AVT GigE TL

Feature Manual

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ALLIED Vision Technologies

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Note

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2 Introduction

2.1 Document history

Version	Date	Changes
1.0.0	25. 02. 2013	Initial version
1.1.0	07. 03. 2013	Different generation of document, small layout changes
1.2.0	13. 05. 2013	Refined some descriptions, changed the layout of document and feature tables, removed the exemplary camera features

2.2 Conventions used in this manual

To give this manual an easily understood layout and to emphasize important information, the following typographical styles and symbols are used:

2.2.1 Styles

Style	Function	Example
Bold	Programs, inputs or highlighting important things	**bold**
Courier	Code listings etc.	`Input`
Upper case	Constants	CONSTANT
Italics	Modes, fields	*Mode*
Parentheses and/or blue	Links	(Link)

2.2.2 Symbols

Note

This symbol highlights important information.

Caution

This symbol highlights important instructions. You have to follow these instructions to avoid malfunctions.

WWW

This symbol highlights URLs for further information. The URL itself is shown in blue.
Example: http://www.alliedvisiontec.com

3 AVTGigETL - Overview

The AVTGigETL is a module according to the GenTL specification and complies to GenICam applications providing a GenTL consumer interface. It consists of several parts: the functional interface and the feature maps for the transport layer and for the camera.

The **functional interface** is needed for dynamically controlling GigE cameras and it covers the complete functionality described in GenTL specification 1.2. There is additional functionality, which is described in chapter 8, **AVT extensions to the functional GenTL interface**.

The **features** exposed by XML files are GenAPI-conforming features described in the chapters:

- Features of the GenTL **System module** in chapter 4. The System is a module for handling multiple GenTL Interfaces in one transport layer.
- Features of the GenTL **Interface module** in chapter 5. The Interface is a module for handling multiple GenTL Devices.
- Features of the GenTL **Device module** in chapter 6. The Device module is a host-side representation of the Camera aka "Remote Device".
- Features of the GenTL **Data Stream module** in chapter 7. The Data Stream module allows handling all streaming-related operations.

The XML file of the cameras is located in the device itself and conforms to the GenICam Standard Features Naming Convention.

4 TL System RegisterMap

This chapter lists features that are potentially available in this module. Some features are only available under certain circumstances.
The following categories can be found below the Root category:

- SystemModule

4.1 SystemModule [AVT]

4.1.1 TLVendorName

Name	TL Vendor Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the GenTL Producer vendor.
Corresponds to the TL_INFO_VENDOR command of TLGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

4.1.2 TLModelName

Name	TL Model Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the GenTL Producer to distinguish different kinds of GenTL Producer implementations from one vendor.
Corresponds to the TL_INFO_MODEL command of TLGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

4.1.3 TLID

Name	TL ID
Interface	IString
Access	Read
Visibility	Beginner

Unique identifier of the GenTL Producer like a GUID.
Corresponds to the TL_INFO_ID command of TLGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

4.1.4 TLDisplayName

Name	TL Display Name
Interface	IString
Access	Read
Visibility	Beginner

User readable name of the GenTL Producer.
Corresponds to the TL_INFO_DISPLAYNAME command of TLGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

4.1.5 TLVersion

Name	TL Version
Interface	IString
Access	Read
Visibility	Beginner

Vendor specific version string.
Corresponds to the TL_INFO_VERSION command of TLGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

4.1.6 TLPath

Name	TL Path
Interface	IString
Access	Read
Visibility	Beginner

Full path to the GenTL Producer driver including name and extension.
Corresponds to the TL_INFO_PATHNAME command of TLGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

4.1.7 TLType

Name	TL Type
Interface	IEnumeration
Access	Read
Visibility	Beginner
Values	GEV [AVT]

Identifies the transport layer technology of the GenTL Producer implementation.
Corresponds to the TL_INFO_TLTYPE command of TLGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

4.1.8 GenTLVersionMajor

Name	GenTL Version Major
Interface	IInteger
Access	Read
Visibility	Expert

Major version number of the GenTL specification the GenTL Producer implementation complies with.
See GenTL specification 1.2 chapter 7 for more details.

