

[MS-CPSWS]: SharePoint Claim Provider Web Service Protocol Specification

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Table of Contents

1 Introduction	8
1.1 Glossary	8
1.2 References	8
1.2.1 Normative References	9
1.2.2 Informative References	9
1.3 Protocol Overview (Synopsis)	9
1.4 Relationship to Other Protocols	10
1.5 Prerequisites/Preconditions	10
1.6 Applicability Statement	10
1.7 Versioning and Capability Negotiation	10
1.8 Vendor-Extensible Fields	10
1.9 Standards Assignments	10
2 Messages	11
2.1 Transport	11
2.2 Common Message Syntax	11
2.2.1 Namespaces	11
2.2.2 Messages	11
2.2.3 Elements	11
2.2.4 Complex Types	12
2.2.4.1 ArrayOfAnyType	12
2.2.4.2 ArrayOfPair	12
2.2.4.3 ArrayOfPickerEntity	13
2.2.4.4 ArrayOfSPPProviderHierarchyNode	13
2.2.4.5 ArrayOfSPPProviderHierarchyTree	13
2.2.4.6 ArrayOfSPSchemaElement	14
2.2.4.7 ArrayOfString	14
2.2.4.8 Pair	14
2.2.4.9 PickerEntity	15
2.2.4.10 SPClaim	15
2.2.4.11 SPPProviderHierarchyElement	16
2.2.4.12 SPPProviderHierarchyNode	17
2.2.4.13 SPPProviderHierarchyTree	17
2.2.4.14 SPPProviderSchema	17
2.2.4.15 SPSchemaElement	18
2.2.5 Simple Types	18
2.2.5.1 SPPrincipalType	18
2.2.5.2 SPSchemaElementType	19
2.2.6 Attributes	20
2.2.7 Groups	20
2.2.8 Attribute Groups	20
3 Protocol Details	21
3.1 Server Details	21
3.1.1 Abstract Data Model	21
3.1.2 Timers	22
3.1.3 Initialization	22
3.1.4 Message Processing Events and Sequencing Rules	22
3.1.4.1 ClaimTypes	23
3.1.4.1.1 Messages	23

3.1.4.1.1.1	IClaimProviderWebService_ClaimTypes_InputMessage	23
3.1.4.1.1.2	IClaimProviderWebService_ClaimTypes_OutputMessage	24
3.1.4.1.2	Elements	24
3.1.4.1.2.1	ClaimTypes	24
3.1.4.1.2.2	ClaimTypesResponse	24
3.1.4.1.3	Complex Types	25
3.1.4.1.4	Simple Types	25
3.1.4.1.5	Attributes	25
3.1.4.1.6	Groups	25
3.1.4.1.7	Attribute Groups	25
3.1.4.2	ClaimValueTypes	25
3.1.4.2.1	Messages	25
3.1.4.2.1.1	IClaimProviderWebService_ClaimValueTypes_InputMessage	26
3.1.4.2.1.2	IClaimProviderWebService_ClaimValueTypes_OutputMessage	26
3.1.4.2.2	Elements	26
3.1.4.2.2.1	ClaimValueTypes	26
3.1.4.2.2.2	ClaimValueTypesResponse	26
3.1.4.2.3	Complex Types	27
3.1.4.2.4	Simple Types	27
3.1.4.2.5	Attributes	27
3.1.4.2.6	Groups	27
3.1.4.2.7	Attribute Groups	27
3.1.4.3	EntityTypes	27
3.1.4.3.1	Messages	28
3.1.4.3.1.1	IClaimProviderWebService_EntityTypes_InputMessage	28
3.1.4.3.1.2	IClaimProviderWebService_EntityTypes_OutputMessage	28
3.1.4.3.2	Elements	28
3.1.4.3.2.1	EntityTypes	28
3.1.4.3.2.2	EntityTypesResponse	29
3.1.4.3.3	Complex Types	29
3.1.4.3.4	Simple Types	29
3.1.4.3.5	Attributes	29
3.1.4.3.6	Groups	29
3.1.4.3.7	Attribute Groups	29
3.1.4.4	GetHierarchy	29
3.1.4.4.1	Messages	30
3.1.4.4.1.1	IClaimProviderWebService_GetHierarchy_InputMessage	30
3.1.4.4.1.2	IClaimProviderWebService_GetHierarchy_OutputMessage	30
3.1.4.4.2	Elements	30
3.1.4.4.2.1	GetHierarchy	31
3.1.4.4.2.2	GetHierarchyResponse	31
3.1.4.4.3	Complex Types	32
3.1.4.4.4	Simple Types	32
3.1.4.4.5	Attributes	32
3.1.4.4.6	Groups	32
3.1.4.4.7	Attribute Groups	32
3.1.4.5	GetHierarchyAll	32
3.1.4.5.1	Messages	33
3.1.4.5.1.1	IClaimProviderWebService_GetHierarchyAll_InputMessage	33
3.1.4.5.1.2	IClaimProviderWebService_GetHierarchyAll_OutputMessage	33
3.1.4.5.2	Elements	33
3.1.4.5.2.1	GetHierarchyAll	33
3.1.4.5.2.2	GetHierarchyAllResponse	34

3.1.4.5.3	Complex Types	34
3.1.4.5.4	Simple Types.....	34
3.1.4.5.5	Attributes.....	34
3.1.4.5.6	Groups.....	34
3.1.4.5.7	Attribute Groups	34
3.1.4.6	HierarchyProviderSchema	35
3.1.4.6.1	Messages	35
3.1.4.6.1.1	IClaimProviderWebService_HierarchyProviderSchema_InputMessage ..	35
3.1.4.6.1.2	IClaimProviderWebService_HierarchyProviderSchema_OutputMessage ..	35
3.1.4.6.2	Elements.....	36
3.1.4.6.2.1	HierarchyProviderSchema	36
3.1.4.6.2.2	HierarchyProviderSchemaResponse	36
3.1.4.6.3	Complex Types	36
3.1.4.6.4	Simple Types.....	36
3.1.4.6.5	Attributes.....	36
3.1.4.6.6	Groups.....	36
3.1.4.6.7	Attribute Groups	37
3.1.4.7	ProviderSchemas	37
3.1.4.7.1	Messages	37
3.1.4.7.1.1	IClaimProviderWebService_ProviderSchemas_InputMessage	37
3.1.4.7.1.2	IClaimProviderWebService_ProviderSchemas_OutputMessage	38
3.1.4.7.2	Elements.....	38
3.1.4.7.2.1	ProviderSchemas.....	38
3.1.4.7.2.2	ProviderSchemasResponse	38
3.1.4.7.3	Complex Types	39
3.1.4.7.3.1	ArrayOfSPPProviderSchema	39
3.1.4.7.4	Simple Types.....	39
3.1.4.7.5	Attributes.....	39
3.1.4.7.6	Groups.....	39
3.1.4.7.7	Attribute Groups	39
3.1.4.8	Resolve	39
3.1.4.8.1	Messages	40
3.1.4.8.1.1	IClaimProviderWebService_Resolve_InputMessage	40
3.1.4.8.1.2	IClaimProviderWebService_Resolve_OutputMessage	40
3.1.4.8.2	Elements.....	40
3.1.4.8.2.1	Resolve	41
3.1.4.8.2.2	ResolveResponse.....	41
3.1.4.8.3	Complex Types	41
3.1.4.8.4	Simple Types.....	41
3.1.4.8.5	Attributes.....	41
3.1.4.8.6	Groups.....	41
3.1.4.8.7	Attribute Groups	42
3.1.4.9	ResolveClaim	42
3.1.4.9.1	Messages	42
3.1.4.9.1.1	IClaimProviderWebService_ResolveClaim_InputMessage	42
3.1.4.9.1.2	IClaimProviderWebService_ResolveClaim_OutputMessage	43
3.1.4.9.2	Elements.....	43
3.1.4.9.2.1	ResolveClaim	43
3.1.4.9.2.2	ResolveClaimResponse	43
3.1.4.9.3	Complex Types	44
3.1.4.9.4	Simple Types.....	44

3.1.4.9.5	Attributes.....	44
3.1.4.9.6	Groups.....	44
3.1.4.9.7	Attribute Groups	44
3.1.4.10	ResolveMultiple.....	44
3.1.4.10.1	Messages	45
3.1.4.10.1.1	IClaimProviderWebService_ResolveMultiple_InputMessage.....	45
3.1.4.10.1.2	IClaimProviderWebService_ResolveMultiple_OutputMessage	45
3.1.4.10.2	Elements.....	45
3.1.4.10.2.1	ResolveMultiple	45
3.1.4.10.2.2	ResolveMultipleResponse	46
3.1.4.10.3	Complex Types	46
3.1.4.10.4	Simple Types	46
3.1.4.10.5	Attributes	46
3.1.4.10.6	Groups.....	46
3.1.4.10.7	Attribute Groups.....	46
3.1.4.11	ResolveMultipleClaim.....	46
3.1.4.11.1	Messages	47
3.1.4.11.1.1	IClaimProviderWebService_ResolveMultipleClaim_InputMessage.....	47
3.1.4.11.1.2	IClaimProviderWebService_ResolveMultipleClaim_OutputMessage.....	47
3.1.4.11.2	Elements.....	48
3.1.4.11.2.1	ResolveMultipleClaim.....	48
3.1.4.11.2.2	ResolveMultipleClaimResponse	48
3.1.4.11.3	Complex Types	49
3.1.4.11.3.1	ArrayOfSPClaim.....	49
3.1.4.11.4	Simple Types	49
3.1.4.11.5	Attributes	49
3.1.4.11.6	Groups.....	49
3.1.4.11.7	Attribute Groups.....	49
3.1.4.12	Search.....	49
3.1.4.12.1	Messages	50
3.1.4.12.1.1	IClaimProviderWebService_Search_InputMessage.....	50
3.1.4.12.1.2	IClaimProviderWebService_Search_OutputMessage	50
3.1.4.12.2	Elements.....	50
3.1.4.12.2.1	Search	51
3.1.4.12.2.2	SearchResponse	51
3.1.4.12.3	Complex Types	51
3.1.4.12.3.1	ArrayOfSPPProviderSearchArguments	52
3.1.4.12.3.2	SPPProviderSearchArguments	52
3.1.4.12.4	Simple Types	52
3.1.4.12.5	Attributes.....	52
3.1.4.12.6	Groups.....	53
3.1.4.12.7	Attribute Groups.....	53
3.1.4.13	SearchAll.....	53
3.1.4.13.1	Messages	53
3.1.4.13.1.1	IClaimProviderWebService_SearchAll_InputMessage	53
3.1.4.13.1.2	IClaimProviderWebService_SearchAll_OutputMessage	54
3.1.4.13.2	Elements.....	54
3.1.4.13.2.1	SearchAll	54
3.1.4.13.2.2	SearchAllResponse.....	55
3.1.4.13.3	Complex Types	55
3.1.4.13.4	Simple Types	55
3.1.4.13.5	Attributes.....	55
3.1.4.13.6	Groups.....	55

3.1.4.13.7 Attribute Groups.....	55
3.1.5 Timer Events	55
3.1.6 Other Local Events	55
4 Protocol Examples.....	56
4.1 GetHierarchyAll	56
4.1.1 Retrieve Claim Provider Hierarchy Trees from All Available Claim Providers	56
4.1.2 Retrieve Claim Provider Hierarchy Trees from One of the Claim Providers.....	57
4.2 SearchAll	59
4.3 Search	60
4.4 GetHierarchy.....	61
4.5 EntityTypes.....	62
4.6 ClaimTypes.....	63
4.7 ClaimValueTypes	64
4.8 Resolve	64
4.9 ResolveMultiple	66
5 Security.....	69
5.1 Security Considerations for Implementers.....	69
5.2 Index of Security Parameters	69
6 Appendix A: Full WSDL.....	70
7 Appendix B: Full XML Schema	76
8 Appendix C: Product Behavior	83
9 Change Tracking.....	84
10 Index	90

1 Introduction

This document specifies the SharePoint Claim Provider Web Service Protocol. This protocol enables a protocol client to access claims, which are a set of statements one subject makes about itself or another subject. Claims are returned by the claims providers that are available on a protocol server. A typical scenario for this protocol is a client application that allows users to search and resolve users and groups from a set of directory services and external identity providers.

