

- Note: Replaced TMF 854 by MTOSI
- Issue: Removal of the Discovery Service
  - Need to write a section on the discovery/self-description of the deployed MTOSI WS
- Issue: Removal of the Use Case section
  - It does not provide any useful additional description of an MTOSI implementation.
  - All MTOSI operation definitions were driven from BA requirement/use case. May be we want traceability of an MTOSI service interface operation with use case(s)?
- Issue: Removal of the Profile section
  - It does not provide any useful additional description of an MTOSI existing implementation statement already captured by the other sections of this document (FIS templates, non FIS, use cases, etc)
- Vendor extensions should be in context
  - Vendor specific SI based on MTOSI WS DG
  - Vendor specific objects, events
  - Extensions of objects and events (attributes)
- Note: One would think it would be beneficial (efficient) to cover with one template the abstract class definitions (i.e. CommonObjectInfo). But the reality is the implementation of each one of these common object/event attributes is usually different (specialized differently for each object/event type). We only are interested in the final element view of a supported object or event.

## ABSTRACT

This document is the main template to use for the generation of the MTOSI Implementation Statement (MTOSI IS) of an OS product/solution that implements one or many of the DDP Interface Implementation Specifications (IIS) offered in MTOSI Release 2.0. Given that the implementation of MTOSI can be realized in different ways, this document is intended to provide guidance with the goal of ensuring interoperability among various vendor implementations.

This MTOSI IS, should be used in conjunction with:

- The *Business Agreement* (BA) of each MTOSI DDP,
- The Information Agreement (IA) of each MTOSI DDP, and
- The *Interface Implementation Specifications* (IIS) of each MTOSI DDP. In particular, the specific MTOSI DDP SD2-1 templates, which are to be used with this main document.

It is expected that this document will be used:

- To facilitate interface agreements between Service Providers and vendors
- As input to a service Provider's Request for Information / Request for Proposal (RFx)
- To allow operational support managers to compare their interface requirements with those identified by the project
- As input for companies developing COTS products.

**Note that the document contact, revision history and acknowledgements can be found at the end of this document.**

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## 1 Introduction

This document defines a set of conformance templates concerning the use of the MTOSI DDP IIS. Specifically, the interoperability statement templates provide a mechanism for OS vendors to precisely state their support for MTOSI and for service providers to precisely state their requirements for vendor support of MTOSI. The main goal of this document is to facilitate interoperability between parties supporting the MTOSI. **The material in this document is not prescriptive.**

### 1.1 How this document will be used

It is expected that this document will be used in several ways:

- (a) As a standard mechanism for service providers to request a specific subset of the MTOSI capabilities from their vendors
- (b) As a standard mechanism for a management system vendor to state the subset of MTOSI supporting in their product(s)
- (c) As a basis for an implementation agreement between 2 or more management system vendors.

### 1.2 Document Structure

The following is a summary of the sections of this document:

Section 1	Introduces the document
Section 2	Functional Interoperability Statements (FIS) is introduced in this section. An FIS is used to detail vendor support (or service provider requirements) for the functions in the TMF 854 interface.
<del>Section 2.4.9</del>	<del>This section is used to detail vendor support (or service provider requirements) concerning the use cases in TMF 517 [R3]. It is also possible to state support of or requirements for use cases beyond those in TMF 517.</del>
Section 4	This section provides templates for Non-functional Interoperability Statements (NIS). An NIS is used to describe how a function is supported rather than what functionality is supported. For example, an NIS could describe how long a client should wait for a response to an operation request.
<del>Section</del>	<del><b>Error! Reference source not found.</b> This section defines a set of profiles (i.e., subsets of the MTOSI XML Solution Set) that an OS supplier might use for their product.</del>
Appendix A	Set of references used to prepare this document.
Appendix B	Set of the standards referenced in this document.

### 1.3 Document Sources Map

The list of all document sources to be used to produce the MTOSI Implementation Statement of an MTOSI OS solution/product is as followed:

- **Framework (FMW): SD2-1\_MTOSI\_IS\_Main** (this document) includes:
  - The structure (skeleton) of the MTOSI IS
  - The templates of the MTOSI generic events defined in the FMW DDP

