Viz Mosart Media Router Guide

Version 4.0

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Contents

1 Introduction

Viz Mosart is a unique tool for making repetitive tasks easy. Your production is made effortless for the operator as robotic camera moves, video effects, audio stings, lighting states, and automatically assigned video ports cue for playback to make a perfectly presented production.

This document contains an overview of system prerequisites, installation, and configuration of the **Media Router** within your broadcast environment.

For information about the other components of Viz Mosart, see the *Viz Mosart User Guide* and *Viz Mosart Administrator Guide*.

1.1 Related Documents

- Viz Mosart Administrator Guide*:* Contains information on how to install the **Viz Mosart** software and supported hardware.
- Viz Mosart User Guide*:* Contains information on how to use Viz Mosart in live production.
- *Viz Mosart Functional Specification*

1.2 Feedback And Suggestions

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2 About Media Router

Media Router allows for device sharing in a limited resource environment. It is used to share broadcast media resources between multiple Viz Mosart Servers and other broadcast equipment.

Media Router uses the functionality provided by Viz Mosart Server, allowing changes to Viz Mosart-controlled resources to be made dynamically, that is, without restarting any of the Viz Mosart applications.

The equipment types which are controllable by Media Router are:

- Video Servers (VS)
- Overlay Graphics (OG)
- Fullscreen Graphics (FG)
- Robotic Cameras (RC)
- Lights (L)
- Video Wall (W)

Media Router is normally used in the following scenarios:

- To change the resource configuration of a Viz Mosart server installation prior to running a show. That is, to share resources between multiple Viz Mosart server installations/galleries.
- In emergencies to make use of backup resources.

The Media Router resembles a router in that changes are done by setting crosspoints in a router setup. Thereby connecting resources (inputs) with Viz Mosart (outputs).

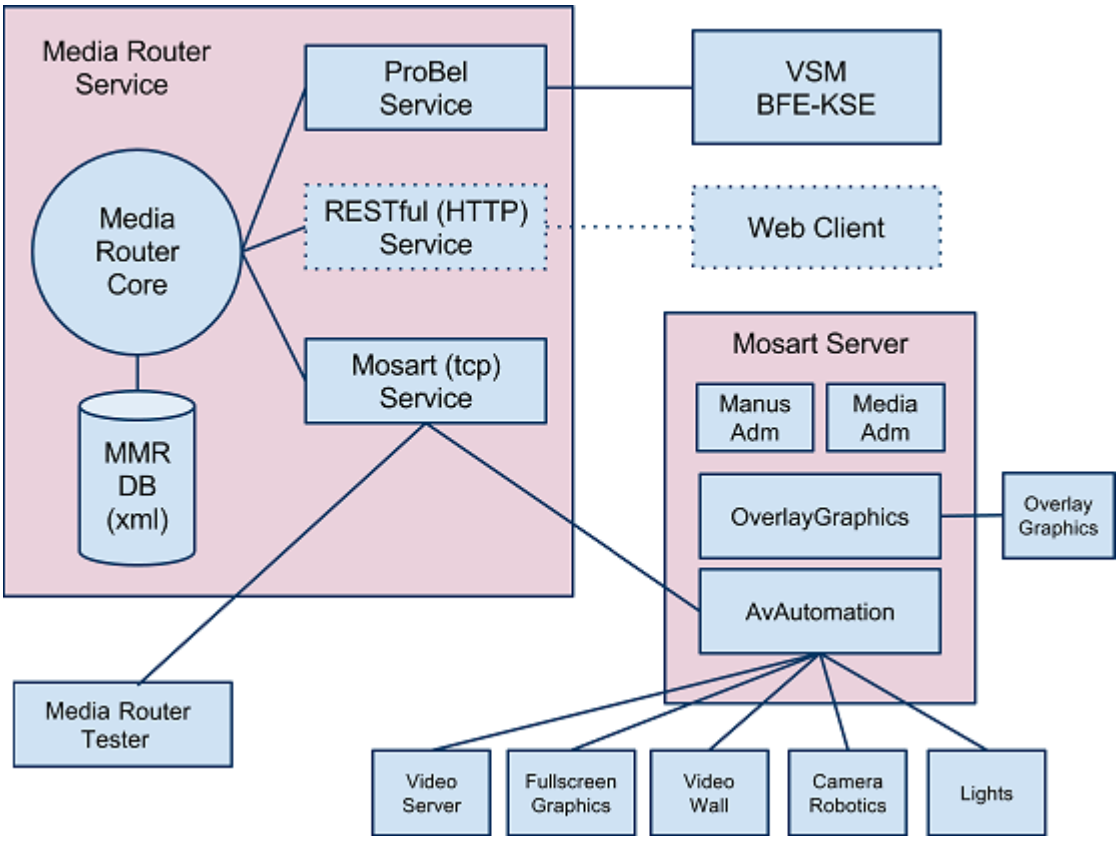
This section contains the following:

2.1 Media Router Naming Convention For Components

When contacting support there is a standard naming convention for the following applications and components that form Viz Mosart:

Short Name	Long Name	Description
AVA	AV Automation	Application controlling attached broadcast equipment.
Client (output)		A client in this context denotes a service which are given access to one or more sources via the Media Router. In router terminology a client defines an output of a router matrix.
CurrentSalvo		Internal Media Router state containing validated crosspoints.
GUI	Viz Mosart GUI	Main user control application.
Manus Admin	Manus Administrator	Application controlling the Viz Mosart rundown.
Media Admin	Media Administrator	Application for monitoring media objects (clips).
OGI	Overlay Graphics Interface	Application that controls Overlay graphics systems.
PendingSalvo		Internal Media Router state containing all pending crosspoints (corresponding configuration changes to be validated by Mosart servers).
Source (input)		A dedicated media content provider to be controlled. Examples of sources in this context are video play-out server ports and graphics controllers. In router terminology a source defines an input of a router matrix
MMR	Mosart Media Router	Previously known as Mosart Media Router or MMR. Application that shares broadcast devices between control rooms.
MMT	Media Router Test Application	
NCS, NRCS	Newsroom Computer System	
Salvo		A predefined list of crosspoint operations which when executed all occur simultaneously.

2.2 Typical Media Router Setup



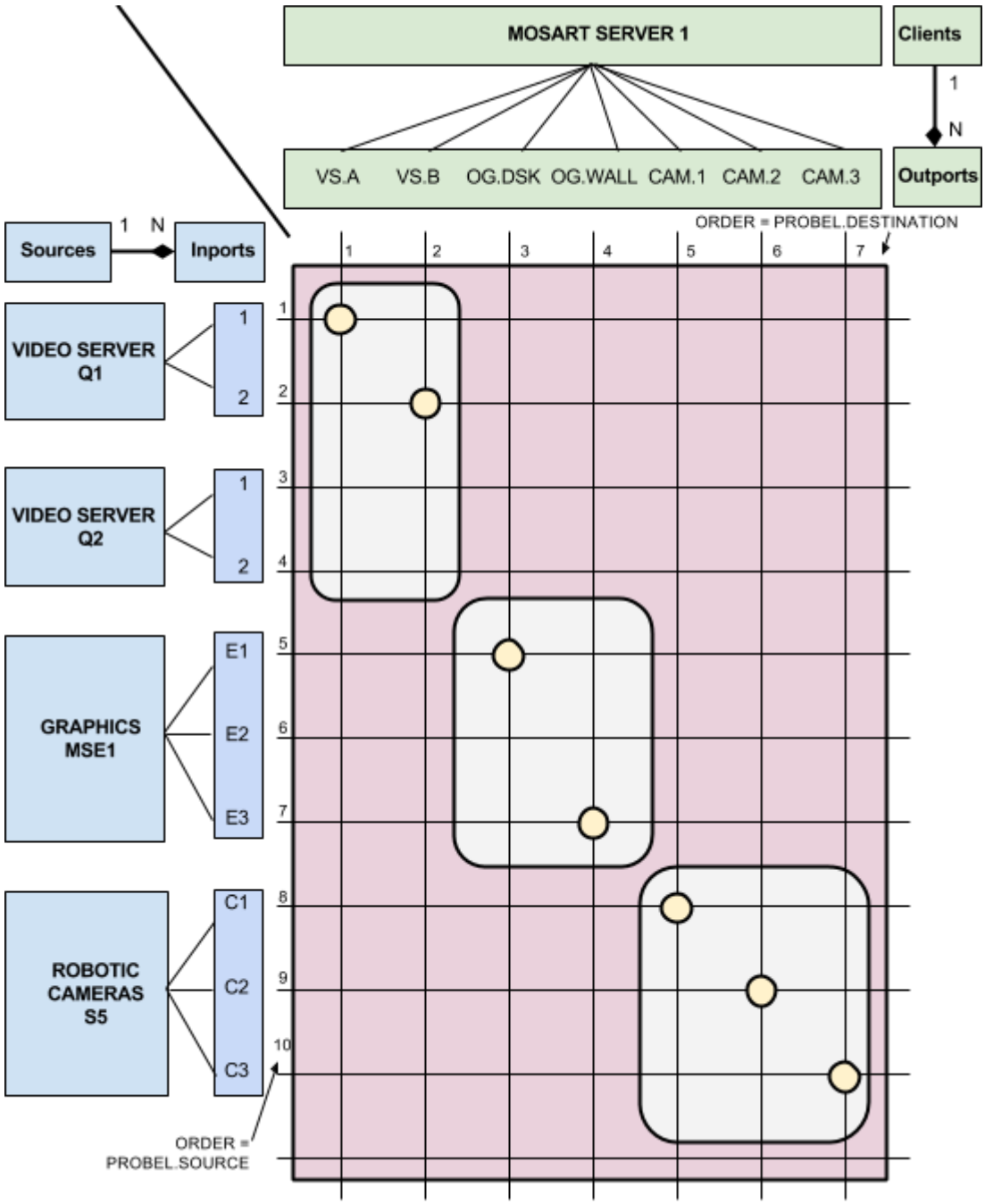
The typical setup, as shown in the figure above consists of the following:

- **Media Router service**: This can be configured to support multiple services for connection. Normally the ProBel SW-P-08 protocol is used for controlling the Media Router whilst the Viz Mosart (TCP) service is used to communicate with the Viz Mosart servers.
- A **Viz Mosart Server** using shared resources for device types currently supported by Media Router. The AV Automation application is responsible for communication with Media Router. Note that AV Automation may forward Media Router configuration to the other Viz Mosart server applications.
- An **external controller** system used to set and change the crosspoints of the Media Router via the ProBel protocol.
- The **Media Router Test Application**. This is a console application part of the Viz Mosart Test suite which may be used to verify the Media Router configuration.
- A **web client** is used to control the Media Router service via the Media Router Rest protocol.