Sections 1.8, 2, and 3 of this specification are normative and contain RFC 2119 language. Sections 1.5 and 1.9 are also normative but cannot contain RFC 2119 language. All other sections and examples in this specification are informative.

1.1 Glossary

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

Hypertext Transfer Protocol (HTTP)
Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)

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

claim
claim type
claim value
claim-based authentication mode
claims provider
claims provider schema
hierarchy provider
Simple Object Access Protocol (SOAP)
SOAP action
SOAP body
SOAP fault
Status-Code
Uniform Resource Identifier (URI)
Web application
Web Services Description Language (WSDL)
WSDL message
WSDL operation
XML namespace
XML namespace prefix
XML schema
XML schema definition (XSD)

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

References to Microsoft Open Specification documents do not include a publishing year because links are to the latest version of the documents, which are updated frequently. References to other documents include a publishing year when one is available.

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. 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.

[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>

[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>

[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>

[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

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

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

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

[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>

1.3 Protocol Overview (Synopsis)

This protocol enables a protocol client to access **claims (2)** returned by the **claims providers** available for a specific **Web application (2)**. A typical scenario for this protocol is a client application that allows users to browse, search, and resolve people and groups from a set of directory services and external identity providers.

This protocol allows a protocol client to send a search query of claims providers and obtain information necessary to store a reference to each claim.

Claims providers can also return metadata relevant to each claim and return claims in hierarchical trees for better presentation by the protocol client.

1.4 Relationship to Other Protocols

This protocol uses the **SOAP** message protocol for formatting request and response messages, as described in [\[SOAP1.1\]](#), [\[SOAP1.2/1\]](#) and [\[SOAP1.2/2\]](#). It transmits those messages by using **HTTP**, as described in [\[RFC2616\]](#), or **Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)**, as described in [\[RFC2818\]](#).

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

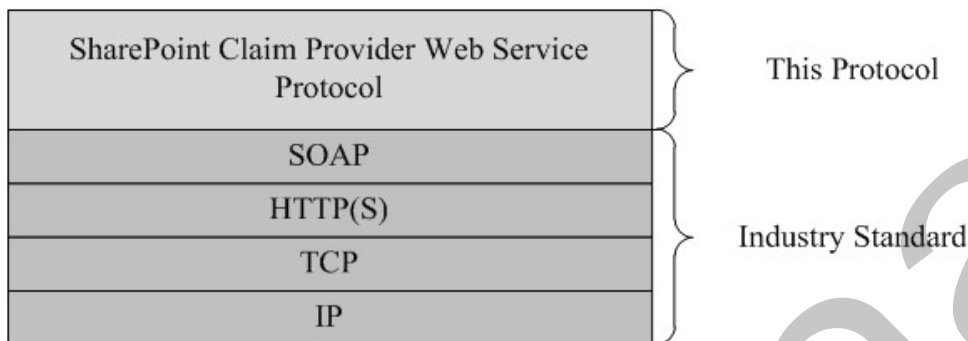


Figure 1: This protocol in relation to other protocols

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/SPClaimProviderWebService.svc"` to the URL of the site, for example: `http://www.contoso.com/_vti_bin/SPClaimProviderWebService.svc`.

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

1.6 Applicability Statement

This protocol is applicable when a client application allows users to browse, search, and resolve people and groups from a set of directory services and external identity providers through claims providers.

This protocol does not specify how the claims providers interface with the directory services or identity providers or how that data is stored.

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

In the following sections, the schema definition might differ from the processing rules imposed by the protocol. The **WSDL** in this specification matches the WSDL that shipped with the product and provides a base description of the schema. The text that introduces the WSDL might specify differences that reflect actual Microsoft product behavior. For example, the schema definition might allow for an element to be **empty**, **null**, or **not present** but the behavior of the protocol as specified restricts the same elements to being **non-empty**, **present**, and **not null**.

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 in [\[SOAP1.1\]](#), section 4 or in [\[SOAP1.2/1\]](#), section 5. Protocol server faults **MUST** be returned using HTTP **Status-Codes** as specified in [\[RFC2616\]](#), section 10 or using **SOAP faults** as specified in [\[SOAP1.1\]](#), section 4.4 or [\[SOAP1.2/1\]](#), section 5.4.

2.2 Common Message Syntax

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

2.2.1 Namespaces

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

Prefix	Namespace URI	Reference
soap	http://schemas.xmlsoap.org/wsdl/soap/	[SOAP1.1]
tns	http://schemas.microsoft.com/sharepoint/claims/	
tns1	http://schemas.microsoft.com/sharepoint/claims/Imports	
wsaw	http://www.w3.org/2006/05/addressing/wsdl	
wsdl	http://schemas.xmlsoap.org/wsdl/	[WSDL]
xs	http://www.w3.org/2001/XMLSchema	[XMLSCHEMA1] [XMLSCHEMA2]

2.2.2 Messages

None.

2.2.3 Elements

This specification does not define any common XSD 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
ArrayOfAnyType	An array of elements of any type.
ArrayOfPair	An array of elements of type Pair (section 2.2.4.8).
ArrayOfPickerEntity	An array of elements of type PickerEntity (section 2.2.4.9).
ArrayOfSPPProviderHierarchyNode	An array of elements of type SPPProviderHierarchyNode (section 2.2.4.12).
ArrayOfSPPProviderHierarchyTree	An array of elements of type SPPProviderHierarchyTree (section 2.2.4.13).
ArrayOfSPSchemaElement	An array of SPSchemaElement (section 2.2.4.15) elements.
ArrayOfString	An array of elements of type string.
Pair	A collection of two named elements of any type in a sequence.
PickerEntity	An object containing basic information about a picker entity.
SPClaim	The claim (2) associated with a login entity.
SPPProviderHierarchyElement	Defines the base type for SPPProviderHierarchyNode and SPPProviderHierarchyTree .
SPPProviderHierarchyNode	A claims provider hierarchy node.
SPPProviderHierarchyTree	A claims provider hierarchy tree.
SPPProviderSchema	The user interface display characteristics of a claims provider.
SPSchemaElement	The user interface display characteristics of a field in a picker entity.

2.2.4.1 ArrayOfAnyType

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of elements of any type.

```
<xs:complexType name="ArrayOfAnyType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="anyType" nillable="true"/>
  </xs:sequence>
</xs:complexType>
```

anyType: An anyType value as specified in [\[XMLSCHEMA1\]](#).

2.2.4.2 ArrayOfPair

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of elements of type **Pair** (section [2.2.4.8](#)).

```
<xs:complexType name="ArrayOfPair" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Pair" nillable="true"
type="tns:Pair"/>
  </xs:sequence>
</xs:complexType>
```

Pair: A collection of two elements.

2.2.4.3 ArrayOfPickerEntity

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of elements of type **PickerEntity** (section [2.2.4.9](#)).

```
<xs:complexType name="ArrayOfPickerEntity" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="PickerEntity" nillable="true"
type="tns:PickerEntity"/>
  </xs:sequence>
</xs:complexType>
```

PickerEntity: An element containing information about a picker entity.

2.2.4.4 ArrayOfSPPProviderHierarchyNode

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of elements of type **SPPProviderHierarchyNode** (section [2.2.4.12](#)).

```
<xs:complexType name="ArrayOfSPPProviderHierarchyNode"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPPProviderHierarchyNode"
nillable="true" type="tns:SPPProviderHierarchyNode"/>
  </xs:sequence>
</xs:complexType>
```

SPPProviderHierarchyNode: An element containing information about a provider hierarchy node.

2.2.4.5 ArrayOfSPPProviderHierarchyTree

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of elements of type **SPPProviderHierarchyTree** (section [2.2.4.13](#)).

```
<xs:complexType name="ArrayOfSPPProviderHierarchyTree"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPPProviderHierarchyTree"
nillable="true" type="tns:SPPProviderHierarchyTree"/>
  </xs:sequence>
```

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

SPProviderHierarchyTree: An element containing information about a claims provider hierarchy tree.

2.2.4.6 ArrayOfSPSchemaElement

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of **SPSchemaElement** (section [2.2.4.15](#)) elements.

```
<xs:complexType name="ArrayOfSPSchemaElement" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPSchemaElement" nillable="true"
      type="tns:SPSchemaElement"/>
  </xs:sequence>
</xs:complexType>
```

SPSchemaElement: The user interface display characteristics of a field in a login entity.

2.2.4.7 ArrayOfString

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of elements of type string.

```
<xs:complexType name="ArrayOfString" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="string" nillable="true"
      type="xs:string"/>
  </xs:sequence>
</xs:complexType>
```

string: A string as specified in [\[XMLSCHEMA1\]](#).

2.2.4.8 Pair

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

A collection of two named elements of any type in a sequence.

```
<xs:complexType name="Pair" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="First"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Second"/>
  </xs:sequence>
</xs:complexType>
```

First: The element at the first position.

Second: The element at the second position.

2.2.4.9 PickerEntity

Namespace: http://schemas.microsoft.com/sharepoint/claims/

An object containing basic information about a picker entity.

```
<xs:complexType name="PickerEntity" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Key" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="DisplayText" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="IsResolved" type="xs:boolean"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Description" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="EntityType" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="EntityGroupName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="HierarchyIdentifier"/>
    <xs:element minOccurs="0" maxOccurs="1" name="EntityDataElements"
type="tns:ArrayOfPair"/>
    <xs:element minOccurs="0" maxOccurs="1" name="MultipleMatches"
type="tns:ArrayOfAnyType"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ProviderName" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
```

Key: The name that uniquely identifies the picker entity.

DisplayText: The name to be used in the user interface.

IsResolved: A Boolean value that indicates if the picker entity has been successfully resolved to a unique match.

Description: The detailed description for the picker entity.

EntityType: The type for the picker entity.

EntityGroupName: The group name of the picker entity.

HierarchyIdentifier: The identifier of the picker entity in the hierarchy.

EntityDataElements: The list of name-value pairs representing the picker entity data.

MultipleMatches: The list of matched picker entities when there is more than one match.

ProviderName: The name of a claims provider.

2.2.4.10 SPClaim

Namespace: http://schemas.microsoft.com/sharepoint/claims/

The claim (2) associated with a login entity.

```
<xs:complexType name="SPClaim" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="ClaimType" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Value" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ValueType" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="OriginalIssuer" type="xs:string"/>
  </xs:sequence>
```

</xs:complexType>

ClaimType: The **claim type**.

Value: The **claim value**.

ValueType: The type of the claim value.

OriginalIssuer: The original issuer of the claim (2). The original issuer string MUST begin with one of the following strings representing type of the issuer followed by an optional valid identifier of the issuer. The original issuer type and identifier MUST be separated by a single colon (:) character.

Prefix	Comment
Windows	Issuer is of type Windows.
SecurityTokenService	Issuer is of type Security Token Service.
Forms	Issuer is of type Forms. The protocol client MUST specify valid identifier of the issuer.
TrustedProvider	Issuer is of type Trusted Provider. The protocol client MUST specify valid identifier of the issuer.
ClaimsProvider	Issuer is of type Claims Provider . The protocol client MUST specify valid identifier of the issuer.

A valid identifier MUST not begin or end with spaces, MUST not contain any control character or character that can be used as XML markup, and MUST not contain any of the following characters: colon (:), comma (,) or semicolon (;).

2.2.4.11 SPPProviderHierarchyElement

Namespace: http://schemas.microsoft.com/sharepoint/claims/

Defines the base type for **SPPProviderHierarchyNode** and **SPPProviderHierarchyTree**.

```
<xs:complexType name="SPPProviderHierarchyElement"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Nm" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ProviderName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="HierarchyNodeID" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="IsLeaf" type="xs:boolean"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Children"
type="tns:ArrayOfSPPProviderHierarchyNode"/>
    <xs:element minOccurs="0" maxOccurs="1" name="EntityData"
type="tns:ArrayOfPickerEntity"/>
    <xs:element minOccurs="1" maxOccurs="1" name="Count" type="xs:int"/>
  </xs:sequence>
</xs:complexType>
```

Nm: The human-readable display name.

ProviderName: The name of the claims provider.

HierarchyNodeID: The unique identifier for the element.

IsLeaf: Whether or not the element is a leaf element. This value is true if and only if the element has no subelements. Otherwise, it is false.

