Universal Profiling Schema for Content Negotiation

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In this document, we give a complete profiling scheme that we adopt in the context of content negotiation in heterogeneous environment. Our model defines five profile schemas expressed in RDF and designed to be handled by advanced content negotiation methods.

1 Client Side

In this section we define two profiles concerning the client device. Schemas are accessible from:

1/ http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ClientProfileSchema-03012002#

2/ http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ClientResourceProfileSchema-03012002#

1.1 Client Profile

a) RDF Schema

```
<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ClientProfileSchema-03012002#">

<!--
  This is the RDF Schema for
  "The Client Profile".
  Defined in the context of content negotiation in heterogeneous environments.
  Author: Tayeb LEMLOUMA, January 2002.
-->

        <rdf:Description ID="ProfileComponent">
          <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
          <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource"/>
          <rdfs:comment>A class that includes different components for the Client Profile description
          </rdfs:comment>
        </rdf:Description>

        <!--
        Common properties
        -->
```

```
<!--
Main Client Profile Components
-->

<rdf:Description ID="HardwarePlatform">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
  <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
  <rdfs:comment>Describe the hardware platform of the client device</rdfs:comment>
</rdf:Description>

<rdf:Description ID="SoftwarePlatform">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
  <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
  <rdfs:comment>Describe the software platform used by the client device: OS, etc.</rdfs:comment>
</rdf:Description>

<rdf:Description ID="BrowserUA">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
  <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
  <rdfs:comment>
  Describe players used by the client device.
  This component plays a major role in the content negotiation and may refer to external profiles.
  Note that the protocol used to access to the network, and player-related network description may be
  added here.
  </rdfs:comment>
</rdf:Description>

<!--
HardwarePlatform Profile Component
-->

<rdf:Description ID="DeviceName">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#HardwarePlatform"/>
  <rdfs:comment>
  The name of the used device
  Example: "iPAQ 3600"
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="screen">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#HardwarePlatform"/>
  <rdfs:comment>
  The screen dimension of the used device
  Example: "30X23mm"
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="display">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#HardwarePlatform"/>
  <rdfs:comment>
  The display  of the used device
  Example: "101x52Pixels"
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="PixelStretch">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#HardwarePlatform"/>
  <rdfs:comment>
  Gives the (height/width) pixels ratio, used in images design
  Example: "1.24", means that the pixels are 24% higher than they are wide
  </rdfs:comment>
</rdf:Description>
```

```
<rdf:Description ID="row">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Bag"/>
  <rdfs:domaine rdf:resource="#HardwarePlatform"/>
  <rdfs:comment>
  Gives the number of the screen rows. Can be given as a set of couple (type,value)
  Example: "Latin, 5" and "Chinese, 3"
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="col">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Bag"/>
  <rdfs:domaine rdf:resource="#HardwarePlatform"/>
  <rdfs:comment>
  The number of the screen columns. Can be given as a set of couple (type,value)
  Example: "14"
  </rdfs:comment>
</rdf:Description>

<!--
SoftwarePlatform Profile Component
-->

<rdf:Description ID="PlatformName">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#SoftwarePlatform"/>
  <rdfs:comment>
  The name of the Operating System used by the user agent
  Example: "Windows Professionnel"
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="PlatformVersion">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#SoftwarePlatform"/>
  <rdfs:comment>
  The version of the Operating System used by the user agent
  Example: "8.0"
  </rdfs:comment>
</rdf:Description>

<!--
BrowserUA Profile Component
-->

<rdf:Description ID="PlayerName">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#BorwserUA"/>
  <rdfs:comment>
  The name of the player used by the client, at a well determined session. The client can use many
  players.
  Example: "Nethix"
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="PlayerVersion">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#BorwserUA"/>
  <rdfs:comment>
   The version of the player.
   Example: "1.1"
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="OnlySupportedResources">
```

```
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Bag"/>
    <rdfs:domaine rdf:resource="#BorwserUA"/>
    <rdfs:comment>
     The only supported set of resources or services. Profiles of these last are denoted using links
     (the   profile element)
     This set is given generally when the it is small and not already described by an existed schema.
     Example: "WML documents, wbmp images"
    </rdfs:comment>
  </rdf:Description>

  <rdf:Description ID="PreferredSupportedResources">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Seq"/>
    <rdfs:domaine rdf:resource="#BorwserUA"/>
    <rdfs:comment>
    A list that gives preferred resources ordered with a priority level value.
    The range of the value is left to the negotiation strategy.
    Example: "wbmp,2,gif,1"
    </rdfs:comment>
  </rdf:Description>

  <rdf:Description ID="NonSupportedResources">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Bag"/>
    <rdfs:domaine rdf:resource="#BorwserUA"/>
    <rdfs:comment>
    The list of the excluded resources.
    Note that if the non supported resource depends to a particular set (WML, HTML, etc.), it's preferable
    to include it on the corresponding profile.
    Example: "the non support of a resource from a predefined set of supported resources"
    </rdfs:comment>
  </rdf:Description>

</rdf:RDF>
```