2.3 The Router Concept

Media Router does dynamic configuration changes to Viz Mosart servers by connecting Viz Mosart device representations with physical devices using a virtual 2D router matrix.

The following figure shows the 2D matrix. It is only possible to set crosspoints in the grey areas.



Physical devices are localised on the vertical dimension organized as *Sources* with *Inports*. A *source* may have one or several *inports*. Viz Mosart servers are localized at the horizontal dimension organized as *Clients* with *Outports*. A *client* may have one or several *outports*.

In the figure above we have the following configuration:

- *Sources*:

    - Two video servers, Q1 and Q2 both with two video ports as *inports*.
    - One graphics system, MSE1 with three graphics engines as *inports*
    - One robotic camera system, S5 with three robotic cameras as *inports*
- *Clients*: One single Viz Mosart Server (M1) with the following device representations as *outports*:
    - Two video ports, A and B
    - Overlay Graphics for DSK and WALL graphics
    - Three cameras to be controlled by robotic cameras, CAM1, CAM2 and CAM3.

By setting crosspoints the following Viz Mosart configuration is accomplished:

- M1.VS.A = VS.Q1.1
- M1.VS.B = VS.Q1.2
- M1.OG.DSK = OG.MSE1.E1
- M1.OG.WALL = OG.MSE1.E3
- M1.RC.CAM1 = RC.S5.C1
- M1.RC.CAM2 = RC.S5.C2
- M1.RC.CAM3 = RC.S5.C3

2.4 Media Router Internal Salvos

The internal state of the Media Router is stored a set of internal salvos (or set of crosspoints).

The following internal Media Router salvos exist:

- MMR PendingSalv(__PENDING) - Represent all current connections.
- MMR CurrentSalv(__CURRENT) - Represent current connections that are verified as valid connections
- MMR ProbelSalvo(__PROBEL) - Represent all current connections set from a controlling ProBel device.

2.4.1 MMR PendingSalvo (__PENDING)

This salvo contains all crosspoints that are currently set in Media Router and shall therefore be treated as the current state of Media Router. Any changes to the PendingSalvo shall lead to configuration changes being sent to corresponding Viz Mosart Servers.

2.4.2 MMR CurrentSalvo (__CURRENT)

This salvo contains all crosspoints currently set and verified by the corresponding Mosart Servers. I.e all crosspoints set in the CurrentSalvo shall represent a valid connection between a Mosart Server and a device controlled by the Mosart Server. The CurrentSalvo shall always be a subset of the PendingSalvo.

2.4.3 MMR ProbelSalvo (__PROBEL)

This salvo represents all crosspoints set by a controlling ProBel device. This salvo is used to combine multiple crosspoints changes from the controlling ProBel device into a single salvo.

2.5 Relation To ProBel Router Protocol

Media Router is controllable from any service supporting the **ProBel router protocol, SW-P-08**. The relation to the ProBel protocol is done by assigning crosspoints a unique number with the “Order” attribute. This order number is directly related to the ProBel protocol as follows:

- Probel.Source = Inport.Order
- Probel.Destination = Outport.Order

The diagram in the section The Router Concept, shows how the corresponding order numbers are indicated for all inports and outports.

3 Media Router Installation And Configuration

Installation of Media Router is via the Viz Mosart installer `VizMosartMediaRouter-<version number>.msi`

Configuration of MMR are done using two xml-based configuration files:

- `MediaRouterServiceConfig.xml` which contains the Media Router service configuration
- `MediaRouterDB.xml` which contains the Media Router Database Configuration. Note that the name of this file is configurable within the Media Router service configuration.

Normally both these files shall be placed located in one of the following directories:

1. `%ProgramData%\Mosart Medialab\ConfigurationFiles`
2. `C:\ChannelTemplates`

> **Info:**
> It is recommended to place all Viz Mosart configuration in `%ProgramData%`. Option 2 using `C:\ChannelTemplates` is scheduled to be deprecated.

3.1 The Media Router Service Configuration

The service configuration XML file contains the following information:

- **Services:** A list over the protocols that will be active. The following protocols are available:
  - MosartMediaRouterService - Service used to connect to the Viz Mosart service via a proprietary protocol.
  - ProBelMediaRouterService - Service allowing Media Router to be controlled via the Probel router protocol, SW-P-08
  - RestMediaRouterService - Service allowing Media Router to be controlled via a proprietary REST protocol
- **Database:** The Media Router database specification.
  - Currently supported is a file repository where the Media Router database is stored as a single xml file. Default named *MediaRouterDB.xml*
- **Service Properties:** A set of properties controlling the behavior of the corresponding services
- **Properties:** A set of properties controlling the behavior of the Media Router Service (MosartMediaRouterService)

3.1.1 Example Service Configuration

The Media Router service configuration is stored in a single xml file as shown below:

MediaRouterServiceConfig.xml

```
<?xml version="1.0" encoding="utf-8" ?>
<MediaRouterConfig>
  <!-- MMR SERVICES: CONFIGURATION OF ACTIVE PROTOCOLS -->
  <Services>
    <Service type="MosartMediaRouterService" />
    <Service name="vsm" type="ProBelMediaRouterSerialService" configuration="Type=Pro
BelMessageServerTransporter;Port=8123" />
    <Service type="RestMediaRouterService" />
  </Services>
  <!-- MMR Database configuration using single xml file -->
  <Database type="File" name="File" configuration="MediaRouterDB.xml" />

  <!--  SERVICE PROPERTIES  -->
  <ServiceProperties name="vsm">     <!-- use name attribute to identify
corresponding service -->
     <item name="Mode" value="Router"/>
     <item name="UpdateCurrentSalvoCrosspoints" value = "true"/>
     <item name="DisableControllerStatusResponse" value = "true"/>
  </ServiceProperties>

  <!-- MosartMediaRouterService PROPERTIES -->
  <Properties>
     <!--  MMR MASTER / SLAVE PROPERTIES -->
     <item name="Id" value="MR1" />
     <item name="PreferredMaster" value="True" />
     <item name="Slave" value="Name=MR2;Server=localhost;Port=8192" />
     <item name="AutoFailover" value="True" />
     <!--  MOSART SERVER REDUNDANCY PROPERTIES  -->
     <item name="MirrorMode" value="True" />
     <item name="MirrorModeMaster" value="Active" />
     <item name="SynchronizedMirroring" value="False" />
     <!-- GENERAL PROPERTIES -->
     <item name="AutoTake" value="False" />
     <item name="BackupOnStartUp" value="True" />
     <!-- MMR REST PROTOCOL PROPERTIES -->
     <item name="UseAuthorisation" value="False" />
  </Properties>
</MediaRouterConfig>
```

MosartMediaRouterService

One service item of type “MosartMediaRouterService” shall be part of the list of services in order to communicate with Viz Mosart Services. Configuration of the MosartMediaRouterService is done using the Properties section of the MMR service configuration file. The following properties are available:

Property	Description	Default
AutoFailover	Set to true if a slave in a master/slave redundancy setup shall take over control automatically when detecting connectivity problems to the master	true
AutoTake	Set to true if all pending crossspoints automatically should be considered as valid. I.e. a corresponding crosspoints set in the CurrentSalvo	false
BackupOnStartUp	If set a backup of the MMR database will automatically be made when the MMR service is started. Backup files are placed in a directory named MediaRouter. The directory is located in the same directory as the MMR database.	true
Id	Unique identity of the MMR Service instance. Used when two MMR Service instance are used in a master/slave redundancy setup.	GUID
LocalServer	For testing only. Set to true if the MMR service should run locally without any valid network attached.	false
MirrorMode	Set to true to activate mirror mode. If mirror mode is activated then all crosspoints set on a Mosart server in a redundancy setup will also be sent to the other Mosart server. Hence ensuring that the configuration of the two Mosart servers are equal.	false

Property	Description	Default
MirrorModeMaster	In mirror mode, determines when crosspoints set for one Mosart server in a redundancy setup should be reflected to the other Mosart server. Options: · *Active* - only crosspoints set on the currently active Mosart server will be reflected to the other. · *LowestOrder* - only crosspoints set on the Mosart server with lowest order number will be reflected to the other. The order number is set in the MMR database configuration.	Active
PreferredMaster	In a MMR redundancy setup set this to true for the MMR Service instance which should be the main or master service.	false
Slave	Connectionstring to the other MMR instance in a master/slave redundancy setup. Syntax: “Name=<id>”;Server=<hostname>;Port=<port>” where: · *id* - Shall equal the Id property of the other MMR instance · *hostname* - is the hostname of the other MMR instance · *port* - is the tcp/ip listening port of the other MMR instance	empty = no redundancy setup
SynchronizedMirroring	If set and in mirror mode any crosspoint set on a Mosart server will be reflected to the other Mosart server. Regardless whether the Mosart server is active or not.	false
UseAuthorisation	Used to activate authorisation for the MMR REST protocol (4)	false

ProBelMediaRouterService

Used to add control of Media Router via the Probel SW-P-08 protocol. The ProBel service itself is configured using a corresponding ServiceProperties section or via the connection string given by the “configuration” attribute. The following properties are available:

Property	Description	Default
Name	Identifies the service and the corresponding ServiceProperties section. Note that Name is also used to tag log messages related to the service.	
Type	Identifies the how to communicate with the controlling ProBel device. The following options are available: **ProBelMessageClientTransporter** - In this case Media Router connects to the controlling device using a tcp/ip connection. Use Server and Port properties to configure the tcp/ip connection. This is the most common type when connection to a VSM system. **ProBelMessageSerialTransporter** - Same as *ProBelMessageClientTransporter* but uses a serial connection. Use ComPort to identify the COM port. **ProBelMessageServerTransporter** - In this case Media Router listens to connecting devices supporting the ProBel protocol. I.e. Media Router acts like a real router. Use the Port property to specify the listening port. This is common type when connecting to a BFE-KSE system.	
Port	Used by Client and Server Transporter types to identify the tcp/ip port.	10000
ComPort	Used by Serial Transporter type to identify the serial COM port	COM1
Server	Used by Client Transporter type to identify the host of the controlling ProBel device.	localhost

