

# [MS-PPSDECO]: PerformancePoint Services Decomposition Tree Protocol Specification

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## Revision Summary

Date	Revision History	Revision Class	Comments
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08/28/2009	0.2	Editorial	Revised and edited the technical content
11/06/2009	0.3	Editorial	Revised and edited the technical content
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# 1 Introduction

This document specifies the PerformancePoint Services Decomposition Tree Protocol. This protocol is used by a protocol client to do contribution analysis on data known to the protocol server.

## 1.1 Glossary

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

**Secure Sockets Layer (SSL)  
server**

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

**data source  
level  
list  
measure  
node  
SOAP action  
SOAP body  
SOAP fault  
WSDL message  
WSDL operation**

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-PPSAS] Microsoft Corporation, "[PerformancePoint Services AuthoringService Protocol Specification](#)"

[RFC1341] Borenstein, N., and Freed, N., "MIME (Multipurpose Internet Mail Extensions): Mechanisms for Specifying and Describing the Format of Internet Message Bodies", RFC 1341, June 1992, <http://www.ietf.org/rfc/rfc1341.txt>

[RFC2068] Fielding, R., Gettys, J., Mogul, J., et al., "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2068, January 1997, <http://www.ietf.org/rfc/rfc2068.txt>

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

[RFC2557] Palme, J., Hopmann, A., and Shelness, N., "MIME Encapsulation of Aggregate Documents, such as HTML (MHTML)", RFC 2557, March 1999, <http://www.rfc-editor.org/rfc/rfc2557.txt>

[RFC2616] Fielding, R., Gettys, J., Mogul, J., 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>

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

[SOAP1.2/1] Gudgin, M., Hadley, M., Mendelsohn, N., Moreau, J., and Nielsen, H.F., "SOAP Version 1.2 Part 1: Messaging Framework", W3C Recommendation, June 2003, <http://www.w3.org/TR/2003/REC-soap12-part1-20030624>

[SOAP1.2/2] Gudgin, M., Hadley, M., Mendelsohn, N., Moreau, J., and Nielsen, H.F., "SOAP Version 1.2 Part 2: Adjuncts", W3C Recommendation, June 2003, <http://www.w3.org/TR/2003/REC-soap12-part2-20030624>

[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] Bray, T., Hollander, D., Layman, A., et al., Eds., "Namespaces in XML 1.0 (Third Edition)", W3C Recommendation, December 2009, <http://www.w3.org/TR/2009/REC-xml-names-20091208/>

[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

[MSDN-ENCLOC] Microsoft Corporation, "Encoding and Localization", .NET Framework Developer's Guide, <http://msdn.microsoft.com/en-us/library/h6270d0z.aspx>

[MS-GLOS] Microsoft Corporation, "[Windows Protocols Master Glossary](#)".

[MS-OFCGLOS] Microsoft Corporation, "[Microsoft Office Master Glossary](#)".

## 1.3 Protocol Overview (Synopsis)

This protocol allows a protocol client to do contribution analysis on a data value using a data source or data source context known to the protocol server.

The protocol allows a protocol client to retrieve grouped, named actions that apply to a specific data value, or named properties and values associated with that node, and then using action name and context retrieved in a previous call, retrieve additional values that contribute to the value.

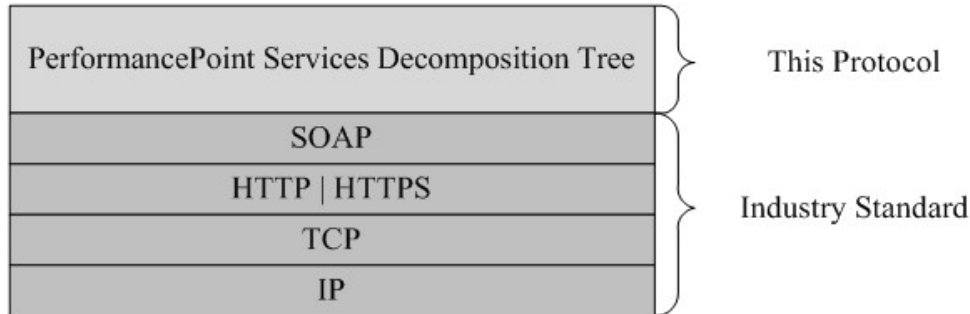
The protocol server returns all data points or some data points, and provides or denies summary data for those data points not returned.

A typical scenario for using this protocol is to display an interactive contribution analysis visualization.

## 1.4 Relationship to Other Protocols

The PPS Decomposition Tree Protocol uses the SOAP messaging protocol for formatting requests and responses as specified either in [\[SOAP1.1\]](#) or in [\[SOAP1.2/1\]](#) and [\[SOAP1.2/2\]](#). It transmits these messages using the HTTP protocol as specified in [\[RFC2616\]](#) or the HTTPS protocol as specified in [\[RFC2818\]](#).

The following diagram shows the underlying messaging and transport stack used by the protocol:



**Figure 1: This protocol in Relation to Other Protocols**

## 1.5 Prerequisites/Preconditions

This protocol operates against a site that is identified by a URL that is known by protocol clients. The protocol server endpoint is formed by appending "/\_vti\_bin/PPS/PPSDecompRenderingService.asmx" to the URL of the site, for example:

`http://www.example.com/Repository/_vti_bin/PPS/PPSDecompRenderingService.asmx.`

This protocol assumes that authentication has been performed by the underlying protocols.

## 1.6 Applicability Statement

This protocol enables communication between a protocol server, which makes connections to a variety of data sources, and a protocol client.

## 1.7 Versioning and Capability Negotiation

This document specifies versioning issues in the following areas:

- **Supported Transports:** This protocol uses multiple transports with SOAP as specified in section Transport (see section [2.1](#))
- **Security and Authentication Methods:** The security and authentication methods supported by this protocol are specified in section Security (see section [5](#)).
- **Localization:** This protocol includes text strings in various messages. Localization considerations for such strings are specified in the Common Message Syntax (Section [2.2](#)) and Message Processing Events and Sequencing Rules (Section [3.1.4](#)) sections.

## 1.8 Vendor-Extensible Fields

None.

## 1.9 Standards Assignments

None.



## 2 Messages

Occasionally, instances occur where this web service's WSDL specifies optionality (for example, `minOccurs="0"` and `maxOccurs="1"`) that conflicts with the stated behavior in this document, or the document doesn't contain the stated behavior. In such cases where the document and the WSDL conflict, the document takes precedence. In cases where the document doesn't specify optionality, the argument has to be present, even if the WSDL specifies that the argument is optional (for example, `minOccurs="0"`).

In cases where an argument is optional and the WSDL specifies both `"minOccurs=0"` and `"Nillable=true"`, treat the argument as only `"minOccurs=0"`.

### 2.1 Transport

Protocol servers **MUST** support SOAP over HTTP. Protocol servers **SHOULD** additionally support SOAP over HTTPS for securing communication with protocol clients.

Protocol messages **MUST** be formatted as specified either in [\[SOAP1.1\]](#), section 4 or in [\[SOAP1.2/1\]](#), section 5. Protocol server faults **MUST** be returned either using HTTP Status Codes as specified in [\[RFC2616\]](#), section 10 or using **SOAP faults** as specified either in [\[SOAP1.1\]](#), section 4.4 or in [\[SOAP1.2/1\]](#), section 5.4. The version of the SOAP fault returned **MUST** correspond to the version of SOAP used for the request **WSDL message**.

### 2.2 Common Message Syntax

This section contains common structures used by this protocol. The syntax of the structures uses XML Schema, as specified in [\[XMLSCHEMA1\]](#) and [\[XMLSCHEMA2\]](#), and Web Services Description Language, as specified in [\[WSDL\]](#).

#### 2.2.1 Namespaces

Prefix	Namespace URI	Reference
s xs	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>	<a href="#">[XMLSCHEMA1]</a> <a href="#">[XMLSCHEMA2]</a>
soap12	<a href="http://schemas.xmlsoap.org/wsdl/soap12/">http://schemas.xmlsoap.org/wsdl/soap12/</a>	<a href="#">[SOAP1.2/1]</a> <a href="#">[SOAP1.2/2]</a>
mime	<a href="http://schemas.xmlsoap.org/wsdl/mime/">http://schemas.xmlsoap.org/wsdl/mime/</a>	<a href="#">[RFC2557]</a> <a href="#">[RFC1341]</a>
tns	<a href="http://www.microsoft.com/performancepoint/scorecards">http://www.microsoft.com/performancepoint/scorecards</a>	<a href="#">[MS-PPSAS]</a>
soapenc	<a href="http://schemas.xmlsoap.org/soap/encoding/">http://schemas.xmlsoap.org/soap/encoding/</a>	<a href="#">[MSDN-ENCLOC]</a>
soap	<a href="http://schemas.xmlsoap.org/wsdl/soap/">http://schemas.xmlsoap.org/wsdl/soap/</a>	<a href="#">[SOAP1.1]</a>
tm	<a href="http://microsoft.com/wsdl/mime/textMatching/">http://microsoft.com/wsdl/mime/textMatching/</a>	<a href="#">[RFC2557]</a> <a href="#">[RFC1341]</a>
http	<a href="http://schemas.xmlsoap.org/wsdl/http/">http://schemas.xmlsoap.org/wsdl/http/</a>	<a href="#">[RFC2068]</a>
wsdl	<a href="http://schemas.xmlsoap.org/wsdl/">http://schemas.xmlsoap.org/wsdl/</a>	<a href="#">[WSDL]</a>

## 2.2.2 Messages

None.