Children: The list of immediate child elements.

EntityData: The **PickerEntity** objects associated with this element.

Count: The number of **PickerEntity** objects in this element and all child elements, calculated recursively.

2.2.4.12 SPPProviderHierarchyNode

Namespace: http://schemas.microsoft.com/sharepoint/claims/

A claims provider hierarchy node.

```
<xs:complexType name="SPPProviderHierarchyNode" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexContent mixed="false">
    <xs:extension base="tns:SPPProviderHierarchyElement"/>
  </xs:complexContent>
</xs:complexType>
```

2.2.4.13 SPPProviderHierarchyTree

Namespace: http://schemas.microsoft.com/sharepoint/claims/

A claims provider hierarchy tree.

```
<xs:complexType name="SPPProviderHierarchyTree" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexContent mixed="false">
    <xs:extension base="tns:SPPProviderHierarchyElement">
      <xs:sequence>
        <xs:element minOccurs="1" maxOccurs="1" name="IsRoot" type="xs:boolean"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

IsRoot: A Boolean value that indicates whether the node root of this tree is also root of the claims provider's complete hierarchy tree.

2.2.4.14 SPPProviderSchema

Namespace: http://schemas.microsoft.com/sharepoint/claims/

The user interface display characteristics of a claims provider.

```
<xs:complexType name="SPPProviderSchema" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="DisplayName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ProviderName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ProviderSchema"
      type="tns:ArrayOfSPSchemaElement"/>
  </xs:sequence>
</xs:complexType>
```

```

    <xs:element minOccurs="1" maxOccurs="1" name="SupportsHierarchy" type="xs:boolean"/>
  </xs:sequence>
</xs:complexType>

```

DisplayName: The name to be used in user interfaces.

ProviderName: The name of a claims provider.

ProviderSchema: The list of schema elements that comprise the claims provider schema.

SupportsHierarchy: A Boolean value that indicates whether the claims provider supports hierarchy.

2.2.4.15 SPSchemaElement

Namespace: http://schemas.microsoft.com/sharepoint/claims/

The user interface display characteristics of a field in a picker entity.

```

<xs:complexType name="SPSchemaElement" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Name" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="DisplayName" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="Type" type="tns:SPSchemaElementType"/>
  </xs:sequence>
</xs:complexType>

```

Name: The name that uniquely identifies the field.

DisplayName: The name to be used for the field in user interfaces.

Type: The display type of a field in a picker entity.

2.2.5 Simple Types

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

Simple type	Description
SPPrincipalType	Contains the value that is used to specify the type(s) of picker entities included in the output claims provider hierarchy tree.
SPSchemaElementType	The display type of a field.

2.2.5.1 SPPrincipalType

Namespace: http://schemas.microsoft.com/sharepoint/claims/

Contains the value that is used to specify the type(s) of picker entities included in the output claims provider hierarchy tree.

```

<xs:simpleType name="SPPrincipalType" xmlns:xs="http://www.w3.org/2001/XMLSchema">

```

```

<xs:list>
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="None"/>
      <xs:enumeration value="User"/>
      <xs:enumeration value="DistributionList"/>
      <xs:enumeration value="SecurityGroup"/>
      <xs:enumeration value="SharePointGroup"/>
      <xs:enumeration value="All"/>
    </xs:restriction>
  </xs:simpleType>
</xs:list>
</xs:simpleType>

```

The following table specifies the allowable values for **SPPrincipalType**.

Value	Meaning
None	No picker entity is included in the output claims provider hierarchy tree.
User	Only picker entities of type user are included in the output claims provider hierarchy tree.
DistributionList	Only picker entities of type Distribution List are included in the output claims provider hierarchy tree.
SecurityGroup	Picker entities of type Security Group and all other types except User and Distribution List are included in the output claims provider hierarchy tree.
SharePointGroup	No picker entity is included in the output claims provider hierarchy tree.
All	No picker entity is included in the output claims provider hierarchy tree.

2.2.5.2 SPSchemaElementType

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

The display type of a field.

```

<xs:simpleType name="SPSchemaElementType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:restriction base="xs:string">
    <xs:enumeration value="None"/>
    <xs:enumeration value="TableViewOnly"/>
    <xs:enumeration value="DetailViewOnly"/>
    <xs:enumeration value="Both"/>
  </xs:restriction>
</xs:simpleType>

```

The following table specifies the allowable values for **SPSchemaElementType**.

Value	Meaning
None	The field is not intended to be displayed in the user interface.
TableViewOnly	The field to be displayed in the Table-View only.

Value	Meaning
DetailViewOnly	The field to be displayed in the Detailed-View only.
Both	The field can be displayed either in Table-View or Detailed-View.

2.2.6 Attributes

This specification does not define any common XSD attribute definitions.

2.2.7 Groups

This specification does not define any common XSD group definitions.

2.2.8 Attribute Groups

This specification does not define any common XSD attribute group definitions.

Preliminary

3 Protocol Details

In the following sections, the schema definition might be less restrictive than the processing rules imposed by the protocol. The WSDL in this specification matches the WSDL that shipped with the product and provides a base description of the schema. The text that introduces the WSDL specifies additional restrictions that reflect protocol behavior. For example, the schema definition might allow for an element to be **empty**, **null**, or **not present** but the behavior of the protocol as specified restricts the same elements to being **non-empty**, **present**, and **not null**.

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, Status-Code Definitions.

This protocol allows protocol servers to notify protocol clients of application-level faults using SOAP faults. Except where specified, these SOAP faults are not significant for interoperability, and protocol clients can interpret them in an implementation-specific manner.

This protocol allows protocol servers to perform implementation-specific authorization checks and notify protocol clients of authorization faults either using HTTP Status-Codes or using SOAP faults as specified previously in this section.

3.1 Server Details

All operations consist of a basic request-response pair and the protocol server treats each request as an independent transaction that is unrelated to any previous request.

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.

The protocol server maintains the following data:

- A list of Web applications (2) in **claim-based authentication mode**.
- A list of claims providers available to the protocol client.

Each claims provider maintains the following data:

- A list of claims (2) that the protocol client can search or resolve against. This protocol does not enforce any implementation on how the list of claims is maintained or the search and resolve operations determined by each claims provider.
- A claims provider hierarchy tree: The tree structure representing the hierarchy of claims as determined by the claim provider. For example, an organization tree could contain a top-level "Contoso" node, a "Sales" child node with 23 claims and an "Engineering" node with 18 claims.
- A **claims provider schema**.

Each claim (2) maintains the following data:

- A claim value.
- A claim type.
- A claim value type.

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Message Processing Events and Sequencing Rules

There are no special sequencing rules for the operations defined in this specification.

The following table summarizes the list of operations as defined by this specification:

Operation	Description
ClaimTypes	This operation is used to retrieve a list of all possible claim types from a list of claims providers.
ClaimValueTypes	This operation is used to retrieve a list of claim value types from a list of claims providers.
EntityTypes	This operation is used to retrieve a list of all possible picker entity types from a list of claims providers.
GetHierarchy	This operation is used to retrieve a claims provider hierarchy tree from a claims provider.
GetHierarchyAll	This operation is used to retrieve a list of claims provider hierarchy trees from a list of claims providers.
HierarchyProviderSchema	This operation is used to retrieve schema for the current hierarchy provider .
ProviderSchemas	This operation is used to retrieve a list of claims provider schemas from a list of claims providers.
Resolve	This operation is used to resolve an input string to picker entities using a list of claims providers.
ResolveClaim	This operation is used to resolve an input claim (2) to picker entities using a list of claims providers.
ResolveMultiple	This operation is used to resolve a list of strings to picker entities using a list of claims providers.
ResolveMultipleClaim	This operation is used to resolve a list of claims to picker entities using a list of claims providers.
Search	This operation is used to perform a search for entities on a list of claims providers. The input to this operation is a search string and the result of this operation is

Operation	Description
	a list of claims provider hierarchy trees that contain the matched entities. If a hierarchy provider is available, the protocol server MAY move results returned by claims providers to hierarchy provider hierarchy tree.
SearchAll	This operation is used to perform a search for entities on a list of claims providers. The result of this operation is a list of claims provider hierarchy trees. If a hierarchy provider is available, the protocol server MAY move entities returned by claims providers to hierarchy provider hierarchy tree.

3.1.4.1 ClaimTypes

This operation is used to retrieve a list of all possible claim types from a list of claims providers.

```
<wsdl:operation name="ClaimTypes" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimTypes"
    message="tns:IClaimProviderWebService_ClaimTypes_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimTypesResponse"
    message="tns:IClaimProviderWebService_ClaimTypes_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an **IClaimProviderWebService_ClaimTypes_InputMessage** (section [3.1.4.1.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_ClaimTypes_OutputMessage** (section [3.1.4.1.1.2](#)) response message.

The protocol server MUST retrieve all known basic claim types. In addition, the protocol server MUST retrieve claim types from claims providers that meet both of the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message.

If the list of provider names is NULL, the protocol server MUST use all the available claims providers.

3.1.4.1.1 Messages

The following table summarizes the set of **WSDL message** definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_ClaimTypes_InputMessage	The request WSDL message for the ClaimTypes WSDL operation .
IClaimProviderWebService_ClaimTypes_OutputMessage	The response WSDL message for the ClaimTypes WSDL operation .

3.1.4.1.1.1 IClaimProviderWebService_ClaimTypes_InputMessage

The request WSDL message for the **ClaimTypes WSDL operation**.

The **SOAP action** value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimTypes
```

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

3.1.4.1.1.2 IClaimProviderWebService_ClaimTypes_OutputMessage

The response WSDL message for the **ClaimTypes** WSDL operation.

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

3.1.4.1.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
ClaimTypes	The input data for the ClaimTypes WSDL operation.
ClaimTypesResponse	The result data for the ClaimTypes WSDL operation.

3.1.4.1.2.1 ClaimTypes

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

```
<xs:element name="ClaimTypes" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names.

3.1.4.1.2.2 ClaimTypesResponse

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

```
<xs:element name="ClaimTypesResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ClaimTypesResult"
        type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

ClaimTypesResult: The list of claim types supported by the claims providers.

3.1.4.1.3 Complex Types

None.

3.1.4.1.4 Simple Types

None.

3.1.4.1.5 Attributes

None.

3.1.4.1.6 Groups

None.

3.1.4.1.7 Attribute Groups

None.

3.1.4.2 ClaimValueTypes

This operation is used to retrieve a list of claim value types from a list of claims providers.

```
<wsdl:operation name="ClaimValueTypes" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimValueTypes" message="tns:IClaimProviderWebService_ClaimValueTypes_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimValueTypesResponse" message="tns:IClaimProviderWebService_ClaimValueTypes_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an **IClaimProviderWebService_ClaimValueTypes_InputMessage** (section [3.1.4.2.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_ClaimValueTypes_OutputMessage** (section [3.1.4.2.1.2](#)) response message.

The protocol server MUST retrieve all known basic claim value types. In addition, the protocol server MUST retrieve claim value types from claims providers that meet both of the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.2.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_ClaimValueTypes_InputMessage	The request WSDL message for the ClaimValueTypes WSDL operation.
IClaimProviderWebService_ClaimValueTypes_OutputMessage	The response WSDL message for the ClaimValueTypes WSDL operation.

3.1.4.2.1.1 IClaimProviderWebService_ClaimValueTypes_InputMessage

The request WSDL message for the **ClaimValueTypes** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimValueTypes
```

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

3.1.4.2.1.2 IClaimProviderWebService_ClaimValueTypes_OutputMessage

The response WSDL message for the **ClaimValueTypes** WSDL operation.

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

3.1.4.2.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
ClaimValueTypes	The input data for the ClaimValueTypes WSDL operation.
ClaimValueTypesResponse	The result data for the ClaimValueTypes WSDL operation.

3.1.4.2.2.1 ClaimValueTypes

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

```
<xs:element name="ClaimValueTypes" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names.

3.1.4.2.2.2 ClaimValueTypesResponse

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

```

<xs:element name="ClaimValueTypesResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ClaimValueTypesResult"
type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

```

ClaimValueTypesResult: The list of claim value types.

3.1.4.2.3 Complex Types

None.

3.1.4.2.4 Simple Types

None.

