Cinegy Route 22.10

© Cinegy GmbH

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Preface

Switching away from SDI does not mean an end to managing and organizing signal streams. Cinegy Route provides the essential building block for IP-based infrastructures, delivering a centralized directory for securing high volumes of programming streams. Client applications allow authorized users to register and preview streams at their desk, as well as use powerful virtual destination objects to replace traditional SDI routing while adding extensive realtime processing options.

User Manual

Chapter 1 Introduction And Setup

1.1 Overview

Modern broadcasters are now able to use Ethernet networks instead of SDI to transport video signals. Tempted by greater capacity, enhanced flexibility, higher quality and lower cost compared to expensive SDI infrastructure, broadcasters who make changes get greater benefits. However, it does not take long before management of these IP video signals becomes challenging, and it only becomes harder once volumes increase.

Cinegy Route provides the ability to register and secure details of all of these incoming signals inside the Cinegy Route Directory Service. Once registered, it becomes easy to deal with a huge number of incoming SD, HD and 4K network streams and satellite feeds simultaneously from client stations throughout the network – users can just browse through an organized tree of sources, preview them, and map these sources to "virtual" destinations, in a manner familiar to anyone who ever worked with SDI routers.

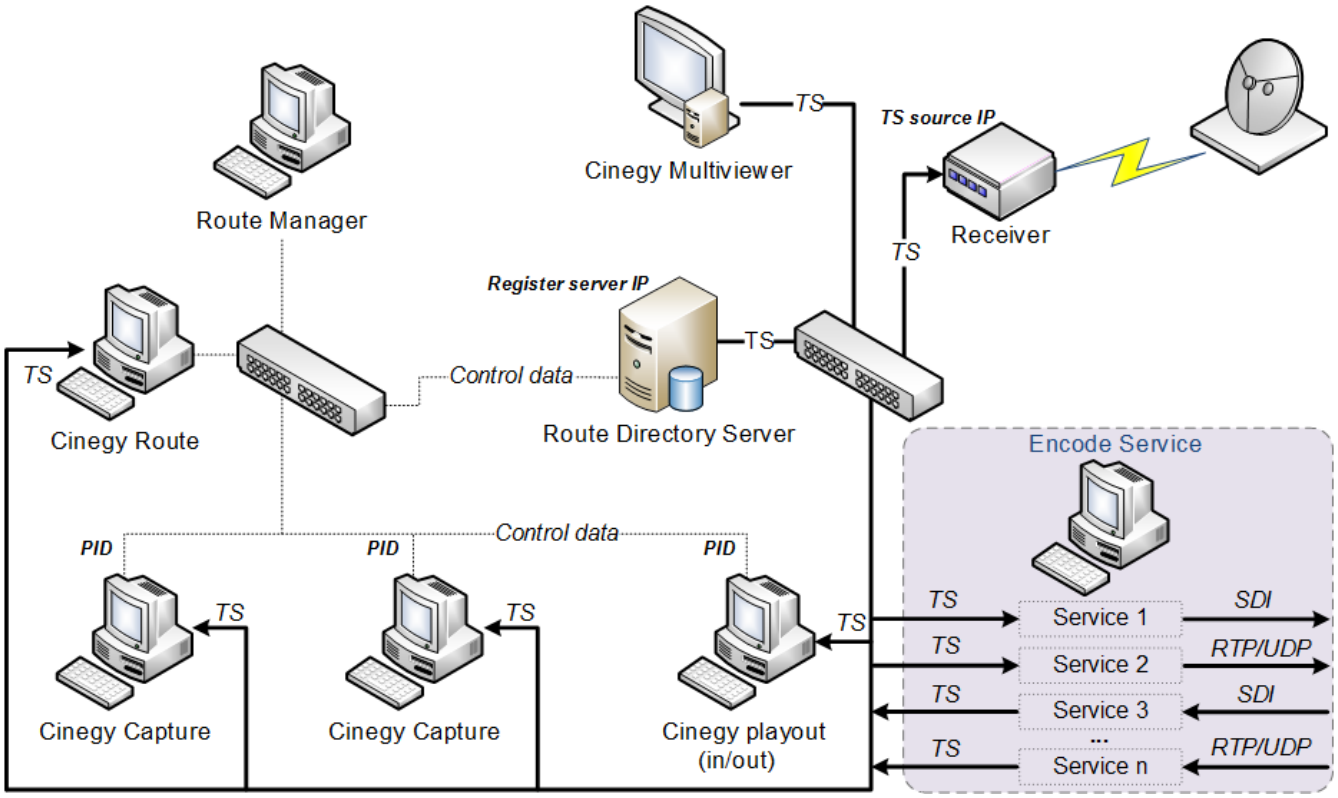
Various pieces of Cinegy software make up the components in a typical IP infrastructure environment, allowing users to control, transmit and receive transport stream data over an Ethernet network.

The core elements of software handling typical operations are: Cinegy Route, Cinegy Encode and Cinegy Multiviewer.

A complete, complex solution implementing Cinegy IP infrastructure contains the following components and operations:

- Registration and management of incoming IP streams for various purposes;
- Browsing through registered streams and choosing services (e.g. inserting them as live items to the Cinegy Air playlists);
- Organizing incoming IP streams by routing them into the virtual RTP/UDP/SRT stream sources via Cinegy Route Control (e.g. to change the input to a Cinegy Encode decoder);
- Monitoring the state of multiple IP streams in real time (e.g. via Cinegy Multiviewer);
- Using RTP/UDP/SRT streams as the live video input;
- Converting incoming SDI signals to RTP/UDP/SRT streams and vice versa in real time via Cinegy Encode;
- Ingest of IP streams into Cinegy Archive (e.g. by recording into Cinegy Capture PRO).

The following diagram shows a typical common configuration of the Cinegy IP infrastructure solution:



As shown in the diagram above, it is recommended to split the network into two independent subnets: one for IP streaming (marked as "TS" – Transport Stream) and the other for data transfer ("control data"). It is not absolutely necessary, but can generally make the system more stable.

Care must always be taken when designing video network architecture to reduce the risk of packet loss, and in critical cases where packet loss cannot be tolerated, we recommend using a primary and a secondary network for video stream transmission failover.

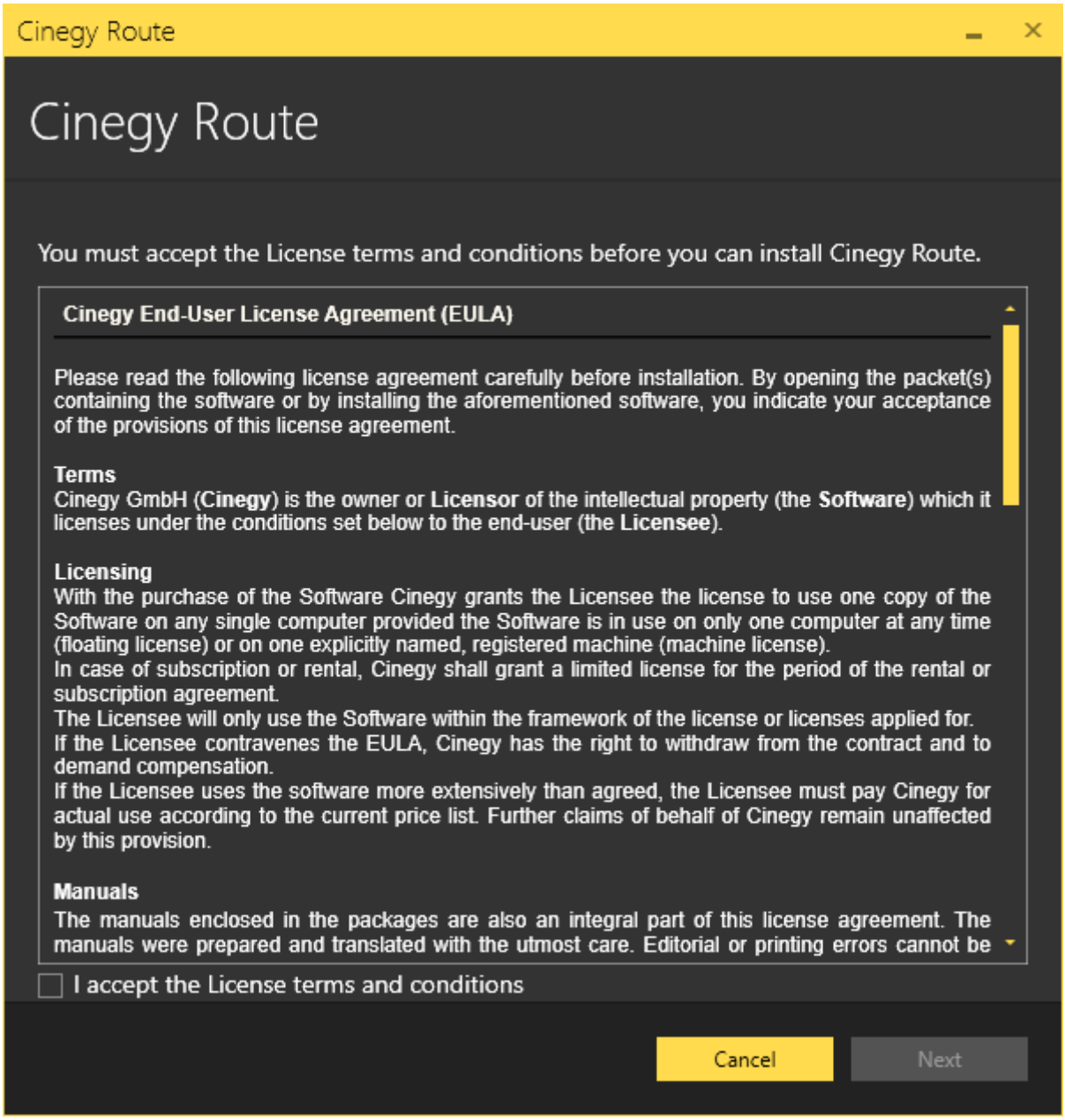
1.2 Installation

Cinegy Route has a unified installer that allows installing all components you need.

⚠	It is required to install critical Windows updates before the application installation.

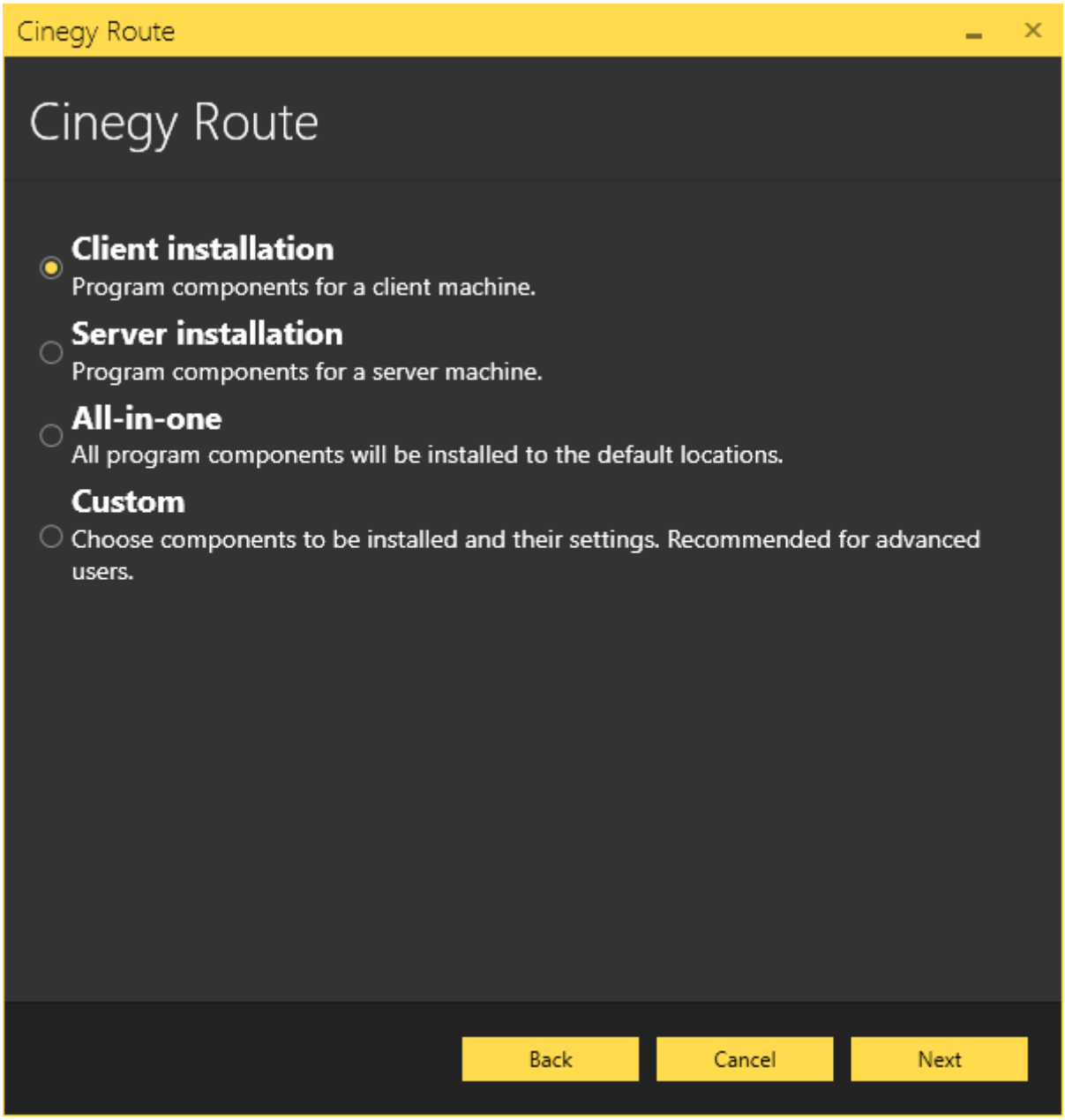
⚠	Installation of .NET Framework 4.6.1 or later is required prior to the Cinegy Route installation. In case online installation takes place, the web installer will update the system components, if necessary. The offline installer can be used if the web installer is unavailable due to lack of Internet connection. In this case, make sure .NET Framework 4.5 is activated as a Windows feature, then download the corresponding offline installer package directly from **Microsoft website**. After .NET Framework 4.6.1 is installed, the OS reboot is required. Otherwise, the installation may fail.

To start the installation, run the Cinegy.Route.Setup.exe file. The setup wizard will be launched:



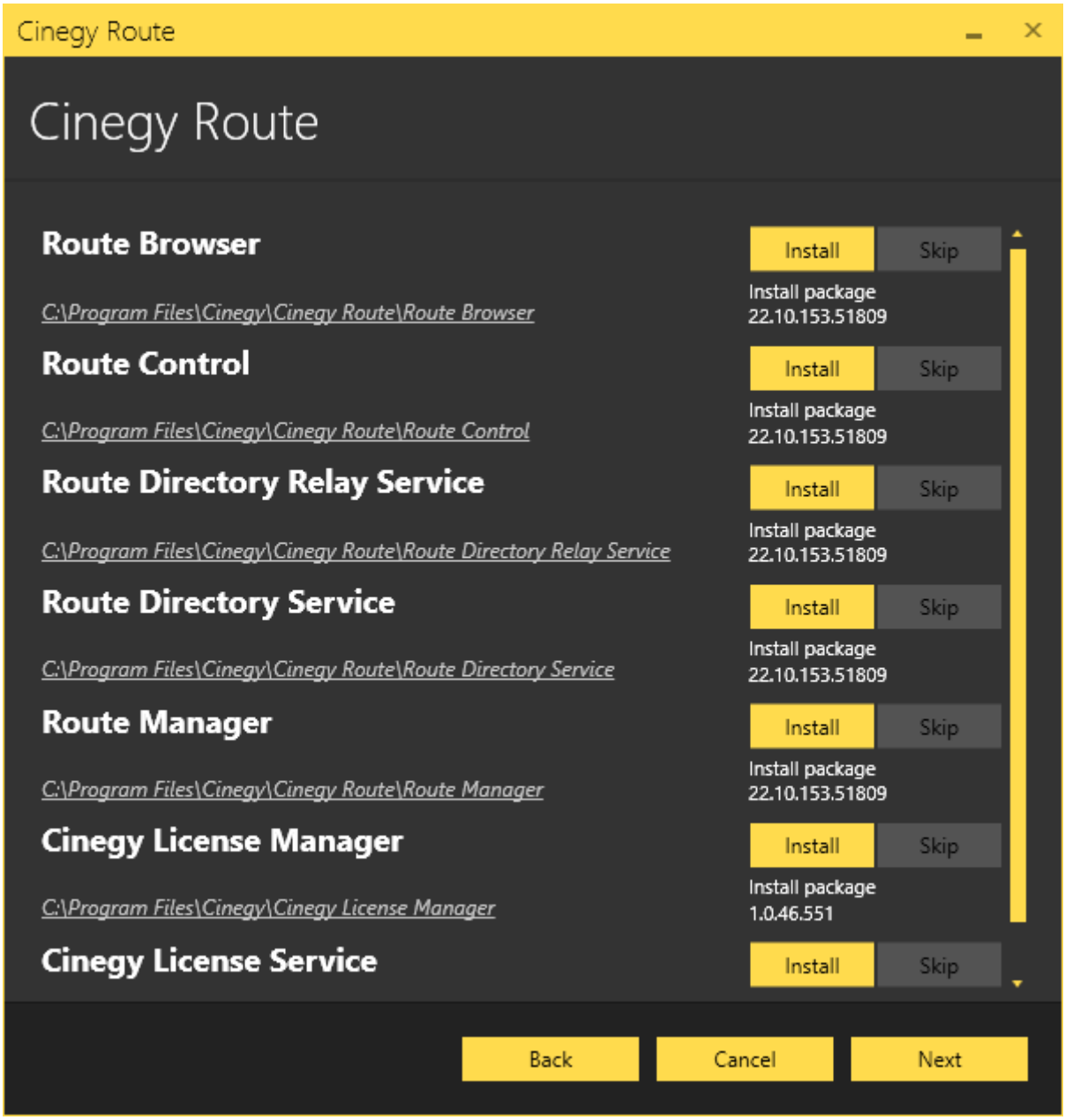
Read the License agreement and check the box to accept its terms.

Select installation mode depending on the purpose of using Cinegy Route on the given machine:



- **Client installation** – the product components for client workstations will be installed with their default settings.
- **Server installation** – the product components for server workstations will be installed with their default settings.
- **All-in-one** – all product components will be installed with their default settings.
- **Custom** – this installation mode allows choosing the components to be installed, their locations and settings, and is recommended for advanced users.

All the package components available for selected installation mode are listed in the following dialog:



Install — Enabled installation of the component(s) is indicated by the "Install" option selected and highlighted with yellow.

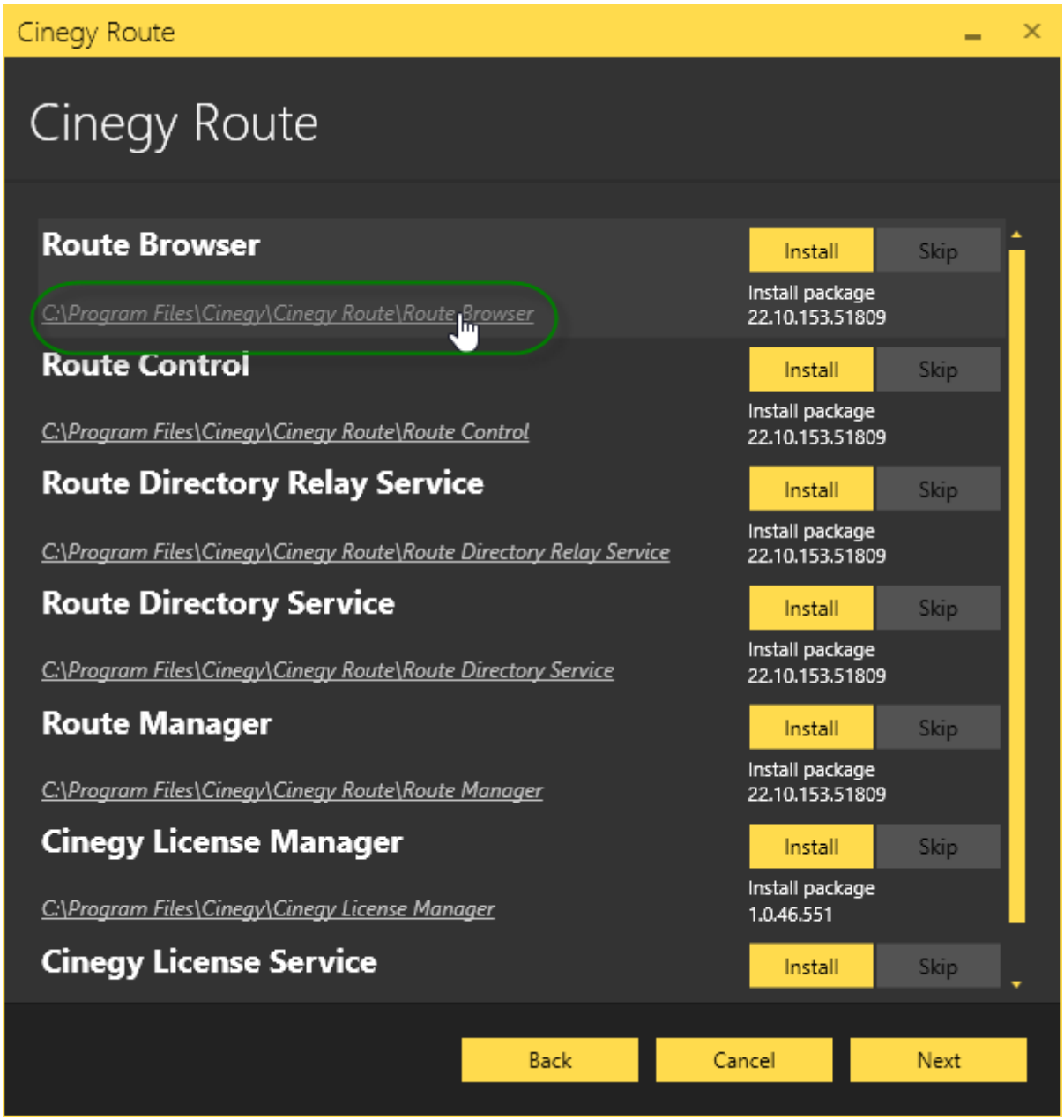
Skip — Select the "Skip" option next to the relevant component to disable its installation.