Property	Description	Default
Mode	Identifies how crosspoint changes from the controlling device shall be handled. Only crosspoints that will change the current state of Media Router will lead to any configuration changes. The following options are available: **Router** - In this case the Media Router is treated as a physical router: · The Media Router salvo “CurrentSalvo” is used for comparison for crosspoint changes. · ProBel CrosspointConnected (04) messages are sent to the Probel controlling device to notify any crosspoint changes. · The client (like vsm / BFE-KSE) shall query Media Router for its internal state after a successful connection. This shall be done using any of the following SW-P-08 commands: ◦ Crosspoint Interrogate Message (01) ◦ Crosspoint Tally Dump Request Message (21) **ControlPanel** - In this case the Media Router is treated by the ProBel controlling device as “a control panel” used to visualize the current state: · The Media Router salvo “PendingSalvo” is used for comparison. · ProBel CrosspointConnect (02) messages are sent to the Probel controlling device to notify any crosspoint changes. · Media Router shall query the client (like vsm / BFE-KSE) for its initial state after a successfull connection. This shall be done using the following SW-P-08 command: ◦ Crosspoint Tally Dump Request Message (21)	Router

Property	Description	Default
UpdateCurrentSalvoCrosspoints	If set will copy any changes to the Media Router “PendingSalvo” to the Media Router “CurrentSalvo”. This is normally used when Mode=”Router” and when it is desirable to treat the pending salvo as the current state.	False
DisableCrosspointChange	If set to true notification of crosspoint changes to the ProBel controlling device is disabled. Otherwise all crosspoint changes are forwarded to the controlling ProBel device according to the value of the Mode property	False
StateSalvo	Specifies the internal Media Router salvo used to track changes for ProBel responses. If set to empty string the internal Media Router salvo will be selected according to the value of the Mode property.	CurrentSalvo
SignalSalvoChangeDelay	Minimum delay between crosspoint messages from the ProBel controlling device for treating the messages to be part of the same salvo.	100 ms
DisableControllerStatusResponse	If set to true will disable any response to the SW-P-08 command: Dual Controller Status Request Message (08). Required when connected to vsm	False
DefaultSourcePort	Port used in Crosspoint Tally Dump Message (22) to denote a not connected destination outport.	-1

RestMediaRouterService

Enables the control of Media Router using Viz Mosart Media Router REST protocol.

Default url for Media Router REST commands is as follows:

```
http://[hostname]:[port]/MosartMediaRouter/Rest.svc/<command>?<params>
```

where:

- **hostname:** Host name where the Media Router service is running

- **port:** TCP/IP port for the Media Router REST service. *Default*: 8094
- **command:** REST command to be processed
- **params:** Optional parameters for the command.

The port may be changed via the `MMediaRouterService.exe.config` configuration file as part of the Media Router service installation.

Command	Description
clients	Retrieves information of all clients.
sources	Retrieves information of all sources.
inports	Retrieves information of all inports or inports connected to a given source
outports	Retrieves information of all outports or outports connected to a given client
salvos	Retrieves information of a single or multiple salvos
current	Retrieves information of the current state of the router
pending	Retrieves information of the pending state of the router
config	Retrieves information of the current or salvo specific configuration for a given client
crosspoints	Retrieves information of changed crosspoints from a given timestamp
setcrosspoint	Sets a specified crosspoint
setsalvo	Fires a specified salvo
status	Returns current Media Router status

For a complete list of REST commands see the Media Router REST Protocol.

3.2 Media Router Database Configuration

Currently the Media Router database configuration is done by editing the Media Router database file, `MediaRouterDb.xml` directly.

The `MediaRouterDb.xml` file is divided into distinct categories for *Clients* > *Outports* and *Sources* > *Inports*. An *outport* is linked to its *client* and an *inport* is linked to its *source* using the *Id* property.

The tables in the following subsections specifies a sample setup with devices to be controlled along with two Viz Mosart servers in a redundancy setup (main/backup). It is recommended to create such tables before doing the Media Router configuration. Note the following abbreviation used to make it easier to identify connection type or category:

- VS = Video Server
- OG = Overlay Graphics
- FG = Fullscreen Graphics
- RC = Robotic Cameras
- L = Lights
- W = Video Wall

3.2.1 Media Router Configuration of Physical Devices: Source Inports

The tables below shows a sample setup of two video servers, two robotic camera controllers, one graphics system dedicated for overlay graphics and one graphics system dedicated for fullscreen graphics. See also corresponding xml content.

Video Servers: category=Video

Category	Order	Source.Id	Inport.Id	Type	DeviceName	ConnectionString
Server		VS.Q1		Quantel		SerialNo=20912;IOR= …
- Port	1	VS.Q1	VS.Q1.1	Quantel	1	
- Port	2	VS.Q1	VS.Q1.2	Quantel	2	
Server		VS.Q2		Quantel		SerialNo=20914;IOR= …
- Port	3	VS.Q2	VS.Q2.1	Quantel	1	
- Port	4	VS.Q2	VS.Q2.2	Quantel	2	

Robotic Cameras: category=RoboticCameras

Category	Order	Source.Id	Inport.Id	Type	DeviceName	ConnectionString
Controller		RC.S5		FX-Motion		
- Camera	5	RC.S5	RC.S5.C1	FX-Motion	1	Host=10.116.5.111
- Camera	6	RC.S5	RC.S5.C2	FX-Motion	2	Host=10.116.5.112
Controller		RC.S6		FX-Motion		
- Camera	7	RC.S6	RC.S6.C1	FX-Motion	1	Host=10.116.5.121
- Camera	8	RC.S6	RC.S6.C2	FX-Motion	2	Host=10.116.5.12

Overlay Graphics: category=OverlayGraphics

Category	Order	Source.Id	Inport.Id	Type	DeviceName	ConnectionString
Controller		OG.MSE1		Vizrt		
- Engine	9	OG.MSE1	OG.MSE1.E1	Vizrt	1	Host=10.116.5.141;Port=6100
- Engine	10	OG.MSE1	OG.MSE1.E2	Vizrt	2	Host=10.116.5.142;Port=610

Fullscreen Graphics: category=FullscreenGraphics

Category	Order	Source.Id	Inport.Id	Type	DeviceName	ConnectionString
Controller		FG.MSE2		Vizrt		
- Engine	11	FG.MSE2	FG.MSE2.E1	Vizrt	1	Host=10.116.5.151;Port=6100
- Engine	12	FG.MSE2	FG.MSE2.E2	Vizrt	2	Host=10.116.5.152;Port=6100

