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Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
Telecommunication management;
Test management Integration Reference Point (IRP):
SOAP Solution Set (SS)
(Release 9)**



Keywords

GSM, UMTS, test, management

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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Test management Integration Reference Point (IRP), as identified below:

- 32.321: "Test management Integration Reference Point (IRP); Requirements"
- 32.322: "Test management Integration Reference Point (IRP): Information Service (IS)"
- 32.323: "Test management Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)"
- 32.325: "Test management Integration Reference Point (IRP): eXtensible Markup Language (XML) definitions"
- 32.327: "Test management Integration Reference Point (IRP): SOAP Solution Set (SS)"**

A 3G telecommunication network is composed of a multitude of different Network Elements (NE). For a successful operation of the network the operator must be provided with mechanisms allowing him to manage the network. These management activities can be grouped into several areas: configuration management, fault management, performance management, accounting management and security management.

A management function assisting in different high level management areas such as fault management and performance management is test management. The purpose of testing is to get information about the functionality and performance of the 3G managed network subject to the test.

The present document is part of a TS-family defining the Telecommunication Management (TM) of 3G systems. The TM principles are described in 3GPP TS 32.101 [5]. The TM architecture is described in 3GPP TS 32.102 [6]. The other specifications define the interface (Itf-N) between the managing system (manager), which is in general the Network Manager (NM) and the managed system (agent), which is either an Element Manager (EM) or the managed NE itself. The Itf-N is composed of a number of integration reference points (IRPs) defining the information in the agent that is visible for the manager, the operations that the manager may perform on this information and the notifications that are sent from the agent to the manager. One of these IRPs is the Test Management IRP.

Each IRP is specified by the requirements part, the IS part and at least one SS (e.g. CORBA SS).

1 Scope

The present document specifies the SOAP SS for the IRP whose semantics is specified in Test Management IRP IS (3GPP TS 32.322 [5]).

This Solution Set specification is related to 3GPP TS 32.322 V9.0.X.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".
- [3] 3GPP TS 32.102: "Telecommunication management; Architecture".
- [4] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".
- [5] 3GPP TS 32.322: "Telecommunication management; Test management Integration Reference Point (IRP): Information Service (IS)".
- [6] 3GPP TS 32.325: "Telecommunication management; Test management Integration Reference Point (IRP); eXtensible Markup Language (XML) definitions".
- [7] W3C SOAP 1.1 specification (<http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>)
- [8] W3C XPath 1.0 specification (<http://www.w3.org/TR/1999/REC-xpath-19991116>)
- [9] W3C WSDL 1.1 specification (<http://www.w3.org/TR/2001/NOTE-wsdl-20010315>)
- [10] W3C SOAP 1.2 specification (<http://www.w3.org/TR/soap12-part1/>)
- [11] 3GPP TS 32.307: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): SOAP solution set".
- [12] 3GPP TS 32.312: "Telecommunication management; Generic Integration Reference Point (IRP) management; Information Service (IS)".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1], 3GPP TS 32.101 [2], 3GPP TS 32.102 [3], 3GPP TS 32.150 [4] apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Test Category: one or more tests sharing a common purpose and similar characteristics

Tester Object (TO): managed object that is instantiated for the purpose of monitoring and controlling a test invocation. Each test invocation has one associated TO. TOs are created and deleted by managed objects with TARR functionality.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1], in 3GPP TS 32.101 [2], 3GPP TS 32.102 [3], 3GPP TS 32.150 [4], and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

NE	Network Element
NM	Network Management Center
TARR	Test Action Request Receiver
TO	Tester Object

4 Architectural features

4.1 General

The overall architectural feature of the Test management IRP is specified in 3GPP TS 32.322 [5]. This clause specifies features that are specific to the SOAP solution set.

The SOAP 1.1 specification [7] and WSDL 1.1 specification [9] are supported.

The SOAP 1.2 specification [10] is supported optionally.

This specification uses "document" style in WSDL file.

This specification uses "literal" encoding style in WSDL file.

The filter language used in the SS is the XPath Language (see W3C XPath 1.0 specification [8]). IRP Agents may throw a FilterComplexityLimit fault when a given filter is too complex.

Relevant definitions are imported from the Test management IRP XML definitions of 3GPP TS 32.325 [6].

This specification uses a number of namespace prefixes throughout that are listed in Table 4.1. 1.

