

iVMS Interface to UK VMS Hub

iVMS-1.5

Issue 5 – 22/07/2021

CHRONOLOGY ISSUES

Issue/ Version	Date	Object
1.0	2020-01-17	Initial document
1.1	2020-10-07	Security measures detailed
1.2	2021-01-14	Details on GPS Quality
1.3	2021-04-01	Including Cipher suites, TLS version, https protocol
1.4	2021-04-15	Update of 2.3 return codes
1.5	2021-07-22	Addition of new Status codes (2.2.5)

LIST OF CONTENTS

1	Introduction.....	4
1.1	Subject of this document.....	4
2	Description of the Web Service	5
2.1	Method definitions.....	5
2.2	Object definitions.....	5
2.2.1	SupplierAuth – Suppliers Authentication	5
2.2.2	AssetReportType - Position and device event report.....	5
2.2.3	Asset - Vessel device	5
2.2.4	AssetPosition – Position.....	5
2.2.5	StatusCode – Enumeration of status	6
2.3	Return codes.....	6
3	Integration.....	8
3.1	Security.....	8
3.2	Throttling.....	8
3.3	Retry mechanism.....	8
4	Secure access to interface – Integration process.....	10
	Step 1 : Integrate with UK VMS Hub PREPROD.....	10
	Step 2 : Integrate with UK VMS Hub PROD.....	10
	Appendix A - Java example.....	11
	Appendix B - WSDL.....	12

1 Introduction

1.1 Subject of this document

The purpose of this document is to describe to iVMS providers how to interact with the iVMS web service provided by UK VMS Hub. This interface allows to submit position reports or other device events.

This document is confidential and shall only be distributed to authorities and technical partners involved in iVMS projects.

This interface is identical for every iVMS provider across the UKFAs.

This interface is dedicated to iVMS data reports.

iVMS device suppliers all report to this interface and are identified thanks to the unique pair of ID and PIN.

Supplier ID and PIN are communicated by the VMS Hub provider and are confidential to the iVMS provider, the VMS Hub supplier and the VMS authority.

2 Description of the Web Service

The Web Service is accessible via the published WSDL (ex in PREPROD <https://127.0.0.1/themislvmsWs?wsdl>) or reproduced in Appendix B - WSDL.

Only `AssetReport` is implemented. Any call to another method will return an HTTP 500 "Not implemented".

2.1 Method definitions

```
public VMSReturn assetReport(SupplierAuth auth, AssetReportType report)
```

Call this method to report a position and/or other device events.

2.2 Object definitions

The following is an explanation for the data fields contained in the wsdl of this SOAP interface.

2.2.1 SupplierAuth – Suppliers Authentication

SupplierID	Supplier identifier
SupplierPIN	Supplier PIN

2.2.2 AssetReportType - Position and device event report

SupplierTimestamp	The time the device supplier received the report from their IVMS device.
ReportReason	Reason for report: "Position", "Zone Entry", "Zone Exit", "Event".
StatusCode	See here after
Channel	Only RC_GPRS other values are ignored
Asset	See here after
Position	See here after
ZoneID	Beacon zone id

2.2.3 Asset - Vessel device

AssetName	The name of the vessel
CallSign	The vessel radio Call Sign
DeviceID	The device identifier

2.2.4 AssetPosition – Position

Latitude	Geographical latitude (decimal degrees)
Longitude	Geographical longitude (decimal degrees)
Course	Course over Ground (degrees, 0;360)

Speed	Speed over Ground (knots)
GPSQuality	Authorized values are: 3D fix, 2D fix, No fix Empty values or absence of the field are accepted and considered No fix
DeviceTimestamp	Timestamp of position report