## 2.2.3 Elements

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

## 2.2.4 Complex Types

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

Complex Type	Description
ArrayOfDecompRenderResultLevel	An array of DecompRenderResultLevel elements.
ArrayOfDecompRenderResultNode	An array of DecompRenderResultNode elements.
DecompRenderResultLevel	The details about a level.
DecompRenderResultNode	The details about a node.
DecompRenderResultRecord	The details about the query result.

### 2.2.4.1 ArrayOfDecompRenderResultLevel

The **ArrayOfDecompRenderResultLevel** complex type specifies an array of [DecompRenderResultLevel](#).

```
<xs:complexType name="ArrayOfDecompRenderResultLevel">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompRenderResultLevel"
      nillable="true" type="tns:DecompRenderResultLevel"/>
  </xs:sequence>
</xs:complexType>
```

**DecompRenderResultLevel:** The details about a **level**.

### 2.2.4.2 ArrayOfDecompRenderResultNode

The **ArrayOfDecompRenderResultNode** complex type specifies an array of [DecompRenderResultNode](#).

```
<xs:complexType name="ArrayOfDecompRenderResultNode">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompRenderResultNode"
      nillable="true" type="tns:DecompRenderResultNode"/>
  </xs:sequence>
</xs:complexType>
```

**DecompRenderResultNode:** The details about a **node**.

### 2.2.4.3 DecompRenderResultLevel

The **DecompRenderResultLevel** complex type represents an ordered list of nodes and count of nodes, where total count includes nodes not returned.

```
<xs:complexType name="DecompRenderResultLevel">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="SortedBy" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="HierarchyName" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="TotalNodeCount" type="xs:int"/>
    <xs:element minOccurs="0" maxOccurs="1" name="UniqueName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Nodes"
type="tns:ArrayOfDecompRenderResultNode"/>
  </xs:sequence>
</xs:complexType>
```

**SortedBy:** Specifies the direction in which the resulting [ArrayOfDecompRenderResultNode](#) is sorted by [DecompRenderResultNode](#) Value. MUST be "ASCENDING" or "DESCENDING" (without quotes), or any case variation of those two values.

**HierarchyName:** If present, server MAY pass an empty string, and MUST be ignored by client.

**TotalNodeCount:** Specifies the total number of nodes. MUST be equal to or greater than the number of [DecompRenderResultNode](#) elements returned in the Nodes element. This is not the actual number of [DecompRenderResultNode](#) element returned.

**UniqueName:** Uniquely identifies the level and is defined by the web service. It MUST NOT be NULL or EMPTY.

**Caption:** Specifies the user-friendly name of the resulting level.

**Nodes:** Specifies a collection of [DecompRenderResultNode](#) elements.

### 2.2.4.4 DecompRenderResultNode

The **DecompRenderResultNode** complex type represents the details of a node.

```
<xs:complexType name="DecompRenderResultNode">
  <xs:sequence>
    <xs:element minOccurs="1" maxOccurs="1" name="Value" type="xs:double"/>
    <xs:element minOccurs="0" maxOccurs="1" name="FormattedValue" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="HasChildren" type="xs:boolean"/>
    <xs:element minOccurs="0" maxOccurs="1" name="UniqueName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="BottomSumValue" type="xs:double"/>
    <xs:element minOccurs="0" maxOccurs="1" name="BottomSumFormattedValue" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="TopSumValue" type="xs:double"/>
    <xs:element minOccurs="0" maxOccurs="1" name="TopSumFormattedValue" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
```

**Value:** Specifies the raw numeric value of the node.

**FormattedValue:** Specifies the user-friendly value of the node.

**HasChildren:** Protocol server SHOULD return true if the [AutoExpand](#) method called using this node's UniqueName will return a positive number of DecompRenderResultNode elements. Otherwise, MUST return false.

**UniqueName:** Uniquely identifies the node and is defined by the web service. It MUST NOT be NULL or EMPTY.

**Caption:** Specifies the user-friendly name of this node.

**BottomSumValue:** If the MeasureIsAdditive property of the associated [DecompRenderResultRecord](#) is true this SHOULD specify the sum of all the Values of the DecompRenderResultNodes occurring after this node in the resulting [ArrayOfDecompRenderResultNode](#).

**BottomSumFormattedValue:** If the MeasureIsAdditive property of the associated DecompRenderResultRecord is true this SHOULD specify the user-friendly value of the **BottomSumValue**.

**TopSumValue:** If the MeasureIsAdditive property of the associated DecompRenderResultRecord is true this SHOULD specify the sum of all the Values of the DecompRenderResultNodes occurring before this node in the resulting ArrayOfDecompRenderResultNode.

**TopSumFormattedValue:** If the MeasureIsAdditive property of the associated DecompRenderResultRecord is true this SHOULD specify the user-friendly value of the **TopSumValue**.

#### 2.2.4.5 DecompRenderResultRecord

The **DecompRenderResultRecord** complex type specifies details and results of a query.

```
<xs:complexType name="DecompRenderResultRecord">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Levels"
type="tns:ArrayOfDecompRenderResultLevel"/>
    <xs:element minOccurs="0" maxOccurs="1" name="MeasureCaption" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="MeasureUniqueName" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="MeasureIsAdditive" type="xs:boolean"/>
    <xs:element minOccurs="0" maxOccurs="1" name="NavigationContext" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ErrorMsg" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ErrorDetails" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
```

**Levels:** MUST specify an [ArrayOfDecompRenderResultLevel](#) containing no more than 1 [DecompRenderResultLevel](#) element.

**MeasureCaption:** Specifies the user-friendly name of the associated **measure**.

**MeasureUniqueName:** Uniquely identifies the measure and is defined by the web service. It MUST NOT be NULL or EMPTY.

**MeasureIsAdditive:** If true, then the TopSumValue, TopSumFormattedValue, BottomSumValue, and BottomSumFormattedValue elements of all the [DecompRenderResultNode](#) element instances contained in the Levels element of this DecompRenderResultRecord MUST specify sum values. If false, the protocol client MUST ignore the TopSumValue, TopSumFormattedValue, BottomSumValue, and BottomSumFormattedValue values."

**NavigationContext:** Specifies a session-specific value that specifies the current state of the protocol server.

**ErrorMsg:** Specifies an error message in the case of an application error on the protocol server.

**ErrorDetails:** Specifies the error details in the case of an application error on the protocol server.

## **2.2.5 Simple Types**

This specification does not define any common XML Schema simple type definitions.

## **2.2.6 Attributes**

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

## **2.2.7 Groups**

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

## **2.2.8 Attribute Groups**

This specification does not define any common XML Schema attribute group 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.

Except where specified, protocol clients SHOULD interpret HTTP Status Codes returned by the protocol server as specified in [\[RFC2616\]](#), section 10.

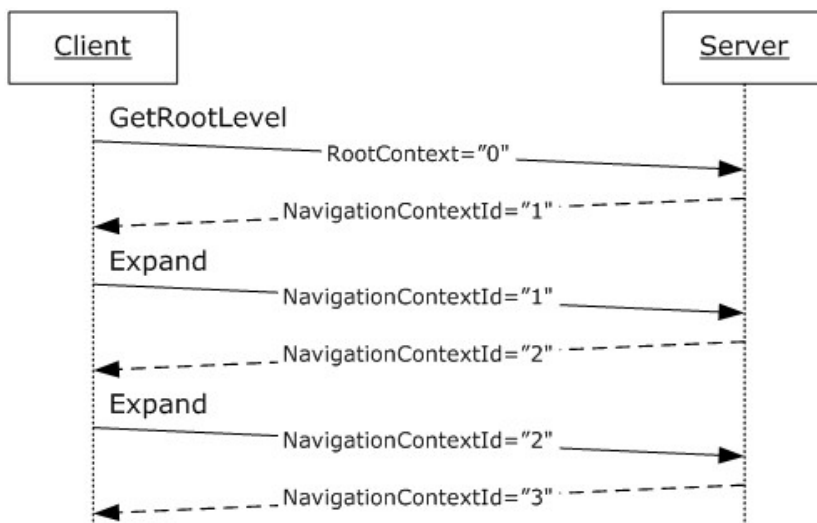
This protocol allows protocol servers to perform implementation-specific localization of text in various messages. The localization of this text is an implementation-specific behavior of the protocol server and not significant for interoperability.

Occasionally, instances occur where this web service's WSDL specifies optionality (for example, `minOccurs="0"` and `maxOccurs="1"`) that conflicts with the stated behavior in this document, or the document doesn't contain the stated behavior. In such cases where the document and the WSDL conflict, the document takes precedence. In cases where the document doesn't specify optionality, the argument has to be present, even if the WSDL specifies that the argument is optional (for example, `minOccurs="0"`).

In cases where an argument is optional and the WSDL specifies both `"minOccurs=0"` and `"Nillable=true"`, treat the argument as only `"minOccurs=0"`.

#### 3.1 Server Details

The following is a high-level sequence diagram illustrating the operation of the protocol.