b) Example

```
<?xml version="1.0"?>
<!-- Client Profile: "device-profiles/clientProfile.xml" -->

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:ccpp="http://www.w3.org/2000/07/04-ccpp#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ClientProfileSchema-
03012002#">

  <rdf:Description ID="ClientProfile">

    <ccpp:component>
      <rdf:Description ID="HardwarePlatform">
        <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/schema-
03012002#HardwarePlatform" />
          <neg:DeviceName>Ericsson-R320</neg:DeviceName>
          <neg:screen>30X23mm</neg:screen>
          <neg:display>101X52Pixels</neg:display>
          <neg:PixelStretch>1.24</neg:PixelStretch>
          <neg:row>
            <rdf:Bag>
              <rdf:li rdf:parseType="Resource">
                <neg:type>Latin</neg:type>
                <neg:value>5</neg:value>
              </rdf:li>
              <rdf:li rdf:parseType="Resource">
                <neg:type>Chinese</neg:type>
                <neg:value>3</neg:value>
              </rdf:li>
```

```
                    </rdf:Bag>
                  </neg:row>
                  <neg:col>
                    <rdf:Bag>
                      <rdf:li rdf:parseType="Resource">
                        <neg:value>14</neg:value>
                      </rdf:li>
                    </rdf:Bag>
                  </neg:col>
              </rdf:Description>
            </ccpp:component>

            <ccpp:component>
              <rdf:Description ID="SoftwarePlatform">
                <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/schema-
03012002#SoftwarePlatform" />
                    <rdf:type rdf:resource="SoftwarePlatform" />
                        <neg:PlatformName>the platform name</neg:PlatformName>
                <neg:PlatformVersion>the platform version</neg:PlatformVersion>
          </rdf:Description>
            </ccpp:component>

            <ccpp:component>
              <rdf:Description ID="BrowserUA">
                <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/schema-
03012002#BrowserUA" />
                    <neg:PlayerName>PlayerName</neg:PlayerName>
             <neg:PlayerVersion>PlayerVersion</neg:PlayerVersion>
                  <neg:OnlySupportedResources>
                    <rdf:Bag>
                      <rdf:li rdf:parseType="Resource">
                        <neg:type>service</neg:type>
                        <neg:serviceDetail>WML 2.0</neg:serviceDetail>
                        <neg:format>wml</neg:format>
                        <neg:profile>device-profiles/wml-profile.xml</neg:profile>
                      </rdf:li>
                          <rdf:li rdf:parseType="Resource">
                        <neg:type>image</neg:type>
                        <neg:format>wbmp</neg:format>
                        <neg:profile>device-profiles/wbmp-profile.xml</neg:profile>
                        <neg:format>gif</neg:format>
                        <neg:profile>device-profiles/gif-profile.xml</neg:profile>
                      </rdf:li>
                    </rdf:Bag>
                  </neg:OnlySupportedResources>
                  <neg:PreferredSupportedResources>
                    <rdf:Seq>
                      <rdf:li rdf:parseType="Resource">
                        <neg:type>image</neg:type>
                        <neg:format>wbmp</neg:format>
                        <neg:prioriyLevel>2</neg:prioriyLevel>
                        <neg:format>gif</neg:format>
                        <neg:prioriyLevel>1</neg:prioriyLevel>
                      </rdf:li>
                  <rdf:li rdf:parseType="Resource">
                        <neg:type>language</neg:type>
                        <neg:format>english</neg:format>
                        <neg:prioriyLevel>2</neg:prioriyLevel>
                        <neg:format>french</neg:format>
                        <neg:prioriyLevel>1</neg:prioriyLevel>
                      </rdf:li>
                    </rdf:Seq>
                  </neg:PreferredSupportedResources>
                      <!--
                      <neg:NonSupportedResources>
```

```
                    </neg:NonSupportedResources>
                    -->

        </rdf:Description>
          </ccpp:component>

  </rdf:Description>
</rdf:RDF>
```

