

SERVICIOS WEB PARA LA CONVERSIÓN DE FORMATOS DE FACTURA ELECTRÓNICA (Facturae, UBL)

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DESCRIPCIÓN

Este documento describe dos procesos de conversión a través de servicios web entre los siguientes formatos de factura electrónica:

Facturae -> UBL 2.0

UBL 2.0 -> Facturae

AEAT-CCI 2.0 -> UBL 2.0

UBL 2.0 -> AEAT-CCI 2.0

El sistema realizado recibe un mensaje SOAP, realiza una transformación sobre el xml integrado en su "body" y devuelve otro mensaje SOAP con dicha transformación.

NOMENCLATURA

- 1) **Servicio XSLT.** Este es el módulo que se ejecutará en un motor las transformaciones indicadas. Además, en este módulo se asocia la descripción del servicio web.
- 2) **Aplicación compuesta:** Este módulo se usa para crear un ensamblaje de servicios que puedan ser desplegados a un servidor JBI (Java Business Integration).
- 3) **Glassfish:** Servidor de aplicaciones proyectado por Sun Microsystems que implementa las tecnologías definidas en la plataforma Java EE y permite ejecutar aplicaciones que siguen esta especificación.
- 4) **OpenESB:** Implementación de la JSR-208 (JBI). Extiende dicha especificación creando un "Enterprise Service Bus" (ESB) para múltiples instancias JBI.
- 5) **JBI define una parte de un ESB (Enterprise Service Bus),** el contenedor de servicios. El contenedor de servicios es el punto donde realmente ocurre la integración, los distintos recursos de tecnología de la información (protocolos, aplicaciones, ficheros de datos etc.) se convierte en proveedores de servicios, consumidores de servicios, o ambos. Los contenedores de servicios tienen que tratar con una gran variedad de tecnologías, y "mapear" a y desde modelos de servicios estándares.

JBI es una forma perfecta de construir dichos contenedores de servicios. Proporciona una arquitectura estandarizada para llevar la tecnología apropiada a realizar tareas particulares de integración. El modelo de servicio WSDL, integrado en JBI, se alinea perfectamente con los servicios de modelo estándar necesitados para el ESB.

REQUERIMIENTOS

Además de los paquetes incluidos con este documento, se requiere la instalación de:

Servidor de Aplicaciones GlassFish (utilizar una versión estable):

<https://glassfish.dev.java.net/public/downloadsindex.html>

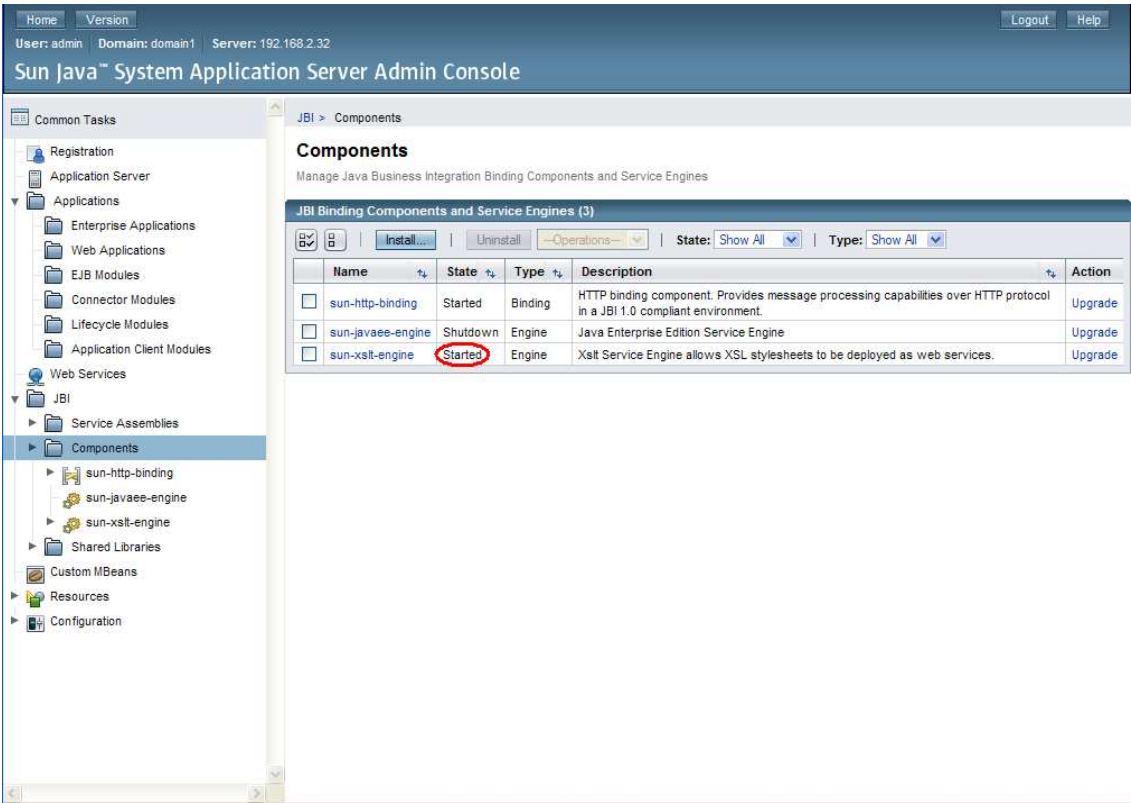
Componente sun-xslt-engine:

http://download.java.net/jbi/binaries/open-jbi-components/main/patches/Build070914_2/xsltpatch/xslt.zip

IMPLANTACIÓN

Una vez instalado glassfish, nos aseguraremos de que el componente sun-xsit-engine se está ejecutando.

Para ello, en la consola de administración de glassfish (por defecto en http://direccionIP_Servidor:4848/), chequearemos que está ejecutándose:



The screenshot shows the Sun Java System Application Server Admin Console. The left sidebar shows the navigation tree with 'Components' selected under 'JBI'. The main panel displays the 'Components' page for JBI Binding Components and Service Engines. A table lists three components:

Name	State	Type	Description	Action
sun-http-binding	Started	Binding	HTTP binding component. Provides message processing capabilities over HTTP protocol in a JBI 1.0 compliant environment.	Upgrade
sun-jaxee-engine	Shutdown	Engine	Java Enterprise Edition Service Engine	Upgrade
sun-xsit-engine	Started	Engine	Xslt Service Engine allows XSL stylesheets to be deployed as web services.	Upgrade

Si su estado no fuera "started", lo seleccionaríamos y en "Operations" seleccionaríamos "Start".

Si este módulo no existiera, descargarlo de la dirección especificada anteriormente, e instalarlo. Para ello, se utilizará la opción "install", especificando la ruta y el fichero descargado anteriormente, y siguiendo las instrucciones indicadas por la consola de administración del de aplicaciones.

Tras esto, es necesario instalar los paquetes de la aplicación.

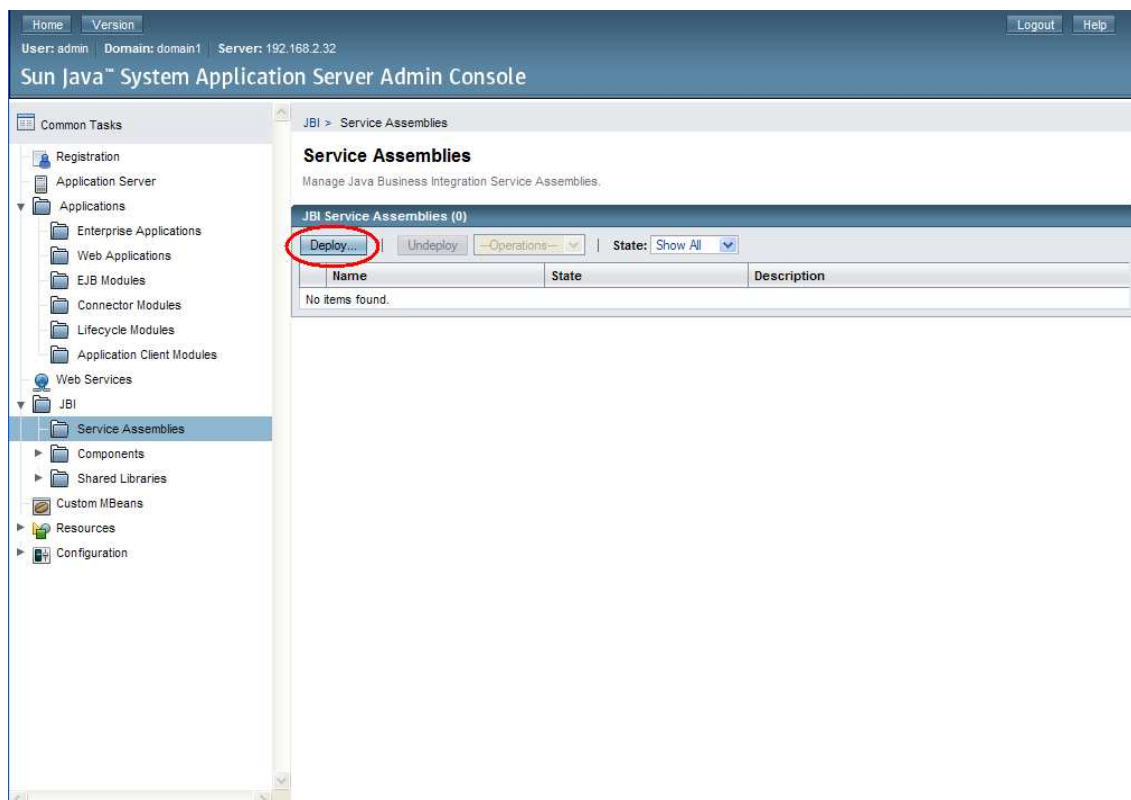
El producto se ha empaquetado para instalar sólo dos servicios JBI, uno para las dos conversiones a UBL 2.0 y otro para las dos conversiones desde UBL 2.0.