**Figure 2: Protocol high level sequence diagram**

First, a protocol client establishes a session with a protocol server with the **GetRootLevel** operation. The client passes in a *RootContextId* known to the server. The server responds with a *NavigationContextId* which represents a session state variable. Navigation operations, **AutoExpand** and **Expand**, require the client to pass the session state to the server. The protocol server will respond to each navigation operation with a new session state variable.

### 3.1.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model as long as their external behavior is consistent with that described in this document.

**Root Context:** The session state known to protocol server and protocol client prior to use of operation **GetRootLevel**.

This state allows the protocol server to keep private information it uses to generate responses, for example connection strings to data sources.

**Navigation Context:** The session state representing an ordered sequence of navigation operations following use of operation **GetRootLevel**. Navigation operations are **AutoExpand** and **Expand**.

This state allows the protocol server to track the ordered sequence of navigation operations performed. For example, for the following operations:

- **GetRootLevel**, *navigationContextId* "0", protocol server responds with *navigationContext* 1"
- **Expand**, *navigationContext* "1" and *itemUniqueName* "[Product].[52]", protocol server responds with *navigationContext* "2"
- **Expand**, *navigationContext* "2" and *itemUniqueName* "[Customer].[79]"

the protocol server references Decomposition Navigation Context identified by "2" (representing the preceding **Expand** operation and its parameters, and the preceding **GetRootLevel** operation and its parameters) to respond to the final **Expand** operation.

### 3.1.2 Timers

If a request exceeds a timeout period, the **server (1)** MUST return a SOAP FAULT response.

### 3.1.3 Initialization

This protocol operates against a site that is identified by a URL that is known by protocol clients. The protocol server endpoint is formed by appending `"/_vti_bin/PPS/PPSDecompRenderingService.asmx"` to the URL of the site, for example:  
`http://www.example.com/_vti_bin/PPS/PPSDecompRenderingService.asmx`.

A connection that uses the underlying protocol layers that are specified in section [1.4](#) MUST be established before using this protocol.

### 3.1.4 Message Processing Events and Sequencing Rules

This section specifies the protocol operations.

This specification includes the following **WSDL operations**:

WSDL Operation	Description
AutoExpand	This operation is used to get additional node data for a specific node, where named actions are not known. See also <a href="#">Expand</a> .

WSDL Operation	Description
CreateNavigationList	This operation returns a list of named actions for use with the <i>navigationItemUniqueName</i> element of the <a href="#">Expand</a> operation.
Expand	This operation is used to get additional node data for a specific node, using a named action.
GetMemberProperties	This operation returns properties associated with a specified node.
GetRootLevel	This operation is used to start a session. A protocol client <b>MUST</b> use operation <b>GetRootLevel</b> to retrieve the Navigation Context session state variable before using other operations.

### 3.1.4.1 AutoExpand

This operation is used to get additional node data for a specific node, where named actions are not known. See also [Expand](#).

```
<wsdl:operation name="AutoExpand">
  <wsdl:input message="tns:AutoExpandSoapIn"/>
  <wsdl:output message="tns:AutoExpandSoapOut"/>
</wsdl:operation>
```

A session state variable is required to successfully complete this operation. As part of the [AutoExpandSoapIn](#) request message, **navigationContext** **MUST** contain a value obtained from a [DecompRenderResultRecord](#) result from a previous successful request to [GetRootLevel](#), [AutoExpand](#), or [Expand](#).

A session state variable, *Navigation Context*, is created in this operation. The *NavigationContext* value is returned as part of the *DecompRenderResultRecord* element. All requests using other protocol messages, such as [AutoExpand](#), [Expand](#), [CreateNavigationList](#) and [GetMemberProperties](#) require such a session state variable.

In the event of an application error on the protocol server during the operation, the protocol server **MUST** return a SOAP FAULT response.

#### 3.1.4.1.1 Messages

##### 3.1.4.1.1.1 AutoExpandSoapIn

The requested WSDL message for the **AutoExpand** WSDL operation.

The **SOAP action** value is:

```
http://www.microsoft.com/performancepoint/scorecards/AutoExpand
```

The **SOAP body** contains the **AutoExpand** element.

##### 3.1.4.1.1.2 AutoExpandSoapOut

The response WSDL message for the **AutoExpand** method.

The SOAP action value is:



The SOAP body contains the **AutoExpandResponse** element.

### 3.1.4.1.2 Elements

#### 3.1.4.1.2.1 AutoExpand

The input data for the **AutoExpand** WSDL operation.

```
<xs:element name="AutoExpand">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="levelUniqueName" type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="itemUniqueName" type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="sortType" type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="navigationContext" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

**levelUniqueName:** Uniquely identifies the level to expand. This identifier is defined by the web service and is the **DecompRenderResultLevel** unique name. It MUST NOT be NULL or EMPTY.

**itemUniqueName:** Uniquely identifies the node to expand. This identifier is defined by the web service and is the [DecompRenderResultNode](#) unique name. It MUST NOT be NULL or EMPTY.

**sortType:** Species a how the result nodes are sorted. MUST be "ASCENDING" or "DESCENDING" (without quotes), and MUST NOT be case sensitive. The [DecompRenderResultNode](#) elements in [ExpandResponse](#) MUST be sorted according to the specified value. If empty, NULL, or not specified, the protocol server MUST use "DESCENDING".

**navigationContext:** A session identifier which defines the state of the client. MUST be the [NavigationContext](#) value from a [DecompRenderResultRecord](#) element obtained from a previous successful request to either [GetRootLevel](#), [AutoExpand](#) or [Expand](#). MUST NOT be NULL and MUST NOT be empty.

#### 3.1.4.1.2.2 AutoExpandResponse

The result data for the **AutoExpand** WSDL operation.

```
<xs:element name="AutoExpandResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="AutoExpandResult"
type="tns:DecompRenderResultRecord"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

**AutoExpandResult:** A [DecompRenderResultRecord](#) element. In the event of an application error on the protocol server, this element will not occur.

### 3.1.4.2 CreateNavigationList

This operation returns a list of named actions for use with the *navigationItemUniqueName* element of the [Expand](#) operation.

```
<wsdl:operation name="CreateNavigationList">
  <wsdl:input message="tns:CreateNavigationListSoapIn"/>
  <wsdl:output message="tns:CreateNavigationListSoapOut"/>
</wsdl:operation>
```

Two tiers of information are returned. The first tier is a list of all the possible groups a node can expand to. Each group within that first tier SHOULD have a list of named actions.

A session state variable is required to successfully complete this operation. As part of the [CreateNavigationListSoapIn](#) request message, **navigationContext** MUST contain a value obtained from a [DecompRenderResultRecord](#) result from a previous successful request to [GetRootLevel](#), [AutoExpand](#), or [Expand](#).

In the event of an application error on the protocol server during the operation, the protocol server MUST return a SOAP FAULT response.

#### 3.1.4.2.1 Messages

##### 3.1.4.2.1.1 CreateNavigationListSoapIn

The requested WSDL message for the **CreateNavigationList** WSDL operation.

The SOAP action value is:

```
http://www.microsoft.com/performancepoint/scorecards/CreateNavigationList
```

The SOAP body contains the **CreateNavigationList** element.

##### 3.1.4.2.1.2 CreateNavigationListSoapOut

The response WSDL message for the **CreateNavigationList** method.

The SOAP action value is:

```
http://www.microsoft.com/performancepoint/scorecards/CreateNavigationList
```

The SOAP body contains the **CreateNavigationListResponse** element.

#### 3.1.4.2.2 Elements

##### 3.1.4.2.2.1 CreateNavigationList

The input data for the **CreateNavigationList** WSDL operation.

```
<xs:element name="CreateNavigationList">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="levelUniqueName" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

```

        <xs:element minOccurs="0" maxOccurs="1" name="itemUniqueName" type="xs:string"/>
        <xs:element minOccurs="0" maxOccurs="1" name="navigationContext" type="xs:string"/>
    </xs:sequence>
</xs:complexType>
</xs:element>

```

**levelUniqueName:** Uniquely identifies the level to expand. This identifier is defined by the web service and is the **DecompRenderResultLevel** unique name. It MUST NOT be NULL or EMPTY.

**itemUniqueName:** Uniquely identifies the node to expand. This identifier is defined by the web service and is the [DecompRenderResultNode](#) unique name. It MUST NOT be NULL or EMPTY.

**navigationContext:** A session identifier which defines the state of the client. MUST be the *NavigationContext* value from a [DecompRenderResultRecord](#) element obtained from a previous successful request to either [GetRootLevel](#), [AutoExpand](#) or [Expand](#). MUST NOT be NULL and MUST NOT be empty.

### 3.1.4.2.2.2 CreateNavigationListResponse

The result data for the **CreateNavigationList** WSDL operation.

```

<xs:element name="CreateNavigationListResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="CreateNavigationListResult"
        type="tns:DecompNavigationList"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

```

**CreateNavigationListResult:** A [DecompNavigationList](#) value. In the event of an application error on the protocol server, this value will not occur.

### 3.1.4.2.3 Complex Types

#### 3.1.4.2.3.1 DecompNavigationList

The **DecompNavigationList** complex type contains a collection of possible grouped, named actions.

