

# [MS-OXWSNTIF]: Notifications Web Service Protocol Specification

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## Revision Summary

Date	Revision History	Revision Class	Comments
07/15/2009	1.0	Major	Initial Availability.
11/04/2009	1.1.0	Minor	Updated the technical content.

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# 1 Introduction

This document specifies the Notification Web Service protocol, which is responsible for pull notifications from the server. Clients use the SOAP protocol [\[SOAP1.1\]](#) to contact the notification service.

## 1.1 Glossary

The following terms are defined in [\[MS-OXGLOS\]](#):

**Hypertext Transfer Protocol (HTTP)**  
**Hypertext Transfer Protocol over Secure Socket Layers (HTTPS)**  
**mailbox**  
**SOAP body**  
**SOAP fault**  
**SOAP header**  
**SOAP message**  
**Web Services Description Language (WSDL)**  
**WSDL message**  
**WSDL port type**  
**XML**  
**XML namespace**  
**XML schema**

The following terms are specific to this document:

**MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:** These terms (in all caps) are used as described in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

## 1.2 References

### 1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com). We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

[MS-OXGLOS] Microsoft Corporation, "[Exchange Server Protocols Master Glossary](#)", June 2008.

[MS-OXWSCDATA] Microsoft Corporation, "[Common Web Service Data Types](#)", July 2009.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <http://www.ietf.org/rfc/rfc2119.txt>.

[RFC2396] Berners-Lee, T., Fielding, R., and Masinter, L., "Uniform Resource Identifiers (URI): Generic Syntax", RFC 2396, August 1998, <http://www.ietf.org/rfc/rfc2396.txt>.

[RFC2616] Fielding, R., et al., "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, June 1999, <http://www.ietf.org/rfc/rfc2616.txt>.

[RFC2818] Rescorla, E., "HTTP over TLS", RFC 2818, May 2000, <http://www.ietf.org/rfc/rfc2818.txt>.

[RFC3066] Alvestrand, H., "Tags for the Identification of Languages", RFC 3066, January 2001, <http://www.ietf.org/rfc/rfc3066.txt>.

[SOAP1.1] Box, D., et al., "Simple Object Access Protocol (SOAP) 1.1", May 2000, <http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>.

[WSDL] Christensen, E., Curbera, F., Meredith, G., and Weerawarana, S., "Web Services Description Language (WSDL) 1.1", W3C Note, March 2001, <http://www.w3.org/TR/2001/NOTE-wsdl-20010315>.

[XMLNS] World Wide Web Consortium, "Namespaces in XML 1.0 (Second Edition)", August 2006, <http://www.w3.org/TR/REC-xml-names/>.

[XMLSCHEMA1] Thompson, H.S., Ed., Beech, D., Ed., Maloney, M., Ed., and Mendelsohn, N., Ed., "XML Schema Part 1: Structures", W3C Recommendation, May 2001, <http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/>.

[XMLSCHEMA2] Biron, P.V., Ed., and Malhotra, A., Ed., "XML Schema Part 2: Datatypes", W3C Recommendation, May 2001, <http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/>.

### 1.2.2 Informative References

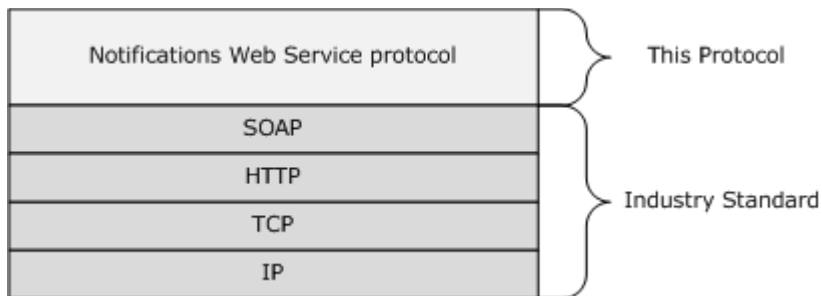
None.

### 1.3 Protocol Overview

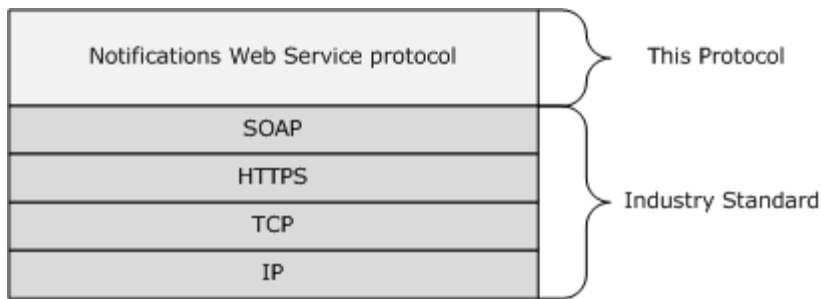
The Notifications Web Service protocol is used to enable clients to pull notifications from the server. Clients subscribe to updates and receive the updates through pull notifications, by which the client periodically requests information from the server.

### 1.4 Relationship to Other Protocols

The Notifications Web Service protocol uses SOAP over **HTTP** and SOAP over **HTTPS**, as shown in the following figures.



**Figure 1: Notification Web Service protocol HTTP stack**



**Figure 2: Notification Web Service protocol HTTPS stack**

The information that is returned by the Notifications Web Service protocol is used when requests are made by using the Push Notifications Web Service protocol [\[MS-OXWSPSNTIF\]](#).

### 1.5 Prerequisites/Preconditions

None.

### 1.6 Applicability Statement

The protocol specified in this document is applicable to environments that incorporate notifications.

### 1.7 Versioning and Capability Negotiation

This document covers versioning issues in the following areas:

**Supported Transports:** This protocol uses SOAP 1.1, as specified in section [2.1](#).

**Protocol Versions:** This protocol specifies only one **WSDL port type** version.

**Security and Authentication Methods:** This protocol relies on the Web server that is hosting it to perform authentication.

**Localization:** This protocol includes text strings in various messages. Localization considerations for such strings are specified in section [3.1.4](#).

**Capability Negotiation:** None.

### 1.8 Vendor Extensible Fields

None.

### 1.9 Standards Assignments

None.

## 2 Messages

### 2.1 Transport

The SOAP version supported is SOAP 1.1. For details, see [\[SOAP1.1\]](#).

### 2.2 Common Message Syntax

This section contains common definitions that are used by this protocol. The syntax of the definitions uses **XML schema** as defined in [\[XMLSCHEMA1\]](#) and [\[XMLSCHEMA2\]](#), and **Web Services Description Language (WSDL)** as defined in [\[WSDL\]](#).

#### 2.2.1 Namespaces

This specification defines and references various **XML namespaces** by using the mechanisms specified in [\[XMLNS\]](#). Although this specification associates a specific XML namespaces prefix for each XML namespaces that is used, the choice of any particular XML namespaces prefix is implementation-specific and not significant for interoperability.