- The templates of the MTOSI generic service interfaces defined in the FMW DDP
- **Network Resource Basic (NRB): *SD2-1\_MTOSI\_IS\_NRB\_Addendum*** includes
  - The template of the NRB DDP defined MTOSI common attributes used by resource objects
- **Network Resource Assurance (NRA): *SD2-1\_MTOSI\_IS\_NRA\_Addendum*** includes
  - The templates of the MTOSI objects defined in the NRA DDP
- **Network Resource Fulfillment (NRF): *SD2-1\_MTOSI\_IS\_NRF\_Addendum*** includes
  - The templates of the MTOSI objects defined in the NRF DDP
- **Manage Resource Inventory (MRI): *SD2-1\_MTOSI\_IS\_MRI\_Addendum*** includes
  - The templates of the MTOSI service interfaces and operations defined in the MRI DDP
  - The templates of the MTOSI (inventory) events defined in the MRI DDP
- **Manage Service Inventory (MSI): *SD2-1\_MTOSI\_IS\_MSI\_Addendum*** includes
  - The templates of the MTOSI service interfaces and operations defined in the MSI DDP
  - The templates of the MTOSI (inventory) events defined in the MSI DDP
- **Resource Performance Management (RPM): *SD2-1\_MTOSI\_IS\_RPM\_Addendum*** includes
  - The templates of the MTOSI service interfaces and operations defined in the RPM DDP
  - The templates of the MTOSI events defined in the RPM DDP
- **Resource Provisioning (RP): *SD2-1\_MTOSI\_IS\_RP\_Addendum*** includes
  - The templates of the MTOSI service interfaces and operations defined in the RP DDP
  - The templates of the MTOSI events defined in the RP DDP
- **Resource Trouble Management (RTM): *SD2-1\_MTOSI\_IS\_RTM\_Addendum*** includes
  - The templates of the MTOSI service interfaces and operations defined in the RTM DDP
  - The templates of the MTOSI events defined in the RTM DDP
- **Service Basic (SB): *SD2-1\_MTOSI\_IS\_SB\_Addendum*** includes
  - The templates of the MTOSI objects defined in the SB DDP
- **Service Activation (SAI): *SD2-1\_MTOSI\_IS\_SAI\_Addendum*** includes
  - The templates of the MTOSI service interfaces and operations defined in the SAI DDP
  - The templates of the MTOSI events defined in the SAI DDP

## 1.4 Key terms used in this document

### **Service Provider**

In this document, the term *Service Provider* (SP) refers to companies who provide telecommunications services as a business. SPs may operate networks, or if they do not operate networks they may simply integrate the services of other providers (who operate networks) in order to deliver a total service to their customers. In this document a *Value-added Service Provider* is also called a SP.

Providing telecommunications service to any one End-Customer may involve multiple SPs, where one SP may "sub-contract" with other SPs to fulfill the customer's needs. When necessary to account for this relationship, the term SP is used in this document to describe the enterprise responsible to provide service to an End-Customer: the SP provides access through a contract or subscription. The term *Other Provider* is used to denote enterprises which have a sub-contractual responsibility.

### **Network and Network Provider**

In this document, the term *Network* refers to the networks, networking components, network systems and/or network management systems which may or may not be owned and operated by the SPs which are used to deliver services.

The network is managed by the *Network Provider* whose primary task is to organize the basic infrastructure, such as switches, interlinks, local loop etc. The services can be supplied internally within the same organization, to its own SP organization, or to external SPs.

Note: The European Commission, in its Green Paper, has regulated that a formal split be made within telecoms in network operating departments and SP departments with a formal supplier relationship that is equal to an external vendor/buyer relationship. This relationship must be non-discriminatory. Similarly, requirements of the FCC Ruling on Interconnection in the US are encouraging companies to formally separate their network provider and SP business.

### **Equipment or Network Elements (NEs)**

*Equipment or Network Elements* (NEs) is the short term for the basic infrastructure, i.e. the hardware and software components of the network. The use of this term emphasizes the technological aspect of network elements and systems components. In the usual case, Equipment is vendor-specific to a large extent. For billing, this means that the raw accounting data is delivered often in a vendor-specific format and reflects the functionality of the elements actually used.

The Network Provider operates the equipment. In the conventional case where the SP and the Network Provider are identical, one may say that the SP has a direct interface to the equipment.

### **Network Management System (NMS)**

The *Network Management System* represents the hardware and software components used by the SP or Network Provider to manage their networks as a whole. The NMS provides an end-to-end network view of the entire network enabling management of the NEs contained in the network. These NEs managed across the network are typically provided by multiple vendors. The NMS performs management functions across the Network Management Layer (NML) of the TMN. Some examples of these management functions include connection management and circuit fault correlation.

### **Element Management System (EMS)**

The *Element Management System* (EMS) represents the hardware and software components used



by the SP or Network Provider to manage one or more Network Elements (NEs). The EMS provides management across a subnetwork or a single NE, typically across a single vendor equipment or collection of single vendor equipment. The EMS performs management functions across the Element Management Layer (EML) of the TMN. Some examples of these management functions include provisioning of NE resources and collection of NE faults.

**Operations System (OS)**

The term Operations System (OS) is used to refer to any system that has EML, NML and/or SML functionality.

**OS-OS Interface**

The *OS-OS Interface* represents the communication data and exchange mechanism between a set of two or more management system(s). The communication is facilitated by a Common Communication Vehicle (CCV).



## 2 Functional Interoperability Statements (FIS)

### 2.1 Overview

This section provides Functional Interoperability Statement (FIS) templates that shall be used to describe the functional aspects of an implementation based on the MTOSI R2.0 DDP Web Services IIS.

The non-functional aspects of an implementation of the MTOSI R2.0 DDP Web Services IIS are discussed in Section 4 (specific policies or non-functional aspects may be better described with the SI & operations)

Functional aspects relate to **what** an entity does, and non-functional aspects related to **how** an entity provides its functionality, e.g., how fast an operation request is fulfilled on average.

