



QosDevice:1 Erratum

Erratum Number:	<i>Next sequential erratum number</i>	Effective Date:	<i>July 14, 2006</i>
Document and Version:	<i>Document erratum applies to QosDevice:1</i>		
Cross References:	<i>List other Erratum's or Documents that this change may apply to or have associated changes with</i>		

This Erratum has been adopted by the UPnP™ Technical Committee and includes the following information:

- A unique Erratum number.
- The date it becomes effective.
- The document version to which this Erratum applies.
- A series of Errata entries (numbered) which list the effected section and page number in the document referenced here, the exiting text in the document with the text to be changed highlighted green and the clarified text with the text modified or added highlighted light blue.

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Background

Schema Validation rules added.

Current Text

2.3.3.1 XML Schema Definition

```
<xs:schema xmlns="http://www.upnp.org/schemas/TrafficDescriptorsPerInterface.xsd"
  elementFormDefault="qualified"
  targetNamespace="http://www.upnp.org/schemas/TrafficDescriptorsPerInterface.xsd"
  xmlns="http://www.upnp.org/schemas"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"

  <xs:import namespace="http://www.upnp.org/schemas"
    schemaLocation="TrafficDescriptorv1.xsd"/>

  <xs:annotation>
    <xs:documentation xml:lang="en">
      Traffic Descriptors Per Interface schema.
      Copyright 2004 UPnP(tm). All rights reserved.
    </xs:documentation>
  </xs:annotation>

  <xs:element name="TrafficDescriptorsPerInterface">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="TdInterfacePair" minOccurs="0" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="upnp-qos:TrafficDescriptor" minOccurs="1" maxOccurs="1"
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="InterfaceId" type="xs:string" minOccurs="1"
          maxOccurs="unbounded" />
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

New Text

2.3.3.1 XML Schema Definition

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema
  targetNamespace="http://www.upnp.org/schemas/TrafficDescriptorsPerInterface.xsd"
  xmlns="http://www.upnp.org/schemas/TrafficDescriptorsPerInterface.xsd"
  xmlns:td="http://www.upnp.org/schemas/TrafficDescriptorv1.xsd"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  id="TrafficDescriptorsPerInterface">

  <xs:import namespace="http://www.upnp.org/schemas/TrafficDescriptorv1.xsd"
    schemaLocation="TrafficDescriptorv1.xsd"/>
```



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```
<xs:annotation>
  <xs:documentation xml:lang="en">
    Traffic Descriptors Per Interface schema.
    Copyright 2004 UPnP(tm). All rights reserved.
  </xs:documentation>
</xs:annotation>
<xs:element name="TrafficDescriptorsPerInterface"
type="TrafficDescriptorsPerInterfaceType"/>
<xs:complexType name="TrafficDescriptorsPerInterfaceType">
  <xs:sequence>
    <xs:element name="TdInterfacePair" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="TrafficDescriptor" type="td:TrafficDescriptorType"/>
          <xs:element name="InterfaceId" type="xs:string" maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
</xs:schema>
```

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Background

Revised examples based on revised schema.

Current Text

2.3.3.3 Sample argument XML string

```
<TrafficDescriptorsPerInterface
xmlns="http://www.upnp.org/schemas/TrafficDescriptorsPerInterface.xsd"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <TdInterfacePair>
    <TrafficDescriptor> ...
  </TrafficDescriptor>
  <InterfaceId>eth0</InterfaceId>
</TdInterfacePair>
<TdInterfacePair>
  <TrafficDescriptor> ...
</TrafficDescriptor>
  <InterfaceId>eth0</InterfaceId>
</TdInterfacePair>
<TdInterfacePair>
  <TrafficDescriptor> ...
</TrafficDescriptor>
  <InterfaceId>eth0</InterfaceId>
  <InterfaceId>eth1</InterfaceId>
</TdInterfacePair>
</TrafficDescriptorsPerInterface>
```

New Text

2.3.3.3 Sample argument XML string