2.2.5 StatusCode – Enumeration of status

SC_EXT_POWER_LOSS	Disconnected from main power
SC_EXT_POWER_RESTORED	Reconnected to main power
SC_GPS_LOST	Loss of GPS signal
SC_LOW_BATTERY	Low battery
SC_NETWORK_LOSS	Loss of GSM signal
SC_POSITION_LATE	Late position
SC_TAMPER	Hardware Tamper
SC_NULL	No status code.
SC_IN_PORT	Vessel in port
SC_LEAVE_PORT	Vessel left port
SC_EXIT_SLEEP	Exit from sleep mode
SC_SATELLITE_LOSS	Loss of satellite signal

2.3 Return codes

Code	Text	Comment
0	Unknown Supplier Auth	When the couple supplierID and SupplierPIN is not known
0	Empty data field: 'SupplierID'	When SupplierID is null
0	Empty data field: 'SupplierPIN'	When SupplierPIN is null
0	Report is missing	When AssetReportType is null
0	Empty data field: 'SupplierTimestamp'	When SupplierTimestamp is null
0	Unknown report channel	When Channel is null or unknown
0	Unknown Status code	When StatusCode is null or unknown
0	Empty data field: 'DeviceId'	When Asset is null
0	Empty data field: {field_name}	When one mandatory field is missing
0	Corrupted Location data	When latitude is not in range $-90 < \text{Latitude} < 90$ When longitude is not in range $-180 < \text{Longitude} < 180$ When speed is not in range $0 \leq \text{speed} < 100$

		When course is not in range $0 \leq \text{course} < 360$ When DeviceTimestamp is after 1 day in the future.
1	OK	The report was correctly transmitted to UK VMS Hub.

Return message is:

Code:0

Text:Unknown Supplier Auth

3 Integration

3.1 Security

Interface will use only https protocol with TLS1.2 for security reason.

Self-signed certificates are not allowed to connect to either VMS Hub Preprod or PROD. Certificates shall always be issued from a valid Certificate Authority.

Certificates from the following cipher suites are the only ones accepted:

- TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f) ECDH x25519 (eq. 3072 bits RSA) FS128
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 (0xc030) ECDH x25519 (eq. 3072 bits RSA) FS256
- TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256 (0xc0ca8) ECDH x25519 (eq. 3072 bits RSA) FS256

3.2 Throttling

On the server-side of the iVMS interface, throttling is enabled.

If too many messages are sent from a single IP address, interface will return HTTP code 429.

Throttling parameters are as follows :

	VMS Hub platform	
	PREPROD	PROD
Nominal limit	1 request per second	5 requests per second
Burst mode limit	5 requests per second	25 requests per second

Burst is the sense of our webserver is defined as :

The `burst` parameter defines how many requests a client can make in excess of the nominal rate specified by the zone.

For example, in PROD, VMS Hub will accept the messages if iVMS providers sends up to 5 request a second. Once that limit is reached and even more requests are sent, up to 25 a second, the messages are queued up, and interface will return a 429 http code. However, if this limit is in turn exceeded, the interface will return a 503 http code.

It is crucial that the iVMS providers take this limitation into account in the implementation.

3.3 Retry mechanism

In order to prevent any loss in data during transmission from iVMS providers to UK VMS Hub, it is crucial that the iVMS provider builds a mechanism that tries to resend the data to UK VMS Hub.

Any time a message is not delivered to UK VMS Hub because of another reason than the ones expressed in 2.3, the message shall be resent to UK VMS Hub.

VMS Hub Supplier recommends a mixture of short and long retries. For example: 3 short retries with a 5-minute period and 3 long retries with a 1-hour period.

If a dual mechanism cannot be implemented, VMS Hub Supplier recommends 3 retries with a 20-minute period.

It goes without saying that said mechanism shall not try to resend the data indefinitely. Mechanism has to be stopped by the iVMS providers as not to saturate the iVMS interface.

4 Secure access to interface – Integration process

In order to integrate UK VMS Hub with your data. The steps below have to be completed:

Step 1 : Integrate with UK VMS Hub PREPROD.

Service URL : <https://127.0.0.1/themislvmsWs>

To be able to connect provider to UK VMS Hub PROD, VMS Hub Supplier needs from the iVMS provider a Certificate Signing Request (CSR) to be issued to VMS Hub Supplier.