1.2 Client Resource Profile

a) RDF Schema

```
<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ClientResourceProfileSch
ema-03012002#">

<!--
  This is the RDF Schema for
  "The Client Resource Profile".
  Defined in the context of content negotiation in heterogeneous environments.
  Author: Tayeb LEMLOUMA, January 2002.
-->

          <rdf:Description ID="ProfileComponent">
            <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
            <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource"/>
            <rdfs:comment>A class that includes different components for the Client Resource Profile description
            </rdfs:comment>
          </rdf:Description>

          <!--
          Common properties
          -->

          <!--
          Main Client Resource Profile Components
          -->

          <rdf:Description ID="ContentRequirement">
            <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
            <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
            <rdfs:comment>
            Give a detail on the client requirements on the a resource
            </rdfs:comment>
          </rdf:Description>

          <!--
          ContentRequirement Profile Component
          -->

          <rdf:Description ID="content">
            <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
            <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Bag"/>
            <rdfs:domaine rdf:resource="#ContentRequirement"/>
            <rdfs:comment>
            Gives the a complete description about resources.
            The bag is includes a complete description about each resource mentioned in the clientProfile.
            The description of each resource can include specific constraints.
            If the resource includes other resources, the elements 'OnlySupportedResources',
            'NonSupportedResources' and 'PreferredSupportedResources'
            can be used
            </rdfs:comment>
```

```
        </rdf:Description>


</rdf:RDF>
```

b) Example

```
<?xml version="1.0"?>
<!-- Client Resource Profile: "device-profiles/wml-profile.xml" -->

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:ccpp="http://www.w3.org/2000/07/04-ccpp#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ClientResourceProfileSch
ema-03012002#">

  <rdf:Description ID="ResourceClientProfile">

        <ccpp:component>
          <rdf:Description ID="ContentRequirement">
            <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ClientResourceProfileSc
hema-03012002#ContentRequirement" />
              <neg:content>
                <rdf:Bag>

                        <rdf:li rdf:parseType="Resource">
                          <neg:type>WML element</neg:type>
                          <neg:signification>WML card</neg:signification>
                          <neg:name>card</neg:name>
                          <neg:specificConstraints>
                            <rdf:Bag>
                              <neg:maxSize>3000Bytes</neg:maxSize>
                            </rdf:Bag>
                          </neg:specificConstraints>
                        </rdf:li>

                        <rdf:li rdf:parseType="Resource">
                          <neg:signification>WML text</neg:signification>
                          <neg:OnlySupportedResources>
                              <rdf:Bag>
                                <rdf:li rdf:parseType="Resource">
                                  <neg:type>element</neg:type>
                                  <neg:signification>text style</neg:signification>
                                  <rdf:li>small</rdf:li>
                                      <rdf:li>bold</rdf:li>
                                      <rdf:li>emphasis</rdf:li>
                                      <rdf:li>strong</rdf:li>
                                </rdf:li>
                                <rdf:li rdf:parseType="Resource">
                                  <neg:type>WML attribute</neg:type>
                                  <neg:signification>text alignement</neg:signification>
                                  <neg:name>p/align</neg:name>
                                      <rdf:li>left</rdf:li>
                                      <rdf:li>center</rdf:li>
                                      <rdf:li>right</rdf:li>
                                </rdf:li>
                              </rdf:Bag>
                          </neg:OnlySupportedResources>
                          <!--
                          <neg:NonSupportedResources>
                          </neg:NonSupportedResources>
                          -->

                        </rdf:li>
```

```
                </rdf:Bag>
              </neg:content>
            </rdf:Description>
          </ccpp:component>
  </rdf:Description>
</rdf:RDF>
```