Prefix	Namespace URI	Reference
soap	<a href="http://schemas.xmlsoap.org/wsdl/soap/">http://schemas.xmlsoap.org/wsdl/soap/</a>	<a href="#">[SOAP1.1]</a>
tns	<a href="http://schemas.microsoft.com/exchange/services/2006/messages">http://schemas.microsoft.com/exchange/services/2006/messages</a>	[MS-OXWSNTIF]
s	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>	<a href="#">[XMLSCHEMA1]</a>
targetNamespace	<a href="http://schemas.microsoft.com/exchange/services/2006/messages">http://schemas.microsoft.com/exchange/services/2006/messages</a>	[MS-OXWSNTIF]
wsdl	<a href="http://schemas.xmlsoap.org/wsdl/">http://schemas.xmlsoap.org/wsdl/</a>	<a href="#">[WSDL]</a>
t	<a href="http://schemas.microsoft.com/exchange/services/2006/types">http://schemas.microsoft.com/exchange/services/2006/types</a>	[MS-OXWSNTIF]

#### 2.2.2 Simple Types

The following table summarizes the set of common **XML schema** simple type definitions that are defined by this specification. XML schema simple type definitions that are specific to a particular operation are defined with the operation.

Simple Type	Description
<a href="#">t:WatermarkType</a>	Specifies an event bookmark in the <b>mailbox</b> event queue.
<a href="#">t:SubscriptionIdType</a>	Specifies the identifier for a subscription.

##### 2.2.2.1 t:WatermarkType Simple Type

The [WatermarkType](#) simple type specifies an event bookmark in the mailbox event queue.

```
<xs:simpleType name="WatermarkType">
  <xs:restriction
    base="t:NonEmptyStringType"
  />
</xs:simpleType>
```



### 2.2.2.2 t:SubscriptionIdType Simple Type

The [SubscriptionIdType](#) simple type specifies the identifier for a subscription.

```
<xs:simpleType name="SubscriptionIdType">
  <xs:restriction
    base="t:NonEmptyStringType"
  />
</xs:simpleType>
```

### 2.2.3 Complex Types

The following table summarizes the set of common XML schema complex type definitions that are defined by this specification. XML schema complex type definitions that are specific to a particular operation are defined with the operation.

Complex Type	Description
<a href="#">m:GetEventsResponseMessageType</a>	Specifies the status and result of a single GetEvents request.
<a href="#">m:SubscribeResponseMessageType</a>	Specifies the status and result of a single Subscribe request.
<a href="#">t:ModifiedEventType</a>	Specifies an event in which an item or folder is modified.
<a href="#">t:MovedCopiedEventType</a>	Specifies a moved or copied event notification.
<a href="#">t:NotificationType</a>	Specifies information about the subscription and the events that have occurred since the last notification.

#### 2.2.3.1 m:GetEventsResponseMessageType Complex Type

The [GetEventsResponseMessageType](#) complex type specifies the status and result of a single GetEvents request.

```
<xs:complexType name="GetEventsResponseMessageType">
  <xs:complexContent>
    <xs:extension
      base="m:ResponseMessageType"
    >
      <xs:sequence>
        <xs:element name="Notification"
          type="t:NotificationType"
          minOccurs="0"
        />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

#### Child Elements

Element	Type	Description
Notification	<a href="#">t:NotificationType</a>	Specifies information about the subscription and the events that have occurred since the last notification.

### 2.2.3.2 m:SubscribeResponseMessageType Complex Type

The [SubscribeResponseMessageType](#) complex type specifies the status and result of a single [Subscribe](#) operation (section [3.1.4.2](#)) request.

```
<xs:complexType name="SubscribeResponseMessageType">
  <xs:complexContent>
    <xs:extension
      base="m:ResponseType"
    >
      <xs:sequence>
        <xs:element name="SubscriptionId"
          type="t:SubscriptionIdType"
          minOccurs="0"
        />
        <xs:element name="Watermark"
          type="t:WatermarkType"
          minOccurs="0"
        />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

#### Child Elements

Element	Type	Description
SubscriptionId	<a href="#">t:SubscriptionIdType</a>	Specifies the identifier for a subscription.
Watermark	<a href="#">t:WatermarkType</a>	Specifies an event bookmark in the mailbox event queue.

### 2.2.3.3 t:BaseNotificationEventType Complex Type

The [t:BaseNotificationEventType](#) complex type specifies the base type for event notifications.

```
<xs:complexType name="BaseNotificationEventType">
  <xs:sequence>
    <xs:element name="Watermark"
      type="t:WatermarkType"
    />
  </xs:sequence>
</xs:complexType>
```

#### Child Elements

Element	Type	Description
Watermark	<a href="#">t:WatermarkType</a>	Specifies an event bookmark in the mailbox event queue.

### 2.2.3.4 t:BaseObjectChangedEventType Complex Type

The BaseObjectChangedEventType complex type specifies create, delete, and new mail events.

```
<xs:complexType name="BaseObjectChangedEventType">
  <xs:complexContent>
    <xs:extension
      base="t:BaseNotificationEventType"
    >
      <xs:sequence>
        <xs:element name="TimeStamp"
          type="xs:dateTime"
        />
        <xs:choice>
          <xs:element name="FolderId"
            type="t:FolderIdType"
          />
          <xs:element name="ItemId"
            type="t:ItemIdType"
          />
        </xs:choice>
        <xs:element name="ParentFolderId"
          type="t:FolderIdType"
        />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Child Elements

Element	Type	Description
TimeStamp	xs:dateTime	Specifies the time stamp of a changed item or folder mailbox event.
FolderId	<a href="#">t:FolderIdType</a>	Specifies a FolderIdType object that identifies the changed store item.
ItemId	<a href="#">t:ItemIdType</a>	Specifies an ItemIdType object that identifies the changed store item.
ParentFolderId	t:FolderIdType	Specifies the parent folder identifier of the changed item or folder.

### 2.2.3.5 t:ModifiedEventType Complex Type

The [ModifiedEventType](#) complex type specifies an event in which an item or folder is modified.

```
<xs:complexType name="ModifiedEventType">
  <xs:complexContent>
    <xs:extension
      base="t:BaseObjectChangedEventType"
    >
  </xs:extension>
</xs:complexType>
```

```

<xs:sequence>
  <xs:element name="UnreadCount"
    type="xs:int"
    minOccurs="0"
    maxOccurs="1"
  />
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

```

#### Child Elements

Element	Type	Description
UnreadCount	xs:int	Specifies the count of unread items within a given folder.

### 2.2.3.6 t:MovedCopiedEventType Complex Type

The [MovedCopiedEventType](#) complex type specifies a moved or copied event notification.

```

<xs:complexType name="MovedCopiedEventType">
  <xs:complexContent>
    <xs:extension
      base="t:BaseObjectChangedEventType"
    >
      <xs:sequence>
        <xs:choice>
          <xs:element name="OldFolderId"
            type="t:FolderIdType"
          />
          <xs:element name="OldItemId"
            type="t:ItemIdType"
          />
        </xs:choice>
        <xs:element name="OldParentFolderId"
          type="t:FolderIdType"
        />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

```

#### Child Elements

Element	Type	Description
OldFolderId	<a href="#">t:FolderIdType</a>	Specifies the old identifier for a copied or moved folder.
OldItemId	<a href="#">t:ItemIdType</a>	Specifies the old identifier for a copied or moved item.
OldParentFolderId	t:FolderIdType	Specifies the identifier of the original parent folder of an item or folder that was moved.

### 2.2.3.7 t:NotificationType Complex Type

The [NotificationType](#) complex type specifies information about the subscription and the events that have occurred since the last notification.