```
<TrafficDescriptorsPerInterface
xmlns="http://www.upnp.org/schemas/TrafficDescriptorsPerInterface.xsd"
:xsi="http://www.w3.org/2001/XMLSchema-instance"
:schemaLocation="http://www.upnp.org/schemas/TrafficDescriptorsPerInterface.xsd
TrafficDescriptorsPerInterface.xsd">
  <TdInterfacePair>
    <TrafficDescriptor>
      <TrafficHandle>kiwin1</TrafficHandle>
      <TrafficId>
        <SourceAddress>
          <Ipv4>192.168.1.50</Ipv4>
        </SourceAddress>
        <SourcePort>23</SourcePort>
        <DestinationAddress>
          <Ipv4>192.168.1.50</Ipv4>
        </DestinationAddress>
        <DestinationPort>23</DestinationPort>
        <IpProtocol>1</IpProtocol>
      </TrafficId>
```



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```
<AvailableOrderedTspecList>
  <Tspec>
    <TspecIndex>300</TspecIndex>
    <TrafficClass>AV</TrafficClass>
  </Tspec>
  <Tspec>
    <TspecIndex>2</TspecIndex>
    <TrafficClass>Audio</TrafficClass>
  </Tspec>
</AvailableOrderedTspecList>
<ActiveTspecIndex>300</ActiveTspecIndex>
<TrafficImportanceNumber>5</TrafficImportanceNumber>
<OptionalPolicyParams>
  <CpName>Amy's CP</CpName>
</OptionalPolicyParams>
</TrafficDescriptor>
<InterfaceId>eth0</InterfaceId>
</TdInterfacePair>
</TrafficDescriptorsPerInterface>
```



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Background

Schema Validation rules added.

Current Text

2.3.6.1 XML Schema Definition

```
<xs:schema
  xmlns="http://www.upnp.org/schemas/QosDeviceCapabilities.xsd"
  elementFormDefault="qualified" id="QosDeviceCapabilities"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:annotation>
    <xs:documentation xml:lang="en">
      QosDeviceCapabilitiesSchema.
      Copyright 2004 UPnP(tm). All rights reserved.
    </xs:documentation>
  </xs:annotation>

  <xs:element name="QosDeviceCapabilities">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Interface" minOccurs="1"
          maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element minOccurs="1" maxOccurs="1"
                name="InterfaceId" type="xs:string" />
              <xs:element minOccurs="0" maxOccurs="1" name="MacAddress"
                type="MacAddressType" />
              <xs:simpleType minOccurs="0" maxOccurs="1"
                name="IanaTechnologyType" type="xs:Integer" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element minOccurs="1" maxOccurs="1"
          name="AdmissionControlSupported">
          <xs:simpleType name="AdmissionControlType">
            <xs:restriction base="xs:NMTOKEN">
              <xs:enumeration value="No" />
              <xs:enumeration value="Yes" />
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:simpleType minOccurs="1" maxOccurs="1" name="NativeQos">
          <xs:union memberTypes="xs:string BasicNativeList" />
        </xs:simpleType>
        <xs:simpleType name="BasicNativeList">
          <xs:restriction base="xs:NMTOKEN">
```



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```
<xs:enumeration value="Prioritized" />
<xs:enumeration value="BestEffort" />
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element minOccurs="1" maxOccurs="1" name="MaxPhyRate"
type="xs:unsignedInt" />
<xs:any minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>
</xs:element>

<xs:complexType name="MacAddressType">
  <xs:sequence>
    <xs:element minOccurs="6" maxOccurs="8" name="octet-n"
type="xs:byte" />
  </xs:sequence>
</xs:complexType>

</xs:schema>
```

New Text

2.3.6.1 XML Schema Definition

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns="http://www.upnp.org/schemas/QosDeviceCapabilities.xsd"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.upnp.org/schemas/QosDeviceCapabilities.xsd"
elementFormDefault="qualified" id="QosDeviceCapabilities">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      QosDeviceCapabilities schema.
      Copyright 2004,2005 UPnP(tm). All rights reserved.
    </xs:documentation>
  </xs:annotation>
  <xs:element name="QosDeviceCapabilities" type="QosDeviceCapabilitiesType"/>
  <xs:complexType name="QosDeviceCapabilitiesType">
    <xs:sequence>
      <xs:element name="Interface" maxOccurs="unbounded">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="InterfaceId" type="xs:string"/>
            <xs:element name="MacAddress" type="MacAddressType" minOccurs="0"/>
            <xs:element name="IanaTechnologyType" type="xs:integer" minOccurs="0"/>
            <xs:element name="AdmissionControlSupported">
              <xs:simpleType>
                <xs:restriction base="xs:string">
                  <xs:enumeration value="No"/>
                  <xs:enumeration value="Yes"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
            <xs:element name="NativeQos" type="NativeQosType"/>
            <xs:element name="MaxPhyRate" type="xs:unsignedInt"/>
            <xs:element name="v2" type="v2ExtensionType" minOccurs="0"/>
            <!-- allow any element except those from target namespace -->
            <xs:choice minOccurs="0" maxOccurs="unbounded">
              <xs:any namespace="##other" processContents="lax"/>
              <xs:any namespace="##local" processContents="lax"/>
            </xs:choice>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```



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```
</xs:choice>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:simpleType name="MacAddressType">
  <xs:restriction base="xs:string">
    <xs:pattern value="[0-9a-fA-F]{12}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="NativeQosType">
  <xs:union memberTypes="BasicNativeList xs:string"/>
</xs:simpleType>
<xs:simpleType name="BasicNativeList">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Prioritized"/>
    <xs:enumeration value="BestEffort"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="v2ExtensionType">
  <xs:sequence>
    <xs:any namespace="##targetNamespace" processContents="lax" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute/>
</xs:complexType>
</xs:schema>
```




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Background

Revised examples based on revised schema.