In return, VMS Hub Supplier will communicate:

- A Certificate dedicated to the iVMS provider along with Certificate Authority (CA) certificate. This Certificate shall be used to establish a SSL 2way connection.
- ID and PIN (see 2.2.1).

In this step, VMS Hub Supplier and iVMS data provider shall perform 2 tests :

- Unit test : in order to make sure that one single device can report all types of information on the iVMS correctly.
- Fleet test : to make sure that several devices can report all at once. Number of reports sent by the provider are to be compared to the number of reports received by the VMS Hub.

Step 2 : Integrate with UK VMS Hub PROD.

Service URL delivered after PREPROD acceptance.

To be able to connect provider to UK VMS Hub PROD, VMS Hub Supplier needs from the iVMS provider another Certificate Signing Request (CSR) to be issued to VMS Hub Supplier.

In return, VMS Hub Supplier will communicate :

- A Certificate dedicated to the iVMS provider along with Certificate Authority (CA) certificate. This Certificate shall be used to establish a SSL 2way connection.
- ID and PIN (see 2.2.1).

In this step, VMS Hub Supplier and iVMS data provider shall perform 2 same tests as above. If both parties agree, as well as the VMS authority, unit test can be skipped.

Appendix A - Java example

```
public static void assetReport(final String device, final double latitude, final double
longitude, final int course, final double speed)
    throws DatatypeConfigurationException {
    final SupplierAuth auth = new SupplierAuth();
    auth.setSupplierID(1);
    auth.setSupplierPIN("gdjFM9xM");

    final Asset asset = new Asset();
    asset.setDeviceID(device);
    final AssetReportType report = new AssetReportType();
    report.setAsset(asset);
    final AssetPosition position = new AssetPosition();
    position.setLatitude(latitude);
    position.setLongitude(longitude);
    position.setCourse(course);
    position.setSpeed(speed);

    position.setDeviceTimestamp(DatatypeFactory.newInstance().newXMLGregorianCalendar(new
GregorianCalendar()));
    report.setPosition(position);
    report.setReportReason("Position");
    report.setStatusCode(StatusCode.SC_NULL);
    report.setZoneID(0);
    report.setChannel(ReportChannel.RC_GPRS);
    report.setFlag(ReportFlag.RF_NATIONAL);

    report.setSupplierTimestamp(DatatypeFactory.newInstance().newXMLGregorianCalendar(new
GregorianCalendar()));

    final JaxWsProxyFactoryBean proxyFactory = new JaxWsProxyFactoryBean();
    proxyFactory.setServiceClass(IVMSServiceSoap.class);
    proxyFactory.setAddress("http://localhost:1080/themisIvmsWs");
    final IVMSServiceSoap port = (IVMSServiceSoap) proxyFactory.create();
    final VMSReturn result = port.assetReport(auth, report);
    System.out.println(result.getText());
}

public static void main(final String[] args) throws Exception {
    final String device = "1147379";
    assetReport(device, 43.53604, 1.50341, 100, 2.2894167201914737);
}
```

Appendix B - WSDL

WSDL is reproduced here for clarity, the only applicable WSDL is the one provided on the endpoint to which the VMS Hub Supplier granted access to the iVMS provider.

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/" xmlns:tns="http://tempuri.org/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/" targetNamespace="http://tempuri.org/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified" targetNamespace="http://tempuri.org/">
      <s:element name="GetAssets">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="Auth" type="tns:SupplierAuth" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="SupplierAuth">
        <s:sequence>
          <s:element minOccurs="1" maxOccurs="1" name="SupplierID" type="s:int" />
          <s:element minOccurs="0" maxOccurs="1" name="SupplierPIN" type="s:string" />
        </s:sequence>
      </s:complexType>
      <s:element name="GetAssetsResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetAssetsResult" type="tns:ArrayOfAsset" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="ArrayOfAsset">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="Asset" nillable="true"
type="tns:Asset" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="Asset">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="AssetName" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="CallSign" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="RegNumber" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="PLN" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="DeviceID" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="VMSID" type="s:unsignedLong" />
        </s:sequence>
      </s:complexType>
      <s:element name="GetAssetReports">
        <s:complexType>
```