3.2.2 Sample Media Router Database (XML)

MediaRouterDb.xml

```
<MediaRouterDBConfig>
    <Sources>
        <!--VIDEO SERVERS -->
        <Value>
            <item id = "VS.Q1" name = "VS.Q1" type = "Quantel">
                <ConnectionString>Name=Q1;Type=Quantel;SerialNo=20912;Mode=Player;IOR
=http://quantel:@10.211.112.112/ZoneManager.ior;Config=ClipServerQuantel.xml</
ConnectionString>
            </item>
        </Value>
        <Value>
            <item id = "VS.Q2" name = "VS.Q2" type = "Quantel">
                <ConnectionString>Name=Q2;Type=Quantel;SerialNo=20914;Mode=Player;IOR
=http://quantel:@10.211.112.114/ZoneManager.ior;Config=ClipServerQuantel.xml</
ConnectionString>
            </item>
        </Value>
        <!--ROBOTIC CAMERA CONTROLLERS -->
        <!--Studio 5: FxMotion robotic camera controller -->
        <Value>
            <item id = "RC.S5" name = "RC.S5" type = "FX-Motion" category =
"RoboticCameras"/>
        </Value>
        <!--Studio 6: FxMotion robotic camera controller -->
        <Value>
            <item id = "RC.S6" name = "RC.S6" type = "FX-Motion" category =
"RoboticCameras"/>
        </Value>
        <!--OVERLAY GRAPHICS ENGINES -->
        <!--Vizrt MSE Controller localhost:8594 for checking profile use http://
localhost:8580/app/vdomconfig/vdomconfig.html -->
        <Value>
            <item id = "OG.MSE1" name = "OG.MSE1" type = "VIZRT" category =
"OverlayGraphics">
                <ConnectionString>Server=localhost;Port=8594;Playlist=Mosart_Overlay<
/ConnectionString>
            </item>
        </Value>
        <!--FULLSCREEN GRAPHICS ENGINES -->
        <Value>
            <item id = "FG.MSE2" name = "FG.MSE2" type = "Vizrt" category =
"FullscreenGraphics">
                <ConnectionString>Host=10.211.112.130;Port=6100</ConnectionString>
            </item>
```

```
        </Value>
        <!--VIDEO WALL -->
        <Value>
            <item id = "VW.PA" name = "VW.PA" type = "Pandora" category = "VideoWall">
                <ConnectionString>Server=10.211.112.140:6162;Backup=10.211.112.150:61
62</ConnectionString>
            </item>
        </Value>
    </Sources>
    <Clients>
        <!--MOSART SERVER, GALLERY 1: MAIN (A) AND BACKUP (B) -->
        <Value>
            <item id = "M1.A" name = "M1.A" order = "1" type = "Mosart">
                <ConnectionString>Server=10.116.5.10;Port=8099</ConnectionString>
                <Slave>M1.B</Slave>
            </item>
        </Value>
        <Value>
            <item id = "M1.B" name = "M1.B" order = "2" type = "Mosart">
                <ConnectionString>Server=10.116.5.20;Port=8099</ConnectionString>
                <Slave>M1.A</Slave>
            </item>
        </Value>
    </Clients>
    <Inports>
        <!--VIDEO PORTS -->
        <!--Quantel, Q1: Video ports -->
        <Value>
            <item id = "VS.Q1.1" name = "VS.Q1.1" order = "1" device = "VS.Q1"
deviceName = "1" crosspoint = "HD1"/>
        </Value>
        <Value>
            <item id = "VS.Q1.2" name = "VS.Q1.2" order = "2" device = "VS.Q1"
deviceName = "2" crosspoint = "HD2"/>
        </Value>
        <!--Quantel, Q2: Video ports -->
        <Value>
            <item id = "VS.Q2.1" name = "VS.Q2.1" order = "3" device = "VS.Q2"
deviceName = "1" crosspoint = "HD1"/>
        </Value>
        <Value>
            <item id = "VS.Q2.2" name = "VS.Q2.2" order = "4" device = "VS.Q2"
deviceName = "2" crosspoint = "HD2"/>
        </Value>
        <!--ROBOTIC CAMERAS -->
        <!--Studio 5: FxMotion robotic cameras -->
        <Value>
            <item id = "RC.S5.1" name = "RC.S5.1" order = "5" device = "RC.S5"
deviceName = "1" category = "RoboticCameras">
                <ConnectionString>Host=10.116.5.111</ConnectionString>
            </item>
        </Value>
```

```
        <Value>
            <item id = "RC.S5.2" name = "RC.S5.2" order = "6" device = "RC.S5"
deviceName = "2" category = "RoboticCameras">
                <ConnectionString>Host=10.116.5.112</ConnectionString>
            </item>
        </Value>
        <!--Studio 6: FxMotion robotic cameras -->
        <Value>
            <item id = "RC.S6.1" name = "RC.S6.1" order = "7" device = "RC.S6"
deviceName = "1" category = "RoboticCameras">
                <ConnectionString>Host=10.116.5.121</ConnectionString>
            </item>
        </Value>
        <Value>
            <item id = "RC.S6.2" name = "RC.S6.2" order = "8" device = "RC.S6"
deviceName = "2" category = "RoboticCameras">
                <ConnectionString>Host=10.116.5.122</ConnectionString>
            </item>
        </Value>
        <!--OVERLAY GRAPHICS ENGINES: Vizrt, 1xMSE + 2 Viz Engines (DSK,WALL) -->
        <Value>
            <item id = "OG.MSE1.E1" name = "OG.MSE1.E1" order = "9" device =
"OG.MSE1" deviceName = "1" category = "OverlayGraphics">
                <ConnectionString>Host=10.116.5.141;Port=6100</ConnectionString>
            </item>
        </Value>
        <Value>
            <item id = "OG.MSE1.E2" name = "OG.MSE1.E2" order = "10" device =
"OG.MSE1" deviceName = "2" category = "OverlayGraphics">
                <ConnectionString>Host=10.116.5.142;Port=6100</ConnectionString>
            </item>
        </Value>
        <!--FULLSCREEN GRAPHICS ENGINES -->
        <Value>
            <item id = "FG.MSE2.E1" name = "FG.MSE2.E1" order = "11" device =
"FG.MSE2" deviceName = "1" category = "FullscreenGraphics">
                <ConnectionString>Host=10.116.5.151;Port=6100;Encoding=UTF-8</
ConnectionString>
            </item>
        </Value>
        <Value>
            <item id = "FG.MSE2.E2" name = "FG.MSE2.E2" order = "12" device =
"FG.MSE2" deviceName = "2" category = "FullscreenGraphics">
                <ConnectionString>Host=10.116.5.152;Port=6100;Encoding=UTF-8</
ConnectionString>
            </item>
        </Value>
        <!--VIDEO WALL -->
        <Value>
            <item id = "VW.PA.1" name = "VW.PA.1" order = "13" device = "VW.PA"
deviceName = "1" category = "VideoWall"/>
        </Value>
```

```
    </Inports>
    <Outports>
        <!--GALLERY 1: MOSART MAIN SERVER -->
        <!--GALLERY 1: MOSART VIDEO PORTS -->
        <Value>
            <item id = "M1.A.VA" name = "M1.A.VA" order = "1" device = "M1.A"
deviceName = "A" category = "Video"/>
        </Value>
        <Value>
            <item id = "M1.A.VB" name = "M1.A.VB" order = "2" device = "M1.A"
deviceName = "B" category = "Video"/>
        </Value>
        <!--GALLERY 1: ROBOTIC CAMERAS -->
        <Value>
            <item id = "M1.A.C1" name = "M1.A.C1" order = "5" device = "M1.A"
deviceName = "1" category = "RoboticCameras"/>
        </Value>
        <Value>
            <item id = "M1.A.C2" name = "M1.A.C2" order = "6" device = "M1.A"
deviceName = "2" category = "RoboticCameras"/>
        </Value>
        <!--GALLERY 1: OVERLAY GRAPHICS ENGINES -->
        <Value>
            <item id = "M1.A.DSK" name = "M1.A.DSK" order = "7" device = "M1.A"
deviceName = "1" category = "OverlayGraphics"/>
        </Value>
        <Value>
            <item id = "M1.A.WALL" name = "M1.A.WALL" order = "8" device = "M1.A"
deviceName = "2" category = "OverlayGraphics"/>
        </Value>
        <!--GALLERY 1: FULLSCREEN GRAPHICS ENGINES -->
        <Value>
        <item id="M1.A.FULL1" name="M1.A.FULL1" order="9" device="M1.A" deviceName="1
" category="FullscreenGraphics" />
        </Value>
    </Outports>
    <Salvos>
        <!-- VIDEO SERVER TEST SALVO: Sets Quantel ports, Swaps ports from SALVO
VS.BA  -->
        <Value>
            <item id = "VS.AB" name = "VS.AB" order = "0" ignore = "false">
                <Crosspoints>
                    <Value>
                        <item inport = "VS.Q2.1" outport = "M1.A.VA"/>
                    </Value>
                    <Value>
                        <item inport = "VS.Q2.2" outport = "M1.A.VB"/>
                    </Value>
                </Crosspoints>
            </item>
        </Value>
```

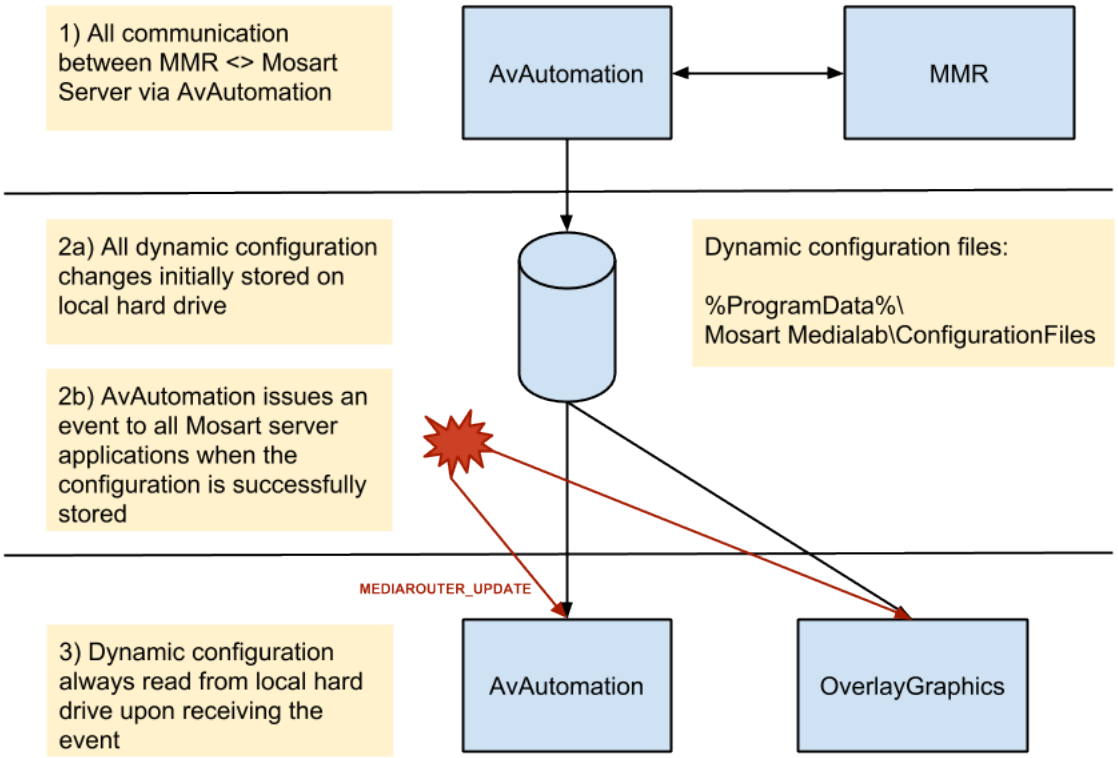
```
        <!--VIDEO SERVER TEST SALVO: Sets Quantel ports, Swaps ports from SALVO VS.AB
-->
        <Value>
            <item id = "VS.BA" name = "VS.BA" order = "1" ignore = "false">
                <Crosspoints>
                    <Value>
                        <item inport = "VS.Q2.2" outport = "M1.A.VA"/>
                    </Value>
                    <Value>
                        <item inport = "VS.Q2.1" outport = "M1.A.VB"/>
                    </Value>
                </Crosspoints>
            </item>
        </Value>
        <!--OVERLAYGRAPHICS TEST SALVO: Sets DSK,WALL engines, Swaps engines from
SALVO OG.W21 -->
        <Value>
            <item id = "OG.W12" name = "OG.W12" order = "2" ignore = "false">
                <Crosspoints>
                    <Value>
                        <item inport = "OG.MSE1.E1" outport = "M1.A.DSK"/>
                    </Value>
                    <Value>
                        <item inport = "OG.MSE1.E2" outport = "M1.A.WALL"/>
                    </Value>
                </Crosspoints>
            </item>
        </Value>
        <!--OVERLAYGRAPHICS TEST SALVO: Sets DSK,WALL engines, Swaps engines from
SALVO OG.W12 -->
        <Value>
            <item id = "OG.W21" name = "OG.W21" order = "3" ignore = "false">
                <Crosspoints>
                    <Value>
                        <item inport = "OG.MSE1.E2" outport = "M1.A.DSK"/>
                    </Value>
                    <Value>
                        <item inport = "OG.MSE1.E1" outport = "M1.A.WALL"/>
                    </Value>
                </Crosspoints>
            </item>
        </Value>
        <!--ROBOTIC CAMERA TEST SALVO: Swaps Cameras from SALVO RC.C21 -->
        <Value>
            <item id = "RC.C12" name = "RC.C12" order = "4" ignore = "false">
                <Crosspoints>
                    <Value>
                        <item inport = "RC.S5.1" outport = "M1.A.C1"/>
                    </Value>
                    <Value>
                        <item inport = "RC.S5.2" outport = "M1.A.C2"/>
                    </Value>
```

```
                </Crosspoints>
            </item>
        </Value>
        <!--ROBOTIC CAMERA TEST SALVO: Swaps Cameras from SALVO RC.C12 -->
        <Value>
            <item id = "RC.C21" name = "RC.C21" order = "5" ignore = "false">
                <Crosspoints>
                    <Value>
                        <item inport = "RC.S5.2" outport = "M1.A.C1"/>
                    </Value>
                    <Value>
                        <item inport = "RC.S5.1" outport = "M1.A.C2"/>
                    </Value>
                </Crosspoints>
            </item>
        </Value>
    </Salvos>
</MediaRouterDBConfig>
```

4 Viz Mosart Server Media Router Configurations

4.1 Viz Mosart Media Router Data Flow

The illustration presents data flow between Media Router and a Viz Mosart Server.