Los ficheros a utilizar son:

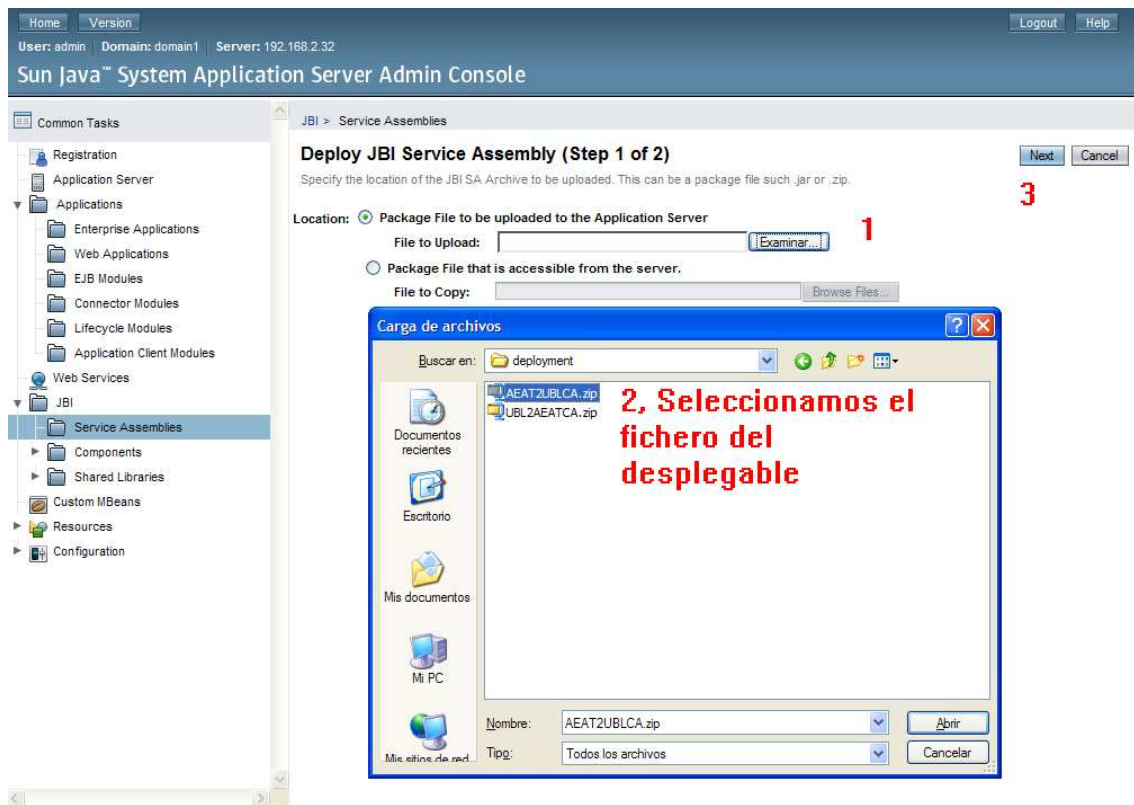
AEAT2UBLCA.zip para la conversión de formato Facturae y AEAT-CCI 2.0 a formato UBL 2.0.

UBL2AEATCA.zip para la conversión de formato UBL 2.0 a Facturae y a AEAT-CCI 2.0.