Table 4.1.1: Prefixes and Namespaces used in this specification

PREFIX	NAMESPACE
(no prefix)	http://schemas.xmlsoap.org/wsdl/
soap	http://schemas.xmlsoap.org/wsdl/soap/
tmIRPSystem	http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#TMIRPSystem
tmIRPData	http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#TMIRPData
genericNm	http://www.3gpp.org/ftp/specs/archive/32_series/32.625#genericNm
genericIRPSystem	http://www.3gpp.org/ftp/Specs/archive/32_series/32.317/schema/32317/GenericIRPSystem
ntfIRPntfSystem	http://www.3gpp.org/ftp/Specs/archive/32_series/32.307/schema/32307/notification/NotificationIRPntfSystem

The WSDL structure is depicted in Figure 4.1.1 below, depicting port type, binding and service. The port type contains port type operations, which again contains input, output and fault messages. The binding contains binding operations, which have the same name as the port type operations. The binding connects to a port inside the service.

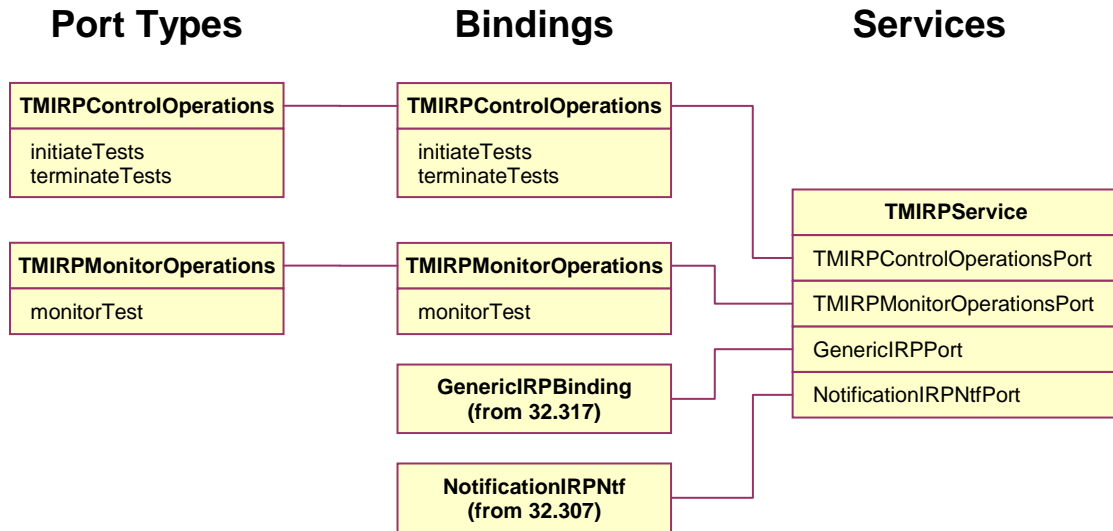


Figure 4.1.1: Test management IRP SOAP Solution Set WSDL structure

5 Mapping

5.1 Operation and notification mapping

The Test management IRP IS (3GPP TS 32.322 [5]) defines semantics of operation and notification visible across the Itf-N. Table 5.1.1 indicates mapping of these operations and notifications to their equivalents defined in this SS.

Table 5.1.1: Mapping from IS Operation to SS Equivalents

IS Operations in 3GPP TS 32.322 [5]	SS Operations	SS Port	Qualifier
initiateTests	initiateTests	TMIRPControlOperationsPort	M
terminateTests	terminateTests	TMIRPControlOperationsPort	M
monitorTest	monitorTest	TMIRPMonitorOperationsPort	M
notifyFilePreparationError	notify (note 1)	NotificationIRPNtfPort	M
NOTE 1: The IS equivalent maps to an XML definition specified in 3GPP TS 32.325 [5], and this being an input parameter to the operation notify under the port type ntfIRPNtfSystem:NotificationIRPNtf and under the binding ntfIRPNtfSystem:NotificationIRPNtf of 3GPP TS 32.307 [11].			

5.2 Operation parameter mapping

The Test management IRP IS (3GPP TS 32.322 [5]) defines semantics of parameters carried in the operations. The tables below show the mapping of these parameters, as per operation, to their equivalents defined in this SS.

Table 5.2.1: Mapping from IS initiateTests parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
testInvocationInitiator	testInvocationInitiator	M
toBeInitiatedTests	toBeInitiatedTests	M
response	response	M

Table 5.2.2: Mapping from IS `terminateTests` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
<code>toBeTerminatedTests</code>	<code>toBeTerminatedTests</code>	M
<code>response</code>	<code>response</code>	M

Table 5.2.3: Mapping from IS `monitorTest` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
<code>toBeMonitoredTO</code>	<code>toBeMonitoredTO</code>	M
<code>monitoredAttributeValues</code>	<code>monitoredAttributeValues</code>	M
<code>error</code>	<code>error</code>	M

5.3 Notification parameter mapping

The Test management IRP Notifications are defined in 32.325 [6].