Current Text

2.3.6.3 *Sample argument XML string*

```
<QosDeviceCapabilities xmlns="http://www.upnp.org/schemas/  
QosDeviceCapabilities.xsd">  
<QosDeviceCapabilities>  
  <Interface>  
    <MacAddress>0212abcdef11</MacAddress>  
    <InterfaceId>eth0</InterfaceId>  
    <IanaTechnologyType>6</IanaTechnologyType>  
    <NativeQos>Prioritized</NativeQos>  
    <MaxPhyRate>100000000</MaxPhyRate>  
    <AdmissionControlSupported>No</AdmissionControlSupported>  
  </Interface>  
  <Interface>  
    <MacAddress>0212abcdef12</MacAddress>  
    <InterfaceId>eth1</InterfaceId>  
    <IanaTechnologyType>71</IanaTechnologyType>  
    <NativeQos>Prioritized</NativeQos>  
    <MaxPhyRate>3000000</MaxPhyRate>  
    <AdmissionControlSupported>No</AdmissionControlSupported>  
  </Interface>  
  <Interface>  
    <MacAddress>0212abcdef13</MacAddress>  
    <InterfaceId>eth2</InterfaceId>  
    <IanaTechnologyType>6</IanaTechnologyType>  
    <NativeQos>BestEffort</NativeQos>  
    <MaxPhyRate>5000000</MaxPhyRate>  
    <AdmissionControlSupported>No</AdmissionControlSupported>  
  </Interface>  
</QosDeviceCapabilities>
```

New Text

2.3.6.3 *Sample argument XML string*

```
<QosDeviceCapabilities xmlns="http://www.upnp.org/schemas/QosDeviceCapabilities.xsd"  
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
xsi:schemaLocation="http://www.upnp.org/schemas/QosDeviceCapabilities.xsd  
QosDeviceCapabilities.xsd">  
  <Interface>  
    <InterfaceId>eth0</InterfaceId>  
    <MacAddress>0212abcdef11</MacAddress>  
    <IanaTechnologyType>6</IanaTechnologyType>  
    <AdmissionControlSupported>No</AdmissionControlSupported>
```



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```
<NativeQos>Prioritized</NativeQos>
<MaxPhyRate>100000000</MaxPhyRate>
</Interface>
<Interface>
  <InterfaceId>eth1</InterfaceId>
  <MacAddress>0212abcdef12</MacAddress>
  <IanaTechnologyType>71</IanaTechnologyType>
  <AdmissionControlSupported>No</AdmissionControlSupported>
  <NativeQos>Prioritized</NativeQos>
  <MaxPhyRate>3000000</MaxPhyRate>
</Interface>
<Interface>
  <InterfaceId>eth2</InterfaceId>
  <MacAddress>0212abcdef13</MacAddress>
  <IanaTechnologyType>6</IanaTechnologyType>
  <AdmissionControlSupported>No</AdmissionControlSupported>
  <NativeQos>BestEffort</NativeQos>
  <MaxPhyRate>5000000</MaxPhyRate>
</Interface>
<Interface>
  <InterfaceId>example1</InterfaceId>
  <MacAddress>0212abcdefff</MacAddress>
  <IanaTechnologyType>12</IanaTechnologyType>
  <AdmissionControlSupported>No</AdmissionControlSupported>
  <NativeQos>BestEffort</NativeQos>
  <MaxPhyRate>5000000</MaxPhyRate>
</Interface>
</QosDeviceCapabilities>
```



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Background

Schema Validation rules added.

Current Text

2.3.7.1 XML Schema Definition

```
<xs:schema xmlns="http://www.upnp.org/schemas/QosDeviceState.xsd"
  elementFormDefault="qualified" id="QosDeviceState"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:annotation>
    <xs:documentation xml:lang="en">
      QosDeviceState schema.
      Copyright 2004 UPnP(tm). All rights reserved.
    </xs:documentation>
  </xs:annotation>

