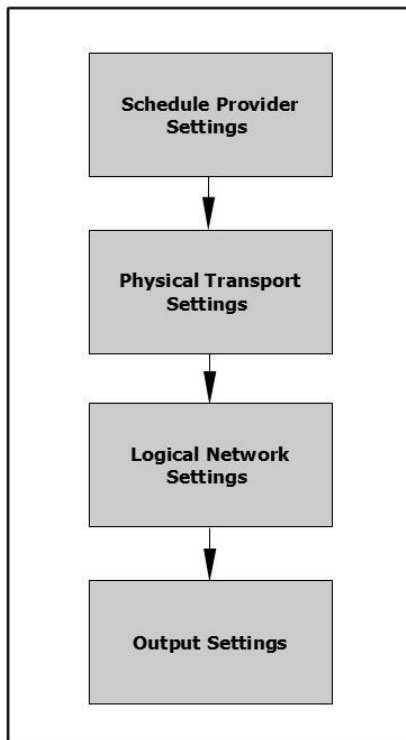


Figure 3-1: GuideBuilder configuration workflow

NOTE Changing configurations that are already configured in GuideBuilder does not necessarily follow this workflow. For example, output settings can be changed without changing schedule provider or transport settings.

3.1.2 Configuration Map

The following diagram shows how DTV elements are linked in the Config App. The vertical arrows depict the hierarchy of the elements. The horizontal arrows depict the linked dependencies between the elements.

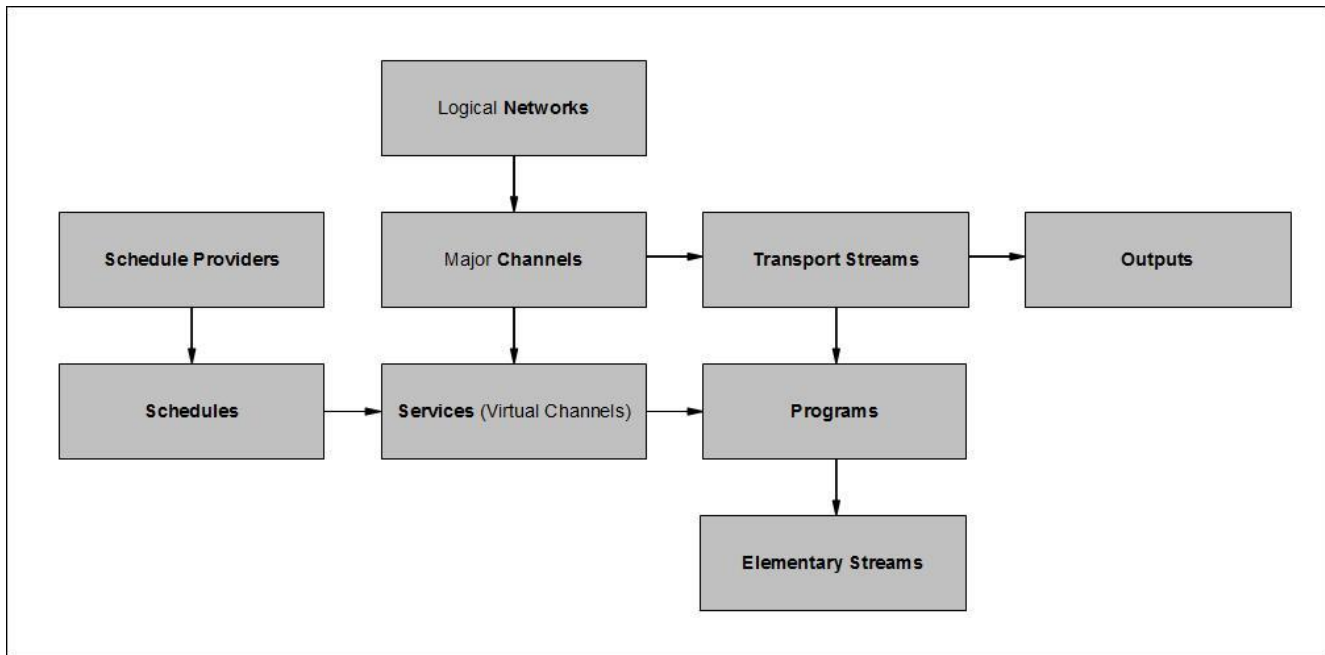


Figure 3-2: GuideBuilder configuration map

As this map shows, to generate program guides major channels and outputs must be linked to transport streams, and services (virtual channels) must be linked to schedules and programs.

3.1.3 Required Data Indicators

In the Config App user interface, all emtru fields that require data are indicated by a checkmarks.



Figure 3-3: Required field indicators

When valid required data is entered in a required field, its indicator turns green . When invalid data is entered, it turns into a red .

3.1.4 Password Display Buttons

In the Config App user interface, passwords are indicated by dots. If you forget a password, you can view it by clicking the button.

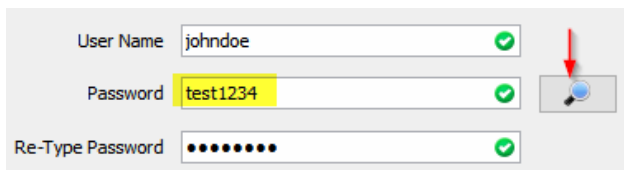


Figure 3-4: Password Reveal Button

3.1.5 GuideBuilder Config App User Interface

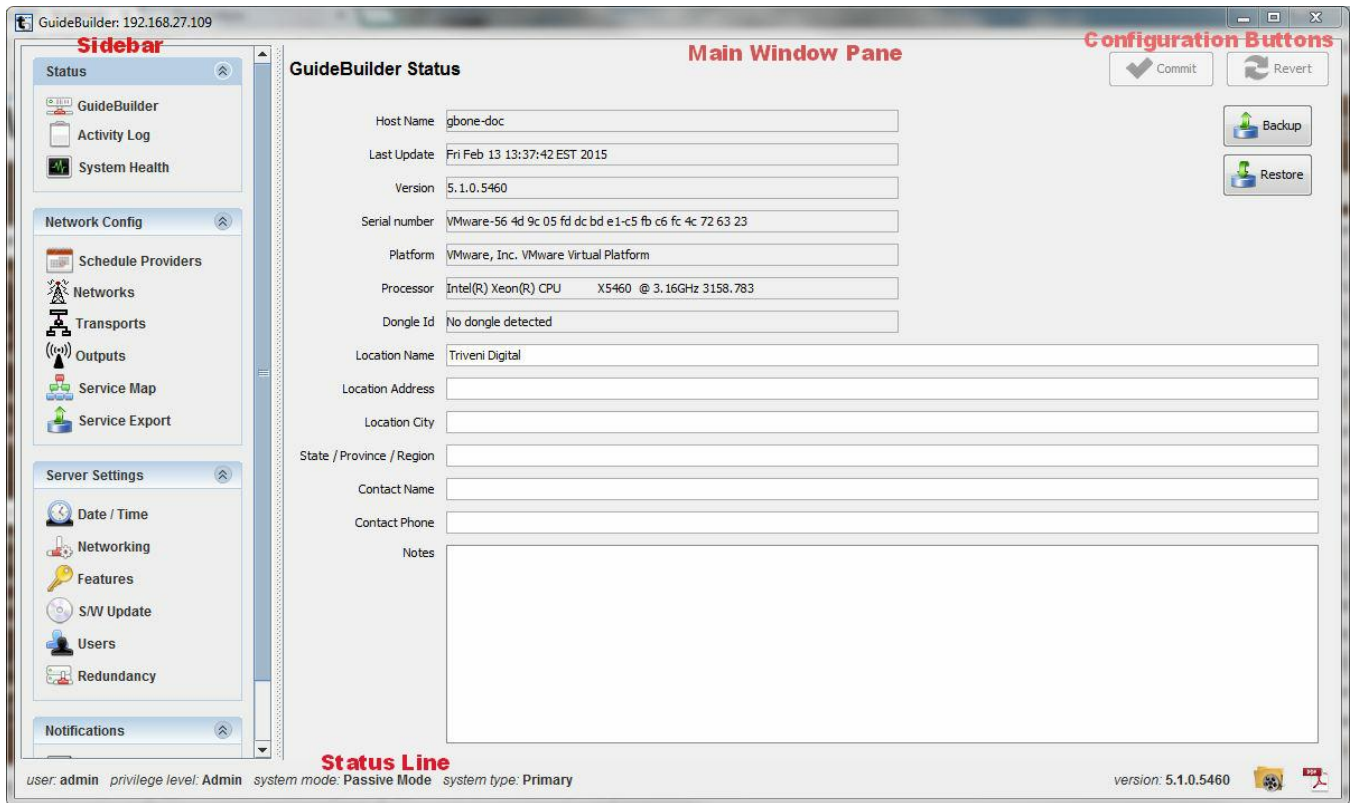


Figure 3-5: GuideBuilder Config App user interface

The user interface of the Config App has these main elements:

- The *sidebar* lists the configuration menu.
- The *main window panel* shows configuration lists, dialogs, and fields. To change the main display, click a sidebar menu command.
- The *configuration buttons* change with the selected configuration command and are grayed out when inactive.
- The *status line* displays the username and privilege level, and the system mode and type.

TIP You can hide or expand sidebar menus by clicking  or .

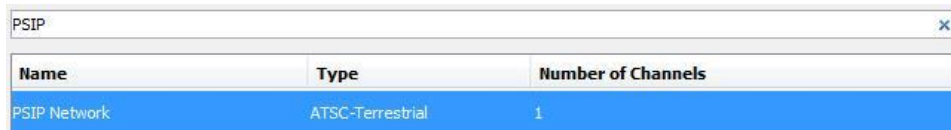
3.1.6 Searching for Configuration Data

In the Config App many dialogs contain Search boxes for finding schedule providers, logical network elements, transport streams, outputs, and other data that have been imported or configured in GuideBuilder.



Figure 3-6: Configuration data search example

To search for an item, start typing its name in the search box until the item is listed below.



Name	Type	Number of Channels
PSIP Network	ATSC-Terrestrial	1

Figure 3-7: Completed configuration data search example

To clear your search, click **X** in the Search box.

TIP You can sort search items by clicking their column headings. For example, to sort items alphabetically by name, click the Name column heading.

3.1.7 Committing Config App Changes

When you add or edit configurations in the Config App, the new configurations are not applied to outputs unless and until you commit them to the GuideBuilder server database.

To commit new or changed configuration settings to the database, click **Commit** at the top right of the main window, and then click **Yes**.



Figure 3-8: Config App Commit and Revert Buttons

If you click **Revert**, your uncommitted configuration changes are discarded.

NOTE Commit and Revert buttons are active only after configuration settings are added or updated.

3.2 Configuring Schedule Providers

3.2.1 Configure an FTP Schedule Provider

Use the Schedule Providers panel to add, edit, or remove listing service schedule providers. Once a schedule provider is configured, its program schedules will be downloaded to the database at the specified intervals.

Before you begin

If you are using the Tribune Media Services (TMS) Listing Interface as the schedule provider, its subscription must be activated.

About this task

Because they link to logical networks, in most cases you should configure one or more schedule providers before configuring logical networks in GuideBuilder.

Steps

- 1 Under Network Config, click **Schedule Providers**.
- 2 In the Schedule Providers panel:
 - To create a new schedule provider, click **Add**.
 - To change a schedule provider, select its **Name**, and then click **Edit**.

TIP To delete a schedule provider, select its **Name**, click **Remove**, and then click **Yes**.

- 3 In the Add or Edit Schedule Provider dialog:
 - a Enter or edit the schedule provider **Name**.
 - b Select **Online**.

NOTE If Online is not selected, GuideBuilder will not download listings from the schedule provider.

c If you are adding a schedule provider, select a **Schedule Provider Type**.

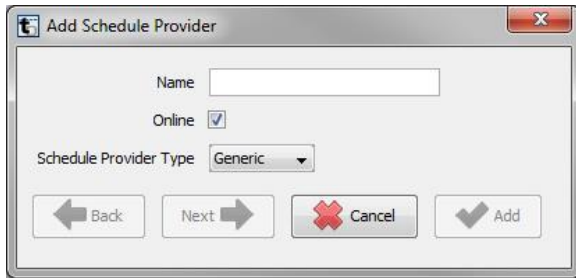


Figure 3-9: Add Schedule Provider

4 Do one of the following:

- If you are adding a schedule provider or have additional edits, click **Next**.
- If you are editing a schedule provider and have no other edits, click **Update**, and then go to Step 12.

If you clicked Next, the Add or Edit Schedule Provider dialog opens.

5 In the Add or Edit Schedule Provider dialog, enter the **FTP Settings**.

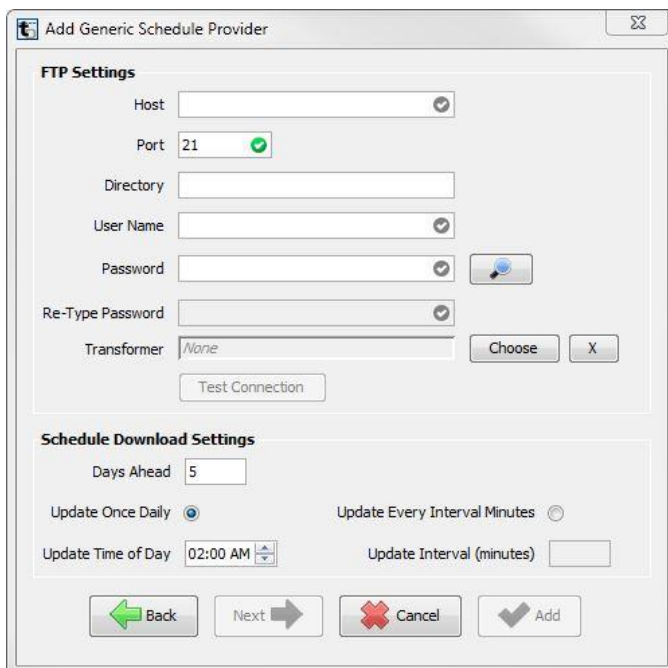


Figure 3-10: Add or Edit Generic Schedule Provider

For details, see "[Schedule Provider FTP Settings](#)."

TIP To display the password while typing it, click .

6 To test the settings, click **Test Connection**.

The Test Connection dialog displays the connection result, including the size and last modified date of the schedule files.

7 In the Test Connection dialog, click **OK**.

8 In the Add or Edit Schedule Provider dialog, enter the **Schedule Download Settings**.

For details, see "[Schedule Provider Download Settings](#)."

9 Click **Add** or **Update**.

The Schedule Providers panel reopens.

- 10 To update the schedule(s) from a provider:
 - a Click a listed schedule provider.
 - b Click **Ingest**.
 - c Click **Yes** to confirm the update.
- 11 To remove a schedule provider, select a **Name** on the list, click **Remove**, and then click **Yes**.
- 12 On the Schedule Providers panel, click **Commit** to commit the configuration to the database.

Result

The schedules from the provider will be downloaded to the database at the specified time.

What's next?

If you are also configuring logical networks, the program schedules from the newly configured schedule provider can be linked to services.

Related topics

[Configuring Logical Networks](#)

3.2.2 Configure an NVR Schedule Provider

GuideBuilder can be configured to receive service listings from a GuideBuilder Network VANC Receiver (NVR) via the Programming Metadata Communication Protocol (PMCP) and Transmission Control Protocol (TCP).

Before you begin

GuideBuilder is a passive receiver of the NVR. New NVR data must be initiated from the NVR.

NOTE If your GuideBuilder was configured for PCMP in the past, this feature will be selected in GuideBuilder 5.3 by default.

Steps

- 1 Under Network Config, click **Schedule Providers**.
- 2 In the Schedule Providers panel:
 - To create a new schedule provider, click **Add**.
 - To change a schedule provider, select its **Name**, and then click **Edit**.

TIP To delete a schedule provider, select its **Name**, click **Remove**, and then click **Yes**.

- 3 In the Add or Edit Schedule Provider dialog:
 - a Enter or edit the schedule provider **Name**.
 - b Select **Online**.
 - c For the schedule provider type, select **PMCP TCP**.
 - d Click **Next**.
- 4 In the Add PMCP TCP Schedule Provider dialog under TCP Settings:
 - a Select a **NIC Card** and a **Port** for the GuideBuilder NVR input.
Because any card can be used, the "Any..." NIC Card setting is recommended.
 - b Click **Test Connection**.
 - c In the Test Connection dialog, click **OK**.

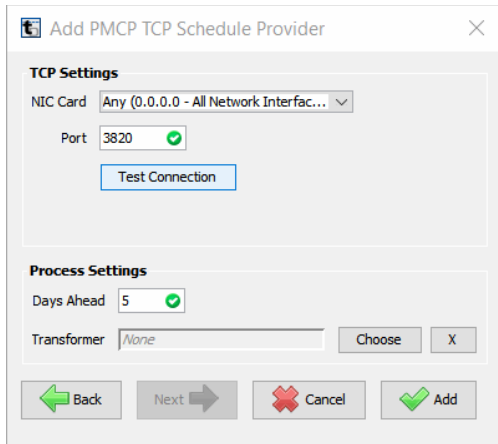


Figure 3-11: Add PMCP TCP Schedule Provider

5 Under Process Settings:

a If needed, change the **Days Ahead**.

This setting stops data input from the NVR beyond the specified number of days.

b Click **Choose**.

The transformer is the XSLT file that transforms the download to PCMP for Generic, PCMP, and PCMP TCP schedule providers. The default is *GBtoPMCP.xslt*.

TIP To clear the transformer, click X.

6 In the Select a Preview Resource dialog, select a transformer, and then click **Select**.

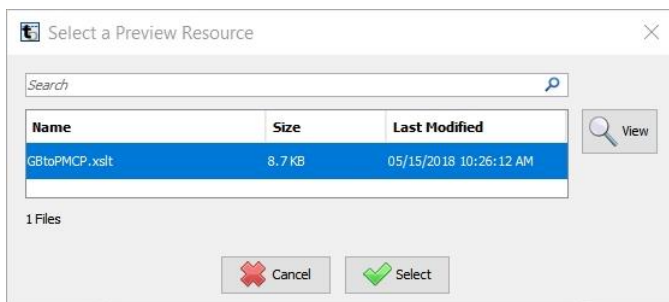


Figure 3-12: Select a Preview Source

TIP To download and view the XSLT resource, click **View**.

3.2.2.1 Schedule Provider Settings

These schedule providers can be configured in GuideBuilder.

Table 3-1: Schedule Providers

Setting	Description
ROVI	Rovi Corporation, a leader in program guide metadata.
PMCP	As specified in the ATSC Programming Metadata Communication Protocol (PMCP) standard (A/76). These files, which may be gzip compressed, can be retrieved from an FTP site or from a file system accessible by GuideBuilder. This interface can also receive data from PMCP clients connecting over TCP/IP.
Generic	DecisionMark's MediaStar Listing service or other Listing/Program Management/Traffic systems. Data from other systems must adhere to the Generic Interface File Format Specification available from Triveni Digital.
TMS	The Tribune Media Services (TMS) listing service via the Triveni Digital FTP site.
TMS Direct	The Tribune Media Services (TMS) listing service directly from the TMS FTP site.
PMCP TCP	Service listings from a GuideBuilder Network VANC Receiver (NVR) via the Programming Metadata Communication Protocol (PMCP) and Transmission Control Protocol (TCP).

3.2.2.2 Schedule Provider FTP Settings

The FTP Settings panel sets the parameters for the FTP server of the schedule provider.

Table 3-2: Schedule Provider FTP Settings

Setting	Description
Call Letters	The station call letters of the station (for ROVI and TMS schedule providers).
Host	The IP address of the FTP server of the schedule provider.
Port	The port number for communicating with the schedule provider FTP site.
Directory	Location of the remote directory.
User Name	The username for FTP server logins.
Password	The password for FTP server logins.
Re-type Password	The password for FTP server logins.

3.2.2.3 Schedule Provider Download Settings

The Schedule Download Settings panel sets the timing for automatic schedule provider downloads.

Table 3-3: Schedule Download Settings

Setting	Description
Days Ahead	Number of days of program guide data that was downloaded
Update Once Daily	Option to download program guide data once a day at specified time
Update Time of Day	Time of day for once daily program guide data downloads
Update Every Interval Minutes	Option to download program guide data at specified intervals
Update Interval (minutes)	Intervals, in minutes, for downloading program guide data

3.2.3 Download Schedules Manually

Program schedules are normally downloaded to GuideBuilder automatically at the time of day configured for the schedule providers. However, you can also download schedules manually.

Steps

- 1 Under Network Config, click **Schedule Providers**.
- 2 On the main window, select a service provider **Name**, and then click **Ingest**.
- 3 Click **Yes** to confirm the download.

The schedule download from the selected provider begins.

- To view the status of the download, click **Status**.

3.2.4 View Schedule Provider Status

To find the time and schedules of the most recent update from a schedule provider, view its schedule provider status. You can also view details about the events in updated schedules.

About this task

The View Schedule Provider Status dialog displays information about the most recent download only. To see the status of previous downloads, view the GuideBuilder server event log messages. For details, see “[View Event Log Messages](#).”

TIP You can also view service provider update statuses from service maps. For details, see “[Viewing Service Maps](#).”

Steps

- Under Network Config, click **Schedule Providers**.
- In the main window, click **Status**.

The View Schedule Provider Status dialog opens.

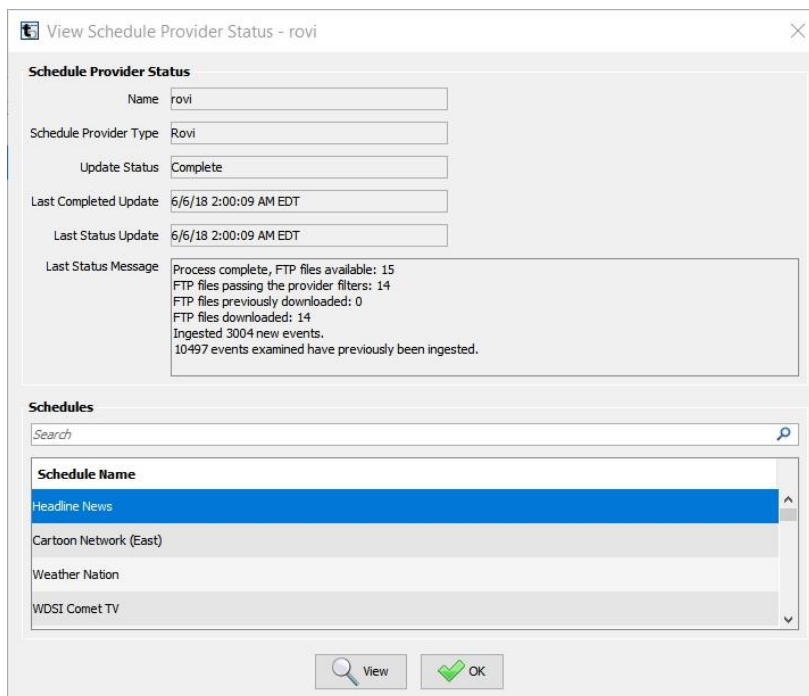


Figure 3-13: Sample View Schedule Provider Status

For details, see “[Schedule Provider Status](#).”

- To view a schedule, select a **Schedule Name**, and then click **View**.

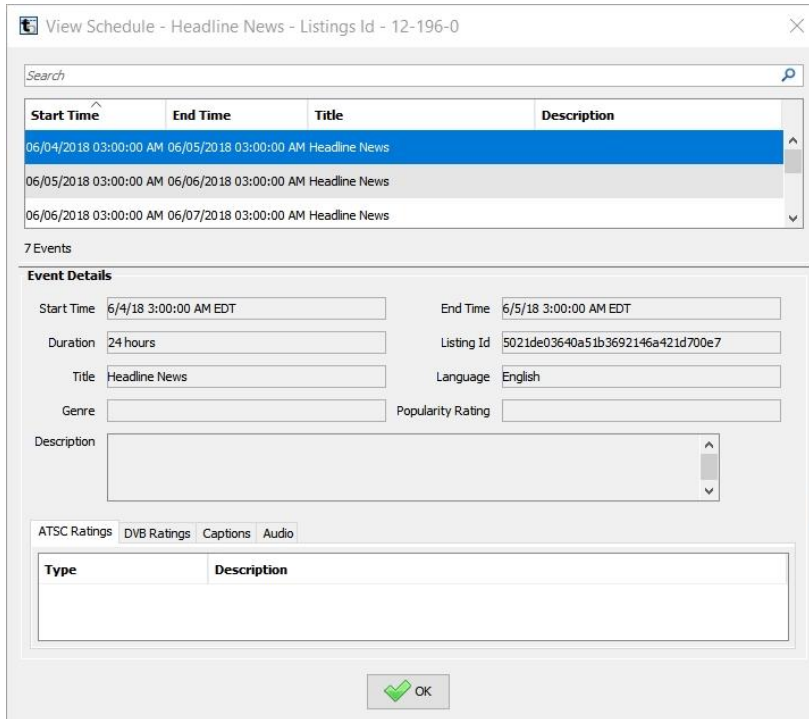


Figure 3-14: Sample View Schedule

- 4 In the View Schedule dialog, to view event details, click a program **Title**.
The Events Details panel displays details for the selected event. See “Event Details.”
- 5 Click the tabs to view ratings and other details.
- 6 Click **OK**.

3.2.4.1 Schedule Provider Statuses

The Schedule Provider Status panel contains the statuses and messages for schedule updates.

Table 3-4: Schedule Provider Statuses

Setting	Description
Name	Schedule provider name
Schedule Provider Type	The type of listing service for the schedule provider
Update Status	<i>Completed</i> – An update was successfully downloaded. <i>Pending</i> – No update has yet been downloaded. <i>Processing</i> – An update is currently downloading. <i>Error</i> – An error occurred in the download process.
Last Completed Update	Date and time of the most recent download of program guide data from the schedule provider that was successful
Last Status Update	Date and time of the most recently attempted download of program guide data from the schedule provider
Last Status Message	Message for the most recent program guide data download

3.2.4.2 Event Details

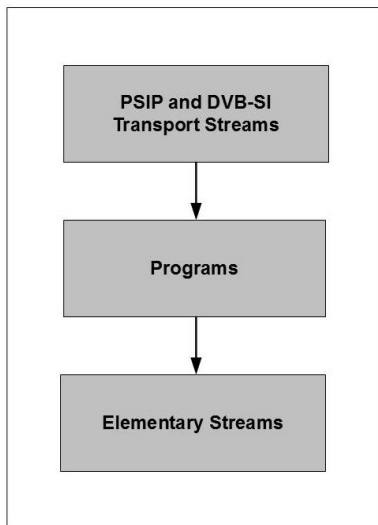
The Event Details panel contains the event details for the selected program schedule.

Table 3-5: Event Details

Setting	Description
Start Time	Start date and time of the program event
End Time	End date and time of the program event
Duration	Duration, in minutes, of the program event
Listing ID	Listing ID of the program event
Title	Title of the program event that will appear in program guides
Language	Language of the program event
Description	Description of the program event that will appear in program guides
ATSC Ratings	ATSC parental rating for the program event content
DVB Ratings	DVB-SI parental rating for the program event content
Captions	Language and other specifications for the captioning service for the program event
Audio	Language, type, and ID for the audio stream for the program

3.3 Configuring Transport Streams

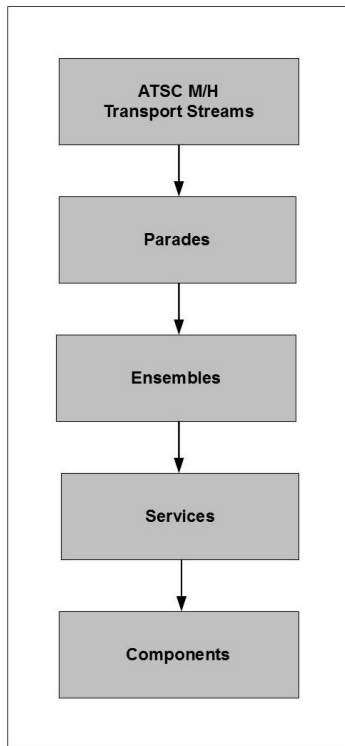
3.3.1 About PSIP and DVB-SI Transport Streams



PSIP and DVB-SI transport streams carry one or more programs, comprised of elementary streams containing video, audio, metadata, etc. In the Config App, PSIP and DVB-SI transport streams are mapped and linked to major channels, and programs are linked to services (that is, virtual channels).

Figure 3-15: PSIP and DVB-SI transport configuration map

3.3.2 About ATSC M/H Transport Streams



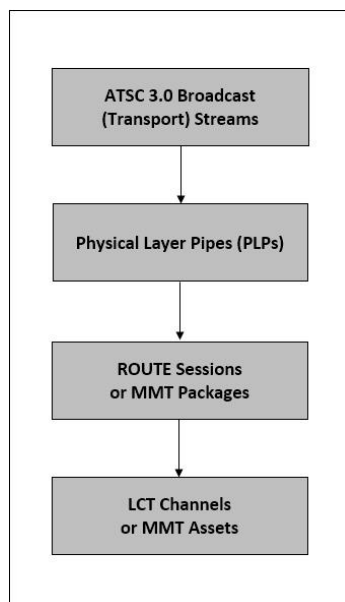
ATSC M/H transport streams consist of parades, ensembles, services, and various components. In the Config App, ATSC M/H transport streams are mapped and linked to major channels, and programs are linked to services (that is, virtual channel).

Figure 3-16: ATSC M/H transport configuration map

3.3.3 About SCTE-65 Transport Streams

SCTE-65 is a U.S. communication standard for delivering out-of-band Service Information (SI) on cable TV networks. SCTE-65 transport streams contain data tables that specify information related to electronic program guides, as well as elementary streams of video, audio, and other data.

3.3.4 About ATSC 3.0 Streams



ATSC 3.0 streams consist of Physical Layer Pipes (PLPs), ROUTE sessions or MMT packages, and LCT channels or MMT assets. In the Config App and the ROUTE/MMTP encoder application, ROUTE sessions and MMT packages are called IP streams.

TV scheduler systems are used to create and manage the PLPs. The IP streams are configured in the encoder application. And the logical networks for these elements are mapped and linked in the Config App. PLPs and IP streams must be configured before they can be mapped.

Figure 3-17: ATSC 3.0 stream configuration map

3.3.5 Configure PSIP or DVB-SI Transport Streams

Use the Physical Transports panel to add, edit, or remove configuration settings for the PSIP and DVB-SI transport streams, programs, and elementary streams (video, audio, etc.).

About this task

One or more transport streams must be configured in the Config App before logical networks can be configured.

Steps

- 1 Under Network Config, click **Transports**.
- 2 In the Physical Transports panel:
 - To create a new transport stream, click **Add**.
 - To change a transport, select its **Name**, and then click **Edit**.
 - To delete a transport, select its **Name**, click **Remove**, and then click **Yes**.

NOTE When a transport is removed from the Physical Transports panel, it is also removed from the Outputs panel.

If you clicked Add or Edit, the Add or Edit Transport Stream dialog opens.

- 3 In the Add or Edit Transport Stream dialog:
 - a Enter or edit the transport stream **Name**.
 - b Enter or edit its **TSID**.
 - c Select a Transport Type.

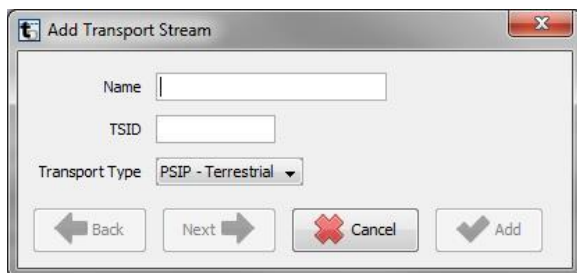


Figure 3-18: Add Transport Stream

- 4 Click **Next**.
- 5 In the Add or Edit PSIP/DVB-SI Transport Stream dialog:
 - To edit PSIP or DVB-SI table settings, click **Edit Table Settings**. For details, see "[PSIP Table Settings](#)" or "[DVB-SI Table Settings](#)."
 - To change the PSI table interval settings, select **Enable PSI**, click **PSI Settings**, and then enter the intervals. For details, see "[PSI Table Settings](#)."
 - To add a program to the transport, click **Add**.
 - To change program settings, select a program, and then click **Edit**.
 - To remove a program from the transport, select a program, and then click **Remove**.

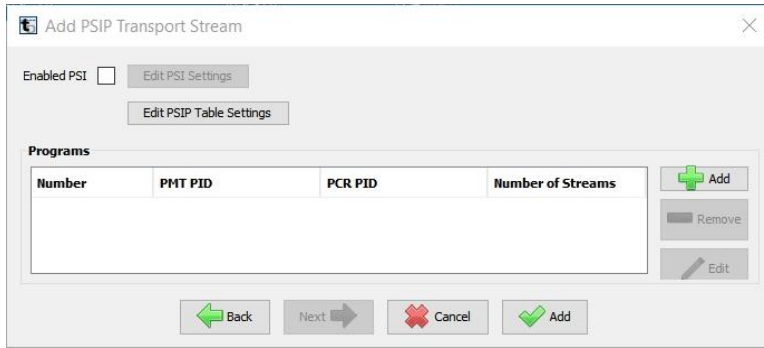


Figure 3-19: Add PSIP Transport Stream

If you clicked Add or Edit, the Add/Edit Program dialog opens.

- 6 In the Add/Edit Program dialog:
 - Enter or edit the program settings. For details, see “[Program Settings](#).”
 - To add an elementary stream to the program, click **Add**.
 - To change stream settings, click a stream, and then click **Edit**.
 - To remove a stream from the program, click a stream, and then click **Remove**.

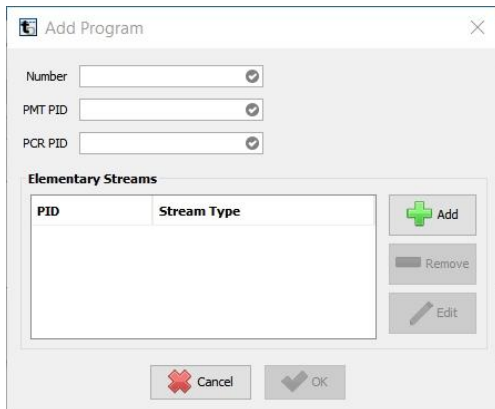


Figure 3-20: Add Program

If you click Add or Edit, the Add/Edit Elementary Stream dialog opens.

- 7 In the Add/Edit Elementary Stream dialog, enter or edit settings.

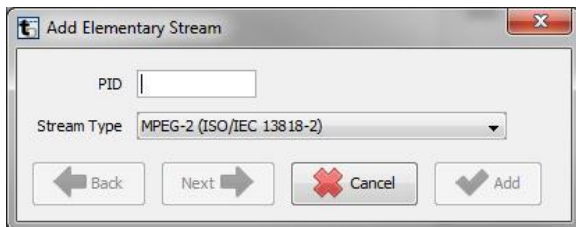


Figure 3-21: Add Elementary Stream

For details, see “[Elementary Stream Settings](#).”

- 8 Do one of the following:
 - If you selected **AC3 Audio** as the stream type, click **Next**.
 - If you selected another stream type, click **Add**.

If you clicked Next, the Add/Edit AC3 Elementary Stream dialog opens.

- 9 In the Add/Edit AC3 Elementary Stream dialog, enter or edit settings:

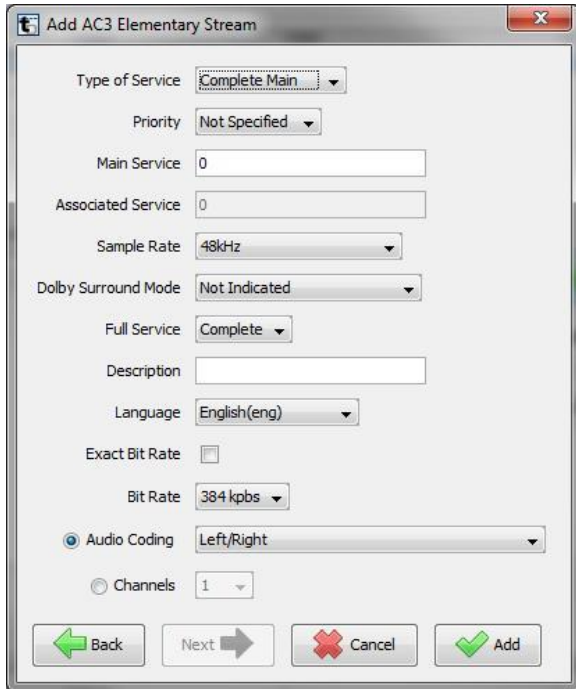


Figure 3-22: Add AC3 Elementary Stream

For details, see “AC3 Audio Settings.”

- 10 Click **Add**.
- 11 In the Add/Edit Program dialog, click **OK**.
- 12 In the Add/Edit DVBSI Transport Stream dialog, click **Update**.
- 13 On the Physical Transports panel, click **Commit** to commit the configuration to the database.

What’s next?

The transport stream can be linked to outputs. For details, see “Configuring Outputs.”

TIP The status of transport streams linked to outputs can be viewed in their service maps. See “Viewing Service Maps.”

3.3.5.1 PSI Table Settings

The PSI Settings dialog sets the values for PSI Table intervals.

Table 3-6: PSI Settings

Setting	Description
PAT Interval (ms)	Interval in milliseconds between Program Association Table packets. The default is 100.
PMT Interval (ms)	Interval in milliseconds between Program Map Table packets. The default is 400.
CAT Interval (ms)	Interval in milliseconds between Conditional Access Table packets. The default is 1000.