```

<xs:complexType name="DecompNavigationList">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Groups"
      type="tns:ArrayOfDecompNavigationGroup"/>
  </xs:sequence>
</xs:complexType>

```

**Groups:** A collection of [DecompNavigationGroup](#) objects.

#### 3.1.4.2.3.2 ArrayOfDecompNavigationGroup

The **ArrayOfDecompNavigationGroup** complex type specifies an array of [DecompNavigationGroup](#).

```

<xs:complexType name="ArrayOfDecompNavigationGroup">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompNavigationGroup"
      nillable="true" type="tns:DecompNavigationGroup"/>
  </xs:sequence>
</xs:complexType>

```

**DecompNavigationGroup:** Contains details about a group of named actions.

### 3.1.4.2.3.3 DecompNavigationGroup

The **DecompNavigationGroup** complex type contains details about a group of named actions.

```

<xs:complexType name="DecompNavigationGroup">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Name" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Actions"
      type="tns:ArrayOfDecompNavigationAction"/>
  </xs:sequence>
</xs:complexType>

```

**Name:** If present, server MAY pass an empty string, and MUST be ignored by client.

**Caption:** MUST specify the user-friendly name of the group.

**Actions:** MUST specify a collection of [DecompNavigationAction](#) elements.

### 3.1.4.2.3.4 ArrayOfDecompNavigationAction

The **ArrayOfDecompNavigationAction** complex type specifies an array of [DecompNavigationAction](#).

```

<xs:complexType name="ArrayOfDecompNavigationAction">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompNavigationAction"
      nillable="true" type="tns:DecompNavigationAction"/>
  </xs:sequence>
</xs:complexType>

```

**DecompNavigationAction:** Contains details about a named action.

### 3.1.4.2.3.5 DecompNavigationAction

The **DecompNavigationAction** complex type contains details about a named action.

```

<xs:complexType name="DecompNavigationAction">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Name" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ParentCaption" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="Enabled" type="xs:boolean"/>
  </xs:sequence>

```

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

**Name:** MUST specify the unique name of the action.

**Caption:** MUST specify the user-friendly name of the action.

**ParentCaption:** Specifies a user-friendly categorization for this action.

**Enabled:** If false, protocol client MUST NOT pass this action's name as the value of the `navigationItemUniqueName` parameter of the [Expand](#) method. If true, this action's name MAY be passed as the value of the `navigationItemUniqueName` parameter of the `Expand` method.

### 3.1.4.3 Expand

This operation is used to get additional node data for a specific node, using a named action.

```
<wsdl:operation name="Expand">
  <wsdl:input message="tns:ExpandSoapIn"/>
  <wsdl:output message="tns:ExpandSoapOut"/>
</wsdl:operation>
```

A session state variable is required to successfully complete this operation. As part of the [ExpandSoapIn](#) request message, **navigationContext** MUST contain a value obtained from a [DecompRenderResultRecord](#) result from a previous successful request to [GetRootLevel](#), [AutoExpand](#), or `Expand`.

A session state variable, *Navigation Context*, is created in this operation. The *NavigationContext* value is returned as part of the `DecompRenderResultRecord` element. All requests using other protocol messages, such as `AutoExpand`, `Expand`, [CreateNavigationList](#) and [GetMemberProperties](#) require such a session state variable.

In the event of an application error on the protocol server during the operation, the protocol server MUST return a SOAP FAULT response.

#### 3.1.4.3.1 Messages

##### 3.1.4.3.1.1 ExpandSoapIn

The requested WSDL message for the **Expand** WSDL operation.

The SOAP action value is:

```
http://www.microsoft.com/performancepoint/scorecards/Expand
```

The SOAP body contains the **Expand** element.

##### 3.1.4.3.1.2 ExpandSoapOut

The response WSDL message for the **Expand** method.

The SOAP action value is:

The SOAP body contains the **ExpandResponse** element.

### 3.1.4.3.2 Elements

#### 3.1.4.3.2.1 Expand

The input data for the **Expand** WSDL operation.

```
<xs:element name="Expand">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="levelUniqueName" type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="itemUniqueName" type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="navigationItemUniqueName"
type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="sortType" type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="navigationContext" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

**levelUniqueName:** Uniquely identifies the level to expand. This identifier is defined by the web service and is the **DecompRenderResultLevel** unique name. It MUST NOT be NULL or EMPTY.

**itemUniqueName:** Uniquely identifies the node to expand. This identifier is defined by the web service and is the [DecompRenderResultNode](#) unique name. It MUST NOT be NULL or EMPTY.

**navigationItemUniqueName:** MUST be the *Name* value from a [DecompNavigationAction](#) element obtained from a previous call to [CreateNavigationList](#). MUST NOT be NULL and MUST NOT be empty.

**sortType:** Species a how the result nodes are sorted. MUST be "ASCENDING" or "DESCENDING" (without quotes), and MUST NOT be case sensitive. The *DecompRenderResultNode* elements in *ExpandResponse* MUST be sorted according to the specified value. If empty, NULL, or not specified, the protocol server MUST use "DESCENDING".

**navigationContext:** A session identifier which defines the state of the client. MUST be the *NavigationContext* value from a [DecompRenderResultRecord](#) element obtained from a previous successful request to [GetRootLevel](#), [AutoExpand](#), or [Expand](#). MUST NOT be NULL and MUST NOT be empty.

#### 3.1.4.3.2.2 ExpandResponse

The result data for the **Expand** WSDL operation.

```
<xs:element name="ExpandResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ExpandResult"
type="tns:DecompRenderResultRecord"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

**ExpandResult:** A [DecompRenderResultRecord](#) value. In the event of an application error on the server, this value will not occur.

#### 3.1.4.4 GetMemberProperties

This operation returns properties associated with a specified node.

```
<wsdl:operation name="GetMemberProperties">
  <wsdl:input message="tns:GetMemberPropertiesSoapIn"/>
  <wsdl:output message="tns:GetMemberPropertiesSoapOut"/>
</wsdl:operation>
```

This operation returns a list of member properties associated with a node.

A session state variable is required to successfully complete this operation. As part of the [GetMemberPropertiesSoapIn](#) request message, **navigationContext** MUST contain a value obtained from a [DecompRenderResultRecord](#) result from a previous successful request to [GetRootLevel](#), [AutoExpand](#), or [Expand](#).

In the event of an application error on the protocol server during the operation, the protocol server MUST return a SOAP FAULT response.

##### 3.1.4.4.1 Messages

###### 3.1.4.4.1.1 GetMemberPropertiesSoapIn

The requested WSDL message for the **GetMemberProperties** WSDL operation.

The SOAP action value is:

```
http://www.microsoft.com/performancepoint/scorecards/GetMemberProperties
```

The SOAP body contains the **GetMemberProperties** element.

###### 3.1.4.4.1.2 GetMemberPropertiesSoapOut

The response WSDL message for the **GetMemberProperties** method.

The SOAP action value is:

```
http://www.microsoft.com/performancepoint/scorecards/GetMemberProperties
```

The SOAP body contains the **GetMemberPropertiesResponse** element.

##### 3.1.4.4.2 Elements

###### 3.1.4.4.2.1 GetMemberProperties

The input data for the **GetMemberProperties** WSDL operation.

```
<xs:element name="GetMemberProperties">
  <xs:complexType>
```

```

<xs:sequence>
  <xs:element minOccurs="0" maxOccurs="1" name="navigationContext" type="xs:string"/>
  <xs:element minOccurs="0" maxOccurs="1" name="itemUniqueName" type="xs:string"/>
</xs:sequence>
</xs:complexType>
</xs:element>

```

**navigationContext:** A session identifier which defines the state of the client. MUST be the *NavigationContext* value from a [DecompRenderResultRecord](#) element obtained from a previous request to either [GetRootLevel](#), [AutoExpand](#) or [Expand](#). MUST NOT be NULL and MUST NOT be empty.

**itemUniqueName:** Uniquely identifies the node to expand. This identifier is defined by the web service and is the [DecompRenderResultNode](#) unique name. It MUST NOT be NULL or EMPTY.

### 3.1.4.4.2 GetMemberPropertiesResponse

The result data for the **GetMemberProperties** WSDL operation.

```

<xs:element name="GetMemberPropertiesResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="GetMemberPropertiesResult"
type="tns:DecompMemberProperties"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

```

**GetMemberPropertiesResult:** A [DecompMemberProperties](#) value.

### 3.1.4.4.3 Complex Types

#### 3.1.4.4.3.1 DecompMemberProperties

The **DecompMemberProperties** complex type contains details about properties of the associated node.

```

<xs:complexType name="DecompMemberProperties">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="MemberName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Properties"
type="tns:ArrayOfDecompMemberProperty"/>
  </xs:sequence>
</xs:complexType>

```

**MemberName:** If present, server MAY pass an empty string, and MUST be ignored by client.

**Properties:** Specifies a collection of [DecompMemberProperty](#) elements.

#### 3.1.4.4.3.2 ArrayOfDecompMemberProperty

The **ArrayOfDecompMemberProperty** complex type specifies an array of [DecompMemberProperty](#).



