



# La valigetta domotica



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## *La valigetta domotica*

costituisce un impianto domotico compatto e trasportabile.

La realizzazione di una valigetta kit-demo (lavoro frutto della collaborazione tra Softec S.p.A. ed il laboratorio di Domotica ISTI-CNR) mostra le funzionalità del nostro prototipo domotico **DomoNet (\*)** messo a punto appositamente sia dal punto di vista software (*in appendice – La configurazione xml/domoDevices.xml*) che hardware. Esso ingloba tre tecnologie domotiche KNX, By-me (Vimar) ed UPnP rendendole interoperabili.

(\*) **DomoNet** è un software open source rilasciato sotto licenza GPL dal laboratorio di domotica dell'ISTI-CNR di Pisa, al fine di proporre una soluzione al problema della non-interoperabilità tra gli standard domotici attualmente presenti sul mercato. Il software permette il controllo dei dispositivi offrendo, a livello di programmazione, un livello di astrazione elevato ed una interfaccia unificata e standardizzata, indipendentemente dalle tecnologie domotiche utilizzate. Si basa sull'uso delle tecnologie standard dei web services ed XML, in modo da offrire un'interfaccia verso il mondo esterno semplice ed efficace.

[Miori V., Russo D., Aliberti M.

[\*Domotic technologies incompatibility becomes user transparent\*](#)

In: Communications of the Acm, vol. 53 (1) pp. 153 - 157. ACM, 2010.]

Le attività svolte si possono sintetizzare inizialmente in due fasi.

La prima fase, molto laboriosa, ha riguardato il recupero, il montaggio e la programmazione dei dispositivi. In particolare è stato assemblato all'interno di una scatola:

- un'interfaccia IP per connettere **DomoNet** al bus domotico KNX e By-me (Vimar)
- piattaforma HW (server): ASUS EEE-box con processore ATOM e S.O. version testing debian
- un alimentatore per la rete domotica By-me (Vimar) cod.01801
- un attuatore KNX a 3 vie
- un termostato KNX (theben RAM 710)
- un gateway KNX-IP
- due pulsantiere By-me (Vimar) cod.20520-20521
- un media server e un media renderer UPnP (Gstreamer player)
- un router wi-fi/ethernet che collega il server con l'interfaccia IP

nota: KNX e By-me (Vimar) condividono, comunicano, sullo stesso bus.  
Ciò per convenienza di spazio.

La seconda fase, ha previsto la configurazione del server, del router, dell'installazione e configurazione di DomoNet.

E' stato infatti riconfigurato il server ed installato il software necessario cercando di evitare di installare l'ambiente grafico X (pesante ed in questo contesto non utile). Dopodichè abbiamo connesso fisicamente i dispositivi domotici al resto e riconfigurato il router per adattarlo al meglio al proprio compito.

Sono state riscritte alcune porzioni di codice del software DomoNet per ottimizzarlo e adattarlo a quel tipo di hardware.

La valigetta realizzata comprende i dispositivi domotici qui di seguito elencati la cui gestione e monitoraggio sono interfacciate tramite "Web Services"

- 1 pulsante semplice di tecnologia By-me (Vimar) per aprire/chiudere un contatto elettrico di un attuatore switch di tecnologia KNX (es. una luce)
- 1 pulsante semplice di tecnologia By-me (Vimar) per aprire/chiudere un contatto elettrico di tecnologia KNX con attivazione di un audio che, riproducendo una voce femminile, allerta una fuga di gas gestita tramite tecnologia UPnP (es. simulazione allarme)
- 1 pulsante basculante di tecnologia By-me (Vimar) per aprire/chiudere un contatto elettrico di tecnologia KNX (esempio una luce)
- 1 pulsante basculante By-me (Vimar) per attivare/disattivare lo streaming di un file audio gestito tramite tecnologia UPnP
- 1 termostato di tecnologia KNX in grado di restituire la temperatura e, se è attivato il contatto, di azionare il riscaldamento o meno

nota: la tecnologia UPnP è particolarmente adatta ad applicazioni di tipo multimediale e di gestione audio/video. Per far funzionare UPnP a livello minimale, è stato sufficiente avere un PC e configurarlo appropriatamente installandovi del software per integrarlo in DomoNet.