2 Server Side

In this section we define three profiles: the document instance profile, the resource profile and the adaptation method profile. Profiles schemas are accessible from:

1/ http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/DocumentInstanceProfileSchema-03012002#
2/ http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ResourceProfileSchema-03012002#
3/ http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/AdaptationMethodProfileSchema-03012002#

2.1 Document Instance Profile

a) RDF Schema

```
<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/DocumentInstanceProfileSchema-03012002#">

<!--
  This is the RDF Schema for
  "The Document Instance Profile".
  Defined in the context of content negotiation in heterogeneous environments.
  Author: Tayeb LEMLOUMA, January 2002.
-->

        <rdf:Description ID="ProfileComponent">
          <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
          <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource"/>
          <rdfs:comment>A class that includes different components for the Document Instance Profile
           description </rdfs:comment>
        </rdf:Description>

        <!--
        Common properties
        -->

        <!--
        Main Document Instance Profile Components
        -->

        <rdf:Description ID="DocumentInstanceDescription">
          <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
          <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
          <rdfs:comment>
          Consider the document instance -requested by the client- as a resource and give a detailed description
          about it.  Here the resource is described independetly to the included resources (images, etc.)
          </rdfs:comment>
        </rdf:Description>

        <rdf:Description ID="MultimediaContent">
          <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
          <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
```

```
  <rdfs:comment>
  A brief description of the included media resources. The included resources profile are given as links
  using the 'profile' element.
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="AdaptableResourcesDescription">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
  <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
  <rdfs:comment>
  Description of related resources that can adapt the document instance.
  The bag can include existing variants and also the adaptation method description, that can adapt
  the instance to other resources formats.
  </rdfs:comment>
</rdf:Description>

<!--
 DocumentInstanceDescription Profile Component
-->

<rdf:Description ID="InstanceType">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
  <rdfs:comment>
  The type of the instance document
  Example: HTML, SMIL
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="InstanceFormat">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
  <rdfs:comment>
  The format of the file that stores the document instance
  Example: html, smi
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="InstanceVersion">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
  <rdfs:comment>
  The version of instance document
  Example: 4.01
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="InstanceDoctype">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
  <rdfs:comment>
  The doctype file of the corresponding document type
  Example: http://www.w3.org/TR/html4/loose.dtd
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="InstanceName">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
  <rdfs:comment>
  The file name of the document instance document
  Exmaple: EXAMPLE.html
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="InstanceLanguage">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
```

```
    <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
    <rdfs:comment>
    The content language of the content document
    Example: english
    </rdfs:comment>
  </rdf:Description>

  <rdf:Description ID="InstanceSize">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
    <rdfs:comment>
    The size of the instance document file
    Example: "910Bytes"
    </rdfs:comment>
  </rdf:Description>

  <rdf:Description ID="InstanceLocation">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
    <rdfs:comment>
    The local location of the document instance file
    Example: NEGOTIATION/WAP/
    </rdfs:comment>
  </rdf:Description>

  <rdf:Description ID="InstanceServer">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdfs:domaine rdf:resource="#DocumentInstanceDescription"/>
    <rdfs:comment>
    The adress of the server that stores the document instance file
    Example: http://yap.inrialpes.fr/
    </rdfs:comment>
  </rdf:Description>

  <!--
   MultimediaContent Profile Component
  -->

  <rdf:Description ID="content">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Bag"/>
    <rdfs:domaine rdf:resource="#MultimediaContent"/>
    <rdfs:comment>
    The bag includes the description of every resource that exists in the document instance.
    Each element of the bag describes a type of resources and gives a link to the corresponding detailed
    profile
    </rdfs:comment>
  </rdf:Description>

  <!--
   AdaptableResourcesDescription Profile Component
  -->

  <rdf:Description ID="AdaptableResources">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Alt"/>
    <rdfs:domaine rdf:resource="#AdaptableResourcesDescription"/>
    <rdfs:comment>
    This bag includes the list of the resources that can adapt the file document instance.
    The resource can already exist or described in term of an adaptation method. A value that indicates the
    adaptability level is also given.
    </rdfs:comment>
  </rdf:Description>


</rdf:RDF>
```