```
<xs:complexType name="NotificationType">
  <xs:sequence>
    <xs:element name="SubscriptionId"
      type="t:SubscriptionIdType"
    />
    <xs:element name="PreviousWatermark"
      type="t:WatermarkType"
    />
    <xs:element name="MoreEvents"
      type="xs:boolean"
    />
    <xs:choice
      maxOccurs="unbounded"
      minOccurs="1"
    >
      <xs:element name="CopiedEvent"
        type="t:MovedCopiedEventType"
      />
      <xs:element name="CreatedEvent"
        type="t:BaseObjectChangedEventType"
      />
      <xs:element name="DeletedEvent"
        type="t:BaseObjectChangedEventType"
      />
      <xs:element name="ModifiedEvent"
        type="t:ModifiedEventType"
      />
      <xs:element name="MovedEvent"
        type="t:MovedCopiedEventType"
      />
      <xs:element name="NewMailEvent"
        type="t:BaseObjectChangedEventType"
      />
      <xs:element name="StatusEvent"
        type="t:BaseNotificationEventType"
      />
    </xs:choice>
  </xs:sequence>
</xs:complexType>
```

#### Child Elements

Element	Type	Description
SubscriptionId	<a href="#">t:SubscriptionIdType</a>	Specifies the identifier for a subscription.
PreviousWatermark	<a href="#">t:WatermarkType</a>	Specifies the watermark of the latest event that was successfully communicated to the client for the subscription.
MoreEvents	xs:boolean	Specifies a value that indicates whether more events to be delivered to the client exist in the

Element	Type	Description
		queue.
CopiedEvent	<a href="#">t:MovedCopiedEventType</a>	Specifies a copied event notification.
CreatedEvent	<a href="#">t:BaseObjectChangedEventType</a>	Specifies a created event notification.
DeletedEvent	t:BaseObjectChangedEventType	Specifies a deleted event notification.
ModifiedEvent	<a href="#">t:ModifiedEventType</a>	Specifies a modified event notification.
MovedEvent	t:MovedCopiedEventType	Specifies a moved event notification.
NewMailEvent	t:BaseObjectChangedEventType	Specifies a new e-mail event notification.
StatusEvent	<a href="#">t:BaseNotificationEventType</a>	Specifies a status event notification.

#### 2.2.4 Elements

This specification does not define any common XML schema element definitions.

#### 2.2.5 Attributes

This specification does not define any common XML schema attribute definitions.

#### 2.2.6 Groups

This specification does not define any common XML schema group definitions.

#### 2.2.7 Attribute Groups

This specification does not define any common XML schema attribute group definitions.

#### 2.2.8 Messages

This specification does not define any common XML schema message definitions.

## 3 Protocol Details

The client side of this protocol is simply a pass-through. That is, no additional timers or other state is required on the client side of this protocol. Calls made by the higher-layer protocol or application are passed directly to the transport, and the results returned by the transport are passed directly back to the higher-layer protocol or application.

### 3.1 ExchangeServicePortType Server Details

The Notifications Web Service protocol defines a single port type with three operations.

Operation	Description
<a href="#">GetEvents</a>	Gets events for a pull notification subscription.
<a href="#">Subscribe</a>	Creates a subscription to notifications of events on mailboxes.
<a href="#">Unsubscribe</a>	Removes a subscription to notifications of events on mailboxes.

#### 3.1.1 Abstract Data Model

The Notifications Web Service protocol is a stateless protocol.

#### 3.1.2 Timers

None.

#### 3.1.3 Initialization

None.

#### 3.1.4 Message Processing Events and Sequencing

This protocol includes the operations that are listed in the following table.

Operation	Description
<a href="#">GetEvents</a>	Gets events for a pull notification subscription.
<a href="#">Subscribe</a>	Creates a subscription to notifications of events on mailboxes.
<a href="#">Unsubscribe</a>	Removes a subscription to notifications of events on mailboxes.

##### 3.1.4.1 GetEvents

The [GetEvents](#) operation gets events for a pull notification subscription.

```
<wsdl:operation name="GetEvents" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input message="tns:GetEventsSoapIn" />
  <wsdl:output message="tns:GetEventsSoapOut" />
</wsdl:operation>
```

Request

Message Format	Description
<a href="#">tns:GetEventsSoapIn</a>	Specifies the <b>SOAP message</b> that requests the events.

Response

Message Format	Description
<a href="#">tns:GetEventsSoapOut</a>	Specifies the SOAP message that is returned by the server in response.

### 3.1.4.1.1 Complex Types

The following XML schema complex type definitions are specific to this operation.

#### 3.1.4.1.1.1 m:GetEventsResponseType Complex Type

The [GetEventsResponseType](#) complex type specifies a response to a [GetEvents](#) operation (section [3.1.4.1](#)) request.

```
<xs:complexType name="GetEventsResponseType">
  <xs:complexContent>
    <xs:extension
      base="m:BaseResponseMessageType"
    />
  </xs:complexContent>
</xs:complexType>
```

#### 3.1.4.1.1.2 m:GetEventsType Complex Type

The **GetEventsType** complex type specifies a request to get events for a pull notification subscription.

```
<xs:complexType name="GetEventsType">
  <xs:complexContent>
    <xs:extension
      base="m:BaseRequestType"
    >
    <xs:sequence>
      <xs:element name="SubscriptionId"
        type="t:SubscriptionIdType"
      />
      <xs:element name="Watermark"
        type="t:WatermarkType"
      />
    </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Child Elements



Element	Type	Description
SubscriptionId	<a href="#">t:SubscriptionIdType</a>	Specifies the identifier of a subscription.
Watermark	<a href="#">t:WatermarkType</a>	Specifies a string that represents an event bookmark in the mailbox event queue.

### 3.1.4.1.2 Elements

The following XML schema element definitions are specific to this operation.

#### 3.1.4.1.2.1 GetEvents Element

The [GetEvents](#) element specifies the operation that is used by pull clients to request notifications from the server.

```
<xs:element name="GetEvents"
  type="m:GetEventsType"
 />
```

#### 3.1.4.1.2.2 GetEventsResponse Element

The [GetEventsResponse](#) element specifies a response to a [GetEvents](#) operation (section [3.1.4.1](#)) request.

```
<xs:element name="GetEventsResponse"
  type="m:GetEventsResponseType"
 />
```

### 3.1.4.1.3 Messages

The following **WSDL message** definitions are specific to this operation.

#### 3.1.4.1.3.1 tns:GetEventsSoapIn Message

The [GetEventsSoapIn](#) message contains four parts, as described in the following table.