4.1.9 GenTLVersionMinor

Name	GenTL Version Minor
Interface	IInteger
Access	Read
Visibility	Expert

Minor version number of the GenTL specification the GenTL Producer implementation complies with.
See GenTL specification 1.2 chapter 7 for more details.

4.1.10 InterfaceUpdateList

Name	Interface Update List
Interface	ICommand
Access	Read/Write
Visibility	Beginner

Update the interface list on this GenTL Producer.
See GenTL specification 1.2 chapter 7 for more details.

4.1.11 InterfaceCount [AVT]

Name	Interface Count
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Number of interfaces on this GenTL Producer.

4.1.12 InterfaceSelector

Name	Interface Selector
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Selector for the different GenTL Producer interfaces.
See GenTL specification 1.2 chapter 7 for more details.

4.1.13 InterfaceID

Name	Interface ID
Interface	IString
Access	Read
Visibility	Beginner

GenTL Producer wide unique identifier of the selected interface.
See GenTL specification 1.2 chapter 7 for more details.

4.1.14 GevVersionMajor

Name	Major version number
Interface	IInteger
Access	Read
Visibility	Beginner

Major version number of the GigE Vision specification the GenTL Producer implementation complies to.
See GenTL specification 1.2 chapter 7 for more details.

4.1.15 GevVersionMinor

Name	Minor version number
Interface	IInteger
Access	Read
Visibility	Beginner

Minor version number of the GigE Vision specification the GenTL Producer implementation complies to.
See GenTL specification 1.2 chapter 7 for more details.

4.1.16 GevInterfaceMACAddress

Name	Interface MAC Address
Interface	IInteger
Access	Read/Write
Visibility	Expert

48-bit MAC address of the interface
See GenTL specification 1.2 chapter 7 for more details.

4.1.17 GevInterfaceDefaultIPAddress

Name	Interface IP Address
Interface	IInteger
Access	Read/Write
Visibility	Expert

IP address of the interface
See GenTL specification 1.2 chapter 7 for more details.

4.1.18 GevInterfaceDefaultSubnetMask

Name	Interface Subnet mask
Interface	IInteger
Access	Read/Write
Visibility	Expert

Subnet mask of the interface
See GenTL specification 1.2 chapter 7 for more details.

5 TL Interface RegisterMap

This chapter lists features that are potentially available in this module. Some features are only available under certain circumstances.
The following categories can be found below the Root category:

- InterfaceModule
  - Gev
- Settings

5.1 InterfaceModule [AVT]

Category for Interface Module features.

5.1.1 InterfaceID

Name	Interface ID
Interface	IString
Access	Read
Visibility	Beginner

GenTL Producer wide unique identifier of the selected interface.
Corresponds to the INTERFACE_INFO_ID command of IFGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

5.1.2 InterfaceType

Name	Interface Type
Interface	IEnumeration
Access	Read
Visibility	Beginner
Values	GEV [AVT]

Identifies the transport layer technology of the interface.
Corresponds to the INTERFACE_INFO_TLTYPE command of IFGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

5.1.3 InterfaceDisplayName

Name	Interface Display Name
Interface	IString
Access	Read
Visibility	Beginner

User readable name of the selected interface.
Corresponds to the INTERFACE_INFO_DISPLAYNAME command of IFGetInfo function.
See GenTL specification 1.2 chapter 7 for more details.

5.1.4 DeviceUpdateList

Name	Device Update List
Interface	ICommand
Access	Read/Write
Visibility	Beginner

Updates the internal device list.
See GenTL specification 1.2 chapter 7 for more details.

5.1.5 DeviceCount [AVT]

Name	Device Count
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Number of found devices.

5.1.6 DeviceSelector

Name	Device Selector
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Selector for the different devices on this interface.
See GenTL specification 1.2 chapter 7 for more details.