3.3.5.2 PSIP Table Settings

The Edit PSIP Table Settings dialog sets the PSIP table values in terrestrial and cable transport streams.

Table 3-7: PSIP Table Settings

Setting	Description
STT Interval (ms)	Interval in milliseconds (default 1000) between System Time Table packets
MGT Interval (ms)	Interval in milliseconds (default 150) between Master Guide Table packets
VCT Interval (ms)	Interval in milliseconds (default 400) between Virtual Channel Table packets
Encode Hidden Services	Include hidden services, normally used for proprietary applications
Enabled RRT	Enables Rating Region Table packets
RRT Interval (ms)	Interval in milliseconds (default 60000) between Rating Region Table packets
Enabled EIT	Enables Event Information Table packets
EIT Start PID	Identifies EIT packets
EIT Count	Number (minimum of four) of EIT packets being sent
EIT Interval (ms)	Interval in milliseconds (default 500) between EIT packets
EIT K Modifier	Increments of cycle time (default 1000) between EIT packets in the transport stream
Enabled ETT	Enables Extended Text Table packets
ETT Start PID	Identifies ETT packets
Channel ETT PID	Identifies ETT for the channel
ETT Interval (ms)	Interval in milliseconds (default 500) between Extended Text Table packets
ETT K Modifier	Increments of cycle time (default 1000) between ETT packets in the transport stream

3.3.5.3 DVB-SI Table Settings

The Edit DVB-SI Table Settings dialog sets the values for DVB-SI tables in transport streams.

Table 3-8 : DVB-SI Table Settings

Setting	Description
Enable EIT- P/F Others	Enables Event Information Table present and following events for other transport streams.
EIT- P/F Others Interval (ms)	Intervals in milliseconds between EIT present and following events for other transport streams
Enable EIT Schedules - Actual	Enables EIT schedule outputs for the actual transport
EIT Schedules – Actual (Days)	Number of calendar days of EIT schedule outputs for the actual transport
First 8 Days – Actual Interval (ms)	Interval in milliseconds between EIT packets for the first eight days of schedule outputs
Next 8 Days – Actual Interval (ms)	Interval in milliseconds between EIT packets for the second eight days of schedule outputs
NIT Actual Interval (ms)	Actual intervals in milliseconds between Network Information Table packets
Enable NIT Others	Enables NIT packets for other transport streams
NIT Others Interval (ms)	Intervals in milliseconds between NIT packets for other transport streams
TDT Interval (ms)	Intervals in milliseconds between Time and Data Table packets
EIT- P/F Interval (ms)	Intervals in milliseconds between EIT present and following events
Enable BAT	Enables Bouquet Association Table packets

BAT Interval	Intervals in milliseconds between Bouquet Association Table packets
Enable EIT Schedules - Others	Enables Event Information Table schedules for other transport streams
First 8 Days – Others Intervals (ms)	Interval in milliseconds between EIT packets for the first eight days of schedule outputs to other routes
Next 8 Days – Others Intervals (ms)	Interval in milliseconds between EIT packets for the second eight days of schedule outputs to other routes
SDT Actual Interval (ms)	Actual intervals in milliseconds between Service Description Table packets
Enable SDT Others	Enables Service Description Table packets for other transport streams
SDT Others Interval (ms)	Intervals in milliseconds between SDT packets for other transport streams
TOT Interval (ms)	Intervals in milliseconds between Time Offset Table packets

3.3.5.4 Program Settings

The Add or Edit Program dialog sets the values that identify programs linked to transport stream.

Table 3-9: Program Settings

Setting	Description
Number	Program number
PMT PID	Packet identifier number for the Program Map Table, used for defining the elementary streams in a program
PCR PID	Packet identifier number for the Program Clock Reference, used for synchronizing elementary streams in a program

3.3.5.5 Elementary Stream Settings

The Add or Edit Elementary Stream dialog sets the values that identify elementary streams that comprise programs.

Table 3-10: Elementary Stream Settings

Setting	Description
PID	Packet identifier number for the elementary stream
Stream Type	MPEG-2, AC-3 Audio, ISO/IEC, or A-90 video, audio, or other type of elementary stream

3.3.5.6 AC3 Audio Settings

The Add or Edit AC3 Elementary Stream dialog sets the values for AC3 audio streams.

Table 3-11: AC3 Audio Settings

Setting	Description
Type of Service	Service type provided by the audio stream
Priority	Indicates if the audio service is the primary or a secondary audio stream.
Audio ID	Integer number that identifies the audio stream. In AC3 streams, a value of 1 through 6.
Main Service	Integer of the main channel associated with the audio stream.
Associated Service	Integers for the service (virtual channel) associated with the audio stream.
Sample Rate	Sample rate of the audio stream.
Dolby Surround Mode	Indicates if Dolby surround sound is encoded in the audio stream.
Full Service	Indicates if the audio service is complete or needs to be combined with another audio service (Partial).
Description	Additional description of the audio service.
Language	Default language of the audio stream.
Exact Bit Rate	Sets the Bit Rate setting below as the exact bit rate.
Bit Rate	Exact rate or the upper limit of transmission.
Audio Coding	How channels in the audio stream are used: mono, stereo (Left/Right), and surround sound.
Channels	Number of channels in the audio stream.

3.3.6 Configure ATSC M/H Transport Streams

Configuring an ATSC M/H transport stream involves selecting M/H parades and ensembles. You can also edit the ESG and M-EAS settings for the transport stream.

About this task

One or more transport streams must be configured in the Config App before logical networks can be configured.

Steps

- 1 Under Network Config, click **Transports**.
- 2 In the Physical Transports panel:
 - To create a new transport stream, click **Add**.
 - To change configurations, select a transport **Name**, and then click **Edit**.
- 3 In the Add or Edit Transport Stream dialog:
 - a Enter or edit the transport stream **Name**.
 - b Enter or edit its **TSID**.
 - c Select the **ATSC M/H** transport type.
 - d Click **Next**.
- 4 In the Add or Edit M/H Transport Stream dialog, click **Edit ESG/M-EAS Settings**.



Figure 3-23: Add M/H Transport Stream

- 5 In the Edit ESG/M-EAS Settings dialog, you can:
 - Select ESG Enabled and Master ESG Enabled, and then enter ESG settings. See “ATSC M/H ESG Settings.”
 - Select **M-EAS Enabled** and **M-EAS NRT Enabled**, and then enter M-EAS settings. See “ATSC M/H M-EAS Settings.”

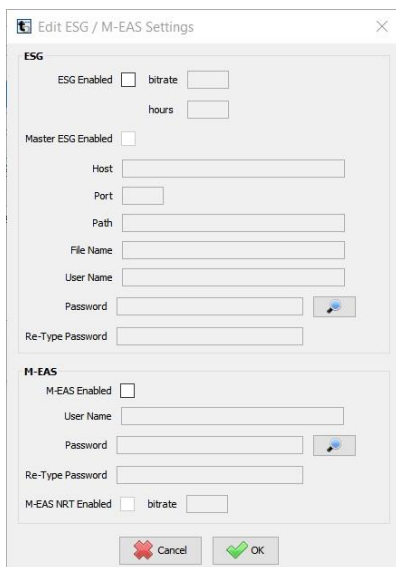


Figure 3-24: ATSC M/H ESG/M-EAS Settings

- 6 Click **OK**.
- 7 To add a mobile transport stream, click **Add**.

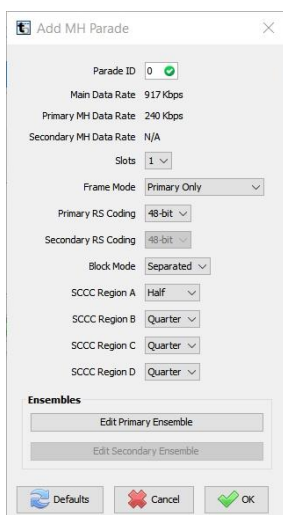


Figure 3-25: Add M/H Parade

- 8 Enter and select M/H parade settings.
For details, see "ATSC M/H Parade Settings."
- 9 Click **Edit Primary Ensemble**.

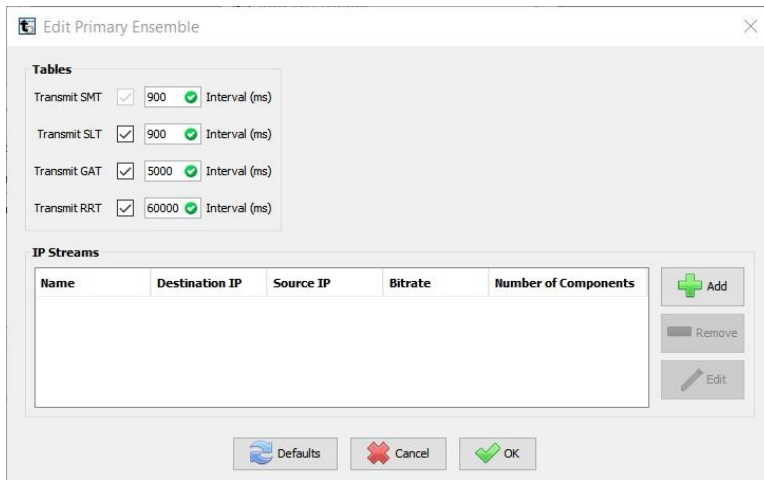


Figure 3-26: Edit Primary Ensemble

- 10 If needed, modify the ensemble **Tables** settings:
 - To disable transmission of a table, deselect it.

NOTE The Service Map Table (SMT) is required and cannot be disabled.

- To change the transmission rate of a table, edit its **Interval (ms)** field.

NOTE In each ensemble, the SLT and GAT tables must be coordinated with the multiplexer and the correct indicators must be set in the FIC.

- 11 To add a service to the ensemble, click **Add**.

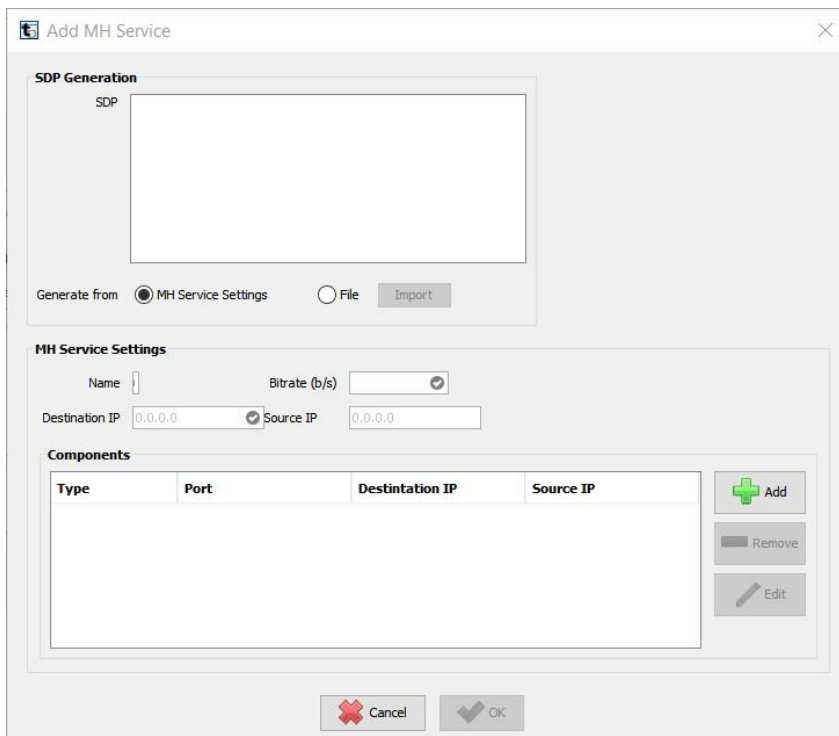


Figure 3-27: Add M/H Service

12 Under SDP Generation, select **M/H Service Settings** or **File**.

13 If you selected File:

- a Click **Import**.
- b Locate an .sdp file.
- c Click **Import**.

The SDP file populates the SDP box, and the components are listed below.

14 If you selected M/H Service Settings:

- a Enter the settings for the service. For details, see “SDP and M/H Service Settings.”
- b Click **Add**.

The screenshot shows the 'Add Component' dialog box with the 'Settings' tab selected. The 'Encryption' sub-tab is also visible. The 'Port' field is empty. 'Destination IP' and 'Source IP' are both set to '0.0.0.0'. 'Component Type' is set to 'H.264'. Under 'H.264 Settings', 'Constraints' are checked for Constraint 0, Constraint 1, and Constraint 2. 'AVC Flags' are unchecked for 'Still Present' and '24 Hour Picture'. 'Profile IDC' is set to 66 (0x42), 'Level IDC' is set to 19 (0x13), and 'AVC Compat Flags' is set to 0 (0x0). At the bottom, there are three buttons: 'Defaults', 'Cancel', and 'Add'.

Figure 3-28: Add Component (ATSC M/H)

For details, see “ATSC M/H Component Settings.”

TIP To return the component settings to their default values, click **Defaults**, and then click **Yes**.

15 If you selected the HEAACv2, STKM, or SVC Enhancement component type, click **Add**.

Select HEAACv2 configurations, a STKM Rights Issuer URI, or an SVC dependent layer ID, and then click OK

16 In the Add or Edit Component dialog, click **Add**.

17 In the Add or Edit M/H Service dialog, click **OK**.

18 In the Add or Edit Primary Ensemble dialog, click **OK**.

19 In the Add or Edit M/H Parade dialog, click **OK**.

20 In the Add or Edit M/H Transport Stream dialog, click **Update**.

21 On the Physical Transports panel, click **Commit** to commit the configuration to the database.

What's next?

The configured transport stream can be linked to logical networks and outputs.

TIP The update status of transport streams that have been linked to outputs can be viewed in their service maps.

3.3.6.1 ATSC M/H ESG Settings

ATSC M/H transport streams have these settings for Electronic Service Guides (ESGs).

Table 3-12: ATSC M/H ESG Settings

Setting	Description
ESG Enabled	Enables Electronic Service Guide (ESG) transmission
bitrate	Bitrate in Kbps of the output for the ESG data
hours	Number of hours of ESG data to be transmitted
Master ESG Enabled	Enables the Master ESG content to be accessed
Host	Server hosting the Master ESG file
Port	Port of access to the Master ESG server
Path	Path to the Master ESG file
File Name	File name of the Master ESG file
User Name	User name to authenticate access to the Master ESG server
Password	Password to authenticate access to the Master ESG server
Re-type Password	Password to authenticate access to the Master ESG server

NOTE Video previews and other media resources can be uploaded to GuideBuilder.

3.3.6.2 ATSC M/H M-EAS Settings

ATSC M/H transport streams have these Mobile Emergency Alert System (M-EAS) settings.

Table 3-13: ATSC M/H M-EAS Settings

Setting	Description
M-EAS Enabled	Enables Mobile Emergency Alert System (M-EAS) transmission
M-EAS NRT Enabled	Enables M-EAS Non-Real-time (NRT) content
Bit rate	Bitrate in Kbps of the output for the M-EAS data
User Name	User name to authenticate FTP access to this M-EAS server
Password	Password to authenticate FTP access to this M-EAS server
Re-type Password	Password to authenticate FTP access to this M-EAS server

3.3.6.3 ATSC M/H Parade Settings

The Add M/H Parade dialog sets the values for ATSC M/H transport stream parades.

Table 3-14: ATSC M/H Parade Settings

Setting	Description
Parade ID	Unique identifier for the parade

Main Data Rate	Required number of "null" packets in the transport stream
Primary M/H Data Rate	Usable bandwidth in the primary ensemble
Secondary M/H Data Rate	Usable bandwidth in the secondary ensemble
Slots	Number of M/H slots to configure for use
Frame Mode	Reed Solomon error correcting frame mode: Primary Only or Primary and Secondary
Primary RS Coding	Bit check types for the primary Reed Solomon coding
Secondary RS Coding	Bit check types for the secondary Reed Solomon coding
Block Mode	Use separate or combined SCCC modes
SCCC Region A	Code rate (1/2 or 1/4) for Serial Concatenated Convolutional Coding (SCCC) Region A
SCCC Region B	Code rate (1/2 or 1/4) for Serial Concatenated Convolutional Coding (SCCC) Region B
SCCC Region C	Code rate (1/2 or 1/4) for Serial Concatenated Convolutional Coding (SCCC) Region C
SCCC Region D	Code rate (1/2 or 1/4) for Serial Concatenated Convolutional Coding (SCCC) Region D

NOTE As M/H parade settings are selected, the data rates change.

3.3.6.4 ATSC M/H Service Settings

The Add M/H Service dialog configures these service settings.

Table 3-15: ATSC M/H Service Settings

Setting	Description
Name	Name of the service
Bitrate (b/s)	Estimate bitrate of the service
Destination IP	Destination IP address of this service's components
Source IP	Optional Source IP address of this service's components

3.3.6.5 ATSC M/H Component Settings

The Add Components dialog sets the values for ATSC M/H service components.

Table 3-16: ATSC M/H Component Settings

Component Type	Setting	Description
FLUTE	TSI	The Transport Session Identifier for the FLUTE session (required).
	Start Time	Date and time for the start of the FLUTE session.
	End Time	Date and time for the end of the FLUTE session.
	TIAS (b/s)	Transport Independent Application Specific bandwidth in bits per second.
	AS (Kbp/s)	Application Specific bandwidth in kilobits per second.
	FEC OTI	The Object Transmission Information for Forward Error Correction.
	Encoding ID	If FEC Encoding ID signaling is required, select and enter value.
	Instance ID	If FEC Instance ID signaling is required, select and enter value.
H.264	Constraints	CAUTION ATSC Mobile DTV Standard A/153 restricts the H.264 component to the default values. Only advanced users should modify these fields.
	AVC Flags	See Caution above.

	Profile IDC	See Caution above.
	Level IDC	See Caution above.
	AVC Compat Flags	See Caution above.
HEAACv2	Language	ISO 639.2/B language code.
	Constant Duration	Used for RTP time stamps, the constant duration in clock ticks.
	Sampling Rate	Appropriate sampling rate.
	RTP Clock Rate	Real-time Transport Protocol clock rate in ticks per second.
	Audio Channel Association	Enter a value from 0 to 7 to identify the audio service. For example, if this component is the primary audio service, enter 0. If this component is a secondary audio service, enter 1.
	Service Type	Select a service type.
LTKM	Protocol Version	Version of the Long-Term Key Message protocol.
	Ad-Hoc Rights Issuer Stream	Indicates the LTKM stream is an ad-hoc RI component of a right issuer service.
	Rights Issuer URL	The service provider URL.
NTP Timebase	Version	NOTE There are no configurable fields in the NTP Timebase component. The NTP timebase is similar to PCR in MPEG-2 systems.
OAM RME DIMS	Version Profile	Open Mobile Alliance Broadcast version profile of the DIMS stream.
	Level	Level of the DIMS stream.
STKM	Protocol Version	Version of the Short-Term Key Message protocol.
	Encryption Type	Identifies the STKM encryption algorithm.
	Stream ID	16-bit integer identifying the STKM stream.
	Base CID	The part of the Service CID or Program CID used to identify the corresponding asset within an OMA DRM 2.0 Rights Object.
	Service CID	When set to <i>1</i> , indicates the <i>base_CID_text()</i> is included.
	Program CID	When set to <i>1</i> , indicates the <i>prg_CID_extension</i> is included.
SVC Enhancement	Profile IDC	The profile IDC of the Scalable Video Coding enhancement layer.
	Constraints	Constraints as defined in the <i>ITU-T H.264</i> recommendation.
	SVC Compatible Flags	4-bit codes as defined in the <i>ITU-T H.264</i> recommendation.
	Level IDC	Coded as defined in the <i>ITU-T H.264</i> recommendation.
	Layer ID	8-bit integer specifying the SVC enhancement layer ID.
	Max Temporal ID	32-bit integer specifying the maximum value of the <i>temporal_id</i> field in the SVC enhancement layer.
	Max Dependency ID	3-bit integer specifying the maximum value of the <i>dependency_id</i> field in the SVC enhancement layer.
	Max Quality ID	4-bit integer specifying the maximum value of <i>quality_id</i> field in the SVC enhancement layer.

3.3.7 Configure SCTE-65 Transport Streams

Use the Physical Transports panel to enter or edit the configuration settings for the programs and elementary streams (video, audio, etc.) that comprise SCTE-65 transport streams.

About this task

One or more transport streams must be configured in the Config App before logical networks can be configured.

Steps

- 1 On the Config App sidebar under **Network Config**, click **Transports**.
- 2 In the Physical Transports panel:
 - To create a new transport stream, click **Add**.
 - To change configurations, select a transport **Name**, and then click **Edit**.

TIP To delete a physical transport, select its **Name**, click **Remove**, and then click **Yes**.

- 3 In the Add or Edit Transport Stream dialog:
 - a Enter or edit the transport stream **Name**.
 - b Enter or edit its **TSID**.
 - c Select the **SCTE-65** transport type.
 - d Click **Next**.
- 4 In the Add or Edit SCTE Transport Stream dialog, click **Edit SCTE Table Settings**.

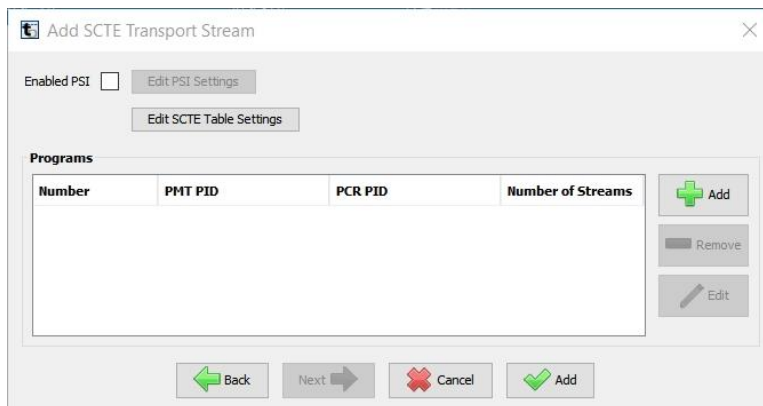


Figure 3-29: Add SCTE Transport Stream

- 5 In the Edit SCTE Table Settings dialog, select and enter settings.

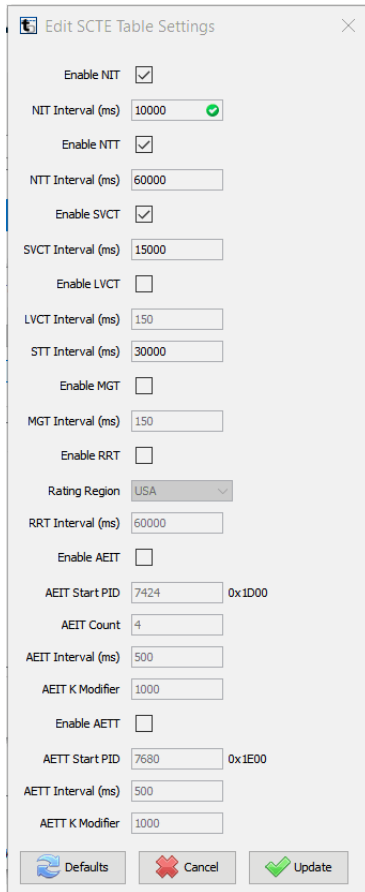


Figure 3-30: SCTE Table Settings

For details, see “SCTE Table Settings.”

6 Click **Update**.

7 On the Physical Transports panel, click **Commit** to commit the configuration to the database.

What’s next?

The configured transport stream can be linked to outputs.

3.3.7.1 SCTE Table Settings

Table 3-17: SCTE Table Settings

Setting	Description
Enable NIT	Enable Network Information Table (NIT) packets
NIT Interval (ms)	Interval in milliseconds (default 150) between NIT packets
Enable NTT	Enable Network Text Table (NTT) packets
NTT Interval (ms)	Interval in milliseconds (default 400) between NTT packets
Enable SVCT	Enable Short-form Virtual Channel Table (SVCT) packets
SVCT Interval (ms)	Interval in milliseconds (default 60000) between SVCT packets
Enable LVCT	Enable Long-form Virtual Channel Table (LVCT) packets
LVCT Interval (ms)	Interval in milliseconds (default 60000) between LCVT packets
STT Interval (ms)	Interval in milliseconds (default 60000) between System Time Table (STT) packets
Enable MGT	Enable Master Guide Table (MGT) packets

MGT Interval (ms)	Interval in milliseconds (default 60000) between MGT packets
Enable RTT	Enable Rating Region Table (RTT) packets
Rating Region	Select rating region: USA, Canada, or both
RTT Interval (ms)	Interval in milliseconds (default 60000) between RTT packets
Enable AEIT	Enable Aggregate Event Information Table (AEIT) packets
AEIT Start PID	Identifies AEIT packets
AEIT Count	Number (minimum of four) of AEIT packets being sent
AEIT Interval (ms)	Interval in milliseconds (default 60000) between AEIT packets
AEIT K Modifier	Increments of cycle time (default 1000) between AEIT packets in the transport stream
Enable AETT	Enable Aggregate Extended Text Table (AETT) packets
AETT Start PID	Identifies AETT packets
AETT Interval (ms)	Interval in milliseconds (default 60000) between AETT packets
AETT K Modifier	Increments of cycle time (default 1000) between AETT packets in the transport stream

3.3.8 Configure ATSC 3.0 Streams

To configure ATSC 3.0 streams, Physical Layer Pipes (PLPs) must be linked to one or more IP streams (ROUTE sessions or MMT packages). You can also select LLS table, ESG, and AEAT settings for the transports.

NOTE If you are using an IP stream encoder other than GuideBuilder XM, external SLS settings must be configured.

Before you begin

One or more ATSC 3.0 streams must be configured in the ROUTE/MMTP encoder. See “[Configure ATSC 3.0 Stream Encoding](#).”

Steps

- 1 Under Network Config, click **Transports**.
 - 2 In the Physical Transports panel:
 - To create a new transport stream, click **Add**.
 - To change configurations, select a transport **Name**, and then click **Edit**.
-
- TIP** To delete a physical transport, select its **Name**, click **Remove**, and then click **Yes**.
-
- 3 In the Add or Edit Transport Stream dialog:
 - a Enter or edit the transport stream **Name**.
 - b Enter or edit its **TSID**.
 - c Select the **ATSC 3.0** transport type.
 - d Click **Next**.
 - 4 In the Add or Edit ATSC 3.0 Transport Stream dialog, click **Edit LLS Table Settings**.
 - 5 Enter LLS table settings.

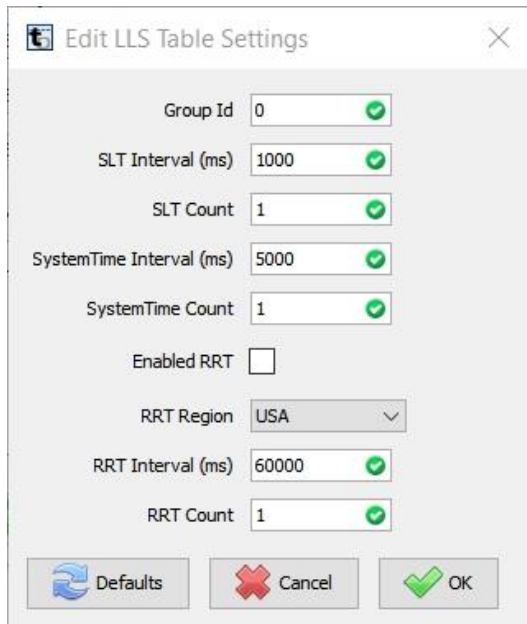


Figure 3-31: Edit LLS Table Settings

For details, see [“LLS Table Settings.”](#)

- 6 Click **OK**.
- 7 In the Add or Edit ATSC 3.0 Transport Stream dialog, click **Edit ESG Settings**.
- 8 Enter ESG settings.

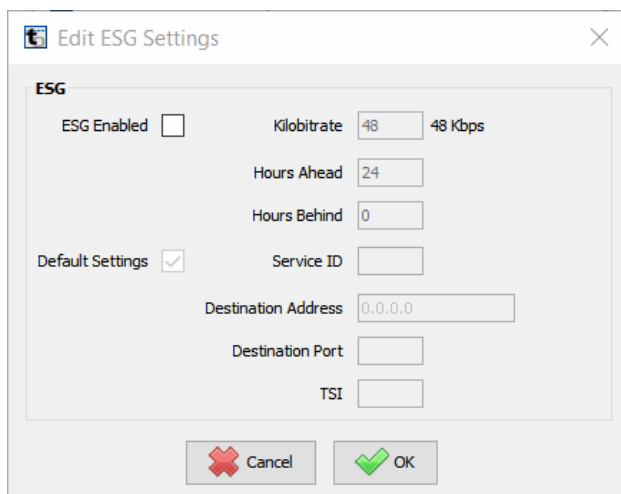


Figure 3-32: ATSC 3.0 ESG Settings

For details, see [“ESG Settings.”](#)

- 9 To include ESGs in the transport, select **ESG Enabled**.
Kilobit Rate, Hours Ahead, and Hours Behind are populated with default values.
- 10 If the transport stream requires a specific service ID, multicast flow, or TSI, deselect Default Settings and enter settings.
- 11 Click **OK**.
- 12 In the Add or Edit ATSC 3.0 Transport Stream dialog, click **Add**.
- 13 In the Edit PLP dialog, enter a **PLP ID**.

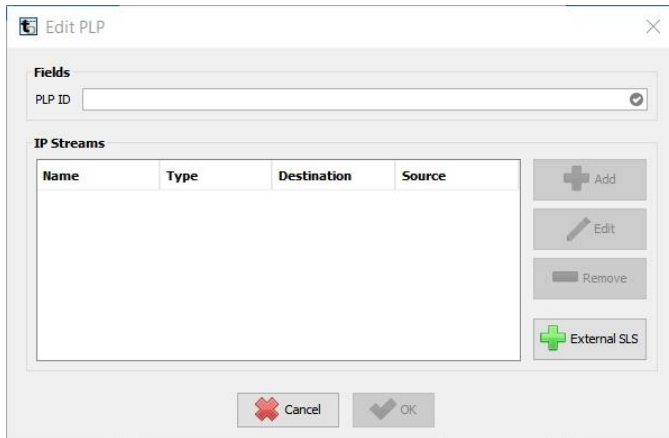


Figure 3-33: Edit PLP

14 If you are using an encoder other than GuideBuilder XM, click **External SLS**.

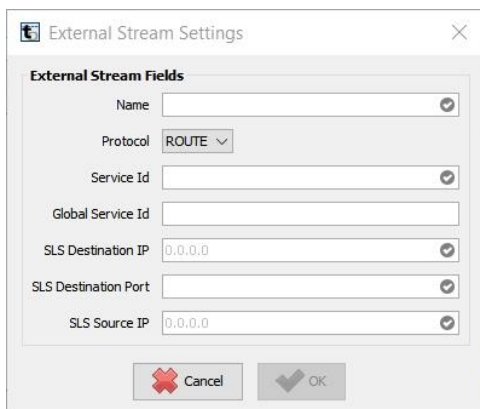


Figure 3-34: External Stream Settings window

For details, see “[External SLS Stream Settings.](#)”

NOTE If you are using GuideBuilder XM as the ATSC 3.0 IP stream encoder, the external stream fields must be blank.

15 To add IP streams to the transport, click **Add** under IP Streams.

16 In the Select ATSC3 Route dialog, click a ROUTE session, and then click **OK**.

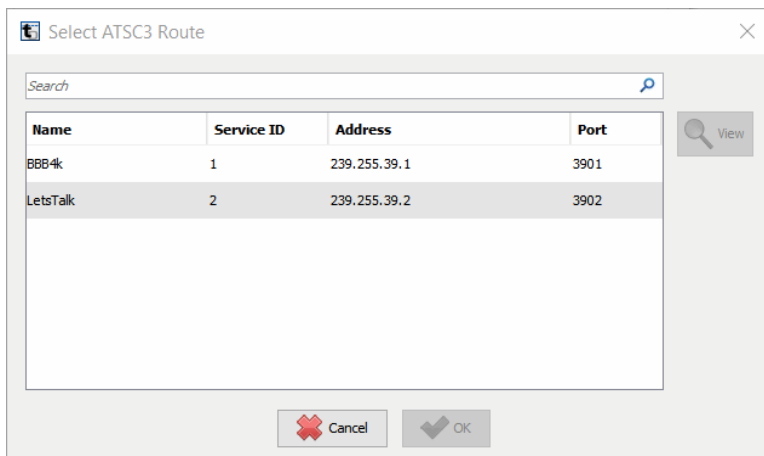


Figure 3-35: Select ATSC3 Route

TIP To view ROUTE settings, click a ROUTE, and then click **View**.

17 To add another IP stream to the PLP, repeat the previous step.

18 In the Edit PLP dialog, click **OK**.

19 In the Add or Edit ATSC 3.0 Transport Stream dialog, click .

20 In the Physical Transports panel, click **Commit** to commit the configuration to the database.

Related topics

[About ATSC 3.0](#)

3.3.8.1 LLS Table Settings

ATSC 3.0 transport stream have these LLS (Low Level Signaling) table settings.

Table 3-18: LLS Table Settings

Setting	Description
Group ID	PLP group ID for the transport stream.
SLT Interval (ms)	Maximum interval per SLT (default = 500).
SLT Count	Number of SLTs sent per interval (default = 1).
System Time Interval (ms)	Maximum interval for system time synchronizations (default = 4000).
System Time Count	Number of system time synchronizations to be sent per interval (default = 1).
Enabled RRT	Includes the Rating Region Table in the transport stream.
RRT Region	Identifies the applicable rating region.
RRT Interval (ms)	Maximum interval per RRT (default = 30000).
RRT Count	Number of RRTs sent per interval.

3.3.8.2 ESG Settings

ATSC 3.0 transport streams can have these Electronic Service Guide (ESG) settings.

Table 3-19: ATSC 3.0 ESG Settings

Setting	Description
ESG Enabled	Enables Electronic Service Guide (ESG) to be transmitted in the transport stream.
Kilobitrate	Bitrate in Kbps for the ESG data (default = 48 Kbps).
Hours Ahead	Number of hours of ESG data after the current time (default = 24 hrs).
Hours Behind	Number of hours of ESG data before the current time (default = 0 hrs).
Default Settings	Deselected, enables modification of the ESG settings.
Service ID	Identifies the ESG service.
Destination Address	Specifies the destination IP address of the ESG service.
Destination Port	Specifies the destination port of the ESG service.
TSI	The Transport Session Identifier (TSC) of the LCT channel for the ESG delivery descriptor.

3.3.8.3 AEA Settings

ATSC 3.0 transport streams can have these Advanced Emergency Alert Table (AEAT) settings.

Table 3-20: ATSC 3.0 AEA Settings

Setting	Description
Enable AEAT	Includes the AEAT in the transport.
AEAT Interval (ms)	Maximum interval per AEAT (default = 1000).

AEAT Count	Number of AEATs sent per interval (default =1).
FTP User Name	User name for the AEA server.
Password	Password for the AEA server.
Re-Type Password	Password for the AEA server.
NRT Enabled	Include Non-Real-Time content in the transport.
NRT Bitrate	Bits per second for Non-Real-Time content (default = 100).

3.3.8.4 External SLS Stream Settings

These settings apply only to ATSC 3.0 encoders other than GuideBuilder XM.

Table 3-21: External Stream Settings

Setting	Description
Name	Name of the encoder server or device.
Protocol	Protocol of the encoded ATSC 3.0 outputs.
Service ID	Identifies the ATSC 3.0 service.
Global Service ID	Identifies the ESG data of the service.
SLS Destination IP	IP address of the UDP multicast destination.
SLS Destination Port	Port number of the UDP multicast destination.
SLS Source IP	IP address of the MPEG-DASH source.

3.4 Configuring Logical Networks

3.4.1 About Logical Networks

A logical network is a set of logical channels, virtual channel services, and program schedules transmitted in a transport stream. A logical channel is a group of one or more services. Services are major and minor virtual channels (such as 2-1, 2-2, etc.). Schedules are program descriptions and other event details from a schedule provider. Configuring a logical network links channels to services and schedules, as well as user-defined, conditional access, and other descriptors.

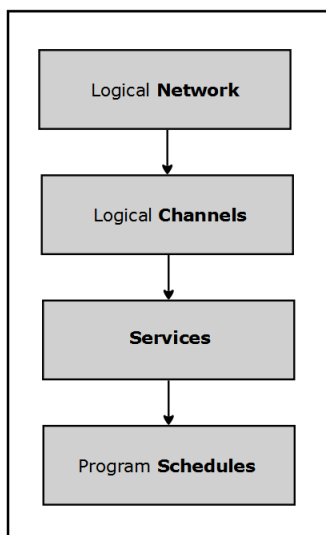


Figure 3-36: Logical Network configuration map

For GuideBuilder to generate program guide metadata, at least one logical network, comprised of at least one logical channel and one service, must be configured in the Config App. By default, the number of major channel numbers that can be configured for ATSC 1.0 and ATSC 3.0 logical networks is equal to the number of licensed transport streams. There is no limit to the number of minor channels that can be configured. To configure multiple major channels, contact Triveni Digital sales or customer support to upgrade the GuideBuilder license.

3.4.2 Configure ATSC Networks

You can create and edit ATSC 1.0 logical networks for signaling and electronic service guides (ESGs). Configuring ATSC 1.0 logical networks is how you link channels to services and program schedules.

Before you begin

- One or more schedule providers must be configured in the Config App. For details, see ["Configuring Schedule Providers."](#)
- One or more transport streams must be configured in the Config App. For details, see ["Configure PSIP or DVB-SI Transport Streams."](#)

Steps

- 1 Under Network Config, click **Networks**.
- 2 In the Logical Networks panel:
 - To create a new ATSC network, click **Add**.
 - To change an ATSC network, select its **Name**, and then click **Edit**.