Part Name	Element/Type	Description
request	<a href="#">tns:GetEvents</a>	Specifies the request.
Impersonation	<a href="#">t:ExchangeImpersonation</a>	Specifies the user whom the client application is impersonating.
MailboxCulture	<a href="#">t:MailboxCulture</a>	Specifies the culture to use for accessing the mailbox. The cultures are defined by <a href="#">[RFC3066]</a> .
RequestVersion	<a href="#">t:RequestServerVersion</a>	Specifies the schema version for the <b>GetEvents</b> operation (section <a href="#">3.1.4.1</a> ) request.

### 3.1.4.1.3.2 tns:GetEventsSoapOut Message

The GetEventsSoapOut message contains two parts, as described in the following table.

Part Name	Element/Type	Description
GetEventsResult	<a href="#">tns:GetEventsResponse</a>	Specifies the response message.
ServerVersion	<a href="#">t:ServerVersionInfo</a>	Specifies the schema version for the GetEventsSoapOut message.

### 3.1.4.2 Subscribe

The [Subscribe](#) operation creates a subscription to notifications of events on mailboxes in the mail server database.

```
<wsdl:operation name="Subscribe" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input message="tns:SubscribeSoapIn" />
  <wsdl:output message="tns:SubscribeSoapOut" />
</wsdl:operation>
```

Request

Message Format	Description
<a href="#">tns:SubscribeSoapIn</a>	Specifies the SOAP message that requests the subscription.

Response

Message Format	Description
<a href="#">tns:SubscribeSoapOut</a>	Specifies the SOAP message that is returned by the server in response.

#### 3.1.4.2.1 Simple Types

The following XML schema simple type definitions are specific to this operation.

##### 3.1.4.2.1.1 t:NotificationEventTypeType Simple Type

The [NotificationEventTypeType](#) simple type specifies the event types that are reported in a notification.

```
<xs:simpleType name="NotificationEventTypeType">
  <xs:restriction>
    <xs:enumeration
      value="CopiedEvent"
    />
    <xs:enumeration
      value="CreatedEvent"
    />
    <xs:enumeration
      value="DeletedEvent"
    />
    <xs:enumeration
```

```

        value="ModifiedEvent"
      />
    <xs:enumeration
      value="MovedEvent"
    />
    <xs:enumeration
      value="NewMailEvent"
    />
  </xs:restriction>
</xs:simpleType>

```

## Enumeration

The following values are defined by the **NotificationEventType** simple type:

Value	Description
CopiedEvent	Identifies the notification as a copied event.
CreatedEvent	Identifies the notification as a created event.
DeletedEvent	Identifies the notification as a deleted event.
ModifiedEvent	Identifies the notification as a modified event.
MovedEvent	Identifies the notification as a moved event.
NewMailEvent	Identifies the notification as a new mail event.

### 3.1.4.2.1.2 t:SubscriptionTimeoutType Simple Type

The **SubscriptionTimeoutType** simple type specifies the duration that a subscription can remain idle without a **GetEvents** operation (section [3.1.4.1](#)) request from the client.

```

<xs:simpleType name="SubscriptionTimeoutType">
  <xs:restriction
    base="xs:int"
  >
    <xs:minInclusive
      value="1"
    />
    <xs:maxInclusive
      value="1440"
    />
  </xs:restriction>
</xs:simpleType>

```

### 3.1.4.2.1.3 t:SubscriptionStatusFrequencyType Simple Type

The [SubscriptionStatusFrequencyType](#) simple type specifies the frequency, in minutes, at which push notification status will be sent to the client when the subscription is idle.

```

<xs:simpleType name="SubscriptionStatusFrequencyType">
  <xs:restriction
    base="xs:int"
  >
    <xs:minInclusive
      value="1"
    />
    <xs:maxInclusive
      value="1440"
    />
  </xs:restriction>
</xs:simpleType>

```

### 3.1.4.2.2 Complex Types

The following XML schema complex type definitions are specific to this operation.

#### 3.1.4.2.2.1 m:SubscribeResponseType Complex Type

The [SubscribeResponseType](#) complex type specifies a response to a [Subscribe](#) operation (section [3.1.4.2](#)) request.

```

<xs:complexType name="SubscribeResponseType">
  <xs:complexContent>
    <xs:extension
      base="m:BaseResponseMessageType"
    />
  </xs:complexContent>
</xs:complexType>

```

#### 3.1.4.2.2.2 m:SubscribeType Complex Type

The [SubscribeType](#) complex type specifies a request to subscribe to notifications of events on mailboxes.

```

<xs:complexType name="SubscribeType">
  <xs:complexContent>
    <xs:extension
      base="m:BaseRequestType"
    >
    <xs:choice>
      <xs:element name="PullSubscriptionRequest"
        type="t:PullSubscriptionRequestType"
      />
      <xs:element name="PushSubscriptionRequest"
        type="t:PushSubscriptionRequestType"
      />
    </xs:choice>
  </xs:extension>
</xs:complexContent>
</xs:complexType>

```

Child Elements

Element	Type	Description
PullSubscriptionRequest	<a href="#">t:PullSubscriptionRequestType</a>	Specifies a pull subscription type.
PushSubscriptionRequest	<a href="#">t:PushSubscriptionRequestType</a>	Specifies a push subscription type.

**3.1.4.2.2.3 t:BaseSubscriptionRequestType Complex Type**

The [BaseSubscriptionRequestType](#) complex type specifies the base class for descendant classes that form the notification requests.

```
<xs:complexType name="BaseSubscriptionRequestType"
  abstract="true"
  >
  <xs:sequence>
    <xs:element name="FolderIds"
      type="t:NonEmptyArrayOfBaseFolderIdsType"
      />
    <xs:element name="EventTypes"
      type="t:NonEmptyArrayOfNotificationEventTypesType"
      />
    <xs:element name="Watermark"
      type="t:WatermarkType"
      minOccurs="0"
      />
  </xs:sequence>
</xs:complexType>
```

Child Elements

Element	Type	Description
FolderIds	<a href="#">t:NonEmptyArrayOfBaseFolderIdsType</a>	Specifies an array of folder identifiers that are used to identify folders to monitor for event notifications.
EventTypes	<a href="#">t:NonEmptyArrayOfNotificationEventTypesType</a>	Specifies the monitored event types for a notification subscription.
Watermark	<a href="#">t:WatermarkType</a>	Specifies an event bookmark in the mailbox event queue.

**3.1.4.2.2.4 t:NonEmptyArrayOfNotificationEventTypesType Complex Type**

The [NonEmptyArrayOfNotificationEventTypesType](#) complex type specifies an array of event notification types that are used to create a subscription.

```
<xs:complexType name="NonEmptyArrayOfNotificationEventTypesType">
  <xs:choice
    minOccurs="1"
    maxOccurs="unbounded"
  >
```

```

    <xs:element name="EventType"
      type="t:NotificationEventTypeType"
    />
  </xs:choice>
</xs:complexType>

```

#### Child Elements

Element	Type	Description
EventType	<a href="#">t:NotificationEventTypeType</a>	Specifies a requested event notification type that is used to create a subscription.