  <xs:element name="QosDeviceState">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="1" maxOccurs="1" name="QosStateId"
          type="xs:string" />
        <xs:element minOccurs="1" maxOccurs="unbounded"
          name="Interface">
          <xs:complexType>
            <xs:sequence>
              <xs:element minOccurs="1" maxOccurs="1"
                name="InterfaceId" type="xs:string" />
              <xs:element minOccurs="0" maxOccurs="4" name="IpAddress"
                type="IpAddressType" />
              <xs:element minOccurs="1" maxOccurs="1"
                name="InterfaceAvailability">
                <xs:simpleType>
                  <xs:restriction base="xs:NMTOKEN">
                    <xs:enumeration value="1" />
                    <xs:enumeration value="0" />
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:any minOccurs="0" maxOccurs="unbounded" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:any minOccurs="0" maxOccurs="unbounded" />
      </xs:sequence>
    </xs:complexType>
  </xs:element>
```



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```
<xs:simpleType name="Ipv4Address">
  <xs:restriction base="xs:string">
    <xs:pattern value="([1-9]?[0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.([1-9]?[0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])" />
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="Ipv6Address">
  <xs:restriction base="xs:hexBinary">
    <xs:length value="32" />
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="IpAddressType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="Ipv4" type="IPv4Address" />
      <xs:element name="Ipv6" type="IPv6Address" />
    </xs:choice>
    <xs:element name="PrefixLength">
      <xs:simpleType>
        <xs:restriction base="xs:positiveInteger" minOccurs="0">
          <xs:minInclusive value="1" />
          <xs:maxInclusive value="128" />
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

New Text

2.3.7.1 XML Schema Definition

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns="http://www.upnp.org/schemas/QosDeviceState.xsd"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.upnp.org/schemas/QosDeviceState.xsd"
  elementFormDefault="qualified"
  id="QosDeviceState">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      QosDeviceState schema.
      Copyright 2004 UPnP(tm). All rights reserved.
    </xs:documentation>
  </xs:annotation>
  <xs:element name="QosDeviceState" type="QosDeviceStateType"/>
  <xs:complexType name="QosDeviceStateType">
    <xs:sequence>
      <xs:element name="QosStateId" type="xs:string"/>
      <xs:element name="Interface" maxOccurs="unbounded">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="InterfaceId" type="xs:string"/>
            <xs:element name="IpAddress" type="IpAddressType" minOccurs="0"
maxOccurs="4"/>
            <xs:element name="InterfaceAvailability">
              <xs:simpleType>
                <xs:restriction base="xs:NMTOKEN">
                  <xs:enumeration value="1"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```



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```
<xs:enumeration value="0"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="v2" type="v2ExtensionType" minOccurs="0"/>
<!-- allow any element except those from target namespace -->
<xs:choice minOccurs="0" maxOccurs="unbounded">
  <xs:any namespace="##other" processContents="lax"/>
  <xs:any namespace="##local" processContents="lax"/>
</xs:choice>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:simpleType name="IPv4Address">
  <xs:restriction base="xs:string">
    <xs:pattern value="([1-9]?[0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.([1-9]?[0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="IPv6Address">
  <xs:restriction base="xs:hexBinary">
    <xs:length value="32"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="PrefixLength">
  <xs:restriction base="xs:positiveInteger">
    <xs:minInclusive value="1"/>
    <xs:maxInclusive value="128"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="IpAddressType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="Ipv4" type="IPv4Address"/>
      <xs:element name="Ipv6" type="IPv6Address"/>
    </xs:choice>
    <xs:element name="PrefixLength" type="PrefixLength" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="v2ExtensionType">
  <xs:sequence>
    <xs:any namespace="##targetNamespace" processContents="lax" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute/>
</xs:complexType>
</xs:schema>
```



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Background

Schema Validation rules added.

Current Text

2.3.8 PathInformation

PathInformation is a structure that provides MAC address information about devices reachable through each active interface.

2.3.8.1 XML Schema Definition

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns="http://www.upnp.org/schemas/PathInformation.xsd"
  targetNamespace="http://www.upnp.org/schemas/PathInformation.xsd"
  elementFormDefault="qualified">

  <xs:annotation>
    <xs:documentation xml:lang="en">
      QosDevice PathInformation schema.
      Copyright 2004 UPnP(tm). All rights reserved.
    </xs:documentation>
  </xs:annotation>

  <xs:element name="DeviceReachableMacs">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="LinkReachableMacs" minOccurs="1"
          maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="LinkId" type="xs:string" minOccurs="1"
                maxOccurs="1" />
              <xs:element name="BridgeId" type="xs:string" minOccurs="0"
                maxOccurs="1" />
              <xs:element name="MacAddress" type="MacAddressType"
                minOccurs="0" maxOccurs="1" />
              <xs:element name="ReachableMac" type="MacAddressType"
                minOccurs="0" maxOccurs="unbounded" />
              <xs:any minOccurs="0" maxOccurs="unbounded" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:any minOccurs="0" maxOccurs="unbounded" />
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```



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2.3.8.2 Description of fields in PathInformation structure

LinkReachableMacs: This is a required field. A LinkReachableMacs definition is required for each available link supported by the device. For a device with physical media dedicated to an interface (such as Ethernet) there will be a LinkReachableMacs definition for each physical interface. For a device with a shared media (such as 802.11) there will be a LinkReachableMacs definition for each device pair where communication is supported by the device.