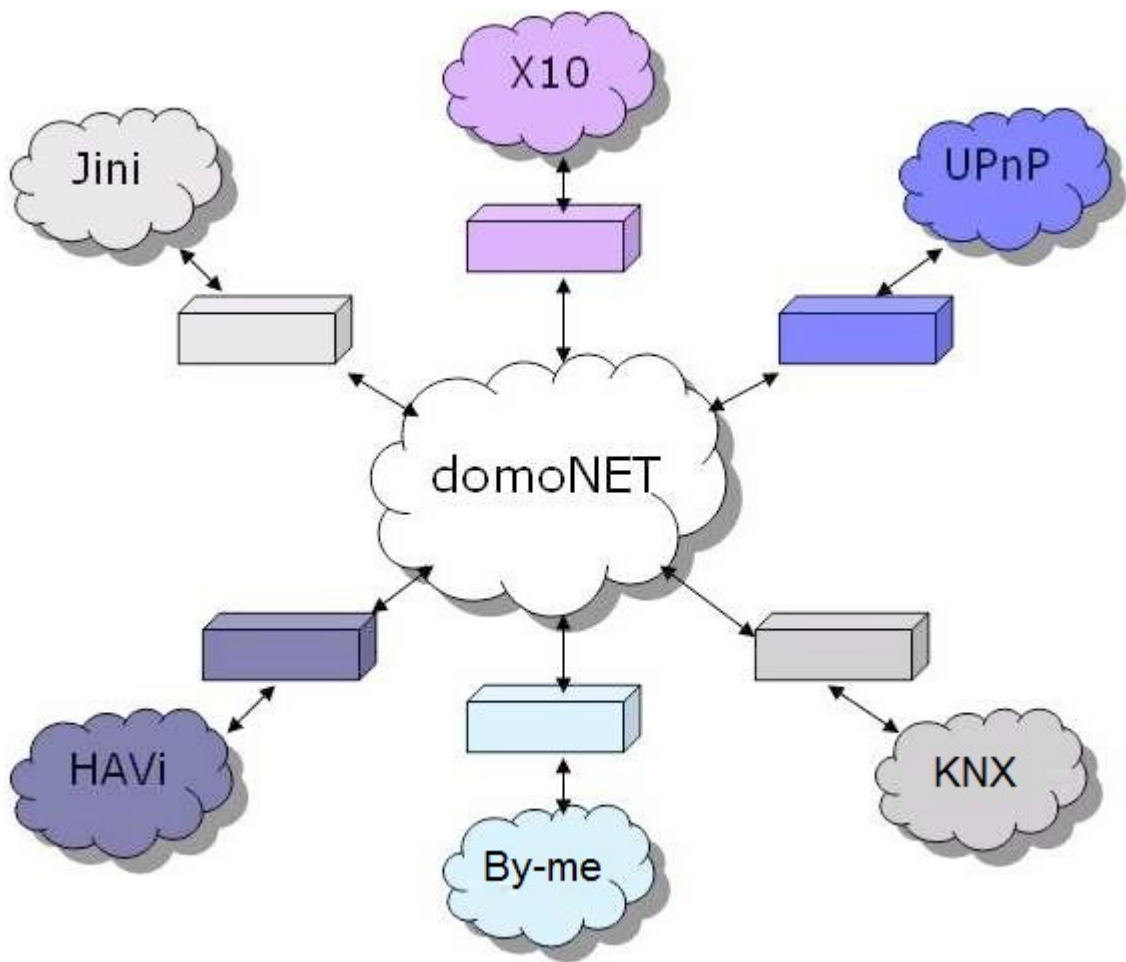
Collegando un paio di casse audio nello spinottino jack del server, è dunque possibile usufruire anche di questa funzionalità.

## TECNOLOGIE UTILIZZATE

- KNX – open standard europeo ed unico riconosciuto dagli enti di standardizzazione alla data odierna
- By-me – tecnologia proprietaria legata al produttore italiano VIMAR
- UPnP – Standard studiato particolarmente per la gestione dinamica di audio/video, ma con concettuali possibilità di poter gestire anche altre funzioni domotiche come la gestione dell'impianto di illuminazione
- Tomcat, WiFi per comunicare in Internet