Refer to the following table to get quick information about the components:

Component	Description
Route Browser	Automatically resolves video streams names registered by the Cinegy Route Directory Service to RTP/UDP/SRT URLs. Installation also enables browsing registered video streams and choosing them from the Cinegy Air control panel.
Route Manager	Allows user to organize and set up physical sources and virtual destination groups used for managing and securing IP streams and channels registered by the Cinegy Route Directory Service.
Route Control	Is used for switching sources of virtual destinations with the ability to preview the incoming video for each virtual destination in real time.

Component	Description
Cinegy Route Directory Service	Registers and maintains records of video streams and virtual destination mappings. The server running this service is used by all Route-aware client applications to exchange data.
Cinegy Route Directory Relay Service	Tracks changes in the Cinegy Route Directory Service and sends them to broadcast clients via multicast transmission. It is not required to be installed and is needed for larger-scale deployments only.
Cinegy License Manager	The tool intended for managing serial numbers and the resultant software licenses used by Cinegy applications when not using licensing dongles.
Cinegy License Service	The tool meant to control an access to the licensed Cinegy software through the USB hardware dongles and software key files.

The default installation directory, which is indicated underneath the package component name, can be changed by clicking the path:



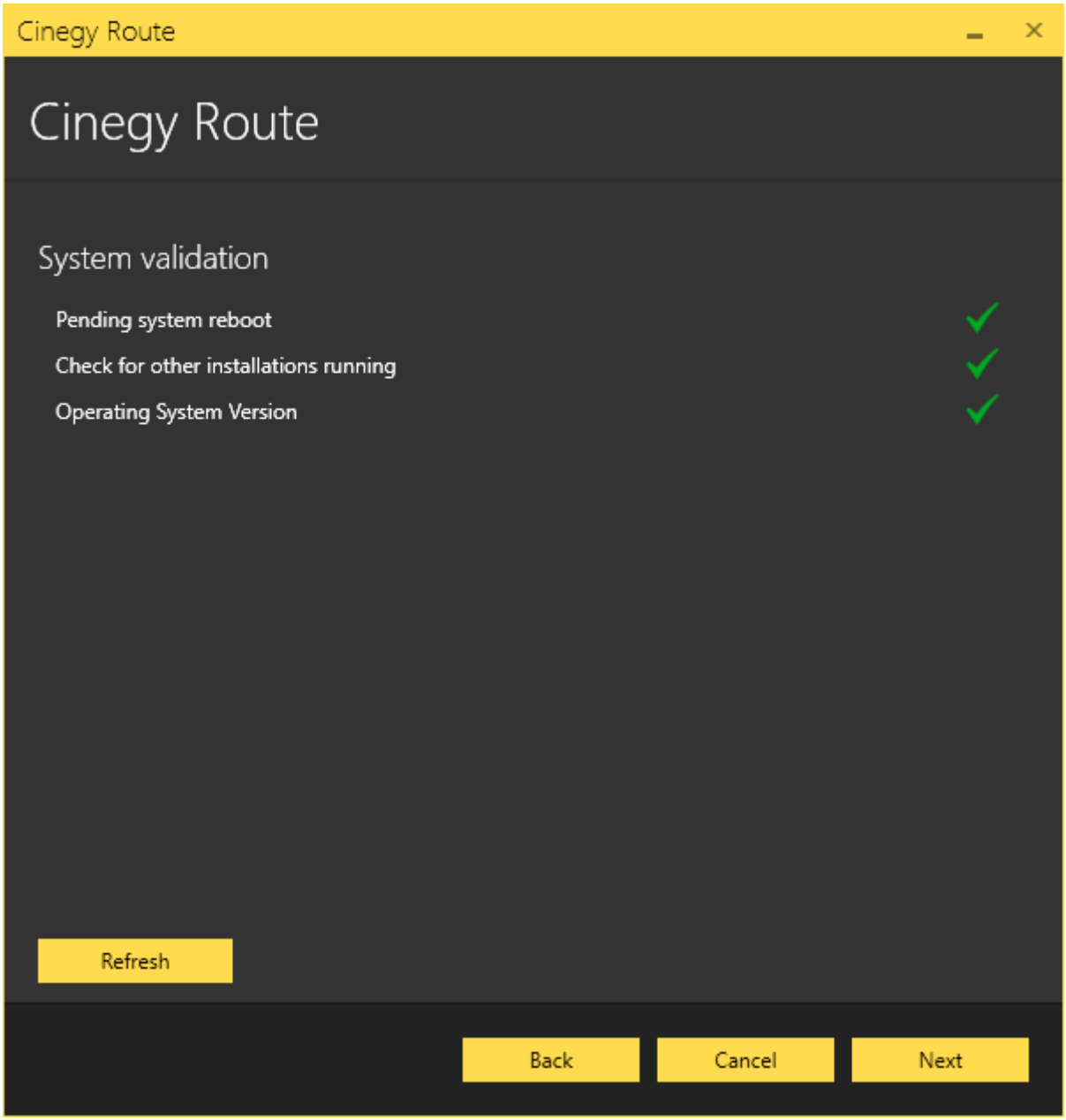
In the "Browse For Folder" dialog that appears, select the required folder for your installation.



You can also create a new folder by pressing the "Make New Folder" button and entering a new folder name. Once the folder is selected, press "OK".

Press "Next" to proceed with the installation.

Check whether your system is ready for the installation in the following dialog:





The green tick indicates that the system resources are ready and no other processes may prevent installation. Clicking the validation entry field displays its detailed information.

While the system performs verification of any parameter, the checking progress is displayed.



If any validation reveals that installation cannot be started, the respective field becomes highlighted and the red cross is displayed with detailed information on the failure reason below.

The explanation differs depending on the reason why the installation cannot proceed.

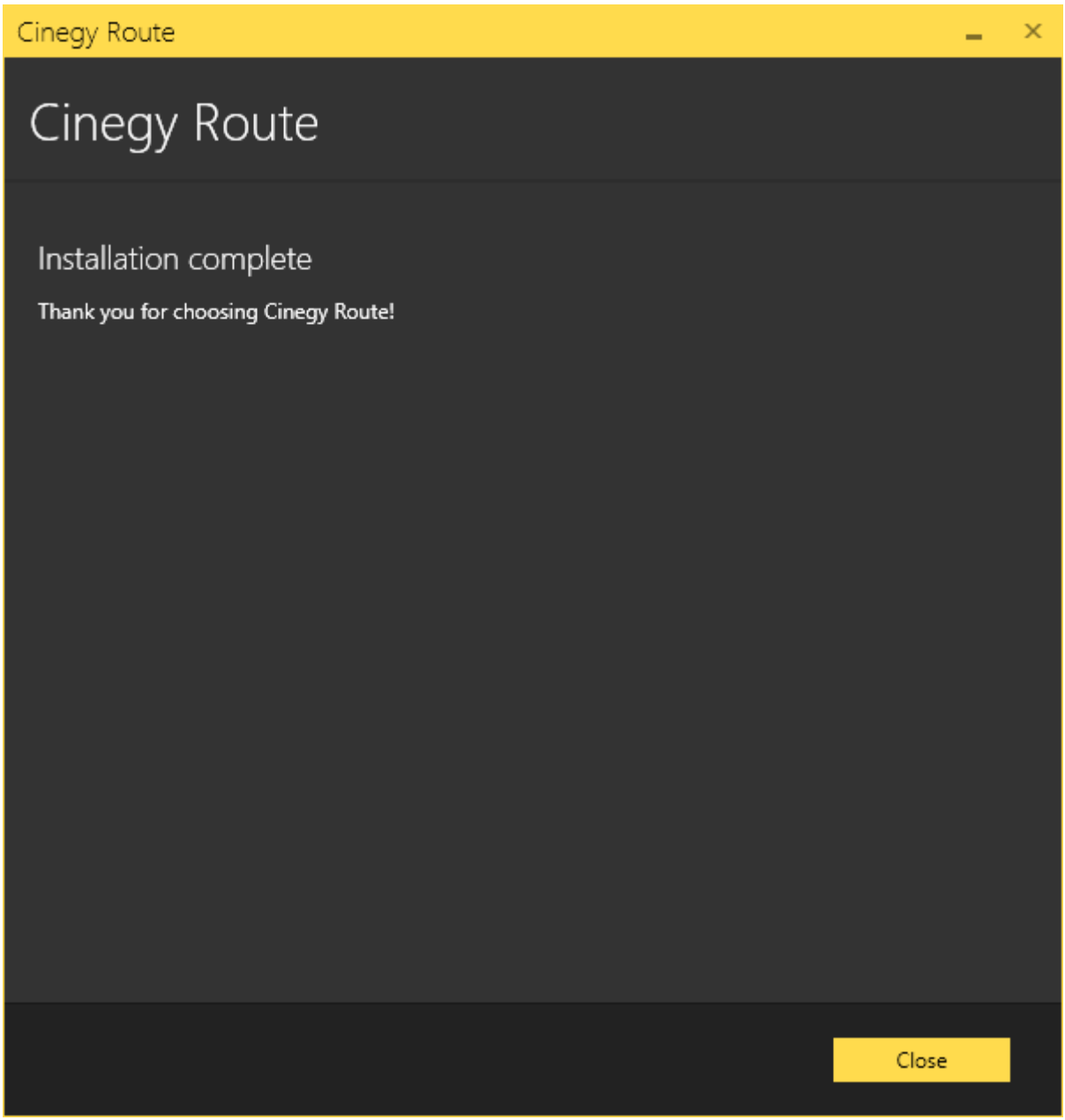
Refresh — Press the "Refresh" button for the system to recheck installation availability. Once the reason for prevention is excluded, you can proceed with installation.

Press "Back" to change the installation settings or "Cancel" to abort and exit the setup wizard.

Next — Press the "Next" button to begin the installation.

The progress bar indicates the progress of the installation process.

The following dialog informs that the installation is completed successfully:



Close — Press "Close" to exit the wizard.

The shortcuts of all the installed Cinegy components will appear on your Windows desktop.

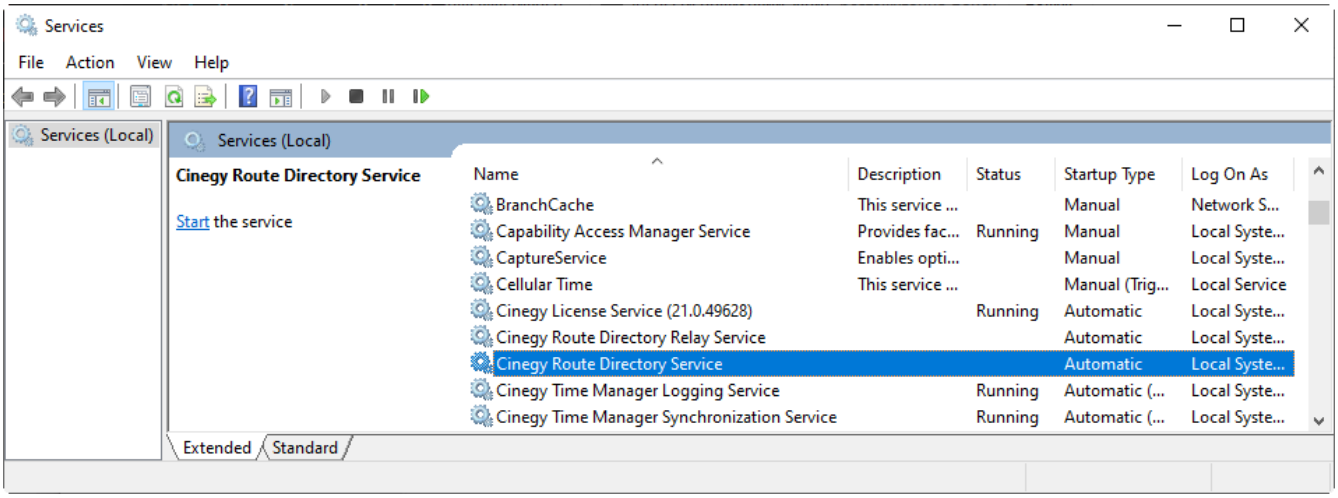
Chapter 2 Stream Management

2.1 Cinegy Route Directory Service

The Cinegy Route Directory Service holds the details of all registered SD, HD and UHD network streams generated by satellite downlinks, playout devices and other network sources. Sources from streams can be discovered, registered, previewed and organized into secure logical virtual groups via Route Manager. Only users, being granted the "visible" privilege through explicit or group membership, can see streams existing in the management tree, thus reducing clutter and unauthorized access.

All the available streams can be registered by the Cinegy Route Directory Service. This service can be installed on any dedicated PC via the Cinegy Route setup wizard and used by all ingest and playout stations, as well as by Cinegy Multiviewer.

The Cinegy Route Directory Service is installed as a Windows service.

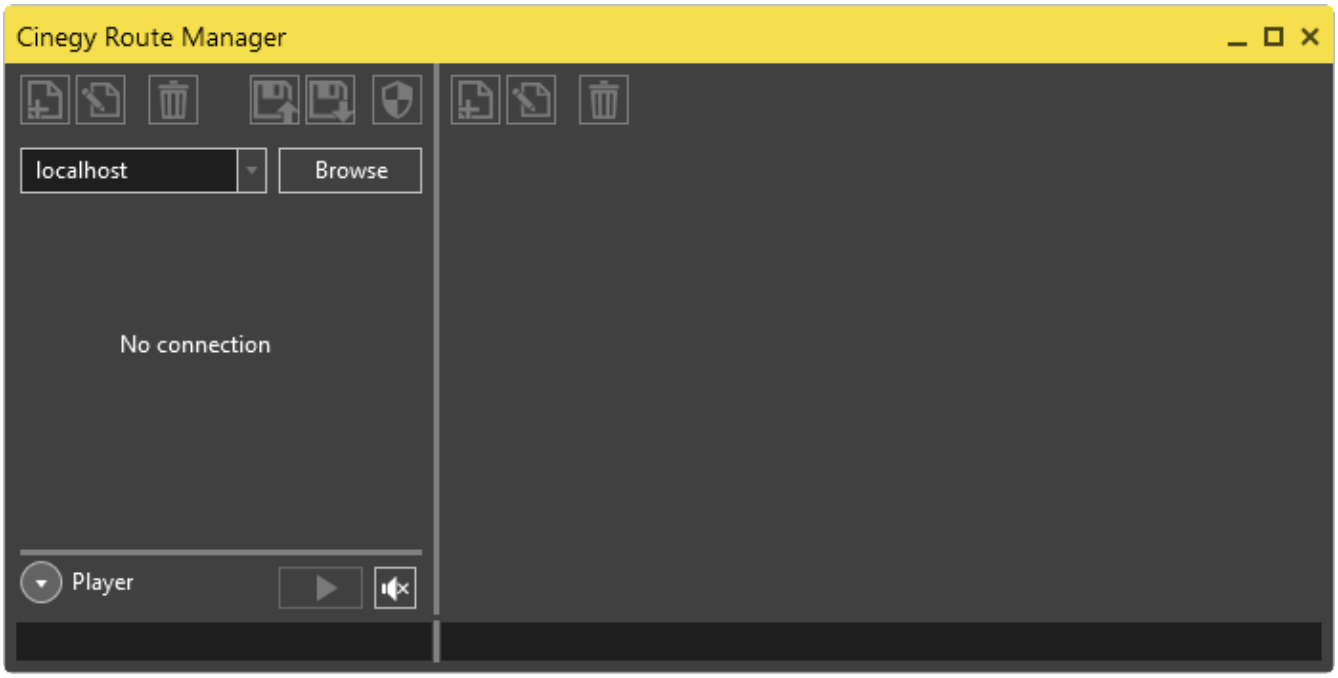


The service can be started either manually by running the ChannelDirectory.exe file from the Cinegy Route installation folder or automatically after a PC restart.

2.2 Cinegy Route Manager

Cinegy Route Manager allows you to manage the streams and channels that are being registered by Cinegy Route Directory Service.

Once Cinegy Route Manager is started, the following window appears:

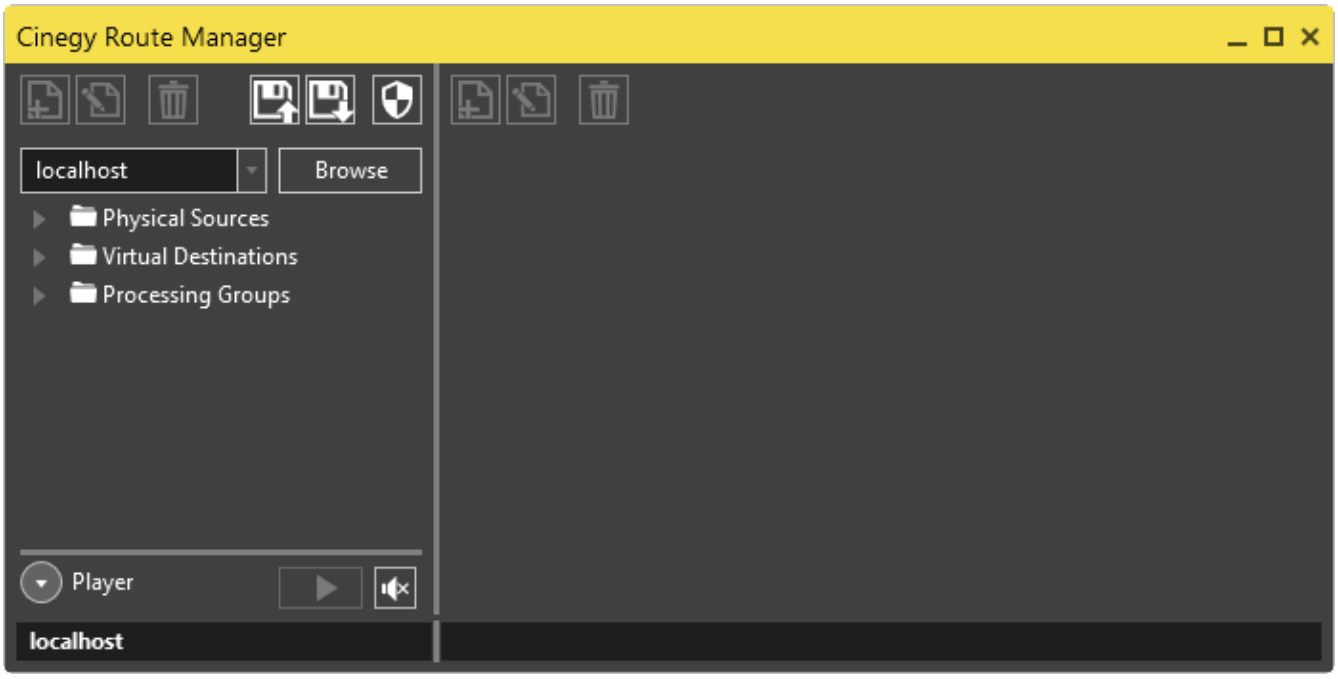


You can connect to localhost if the Cinegy Route Directory Service is installed on your local computer or enter the Cinegy Route Directory Service IP address or the network name in case it is being used remotely.

Please make sure the Cinegy Route Directory Service is running; otherwise your connection cannot be established.

Browse

Press the "Browse" button to connect to the Cinegy Route Directory Service on the specified server. After a successful connection is established, a list of specified streams and channels will appear:



Main Menu

Using Route Manager, you can organize and set up the physical sources groups and virtual destinations groups used for managing IP streams and channels being registered by the Cinegy Route Directory Service.

With the help of the first two buttons of the main toolbar, you can add or edit a physical source or a virtual destination group.

Alternatively, double-click the required physical source / virtual destination to edit it.

To delete an existing physical source, select the required group and press the "Delete" button in the left-hand part of the main toolbar. You will be asked to confirm your decision.

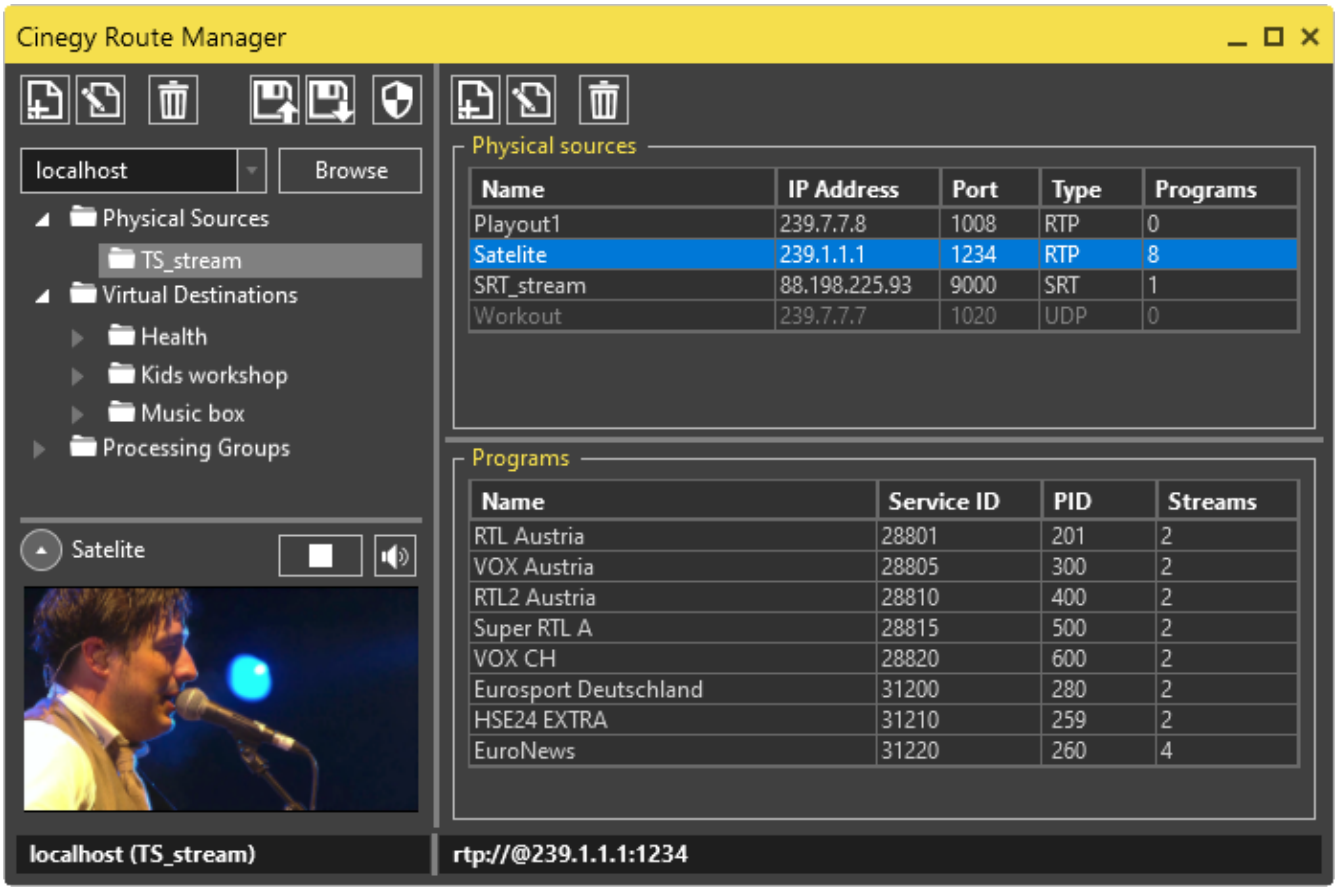
The next two buttons allow you to back up the database or restore a previously saved database.