LinkId: This is a required field. Its value is of type string, it must be unique within the device. It identifies the layer-2 link.

MacAddress: This is a required field when available. Provides the MAC address of the interface for an end point device.

ReachableMac: Provides the MAC address(es) of end point devices that are reachable through the link, if any.

BridgedId: Identifies the links that are bridged together. All links that have the same BridgeId are interconnected within the device such that layer-2 frames are forwarded between them.

2.3.8.3 Sample argument XML string – PC with two network interfaces

This is an example of an end point network device with two network interfaces.

```
<DeviceReachableMacs xmlns="http://www.upnp.org/schemas/QoSDevice.xsd">
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <MacAddress>112233aabb03</MacAddress>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth1</LinkId>
    <MacAddress>112233aabb02</MacAddress>
  </LinkReachableMacs>
</DeviceReachableMacs>
```

2.3.8.4 Sample argument XML string – PC with two network interfaces that are both end point device and bridged

Similar to the previous example this is an example of an end point network device with two network interfaces. However this device all forwards layer-2 frames between the two network interfaces.

```
<DeviceReachableMacs xmlns="http://www.upnp.org/schemas/QoSDevice.xsd">
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <MacAddress>112233aabb03</MacAddress>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth1</LinkId>
    <MacAddress>112233aabb02</MacAddress>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <BridgeId>Bridge</BridgeId>
    <ReachableMac>112233aabb03</ReachableMac>
    <ReachableMac>112233aabb02</ReachableMac>
    <ReachableMac>112233aabb01</ReachableMac>
    <ReachableMac>112233aabb04</ReachableMac>
  </LinkReachableMacs>
</DeviceReachableMacs>
```



QoSDevice:1 Erratum

```
</LinkReachableMaes>
<LinkReachableMaes>
  <LinkId>eth1</LinkId>
  <BridgeId>Bridge0</BridgeId>
  <ReachableMac>112233aabb05</ReachableMac>
</LinkReachableMaes>
</DeviceReachableMaes>
```

2.3.8.5 Sample argument XML string –Four port Ethernet Switch

This is an example of a layer-2 switching device that interconnects four physical Ethernet ports. The device supports layer-2 frame forwarding between all ports.

```
<DeviceReachableMaes xmlns="http://www.upnp.org/schemas/QoSDevice.xsd">
  <LinkReachableMaes>
    <LinkId>eth0</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb03</ReachableMac>
  </LinkReachableMaes>
  <LinkReachableMaes>
    <LinkId>eth1</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb07</ReachableMac>
    <ReachableMac>112233aabb05</ReachableMac>
  </LinkReachableMaes>
  <LinkReachableMaes>
    <LinkId>eth2</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb02</ReachableMac>
    <ReachableMac>112233aabb01</ReachableMac>
    <ReachableMac>112233aabb04</ReachableMac>
  </LinkReachableMaes>
  <LinkReachableMaes>
    <LinkId>eth3</LinkId>
    <BridgeId>Bridge0</BridgeId>
  </LinkReachableMaes>
</DeviceReachableMaes>
```

2.3.8.6 Sample argument XML string – Wireless AP with one Ethernet Interface

This is an example of a wireless access point with three associated wireless stations and a single Ethernet port. The device supports layer-2 frame forwarding between all links.

This includes forwarding between wireless station or to the Ethernet interface.

```
<DeviceReachableMaes xmlns="http://www.upnp.org/schemas/QoSDevice.xsd">
  <LinkReachableMaes>
    <LinkId>WL0</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb02</ReachableMac>
  </LinkReachableMaes>
  <LinkReachableMaes>
    <LinkId>WL1</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb01</ReachableMac>
  </LinkReachableMaes>
  <LinkReachableMaes>
    <LinkId>WL2</LinkId>
    <BridgeId>Bridge0</BridgeId>
  </LinkReachableMaes>
</DeviceReachableMaes>
```




QoSDevice:1 Erratum

```
<ReachableMac>112233aabb04</ReachableMac>
<ReachableMac>112233aabb09</ReachableMac>
</LinkReachableMacs>
<LinkReachableMacs>
  <LinkId>eth0</LinkId>
  <BridgeId>Bridge0</BridgeId>
  <ReachableMac>112233aabb03</ReachableMac>
  <ReachableMac>112233aabb07</ReachableMac>
  <ReachableMac>112233aabb05</ReachableMac>
</LinkReachableMacs>
</DeviceReachableMacs>
```

2.3.8.7 Sample argument XML string – Bridge device between Wireless station and Ethernet

This is an example of a bridging device with two interfaces on different network technologies. It does layer-2 forwarding of frames between wireless station interface and the wired Ethernet interface.

```
<DeviceReachableMacs xmlns="http://www.upnp.org/schemas/QoSDevice.xsd">
  <LinkReachableMacs>
    <LinkId>WL0</LinkId>
    <BridgeId>Bridge0</BridgeId>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb04</ReachableMac>
  </LinkReachableMacs>
</DeviceReachableMacs>
```

New Text

2.3.8 PathInformation

PathInformation is a structure that provides MAC address information about devices reachable through each active interface.