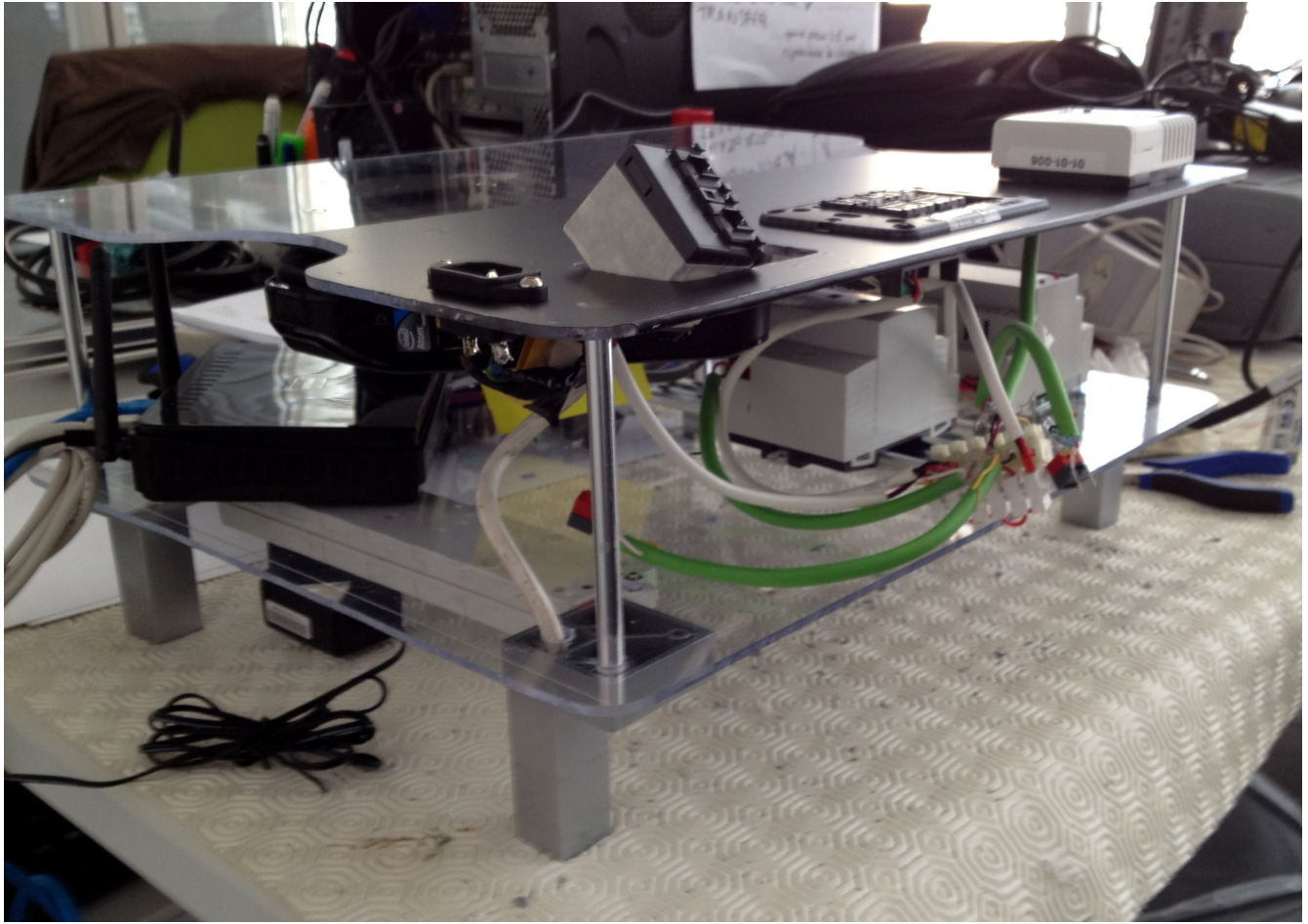
La scelta di tali tecnologie standard non è stata basata sull'aspetto **compatibilità** in quanto raramente tecnologie domotiche diverse sono interoperabili tra loro, dunque l'attenzione è stata posta su **potenzialità, diffusione e costi.**

La possibilità di far interoperare le diverse tecnologie domotiche, indipendentemente dallo standard di appartenenza, introduce l'innovazione ed il valore aggiunto dell'applicazione realizzata e soprattutto dimostra che è possibile risolvere uno dei più grossi problemi legati **alla scelta dei dispositivi.**