b) Example

```
<?xml version="1.0"?>
<!-- Document Instance Profile: "server-profiles/EXAMPLE-html-profile.xml" -->

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:ccpp="http://www.w3.org/2000/07/04-ccpp#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/DocumentInstanceSchem
a-03012002#">

        <rdf:Description ID="DocumentInstanceProfile">

                <ccpp:component>
                  <rdf:Description ID="DocumentInstanceDescription">
                    <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/DocumentInstanceSche
ma-03012002#DocumentInstanceDescription"/>
                        <neg:InstanceType>HTML</neg:InstanceType>
                        <neg:InstanceFormat>html</neg:InstanceFormat>
                        <neg:InstanceVersion>4.01</neg:InstanceVersion>
                        <neg:InstanceDoctype>http://www.w3.org/TR/html4/loose.dtd</neg:InstanceDoctype>
                        <neg:InstanceName>EXAMPLE.html</neg:InstanceName>
                        <neg:InstanceLanguage>english</neg:InstanceLanguage>
                        <neg:InstanceSize>910Bytes</neg:InstanceSize>
                        <neg:InstanceLocation>NEGOTIATION/WAP/</neg:InstanceLocation>
                        <neg:InstanceServer>http://yap.inrialpes.fr/</neg:InstanceServer>
                  </rdf:Description>
                </ccpp:component>

                <ccpp:component>
                  <rdf:Description ID="MultimediaContent">
                    <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/DocumentInstanceSche
ma-03012002#MultimediaContent" />
                      <neg:content>
                          <rdf:Bag>
                                  <rdf:li rdf:parseType="Resource">
                                          <neg:ResourceType>image</neg:ResourceType>
                                          <neg:ResourceFormat>jpg</neg:ResourceFormat>
                                          <neg:ResourceProfile>profiles/background-jpg-
                                          profile.xml</neg:ResourceProfile>
                                          <neg:ResourceProfile>profiles/phone-jpg-
                                          profile.xml</neg:ResourceProfile>
                                          <neg:ResourceProfile>profiles/thank_you-jpg-
                                          profile.xml</neg:ResourceProfile>
                                  </rdf:li>
                                  <rdf:li rdf:parseType="Resource">
                                          <neg:ResourceType>image</neg:ResourceType>
                                          <neg:ResourceFormat>gif</neg:ResourceFormat>
                                          <neg:ResourceProfile>profiles/realplayer-gif-
                                          profile.xml</neg:ResourceProfile>
                                  </rdf:li>
                                  <rdf:li rdf:parseType="Resource">
                                          <neg:ResourceType>audio</neg:ResourceType>
                                          <neg:ResourceFormat>wav</neg:ResourceFormat>
                                          <neg:ResourceProfile>profiles/WapTechnology-wav-
                                          profile.xml</neg:ResourceProfile>
                                  </rdf:li>
                          </rdf:Bag>
                      </neg:content>
                  </rdf:Description>
                </ccpp:component>

                <ccpp:component>
                  <rdf:Description ID="AdaptableResourcesDescription">
```

```
                    <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/DocumentInstanceSche
ma-03012002#AdaptableResourcesDescription" />
                      <neg:AdaptableResources>
                       <rdf:Alt>
                       <rdf:li rdf:parseType="Resource">
                          <!– a resume–>
                          <neg:ResourceType>textResume</neg:ResourceType>
                          <neg:ResourceFormat>xml</neg:ResourceFormat>
                          <neg:ResourceProfile>profiles/EXAMPLE-xml-profile.xml</neg:ResourceProfile>
                          <neg:ResourceAdaptabilityValue>0.2</neg:ResourceAdaptabilityValue>
                       </rdf:li>
                       </rdf:Alt>
                      </neg:AdaptableResources>
                  </rdf:Description>
                </ccpp:component>


        </rdf:Description>
</rdf:RDF>
```