```

<xs:complexType name="ArrayOfDecompMemberProperty">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompMemberProperty"
      nillable="true" type="tns:DecompMemberProperty"/>
  </xs:sequence>
</xs:complexType>

```

**DecompMemberProperty:** Contains details about a property.

### 3.1.4.4.3.3 DecompMemberProperty

The **DecompMemberProperty** complex type contains details about a property of the associated node.

```

<xs:complexType name="DecompMemberProperty">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Name" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Value" type="xs:string"/>
  </xs:sequence>
</xs:complexType>

```

**Name:** MUST be ignored.

**Caption:** Specifies the user-friendly name of the property.

**Value:** Specifies the value of the property.

### 3.1.4.5 GetRootLevel

This operation is used to start a session. A protocol client MUST use operation **GetRootLevel** to retrieve the Navigation Context session state variable before using other operations.

```

<wsdl:operation name="GetRootLevel">
  <wsdl:input message="tns:GetRootLevelSoapIn"/>
  <wsdl:output message="tns:GetRootLevelSoapOut"/>
</wsdl:operation>

```

This operation, if successful, will return a non-empty [DecompRenderResultRecord](#) record that contains data for a specific node in the form of a [DecompRenderResultLevel](#) and a [DecompRenderResultNode](#).

A session state variable, *Navigation Context*, is created in this operation. The *NavigationContext* value is returned as part of the *DecompRenderResultRecord* element. All requests using other protocol messages, such as [AutoExpand](#), [Expand](#), [CreateNavigationList](#) and [GetMemberProperties](#) require such a session state variable.

In the event of an application error on the protocol server during the operation, the protocol server MUST return a SOAP FAULT response.

### 3.1.4.5.1 Messages

#### 3.1.4.5.1.1 GetRootLevelSoapIn

The requested WSDL message for the **GetRootLevel** WSDL operation.

The SOAP action value is:

```
http://www.microsoft.com/performancepoint/scorecards/GetRootLevel
```

The SOAP body contains the **GetRootLevel** element.

#### 3.1.4.5.1.2 GetRootLevelSoapOut

The response WSDL message for the **GetRootLevel** method.

The SOAP action value is:

```
http://www.microsoft.com/performancepoint/scorecards/GetRootLevel
```

The SOAP body contains the **GetRootLevelResponse** element.

### 3.1.4.5.2 Elements

#### 3.1.4.5.2.1 GetRootLevel

The input data for the **GetRootLevel** WSDL operation.

```
<xs:element name="GetRootLevel">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="navigationType" type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="navigationContextId" type="xs:string"/>
      <xs:element minOccurs="0" maxOccurs="1" name="tupleRecord"
type="tns:DecompTupleRecord"/>
      <xs:element minOccurs="0" maxOccurs="1" name="viewState" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

**navigationType:** MUST be "olap" (without quotes.)

**navigationContextId:** MUST be a string identifying the Root Context session state known to the protocol server. MUST NOT be NULL and MUST NOT be empty. An implementation of this protocol, for example, could pass the identifier of the initial report containing the cell that is being analyzed as the value of this parameter.

**tupleRecord:** MUST be a [DecompTupleRecord](#) value. Specifies specific named filters to be applied to the response. MUST NOT be NULL.

**viewState:** MAY be empty. If empty, this value is ignored. If non-empty, this value is xml-formatted and is a set of name-value pairs, where the names MUST be a string type and unique and its associated value MUST be a string type. For example:

```

<ViewState>
  <GridViewDataInputs />
  <TimeFilters />
</ViewState>

```

### 3.1.4.5.2.2 GetRootLevelResponse

The result data for the **GetRootLevel** WSDL operation.

```

<xs:element name="GetRootLevelResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="GetRootLevelResult"
type="tns:DecompRenderResultRecord"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

```

**GetRootLevelResult:** A [DecompRenderResultRecord](#) value. In the event of an application error on the protocol server, this value will not occur.

### 3.1.4.5.3 Complex Types

#### 3.1.4.5.3.1 DecompTupleRecord

The **DecompTupleRecord** complex type names specific filters to be applied.

```

<xs:complexType name="DecompTupleRecord">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="RowSelections" type="tns:ArrayOfString"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ColumnSelections"
type="tns:ArrayOfString"/>
    <xs:element minOccurs="0" maxOccurs="1" name="BackgroundMeasureName" type="xs:string"/>
  </xs:sequence>
</xs:complexType>

```

**RowSelections:** MUST specify 0 or more filter names. Names MUST be known to the protocol server. These named filters are applied to the response to scope it to a subset of results that match.

**ColumnSelections:** MUST specify 0 or more filter names. Names MUST be known to the protocol server. These named filters are applied to the response to scope it to a subset of results that match.

**BackgroundMeasureName:** MAY be empty. Uniquely identifies a measure. MUST be known to the protocol server. Measures are the central values that are aggregated and analyzed.

#### 3.1.4.5.3.2 ArrayOfString

The ArrayOfString complex type specifies an array of strings.

```

<xs:complexType name="ArrayOfString">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="string" nillable="true"
type="xs:string"/>
  </xs:sequence>
</xs:complexType>

```

```
</xs:sequence>  
</xs:complexType>
```

**string:** This element MUST NOT be null and MUST conform to the XML data type string.

### 3.1.5 Timer Events

None.

### 3.1.6 Other Local Events

None.

## 4 Protocol Examples

### 4.1 Starting a Session and Expanding to a Second Level

In this example, the protocol client starts a session with the protocol server, receives a node, then uses the default named action to retrieve additional nodes.

The named filter `[Product].[Product Categories].[All Products]` and measure name `[Measures].[Internet Order Count]` are already known to the protocol client from previous interactions with a data source being used by the implementation of the protocol server. The navigation context value `{b1150827-c56c-963f-a02c-b5a526402953}` is known to the protocol client from previous interactions with the implementation of the protocol server.

Using these values, the protocol client constructs the following **GetRootLevel** message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/"><s:Body><GetRootLevel
xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://www.microsoft.com/performancepoint/scorecards"><navigationType>olap</navigation
Type><navigationContextId>{b1150827-c56c-963f-a02c-
b5a526402953}</navigationContextId><tupleRecord><RowSelections><string>[Product].[Product
Categories].[All
Products]</RowSelections><ColumnSelections><string>[Measures].[Internet Order
Count]</string></ColumnSelections></tupleRecord><viewState></viewState></GetRootLevel></s:Body></s:Envelope>
```

The protocol server responds with the following:

```
<?xml version="1.0" encoding="utf-8"?><soap:Envelope
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"><soap:Body><GetRootLevelResponse
xmlns="http://www.microsoft.com/performancepoint/scorecards"><GetRootLevelResult><Levels><DecompRenderResultLevel><SortedBy>DESCENDING</SortedBy><HierarchyName>[Product].[Product Categories]</HierarchyName><TotalNodeCount>1</TotalNodeCount><UniqueName>[Product].[Product Categories].[All]</UniqueName><Caption>(All)</Caption><Nodes><DecompRenderResultNode><Value>27659</Value><FormattedValue>27,659</FormattedValue><HasChildren>true</HasChildren><UniqueName>[Product].[Product Categories].[All Products]</UniqueName><Caption>All Products</Caption><BottomSumValue>0</BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode></Nodes></DecompRenderResultLevel></Levels><MeasureCaption>Internet Order Count</MeasureCaption><MeasureUniqueName>[Measures].[Internet Order Count]</MeasureUniqueName><MeasureIsAdditive>false</MeasureIsAdditive><NavigationContext>{"Type":"olap","NavigationContext":"%7B430cc761-8437-7443-d7ea-aa397ef1b132%7D","Title":"Protocol Sample Report"}</NavigationContext></GetRootLevelResult></GetRootLevelResponse></soap:Body></soap:Envelope>
```

The protocol client renders this data for the user.

The protocol client constructs the following **AutoExpand** message using the values of the elements `DecompRenderResultLevel/UniqueName`, `DecompRenderResultLevel/Nodes[0]/DecompRenderResultNode/UniqueName`, and `DecompRenderResultLevel/NavigationContext` from the first response:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/"><s:Body><AutoExpand
xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://www.microsoft.com/performancepoint/scorecards"><levelUniqueName>[Product].[Prod
```

```
uct Categories].[All)]</levelUniqueName><itemUniqueName>[Product].[Product Categories].[All
Products]</itemUniqueName><sortType>DESCENDING</sortType><navigationContext>{"Type":"olap","N
avigationContext":"%7B430cc761-8437-7443-d7ea-aa397ef1b132%7D","Title":"Protocol Sample
Report"}</navigationContext></AutoExpand></s:Body></s:Envelope>
```

The protocol server responds with the following:

```
<?xml version="1.0" encoding="utf-8"?><soap:Envelope
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"><soap:Body><AutoExpandResponse
xmlns="http://www.microsoft.com/performancepoint/scorecards"><AutoExpandResult><Levels><Decomp
RenderResultLevel><SortedBy>DESCENDING</SortedBy><HierarchyName>[Product].[Product
Categories]</HierarchyName><TotalNodeCount>3</TotalNodeCount><UniqueName>[Product].[Product
Categories].[Category]</UniqueName><Caption>Category</Caption><Nodes><DecompRenderResultNode><
Value>18208</Value><FormattedValue>18,208</FormattedValue><HasChildren>true</HasChildren><Un
iqueName>[Product].[Product
Categories].[Category]&[4]</UniqueName><Caption>Accessories</Caption><BottomSumValue>0</
BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode><DecompRenderResultNode><Value>
15205</Value><FormattedValue>15,205</FormattedValue><HasChildren>true</HasChildren><Uniq
ueName>[Product].[Product
Categories].[Category]&[1]</UniqueName><Caption>Bikes</Caption><BottomSumValue>0</Bottom
SumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode><DecompRenderResultNode><Value>
7461</Value><FormattedValue>7,461</FormattedValue><HasChildren>true</HasChildren><UniqueName>
[Product].[Product
Categories].[Category]&[3]</UniqueName><Caption>Clothing</Caption><BottomSumValue>0</Bot
tomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode></Nodes></DecompRenderResult
Level></Levels><MeasureCaption>Internet Order
Count</MeasureCaption><MeasureUniqueName>[Measures].[Internet Order
Count]</MeasureUniqueName><MeasureIsAdditive>false</MeasureIsAdditive><NavigationContext>{"Ty
pe":"olap","NavigationContext":"%7B4ca709b5-7e78-9571-e7be-f6f89e3b0e6d%7D","Title":"Protocol
Sample
Report"}</NavigationContext></AutoExpandResult></AutoExpandResponse></soap:Body></soap:Envelo
pe>
```

The protocol client renders the response data for the user.