Annex A (normative): WSDL specifications

```

<?xml version="1.0" encoding="UTF-8"?>
<!--
  3GPP TS 32.327 Test Management IRP SOAP Solution Set
-->
<definitions
  xmlns="http://schemas.xmlsoap.org/wsdl/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns:tmIRPSystem="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#TMIRPSystem"
  xmlns:tmIRPData="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#TMIRPData"
  xmlns:genericNrm="http://www.3gpp.org/ftp/specs/archive/32_series/32.625#genericNrm"
  xmlns:genericIRPSystem="http://www.3gpp.org/ftp/Specs/archive/32_series/32.317/schema/32317-810/GenericIRPSystem"
  xmlns:ntfIRPNTfSystem="http://www.3gpp.org/ftp/Specs/archive/32_series/32.307/schema/32307-810/notification/NotificationIRPNTfSystem"
  targetNamespace="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#TMIRPSystem">
  <import namespace="http://www.3gpp.org/ftp/Specs/archive/32_series/32.317/schema/32317-810/GenericIRPSystem"/>
  <import namespace="http://www.3gpp.org/ftp/Specs/archive/32_series/32.307/schema/32307-810/notification/NotificationIRPNTfSystem"/>
  <types>
    <schema targetNamespace="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#TMIRPData"
      xmlns="http://www.w3.org/2001/XMLSchema">
      <import namespace="http://www.3gpp.org/ftp/specs/archive/32_series/32.625#genericNrm"/>
      <!-- attributeNameValue Type -->
      <complexType name="attributeNameValueType">
        <sequence>
          <element name="attributeName" type="string"/>
          <element name="attributeValue" type="string"/>
        </sequence>
      </complexType>
      <!-- operationResult Type -->
      <simpleType name="operationResultType">
        <restriction base="string">
          <enumeration value="operationFailedEntirely"/>
          <enumeration value="operationFailedPartly"/>
          <enumeration value="operationSucceeded"/>
        </restriction>
      </simpleType>
      <!-- initiateTests Request -->
      <element name="initiateTestsRequest">
        <complexType>
          <sequence>
            <element name="testInvocationInitiator" type="genericNrm:dn"/>
            <element name="toBeInitiatedTests">
              <complexType>
                <sequence maxOccurs="unbounded">
                  <choice minOccurs="0">
                    <element name="maxTestingStateDuration" type="duration"/>
                    <element name="noLimitTestingStateDuration"/>
                  </choice>
                  <element name="toBeTestedMORT" type="genericNrm:dn" minOccurs="0"/>
                  <element name="testerObjectClass" type="genericNrm:dn"/>
                  <element name="testerObjectName" type="string" minOccurs="0"/>
                  <element name="testerObjectInitialAttributeList" minOccurs="0">
                    <complexType>
                      <sequence maxOccurs="unbounded">
                        <element name="initialAttribute"
type="tmIRPData:attributeNameValueType"/>
                      </sequence>
                    </complexType>
                  </element>
                </sequence>
              </complexType>
            </element>
          </sequence>
        </complexType>
      </element>
      <!-- initiateTests Response -->
      <element name="initiateTestsResponse">
        <complexType>
          <sequence>