The Media Router <> Viz Mosart data flow has the following characteristics:

1. All communication between Media Router and Viz Mosart Server is done via the AV Automation application. Hence the Media Router configuration of a Viz Mosart Server is located in AvAutomation.
2. When AvAutomation receives dynamical configuration changes from Media Router two distinct steps are carried out:

a. The received dynamic configuration is stored to the local hard drive
b. A MEDIAROUTER_UPDATE event is issued to all Viz Mosart applications.

1. When an MEDIAROUTER_UPDATE event is received by a Viz Mosart application any corresponding dynamic configuration is obtained from the local hard drive.

Advantages of this approach are as follows:

- I f connection to Media Router is lost or missing, the Viz Mosart server will use the last stored configuration.
- Changes to the stored dynamic configuration can be used for testing and verifying connections to devices to be controlled by the Viz Mosart server.

4.1.1 AvAutomation, local Media Router configuration files

Whenever a Media Router configuration change is received from the Media Router, the corresponding configuration is stored in one or several files on the local hard drive. This is indicated in point 2a in the figure above. These configuration files are as follows:

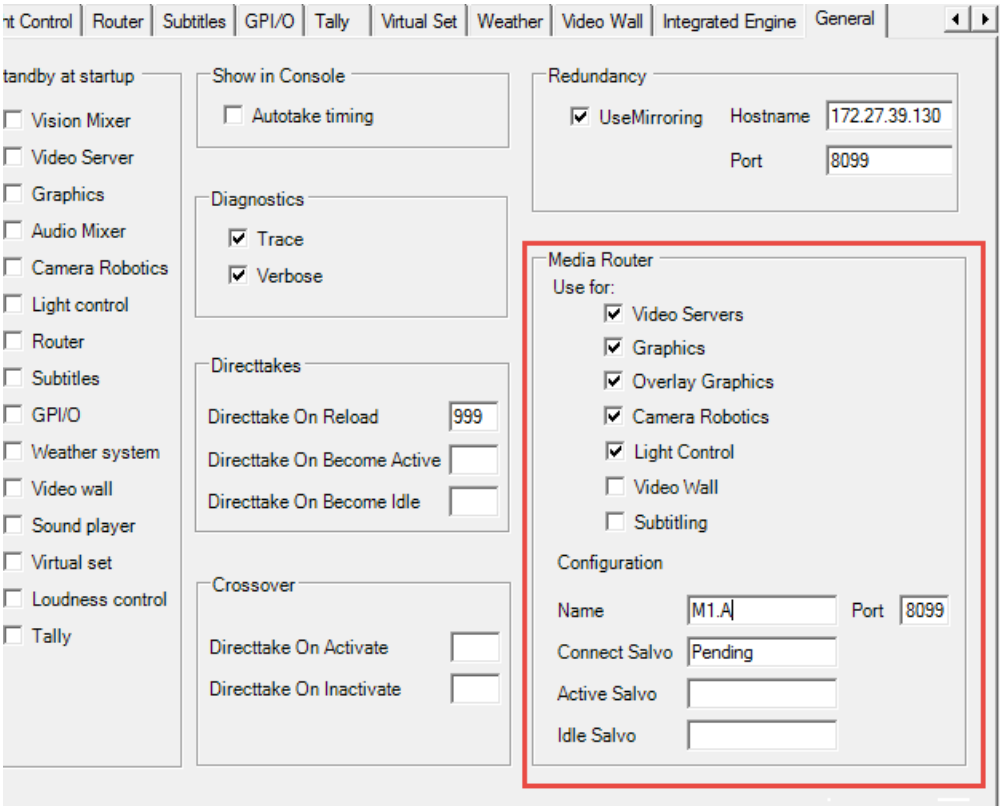
- M ediaRouterConfigVideo.xml - contains the current video server configuration.
- `MediaRouterConfigOverlayGraphics.xml` - contains the current overlay graphics configuration.
- `MediaRouterConfigFullscreenGraphics.xml` - contains the current fullscreen graphics configuration.
- `MediaRouterConfigRoboticCameras.xml` - contains the current camera robotics configuration.
- `MediaRouterConfigVideoWall.xml` - contains the current video wall configuration.
- `MediaRouterConfigLights.xml` - contains the current lights configuration.
- `MediaRouterConfigSubtitles.xml` - contains the current subtitles configuration.

All these configuration files shall be located in the `%ProgramData%\Mosart Medialab\ConfigurationFiles` directory.

This section presents the following Viz Mosart Server Media Router topics:

4.1.2 AvAutomation Media Router Configuration

In AvAutomation all Media Router configuration is done via the **General** tab of the **Device > Preferences** dialog:



The area indicated in the red rectangle is the Media Router configuration.

Media Router is enabled for each of the supporting device types by checking the corresponding checkbox. In the example above Media Router is activated for video servers, fullscreen graphics, overlay graphics, camera robotics and lights.

> ⚠ **Enabling Media Router for OverlayGraphics**
> Enabling Media Router support for OverlayGraphics also requires configuration in the OverlayGraphics application

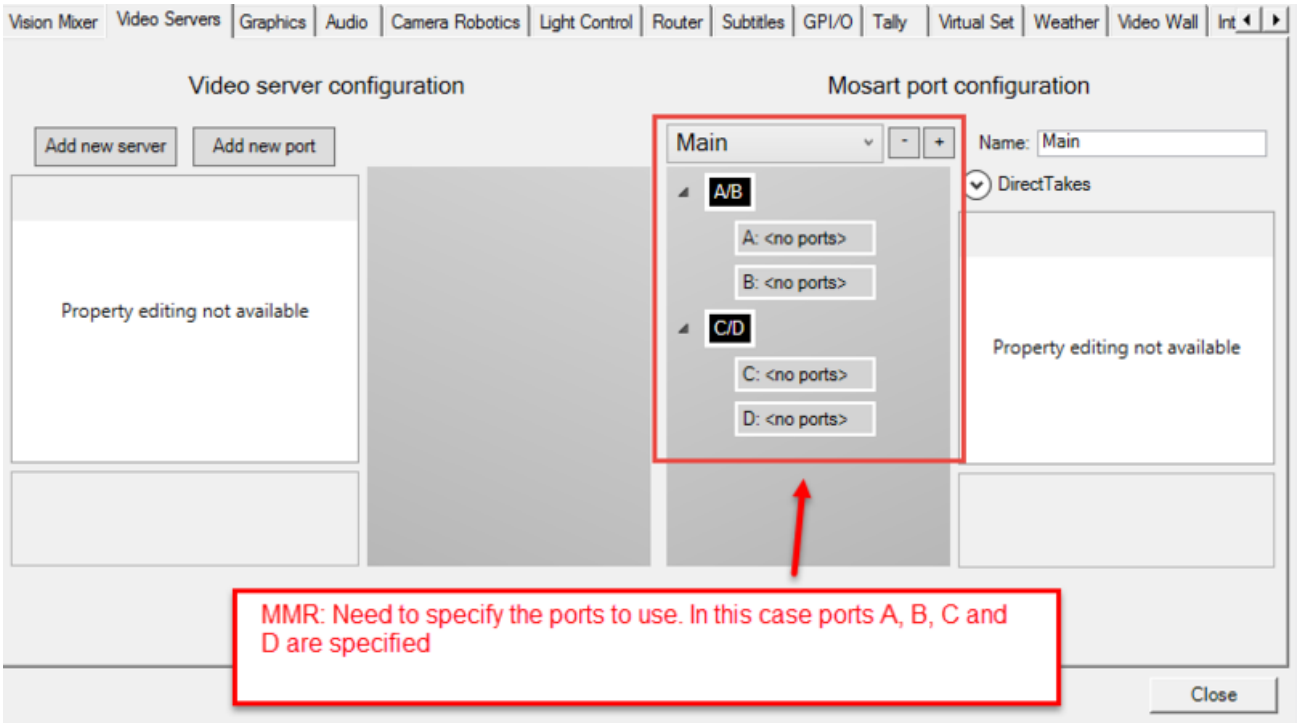
Other Media Router configuration properties are as follows:

Property	Description
Name	The name of the Viz Mosart Server. This name is used in the Media Router database configuration to identify the Viz Mosart Server. This has to match the corresponding Mosart server configuration in the Media Router database (MediaRouterDb.xml)
Port	The tcp/ip listening port used by AvAutomation to listen to any Media Router connections. This property is used by the Media Router database configuration.

Property	Description
Connect Salvo	Salvo requested by Viz Mosart Server after a successful connection to Media Router. Default: Pending
Active Salvo	Salvo requested by Viz Mosart Server when activated. Default: <empty>
Idle Salvo	Salvo requested by Viz Mosart Server when become idle. Default: <empty>

4.1.3 AvAutomation, Media Router – Video Server Configuration

When Media Router is used for video servers it is necessary to specify the ports that are to be used by the Viz Mosart Server. This is done in the **Video Servers** configuration found in **Device > Properties** dialog:



Note: In the example above, it is only necessary to specify the Mosart port configuration (right side). The static video server configuration (left side) may be left empty.

4.1.4 AvAutomation keyboard shortcuts

The following keyboard shortcuts in AvAutomation can be used to verify and test a Media Router setup:

Shortcut	Description
CTRL+SHIFT+V	Reloads video server configuration
CTRL+SHIFT+G	Reloads fullscreen graphics configuration
CTRL+SHIFT+R	Reloads camera robotics configuration
CTRL+SHIFT+L	Reloads lights configuration
CTRL+SHIFT+W	Reloads video wall configuration
CTRL+SHIFT+S	Reloads subtitles configuration
CTRL+SHIFT++ CTRL+SHIFT+D	Stores current configuration to local hard drive. I.e. emulate configuration received from Media Router.