2.2 Resource Profile

a) RDF Schema

```
<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ResourceProfileSchema-
03012002#">

<!--
  This is the RDF Schema for
  "The Resource Profile".
  Defined in the context of content negotiation in heterogeneous environments.
  Author: Tayeb LEMLOUMA, January 2002.
-->

        <rdf:Description ID="ProfileComponent">
          <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
          <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource"/>
          <rdfs:comment>A class that includes different components for the Resource Profile description
          </rdfs:comment>
        </rdf:Description>

        <!–
        Common properties
        -->

        <!–
        Main Resource Profile Components
        -->

        <rdf:Description ID="MediaResourceDescription">
          <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
          <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
          <rdfs:comment>
          A detailed description about the resource
          </rdfs:comment>
        </rdf:Description>

        <rdf:Description ID="AdaptableResourcesDescription">
          <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
          <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
          <rdfs:comment>
```

```
   Description of related resources that can adapt this one.
   The bag can include existing variants and also the adaptation method description, that can adapt
   the resource to other resources formats.

   </rdfs:comment>
</rdf:Description>

<!--
 "Media Resource Description" Profile Component
-->

<rdf:Description ID="ResourceName">
   <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
   <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
   <rdfs:comment>
   The resource file name
   Example: background.jpg
   </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceFormat">
   <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
   <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
   <rdfs:comment>
   The format of the resource file
   Example: jpg
   </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceSize">
   <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
   <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
   <rdfs:comment>
   The size of the resource file
   Example: 1000Bytes
   </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceLocation">
   <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
   <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
   <rdfs:comment>
   </rdfs:comment>
   The local location of the resource file
   Example: smil/images/
</rdf:Description>

<rdf:Description ID="ResourceServer">
   <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
   <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
   <rdfs:comment>
   The server that stores the resource file
   Example: http://yap.inrialpes.fr/
   </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceDimension">
   <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
   <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
   <rdfs:comment>
   The dimension of the resource if this is supported, example for an image we give heightXwidth
   Example: 800X600Pixels
   </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceResolution">
   <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
```

```
    <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
    <rdfs:comment>
    The resolution of the resource if this is supported, example for an image we give
     heightResolutionXwidthResolution
    Example: 300X300Pixels
    </rdfs:comment>
  </rdf:Description>

  <rdf:Description ID="ResourceColorBit">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
    <rdfs:comment>
    The color bit number of the resource if this is supported
    Example: 24
    </rdfs:comment>
  </rdf:Description>

  <rdf:Description ID="ResourceColorRepresentation">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdfs:domaine rdf:resource="#MediaResourceDescription"/>
    <rdfs:comment>
    The format of presentation of the resource color
    Example: true RGB
    </rdfs:comment>
  </rdf:Description>

  <!--
   "Adaptable Resources Description" Profile Component
  -->

  <rdf:Description ID="AdaptableResources">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Alt"/>
    <rdfs:domaine rdf:resource="#AdaptableResourcesDescription"/>
    <rdfs:comment>
    This bag includes the list of the resources that can adapt this one.
    The resource can already exist or described in term of an adaptation method. A value that indicates the
     adaptability level is also given.
    </rdfs:comment>
  </rdf:Description>


</rdf:RDF>
```