TIP To delete a logical network, select its **Name**, click **Remove**, and then click **Yes**.

- 3 In the Add or Edit Network dialog:
 - Enter or edit the **Network Name**.
 - Select a type: **ATSC-Cable** or **ATSC-Terrestrial**.

Figure 3-37: Add Network dialog

The type of a configured logical network cannot be changed. If you edited the name of a configured network, and do not want to make other edits, click Update.

- 4 Click **Next**.

The Add or Edit ATSC Network dialog opens.

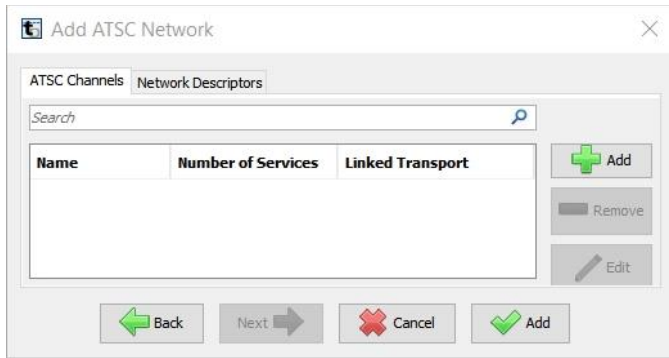


Figure 3-38: Add ATSC Network dialog

- 5 To add or edit network descriptors for the channels:
 - a Click the **Network Descriptors** tab.
 - b Click **Add**.
 - c Select a descriptor type. For details, see “Descriptor Types.”

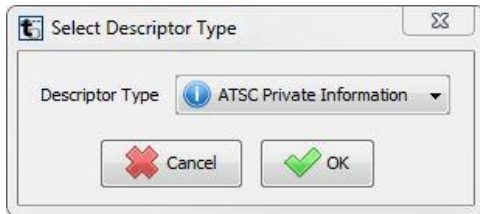


Figure 3-39: Select Descriptor Type dialog

- d Click **OK**.
 - e In the Add Descriptor dialog, enter settings.
 - f Click **Add**.
- 6 In the Add or Edit ATSC Channel dialog:
 - Enter or edit the **Channel Settings**.
 - To add a service (virtual channel), click **Add**.
 - To change service settings, click a service **Name**, and then click **Edit**.
 - To add descriptors, click **Channel Descriptors**, and then click **Add**.
 - To change the services order, click the arrow buttons.

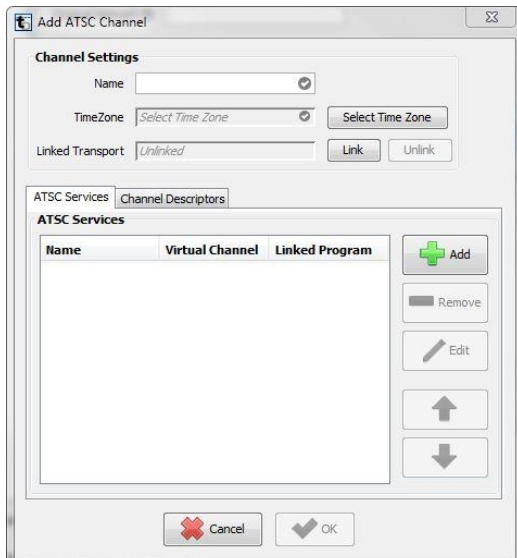


Figure 3-40: Add ATSC Channel

An ATSC channel can have multiple services (virtual channels). By default, GuideBuilder can be configured for only one major channel.

NOTE To configure multiple major channels, contact Triveni Digital sales or customer support to upgrade your license.

- 7 Click **OK**.
- 8 In the Add or Edit Service dialog, enter or edit **Service Settings**.

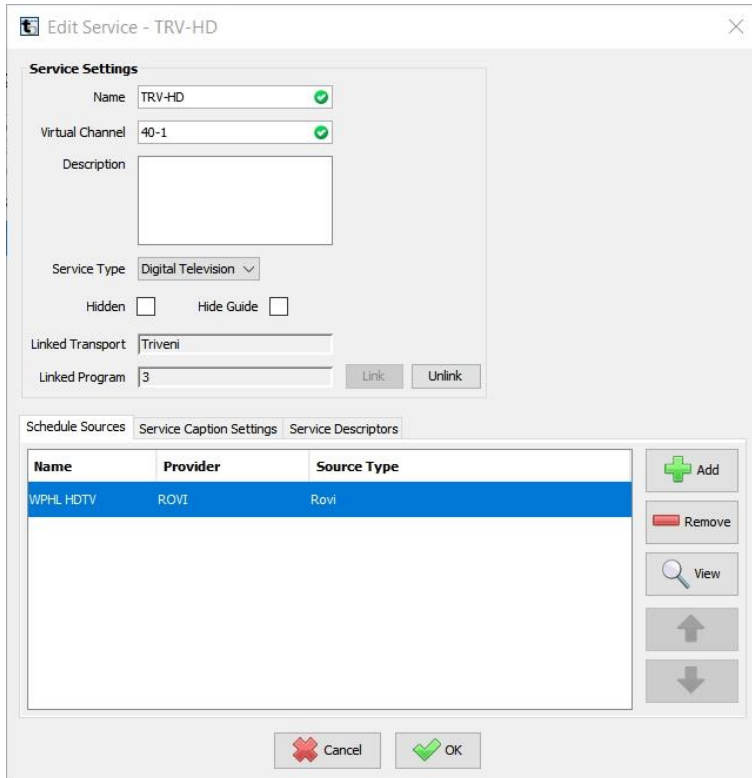


Figure 3-41: Edi Service dialog

The seven-character maximum service name is visible to viewers. For details, see “[Service Settings.](#)”

- 9 To add a schedule for the service, click **Schedule Sources**, and then click **Add**.
If multiple schedules are assigned to a service, use the arrow buttons to move the overriding schedule to the top of the list.
- 10 In the Select a Schedule dialog, select a **Schedule Name**, and then click **OK**.

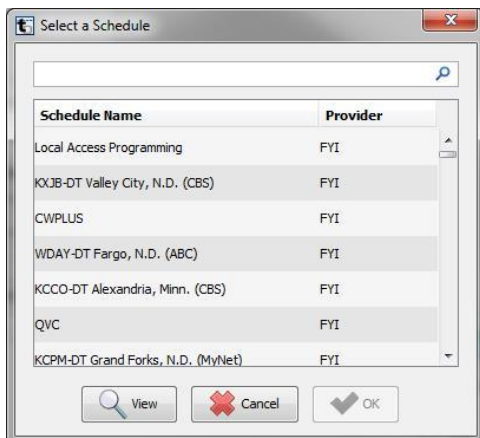


Figure 3-42: Select a Schedule (ATSC)

TIP To view a schedule, click it, and then click **View**.

- 11 To change the default service or linked schedule caption settings:
 - a Click the **Service Caption Settings** tab.
 - b Click **Add**.
 - c In the Service Caption Setting dialog, select and enter settings, and then click **OK**.

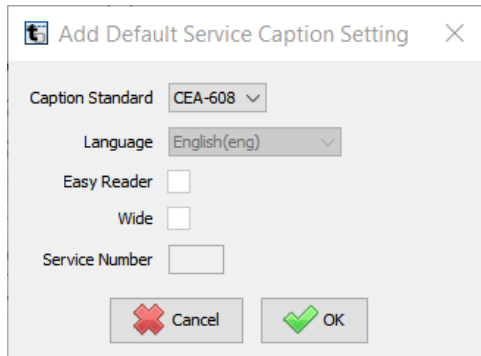


Figure 3-43: Add Default Service Caption Setting

Default and linked schedule caption settings are used to indicate closed captions. For details, see ["About Service Captions."](#)

- 12 To add descriptors to the service, click **Service Descriptors**, and then click **Add**.
- 13 In the Add or Edit Service dialog, you can:
 - Click **View** to view program events and event details.
 - Click **Remove** and then **Yes** to remove a schedule source from the service.
- 14 In the Add or Edit Service dialog, click **OK**.
- 15 In the Add or Edit ATSC Channel dialog, click **OK**.
- 16 In the Add or Edit ATSC Network dialog, click **Add** or **Update**.
- 17 On the Logical Networks panel, click **Commit** to commit the configuration to the database.

3.4.3 Configure ATSC M/H Networks

You can create and edit ATSC Mobile/Handheld (M/H) logical networks for signaling and Electronic Service Guides (ESGs). Configuring ATSC M/H networks is how you link channels to mobile DTV services and program schedules.

Before you begin

- One or more schedule providers must be configured in the Config App, and its schedules downloaded. For details, see ["Configuring Schedule Providers"](#).
- One or more ATSC M/H transport streams must be configured in the Config App. For details, see ["Configure ATSC M/H Transport Streams."](#)
- To link IP services, icons, and interstitial images to ATSC M/H services, media resources must be uploaded to the GuideBuilder server database. For details, see ["Uploading Media Resources."](#)

Steps

- 1 Under Network Config, click **Networks**.
- 2 In the Logical Networks panel:
 - To create a new ATSC M/H network, click **Add**.
 - To change an ATSC M/H network, select its **Name**, and then click **Edit**.

TIP To delete a logical network, select its **Name**, click **Remove**, and then click **Yes**.

- 3 In the Add or Edit Network dialog:
 - a Enter a network **Name**.
 - b Select type **ATSC-M/H**.
- 4 Click **Next**.
- 5 In the Add or Edit ATSC Network dialog:
 - To create a new ATSC M/H service, click **Add**.
 - To change an ATSC M/H service, select its **Name**, and then click **Edit**.

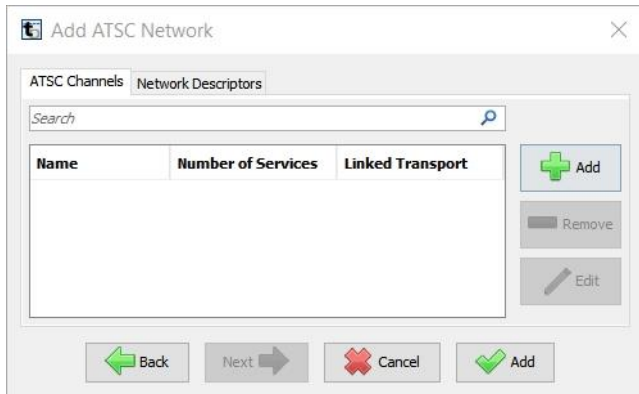


Figure 3-44: Add ATSC M/H Network

- 6 In the Add or Edit Service dialog, enter or edit service settings.

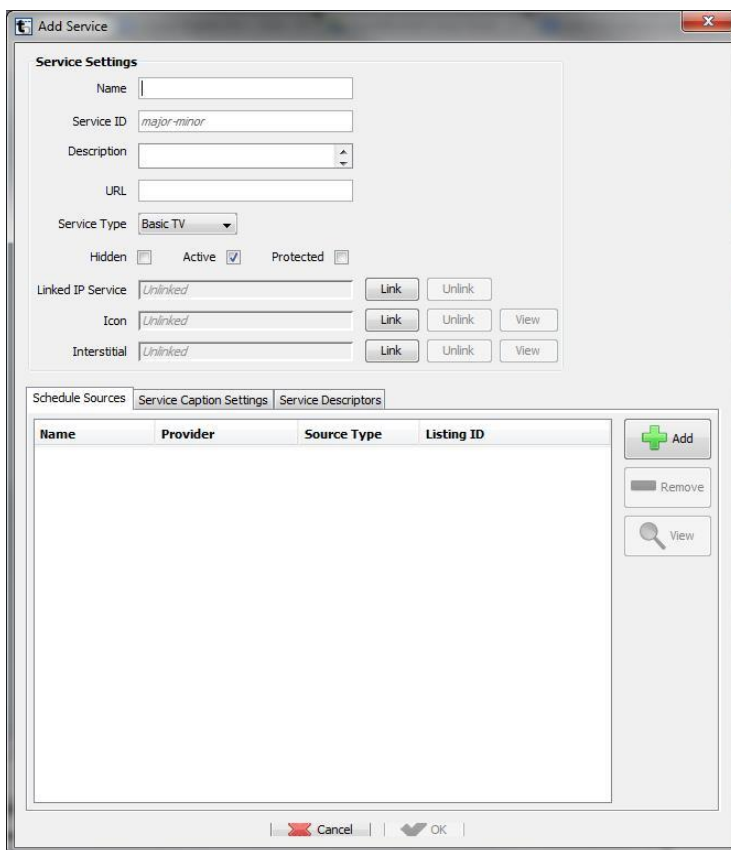


Figure 3-45: Add Service (ATSC M/H network)

For details, see “Service Settings.”

- 7 To add a schedule for the service, click **Schedule Sources**, and then click **Add**.
- 8 In the Select a Schedule dialog, select a **Schedule Name**, and then click **OK**.

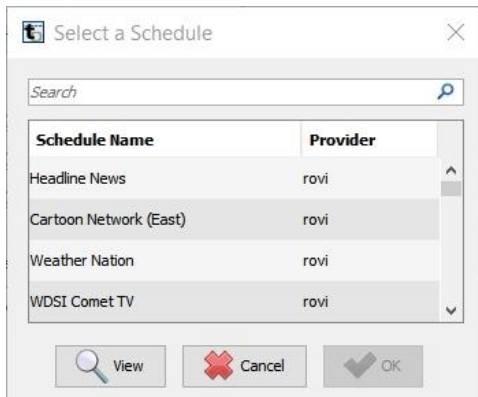


Figure 3-46: Select a Schedule (ATSC M/H networks)

TIP To view a schedule, click it, and then click **View**.

- 9 To change the default service or linked schedule caption settings:
 - a Click the **Service Caption Settings** tab.
 - b Click **Add**.
 - c In the Service Caption Setting dialog, select and enter settings, and then click **OK**.

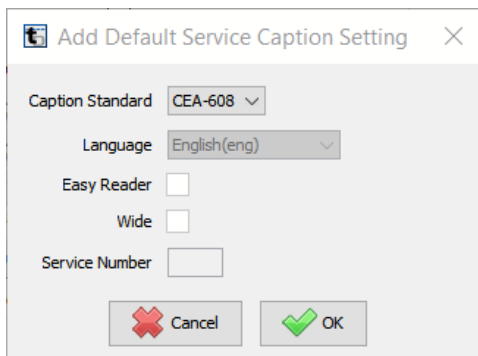


Figure 3-47: Add Default Service Caption Setting

Default and linked schedule caption settings are used to indicate closed captions. For details, see ["About Service Captions."](#)

- 10 To add content protection to the service:
 - a Click the Service Descriptors tab.
 - b Click **Add**.
 - c In the Select Descriptor Type dialog, select a **M/H Protection**.
 - d Click **OK**.
- 11 In the Add or Edit Service dialog, you can also:
 - Click **View** to view program events and event details.
 - Click **Remove** and then **Yes** to remove a schedule source from the service.
- 12 In the Add or Edit Service dialog, click **OK**.
- 13 In the Add or Edit ATSC Network dialog, click **Add** or **Update**.
- 14 On the Logical Networks panel, click **Commit** to commit the configuration to the database.

3.4.4 Configure DVB Networks

You can create and edit the channels and services (virtual channels) linked to DVB terrestrial, cable, or satellite networks.

Before you begin

- One or more schedule providers must be configured in the Config App. For details, see “[Configuring Schedule Providers.](#)”
- One or more DVB-SI transport streams must be configured in the Config App. For details, see “[Configure PSIP or DVB-SI Transport Streams.](#)”

Steps

- 1 Under Network Config, click **Networks**.
- 2 In the Logical Networks panel:
 - To create a new DVB network, click **Add**.
 - To change a DVB network, select its **Name**, and then click **Edit**.

TIP To delete a logical network, select its **Name**, click **Remove**, and then click **Yes**.

- 3 In the Add or Edit Network dialog:
 - Enter or edit the **Network Name**.
 - Select a type: **DVB-Cable**, **DVB-Terrestrial**, or **DVB-Satellite**.

NOTE The network type of a configured logical network cannot be changed. If you edited the name of a configured logical network, and want to make no other edits, click Update.

- 4 Click **Next**.
- 5 In the Add DVB Network dialog, enter or edit the **Network ID** number.



Figure 3-48: Add DVB Network

- 6 To change the network delivery settings, click **Default Delivery Settings**.

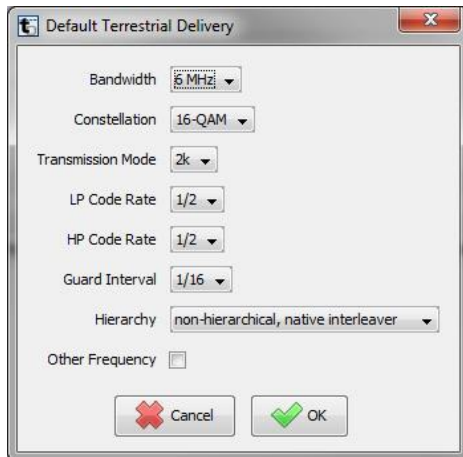


Figure 3-49: Default Terrestrial Delivery (DVB)

The settings vary by delivery type. For details, see ["Delivery Settings."](#)

- 7 Select the default delivery settings, and then click **OK**.
- 8 To add descriptors, click the **Network Descriptors**, and then click **Add**.
- 9 In the Select Descriptor Type dialog, select a type.

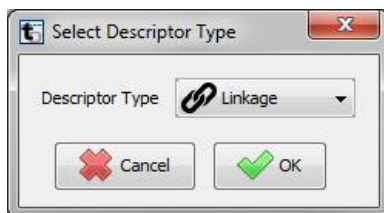


Figure 3-50: Select Descriptor Type (DVB)

For details, see ["Descriptor Types."](#)

- 10 Click **OK**.
- 11 In the Add Descriptor dialog, enter the appropriate network descriptors.

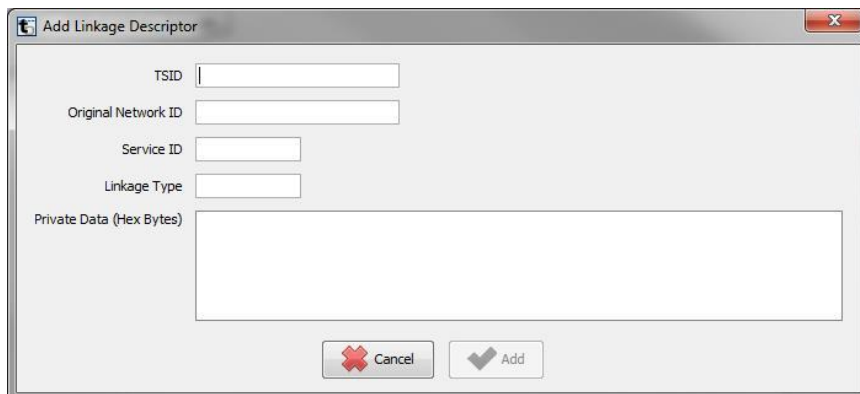


Figure 3-51: Add Linkage Descriptor (DVB)

The settings vary by descriptor type.

- 12 In the Add DVB Network dialog:
 - To create a new channel, click **Add**.
 - To change settings, click a channel, and then click **Edit**.
- 13 In the Add or Edit Channel dialog:
 - To add a service to the channel, click **Add**.
 - To add channel descriptors, click the **Descriptors** tab, and then click **Add**.

- To select channel delivery settings, click **Delivery Settings**. For details, see “[Delivery Settings](#).”
- To change service settings, click a service **Name**, and then click **Edit**.
- If you clicked to add or edit a service, the Add or Edit Service dialog opens.

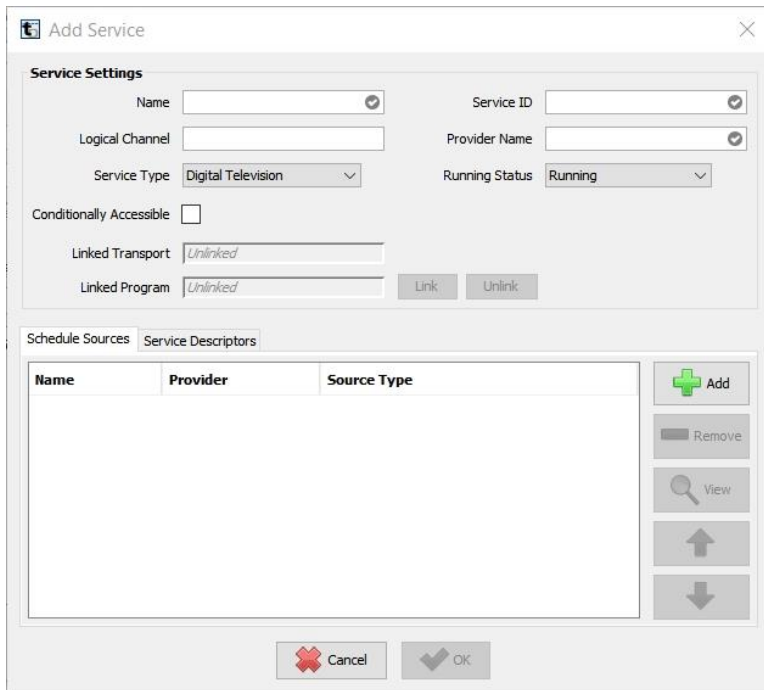


Figure 3-52: Add Service (DVB)

- 14 In the Add Service dialog, enter or edit service settings. For details, see “[Service Settings](#).”
- 15 To add a schedule for the service, click **Schedule Sources**, and then click **Add**.
- 16 In the Select a Schedule dialog, select a **Schedule Name**, and then click **OK**.

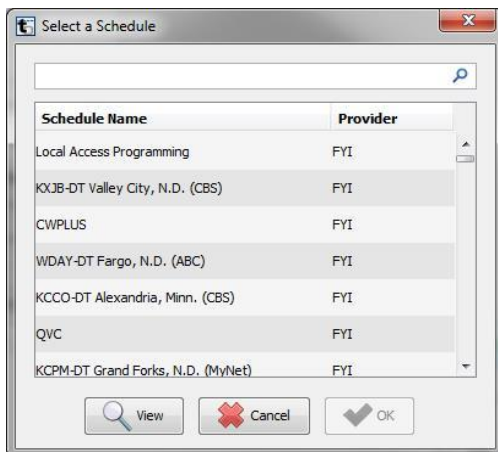


Figure 3-53: Select a Schedule (DVB)

TIP To view a schedule, click it, and then click **View**.

- 17 In the Add or Edit Service dialog:
 - To add descriptors to the service, click the **Descriptors** tab, and then click **Add**. For details, see “[Descriptor Types](#).”
 - To view the program events and event details, click **View**.

- To remove a schedule source from the service, click **Remove** and then click **Yes**.

18 In the Add or Edit Service dialog, click **OK**.

19 In the Add or Edit DVB Channel dialog, click **OK**.

20 In the Add or Edit DVB Network dialog, click **Add** or **Update**.

21 In the Logical Networks panel, click **Commit** to commit the configuration to the database.

3.4.5 Configure SCTE-65 Networks

You can create and edit the channels and services (virtual channels) linked to SCTE-65 terrestrial, cable, or satellite networks.

Before you begin

- One or more schedule providers must be configured in the Config App. For details, see ["Configuring Schedule Providers."](#)
- One or more transport streams must be configured in the Config App. For details, see ["Configure SCTE-65 Transport Streams."](#)

Steps

1 Under Network Config, click **Networks**.

2 In the Logical Networks panel:

- To create a new SCTE-65 network, click **Add**.
- To change a SCTE-65 network, select its **Name**, and then click **Edit**.

TIP To delete a logical network, select its **Name**, click **Remove**, and then click **Yes**.

3 In the Add or Edit Network dialog:

- Enter or edit the **Network Name**.
- Select type **SCTE-65**.
- Click **Next**.

NOTE The network type of a configured logical network cannot be changed. If you edited the name of a configured logical network, and want to make no other edits, click Update.

4 In the Add or Edit SCTE Network dialog, enter or edit the **Map ID** and **VCT ID** numbers.

Figure 3-54: Add SCTE Network

The Map ID is a 16-bit integer that identifies the Master Guide Table for this SCTE network. The VCT ID is a 16-bit integer that identifies the Virtual Channel Table for this SCTE network.

5 To add network descriptors:

- a Click the **Network Descriptors** tab.
- b Click **Add**.
- c Select a **Descriptor Type**.
- d Click **OK**.
- e In the Add Descriptor dialog, enter settings, and then click **Add**.

For details, see “[Descriptor Types](#).”

- 6 To link channels to the output, click the **SCTE Channels** tab, and then click **Add**.
- 7 In the Add or Edit SCTE Channel dialog, enter **Channel Settings**.

Figure 3-55: Add SCTE Channel

For details, see “[Channel Settings](#).”

- 8 To add channel descriptors:
 - a Click the **Channel Descriptors** tab.
 - b Click **Add**.
 - c Select a **Descriptor Type**.
 - d Click **OK**.
 - e In the Add Descriptor dialog, enter settings, and then click **Add**.

For details, see “[Descriptor Types](#).”
- 9 To link services to the channel, click the **SCTE Channels** tab, and then click **Add**.
- 10 In the Add or Edit Service dialog, enter **Service Settings**.

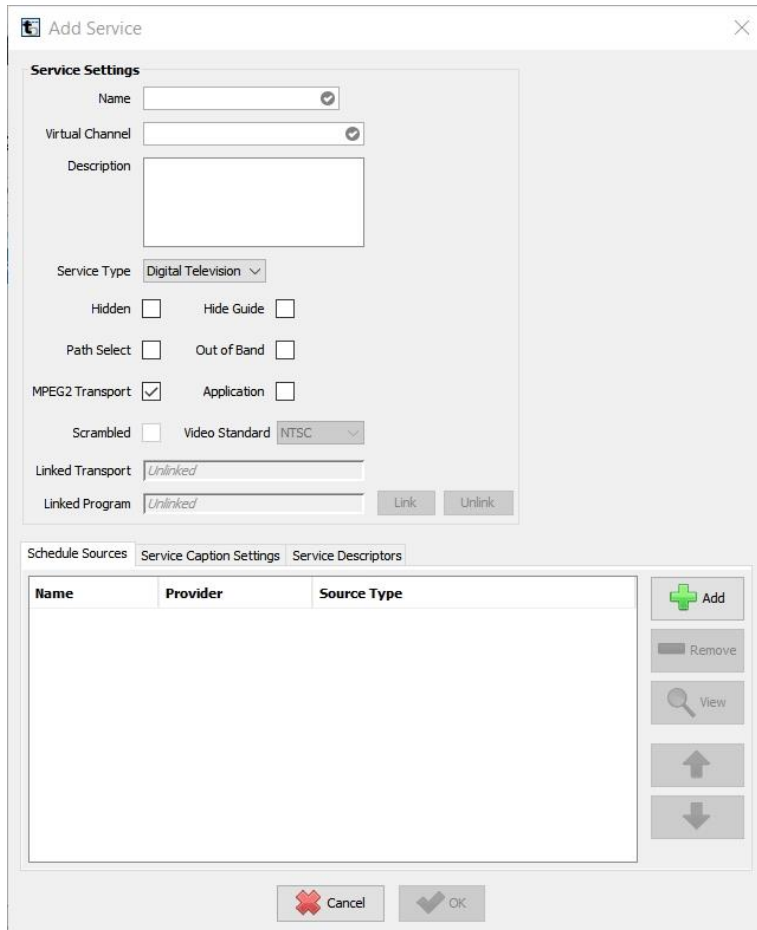


Figure 3-56: Add Service (SCTE-65)

For details, see “Service Settings.”

- 11 To link a program schedule to the service:
 - a Click the **Schedule Sources** tab.
 - b Click **Add**.
 - c Find and click a **Schedule Name**.
 - d Click **OK**.

TIP To view schedule details, click a Schedule Name, and then click View.

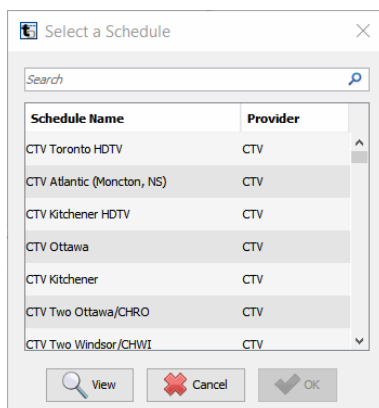


Figure 3-57: Select a Schedule (SCTE-65)

- 12 To change the default service or linked schedule caption settings:

- a Click the **Service Caption Settings** tab.
- b Click **Add**.
- c In the Service Caption Setting dialog, select and enter settings, and then click **OK**.

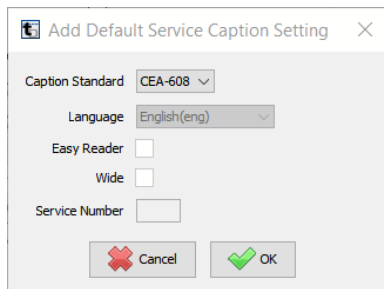


Figure 3-58: Add Default Service Caption Setting

For details, see ["Service Caption Settings."](#)

NOTE Default and linked schedule caption settings are used to indicate closed captions. To learn more, see ["About Service Captions."](#)

- 13 To add service descriptors:
 - a Click the **Service Descriptors** tab.
 - b Click **Add**.
 - c Select a **Descriptor Type**.
 - d Click **OK**.
 - e In the Add Descriptor dialog, enter settings, and then click **Add**.

For details, see ["Descriptor Types."](#)

- 14 In the Add or Edit Service dialog, click **OK**.
- 15 In the Add or Edit SCTE Channel dialog, click **OK**.
- 16 In the Add or Edit SCTE Network dialog, click **Add** or **Update**.
- 17 On the Logical Networks panel, click **Commit** to commit the configuration to the database.

3.4.6 Configure ATSC 3.0 Networks

To set up ATSC 3.0 signaling, one or more ATSC 3.0 logical networks need to be configured. Configuring ATSC 3.0 logical networks involves linking channels and services to ATSC 3.0 transports, IP streams, and schedules.

Before you begin

- One or more ATSC 3.0 transports must be configured in the Config App. For details, see ["Configure ATSC 3.0 Streams."](#)
- One or more schedule providers must be configured in the Config App. For details, see ["Configuring Schedule Providers."](#)
- One or more ATSC 3.0 IP streams must be configured in the ROUTE/MMTP encoder. For details, see ["Configure ."](#)

Steps

- 1 Under Network Config, click **Networks**.
- 2 In the Logical Networks panel:
 - To create a new ATSC 3.0 network, click **Add**.
 - To change an ATSC 3.0 network, click its **Name**, and then click **Edit**.

TIP To delete a logical network, select its **Name**, click **Remove**, and then click **Yes**.

- 3 In the Add or Edit Network dialog:
 - Enter or edit the **Network Name**.
 - Select type **ATSC 3.0**.
 - Click **Next**.

NOTE The network type of a configured logical network cannot be changed. If you edited the name of a configured logical network, and want to make no other edits, click Update.

- 4 In the Add or Edit ATSC Network dialog:
 - To select descriptors, click the **Network Descriptors** tab, click **Add**, select a descriptor type, and then click **OK**. For details, see “[Descriptor Types](#).”
 - To add an ATSC 3.0 channel, click **Add**.
 - To change a channel, click its name, and then click **Edit**.

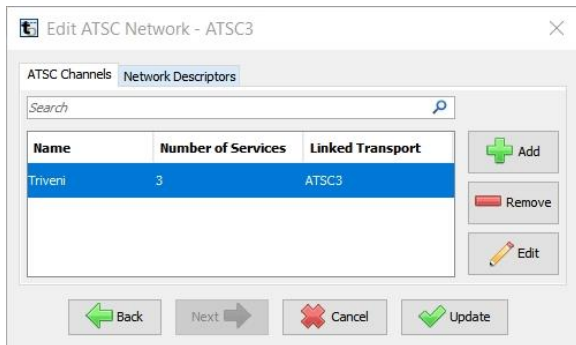


Figure 3-59: Edit ATSC Network – ATSC 3.0 dialog

- 5 In the Add or Edit ATSC Channel dialog:
 - a Enter or edit the channel **Name**.
For example, the station call letters.
 - b Click **Select Time Zone**, click a time zone, and then click **Select**.

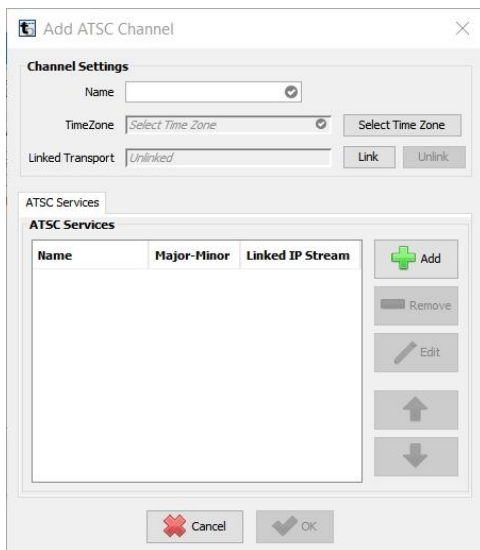


Figure 3-60: Add ATSC Channel

- 6 Next to Linked Transport, click **Link**.



Figure 3-61: ATSC 3.0 transport Link button

NOTE ATSC 3.0 transports must be configured before they can be linked a logical network. See “[Configure ATSC 3.0 Streams.](#)”

- 7 In the Select Transport dialog:
 - a Click a transport **Name**.
 - b Click **OK**.

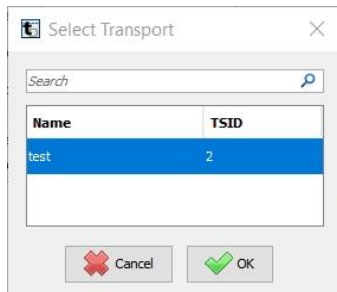


Figure 3-62: Select (ATSC 3.0) Transport

- 8 In the Add or Edit ATSC Channel dialog under ATSC Services:
 - a To add a new service, click **Add**.
 - b To change a service, click its **Name**, and then click **Edit**.
- 9 In the Add or Edit Service dialog:
 - a Enter or edit the service **Name**.
This name, with a maximum of seven characters, is visible to viewers.
 - b Enter the **Major-Minor** number of the service.
The Major-Minor number must be hyphenated (for example, 12-1), and a lone zero cannot be the final number
 - c If needed, type a **Description** of the service.
 - d Select a **Service Type** and other settings.
For details, see “[Service Settings.](#)”

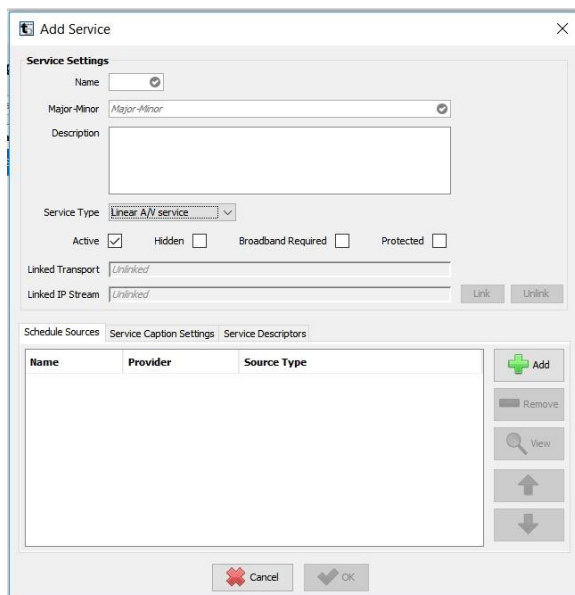


Figure 3-63: Add ATSC 3.0 Service

TIP To learn how to add service caption settings and descriptors, see “[Configure ATSC Networks.](#)”

- 10 Next to Linked IP Stream, click **Link**.

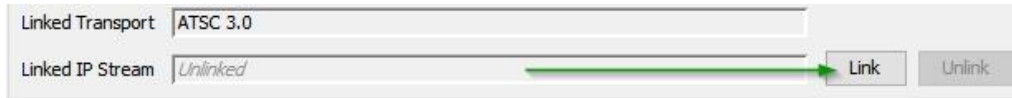


Figure 3-64: IP stream Link button

NOTE A transport must be linked to the network. If not, the IP stream Link button will be grayed out.

- 11 In the Select IP Stream dialog:
 - a Click an IP stream **Name**.
 - b Click **OK**.

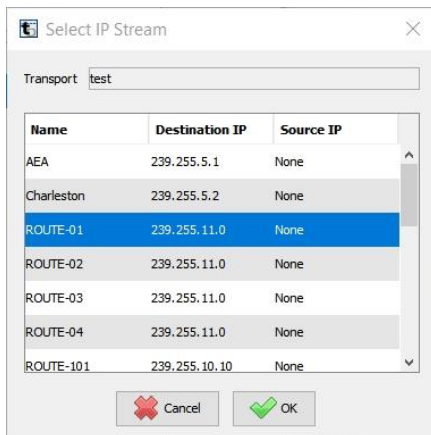


Figure 3-65: Select IP Stream

NOTE ATSC 3.0 IP streams are configured in the ROUTE/MMTP encoder. See "Configure ."

- 12 In the Add or Edit Service dialog:
 - a Click the **Schedule Sources** tab.
 - b Click **Add**.
- 13 In the Select a Schedule dialog:
 - a Click a **Schedule Name**.
 - b Click **OK**.