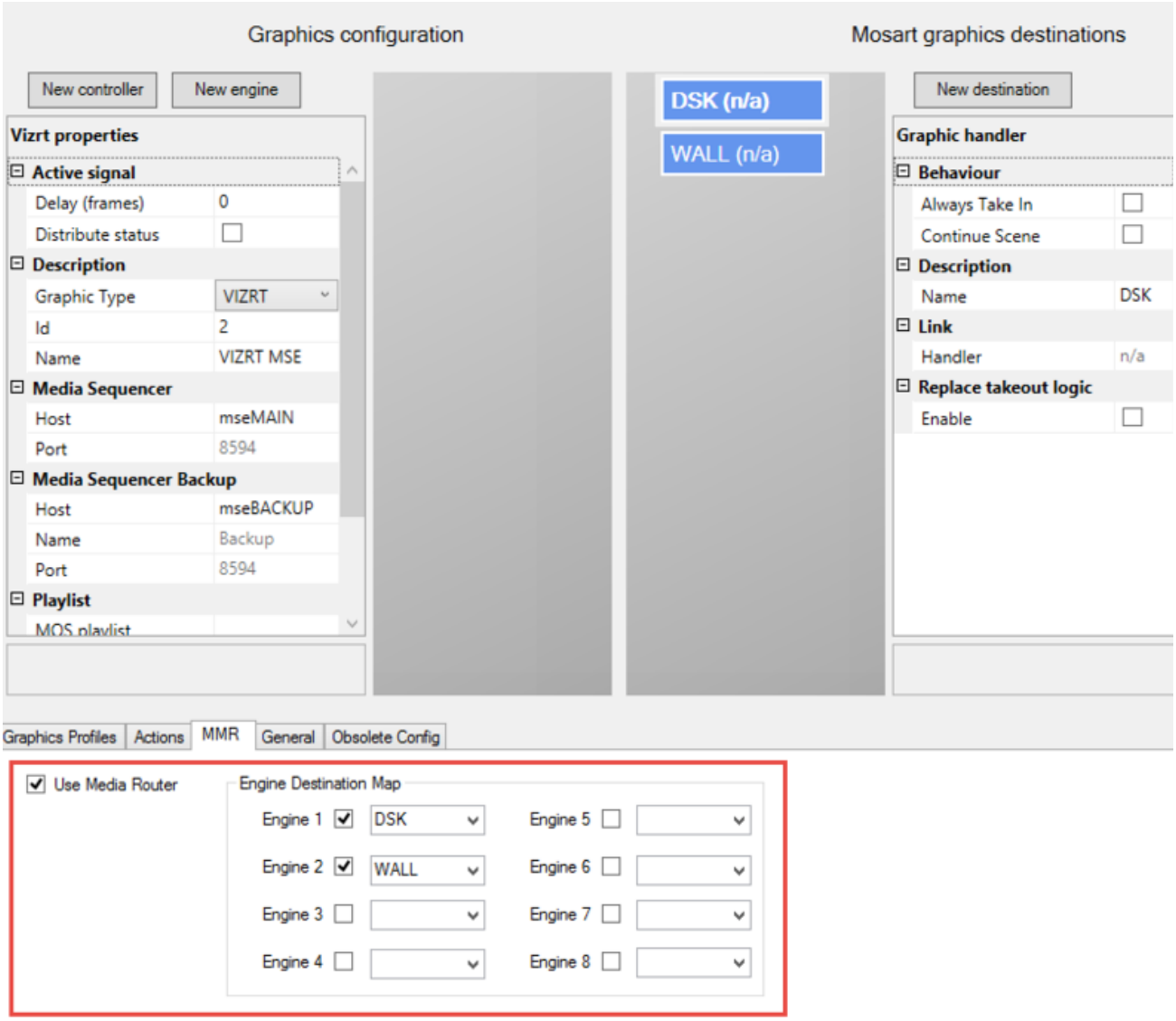
Note: The shortcuts also works when AvAutomation uses the static configuration.

4.1.5 OverlayGraphics Media Router Configuration

To enable dynamic / Media Router configuration in OverlayGraphics the following has to be done:

- Media Router for OverlayGraphics need to be enabled in AvAutomation. See previous section
- In OverlayGraphics Settings:
  - Enable Media Router by checking the **Use Media Router** check box.
  - Optional: Configure the engine destination map with required destinations (right side). This is only necessary if engine numbers are used in the MMR Mosart overlay graphics configuration (Outport.DeviceName)

The following figure shows a configuration where Engine 1 and 2 is used for DSK and WALL graphics destinations respectively.



Note: When using Media Router for OverlayGraphics, it is not necessary to create any Graphics configuration (left side).
However it is required to specify all graphics destinations (right side) together with an optional mapping between engine number and graphics destination.

The DeviceName property as part of the MMR Outport configuration is used to either specify the graphics destination directly (DSK,WALL) or indirectly via engine numbers (1,2).

Note: Enable Media Router for OverlayGraphics also requires OverlayGraphics to be enabled in AvAutomation.

4.1.6 OverlayGraphics keyboard shortcuts

Shortcut	Description
CTRL+SHIFT+G	Reloads overlay graphics configuration and performs a reconnect.
CTRL+SHIFT+Add	Dumps the current configuration to file used to store the MMR configuration. May be used to verify MMR without presence of MMR. See also Viz Mosart Media Router dataflow

Note: This shortcut also works when OverlayGraphics uses the static configuration.

5 Using Media Router

This section contains the following:

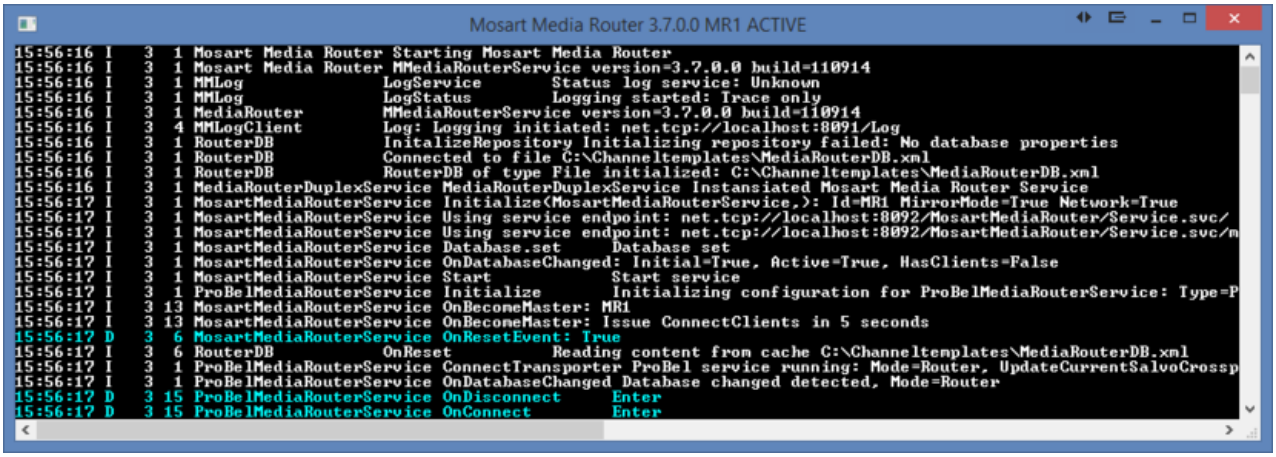
5.1 Running Media Router As A Console Application

Normally Media Router is started as a console application. This makes it possible to monitor changes done by the Media Router as well as controlling it by using appropriate Media Router Console Commands.

```
%ProgramFiles%\Mosart Medialab\Mosart Media Router Service\MMediaRouterService.exe
```

> **Note:** It is recommended to stop any running Media Router service prior to starting the Media Router as a console application.

Start the application as any other Windows application. The console window will appear as shown in the figure below



Note that the initial messages in the console window gives information regarding the various protocols (services) used by the Media Router. This according to the Media Router service configuration

In the sample above the following services are configured:

- Media Router Service – Used internally by Viz Mosart applications. Used to communicate with Viz Mosart Server using a proprietary protocol
- ProBel Media Router Serial Service – Allows router control via the ProBel protocol.

5.2 Running Media Router As A Windows Service

The Media Router installer automatically registers Media Router as a Windows service.

This means that starting and stopping the Media Router as a service may be done via the Windows Service Manager. The service name is **Mosart Media Router Service**.

> ⚠ **Note:** It is recommended to stop the Media Router service prior to starting the Media Router as a console application.

5.3 Media Router Console Commands

It is possible to activate predefined salvos, to set individual crosspoints and to get router information by entering appropriate console commands. The following commands are available:

- **autofailover:** Toggles auto failover mode. See the MosartMediaRouterService configuration.
- **autotake:** Toggle autotake mode. See the MosartMediaRouterService configuration.
- **clear:** Clears the console window
- **command:** Syntax: `command cmd [arg1] [arg2]`. Executes a Media Router command with two optional arguments. The following commands are available:
  - **backup:** Enforces a backup of the Media Router database
  - **get <filename>** : Retrieves the current Media Router database and stores the database using the given filename.
  - **reset:** Resets the Media Router to the latest Media Router database stored on the file system.
  - **restore <filename>** : Restores the Media Router database to the content of the database stored in the given filename
  - **flush:** Flushes the current content of the Media Router to file storage. This command may be used to set the initial state of the Media Router
- **deletesalvo:** Syntax: `deletesalvo salvo`. Deletes the specified salvo
- **exit:** Exits the Media Router
- **getconfig:** Syntax: `getconfig client`. Returns the current configuration for the given client. Used mainly for testing Mosart Server clients
- **getstatus:** Returns an xml string containing current Media Router status.
- **help:** Lists all commands
- **idle:** Toggles active / idle mode of the Media Router service. Used for testing
- **list:** Syntax: `list [salvos|clients|sources|inputs|outputs|all]`. List various router information
- **restore:** Syntax: `restore <filename>`. Restores the Media Router database to the content of the database stored in the given filename.
- **save:** Syntax: `save <filename>`. Retrieves the current Media Router database and stores the database using the given filename.
- **setactive:** Activates the Media Router service

- **setcrosspoint:** Syntax: `setcrosspoint inport outport [salvo]`. Sets a crosspoint in the given salvo:
  - If no salvo is given then the pending salvo is used. I.e. a set crosspoint request is sent to corresponding clients.
  - If the given salvo is not present, a new salvo will be created.
- **setsalvo:** Syntax: `setsalvo salvo`. Fires the specified salvo
- **verbose:** Turns on/off verbose diagnostics
  Note when specifying crosspoints in console commands the inport/outport name shall be used to identify the corresponding port.