## domoDevices.xml

```
<devices>
<device description="GMediaServer" id="1" manufacturer="Oskar
Liljeblad" position="" positionDescription=""
serialNumber="MediaServer" tech="UPNP" type="MediaServer">
<service description="" name="Play" output="STRING"
outputDescription="" outputName="State" prettyName="Play"><input
description="" name="mediaRendererId" type="STRING" /><input
description="" name="mediaRendererURL" type="STRING" /><input
description="" name="mediaContainerId" type="STRING" /><input
description="" name="mediaContentId" type="STRING" /></service>
<service description="" name="Stop" output="STRING"
outputDescription="" outputName="State" prettyName="Stop" />
<service description="" name="GetSearchCapabilities" output="STRING"
outputName="SearchCaps" prettyName="GetSearchCapabilities
(SearchCaps)" /><service description="" name="GetSortCapabilities"
output="STRING" outputName="SortCaps"
prettyName="GetSortCapabilities (SortCaps)" /><service description=""
name="GetSystemUpdateID" output="LONG" outputName="Id"
prettyName="GetSystemUpdateID (Id)" /><service description=""
name="Browse" output="MEDIALIST" outputName="Result"
prettyName="Browse (Result)"><input description="" name="ObjectID"
type="STRING" /><input description="" name="BrowseFlag"
type="STRING" /><input description="" name="Filter"
type="STRING" /><input description="" name="StartingIndex"
type="LONG" /><input description="" name="RequestedCount"
type="LONG" /><input description="" name="SortCriteria"
type="STRING" /></service><service description="" name="Browse"
output="LONG" outputName="NumberReturned" prettyName="Browse
(NumberReturned)"><input description="" name="ObjectID"
type="STRING" /><input description="" name="BrowseFlag"
type="STRING" /><input description="" name="Filter"
type="STRING" /><input description="" name="StartingIndex"
type="LONG" /><input description="" name="RequestedCount"
type="LONG" /><input description="" name="SortCriteria"
type="STRING" /></service><service description="" name="Browse"
```

```
output="LONG" outputName="TotalMatches" prettyName="Browse
(TotalMatches)"><input description="" name="ObjectID" type="STRING"
/><input description="" name="BrowseFlag" type="STRING" /><input
description="" name="Filter" type="STRING" /><input description=""
name="StartingIndex" type="LONG" /><input description=""
name="RequestedCount" type="LONG" /><input description=""
name="SortCriteria" type="STRING" /></service><service description=""
name="Browse" output="LONG" outputName="UpdateID"
prettyName="Browse (UpdateID)"><input description=""
name="ObjectID" type="STRING" /><input description=""
name="BrowseFlag" type="STRING" /><input description=""
name="Filter" type="STRING" /><input description=""
name="StartingIndex" type="LONG" /><input description=""
name="RequestedCount" type="LONG" /><input description=""
name="SortCriteria" type="STRING" /></service><service description=""
name="Search" output="MEDIALIST" outputName="Result"
prettyName="Search (Result)"><input description=""
name="ContainerID" type="STRING" /><input description=""
name="SearchCriteria" type="STRING" /><input description=""
name="Filter" type="STRING" /><input description=""
name="StartingIndex" type="LONG" /><input description=""
name="RequestedCount" type="LONG" /><input description=""
name="SortCriteria" type="STRING" /></service><service description=""
name="Search" output="LONG" outputName="NumberReturned"
prettyName="Search (NumberReturned)"><input description=""
name="ContainerID" type="STRING" /><input description=""
name="SearchCriteria" type="STRING" /><input description=""
name="Filter" type="STRING" /><input description=""
name="StartingIndex" type="LONG" /><input description=""
name="RequestedCount" type="LONG" /><input description=""
name="SortCriteria" type="STRING" /></service><service description=""
name="Search" output="LONG" outputName="TotalMatches"
prettyName="Search (TotalMatches)"><input description=""
name="ContainerID" type="STRING" /><input description=""
name="SearchCriteria" type="STRING" /><input description=""
name="Filter" type="STRING" /><input description=""
name="StartingIndex" type="LONG" /><input description=""
name="RequestedCount" type="LONG" /><input description=""
name="SortCriteria" type="STRING" /></service><service description=""
name="Search" output="LONG" outputName="UpdateID"
prettyName="Search (UpdateID)"><input description=""
name="ContainerID" type="STRING" /><input description=""
```

```
name="SearchCriteria" type="STRING" /><input description=""
name="Filter" type="STRING" /><input description=""
name="StartingIndex" type="LONG" /><input description=""
name="RequestedCount" type="LONG" /><input description=""
name="SortCriteria" type="STRING" /></service><service description=""
name="CreateObject" output="STRING" outputName="ObjectID"