5.1.7 DeviceID

Name	Device ID
Interface	IString
Access	Read
Visibility	Beginner

Interface wide unique identifier of the selected device.
See GenTL specification 1.2 chapter 7 for more details.

5.1.8 DeviceDisplayName [AVT]

Name	Device Display Name
Interface	IString
Access	Read
Visibility	Beginner

User readable name of the selected device.

5.1.9 DeviceVendorName

Name	Device Vendor Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the device vendor.
See GenTL specification 1.2 chapter 7 for more details.

5.1.10 DeviceModelName

Name	Device Model Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the device model.
See GenTL specification 1.2 chapter 7 for more details.

5.1.11 DeviceType [AVT]

Name	Device Type
Interface	IEnumeration
Access	Read
Visibility	Beginner
Values	GEV

Identifies the transport layer technology of the device.

5.1.12 DeviceAccessStatus

Name	Device Access Status
Interface	IEnumeration
Access	Read
Visibility	Beginner
Values	Unknown ReadWrite ReadOnly NoAccess

Gives the device's access status at the moment of the last execution of "DeviceUpdateList".
See GenTL specification 1.2 chapter 7 for more details.

5.2 Gev [AVT]

5.2.1 GevInterfaceMACAddress

Name	Interface MAC address
Interface	IInteger
Access	Read/Write
Visibility	Expert

48-bit MAC address of this interface.
See GenTL specification 1.2 chapter 7 for more details.

5.2.2 GevInterfaceSubnetIPAddress

Name	Interface IP address
Interface	IInteger
Access	Read/Write
Visibility	Expert

IP address of the selected subnet of this interface.
See GenTL specification 1.2 chapter 7 for more details.

5.2.3 GevInterfaceSubnetMask

Name	Interface subnet mask
Interface	IInteger
Access	Read/Write
Visibility	Expert

Subnet mask of the selected subnet of this interface.
See GenTL specification 1.2 chapter 7 for more details.

5.2.4 GevDeviceIPAddress

Name	Device IP address
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Current IP address of the GVCP interface of the selected remote device.
See GenTL specification 1.2 chapter 7 for more details.

5.2.5 GevDeviceSubnetMask

Name	Device subnet mask
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Current subnet mask of the GVCP interface of the selected remote device.
See GenTL specification 1.2 chapter 7 for more details.

5.2.6 GevDeviceMACAddress

Name	Device MAC address
Interface	IInteger
Access	Read/Write
Visibility	Beginner

48-bit MAC address of the GVCP interface of the selected remote device.
See GenTL specification 1.2 chapter 7 for more details.

5.3 Settings [AVT]

5.3.1 InterfaceBeatRate [AVT]

Name	Interface Beat Rate
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	10..10000

Rate (in ms) at which the interface will perform device discovery.

5.3.2 InterfaceHailPace [AVT]

Name	Interface Hail Pace
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	1..10

Pace (as in every X beats) at which the interface will hail for devices to reply.

5.3.3 InterfacePingPace [AVT]

Name	Interface Ping Pace
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	1..10

Pace (as in every X beats) at which the interface will ping detected devices.

5.3.4 DiscoveryMode [AVT]

Name	Devices Discovery Mode
Interface	IEnumeration
Access	Read/Write
Visibility	Beginner
Values	Off Auto Once

Defines how the interfaces should discovers connected devices

5.3.5 DiscoveryBroadcastMode [AVT]

Name	Devices Discovery Broadcast Mode
Interface	IEnumeration
Access	Read/Write
Visibility	Beginner
Values	Local Subnet

Defines how the interfaces should send its discovery broadcast

6 TL Device RegisterMap

This chapter lists features that are potentially available in this module. Some features are only available under certain circumstances.
The following categories can be found below the Root category:

- DeviceModule
  - Gev
- GigE
  - GVCP

6.1 DeviceModule

Category for Device Module features.
See GenTL specification 1.2 chapter 7 for more details.

6.1.1 DeviceID

Name	Device ID
Interface	IString
Access	Read
Visibility	Beginner

Interface-wide unique identifier of this device.
See GenTL specification 1.2 chapter 7 for more details.