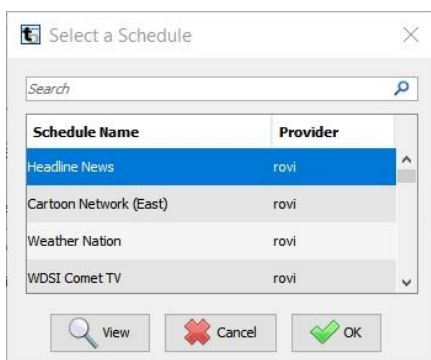


Figure 3-66: Select a Schedule

TIP To view schedule details, click View, and then click OK.

- 14 In the Add or Edit Service dialog, click **OK**.
- 15 In the Add or Edit ATSC Channel dialog, click **OK**.
- 16 In the Add or Edit ATSC Network dialog, click **Update**.
- 17 In the Logical Networks panel, click **Commit**.

The logical network is saved to the GuideBuilder server database.

3.4.6.1 Channel Settings

The Channel Settings panel displays settings for major channels in logical networks.

Table 3-22: Channel Settings

Network Type	Channel Setting	Description
ATSC 1.0, M/H, and 3.0	Name	Name of the channel (for example, WABC).
	Time Zone	Reception time zone for the channel.
	Linked Transport	Link the channel to a physical transport stream configured in GuideBuilder.
DVB	Name	Name of the channel.
	Frequency (MHz or GHz)	OTA transmission frequency of the channel.
	Linked Transport	Transport stream linked to the major channel.
	Original Network ID	ID of the network that originally transmitted the channel.
SCTE-65	Name	Name of the channel.
	Time Zone	Reception time zone for the channel.
	Linked Transport	Link the channel to a physical transport stream configured in GuideBuilder.
	Frequency	OTA transmission frequency of the channel.
	Modulation Format	Defines the basic modulation format for the carrier.
	Transmission System	Identifies the transmission standard employed.
	Inner Coding Mode	Indicates the coding mode for the inner code.
	Symbol Rate	Indicates the symbol rate in symbols per second.
Split Bitstream	Indicates if the split bitstream mode applies.	

3.4.6.2 Service Settings

Add and Edit Service dialogs have these service settings for various network types.

Table 3-23: Service Settings

Network Type	Service Setting	Description
ATSC Cable/Terrestrial	Name	Visible to viewers, with a seven-character maximum length.
	Virtual Channel	Integer values for the major and minor channel number, separated by a dash (for example, 8-1 and 8-2). This number determines the virtual channel assigned to the program by the receiver.
	Description	ATSC recommended practice is that the description should contain the station's mailing address.
	Service Type	<ul style="list-style-type: none"> <i>Digital Television</i> for digital video, audio, and data services. <i>Audio</i> for digital or radio audio-only services. <i>Data broadcasting</i> for data broadcasting-only services.
	Hidden	When selected, the service cannot be tuned to by a DTV receiver and viewers cannot access the service by number or channel surfing. Typically used for test signals and NVOD services.
	Hide Guide	When selected, the events for a hidden service will not appear in EPGs. Events for nonhidden services always appear in program guides.

	Linked Transport	Transport stream linked to the major channel to which the service belongs.
	Path Select	Select to associate the virtual channel with the alternative transmission path (physical input cable).
	Out of Band	Select for the virtual channel to be carried on the out of band physical transmission cable.
	Linked Program	Program linked to the service.
ATSC M/H	Name	Visible to viewers, with a seven-character maximum length.
	Virtual Channel	Integer values for the major and minor channel number, separated by a dash (for example, 8-1 and 8-2). This number determines the virtual channel assigned to the program by the receiver.
	Service ID	Integer value for the service number, also called the minor channel number. This number determines the virtual channel number assigned to the program by the receiver (for example, 12-1 or 12-2).
	Description	ATSC recommends that the description contain the station’s mailing address.
	URL	When selected, the service cannot be tuned to by a DTV receiver and viewers cannot access the service by number or channel surfing. Typically used for test signals and NVOD services.
	Service Type	Type of data carried by the service.
	Hidden/Active/Protected	<ul style="list-style-type: none"> • <i>Active</i>, the default value. • <i>Hidden</i> for proprietary applications. • <i>Protected</i> for pay-per-view or other protected services.
	Linked IP Stream	Link a program to the service.
	Icon	Link a JPEG image file to display as the channel icon file for the service in ESGs.
	Interstitial	Link a JPEG image file that appears before the video plays to the service.
ATSC 3.0	Name	Visible to viewers, with a seven-character maximum length.
	Major-Minor	Integer values for the major and minor channel number, separated by a dash (for example, 8-1 and 8-2). This number determines the virtual channel assigned to the program by the receiver.
	Description	ATSC recommends that the description contain the station’s mailing address.
	Service Type	<ul style="list-style-type: none"> • <i>Linear A/V service</i> for continuous, real-time video, audio, and closed captioning. • <i>Linear audio only service</i> for continuous, real-time audio and closed captioning only. • <i>App-based service</i> for app-based enhancement components. • <i>ESG service</i> for electronic service guide (ESG) information. • <i>EAS service</i> for media resources referenced in emergency alerts.
	Active/Hidden/Broadband Required/Protected	<ul style="list-style-type: none"> • <i>Active</i>, the default value. • <i>Hidden</i> for proprietary applications. • <i>Broadband required</i> when broadband access is required to receive the service • <i>Protected</i> for pay-per-view or other protected services.
	Linked Transport	Transport stream linked to the channel to which the service belongs.
	Linked IP Stream	IP stream linked to the service.

DVB	Name	Visible to viewers, with a seven-character maximum length.
	Logical Channel	Logical number of the channel to which the service is linked.
	Service Type	<ul style="list-style-type: none"> • <i>Digital Television</i> for a digital TV service. • <i>Digital Radio</i> for a digital radio sound service. • <i>Teletext</i> for a teletext service. • <i>NVOD Reference Service</i> for a Near Video on Demand reference service. • <i>NVOD Time Shifted</i> for a Near Video on Demand time-shifted service. • <i>Mosaic</i> for a mosaic video service. • <i>FM Radio</i> for an FM radio service. • <i>Data broadcasting</i> for a data broadcasting service.
	Conditionally Accessible	When selected, enables a Conditional Access Table (CAT) PID to be associated with this service for encryption.
	Linked Transport	Transport stream linked to the channel to which the service belongs.
	Linked Program	Program, identified by its PMT PID, linked to the service.
	Service ID	Unique identifier of the service. The Service ID field interprets values starting with 0x as hexadecimal.
	Provider Name	Name of the schedule provider for this service.
	Running Status	Running status of the service. "Undefined" is used for NVOD services. "Starts in a few seconds" is typically used for video recording.

SCTE-65	Name	Visible to viewers, with a seven-character maximum length.
	Virtual Channel	Integer values for the major and minor channel number, separated by a dash (for example, 8-1 and 8-2). This setting determines the virtual channel assigned to the service by the receiver.
	Description	ATSC PSIP Recommended Practice is that the description should contain the station's mailing address.
	Service Type	The type of service carried in this virtual channel: <ul style="list-style-type: none"> • Digital Television (video, audio, and data) • Audio (no video, audio and data only) • Data Broadcast (data only)
	Hidden	Indicates this service cannot be tuned to by a DTV receiver and viewers cannot access this service by number or channel surfing. <hr/> <p>NOTE This setting is typically used for test signals and NVOD services.</p>
	Hide Guide	Indicates that program events for this "hidden" service will not appear in EPGs. <hr/> <p>NOTE Events for nonhidden services always appear in program guides.</p>
	Path Select	Indicates this service is associated with the alternative transmission path (physical input cable).
	Out of Band	Indicates this service is carried on the out of band physical transmission cable.
	MPEG2 Transport	Identifies the type of transport carried on this carrier as either MPEG-2 transport stream.
	Application	Indicates this service defines an access point represented by the application ID. If unselected, the service is not an application access point, and this service defines an access point represented by the source ID.

NOTE Support for application-type virtual channels is optional. Hosts not supporting application-type virtual channels may disregard virtual channel data.

Scrambled	Indicates this service is encrypted.
Video Standard	The video standard associated with this service.
Linked Transport	The transport stream linked to the major channel to which this service belongs.
Linked Program	The program linked to this service.

3.4.6.3 About Descriptors

Descriptors are optional metadata that provide additional information about the channels and services for TV receiver devices. For example, a descriptor could be created to signal firmware updates to set-top boxes.

Using GuideBuilder, you can configure linkage, local time offset, user-defined, conditional access table (CAT), and other descriptors for channels and services. Linkage descriptors communicate the location of program guide data elements in DVB transport streams to set-top boxes. Local time offset descriptors make adjustments to channels for seasonal time zone changes. User-defined descriptors, also known as private extensions, enable custom or proprietary content to be linked to transport streams. Conditional access descriptors enable broadcasters to deliver pay services.

3.4.6.4 Descriptor Types

These types of descriptors can be added to logical networks, channels, and services.

Table 3-24: Descriptor Types

Type	Network(s)	Setting(s)	Description
ATSC Private Information	ATSC	Format Identifier	Identifies the format of private information.
		Private Data	The private information in hexadecimal bytes.
Capabilities	ATSC 3.0	Capabilities	Identifies the receiver device capabilities, such as 3-D video and AC-3 audio, of a service.
Conditional Access	ATSC, DVB, or SCTE	System ID	Identifies the type of system for conditional access information.
		PID	Packet Identifier of the conditional information
		Private Data	The private information in hexadecimal bytes.
Extended Channel Name	ATSC	Extended Channel Name	Displays the full channel name of a service in program guides.
Linkage	DVB	TSID	Identifies the transport stream to be linked.
		Original Network ID	Identifies the network ID of the originating service to be linked.
		Service ID	Identifies the service to be linked.
		Linkage Type	Identifies the type of linkage (for example, information service, replacement service, or data broadcast service).
		Private Data	The private information in hexadecimal bytes.
Local Time Offset	DVB	Select Country	Select a country to insert the three-letter ISO 3166 country code for a channel.
		Manual Entry	Enter the three-letter ISO 3166 country code.

		Region ID	Identifies the applicable time zone in the country. Set to zero if there are no local time zones in the country.
		Time Zone	The selected time zone.
		Select Time Zone	Click the Select Time Zone button, search or scroll to the desired UTC time zone, and then click Select.
M/H Protection	ATSC M/H	Option A	Some packets are encrypted.
		Option B	All packets are encrypted.
Redistribution Control	ATSC	Redistribution Control	Controls consumer redistribution of video, audio, or data.
Service Icon	ATSC 3.0	Service Icon	Displays service logos in electronic service guides (ESGs).
			NOTE Graphics files must be uploaded to the GuideBuilder server database. See "Uploading Media Resources."
User Defined	ATSC, DVB, or SCTE	User Tag	Type the decimal number that displays the hexadecimal code for the appropriate DVB descriptor.
		User Defined Data	The payload of the user defined descriptor in hexadecimal bytes.

3.4.6.5 Delivery Settings

These are the delivery settings for DVB cable, terrestrial, and satellite networks and channels.

Table 3-25: DVB Delivery Settings

Network Type	Setting	Description
DVB Cable	Modulation	The modulation type for DVB cable channels. 64 QAM and 256 QAM are the SCTE mandated modes for digital cable.
	FEC Inner	The Forward Error Correction code for the inner interleaver.
	FEC Outer	The Forward Error Correction code for the outer interleaver.
	Symbol Rate	The symbol or modulation rate for the DVB cable channels, measured in baud (Bd) or symbols per second.
DVB Terrestrial	Bandwidth	The channel bandwidth in megahertz for each DVB signal.
	Constellation	RF constellation for DVB terrestrial channels
	Transmission Mode	COFDM transmission mode. 2k uses 1705 subcarriers and is suitable for small single frequency networks. 8k uses 6817 subcarriers and is used for large networks.
	LP Code Rate	Low Priority coding rate for the internal encoder.
	HP Code Rate	High Priority coding rate for the internal encoder.
	Guard Interval	Guard interval insertion expressed in fractions of a symbol period. 1/32 provides the lowest protection and highest program guide data rate, 1/4 the best protection but lowest data rate.
	Hierarchy	Modulation, hierarchical or nonhierarchical, and block interleaving technique (native or in-depth) used by the transport stream(s).
Other Frequency	When selected, indicates that more than one frequency is in use.	
DVB Satellite	Modulation	Modulation type for DVB satellite channels.
	Polarization	Polarization type used for DVB satellite channels.
	West/East	Direction of longitudinal measurements from the Prime Meridian for DVB satellite channels.

FEC Inner	Forward Error Correction code for the inner interleaver.
Orbital Position	Longitudinal orbital location, expressed in degrees East or West, for DVB satellite channels.
Roll Off Factor	Decimal number expressing the bandwidth occupied beyond the Nyquist bandwidth of 1/2T.
Symbol Rate	Decimal number expressing the data rate divided by error correction and modulation factors.

3.4.6.6 About Service Captions

Linked schedule caption settings complete the signalling when a schedule indicates a program event is closed captioned. Typically, the schedule does not provide sufficient information to signal this. In absence of a linked schedule, or when a schedule incorrectly indicates an event is not closed captioned, the default service caption settings signal closed captioning.

3.4.6.7 Service Caption Settings

Service caption settings include default service and linked schedule caption settings.

Table 3-26: Service Caption Settings

Setting	Description
Caption Standard	CEA-708 is the standard for ATSC digital TV closed captions. CEA-608, also known as Line 21 captioning, is the standard for NTSC analog TV closed captions.
Language	Indicates the language of CEA-708 captioning. *
Easy Reader	Indicates that CEA-708 captions are the Easy Reader type. *
Wide	Indicates that CEA-708 captions displayed are intended for a wide aspect ratio display. *
Service Number	Enter a unique value from 1-63 (required) for CEA-708 captions. *

*These fields do not apply to CEA-608 captioning.

3.5 Configuring Outputs

3.5.1 About GuideBuilder Outputs

Once schedule providers, transport streams, and logical networks have been configured for metadata generation in GuideBuilder, transport streams can be configured for outputs to ports and network devices such as encoders and multiplexers. Each output is linked to one transport stream, but one transport stream can have multiple outputs.

NOTE During configuration, connections to specific network output devices, but not to ASI and UPD outputs, can be tested.

3.5.2 Configure ASI Outputs

You can link a ATSC 1.0 transport stream with EPG metadata to an Asynchronous Serial Interface (ASI) output for ASI-compatible multiplexers, routers, and other network devices.

Before you begin

- One or more expansion cards with ASI output ports must be installed in the GuideBuilder server.
- One or more transport streams must be configured in the Config App. For details, "[Configuring Transport Streams.](#)"

Steps

- 1 Under Network Config, click **Outputs**.
- 2 In the Outputs panel:
 - To create a new output, click **Add**.
 - To change an output, select its **Name**, and then click **Edit**.
 - To prevent an output from transmitting, click **Disable**. A red X appears in the Outputs list.
 - To delete an output, select its **Name**, click **Remove**, and then click **Yes**.
- 3 In the Add or Edit Output dialog:
 - a Enter or edit an output **Name**.
 - b If the service provider, logical network, and transport streams have been configured, select **Online**.
 - c Select **ASI** at the output type.
 - d Click **Next**.
- 4 In Add or Edit ASI Output dialog:
 - a Select an ASI **Card ID**.
 - b Enter a **Bit rate**.
 - c To enable multiple transmitters to be synchronized, select **Transmit A110 Packet**.

The screenshot shows the 'Add ASI Output' dialog box. It features a title bar with a close button. The main area contains a 'Card ID' dropdown menu, a 'Bitrate (b/s)' text input field with the value '1000000', and a 'Transmit A110 Packet' checkbox. Below these is a 'Select a Transport' section with 'Name', 'Type', and 'TSID' text input fields, and 'Add', 'Remove', and 'View' buttons. At the bottom are 'Back', 'Next', 'Cancel', and 'Add' buttons.

Figure 3-67: Add ASI Output dialog

Selecting Transmit A110 Packet creates an 01FFA PID.

- 5 Click **Add** to select a transport.
- 6 In the Select Transport dialog, search for or select a transport.

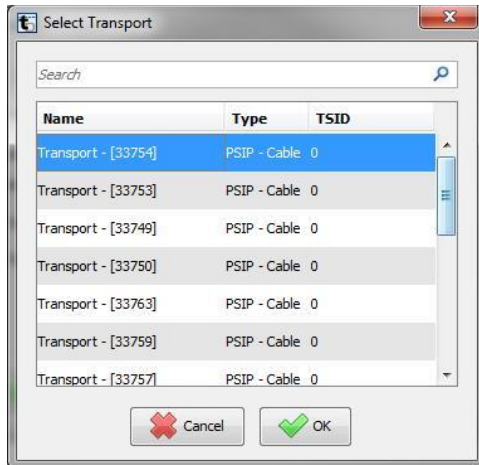



Figure 3-68: Select Transport (ASI)

NOTE The types of transport streams listed in the Select Transport dialog depend on your GuideBuilder license.

- 7 Click **OK**.
The Add or Edit ASI Output dialog reappears.
- 8 To view the elementary streams in the selected transport stream, click **View**.
- 9 Click **Add**.
The configured ASI output is listed in the Outputs panel.
- 10 On the Outputs panel, click **Commit** to commit the configuration to the database.

Result

If the output is online it will be transmitted at the scheduled times.

NOTE Outputs that are not online are listed on the Outputs panel with an .

3.5.3 Configure Device Outputs

You can link transport streams with EPG metadata to various multiplexers and other network output devices.

Before you begin

One or more transport streams must be configured in the Config App. For details, see “[Configuring Transport Streams](#).”

About this task

To learn how to link transport streams to UDP outputs, see “[Configure ATSC 1.0 UDP Outputs](#).”

Steps

- 1 Under Network Config, click **Outputs**.
- 2 In the Outputs panel:
 - To create a new output, click **Add**.
 - To change an output, select its **Name**, and then click **Edit**.
 - To prevent an output from transmitting, click **Disable**. A red X appears in the Outputs list.
 - To delete an output, select its **Name**, click **Remove**, and then click **Yes**.

If you clicked Add or Edit, the Add or Edit Output dialog opens.

- 3 In the Add or Edit Output dialog:
 - a Enter or edit an output **Name**.

- b If the service provider, logical network, and transport streams have been configured, select **Online**.
- c Select an **Output Type**.

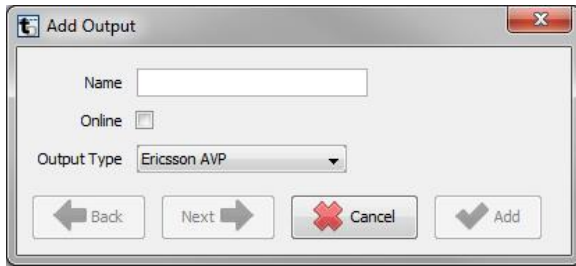


Figure 3-69: Add Output


- 4 Click **Next**.
- 5 In the Add or Edit Output dialog for the selected output, enter or edit the **Address** of the output device and other settings.
For details, see “[Device Output Settings](#).”
- 6 To test the connection to the output device, click **Test Connection**, and then click **OK**.
The test does not send data but pings the FTP or socket connection to the output device.
- 7 Under Select a Transport, click **Add**.
- 8 In the Select Transport dialog, select a transport **Name**.
- 9 Click **OK**.
In the Add or Edit Output dialog, the settings for the selected transport are entered.

TIP To view the transport stream structure, click **View**. To remove the transport stream, click **Remove** and **Yes**.

- 10 In the Add or Edit Output dialog, click **OK** or **Update**.
- 11 On the Outputs panel, click **Commit** to commit the configuration to the database.

Result

If the output is online it will be transmitted at the scheduled times.

NOTE Outputs that are not online are listed on the Outputs panel with an .

3.5.3.1 Device Output Settings

The Add or Edit Output dialog lists the settings for these output types.

Table 3-27: Device Output Settings

Output Type	Setting	Description
Ericsson AVP, MX5600, and MX8400	Address	IP address of the output multiplexer.
Harris NetVX and Selenio	Address	IP address of the output multiplexer.
	Slot ID	Slot number for the applicable multiplexer card.
	Multiplexer Identifier	The multiplexer identifier (typically <i>txifc01</i> or <i>ifc01</i>).
Harris Synchrony MNA	Address	IP address of the output multiplexer.
	ESG NIC	Ethernet port for the Synchrony MNA’s control network interface card.

	ICD Version	Select Interface Control Document (ICD) 1.1 if the Synchrony MNA is enabled for Mobile EAS.
	Carousel Encrypted	Select if the Synchrony MNA is configured for encrypted carousels.
M/H UDP	Network Interface	URL of the Ethernet port for the output.
	M-EAS Aware	Include Mobile Emergency Alert Service metadata in the output.
Rohde & Schwarz AEM100	Address	Unicast or multicast address for the output multiplexer.
	Mobile IP Input NIC	IP address of the AEM100A network interface card.
	Password	Administrative password for the AEM100 mux. The default value is <i>AEM100</i> .
Thomson NetProcessor	Address	IP address of NetProcessor MPEG processor.
	Port	Port number of the NetProcessor MPEG processor.
Triveni Carousel	Address	IP address of the Logic Innovations, Harmonic Electra, or Evertz multiplexer.
	Port	Port number of the Logic Innovations, Harmonic Electra, or Evertz multiplexer.
UDP	Network Interface	URL of the Ethernet port for the output.
	Time to Live	The number of routers the UDP packets can traverse before being discarded.

3.5.4 Configure ATSC 1.0 UDP Outputs

You can link ATSC 1.0 transport streams with PSIP metadata to User Datagram Protocol (UDP) outputs. UDP is typically used for video transmission on IP networks.

Before you begin

One or more PSIP transport streams must be configured in the Config App. For details, see ["Configure PSIP or DVB-SI Transport Streams."](#)

Steps

- 1 Under Network Config, click **Outputs**.
- 2 In the Outputs panel:
 - To create a new output, click **Add**.
 - To change settings, click an output, and then click **Edit**.
 - To prevent an output from transmitting, click **Disable**. A red X appears in the Outputs list.
 - To delete an output, select its **Name**, click **Remove**, and then click **Yes**.
- 3 In the Add or Edit Output dialog:
 - a Enter or edit an output **Name**.
 - b If the service provider, logical network, and transport streams have been configured, select **Online**.
 - c Select the **UDP** output type.
 - d Click **Next**.
- 4 In the Add or Edit UDP Output dialog:
 - Select a **Network Interface**: eth1 or eth0.

- If needed, change the **Time to Live** value.
The Time to Live is the number of hops enabled for IP packets from the GuideBuilder server. The default value, 32, is recommended.
- To enable multiple transmitters to be synchronized, select **Transmit A110 Packet**.
Selecting Transmit A110 Packet creates the 01FFA PID.
- To remove transport stream from the output, click a transport, and then click **Remove**.

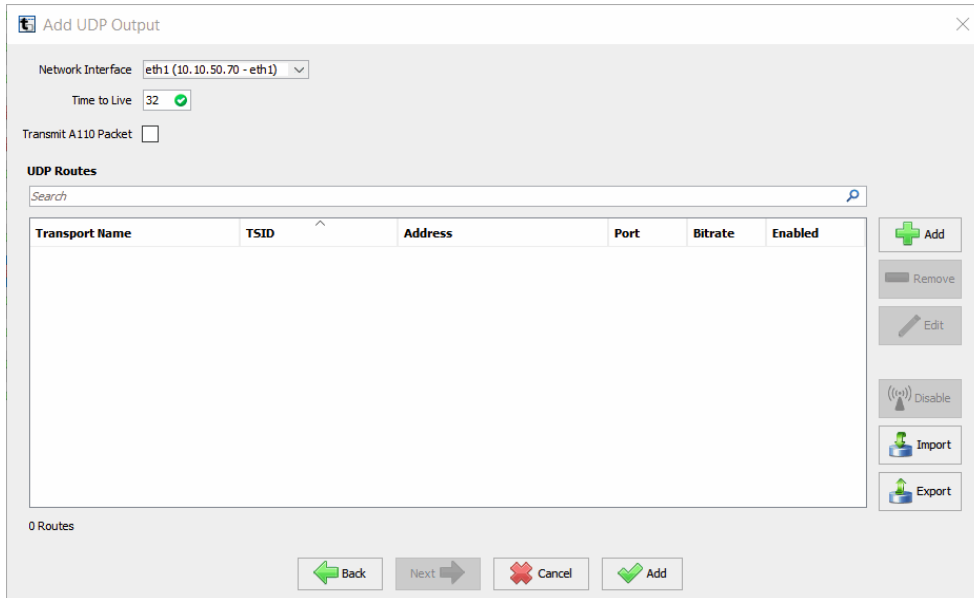


Figure 3-70: Add or Edit UDP Output

- 5 To link a transport stream to the output, or edit a linked transport, click **Add** or **Edit**.
- 6 In the Add or Edit UDP Route dialog, click a configured transport stream.
- 7 To change the route settings, enter new values.

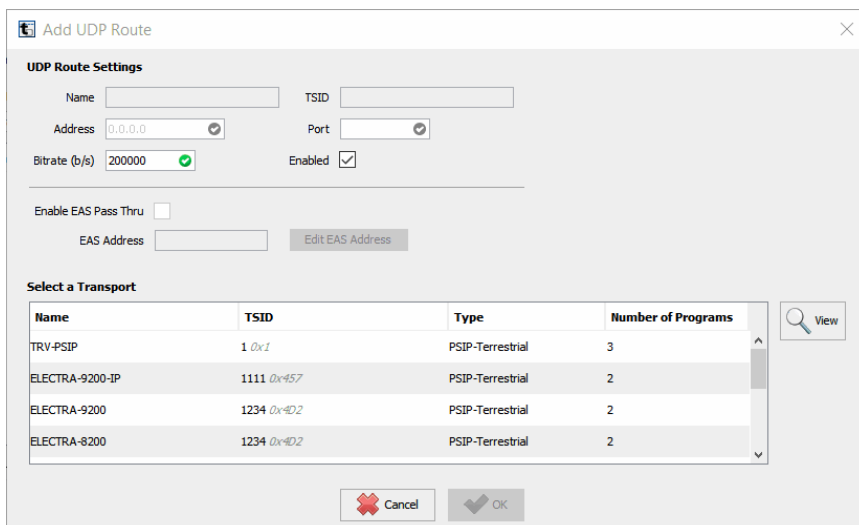


Figure 3-71: Add or Edit UDP Route

For details, see “[UDP Output Route Settings.](#)”

- 8 To include SCTE-18 EAS messages in the output:
 - a Select a PSIP-Cable transport from the list.
Only PSIP-Cable transports can output SCTE-18 EAS messages.

- b Click **Enable EAS Pass Thru**.
- c Click **Edit EAS Address**.
- d Enter settings in the Edit EAS Address dialog.

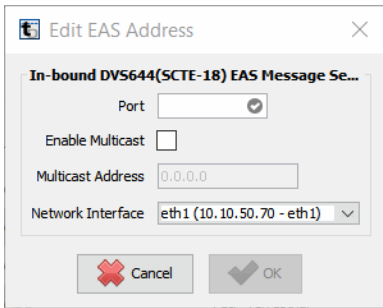


Figure 3-72: Edit EAS Address

For details, see “UDP EAS Address Settings.”

- e Click **OK**.
- 9 To view the programs linked to a transport stream, click **View**. Click **X** to close the View Transport panel.
 - 10 When done, click **OK**.
 - 11 In the Add or Edit UDP Output dialog, click **Add** or **Update**.
 - 12 On the Outputs panel, click **Commit** to commit the configuration to the database.

Result

If the output is online it will be transmitted at the scheduled times.

NOTE Outputs that are not online are listed on the Outputs panel with an .

3.5.4.1 UDP Output Route Settings

The Add or Edit UDP Route dialog lists the output settings for the linked transport streams.

Table 3-28: UDP Output Route Settings

Setting	Description
Name	Name of the transport stream linked to an output
Address	Unicast or multicast address for the output of the selected transport stream
Bitrate (b/s)	Bitrate for the output of the selected transport stream
TSID	Identifier of the transport stream linked to an output
Port	Port number for the output of the selected transport stream
Enabled	UDP route settings are enabled.
Enable EAS Pass Thru	Adds SCTE-18 EAS messages inbound from the specified EAS address to the output.
EAS Address	IP address of the unicast or multicast input device for SCTE-18 EAS messages.

3.5.4.2 UDP EAS Address Settings

The Edit EAS Address dialog has these settings for inbound SCTE-18 EAS messages in UDP outputs.

Table 3-29: UDP EAS Address Settings

Setting	Description
Port	Port on the unicast or multicast network device for inbound SCTE-18 EAS messages.
Enable Multicast	Enables input from a multicast network device for inbound SCTE-18 EAS messages.
Multicast Address	IP address of the multicast network device for inbound SCTE-18 EAS messages.
Network Interface	GuideBuilder Ethernet port for inbound SCTE-18 EAS messages.

3.5.5 Configure ATSC M/H Outputs

From the Outputs panel, you can link an ATSC Mobile/Handheld (M/H) transport stream to a User Datagram Protocol (UDP) output.

Before you begin

One or more ATSC M/H transport streams must be configured in the Config App. For details, see “Configure ATSC M/H Transport Streams.”

Steps

- Under Network Config, click **Outputs**.
- In the Outputs panel:
 - To create a new output, click **Add**.
 - To change an output, select its **Name**, and then click **Edit**.
 - To prevent an output from transmitting, click **Disable**. A red X appears in the Outputs list.
 - To delete an output, select its **Name**, click **Remove**, and then click **Yes**.
- In the Add or Edit Output dialog:
 - Enter or edit an output **Name**.
 - If the service provider, logical network, and transport streams are configured, select **Online**.
 - Select **M/H UDP** as the output type.
 - Click **Next**.
- In the Add or Edit UDP output dialog:
 - Select an Ethernet port as its the **Network Interface**
 - Select **M-EAS Aware** if you want to include mobile emergency alert service metadata in the output.

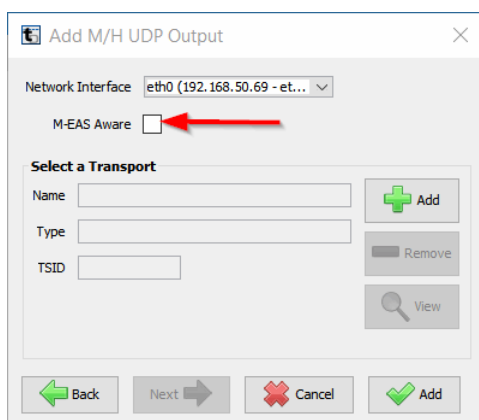


Figure 3-73: Add M/H UDP Output

- Under Select a Transport, click **Add**.
- In the Select Transport dialog, search for and/or select a configured transport stream.


- 7 Click **OK**
- 8 In the Add or Edit UDP Output dialog, click .

TIP To view the elementary streams in the transport, click **View**.

- 9 On the Outputs panel, click **Commit** to commit the configuration to the database.

Result

If the output is online it will be transmitted at the scheduled times.

NOTE Outputs that are not online are listed on the Outputs panel with an .

3.5.6 Configure ATSC 3.0 UDP Outputs

You can configure one UDP output for each ATSC 3.0 stream.

Before you begin

- One or more ATSC 3.0 streams must be configured in the ROUTE/MMTP encoder. For details, see "ROUTE/MMTP Encoder."
- One or more ATSC 3.0 streams must be configured in the Config App. For details, see "Configure ATSC 3.0 Streams."

Steps

- 1 Under Network Config, click **Outputs**.
- 2 In the Outputs panel:
 - To create a new output, click **Add**.
 - To change an output, select its **Name**, and then click **Edit**.
 - To prevent an output from transmitting, click **Disable**. A red X appears in the Outputs list.
 - To delete an output, select its **Name**, click **Remove**, and then click **Yes**.
- 3 In the Add or Edit – ATSC3 Output dialog:
 - a Enter or edit an output **Name**.
 - b If the service provider, logical network, and transport are configured, select **Online**.
 - c Select the **ATSC 3.0 UDP** output type.
 - d Click **Next**.
- 4 In the Add or Edit ATSC 3.0 UDP Output dialog, select an Ethernet port as the **Network Interface**.

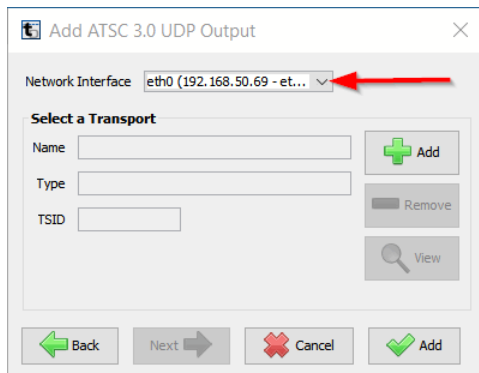



Figure 3-74: Add ATSC 3.0 UDP Output dialog

For ATSC 3.0 outputs, an Ethernet port that carries ATSC 3.0 transports only is recommended.

- 5 If you are editing the output, click **Update**, and go to Step 10.

TIP To view the IP streams in the transport, click **View**.

- 6 If you are creating a new output, click .
- 7 In the Select Transport dialog, search for and select an ATSC 3.0 transport stream.

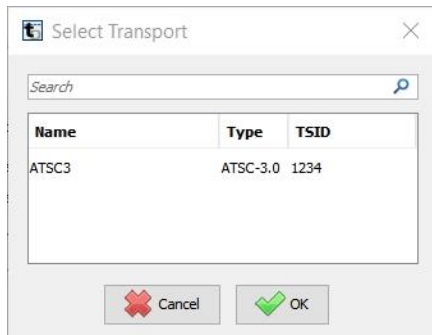




Figure 3-75: Select Transport dialog

- 8 Click **OK**.
- 9 In the Add or Edit Output dialog, click .
- 10 If you added a new output for transmission, click **Enable**.
- 11 On the Outputs panel, click **Commit** to commit the configuration to the database.

Result

If the output is online it will be transmitted at the scheduled times.

NOTE Outputs that are not online are listed on the Outputs panel with an .

3.5.7 View Output Statuses

Once an output is configured and saved in the Config App, you can view its update and encoding statuses, as well as the table details of its transport streams.

Steps

- 1 Under Network Config, click **Outputs** or **Service Map**.
- 2 Do one of the following:
 - If you clicked Outputs, select an output **Name**, and then click **Status**.
 - If you clicked Service Map, select a service **Name**, and then click **Status** in the Output box.

The View Output Status window opens.

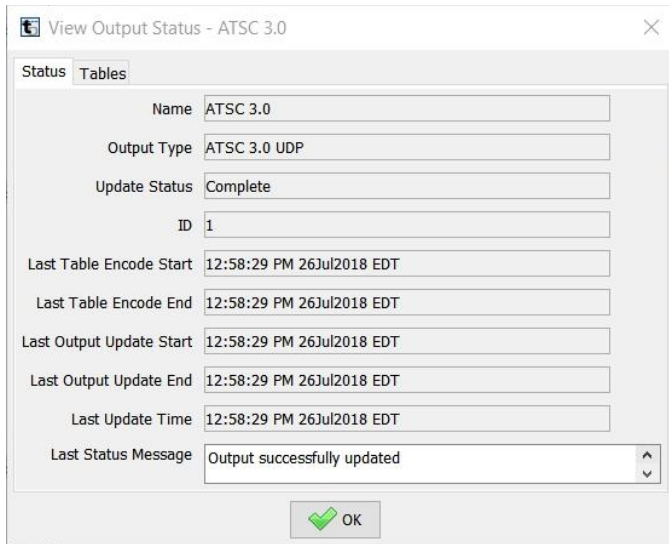


Figure 3-76: View Output Status window, Status tab

For details, see "Output Status Fields."

- 3 Click the **Tables** tab.
- 4 Click **+** to expand the tree diagram.
- 5 Click a table to view its details.

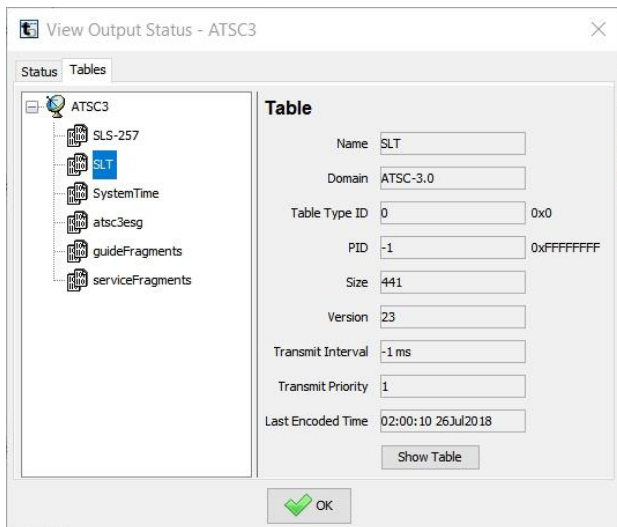


Figure 3-77: View Output Status window, Tables tab

For details, see "Output Status Table Fields."

- 6 To view the hexadecimal values for the selected table, click **Show Table**.