```

```

<element name="initiateTestsResult" type="tmIRPData:operationResultType"/>
<element name="response">
  <complexType>
    <sequence maxOccurs="unbounded">
      <choice>
        <element name="testInitiated">
          <complexType>
            <sequence>
              <element name="testInvocationId" type="string"/>
              <element name="testerObjectName" type="string"
minOccurs="0"/>
            </sequence>
          </complexType>
        </element>
        <element name="testNotInitiated">
          <complexType>
            <sequence>
              <element name="failureReason">
                <simpleType>
                  <restriction base="string">
                    <enumeration value="TOClassNotExisting"/>
                    <enumeration value="MORTNotExisting"/>
                    <enumeration value="MORTNotAvailable"/>
                    <enumeration
value="operation_failed_invalid_input_parameter"/>
                    <enumeration
value="operation failed unsupported optional input parameter_maxTestingStateDuration"/>
                    <enumeration
value="operation_failed_unsupported_optional_input_parameter_noLimitTestingStateDuration"/>
                    <enumeration
value="operation_failed_unsupported_optional_input_parameter_toBeTestedMORT"/>
                    <enumeration
value="operation failed unsupported optional input parameter_testerObjectName"/>
                    <enumeration
value="operation_failed_unsupported_optional_input_parameter_testerObjectInitialAttributeList"/>
                    <enumeration
value="operation_failed_internal_problem"/>
                  </restriction>
                </simpleType>
              </element>
            </sequence>
          </complexType>
        </element>
      </choice>
    </sequence>
  </complexType>
</element>
<!-- initiateTests Fault -->
<element name="initiateTestsFault">
  <simpleType>
    <restriction base="string">
      <enumeration value="OperationFailed"/>
    </restriction>
  </simpleType>
</element>
<!-- terminateTests Request -->
<element name="terminateTestsRequest">
  <complexType>
    <sequence maxOccurs="unbounded">
      <element name="testInvocationId" type="string"/>
    </sequence>
  </complexType>
</element>
<!-- terminateTests Response -->
<element name="terminateTestsResponse">
  <complexType>
    <sequence>
      <element name="terminateTestsResult" type="tmIRPData:operationResultType"/>
      <element name="response">
        <complexType>
          <sequence maxOccurs="unbounded">
            <choice>
              <element name="testTerminated">
                <complexType>
                  <sequence>

```

```

        <element name="testInvocationId" type="string"/>
      </sequence>
    </complexType>
  </element>
  <element name="testNotTerminated">
    <complexType>
      <sequence>
        <element name="testInvocationId" type="string"/>
        <element name="failureReason">
          <simpleType>
            <restriction base="string">
              <enumeration value="testInvocationIdNotExisting"/>
              <enumeration
value="operation_failed_invalid_input_parameter"/>
              <enumeration
value="operation_failed_internal_problem"/>
            </restriction>
          </simpleType>
        </element>
      </sequence>
    </complexType>
  </element>
</choice>
</sequence>
</complexType>
</element>
</sequence>
</complexType>
</element>
<!-- terminateTests Fault -->
<element name="terminateTestsFault">
  <simpleType>
    <restriction base="string">
      <enumeration value="OperationFailed"/>
    </restriction>
  </simpleType>
</element>
<!-- monitorTest Request -->
<element name="monitorTestRequest">
  <complexType>
    <sequence>
      <element name="toBeMonitoredTO" type="genericNrm:dn"/>
    </sequence>
  </complexType>
</element>
<!-- monitorTest Response -->
<element name="monitorTestResponse">
  <complexType>
    <sequence>
      <element name="monitorTestResult" type="tmIRPData:operationResultType"/>
      <element name="monitoredAttributeValues" minOccurs="0">
        <complexType>
          <sequence>
            <element name="testState">
              <simpleType>
                <restriction base="string">
                  <enumeration value="notInitialized"/>
                  <enumeration value="idle"/>
                  <enumeration value="initializing"/>
                  <enumeration value="testing"/>
                  <enumeration value="terminating"/>
                  <enumeration value="disabled"/>
                </restriction>
              </simpleType>
            </element>
            <element name="testOutcome">
              <simpleType>
                <restriction base="string">
                  <enumeration value="pass"/>
                  <enumeration value="fail"/>
                  <enumeration value="inconclusive"/>
                  <enumeration value="timed-out"/>
                  <enumeration value="premature-termination"/>
                </restriction>
              </simpleType>
            </element>
          </sequence>
        </complexType>
      </element>
    </sequence>
  </complexType>
</element>
<sequence minOccurs="0" maxOccurs="unbounded">