#### 3.1.4.2.2.5 t:PullSubscriptionRequestType Complex Type

The [PullSubscriptionRequestType](#) complex type specifies a subscription to a pull-based event notification subscription.

```

<xs:complexType name="PullSubscriptionRequestType">
  <xs:complexContent>
    <xs:extension
      base="t:BaseSubscriptionRequestType"
    >
    <xs:sequence>
      <xs:element name="Timeout"
        type="t:SubscriptionTimeoutType"
      />
    </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

```

#### Child Elements

Element	Type	Description
Timeout	<a href="#">t:SubscriptionTimeoutType</a>	Specifies the duration that a subscription client can remain idle without a GetEvents request from the client.

#### 3.1.4.2.2.6 t:PushSubscriptionRequestType Complex Type

The [PushSubscriptionRequestType](#) complex type specifies a subscription to a push-based event notification.

```

<xs:complexType name="PushSubscriptionRequestType">
  <xs:complexContent>
    <xs:extension
      base="t:BaseSubscriptionRequestType"
    >
    <xs:sequence>
      <xs:element name="StatusFrequency"
        type="t:SubscriptionStatusFrequencyType"
      />
    </xs:sequence>
  </xs:complexContent>
</xs:complexType>

```

```

    />
    <xs:element name="URL"
      type="xs:string"
    />
  </xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

```

#### Child Elements

Element	Type	Description
StatusFrequency	<a href="#">t:SubscriptionStatusFrequencyType</a>	Specifies the frequency, specified in minutes, in which push notification status will be sent to the client when the subscription is idle.
URL	xs:string	Specifies the location of the client Web service for push notifications.

### 3.1.4.2.3 Elements

The following XML schema element definitions are specific to this operation.

#### 3.1.4.2.3.1 Subscribe Element

The [Subscribe](#) element specifies the properties that are used to create subscriptions.

```

<xs:element name="Subscribe"
  type="m:SubscribeType"
/>

```

#### 3.1.4.2.3.2 SubscribeResponse Element

The [tns:SubscribeResponse](#) element specifies a response to a [Subscribe](#) operation (section [3.1.4.2](#)) request.

```

<xs:element name="SubscribeResponse"
  type="m:SubscribeResponseType"
/>

```

### 3.1.4.2.4 Messages

The following **WSDL message** definitions are specific to this operation.

#### 3.1.4.2.4.1 tns:SubscribeSoapIn Message

The SubscribeSoapIn message contains four parts, as described in the following table.

Part Name	Element/Type	Description
request	<a href="#">tns:Subscribe</a>	Specifies the request.
Impersonation	<a href="#">t:ExchangeImpersonation</a>	Specifies the user whom the client application is impersonating.
MailboxCulture	<a href="#">t:MailboxCulture</a>	Specifies the culture to use for accessing the mailbox. The cultures are defined by <a href="#">[RFC3066]</a> .
RequestVersion	<a href="#">t:RequestServerVersion</a>	Specifies the schema version for the <b>Subscribe</b> operation (section <a href="#">3.1.4.2</a> ) request.

### 3.1.4.2.4.2 tns:SubscribeSoapOut Message

The SubscribeSoapOut message contains two parts, as described in the following table.

Part Name	Element/Type	Description
SubscribeResult	<a href="#">tns:SubscribeResponse</a>	Specifies the response message.
ServerVersion	<a href="#">t:ServerVersionInfo</a>	Specifies the schema version for the <b>Subscribe</b> operation (section <a href="#">3.1.4.2</a> ) message.

### 3.1.4.3 Unsubscribe

The [Unsubscribe](#) operation removes a subscription to notifications of events on mailboxes.

Request

Message Format	Description
<a href="#">tns:UnsubscribeSoapIn</a>	Specifies the SOAP message that requests the subscription removal.

Response

Message Format	Description
<a href="#">tns:UnsubscribeSoapOut</a>	Specifies the SOAP message that are returned by the server in response.

### 3.1.4.3.1 Complex Types

The following XML schema complex type definitions are specific to this operation.

#### 3.1.4.3.1.1 m:UnsubscribeResponseType Complex Type

The [UnsubscribeResponseType](#) complex type specifies a response to an [Unsubscribe](#) operation (section [3.1.4.3](#)) request.

```
<xs:complexType name="UnsubscribeResponseType">
  <xs:complexContent>
    <xs:extension
      base="m:BaseResponseMessageType"
    />
  </xs:complexContent>
</xs:complexType>
```



```
</xs:complexContent>
</xs:complexType>
```

### 3.1.4.3.1.2 m:UnsubscribeType Complex Type

The [UnsubscribeType](#) complex type specifies a request to end a pull notification subscription.

```
<xs:complexType name="UnsubscribeType">
  <xs:complexContent>
    <xs:extension
      base="m:BaseRequestType"
    >
      <xs:sequence>
        <xs:element name="SubscriptionId"
          type="t:SubscriptionIdType"
        />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Child Elements

Element	Type	Description
SubscriptionId	<a href="#">t:SubscriptionIdType</a>	Specifies the subscription identifier of a subscription to cancel.

### 3.1.4.3.2 Elements

The following XML schema element definitions are specific to this operation.

#### 3.1.4.3.2.1 Unsubscribe Element

The [Unsubscribe](#) element specifies the properties used to unsubscribe from a subscription.

```
<xs:element name="Unsubscribe"
  type="m:UnsubscribeType"
/>
```

#### 3.1.4.3.2.2 UnsubscribeResponse Element

The [UnsubscribeResponse](#) element specifies a response to an [Unsubscribe](#) operation (section [3.1.4.3](#)) request.