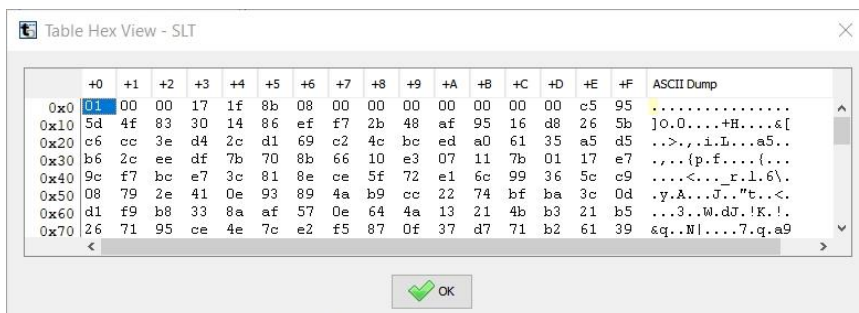


Figure 3-78: Sample Table Hex View

- 7 Click **OK**.
- 8 If you are viewing the status of a UDP output, click the **Routes** tab.

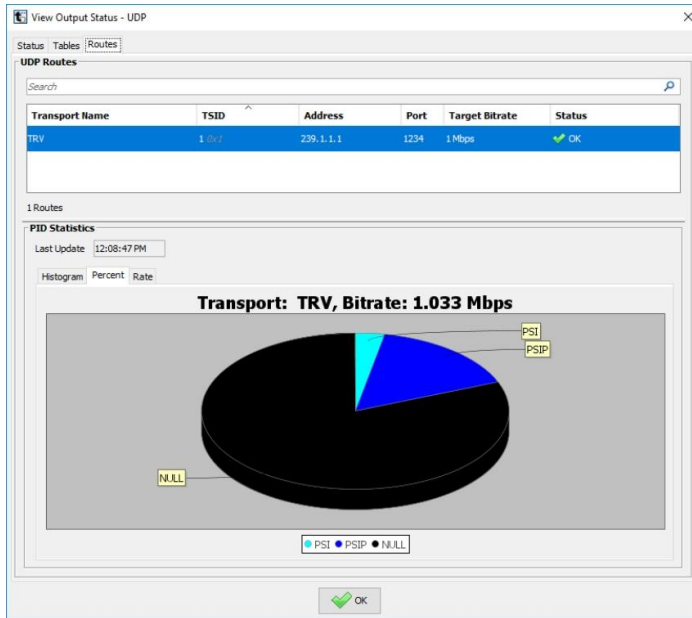


Figure 3-79: View Output Status - UDP

- 9 Click the Percent and Rate tabs to view PID statistics.
- 10 Click **OK**.

3.5.7.1 Output Status Fields

The Status tab of the View Output Status window lists data about the most recent output update.

Table 3-30: Output Status Fields

Field	Description
Name	Name of the output
Output Type	Type of output
Update Status	Status of the most recent output: Complete, In Progress, Error
Last Table Encode Start	Time and date when GuideBuilder started to encode the tables for the most recent output
Last Table Encode End	Time and date when GuideBuilder completed encoding the tables for the most recent output
Last Output Update Start	Time and date when GuideBuilder updated the most recent output
Last Output Update End	Time and date when GuideBuilder completed the most recent output update
Last Update Time	Time and Date when the last update ended
Last Status Message	Status message of the most recent output update

3.5.7.2 Output Status Table Fields

The Tables tab of the View Output Status window lists data about the most recent transport stream update linked to the output.

Table 3-31: Output Status Table Fields

Field	Description
Name	Name of the table.
Domain	Network type of the table (for example, PSIP or ATSC 3.0)
Table Type ID	In ATSC streams, identifies the table type.
PID	In ATSC streams, the Packet ID of the table.
Size	Number of rows in the table.
Version	In ATSC streams, the table version
Transmit Interval	Intervals (in ms) between this table.
Transmit Priority	Sets the priority of the table.
Last Encoded Time	Time and date when GuideBuilder encoded the table in the most recent output.

3.5.8 Encode a Manual Output

GuideBuilder normally outputs transport streams on a scheduled basis, but, if needed, unscheduled manual outputs can be encoded.

About this task

Manual outputs may be needed when a MUX or other network device has been reset or new device has been installed. When GuideBuilder encodes a transport stream for manual output, it assigns a new version number to its EPG metadata and includes any new program schedules received since its most recent output.

NOTE Only outputs that are currently online can be encoded for manual outputs.

Steps

- 1 Under Network Config, click **Outputs**.
- 2 In the Outputs panel, click an online output.

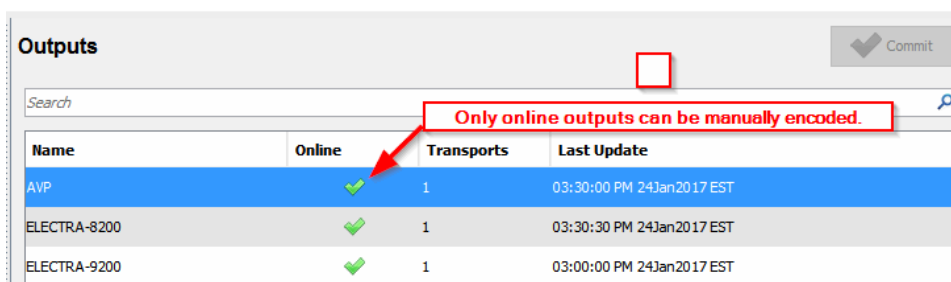


Figure 3-80: Online outputs

- 3 Click **Encode**.
- 4 In the Encode Output Confirmation window, click **Yes**.

Result

The encoded transport stream outputs to the selected port or device.

3.6 Viewing Service Maps

Once schedule providers, transport streams, logical networks, and outputs have been configured in the Config App and committed to the database, you can view their mapping by services.

About this task

In a service map, you can also view the status and other details of the schedule providers and outputs mapped to the service.

Steps

- 1 Under Network Config, click **Service Map**.
- 2 In the Service Map panel, select a service **Name**.
The Servicer Network Map for the selected service opens.

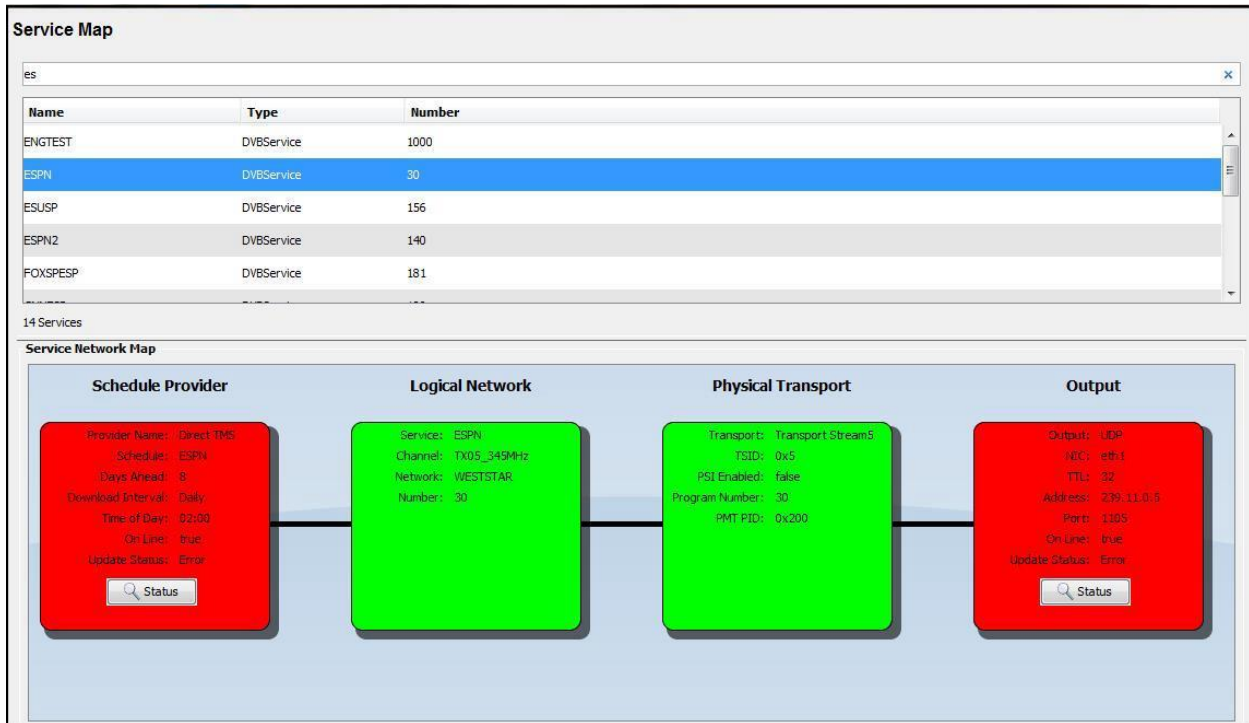


Figure 3-81: Service Map panel

The colored boxes indicate the status of the schedule provider ingests and program guide outputs. Red indicates an error.

- 3 Under Service Network Map, you can:
 - Click **Status** in the Schedule Provider box to view the schedule provider update status. For details, see “View Schedule Provider Status.”
 - Select an output in the Output panel, and then click **Status** to view the output update status.

3.7 Using GuideBuilder Configuration Files

3.7.1 About GuideBuilder Configuration Files

GuideBuilder configuration files are .csv files containing the settings of physical transport and logical networks for the Config App. These configuration files can be used for revising settings in a spreadsheet application.

NOTE GuideBuilder configuration files are not intended for backing up the entire GuideBuilder server database.

3.7.2 Export a Configuration File

From the Config App, you can export physical transport and logical network configurations and save them as .csv files to a local or network directory.

Before you begin

Before you can create a configuration file, one or more physical transports or logical networks must be configured in the Config App and committed to the database.

Steps

- 1 Under Network Config, click **Transports** or **Networks**.
- 2 In the Physical Transport or Logical Networks panel, select a transport or network.
- 3 Click **Export**.
- 4 In the Select Transport or Network Export File dialog, select an encoding type for the CSV file.

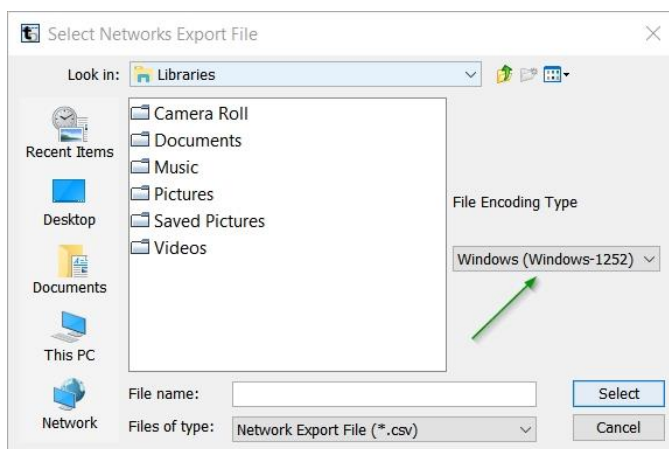


Figure 3-82: Select Export File

- 5 Browse to a directory.
- 6 Type a name for the file.
- 7 Click **Select**.
- 8 Click **OK** to save the file.

TIP To edit the exported configuration file, you can open it in a spreadsheet application.

3.7.3 Import a Configuration File


Once physical transport stream and logical network configurations have been saved to a .csv file, you can import the configuration file back to GuideBuilder.

About this task

Only valid configuration values can be imported to GuideBuilder. Check tables in this user guide or the GuideBuilder Config App for assistance.

Steps

- 1 Under Network Config, click **Networks** or **Transports**.
- 2 In the Physical Transports or Logical Networks panel, click **Import**.
- 3 In the Select Transports or Networks Import File dialog:
 - a Browse to the directory.
 - b Select a configuration file
 - c Click **Select**.

- 4 In the Import Transports or Networks dialog, click .

If you are importing a transport configuration file, you can enable and edit the PSI and PSIP default values.

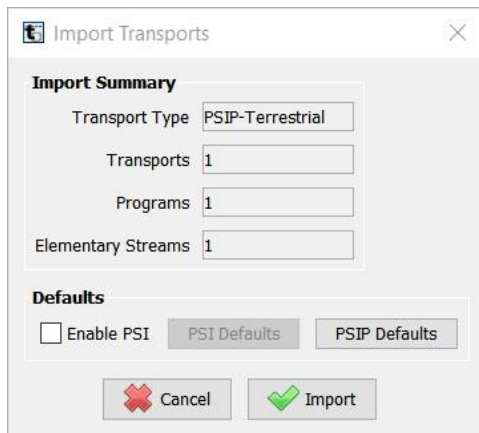


Figure 3-83: Import Transports dialog

NOTE The imported file must match the file encoding type. If an error message appears, click **OK**, and then revise the file before importing.

- 5 In the main window, click **Commit** to commit the configuration to the database.

3.8 Using GuideBuilder Archive Files

3.8.1 About GuideBuilder Archive Files

GuideBuilder archive files are used for backing up the GuideBuilder server database as restore points for GuideBuilder software upgrades. These archive files contain all the configuration settings and data in the GuideBuilder database, including:

- Activity logs
- Schedule provider configurations
- Logical network configurations
- Transport stream configurations
- Output configurations
- User accounts
- SNMP and SMTP/Email settings

GuideBuilder archive files are ZIP compressed Structured Query Language (.sql) files.

3.8.2 Backup the GuideBuilder Server Database

For backups and upgrades, you can create archive files of the database and save the files to a local or network directory.

Steps

- 1 Under Status, click **GuideBuilder**.
- 2 In the GuideBuilder Status panel, click **Backup**.
- 3 In the Select GuideBuilder Archive File dialog, find a directory in which to save the archive file.
- 4 Type a **Name** for the archive file.

- 5 Click **Select**.
- 6 In the Create GuideBuilder Archive File dialog, type an **Archival Description**.

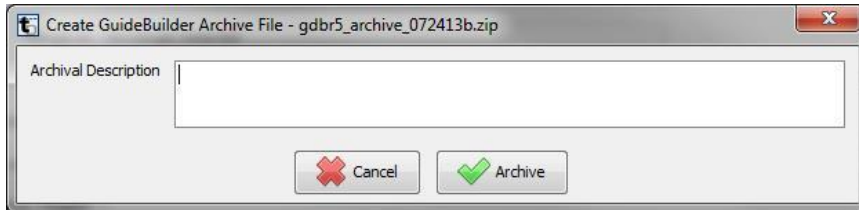


Figure 3-84: Create GuideBuilder Archive File

The description can contain additional details about the archive file and its contents.

- 7 Click **Archive**.
The compressed archive file is created and downloaded from the GuideBuilder server to the selected directory.
- 8 When complete, click **OK**.

3.8.3 Restore a GuideBuilder Server Database

Once a GuideBuilder archive file has been created and saved, you can import the archive back into GuideBuilder to restore its configuration settings to the date and time the file was created.

About this task

When an archive file is restored in GuideBuilder, the configuration settings in the restored database are applied to program guide metadata.

Steps

- 1 Under Status, click **GuideBuilder**.
- 2 In the GuideBuilder Status panel, click **Restore**.
- 3 In the Select GuideBuilder Archive File dialog, locate the saved archive file.
- 4 Click the archive file.
- 5 Click **Select**.

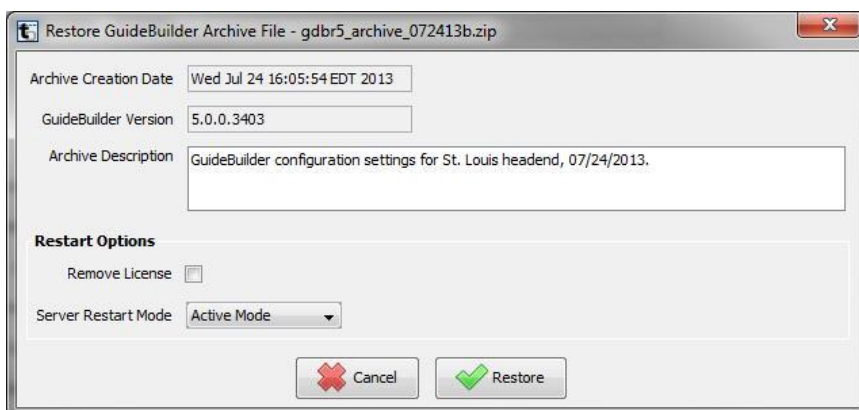


Figure 3-85: Restore GuideBuilder Archive File

- 6 In the Restore GuideBuilder Archive File dialog, select restart options.
For details, see "[GuideBuilder Archive Restart](#) ."
- 7 Click **Restore**.
- 8 In the GuideBuilder Status panel, click **OK**.
The GuideBuilder server is restored to the configuration settings of the archive file.

3.8.3.1 GuideBuilder Archive Restart Options

The Restore GuideBuilder Archive File dialog has these options for restarting the GuideBuilder server after a database archive file has been imported.

Table 3-32: GuideBuilder Archive Restart Options

Option	Description
Remove License	On restart, restore the GuideBuilder server to its factory default settings, not the settings of your GuideBuilder license.
Server Restart Mode	<p><i>Active</i> – Restart the GuideBuilder server with full operations, including live outputs. Use this option for normal restarts.</p> <p><i>Passive</i> – Restart the GuideBuilder server with no live outputs. All other operations are fully functional. Use this option for test restarts.</p> <p><i>Maintenance</i> – Restart the GuideBuilder webserver application only. No other GuideBuilder Config App operations are functional. Use this option for troubleshooting and repairs.</p>

3.8.4 View the GuideBuilder Server Status

In the GuideBuilder Config App, you can view status and version information about the GuideBuilder server. This information is useful when performing software updates or troubleshooting operational issues.

Steps

- 1 Under Status, click **GuideBuilder**.

The GuideBuilder Status panel opens.

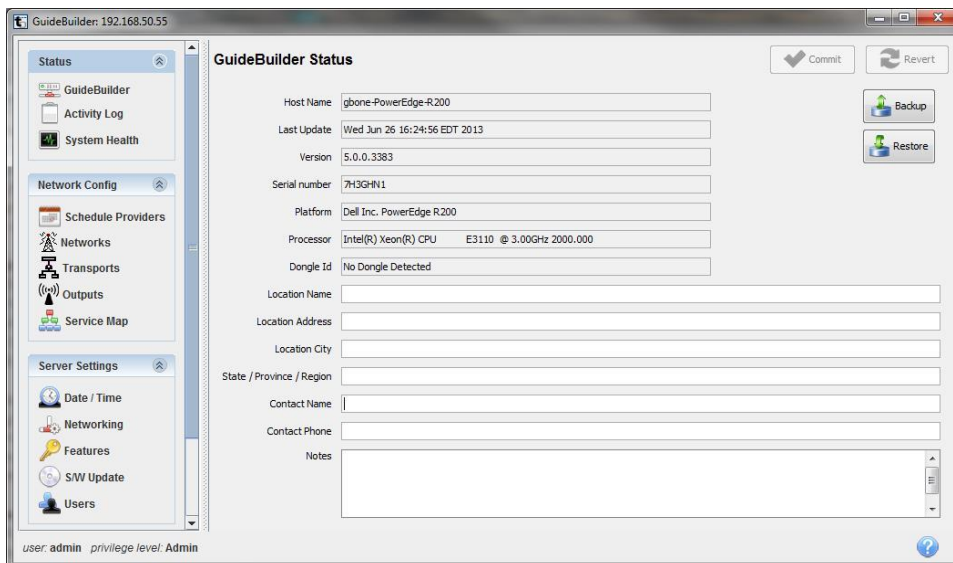


Figure 3-86: GuideBuilder Status panel

- 2 If needed, enter data in the open fields.
For details, see "GuideBuilder Server Status Settings."

3.8.4.1 GuideBuilder Server Status Settings

The GuideBuilder Status panel displays system information about the GuideBuilder server.

Table 3-33: GuideBuilder Server Status Settings

Setting	Description
Host Name	Name of this GuideBuilder server

Last Update	Date and time of the most recent update (download) of EPG data to the GuideBuilder server
Version	Software version currently running on this GuideBuilder server
Serial Number	Serial number of this GuideBuilder server
Platform	Hardware platform of this GuideBuilder server
Processor	Central processor type and speed of this GuideBuilder server
Dongle ID	USB configuration key installed in this GuideBuilder server
Location Name	Name of the installation site of this GuideBuilder server
Location Address	Address of the installation site of this GuideBuilder server
Location City	City of the installation site of this GuideBuilder server
State/Province/Region	State, province, or region of the installation site of this GuideBuilder server
Contact Name	Name of person to contact regarding issues with the GuideBuilder server
Contact Phone	Phone number of the contact name for this GuideBuilder server
Notes	Notes regarding this GuideBuilder server

3.9 Exporting Services

3.9.1 About Service Exports

GuideBuilder can export the program schedules of TV listing services. Service schedules can be exported via FTP or TCP to local and remote computers, which can be accessed by web servers to update channel lineups online. Service schedules can also be exported to StreamScope remote transport stream monitors for Quality of Service (QoS) synchronization.

3.9.2 Configure Service Exports

You can configure service program schedules to be exported daily, at selected intervals, or on demand. You can also select how many days of a schedule are exported.

Before you begin

One or more schedule providers must be configured in the Config App. For details, see [“Configuring Schedule Providers.”](#)

Steps

- 1 Under Network Config, click **Service Export**.
- 2 In the Service Export panel:
 - To create a new export, click **Add**.
 - To change an export, select its **Name**, and then click **Edit**.

TIP To view the status of an export, click it, and then click **Status**.

- 3 In the Add or Edit Service Export dialog, enter or edit a **Name**.

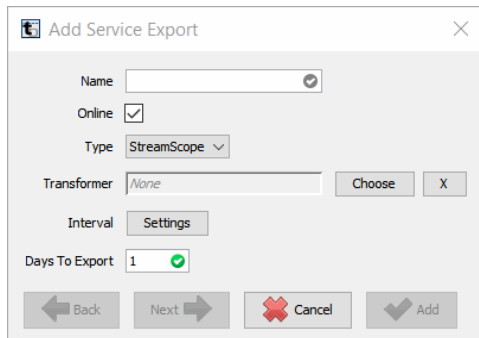


Figure 3-87: Add Service Export

Unless you want to deactivate this export, leave **Online** selected.

- 4 Select an export **Type**:
 - **StreamScope** to export schedules to a StreamScope remote transport stream monitor.
 - **TCP** to export schedules via Transmission Control Protocol.
 - **FTP** to export schedules via File Transfer Protocol.
- 5 To select an XML transformer for the export:
 - a Click **Choose**.
 - b In the Select a Preview Resource dialog, click an XSLT file.
 - c To view the XSLT file, click **View** and then **OK**.
 - d Click **Select**.

TIP To clear the selected transformer, click X.

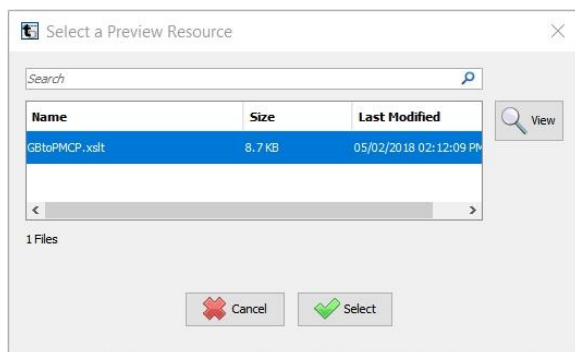


Figure 3-88: Select a Preview Resource

The default *GBtoPMCP.xslt* file transforms schedules exported via FTP or TCP to PMCP format. Additional XML transformers can be created for other types of exports.

NOTE StreamScope exports do not require an XML transformer.

- 6 To select export intervals:
 - a After Interval, click **Settings**.
 - b In the Set Interval Settings dialog, select an export frequency, interval, and time.
 - c Click **OK**.

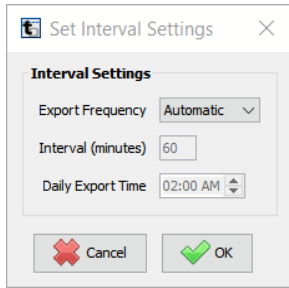


Figure 3-89: Set Interval Settings

For details, see “[Service Export Interval Settings](#).”

7 Enter the number of **Days to Export**.

This is the range of the schedule export, starting from the current date.

8 Click **Next**.

The window for the selected export type opens.

9 If you selected StreamScope as the export type, copy and paste a GuideBuilder URL from the Transport URLs tab of the GuideBuilder Synchronization page.

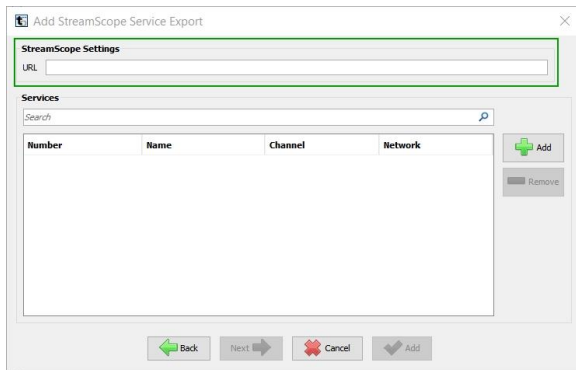


Figure 3-90: StreamScope Service Export Settings

10 If you selected TCP as the export type, enter TCP settings:

- The IP address of the destination computer.
- The port number of the destination computer.

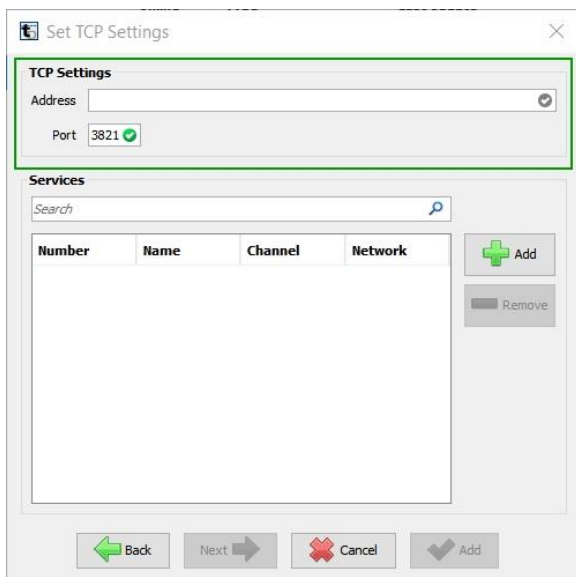


Figure 3-91: TCP Settings

11 If you selected FTP as the export type, enter FTP settings.

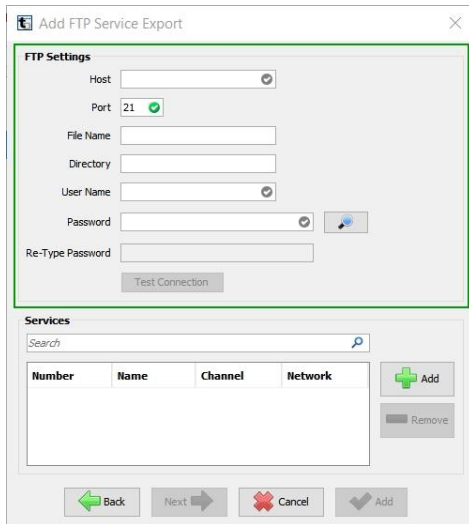


Figure 3-92: FTP Service Export

For details, see “FTP Service Export Settings.”

12 Under Services, click  .

13 In the Select Services window, click one or more services.

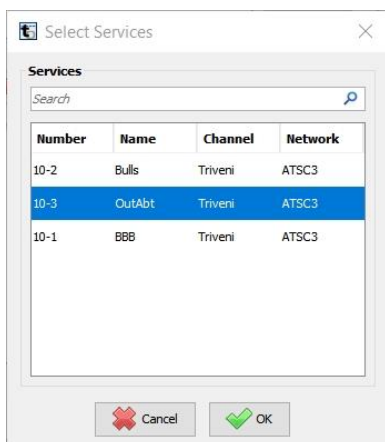




Figure 3-93: Select Services for Schedule Exports

TIP To select multiple services, hold CTRL and then click

14 Click **OK**.

15 In the window for the selected export type, click  or  .

16 Click **Commit**.

3.9.3 Export Services on Demand

Service schedules are normally configured to export automatically, but you can also manually export services on demand.

Before you begin

To be able to export service schedules, one or more schedule providers must be configured in the Config App. See “Configuring Schedule Providers.”

Steps

- 1 Under Network Config, click **Service Export**.
- 2 In the Service Export panel, click a service.
- 3 To change the selected service to online, click **Enable**.

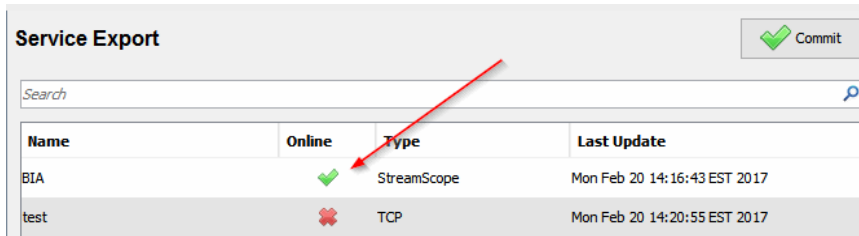


Figure 3-94: Online Service Export

Green checkmarks indicate online services.

- 4 Click **Export**.
If the export is successful, the Last Update date and time changes to the present.
- 5 If the export fails, click **Status** to view a status message.

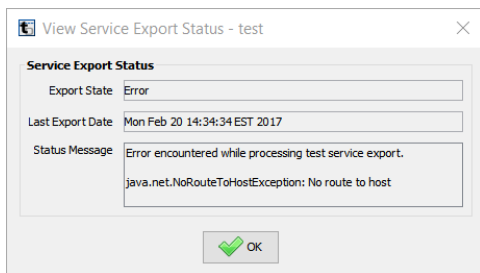


Figure 3-95: View Service Export Status

- 6 Click **OK**.

3.9.4 Remove a Service Export

Service exports committed to the GuideBuilder database can be removed from the database.

Steps

- 1 Under Network Config, click **Service Export**.
- 2 Click a listed service export.
- 3 Click **Remove**.
- 4 In the popup window, click **Yes**.
- 5 Click **Commit**.

3.9.4.1 Service Export Interval Settings

The interval settings set the type and timing of schedule exports.

Table 3-34: Service Export Interval Settings

Setting	Description
Export Frequency	<ul style="list-style-type: none"> • <i>Automatic</i> exports profiles when there is a change in program guide data. • <i>Daily</i> exports profiles on the selected days of the week at the specified time. • <i>Interval</i> exports profiles at the specified intervals (see below). • <i>On Demand</i> exports the profile when it is configured.
Interval (minutes)	When Interval is the frequency, the number of minutes (range 1-999) between service exports.
Daily Export Time	When Daily is the frequency, the time of day for the exports.

3.9.4.2 FTP Service Export Settings

FTP service export settings identify the computer and directory to receive exported schedules.

Table 3-35: FTP Service Export Settings

Setting	Description
Host	IP address of the destination server.
Port	Port on the destination server for the export.
File Name	Filename for the export(s).
Directory	Directory on the destination server.
User Name	User name for access to the destination server
Password	Password for access to the destination server.
Re-Type Password	Password verification.


3.10 Uploading Media Resources

Media resources such as service logos and interstitial ads can be uploaded to the GuideBuilder server database. Then they can be linked to ATSC 3.0 and ATSC M/H services for use in ESG previews. In addition, transport stream files can be uploaded for use in custom applications.

About this task

Before media resources can be linked to services, at least one ATSC 3.0 or ATSC M/H logical network must be configured in the Config App.

Steps

- 1 At the bottom of the Config App window, click .
- 2 In the Media Resources window, click **Add**.

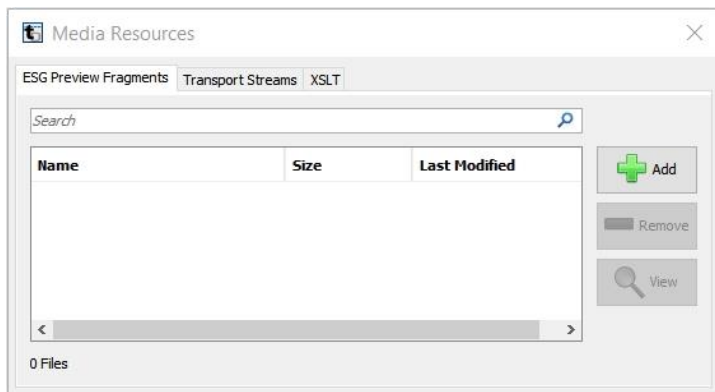


Figure 3-96: Media Resources window

- 3 In the Add File dialog, browse for the appropriate JPEG and PNG file.
- 4 Click **Select**.
The ESG Preview Fragments tab lists the selected file.
- 5 To view a file, click it, and then click **View**.
- 6 If needed, add other files to the list.
- 7 To upload a transport stream file:
 - a Click the Transport Streams tab.
 - b Click **Add**.

- c Browse for the appropriate .ts or .tp file.
- d Click **Select**.

NOTE For more information about using uploaded transport stream files, contact Triveni Digital Customer Support.

- 8 To remove a listed file, click its name, and then click **Remove**.
- 9 Click **X** to close the Media Resources window.

3.11 Log off the Config App

You log off the GuideBuilder Config App by closing its main window.

Steps

Do one of the following:

- Click the X button at the upper right of the window.
- Click the top bar of the window, and then select **Close**.
- Press Alt + F4.

4

Chapter 4: Program Editor

4.1 About the Program Editor

The GuideBuilder Program Editor is a web-based client application that displays the program event schedules of the channels and services configured in the GuideBuilder Config App. The event schedules displayed in the Program Editor are downloaded and ingested from external sources, such as TV listing services or traffic systems.

Administrative and Program Editor only users can add, edit, and delete one-time and recurring program events. Multiple users can access the Program Editor at the same time, and the same user can log in from different clients.

NOTE Program Editor user accounts can be configured for access to selected channels and services only. For details, see ["Create a User Account."](#)

4.2 Log on the Program Editor

If you have a GuideBuilder user account, you can launch and log on the Program Editor to view and edit event schedules.

NOTE Triveni Digital recommends Firefox for viewing the Program Editor. Some Program Editor pages and controls are optimized for Firefox and other browsers that support modern web languages.

Before you begin

You need:

- A computer with a compatible web browser.
- The IP address of the GuideBuilder server.
- A GuideBuilder username and password.

For assistance, ask your system administrator.

Steps

- 1 Open a web browser on your computer.
- 2 In the browser address bar:
 - Enter the IP address of the GuideBuilder server in <http://xxx.xxx.xxx.xxx/> format, and then click **Program Editor**.
 - Or, enter the IP address of the GuideBuilder server in <http://xxx.xxx.xxx.xxx/pe> format.

TIP For more secure logins, type *https* rather than *http* at the start of the IP address.

- 3 Type your GuideBuilder username and password.

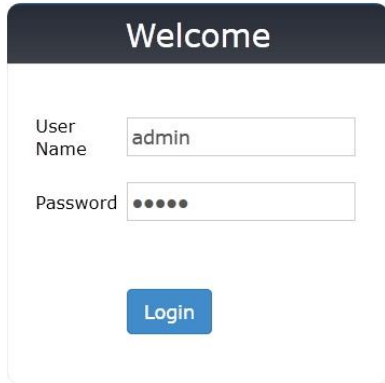


Figure 4-1: Program Editor welcome page

4 Click **Login**.

Result

If this is the first time you have logged on the Program Editor, the Service List page opens. If you have logged on before, the most recently viewed page opens.

TIP To log off the Program Editor, click **Logout** at the upper right of its heading bar.

4.3 View Event Schedules

Once you have logged into the Program Editor, you can view the event schedules of the configured services (virtual channels).

Steps

- 1 Log on the Program Editor.
The Service List page opens.

[Service List](#)



Figure 4-2: Program Editor Service List

- 2 If there are many services listed, you can:
 - Click **Next** or **Previous** to view the next or previous page.
 - From the **Show** menu, select the number of services listed per page.

TIP To search for a service, type all or part of its name, and then click .

- 3 Click a listed service to view its event schedule.

Event Schedule - Resolved Schedule

Service List | Event Schedule

ATSC3 | ATSC3 | TRV1 [40-1]

Service Map | Recurring Event | Default Event

Show 10 events | Time Zone : Eastern Time | Previous | Next


Thursday, 03 May 2018 | Commit | Refresh

Start Time	End Time	Title	Description	Extensions	Action
10:00	10:30	The Verdict With Judge Hatchett	A woman sues her ex-boyfriend for unpaid rent.		
10:30	11:00	Couples Court	A woman is convinced that her boyfriend of two years is sleeping with her sister.		
11:00	11:30	Couples Court	Singer Bobby V brings his expertise as a "former cheater" to court to help an Indiana couple work through their issues of infidelity.		
11:30	12:00	Justice With Judge Mablean	Damages and medical expenses resulting from a confrontation over a man are discussed in court. Then, a bride sues her wedding caterer after she choked on a fish bone.		
12:00	13:00	The Steve Wilkos Show	Men who want to know for sure if they are the father of a child ask Steve for help.		
13:00	14:00	Jerry Springer	Clutch cheated on his girlfriend, Marsha, with their roommate Crystal, but claims he did it in order to keep a roof over their head. Then, Briana claims to be in love with another woman's man. Plus, Niysh suspects that her boyfriend C-Food is having sex with a social media video vixen.		
14:00	15:00	The Steve Wilkos Show	A man claims that he slept with his father's wife when he was 15 years old, but she denies this; a woman suspects that her boyfriend slept with her cousin.		
15:00	16:00	Maury	Caliyah is haunted by Anthony's dark past and fears he's not capable of being with one woman. Next, Sarah wants to confront her fiancé Casey about his philandering ways.		
16:00	17:00	Crime Watch Daily With Chris Hansen	Mystery gunman targets local lawyers in crime spree.		
17:00	17:30	DailyMailTV			

User | Recurring | Default | WPHL HDTV

Figure 4-3: Program Editor Event Schedule

The current event is listed at the top of the schedule. The dates and times of the events reflect the date, time, and time zone settings on the GuideBuilder server.