There are MTOSI R2.0 FIS templates for each one of the following DDP IIS WS definitions:

#### Objects

A template (in the form of a table) is provided for each MTOSI object, e.g., managed element (defined in the NRF DDP SD2-1) and performance monitoring point (defined in the NRA DDP SD2-1).

#### Events

A template (in the form of a table) is provided for each MTOSI event, e.g., heartbeat (defined in the FMW DDP SD2-1 – this main document) and resource object creation (defined in the MRI DDP SD2-1).

#### Service Interfaces

A template (in the form of a table) is provided for each MTOSI service interface, e.g., NotificationProducer (defined in the FMW DDP SD2-1 – this main document) and ManagedElementRetrieval (defined in the MRI DDP SD2-1).

#### Operations

Three templates (in the form of a tables) are provided to describe the Request/Response/Exception messages of some of the more complex MTOSI operations. The simpler operations are handled via the single row entry in the associated service interface template.

This document only has the templates that are relevant to the MTOSI R2.0 Framework DDP IIS WS definitions. Templates from other MTOSI R2.0 DDPs shall be inserted in this document to describe an implementation of the MTOSI R2.0 DDP Web Services IIS.

### 2.1.1 Vendor Extensions

Inevitably, service providers will develop vendor/proprietary extensions to their MTOSI implementation in order to meet product delivery needs.

With regard to vendor extensions the following is recommended:

1. Extensions should be made using the extension mechanisms defined in MTOSI. The following Framework DDP supporting documents should be consulted for more detail:
  - SD2-6, *MTOSI Versioning and Extensibility*
  - SD2-13, *Attribute Extensibility*
2. Extensions should only be used to add functionality that is not currently present in MTOSI and not used to replace an existing MTOSI capability with an alternative approach.

3. It is expected that those making extensions work with the MTOSI team to reflect their proposed extensions in a future MTOSI release. The first step in the process is to send a Change Request (CR) to the MTOSI Product Planning Council (PPC). The PPC exploder is [mtopppc@lists.tmforum.org](mailto:mtopppc@lists.tmforum.org).

## 2.2 Objects

### 2.2.1 Template Description

There is one table for each MTOSI object. A description of an MTOSI object template follows.

**Table 2-1. MTOSI Object Template Description**

Attribute Name	Set By	Set When	Support	Clarification Needed
attribute1, e.g., userLabel	The entity or entities that may set the attribute	Set When: C, L, A (see the note below for definition of these abbreviations) Set How: List operations that can be used to set the attribute's value. Typically, this field would only be included if the attribute is settable by non-stewarding OSs.	This is used to state support for a given attribute. A party can indicate that they support an extension to this attribute (if allowed in SD2-13) or if they support a subset of the values allocated to this attribute.	For example, size limitations should be stated here
attribute2				
...				

#### Table Description:

**Set By** – an indication of which OS can set the attribute. The following OS roles are typically used to populate the “Set By” field.

- Client OS – this role is played by an OS that is preparing to or is actually using the services provided by another OS.
- Server OS – this role is played by an OS that can or is currently providing services to other OSs.
- Naming OS – this role is played by the OS that provides the unique MTOSI name for a given object. There may be a different Naming OS for each object.
- Discovering OS – this role is played by the OS that first announces an object on the CCV. The discovering OS provides a discovered name for the OS. For a given object, the same OS may play the Naming and Discovering OS roles.
- Requesting OS – this role is played by an OS that is sending a data retrieval request to another OS (known as the target OS). This role can also be played by an OS that is asking another OS to perform some activity, e.g., establish an SNC. The requesting OS role has an “is a” relationship with the client OS role.
- Target OS – this role is played by an OS that is receiving and fulfilling a data retrieval or action request from another OS (known as the Requesting OS). The target OS role has an “is a” relationship with the server OS role.

- Publishing OS – this role is played by an OS that is generating notifications (or alarms) and is sending the notifications (or alarms) to other OSs (known as subscriber OSs) on the CCV via a notification service. The publishing OS role has an “is a” relationship with the server OS role.
- Subscriber OS – this role is played by an OS that has registered to receive notifications or alarms from another OS. The subscriber OS role has an “is a” relationship with the client OS role.

**Set When** – an indication of when the attribute can be set. “C” (creation) means the attribute can only be set when the object is created, “L” (lifespan) means the attribute is only set after the managed object is created, and “A” (anytime) means the value can be set at birth or anytime thereafter.

**Support** – this column is used by a party (vendor or service provider) to indicate their support for a given attribute. In particular, the party should indicate if the support any extensions to the attribute (the reader should consult SD2-13, Attribute Extensibility, to see what type extensions are allowed for a given attribute, if any). Also, one can indicate if the only support a subset of the values allocated for an attribute. Attribute for which one can support a subset of the values allocated by the MTOSI team are listed as “VALUE LIST” in the tables that follow.

**Clarification Needed** – in cases where an attribute may allow for various implementation options, the OS vendor should state how they are handling the option.