2.3.8.1 XML Schema Definition

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns="http://www.upnp.org/schemas/PathInformation.xsd"
  targetNamespace="http://www.upnp.org/schemas/PathInformation.xsd"
  elementFormDefault="qualified" id="PathInformation">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      QoSDevice PathInformation schema.
      Copyright 2004 UPnP(tm). All rights reserved.
    </xs:documentation>
  </xs:annotation>
  <xs:element name="DeviceReachableMacs" type="DeviceReachableMacsType"/>
  <xs:complexType name="DeviceReachableMacsType">
    <xs:sequence>
      <xs:element name="LinkReachableMacs" maxOccurs="unbounded">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="LinkId" type="xs:string"/>
            <xs:element name="BridgeId" type="xs:string" minOccurs="0"/>
            <xs:element name="MacAddress" type="MacAddressType" minOccurs="0"/>
            <xs:element name="ReachableMac" type="MacAddressType" minOccurs="0"
maxOccurs="unbounded"/>
          <!-- allow any element except those from target namespace -->
```

```

        <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:any namespace="##other" processContents="lax"/>
            <xs:any namespace="##local" processContents="lax"/>
        </xs:choice>
    </xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="v2" type="v2ExtensionType" minOccurs="0"/>
<!-- allow any element except those from target namespace -->
<xs:choice minOccurs="0" maxOccurs="unbounded">
    <xs:any namespace="##other" processContents="lax"/>
    <xs:any namespace="##local" processContents="lax"/>
</xs:choice>
</xs:sequence>
</xs:complexType>
<xs:simpleType name="MacAddressType">
    <xs:restriction base="xs:string">
        <xs:pattern value="[0-9a-fA-F]{12}"/>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="v2ExtensionType">
    <xs:sequence>
        <xs:any namespace="##targetNamespace" processContents="lax" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute/>
</xs:complexType>
</xs:schema>

```

2.3.8.2 Description of fields in PathInformation structure

LinkReachableMacs: This is a required field. A LinkReachableMacs definition is required for each available link supported by the device. For a device with physical media dedicated to an interface (such as Ethernet) there will be a LinkReachableMacs definition for each physical interface. For a device with a shared media (such as 802.11) there will be a LinkReachableMacs definition for each device pair where communication is supported by the device.

LinkId: This is a required field. Its value is of type string, it must be unique within the device. It identifies the layer-2 link.

MacAddress: This is a required field when available. Provides the MAC address of the interface for an end point device.

ReachableMac: Provides the MAC address(es) of end point devices that are reachable through the link, if any.

BridgedId: Identifies the links that are bridged together. All links that have the same BridgeID are interconnected within the device such that layer-2 frames are forwarded between them.

2.3.8.3 Sample argument XML string – PC with two network interfaces

This is an example of an end point network device with two network interfaces.

```

<DeviceReachableMacs
  xmlns="http://www.upnp.org/schemas/PathInformation.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.upnp.org/schemas/PathInformation.xsd
  PathInformation.xsd">
    <LinkReachableMacs>
        <LinkId>eth0</LinkId>
        <MacAddress>112233aabb03</MacAddress>
    </LinkReachableMacs>
    <LinkReachableMacs>

```



QosDevice:1 Erratum

```
<LinkId>eth1</LinkId>
<MacAddress>112233aabb02</MacAddress>
</LinkReachableMacs>
</DeviceReachableMacs>
```

2.3.8.4 Sample argument XML string – PC with two network interfaces that are both end point device and bridged

Similar to the previous example this is an example of an end point network device with two network interfaces. However this device all forwards layer-2 frames between the two network interfaces.

```
<DeviceReachableMacs
  xmlns="http://www.upnp.org/schemas/PathInformation.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.upnp.org/schemas/PathInformation.xsd
PathInformation.xsd">
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <MacAddress>112233aabb03</MacAddress>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth1</LinkId>
    <MacAddress>112233aabb02</MacAddress>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <BridgeId>Bridge</BridgeId>
    <ReachableMac>112233aabb03</ReachableMac>
    <ReachableMac>112233aabb02</ReachableMac>
    <ReachableMac>112233aabb01</ReachableMac>
    <ReachableMac>112233aabb04</ReachableMac>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth1</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb05</ReachableMac>
  </LinkReachableMacs>
</DeviceReachableMacs>
```

2.3.8.5 Sample argument XML string –Four port Ethernet Switch

This is an example of a layer-2 switching device that interconnects four physical Ethernet ports. The device supports layer-2 frame forwarding between all ports.