prettyName="CreateObject (ObjectID)"><input description=""
name="ContainerID" type="STRING" /><input description=""
name="Elements" type="STRING" /></service><service description=""
name="CreateObject" output="STRING" outputName="Result"
prettyName="CreateObject (Result)"><input description=""
name="ContainerID" type="STRING" /><input description=""
name="Elements" type="STRING" /></service><service description=""
name="ImportResource" output="LONG" outputName="TransferID"
prettyName="ImportResource (TransferID)"><input description=""
name="SourceURI" type="STRING" /><input description=""
name="DestinationURI" type="STRING" /></service><service
description="" name="GetTransferProgress" output="STRING"
outputName="TransferStatus" prettyName="GetTransferProgress
(TransferStatus)"><input description="" name="TransferID"
type="LONG" /></service><service description=""
name="GetTransferProgress" output="STRING"
outputName="TransferLength" prettyName="GetTransferProgress
(TransferLength)"><input description="" name="TransferID"
type="LONG" /></service><service description=""
name="GetTransferProgress" output="STRING"
outputName="TransferTotal" prettyName="GetTransferProgress
(TransferTotal)"><input description="" name="TransferID" type="LONG"
/></service><service description="" name="CreateReference"
output="STRING" outputName="NewID" prettyName="CreateReference
(NewID)"><input description="" name="ContainerID" type="STRING"
/><input description="" name="ObjectID" type="STRING"
/></service><service description="" name="GetProtocolInfo"
output="STRING" outputName="Source" prettyName="GetProtocolInfo
(Source)" /><service description="" name="GetProtocolInfo"
output="STRING" outputName="Sink" prettyName="GetProtocolInfo
(Sink)" /><service description="" name="GetCurrentConnectionIDs"
output="STRING" outputName="ConnectionIDs"
prettyName="GetCurrentConnectionIDs (ConnectionIDs)" /><service
description="" name="GetCurrentConnectionInfo" output="INT"
outputName="RcsID" prettyName="GetCurrentConnectionInfo
(RcsID)"><input description="" name="ConnectionID" type="INT"
```

```
/></service><service description="" name="GetCurrentConnectionInfo"
output="INT" outputName="AVTransportID"
prettyName="GetCurrentConnectionInfo (AVTransportID)"><input
description="" name="ConnectionID" type="INT" /></service><service
description="" name="GetCurrentConnectionInfo" output="STRING"
outputName="ProtocolInfo" prettyName="GetCurrentConnectionInfo
(ProtocolInfo)"><input description="" name="ConnectionID"
type="INT" /></service><service description=""
name="GetCurrentConnectionInfo" output="STRING"
outputName="PeerConnectionManager"
prettyName="GetCurrentConnectionInfo
(PeerConnectionManager)"><input description="" name="ConnectionID"
type="INT" /></service><service description=""
name="GetCurrentConnectionInfo" output="INT"
outputName="PeerConnectionID"
prettyName="GetCurrentConnectionInfo (PeerConnectionID)"><input
description="" name="ConnectionID" type="INT" /></service><service
description="" name="GetCurrentConnectionInfo" output="STRING"
outputName="Direction" prettyName="GetCurrentConnectionInfo
(Direction)"><input description="" name="ConnectionID" type="INT"
/></service><service description="" name="GetCurrentConnectionInfo"
output="STRING" outputName="Status"
prettyName="GetCurrentConnectionInfo (Status)"><input description=""
name="ConnectionID" type="INT" /></service></device>
```

```
<device description="GMediaRender" id="2" manufacturer="Ivo
Clarysse" position="" positionDescription=""
serialNumber="MediaRenderer" tech="UPNP" type="MediaRenderer">
<service description="" name="GetCurrentTransportActions"
output="STRING" outputName="Actions"
prettyName="GetCurrentTransportActions (Actions)"><input
description="" name="InstanceID" type="LONG" /></service><service
description="" name="GetDeviceCapabilities" output="STRING"
outputName="PlayMedia" prettyName="GetDeviceCapabilities
(PlayMedia)"><input description="" name="InstanceID" type="LONG"
/></service><service description="" name="GetDeviceCapabilities"
output="STRING" outputName="RecMedia"
prettyName="GetDeviceCapabilities (RecMedia)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetDeviceCapabilities" output="STRING"
outputName="RecQualityModes" prettyName="GetDeviceCapabilities
(RecQualityModes)"><input description="" name="InstanceID"
```



```
type="LONG" /></service><service description="" name="GetMediaInfo"
output="LONG" outputName="NrTracks" prettyName="GetMediaInfo
(NrTracks)"><input description="" name="InstanceID" type="LONG"
/></service><service description="" name="GetMediaInfo"
output="STRING" outputName="MediaDuration"
prettyName="GetMediaInfo (MediaDuration)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetMediaInfo" output="STRING" outputName="CurrentURI"
prettyName="GetMediaInfo (CurrentURI)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetMediaInfo" output="STRING"