3.1.4.2.5 Attributes

None.

3.1.4.2.6 Groups

None.

3.1.4.2.7 Attribute Groups

None.

3.1.4.3 EntityTypes

This operation is used to retrieve a list of all possible picker entity types from a list of claims providers.

```

<wsdl:operation name="EntityTypes" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/EntityTypes"
message="tns:IClaimProviderWebService_EntityTypes_InputMessage"
xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/EntityTypesResponse"
message="tns:IClaimProviderWebService_EntityTypes_OutputMessage"
xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>

```

The protocol client sends an **IClaimProviderWebService_EntityTypes_InputMessage** (section [3.1.4.3.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_EntityTypes_OutputMessage** (section [3.1.4.3.1.2](#)) response message.

The protocol server MUST retrieve picker entity types from **claims providers** that meet both of the following criteria:

- The claims providers are associated with the Web application specified in the input message.
- The claims providers are listed in the provider names in the input message.

If no provider names are specified, the protocol server **MUST** use all the available claims providers.

3.1.4.3.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_EntityTypes_InputMessage	The request WSDL message for the EntityTypes WSDL operation.
IClaimProviderWebService_EntityTypes_OutputMessage	The response WSDL message for the EntityTypes WSDL operation.

3.1.4.3.1.1 IClaimProviderWebService_EntityTypes_InputMessage

The request WSDL message for the **EntityTypes** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/EntityTypes
```

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

3.1.4.3.1.2 IClaimProviderWebService_EntityTypes_OutputMessage

The response WSDL message for the **EntityTypes** WSDL operation.

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

3.1.4.3.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
EntityTypes	The input data for the EntityTypes WSDL operation.
EntityTypesResponse	The result data for the EntityTypes WSDL operation.

3.1.4.3.2.1 EntityTypes

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

```
<xs:element name="EntityTypes" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

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

providerNames: The list of claims provider names. If this is not specified, the protocol server MUST return results from all available claims providers.

3.1.4.3.2 EntityTypesResponse

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

```
<xs:element name="EntityTypesResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="EntityTypesResult"
        type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

EntityTypesResult: The list of picker entity types supported by the claims providers.

3.1.4.3.3 Complex Types

None.

3.1.4.3.4 Simple Types

None.

3.1.4.3.5 Attributes

None.

3.1.4.3.6 Groups

None.

3.1.4.3.7 Attribute Groups

None.

3.1.4.4 GetHierarchy

This operation is used to retrieve a claims provider hierarchy tree from a claims provider.

```
<wsdl:operation name="GetHierarchy" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchy"
    message="tns:IClaimProviderWebService_GetHierarchy_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchy"
    message="tns:IClaimProviderWebService_GetHierarchy_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

```

rchyResponse" message="tns:IClaimProviderWebService_GetHierarchy_OutputMessage"
xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>

```

The protocol client sends an **IClaimProviderWebService_GetHierarchy_InputMessage** (section [3.1.4.4.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_GetHierarchy_OutputMessage** (section [3.1.4.4.1.2](#)) response message.

The protocol server MUST retrieve a claims provider hierarchy tree from the claims provider that meets all the following criteria:

- The claims provider name is specified in the input message.
- The claims provider is associated with the Web application (2) specified in the input message.
- The claims provider supports hierarchy.

3.1.4.4.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_GetHierarchy_InputMessage	The request WSDL message for the GetHierarchy WSDL operation.
IClaimProviderWebService_GetHierarchy_OutputMessage	The response WSDL message for the GetHierarchy WSDL operation.

3.1.4.4.1.1 IClaimProviderWebService_GetHierarchy_InputMessage

The request WSDL message for the **GetHierarchy** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchy
```

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

3.1.4.4.1.2 IClaimProviderWebService_GetHierarchy_OutputMessage

The response WSDL message for the **GetHierarchy** WSDL operation.

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

3.1.4.4.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
GetHierarchy	The input data for the GetHierarchy WSDL operation.
GetHierarchyResponse	The result data for the GetHierarchy WSDL operation.

3.1.4.4.2.1 GetHierarchy

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

```
<xs:element name="GetHierarchy" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerName" type="xs:string"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="hierarchyNodeID" type="xs:string"/>
      <xs:element minOccurs="1" maxOccurs="1" name="numberOfLevels" type="xs:int"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerName: The claims provider name. The value of this element **MUST NOT** be NULL.

principalType: The SPPPrincipalType value that is used to specify the type(s) of picker entities to be included in the output claims provider hierarchy tree.

hierarchyNodeID: Identifier of the node to be used as root of the returned claims provider hierarchy tree. If NULL is specified, then the protocol server **MUST** return the existing root of claims provider hierarchy tree.

numberOfLevels: The maximum number of levels that can be returned by the protocol server in any of the output claims provider hierarchy tree. The value of this element **MUST NOT** be less than 1.

The protocol server **MUST** return all levels up to the specified number of levels from the root of the claims provider hierarchy tree. If a claims provider hierarchy tree has more than specified number of levels, then the protocol server **MUST** only return the specified number of levels from the root of the claims provider hierarchy tree.

The protocol server **MUST** return **ArgumentOutOfRangeException** <"numberOfLevels"> message if the value of this element is less than 1.

3.1.4.4.2.2 GetHierarchyResponse

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

```
<xs:element name="GetHierarchyResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="GetHierarchyResult"
type="tns:SPPProviderHierarchyTree"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

GetHierarchyResult: A claims provider hierarchy tree.

3.1.4.4.3 Complex Types

None.

3.1.4.4.4 Simple Types

None.

3.1.4.4.5 Attributes

None.

3.1.4.4.6 Groups

None.

3.1.4.4.7 Attribute Groups

None.

3.1.4.5 GetHierarchyAll

This operation is used to retrieve a list of claims provider hierarchy trees from a list of claims providers.

```
<wsdl:operation name="GetHierarchyAll" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchyAll" message="tns:IClaimProviderWebService_GetHierarchyAll_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchyAllResponse" message="tns:IClaimProviderWebService_GetHierarchyAll_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an [IClaimProviderWebService_GetHierarchyAll_InputMessage](#) (section [3.1.4.5.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_GetHierarchyAll_OutputMessage** (section [3.1.4.5.1.2](#)) response message.

The protocol server MUST retrieve claims provider hierarchy trees from claims providers that meet all the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message.
- The claims providers support hierarchy.

The protocol server MUST also retrieve hierarchy provider hierarchy tree if one is available.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.5.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_GetHierarchyAll_InputMessage	The request WSDL message for the GetHierarchyAll WSDL operation.
IClaimProviderWebService_GetHierarchyAll_OutputMessage	The response WSDL message for the GetHierarchyAll WSDL operation.

3.1.4.5.1.1 IClaimProviderWebService_GetHierarchyAll_InputMessage

The request WSDL message for the **GetHierarchyAll** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchyAll
```

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

3.1.4.5.1.2 IClaimProviderWebService_GetHierarchyAll_OutputMessage

The response WSDL message for the **GetHierarchyAll** WSDL operation.

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

3.1.4.5.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
GetHierarchyAll	The input data for the GetHierarchyAll WSDL operation.
GetHierarchyAllResponse	The result data for the GetHierarchyAll WSDL operation.

3.1.4.5.2.1 GetHierarchyAll

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

```
<xs:element name="GetHierarchyAll" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPrincipalType"/>
      <xs:element minOccurs="1" maxOccurs="1" name="numberOfLevels" type="xs:int"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names. If this is not specified, the protocol server MUST return hierarchy tree for all available claims providers.

principalType: The SPPPrincipalType value that is used to specify the type(s) of picker entities to be included in the output claims provider hierarchy tree.

numberOfLevels: The maximum number of levels that can be returned by the protocol server in any of the output claims provider hierarchy trees. The value of this element MUST NOT be less than 1.

The protocol server MUST return all levels up to the specified number of levels from the root of the claims provider hierarchy tree. If a claims provider hierarchy tree has more than the specified number of levels, then the protocol server MUST only return the specified number of levels from the root of the claims provider hierarchy tree.

The protocol server MUST return an **ArgumentOutOfRangeException** <"numberOfLevels"> message if the value of this element is less than 1.

3.1.4.5.2.2 GetHierarchyAllResponse

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

```
<xs:element name="GetHierarchyAllResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="GetHierarchyAllResult"
type="tns:ArrayOfSPPProviderHierarchyTree"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

GetHierarchyAllResult: The list of claims provider hierarchy trees.

The protocol server MUST return one claims provider hierarchy tree for each claims provider that match the criteria specified in the input message.

3.1.4.5.3 Complex Types

None.

3.1.4.5.4 Simple Types

None.

3.1.4.5.5 Attributes

None.

3.1.4.5.6 Groups

None.

3.1.4.5.7 Attribute Groups

None.

3.1.4.6 HierarchyProviderSchema

This operation is used to retrieve schema for the current hierarchy provider.

```
<wsdl:operation name="HierarchyProviderSchema" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/HierarchyProviderSchema" message="tns:IClaimProviderWebService_HierarchyProviderSchema_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/HierarchyProviderSchemaResponse"
    message="tns:IClaimProviderWebService_HierarchyProviderSchema_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an

IClaimProviderWebService_HierarchyProviderSchema_InputMessage (section [3.1.4.6.1.1](#))

request WSDL message and the protocol server responds with an

IClaimProviderWebService_HierarchyProviderSchema_OutputMessage (section [3.1.4.6.1.2](#))

response message.

3.1.4.6.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_HierarchyProviderSchema_InputMessage	The request WSDL message for the HierarchyProviderSchema WSDL operation.
IClaimProviderWebService_HierarchyProviderSchema_OutputMessage	The response WSDL message for the HierarchyProviderSchema WSDL operation.

3.1.4.6.1.1 IClaimProviderWebService_HierarchyProviderSchema_InputMessage

The request WSDL message for the **HierarchyProviderSchema** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/HierarchyProviderSchema
```

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

3.1.4.6.1.2 IClaimProviderWebService_HierarchyProviderSchema_OutputMessage

The response WSDL message for the **HierarchyProviderSchema** WSDL operation.

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

3.1.4.6.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
HierarchyProviderSchema	The input data for the HierarchyProviderSchema WSDL operation.
HierarchyProviderSchemaResponse	The result data for the HierarchyProviderSchema WSDL operation.

3.1.4.6.2.1 HierarchyProviderSchema

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

```
<xs:element name="HierarchyProviderSchema" xmlns:xs="http://www.w3.org/2001/XMLSchema">  
  <xs:complexType/>  
</xs:element>
```

3.1.4.6.2.2 HierarchyProviderSchemaResponse

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

```
<xs:element name="HierarchyProviderSchemaResponse"  
  xmlns:xs="http://www.w3.org/2001/XMLSchema">  
  <xs:complexType>  
    <xs:sequence>  
      <xs:element minOccurs="0" maxOccurs="1" name="HierarchyProviderSchemaResult"  
        type="tns:SPPProviderSchema"/>  
    </xs:sequence>  
  </xs:complexType>  
</xs:element>
```

HierarchyProviderSchemaResult: The list of hierarchy claims provider schemas.

3.1.4.6.3 Complex Types

None.

3.1.4.6.4 Simple Types

None.

3.1.4.6.5 Attributes

None.

3.1.4.6.6 Groups

None.

3.1.4.6.7 Attribute Groups

None.

3.1.4.7 ProviderSchemas

This operation is used to retrieve a list of claims provider schemas from a list of claims providers.

```
<wsdl:operation name="ProviderSchemas" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ProviderSchemas" message="tns:IClaimProviderWebService_ProviderSchemas_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ProviderSchemasResponse" message="tns:IClaimProviderWebService_ProviderSchemas_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an **IClaimProviderWebService_ProviderSchemas_InputMessage** (section [3.1.4.7.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_ProviderSchemas_OutputMessage** (section [3.1.4.7.1.2](#)) response message.

The protocol server MUST retrieve claims provider schemas from claims providers that meet all the following criteria:

- The claims providers are enabled for the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message or SharePoint Groups provider.
- The claims providers support search and resolve.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.7.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_ProviderSchemas_InputMessage	The request WSDL message for the ProviderSchemas WSDL operation.
IClaimProviderWebService_ProviderSchemas_OutputMessage	The response WSDL message for the ProviderSchemas WSDL operation.