Refer to the **Database Backup and Restoring** article for details.

The "Security" button opens a window to check Route server security settings for the corresponding group.

Refer to the **Server Security** article for more information about the server security management.

The left-hand panel displays the groups of physical sources and virtual destinations for the currently connected the Cinegy Route Directory Service in the tree-like structure:



Below this tree there is a player where the video stream of the selected network source is previewed.

You can show / hide the player using the corresponding button.

Press the corresponding buttons to start/stop the playback.

You can play/mute audio by pressing the corresponding buttons.

Once you click the "Physical Sources" or a physical sources group, all the available network physical sources with their corresponding information will be displayed in the right-hand panel of the Cinegy Route Manager window. All the available programs for the selected source are listed in the table below.

The virtual destinations structure allows the user to classify incoming physical streams into logical virtual groups.

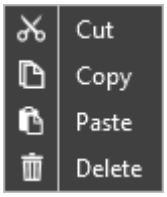
All the publicly visible sources are highlighted, whilst non-visible sources are dimmed.

	Refer to the **Visibility Management** article for details on the visibility configuration.

	All the sources and programs in the tables in the right-hand panels can be sorted by pressing the corresponding column header.

Objects Copying and Moving

Cinegy Route Manager allows you to copy and/or move folders and channels. To copy objects and paste them to a desired location, use the "Copy" and "Paste" context menu commands respectively:



To move the object(s) from one source group to another, use the "Cut" and "Paste" context menu commands.

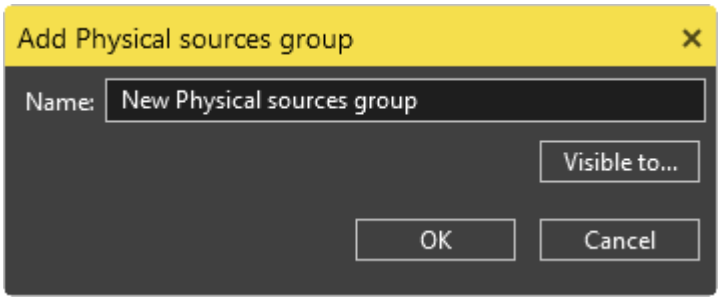
Physical Sources

Physical Sources Groups

Grouping the physical sources can help the operator to organize and simplify managing of the multicast IP streams.



To create a new physical sources group, choose the "Physical Sources" object and press the "Add Physical sources group" button in the left-hand part of the main toolbar. The following dialog box appears:



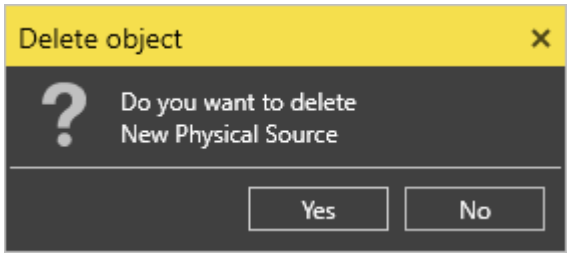
Enter a group name here and define its visibility parameters using the "Visible to…" button.



To change the name or visibility parameters of the existing physical sources group, use the "Edit Physical sources group" button in the left-hand part of the main toolbar.



To delete an existing physical sources group, select the required group and press the "Delete Physical sources group" button in the left-hand part of the main toolbar. The following dialog box will appear asking you to confirm your decision:

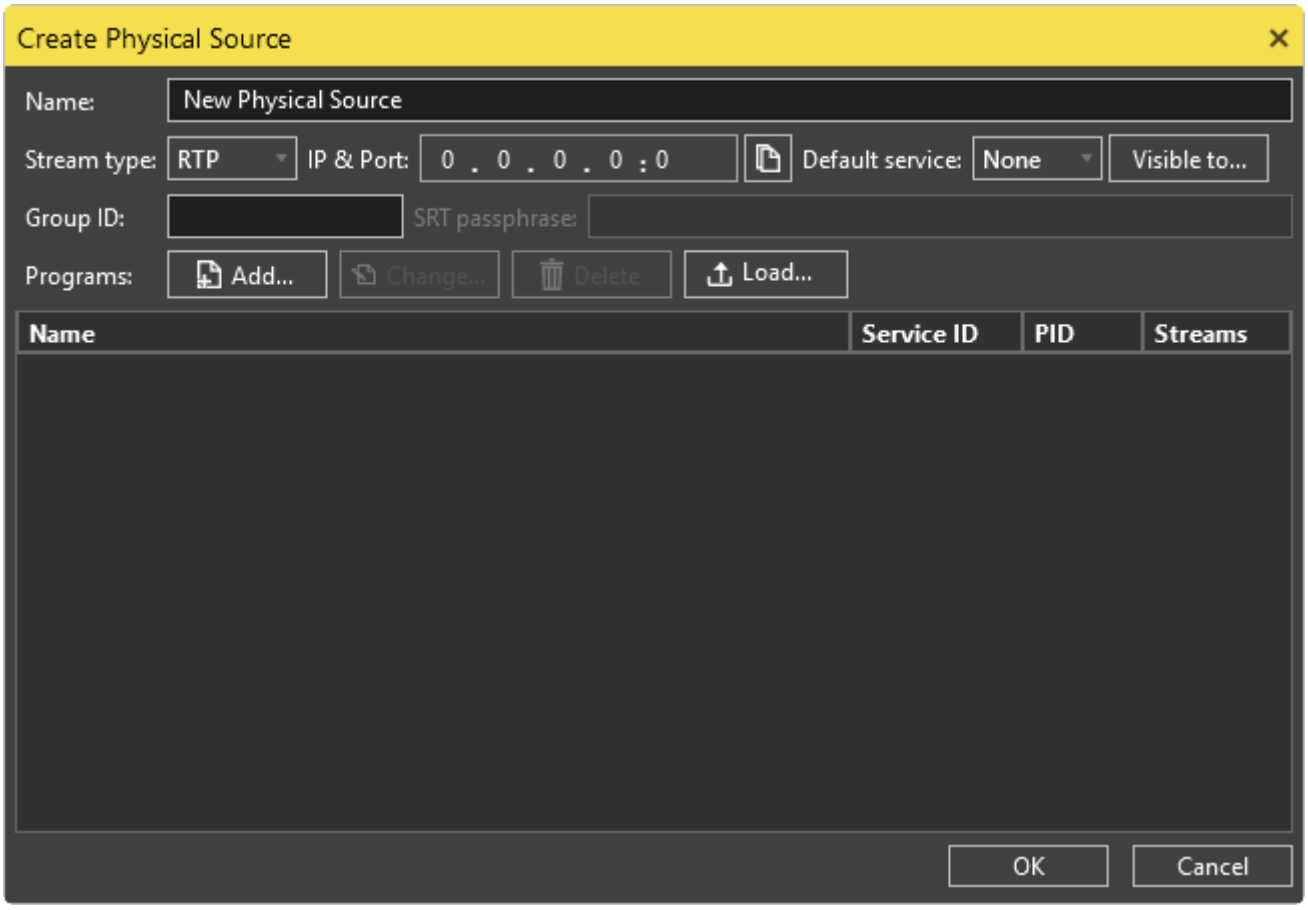


The procedure for creating, editing and deleting virtual destination groups is the same as for operations with physical sources groups.

Physical Source Creation

To add a new physical source, select the physical group, in which you would like to create it, and press the "Add Physical source" button located in the right-hand part of the Route Manager main toolbar.

The following dialog box appears:



Here define the following parameters:

- **Name** – a stream name.
- **Stream type** – the stream protocol type (RTP, UDP or SRT).
- **IP & Port** – the source IP (multicast group IP) and a port number.

Port 8888 is the default service port; it cannot be used here.

Press the button to copy the RTP/UDP/SRT URL to clipboard.

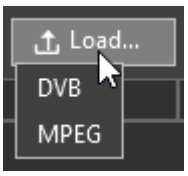
- **Default service** – default service ID; it defines which service (program) from the stream will be used by default. Defining this parameter (when it is not "None"), provides you with the ability to manage the whole stream as the program and this very program will be used as the default service for this stream.

  When working with a single-program stream, the only existing program is always used as the default service.

  The service ID value is "None" by default.

- **Visible to** – define the visibility parameters for the current network source.
- **Group ID** – the physical sources group identifier.
- **SRT passphrase** – define the passphrase for SRT stream encryption.

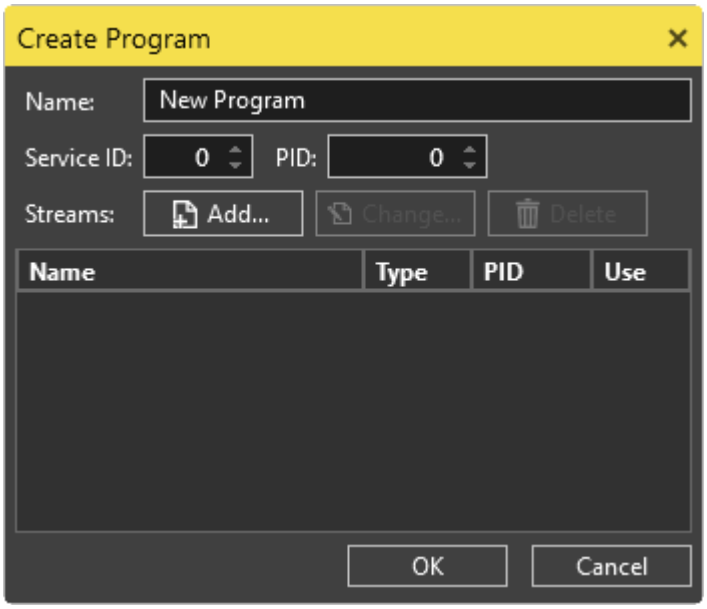
To load the stream information directly from either DVB or MPEG stream, press the "Load" button in the "Programs" field and use the corresponding option to create the list of all available channels automatically:



Program Creation

Add... To add a channel manually for the current physical source, use the "Add…" button in the "Programs" field.

The following dialog box appears:



Enter the program name, service ID and a Program Identification (PID) number here.

The program PID number should be unique.

Add... Press the "Add…" button in the "Streams" field to add a new stream to the "Streams" list for the program you are creating.

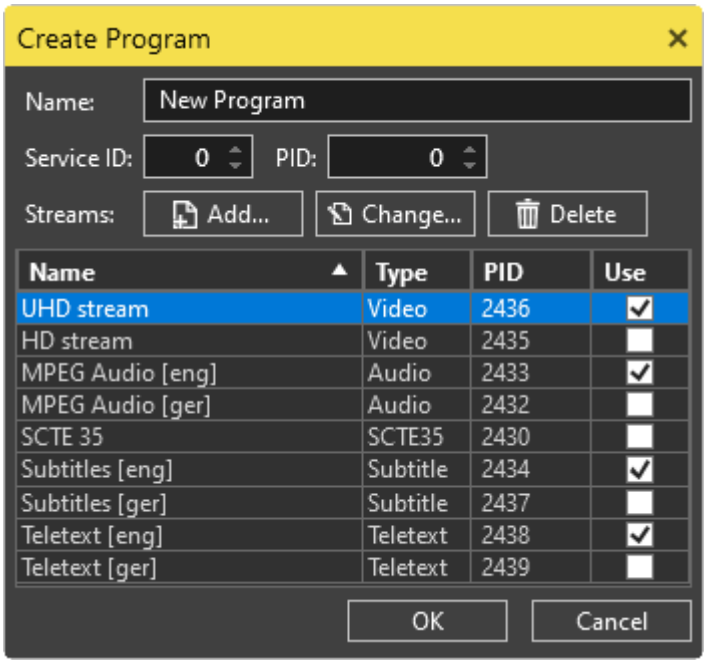
The following dialog box appears:



Enter a name for the new stream and define its type (Video, Audio, Subtitle, Teletext or SCTE35) and PID number. Press "OK" to create the stream.

The program PID number should be unique.

In the "Create Program" dialog box you can also define which streams to use in the current program by selecting the corresponding stream(s) in the "Use" column:



Change... Press the "Change…" button to edit the selected object.

Delete Press the "Delete" button to remove the selected object.

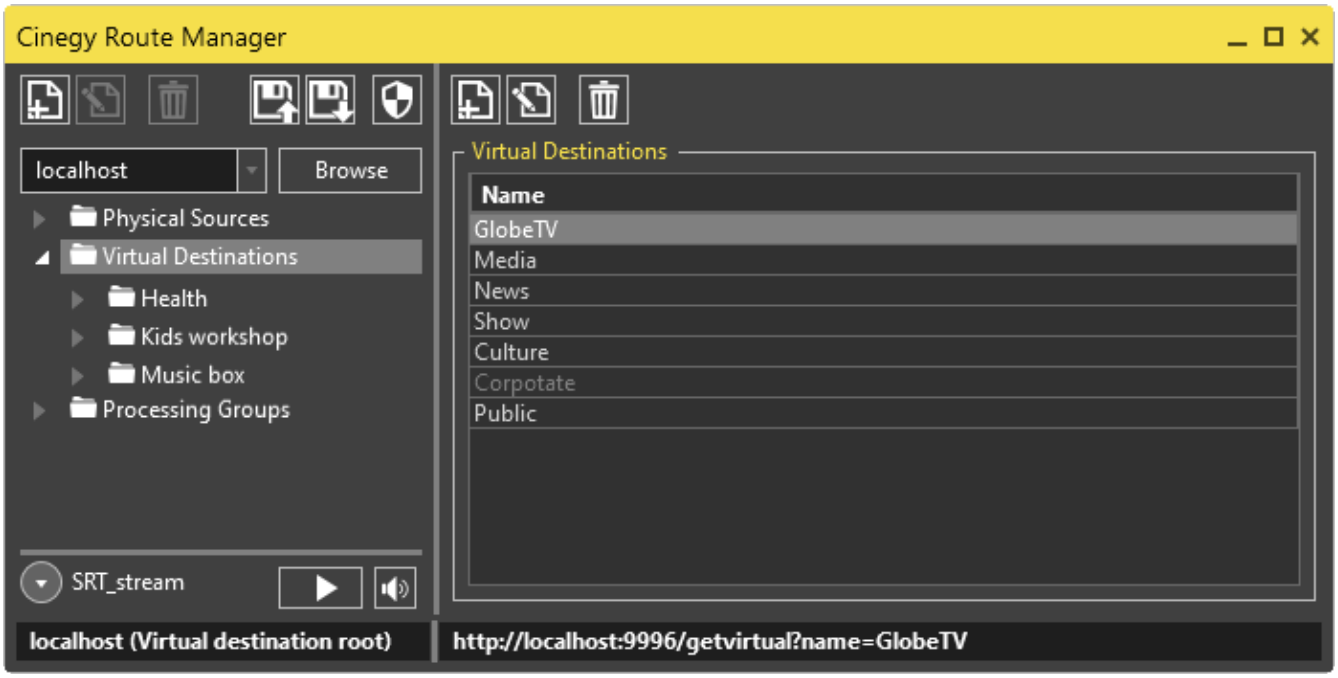
Virtual Destinations

Virtual destinations are intended to create source IP streams using the dynamic physical source IP streams switch. This allows the operator to change the physical source IP stream any time without the necessity for re-configuring all the clients to listen to the new IP stream. When the virtual destination IP stream is changed, all the clients will receive updated info in a few seconds without interrupting the playback.

Refer to the **Cinegy Route Browser** article for details on configuring virtual destinations.

Virtual Destination Groups

Virtual destination groups are intended to organize incoming IP streams into logical groups:



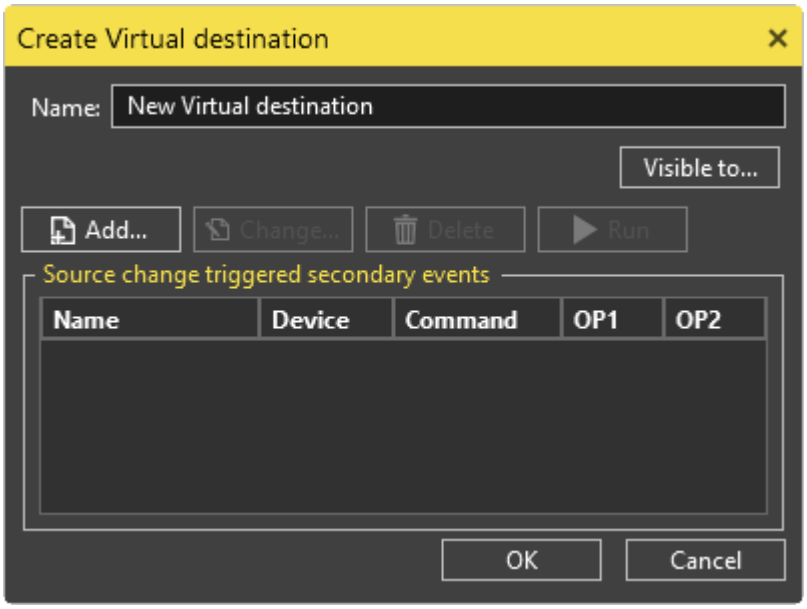
Creating, deleting and editing virtual destination groups is similar to the physical sources groups operation.

Virtual destination groups will be shown as separate tabs in the Cinegy Route Control application.

Virtual Destination Creation

To add a new virtual destination, choose "Virtual Destinations" or select a desired virtual destinations group, in which you would like to create a new destination and press the "Add Virtual destination" button in the right-hand part of the main toolbar.

The following dialog box appears:



Enter a virtual destination name here and define its visibility parameters using the "Visible to…" control.



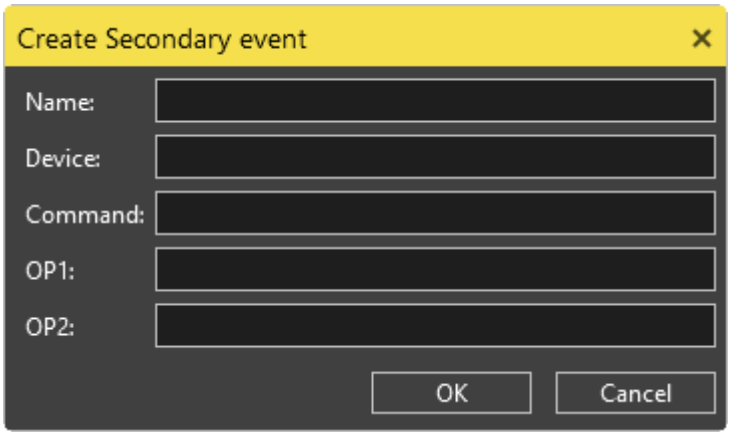
Visibility configuration is described in the **Visibility Management** article.

Secondary Events

Cinegy Route Manager allows users to add events to network streams which are controllable via the secondary events through Cinegy Event Manager.



To create a secondary event for the current virtual source, use the "Add…" button in the "Source change triggered secondary events" section. The following dialog box appears:



Here define the following parameters:

- **Name** – the name of the secondary event.
- **Device** – the device that will receive the event.
- **Command** – the command.
- **OP1** – the command option 1.
- **OP2** – the command option 2.

Having defined parameters, press "OK".



Press the "Change…" button to edit the selected object.



Press the "Delete" button to remove the selected object.



Press the "Run" button to send the event to Cinegy Event Manager for further processing.

Processing Nodes

Processing nodes are intended to create and edit sets of various video and audio streams. You can select only one video stream from the primary video sources and up to four audio streams from the secondary audio sources. In processing nodes it is possible to mix audio streams, edit the audio delay and signal level values. When the set of video and audio streams is changed, all the clients will receive the updated information in a few seconds without interrupting the playback.

The processing groups and nodes can be created, edited and deleted in the same way as virtual destination groups and nodes.

