



# **IPDR/Capability File Format**

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# 1 Introduction

The IPDR Capability File enables discovery of capabilities among a set of collaborating IPDR Systems.

Capability files provide basic information about the set of protocols available on a system.

## 2 Architecture

All IPDR Transmitters should have associated with them a “Capability URL”. This URL identifies a file, which contains the XML encoding of a rooted with the element, <CapabilityRsp>. The choice of this element name is for reuse with the capability mechanism IPDR defines for SOAP based exchange.

For example an IPDR Transmitter may have the Capability URL of [http://voip1.myco.com/voip1\\_capabilities.xml](http://voip1.myco.com/voip1_capabilities.xml). The specific file naming is determined by the IT itself, but it is recommended to end with the “.xml” suffix.

This would imply through the default HTTP port, there should be an XML document describing the capabilities of that IPDR Transmitter.

By parsing this XML document a consuming system has an enumeration of all available protocols available for exchange.

### 3 XML Format

The capabilities file documents the particular capabilities of an IPDR Transmitter supporting one or more IPDR protocols.

Capability files are always encoded in XML. There is not a general binary equivalent of the Capability file format. This is because these files will be relatively small and exchanged infrequently; hence, the benefit of a more compact format doesn't justify the additional complexity of defining and supporting a binary equivalent.

The following is the base schema of the capabilities file. New IPDR protocols may extend this schema to describe additional protocol specific details.

```
<?xml version = "1.0" encoding = "UTF-8"?>
<!--Generated by Turbo XML 2.4.1.100. Conforms to w3c
http://www.w3.org/2001/XMLSchema-->
<xsd:schema xmlns = "http://www.ipdr.org/namespaces/ipdrCap"
  targetNamespace = "http://www.ipdr.org/namespaces/ipdrCap"
  xmlns:ipdr = "http://www.ipdr.org/namespaces/ipdr"
  xmlns:xsd = "http://www.w3.org/2001/XMLSchema"
  version = "3.5"
  elementFormDefault = "qualified"
  attributeFormDefault = "unqualified">
  <xsd:element name = "CapabilityRsp">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name = "supportedProtocolList" type =
"supportedProtocolListType"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:complexType name = "supportedProtocolItemType">
    <xsd:sequence>
      <xsd:element ref = "primitiveList"/>
      <xsd:element ref = "extension"/>
    </xsd:sequence>
    <xsd:attribute name = "version" use = "required" type =
"xsd:decimal"/>
    <xsd:attribute name = "protocolMapping" use = "required">
      <xsd:simpleType>
        <xsd:restriction base = "xsd:NMTOKEN">
          <xsd:enumeration value = "File"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name = "encoding" use = "required">
      <xsd:simpleType>
        <xsd:restriction base = "xsd:NMTOKEN">
          <xsd:enumeration value = "XML"/>
          <xsd:enumeration value = "XDR"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
  </xsd:complexType>
  <xsd:complexType name = "supportedProtocolListType">
    <xsd:sequence>
```

```

        <xsd:element name = "supportedProtocolItem" type =
"supportedProtocolItemType" maxOccurs = "unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name = "primitiveList">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element name = "primitiveItem" type =
"xsd:string" maxOccurs = "unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>
<xsd:element name = "groupInfoList">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element name = "groupInfoItem" type =
"groupInfoItemType" maxOccurs = "unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>
<xsd:complexType name = "groupInfoItemType">
    <xsd:sequence>
        <xsd:element ref = "groupId"/>
        <xsd:element ref = "controlFileDirectory"/>
        <xsd:element ref = "controlFilePrefix"/>
        <xsd:element ref = "controlFileNamePolicy"/>
        <xsd:element ref = "controlFileSuffix"/>
        <xsd:element ref = "BRRecord" minOccurs = "1"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name = "extensionType">
    <xsd:sequence minOccurs = "0" maxOccurs = "unbounded">
        <xsd:any namespace = "##any" processContents = "lax"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name = "primitiveItem" type = "xsd:string"/>
<xsd:element name = "controlFileDirectory" type = "xsd:anyURI"/>
<xsd:element name = "controlFilePrefix" type = "xsd:string"/>
<xsd:element name = "controlFileNamePolicy" type = "xsd:string"/>
<xsd:element name = "controlFileSuffix" type = "xsd:string"/>
<xsd:element name = "groupId" type = "xsd:string"/>
<xsd:element name = "extension" type = "extensionType"/>
<xsd:element name = "transmitterId" type = "xsd:anyURI"/>
<xsd:element name = "BRRecord">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element ref = "homeServiceProviderType"/>
            <xsd:element ref = "homeServiceProvider"/>
            <xsd:element ref = "homeServiceProviderName"/>
            <xsd:element ref = "accessProviderType"/>
            <xsd:element ref = "accessProvider"/>
            <xsd:element ref = "accessProviderName"/>
            <xsd:element ref = "contractReference" minOccurs =
"0"/>
            <xsd:element ref = "businessRelationshipID"/>
            <xsd:element ref = "summaryXchgHrs"/>
            <xsd:element ref = "settlementXcghDays"/>
            <xsd:element ref = "netPosXchgDays"/>
            <xsd:element ref = "effectiveDateTime"/>
            <xsd:element ref = "response" minOccurs = "0"/>
            <xsd:element ref = "xchgProtocol"/>
        </xsd:sequence>
    </xsd:complexType>