```

    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="Auth" type="tns:SupplierAuth" />
      <s:element minOccurs="0" maxOccurs="1" name="asset" type="tns:Asset" />
      <s:element minOccurs="1" maxOccurs="1" name="FromDate" type="s:dateTime" />
      <s:element minOccurs="1" maxOccurs="1" name="ToDate" type="s:dateTime" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="GetAssetReportsResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="GetAssetReportsResult"
type="tns:ArrayOfAssetReport" />
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:complexType name="ArrayOfAssetReport">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="unbounded" name="AssetReport" nillable="true"
type="tns:AssetReportType" />
      </s:sequence>
    </s:complexType>
  </s:complexType name="AssetReportType">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="Asset" type="tns:Asset" />
      <s:element minOccurs="0" maxOccurs="1" name="Position" type="tns:AssetPosition" />
      <s:element minOccurs="1" maxOccurs="1" name="SupplierTimestamp" type="s:dateTime" />
      <s:element minOccurs="0" maxOccurs="1" name="ReportReason" type="s:string" />
      <s:element minOccurs="1" maxOccurs="unbounded" name="StatusCode" type="tns:StatusCode"
/>
      <s:element minOccurs="1" maxOccurs="1" name="ZoneID" type="s:int" />
      <s:element minOccurs="1" maxOccurs="1" name="Channel" type="tns:ReportChannel" />
      <s:element minOccurs="1" maxOccurs="1" name="Flag" type="tns:ReportFlag" />
      <s:element minOccurs="1" maxOccurs="1" name="SupplierReportID" type="s:unsignedLong" />
      <s:element minOccurs="1" maxOccurs="1" name="VMSReportID" type="s:unsignedLong" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="AssetPosition">
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="Latitude" type="s:double" />
      <s:element minOccurs="1" maxOccurs="1" name="Longitude" type="s:double" />
      <s:element minOccurs="1" maxOccurs="1" name="Course" type="s:int" />
      <s:element minOccurs="1" maxOccurs="1" name="Speed" type="s:double" />
      <s:element minOccurs="0" maxOccurs="1" name="GPSQuality" type="s:string" />
      <s:element minOccurs="1" maxOccurs="1" name="DeviceTimestamp" type="s:dateTime" />
    </s:sequence>
  </s:complexType>
  <s:simpleType name="StatusCode">
    <s:restriction base="s:string">
      <s:enumeration value="SC_NULL" />
      <s:enumeration value="SC_EXT_POWER_LOSS" />
      <s:enumeration value="SC_EXT_POWER_RESTORED" />
      <s:enumeration value="SC_LOW_BATTERY" />
      <s:enumeration value="SC_NETWORK_LOSS" />
      <s:enumeration value="SC_GPS_LOST" />
      <s:enumeration value="SC_TAMPER" />
    </s:restriction>
  </s:simpleType>

```

```

    <s:enumeration value="SC_POSITION_LATE" />
    <s:enumeration value="SC_IN_PORT" />
    <s:enumeration value="SC_LEAVE_PORT" />
    <s:enumeration value="SC_EXIT_SLEEP" />
    <s:enumeration value="SC_SATELLITE_LOSS"/>
  </s:restriction>
</s:simpleType>
<s:simpleType name="ReportChannel">
  <s:restriction base="s:string">
    <s:enumeration value="RC_GPRS" />
    <s:enumeration value="RC_Satellite" />
  </s:restriction>
</s:simpleType>
<s:simpleType name="ReportFlag">
  <s:restriction base="s:string">
    <s:enumeration value="RF_National" />
    <s:enumeration value="RF_EU" />
  </s:restriction>
</s:simpleType>
<s:element name="AssetReport">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="Auth" type="tns:SupplierAuth" />
      <s:element minOccurs="0" maxOccurs="1" name="Report" type="tns:AssetReportType" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="AssetReportResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="AssetReportResult" type="tns:VMSReturn" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:complexType name="VMSReturn">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="Code" type="s:unsignedLong" />
    <s:element minOccurs="0" maxOccurs="1" name="Text" type="s:string" />
  </s:sequence>
</s:complexType>
<s:element name="AddAsset">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="Auth" type="tns:SupplierAuth" />
      <s:element minOccurs="0" maxOccurs="1" name="asset" type="tns:Asset" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="AddAssetResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="AddAssetResult" type="tns:VMSReturn" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="RemoveDevice">

```