2.3 Visibility Management

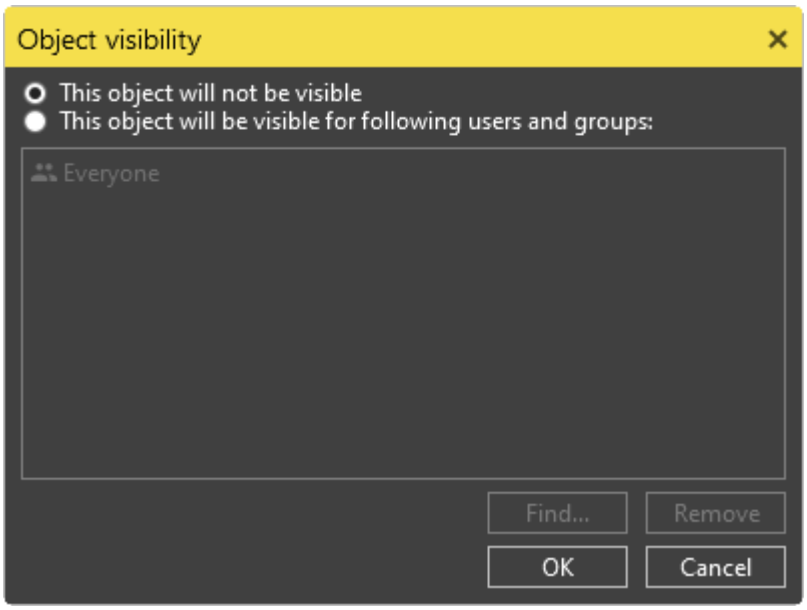
Visibility parameters should be individually configured for all the sources being created via Cinegy Route Manager. Setting the visibility means that others are able to see and use the actual source (or group) in the related applications or the IP client applications (like Cinegy Capture, Cinegy Air, Cinegy Encode, Cinegy Multiviewer, etc.).

All the sources being created are not visible by default.

Source Visibility

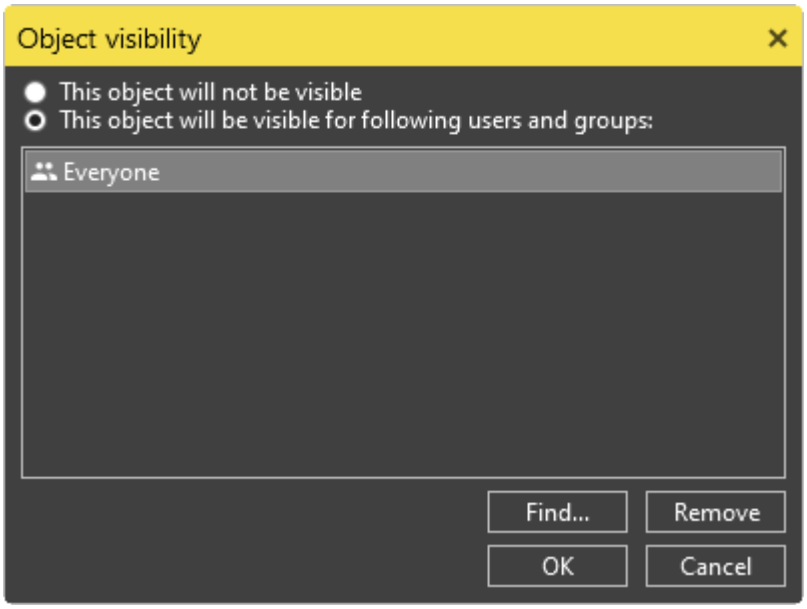
Visible to...

While creating or editing a network source via Cinegy Route Manager, press the "Visible to…" button to define its visibility parameters. The following dialog box appears:

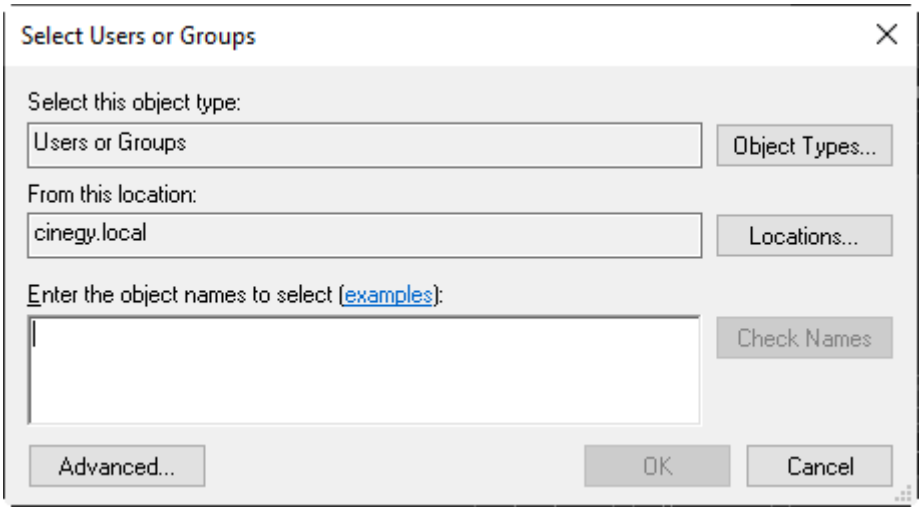


"This object will not be visible" is set by default. In this mode, the corresponding object is not visible and not available in the related applications and the RTP/UDP/SRT client applications.

If you want to make this source visible for selected clients, set the radio button to "This object will be visible for following users and groups". The source will be visible to users belonging only to the selected group. To make the source public, select the predefined "Everyone" group.



Find... Press the "Find" button to add a certain user or the whole group to the user visibility list. The following dialog box appears:



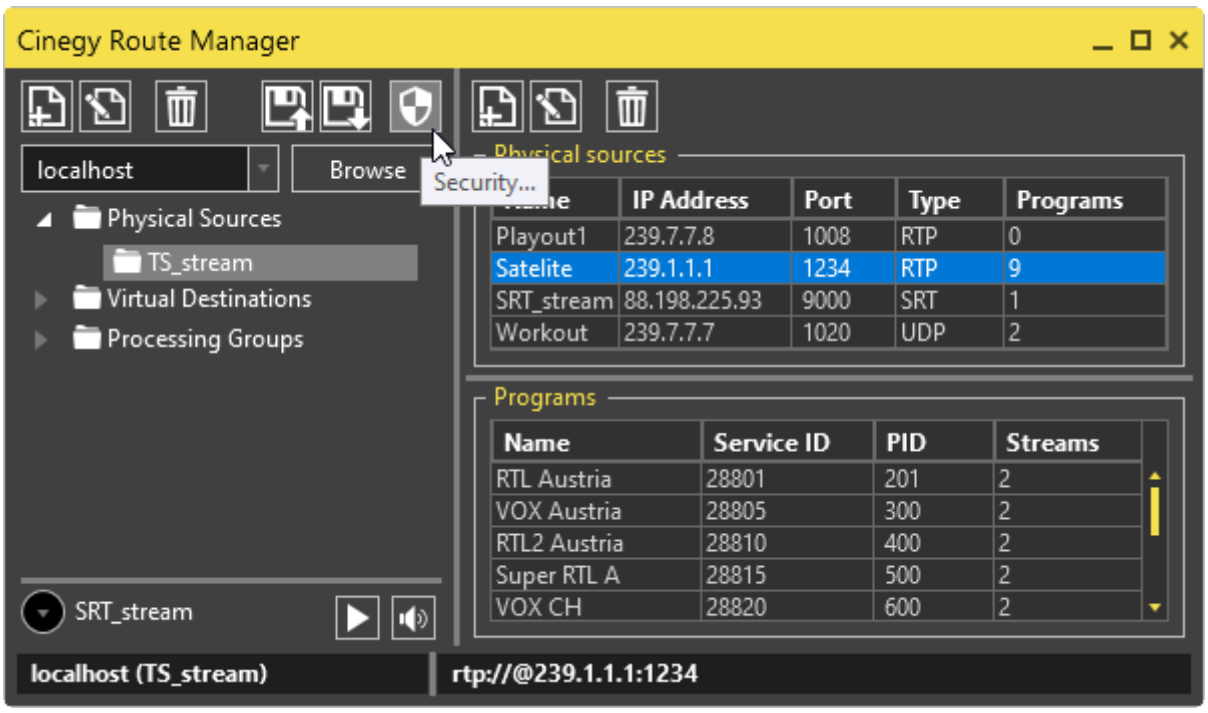
Here define the object type and the location to search; enter the object name.

Remove Press the "Remove" button to delete the selected user or group from the user visibility list.

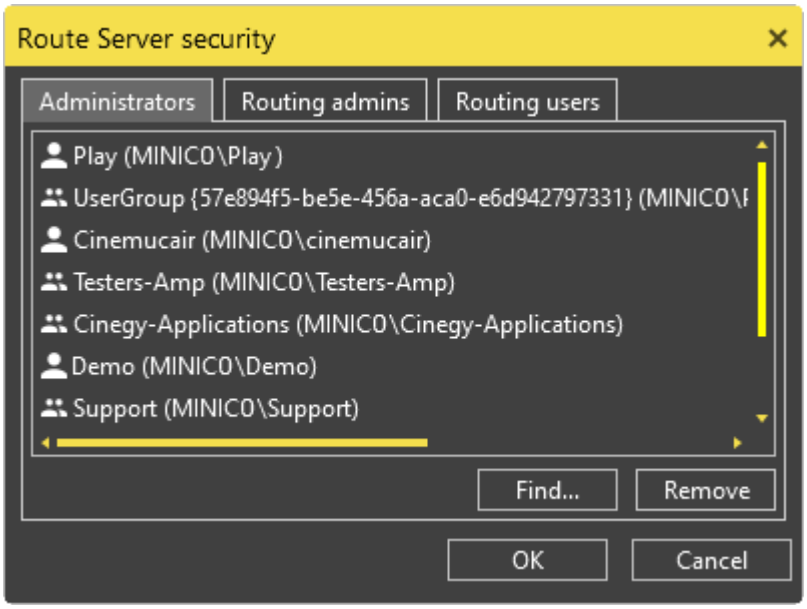
2.4 Server Security

The user permissions should be individually configured for all the sources being created via Cinegy Route Manager to secure the IP streaming management and routing from incompetent users.

To set up the Route Directory Service security, use the "Security…" menu of Cinegy Route Manager:



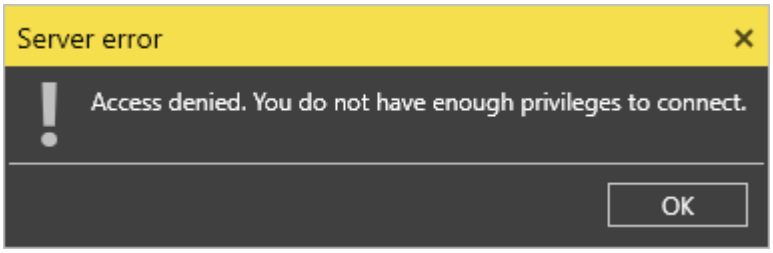
The following dialog box appears:



You can administer the user roles according to the tasks and actions permitted for the assigned users / user groups. The following user roles can be administered here:

- Administrators;
- Routing Administrators;
- Routing Users.

If users not belonging to these groups and having not enough privileges to work either with the Cinegy Route Directory Service or Cinegy Route Control try to connect to these products, the following error message appears:



Administrators

On the "Administrators" tab, all the Cinegy Route Directory Service administrators are listed. The users of this group have privileges to administer the Cinegy Route Directory Service and work with Cinegy Route Control. When routing, all the channels locked by the administrator cannot be unlocked by users of other groups.

	By default, the administrator role is assigned to the local administrator of the current PC.

Routing Administrators

On the "Routing Admins" tab, all users and groups of users with the routing privileges are listed. The routing administrators control physical sources to virtual destinations routing except for the sources locked by the administrator.

	Refer to the **Locking** paragraph for information about virtual destinations locking.

Routing Users

On the "Routing Users" tab, all users and groups of users with the limited routing permissions are listed. Routing users have no privileges to work with the Cinegy Route Directory Service and can route only unlocked sources and sources locked by other routing users. All the sources locked by the superior user (either the administrator or the routing administrator) are not available for routing.

Server Security Management



Press the "Find" button to add a certain user or the whole group to the corresponding user group the same way as described in the **Visibility Management** article.



Press the "Remove" button to delete the selected member from the corresponding user group. You will be asked to confirm your decision.

2.5 Database Backup and Restoring

Cinegy Route Manager provides you with the ability to back up your Route database content and configuration and restore it back when needed.

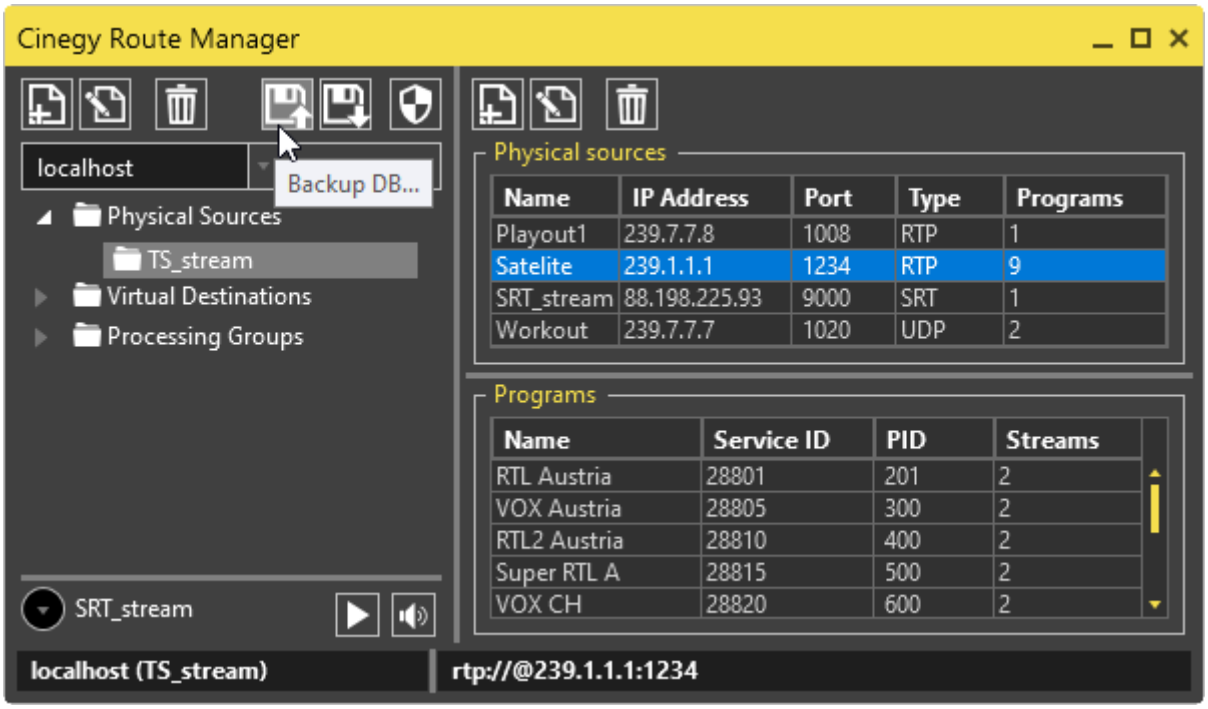


Please note, backups created in earlier versions of Cinegy Route will not be compatible with Cinegy Route v22.10 and henceforth the restore operation will fail. Refer to the **Previous Version Backups** paragraph below for instructions.

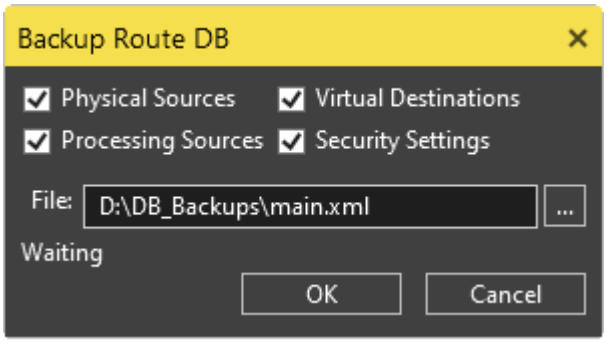
Database Backup



To back up your Route database, press the "Backup DB…" button from the main menu.



The following "Backup Route DB" dialog appears:



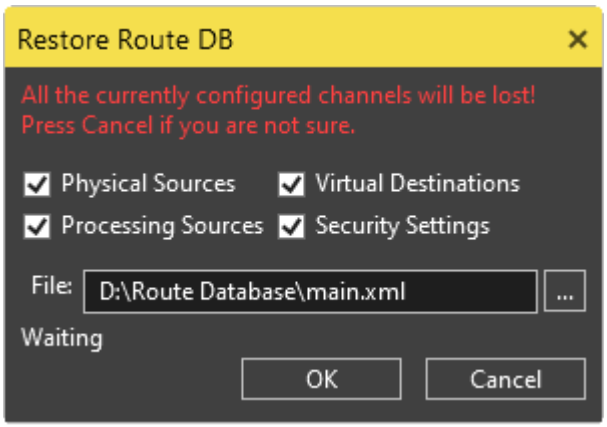
Here check the backup options and define the backup file path using the ... button or enter the path via the keyboard in the "File" field.

Press the "OK" button to save the selected sources and/or settings to the defined location. To cancel the database backup and close the "Backup Route DB" dialog, press "Cancel".

Restore Database

To restore your Cinegy Route database from the backup file, press the "Restore DB…" button from the main menu.

When performing the restoring operation, all the currently configured channels are lost. The following window with a warning at the top will appear:



If you choose to continue restoring the server, choose the sources and/or settings to restore by selecting the corresponding checkboxes and define the location of the backup file using the ... button or enter the path via the keyboard in the "File" field.

Press "OK" to proceed with the backup restoration or "Cancel" to abort the process.

Previous Version Backups

Backups created in earlier versions of Cinegy Route will not be compatible with Cinegy Route v22.10 and henceforth the restore operation will fail. In order to transfer your Cinegy Route database safely, just follow these simple steps:

1. Stop the Cinegy Route Directory Service.
2. Copy all the contents of `C:\ProgramData\Cinegy\VoIP Registry Server\Database` folder.
3. Paste the copied content into a newly created `C:\ProgramData\Cinegy\Cinegy Route Directory Server\Database` folder with replace.
4. Start the Cinegy Route Directory Service and launch Cinegy Route Manager to see the content of your Cinegy Route database.

Chapter 3 Cinegy Route Directory Relay Service

3.1 Overview

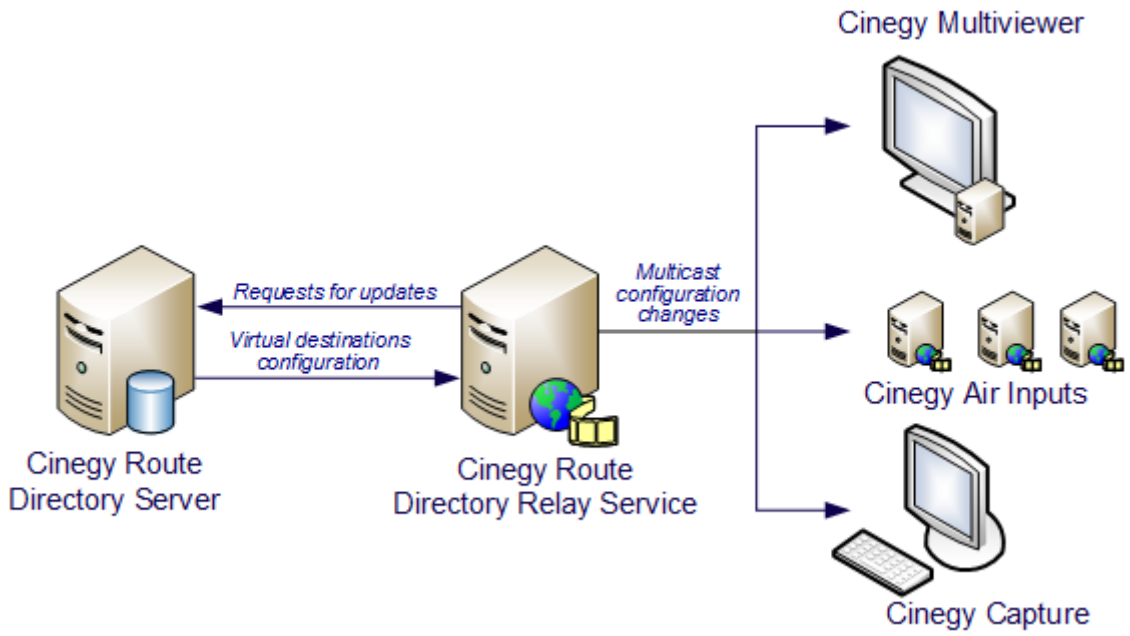
The Cinegy Route Directory Service is quick and easy to set up, and works well in small to medium size environments. However, once the number of connected clients increases, or network topology becomes more complex, the polling request model becomes limited.

To address this, Cinegy Route comes with the Cinegy Route Directory Relay Service, a dedicated service for tracking changes on the central Cinegy Route Directory Service and notifying the broadcast clients about them over multicast, reducing network load and the load on the core Cinegy Route service.

Using the Cinegy Route Directory Relay Service is an advanced option. It requires the installation engineer to have skills in network configuration, multicast adjustment and routing, as well as packet inspection to verify correct operations and perform any multicast troubleshooting.

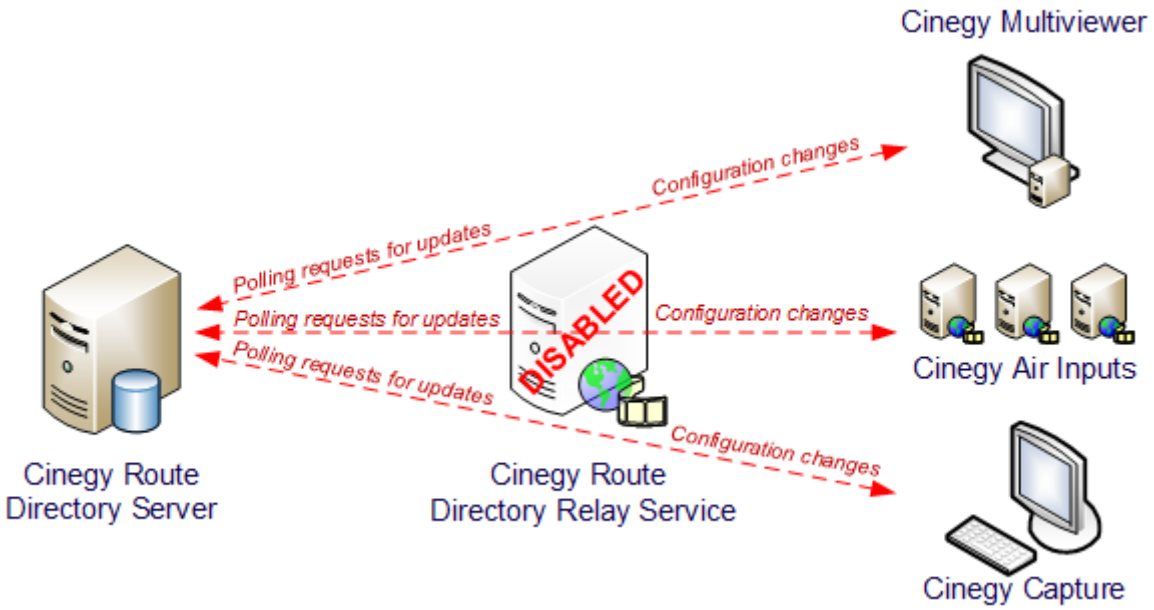
The Cinegy Route Directory Relay Service tracks changes on the Cinegy Route Directory Service and sends them to the signal receivers.