Para instalar cada uno de estos paquetes, seleccionaremos la opción “Deploy” dentro de JBI → Services Assemblies.



En la siguiente pantalla (bajo estas líneas), está la opción de “subir” los ficheros al servidor, o de utilizar ficheros locales (al servidor). En la implantación actual, utilizaremos la primera opción. Para ello, seleccionaremos “Examinar”, e indicaremos la ruta de uno de los ficheros (en este caso, AEAT2UBLCA.zip, aunque el orden carece de importancia):



En esta pantalla podemos especificar que si deseamos que el servicio esté activo por defecto. Para completar la instalación pulsaremos "Finish"

Con el otro fichero (UBL2AEATCA.zip) realizaremos la misma operación.

Cada Servicio XSLT consta de:

1 Definición de los esquemas (.xsd), que definen la estructura del mensaje entrante y del saliente. En el caso que nos ocupa, los mensajes entrante y saliente están definidos bien por OASIS, bien por el Gobierno de España.

2 Transformación XSL que defina las reglas a aplicar al mensaje de entrada, para obtener la salida deseada.

3 Interface Web Service, a través de un fichero wsdl (Web Services Description Language), que defina el formato de intercambio de mensajes del servicio web.

Los servicios XSLT están ensamblados en un tipo de módulo que puede ser ensamblado en el servidor JBI, mediante un proyecto de tipo Aplicación Compuesta.

Definimos la 4 operaciones, correspondientes a cada uno de las transformaciones a realizar.

El protocolo de comunicación usado por los dos servicios web es SOAP, y el transporte es "http" por ser de los más comunes.

Las operaciones son de tipo "Request-response" y tiene un estilo de tipo "document".

Facturae2UBL.wsdl

```
<?xml version="1.0" encoding="windows-1252"?>
<definitions name="facturae2UBL"
targetNamespace="http://j2ee.netbeans.org/wsdl/facturae2UBL"
xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://j2ee.netbeans.org/wsdl/facturae2UBL"
xmlns:ns="http://www.facturae.es/Facturae/2007/v3.0/Facturae"
xmlns:ns0="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
xmlns:plnk="http://docs.oasis-open.org/wsbpel/2.0/plnktype"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:ns2="http://www.w3.org/2000/09/xmldsig#">
  <types>
    <xsd:schema
targetNamespace="http://j2ee.netbeans.org/wsdl/facturae2UBL"
xmlns:ns2="http://www.w3.org/2000/09/xmldsig#">
      <xsd:import
namespace="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
schemaLocation="cs-UBL-2.0/xsd/maindoc/UBL-Invoice-2.0.xsd"/>
      <xsd:import
namespace="http://www.facturae.es/Facturae/2007/v3.0/Facturae"
schemaLocation="Facturae30.xsd"/>
      <xsd:import namespace="http://www.w3.org/2000/09/xmldsig#"
schemaLocation="www.w3.org/TR/2002/REC-xmldsig-core-
20020212/xmldsig-core-schema.xsd"/>
    </xsd:schema>
  </types>
  <message name="facturae2UBLRequest">
    <part name="facturae" element="ns:Facturae"/>
  </message>
  <message name="facturae2UBLReply">
    <part name="invoiceUBL" element="ns0:Invoice"/>
  </message>
  <portType name="facturae2UBLPortType">
    <operation name="facturae2UBL">
      <input name="input1" message="tns:facturae2UBLRequest"/>
      <output name="output1" message="tns:facturae2UBLReply"/>
    </operation>
  </portType>

```

```

</portType>
<binding name="facturae2UBLBinding"
type="tns:facturae2UBLPortType">
<soap:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
<operation name="facturae2UBL">
<soap:operation/>
<input name="input1">
<soap:body use="literal"/>
</input>
<output name="output1">
<soap:body use="literal"/>
</output>
</operation>
</binding>
<service name="facturae2UBLService">
<port name="facturae2UBLPort" binding="tns:facturae2UBLBinding">
<soap:address
location="http://localhost:18181/facturae2UBLService/facturae2UBLPort"/>
</port>
</service>
<plnk:partnerLinkType name="facturae2UBL1">
<!-- A partner link type is automatically generated when a new port
type is added. Partner link types are used by BPEL processes.

In a BPEL process, a partner link represents the interaction
between the BPEL process and a partner service. Each partner link
is associated with a partner link type.

A partner link type characterizes the conversational relationship
between two services. The partner link type can have one or two
roles.-->
<plnk:role name="facturae2UBLPortTypeRole"
portType="tns:facturae2UBLPortType"/>
</plnk:partnerLinkType>
</definitions>