outputName="CurrentURIMetaData" prettyName="GetMediaInfo
(CurrentURIMetaData)"><input description="" name="InstanceID"
type="LONG" /></service><service description="" name="GetMediaInfo"
output="STRING" outputName="NextURI" prettyName="GetMediaInfo
(NextURI)"><input description="" name="InstanceID" type="LONG"
/></service><service description="" name="GetMediaInfo"
output="STRING" outputName="NextURIMetaData"
prettyName="GetMediaInfo (NextURIMetaData)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetMediaInfo" output="STRING" outputName="PlayMedium"
prettyName="GetMediaInfo (PlayMedium)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetMediaInfo" output="STRING" outputName="RecordMedium"
prettyName="GetMediaInfo (RecordMedium)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetMediaInfo" output="STRING" outputName="WriteStatus"
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name="InstanceID" type="LONG" /></service><service description=""
name="GetPositionInfo" output="LONG" outputName="Track"
prettyName="GetPositionInfo (Track)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
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(TrackMetaData)"><input description="" name="InstanceID"
type="LONG" /></service><service description=""
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prettyName="GetPositionInfo (TrackURI)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
```

```
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name="InstanceID" type="LONG" /></service><service description=""
name="GetPositionInfo" output="STRING" outputName="AbsTime"
prettyName="GetPositionInfo (AbsTime)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
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prettyName="GetPositionInfo (RelCount)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetPositionInfo" output="INT" outputName="AbsCount"
prettyName="GetPositionInfo (AbsCount)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetTransportInfo" output="STRING"
outputName="CurrentTransportState" prettyName="GetTransportInfo
(CurrentTransportState)"><input description="" name="InstanceID"
type="LONG" /></service><service description=""
name="GetTransportInfo" output="STRING"
outputName="CurrentTransportStatus" prettyName="GetTransportInfo
(CurrentTransportStatus)"><input description="" name="InstanceID"
type="LONG" /></service><service description=""
name="GetTransportInfo" output="STRING"
outputName="CurrentSpeed" prettyName="GetTransportInfo
(CurrentSpeed)"><input description="" name="InstanceID" type="LONG"
/></service><service description="" name="GetTransportSettings"
output="STRING" outputName="PlayMode"
prettyName="GetTransportSettings (PlayMode)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetTransportSettings" output="STRING"
outputName="RecQualityMode" prettyName="GetTransportSettings
(RecQualityMode)"><input description="" name="InstanceID"
type="LONG" /></service><service description=""
name="GetCurrentConnectionIDs" output="STRING"
outputName="ConnectionIDs" prettyName="GetCurrentConnectionIDs
(ConnectionIDs)" /><service description=""
name="GetCurrentConnectionInfo" output="INT" outputName="RcsID"
prettyName="GetCurrentConnectionInfo (RcsID)"><input description=""
name="ConnectionID" type="INT" /></service><service description=""
name="GetCurrentConnectionInfo" output="INT"
outputName="AVTransportID" prettyName="GetCurrentConnectionInfo
(AVTransportID)"><input description="" name="ConnectionID"
type="INT" /></service><service description=""
name="GetCurrentConnectionInfo" output="STRING"
```

```
outputName="ProtocolInfo" prettyName="GetCurrentConnectionInfo
(ProtocolInfo)"><input description="" name="ConnectionID"
type="INT" /></service><service description=""
name="GetCurrentConnectionInfo" output="STRING"
outputName="PeerConnectionManager"
prettyName="GetCurrentConnectionInfo
(PeerConnectionManager)"><input description="" name="ConnectionID"
type="INT" /></service><service description=""
name="GetCurrentConnectionInfo" output="INT"
outputName="PeerConnectionID"
prettyName="GetCurrentConnectionInfo (PeerConnectionID)"><input
description="" name="ConnectionID" type="INT" /></service><service
description="" name="GetCurrentConnectionInfo" output="STRING"
outputName="Direction" prettyName="GetCurrentConnectionInfo
(Direction)"><input description="" name="ConnectionID" type="INT"
/></service><service description="" name="GetCurrentConnectionInfo"
output="STRING" outputName="Status"
prettyName="GetCurrentConnectionInfo (Status)"><input description=""
name="ConnectionID" type="INT" /></service><service description=""
name="GetProtocolInfo" output="STRING" outputName="Source"
prettyName="GetProtocolInfo (Source)" /><service description=""
name="GetProtocolInfo" output="STRING" outputName="Sink"