6.1.2 DeviceVendorName

Name	Device Vendor Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the device vendor.
See GenTL specification 1.2 chapter 7 for more details.

6.1.3 DeviceModelName

Name	Device Model Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the device model.
See GenTL specification 1.2 chapter 7 for more details.

6.1.4 DeviceType

Name	Device Type
Interface	IEnumeration
Access	Read
Visibility	Beginner
Values	GEV [AVT]

Identifies the transport layer technology of the device
See GenTL specification 1.2 chapter 7 for more details.

6.1.5 DeviceDisplayName

Name	Device Display Name
Interface	IString
Access	Read
Visibility	Beginner

User readable name of the device.
See GenTL specification 1.2 chapter 7 for more details.

6.1.6 StreamCount [AVT]

Name	Stream Count
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Number of available streams.

6.1.7 StreamSelector

Name	Stream Selector
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Selector for the different stream channels.
See GenTL specification 1.2 chapter 7 for more details.

6.1.8 StreamID

Name	Stream ID
Interface	IString
Access	Read
Visibility	Beginner

Device unique ID for the stream, e.g.
a GUID
See GenTL specification 1.2 chapter 7 for more details.

6.2 Gev

See GenTL specification 1.2 chapter 7 for more details.

6.2.1 GevDeviceIPAddress

Name	Device IP address
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Current IP address of the GVCP interface of the remote device.
See GenTL specification 1.2 chapter 7 for more details.

6.2.2 GevDeviceSubnetMask

Name	Device subnet mask
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Current subnet of the GVCP interface of the selected remote device.
See GenTL specification 1.2 chapter 7 for more details.

6.2.3 GevDeviceMACAddress

Name	Device MAC address
Interface	IInteger
Access	Read/Write
Visibility	Beginner

48-bit MAC address of the GVCP interface of the selected remote device.
See GenTL specification 1.2 chapter 7 for more details.

6.2.4 GevDeviceGateway

Name	Device gateway
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Current gateway of the GVCP interface of the selected remote device.
See GenTL specification 1.2 chapter 7 for more details.

6.3 GigE [AVT]

6.4 GVCP [AVT]

6.4.1 GVCPHBInterval [AVT]

Name	Heartbeat Interval
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	500..5000

Interval of time at which an heartbeat message should be send to the device.

6.4.2 GVCPCmdTimeout [AVT]

Name	Command Timeout
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	100..1000

Timeout waiting for an answer from the device.

6.4.3 GVCPCmdRetries [AVT]

Name	Command Retries
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	1..10

Number of time a particular command to the device will be resend when no answer is being received.

7 TL Stream RegisterMap

This chapter lists features that are potentially available in this module. Some features are only available under certain circumstances.
The following categories can be found below the Root category:

- StreamModule
- Stream
  - Multicast
  - Info
  - Settings
  - Statistics

7.1 StreamModule [AVT]

Category for Stream module features.

7.1.1 StreamID

Name	Stream ID
Interface	IString
Access	Read
Visibility	Beginner

Device unique identifier for this data stream.
See GenTL specification 1.2 chapter 7 for more details.

7.1.2 StreamAnnouncedBufferCount

Name	Stream Announced Buffer Count
Interface	IInteger
Access	Read/Write
Visibility	Beginner

Number of announced (known) buffers on this stream.
See GenTL specification 1.2 chapter 7 for more details.

7.1.3 StreamAcquisitionModeSelector

Name	Stream Acquisition Mode Selector
Interface	IEnumeration
Access	Read
Visibility	Beginner
Values	Default [AVT]

Available acquisition modes of this Stream.
See GenTL specification 1.2 chapter 7 for more details.

7.1.4 StreamAnnounceBufferMinimum

Name	Stream Announce Buffer Minimum
Interface	IInteger
Access	Read
Visibility	Beginner

Minimal number of buffers to announce to enable selected acquisition mode.
See GenTL specification 1.2 chapter 7 for more details.