5.3.1 Media Router console command examples

- List all current salvos: `list salvos`
- List active connections: `list salvos current`
- List pending connections: `list salvos pending`
- List a specified salvo: `list salvos M1.A`
- Connects video port M1.A.A to Quantel 2 / Port 1: `setcrosspoint VS.Q2.1 M1.A.VA`
- Sets a crosspoint in a salvo: `setcrosspoint VS.Q2.1 M1.A.VA M1.Backup`
- Fires a salvo: `setsalvo M1.Backup`
- Deletes a salvo: `deletesalvo M1.Backup`

5.4 Redundancy Setup

It is possible to use two Media Router service instances in a redundancy setup. In this case one of the Media Router service instances are configured to be the master in a master / slave relationship. The following rules are applied:

- There shall be only one Media Router service configured as master. This is done using the *PreferredMaster* property.
- The slave Media Router service will automatically take control if the master is down or not responding. This behaviour may be overridden by setting the *AutoFailover* property to false. If so, activating the slave Media Router service has to be done manually by issuing the *SetActive* command.
- The master Media Router service will always be the active Media Router service instance if it is running. I.e. if the master is started then the master will take over the control of any active slave.
- Inactive or idle Media Router services will ignore any crosspoint changes sent from any clients.
- The master Media Router service will ensure that the Media Router state is synchronized with the slave. Hence both master and slave shall always have the same configuration and crosspoints.
- Clients controlling the Media Router services need to apply one of the following strategies:
  - Send crosspoints to both master and slave Media Router services.

- Send crosspoints only to the active Media Router service. In this case the clients need to monitor whether the Media Router services are active or not.

5.4.1 Related service properties

- **Id:** To set an unique identity of the Media Router service
- **PreferredMaster:** Set to true for the master Media Router service
- **Slave:** Connection string to the other Media Router service in a redundancy setup.
- **AutoFailover:** Set to false to ignore automatic failover by the slave when loosing connection to the master.

5.5 Mirror Mode

Viz Mosart servers are normally configured in pairs in a redundancy setup. Most common the configurations sent to both Viz Mosart main and backup servers should be identical. I.e. both Viz Mosart servers are controlling the same devices.

In Media Router such a main/backup redundancy setup requires both Viz Mosart servers to be configured as clients with the same set of outports. In such scenarios it is required that the configurations to both Viz Mosart servers are synchronized. I.e. Media Router should ensure that the same configuration is sent to both. This is done by activating Mirror Mode

In Mirror Mode setting, a crosspoint related to one Viz Mosart server in a redundancy setup then the same configuration will be sent to both Viz Mosart servers.

5.5.1 Related service properties

- **MirrorMode:** Set to true to activate Mirror Mode
- **MirrorModeMaster:** Specifies which Viz Mosart server that should receive crosspoint changes.
- **SynchronizedMirroring:** If set, then crosspoint changes related to any Viz Serveres will be reflected to both.

6 MMT Test Application

The Media Router Test Application (MMT) is a console application for testing the Media Router service. It may be installed as part of the Mosart Test Suite (separate installer) and used for testing, verifying and controlling the Media Router.

```
%ProgramFiles%\Mosart Medialab\Mosart Test Suite\MediaRouterTester.exe
```

This section contains the following:

6.1 MMT Console Commands

From Media Router Test Application (MMT) it is possible to activate predefined salvos, to set individual crosspoints and to get router information by entering appropriate console commands. The following commands are available:

- **autotake:** Toggle autotake mode. See the MosartMediaRouterService configuration.
- **clear:** Clears the console window
- **configconnect:** Syntax: configconnect [config]. Connects to an Media Router service using a named predefined configuration located in the MMT application configuration file, MediaRouterTester.exe.config
- **connect:** Syntax: `connect [name] [host] [port]`. Connects to a Media Router service located at host:port using the give name as subscription name. Issuing connect without any parameters is the same as a reconnect.
- **crosspointchanged:** Syntax: `crosspointchanged inport outport [salvo]`. Emulates a crosspoint change from the MMT
- **deletesalvo:** Syntax: `deletesalvo salvo`. Deletes the specified salvo
- **exit:** Exits the Media Router
- **getstatus:** Returns an xml string containing current Media Router status.
- **help:** Lists all commands
- **list:** Syntax: `list [salvos|clients|sources|inputs|outputs|all]`. List various router information
- **listen:** Syntax: `listen name port`. Starts listening for Media Router connection using given name and port. Same as -N and -L command line arguments.
- **restore:** Syntax: `restore <filename>`. Restores the Media Router database to the content of the database stored in the given filename.
- **save:** Syntax: `save <filename>`. Retrieves the current Media Router database and stores the database using the given filename
- **sendcommand:** Syntax: `sendcommand command [arg1] [arg2]`. Sends a command to the Media Router with two optional arguments. See the corresponding Media Router console command for a list of valid commands.
- **sendheartbeat:** Forces a heartbeat to be sent to the connected Media Router service. For testing
- **setactive:** Activates the connected Media Router service

- **setcrosspoint:** Syntax: `setcrosspoint inport outport [salvo]`. Sets a crosspoint in the given salvo:
  - If no salvo is given then the pending salvo is used. I.e. a set crosspoint request is sent to corresponding clients.
  - If the given salvo is not present, a new salvo will be created.
- **setsalvo:** Syntax: `setsalvo salvo`. Fires the specified salvo
- **subscribe:** Syntax: `subscribe <name>`. Changes the subscription name. Used when using the MMT for emulating a Mosart server. See also the connect command
- **swap:** Syntax: `swap <client1> <client2>`. Swaps configuration between client1 and client2. Used in redundancy setup not using mirror mode. Not recommended.
- **verbose:** Turns on/off verbose diagnostics

6.2 MMT Emulating A Viz Mosart Server Client

6.2.1 Starting MMT to emulate a second Viz Mosart Server client

The Media Router is configured to connect to two Viz Mosart Servers:

- Mosart1 @ <hostname>:8191
- Mosart2 @ localhost:8192
  AV Automation at Viz Mosart Server @ <hostname> is configured as Mosart1:8191. The second Viz Mosart Server client is used for monitoring the Media Router. Start MMT with command arguments "-N Mosart2 -L 8192 to emulate the second Viz Mosart Server client:

```
%ProgramFiles%\Mosart Medialab\Mosart Test Suite\MediaRouterTester.exe -N Mosart2 -L 8192
```

7 Media Router REST Protocol

This section contains the REST protocol used to communicate with the Viz Mosart Media Router.

The REST protocol is based upon using HTTP GET for all protocols, even for setting crosspoints and properties on the server. This makes it easy to test all functionalities using the REST protocol via a web browser.

This section will cover the following topics:

7.1 Viz Mosart Media Router REST Command Format

The following command is the general Mosart Media Router REST protocol command:

```
http://[hostname]:[port]/MosartMediaRouter/Rest.svc/<command>?<params>
```

hostname: Server name or IP-address for the Mosart Media Router REST service.

port: TCP/IP port for the Mosart Media Router REST service. Default 8094.

<command>: Command issued.

<params>: Optional parameters for the command.

For simplicity, the service part of the REST URI templates will be replaced with [service] in the following. i.e:

`[service] = http://[hostname]:[port]/MosartMediaRouter/Rest.svc`

7.2 REST Commands

The available commands via the REST protocol are as follows:

Command	Description
clients	Retrieves information of all clients.
sources	Retrieves information of all sources.
inports	Retrieves information of all inports or inports connected to a given source
outports	Retrieves information of all outports or outports connected to a given client
salvos	Retrieves information of a single or multiple salvos
current	Retrieves information of the current state of the router
pending	Retrieves information of the pending state of the router
config	Retrieves information of the current or salvo specific configuration for a given client
crosspoints	Retrieves information of changed crosspoints from a given timestamp
setcrosspoint	Sets a specified crosspoint
setsalvo	Fires a specified salvo
status	Returns current Media Router status

To communicate with the Mosart Media Router REST service, the event client requires an authentication process. Depending on who the user is, some parts of the router may be restricted. The specifications for authentication are provided in the Retrieval Commands. The authentication process is based on OAuth, a common protocol for web services for this purpose. Details of this authentication process are still under development.

7.2.1 Retrieval Commands

This section contains commands for obtaining information.

clients

The *clients* command is used to obtain information about the clients of the Mosart Media Router. A typical client is a Mosart Server or Omnibus.

The REST URI template for the clients command:

```
[Service]/clients
```

sources

The *sources* command is used to obtain information about the sources of the Mosart Media Router. A typical source is a video playout server.

The REST URI template for the sources command:

```
[Service]/sources
```

inports

The *inports* command is used to obtain information about the inports of the Mosart Media Router. A typical inport is a port of a video playout server. Two variants of this command exist. One for retrieving all inports and one for retrieving inports for a given source. The REST URI template for the inports command:

```
[Service]/inports
[Service]/inports?source=[source]
```

source: Name of the source to obtain inports for.

outports

The *outports* command is used to obtain information about the outports of the Mosart Media Router. A typical outport is a port used by a Mosart Server. Two variants of this command exist. One for retrieving all outports and one for retrieving outports for a given client. The REST URI template for the outports command:

```
[Service]/outports
[Service]/outports?client=[client]
```

client: Name of the client to obtain outports for.

salvos

The *salvos* command is used to obtain information about the registered salvos within the Mosart Media Router. Two variants of this command exist. One for retrieving information for all salvos and one for retrieving information for a given salvo.

The REST URI template for the salvos command:

```
[Service]/salvos
[Service]/salvos?salvo=[salvo]
```

salvo: Name of the salvo to obtain information for.

current

The *current* command is used to obtain information about the current salvo within the Mosart Media Router. The current salvo is the same as the current state of the Mosart Media Router.

The REST URI template for the current command:

```
[Service]/current
```

pending

The *pending* command is used to obtain information about the pending salvo within the Mosart Media Router. The pending salvo is the same as the current state but may contain crosspoints that are not verified (pending) by the clients.

The REST URI template for the pending command:

```
[Service]/pending
```

config

The *config* command is used to obtain information about the crosspoints for a given client either for the current or a specified

The REST URI template for the config command:

```
[Service]/config?client=[client]
[Service]/config?client=[client]&salvo=[salvo]
```

client: Name of the client to obtain the configuration for.

salvo: Name of the salvo to obtain the client configuration for, if specified.

crosspoints

The *crosspoints* command is used to obtain information about the crosspoint that have been changed since a given timestamp. This command is normally used to poll the Mosart Media Router for its current state.