3.1.4.7.1.1 IClaimProviderWebService_ProviderSchemas_InputMessage

The request WSDL message for the **ProviderSchemas** WSDL operation.

The SOAP action value is:

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

3.1.4.7.1.2 IClaimProviderWebService_ProviderSchemas_OutputMessage

The response WSDL message for the **ProviderSchemas** WSDL operation.

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

3.1.4.7.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
ProviderSchemas	The input data for the ProviderSchemas WSDL operation.
ProviderSchemasResponse	The result data for the ProviderSchemas WSDL operation.

3.1.4.7.2.1 ProviderSchemas

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

```
<xs:element name="ProviderSchemas" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names. If this is not specified, the protocol server MUST return results from all available claims providers.

3.1.4.7.2.2 ProviderSchemasResponse

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

```
<xs:element name="ProviderSchemasResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ProviderSchemasResult"
        type="tns:ArrayOfSPProviderSchema"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

ProviderSchemasResult: The list of claims provider schemas.

3.1.4.7.3 Complex Types

The following table summarizes the XML schema complex type definitions that are specific to this operation.

Complex type	Description
ArrayOfSPPProviderSchema	

3.1.4.7.3.1 ArrayOfSPPProviderSchema

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of **SPPProviderSchema** (section [2.2.4.14](#)) elements.

```
<xs:complexType name="ArrayOfSPPProviderSchema" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPPProviderSchema" nillable="true"
      type="tns:SPPProviderSchema"/>
  </xs:sequence>
</xs:complexType>
```

SPPProviderSchema: The user interface display characteristics of a field in an entity.

3.1.4.7.4 Simple Types

None.

3.1.4.7.5 Attributes

None.

3.1.4.7.6 Groups

None.

3.1.4.7.7 Attribute Groups

None.

3.1.4.8 Resolve

This operation is used to resolve an input string to picker entities using a list of claims providers.

```
<wsdl:operation name="Resolve" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Resolve"
    message="tns:IClaimProviderWebService_Resolve_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveR
    esponse" message="tns:IClaimProviderWebService_Resolve_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an **IClaimProviderWebService_Resolve_InputMessage** (section [3.1.4.8.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_Resolve_OutputMessage** (section [3.1.4.8.1.2](#)) response message.

The protocol server MUST resolve across all claims providers that meet all the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message.
- The claims providers support resolve.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.8.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_Resolve_InputMessage	The request WSDL message for the Resolve WSDL operation.
IClaimProviderWebService_Resolve_OutputMessage	The response WSDL message for the Resolve WSDL operation.

3.1.4.8.1.1 IClaimProviderWebService_Resolve_InputMessage

The request WSDL message for the **Resolve** WSDL operation.

The SOAP action value is:

`http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Resolve`

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

3.1.4.8.1.2 IClaimProviderWebService_Resolve_OutputMessage

The response WSDL message for the **Resolve** WSDL operation.

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

3.1.4.8.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
Resolve	The input data for the Resolve WSDL operation.
ResolveResponse	The result data for the Resolve WSDL operation.

3.1.4.8.2.1 Resolve

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

```
<xs:element name="Resolve" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="resolveInput" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names. If this is not specified, the protocol server MUST return results from all available claims providers.

principalType: The SPPrincipalType value that is used to specify the type(s) of picker entities to be included in the output claims provider hierarchy tree.

resolveInput: The input to be resolved. This MUST NOT be NULL. If this is NULL, the protocol server MUST return an **ArgumentNullException**<"resolveInput"> message.

3.1.4.8.2.2 ResolveResponse

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

```
<xs:element name="ResolveResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ResolveResult"
type="tns:ArrayOfPickerEntity"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

ResolveResult: The list of picker entities.

3.1.4.8.3 Complex Types

None.

3.1.4.8.4 Simple Types

None.

3.1.4.8.5 Attributes

None.

3.1.4.8.6 Groups

None.

3.1.4.8.7 Attribute Groups

None.

3.1.4.9 ResolveClaim

This operation is used to resolve an input claim (2) to picker entities using a list of claims providers.

```
<wsdl:operation name="ResolveClaim" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveClaim"
    message="tns:IClaimProviderWebService_ResolveClaim_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveClaimResponse"
    message="tns:IClaimProviderWebService_ResolveClaim_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an **IClaimProviderWebService_ResolveClaim_InputMessage** (section [3.1.4.9.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_ResolveClaim_OutputMessage** (section [3.1.4.9.1.2](#)) response message.

The protocol server MUST resolve across all claims providers that meet all the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message.
- The claims providers support resolve.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.9.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_ResolveClaim_InputMessage	The request WSDL message for the ResolveClaim WSDL operation.
IClaimProviderWebService_ResolveClaim_OutputMessage	The response WSDL message for the ResolveClaim WSDL operation.

3.1.4.9.1.1 IClaimProviderWebService_ResolveClaim_InputMessage

The request WSDL message for the **ResolveClaim** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveClaim
```

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

3.1.4.9.1.2 IClaimProviderWebService_ResolveClaim_OutputMessage

The response WSDL message for the **ResolveClaim** WSDL operation.

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

3.1.4.9.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
ResolveClaim	The input data for the ResolveClaim WSDL operation.
ResolveClaimResponse	The result data for the ResolveClaim WSDL operation.

3.1.4.9.2.1 ResolveClaim

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

```
<xs:element name="ResolveClaim" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="resolveInput" type="tns:SPClaim"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names. If this is not specified, the protocol server MUST return results from all available claims providers.

principalType: The SPPrincipalType value that is used to specify the type(s) of picker entities to be included in the output claims provider hierarchy tree.

resolveInput: The input to be resolved, represented as an **SPClaim** (section [2.2.4.10](#)). The value of this element MUST NOT be NULL.

3.1.4.9.2.2 ResolveClaimResponse

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

```
<xs:element name="ResolveClaimResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ResolveClaimResult"
type="tns:ArrayOfPickerEntity"/>
    </xs:sequence>
  </xs:complexType>
```

</xs:element>

ResolveClaimResult: The list of picker entities.

3.1.4.9.3 Complex Types

None.

3.1.4.9.4 Simple Types

None.

3.1.4.9.5 Attributes

None.

3.1.4.9.6 Groups

None.

3.1.4.9.7 Attribute Groups

None.

3.1.4.10 ResolveMultiple

This operation is used to resolve a list of strings to picker entities using a list of claims providers.

```
<wsdl:operation name="ResolveMultiple" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveMultiple" message="tns:IClaimProviderWebService_ResolveMultiple_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveMultipleResponse" message="tns:IClaimProviderWebService_ResolveMultiple_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an [IClaimProviderWebService_ResolveMultiple_InputMessage](#) (section [3.1.4.10.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_ResolveMultiple_OutputMessage** (section [3.1.4.10.1.2](#)) response message.

The protocol server MUST resolve across all claims providers that meet all the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message.
- The claims providers support resolve.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.10.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_ResolveMultiple_InputMessage	The request WSDL message for the ResolveMultiple WSDL operation.
IClaimProviderWebService_ResolveMultiple_OutputMessage	The response WSDL message for the ResolveMultiple WSDL operation.

3.1.4.10.1.1 IClaimProviderWebService_ResolveMultiple_InputMessage

The request WSDL message for the **ResolveMultiple** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveMultiple
```

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

3.1.4.10.1.2 IClaimProviderWebService_ResolveMultiple_OutputMessage

The response WSDL message for the **ResolveMultiple** WSDL operation.

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

3.1.4.10.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
ResolveMultiple	The input data for the ResolveMultiple WSDL operation.
ResolveMultipleResponse	The result data for the ResolveMultiple WSDL operation.

3.1.4.10.2.1 ResolveMultiple

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

```
<xs:element name="ResolveMultiple" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="resolveInput" type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names. If this is not specified, the protocol server MUST return results from all available claims providers.

principalType: The SPPrincipalType value that is used to specify the type(s) of picker entities to be included in the output claims provider hierarchy tree.

resolveInput: The list of input strings to be resolved. This MUST NOT be NULL. If this is NULL, the protocol server MUST return an **ArgumentNullException** <"resolveInput"> message.

The protocol server MUST resolve each string across all claims providers.

3.1.4.10.2.2 ResolveMultipleResponse

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

```
<xs:element name="ResolveMultipleResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ResolveMultipleResult"
type="tns:ArrayOfPickerEntity"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

ResolveMultipleResult: The list of picker entities.

The list MUST contain one and only one picker entity per string in the input.

If there are multiple matches for an input string, then the protocol server MUST return a picker entity whose IsResolved is set to false and contains the multiple matched picker entities as the child entities.

3.1.4.10.3 Complex Types

None.

3.1.4.10.4 Simple Types

None.

3.1.4.10.5 Attributes

None.

3.1.4.10.6 Groups

None.

3.1.4.10.7 Attribute Groups

None.

3.1.4.11 ResolveMultipleClaim

This operation is used to resolve a list of claims to picker entities using a list of claims providers.

```

<wsdl:operation name="ResolveMultipleClaim" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveMultipleClaim" message="tns:IClaimProviderWebService_ResolveMultipleClaim_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveMultipleClaimResponse"
    message="tns:IClaimProviderWebService_ResolveMultipleClaim_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>

```

The protocol client sends an **IClaimProviderWebService_ResolveMultipleClaim_InputMessage** (section [3.1.4.11.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_ResolveMultipleClaim_OutputMessage** (section [3.1.4.11.1.2](#)) response message.

The protocol server MUST resolve across all claims providers that meet all the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message.
- The claims providers support resolve.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.11.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_ResolveMultipleClaim_InputMessage	The request WSDL message for the ResolveMultipleClaim WSDL operation.
IClaimProviderWebService_ResolveMultipleClaim_OutputMessage	The response WSDL message for the ResolveMultipleClaim WSDL operation.

3.1.4.11.1.1 IClaimProviderWebService_ResolveMultipleClaim_InputMessage

The request WSDL message for the **ResolveMultipleClaim** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveMultipleClaim
```

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

3.1.4.11.1.2 IClaimProviderWebService_ResolveMultipleClaim_OutputMessage

The response WSDL message for the **ResolveMultipleClaim** WSDL operation.

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

3.1.4.11.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
ResolveMultipleClaim	The input data for the ResolveMultipleClaim WSDL operation.
ResolveMultipleClaimResponse	The result data for the ResolveMultipleClaim WSDL operation.

3.1.4.11.2.1 ResolveMultipleClaim

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

```
<xs:element name="ResolveMultipleClaim" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="resolveInput" type="tns:ArrayOfSPClaim"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names. If this is not specified, the protocol server MUST return results from all available claims providers.

principalType: The SPPrincipalType value that is used to specify the type(s) of picker entities to be included in the output claims provider hierarchy tree.

resolveInput: The list of claims (2) to be resolved. This MUST NOT be NULL. If this is NULL, the protocol server MUST return an **ArgumentNullException** <"searchPattern"> message.

3.1.4.11.2.2 ResolveMultipleClaimResponse

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

```
<xs:element name="ResolveMultipleClaimResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ResolveMultipleClaimResult"
type="tns:ArrayOfPickerEntity"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

ResolveMultipleClaimResult: The list of picker entities. The list MUST contain one and only one picker entity per one claim (2) in the input. If there are multiple matches for an input claim, the protocol server MUST return a picker entity whose **IsResolved** is set to **false** and contains the multiple matched picker entity as the child entities.

3.1.4.11.3 Complex Types

The following table summarizes the XML schema complex type definitions that are specific to this operation.

Complex type	Description
ArrayOfSPClaim	

3.1.4.11.3.1 ArrayOfSPClaim

Namespace: <http://schemas.microsoft.com/sharepoint/claims/>

An array of elements of type **SPClaim** (section [2.2.4.10](#)).

```
<xs:complexType name="ArrayOfSPClaim" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPClaim" nillable="true"
type="tns:SPClaim"/>
  </xs:sequence>
</xs:complexType>
```

SPClaim: The claim (2) associated with an entity.

3.1.4.11.4 Simple Types

None.

3.1.4.11.5 Attributes

None.

3.1.4.11.6 Groups

None.

3.1.4.11.7 Attribute Groups

None.

3.1.4.12 Search

This operation is used to perform a search for entities on a list of claims providers.

The input to this operation is a search string and the result of this operation is a list of claims provider hierarchy trees that contain the matched entities. If a hierarchy provider is available, the protocol server MAY move results returned by claims providers to hierarchy provider hierarchy tree.