```

```

        <xsd:element ref = "xchgSLA"/>
        <xsd:element ref = "xchgEncoding"/>
        <xsd:element ref = "disputeResolution"/>
        <xsd:element ref = "locationInfo"/>
        <xsd:element ref = "BRContactName"/>
        <xsd:element ref = "rejectReturn"/>
        <xsd:element ref = "frequencyOfAuditReconciliation"/>
        <xsd:element ref = "xchgCurrencyType"/>
        <xsd:element ref = "unitOfMeasure"/>
        <xsd:element ref = "chargeableUnit"/>
        <xsd:element ref = "ratePerChargeableUnit"/>
        <xsd:element ref = "clearingIntermediaryName"
minOccurs = "0"/>
        <xsd:element ref = "billingIntermediaryName" minOccurs
= "0"/>
        <xsd:element ref =
"sendingServiceProviderDisposition"/>
        <xsd:element ref = "lastChangedDateTime"/>
        <xsd:element ref = "fileRetentionDays"/>
    </xsd:sequence>
</xsd:complexType>
</xsd:element>
<xsd:element name = "homeServiceProviderType">
    <xsd:simpleType>
        <xsd:restriction base = "xsd:integer">
            <xsd:enumeration value = "1">
                <xsd:annotation>
                    <xsd:documentation>
                        &lt;ipdr:enumMeaning>Domain&lt;/ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
            <xsd:enumeration value = "2">
                <xsd:annotation>
                    <xsd:documentation>
                        &lt;ipdr:enumMeaning>PMN
Code&lt;/ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
            <xsd:enumeration value = "3">
                <xsd:annotation>
                    <xsd:documentation>
                        &lt;ipdr:enumMeaning>SID or
BID&lt;/ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
            <xsd:enumeration value = "4">
                <xsd:annotation>
                    <xsd:documentation>
                        &lt;ipdr:enumMeaning>BRI&lt;/ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
        </xsd:restriction>
    </xsd:simpleType>
</xsd:element>

```

```

        </xsd:restriction>
    </xsd:simpleType>
</xsd:element>
<xsd:element name = "homeServiceProvider" type = "string"/>
<xsd:element name = "homeServiceProviderName" type = "string"/>
<xsd:element name = "accessProviderType">
    <xsd:simpleType>
        <xsd:restriction base = "xsd:integer">
            <xsd:enumeration value = "1">
                <xsd:annotation>
                    <xsd:documentation>
                        &lt;ipdr:enumMeaning>Domain&lt;/ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
            <xsd:enumeration value = "2">
                <xsd:annotation>
                    <xsd:documentation>
                        &lt;ipdr:enumMeaning>PMN
Code&lt;/ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
            <xsd:enumeration value = "3">
                <xsd:annotation>
                    <xsd:documentation>
                        &lt;ipdr:enumMeaning>SID or
BID&lt;/ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
            <xsd:enumeration value = "4">
                <xsd:annotation>
                    <xsd:documentation>
                        &lt;ipdr:enumMeaning>BRI&lt;/ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
        </xsd:restriction>
    </xsd:simpleType>
</xsd:element>
<xsd:element name = "accessProvider" type = "string"/>
<xsd:element name = "accessProviderName" type = "string"/>
<xsd:element name = "contractReference" type = "string"/>
<xsd:element name = "businessRelationshipID" type = "string"/>
<xsd:element name = "summaryXchgHrs" type = "integer"/>
<xsd:element name = "settlementXcghDays" type = "string"/>
<xsd:element name = "netPosXchgDays" type = "string"/>
<xsd:element name = "effectiveDateTime" type = "xsd:dateTime"/>
<xsd:element name = "response">
    <xsd:simpleType>
        <xsd:restriction base = "xsd:integer">
            <xsd:enumeration value = "1">
                <xsd:annotation>
                    <xsd:documentation>