b) Example

```
<?xml version="1.0"?>
<!-- Resource Profile: "server-profiles/background-jpg-profile.xml" -->

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:ccpp="http://www.w3.org/2000/07/04-ccpp#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ResourceProfileSchema-
03012002#">
  <rdf:Description ID="ResourceProfile">

    <ccpp:component>
      <rdf:Description ID="MediaResourceDescription">
        <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ResourceProfileSchema-
03012002#MediaResourceDescription"/>
        <neg:ResourceName>background.jpg</neg:ResourceName>
        <neg:ResourceFormat>jpg</neg:ResourceFormat>
        <neg:ResourceSize>25824Bytes</neg:ResourceSize>
        <neg:ResourceLocation>smil/images/</neg:ResourceLocation>
        <neg:ResourceServer>http://yap.inrialpes.fr/</neg:ResourceServer>
        <neg:ResourceDimension>800X600Pixels</neg:ResourceDimension>
```

```
                    <neg:ResourceResolution>300X300Pixels</neg:ResourceResolution>
                    <neg:ResourceColorBit>24</neg:ResourceColorBit>
                    <neg:ResourceColorRepresentation>true RGB</neg:ResourceColorRepresentation>
                  </rdf:Description>
            </ccpp:component>

            <ccpp:component>
                  <rdf:Description ID="AdaptableResourcesDescription">
                    <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/ResourceProfileSchema-
03012002#AdaptableResourcesDescription"/>
                        <neg:AdaptableResources>
                          <rdf:Alt>
                           <rdf:li rdf:parseType="Resource">
                                 <neg:ResourceType>image</neg:ResourceType>
                                 <neg:ResourceFormat>gif</neg:ResourceFormat>
                                 <neg:ResourceProfile>profiles/background02-gif-
                                  profile.xml</neg:ResourceProfile>
                                 <neg:ResourceAdaptatbilityValue>3</neg:ResourceAdaptatbilityValue>
                           </rdf:li>
                           <rdf:li rdf:parseType="Resource">
                                 <neg:ResourceType>method</neg:ResourceType>
                                 <neg:outputformats>
                                 <!-- includes just the formats that can be obtained from the original resource
                                 format using the adaptation -->
                                   <rdf:Bag>
                                     <rdf:li>gif</rdf:li>
                                     <rdf:li>wbmp</rdf:li>
                                   </rdf:Bag>
                                 </neg:outputformats>
                                 <neg:ResourceProfile>profiles/jpgtransformer-class-
                                 profile.xml</neg:ResourceProfile>
                           </rdf:li>

                          </rdf:Alt>
                        </neg:AdaptableResources>
                  </rdf:Description>
            </ccpp:component>

      </rdf:Description>
</rdf:RDF>
```

2.3 Adaptation Method Profile

a) RDF Schema

```
<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/AdaptationMethodProfileS
chema-03012002#">

<!--
  This is the RDF Schema for
  "The Adaptation Method Profile ".
  Defined in the context of content negotiation in heterogeneous environments.
  Author: Tayeb LEMLOUMA, January 2002.
-->

      <rdf:Description ID="ProfileComponent">
        <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
        <rdfs:subClassOf rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource"/>
        <rdfs:comment>A class that includes different components for the Adaptation Method Profile
        description </rdfs:comment>
      </rdf:Description>
```

```
<!--
Common properties
-->

<!--
Main Adaptation Method Profile Components
-->

<rdf:Description ID="AdaptationMethodResourceDescription">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
  <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
  <rdfs:comment>
  Consider the adaptation method as a resource and give a detailed description about it
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="AdaptationMethodDescription">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
  <rdfs:subClassOf rdf:resource="#ProfileComponent"/>
  <rdfs:comment>
  Describe tha capabilities of the adaptation method
  </rdfs:comment>
</rdf:Description>

<!--
 "Adaptation Method Resource Description" Profile Component
-->

<rdf:Description ID="ResourceType">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#AdaptationMethodResourceDescription"/>
  <rdfs:comment>
  Indicates the type of the adaptation method
  Example: XSLT style sheet
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceFormat">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#AdaptationMethodResourceDescription"/>
  <rdfs:comment>
  The format of the adaptation method file
  Example: xsl
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceName">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#AdaptationMethodResourceDescription"/>
  <rdfs:comment>
  The name of the adaptation method file
  Example: XML2LaTeX.xsl
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceSize">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#AdaptationMethodResourceDescription"/>
  <rdfs:comment>
  The size of the adaptation method file
  Example: 19568Bytes
  </rdfs:comment>
</rdf:Description>

<rdf:Description ID="ResourceLocation">
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
  <rdfs:domaine rdf:resource="#AdaptationMethodResourceDescription"/>
```

```
    <rdfs:comment>
    The local location of the adaptation method file
    Example: opera/people/Tayeb.Lemlouma/MULTIMEDIA/XSLT/
    </rdfs:comment>
  </rdf:Description>

  <rdf:Description ID="ResourceServer">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdfs:domaine rdf:resource="#AdaptationMethodResourceDescription"/>
    <rdfs:comment>
    The server that stores the adaptation method file
    Example: http://www.inrialpes.fr/
    </rdfs:comment>
  </rdf:Description>

  <!--
   "Adaptation Method Description" Profile Component
  -->

  <rdf:Description ID="SubAdaptationMethods">
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Property"/>
    <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Bag"/>
    <rdfs:domaine rdf:resource="#AdaptationMethodDescription"/>
    <rdfs:comment>
    This bag includes the list of possible adaptations that can be done using the global adaptation method.
    The description is given in terms of InputRequirements and OutputDescriptions of each submethod.
    InputRequirement can include specific constraints which must be respected befor the application of the
    adaptation
    </rdfs:comment>
  </rdf:Description>



</rdf:RDF>
```