```
<wsdl:operation name="Search" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Search"
message="tns:IClaimProviderWebService_Search_InputMessage"
xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/SearchRe
```

```
sponse" message="tns:IClaimProviderWebService_Search_OutputMessage"
xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an **IClaimProviderWebService_Search_InputMessage** (section [3.1.4.12.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_Search_OutputMessage** (section [3.1.4.12.1.2](#)) response message.

The protocol server MUST search across all claims providers that meet all the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider search arguments in the input message.
- The claims providers support search.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.12.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_Search_InputMessage	The request WSDL message for the Search WSDL operation.
IClaimProviderWebService_Search_OutputMessage	The response WSDL message for the Search WSDL operation.

3.1.4.12.1.1 IClaimProviderWebService_Search_InputMessage

The request WSDL message for the **Search** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Search
```

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

3.1.4.12.1.2 IClaimProviderWebService_Search_OutputMessage

The response WSDL message for the **Search** WSDL operation.

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

3.1.4.12.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
Search	The input data for the Search WSDL operation.
SearchResponse	The result data for the Search WSDL operation.

3.1.4.12.2.1 Search

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

```
<xs:element name="Search" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerSearchArguments"
type="tns:ArrayOfSPPProviderSearchArguments"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="searchPattern" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerSearchArguments: The list of **SPPProviderSearchArguments** (section [3.1.4.12.3.2](#)) that specify what claims providers to search, where to begin the search in each claims provider, and how many entities can be included in the output.

principalType: The SPPPrincipalType value that is used to specify the type(s) of picker entities to be included in the output claims provider hierarchy tree.

searchPattern: The search string. The protocol server **MUST** search for the string in each claims provider. If this is NULL, the protocol server **MUST** return an **ArgumentNullException** <"searchPattern"> message.

3.1.4.12.2.2 SearchResponse

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

```
<xs:element name="SearchResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="SearchResult"
type="tns:ArrayOfSPPProviderHierarchyTree"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

SearchResult: The list of claims provider hierarchy trees.

The protocol server **MUST** return one claims provider hierarchy tree for each claims provider that contains entities that match the search string.

3.1.4.12.3 Complex Types

The following table summarizes the XML schema complex type definitions that are specific to this operation.

Complex type	Description
ArrayOfSPPProviderSearchArguments	
SPPProviderSearchArguments	

3.1.4.12.3.1 ArrayOfSPPProviderSearchArguments

Namespace: http://schemas.microsoft.com/sharepoint/claims/

An array of **SPPProviderSearchArguments** (section [3.1.4.12.3.2](#)).

```
<xs:complexType name="ArrayOfSPPProviderSearchArguments"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPPProviderSearchArguments"
nillable="true" type="tns:SPPProviderSearchArguments"/>
  </xs:sequence>
</xs:complexType>
```

SPPProviderSearchArguments: The information to control search in a claims provider.

3.1.4.12.3.2 SPPProviderSearchArguments

Namespace: http://schemas.microsoft.com/sharepoint/claims/

The information to control search in a claims provider.

```
<xs:complexType name="SPPProviderSearchArguments" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="ProviderName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="HierarchyNodeID" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="MaxCount" type="xs:int"/>
  </xs:sequence>
</xs:complexType>
```

ProviderName: The name of a claims provider.

HierarchyNodeID: The node identifier of a node in claims provider hierarchy tree where the protocol server begins the search. If NULL is specified, then the protocol server MUST begin the search at the root of the claims provider hierarchy tree.

MaxCount: The maximum number of matched entities to be returned by the protocol server in the output claims provider hierarchy tree for the specified claims provider. This value MUST be greater than or equal to 1.

3.1.4.12.4 Simple Types

None.

3.1.4.12.5 Attributes

None.

3.1.4.12.6 Groups

None.

3.1.4.12.7 Attribute Groups

None.

3.1.4.13 SearchAll

This operation is used to perform a search for entities on a list of claims providers. The result of this operation is a list of claims provider hierarchy trees. If a hierarchy provider is available, the protocol server MAY move entities returned by claims providers to hierarchy provider hierarchy tree.

```
<wsdl:operation name="SearchAll" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:input
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/SearchAll"
    message="tns:IClaimProviderWebService_SearchAll_InputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
  <wsdl:output
    wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/SearchAllResponse"
    message="tns:IClaimProviderWebService_SearchAll_OutputMessage"
    xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"/>
</wsdl:operation>
```

The protocol client sends an **IClaimProviderWebService_SearchAll_InputMessage** (section [3.1.4.13.1.1](#)) request WSDL message and the protocol server responds with an **IClaimProviderWebService_SearchAll_OutputMessage** (section [3.1.4.13.1.2](#)) response message.

The protocol server MUST search across all claims providers that meet all the following criteria:

- The claims providers are associated with the Web application (2) specified in the input message.
- The claims providers are listed in the provider names in the input message.
- The claims providers support search.

If no provider names are specified, the protocol server MUST use all the available claims providers.

3.1.4.13.1 Messages

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
IClaimProviderWebService_SearchAll_InputMessage	The request WSDL message for the SearchAll WSDL operation.
IClaimProviderWebService_SearchAll_OutputMessage	The response WSDL message for the SearchAll WSDL operation.

3.1.4.13.1.1 IClaimProviderWebService_SearchAll_InputMessage

The request WSDL message for the **SearchAll** WSDL operation.

The SOAP action value is:

```
http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/SearchAll
```

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

3.1.4.13.1.2 IClaimProviderWebService_SearchAll_OutputMessage

The response WSDL message for the **SearchAll** WSDL operation.

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

3.1.4.13.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
SearchAll	The input data for the SearchAll WSDL operation.
SearchAllResponse	The result data for the SearchAll WSDL operation.

3.1.4.13.2.1 SearchAll

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

```
<xs:element name="SearchAll" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames" type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="searchPattern" type="xs:string"/>
      <xs:element minOccurs="1" maxOccurs="1" name="maxCount" type="xs:int"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

providerNames: The list of claims provider names. If this is NULL, the protocol server MUST return results from all available claims providers.

principalType: The SPPrincipalType value that is used to specify the type(s) of picker entities to be included in the output claims provider hierarchy tree.

searchPattern: The search string. This MUST NOT be NULL. If list of provider names is NULL, the protocol server MUST search for each string in all claims providers. If this is NULL, the protocol server MUST return an **ArgumentNullException**<"searchPattern"> message.

maxCount: The maximum number of matched entities to be returned in total across all the output claims provider hierarchy trees. This number MUST be greater than or equal to 1.

3.1.4.13.2.2 SearchAllResponse

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

```
<xs:element name="SearchAllResponse" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="SearchAllResult"
        type="tns:ArrayOfSPPProviderHierarchyTree"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

SearchAllResult: The list of claims provider hierarchy trees.

The protocol server **MUST** return one claims provider hierarchy tree for each claims provider that contains entities that match the search string.

3.1.4.13.3 Complex Types

None.

3.1.4.13.4 Simple Types

None.

3.1.4.13.5 Attributes

None.

3.1.4.13.6 Groups

None.

3.1.4.13.7 Attribute Groups

None.

3.1.5 Timer Events

None.

3.1.6 Other Local Events

None.

4 Protocol Examples

4.1 GetHierarchyAll

The protocol server has four claims providers: System, AllUsers, Group and People. The System **claims provider** has claim types - Application Pool Identity and Farm identifier. The protocol server has a Web application (2) (<http://localhost>) that is configured to use claim-based authentication mode.

4.1.1 Retrieve Claim Provider Hierarchy Trees from All Available Claim Providers

In this example, claims provider hierarchy trees are fetched from all available claims providers. The protocol server has four claims providers: System, AllUsers, Group and People.

The protocol client constructs the following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <GetHierarchyAll xmlns="http://tempuri.org/"
      xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <providerNames>
        <string>System</string>
        <string>AllUsers</string>
        <string>Group</string>
        <string>People</string>
      </providerNames>
      <principalType>User</principalType>
      <numberOfLevels>3</numberOfLevels>
    </GetHierarchyAll>
  </s:Body>
</s:Envelope>
```

The protocol server responds with following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <GetHierarchyAllResponse xmlns="http://tempuri.org/">
      <GetHierarchyAllResult>
        <SPPProviderHierarchyTree>
          <Nm>System</Nm>
          <ProviderName>System</ProviderName>
          <HierarchyNodeID/>
          <IsLeaf>false</IsLeaf>
          <Children>
            <SPPProviderHierarchyNode>
              <Nm>Application Pool Identity</Nm>
              <ProviderName>System</ProviderName>
              <HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/processidentitylogonname/</HierarchyNodeID>
              <IsLeaf>true</IsLeaf>
              <Children/>
              <EntityData/>
              <Count>-1</Count>
            </SPPProviderHierarchyNode>
          </Children>
        </SPPProviderHierarchyTree>
      </GetHierarchyAllResult>
    </GetHierarchyAllResponse>
  </s:Body>
</s:Envelope>
```



```

        </SPPProviderHierarchyNode>
        <SPPProviderHierarchyNode>
            <Nm>Farm ID</Nm>
            <ProviderName>System</ProviderName>
        <HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/farmid</HierarchyNode
ID>
            <IsLeaf>true</IsLeaf>
            <Children/>
            <EntityData/>
            <Count>-1</Count>
        </SPPProviderHierarchyNode>
    </Children>
    <EntityData/>
    <Count>-1</Count>
    <IsRoot>true</IsRoot>
</SPPProviderHierarchyTree>
<SPPProviderHierarchyTree>
    <Nm>AllUsers</Nm>
    <ProviderName>AllUsers</ProviderName>
    <HierarchyNodeID/>
    <IsLeaf>true</IsLeaf>
    <Children/>
    <EntityData/>
    <Count>-1</Count>
    <IsRoot>true</IsRoot>
</SPPProviderHierarchyTree>
<SPPProviderHierarchyTree>
    <Nm>Group</Nm>
    <ProviderName>Group</ProviderName>
    <HierarchyNodeID/>
    <IsLeaf>true</IsLeaf>
    <Children/>
    <EntityData/>
    <Count>-1</Count>
    <IsRoot>true</IsRoot>
</SPPProviderHierarchyTree>
<SPPProviderHierarchyTree>
    <Nm>People and Organizations</Nm>
    <ProviderName>People</ProviderName>
    <HierarchyNodeID/>
    <IsLeaf>true</IsLeaf>
    <Children/>
    <EntityData/>
    <Count>-1</Count>
    <IsRoot>true</IsRoot>
</SPPProviderHierarchyTree>
</GetHierarchyAllResult>
</GetHierarchyAllResponse>
</s:Body>
</s:Envelope>

```

4.1.2 Retrieve Claim Provider Hierarchy Trees from One of the Claim Providers

In this example, claims provider hierarchy trees are fetched from one of the claims providers ("System").

The protocol client constructs the following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <GetHierarchyAll xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-
instance">
      <context>http://localhost</context>
      <providerNames>
        <string>System</string>
      </providerNames>
      <numberOfLevels>3</numberOfLevels>
      <includeEntityData>true</includeEntityData>
    </GetHierarchyAll>
  </s:Body>
</s:Envelope>