## 4.2 Retrieving a List of Named Actions and Expanding to a Third Level

In this scenario, the protocol client has previously started a session with the protocol server (Example 1.) It retrieves a list of named actions for one of the nodes from the second set of nodes retrieved in Example 1, then it retrieves a third set of nodes using a named action.

The protocol client constructs the following **CreateNavigationList** message using the values of the elements *DecompRenderResultLevel/UniqueName*, *DecompRenderResultLevel/Nodes[0]/DecompRenderResultNode/UniqueName*, and *DecompRenderResultLevel/NavigationContext* from the second protocol server response in Example 1:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/"><s:Body><CreateNavigationList
xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://www.microsoft.com/performancepoint/scorecards"><levelUniqueName>[Product].[Prod
uct Categories].[Category]</levelUniqueName><itemUniqueName>[Product].[Product
Categories].[Category]&[4]</itemUniqueName><navigationContext>{"Type":"olap","Navigation
Context":"%7B4ca709b5-7e78-9571-e7be-f6f89e3b0e6d%7D","Title":"Protocol Sample
Report"}</navigationContext></CreateNavigationList></s:Body></s:Envelope>
```

The protocol server responds with the following:

```

<?xml version="1.0" encoding="utf-8"?><soap:Envelope
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"><soap:Body><CreateNavigationListResponse
xmlns="http://www.microsoft.com/performancepoint/scorecards"><CreateNavigationListResult><Gro
ups><DecompNavigationGroup><Name>[Product]</Name><Caption>Product</Caption><Actions><DecompNa
vigationAction><Name>[Product].[Product
Categories].[Category]</Name><Caption>Category</Caption><ParentCaption>Categories</ParentCapt
ion><Enabled>>false</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[Product].
[Product
Categories].[Subcategory]</Name><Caption>Subcategory</Caption><ParentCaption>Categories</Pare
ntCaption><Enabled>>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[Prod
uct].[Product
Categories].[Product]</Name><Caption>Product</Caption><ParentCaption>Categories</ParentCaptio
n><Enabled>>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[Product].[Pr
oduct Model Lines].[Product Line]</Name><Caption>Product Line</Caption><ParentCaption>Model
Lines</ParentCaption><Enabled>>true</Enabled></DecompNavigationAction><DecompNavigationAction>
<Name>[Product].[Product Model
Lines].[Model]</Name><Caption>Model</Caption><ParentCaption>Model
Lines</ParentCaption><Enabled>>true</Enabled></DecompNavigationAction><DecompNavigationAction>
<Name>[Product].[Stock Level].[Safety Stock Level]</Name><Caption>Safety Stock
Level</Caption><ParentCaption>Stock
Level</ParentCaption><Enabled>>true</Enabled></DecompNavigationAction><DecompNavigationAction>
<Name>[Product].[Stock Level].[Product]</Name><Caption>Product</Caption><ParentCaption>Stock
Level</ParentCaption><Enabled>>true</Enabled></DecompNavigationAction><DecompNavigationAction>
<Name>[Product].[Class].[Class]</Name><Caption>Class</Caption><Enabled>>true</Enabled></Decomp
NavigationAction><DecompNavigationAction><Name>[Product].[Color].[Color]</Name><Caption>Color
</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[Prod
uct].[Days to Manufacture].[Days to Manufacture]</Name><Caption>Days to
Manufacture</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction>
<Name>[Product].[Dealer Price].[Dealer Price]</Name><Caption>Dealer
Price</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>
[Product].[End Date].[End Date]</Name><Caption>End
Date</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[
Product].[Large Photo].[Large Photo]</Name><Caption>Large
Photo</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>
[Product].[List Price].[List Price]</Name><Caption>List
Price</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>
[Product].[Model Name].[Model Name]</Name><Caption>Model
Name</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[
Product].[Reorder Point].[Reorder Point]</Name><Caption>Reorder
Point</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>
[Product].[Size].[Size]</Name><Caption>Size</Caption><Enabled>true</Enabled></DecompNavigatio
nAction><DecompNavigationAction><Name>[Product].[Size Range].[Size Range]</Name><Caption>Size
Range</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>
[Product].[Standard Cost].[Standard Cost]</Name><Caption>Standard
Cost</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[
Product].[Start Date].[Start Date]</Name><Caption>Start
Date</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[
Product].[Status].[Status]</Name><Caption>Status</Caption><Enabled>true</Enabled></DecompNavi
gationAction><DecompNavigationAction><Name>[Product].[Style].[Style]</Name><Caption>Style</Ca
ption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[Product]
.[Weight].[Weight]</Name><Caption>Weight</Caption><Enabled>true</Enabled></DecompNavigationAc
tion></Actions></DecompNavigationGroup><DecompNavigationGroup><Name>[Promotion]</Name><Captio
n>Promotion</Caption><Actions><DecompNavigationAction><Name>[Promotion].[Promotions].[Categor
y]</Name><Caption>Category</Caption><ParentCaption>Promotions</ParentCaption><Enabled>true</E
nabled></DecompNavigationAction><DecompNavigationAction><Name>[Promotion].[Promotions].[Type]
</Name><Caption>Type</Caption><ParentCaption>Promotions</ParentCaption><Enabled>true</Enabled
></DecompNavigationAction><DecompNavigationAction><Name>[Promotion].[Promotions].[Promotion]
</Name><Caption>Promotion</Caption><ParentCaption>Promotions</ParentCaption><Enabled>true</Ena
bled></DecompNavigationAction><DecompNavigationAction><Name>[Promotion].[Discount
Percent].[Discount Percent]</Name><Caption>Discount
Percent</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Nam
e>[Promotion].[End Date].[End Date]</Name><Caption>End

```

```

Date</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Name>[
Promotion].[Max Quantity].[Max Quantity]</Name><Caption>Max
Quantity</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Na
me>[Promotion].[Min Quantity].[Min Quantity]</Name><Caption>Min
Quantity</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNavigationAction><Na
me>[Promotion].[Promotion Category].[Promotion
Category]</Name><Caption>Category</Caption><Enabled>true</Enabled></DecompNavigationAction><D
ecompNavigationAction><Name>[Promotion].[Promotion Type].[Promotion
Type]</Name><Caption>Type</Caption><Enabled>true</Enabled></DecompNavigationAction><DecompNav
igationAction><Name>[Promotion].[Start Date].[Start Date]</Name><Caption>Start
Date</Caption><Enabled>true</Enabled></DecompNavigationAction></Actions></DecompNavigationGro
up></Groups></CreateNavigationListResult></CreateNavigationListResponse></soap:Body></soap:En
velope>

```

The protocol client renders this data in a hierarchical user interface.

The user of the protocol client selects an action by its *DecompNavigationAction/Caption* value "Subcategory".

The protocol client constructs the following **Expand** message using the *DecompNavigationAction/Name* value of the action:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/"><s:Body><Expand
xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://www.microsoft.com/performancepoint/scorecards"><levelUniqueName>[Product].[Prod
uct Categories].[Category]</levelUniqueName><itemUniqueName>[Product].[Product
Categories].[Category].&[4]</itemUniqueName><navigationItemUniqueName>[Product].[Product
Categories].[Subcategory]</navigationItemUniqueName><sortType>DESCENDING</sortType><navigatio
nContext>{"Type":"olap","NavigationContext":"%7B4ca709b5-7e78-9571-e7be-
f6f89e3b0e6d%7D","Title":"Protocol Sample
Report"}</navigationContext></Expand></s:Body></s:Envelope>