The REST URI template for the crosspoints command:

```
[Service]/crosspoints?from=[timestamp]
```

timestamp: Returns all crosspoints changed after the specified timestamp.

7.2.2 Control Commands

Commands in this section control the Mosart Media Router, by changing the state of the Mosart Media Router.

> **Note:** The HTTP GET protocol is used instead of HTTP PUT. This makes it possible to test the commands using an ordinary web browser.

setcrosspoint

The *setcrosspoint* command is used to set a crosspoint in any salvo. If no salvo is given the crosspoint is set in the pending salvo to be executed immediately. If the specified salvo does not exist, a new salvo with the corresponding name shall be generated.

The REST URI template for the setcrosspoint command:

```
[Service]/setcrosspoint/[inport]/[outport]
[Service]/setcrosspoint/[inport]/[outport]?salvo=[salvo]
```

inport: Specifies the inport of the crosspoint.

outport: Specifies the outport of the crosspoint.

salvo: Specifies the salvo where the crosspoint shall be set. If no salvo is given, the crosspoint is set directly in the router (pending salvo).

setsalvo

The *setsalvo* command is used to fire a salvo.

The REST URI template for the setsalvo command:

```
[Service]setsalvo/[salvo]
```

salvo: Specifies the salvo to fire.

8 MMR Configuration Of Vizrt Graphics

All MMR configuration is performed directly in an xml file, `MediaRouterDB.xml`.

> **Note:** `MediaRouterDB.xml`, is updated when using MMR with state information. It is therefore recommended to keep the original configuration in a separate file and copy any changes to the file used by MMR.

Viz MSEs and Viz Engines to be used by a Mosart installation are specified in the MMR configuration as *sources* and *inports* respectively. An *inport* shall always be attached to a single client which means for Viz graphics all Viz Engines must be associated with a single Viz MSE. This means that a configuration where a Viz Engine is used by *different* Viz MSEs, the Viz Engine must be specified multiple times, one for each Viz MSE.

Below are some examples how Viz Graphics is configured in the MMR configuration file, `MediaRouterDb.xml`. Note that only details relevant to this example are shown.

8.1 Configuration Of Viz MSE

Viz MSE is configured as a graphics controller and in MMR terms, configured as a *source*:

```
<Sources>
    <Value>
        <item id = "FG.NEWS" ignore = "false" type = "Vizrt" category =
"FullscreenGraphics">
            <ConnectionString>Server=hostname</ConnectionString>
        </item>
    </Value>
</Sources>
```

where:

- **Id:** Unique identifier for the *source*. Used in *inports* to relate to the *source*. Recommended to follow naming convention in the MMR database configuration.
- **ignore:** If set to true, the *source* will be ignored by MMR. Used to disable configuration.
- **type:** Graphics type. Set to “Vizrt” for Viz Graphics
- **category:** Device category. Set to either *FullscreenGraphics* or *OverlayGraphics*. Both types can be used for both FullscreenGraphics and OverlayGraphics.
- **ConnectionString:** *Source* specific properties, separated by ‘;’. For Viz MSE:
  - Syntax: Server=hostname[:port][,hostname[:port]][;AutoHandlerNames=true]
  - **Server:** Specify hostname/ip-address of Viz MSE:
    - **Syntax:** Server=hostname[:port][,hostname[:port]]
    - Some examples:
      - Backup MSE: main_host,backup_host
      - Tcp/ip port: hostname:port
  - **AutoHandlerNames:** To generate Viz MSE handler names automatically.

- Syntax: AutoHandlerNames=[true,false]
- Default true for Viz Graphics
- AutoHandlerNames = true is required for mirrored graphics.

8.2 Configuration Of Viz Engine

Viz Engines are configured in MMR terms as an *inport* and therefore must be related to a *source:*

```
<Inports>
   <Value>
      <item id="FG.NEWS.E1" order="1" ignore="false" device="FG.NEWS" deviceName="1"
            category="FullscreenGraphics" deviceType="Vizrt" ">
         <ConnectionString>Host=hostname; Encoding=UTF-8</ConnectionString>
      </item>>
   </Value>
</Inports>
```

where:

- **Id :** Unique identifier for the *inport*. Recommended to follow naming convention in the MMR database configuration.
- ***order:*** Used to relate to Probel crosspoint source
- **ignore:** If set to true, the *inport* will be ignored by MMR. Used to disable configuration.
- **device:** Specifies the *source* the inport belongs to. A *source* in this context refers to a Viz MSE. Must be a valid *source*.
- **deviceName:** Device specific. For Viz graphics this is used to specify the viz handler name as used by the Viz MSE. This is ignored when *AutoHandlerNames* = true (see configuration of Viz MSE)
- **type:** Graphics type. Set to “Vizrt” for Viz Graphics
- **category:** Device category. Set to either *FullscreenGraphics* or *OverlayGraphics*. Both types can be used for both FullscreenGraphics and OverlayGraphics.
- **ConnectionString:** Device specific properties, separated by ‘;’. For Viz Engine:
  - Syntax: hostname[:port][,hostname[:port]][,hostname[:port][,…] [;Method=scene_AB_mode][;Encoding=UTF-8]
  - **Host=hostname:** Specify hostname(s) for the Viz Engine
    - Syntax: hostname[:port][,hostname[:port]][,hostname[:port][,…]
    - Use multiple hostnames for mirrored graphics.
    - Optional tcp/ip ports are specified by appending the port after ‘:’
    - Some examples:
      - Mirrored graphics: hostname1,hostname2
      - Tcp/ip port: hostname:6110
  - Method=scene_AB_mode – Used to specify scene transition mode on Viz Engine.
    - Syntax: Method=scene_AB_mode
  - Encoding – sets the MSE encoding. Normally UTF-8

8.3 Configuration Of Mosart Fullscreen Graphics

Mosart fullscreen graphics are configured in MMR terms as an *outport* related to a *client* which specifies a Mosart server.

```
<Clients>
   <Value>
      <item id="STUDIO1" ignore="false" type="Mosart">
         <ConnectionString>Server=hostname;Port=8099</ConnectionString>
      </item>
   </Value>
<Clients>

<Outports>
   <Value>
      <item id="STUDIO1.FG1" order="1" ignore="false" device="STUDIO1" deviceName="1"
 category="FullscreenGraphics" deviceType="Mosart" />
   </Value>
</Outports>
```

The *client* is used to specify a Mosart Server. The connection point for MMR is AvAutomation. To enable MMR on a Mosart Server is therefore done in AvAutomation.

8.3.1 Mosart Server (client) properties

The Mosart Server itself is configured as an MMR *client* with the following properties:

- *Id* – Unique identifier for the *client*. Used in *outports* to relate to the *client*. Recommended to follow naming convention in the MMR database configuration.
- *ignore* – If set to true, the *client* will be ignored by MMR. Used to disable configuration.
- *type* – Identifies client type. Set to "Mosart"
- *ConnectionString* – Sets the connectivity properties for the Mosart Server
  - Server=hostname – Specifies the server hostname or ip-address for the Mosart Server
  - Port=portno – Specifies the tcp/ip listening port used by AvAutomation in the Mosart Server. This port is configurable in AvAutomation in Devices / Preferences / General tab / MediaRouter section.

8.3.2 Mosart Server fullscreen (outport) properties

Mosart Server fullscreen graphics is configured as MMR *outports* with the following properties:

- ***Id:*** Unique identifier for the *outport*. Recommended to follow naming convention in the MMR database configuration.
- **order:** Used to relate to Probel crosspoint destination
- **ignore:** If set to true, the *outport* will be ignored by MMR. Used to disable configuration.
- **device:** Specifies the *client* the *outport* belongs to. Must be a valid *client*.

- **deviceName:** For Viz fullscreen graphics this is used to specify the corresponding fullscreen engine used by AvAutomation.
  Must a number in the range [1..5] or [11..15] where the latter is mirrored engines in the following pairs: (1,11), (2,12), ..., (5,15).

  > ⚠ **Note:** Mirroring for Viz graphics is also possible by specifying multiple hostnames in the ConnectionString for the Viz Engine.

- **category:** Device category. Set to *FullscreenGraphics* for fullscreen graphics.

8.3.3 Configuration of Mosart overlay graphics

Mosart overlay graphics are configured in MMR terms as an *outport* related to a *client* which specifies a Mosart server.

```
<Clients>
   <Value>
      <item id="STUDIO1" ignore="false" type="Mosart">
         <ConnectionString>Server=hostname;Port=8099</ConnectionString>
      </item>
   </Value>
<Clients>

<Outports>
   <Value>
      <item id="STUDIO1.OG1" order="2" ignore="false" device="STUDIO1" deviceName="DSK" category="OverlayGraphics" deviceType="Mosart" />
   </Value>
</Outports>
```

8.3.4 Mosart Server Overlay (outport) properties

Mosart Server overlay graphics is configured as MMR *outports* with the following properties:

- **Id:** Unique identifier for the *outport*. Recommended to follow naming convention in the MMR database configuration.
- **order:** Used to relate to Probel crosspoint destination
- **ignore:** If set to true, the *outport* will be ignored by MMR. Used to disable configuration.
- **device:** Specifies the *client* the *outport* belongs to. Must be a valid *client*.
- **deviceName:** For Viz overlay graphics this is used to specify graphics destination as configured in the OverlayGraphics static configuration.
  Either a valid destination name or a number in the range [1..8]. The latter is former configuration which requires mapping between destination number and destination. This mapping table is part of the OverlayGraphics static configuration.
- **category:** Device category. Set to *OverlayGraphics* for overlay graphics.

8.4 Viz Graphics Additional Properties

From the configuration there are some properties that are important when using MMR and mirrored graphics:

8.4.1 Apply Channel Name to Elements

This property is available in both OverlayGraphics and FullscreenGraphics static configurations. When enabled all graphics elements will be tagged with the corresponding destinations in the Mosart playlists. The graphics will also be controlled via the Viz MSE Channels. This is the preferred and recommended way by Viz MSE. Enabling this property is a requirement for mirrored graphics.

For MMR this property is set using the *ApplyChannelNameToNewElements* property located in the *GraphicsDefaultConfiguration.xml* configuration file.

8.4.2 Remove Unused Channels Outputs

This property is available in the *VizrtGraphicsConfiguration.xml* configuration file. When enabled the Mosart profile in Viz MSE will synchronize to the current Mosart fullscreen and overlay configurations. This is mandatory when using MMR.