prettyName="GetProtocolInfo (Sink)" /><service description=""
name="GetBlueVideoBlackLevel" output="INT"
outputName="CurrentBlueVideoBlackLevel"
prettyName="GetBlueVideoBlackLevel
(CurrentBlueVideoBlackLevel)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetBlueVideoGain" output="INT"
outputName="CurrentBlueVideoGain" prettyName="GetBlueVideoGain
(CurrentBlueVideoGain)"><input description="" name="InstanceID"
type="LONG" /></service><service description="" name="GetBrightness"
output="INT" outputName="CurrentBrightness"
prettyName="GetBrightness (CurrentBrightness)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetColorTemperature" output="INT"
outputName="CurrentColorTemperature"
prettyName="GetColorTemperature (CurrentColorTemperature)"><input
description="" name="InstanceID" type="LONG" /></service><service
description="" name="GetContrast" output="INT"
outputName="CurrentContrast" prettyName="GetContrast
(CurrentContrast)"><input description="" name="InstanceID"
```

```
type="LONG" /></service><service description=""
name="GetGreenVideoBlackLevel" output="INT"
outputName="CurrentGreenVideoBlackLevel"
prettyName="GetGreenVideoBlackLevel
(CurrentGreenVideoBlackLevel)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetGreenVideoGain" output="INT"
outputName="CurrentGreenVideoGain"
prettyName="GetGreenVideoGain (CurrentGreenVideoGain)"><input
description="" name="InstanceID" type="LONG" /></service><service
description="" name="GetHorizontalKeystone" output="INT"
outputName="CurrentHorizontalKeystone"
prettyName="GetHorizontalKeystone
(CurrentHorizontalKeystone)"><input description="" name="InstanceID"
type="LONG" /></service><service description="" name="GetLoudness"
output="BOOLEAN" outputName="CurrentLoudness"
prettyName="GetLoudness (CurrentLoudness)"><input description=""
name="InstanceID" type="LONG" /><input description=""
name="Channel" type="STRING" /></service><service description=""
name="GetMute" output="BOOLEAN" outputName="CurrentMute"
prettyName="GetMute (CurrentMute)"><input description=""
name="InstanceID" type="LONG" /><input description=""
name="Channel" type="STRING" /></service><service description=""
name="GetRedVideoBlackLevel" output="INT"
outputName="CurrentRedVideoBlackLevel"
prettyName="GetRedVideoBlackLevel
(CurrentRedVideoBlackLevel)"><input description="" name="InstanceID"
type="LONG" /></service><service description=""
name="GetRedVideoGain" output="INT"
outputName="CurrentRedVideoGain" prettyName="GetRedVideoGain
(CurrentRedVideoGain)"><input description="" name="InstanceID"
type="LONG" /></service><service description="" name="GetSharpness"
output="INT" outputName="CurrentSharpness"
prettyName="GetSharpness (CurrentSharpness)"><input description=""
name="InstanceID" type="LONG" /></service><service description=""
name="GetVerticalKeystone"
output="INT" outputName="CurrentVerticalKeystone"
prettyName="GetVerticalKeystone (CurrentVerticalKeystone)"><input
description="" name="InstanceID" type="LONG" /></service><service
description="" name="GetVolume" output="INT"
outputName="CurrentVolume" prettyName="GetVolume
(CurrentVolume)"><input description="" name="InstanceID"
```

```
type="LONG" /><input description="" name="Channel"
type="STRING" /></service><service description=""
name="GetVolumeDB" output="INT" outputName="CurrentVolume"
prettyName="GetVolumeDB (CurrentVolume)"><input description=""
name="InstanceID" type="LONG" /><input description=""
name="Channel" type="STRING" /></service><service description=""
name="GetVolumeDBRange" output="INT" outputName="Min Value"
prettyName="GetVolumeDBRange (Min Value)"><input description=""
name="InstanceID" type="LONG" /><input description=""
name="Channel" type="STRING" /></service><service description=""
name="GetVolumeDBRange" output="INT" outputName="Max Value"
prettyName="GetVolumeDBRange (Max Value)"><input description=""
name="InstanceID" type="LONG" /><input description=""
name="Channel" type="STRING" /></service><service description=""
name="ListPresets" output="STRING"
outputName="CurrentPresetNameList" prettyName="ListPresets
(CurrentPresetNameList)"><input description="" name="InstanceID"
type="LONG" /></service></device>
```

```
<device description="Pulsante luce 1" id="3" manufacturer=""
position=""
positionDescription="" serialNumber="KNX01" tech="KNX"
type="pulsante on/off" url="">
<service description="Stato luce 1" name="9/7/33" output="BOOLEAN"
outputDescription="" prettyName="Stato luce" />
<service description="Imposta luce 1" name="9/7/33"
prettyName="Imposta luce 1">
<input description="0 per off, 1 per on" name="value"
type="BOOLEAN">
<allowed value="0" />
<allowed value="1" />
</input>
<linkedService id="4" url="" service="0/2/0">
<linkedInput from="value" to="value" />
</linkedService>
</service>
</device>
```

```
<device description="Attuatore luce 1" id="4" manufacturer=""