```

UBL2facturae.wsdl

```
<?xml version="1.0" encoding="windows-1252"?>
<definitions name="UBL2facturae"
targetNamespace="http://j2ee.netbeans.org/wsdl/UBL2facturae"
xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://j2ee.netbeans.org/wsdl/UBL2facturae"
xmlns:ns0="http://www.facturae.es/Facturae/2007/v3.0/Facturae"
xmlns:ns="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
xmlns:plnk="http://docs.oasis-open.org/wsbpel/2.0/plnktype"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:ns2="http://www.w3.org/2000/09/xmldsig#">
<types>
<xsd:schema
targetNamespace="http://j2ee.netbeans.org/wsdl/UBL2facturae"
xmlns:ns2="http://www.w3.org/2000/09/xmldsig#">
<xsd:import
namespace="http://www.facturae.es/Facturae/2007/v3.0/Facturae"
schemaLocation="Facturae30.xsd"/>
<xsd:import
namespace="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
schemaLocation="cs-UBL-2.0/xsd/maindoc/UBL-Invoice-2.0.xsd"/>
<xsd:import namespace="http://www.w3.org/2000/09/xmldsig#"
schemaLocation="www.w3.org/TR/2002/REC-xmldsig-core-
20020212/xmldsig-core-schema.xsd"/>
</xsd:schema>
</types>
<message name="UBL2facturaeRequest">
<part name="invoiceUBL" element="ns:Invoice"/>
</message>
<message name="UBL2facturaeReply">
<part name="facturae" element="ns0:Facturae"/>
</message>
<portType name="UBL2facturaePortType">
<operation name="UBL2facturae">
<input name="input1" message="tns:UBL2facturaeRequest"/>
<output name="output1" message="tns:UBL2facturaeReply"/>
</operation>
```

```

</portType>
<binding name="UBL2facturaeBinding"
type="tns:UBL2facturaePortType">
<soap:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
<operation name="UBL2facturae">
<soap:operation/>
<input name="input1">
<soap:body use="literal"/>
</input>
<output name="output1">
<soap:body use="literal"/>
</output>
</operation>
</binding>
<service name="UBL2facturaeService">
<port name="UBL2facturaePort" binding="tns:UBL2facturaeBinding">
<soap:address
location="http://localhost:18181/UBL2facturaeService/UBL2facturaePo
rt"/>
</port>
</service>
<plnk:partnerLinkType name="UBL2facturae1">
<!-- A partner link type is automatically generated when a new port
type is added. Partner link types are used by BPEL processes.

In a BPEL process, a partner link represents the interaction
between the BPEL process and a partner service. Each partner link
is associated with a partner link type.

A partner link type characterizes the conversational relationship
between two services. The partner link type can have one or two
roles.-->
<plnk:role name="UBL2facturaePortTypeRole"
portType="tns:UBL2facturaePortType"/>
</plnk:partnerLinkType>
</definitions>

```

AEATCCI2UBL.wsdl

```
<?xml version="1.0" encoding="windows-1252"?>
<definitions name="AEATCCI2UBL"
targetNamespace="http://j2ee.netbeans.org/wsdl/AEATCCI2UBL"
xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://j2ee.netbeans.org/wsdl/AEATCCI2UBL"
xmlns:ns="http://www.asociacioncci.es/AEAT/2005/v2.0/eFactura_AEAT-CCI"
xmlns:ns0="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
xmlns:plnk="http://docs.oasis-open.org/wsbpel/2.0/plnktype"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:ns2="http://www.w3.org/2000/09/xmldsig#">
  <types>
    <xsd:schema
targetNamespace="http://j2ee.netbeans.org/wsdl/AEATCCI2UBL"
xmlns:ns2="http://www.w3.org/2000/09/xmldsig#">
      <xsd:import
namespace="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
schemaLocation="cs-UBL-2.0/xsd/maindoc/UBL-Invoice-2.0.xsd"/>
      <xsd:import
namespace="http://www.asociacioncci.es/AEAT/2005/v2.0/eFactura_AEAT-CCI"
schemaLocation="AEATCCIV_2_0.xsd"/>
      <xsd:import namespace="http://www.w3.org/2000/09/xmldsig#"
schemaLocation="www.w3.org/TR/2002/REC-xmldsig-core-20020212/xmldsig-core-schema.xsd"/>
    </xsd:schema>
  </types>
  <message name="AEATCCI2UBLRequest">
    <part name="part1" element="ns:eFactura_AEAT-CCI"/>
  </message>
  <message name="AEATCCI2UBLReply">
    <part name="invoice" element="ns0:Invoice"/>
  </message>
  <portType name="AEATCCI2UBLPortType">
    <operation name="AEATCCI2UBL">
      <input name="input1" message="tns:AEATCCI2UBLRequest"/>
      <output name="output1" message="tns:AEATCCI2UBLReply"/>
    </operation>
  </portType>