```
<xs:element name="UnsubscribeResponse"
  type="m:UnsubscribeResponseType"
/>
```

### 3.1.4.3.3 Messages

The following **WSDL message** definitions are specific to this operation.

#### 3.1.4.3.3.1 tns:UnsubscribeSoapIn Message

The UnsubscribeSoapIn message contains four parts, as described in the following table.

Part Name	Element/Type	Description
request	<a href="#">tns:Unsubscribe</a>	Specifies the request.
Impersonation	<a href="#">t:ExchangeImpersonation</a>	Specifies the user whom the client application is impersonating.
MailboxCulture	<a href="#">t:MailboxCulture</a>	Specifies the culture to use for accessing the mailbox. The cultures are defined by <a href="#">[RFC3066]</a> .
RequestVersion	<a href="#">t:RequestServerVersion</a>	Specifies the schema version for the <b>Unsubscribe</b> operation (section <a href="#">3.1.4.3</a> ) request.

#### 3.1.4.3.3.2 tns:UnsubscribeSoapOut Message

The UnsubscribeSoapOut message contains two parts, as described in the following table.

Part Name	Element/Type	Description
UnsubscribeResult	<a href="#">tns:UnsubscribeResponse</a>	Specifies the response message.
ServerVersion	<a href="#">t:ServerVersionInfo</a>	Specifies the schema version for the UnsubscribeSoapOut message.

### 3.1.5 Timer Events

None.

### 3.1.6 Other Local Events

None.

## 3.2 Client Details

None.

### 3.2.1 Abstract Data Model

None.

### 3.2.2 Timers

None.

### 3.2.3 Initialization

None.

### **3.2.4 Message Processing Events and Sequencing**

None.

### **3.2.5 Timer Events**

None.

### **3.2.6 Other Local Events**

None.

## 4 Protocol Examples

None.

## **5 Security**

### **5.1 Security Considerations for Implementers**

The Notifications Web Service protocol does not use any additional security mechanisms.

### **5.2 Index of Security Parameters**

None.

## 6 Appendix A: Full WSDL

The following table lists the **XML** files that are required in order to implement the functionality that is specified in this document. The contents of each file are included in this section.

File name	Description	Section
MS-OXWSNTIF.wsdl	Contains the <b>WSDL</b> for the implementation of this protocol.	<a href="#">6.1</a>
MS-OXWSNTIF-types.xsd	Contains the XML schema type definitions that are used in this protocol.	<a href="#">6.2</a>
MS-OXWSNTIF-messages.xsd	Contains the XML schema message definitions that are used in this protocol.	<a href="#">6.3</a>

These files have to be placed in a common folder in order for the WSDL to validate and operate. Also, any schema files that are included in or imported into the MS-OXWSNTIF-types.xsd or MS-OXWSNTIF-messages.xsd schemas have to be placed in the common folder along with the files.

### 6.1 WSDL

This section contains the contents of the MS-OXWSNTIF.wsdl file.

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tns="http://schemas.microsoft.com/exchange/services/2006/messages"
xmlns:s="http://www.w3.org/2001/XMLSchema" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:t="http://schemas.microsoft.com/exchange/services/2006/types"
targetNamespace="http://schemas.microsoft.com/exchange/services/2006/messages">
<wsdl:types>
<xs:schema id="messages" elementFormDefault="qualified" version="Exchange2010"
xmlns:m="http://schemas.microsoft.com/exchange/services/2006/messages"
xmlns:tns="http://schemas.microsoft.com/exchange/services/2006/messages"
xmlns:t="http://schemas.microsoft.com/exchange/services/2006/types"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://schemas.microsoft.com/exchange/services/2006/messages"
xmlns="http://schemas.microsoft.com/exchange/services/2006/messages">
<xs:import namespace="http://schemas.microsoft.com/exchange/services/2006/types"/>
<xs:include schemaLocation="MS-OXWSNTIF-messages.xsd" />
<xs:include schemaLocation="MS-OXWSCDATA-messages.xsd"/>
<!-- Add global elements and types from messages.xsd -->
</xs:schema>
<xs:schema id="types" elementFormDefault="qualified" version="Exchange2010"
xmlns:t="http://schemas.microsoft.com/exchange/services/2006/types"
targetNamespace="http://schemas.microsoft.com/exchange/services/2006/types"
xmlns="http://schemas.microsoft.com/exchange/services/2006/types"
xmlns:tns="http://schemas.microsoft.com/exchange/services/2006/types"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:import namespace="http://www.w3.org/XML/1998/namespace"/>
<!-- Add global elements and types from types.xsd -->
</xs:schema>
</wsdl:types>
<wsdl:portType name="ExchangeServicePortType">
<wsdl:operation name="Subscribe">
<wsdl:input message="tns:SubscribeSoapIn" />
<wsdl:output message="tns:SubscribeSoapOut" />
</wsdl:operation>
<wsdl:operation name="Unsubscribe">
```

```

        <wsdl:input message="tns:UnsubscribeSoapIn" />
        <wsdl:output message="tns:UnsubscribeSoapOut" />
    </wsdl:operation>
    <wsdl:operation name="GetEvents">
        <wsdl:input message="tns:GetEventsSoapIn" />
        <wsdl:output message="tns:GetEventsSoapOut" />
    </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="ExchangeServiceBinding" type="tns:ExchangeServicePortType">
<wsdl:documentation>
<wsi:Claim conformsTo="http://ws-i.org/profiles/basic/1.0" xmlns:wsi="http://ws-
i.org/schemas/conformanceClaim/" />
</wsdl:documentation>
<soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
    <wsdl:operation name="Subscribe">
        <soap:operation
soapAction="http://schemas.microsoft.com/exchange/services/2006/messages/Subscribe" />
        <wsdl:input>
            <soap:header message="tns:SubscribeSoapIn" part="Impersonation"
use="literal" />
            <soap:header message="tns:SubscribeSoapIn" part="MailboxCulture"
use="literal" />
            <soap:header message="tns:SubscribeSoapIn" part="RequestVersion"
use="literal" />
            <soap:body parts="request" use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body parts="SubscribeResult" use="literal" />
            <soap:header message="tns:SubscribeSoapOut" part="ServerVersion"
use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="Unsubscribe">
        <soap:operation
soapAction="http://schemas.microsoft.com/exchange/services/2006/messages/Unsubscribe" />
        <wsdl:input>
            <soap:header message="tns:UnsubscribeSoapIn" part="Impersonation"
use="literal" />
            <soap:header message="tns:UnsubscribeSoapIn" part="MailboxCulture"
use="literal" />
            <soap:header message="tns:UnsubscribeSoapIn" part="RequestVersion"
use="literal" />
            <soap:body parts="request" use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body parts="UnsubscribeResult" use="literal" />
            <soap:header message="tns:UnsubscribeSoapOut" part="ServerVersion"
use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetEvents">
        <soap:operation
soapAction="http://schemas.microsoft.com/exchange/services/2006/messages/GetEvents" />
        <wsdl:input>
            <soap:header message="tns:GetEventsSoapIn" part="Impersonation"
use="literal" />
            <soap:header message="tns:GetEventsSoapIn" part="MailboxCulture"
use="literal" />
            <soap:header message="tns:GetEventsSoapIn" part="RequestVersion"
use="literal" />

```

```

        <soap:body parts="request" use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body parts="GetEventsResult" use="literal" />
        <soap:header message="tns:GetEventsSoapOut" part="ServerVersion"
use="literal"/>
    </wsdl:output>
</wsdl:operation>
</wsdl:binding>
<wsdl:message name="SubscribeSoapIn">
    <wsdl:part name="request" element="tns:Subscribe" />
    <wsdl:part name="Impersonation" element="t:ExchangeImpersonation"/>
    <wsdl:part name="MailboxCulture" element="t:MailboxCulture"/>
    <wsdl:part name="RequestVersion" element="t:RequestServerVersion"/>
</wsdl:message>
<wsdl:message name="SubscribeSoapOut">
    <wsdl:part name="SubscribeResult" element="tns:SubscribeResponse" />
    <wsdl:part name="ServerVersion" element="t:ServerVersionInfo"/>
</wsdl:message>
<wsdl:message name="UnsubscribeSoapIn">
    <wsdl:part name="request" element="tns:Unsubscribe" />
    <wsdl:part name="Impersonation" element="t:ExchangeImpersonation"/>
    <wsdl:part name="MailboxCulture" element="t:MailboxCulture"/>
    <wsdl:part name="RequestVersion" element="t:RequestServerVersion"/>
</wsdl:message>
<wsdl:message name="UnsubscribeSoapOut">
    <wsdl:part name="UnsubscribeResult" element="tns:UnsubscribeResponse" />
    <wsdl:part name="ServerVersion" element="t:ServerVersionInfo"/>
</wsdl:message>
<wsdl:message name="GetEventsSoapIn">
    <wsdl:part name="request" element="tns:GetEvents" />
    <wsdl:part name="Impersonation" element="t:ExchangeImpersonation"/>
    <wsdl:part name="MailboxCulture" element="t:MailboxCulture"/>
    <wsdl:part name="RequestVersion" element="t:RequestServerVersion"/>
</wsdl:message>
<wsdl:message name="GetEventsSoapOut">
    <wsdl:part name="GetEventsResult" element="tns:GetEventsResponse" />
    <wsdl:part name="ServerVersion" element="t:ServerVersionInfo"/>
</wsdl:message>
</wsdl:definitions>