```

```

        <element name="otherAttribute"
type="tmIRPData:attributeNameValueType"/>
    </sequence>
</sequence>
</complexType>
</element>
<element name="error">
    <complexType>
        <sequence>
            <element name="failureReason">
                <simpleType>
                    <restriction base="string">
                        <enumeration value="TOInstanceNotExisting"/>
                        <enumeration value="errorReadingAttribute"/>
                        <enumeration value="operation_failed_invalid_input_parameter"/>
                        <enumeration value="operation_failed_internal_problem"/>
                    </restriction>
                </simpleType>
            </element>
            <element name="errorInfo" type="string"/>
        </sequence>
    </complexType>
</element>
</sequence>
</complexType>
</element>
<!-- monitorTest Fault -->
<element name="monitorTestFault">
    <simpleType>
        <restriction base="string">
            <enumeration value="OperationFailed"/>
        </restriction>
    </simpleType>
</element>
</schema>
</types>
<message name="initiateTestsRequest">
    <part name="parameter" element="tmIRPData:initiateTestsRequest"/>
</message>
<message name="initiateTestsResponse">
    <part name="parameter" element="tmIRPData:initiateTestsResponse"/>
</message>
<message name="initiateTestsFault">
    <part name="parameter" element="tmIRPData:initiateTestsFault"/>
</message>
<message name="terminateTestsRequest">
    <part name="parameter" element="tmIRPData:terminateTestsRequest"/>
</message>
<message name="terminateTestsResponse">
    <part name="parameter" element="tmIRPData:terminateTestsResponse"/>
</message>
<message name="terminateTestsFault">
    <part name="parameter" element="tmIRPData:terminateTestsFault"/>
</message>
<message name="monitorTestRequest">
    <part name="parameter" element="tmIRPData:monitorTestRequest"/>
</message>
<message name="monitorTestResponse">
    <part name="parameter" element="tmIRPData:monitorTestResponse"/>
</message>
<message name="monitorTestFault">
    <part name="parameter" element="tmIRPData:monitorTestFault"/>
</message>
<portType name="TMIRPControlOperations">
    <operation name="initiateTests">
        <input message="tmIRPSystem:initiateTestsRequest"/>
        <output message="tmIRPSystem:initiateTestsResponse"/>
        <fault name="initiateTestsFault" message="tmIRPSystem:initiateTestsFault"/>
    </operation>
    <operation name="terminateTests">
        <input message="tmIRPSystem:terminateTestsRequest"/>
        <output message="tmIRPSystem:terminateTestsResponse"/>
        <fault name="terminateTestsFault" message="tmIRPSystem:terminateTestsFault"/>
    </operation>
</portType>
<portType name="TMIRPMonitorOperations">
    <operation name="monitorTest">
        <input message="tmIRPSystem:monitorTestRequest"/>

```

```

        <output message="tmIRPSystem:monitorTestResponse"/>
        <fault name="monitorTestFault" message="tmIRPSystem:monitorTestFault"/>
    </operation>
</portType>
<binding name="TMIRPCControlOperations" type="tmIRPSystem:TMIRPCControlOperations">
    <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
    <operation name="initiateTests">
        <soap:operation
soapAction="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#initiateTests" style="document"/>
        <input>
            <soap:body use="literal"/>
        </input>
        <output>
            <soap:body use="literal"/>
        </output>
        <fault name="initiateTestsFault">
            <soap:fault name="initiateTestsFault" use="literal"/>
        </fault>
    </operation>
    <operation name="terminateTests">
        <soap:operation
soapAction="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#terminateTests"
style="document"/>
        <input>
            <soap:body use="literal"/>
        </input>
        <output>
            <soap:body use="literal"/>
        </output>
        <fault name="terminateTestsFault">
            <soap:fault name="terminateTestsFault" use="literal"/>
        </fault>
    </operation>
</binding>
<binding name="TMIRPMonitorOperations" type="tmIRPSystem:TMIRPMonitorOperations">
    <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
    <operation name="monitorTest">
        <soap:operation
soapAction="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#monitorTest" style="document"/>
        <input>
            <soap:body use="literal"/>
        </input>
        <output>
            <soap:body use="literal"/>
        </output>
        <fault name="monitorTestFault">
            <soap:fault name="monitorTestFault" use="literal"/>
        </fault>
    </operation>
</binding>
<service name="TMIRPService">
    <port name="TMIRPCControlOperationsPort" binding="tmIRPSystem:TMIRPCControlOperations">
        <soap:address
location="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#TMIRPCControl"/>
    </port>
    <port name="TMIRPMonitorOperationsPort" binding="tmIRPSystem:TMIRPMonitorOperations">
        <soap:address
location="http://www.3gpp.org/ftp/Specs/archive/32_series/32.327#TMIRPMonitor"/>
    </port>
    <port name="GenericIRPPort" binding="genericIRPSystem:GenericIRPBinding">
        <soap:address
location="http://www.3gpp.org/ftp/Specs/archive/32_series/32.317#GenericIRP"/>
    </port>
    <port name="NotificationIRPNtfPort" binding="ntfIRPNtfSystem:NotificationIRPNtf">
        <soap:address
location="http://www.3gpp.org/ftp/Specs/archive/32_series/32.307#NotificationIRPNtf"/>
    </port>
</service>
</definitions>

```

Annex B (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	R	Subject/Comment	Cat	Old	New
2009-12	SA#46	SP-090726	--	--	Presentation to SA for Information	--	--	1.0.0
2010-03	SA#47	SP-100045	--	--	Presentation to SA for Approval	--	1.0.0	2.0.0
2010-03	--	--	--	--	Publication of SA approved version	--	2.0.0	9.0.0