```

```

Supported<ipdr:enumMeaning>Not
    </xsd:documentation>
  </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value = "2">
  <xsd:annotation>
    <xsd:documentation>
      <ipdr:enumMeaning>Manual
Intervention Needed</ipdr:enumMeaning>
    </xsd:documentation>
  </xsd:annotation>
</xsd:enumeration>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name = "xchgProtocol">
  <xsd:simpleType>
    <xsd:restriction base = "xsd:integer">
      <xsd:enumeration value = "1">
        <xsd:annotation>
          <xsd:documentation>
            <ipdr:enumMeaning>FTP Over TCP
IP</ipdr:enumMeaning>
    </xsd:documentation>
  </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value = "2">
  <xsd:annotation>
    <xsd:documentation>
      <ipdr:enumMeaning>FFS</ipdr:enumMeaning>
    </xsd:documentation>
  </xsd:annotation>
</xsd:enumeration>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name = "xchgSLA">
  <xsd:simpleType>
    <xsd:restriction base = "xsd:integer">
      <xsd:enumeration value = "1">
        <xsd:annotation>
          <xsd:documentation>
            <ipdr:enumMeaning>Strict
Compliance to BR (with penalties)</ipdr:enumMeaning>
    </xsd:documentation>
  </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value = "2">
  <xsd:annotation>
    <xsd:documentation>
      <ipdr:enumMeaning>Best
Effort</ipdr:enumMeaning>
    </xsd:documentation>
  </xsd:annotation>
</xsd:documentation>

```

```

        </xsd:annotation>
      </xsd:enumeration>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
<xsd:element name = "xchgEncoding">
  <xsd:simpleType>
    <xsd:restriction base = "xsd:integer">
      <xsd:enumeration value = "1">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>UTF-
8&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
      <xsd:enumeration value = "2">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>Compact
Binary&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
      <xsd:enumeration value = "3">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>FFS&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
<xsd:element name = "disputeResolution">
  <xsd:simpleType>
    <xsd:restriction base = "xsd:integer">
      <xsd:enumeration value = "1">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>Manual-Not
Supported&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
      <xsd:enumeration value = "2">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>Best
Effort&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
    </xsd:restriction>
  </xsd:simpleType>

```

```

</xsd:element>
<xsd:element name = "locationInfo" type = "string"/>
<xsd:element name = "BRContactName" type = "string"/>
<xsd:element name = "rejectReturn">
  <xsd:simpleType>
    <xsd:restriction base = "xsd:integer">
      <xsd:enumeration value = "1">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>Manual-Not
Supported&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
      <xsd:enumeration value = "2">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>Best
Effort&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
<xsd:element name = "frequencyOfAuditReconciliation" type = "integer"/>
<xsd:element name = "xchgCurrencyType" type = "string"/>
<xsd:element name = "unitOfMeasure">
  <xsd:simpleType>
    <xsd:restriction base = "xsd:integer">
      <xsd:enumeration value = "1">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>Bytes&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
      <xsd:enumeration value = "2">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>Kilobytes&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
      <xsd:enumeration value = "3">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>Seconds&lt;/ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
      <xsd:enumeration value = "4">
        <xsd:annotation>
          <xsd:documentation>
            &lt;ipdr:enumMeaning>
          </xsd:documentation>
        </xsd:annotation>
      </xsd:enumeration>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>

```

```

        <xsd:documentation>
    <ipdr:enumMeaning>Minutes</ipdr:enumMeaning>
        </xsd:documentation>
    </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value = "5">
    <xsd:annotation>
        <xsd:documentation>
    <ipdr:enumMeaning>Hours</ipdr:enumMeaning>
        </xsd:documentation>
    </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value = "6">
    <xsd:annotation>
        <xsd:documentation>
    <ipdr:enumMeaning>Days</ipdr:enumMeaning>
        </xsd:documentation>
    </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value = "7">
    <xsd:annotation>
        <xsd:documentation>
    <ipdr:enumMeaning>Sessions</ipdr:enumMeaning>
        </xsd:documentation>
    </xsd:annotation>
</xsd:enumeration>
<xsd:enumeration value = "8">
    <xsd:annotation>
        <xsd:documentation>
            <ipdr:enumMeaning>Per X
Users</ipdr:enumMeaning>
        </xsd:documentation>
    </xsd:annotation>
</xsd:enumeration>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name = "chargeableUnit">
    <xsd:simpleType>
        <xsd:restriction base = "xsd:integer">
            <xsd:enumeration value = "1">
                <xsd:annotation>
                    <xsd:documentation>
                        <ipdr:enumMeaning>Incoming
Volume</ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
            <xsd:enumeration value = "2">
                <xsd:annotation>