```

The protocol server responds with the following:

```

<?xml version="1.0" encoding="utf-8"?><soap:Envelope
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"><soap:Body><ExpandResponse
xmlns="http://www.microsoft.com/performancepoint/scorecards"><ExpandResult><Levels><DecompRen
derResultLevel><SortedBy>DESCENDING</SortedBy><HierarchyName>[Product].[Product
Categories]</HierarchyName><TotalNodeCount>8</TotalNodeCount><UniqueName>[Product].[Product
Categories].[Subcategory]</UniqueName><Caption>Subcategory</Caption><Nodes><DecompRenderResul
tNode><Value>9867</Value><FormattedValue>9,867</FormattedValue><HasChildren>true</HasChildren
><UniqueName>[Product].[Product
Categories].[Subcategory].&[37]</UniqueName><Caption>Tires and
Tubes</Caption><BottomSumValue>0</BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderRe
sultNode><DecompRenderResultNode><Value>6440</Value><FormattedValue>6,440</FormattedValue><Ha
sChildren>true</HasChildren><UniqueName>[Product].[Product
Categories].[Subcategory].&[31]</UniqueName><Caption>Helmets</Caption><BottomSumValue>0</
BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode><DecompRenderResultNode><
Value>4768</Value><FormattedValue>4,768</FormattedValue><HasChildren>true</HasChildren><Uniqu
eName>[Product].[Product Categories].[Subcategory].&[28]</UniqueName><Caption>Bottles and
Cages</Caption><BottomSumValue>0</BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderRe
sultNode><DecompRenderResultNode><Value>2121</Value><FormattedValue>2,121</FormattedValue><Ha
sChildren>true</HasChildren><UniqueName>[Product].[Product
Categories].[Subcategory].&[30]</UniqueName><Caption>Fenders</Caption><BottomSumValue>0</
BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode><DecompRenderResultNode><
Value>908</Value><FormattedValue>908</FormattedValue><HasChildren>true</HasChildren><Uniqu
eName>[Product].[Product
Categories].[Subcategory].&[29]</UniqueName><Caption>Cleaners</Caption><BottomSumValue>0<
/BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode><DecompRenderResultNode>

```



```
<Value>733</Value><FormattedValue>733</FormattedValue><HasChildren>true</HasChildren><UniqueName>[Product].[Product Categories].[Subcategory].&[32]</UniqueName><Caption>Hydration Packs</Caption><BottomSumValue>0</BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode><DecompRenderResultNode><Value>328</Value><FormattedValue>328</FormattedValue><HasChildren>true</HasChildren><UniqueName>[Product].[Product Categories].[Subcategory].&[26]</UniqueName><Caption>Bike Racks</Caption><BottomSumValue>0</BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode><DecompRenderResultNode><Value>249</Value><FormattedValue>249</FormattedValue><HasChildren>true</HasChildren><UniqueName>[Product].[Product Categories].[Subcategory].&[27]</UniqueName><Caption>Bike Stands</Caption><BottomSumValue>0</BottomSumValue><TopSumValue>0</TopSumValue></DecompRenderResultNode></Nodes></DecompRenderResultLevel></Levels><MeasureCaption>Internet Order Count</MeasureCaption><MeasureUniqueName>[Measures].[Internet Order Count]</MeasureUniqueName><MeasureIsAdditive>false</MeasureIsAdditive><NavigationContext>{"Type": "olap", "NavigationContext": "%7Bc10f24bc-3a2a-403a-c2e9-eab0313455d5%7D", "Title": "Protocol Sample Report"}</NavigationContext></ExpandResult></ExpandResponse></soap:Body></soap:Envelope>
```

The protocol client renders the response data for the user.

### 4.3 Retrieving Properties

In this scenario, the protocol client has previously started a session with the protocol server (Example 1) and has retrieved an additional set of nodes (Example 2.) It retrieves a list of properties for the nodes retrieved in Example 2.

The protocol client constructs the following **GetMemberProperties** message, using the values of the elements *DecompRenderResultLevel/NavigationContext* and *DecompRenderResultLevel/Nodes[0]/DecompRenderResultNode/UniqueName* from the second protocol server response in Example 2:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/"><s:Body><GetMemberProperties xmlns:i="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://www.microsoft.com/performancepoint/scorecards"><navigationContext>{"Type": "olap", "NavigationContext": "%7Bc10f24bc-3a2a-403a-c2e9-eab0313455d5%7D", "Title": "Protocol Sample Report"}</navigationContext><itemUniqueName>[Product].[Product Categories].[Subcategory].&[37]</itemUniqueName></GetMemberProperties></s:Body></s:Envelope>
```

The protocol server responds with the following:

```
<?xml version="1.0" encoding="utf-8"?><soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"><soap:Body><GetMemberPropertiesResponse xmlns="http://www.microsoft.com/performancepoint/scorecards"><GetMemberPropertiesResult><MemberName>[Product].[Product Categories].[Subcategory].&[37]</MemberName><Properties><DecompMemberProperty><Name>Category</Name><Caption>Category</Caption><Value>Accessories</Value></DecompMemberProperty></Properties></GetMemberPropertiesResult></GetMemberPropertiesResponse></soap:Body></soap:Envelope>
```

The protocol client renders the response data for the user.

## 5 Security

### 5.1 Security Considerations for Implementers

It is possible to use **Secure Sockets Layer (SSL)** to securely implement this protocol. The protocol exposes **data sources (1)** to potential tampering or data disclosure without SSL.

The security permissions required for all operations are inherited from the parent **list (1)** item.

### 5.2 Index of Security Parameters

None

## 6 Appendix A: Full WSDL

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:tns="http://www.microsoft.com/performancepoint/scorecards"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
targetNamespace="http://www.microsoft.com/performancepoint/scorecards"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:types>
    <xs:schema elementFormDefault="qualified"
targetNamespace="http://www.microsoft.com/performancepoint/scorecards"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
      <xs:element name="AutoExpand">
        <xs:complexType>
          <xs:sequence>
            <xs:element minOccurs="0" maxOccurs="1" name="levelUniqueName" type="xs:string"
/>
            <xs:element minOccurs="0" maxOccurs="1" name="itemUniqueName" type="xs:string" />
            <xs:element minOccurs="0" maxOccurs="1" name="sortType" type="xs:string" />
            <xs:element minOccurs="0" maxOccurs="1" name="navigationContext" type="xs:string"
/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="AutoExpandResponse">
        <xs:complexType>
          <xs:sequence>
            <xs:element minOccurs="0" maxOccurs="1" name="AutoExpandResult"
type="tns:DecompRenderResultRecord" />
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:complexType name="DecompRenderResultRecord">
        <xs:sequence>
          <xs:element minOccurs="0" maxOccurs="1" name="Levels"
type="tns:ArrayOfDecompRenderResultLevel" />
          <xs:element minOccurs="0" maxOccurs="1" name="MeasureCaption" type="xs:string" />
          <xs:element minOccurs="0" maxOccurs="1" name="MeasureUniqueName" type="xs:string"
/>
          <xs:element minOccurs="1" maxOccurs="1" name="MeasureIsAdditive" type="xs:boolean"
/>
          <xs:element minOccurs="0" maxOccurs="1" name="NavigationContext" type="xs:string"
/>
          <xs:element minOccurs="0" maxOccurs="1" name="ErrorMsg" type="xs:string" />
          <xs:element minOccurs="0" maxOccurs="1" name="ErrorDetails" type="xs:string" />
        </xs:sequence>
      </xs:complexType>
      <xs:complexType name="ArrayOfDecompRenderResultLevel">
        <xs:sequence>
          <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompRenderResultLevel"
nillable="true" type="tns:DecompRenderResultLevel" />
        </xs:sequence>
      </xs:complexType>
      <xs:complexType name="DecompRenderResultLevel">
        <xs:sequence>
          <xs:element minOccurs="0" maxOccurs="1" name="SortedBy" type="xs:string" />
          <xs:element minOccurs="0" maxOccurs="1" name="HierarchyName" type="xs:string" />
          <xs:element minOccurs="1" maxOccurs="1" name="TotalNodeCount" type="xs:int" />
        </xs:sequence>
      </xs:complexType>
    </xs:schema>
  </wsdl:types>

```

```

        <xs:element minOccurs="0" maxOccurs="1" name="UniqueName" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Nodes"
type="tns:ArrayOfDecompRenderResultNode" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ArrayOfDecompRenderResultNode">
    <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompRenderResultNode"
nillable="true" type="tns:DecompRenderResultNode" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="DecompRenderResultNode">
    <xs:sequence>
        <xs:element minOccurs="1" maxOccurs="1" name="Value" type="xs:double" />
        <xs:element minOccurs="0" maxOccurs="1" name="FormattedValue" type="xs:string" />
        <xs:element minOccurs="1" maxOccurs="1" name="HasChildren" type="xs:boolean" />
        <xs:element minOccurs="0" maxOccurs="1" name="UniqueName" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string" />
        <xs:element minOccurs="1" maxOccurs="1" name="BottomSumValue" type="xs:double" />
        <xs:element minOccurs="0" maxOccurs="1" name="BottomSumFormattedValue"
type="xs:string" />
        <xs:element minOccurs="1" maxOccurs="1" name="TopSumValue" type="xs:double" />
        <xs:element minOccurs="0" maxOccurs="1" name="TopSumFormattedValue"
type="xs:string" />
    </xs:sequence>
</xs:complexType>
<xs:element name="Expand">
    <xs:complexType>
        <xs:sequence>
            <xs:element minOccurs="0" maxOccurs="1" name="levelUniqueName" type="xs:string"
/>
            <xs:element minOccurs="0" maxOccurs="1" name="itemUniqueName" type="xs:string" />
            <xs:element minOccurs="0" maxOccurs="1" name="navigationItemUniqueName"
type="xs:string" />
            <xs:element minOccurs="0" maxOccurs="1" name="sortType" type="xs:string" />
            <xs:element minOccurs="0" maxOccurs="1" name="navigationContext" type="xs:string"
/>
        </xs:sequence>
    </xs:complexType>
</xs:element>
<xs:element name="ExpandResponse">
    <xs:complexType>
        <xs:sequence>
            <xs:element minOccurs="0" maxOccurs="1" name="ExpandResult"
type="tns:DecompRenderResultRecord" />
        </xs:sequence>
    </xs:complexType>
</xs:element>
<xs:element name="CreateNavigationList">
    <xs:complexType>
        <xs:sequence>
            <xs:element minOccurs="0" maxOccurs="1" name="levelUniqueName" type="xs:string"
/>
            <xs:element minOccurs="0" maxOccurs="1" name="itemUniqueName" type="xs:string" />
            <xs:element minOccurs="0" maxOccurs="1" name="navigationContext" type="xs:string"
/>
        </xs:sequence>
    </xs:complexType>
</xs:element>