```
<DeviceReachableMacs
  xmlns="http://www.upnp.org/schemas/PathInformation.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.upnp.org/schemas/PathInformation.xsd
PathInformation.xsd">
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb03</ReachableMac>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth1</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb07</ReachableMac>
    <ReachableMac>112233aabb05</ReachableMac>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth2</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb02</ReachableMac>
    <ReachableMac>112233aabb01</ReachableMac>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth3</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb04</ReachableMac>
    <ReachableMac>112233aabb06</ReachableMac>
  </LinkReachableMacs>
</DeviceReachableMacs>
```

```
<ReachableMac>112233aabb04</ReachableMac>
</LinkReachableMacs>
<LinkReachableMacs>
  <LinkId>eth3</LinkId>
  <BridgeId>Bridge0</BridgeId>
</LinkReachableMacs>
</DeviceReachableMacs>
```

2.3.8.6 Sample argument XML string – Wireless AP with one Ethernet Interface

This is an example of a wireless access point with three associated wireless stations and a single Ethernet port. The device supports layer-2 frame forwarding between all links.

This includes forwarding between wireless station or to the Ethernet interface.

```
<DeviceReachableMacs
  xmlns="http://www.upnp.org/schemas/PathInformation.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.upnp.org/schemas/PathInformation.xsd
PathInformation.xsd">
  <LinkReachableMacs>
    <LinkId>WL0</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb02</ReachableMac>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>WL1</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb01</ReachableMac>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>WL2</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb04</ReachableMac>
    <ReachableMac>112233aabb09</ReachableMac>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb03</ReachableMac>
    <ReachableMac>112233aabb07</ReachableMac>
    <ReachableMac>112233aabb05</ReachableMac>
  </LinkReachableMacs>
</DeviceReachableMacs>
```

2.3.8.7 Sample argument XML string – Bridge device between Wireless station and Ethernet

This is an example of a bridging device with two interfaces on different network technologies. It does layer-2 forwarding of frames between wireless station interface and the wired Ethernet interface.

```
<DeviceReachableMacs
  xmlns="http://www.upnp.org/schemas/PathInformation.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.upnp.org/schemas/PathInformation.xsd
PathInformation.xsd">
  <LinkReachableMacs>
    <LinkId>WL0</LinkId>
    <BridgeId>Bridge0</BridgeId>
  </LinkReachableMacs>
  <LinkReachableMacs>
    <LinkId>eth0</LinkId>
    <BridgeId>Bridge0</BridgeId>
    <ReachableMac>112233aabb04</ReachableMac>
  </LinkReachableMacs>
</DeviceReachableMacs>
```

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Background

Schema Validation rules added.

Current Text

2.3.9.1 XML Schema Definition

```

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns="http://www.upnp.org/schemas/QoSDeviceInfo.xsd"
  targetNamespace="http://www.upnp.org/schemas/QoSDeviceInfo.xsd"
  elementFormDefault="qualified">

  <xs:annotation>
    <xs:documentation xml:lang="en">
      QoS Device Path Information schema.
      Copyright 2004 UPnP(tm). All rights reserved.
    </xs:documentation>
  </xs:annotation>

  <xs:element name="QoSDeviceInfo">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="TrafficHandle" type="xs:string"
          minOccurs="1" maxOccurs="1"/>
        <xs:element name="SourcePort" type="IpPortNumber"
          minOccurs="0" maxOccurs="1"/>
        <xs:element name="DestinationPort" type="IpPortNumber"
          minOccurs="0" maxOccurs="1"/>
        <xs:element name="IpProtocol" type="IpProtocolType"
          minOccurs="1" maxOccurs="1"/>
        <xs:any minOccurs="0" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>

    <xs:simpleType name="IpPortNumber">
      <xs:restriction base="xs:positiveInteger">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="65535"/>
      </xs:restriction>
    </xs:simpleType>

    <xs:simpleType name="IpProtocolType">
      <xs:restriction base="xs:nonNegativeInteger">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="255"/>
      </xs:restriction>
    </xs:simpleType>

```



QoSDevice:1 Erratum