The following diagram shows the general channel relay workflow, in normal operation:



As shown above, the Cinegy Route Directory Relay Service sends requests to the Cinegy Route Directory Service for information about changes in the physical sources and virtual destinations configuration. If any changes are found, they are sent to the network as a multicast data stream, which any broadcast clients discover by checking a fixed multicast address for changes that are applicable to them. Then clients adjust to the change with no communication to the Cinegy Route Directory Service required.

When the relay multicast messages are not received by a client for more than 10 seconds, for example, because of connection loss or the service being stopped, the client will try to directly connect to the main Cinegy Route Directory Service. In case of failure to connect, the last known configuration is retained until messages are recovered. The following diagram shows this configuration model:

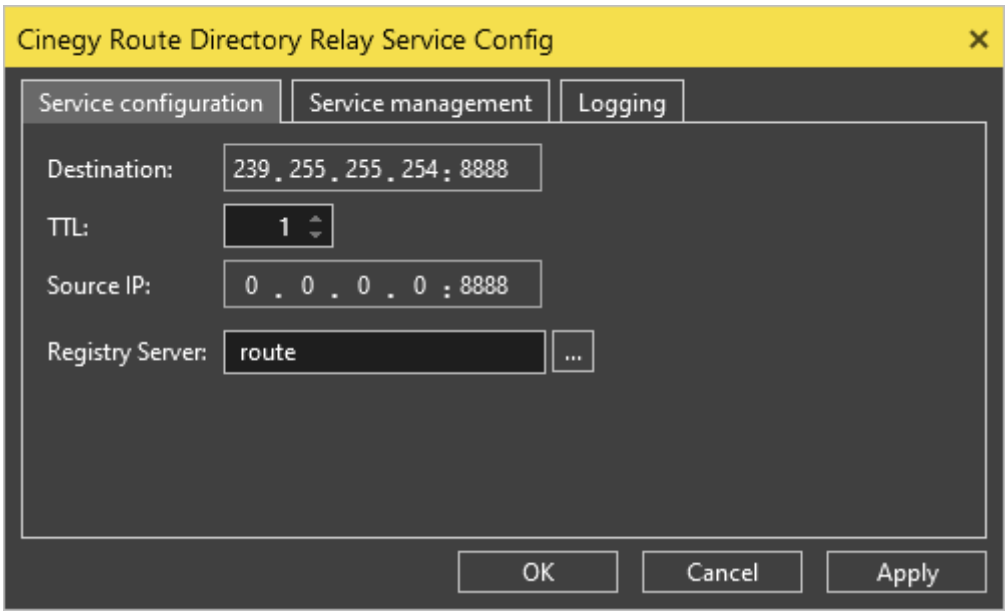


With a great number of RTP/UDP/SRT streams, this configuration can cause network overload.

3.2 Configuration

Installation of this service is optional and in many cases the Cinegy Route Directory Service will function seamlessly without installation of the relay service.

To configure the Cinegy Route Directory Relay Service, go to *Start* > *Cinegy* > *Cinegy Route Directory Relay Cfg*; the following configurator will be launched:



It contains the following tabs: Service configuration, Service management and Logging.

Service Configuration

In the "Service configuration" tab specify the following parameters:

- **Destination** – define the network group to broadcast information about configuration changes.

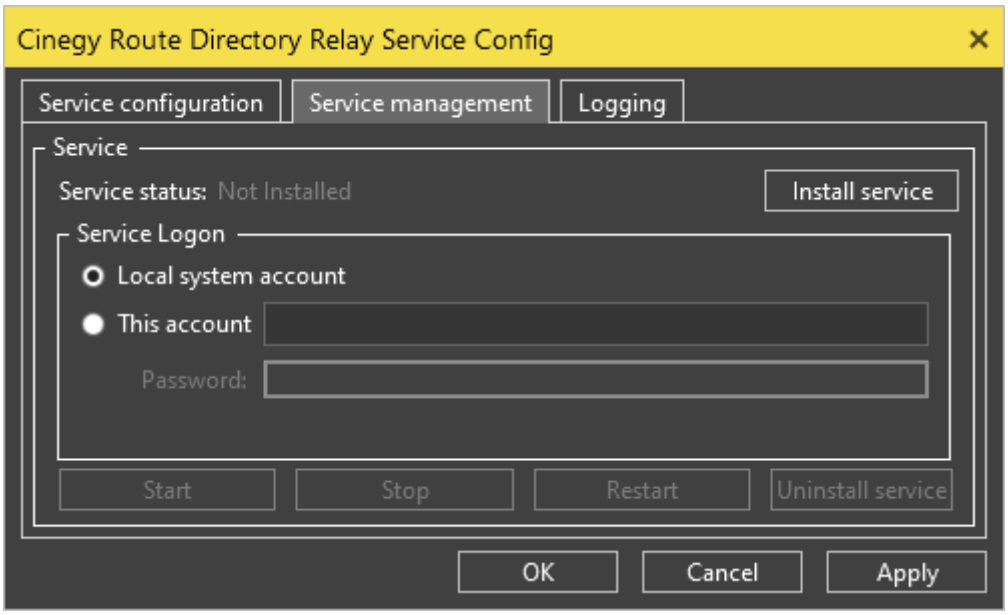
> This parameter should not normally be adjusted, since all Cinegy clients will look for configuration information at this default pre-set address, and changing this value will prevent clients from registering any messages.

- **TTL** – define time-to-live for multicast transmission of relay packets, used to control the number of router hops a packet is permitted to make before being dropped.
- **Source IP** – define the local IP address and the port to be used for broadcasting the configuration changes. This value should correspond to the IP address of the server - local adapter for multicast configuration data to be transmitted on.
- **Registry Server** – define the network name of the machine running central Cinegy Route Directory Service that you want to relay.

> The "Registry Server" name must match the server used when connecting to Cinegy tools and defining virtual destination addresses. If a client is subscribed to a virtual destination of http://route:9996/getvirtual?group=Bristol&name=CLIENT1, but the parameter on the Relay server is set to an IP address or a fully-qualified domain name, subscribed clients will not consider the details of changes to this virtual destination in the multicast data stream as a match, and will continue polling the central service.

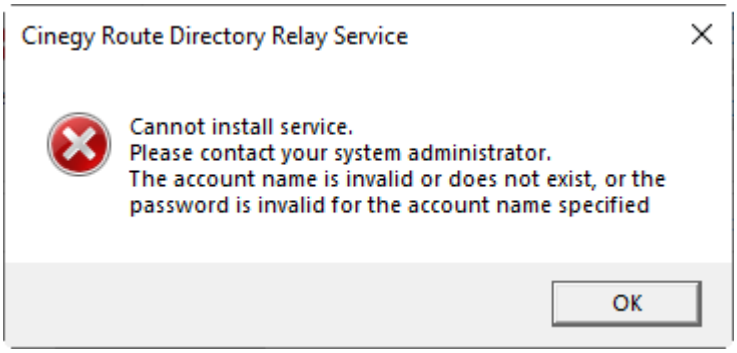
Service Management

To run the Cinegy Route Directory Relay Service as a Windows service, go to the "Service management" tab of the configurator:

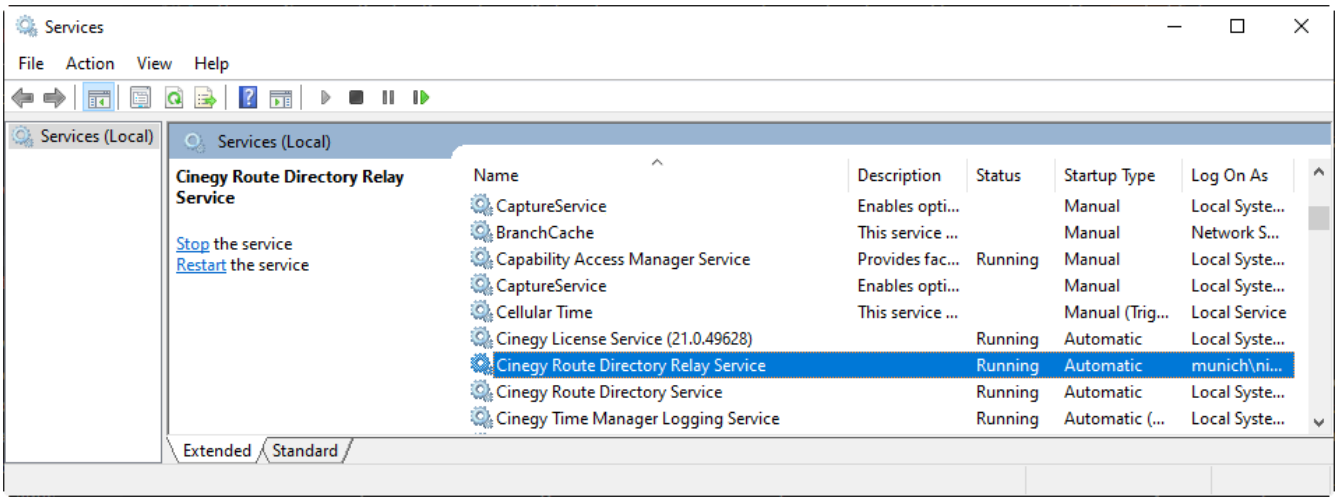


Install service To install it as a Windows service, press the "Install service" button.

If the entered data on a different account is invalid or this account does not exist, a warning message appears:



Start — To start the service, press the "Start" button. The Cinegy Route Directory Relay Service will be launched as a Windows service:



Stop — You can stop the Cinegy Route Directory Relay Service by pressing the "Stop" button on the "Service management" tab or by pressing Stop in the "Services" window.

Restart — To restart the Cinegy Route Directory Relay Service, use the "Restart" button on the "Service management" tab or press Restart in the "Services" window.

Uninstall service — To uninstall the Cinegy Route Directory Relay Service, use the "Uninstall service" button.

The service statuses are indicated with the following colors:

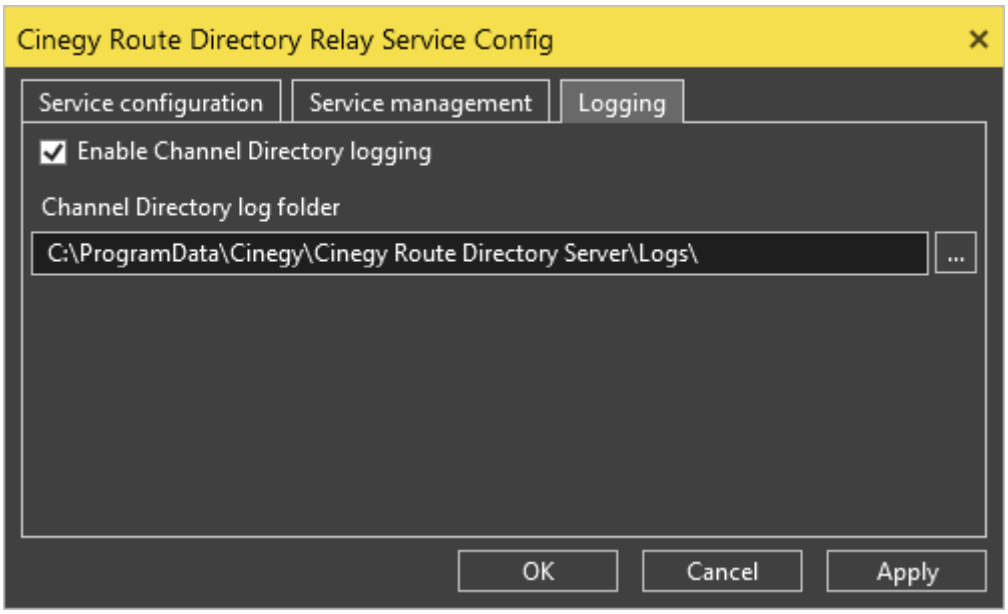
Stopped — The stopped service status is shown in red.

Running — The running service status is shown in green.

Start Pending / Stop Pending — When the service is being started/stopped, its status is shown in yellow.

Not Installed — Gray is used to indicate that the service is not installed.

Logging



To enable tracking of lock/unlock events with short details in the logs, select the corresponding checkbox and specify the location of the folder where the user log files will be stored. To do this, use the ... button or enter the path via the keyboard.

Having completed configuring the Cinegy Route Directory Relay Service, it should be restarted to apply the changes.

Use of network switch tools should show a multicast stream coming from the service, and it is recommended that client traffic is analyzed via network monitoring tools (e.g. WireShark) to verify proper operation.

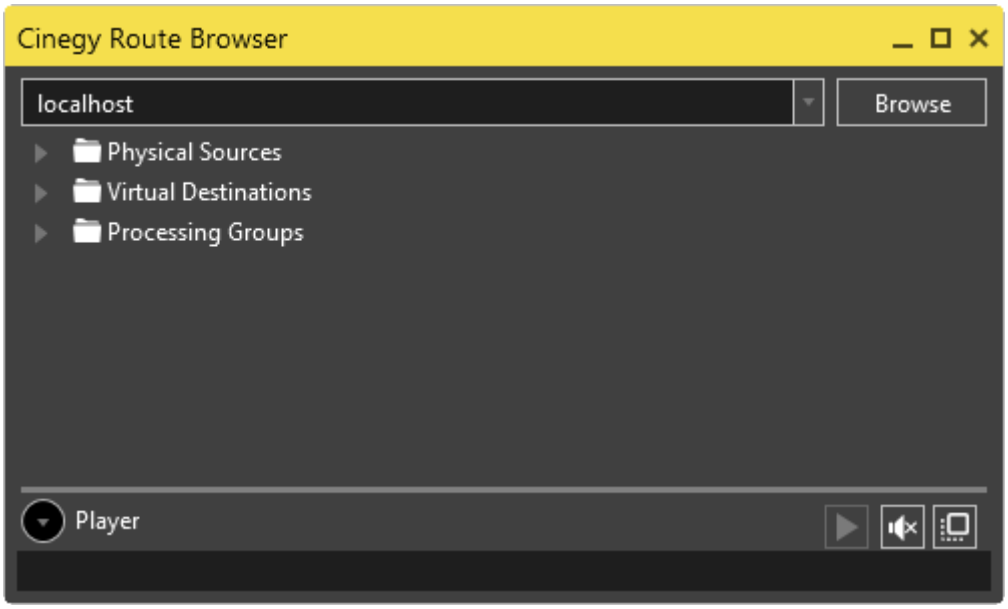
Chapter 4 Cinegy Route Browser

Cinegy Route Browser is a useful tool for browsing video streams registered by the Cinegy Route Directory Service and automatically converting them to RTP/UDP/SRT URLs.



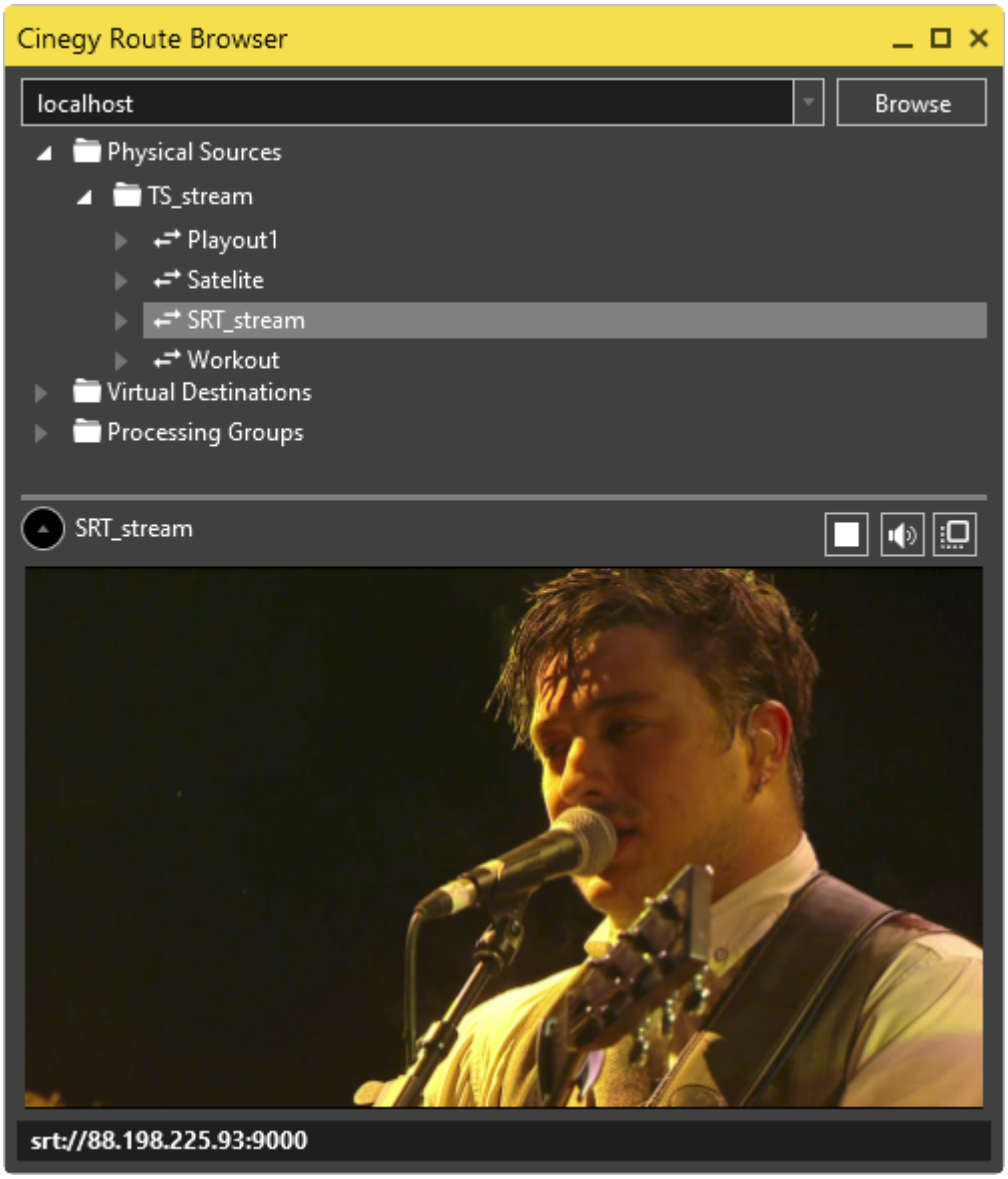
Refer to the **RTP/UDP/SRT URL Format** article for more information about the URLs' format.

To start Cinegy Route Browser, go to *Start* > *Cinegy* > *Cinegy Route Browser*. It will automatically connect to localhost:





You can use localhost if the Cinegy Route Directory Service is installed on your local computer or enter the proper server address or the network name in case it is being used remotely. Then press the "Browse" button to connect to the given server for browsing through the registered streams:



Only streams marked as "Visible" for current user will be available for browsing.

Below the tree of the registered streams there is a player where the video stream of the selected network source is previewed.



You can show / hide the player using the corresponding button.



The "Play / Stop" button toggles playback mode.

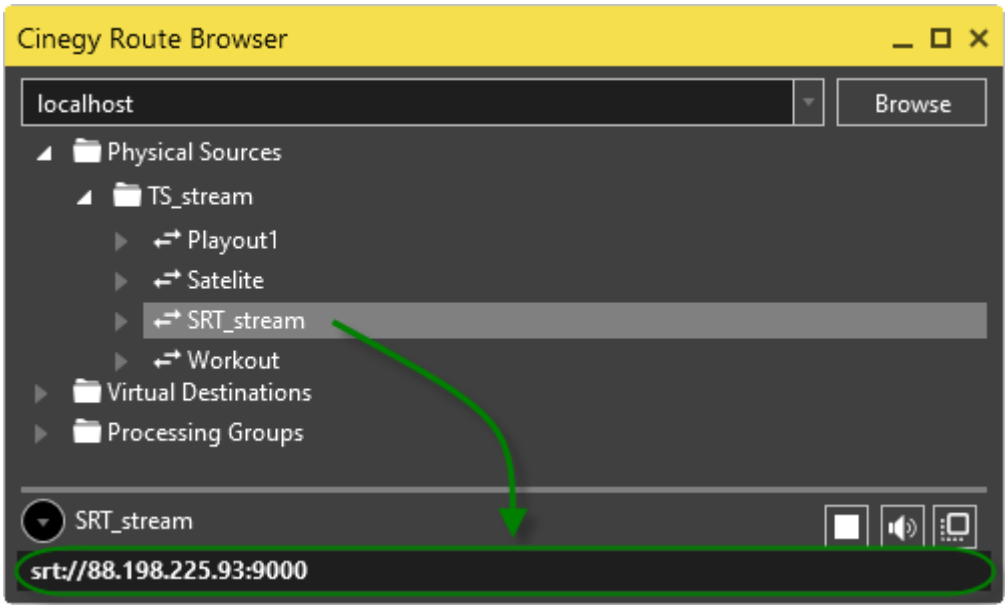


You can play/mute audio by pressing the corresponding buttons.



Press the "Always on top" button to always display the Cinegy Route Browser window on top of any other open windows.

At the bottom of the dialog box you can see the RTP/UDP/SRT URL corresponding to the selected source or program.



Route Browser supports direct drag-and-drop of the selected program into the Cinegy Air playlist (the corresponding live item will be created in this case) or into the text fields (a source RTP/UDP/SRT URL will be copied).