- 4 From an Event Schedule page, you can:
 - Select a number from the **Show** menu to change the number of events per page.
 - Click **Previous** or **Next** to display earlier or later events.
 - Click the triangles next to the date to view the previous or next events.
 - Click  to display today's program events, starting with the current event.
 - Click **Recurring Event** to add a recurring event to the schedule. For details, see "Add a Recurring Event."
 - Click **Default Event** to edit a default program on the schedule. For details, see "

- [Create a Default Event.](#)

NOTE When you edit an event schedule, other Program Editor users currently logged in will not see your changes unless they refresh the event schedule in their browsers.

5 To view the network configurations of the service, click **Service Map**.

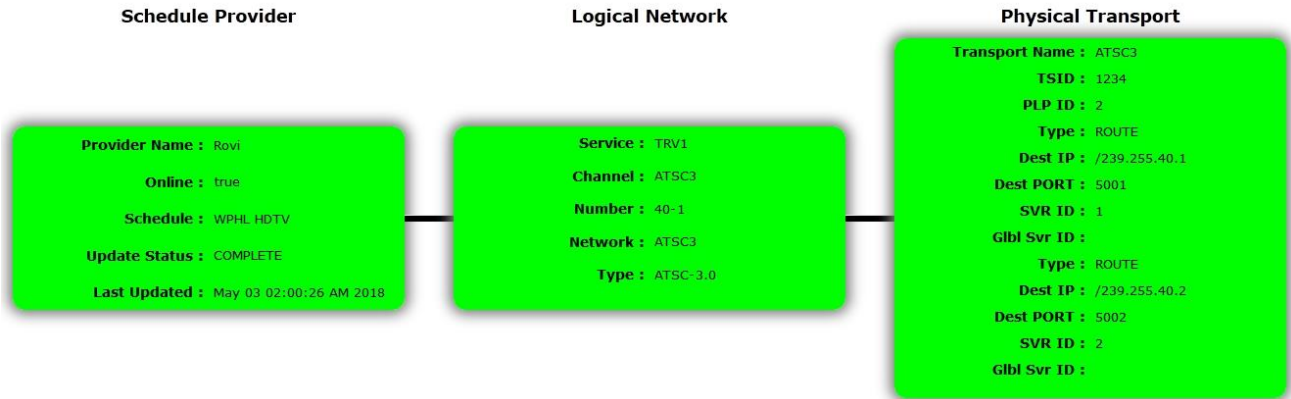


Figure 4-4: Program Editor Service Map

- 6 To view the service extensions of an event:
- Click to view its parental ratings.
 - Click to view its audio settings.
 - Click to view its closed caption settings.

Related topics

[Event Extensions](#)

4.3.1 Program Event Types

In Program Editor schedules, event types are color-coded in the left column.









Table 4-1: Program Event Types

Event Type	Color	Description
User		An event that was added by a user to the schedule from the Program Editor. User events can be edited and deleted from schedules. User events can also be moved to other time slots and have their end times extended for overruns.
Listings		An event that was downloaded from a schedule provider listing service.
Default		An event that fills gaps in the schedule by default. When no user, listing, or recurring event has been scheduled for a time slot, the default event occurs. NOTE You can change the color coding of default events to white, green, or gray. See " Create a Default Event. "
Recurring		An event that occurs on a regular basis, such as every day at the same time.
Conflict		An event that conflicts with one or more scheduled events. NOTE Conflict events are overridden but not deleted from the schedule. They do not appear in outputs, unless the overriding user event is deleted.

4.3.2 Program Editor Icons

The Program Editor displays these icons on event schedules.

Table 4-2: Program Editor Icons

Icon	Description
	Click to display the event schedule for the current day.
	A user event that conflicts with one or more previously scheduled events. TIP To display the conflict event(s), click this icon or click the plus sign in the left column.
	An event with a parental content rating. Click to open the Rating Extension Editor.
	An event with an audio extension. Click to open the Audio Extension Editor.
	An event with closed captioning service. Click to open the Caption Extension Editor.
	Add an event to the schedule.
	Click to edit a user event.
	Click to delete a user event.

4.3.3 Refreshing the Event Schedules

All the event schedules are refreshed when you log on the Program Editor. But an event schedule later displayed in the Program Editor may not be the most recent version if the following have occurred during your current session:

- A new schedule has been downloaded from a schedule provider,
- Another Program Editor user committed manual changes to the schedule.

To view the most recent version of an event schedule, click **Refresh** and then click **Yes**.



Figure 4-5: Program Editor Refresh Button.

CAUTION When an event schedule is refreshed, any uncommitted changes made during the current session are discarded.

4.3.4 Committing Program Editor Changes

When you make changes to event schedules, the changes are not committed to the GuideBuilder server database unless you click Commit on the Event Schedule page, and then click Yes.



Figure 4-6: Program Editor Commit and Revert Buttons

If you click Revert, the changes are discarded and the Program Editor displays the event schedule most recently committed to the database.

NOTE Commit and Revert buttons are active only after changes have been manually entered. When active, the Commit button turns green, and the Revert button replaces the Refresh button.


4.4 Add an Event to a Schedule

Administrative and Program Editor only users can manually add programs to event schedules.

About this task

Added events are known as user events. When you add an event to a schedule, other users currently logged into the Program Editor will not see the event until they refresh the schedule in their browsers.

Steps

- 1 In the Program Editor, select a service from a Service List.
- 2 On its Event Schedule, find a time slot for the new event.
- 3 Under **Action** for that time slot, click .
- 4 In the Add Event dialog, type an **Event Title** and **Event Description**.

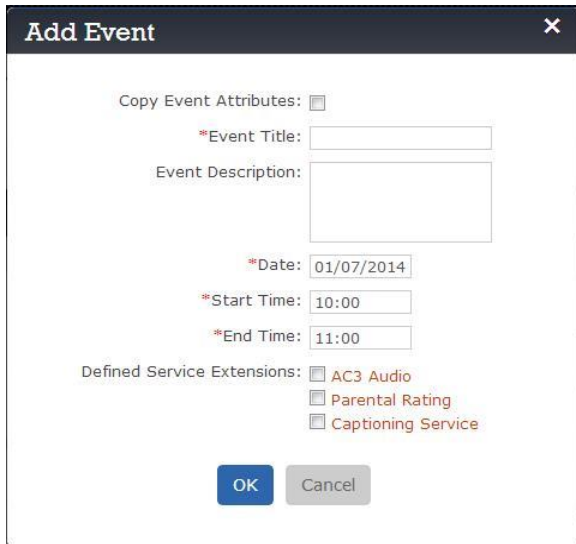


Figure 4-7: Add Event

- 5 Click the **Date** field, and then select a date from the calendar.



Figure 4-8: Add Event Calendar

- 6 Click the **Start Time** and **End Time** fields and select or type times.

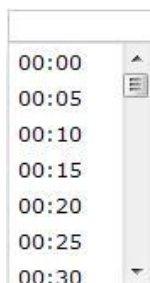


Figure 4-9: Start Time menu

TIP The menus are in five-minute increments. To enter other increments, type numbers.

- 7 Define the service extensions for the event.
For details, see ["Event Extensions."](#)
- 8 Click **OK**.

The new event is listed on the Event Schedule and can be edited later.

- 9 On the Event Schedule, click **Commit** and **Yes**.

TIP To discard your changes, click **Revert**. Your changes will not be saved to the database, and the Program Editor will display the most recent event schedule.

Result

The user event overrides the previously scheduled event(s), but the conflicting events are not deleted. The conflicting event(s) remain on the schedule should the user event need to be deleted.

4.4.1 About Conflicting Events

Events may overlap on schedules, particularly when they are from multiple sources, such as imported from a TV listings service and manually entered in the Program Editor. When events completely conflict, GuideBuilder prioritizes which event appears in program guides according to the source of the events. For example, if you create an event in the Program Editor scheduled for the same time as a listing event, the user event appears in the program guide.

When two events partially conflict (for example, due to an event overrun), the end and start times of the two events, and subsequent events, can be edited so that both events appear in the program guides.

4.4.2 How Conflicting Events are Resolved

When events completely conflict on a schedule, GuideBuilder uses these priorities to determine which event appears in the program guide.

Table 4-3: Conflicting Event Priorities

Priority	Event Type and Source
1 (highest)	One-time events added by Program Editor users
2	Recurring events added by Program Editor users
3 (lowest)	Events imported from schedule providers (that is, listing events)

4.5 Adjust an Event Overrun

When a program runs longer than scheduled, you can adjust its end time, as well as shift the start and end times of up to ten subsequent events.

About this task

Overruns can be adjusted for user events only. To adjust an overrun for a listing event, you must copy and save it as a user event.

Steps


- 1 In the Program Editor, select a service from the Service List.
- 2 On its Event Schedule, find the overrunning event.
- 3 Under **Action** for that event, click .
- 4 If the event is a user event, go to Step 7.
- 5 In the Add Event dialog, click **Copy Event Attributes**.

Figure 4-10: Sample Copy Event Attributes

6 Click **OK**.

The user event appears as an overlapping event on the schedule.

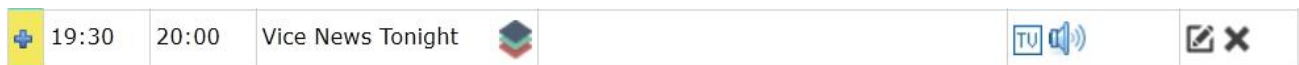


Figure 4-11: User Event Conflict

TIP To view the overlapped events, click the plus sign in the left column or the icon.

7 Under **Action** for the event to be extended, click

8 Select the overrun settings for the event:

Figure 4-12: Edit Event Dialog Event Overrun Settings

Do not change the original End Time value. For details, see “Event Overrun Settings.”

9 Click **OK**.

The overrunning event appears on the schedule.

+	17:00	17:35	DailyMailTV				
+	17:35	18:05	Friends		As Rachel sets off to tell her baby's father that he's going to be a daddy, the new Bings hit a dead end trying to get to their honeymoon. Treeger: Mike Hagerty. Joey: Matt LeBlanc. Rachel: Jennifer Aniston. Ross: David Schwimmer.		
+	18:05	18:30	The Goldbergs		Barry accuses Beverly of liking Adam best; and Murray immediately takes a disliking to Erica's new beau, while Erica develops a fondness for the band Rush.		

Figure 4-13: Schedule with Overrun Event

10 On the Event Schedule, click **Commit** and **Yes**.

4.5.1 Event Overrun Settings

In the Edit Event dialog for user events, these settings apply to event overruns.

Table 4-4: Event Overrun Settings

Setting	Description
Event time will overrun by	Number of minutes of event overrun from its originally scheduled end time
Shift the start time of the next	Number of subsequent events that will have their start times shifted to accommodate the new end time. If one, only the next event will be shifted.
Shift last event in its entirety	Specifies that the last event with a shifted start time that will play in its entirety. The event after that event will only be partially played.

4.6 Add a Recurring Event

To create events that occur on a regular basis, you can add one or more recurring programs to event schedules.

Steps

- 1 In the Program Editor, select a service from the Service List.
- 2 On its Event Schedule, click **Recurring Event**.
- 3 In the Recurring Event Settings dialog, click **New**.



Figure 4-14: Recurring Events Settings

- 4 In the **Recurring Event** window, select event attributes.

Figure 4-15: Recurring Event dialog

For details, see “[Recurring Event Settings](#).”

- 5 Type an event title and description.
- 6 Click the **Date** field, and then select a date from the calendar.
- 7 Click the **Start Time** and **End Time** fields, and then select times from the drop-down menus.
- 8 Select service extensions for the event.
For details, see “[Event Extensions](#).”
- 9 Select recurring days of the week or one of the options.
- 10 For the range of recurrence, select **No end date** or an **End by** date from the calendar.
- 11 Click **OK**.

The Recurring Event Settings window lists the new event and its days of recurrence.

- 12 Click **Close**.
- 13 Click **Commit** and **Yes**.

Result

The recurring event appears on the schedule on the selected days.

4.6.1 Edit or Remove a Recurring Event

Once a recurring event has been added to a schedule, you can edit or remove it.

Steps

- 1 In the Program Editor, select a service from the Service List.
- 2 On its Event Schedule page, click **Recurring Event**.
- 3 In the Recurring Event Settings window, click a recurring event.

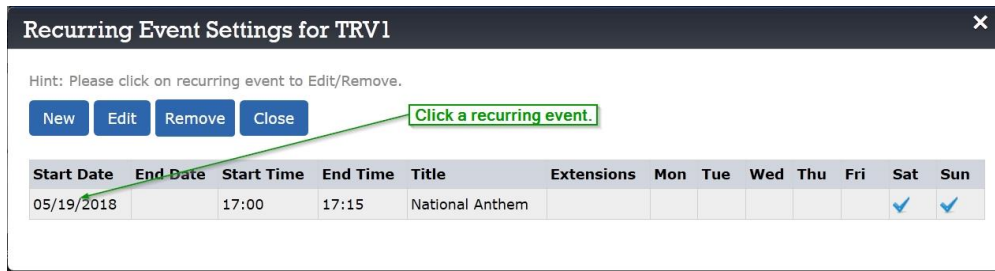


Figure 4-16: Recurring Events Settings

TIP To remove the selected recurring event from the schedule, click **Remove** and **Yes**.

- 4 Click **Edit**.
- 5 In the Recurring Event dialog, enter and select event settings.
For details, see "Recurring Event Settings."
- 6 When done, click **OK**.
- 7 In the Recurring Event Settings, dialog, click **Close**.
- 8 On the Event Schedule, click **Commit** and **Yes**.

4.6.2 Recurring Event Settings

The Recurring Event dialog in the Program Editor has these settings.

Table 4-5: Recurring Event Settings

Setting	Description
Event Title	Name of the recurring event. The maximum length is 255 characters, but the entire title may not appear in generated program guides.
Event Description	Description of the event. The maximum length is 4096 characters, but the entire description may not appear in program guides.
Date	Date of the event.
Start Time	Start time of the event, in 24-hour clock settings.
End Time	End time of the event, in 24-hour clock settings.
Defined Service Extensions	The service extensions for the event: Audio, Parental Rating, and Captioning Service. See "Event Extensions."
Recurring day of the week	The day(s) of the week on which the event occurs, with these button options: <ul style="list-style-type: none"> • <i>Select All Days</i> – Monday through Sunday. • <i>Select Week Days Only</i> – Saturday and Sunday. • <i>Select Weekends Only</i> – Monday through Friday. • <i>Clear All Days</i>.
Range of recurrence	The date on which the recurring event ceases.

4.7 Create a Default Event

In the Program Editor, you can change the title, description, and duration of the default event for a schedule. You can also change the color-coding of the default events in all the schedules.

About this task

For each schedule linked to a service provider, GuideBuilder creates a default program event. The default event fills gaps in the schedule, ensuring that something will appear in program guides even when there is no listing, user, or recurring event in a time slot. Each service can have a different default event.

Steps

- 1 In the Program Editor, select a service from the Service List.
- 2 On its Events Schedule, click **Default Event**.
- 3 In the Default Event dialog, type a new **Default Title** for the event.

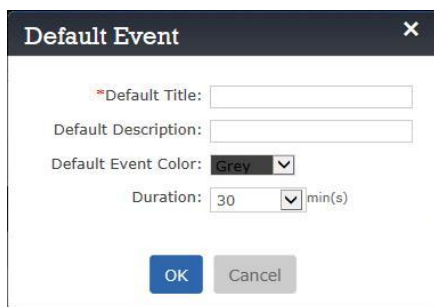


Figure 4-17: Default Event

This title will appear in the schedule in all time slots filled in by the default event.

- 4 If needed, type a new **Default Description**.
This setting is optional.
- 5 If needed, select a new **Default Event Color**.
This setting changes the color-coding of default events in the left column of all event schedules in the Program Editor on your computer.
- 6 Select a **Duration** for the default event.
All the default events in a service are the same duration. This setting applies only to the selected service.
- 7 Click **OK**.
- 8 On the Event Schedule, click **Commit**, and then click **Yes**.

Result

The default event appears on the selected schedule in the program guides.


4.8 Copy a Listings Event

In the Program Editor you can copy an event from a TV listings service to another date or time on a schedule.

About this task

When you copy a listing event to a new date and time on a schedule, the new event becomes a user event that can be edited and moved again.

Steps

- 1 Click a service on the Service List.
- 2 On the Event Schedule, find a listing event to copy.
- 3 Under **Action**, click .
- 4 In the Add Event dialog, select **Copy Event Attributes**.
The attributes of the copied event fill the Add Event fields.
- 5 Click the **Date** field and select a new date on the calendar.
- 6 Enter a **Start Time** and **End Time** if needed.
- 7 Click **OK**.
The listing event is copied to the selected date and time and becomes a user event that can be edited or moved later.
- 8 Click **Commit**, and then click **Yes**.

Result

The copied event will be included in GuideBuilder outputs.

4.9 Event Extensions

4.9.1 About Event Extensions

Service extensions, which can be configured in the GuideBuilder Config App, describe service attributes such as AC3 audio settings, closed captioning services, and content ratings. In the Program Editor, you can view and change the extensions of individual events.

You can view the extensions of listing events, user events, and recurring events. However, you can add, edit, and remove extensions for user and recurring events only. To change the extensions of a listing event, it must first be copied and saved as a user event.

NOTE Extensions do not apply to default events.

4.9.2 Add Event Extensions

Program Editor users can add extensions to user events on schedules.

Steps

- 1 Click a service on the Service List.
- 2 On its event schedule, find a user event.
User events are marked in yellow and have a conflict icon.

	Start Time	End Time	Title	
+	14:00	15:00	Local News	Conflict icon 

Figure 4-18: User event example

- 3 Under **Actions**, click .
- 4 In the Edit Event window, click a defined service extension:

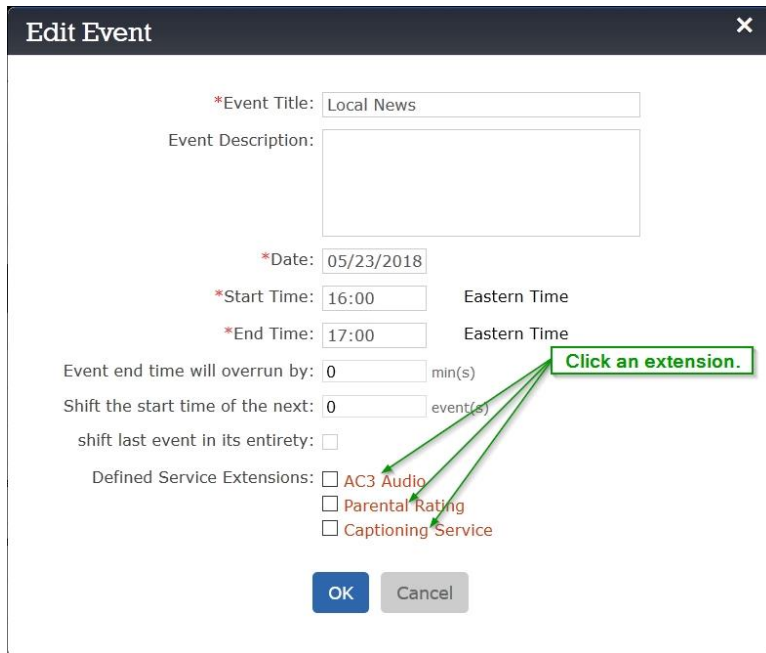


Figure 4-19: Edit Event window

- 5 If you clicked **AC3 Audio**:
 - a Click **Add** in the first Audio Extension Editor.
 - b Enter an Audio ID, service type, and language in the second Audio Extension Editor.



Figure 4-20: Audio Extension Editor

For details, see “[Audio Extension Settings.](#)”

- c Click **OK** in the second Audio Extension Editor.
 - d Click **OK** in the first Audio Extension Editor.
 - e To add more audio extensions to the event, repeat Step 5.
- 6 If you clicked **Parental Rating**:
 - a Select settings in the Rating Extension Editor.

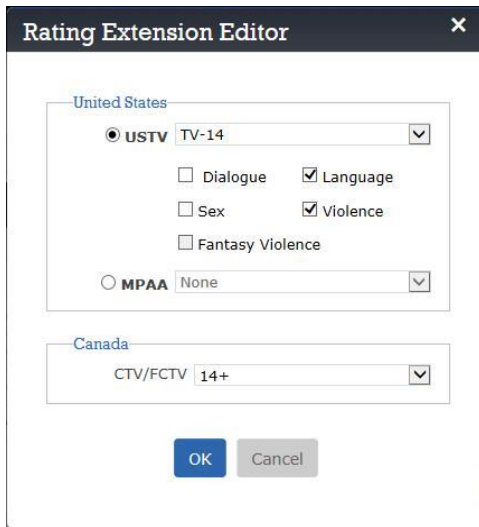


Figure 4-21: Rating Extension Editor

NOTE For certain USTV ratings, you can select sub-ratings (for example, “Violence”) of thematic elements.

For details, see “[Rating Extension Settings.](#)”

b Click **OK**.

7 If you clicked **Captioning Service**:

a Click **Add** in the Caption Extension Editor.

b Enter a type, language, and service number in the Caption Service Editor.

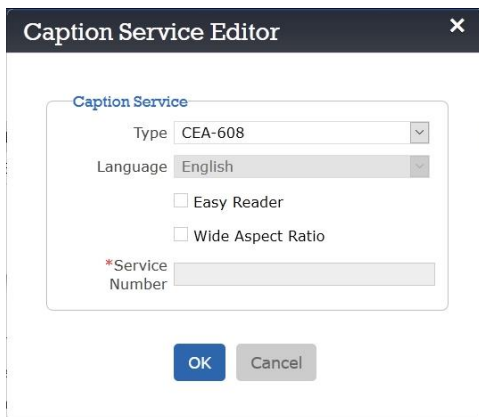


Figure 4-22: Caption Service Editor

For details, see “[Caption Extension Settings.](#)”

c Click **OK** in the Caption Service Editor.

d Click **OK** in the Caption Extension Editor.

e To add more caption extensions to the event, repeat Step 7.

8 Click **Commit**, and then click **Yes**.

The committed changes will be included in outputs.

4.9.3 Edit or Remove Event Extensions

If a user event has extensions, they can be edited or removed in the Program Editor.

Steps


- 1 Click a service on the Service List.
- 2 On its Event Schedule, find a user event with extensions.

User events with extensions are marked in yellow and have extension icons.




Figure 4-23: User event with extensions


3 Under **Extensions**, click an icon.

4 If you clicked :


- a In the Rating Extension Editor, select new settings.
For details, see "Rating Extension Settings."
- b Click **OK**.


TIP To remove the rating extension, select None in the Rating Extension Editor, and then click OK.

5 If you clicked :

- a In the first Audio Extension Editor, click a  under Action.
- b In the second Audio Extension Editor, select new settings.
For details, see "Audio Extension Settings."
- c Click **OK**.
- d In the first Audio Extension Editor, click **OK**.

TIP To remove an audio extension, click an  under Action in the first Audio Extension Editor.

6 If you clicked :

- In the Caption Extension Editor, click a  under Action.
- In the Caption Service Editor, select new settings.
For details, see "Audio Extension Settings."
- Click **OK**.
- In the Caption Extension Editor, click **OK** in the first Audio Extension Editor.

TIP To remove a caption extension, click an  under Action in the Caption Extension Editor.

7 Click **Commit**, and then click **Yes**.

4.9.4 Audio Extension Settings

The Audio Extension Editor contains these settings.

Table 4-6: Audio Extension Settings

Setting	Description
Audio ID	(Required) Identifies the applicable elementary stream.
Type of Service	Identifies the type of audio service.
Language	Identifies the language of the audio.

4.9.5 Rating Extension Settings

The Rating Extension Editor contains these settings.

Table 4-7: Rating Extension Settings

Settings	Descriptions
USTV	United States Television parental advisory guidelines: <ul style="list-style-type: none"> • <i>TV-G</i> – Suitable for all ages • <i>TV-PG</i> – Parents may find content unsuitable for younger children • <i>TV-14</i> – Unsuitable for children under 14 • <i>TV-Y</i> – Appropriate for all children • <i>TV-Y7</i> – Appropriate for children age 7 or above
MPAA	Film rating system of the Motion Picture Association of America: <ul style="list-style-type: none"> • <i>N/A</i> Not applicable • <i>G</i> – General audiences • <i>PG</i> – Parental guidance suggested • <i>PG-13</i> – Parents strongly cautioned (may be inappropriate for children under 13) • <i>R</i> – Restricted (under 17 requires accompanying adult) • <i>NC-17</i> – Adults only (no one under 17 admitted) • <i>X</i> – No one under 17 admitted (1970-1984) • <i>Not rated</i>
Canada	Rating system for Canadian Television/French Canadian Television

4.9.6 Caption Extension Settings

The Caption Service Editor window contains these caption extension settings.

Table 4-8: Caption Extension Settings

Setting	Description
Language	Specifies the language of the closed caption service.
Type	Indicates whether the caption service is ATSC 708 or ATSC 608.
Service Number	Identifies the caption service (range = 1 to 63). NOTE No two caption services should use the same number.
Easy Reader	Indicates whether the closed caption service contains text tailored to the needs of beginning readers
Wide Aspect Ratio	Indicates whether the closed caption service is formatted to a wide aspect ratio (16:9) instead of the standard ratio (4:3).

5

Chapter 5: ROUTE/MMTP Encoder

5.1 About the ROUTE/MMTP Encoder

The GuideBuilder ROUTE/MMTP encoder application enables TV engineers to configure the encoding and monitor the ingest and transmission of ATSC 3.0 IP streams. GuideBuilder ingests MPEG-DASH streams from packagers and transmits them as ROUTE or MTTP streams for UDP outputs to schedulers and other DTV network devices.

5.2 Log on the Encoder App

Triveni Digital recommends using Mozilla Firefox or Google Chrome browsers for the encoder app.

Steps

- 1 In a web browser, enter the IP address of the GuideBuilder XM server.
- 2 On the Welcome page, click **ROUTE/MMTP Encoder**.
- 3 Enter a username and password.

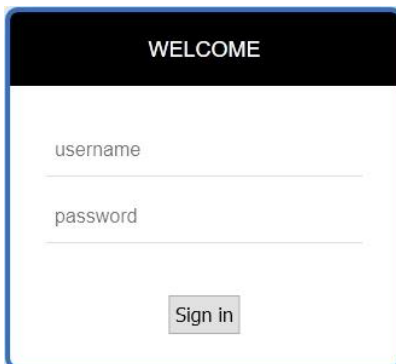


Figure 5-1: Encoder logon



The default username and password are *admin*. If you do not have a GuideBuilder username and password, contact your system administrator.

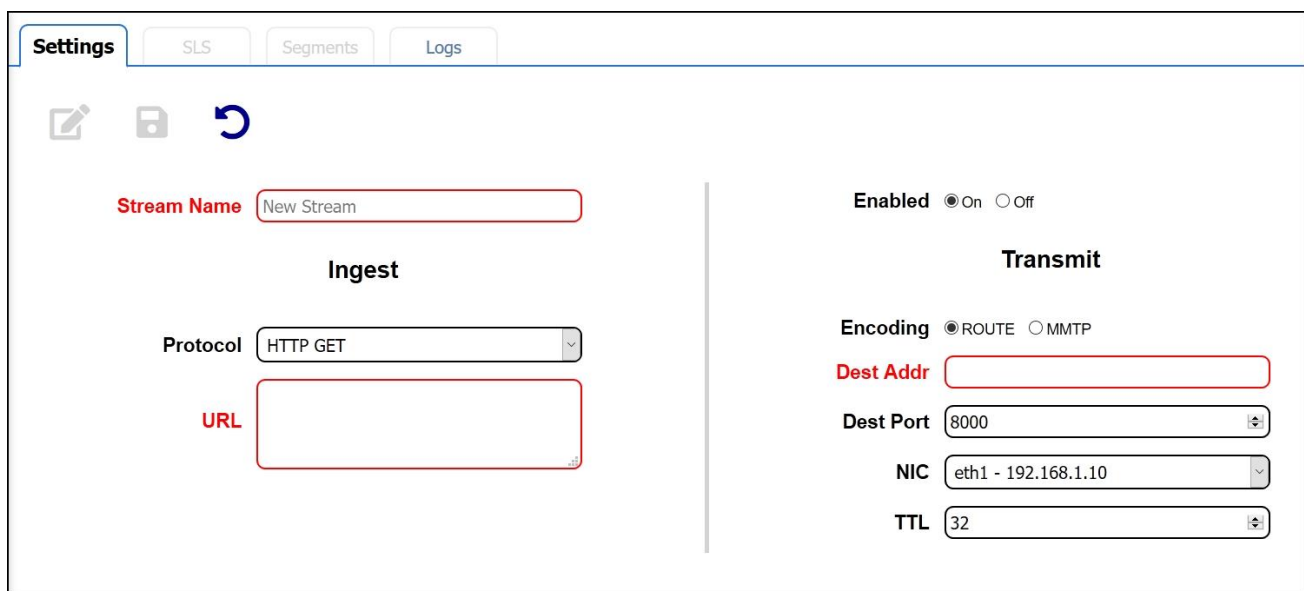
- 4 Click **Sign in**.
The encoder app opens.
- 5 To exit the encoder, click **Logout**.

5.3 Configure ATSC 3.0 Stream Encoding

For GuideBuilder to encode MPEG-DASH ingest (input) streams as ROUTE or MMTP transmit (output) streams, ATSC 3.0 IP streams must be configured in the encoder app.

Steps




- On the encoder sidebar, do one of the following:
 - To add a new stream, click .
 - To edit an existing stream, click its name, and then click  on the Settings tab.
- If this is a new stream, enter a stream name in the Settings tab.
For example, a ROUTE number or station call letters.
- Select and enter ingest and transmit settings for the stream.



The screenshot shows the 'Settings' tab of the encoder interface. It is divided into two main sections: 'Ingest' and 'Transmit'. The 'Ingest' section includes a 'Stream Name' field (containing 'New Stream'), a 'Protocol' dropdown menu (set to 'HTTP GET'), and a 'URL' text area. The 'Transmit' section includes an 'Enabled' toggle (set to 'On'), an 'Encoding' dropdown menu (set to 'ROUTE'), a 'Dest Addr' text field, a 'Dest Port' dropdown menu (set to '8000'), a 'NIC' dropdown menu (set to 'eth1 - 192.168.1.10'), and a 'TTL' dropdown menu (set to '32'). There are also icons for edit, save, and refresh at the top left of the settings area.

Figure 5-2: Encoder Settings tab

Ingest settings are for the input from the packager. Transmit settings configure the output from GuideBuilder. Settings in red are required. For details, see “ATSC 3.0 Ingest and Transmit Settings.”

- Click  to save the settings.
Or click  to cancel the edit.
- If you need to delete a stream, click it on the sidebar, and then click .
- Click **Commit**, and then OK, to commit the configuration to the database.
GuideBuilder starts ingesting and encoding the stream.
- If needed, configure additional streams.

What's next?

For GuideBuilder to transmit ROUTE or MMTP streams to a scheduler, the physical transports, logical networks, and outputs must be configured in the Config App.

Related topics

[Configure ATSC 3.0 Streams](#)





[Configure ATSC 3.0 Networks](#)

[Configure ATSC 3.0 UDP Outputs](#)

5.3.1 Disable ATSC 3.0 Encoding

If needed, you can disable the encoding of an ATSC 3.0 IP stream.

Steps

- 1 On the encoder sidebar, click a stream name.
 Service 1 
Figure 5-3: Enabled stream icon
 Streams with enabled encoding are indicated by green triangles.
- 2 On the Settings tab, click .
- 3 After Enabled, select **Off**.
- 4 Click  to save the change.
 Or click  to cancel the edit.
- 5 Click **Commit** and then **OK** to commit the change to the database.

Service 1 

Figure 5-4: Disabled stream icon

Streams with disabled encoding are indicated by black squares.

5.3.2 ATSC 3.0 Ingest and Transmit Settings

Table 5-1: ATSC 3.0 Stream Ingest and Transmit Settings

Direction	Setting	Description
Ingest	Protocol	<i>HTTP Get</i> – Requests retrieval of data from a server. <i>FTP</i> – File Transfer Protocol for client/server networks. <i>WEBDAV</i> – A protocol for Web content. <i>HTTP Put</i> – Receives and replaces transferred data.
	Path	Directory path to the FTP, WEBDAV, or HTTP Put site.
	Ingress URL	Web address of the input video file.
	User name	Username for the FTP or WEBDAV site.
	Password	Password for the FTP or WEBDAV site.
	Transmit	Encoding
Dest Address		IP address of the UDP multicast destination.
Dest Port		Port number of the UDP multicast destination.
NIC		The output Network Interface Card for the stream.
TTL		Time-to-Live range for IP packets in the stream. The default value is 32, that is, restricted to the same site.

5.4 View ATSC 3.0 Streams Summary

On the Summary tab, you can monitor the transmit bitrates, video thumbnails, and log messages of all the enabled transmit ATSC 3.0 IP streams.

Steps

- 1 On the encoder sidebar, click **Summary**.
- 2 If needed, scroll to view all the streams.



Figure 5-5: Sample Summary tab

The graph displays transmit bitrates for the enabled streams. The thumbnails refresh every second.

TIP To learn how to view bitrates and other details of an individual stream, see [“View Stream Segment Graphs and Charts.”](#)

- 3 Click the **Logs** tab.

The screenshot shows the 'Logs' tab of the encoder interface. It contains a table with the following columns: Stream, Timestamp, Level, and Message. There is a 'Clear' button in the top right corner of the table area.

Stream	Timestamp	Level	Message
Service 2	12/5/19 3:33:06 PM	WARNING	Service 2 late segment, repld: 0 segment: 1505794 delta: -670
Service 2	12/5/19 3:33:04 PM	WARNING	Service 2 late segment, repld: 0 segment: 1505793 delta: -284
Service 2	12/5/19 3:32:20 PM	WARNING	Service 2 late segment, repld: 1 segment: 1505771 delta: -874
Service 2	12/5/19 3:32:14 PM	WARNING	Service 2 late segment, repld: 0 segment: 1505768 delta: -487
Service 2	12/5/19 3:32:14 PM	WARNING	Service 2 late segment, repld: 1 segment: 1505768 delta: -316
Service 2	12/5/19 3:32:08 PM	WARNING	Service 2 late segment, repld: 0 segment: 1505765 delta: -11
Service 2	12/5/19 3:31:58 PM	WARNING	Service 2 late segment, repld: 0 segment: 1505760 delta: -236
Service 2	12/5/19 3:31:58 PM	WARNING	Service 2 late segment, repld: 1 segment: 1505760 delta: -168

Figure 5-6: Sample Summary Logs tab

Up to 1,000 recent log messages are listed. For details, see [“Encoder Log Message Severity Levels.”](#)

TIP To learn how to view the log messages for a specific stream, see "View Stream Segment Graphs and Charts."

- 4 To clear the log list, click **Clear**, and then **OK**.

5.4.1 Encoder Log Message Severity Levels

Table 5-2: Encoder Log Message Severity Levels

Level	Description
Information	A message about encoder system events.
Warning	A message about encoder system events that may require corrective action.
Severe	A message about a stream failure event.

5.5 View SLS Details

On the SLS tab, you can view ingest and transmit Service Level Signaling details, including XML files, for specific ATSC 3.0 IP streams enabled for encoding.

Steps

- 1 On the encoder sidebar, click a stream name.
- 2 Click the **SLS** tab.

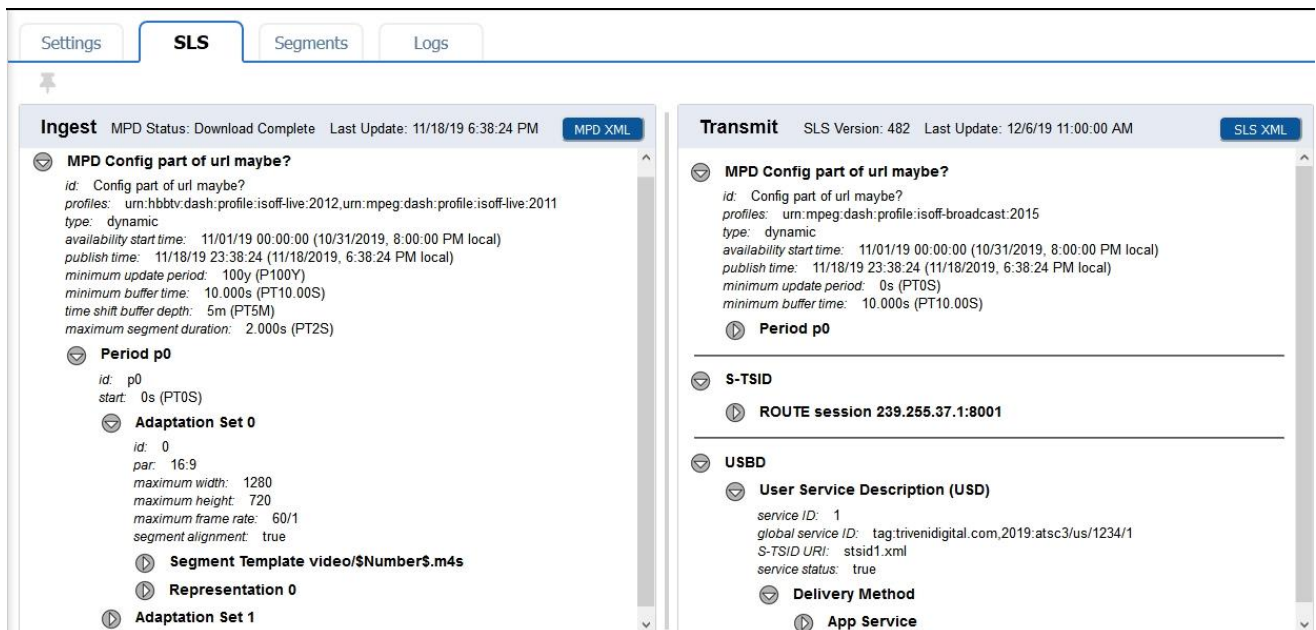


Figure 5-7: Encoder SLS tab

- 3 To view more details, click a play button in the lists.
- 4 To view the MPD and SLS XML files, click the buttons.