**Remarks:**

1. All object attributes should be readable by any OS on the CCV. Consequently, there is no column to indicate whether or not an attribute is readable.
2. Only a few of the attributes must be set when the object is first created. It is valid to create an object with only the name or discoveredName attribute populated. The other attributes can be populated (after object creation) via a process outside of MTOSI, e.g., GUI entry. Some attributes may be settable at creation and after creation via MTOSI operations, e.g., create, set and modify operations.

## 2.2.2 Common Network Resource Object Attributes

[Insert here the templates from SD2-1\\_MTOSI\\_IS\\_NRB\\_Addendum.doc found in the SD folder of the Network Resource Basic DDP.](#)

## 2.2.3 Network Resource Assurance Objects

[Insert here the templates from SD2-1\\_MTOSI\\_IS\\_NRA\\_Addendum.doc found in the SD folder of the Network Resource Assurance DDP.](#)

## 2.2.4 Network Resource Fulfillment Objects

[Insert here the templates from SD2-1\\_MTOSI\\_IS\\_NRF\\_Addendum.doc found in the SD folder of the Network Resource Assurance DDP.](#)

## 2.2.5 Service Objects

[Insert here the templates from SD2-1\\_MTOSI\\_IS\\_SB\\_Addendum.doc found in the SD folder of the Service Basic DDP.](#)

## 2.3 Events

### 2.3.1 Template Description

There is one table for each MTOSI event. A description of an MTOSI event template follows.

**Table 2-2.** MTOSI Event Template Description

Attribute Name	Support	Clarification Needed
notificationId	This is used to state support for a given attribute. A party can indicate that they support an extension to this attribute (if allowed in SD2-13) or if they support a subset of the values allocated to this attribute.	For example, size limitations should be stated here
attribute2		
...		

**Table Description:**

**Support** – this column is used by a party (vendor or service provider) to indicate their support for a given attribute. In particular, the party should indicate if the support any extensions to the attribute (the reader should consult SD2-13, Attribute Extensibility, to see what type extensions are allowed for a given attribute, if any). Also, one can indicate if the only support a subset of the values allocated for an attribute. Attribute for which one can support a subset of the values allocated by the MTOSI team are listed as “VALUE LIST” in the tables that follow.

**Clarification Needed** – in cases where an attribute may allow for various implementation options, the OS vendor should state how they are handling the option.

**Remarks:**

1. All event attributes are set by the Publishing OS

**Usage Policy:**

Additional information may be provided by the OS supplier to further describe the context regarding the implementation of an MTOSI event, which would constitute a usage policy. See following examples:

- Timing consideration regarding the notification of the event
- Suppression of other MTOSI events considerations regarding the notification of the event

### 2.3.2 Framework (Generic) Events

All following events are generic MTOSI events. The purpose of these events aside from *fileTransferStatus* is essentially to monitor the status of the notification service (Refer to the SD2-8 for explanation details about the utilization of these events).

#### 2.3.2.1 Event Loss Occurred

**Table 2-3.** Event Loss Occurred

Attribute Name	Support	Clarification Needed
notificationID		
objectName		

objectType		
startTime		
firstEventLostNotificationId		
vendorExtensions		

**Usage Policy:**

- Enter policy here

**2.3.2.2 Event Loss Cleared****Table 2-4. Event Loss Cleared**

Attribute Name	Support	Clarification Needed
notificationId		
objectName		
objectType		
endTime		
vendorExtensions		

**Usage Policy:**

- Enter policy here

**2.3.2.3 File Transfer Status****Table 2-5. File Transfer Status**

Attribute Name	Support	Clarification Needed
notificationId		
fileName		
transferStatus		
percentComplete		
failureReason		
vendorExtensions		

**Usage Policy:**

- [Example] The fileTransferStatus event is only sent upon completion of the file transfer process (no in progress events)

### 2.3.2.4 Heartbeat

**Table 2-6.** Heartbeat

Attribute Name	Support	Clarification Needed
notificationId		
objectName		
objectType		
osTime		
vendorExtensions		

**Usage Policy:**

- [Example] A *heartbeat* event is sent every 2 minutes to all notification subscribers

### 2.3.3 Network Resource Assurance Events

Insert here the templates from :

- SD2-1\_MTOSI\_IS\_RPM\_Addendum.doc found in the SD folder of the Resource Performance Management DDP.
- SD2-1\_MTOSI\_IS\_RTM\_Addendum.doc found in the SD folder of the Resource Trouble Management DDP.

### 2.3.4 Network Resource Fulfillment Events

Insert here the templates from :

- SD2-1\_MTOSI\_IS\_MRI\_Addendum.doc found in the SD folder of the Manage Resource Inventory DDP.
- SD2-1\_MTOSI\_IS\_RP\_Addendum.doc found in the SD folder of the Resource Provisioning DDP.

### 2.3.5 Service Events

Insert here the templates from:

- SD2-1\_MTOSI\_IS\_SAI\_Addendum.doc found in the SD folder of the Service Activation DDP.
- SD2-1\_MTOSI\_IS\_MSI\_Addendum.doc found in the SD folder of the Manage Service Inventory DDP.

## 2.4 Service Interfaces

### 2.4.1 Templates Description

#### 2.4.1.1 Service Interface Template

There is one table for each MTOSI service interface. A description of an MTOSI service interface template follows.