7.1.5 StreamType

Name	Stream Type
Interface	IEnumeration
Access	Read
Visibility	Beginner
Values	GEV [AVT]

Identifies the transport layer technology of the stream.
See GenTL specification 1.2 chapter 7 for more details.

7.2 Stream [AVT]

7.3 Multicast [AVT]

7.3.1 MulticastEnable [AVT]

Name	Multicast Enable
Interface	IBoolean
Access	Read/Write
Visibility	Expert

Enable multicast streaming.

7.3.2 MulticastIPAddress [AVT]

Name	Multicast IP Address
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	224..4294967279

IP address of the target multicasting group.

7.4 Info [AVT]

7.4.1 GVSPFilterVersion [AVT]

Name	GVSP Filter Version
Interface	IString
Access	Read
Visibility	Expert

Version of the GVSP Filter driver

7.5 Settings [AVT]

7.5.1 GVSPTimeout [AVT]

Name	GVSP Timeout
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	10..5000

Timeout (in ms) used for stream packets.

7.5.2 GVSPDriver

Name	GVSP Driver Selector
Interface	IEnumeration
Access	Read/Write
Visibility	Expert
Values	Socket [AVT] Filter [AVT]

Streaming driver to be used
See GenTL specification 1.2 chapter 7 for more details.

7.5.3 GVSPHostReceiveBuffers [AVT]

Name	GVSP Host Receive Buffers
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	256..2048

Number of receive buffers to be used by the OS' socket (hint).

7.5.4 GVSPBurstSize [AVT]

Name	GVSP Burst Size
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	1..256

Maximum number of GVSP packets to be processed in a burst.

7.5.5 GVSPMaxLookBack [AVT]

Name	GVSP Max Look Back
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	1..1024

Size of the missing GVSP packets detection windows.

7.5.6 GVSPMaxRequests [AVT]

Name	GVSP Max Requests
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	1..512

Maximum number of requests (to the device) for a missing GVSP packet.

7.5.7 GVSPMissingSize [AVT]

Name	GVSP Missing Size
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	0..1024

Maximum number of simulatenous missing GVSP packets before dropping the frame (0 = OFF).

7.5.8 GVSPTiltingSize [AVT]

Name	GVSP Tilting Size
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	0..1024

Maximum number GVSP packets received from a following frame before dropping the frame (0 = OFF).

7.5.9 GVSPMaxWaitSize [AVT]

Name	GVSP Max Wait Size
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	8..1024

Maximum number of received GVSP packets following a resend request to wait before requesting again.

7.5.10 GVSPPacketSize [AVT]

Name	GVSP Packet Size
Interface	IInteger
Access	Read/Write
Visibility	Expert

GVSP Packet size (in bytes).

7.5.11 GVSPAdjustPacketSize [AVT]

Name	GVSP Adjust Packet Size
Interface	ICommand
Access	Read/Write
Visibility	Expert

Request the packet size used to be adjusted automatically.

7.6 Statistics [AVT]

7.6.1 StatFrameDelivered [AVT]

Name	Stat Frames Delivered
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Number of frames succesfully delivered by the streaming engine.

7.6.2 StatFrameDropped [AVT]

Name	Stat Frames Dropped
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Number of frames dropped by the streaming engine due to missing packets.

7.6.3 StatFrameUnderrun [AVT]

Name	Stat Frames Underrun
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	0..

Number of frames missed due to the non-availibity of a user supplied buffer.

7.6.4 StatFrameShoved [AVT]

Name	Stat Frames Shoved
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	0..

Number of frames dropped because a following frame was completed before.

7.6.5 StatFrameRescued [AVT]

Name	Stat Frames Rescued
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	0..

Number of frames succesfully delivered by the streaming engine after having had missing packets.

7.6.6 StatPacketReceived [AVT]

Name	Stat Packets Received
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Number of packets received and processed by the stream engine.

7.6.7 StatPacketMissed [AVT]

Name	Stat Packets Missed
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Number of packets expected and not received by the stream engine.

7.6.8 StatPacketErrors [AVT]

Name	Stat Packets Errors
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	0..