b) Example

```
<?xml version="1.0"?>
<!-- Adaptation Method Profile: "server-profiles/XML2LaTeX-xsl-profile.xml" -->

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:ccpp="http://www.w3.org/2000/07/04-ccpp#"
xmlns:neg="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/AdaptationMethodProfileS
chema-03012002#">
    <rdf:Description ID="AdaptationMethodProfile">

      <ccpp:component>
          <rdf:Description ID="AdaptationMethodResourceDescription">
            <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/AdaptationMethodProfile
Schema-03012002#AdaptationMethodResourceDescription"/>
              <neg:ResourceType>XSLT style sheet</neg:ResourceType>
              <neg:ResourceFormat>xsl</neg:ResourceFormat>
              <neg:ResourceName>XML2LaTeX.xsl</neg:ResourceName>
              <neg:ResourceSize>19568Bytes</neg:ResourceSize>
              <neg:ResourceLocation>opera/people/Tayeb.Lemlouma/MULTIMEDIA/XSLT/
              </neg:ResourceLocation>
              <neg:ResourceServer>http://www.inrialpes.fr/</neg:ResourceServer>
          </rdf:Description>
      </ccpp:component>

      <ccpp:component>
          <rdf:Description ID="AdaptationMethodDescription">
            <rdf:type
rdf:resource="http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/NegotiationSchema/AdaptationMethodProfile
Schema-03012002#AdaptationMethodDescription"/>
```

```
                        <neg:SubAdaptationMethods>
                          <rdf:Bag>

                              <rdf:li rdf:parseType="Resource">
                                <neg:InputRequirements>
                                  <rdf:Bag>
                                    <rdf:li rdf:parseType="Resource">
                                     <neg:ResourceType>XML</neg:ResourceType>
                                     <neg:ResourceFormat>xml</neg:ResourceFormat>
                                     <neg:ResourceDTD>
                                      http://www.inrialpes.fr/opera/people/Tayeb.Lemlouma/MULTIMEDIA/
                                      XSLT/LaTeXDTD.dtd
                                     </neg:ResourceDTD>
                                    </rdf:li>
                                  </rdf:Bag>
                                    </neg:InputRequirements>

                                <neg:OutputDescription>
                                  <rdf:Bag>
                                    <rdf:li rdf:parseType="Resource">
                                     <neg:ResourceType>LATEX</neg:ResourceType>
                                     <neg:ResourceFormat>tex</neg:ResourceFormat>
                                    </rdf:li>
                                  </rdf:Bag>
                                    </neg:OutputDescription>
                              </rdf:li>

                          </rdf:Bag>
                        </neg:SubAdaptationMethods>
                  </rdf:Description>
            </ccpp:component>

          </rdf:Description>
</rdf:RDF>
```