```

    <s:complexType>
      <s:sequence>
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        <s:element minOccurs="0" maxOccurs="1" name="asset" type="tns:Asset" />
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:element name="RemoveDeviceResponse">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="RemoveDeviceResult" type="tns:VMSReturn"
/>
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:element name="AddDevice">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="Auth" type="tns:SupplierAuth" />
        <s:element minOccurs="0" maxOccurs="1" name="asset" type="tns:Asset" />
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:element name="AddDeviceResponse">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="AddDeviceResult" type="tns:VMSReturn" />
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:element name="UpdateAsset">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="Auth" type="tns:SupplierAuth" />
        <s:element minOccurs="0" maxOccurs="1" name="asset" type="tns:Asset" />
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:element name="UpdateAssetResponse">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="UpdateAssetResult" type="tns:VMSReturn" />
      </s:sequence>
    </s:complexType>
  </s:element>
</s:schema>
</wsdl:types>
<wsdl:message name="GetAssetsSoapIn">
  <wsdl:part name="parameters" element="tns:GetAssets" />
</wsdl:message>
<wsdl:message name="GetAssetsSoapOut">
  <wsdl:part name="parameters" element="tns:GetAssetsResponse" />
</wsdl:message>
<wsdl:message name="GetAssetReportsSoapIn">
  <wsdl:part name="parameters" element="tns:GetAssetReports" />
</wsdl:message>

```

```

<wsdl:message name="GetAssetReportsSoapOut">
  <wsdl:part name="parameters" element="tns:GetAssetReportsResponse" />
</wsdl:message>
<wsdl:message name="AssetReportSoapIn">
  <wsdl:part name="parameters" element="tns:AssetReport" />
</wsdl:message>
<wsdl:message name="AssetReportSoapOut">
  <wsdl:part name="parameters" element="tns:AssetReportResponse" />
</wsdl:message>
<wsdl:message name="AddAssetSoapIn">
  <wsdl:part name="parameters" element="tns:AddAsset" />
</wsdl:message>
<wsdl:message name="AddAssetSoapOut">
  <wsdl:part name="parameters" element="tns:AddAssetResponse" />
</wsdl:message>
<wsdl:message name="RemoveDeviceSoapIn">
  <wsdl:part name="parameters" element="tns:RemoveDevice" />
</wsdl:message>
<wsdl:message name="RemoveDeviceSoapOut">
  <wsdl:part name="parameters" element="tns:RemoveDeviceResponse" />
</wsdl:message>
<wsdl:message name="AddDeviceSoapIn">
  <wsdl:part name="parameters" element="tns:AddDevice" />
</wsdl:message>
<wsdl:message name="AddDeviceSoapOut">
  <wsdl:part name="parameters" element="tns:AddDeviceResponse" />
</wsdl:message>
<wsdl:message name="UpdateAssetSoapIn">
  <wsdl:part name="parameters" element="tns:UpdateAsset" />
</wsdl:message>
<wsdl:message name="UpdateAssetSoapOut">
  <wsdl:part name="parameters" element="tns:UpdateAssetResponse" />
</wsdl:message>
<wsdl:portType name="IVMSServiceSoap">
  <wsdl:operation name="GetAssets">
    <wsdl:input message="tns:GetAssetsSoapIn" />
    <wsdl:output message="tns:GetAssetsSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetAssetReports">
    <wsdl:input message="tns:GetAssetReportsSoapIn" />
    <wsdl:output message="tns:GetAssetReportsSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="AssetReport">
    <wsdl:input message="tns:AssetReportSoapIn" />
    <wsdl:output message="tns:AssetReportSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="AddAsset">
    <wsdl:input message="tns:AddAssetSoapIn" />
    <wsdl:output message="tns:AddAssetSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="RemoveDevice">
    <wsdl:input message="tns:RemoveDeviceSoapIn" />
    <wsdl:output message="tns:RemoveDeviceSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="AddDevice">
    <wsdl:input message="tns:AddDeviceSoapIn" />
  </wsdl:operation>

```