```

```

                                <xsd:documentation>
                                    &lt;ipdr:enumMeaning>Outgoing
Volume&lt;/ipdr:enumMeaning>
                                </xsd:documentation>
                                </xsd:annotation>
                                </xsd:enumeration>
                                <xsd:enumeration value = "3">
                                    <xsd:annotation>
                                        <xsd:documentation>
                                            &lt;ipdr:enumMeaning>Total
Volume&lt;/ipdr:enumMeaning>
                                        </xsd:documentation>
                                    </xsd:annotation>
                                </xsd:enumeration>
                                <xsd:enumeration value = "4">
                                    <xsd:annotation>
                                        <xsd:documentation>
                                            &lt;ipdr:enumMeaning>Duration&lt;/ipdr:enumMeaning>
                                        </xsd:documentation>
                                    </xsd:annotation>
                                </xsd:enumeration>
                                <xsd:enumeration value = "5">
                                    <xsd:annotation>
                                        <xsd:documentation>
                                            &lt;ipdr:enumMeaning>Event&lt;/ipdr:enumMeaning>
                                        </xsd:documentation>
                                    </xsd:annotation>
                                </xsd:enumeration>
                                <xsd:enumeration value = "6">
                                    <xsd:annotation>
                                        <xsd:documentation>
                                            &lt;ipdr:enumMeaning>Fixed&lt;/ipdr:enumMeaning>
                                        </xsd:documentation>
                                    </xsd:annotation>
                                </xsd:enumeration>
                                <xsd:enumeration value = "7">
                                    <xsd:annotation>
                                        <xsd:documentation>
                                            &lt;ipdr:enumMeaning>Content&lt;/ipdr:enumMeaning>
                                        </xsd:documentation>
                                    </xsd:annotation>
                                </xsd:enumeration>
                                <xsd:enumeration value = "8">
                                    <xsd:annotation>
                                        <xsd:documentation>
                                            &lt;ipdr:enumMeaning>Bulk
Users&lt;/ipdr:enumMeaning>
                                        </xsd:documentation>
                                    </xsd:annotation>
                                </xsd:enumeration>

```

```

        </xsd:restriction>
    </xsd:simpleType>
</xsd:element>
<xsd:element name = "ratePerChargeableUnit" type = "integer"/>
<xsd:element name = "clearingIntermediaryName" type = "string"/>
<xsd:element name = "billingIntermediaryName" type = "string"/>
<xsd:element name = "sendingServiceProviderDisposition" type = "integer">
    <xsd:simpleType>
        <xsd:restriction base = "xsd:integer">
            <xsd:enumeration value = "1">
                <xsd:annotation>
                    <xsd:documentation>
                        <ipdr:enumMeaning>Serving</ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
            <xsd:enumeration value = "2">
                <xsd:annotation>
                    <xsd:documentation>
                        <ipdr:enumMeaning>Home</ipdr:enumMeaning>
                    </xsd:documentation>
                </xsd:annotation>
            </xsd:enumeration>
        </xsd:restriction>
    </xsd:simpleType>
</xsd:element>
<xsd:element name = "lastChangedDateTime" type = "xsd:dateTime"/>
<xsd:element name = "fileRetentionDays" type = "integer"/>
</xsd:schema>

```

The basic structure of a Capability file is discussed below:

- supportedProtocolList - a list of items, which describe the capabilities of this transmitter. Each item consists of three subfields, plus optional extensions:
  - version - a protocol version that this IPDR Transmitter supports. (string, e.g., “3.1”)
  - primitiveList - a list of the operations. A single name identifies the request, response+ and response- primitives, which are supported by this IPDR Transmitter. (string list, e.g., “Capability, ListGroups, Subscribe, and Push”). Note that Unsubscribe is implied if Subscribe is offered.
  - protocolMapping - a specific transport that is supported. Each IPDR protocol specification defines the value(s) of this field.
  - extension - a container for version specific information. The contents of the extension are determined by the version and protocolMapping, and can be ignored by systems not supporting them. Each IPDR protocol specification defines the value(s) of this field. As an example, IPDR/FTP would use the following:
 

```

                    <extension>
                    <transmitterId>http://voip_it1.example.com:6614/voip_it</transmitterId>
                    </extension>
                    
```

## 4 Security Considerations

The recommended mechanism for accessing capabilities information is via a designated Capabilities.xml file with a well-known URL for an IPDR Transmitter system.

URL's may identify protocols such as FTP or HTTP that may have known security limitations, such as no authentication or the passing of credentials (e.g., passwords) in the clear.

The information contained in the Capability File itself is in general meant to enable other collaborating systems to discover the capabilities of the IPDR Transmitter. As such the information is not particularly sensitive.

However, an implementation may choose to balance the ease of discovery by other systems with concerns around sharing this information too widely. Use of underlying transport security mechanisms such as HTTPS may be used to address such concerns.