Chapter 5 Cinegy Route Control

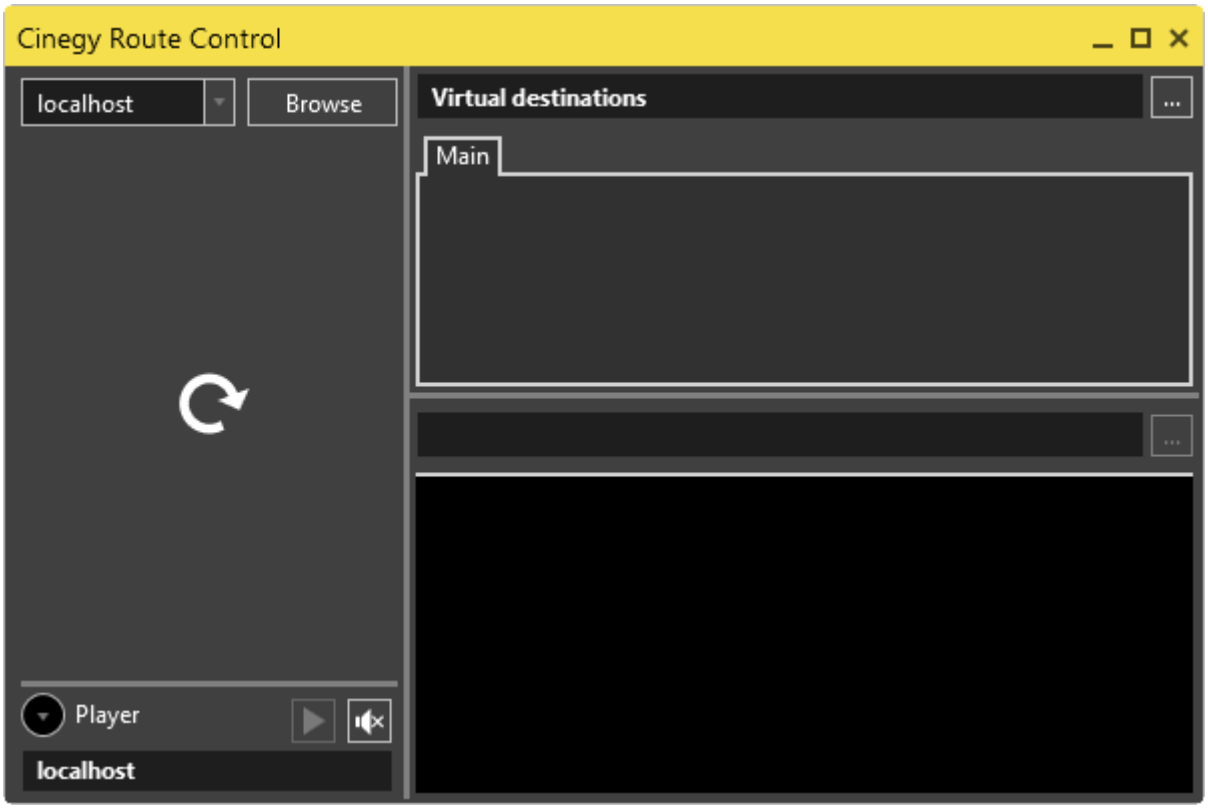
5.1 Getting Started

Cinegy Route Control is used for switching sources of the virtual destinations that allows the route operator to preview the incoming video for each virtual destination in real time.

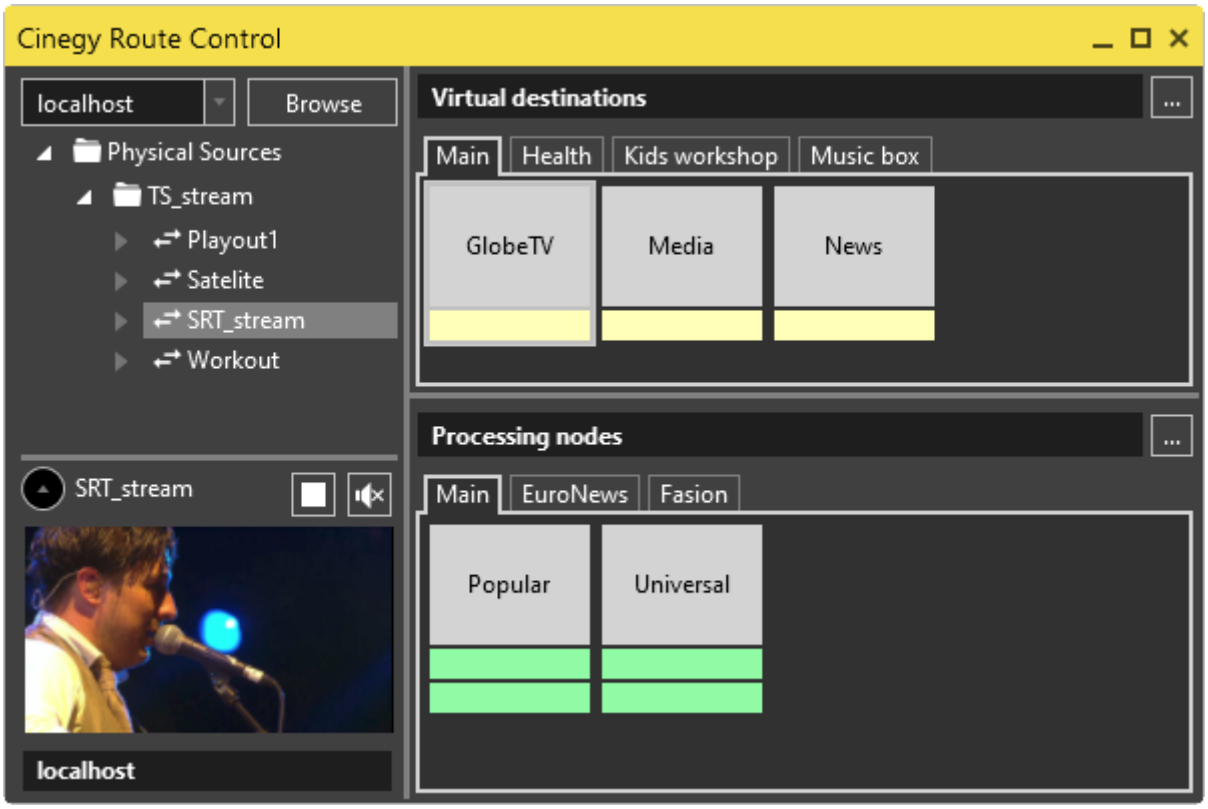


To have enough privileges to work with Cinegy Route Control, the user should be included at least to the "Routing users" group.

To start Cinegy Route Control, go to *Start* > *Cinegy* > *Cinegy Route Control*:



You can connect to localhost if the Cinegy Route Directory Service is installed on your local computer or enter the Cinegy Route Directory Service IP address or the network name in case it is being used remotely and press "Connect". All visible physical network sources, available for the currently connected server, will be displayed in a tree-like form on the left:



Below this tree, there is a player where the video stream of the selected network source is previewed.



You can show / hide the player using the corresponding button.



You can start/stop the playback by pressing the corresponding buttons.

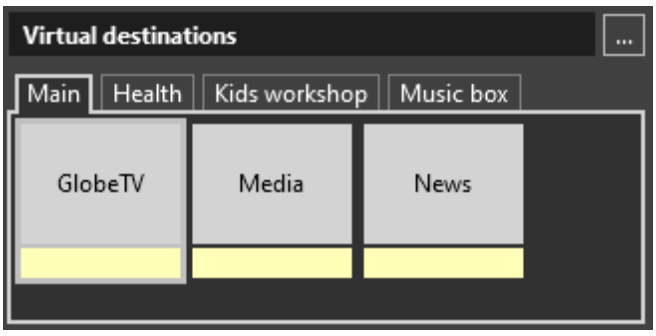


You can play/mute audio by pressing the corresponding buttons.

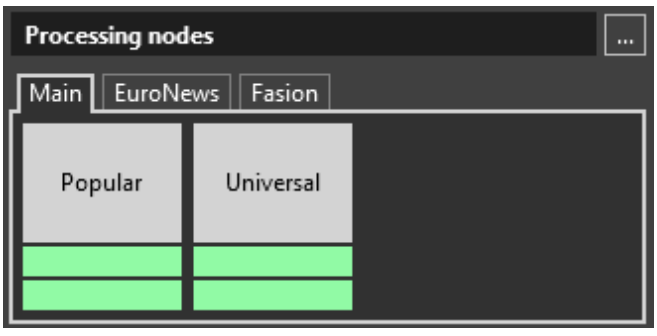
The right side of the Cinegy Route Control window is divided into two parts:

- **Virtual Destinations** – a panel where all virtual destinations for the currently selected network source are displayed. Use the ... button to choose another virtual folder.
- **Processing Nodes** – a panel where all processing nodes for the currently selected network source are displayed. Use the ... button to choose another processing folder.

All available virtual destinations and processing nodes may be grouped into different tabs according to the virtual source and processing source groups correspondingly created via Cinegy Route Manager.



Virtual destinations



Processing nodes

Locking

Virtual destinations can be locked for security reasons. Locked sources are marked with the lock label:



Can be unlocked



Cannot be unlocked

The yellow lock means that the source is locked, but the current user has privileges to unlock it.

The red lock means that the source is locked by the superior user and the current user has no privileges to unlock it.

Refer to the **Server Security** article for more information about the server security management.

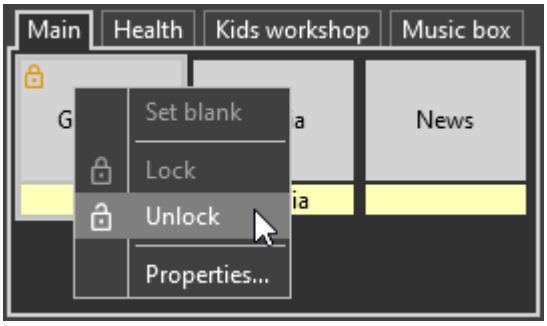
All the lock/unlock events are tracked with short details in the logs. Log files are created every day in the following location: `C:\ProgramData\Cinegy\Cinegy Route Directory Server\Logs\` at the definite time set through the ChannelDirectory.exe.config XML configuration file. A sample of its structure is shown below:

```
<?xml version="1.0"?>
<configuration>
    <configSections>
        <sectionGroup name="applicationSettings" type
="System.Configuration.ApplicationSettingsGroup, System, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089">
            <section name="ChannelDirectory.Properties.Settings" type
="System.Configuration.ClientSettingsSection, System, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089" requirePermission="false"/>
        </sectionGroup>
    </configSections>
    <applicationSettings>
      <ChannelDirectory.Properties.Settings>
            <setting name="LogDayStartAt" serializeAs="String">
                <value>time</value>
            </setting>
        </ChannelDirectory.Properties.Settings>
    </applicationSettings>
</configuration>
```

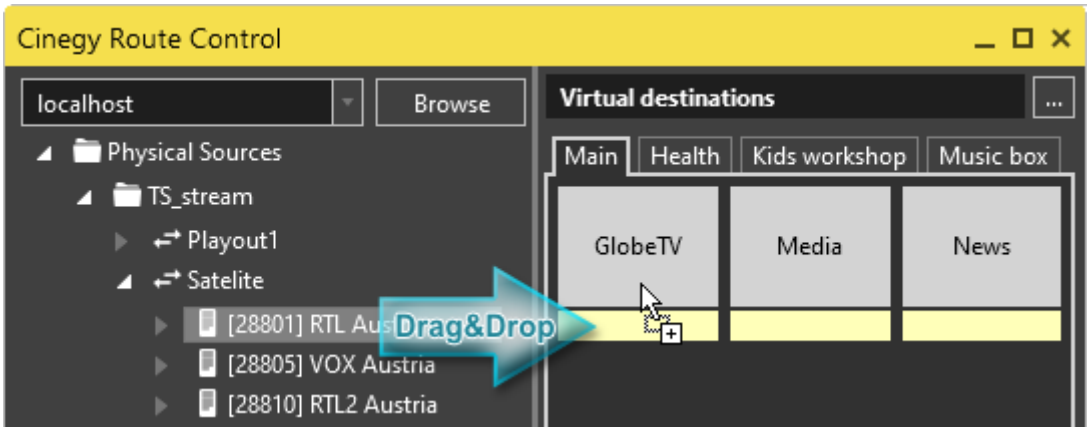
Here the `time` value defines the time when a new daily log is created.

Routing

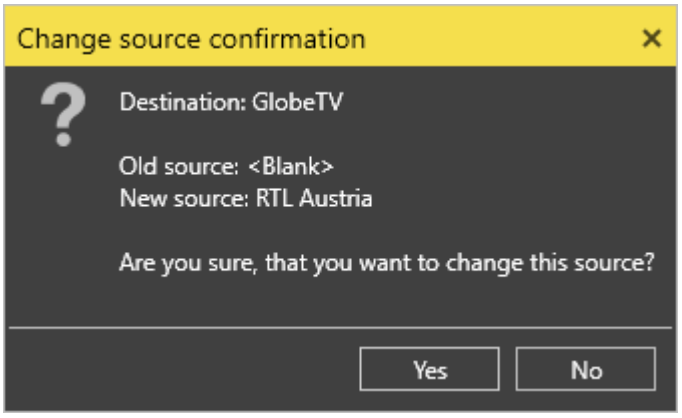
If the source is locked, unlock it first before you start routing. Use the "Unlock" command from the context menu to unlock the selected virtual destination:



Select the desired physical source and add it to the unlocked virtual destination via drag-and-drop:



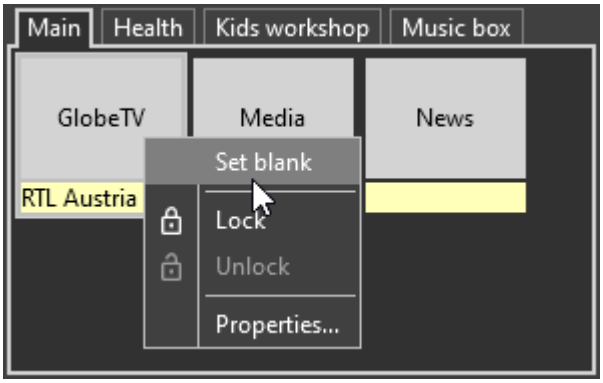
The following dialog box appears asking you to confirm your decision about changing the source:



The physical source name will be shown in the bottom part of the virtual destination icon:



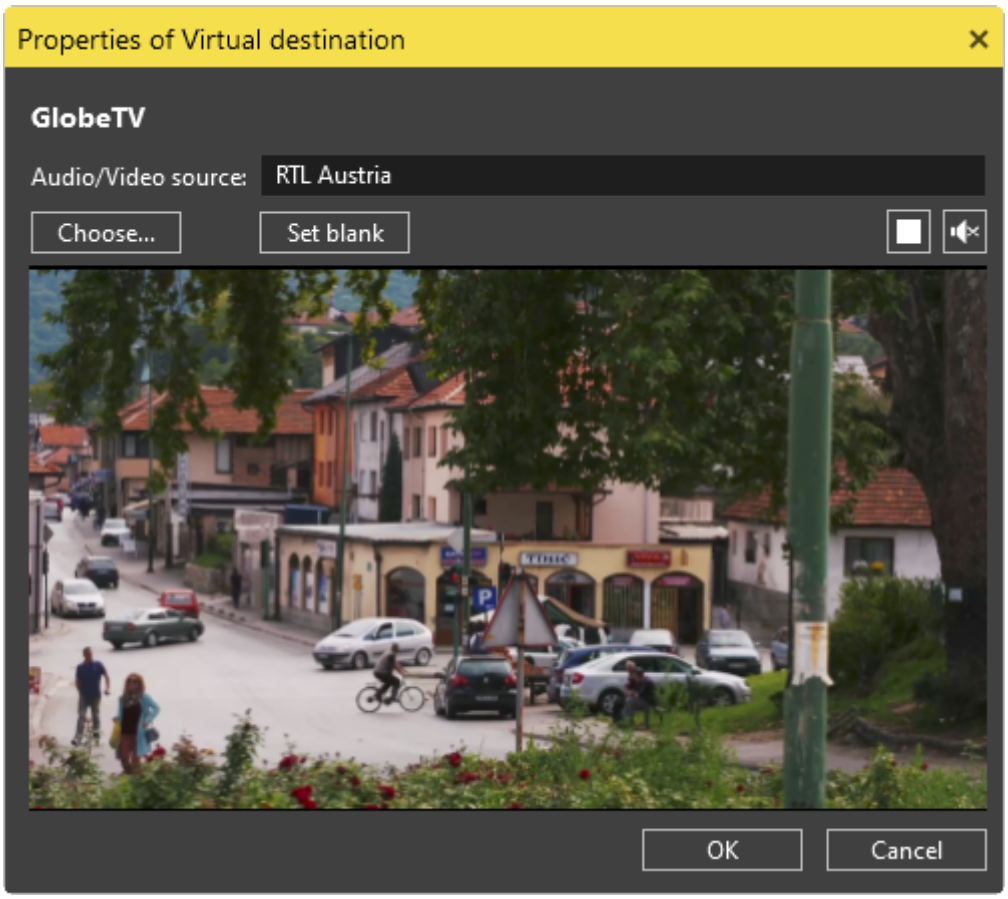
To disable routing for the current virtual destination, use the "Set blank…" command from the context menu:



Alternatively, use the "Set blank" button in the "Properties" menu of the virtual destination.

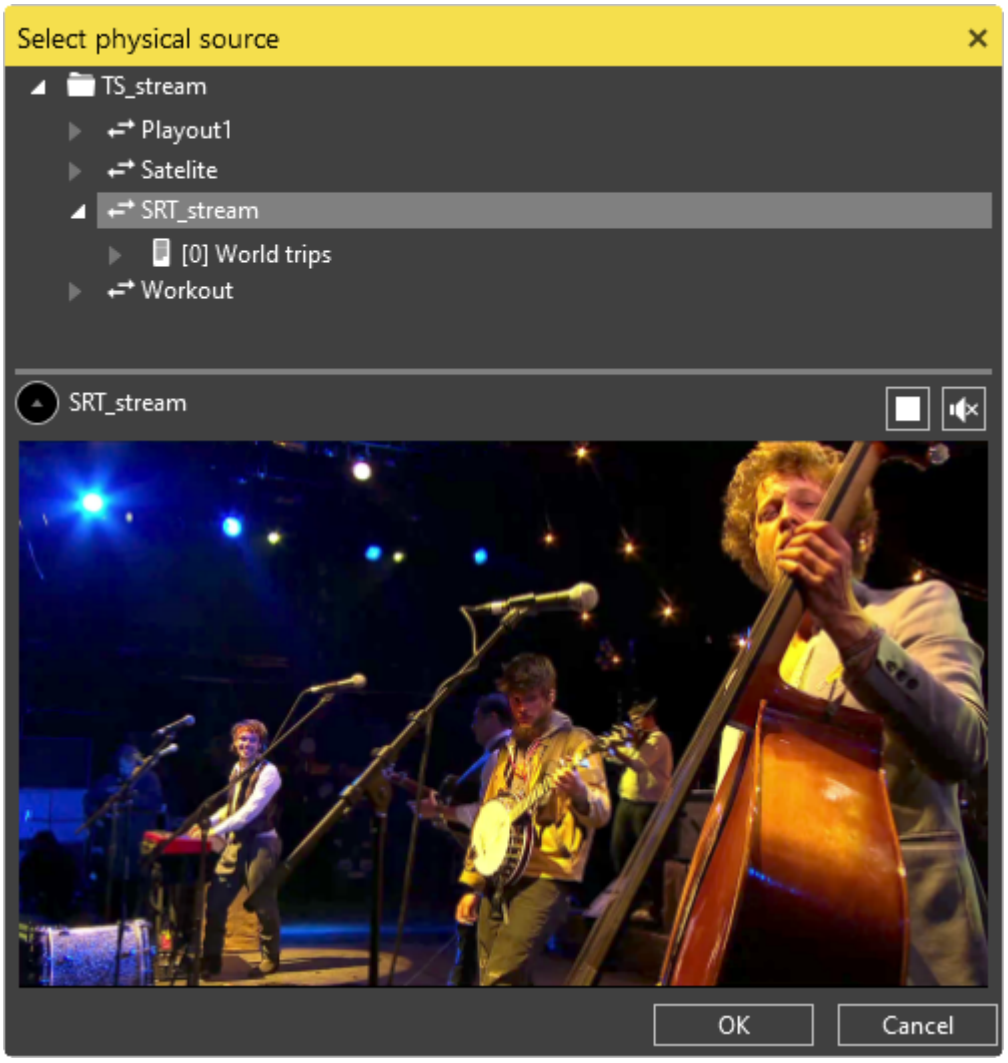
5.2 Virtual Destinations Properties

To see the properties of the virtual destination, double-click it or use the "Properties" command from the context menu. The following "Properties" window will appear:



In the "Properties" window, the preview plays the incoming video for the current virtual destination in real time.

Choose... Press the "Choose" button to select any other physical source for the current virtual destination. The following dialog box appears, where you can select the desired physical source you wish to add:



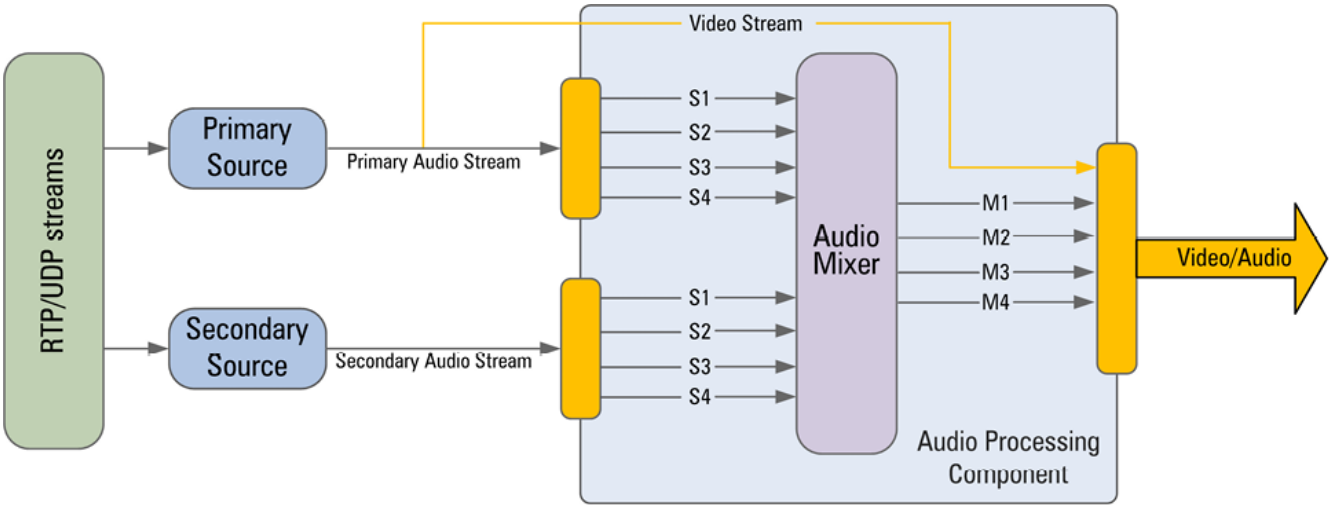
After selecting the physical source, click "OK" to close the dialog box.