**Table 2-7.** MTOSI Service Interface Template Description

Operation	Support	Exception/ Error Reason	Comments
Operation1	SRR	ExceptionType <error reason string>	
Operation2	SIT		
...			

**Table Description:**

**Support** – an indication of whether or not an operation is implemented by an OS supplier (or required by a service provider). When an operation is implemented, the OS supplier should indicate which Message Exchange Pattern (MEP) is supported from the following list:

- SRR (Synchronous Request Response)
- SIT (Synchronous Iterator)
- SFB (Synchronous File Bulk response)
- ARR (Asynchronous Request Response)
- ABR (Asynchronous Batch Response)
- SFB (Asynchronous File Bulk response)

For more MEP details refer to the description of MTOSI MEPs in MTOSI Framework DDP SD2-5.

**Exception/Error Reason** – a list of the implemented exception types. Additionally, vendor-specific error reason strings on an operation/exception may captured in this table. Otherwise, if the error reason strings are long, they can be listed and numbered elsewhere, and then cross-referenced from the table.

**Comments** – this field is used by the OS supplier to state specific behavioral peculiarities of an operation implementation. Implementation description of many MTOSI operations will not require much additional comments. This is particularly true of most MTOSI fine-grained operations, which are based on a simple operation synopsis (request/response/exception). However, some operations will require a more detailed implementation description that cannot be fully integrated in the MTOSI service interface template. This is true of all MTOSI coarse-grained operations. Then, it is recommended to describe details of the implemented operation using the MTOSI operation templates (See below).

### 2.4.1.2 Service Interface Usage Policy

Additional information may be provided by the OS supplier to further describe the context regarding the implementation of an MTOSI service interface, which would constitute a usage policy. See following examples:

- Deployment considerations (WS endpoint enable/disable configuration)
- Engineering considerations (WS maximum concurrent/threading configuration)
- Dependency with other OS supplier applications

### 2.4.1.3 Operation Templates

As noted above, use of the MTOSI operation templates is necessary to fully describe all the implementation details of an MTOSI operation, which is based on a complex synopsis/signature (request/response/exception) such as those with a coarse-grained style.

The MTOSI operation templates are used to capture implementation details of each one the operation messages; Request, Response and Exception. Examples are available in the following sections.

#### 2.4.1.3.1 Operation Request Message Template

There is one table to capture implementation details of an MTOSI operation request message. A description of an MTOSI operation request (SOAP Envelope) message template follows.

**Table 2-8.** MTOSI Operation Request Message Template Description

Parameter	Supported Values	Comments/ Clarifications
<b>Header</b>		
<i>Param1</i>		
<b>Body</b>		
<i>Param1</i>		

**Table Description:**

The table is split in two parts as followed:

- First part contains a description of some of the MTOSI header parameters (in SOAP Header) which may be further explained. Especially, the MEP control parameters such as *requestedBatchSize*
- Second part contains a description of the parameters found in the MTOSI message body (in SOAP Body), which is the operation message payload (input/output).

**Supported Values** – this field is used by the OS supplier to describe range of supported values.

**Comments/Clarifications** – this field is used by the OS supplier to further clarify the characteristics and/or usage of the parameter. One can use this column (for example) to indicate the maximum supported length of a parameter, and the default value for a parameter.

#### 2.4.1.3.2 Operation Response Message Template.

There is one table to capture implementation details of an MTOSI operation response (SOAP Envelope) message. Use the same table as the one used to describe the operation request message (See above).

#### 2.4.1.3.3 Operation Exception Message Template.

All MTOSI WS (server-side) failures to execute an operation result to the sending by the Server OS of an MTOSI operation exception (SOAP Fault) message to the Client OS. The Server OS may provide an error reason in conjunction with an exception. The allowable error reasons are not defined in MTOSI. It is proposed that the following table be used in cases where the OS supplier wishes to provide further information about their error reasons.

**Table 2-9.** MTOSI Operation Exception Message Template Description

Exception	Error Reason	Explanation
EXCPT_NOT_IMPLEMENTED		
EXCPT_INTERNAL_ERROR		

EXCPT_INVALID_INPUT	Some possible examples are <ol style="list-style-type: none"><li>1. filter type not supported</li><li>2. dateAndTime parameter is not supported</li><li>3. invalid value for dateAndTime</li><li>4. request exceeds maximum batch size</li></ol>	
EXCPT_COMM_FAILURE		

#### 2.4.1.4 Operation Usage Policy

Additional information may be provided by the OS supplier to further describe the context regarding the implementation of an MTOSI service interface operation, which would constitute a usage policy.

See following examples:

- Timing considerations (response time-out)
- Dependency with other OS supplier applications

#### 2.4.2 Framework (Generic) Service Interfaces

The MTOSI Framework DDP IIS includes the following generic service interfaces.