Number of received packets that are erroneous (usually signal an hardware issue on the device).

7.6.9 StatPacketRequested [AVT]

Name	Stat Packets Requested
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Number of missing packets that were requested for resent by the device.

7.6.10 StatPacketResent [AVT]

Name	Stat Packets Resent
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Number of missing packets that were resent by the device after having been requested.

7.6.11 StatFrameRate [AVT]

Name	Stat Frame Rate
Interface	IFloat
Access	Read/Write
Visibility	Beginner
Values	0.0..

Rate at which the device is sending frame to the streaming engine (frame/s).

7.6.12 StatLocalRate [AVT]

Name	Stat Local Rate
Interface	IFloat
Access	Read/Write
Visibility	Expert
Values	0.0..

Rate at which the streaming engine is processing the frames sent by the device (frame/s).

7.6.13 StatTimeElapsed [AVT]

Name	Stat Time Elapsed
Interface	IFloat
Access	Read/Write
Visibility	Expert
Values	0.0..

Elapsed time (in s) since the streaming was started.

8 AVT extensions to the functional GenTL interface

AVT transport layers provide additional functionality to the general GenTL interface. The provided extensions to Transport Layer Events allow monitoring system changes. Other extensions allow comfortable access to additional URL information.

8.1 Custom Transport Layer events

Custom additions to the following Enumerations are available:

- EVENT_TYPE_LIST (used in GCRegisterEvent and GCUnregisterEvent)
- EVENT_DATA_INFO_CMD_LIST (used in EventGetDataInfo)

Additionally, an enumeration for determining the type of a change is provided: IFCHANGE_WHAT_LIST
These extensions allow the users of AVT transport layers to get informed about changes to either the interface list or the camera list.

8.1.1 Additions to EVENT_TYPE_LIST

Listing 1: Event types

```
enum EVENT_TYPE_LIST_AVT
{
    EVENT_SYSTEM_CHANGE         = 1000, // System detected some change
    EVENT_INTERFACE_CHANGE      = 1001  // Interface detected some change
}
```

8.1.2 Additions to EVENT_DATA_INFO_CMD_LIST

Listing 2: Change Events

```
enum EVENT_DATA_INFO_CMD_LIST_AVT
{
    // for event type EVENT_SYSTEM_CHANGE
    EVENT_DATA_SYSTEM_IFCOUNT   = 1000, // UINT32
Number of detected interfaces

    // for event type EVENT_INTERFACE_CHANGE
    EVENT_DATA_IFCHANGE_DUID    = 1001, // STRING    Device UID
    EVENT_DATA_IFCHANGE_WHAT    = 1002, // UINT32
Bitfield of what has changed
                                        //  (IFCHANGE_WHAT_LIST)
    EVENT_DATA_IFCHANGE_DATA    = 1003  // UINT32
Bitfield of current state of
                                        //  the device (IFCHANGE_WHAT_LIST)
};
```

8.1.3 Additional enumeration IFCHANGE_WHAT_LIST

Listing 3: Change Event optionss

```
enum IFCHANGE_WHAT_LIST
{
    IFCHANGE_WHAT_VISIBILITY    = 1,    // Device visibility has changed
    IFCHANGE_WHAT_REACHABILITY = 2      // Device reachability has changed
};
```

8.2 Additional URL information

For the following Enumeration, extensions are available:

- URL_INFO_CMD_LIST (used inGCGetPortURLInfo)

The extensions allow the user of the AVT transport layers to access URL information without having to parse the URL string.

8.2.1 Additions to URL_INFO_CMD_LIST

Listing 4: URL information

```
enum URL_INFO_CMD_LIST_AVT
{
    URL_INFO_FILENAME           = 1000,  // STRING
Filename of the port XML file
    URL_INFO_ADDRESS            = 1001,  // UINT64
Start address of the XML file
    URL_INFO_LENGTH             = 1002,  // SIZET
XML file length (in bytes)
    URL_INFO_ZIPPED             = 1003   // BOOL8
Is the XML file zipped
};
```