```
</xs:element>  
</xs:schema>
```

New Text

2.3.9.1 XML Schema Definition

```
<?xml version="1.0" encoding="utf-8"?>  
<xs:schema xmlns="http://www.upnp.org/schemas/QoSDeviceInfo.xsd"  
:xs="http://www.w3.org/2001/XMLSchema" ="http://www.upnp.org/schemas/QoSDeviceInfo.xsd"  
="qualified" id="QoSDeviceInfo">  
  <xs:annotation>  
    <xs:documentation xml:lang="en">  
      QoS Device Information schema.  
      Copyright 2004, 2005 UPnP(tm). All rights reserved.  
    </xs:documentation>  
  </xs:annotation>  
  <xs:element name="QoSDeviceInfo" type="QoSDeviceInfoType"/>  
  <xs:complexType name="QoSDeviceInfoType">  
    <xs:sequence>  
      <xs:element name="TrafficHandle" type="xs:string"/>  
      <xs:element name="SourcePort" type="IpPortNumber" minOccurs="0"/>  
      <xs:element name="DestinationPort" type="IpPortNumber" minOccurs="0"/>  
      <xs:element name="IpProtocol" type="IpProtocolType"/>  
      <xs:element name="v2" type="v2ExtensionType" minOccurs="0"/>  
      <!-- allow any element except those from target namespace -->  
      <xs:choice minOccurs="0" maxOccurs="unbounded">  
        <xs:any namespace="##other" processContents="lax"/>  
        <xs:any namespace="##local" processContents="lax"/>  
      </xs:choice>  
    </xs:sequence>  
  </xs:complexType>  
  <xs:simpleType name="IpPortNumber">  
    <xs:restriction base="xs:nonNegativeInteger">  
      <xs:minInclusive value="0"/>  
      <xs:maxInclusive value="65535"/>  
    </xs:restriction>  
  </xs:simpleType>  
  <xs:simpleType name="IpProtocolType">  
    <xs:restriction base="xs:nonNegativeInteger">  
      <xs:minInclusive value="0"/>  
      <xs:maxInclusive value="255"/>  
    </xs:restriction>  
  </xs:simpleType>  
  <xs:complexType name="v2ExtensionType">  
    <xs:sequence>  
      <xs:any namespace="##targetNamespace" processContents="lax" maxOccurs="unbounded"/>  
    </xs:sequence>  
    <xs:anyAttribute/>  
  </xs:complexType>  
</xs:schema>
```

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Background

Some of the input parameter restrictions could not be described by XML schema. Hence clarifications are added.

Current Text

2.5.3 SetupTrafficQos

SetupTrafficQoS interface indicates to the device to setup QoS for the Traffic described by A_ARG_TYPE_TrafficDescriptor. If there is no traffic descriptor with the same A_ARG_TYPE_TrafficHandle, then the traffic descriptor is registered in the device. If the device already has the traffic descriptor (identified by the traffic handle) registered, then the device must return an error (Error Code 702).

Please refer to the [QM] document Appendix ‘Traffic Descriptor Matrix’ for information about all of the fields of the TrafficDescriptor and how they are used.

Typically, the QoS Manager calls this action only once per traffic handle registration. If the QoS Manager intends to update QoS associated with the traffic (e.g. the lease time of the traffic), then it has to go over the complete traffic setup process again after it has released the QoS.

New Text

2.5.3 SetupTrafficQos

SetupTrafficQoS interface indicates to the device to setup QoS for the Traffic described by A_ARG_TYPE_TrafficDescriptor. If there is no traffic descriptor with the same A_ARG_TYPE_TrafficHandle, then the traffic descriptor is registered in the device. If the device already has the traffic descriptor (identified by the traffic handle) registered, then the device must return an error (Error Code 702).

Please refer to the [QM] document Appendix ‘Traffic Descriptor Matrix’ for information about all of the fields of the TrafficDescriptor and how they are used.

Typically, the QoS Manager calls this action only once per traffic handle registration. If the QoS Manager intends to update QoS associated with the traffic (e.g. the lease time of the traffic), then it has to go over the complete traffic setup process again after it has released the QoS.

When QosManager supplies TrafficDescriptor to QosDevice when calling this action, it must provide TrafficImportanceNumber. If the TrafficImportanceNumber is not provided then QosDevice must return error 711 (Insufficient information) indicating that the input information is not complete.

When QosManager supplies TrafficDescriptor to QosDevice when calling this action, it must provide ActiveTspecIndex. If the ActiveTspecIndex is not provided then QosDevice must return error 722.



QosDevice:1 Erratum

If a QosManager does not supply a TrafficHandle in a TrafficDescriptor to QosDevice, the QosDevice must return error code 700.

In the TrafficDescriptor to the QosDevice, the Tspec for which TrafficPolicy is provided is indicated by the ActiveTspecIndex. ActiveTspecIndex must be one of the TspecIndex values in the AvailableOrderedTspecList. If not, QosDevice must return an error code 723.



QosDevice:1 Erratum

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