##### 2.4.2.1 Common Object Info Provisioning

**Table 2-10.** Common Object Info Provisioning

Operation	Support	Exception/ Error Reason	Comments
setAliasNames	ARR, SRR		
setUserLabel	ARR, SRR		
setOwner	ARR, SRR		
setNetworkAccessDomain	ARR, SRR		
setVendorExtensions	ARR, SRR		

##### Usage Policy:

- Enter policy here

##### 2.4.2.2 Notification Broker

**Table 2-11.** Notification Broker

Operation	Support	Exception/ Error Reason	Comments
notify	Notification		
subscribe	SRR		

unsubscribe	SRR		
-------------	-----	--	--

**Notes:**

- This MTOSI SI is not applicable for an implementation based on a JMS CCV (See SD2-5 & SD2-9)

**Usage Policy:**

- Enter policy here

**2.4.2.3 Notification Consumer****Table 2-12.** Notification Consumer

Operation	Support	Exception/ Error Reason	Comments
notify	Notification		

**Notes:**

- This MTOSI SI is not applicable for an implementation based on a JMS CCV (See SD2-5 & SD2-9)
- This MTOSI SI is implemented by the OS (Notification) Subscriber to allow reception of pushed notifications.
- A Pull based notification will be available in the future with adoption of the OASIS WS-Notification specifications (currently being evaluated by the mTOP Methodology team)

**Usage Policy:**

- Enter policy here

**2.4.2.4 Notification Producer****Table 2-13.** Notification Producer

Operation	Support	Exception/ Error Reason	Comments
subscribe	SRR		See usage policy for supported topics
unsubscribe	SRR		

**Notes:**

- This MTOSI SI is not applicable for an implementation based on a JMS CCV (See SD2-5 & SD2-9)

**Usage Policy:**

- [Example] Topics and events supported by this implementation of the MTOSI Notification Producer are:
  - Inventory: All object life cycle events (creation, deletion, change)
  - Fault: Alarm, TCA
  - Protection: command events
- [Example] Maximum number of subscribers:
- [Example] Support *heartbeat* event to ensure alive notification channel between OS Publisher and Subscribers (See 2.3.2.4)

- [Example] Support *eventLossOccured* event for notification overflow status event by OS Publisher (See 2.3.2.1)
- [Example] Support *eventLossCleared* event for notification overflow status event by OS Publisher (See 2.3.2.2)

### **2.4.3 Manage Resource Inventory Service Interfaces**

Insert here the Service Interface templates from SD2-1\_MTOSI\_IS\_MRI\_Addendum.doc found in the SD folder of the Manage Resource Inventory DDP.

### **2.4.4 Manage Service Inventory Service Interfaces**

Insert here the Service Interface templates from SD2-1\_MTOSI\_IS\_MSI\_Addendum.doc found in the SD folder of the Manage Service Inventory DDP.

### **2.4.5 Resource Performance Management Service Interfaces**

Insert here the Service Interface templates from SD2-1\_MTOSI\_IS\_RPM\_Addendum.doc found in the SD folder of the Resource Performance Management DDP.

### **2.4.6 Resource Provisioning Service Interfaces**

Insert here the Service Interface templates from SD2-1\_MTOSI\_IS\_RP\_Addendum.doc found in the SD folder of the Resource Provisioning DDP.

### **2.4.7 Resource Trouble Management Service Interfaces**

Insert here the Service Interface templates from SD2-1\_MTOSI\_IS\_MSI\_Addendum.doc found in the SD folder of the Resource Trouble Management DDP.

### **2.4.8 Service Activation Service Interfaces**

Insert here the Service Interface templates from SD2-1\_MTOSI\_IS\_SAI\_Addendum.doc found in the SD folder of the Service Activation DDP.

### **2.4.9 Proprietary (Vendor Specific) Service Interfaces**

Insert here all Service Interfaces implemented from vendor specific IIS, which has been defined in a similar style as the MTOSI IIS (refer to the SD0-5\_mTOPGuidelines\_WebServices.doc)

### 3 Use Cases

Suggest this is removed. All use cases are part of the DDP BA. May be we want traceability of an MTOSI service interface operation with use case(s)?

#### 3.1 Template Description

TMF 517 provides a number of use cases which cover the functionality provided by MTOSI. It should be emphasized that the use cases in TMF 517 are not prescriptive. They simply show a way to accomplish a specific task using the MTOSI capabilities. The same task (in most cases) can be accomplished in several ways.

This table below provides the OS vendor with an opportunity to state which use cases they support. Typically, the OS vendor would enter “Yes” or “No” in the “Support” column and then make specific qualifications in the “Qualifications” column. Some example qualifications are

- The functionality in the use case is supported; however, a different set of steps are followed.
- The functionality in the use case is supported; however, we only support the use case for the following subset of objects from the set of objects mentioned in the use case.

In some cases, the Qualification column will not be large enough to contain the complete explanation. In such cases, it is suggestion that a subsection be added to this section and then referenced from the Qualification column. For example, “The functionality in this used case is supported, but via a different set of steps (see Section 3.x for the details)”.

It is also possible for an OS vendor to provide a use case that is not covered by TMF 517. In such cases, it is suggest that the vendor provide a subsection to this section with the additional use cases.