Set blank Press the "Set blank" button in the "Properties" dialog box to disable routing for the current virtual destination.

5.3 Processing Nodes

A processing node is a special type of the IP source that can be assigned to two input audio streams – primary and secondary, and process them according to the preconfigured audio mixer settings. The video stream from the primary source only is used in this process, whereas the video stream from the secondary source is not used at all.

The following diagram represents this process graphically:



As shown on the diagram above, the main part of the audio processing component is the eight-to-four channel audio mixer, which can process up to 8 input stereo audio channels (4 for the primary source, 4 for the secondary one).

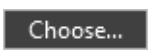
Properties

To see the properties of the processing node, double-click it or use the "Properties" command from the context menu. The following window will appear:



In the "Properties" window, the preview of the resulting signal for the current processing node is shown.

Select the physical source for the current processing node in the same way as for virtual destination.



You can also add the secondary audio source for the selected primary physical source via the "Choose" button.

Audio Settings

The audio mixer consists of 8 incoming processing groups – 4 for the primary channel and 4 for the secondary one – which build up the audio pipe-line. Each incoming primary and secondary audio channel can be processed individually according to the pre-configured settings. The processed (mixed) signal can further be sent to any of the four master output channels.



Cinegy Route Control provides you with a set of audio channel controls. The M1 … M4 buttons matrix for the primary and secondary audio channels allows you to program the outgoing sound (master channel selection).

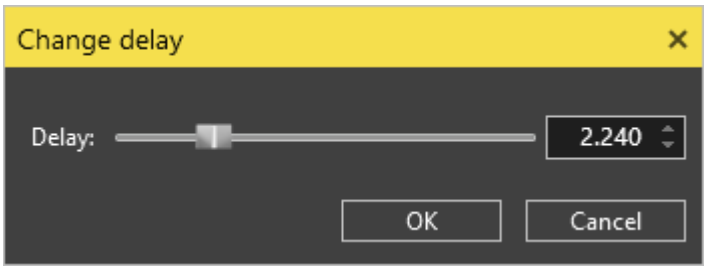
The M-L-R-S buttons make up the so-called "legs control" that allows you to select which leg to process and in which way. It offers the following options:



M – use mono
L – use left only
R – user right only
S – swap left and right legs.



The "Eq" button allows you to configure the audio delay shift in relation to video. It can be used in order to synchronize the audio streams coming through different sources (e.g. Satellite, ISDN, etc.). When pressed, the following dialog box appears:



Drag the slider to define the audio delay value in seconds (0 – 10). You can also set the desired value via the keyboard or by pressing the buttons.



Drag the S1…S4 slider to define the volume level of the initial signal separately for each primary and/or secondary channel.



Drag the M1…M4 slider to adjust the volume of the processed audio signal for the master channel.

Reset audio Press the "Reset audio" button to return to the default audio settings.

Having set all the parameters for the current processing node, press the "OK" button to return to the Cinegy Route Control main window.

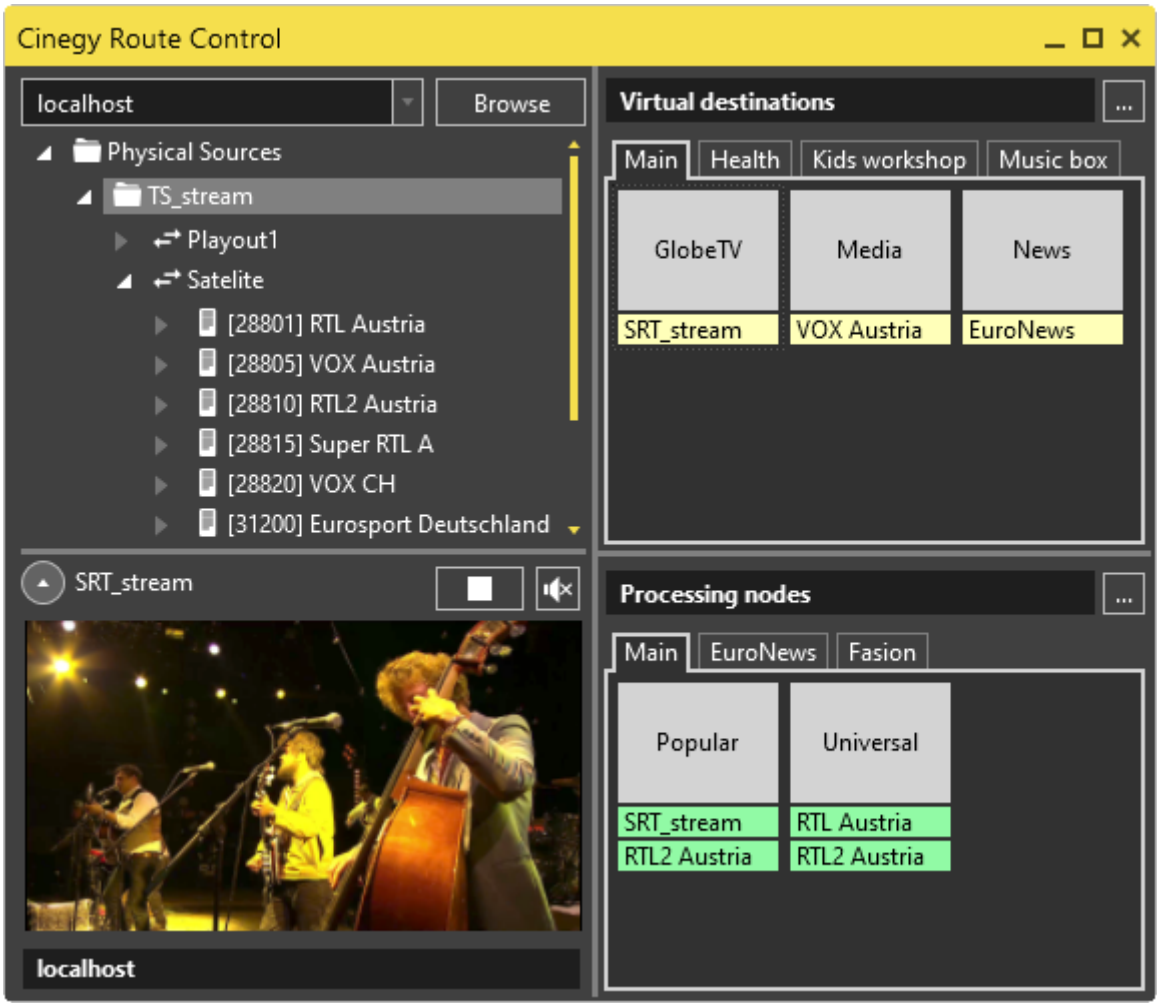
Processing Nodes Routing

On the basis of the processing groups and nodes, both the Cinegy Route Manager and Cinegy Route Control applications support extended routing.

Configuration

All processing parameters are configured via the Cinegy Route Control application.

The bottom right panel contains all available processing nodes previously created via Cinegy Route Manager:



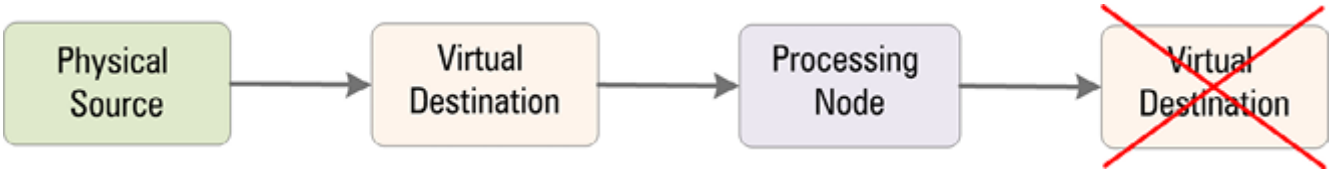
Each processing node requires two input streams as the source: the primary stream containing both audio and video, as well as the secondary stream containing only audio. To configure the desired processing node, double-click it and define its parameters in the "Properties" dialog.

As soon as the processing node is configured and the source streams are assigned, this node may be selected as the source and used in the usual way in any Cinegy application.

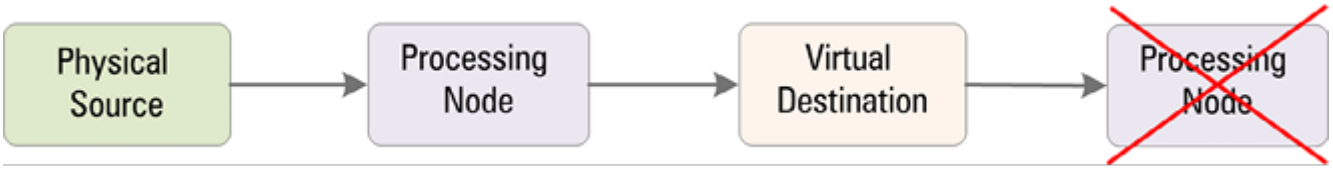
	Please note that actual processing takes place on the client side, i.e. on the receiver where the given processing node is used.

Using Virtual Destinations and Processing Nodes

It is possible to combine virtual destinations and processing nodes, but only one level of recurring is supported. It means that only one virtual destination can be used as the source for the processing node that already has the physical source assigned to it:



In the same way the assignment of the processing node to the virtual destination is supported:


Physical Source
Processing Node
Virtual Destination
Processing Node

Chapter 6 Amino Integration

6.1 Overview and Setting Up

The Cinegy Route virtual destination functionality is a useful mechanism to achieve the simulation of SDI switching with IP flows. A virtual destination is actually best considered as an URL rendezvous-point, which can either be used as a key when listening to the multicast broadcast of the system state, or as a resource to access via the HTTP GET. While the mechanism is not a standard, it is open and accessible to any third-party devices that wish to inter-operate with Cinegy Route.

One class of third-party devices are network stream receiver boxes (or set-top-boxes / STBs), and Cinegy Route comes with out-of-the-box support for a particular, popular box – the Amino A140. While other boxes, devices and software can easily be extended to support the virtual destination rendezvous, the A140 can be used instantly with just a shipping copy of Cinegy Route.

The benefits of using an off-the-shelf STB for stream decoding is largely that any commercial TV can instantly be turned into a broadcast monitor, with just an inexpensive box mounted near with only power and an Ethernet lead connected. Customers can build complete gallery walls running without major expense, or can drop fully routable monitors all around the office or the newsroom.

The Amino A140 STB is designed to be managed at scale, and is quite capable of being set up just by registering the MAC address centrally in DHCP and plugging in. For this reason, they can seem a little daunting to set up quickly for a small setup with a single screen.

However, starting with just a single unit is the easiest way to get familiar with the process. The Amino website has a huge amount of information to help you get started, including configuration and installation guides. These contain details of how to set TV formats, perform firmware updates, access management menus and perform troubleshooting. All customers are recommended to review this information before attempting integration with Cinegy Route.



Cinegy does not provide any support for Amino STB units, setup or issues arising with these boxes. The information provided comes with no warranty, and is presented to show a working model of integration. However, multiple customers have great success with these units, being in active use by Cinegy at multiple company sites and for the last several years at major tradeshows. Please contact your system integrator for professional assistance, if required.

6.2 Getting Started With a Single A140

The simplest way to use an A140 is to attach a keyboard, and type the URL for the Amino control page hosted by Cinegy Route. With the keyboard attached, it is possible to press the `F10` key to access the URL entry dialog which appears along the top-edge of the screen. Any reachable web-address can be entered here to test the Amino machine and the network behavior.



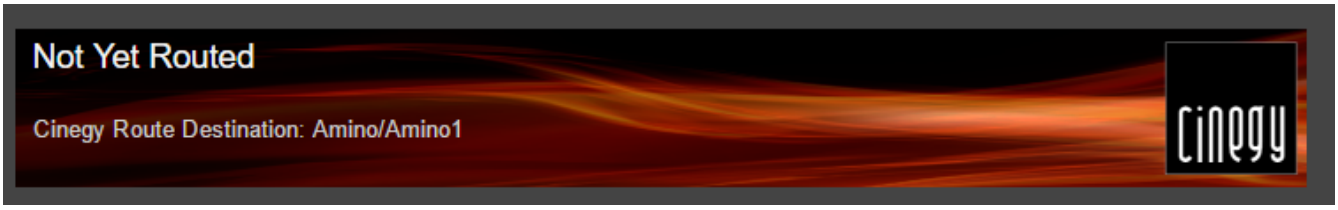
Amino USB keyboards are not hot-pluggable; you will need to restart the Amino for the keyboard to be detected. With a keyboard attached, you can also use `Alt-M` and `ALT+P` to access system menus – please see Amino configuration guides for more information.

To ask the Amino to attach to the Cinegy Route, you can enter the following URL (substituting the real address of the Cinegy Route Directory Service server):

http://<routeservernameorip>:9996/control/amino/amino.html

The same URL can be tested inside a desktop browser, to verify the network is accessible and working.

By default, a channel pop-up menu will appear, probably indicating that "Not Yet Routed". This pop-up will show you the virtual destination that the box is attempting to map to – by default, this is a virtual destination called "Amino1" inside the "Amino" folder.



Once this virtual destination is created inside Cinegy Route Manager, you can map a stream or channel to the virtual destination. As soon as this connection is established, the Amino should switch to the described channel (the Amino reboot may be required if the virtual destination was just created):



The above strap shows the virtual destination now mapped to a channel within a multi-program transport stream, and the Amino should be playing the specified channel. After approximately 10 seconds, the strap should disappear.

When any changes are made to the virtual destination, the Amino should change within approximately 1 second to the new destination, and the pop-up strap will temporarily re-appear to indicate the changed location again.

Please note, Amino A140 units do not support all profiles and bitrates possible with MPEG2 and H.264 – details of what is supported can be found on the technical specification sheet for the Amino unit. For higher-capability decoding of formats such as 422 video, we recommend using Cinegy Encode software as a decoder.

Once you are comfortable that the Amino unit is working correctly with the manually entered URL, you can choose to set the Amino default homepage (within the `Alt+M` management settings page) to this URL at start-up. If deploying multiple Amino units, you may wish to make a binding in the JavaScript file on the Route server to connect a specific Amino MAC address to a specific virtual destination – this is described in the later section about customising the Amino HTML page.

Alternatively, as a more scalable and recommended method, you can customise a DHCP server available to direct any Amino to default or specific settings – which is discussed in the next section.

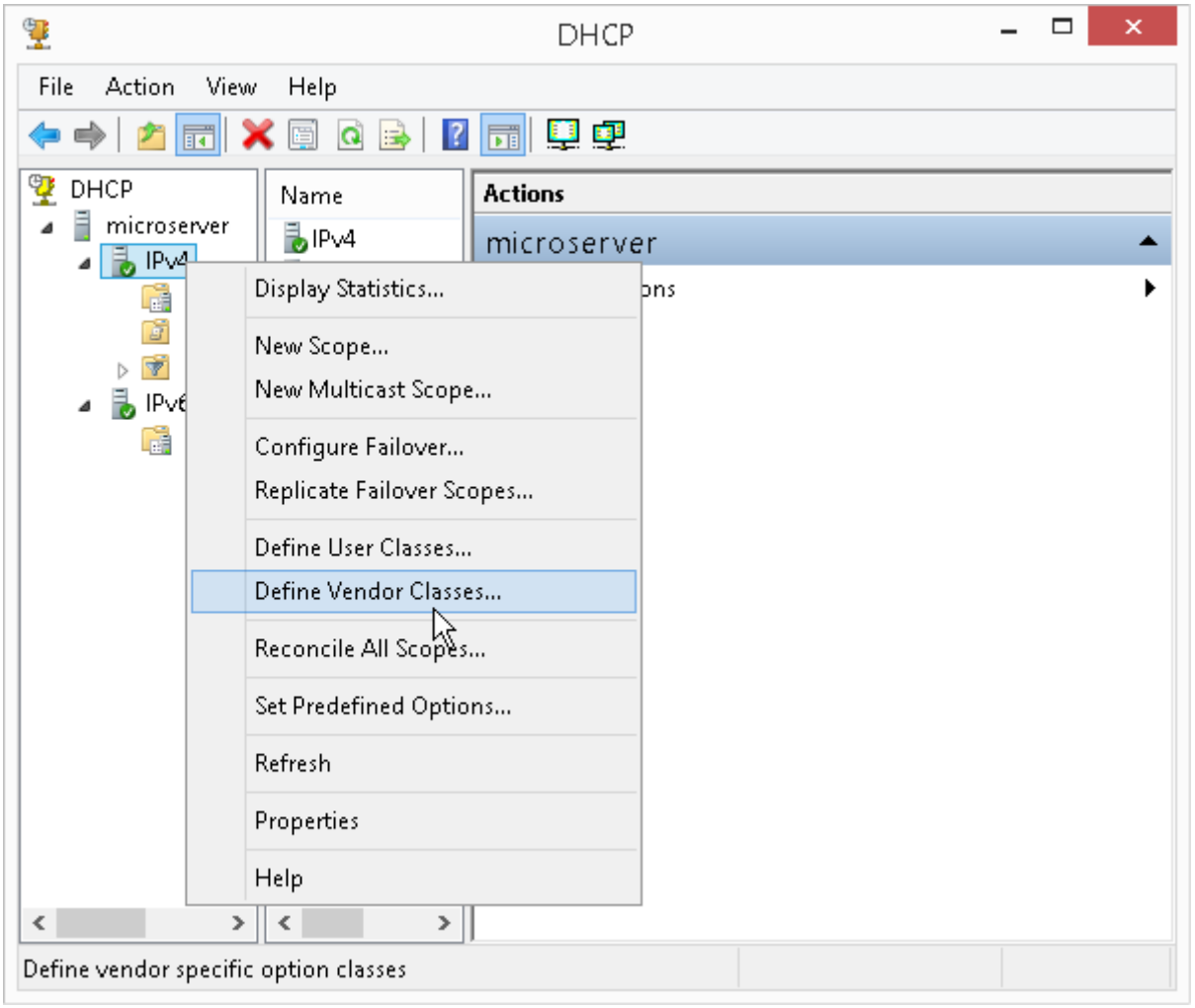
Amino DHCP on Windows Server

With a centralised DHCP server, it is possible to send parameters to all or specific Amino units as DHCP 'OPTION' messages. More details are provided within the Amino Installation & Configuration guide, including complete instructions for setting up a Linux-based DHCP server.

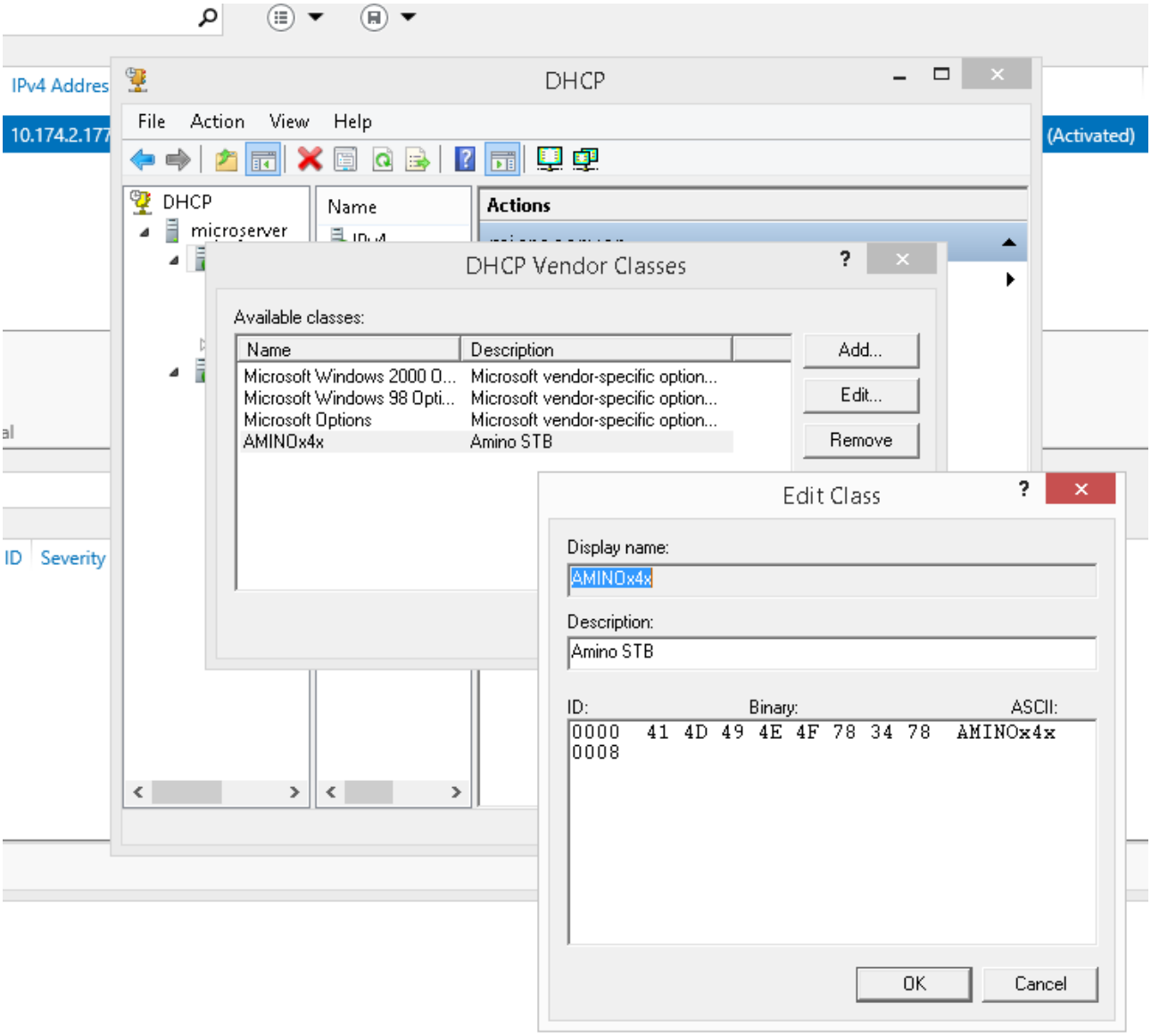
This section describes how to set up a Windows-based DHCP server using the integrated DHCP role available in Windows 2008 and later. It assumes the reader is comfortable with administering Windows DHCP, and has an operational understanding of the network technologies involved.