```

```

</operation>
</portType>
<binding name="AEATCCI2UBLBinding" type="tns:AEATCCI2UBLPortType">
  <soap:binding style="document"
    transport="http://schemas.xmlsoap.org/soap/http"/>
  <operation name="AEATCCI2UBL">
    <soap:operation/>
    <input name="input1">
      <soap:body use="literal"/>
    </input>
    <output name="output1">
      <soap:body use="literal"/>
    </output>
  </operation>
</binding>
<service name="AEATCCI2UBLService">
  <port name="AEATCCI2UBLPort" binding="tns:AEATCCI2UBLBinding">
    <soap:address
      location="http://localhost:18181/AEATCCI2UBLService/AEATCCI2UBLPort"
    />
  </port>
</service>
<plnk:partnerLinkType name="AEATCCI2UBL1">
  <!-- A partner link type is automatically generated when a new port
  type is added. Partner link types are used by BPEL processes.

  In a BPEL process, a partner link represents the interaction
  between the BPEL process and a partner service. Each partner link
  is associated with a partner link type.

  A partner link type characterizes the conversational relationship
  between two services. The partner link type can have one or two
  roles.-->
  <plnk:role name="AEATCCI2UBLPortTypeRole"
    portType="tns:AEATCCI2UBLPortType"/>
</plnk:partnerLinkType>
</definitions>

```

UBL2AEATCCI.wsdl

```
<?xml version="1.0" encoding="windows-1252"?>
<definitions name="UBL2AEATCCI"
targetNamespace="http://j2ee.netbeans.org/wsdl/UBL2AEATCCI"
xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://j2ee.netbeans.org/wsdl/UBL2AEATCCI"
xmlns:ns0="http://www.asociacioncci.es/AEAT/2005/v2.0/eFactura_AEAT-CCI"
xmlns:ns="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
xmlns:plnk="http://docs.oasis-open.org/wsbpel/2.0/plnktype"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:ns2="http://www.w3.org/2000/09/xmldsig#">
<types>
<xsd:schema
targetNamespace="http://j2ee.netbeans.org/wsdl/UBL2AEATCCI"
xmlns:ns2="http://www.w3.org/2000/09/xmldsig#">
<xsd:import
namespace="http://www.asociacioncci.es/AEAT/2005/v2.0/eFactura_AEAT-CCI" schemaLocation="AEATCCIV_2_0.xsd"/>
<xsd:import
namespace="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
schemaLocation="cs-UBL-2.0/xsd/maindoc/UBL-Invoice-2.0.xsd"/>
<xsd:import namespace="http://www.w3.org/2000/09/xmldsig#"
schemaLocation="www.w3.org/TR/2002/REC-xmldsig-core-20020212/xmldsig-core-schema.xsd"/>
</xsd:schema>
</types>
<message name="UBL2AEATCCIRequest">
<part name="invoice" element="ns:Invoice"/>
</message>
<message name="UBL2AEATCCIReply">
<part name="efactura" element="ns0:eFactura_AEAT-CCI"/>
</message>
<portType name="UBL2AEATCCIPortType">
<operation name="UBL2AEATCCI">
<input name="input1" message="tns:UBL2AEATCCIRequest"/>
<output name="output1" message="tns:UBL2AEATCCIReply"/>
</operation>
```



```

</portType>
<binding name="UBL2AEATCCIBinding" type="tns:UBL2AEATCCIPortType">
  <soap:binding style="document"
    transport="http://schemas.xmlsoap.org/soap/http"/>
  <operation name="UBL2AEATCCI">
    <soap:operation/>
    <input name="input1">
      <soap:body use="literal"/>
    </input>
    <output name="output1">
      <soap:body use="literal"/>
    </output>
  </operation>
</binding>
<service name="UBL2AEATCCIService">
  <port name="UBL2AEATCCIPort" binding="tns:UBL2AEATCCIBinding">
    <soap:address
      location="http://localhost:18181/UBL2AEATCCIService/UBL2AEATCCIPort"
    />
  </port>
</service>
<plnk:partnerLinkType name="UBL2AEATCCI1">
  <!-- A partner link type is automatically generated when a new port
  type is added. Partner link types are used by BPEL processes.

  In a BPEL process, a partner link represents the interaction
  between the BPEL process and a partner service. Each partner link
  is associated with a partner link type.

  A partner link type characterizes the conversational relationship
  between two services. The partner link type can have one or two
  roles.-->
  <plnk:role name="UBL2AEATCCIPortTypeRole"
    portType="tns:UBL2AEATCCIPortType"/>
</plnk:partnerLinkType>
</definitions>