```

The protocol server responds with following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <GetHierarchyAllResponse xmlns="http://tempuri.org/">
      <GetHierarchyAllResult>
        <SPPProviderHierarchyTree>
          <Nm>System</Nm>
          <ProviderName>System</ProviderName>
          <HierarchyNodeID/>
          <IsLeaf>false</IsLeaf>
          <Children>
            <SPPProviderHierarchyNode>
              <Nm>Application Pool Identity</Nm>
              <ProviderName>System</ProviderName>
              <HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/processidentitylogonn
ame</HierarchyNodeID>
              <IsLeaf>true</IsLeaf>
              <Children/>
              <EntityData/>
              <Count>-1</Count>
            </SPPProviderHierarchyNode>
          <SPPProviderHierarchyNode>
            <Nm>Farm ID</Nm>
            <ProviderName>System</ProviderName>
            <HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/farmid</HierarchyNode
ID>
            <IsLeaf>true</IsLeaf>
            <Children/>
            <EntityData/>
            <Count>-1</Count>
          </SPPProviderHierarchyNode>
        </Children>
        <EntityData/>
        <Count>-1</Count>
        <IsRoot>true</IsRoot>
      </SPPProviderHierarchyTree>
    </GetHierarchyAllResult>
  </GetHierarchyAllResponse>
</s:Body>
</s:Envelope>

```

4.2 SearchAll

In this example, protocol client calls the SearchAll method to search the entities on two claims providers ("System" and "All Users") with a search pattern "domain\user1". The **URI** of the Web application (2) (<http://localhost>) and the maximum number of matched entities to be returned (100) are also specified.

The protocol server has four claims providers: System, AllUsers, Group and People. The System claims provider has claim types - Application Pool Identity and Farm identifier. The protocol server has a Web application (2) (<http://localhost>) that is configured to use claim-based authentication mode.

The protocol client constructs the following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <SearchAll xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <context>http://localhost</context>
      <providerNames>
        <string>System</string>
        <string>Groups</string>
      </providerNames>
      <searchPattern>Domain\User1</searchPattern>
      <maxCount>100</maxCount>
    </SearchAll>
  </s:Body>
</s:Envelope>
```

The protocol server responds with following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <SearchAllResponse xmlns="http://tempuri.org/">
      <SearchAllResult>
        <SPPProviderHierarchyTree>
          <Nm>System</Nm>
          <ProviderName>System</ProviderName>
          <HierarchyNodeID/>
          <IsLeaf>false</IsLeaf>
          <Children>
            <SPPProviderHierarchyNode>
              <Nm>Application Pool Identity</Nm>
              <ProviderName>System</ProviderName>
              <HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/processidentitylogonname</HierarchyNodeID>
              <IsLeaf>true</IsLeaf>
              <Children/>
              <EntityData>
                <PickerEntity>
                  <Key>c:0'0c|System|Domain\User1</Key>
                  <DisplayText>Domain\User1 (/sharepoint/2009/08/claims/processidentitylogonname)</DisplayText>
                  <IsResolved>true</IsResolved>
                  <Description/>
                  <EntityType>System</EntityType>
                </PickerEntity>
              </EntityData>
            </SPPProviderHierarchyNode>
          </Children>
        </SPPProviderHierarchyTree>
      </SearchAllResult>
    </SearchAllResponse>
  </s:Body>
</s:Envelope>
```

```

        <EntityDataElements/>
        <MultipleMatches/>
    </PickerEntity>
</EntityData>
<Count>-1</Count>
</SPPProviderHierarchyNode>
<SPPProviderHierarchyNode>
    <Nm>Farm ID</Nm>
    <ProviderName>System</ProviderName>
<HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/farmid</HierarchyNode
ID>
    <IsLeaf>true</IsLeaf>
    <Children/>
    <EntityData/>
    <Count>-1</Count>
    </SPPProviderHierarchyNode>
</Children>
<EntityData/>
<Count>-1</Count>
<IsRoot>true</IsRoot>
</SPPProviderHierarchyTree>
</SearchAllResult>
</SearchAllResponse>
</s:Body>
</s:Envelope>

```

4.3 Search

In this example, protocol client calls the Search method to search the entities on one of the claims providers ("System") with a search pattern "domain\user1". The URI of the Web application (<http://localhost>) and the maximum number of matched entities to be returned (100) are also specified.

The protocol server has four claims providers: System, AllUsers, Group and People. The System claims provider has claim types - Application Pool Identity and Farm identifier. The protocol server has a Web application (2) (<http://localhost>) that is configured to use claim-based authentication mode.

The protocol client constructs the following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <Search xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-
instance">
      <context>http://localhost</context>
      <providerSearchArguments>
        <SPPProviderSearchArguments>
          <ProviderName>System</ProviderName>
          <MaxCount>100</MaxCount>
        </SPPProviderSearchArguments>
      </providerSearchArguments>
      <searchPattern> domain\user1</searchPattern>
    </Search>
  </s:Body>
</s:Envelope>

```

The protocol server responds with following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <SearchResponse xmlns="http://tempuri.org/">
      <SearchResult>
        <SPPProviderHierarchyTree>
          <Nm>System</Nm>
          <ProviderName>System</ProviderName>
          <HierarchyNodeID/>
          <IsLeaf>false</IsLeaf>
          <Children>
            <SPPProviderHierarchyNode>
              <Nm>Application Pool Identity</Nm>
              <ProviderName>System</ProviderName>
              <HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/processidentitylogonname</HierarchyNodeID>
              <IsLeaf>true</IsLeaf>
              <Children/>
              <EntityData>
                <PickerEntity>
                  <Key>c:0'0c|System|Domain\User1</Key>
                  <DisplayText>Domain\User1
(/sharepoint/2009/08/claims/processidentitylogonname)</DisplayText>
                  <IsResolved>true</IsResolved>
                  <Description/>
                  <EntityType>System</EntityType>
                  <EntityDataElements/>
                  <MultipleMatches/>
                </PickerEntity>
              </EntityData>
              <Count>-1</Count>
            </SPPProviderHierarchyNode>
            <SPPProviderHierarchyNode>
              <Nm>Farm ID</Nm>
              <ProviderName>System</ProviderName>
              <HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/farmid</HierarchyNodeID>
              <IsLeaf>true</IsLeaf>
              <Children/>
              <EntityData/>
              <Count>-1</Count>
            </SPPProviderHierarchyNode>
          </Children>
          <EntityData/>
          <Count>-1</Count>
          <IsRoot>true</IsRoot>
        </SPPProviderHierarchyTree>
      </SearchResult>
    </SearchResponse>
  </s:Body>
</s:Envelope>
```

4.4 GetHierarchy

In this example, protocol client retrieves a claims provider hierarchy tree from a claims provider by specifying node identifier of the claims provider hierarchy tree.

The protocol server has four claims providers: System, AllUsers, Group and People. The System claims provider has claim types - Application Pool Identity and Farm identifier. The protocol server has a Web application (2) (<http://localhost>) that is configured to use claim-based authentication mode.

The protocol client constructs the following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <GetHierarchy xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <context>http://localhost</context>
      <providerName>System</providerName>

      <hierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/processidentitylogonname</hierarchyNodeID>
      <numberOfLevels>4</numberOfLevels>
      <includeEntityData>true</includeEntityData>
    </GetHierarchy>
  </s:Body>
</s:Envelope>
```

The protocol server responds with following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <GetHierarchyResponse xmlns="http://tempuri.org/">
      <GetHierarchyResult>
        <Nm>Application Pool Identity</Nm>
        <ProviderName>System</ProviderName>
      <HierarchyNodeID>http://schemas.microsoft.com/sharepoint/2009/08/claims/processidentitylogonname</HierarchyNodeID>
      <IsLeaf>true</IsLeaf>
      <Children/>
      <EntityData/>
      <Count>-1</Count>
      <IsRoot>>false</IsRoot>
    </GetHierarchyResult>
  </GetHierarchyResponse>
</s:Body>
</s:Envelope>
```

4.5 EntityTypes

In this example, protocol client fetches the picker entity types from one of the claims providers ("System").

The protocol server has four claims providers: System, AllUsers, Group and People. The protocol server has a Web application (2) (<http://localhost>) that is configured to use claim-based authentication mode.

The protocol client constructs the following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
```

```

    <EntityTypes xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-
instance">
      <context>http://localhost</context>
      <providerNames>
        <string>System</string>
      </providerNames>
    </EntityTypes>
  </s:Body>
</s:Envelope>

```

The protocol server responds with following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <EntityTypesResponse xmlns="http://tempuri.org/">
      <EntityTypesResult>
        <string>System</string>
      </EntityTypesResult>
    </EntityTypesResponse>
  </s:Body>
</s:Envelope>

```

4.6 ClaimTypes

In this example, protocol client fetches the claim types from one of the claims providers ("System").

The protocol server has four claims providers: System, AllUsers, Group and People. The protocol server has a Web application (2) (<http://localhost>) that is configured to use claim-based authentication mode.

The protocol client constructs the following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <ClaimTypes xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-
instance">
      <context>http://localhost</context>
      <providerNames>
        <string>System</string>
      </providerNames>
    </ClaimTypes>
  </s:Body>
</s:Envelope>

```

The protocol server responds with following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <ClaimTypesResponse xmlns="http://tempuri.org/">
      <ClaimTypesResult>
        <string>http://schemas.microsoft.com/sharepoint/2009/08/claims/farmid</string>
        <string>http://schemas.microsoft.com/sharepoint/2009/08/claims/processidentitylogonname</stri

```

```

ng>
<string>http://schemas.microsoft.com/sharepoint/2009/08/claims/processidentitysid</string>

<string>http://schemas.microsoft.com/sharepoint/2009/08/claims/windowstoken/handle</string>
<string>http://sharepoint.microsoft.com/claims/2009/01/windowstoken/processid</string>
  </ClaimTypesResult>
</ClaimTypesResponse>
</s:Body>
</s:Envelope>

```

4.7 ClaimValueTypes

In this example, protocol client fetches the claim value types from one of the claims providers ("System").

The protocol server has four claims providers: System, AllUsers, Group and People. The protocol server has a Web application (2) (<http://localhost>) that is configured to use claims authentication mode.

The protocol client constructs the following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <ClaimValueTypes xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <context>http://localhost</context>
      <providerNames>
        <string>System</string>
      </providerNames>
    </ClaimValueTypes>
  </s:Body>
</s:Envelope>

```

The protocol server responds with following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <ClaimValueTypesResponse xmlns="http://tempuri.org/">
      <ClaimValueTypesResult>
        <string>http://www.w3.org/2001/XMLSchema#Guid</string>
        <string>http://www.w3.org/2001/XMLSchema#string</string>
      </ClaimValueTypesResult>
    </ClaimValueTypesResponse>
  </s:Body>
</s:Envelope>

```

4.8 Resolve

In this example, protocol client calls **Resolve** method to resolve an input string ("domain\user1") to picker entities using the available claims providers.

The protocol server has four claims providers: System, AllUsers, Group and People. The System claims provider has claim types: Application Pool Identity and Farm identifier. The protocol server

has a Web application (2) (<http://localhost>) that is configured to use claim-based authentication mode.

The protocol client constructs the following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <Resolve xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <providerNames>
        <string>System</string>
        <string>AllUsers</string>
        <string>Group</string>
        <string>People</string>
      </providerNames>
      <principalType>User</principalType>
      <resolveInput>domain\user1</resolveInput>
    </Resolve>
  </s:Body>
</s:Envelope>
```

The protocol server responds with following message:

```
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <ResolveResponse xmlns="http://tempuri.org/">
      <ResolveResult>
        <PickerEntity>
          <Key>c:0'0c|System| domain\user1</Key>
          <DisplayText>user1</DisplayText>
          <IsResolved>true</IsResolved>
          <Description/>
          <EntityType>System</EntityType>
          <EntityDataElements/>
          <MultipleMatches/>
        </PickerEntity>
        <PickerEntity>
          <Key>i:0#0w| domain\user1</Key>
          <DisplayText>User1
(/sharepoint/2009/08/claims/processidentitylogonname)</DisplayText>
          <IsResolved>true</IsResolved>
          <Description> domain\user1</Description>
          <EntityType>User</EntityType>
          <EntityGroupName>User</EntityGroupName>
          <EntityDataElements>
            <Pair>
              <First xsi:type="xsd:string">Email</First>
              <Second xsi:type="xsd:string"/>
            </Pair>
            <Pair>
              <First xsi:type="xsd:string">SIPAddress</First>
            </Pair>
            <Pair>
              <First xsi:type="xsd:string">Title</First>
              <Second xsi:type="xsd:string"/>
            </Pair>
            <Pair>

```

```

        <First xsi:type="xsd:string">WorkPhone</First>
        <Second xsi:type="xsd:string"/>
    </Pair>
</EntityDataElements>
<MultipleMatches/>
</PickerEntity>
</ResolveResult>
</ResolveResponse>
</s:Body>
</s:Envelope>

```

4.9 ResolveMultiple

In this example, protocol client calls **ResolveMultiple** method to resolve two input strings ("domain\user1" and "domain\user2") to picker entities using the available claims providers.