```

    <wsdl:output message="tns:AddDeviceSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="UpdateAsset">
    <wsdl:input message="tns:UpdateAssetSoapIn" />
    <wsdl:output message="tns:UpdateAssetSoapOut" />
  </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="IVMSServiceSoap" type="tns:IVMSServiceSoap">
  <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="GetAssets">
    <soap:operation soapAction="http://tempuri.org/GetAssets" style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="GetAssetReports">
    <soap:operation soapAction="http://tempuri.org/GetAssetReports" style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="AssetReport">
    <soap:operation soapAction="http://tempuri.org/AssetReport" style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="AddAsset">
    <soap:operation soapAction="http://tempuri.org/AddAsset" style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="RemoveDevice">
    <soap:operation soapAction="http://tempuri.org/RemoveDevice" style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="AddDevice">
    <soap:operation soapAction="http://tempuri.org/AddDevice" style="document" />

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<wsdl:input>
  <soap:body use="literal" />
</wsdl:input>
<wsdl:output>
  <soap:body use="literal" />
</wsdl:output>
</wsdl:operation>
<wsdl:operation name="UpdateAsset">
  <soap:operation soapAction="http://tempuri.org/UpdateAsset" style="document" />
  <wsdl:input>
    <soap:body use="literal" />
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal" />
  </wsdl:output>
</wsdl:operation>
</wsdl:binding>
<wsdl:binding name="IVMSServiceSoap12" type="tns:IVMSServiceSoap">
  <soap12:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="GetAssets">
    <soap12:operation soapAction="http://tempuri.org/GetAssets" style="document" />
    <wsdl:input>
      <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap12:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="GetAssetReports">
    <soap12:operation soapAction="http://tempuri.org/GetAssetReports" style="document" />
    <wsdl:input>
      <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap12:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="AssetReport">
    <soap12:operation soapAction="http://tempuri.org/AssetReport" style="document" />
    <wsdl:input>
      <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap12:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="AddAsset">
    <soap12:operation soapAction="http://tempuri.org/AddAsset" style="document" />
    <wsdl:input>
      <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap12:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="RemoveDevice">

```

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<soap12:operation soapAction="http://tempuri.org/RemoveDevice" style="document" />
<wsdl:input>
  <soap12:body use="literal" />
</wsdl:input>
<wsdl:output>
  <soap12:body use="literal" />
</wsdl:output>
</wsdl:operation>
<wsdl:operation name="AddDevice">
  <soap12:operation soapAction="http://tempuri.org/AddDevice" style="document" />
  <wsdl:input>
    <soap12:body use="literal" />
  </wsdl:input>
  <wsdl:output>
    <soap12:body use="literal" />
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="UpdateAsset">
  <soap12:operation soapAction="http://tempuri.org/UpdateAsset" style="document" />
  <wsdl:input>
    <soap12:body use="literal" />
  </wsdl:input>
  <wsdl:output>
    <soap12:body use="literal" />
  </wsdl:output>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="IVMSService">
  <wsdl:port binding="tns:IVMSServiceSoap" name="IVMSServiceSoap">
    <soap:address location="http://localhost/themislvmsWs"/>
  </wsdl:port>
  <wsdl:port name="IVMSServiceSoap12" binding="tns:IVMSServiceSoap12">
    <soap12:address location="http://localhost:8080/themislvmsWs" />
  </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```