```

Opciones sobre la firma digital en la conversión de facturas

Introducción

La legislación vigente en España obliga a que las facturas estén firmadas. Además, se establece que el destinatario de la factura es tiene la obligación de verificar la validez de la firma y, por tanto, el certificado firmante.

En el caso que nos ocupa, el de la conversión de facturas entre los formatos facturae y UBL, hemos definido 3 escenarios de aplicación

Firma en puesto cliente

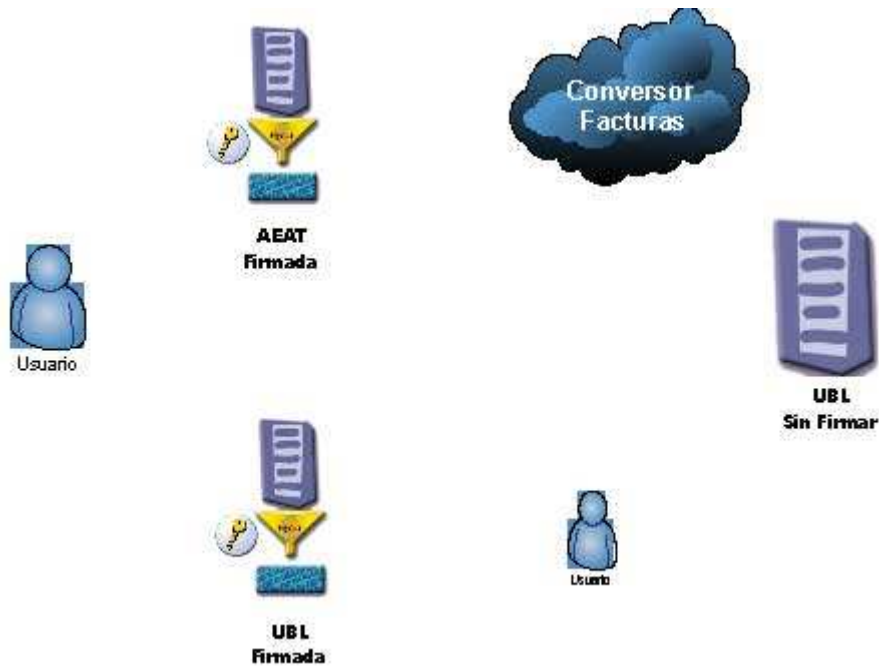
Objetivo

En esta opción la firma digital es realizada por la persona poseedora de la factura y solicitante del servicio de conversión. En este caso ambas facturas Facturae y UBL, son firmadas con un certificado válido.

Implementación

- 1) Se firma la factura Facturae en el PC local, con un certificado personal instalado en su máquina.
- 2) Se envía la factura al conversor el cual se la devuelve al cliente sin firmar, con formato UBL.
- 3) El cliente firma de nuevo la factura con formato UBL con su ordenador Local.
- 4) La factura UBL tiene la misma firma válida que la original en AEAT.

Este proceso es extrapolable a cualquier conversión, aunque por simplicidad se ha indicado sólo el proceso de Facturae a UBL 2.0.