```

## 6.2 Types Schema

This section contains the contents of the MS-OXWSNTIF-types.xsd file and information about additional files that this schema file requires to operate correctly.

MS-OXWSNTIF-types.xsd includes the file listed in the following table. To operate correctly, this file has to be present in the folder that contains the WSDL, types, and messages schema files for this protocol.

File name	Defining specification
MS-OXWSCDATA-types.xsd	<a href="#">[MS-OXWSCDATA]</a> section 6.2



```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:t="http://schemas.microsoft.com/exchange/services/2006/types"
xmlns:tns="http://schemas.microsoft.com/exchange/services/2006/types"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://schemas.microsoft.com/exchange/services/2006/types"
elementFormDefault="qualified" version="Exchange2010" id="types">
  <xs:import namespace="http://www.w3.org/XML/1998/namespace"/>
  <xs:include schemaLocation="MS-OXWSCDATA-types.xsd"/>
  <xs:complexType name="BaseNotificationEventType">
    <xs:sequence>
      <xs:element name="Watermark" type="t:WatermarkType"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="BaseObjectChangedEventType">
    <xs:complexContent>
      <xs:extension base="t:BaseNotificationEventType">
        <xs:sequence>
          <xs:element name="TimeStamp" type="xs:dateTime"/>
          <xs:choice>
            <xs:element name="FolderId" type="t:FolderIdType"/>
            <xs:element name="ItemId" type="t:ItemIdType"/>
          </xs:choice>
          <xs:element name="ParentFolderId" type="t:FolderIdType"/>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
  <xs:complexType name="BaseSubscriptionRequestType" abstract="true">
    <xs:sequence>
      <xs:element name="FolderIds" type="t:NonEmptyArrayOfBaseFolderIdsType"
minOccurs="0"/>
      <xs:element name="EventTypes"
type="t:NonEmptyArrayOfNotificationEventTypesType"/>
      <xs:element name="Watermark" type="t:WatermarkType" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="SubscribeToAllFolders" type="xs:boolean" use="optional"/>
  </xs:complexType>
  <xs:complexType name="ModifiedEventType">
    <xs:complexContent>
      <xs:extension base="t:BaseObjectChangedEventType">
        <xs:sequence>
          <xs:element name="UnreadCount" type="xs:int" minOccurs="0"/>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
  <xs:complexType name="MovedCopiedEventType">
    <xs:complexContent>
      <xs:extension base="t:BaseObjectChangedEventType">
        <xs:sequence>
          <xs:choice>
            <xs:element name="OldFolderId" type="t:FolderIdType"/>
            <xs:element name="OldItemId" type="t:ItemIdType"/>
          </xs:choice>
          <xs:element name="OldParentFolderId" type="t:FolderIdType"/>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>

```

```

<xs:complexType name="NonEmptyArrayOfNotificationEventTypesType">
  <xs:choice maxOccurs="unbounded">
    <xs:element name="EventType" type="t:NotificationEventTypeType"/>
  </xs:choice>
</xs:complexType>
<xs:complexType name="NotificationType">
  <xs:sequence>
    <xs:element name="SubscriptionId" type="t:SubscriptionIdType"/>
    <xs:element name="PreviousWatermark" type="t:WatermarkType"/>
    <xs:element name="MoreEvents" type="xs:boolean"/>
    <xs:choice maxOccurs="unbounded">
      <xs:element name="CopiedEvent" type="t:MovedCopiedEventType"/>
      <xs:element name="CreatedEvent" type="t:BaseObjectChangedEventType"/>
      <xs:element name="DeletedEvent" type="t:BaseObjectChangedEventType"/>
      <xs:element name="ModifiedEvent" type="t:ModifiedEventType"/>
      <xs:element name="MovedEvent" type="t:MovedCopiedEventType"/>
      <xs:element name="NewMailEvent" type="t:BaseObjectChangedEventType"/>
      <xs:element name="StatusEvent" type="t:BaseNotificationEventType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
<xs:simpleType name="NotificationEventTypeType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="CopiedEvent"/>
    <xs:enumeration value="CreatedEvent"/>
    <xs:enumeration value="DeletedEvent"/>
    <xs:enumeration value="ModifiedEvent"/>
    <xs:enumeration value="MovedEvent"/>
    <xs:enumeration value="NewMailEvent"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="PushSubscriptionRequestType">
  <xs:complexContent>
    <xs:extension base="t:BaseSubscriptionRequestType">
      <xs:sequence>
        <xs:element name="StatusFrequency"
type="t:SubscriptionStatusFrequencyType"/>
        <xs:element name="URL" type="xs:string"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="PullSubscriptionRequestType">
  <xs:complexContent>
    <xs:extension base="t:BaseSubscriptionRequestType">
      <xs:sequence>
        <xs:element name="Timeout" type="t:SubscriptionTimeoutType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:simpleType name="SubscriptionIdType">
  <xs:restriction base="t:NonEmptyStringType"/>
</xs:simpleType>
<xs:simpleType name="WatermarkType">
  <xs:restriction base="t:NonEmptyStringType"/>
</xs:simpleType>
<xs:simpleType name="SubscriptionTimeoutType">
  <xs:restriction base="xs:int">

```

```

        <xs:minInclusive value="1"/>
        <xs:maxInclusive value="1440"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="SubscriptionStatusFrequencyType">
    <xs:restriction base="xs:int">
        <xs:minInclusive value="1"/>
        <xs:maxInclusive value="1440"/>
    </xs:restriction>
</xs:simpleType>
</xs:schema>

```

### 6.3 Messages Schema

This section contains the contents of the MS-OXWSNTIF-messages.xsd file and information about additional files that this schema file requires to operate correctly.

MS-OXWSNTIF-types.xsd includes the file listed in the following table. To operate correctly, this file has to be present in the folder that contains the WSDL, types schema, and messages schema files for this protocol.