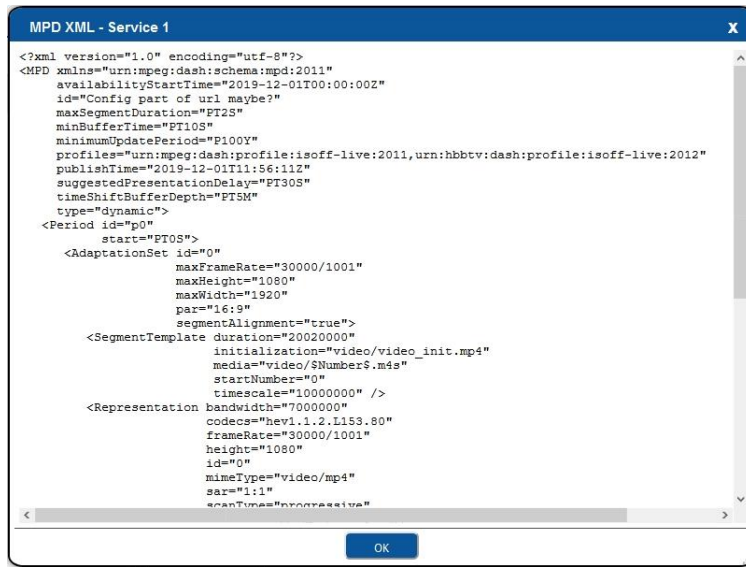


Figure 5-8: Sample MPD XML file

- 5 Click **OK**.

5.6 View Stream Segment Graphs and Charts

On the Segments tab, you can view ingest and transmit stream graphs and charts for ATSC 3.0 IP stream segments. A segment is a unit of media content (video, audio, metadata, etc.) of a specified viewing duration, typically two seconds in length.

Steps

- 1 On the encoder sidebar, click a stream name.
- 2 Click the **Segments** tab.

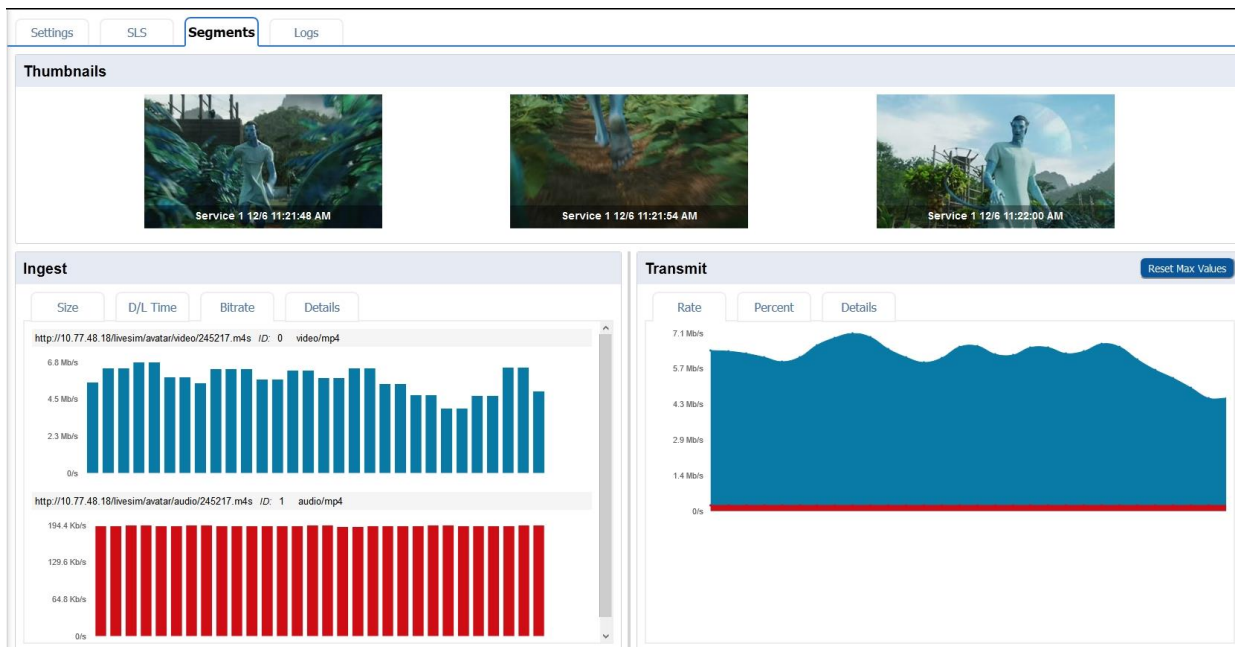


Figure 5-9: Encoder Segments tab

- 3 To view ingest stream details, click the tabs:

- Click **Size** to view the segment sizes.
See Figure 5-9. Each bar on the graph represents a segment.
- Click **D/L Time** to view download times of segments to the encoder.



Figure 5-10: Ingest D/L Time graphs

- Click **Bitrate** to view ingest segment bitrates.



Figure 5-11: Ingest Bitrate graphs

- Click **Details** to view more ingest details.
The details are since the last max values reset.
- 4 To view transmit details, click these tabs:
- Click **Rate** to view the transmit bitrates over time.



Figure 5-12: Transmit Rate graph

- Click **Percent** to view the transmit video and audio percentages.



Figure 5-13: Transmit Percent graph

- Click **Details** to view more transmit details.
The details are since the last max values reset.
- 5 Click the **Logs** tab to view the stream log.
For details, see ["Encoder Log Message Severity Levels."](#)
 - 6 To reset the ingest and transmit maximum values to zero, click **Reset Max Values**, and then click **OK**.
The zero values typically last less than a second.

6

Chapter 6: Server Administration

6.1 Set the System Date and Time

After GuideBuilder is installed, its system date and time must be set for accurate operation. You may also need to adjust these settings for time zone and daylight savings time changes later.

Before you begin

Triveni Digital recommends using Network Time Protocol (NTP) servers to synchronize the GuideBuilder system clock with your network. If you are using NTP, you need the IP addresses of a primary and (optional) secondary NTP server.

Steps

- 1 Under Server Settings, click **Date/Time**.
- 2 On the Date/Time Settings panel, click **Update Date/Time/NTP**.

Figure 6-1: Date/Time Settings panel

- 3 In the Update Date/Time dialog:
 - To set the date and time, click the arrows next to each field.
 - To use NTP, select **Enable NTP**, and then enter the IP address of the primary and secondary NTP server.

Figure 6-2: Update Date/Time

- 4 Click **OK**.
- 5 To select a time zone on the Date/Time Settings panel:

- a Click **Update Time Zone**.
- b In the Select a Time Zone dialog, select the appropriate UTC time zone.
- c Click **Select**.

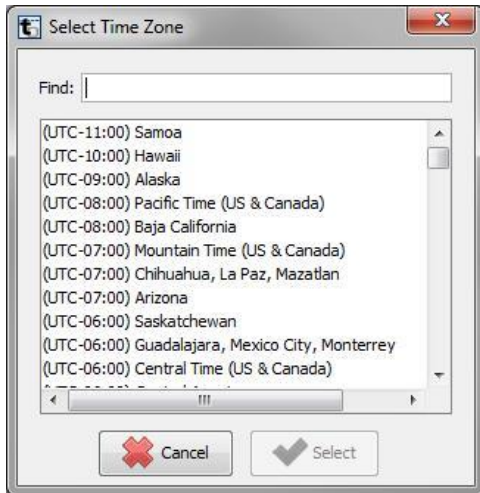


Figure 6-3: Select Time Zone

- 6 On the Date/Time Settings panel, click **Commit** to save the settings.

6.2 Configuring Network Settings

6.2.1 View or Change the GuideBuilder Network Settings

From the Network Settings panel, you can view and change the GuideBuilder server hostname and IP settings.

Before you begin

If you do not know the IP address of the GuideBuilder server, ask your system administrator.

Steps

- 1 On the Config App sidebar under Server Settings, click **Networking**.
The Network Settings panel opens.
- 2 To change the network name of the server, type a new hostname.

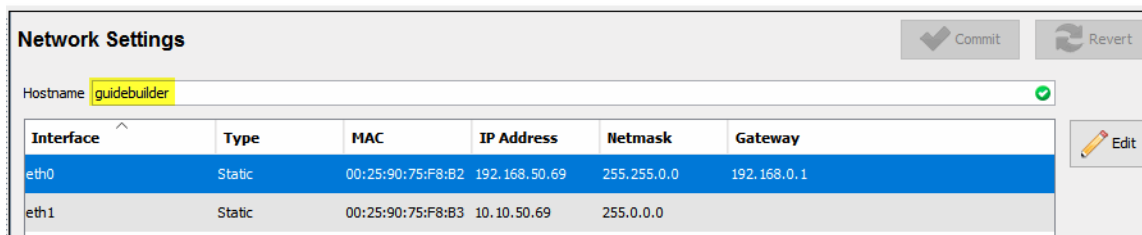


Figure 6-4: GuideBuilder server hostname

GuideBuilder is the default hostname.

- 3 To change the IP settings of an Ethernet interface, click **eth0** or **eth1**.
- 4 Click **Edit**.
- 5 In the Edit IP Settings dialog, enter or edit the settings for the Ethernet interface.

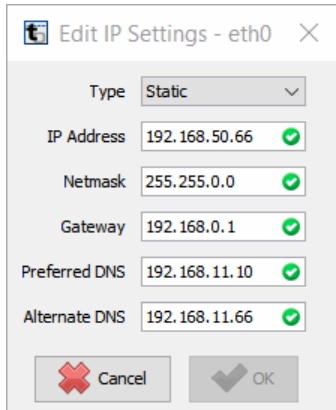


Figure 6-5: Edit IP Settings

For details, see “[GuideBuilder IP Settings](#).”

NOTE It is recommended to configure *eth0* for DHCP and to leave *eth1* unconfigured, but Ethernet networks vary.

- 6 Click **OK**.
- 7 In the Network Settings panel, click **Commit** to save the new settings.

6.2.2 GuideBuilder IP Settings

The Edit IP Settings dialog sets the IP addresses, as dotted-quad values, for the Ethernet connections to a GuideBuilder server.

Table 6-1: GuideBuilder IP Settings

Setting	Description
Type	IP address type: DHCP, Static, or Unconfigured
IP Address	IP address of the GuideBuilder server
Netmask	IP address of the subnet mask for the GuideBuilder server
Gateway	Default IP address of the gateway (router) for the GuideBuilder server
Preferred DNS	IP address of the primary Domain Name Server (DNS) for the GuideBuilder server
Alternate DNS	IP address of the secondary Domain Name Server (DNS) for the GuideBuilder server

6.3 Updating the GuideBuilder Software

Customers entitled to GuideBuilder software updates can download new releases from the GuideBuilder entitlement site and then upload the software updates to a GuideBuilder server.

Before you begin

To download GuideBuilder software updates, you need a GuideBuilder entitlement site username and password. If you do not have these, contact Triveni Digital customer support.

About this task

GuideBuilder software updates incorporate the previous GuideBuilder licensed features, as well as your previous GuideBuilder configurations.

NOTE Updating to a new dot release requires uploading a new license file for that release to the server. To learn how, see “[Activate a Software License](#).”

6.3.1 Download the GuideBuilder Software

- 1 Under Server Settings, click **Features**.
- 2 Click GuideBuilder Entitlement Site.
- 3 Enter a Username and Password.

Figure 6-6: GuideBuilder entitlement site login

- 4 Click **Submit**.
- 5 In the GuideBuilder entitlements list, locate the appropriate GuideBuilder release.

Product	Mfr	Serial Number	Dongle Key	ESSP			
GUIDEBUILDER.GB.5.1.0	ARIESYS	987654001	000-1	2015-12-31			
GUIDEBUILDER.GB.5.0.1	ARIESYS	987654321	000-1	2015-12-31			
GUIDEBUILDER.GB.5.0.2	ARIESYS	987654322	000-1	2015-12-31			
GUIDEBUILDER.GB.5.1.0	ARIESYS	987654324	000-1	2015-12-31			
GUIDEBUILDER.GB.5.2.0	ARIESYS	987654325	000-1	2015-12-31			
GUIDEBUILDER.GB.5.1.1	ARIESYS	987654326	000-1	2015-12-31			
GUIDEBUILDER.GB.5.0.3	ARIESYS	987654000	000-1	2015-12-31			
GUIDEBUILDER.GB.5.2.0	ARIESYS	987654328	000-1	2015-12-31			

Figure 6-7: GuideBuilder entitlements site

The GuideBuilder entitlement site lists the software releases available for your account. The serial number and ESSP end date of each release is displayed.

- 6 Click

6.3.2 Upload the Software Update

- 1 Under Server Settings, click **S/W Update**.
- 2 In the S/W Update panel, click **Upload S/W Update**.

Figure 6-8: S/W Update panel

The release number and build date of the GuideBuilder software currently installed on the server are displayed, as well as the release number to which you are entitled to update.

- 3 In the Select GuideBuilder Software Update File dialog, find the saved .deb file.

- 4 Click **Select**.
- 5 In the Software Update Confirmation dialog, select **Restart Options**.

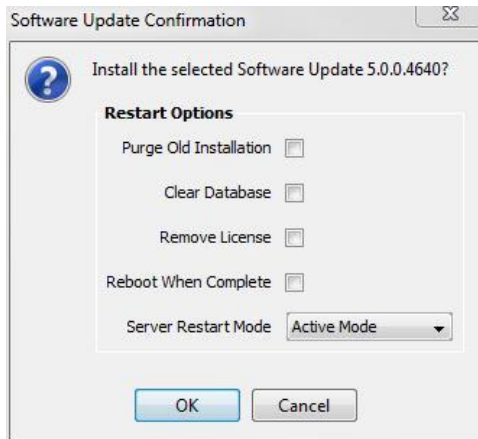


Figure 6-9: Software Update Confirmation

For details, see ["GuideBuilder Server Restart Options."](#)

- 6 Click **OK**.
A progress bar tracks the upload.
- 7 In the GuideBuilder Software Update dialog, click **OK**.
The Config App closes, and the selected restart options are executed.
- 8 After a few minutes, refresh the GuideBuilder welcome page in your web browser.

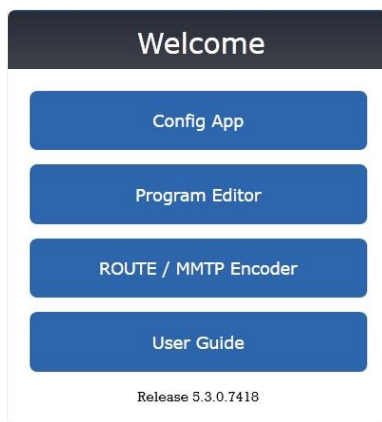


Figure 6-10: GuideBuilder Welcome page

The welcome page displays the new release number.

- 9 Click **Launch Config App** to start and log on the Config App.
An updated release of the GuideBuilder software opens.

What's next?

If you updated to a new dot release, you must upload the license file for that release to the GuideBuilder server.

Related topics

[Activate a Software License](#)

6.4 Managing User Accounts

6.4.1 About the Default User Account

The default GuideBuilder user account is (username) *admin*, (password) *admin*. This account has full administrative privileges.

NOTE The default account cannot be deleted, but its password can be changed.

6.4.2 About User Account Types

There are two types of GuideBuilder user accounts:

- Accounts with administrative privileges
- Accounts with Program Editor privileges only

Users with administrative privileges can log on the GuideBuilder Config App and the GuideBuilder Program Editor and access all their features. Users with Program Editor privileges can log on the Program Editor only and may have restricted access to the services in the Program Editor.

There can be multiple accounts with administrative privileges and multiple accounts with Program Editor privileges. However, only one user with administrative privileges can log on the Config App at a time. Multiple users with Program Editor privileges can log on the Program Editor simultaneously.

Related topic

[User Account Privileges](#)

6.4.3 Create a User Account

GuideBuilder users with administrative privileges can create new user accounts.

Steps

- 1 Under Server Settings, click **Users**.
- 2 In the Users panel, click **Add**.
- 3 In the Add User Name dialog, enter a **User Name**, **Password**, and then retype the password.



Figure 6-11: Add User Name

- 4 Select a Privilege level: **Admin** or **Program Editor Only**.
For details, see ["About the Default User Account."](#)
- 5 If you selected Admin, go to Step 11.
- 6 If you selected Program Editor Only, click **Select Authorized Services**.

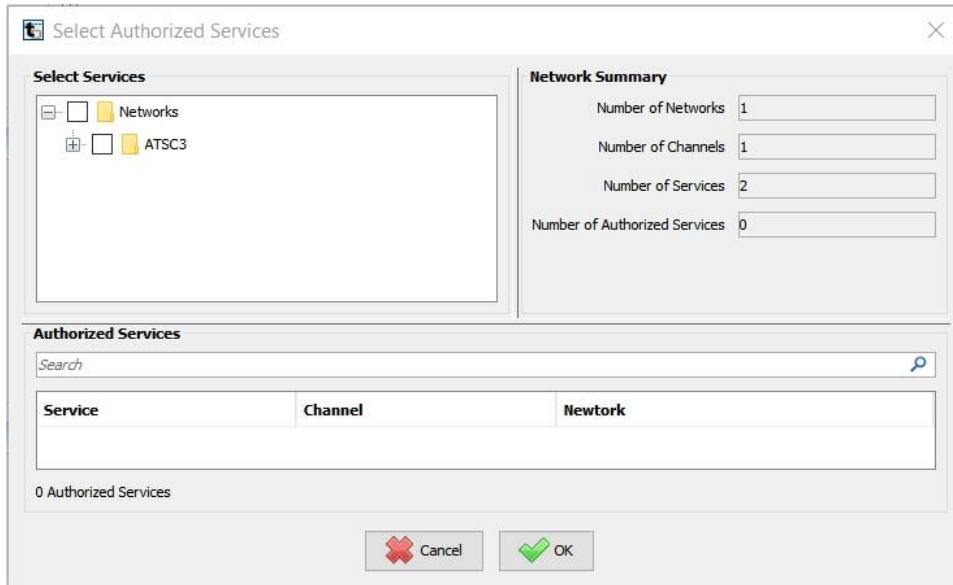


Figure 6-12: Select Authorized Services

- 7 Under Authorized Services, expand the tree of available services.
- 8 To view details about a network, channel, or service, click its name on the tree.

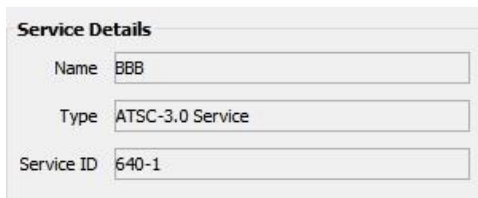


Figure 6-13: Authorized Services Service Details

The details appear in the upper right panel.

- 9 To authorize access to a network, channel, or service, select its checkbox. The services you selected appear in the lower panel.

TIP You can find a listed authorized service by searching for part or all its name in the Search field.

- 10 When you're done selecting services, click **OK**.
- 11 In Add User Name dialog, click **Add**.
- 12 On the Users panel, click **Commit**.

6.4.4 Edit a User Account

GuideBuilder users with administrative privileges can edit existing user accounts to change their passwords and privileges.

About this task

User names cannot be edited. To change the username of an existing account, first delete the account, and then create a new account with a new username.

Steps

- 1 Under Server Settings, click **Users**.
- 2 In the Users panel, click a **User Name**.
- 3 Click **Edit**.



Figure 6-14: Edit User Name

- 4 To change the password, type and retype a new password.
- 5 To change the privileges of a Program Editor user account:
 - a Click **Select Authorized Services**.
 - b In the Select Authorized Services dialog, select and deselect services.
For details, see "[Create a User Account](#)."
 - c Click **OK**.
- 6 In the Edit User Name dialog, click **Update**.
- 7 On the Users panel, click **Commit** to commit the user account to the database.

6.4.5 Delete a User Account

GuideBuilder users with administrative privileges can delete existing user accounts.

NOTE The default user account cannot be deleted.

Steps

- 1 Under Server Settings, click **Users**.
- 2 In the Users panel, click a **User Name**.
- 3 Click **Remove**.
- 4 In the confirmation dialog, click **Yes**.
- 5 Click **Commit** to delete the user account from the database.

Result

The user account cannot be used to log on GuideBuilder applications.

6.4.6 User Account Privileges

GuideBuilder user accounts can be assigned these levels of privileges.

Table 6-2: User Account Privileges

Privilege Level	Description
Admin	Can log on and use the Config App and Program Editor, and perform all GuideBuilder functions, including starting and stopping the server, configuring settings, managing user accounts, and viewing and editing event schedules.
Program Editor Only	Can log on and use only the Program Editor to view and edit event schedules, etc. Cannot perform GuideBuilder administrative functions such as changing configuration settings.

6.5 Viewing the Activity Log

6.5.1 View Event Log Messages

To check the time, source, and status of important GuideBuilder server events, you can view event log messages.

About this task

Event log messages include information about schedule downloads, configuration changes, database backups, and other server events critical to program guide metadata generation. Event log messages have three severity levels. For details, see “[Event Log Message Severity Levels.](#)”

NOTE Activity Logs can list up to 10,000 event log messages, based on their recency.

Steps

- 1 Under Status, click **Activity Log**.
- 2 In the Activity Log panel, click the **Event Log Messages** tab.

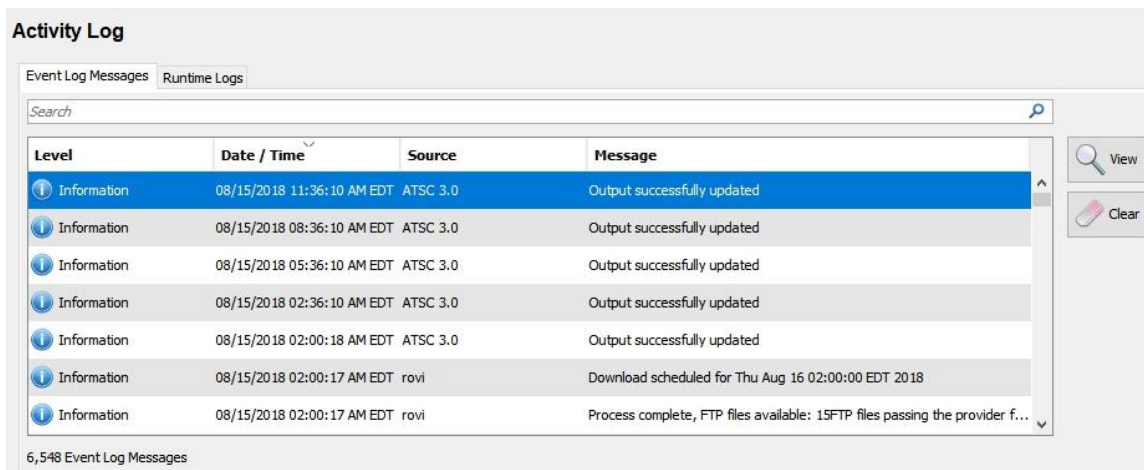


Figure 6-15: Activity Log

TIP To clear the event log messages in the Activity Log from the database, click Clear, and then click OK.

- 3 To sort the event log messages, click a column heading.
For example, to sort the log messages by severity level, click **Level**.
- 4 To view a message, select it, and then click **View**.
The View Event Log Message dialog opens.

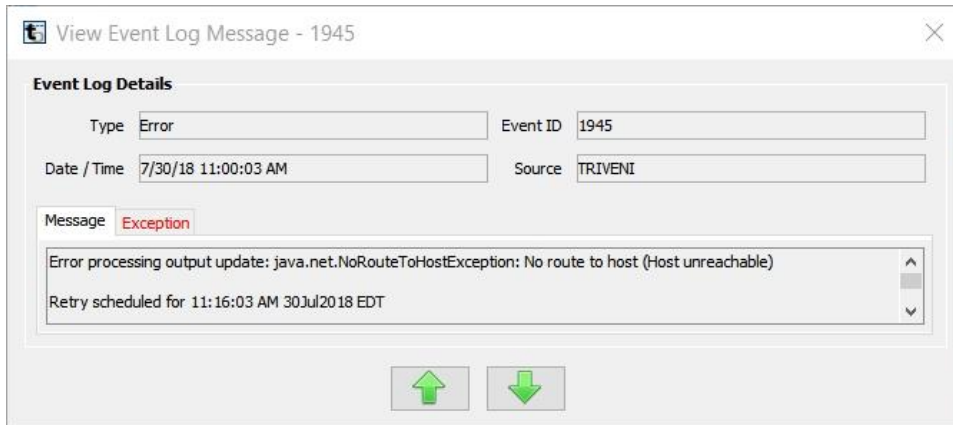


Figure 6-16: View Event Log Message

For details, see “Event Log Details.”

- 5 Click the **Exception** tab to view its stack trace exception code.
- 6 To view the next or previous log message, click ↓ or ↑.
- 7 Click **X** to close log message window.

6.5.2 Event Log Message Severity Levels

In the Activity Log panel, event log message severities are indicated by these icons.

Table 6-3: Event Log Message Severity Levels

Level	Icon	Description
Information		An event is in progress or successfully occurred.
Warning		An event important but not critical to program guide generation failed to process successfully.
Error		An event critical to program guide generation failed to process successfully.

6.5.3 Event Log Details

The View Event Log Message dialog displays details for the events in the Activity Log.

Table 6-4: Event Log Details

Setting	Description
Type	Type and severity level of the event message: error, warning, or information
Date/Time	Date and time the event
Event ID	Numeric identifier assigned by GuideBuilder to the event
Source	Source component of the event
Message	Brief description of the event
Exception	Stack trace exception code for the event

6.5.4 View and Export Runtime Log Files

For troubleshooting purposes, you can view the daily GuideBuilder server runtime log files. You can also export these runtime log files to an external directory, so they can be archived or sent to Triveni Digital customer support for assistance.

About this task

Each runtime log file lists the times, sources (logger), severity levels, IO exceptions, and messages for all the GuideBuilder server events that occurred on a given calendar day. Runtime log files are exported and archived as compressed HTML files.

Steps

- 1 Under Status, click **Activity Log**.
- 2 In the Activity Log panel, click the **Runtime Logs** tab.
- 3 To view a log file, select the file and then click **View**.

Log session start time Sun Jul 21 07:30:29 EDT 2013			
Time	Logger	Level	Message
07:30:29 AM 07/21/13	FixedRateDataMux	INFO	FixedRateDataMuxThread: maxBitrate: 2300000, targetBurstSize: 112800, targetIntervalSleepInMillis: 50
07:30:29 AM 07/21/13	FixedRateDataMux	INFO	FixedRateDataMuxThread: maxBitrate: 2300000, targetBurstSize: 112800, targetIntervalSleepInMillis: 50
07:30:30 AM 07/21/13	FixedRateDataMux	INFO	FixedRateDataMuxThread: maxBitrate: 2300000, targetBurstSize: 112800, targetIntervalSleepInMillis: 50
07:30:30 AM 07/21/13	FixedRateDataMux	INFO	FixedRateDataMuxThread: maxBitrate: 2300000, targetBurstSize: 112800, targetIntervalSleepInMillis: 50
07:30:30 AM 07/21/13	FixedRateDataMux	INFO	FixedRateDataMuxThread: maxBitrate: 2300000, targetBurstSize: 112800, targetIntervalSleepInMillis: 50
07:30:30 AM 07/21/13	FixedRateDataMux	INFO	FixedRateDataMuxThread: maxBitrate: 2300000, targetBurstSize: 112800, targetIntervalSleepInMillis: 50

Figure 6-17: Sample Runtime Log File

The file opens in a browser window. Scroll down to view its contents.

- 4 To export a runtime log file:
 - a On the Activity Log page, select a log file, and then click **Export**.
 - b Locate a directory.
 - c Type a name for the file, and then click **Select**.
 - d In the GuideBuilder Logs Export Complete dialog, click **OK**.

Result

The runtime log file is downloaded to the selected directory. You can view the file by opening it in a web browser.

6.6 Using Redundant GuideBuilder Servers

6.6.1 About GuideBuilder Redundancy

To ensure the uninterrupted output of EPG metadata to transport streams and services, a redundant GuideBuilder server can be connected to a primary GuideBuilder server. Once connected and configured, the redundant server copies the program schedule database of the primary server whenever changes are made to the outputs, but it does not generate outputs. In a failover situation, the redundant server can be switched to download program schedules from the listing services and output EGP metadata until problems with the primary server are corrected.

NOTE The redundant GuideBuilder server also copies the configuration settings from the primary server whenever the system modes are switched, or the redundant server is restarted for other reasons.

6.6.2 GuideBuilder System Modes and Types

Primary and redundant GuideBuilder server types have these system modes.

Table 6-5: GuideBuilder System Modes and System Types

System Mode	System Types	Description
Active	Primary or Redundant	The primary or redundant server downloads the program schedules and outputs EPG metadata.
Passive	Primary only	The primary server downloads program schedules but does not output EPG metadata.
Redundant	Redundant only	The redundant server copies configuration changes from the primary server but does not download program schedules or output EPG metadata.

6.6.3 Configure the Redundant GuideBuilder Server

To enable GuideBuilder redundancy, you configure a redundant GuideBuilder server that is connected to a primary GuideBuilder server.

Before you begin

You must have a primary GuideBuilder server installed, configured, and operating to have a redundant GuideBuilder system.

About this task

You can set up a General Purpose Input (GPI) device for use with the redundant GuideBuilder server. A GPI device enables the redundant server to be switched over from Redundant Mode for backup to Active Mode for EPG output from a button on the device.

Steps

- 1 Install the redundant GuideBuilder server at the appropriate site.
To learn how, see ["Set up the GuideBuilder Server."](#)
- 2 If you have a GPI device, connect it to the redundant server.
For details, contact Triveni Digital Customer Support.
- 3 Launch the Config App of the redundant server.

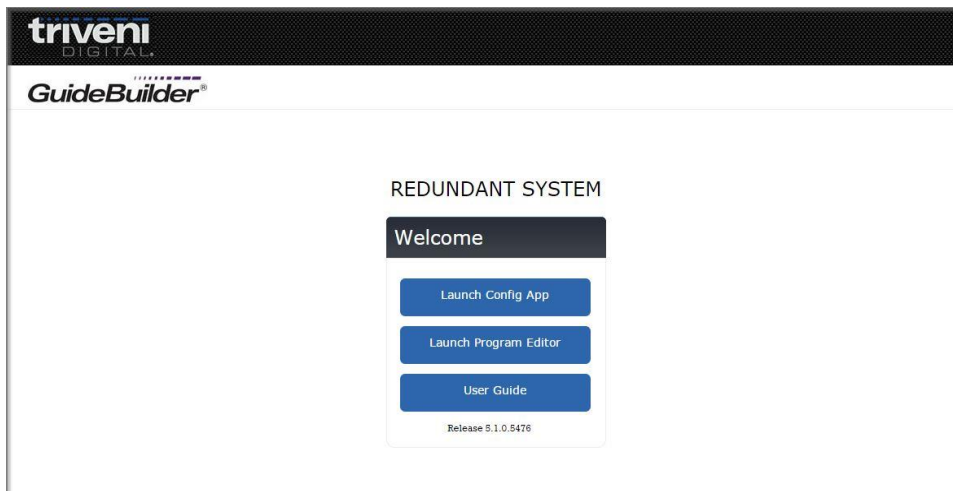


Figure 6-18: GuideBuilder welcome page for a redundant system

- 4 Log on the Config App of the redundant server.
For details, see ["Log on the Config App."](#)

5 Under Server Settings, click **Redundancy**.

The Redundancy Settings panel opens.

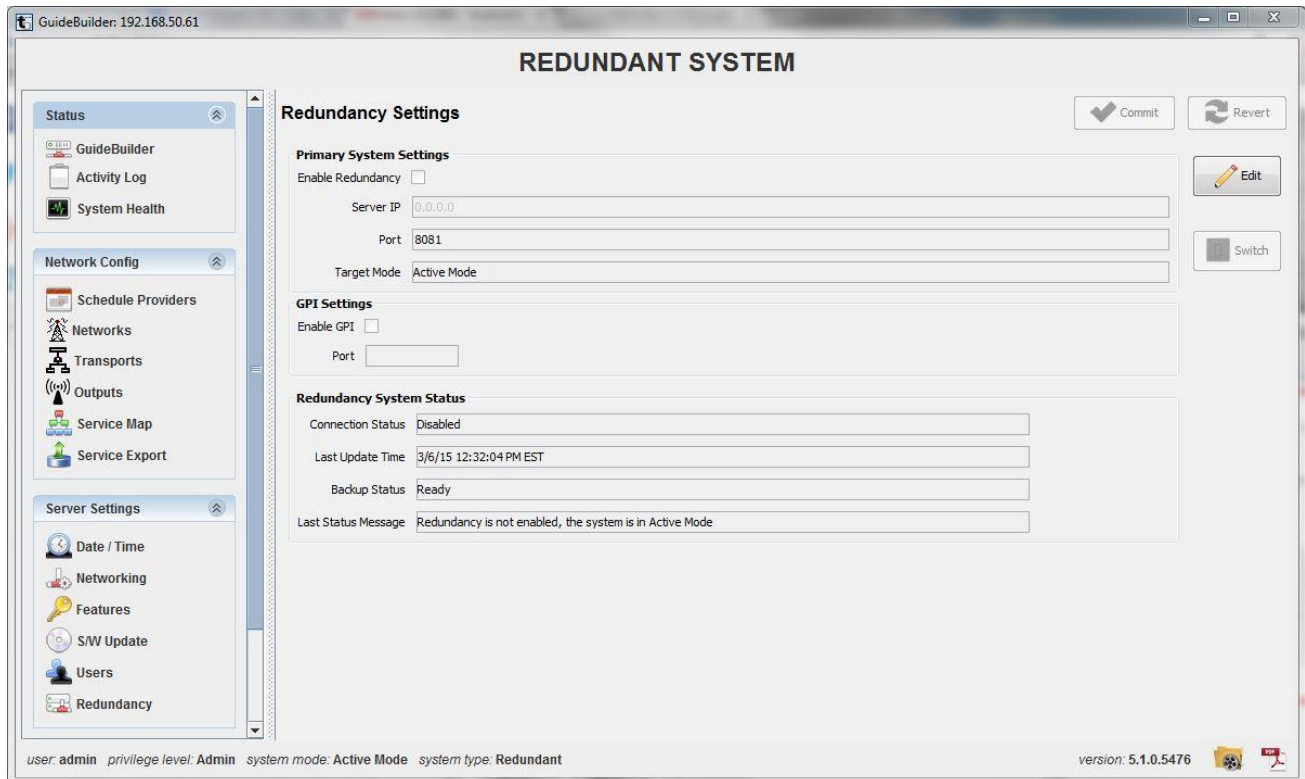


Figure 6-19: Redundant Settings panel for a redundant system

6 Click **Edit**.

7 In the Edit Redundancy Settings dialog, select **Enable Redundancy**.

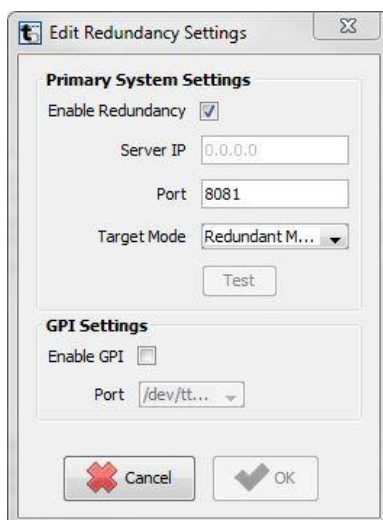


Figure 6-20: Edit Redundancy Settings

8 Enter the Primary System Settings:

- **Server IP** – the IP address of the primary GuideBuilder server.
- **Port** – The Ethernet port on the primary GuideBuilder through which it is connected to the redundant GuideBuilder server for downloading data, by default 8081.

- **Target Mode** - The system mode of the redundant server. By default, it is Redundant Mode (for backup) when redundancy is enabled.

TIP To verify that the settings for the primary server are correct, click **Test**.

- 9 If you are using a GPI device, select **Enable GPI** and the serial **Port** on the redundant server connected to the GPI device.
- 10 Click **OK**.
- 11 In the Redundancy Settings panel, click **Commit**.
- 12 In the Commit Warning window, click **Yes**.
- 13 In the Server Connection Closed window, click **OK**.

The Config App closes. Wait a few minutes for the redundant server to restart.

NOTE When the redundant server restarts, it downloads data from the primary server to be updated.

- 14 Launch and log back into the Config App of the redundant server.
- 15 Under Server Settings, click **Redundancy**.

The Redundancy Settings panel displays the current redundancy system status.