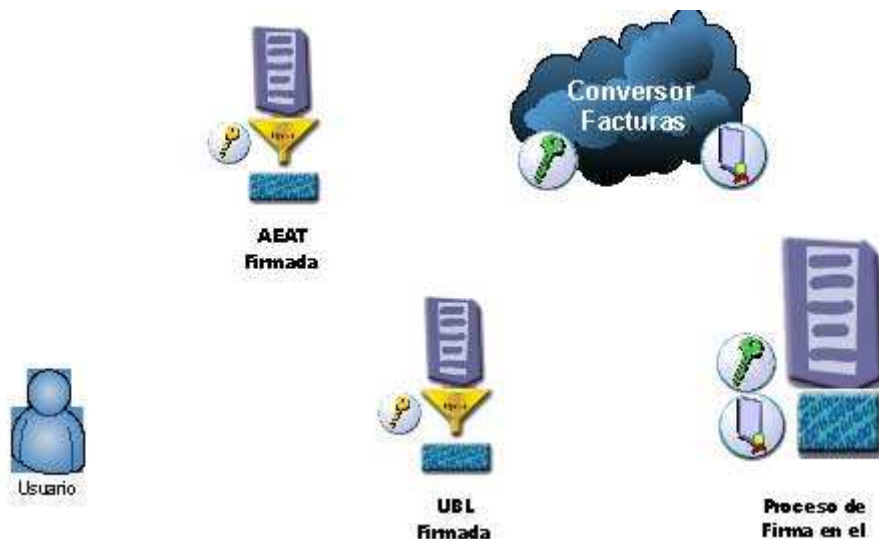
UBL con AEAT incrustada

Objetivo

En esta opción la factura UBL no está firmada, pero incorpora en un campo la factura AEAT inicial, la cual si debería incluir la firma antes de la conversión.

Implementación

- 1) La factura en Formato AEAT es firmada en el ordenador Local.
- 2) Se envía la factura al conversor.
- 3) EL conversor transforma la factura a formato UBL e incrusta la primera factura firmada como parte del fichero UBL.
- 4) La factura UBL no está firmada, pero incorpora la factura AEAT original y firmada por si se necesitara una validación.



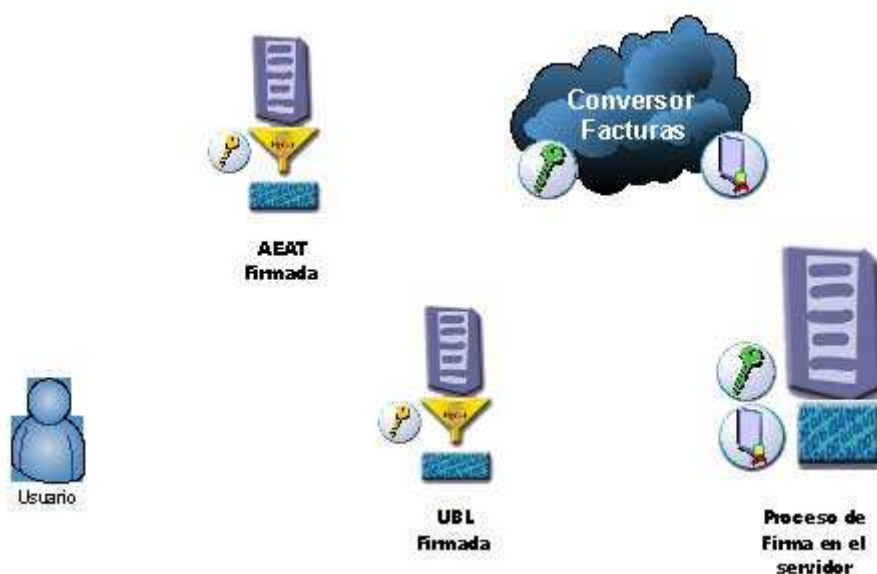
Firma con subfacturación

Objetivo

Para esta opción es necesario que previamente el que genera la factura delegue en un tercero, propietario del servidor, la capacidad de firma en su nombre y este entonces puede con su propio certificado instalado en el servidor, firmar las facturas UBL de forma válida. Esta opción denominada subfacturación es un caso contemplado por la actual legislación con lo que la firma del servidor sería válida a efectos legales.

Implementación

- 1) Factura AEAT Firmada en local se envía al conversor.
- 2) EL conversor firma la nueva factura UBL, usando un certificado instalado en el servidor.
- 3) La factura UBL está firmada por un tercero.



Resumen y Conclusiones

El primer escenario cumple completamente la legislación vigente, siendo el más recomendable por su sencillez de diseño y su versatilidad.

El segundo escenario, aunque podría ser defendible, no cumpliría la legislación vigente, ya que la factura resultante de la conversión no cumpliría la legislación vigente.

El tercer escenario cumple con la legislación vigente, aunque es difícil que se difunda ampliamente la idea de que una tercera parte tenga potestad para firmar documentos en nombre de otro.

Por todo ello, recomendamos la primera opción. Además, esta opción no es incompatible con la tercera, ya que una vez convertida la factura, puede enviarse a una tercera parte para que realice la firma.

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