#### 3.2 Generic (Framework) Uses Cases

Table 3-1. Generic Use Cases Table

Use Case	Support	Qualification
<b>1. OS Initialization Use Cases</b>		
a. OS Restarts		
b. Client OS prepares to use the services of a Server OS		
c. Server OS no longer allows client OS to use its services		
d. Client OS detects that server OS is unavailable		
e. Naming		
i. <i>Inventory OS Provides Names for installed network entities</i>		
ii. <i>Discovery OS Provides Names for installed network entities</i>		
iii. <i>Inventory OS Provides Names for planned network entities</i>		

iv. <i>Naming for installed network entities - No separate Discovery OS</i>		
f. Distributed stewarding		
g. OS discards an event to be sent to the notification service		
h. OS succeeds in forwarding an event to the notification service again		
i. OS notifies a heartbeat notification to the notification service		

### 3.2.1 Manage Resource Inventory Use Cases

Insert here the Use Case templates from [SD2-1\\_MTOSI\\_IS\\_MRI\\_Addendum.doc](#) found in the SD folder of the Manage Resource Inventory DDP.

### 3.2.2 Manage Service Inventory Use Cases

Insert here the Use Case templates from [SD2-1\\_MTOSI\\_IS\\_MSI\\_Addendum.doc](#) found in the SD folder of the Manage Service Inventory DDP.

### 3.2.3 Resource Performance Management Use Cases

Insert here the Use Case templates from [SD2-1\\_MTOSI\\_IS\\_RPM\\_Addendum.doc](#) found in the SD folder of the Resource Performance Management DDP.

### 3.2.4 Resource Provisioning Use Cases

Insert here the Use Case templates from [SD2-1\\_MTOSI\\_IS\\_RP\\_Addendum.doc](#) found in the SD folder of the Resource Provisioning DDP.

### 3.2.5 Resource Trouble Management Use Cases

Insert here the Use Case templates from [SD2-1\\_MTOSI\\_IS\\_RTM\\_Addendum.doc](#) found in the SD folder of the Resource Trouble Management DDP.

### 3.2.6 Service Activation Use Cases

Insert here the Use Case templates from [SD2-1\\_MTOSI\\_IS\\_SAI\\_Addendum.doc](#) found in the SD folder of the Service Activation DDP.

## 4 Non-Functional interoperability Statements (NIS)

This section covers interoperability issues related to the non-functional aspects of the MTOSI. Mainly, all general usage policies regarding the server-side implementation of MTOSI.

### 4.1 Timing Issues

This should be part of each specific policy of service interface or operation description.

None of the other MTNM documents address timing. A set of OSs could follow all the MTNM standards as well as an agreed to interoperability statement (such as the one suggested in Section 2 of this document) and still fail to interoperate because of timing issues.

For example, if a requesting OS uses a wide filter in the getInventory operation (perhaps no filter at all), the serving OS may take too long to prepare the result, leading to a message timeout. So, the OSs on the CCV (or more precisely, the suppliers of the OSs on a CCV) need to agree on a reasonable timeout value based on the size of the request inventory.

In general, the maximum time a requesting OS is designed to wait for a response to a particular type operation request should be greater than expected maximum time the serving OS takes to fulfill the operation request. It is suggested that the OS provide the following table as guidance for the operations that the OS supports:

**Table 4-1.** Operations Response Times and Timeouts

Operation Type	Maximum Expected Response Time for the Serving OS	Suggested Timeout Setting for the Requesting OS	Comments
Data retrieval of a single data structure for an MTOSI network entity such as a managed element			
Data retrieval of a bulk inventory file			This will depend on the number and type of entities identified in the bulk inventory request.
Retrieval of active alarms			This will depend on the filter used to restrict the set of alarms.

A similar table is needed for each notification type. There may be delays in delivering a notification. Once a notification has reached a particular age without being delivered to a subscribed OS, it may make no sense to deliver the notification. The parties representing the publishing and subscribing OSs need to agree on a timeout period for each notification type.

### 4.2 Server Resource Management

In keeping with a Service Oriented Architecture (SOA), the MTOSI does not support a session concept. So, a server OS does not track whether its clients are still in existence. This creates something of a problem if a server OS has allocated interface resources on behalf of a client OS. This problem can be solved in several ways.

First off, in the case of a graceful shut-down, a client OS should send a state change notification to the notification service. Based its policies, a server OS (upon receiving the state change notification from the client



OS) might delete all iterators allocated to the client. The server OS might also delete any bulk inventory files or PM files allocated to the client OS. (Note PM is not supported in MTOSI Rel. 1.1.) This is only for the case where the client retrieves the file from the server. If the server sends the file to the client in batches (or in one piece), then the server OS might discontinue sending upon receiving the state change notification from the client. Alternately, the server might retain the iterators and retain (or continue sending) files for a given period of time after a client OS has indicated that it is shutting-down (perhaps in expectation that the client will soon be re-started). In any event, the supplier of the server OS should make a specific statement concerning the behavior of the server OS when it receives notification that a client OS is shutting-down.

Secondly, and independent of a client OS shutting-down, the supplier of a server OS should state how long the server OS will retain iterators and inventory (or PM) files on behalf of a client. In the case of inventory or PM files, the supplier of the server OS should state how long the file is retained after the server OS has sent a FILE\_TRANSFER\_STATUS message indicating that the file transfer is complete. In the case, server OS sends the request file directly to the requestor, this type of timer is not needed.