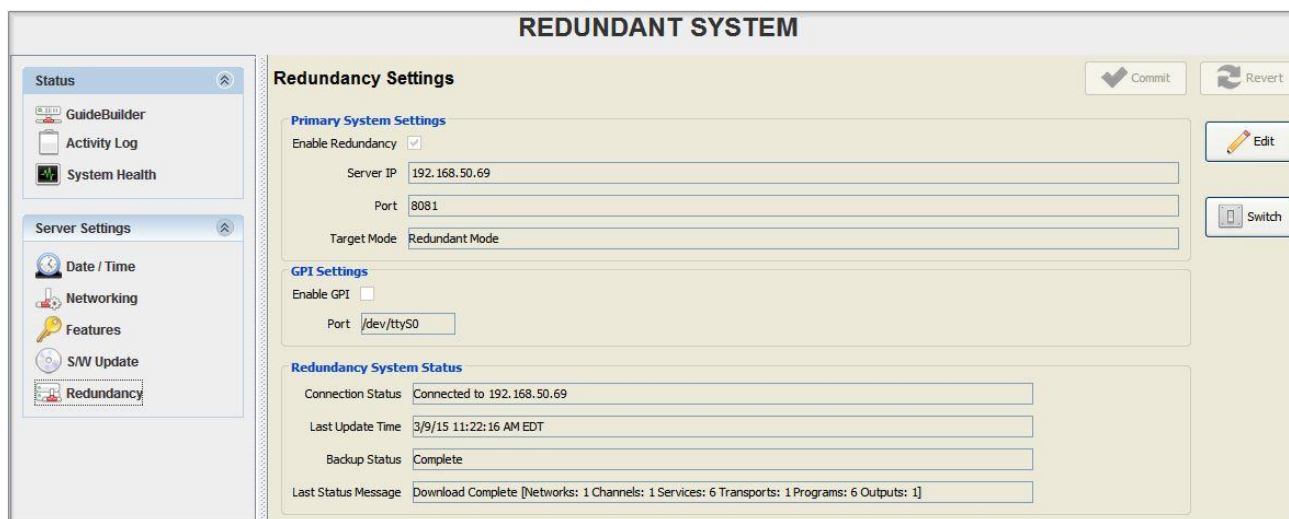


Figure 6-21: GuideBuilder configured for redundancy

The redundant GuideBuilder server performs only backups in Redundant Mode, so its Config App sidebar is simplified.

Result

The redundant server is configured and operating in Redundant Mode, copying the program schedule database from the primary server when the outputs are updated.

6.6.4 Switchover to the Redundant GuideBuilder Server

Once a redundant GuideBuilder server has been connected and configured to a primary GuideBuilder server, the program schedule download and EPG output functions can be switched over to the redundant server if needed (for example, for troubleshooting or repairing the primary server).

Before you begin

Log on the Config Apps of both the primary and redundant GuideBuilder servers. For details, see "Log on the Config App."

About this task

If primary and redundant GuideBuilder servers are connected to a General Purpose Input (GPI) device, switchover to the redundant server can usually be accomplished by pressing a button on the device.

Steps

- 1 In the Config App of the redundant server, Under Server Settings, click **Redundancy**.
- 2 In the Redundancy Settings panel, click **Switch**.
- 3 In the Commit Warning window, click **Yes**.
- 4 In the Server Connection Closed window, click **OK**.
The Config App of the redundant server closes, and the redundant server restarts.
- 5 In the Config App of the primary server, click **OK** in the Server Connection Closed window.
The Config App of the primary server closes, and the primary server restarts.
- 6 Launch and log on the Config Apps of the primary and redundant GuideBuilder servers.

Result

The redundant server is in Active Mode, and the primary server is in Passive Mode.

6.6.5 Switchback to the Primary GuideBuilder Server

If the program schedule download and EPG outputs functions have been switched over to the redundant GuideBuilder server, you can switch them back to the primary server when ready.

Before you begin

Log on the Config Apps of both the primary and redundant GuideBuilder servers. For details, see “Log on the Config App.”

About this task

Switching back involves restarting the primary GuideBuilder server.

Steps

- 1 In the Config App of the redundant server, Under Server Settings, click **Redundancy**.
- 2 In the Redundancy Settings panel, click **Switch**.
- 3 In the Commit Warning window, click **Yes**.
- 4 In the Server Connection Closed window, click **OK**.
The Config App of the redundant server closes, and the redundant server restarts.
- 5 In the Config App of the primary server, under Status in the sidebar, click **System Health**.
- 6 Under System Control, click **Restart**.



Figure 6-22: System Control panel

- 7 In the Restart GuideBuilder Confirmation dialog, select **Active Mode** as the Server Restart Mode and other restart options.

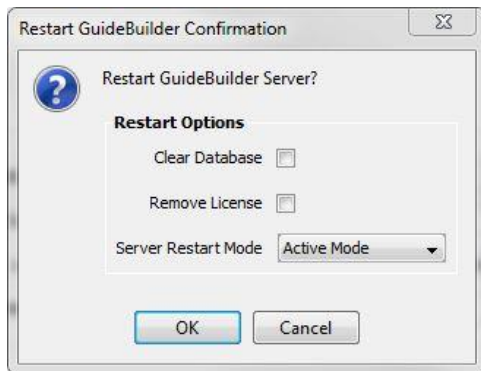


Figure 6-23: Restart GuideBuilder Confirmation

For details, see ["GuideBuilder Server Restart Options."](#)

- 8 Click **OK**.
- 9 In the GuideBuilder Restart window, click **OK**.
The Config App of the primary server closes, and the primary server restarts in a few minutes.
- 10 Launch and log on the Config Apps of the primary and redundant GuideBuilder servers.

Result

The primary server returns to Active Mode, and the redundant server returns to Redundant Mode.

6.7 Configuring Error Notifications

6.7.1 About GuideBuilder Notifications

GuideBuilder can be configured to send traps to a Simple Network Management Protocol (SNMP) manager server. The SNMP traps are defined in the GuideBuilder MIB and are organized into three types: input errors, internal errors, and output errors.

GuideBuilder can also be configured to send emails and Short Message Service (SMS) text messages via a Simple Mail Transfer Protocol (SMTP) server. These email notifications contain the GuideBuilder trap information in greater detail.

6.7.2 Configure SNMP Settings

For an SNMP manager to receive traps from the GuideBuilder server, it must be configured in the Config App and registered with the GuideBuilder server. Users with admin privileges can add, edit, and delete SNMP settings, as well as view the GuideBuilder Management Information Base (MIB).

Steps

- 1 In the Config App under Notifications, click **SNMP**.
- 2 In the SNMP Settings panel, click **Text Format** or **HMTL Format** to view the GuideBuilder MIB.



The screenshot shows the 'SNMP Settings' panel. At the top right are 'Commit' and 'Revert' buttons. The 'SNMP Parameters' section contains three input fields: 'System Name', 'System Location', and 'Community ReadOnly String' (with 'public' entered). To the right is a 'View MIB' section with 'Text Format' and 'HTML Format' buttons. Below is the 'SNMP Managers' section, which includes a search bar and a table with columns 'Manager Name', 'IP Address', and 'SNMP Version'. The table is currently empty. To the right of the table are 'Add', 'Remove', and 'Edit' buttons. At the bottom left, it says '0 SNMP Managers'.

Figure 6-24: SNMP Settings panel

The MIB opens in the web browser.

```

TRIVENI-GUIDEBUILDER-MIB DEFINITIONS ::= BEGIN

IMPORTS
    enterprises,
    MODULE-IDENTITY,
    OBJECT-TYPE,
    NOTIFICATION-TYPE,
    IpAddress,
    Unsigned32
        FROM SNMPv2-SMI
    DisplayString,
    DateAndTime,
    TEXTUAL-CONVENTION
        FROM SNMPv2-TC
    OBJECT-GROUP,
    NOTIFICATION-GROUP
        FROM SNMPv2-CONF;

gbModule MODULE-IDENTITY
    LAST-UPDATED "201304301940Z" -- Apr 30, 2013 7:40:00 PM
    ORGANIZATION "Triveni Digital, Inc."
    CONTACT-INFO
        "Triveni Digital, Inc.
        40 Washington Road
        Princeton Junction, NJ 08550
        Phone: 609-936-3434
        Fax: 609-716-3503
        Email: support@TriveniDigital.com
        Web: http://www.trivenidigital.com/"

    DESCRIPTION
        ""
        -- 1.3.6.1.4.1.8716.4.1
        ::= { enterprises 8716 4 1 }

GbModuleStateType ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        "Indicates current state of GuideBuilder module"
    SYNTAX INTEGER {

```

Figure 6-25: GuideBuilder MIB, HTML Version

- 3 In the SNMP Settings panel, enter SNMP parameters.
For details, see "SNMP Parameters."
- 4 Under SMNP Managers:
 - To create a new SNMP manager, click **Add**.
 - To change an SNMP manager, click it, and then click **Edit**.
 - To delete a configured SNMP manager, click it, and then click **Remove** and **Yes**.
- 5 If you clicked Add or Edit, enter SNMP manager settings.

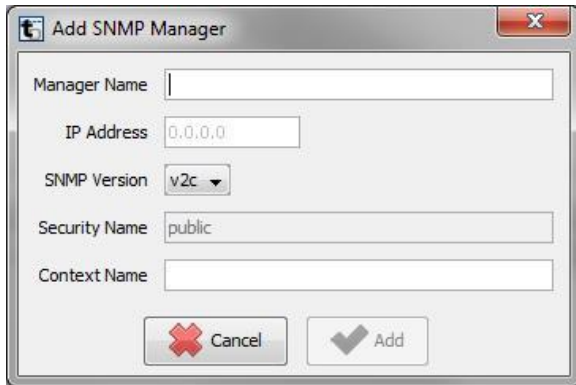


Figure 6-26: Add or Edit SNMP Manager

For details, see “SNMP Manager Settings.”

- 6 When done, click **Add** or **Update**.
- 7 On the SNMP Settings panel, click **Commit** to commit the configuration to the database.

6.7.3 SNMP Parameters

The SNMP Settings panel displays the SNMP parameters.

Table 6-6: SNMP Parameters

Setting	Description
System Name	Name identifying the SNMP agent on the GuideBuilder server, typically “GuideBuilder”
System Location	Geographic or system location of the GuideBuilder server (with the SNMP agent). This value will appear in the SNMP traps.
Community Read-Only String	Defines the community string used by the SNMP manager to access the GuideBuilder MIB. Typically, <i>public</i> is the community string used in most environments.

6.7.4 SNMP Manager Settings

The SNMP Settings panel displays the SNMP Manager settings.

Table 6-7: SNMP Manager Settings

Setting	Description
Manager Name	Name of the SNMP manager server
IP Address	IP address of the SNMP manager server, in the form of a dotted quad, that is, xxx.xxx.xxx.xxx.
SNMP Version	Version for the specified SNMP manager. GuideBuilder supports SNMP v1 and v2c. If v2c is selected, a Context Name can be entered.
Security Name	Community string used to authenticate the SNMP manager. The default value is <i>public</i> .
Context Name	In SNMP v2c, an octet string identifying the GuideBuilder MIB.

6.7.5 Configure SMTP Email Settings

Users with administrative privileges can configure GuideBuilder to send email and/or SMS text messages to specified email addresses via a SMTP server.

Steps

- 1 In the Config App under Notifications, click **SMTP/Email**.

- In the SMTP/Email panel, click **Edit**.

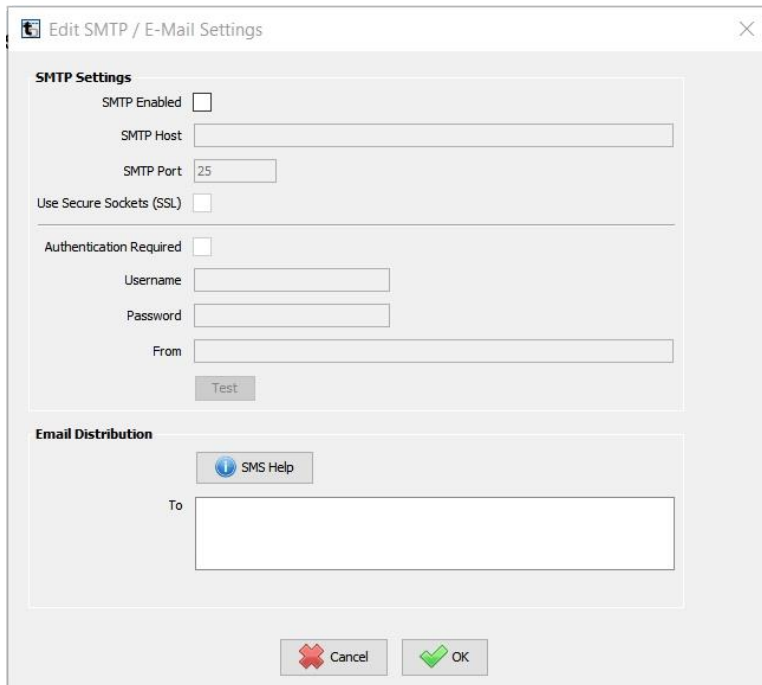


Figure 6-27: Edit SMTP/Email Settings

- In the Edit SMTP/Email Settings dialog, enter or edit the SMTP settings. For details, see “SMTP Email Settings.”
- To test the SMTP settings, click **Test**.
- In the To box under Email Distribution, type one or more comma-separated email addresses:
 - For email addresses, use the standard <name>@<domain>.com format.
 - For SMS text messages, use the address format of the carrier. For details, click SMS Help.
- Click **OK**.

Result

The email settings are saved to the GuideBuilder server database.

6.7.6 SMTP Email Settings

The SMTP/Email Settings panel sets the parameters for sending standard and SMS email notifications from GuideBuilder.

Table 6-8: SMTP/Email Settings

Setting	Description
SMTP Host	IP address of the SMTP mail server. The mail server must be accessible from a network interface. It is possible to define a name service if the system is using a static configuration but not via the web interface. For details, contact Triveni Digital customer support.
SMTP Port	Port number of the SMTP service on the mail server. Typically, it is port 25.
Use Secure Sockets (SSL)	Selects the Secure Sockets Layer protocol for communications between the GuideBuilder server and the mail server. If selected, sets the SMTP port to 465.
Authentication Required	Indicates if an authentication is required by the mail server
Username	Username to log on the SMTP server if authentication is required
Password	Password to log on the SMTP server if authentication is required

From	Name or other identifier to appear in the "From" field of email notifications
Email Distribution To	Standard email and/or SMS addresses for notifications, separated by commas

6.8 Turning off a GuideBuilder Server

6.8.1 Restart, Reboot, or Shutdown a GuideBuilder Server

For upgrades and other operational purposes, you can restart, reboot, or shutdown a GuideBuilder server from the GuideBuilder config app.

CAUTION Restarting, rebooting, or shutting down the GuideBuilder system interrupts or stops PSIP/DVB-SI generation.

Steps

- 1 Under Status, click **System Health**.

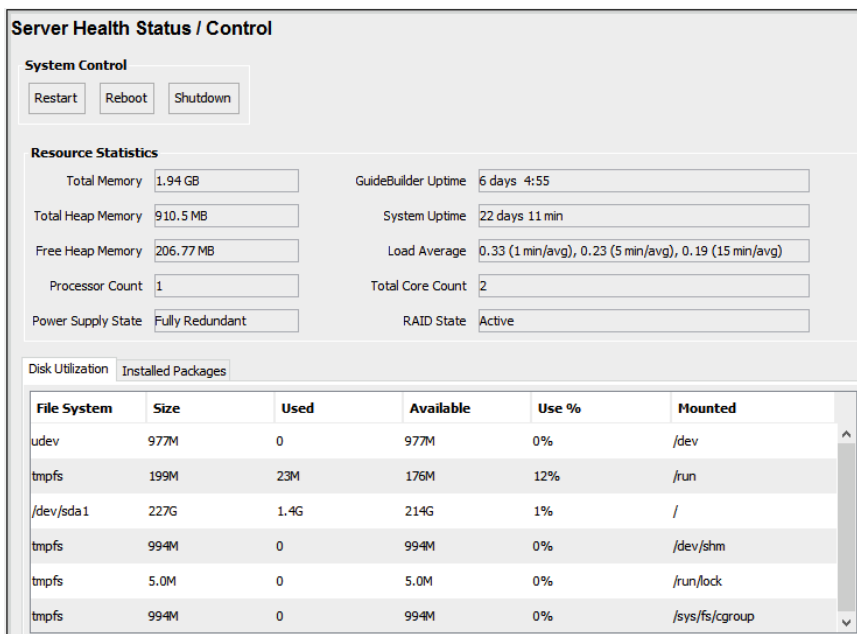


Figure 6-28: Server Health Status/Control

The Server Health Status/Control panel displays the CPU and memory (RAM and disk) usage of the GuideBuilder server. For details, see ["Resource Statistics and Disk Utilization."](#)

- 2 Do one of the following:
 - To restart the GuideBuilder server, click **Restart**.
 - To reboot the GuideBuilder server, click **Reboot**.
 - To shut down the GuideBuilder server, click **Shutdown**.

For details, see ["GuideBuilder System Controls ."](#)

6.8.2 GuideBuilder System Controls

The Server Health/Status Control panel includes the following options for turning off and restarting a GuideBuilder server

Table 6-9: GuideBuilder System Controls

Option	Description
Restart	Temporarily stops and then starts the GuideBuilder server. The start causes the GuideBuilder application software to be launched. The SNMP sub-agent is started. Other system services, such as the web server and primary SNMP server, are not affected.
Reboot	Reboots the GuideBuilder server. All program guide generation operations are terminated, the operating system is gracefully stopped and the hardware platform resets. The operating system then restarts, and GuideBuilder resumes operations. The GuideBuilder web-based user interface is unavailable during the reboot, and a new login is required after the server is restored. NOTE A GuideBuilder server may take approximately two to three minutes to reboot.
Shutdown	Powers off the GuideBuilder server. All program guide generation operations are terminated, the operating system is gracefully stopped, and the hardware platform powers off. Shutdown can also be initiated by pressing the power button on the front of the server. Pressing the button once and releasing causes a graceful shutdown. Pressing the power button for more than three seconds forcibly removes power from the system, like disconnecting the power cord. This can cause data loss since the operating system may or may not have had time to back up crucial information to the hard drives.

6.8.3 GuideBuilder Server Restart Options

These are the options for restarting the GuideBuilder server after a software update.

Table 6-10: GuideBuilder Server Restart Options

Option	Description
Purge Old Installation	Remove all code and data of the previous version from the GuideBuilder server.
Clear Database	Delete the GuideBuilder configuration data.
Remove License	Delete the GuideBuilder license from the server installation.
Reboot When Complete	Reboot the GuideBuilder server after the software update is complete. If not selected, the Config App restarts, but the server does not reboot.
Server Restart Mode	<ul style="list-style-type: none"> <i>Active Mode</i> – Restarts the Config App so that users can log in and configured program guide data outputs are active. This is the default restart mode. <i>Passive Mode</i> - Restarts the Config App so that users can log in and configure data, but the program guide data outputs are not active. Select this restart mode if the Config App requires configuration before outputs are valid. <i>Maintenance Mode</i> – The updated Config App is installed on the GuideBuilder server but cannot be accessed via login, and no outputs are active. Select this mode for troubleshooting.

6.8.4 Resource Statistics and Disk Utilization

The Server Health Status/Control panel displays resource and disk utilization statistics for the GuideBuilder server.

Table 6-11: GuideBuilder Server Resource Statistics and Disk Utilization

Panel	Setting	Description
Resource Statistics	Total Memory	Megabytes of RAM in the GuideBuilder server that can be used by the operating system and applications.
	Total Heap Memory	Megabytes of RAM that can be allocated for use by processes on the GuideBuilder server.
	Free Heap Memory	Megabytes of RAM currently not allocated for use by processes on the GuideBuilder server.
	Processor Count	Number of CPUs in the GuideBuilder server.

Power Supply State	Fully Redundant, Redundancy Lost, and Unavailable (GuideBuilder can't determine the number of power supplies).	
GuideBuilder Uptime	Days, hours, and minutes since the Config App was last launched and logged in to.	
System Uptime	Days, hours, and minutes since the GuideBuilder server was last restarted, rebooted, or shutdown (aka OS uptime).	
Load Average	Average computer units per second for one-, five-, and 15-minute periods.	
Total Core Count	Number of CPU cores in the GuideBuilder server.	
RAID State	RAID disks are Active, Degraded (one of the two disks failed), or Recovering (GuideBuilder is synchronizing the two disks to return to the Active state).	
Disk Utilization	File System	Name of a file system on the server disk drive.
	Size	Memory size in gigabytes or megabytes of the file system.
	Used	Memory currently used to store data in the file system.
	Available	Unused memory available in the file system.
	Use %	Percentage of memory in the file system currently storing data.
	Mounted	Mount point of the file system on the disk drive.

Appendix: References



This appendix contains a list of documentation references for this user guide.

ATSC Standards

These documents are available for download from the ATSC website at <http://www.atsc.org/>.

A/52: Digital Audio Compression (AC-3, E-AC-3)

This document specifies coded representation of audio information and the decoding process, as well as information on the encoding process. The coded representation specified is suitable for use in digital audio transmission and storage applications, and may convey from 1 to 5 full bandwidth audio channels, along with a low-frequency enhancement channel.

A/53: ATSC Digital Television

The Digital Television Standard describes the system characteristics of the advanced television (ATV) system. The document and its normative Parts provide detailed specification of the parameters of the system including the video encoder input scanning formats and the preprocessing and compression parameters of the video encoder, the audio encoder input signal format and the pre-processing and compression parameters of the audio encoder, the service multiplex and transport layer characteristics and normative specifications, and the VSB RF/Transmission subsystem.

A/65: PSIP for Terrestrial Broadcast and Cable

This document defines a standard for System Information (SI) and Program Guide (PG) data compatible with digital multiplex bit streams constructed in accordance with ISO/IEC 13818-1 (MPEG-2 Systems). The document defines the standard protocol for transmission of the relevant data tables contained within packets carried in the transport stream multiplex.

A/69: PSIP Implementation Guidelines for Broadcasters

Provides a set of guidelines for the use and implementation of the ATSC Program and System Information Protocol. The guidelines apply to broadcasters, network operators, infrastructure manufacturers, and receiver manufacturers.

A/76: Programming Metadata Communication Protocol

This standard defines a method for communicating metadata related to PSIP (Program and System Information Protocol), including duplicate data that needs to be entered in other locations in the Transport Stream. Communication is based on a protocol utilizing XML message documents generated in accordance with a Programming Metadata Communication Protocol (PMCP) XML Schema.

A/153: ATSC-Mobile DTV

This standard describes the ATSC Mobile DTV system, hereafter referred to as the ATSC mobile/handheld (M/H) system. The M/H system provides mobile/pedestrian/handheld broadcasting services using a portion of the ~19.39 Mbps ATSC 8-VSB payload, while the remainder is still available for HD and/or multiple SD television services. The M/H system is a dual-stream system—the ATSC service multiplex for existing digital television services and the M/H service multiplex for one or more mobile, pedestrian and handheld services.

A/300: ATSC 3.0 System

This standard describes the ATSC 3.0 digital television system. ATSC 3.0 is a suite of voluntary technical Standards and Recommended Practices that is fundamentally different from predecessor ATSC systems and is therefore largely incompatible with them.

A/330: Link-Layer Protocol

This standard defines the ATSC Link-Layer Protocol (ALP). ALP corresponds to the data link layer in the OSI 7-layer model. ALP provides a path to deliver IP packets, link layer signaling packets, and MPEG-2 Transport Stream (TS) packets down to the RF Layer and back, after reception. ALP also optimizes the proportion of useful data in the ATSC 3.0 Physical Layer.

A/331: Signaling, Delivery, Synchronization, and Error Protection

This document specifies protocols used for delivery and synchronization of media and non-timed data in the ATSC 3.0 system. A/331 specifies the technical mechanisms and procedures pertaining to service signaling and IP-based delivery of a variety of ATSC 3.0 services and contents to ATSC 3.0-capable receivers over broadcast, broadband, and hybrid broadcast/broadband networks.

A/332: Service Announcement

The normative portions of this document define a standard for announcement of services in an ATSC 3.0 broadcast. A component of A/332 is the accompanying schema.

DVB Documents

These documents are available for download from the DVB website at <http://www.etsi.org/>.

EN300 468: Specification for Service Information (SI) in DVB Systems

This document specifies the Service Information (SI) data which forms a part of DVB bitstreams, in order that the user can be provided with information to assist in selection of services and/or events within the bitstream, and so that the Integrated Receiver Decoder (IRD) can configure itself for the selected service.

Electronic Industry Association Standards

Electronic Industry Association documents can be purchased from the Global Engineering Documents website at <http://global.ihs.com>.

EIA-708A: Specification for Advanced Television Closed Captioning (ATVCC)

This document provides a definition of ATV closed captioning and guidelines for caption service providers and manufacturers of ATVCC decoders and encoders.

EIA-766: U.S. RRT and Content Advisory Descriptor for Transport of Content Advisory Information using ATSC A/65 PSIP

This standard augments ATSC Standard N65 23 Dec 1997 and SCTE DVS-097 Rev. 7, i0 Nov 1997 which are identical and are both titled Program and System Information Protocol for Terrestrial Broadcast and Cable (PSIP). Along with the above two standards, this standard designates the RRT which provides the receiver with the definition of the rating system and the Content Advisory Descriptor which provides the receiver with the specific program rating for each program. Specifically, this standard specifies the exact syntax to be used to define the U.S. Rating Region Table (RRT) in accordance with Section 6.4 of N65 as well as the exact syntax to be used in the Content Advisory Descriptors that convey the rating information for each program in accordance with Section 6.7.4 of N65. Thus D N receivers may block unwanted programs as determined by the user.

ISO/IEC Documents

ISO/IEC documents can be purchased from the ISO website at: <http://www.iso.ch/>.

13818-1 Generic coding of moving pictures and associated audio, Part 1: Systems

From the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC), this document defines standards for MPEG-2 Systems, which form the infrastructure for delivery of audio and video information in many industry sectors, including television distribution, visual telecommunications, and a host of computer and multimedia applications.

ITU Documents

ISO/IEC documents can be purchased from the ITU website at: <http://www.itu.int/>.

ITU-T H.264 Advanced Video Coding for Generic Audiovisual Services

Represents an evolution of the existing video coding standards (ITU-T H.261, ITU-T H.262, and ITU-T H.263) and was developed in response to the growing need for higher compression of moving pictures for various applications such as videoconferencing, digital storage media, television broadcasting, Internet streaming, and communication.

SCTE Documents

SCTE standards documents can be downloaded at:
www.scte.org/SCTE/Standards/Download/SCTE/Standards/Download_SCTE_Standards.aspx.

ANSI/SCTE 65 2008 Service Information Delivered Out-of-Band for Digital Cable Television

This document defines a standard for Service Information (SI) delivered out-of-band on cable. This standard is designed to support "navigation devices" on cable. The current specification defines the syntax and semantics for a standard set of tables providing the data necessary for such a device to discover and access digital and analog services offered on cable.

Glossary

**0x**

A convention for notating numbers in hexadecimal (base 16) format. The numerals and letters (A-F) following "0x" comprise a hexadecimal value, for example "0x1E08".

AC-3

Also known as "Dolby Digital," the digital audio encoding and compression standard adopted by ATSC for DTV audio. Sometimes called "5.1-channel," because it provides five full channels for front left, front right, center, left surround, and right surround speakers, plus one smaller channel for low-frequency effects similar to sub-woofer.

ASI

Asynchronous Serial Interface. A standard interface for transport streams, often used to connect DTV production and broadcasting equipment. Also called *DVB ASI*.

ATSC

Advanced Television Systems Committee. The digital television broadcasting standard adopted in North America and some countries outside Europe.

bandwidth

The amount of data that can be transmitted in a fixed amount of time. For digital devices, bandwidth is usually expressed in bits per second (bps) or bytes per second.

bit

A "binary digit" (0 or 1), the fundamental unit of all digital data.

bitstream

A continuous series of transmitted data bits.

CAT

Conditional Access Table, an optional MPEG-2 PSI table that dictates conditional access (for example, by subscription) to certain elementary streams.

centralcasting

Contraction of "centralized broadcasting," in which multiple stations over a given geographic region are linked, and depending on the degree of centralization, either run from a single facility with centralized playout or, using a more distributed approach, incorporate store-and-forward content distribution and remote automation. Centralized broadcasting offers cost savings associated with consolidation while also facilitating opportunities for collaboration between multiple sites.

CVCT

Cable Virtual Channel Table, a type of PSIP table that identifies and describes virtual channels in a digital cable transport stream.

datacasting

The broadcasting of data resources (such as text and graphics files or streaming media) in DTV signals which are not ATSC video, audio, or metadata. Specially-equipped DTV receivers, set-top boxes, or computers can download the data.

digital channel

A set of one or more digital elementary streams. See *Virtual channel*.

digital television

(DTV) refers generally to any television signal that has been digitized. HDTV, SDTV, and datacasting are all included within DTV.

Dolby Digital

See [AC-3](#)

DTV

See [digital television](#)

DVB ASI

See [ASI](#)

EIT

Event Information Table, a type of PSIP table that contains the titles, start and end times of current and upcoming events within a transport stream. The PIDs of EITs are given in the MGT. For extended event descriptions, an EIT may refer to an ETT.

elementary stream

A bitstream of video, audio, or datacast content. An elementary stream is packetized to form a PES, and all the elementary streams comprising a broadcast are multiplexed into a transport stream in which packets from the various elementary streams are interleaved with each other. When received, the elementary streams are re-formed to present the video and audio of a TV program.

EPG

Electronic Program Guide, an interactive on-screen guide to available TV programming. In ATSC DTV, electronic program guides are formed from PSIP information.

ETM

Extended Text Message.

ETT

Extended Text Table, a type of PSIP table that contains an extended description of a channel or event (program).

event

A collection of elementary streams with a common time base, an associated start time, and an associated end time. An event can be thought of as a traditional "television program," but could also refer to a data broadcasting service.

HDTV

High-Definition Television, digital television formats of the highest picture quality, approximately twice the resolution of NTSC pictures both horizontally and vertically. The ATSC standard contains two HDTV formats, both using a 16:9 aspect ratio.

IP

Internet Protocol, pronounced as two separate letters. IP specifies the format of packets, also called datagrams, and the addressing scheme. Most networks combine IP with higher-level protocols called Transport Control Protocol (TCP), which establishes a virtual connection between a destination and a source, and User Datagram Protocol (UDP), which enables open-ended communication from a source to a destination.

IRD

Integrated Receiver Decoder. A set-top box receiver with a built-in descrambler for decoding TV services.

LCT Channel

An LCT channel is a transport stream that delivers ROUTE objects of a specific content-type. For streaming services, such as video or audio, two types of objects are delivered: "Initialization" objects and segments. Initialization objects are small static objects that contain only a map of how segments are interpreted by the codec.

metadata

Literally data about data. In DTV broadcasting, metadata is information in the transport stream which describes the composition of the stream, such as how many programs it contains and how to identify the video or audio information in the stream. Two kinds of metadata are PSIP and MPEG-2 PSI tables.

MGT

Master Guide Table, a type of PSIP table that defines what other PSIP tables are present in a transport stream and provides their PIDs. The PID of the MGT is always 0x1FFB.

MMT

MPEG Media Transport standard also used by ATSC 3.0

MPAA

Motion Picture Association of America

MPEG-2

Common name for the set of international standards developed by the Moving Picture Experts Group (MPEG), ISO/IEC 13818, for "generic coding of moving pictures and associated audio information," upon which the ATSC DTV standards are based.

MPD

A Media Presentation Description is an XML file in an MPEG-DASH stream containing metadata about the segment types and timing.

MPU

Media Processing Units transported by the MPEG Media Transport Protocol (MMTP)

multiplex (verb)

To sequentially incorporate several data streams into a single bitstream such that each original stream may later be recovered intact. A multiplexer is a device that multiplexes several input streams into a single transport stream.

NTSC

National TV Systems Committee and the name of the analog transmission standard used in the United States.

NVOD

Near Video on Demand. A strategy of broadcasting content, such as a movie, on several virtual channels at once, with staggered start times so that the viewer has several chances to join the beginning of the pre-recorded content.

packet

A 188-byte unit of data in an *MPEG-2 transport stream*. All DTV content is "packetized" before broadcasting.

packet identifier

See [PID](#)

PAT

Program Association Table, a mandatory MPEG-2 PSI table that defines the programs contained in a transport stream and lists the PID for the PMT of each program. The PAT is always found in PID 0x0000.

PES

Packetized Elementary Stream. See also *packet* and *elementary stream*.

physical channel

A 6 MHz block of radio frequencies (bandwidth) allocated for television transmission. A 6 MHz channel can carry one NTSC analog program, but can potentially carry multiple digital programs, each in a separate *virtual channel*.

PID

Packet Identifier, an integer carried in each packet of a transport stream that identifies the elementary stream to which the packet belongs. Each elementary stream uses a unique PID within the transport stream.

playout

The generation and output of PSIP data streams from GuideBuilder.

PLP

Physical Layer Pipes are the basic data-carrying structures in ATSC 3.0 streams. If they have the same level of robustness, up to four PLPs can be used to carry the data needed for a single channel

PMCP

Programming Metadata Communication Protocol, the standard that defines a method for communicating metadata related to PSIP (Program and System Information Protocol), including duplicate data that needs to be entered in other locations in the transport stream. Communication is based on a protocol utilizing XML message documents generated in accordance with a Programming Metadata Communication Protocol (PMCP) XML Schema.

PMT

Program Map Table, a mandatory MPEG-2 PSI table that defines the elementary streams that comprise a program and specifies the PID of each elementary stream in the program. Each program in a transport stream has its own PMT.

program

A collection of related elementary streams belonging to the same program number, defined by a PMT. Can also refer to a "television program," although that is more specifically described in DTV terminology by the term *event*.

PSI

Program Specific Information, a set of MPEG-2 metadata tables, which contain information for re-forming the elementary streams of a transport stream. The PAT, PMT, and CAT are standard types of PSI tables. PSIP tables are also special types of PSI tables.

PSIP

Program and System Information Protocol, the protocol specified by the ATSC for metadata tables in the transport stream that enable DTV receivers to create electronic program guides and tune into specific virtual channels within a physical channel. PSIP consists of EIT, ETT, MGT, RRT, STT, and TVCT tables.

ROUTE

Real-Time Object Delivery over Unidirectional Transport protocol used for the delivery of DASH-formatted content and non-real time (NRT) data in ATSC 3.0.

RRT

Rating Region Table, a type of PSIP table that defines the content ratings system or systems being used.

SCTE

Society of Cable Telecommunications Engineers. A non-profit professional association dedicated to serving the industry of telecommunications professionals by providing technical training, certification and standards.

SDTV

Standard-Definition Television, digital television formats in which the picture quality is approximately equal or superior to NTSC pictures, but not as high as HDTV. The ATSC standard contains 12 SDTV formats of both 4:3 or 16:9 aspect ratio, progressive scan or interlaced, and various resolutions and frame presentation rates.

service description

Information about the service and the elementary streams that make up the service, such as location information, time-shift information, closed captioning information, and AC-3 audio information.

slot

The location of an event (for example, a program, announcement, datacast product, or commercial) in a broadcast schedule.

SMPTE

Society of Motion Picture and Television Engineers, a professional association that helps define standards for television in the United States. SMPTE-310M is a common standard interface for transport streams, often used to connect DTV production and broadcasting equipment.

stream

An ordered series of bytes. The usual context for the term stream is the series of bytes extracted from transport stream packet payloads which have the same unique PID value.

STT

System Time Table, a type of PSIP table that supplies the current UTC time.

table

A collection of data arranged in a series of fields and values. In print, the fields are usually represented by columns and the values are arranged in rows. In digital data tables, the values conform to a predefined format and are digitized into bits. With PSIP and PSI tables, the bits are then multiplexed into the DTV stream.

table instance

Tables are identified by the table_id field. However, in cases such as EIT, ETT, or PMT, several instances of a table may be defined simultaneously. All instances have the same PID and table_id but different table_id_extension.

transport stream

A stream of 188-byte transport packets that contains audio, video, and data belonging to one or more DTV programs.

TSID

Transport Stream Identifier. An integer carried in a transport stream that identifies the major channel for the MPEG-2 program.

TVCT

Terrestrial Virtual Channel Table, a type of PSIP table that identifies and describes virtual channels in a terrestrial DTV transport stream.

UTC

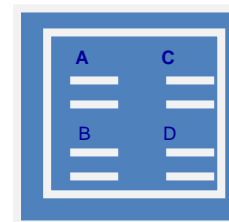
Coordinated Universal Time, or Universal Coordinated Time (abbreviated as UTC as a compromise between U.S. and European terminology differences). A time standard based on the local time at the prime meridian (0° longitude) of Earth and used to avoid confusion of time zones. UTC is the same as Greenwich Mean Time (GMT), and is 5 hours ahead of US Eastern Standard Time (4 hours

during daylight savings). UTC is typically represented as the number of seconds since 00:00:00 GMT on January 1, 1970.

virtual channel

A virtual channel is the designation, usually a number that is recognized by the user as the single entity that will provide access to an analog TV program or a set of one or more digital elementary streams. It is called "virtual" because its identification (name and number) may be defined independently from its physical location. Examples of virtual channels are: digital radio (audio only), a typical analog TV channel, a typical digital TV channel (composed of one audio and one video stream), multi-visual digital channels (composed of several video streams and one or more audio tracks), or a data broadcast channel (composed of one or more data streams). In the case of an analog TV channel, the virtual channel designation will link to a specific physical transmission channel. In the case of a digital TV channel, the virtual channel designation will link both to the physical transmission channel and to the video and audio streams within that physical transmission channel.

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