position=""
positionDescription="" serialNumber="KNX02" tech="KNX"
type="attuatore on/off" url="">
```

```
<service description="Stato uscita 1" name="0/2/0" output="BOOLEAN"
  outputDescription="" prettyName="Stato luce" />
<service description="Imposta uscita 1" name="0/2/0"
  prettyName="Imposta uscita 1">
  <input description="0 per off, 1 per on" name="value"
type="BOOLEAN">
  <allowed value="0" />
  <allowed value="1" />
  </input>
</service>
</device>
```

```
<device description="Pulsante allarme" id="5" manufacturer=""
position=""
  positionDescription="" serialNumber="KNX03" tech="KNX"
type="allarme"
  url="">
  <service description="Stato uscita 1" name="9/7/37"
output="BOOLEAN"
  outputDescription="" prettyName="Stato allarme" />
  <service description="Imposta allarme" name="9/7/37"
  prettyName="Imposta allarme">
  <input description="0 per off, 1 per on" name="value"
type="BOOLEAN">
  <allowed value="0" />
  <allowed value="1" />
  </input>
  <linkedService id="1" service="Stop" url="" />
  <linkedService hasValue="1" id="1" ifInput="value" service="Play"
url="">
  <linkedInput to="mediaRendererId" value="2" />
  <linkedInput to="mediaRendererURL" value="" />
  <linkedInput to="mediaContainerId" value="0" />
  <linkedInput to="mediaContentId" value="1"/>
  </linkedService>
  <linkedService id="6" url="" service="0/2/1">
  <linkedInput from="value" to="value" />
  </linkedService>
</service>
</device>
```

```
<device description="Attuatore luce allarme" id="6" manufacturer=""
```

```
    position="" positionDescription="" serialNumber="KNX04"
tech="KNX"
```

```
    type="attuatore on/off" url="">
```

```
    <service description="Stato uscita allarme" name="0/2/1"
```

```
output="BOOLEAN"
```

```
    outputDescription="" prettyName="Stato luce" />
```

```
    <service description="Imposta uscita 1" name="0/2/1"
    prettyName="Imposta uscita allarme">
```

```
    <input description="0 per off, 1 per on" name="value"
```

```
type="BOOLEAN">
```

```
    <allowed value="0" />
```

```
    <allowed value="1" />
```

```
    </input>
```

```
    </service>
```

```
</device>
```

```
<device description="Pulsante luce 2" id="7" manufacturer=""
```

```
position=""
```

```
    positionDescription="" serialNumber="KNX05" tech="KNX"
```

```
    type="attuatore on/off" url="">
```

```
<service description="Stato luce 2" name="9/7/45" output="BOOLEAN"
```

```
    outputDescription="" prettyName="Stato luce" />
```

```
<service description="Imposta luce" name="9/7/45"
```

```
    prettyName="Imposta luce">
```

```
    <input description="0 per off, 1 per on" name="value"
```

```
type="BOOLEAN">
```

```
    <allowed value="0" />
```

```
    <allowed value="1" />
```

```
    </input>
```

```
    <linkedService id="8" url="" service="0/2/2">
```

```
    <linkedInput from="value" to="value" />
```

```
    </linkedService>
```

```
    </service>
```

```
</device>
```

```
<device description="Attuatore luce 2" id="8" manufacturer=""
```

```
position="" positionDescription="" serialNumber="KNX06"
```

```
tech="KNX"
```

```
    type="attuatore on/off" url="">
```

```
<service description="Stato uscita 2" name="0/2/2" output="BOOLEAN"
```

```
    outputDescription="" prettyName="Stato luce" />
```

```
<service description="Imposta uscita 1" name="0/2/2"
```

```
    prettyName="Imposta uscita 2">
    <input description="0 per off, 1 per on" name="value"
type="BOOLEAN">
    <allowed value="0" />
    <allowed value="1" />
    </input>
</service>
</device>
```

```
<device description="Pulsante musica" id="9" manufacturer=""
position=""
positionDescription="" serialNumber="KNX07" tech="KNX"
type="attuatore on/off" url="">
<service description="Stato musica" name="9/7/41"
output="BOOLEAN"
outputDescription="" prettyName="Stato luce" />
<service description="Imposta musica" name="9/7/41"
prettyName="Imposta musica">
<input description="0 per off, 1 per on" name="value"
type="BOOLEAN">
    <allowed value="0" />
    <allowed value="1" />
    </input>
    <linkedService id="1" service="Stop" url="" />
    <linkedService hasValue="1" id="1" ifInput="value" service="Play"
url="">
    <linkedInput to="mediaRendererId" value="2" />
    <linkedInput to="mediaRendererURL" value="" />
    <linkedInput to="mediaContainerId" value="0" />
    <linkedInput to="mediaContentId" value="2"/>
    </linkedService>
</service>
</device>
```

```
<device description="Termostato" id="10" manufacturer="" position=""
positionDescription="Soggiorno" serialNumber="KNX08" tech="KNX"
type="Termostato" url="">
<service description="" name="0/0/12" output="TWOBYTE"
outputDescription=""
prettyName="Temperatura attuale" />
<service description="" name="0/0/9" output="BOOLEAN"
outputDescription=""
```



```
    prettyName="Attivo" />  
  </device>  
</devices>
```