To configure Amino DHCP on the Windows server, follow the steps below:

1. Open DHCP on the server, and then define a custom vendor class for "Amino" devices:



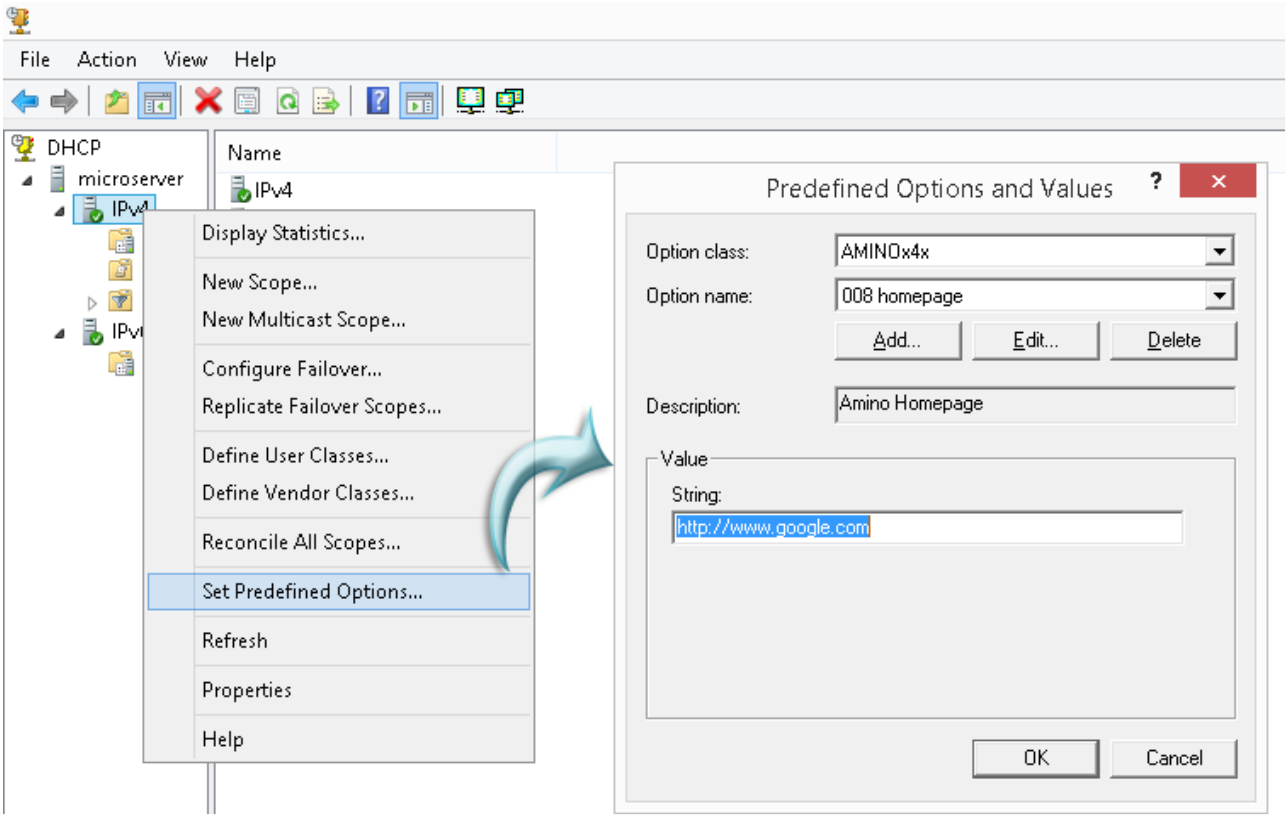
2. Set the ASCII value to AMINOx4x:



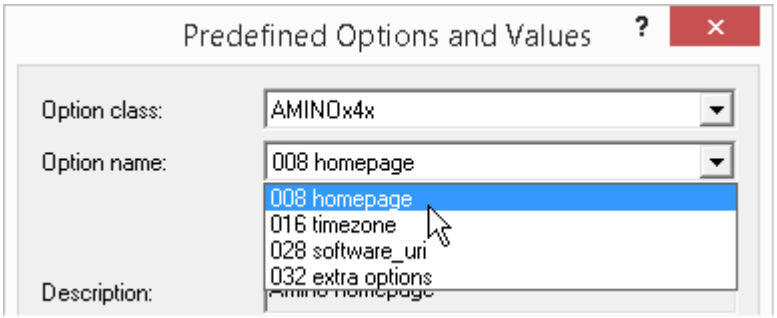


This step is very important, since this is the key the devices will lock onto.

3. Create some custom predefined options against this new vendor class, as shown below:



The Amino manuals show various codes available to inject here, but the four most useful ones are shown below:



For more details on the codes and their usage, please refer to the **Amino website**.

Code Descriptions

The following table contains description of the four most useful codes:

Code	Description
008 homepage	Defines a specific page to navigate to after booting.
016 timezone	Sets the time zone of the Amino box. Please note that this code is optional. It only matters if you set a generic NTP server, and want to telnet the Amino box and trace logs with accurate timestamps.

Code	Description
028 software_uri	Enables you to host an MCFS firmware file and the point to it here, when there is a need to apply new firmwares. On boot, any Amino A140 will check the file and apply the update if needed. When using this code, please add a suitable MIMETYPE (such as application/octet-stream) to the web server hosting the file server as well.
032 extra_options	Allows you to specify space-delimited custom options, which are used by the Cinegy Route Directory Service to attach an Amino box to a specific Cinegy Route virtual destination. Please note that these codes can be combined with DHCP standard options for DNS, routers, etc.

Code Deployment Examples

Homepage

The example of homepage URL to read the Amino control page from Cinegy Route is as follows:

```
http://<routeservernameorip>:9996/control/amino/amino.html
```

Extra Options

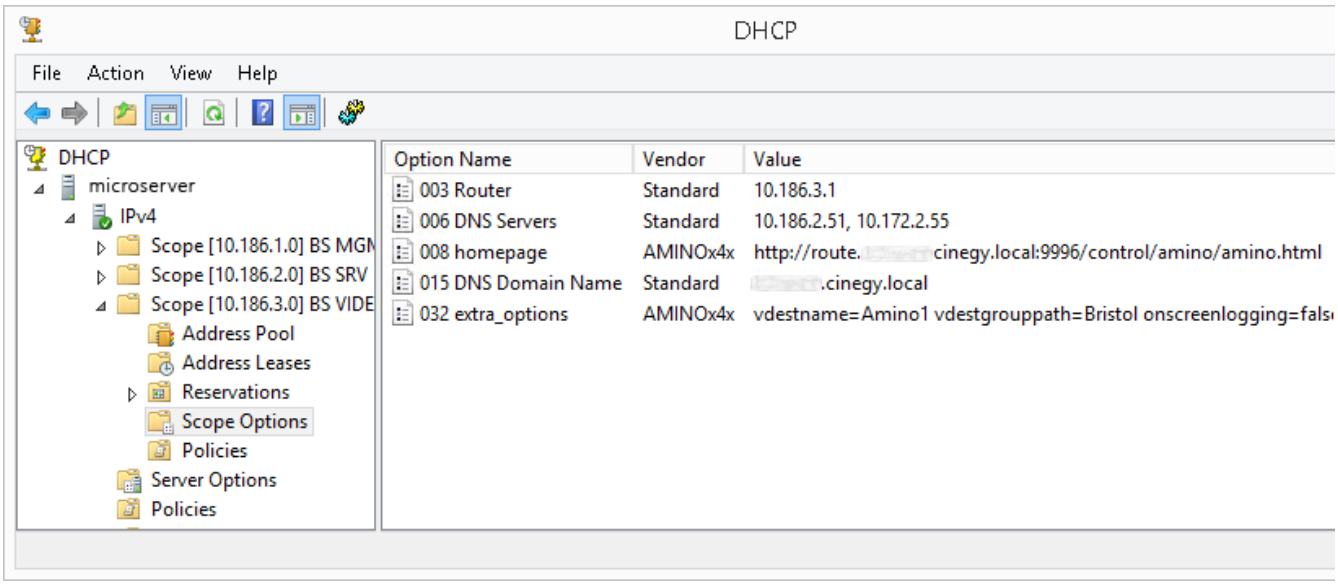
The example of extra_options values is as follows:

```
vdestname=Desk_Amino vdestgrouppath=Amino onscreenlogging=true
```

Please note that this code is useful only when pointing the Amino box at Cinegy Route Control homepages.

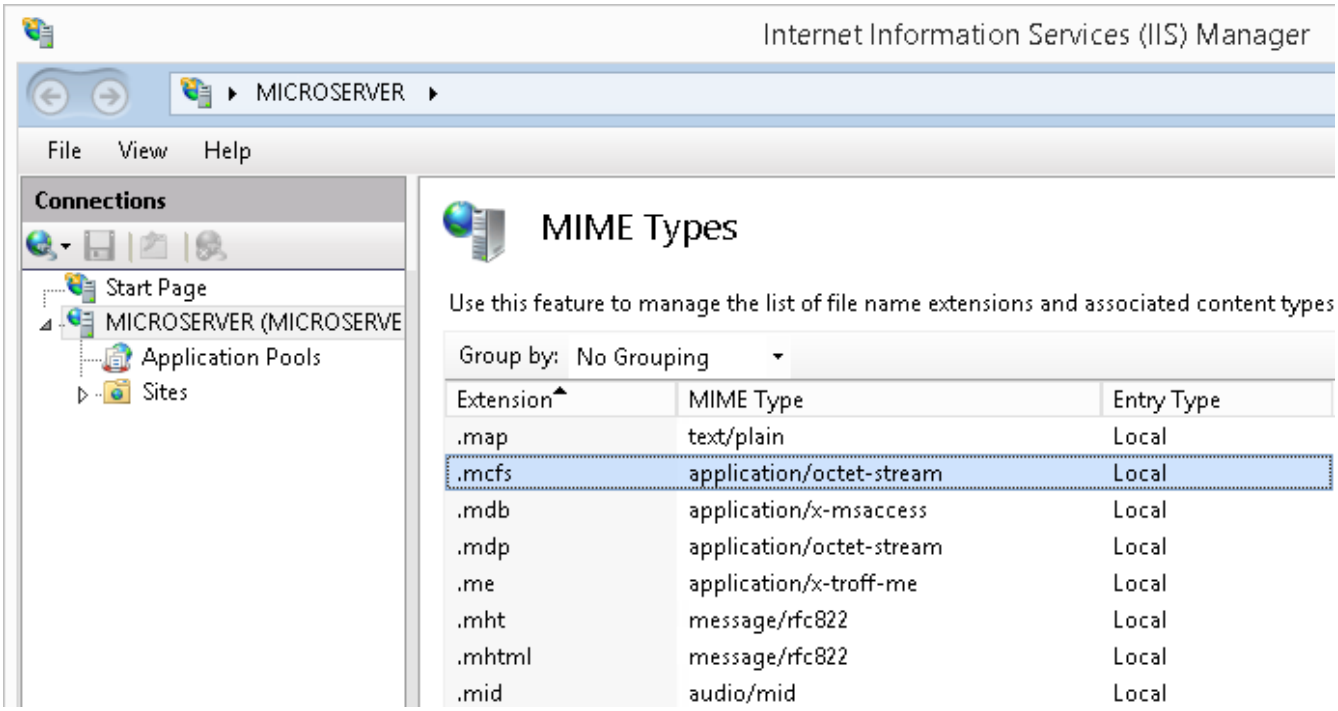
Global Scope Options

Global scope options applied to all units (so all Amino boxes get the same firmware) look as follows:



MIME Types

If using IIS to host the firmware, a MIME type registered for this is also required:



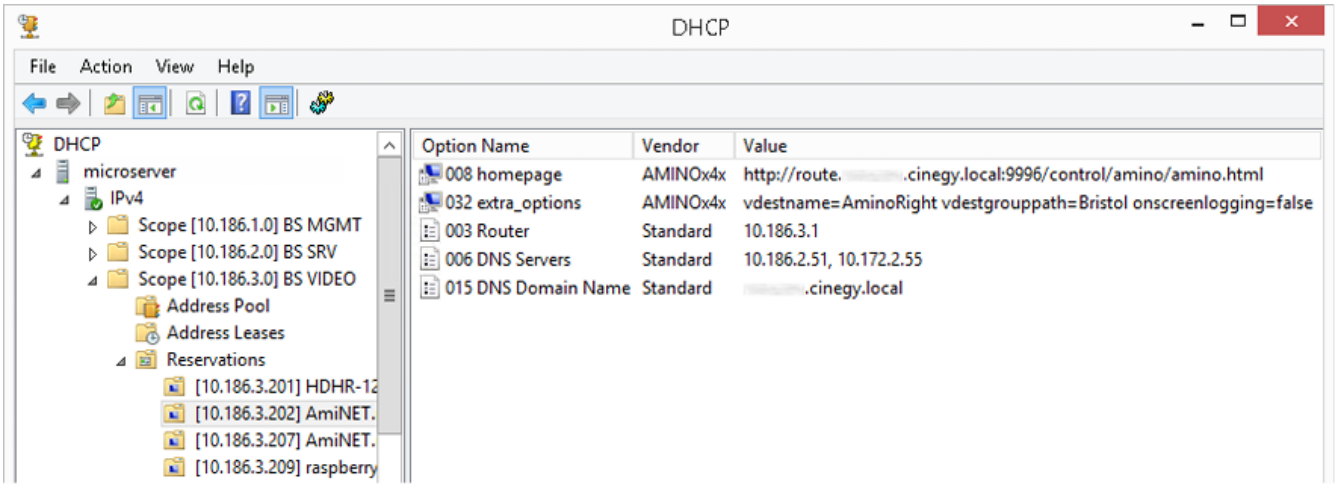
Please keep in mind that HTTP server logging can be used to spy on the actions of misbehaving Amino boxes, to see what they are trying to do, and can be helpful when troubleshooting.

Amino Box Overriding

Global settings are useful when all Amino units should share the same settings. However, it is quite likely that different units should be bound to different virtual destinations. This can either be handled by editing the control pages to register the MAC address inside the control pages (see the section on customizing the control pages later), or it can be done using DHCP reservations.

In a normal environment, using Cinegy Route – Amino integration, it is expected that each Amino box has a reservation, which tells it on boot "what" Cinegy Route virtual destination to bind to (and turns on/off on-screen logging and such).

The screenshot below displays the homepage being overridden for a specific Amino box:



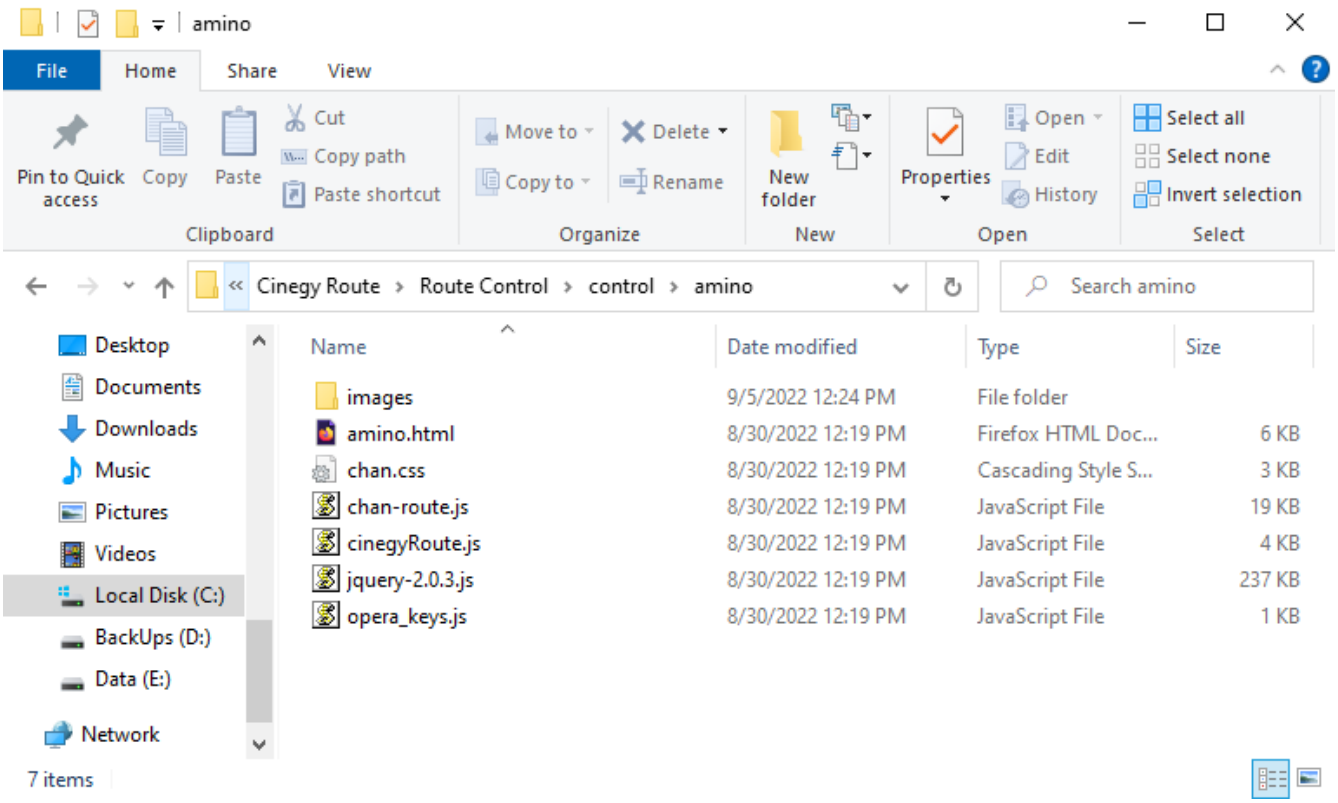
You cannot mix AMINO specific options between global and reservation scope – so if make a reservation, also set any other AMINO specific options (like homepage) explicitly in the reservation. Any global options specific to the AMINO class will be ignored by the reserved unit. The above screenshot shows the homepage explicitly copied to the reservation.

6.3 Customizing the A140 HTML Control Pages

The Amino A140 is integrated to Cinegy Route using the Amino/JavaScript API (JMACX) technology. This allows simple in-browser JavaScript to drive Amino channel selection and other settings.

While Cinegy Route comes with a ready-to-go installation of the required HTML files, as well as a simple HTTP server running with the service on TCP port 9996, customers are encouraged to customize and relocate the HTML pages, if required.

The following screenshot shows the files used by the Amino STB in the default location on the Cinegy Route Directory Service server:



When any client, be that an Amino or a desktop browser, accesses the URL

http://<routeservernameorip>:9996/control/amino/amino.html

Then they are being served files from this folder. Customers are welcome to relocate this folder, and serve these files from any HTTP server – no files from the control/amino folder are used in other operations of Cinegy Route. Similarly, other folders under the "control" folder may be created for simple hosting from the Cinegy Route Directory Service – allowing customers to easily add other STB support. Anyone customizing these files is encouraged to consider hosting the customized files in an alternative location, to avoid corruption during upgrades.

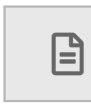
If a customer wishes to direct Amino units to specific virtual destinations without using DHCP, the control pages may be directly edited to add a list of Amino MAC addresses (network specific addresses, printed on the base of each Amino). Example entries are set inside the amino.html file directly, as shown below:

```
52
53                  //pick friendly-named amino vdests for known aminos
54                  switch(aminoMac)
55                  {
56                      case "00020246c179":
57                          virtualDirGroupPath = "Amino";
58                          virtualDestinationName = "Amino1";
59                          break;
60                      case "00020246c26c":
61                          virtualDirGroupPath = "Amino";
62                          virtualDestinationName = "Amino2";
63                          break;
64                  }
```

```
//pick friendly-named amino vdests for known aminos
switch(aminoMac)
{
        case "00020246c179":
                virtualDirGroupPath = "Amino";
                virtualDestinationName = "Amino1";
                break;
        case "00020246c26c":
                virtualDirGroupPath = "Amino";
                virtualDestinationName = "Amino2";
                break;
}
```

Similarly, this file contains a list of default channels to load into the Amino, so that the remote wand may be used to access static UDP, RTP or SRT signals. The relevant section is shown below:

```
99                  //example entries to override channels
100                 //add(1, "igmp://239.1.1.34:5000", "Air1");
101                 //add(2, "igmp://239.1.1.37:5000", "Multiviewer2");
102
103                 //put three channels for testing at 901+
104                 add(901, "igmp://239.1.1.1:1234", "Cinegy 1");
105                 add(902, "igmp://239.1.1.2:1234", "Cinegy 2");
106                 add(903, "igmp://239.1.1.3:1234", "Cinegy 3");
107                 addChannelList();
```



Please back up the original files before taking customization steps. Similarly, please be aware that re-installing Cinegy Route or upgrading the version installed may reset changes made.

Examples of other elements that may be altered:

- changing branding for popups;
- replacing CSS file contents;
- altering PNG files.