### 4.3 Registration & Discovery Policies

MTOSI R2.0 IIS does not provide any guidelines regarding the registration & discovery associated with the deployment life cycle of implemented MTOSI service interfaces.

#### 4.3.1 Discovery Template Description

This section of the MTOSI IS can be used for the description of the discovery policy of the implemented MTOSI service interfaces by the product this MTOSI IS describes. An OS supplier can use the following MTOSI WS template to publish the WS endpoint ports (SOAP address) of all implemented MTOSI service interfaces.

**Table 4-2.** MTOSI WS Discovery Template

Service Interface	WS Endpoint Port	Comments
<ServiceInterface>:<V1.0>		

##### Table Description:

**Service Interface** – this field indicates the MTOSI service interface.

Recommended format is: **<ServiceInterface>:<FullVersion>**

**Port** – this field is used by the OS supplier to enter the default deployment port of the implemented service interface. The port value is based on the CCV implementation profile, which can be:

- The SOAP address of the MTOSI WS for a SOAP/HTTP implementation profile.
- The JMS destination of the MTOSI WS for a SOAP/JMS implementation profile.

**Comments** – this field is used by the OS supplier to provide additional information about the service interface discovery policy

#### 4.3.2 Generic (FMW DDP) MTOSI WS Discovery

**Table 4-3.** Generic (Framework DDP) MTOSI WS Discovery

Service Interface	WS Endpoint Port	Comments
CommonObjectInfoProvisioning:V1.0		
NotificationBroker:V1.0		
NotificationConsumer:V1.0		

NotificationProducer:V1.0		
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### **4.3.3 Manage Resource Inventory MTOSI WS Discovery**

Insert here the MTOSI WS Discovery templates from SD2-1\_MTOSI\_IS\_MRI\_Addendum.doc found in the SD folder of the Manage Resource Inventory DDP.

### **4.3.4 Manage Service Inventory Use Cases**

Insert here the MTOSI WS Discovery templates from SD2-1\_MTOSI\_IS\_MSI\_Addendum.doc found in the SD folder of the Manage Service Inventory DDP.

### **4.3.5 Resource Performance Management Use Cases**

Insert here the MTOSI WS Discovery templates from SD2-1\_MTOSI\_IS\_RPM\_Addendum.doc found in the SD folder of the Resource Performance Management DDP.

### **4.3.6 Resource Provisioning Use Cases**

Insert here the MTOSI WS Discovery templates from SD2-1\_MTOSI\_IS\_RP\_Addendum.doc found in the SD folder of the Resource Provisioning DDP.

### **4.3.7 Resource Trouble Management Use Cases**

Insert here the MTOSI WS Discovery templates from SD2-1\_MTOSI\_IS\_RTM\_Addendum.doc found in the SD folder of the Resource Trouble Management DDP.

### **4.3.8 Service Activation Use Cases**

Insert here the MTOSI WS Discovery templates from SD2-1\_MTOSI\_IS\_SAI\_Addendum.doc found in the SD folder of the Service Activation DDP.

## **4.4 Security Policies**

Description of all security policies supported the OS product/solution shall be inserted here:

- Authentication
- Encryption
- Access Control

## REFERENCES

To be re-defined based mTOP DDP as the new MTOSI release document structure

- [R1] TMF 517, MTOSI Business Agreement.
- [R2] TMF 608, MTNM Information Agreement.
- [R3] TMF 854, MTOSI XML Solution Set.
- [R4] TMF 814, MTNM CORBA Solution Set.

## STANDARDS

- [S1] ITU-T Recommendation X.731, *State Management Function*, 1992.
- [S2] ITU-T Recommendation X.733, *Alarm Reporting Function*, 1992.
- [S3] GR-1093-CORE (Telcordia), *Generic State Requirements for Network Elements (NEs)*, Issue 2, June 2000.

## Revision History

Version	Date	Description of Change
1.0	May 2005	This is the first version of this document and as such, there are no revisions to report.
1.1	November 2005	Corrected minor errors
1.2	April 2006	Updates to reflect alignment with ETSI equipment model. Added manufacturer and manufacturerDate to EH, manufacturerDate to ME
1.3	June 2006	Added support for synchronous MEPs
1.4	July 2006	Removed duplicated operations from Table 2-38
1.5	October 2006	<ul style="list-style-type: none"><li>- Changed section 5 on Profiles</li><li>- Changes “operations” into business activities” in many tables.</li><li>- Corrected different inconsistencies</li><li>- Changed section 2.3.4 Notification Service to focus only at the business activity level and leave details to SD2-8.</li></ul>
1.6	November 2007	Adaptation to the new DDP for MTOSI R2.0

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## How to comment on the document

Comments and requests for information must be in written form and addressed to the contact identified below:

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Please be specific, since your comments will be dealt with by the team evaluating numerous inputs and trying to produce a single text. Thus we appreciate significant specific input. We are looking for more input than “wordsmith” items, however editing and structural help are greatly appreciated where better clarity is the result.