```

```

    <xs:element name="CreateNavigationListResponse">
      <xs:complexType>
        <xs:sequence>
          <xs:element minOccurs="0" maxOccurs="1" name="CreateNavigationListResult"
type="tns:DecompNavigationList" />
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:complexType name="DecompNavigationList">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="Groups"
type="tns:ArrayOfDecompNavigationGroup" />
      </xs:sequence>
    </xs:complexType>
    <xs:complexType name="ArrayOfDecompNavigationGroup">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompNavigationGroup"
nillable="true" type="tns:DecompNavigationGroup" />
      </xs:sequence>
    </xs:complexType>
    <xs:complexType name="DecompNavigationGroup">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="Name" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Actions"
type="tns:ArrayOfDecompNavigationAction" />
      </xs:sequence>
    </xs:complexType>
    <xs:complexType name="ArrayOfDecompNavigationAction">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompNavigationAction"
nillable="true" type="tns:DecompNavigationAction" />
      </xs:sequence>
    </xs:complexType>
    <xs:complexType name="DecompNavigationAction">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="Name" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="ParentCaption" type="xs:string" />
        <xs:element minOccurs="1" maxOccurs="1" name="Enabled" type="xs:boolean" />
      </xs:sequence>
    </xs:complexType>
    <xs:element name="GetMemberProperties">
      <xs:complexType>
        <xs:sequence>
          <xs:element minOccurs="0" maxOccurs="1" name="navigationContext" type="xs:string"
/>
          <xs:element minOccurs="0" maxOccurs="1" name="itemUniqueName" type="xs:string" />
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="GetMemberPropertiesResponse">
      <xs:complexType>
        <xs:sequence>
          <xs:element minOccurs="0" maxOccurs="1" name="GetMemberPropertiesResult"
type="tns:DecompMemberProperties" />
        </xs:sequence>
      </xs:complexType>
    </xs:element>

```

```

    <xs:complexType name="DecompMemberProperties">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="MemberName" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Properties"
type="tns:ArrayOfDecompMemberProperty" />
      </xs:sequence>
    </xs:complexType>
    <xs:complexType name="ArrayOfDecompMemberProperty">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="DecompMemberProperty"
nillable="true" type="tns:DecompMemberProperty" />
      </xs:sequence>
    </xs:complexType>
    <xs:complexType name="DecompMemberProperty">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="Name" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Caption" type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Value" type="xs:string" />
      </xs:sequence>
    </xs:complexType>
    <xs:element name="GetRootLevel">
      <xs:complexType>
        <xs:sequence>
          <xs:element minOccurs="0" maxOccurs="1" name="navigationType" type="xs:string" />
          <xs:element minOccurs="0" maxOccurs="1" name="navigationContextId"
type="xs:string" />
          <xs:element minOccurs="0" maxOccurs="1" name="tupleRecord"
type="tns:DecompTupleRecord" />
          <xs:element minOccurs="0" maxOccurs="1" name="viewState" type="xs:string" />
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:complexType name="DecompTupleRecord">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="RowSelections"
type="tns:ArrayOfString" />
        <xs:element minOccurs="0" maxOccurs="1" name="ColumnSelections"
type="tns:ArrayOfString" />
        <xs:element minOccurs="0" maxOccurs="1" name="BackgroundMeasureName"
type="xs:string" />
      </xs:sequence>
    </xs:complexType>
    <xs:complexType name="ArrayOfString">
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="string" nillable="true"
type="xs:string" />
      </xs:sequence>
    </xs:complexType>
    <xs:element name="GetRootLevelResponse">
      <xs:complexType>
        <xs:sequence>
          <xs:element minOccurs="0" maxOccurs="1" name="GetRootLevelResult"
type="tns:DecompRenderResultRecord" />
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:schema>
</wsdl:types>
<wsdl:message name="AutoExpandSoapIn">
  <wsdl:part name="parameters" element="tns:AutoExpand" />

```

```

</wsdl:message>
<wsdl:message name="AutoExpandSoapOut">
  <wsdl:part name="parameters" element="tns:AutoExpandResponse" />
</wsdl:message>
<wsdl:message name="ExpandSoapIn">
  <wsdl:part name="parameters" element="tns:Expand" />
</wsdl:message>
<wsdl:message name="ExpandSoapOut">
  <wsdl:part name="parameters" element="tns:ExpandResponse" />
</wsdl:message>
<wsdl:message name="CreateNavigationListSoapIn">
  <wsdl:part name="parameters" element="tns:CreateNavigationList" />
</wsdl:message>
<wsdl:message name="CreateNavigationListSoapOut">
  <wsdl:part name="parameters" element="tns:CreateNavigationListResponse" />
</wsdl:message>
<wsdl:message name="GetMemberPropertiesSoapIn">
  <wsdl:part name="parameters" element="tns:GetMemberProperties" />
</wsdl:message>
<wsdl:message name="GetMemberPropertiesSoapOut">
  <wsdl:part name="parameters" element="tns:GetMemberPropertiesResponse" />
</wsdl:message>
<wsdl:message name="GetRootLevelSoapIn">
  <wsdl:part name="parameters" element="tns:GetRootLevel" />
</wsdl:message>
<wsdl:message name="GetRootLevelSoapOut">
  <wsdl:part name="parameters" element="tns:GetRootLevelResponse" />
</wsdl:message>
<wsdl:portType name="PPSDecompRenderingServiceSoap">
  <wsdl:operation name="AutoExpand">
    <wsdl:input message="tns:AutoExpandSoapIn" />
    <wsdl:output message="tns:AutoExpandSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="Expand">
    <wsdl:input message="tns:ExpandSoapIn" />
    <wsdl:output message="tns:ExpandSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="CreateNavigationList">
    <wsdl:input message="tns:CreateNavigationListSoapIn" />
    <wsdl:output message="tns:CreateNavigationListSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetMemberProperties">
    <wsdl:input message="tns:GetMemberPropertiesSoapIn" />
    <wsdl:output message="tns:GetMemberPropertiesSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetRootLevel">
    <wsdl:input message="tns:GetRootLevelSoapIn" />
    <wsdl:output message="tns:GetRootLevelSoapOut" />
  </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="PPSDecompRenderingServiceSoap"
type="tns:PPSDecompRenderingServiceSoap">
  <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="AutoExpand">
    <soap:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/AutoExpand" style="document"
/>
    <wsdl:input>
      <soap:body use="literal" />

```

```

        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="Expand">
        <soap:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/Expand" style="document" />
        <wsdl:input>
            <soap:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="CreateNavigationList">
        <soap:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/CreateNavigationList"
style="document" />
        <wsdl:input>
            <soap:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetMemberProperties">
        <soap:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/GetMemberProperties"
style="document" />
        <wsdl:input>
            <soap:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetRootLevel">
        <soap:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/GetRootLevel"
style="document" />
        <wsdl:input>
            <soap:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
</wsdl:binding>
<wsdl:binding name="PPSDecompRenderingServiceSoap12"
type="tns:PPSDecompRenderingServiceSoap">
    <soap12:binding transport="http://schemas.xmlsoap.org/soap/http" />
    <wsdl:operation name="AutoExpand">
        <soap12:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/AutoExpand" style="document"
/>
        <wsdl:input>
            <soap12:body use="literal" />
        </wsdl:input>
        <wsdl:output>

```



```

        <soap12:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="Expand">
    <soap12:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/Expand" style="document" />
    <wsdl:input>
        <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap12:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="CreateNavigationList">
    <soap12:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/CreateNavigationList"
style="document" />
    <wsdl:input>
        <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap12:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetMemberProperties">
    <soap12:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/GetMemberProperties"
style="document" />
    <wsdl:input>
        <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap12:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetRootLevel">
    <soap12:operation
soapAction="http://www.microsoft.com/performancepoint/scorecards/GetRootLevel"
style="document" />
    <wsdl:input>
        <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap12:body use="literal" />
    </wsdl:output>
</wsdl:operation>
</wsdl:binding>
</wsdl:definitions>

```

## 7 Appendix B: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

- Microsoft® Office 2010 suites

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is 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 the product does not follow the prescription.

## 8 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

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