File name	Defining specification
MS-OXWSCDATA-messages.xsd	<a href="#">[MS-OXWSCDATA]</a> section 6.3

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:m="http://schemas.microsoft.com/exchange/services/2006/messages"
xmlns:tns="http://schemas.microsoft.com/exchange/services/2006/messages"
xmlns:t="http://schemas.microsoft.com/exchange/services/2006/types"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://schemas.microsoft.com/exchange/services/2006/messages"
elementFormDefault="qualified" version="Exchange2010" id="messages">
    <!--      CHANGE THE SCHEMA LOCATION TO REFLECT THE TYPES XSD ASSOCIATED WITH THIS
    DOCUMENT
    <xs:import namespace="http://schemas.microsoft.com/exchange/services/2006/types"
    schemaLocation="types.xsd"/>
    <xs:include/>
-->
    <xs:import namespace="http://schemas.microsoft.com/exchange/services/2006/types"
    schemaLocation="MS-OXWSNTIF-types.xsd"/>
    <xs:include schemaLocation="MS-OXWSCDATA-messages.xsd"/>
    <xs:complexType name="GetEventsType">
        <xs:complexContent>
            <xs:extension base="m:BaseRequestType">
                <xs:sequence>
                    <xs:element name="SubscriptionId" type="t:SubscriptionIdType"/>
                    <xs:element name="Watermark" type="t:WatermarkType"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:element name="GetEvents" type="m:GetEventsType"/>
    <xs:complexType name="GetEventsResponseMessageType">
        <xs:complexContent>
            <xs:extension base="m:ResponseMessageType">
                <xs:sequence>

```

```

        <xs:element name="Notification" type="t:NotificationType"
minOccurs="0"/>
        </xs:sequence>
    </xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="GetEventsResponseType">
    <xs:complexContent>
        <xs:extension base="m:BaseResponseMessageType"/>
    </xs:complexContent>
</xs:complexType>
<xs:element name="GetEventsResponse" type="m:GetEventsResponseType"/>
<xs:complexType name="SubscribeType">
    <xs:complexContent>
        <xs:extension base="m:BaseRequestType">
            <xs:choice>
                <xs:element name="PullSubscriptionRequest"
type="t:PullSubscriptionRequestType"/>
                <xs:element name="PushSubscriptionRequest"
type="t:PushSubscriptionRequestType"/>
            </xs:choice>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
<xs:element name="Subscribe" type="m:SubscribeType"/>
<xs:complexType name="SubscribeResponseMessageType">
    <xs:complexContent>
        <xs:extension base="m:ResponseMessageType">
            <xs:sequence>
                <xs:element name="SubscriptionId" type="t:SubscriptionIdType"
minOccurs="0"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
<xs:element name="Watermark" type="t:WatermarkType" minOccurs="0"/>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="SubscribeResponseType">
    <xs:complexContent>
        <xs:extension base="m:BaseResponseMessageType"/>
    </xs:complexContent>
</xs:complexType>
<xs:element name="SubscribeResponse" type="m:SubscribeResponseType"/>
<xs:complexType name="UnsubscribeType">
    <xs:complexContent>
        <xs:extension base="m:BaseRequestType">
            <xs:sequence>
                <xs:element name="SubscriptionId" type="t:SubscriptionIdType"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
<xs:element name="Unsubscribe" type="m:UnsubscribeType"/>
<xs:complexType name="UnsubscribeResponseMessageType">
    <xs:complexContent>
        <xs:extension base="m:BaseResponseMessageType"/>
    </xs:complexContent>
</xs:complexType>
<xs:element name="UnsubscribeResponse" type="m:UnsubscribeResponseMessageType"/>
</xs:schema>

```



## 7 Appendix B: Product Behavior

The information in this specification is applicable to the following product versions. References to product versions include released service packs.

- Microsoft Exchange Server 2010

Exceptions, if any, are noted below. If a service pack number appears with the product version, behavior changed in that service pack. The new behavior also applies to subsequent service packs of the product unless otherwise specified.

Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that product does not follow the prescription.

## 8 Change Tracking

This section identifies changes made to [MS-OXWSNTIF] protocol documentation between July 2009 and November 2009 releases. Changes are classed as major, minor, or editorial.

**Major** changes affect protocol interoperability or implementation. Examples of major changes are:

- A document revision that incorporates changes to interoperability requirements or functionality.
- An extensive rewrite, addition, or deletion of major portions of content.
- A protocol is deprecated.
- The removal of a document from the documentation set.
- Changes made for template compliance.

**Minor** changes do not affect protocol interoperability or implementation. Examples are updates to fix technical accuracy or ambiguity at the sentence, paragraph, or table level.

**Editorial** changes apply to grammatical, formatting, and style issues.

**No changes** means that the document is identical to its last release.

Major and minor changes can be described further using the following revision types:

- New content added.
- Content update.
- Content removed.
- New product behavior note added.
- Product behavior note updated.
- Product behavior note removed.
- New protocol syntax added.
- Protocol syntax updated.
- Protocol syntax removed.
- New content added due to protocol revision.
- Content updated due to protocol revision.
- Content removed due to protocol revision.
- New protocol syntax added due to protocol revision.
- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.

- Content removed for template compliance.
- Obsolete document removed.

Editorial changes always have the revision type "Editorially updated."

Some important terms used in revision type descriptions are defined as follows:

**Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.

**Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

Changes are listed in the following table. If you need further information, please contact [protocol@microsoft.com](mailto:protocol@microsoft.com).

Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
<a href="#">1 Introduction</a>	52356 Updated the link to the SOAP 1.1 protocol.	N	Content update.
<a href="#">2.1 Transport</a>	52678 Updated the text to include a link to the SOAP protocol.	N	Content update.
<a href="#">2.2 Common Message Syntax</a>	52678 Updated the text to include links to defining protocols.	N	Content update.
<a href="#">2.2.1 Namespaces</a>	52678 Updated the table to include links to defining protocols.	N	Content update.
<a href="#">3.1 ExchangeServicePortType Server Details</a>	52678 Added links to and descriptions of the operations.	N	New content added.
<a href="#">3.1.4.1.3.1 tns:GetEventsSoapIn Message</a>	52416 Updated the section title to include the word "Message".	N	Content update.
<a href="#">3.1.4.1.3.2 tns:GetEventsSoapOut Message</a>	52416 Updated the section title to include the word "Message".	N	Content update.
<a href="#">3.1.4.2.1.2 t:SubscriptionTimeoutType Simple Type</a>	52357 Added a link to the GetEvents operation.	N	Content update.
<a href="#">3.1.4.2.4.1 tns:SubscribeSoapIn Message</a>	52416 Updated the section title to include the word "Message".	N	Content update.
<a href="#">3.1.4.2.4.2</a>	52416	N	Content



Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
<a href="#">tns:SubscribeSoapOut Message</a>	Updated the section title to include the word "Message".		update.
<a href="#">3.1.4.3.3.1</a> <a href="#">tns:UnsubscribeSoapIn Message</a>	52416 Updated the section title to include the word "Message".	N	Content update.
<a href="#">3.1.4.3.3.2</a> <a href="#">tns:UnsubscribeSoapOut Message</a>	52416 Updated the section title to include the word "Message".	N	Content update.

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