The protocol server has four claims providers: System, AllUsers, Group and People. The System claims provider has the following claim types: Application Pool Identity, and Farm identifier. The protocol server has a Web application (2) (http://localhost) that is configured to use claim-based authentication mode.

The protocol client constructs the following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body>
    <ResolveMultiple xmlns="http://tempuri.org/" xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <providerNames>
        <string>System</string>
        <string>AllUsers</string>
        <string>Group</string>
        <string>People</string>
      </providerNames>
      <principalType>User</principalType>
      <resolveInput>
        <string>domain\user1</string>
        <string>domain\user2</string>
      </resolveInput>
    </ResolveMultiple>
  </s:Body>
</s:Envelope>

```

The protocol server responds with following message:

```

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <ResolveMultipleResponse xmlns="http://tempuri.org/">
      <ResolveMultipleResult>
        <PickerEntity>
          <Key/>
          <DisplayText>domain\user1</DisplayText>
          <IsResolved>>false</IsResolved>
          <Description/>
          <EntityType/>
          <EntityDataElements/>

```

```

<MultipleMatches>
  <anyType xsi:type="PickerEntity">
    <Key>c:0'0c|System|domain\user1</Key>
    <DisplayText>User1
(/sharepoint/2009/08/claims/processidentitylogonname)</DisplayText>
    <IsResolved>>true</IsResolved>
    <Description/>
    <EntityType>System</EntityType>
    <EntityDataElements/>
    <MultipleMatches/>
  </anyType>
  <anyType xsi:type="PickerEntity">
    <Key>i:0#0w|domain\user1</Key>
    <DisplayText>User1</DisplayText>
    <IsResolved>>true</IsResolved>
    <Description>domain\user1</Description>
    <EntityType>User</EntityType>
    <EntityDataElements>
      <Pair>
        <First xsi:type="xsd:string">Email</First>
        <Second xsi:type="xsd:string"/>
      </Pair>
      <Pair>
        <First xsi:type="xsd:string">SIPAddress</First>
      </Pair>
      <Pair>
        <First xsi:type="xsd:string">Title</First>
        <Second xsi:type="xsd:string"/>
      </Pair>
      <Pair>
        <First xsi:type="xsd:string">WorkPhone</First>
        <Second xsi:type="xsd:string"/>
      </Pair>
    </EntityDataElements>
    <MultipleMatches/>
  </anyType>
</MultipleMatches>
</PickerEntity>
<PickerEntity>
  <Key/>
  <DisplayText>domain\user2</DisplayText>
  <IsResolved>>false</IsResolved>
  <Description/>
  <EntityType/>
  <EntityDataElements/>
  <MultipleMatches>
    <anyType xsi:type="PickerEntity">
      <Key>c:0'0c|System|domain\user2</Key>
      <DisplayText>User2
(/sharepoint/2009/08/claims/processidentitylogonname)</DisplayText>
      <IsResolved>>true</IsResolved>
      <Description/>
      <EntityType>System</EntityType>
      <EntityDataElements/>
      <MultipleMatches/>
    </anyType>
    <anyType xsi:type="PickerEntity">
      <Key>i:0#0w|domain\user2</Key>
      <DisplayText>User2</DisplayText>
    </anyType>
  </MultipleMatches>
</PickerEntity>

```

```
<IsResolved>true</IsResolved>
<Description>domain\user2</Description>
<EntityType>User</EntityType>
<EntityDataElements>
  <Pair>
    <First xsi:type="xsd:string">Email</First>
    <Second xsi:type="xsd:string"/>
  </Pair>
  <Pair>
    <First xsi:type="xsd:string">SIPAddress</First>
  </Pair>
  <Pair>
    <First xsi:type="xsd:string">Title</First>
    <Second xsi:type="xsd:string"/>
  </Pair>
  <Pair>
    <First xsi:type="xsd:string">WorkPhone</First>
    <Second xsi:type="xsd:string"/>
  </Pair>
</EntityDataElements>
<MultipleMatches/>
</anyType>
</MultipleMatches>
</PickerEntity>
</ResolveMultipleResult>
</ResolveMultipleResponse>
</s:Body>
</s:Envelope>
```

5 Security

5.1 Security Considerations for Implementers

This protocol introduces no additional security considerations beyond those applicable to its underlying protocols.

5.2 Index of Security Parameters

None.

Preliminary

6 Appendix A: Full WSDL

For ease of implementation, the full WSDL is provided in this appendix.

```
<?xml version="1.0"?>
<wSDL:definitions xmlns:tns="http://schemas.microsoft.com/sharepoint/claims/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl" name="SPClaimProviderWebService"
targetNamespace="http://schemas.microsoft.com/sharepoint/claims/"
xmlns:wSDL="http://schemas.xmlsoap.org/wsdl/">
  <wSDL:types>
    <xs:schema xmlns:tns1="http://schemas.microsoft.com/sharepoint/claims/Imports"
targetNamespace="http://schemas.microsoft.com/sharepoint/claims/Imports">
      <xs:import
schemaLocation="http://www.example.com/_vti_bin/SPClaimProviderWebService.svc?xsd=xsd0"
namespace="http://schemas.microsoft.com/sharepoint/claims/" />
    </xs:schema>
  </wSDL:types>
  <wSDL:message name="IClaimProviderWebService_ClaimTypes_InputMessage">
    <wSDL:part name="parameters" element="tns:ClaimTypes" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_ClaimTypes_OutputMessage">
    <wSDL:part name="parameters" element="tns:ClaimTypesResponse" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_ClaimValueTypes_InputMessage">
    <wSDL:part name="parameters" element="tns:ClaimValueTypes" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_ClaimValueTypes_OutputMessage">
    <wSDL:part name="parameters" element="tns:ClaimValueTypesResponse" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_EntityTypes_InputMessage">
    <wSDL:part name="parameters" element="tns:EntityTypes" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_EntityTypes_OutputMessage">
    <wSDL:part name="parameters" element="tns:EntityTypesResponse" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_ProviderSchemas_InputMessage">
    <wSDL:part name="parameters" element="tns:ProviderSchemas" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_ProviderSchemas_OutputMessage">
    <wSDL:part name="parameters" element="tns:ProviderSchemasResponse" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_HierarchyProviderSchema_InputMessage">
    <wSDL:part name="parameters" element="tns:HierarchyProviderSchema" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_HierarchyProviderSchema_OutputMessage">
    <wSDL:part name="parameters" element="tns:HierarchyProviderSchemaResponse" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_GetHierarchyAll_InputMessage">
    <wSDL:part name="parameters" element="tns:GetHierarchyAll" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_GetHierarchyAll_OutputMessage">
    <wSDL:part name="parameters" element="tns:GetHierarchyAllResponse" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_GetHierarchy_InputMessage">
    <wSDL:part name="parameters" element="tns:GetHierarchy" />
  </wSDL:message>
  <wSDL:message name="IClaimProviderWebService_GetHierarchy_OutputMessage">
```

```

    <wsdl:part name="parameters" element="tns:GetHierarchyResponse"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_SearchAll_InputMessage">
    <wsdl:part name="parameters" element="tns:SearchAll"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_SearchAll_OutputMessage">
    <wsdl:part name="parameters" element="tns:SearchAllResponse"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_Search_InputMessage">
    <wsdl:part name="parameters" element="tns:Search"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_Search_OutputMessage">
    <wsdl:part name="parameters" element="tns:SearchResponse"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_Resolve_InputMessage">
    <wsdl:part name="parameters" element="tns:Resolve"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_Resolve_OutputMessage">
    <wsdl:part name="parameters" element="tns:ResolveResponse"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_ResolveClaim_InputMessage">
    <wsdl:part name="parameters" element="tns:ResolveClaim"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_ResolveClaim_OutputMessage">
    <wsdl:part name="parameters" element="tns:ResolveClaimResponse"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_ResolveMultiple_InputMessage">
    <wsdl:part name="parameters" element="tns:ResolveMultiple"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_ResolveMultiple_OutputMessage">
    <wsdl:part name="parameters" element="tns:ResolveMultipleResponse"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_ResolveMultipleClaim_InputMessage">
    <wsdl:part name="parameters" element="tns:ResolveMultipleClaim"/>
  </wsdl:message>
  <wsdl:message name="IClaimProviderWebService_ResolveMultipleClaim_OutputMessage">
    <wsdl:part name="parameters" element="tns:ResolveMultipleClaimResponse"/>
  </wsdl:message>
  <wsdl:portType name="IClaimProviderWebService">
    <wsdl:operation name="ClaimTypes">
      <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimTypes" message="tns:IClaimProviderWebService_ClaimTypes_InputMessage"/>
      <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimTypesResponse" message="tns:IClaimProviderWebService_ClaimTypes_OutputMessage"/>
    </wsdl:operation>
    <wsdl:operation name="ClaimValueTypes">
      <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimValueTypes" message="tns:IClaimProviderWebService_ClaimValueTypes_InputMessage"/>
      <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimValueTypesResponse" message="tns:IClaimProviderWebService_ClaimValueTypes_OutputMessage"/>
    </wsdl:operation>
    <wsdl:operation name="EntityTypes">
      <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/EntityTypes" message="tns:IClaimProviderWebService_EntityTypes_InputMessage"/>

```

```

        <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/EntityTypesResponse" message="tns:IClaimProviderWebService_EntityTypes_OutputMessage"/>
        </wsdl:operation>
        <wsdl:operation name="ProviderSchemas">
            <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ProviderSchemas" message="tns:IClaimProviderWebService_ProviderSchemas_InputMessage"/>
            <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ProviderSchemasResponse" message="tns:IClaimProviderWebService_ProviderSchemas_OutputMessage"/>
            </wsdl:operation>
            <wsdl:operation name="HierarchyProviderSchema">
                <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/HierarchyProviderSchema" message="tns:IClaimProviderWebService_HierarchyProviderSchema_InputMessage"/>
                <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/HierarchyProviderSchemaResponse" message="tns:IClaimProviderWebService_HierarchyProviderSchema_OutputMessage"/>
                </wsdl:operation>
                <wsdl:operation name="GetHierarchyAll">
                    <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchyAll" message="tns:IClaimProviderWebService_GetHierarchyAll_InputMessage"/>
                    <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchyAllResponse" message="tns:IClaimProviderWebService_GetHierarchyAll_OutputMessage"/>
                    </wsdl:operation>
                    <wsdl:operation name="GetHierarchy">
                        <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchy" message="tns:IClaimProviderWebService_GetHierarchy_InputMessage"/>
                        <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierarchyResponse" message="tns:IClaimProviderWebService_GetHierarchy_OutputMessage"/>
                        </wsdl:operation>
                        <wsdl:operation name="SearchAll">
                            <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/SearchAll" message="tns:IClaimProviderWebService_SearchAll_InputMessage"/>
                            <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/SearchAllResponse" message="tns:IClaimProviderWebService_SearchAll_OutputMessage"/>
                            </wsdl:operation>
                            <wsdl:operation name="Search">
                                <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Search" message="tns:IClaimProviderWebService_Search_InputMessage"/>
                                <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/SearchResponse" message="tns:IClaimProviderWebService_Search_OutputMessage"/>
                                </wsdl:operation>
                                <wsdl:operation name="Resolve">
                                    <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Resolve" message="tns:IClaimProviderWebService_Resolve_InputMessage"/>
                                    <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveResponse" message="tns:IClaimProviderWebService_Resolve_OutputMessage"/>
                                    </wsdl:operation>

```



```

        <wsdl:operation name="ResolveClaim">
            <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveC
laim" message="tns:IClaimProviderWebService_ResolveClaim_InputMessage"/>
            <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveC
laimResponse" message="tns:IClaimProviderWebService_ResolveClaim_OutputMessage"/>
            </wsdl:operation>
        <wsdl:operation name="ResolveMultiple">
            <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveM
ultiple" message="tns:IClaimProviderWebService_ResolveMultiple_InputMessage"/>
            <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveM
ultipleResponse" message="tns:IClaimProviderWebService_ResolveMultiple_OutputMessage"/>
            </wsdl:operation>
        <wsdl:operation name="ResolveMultipleClaim">
            <wsdl:input
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveM
ultipleClaim" message="tns:IClaimProviderWebService_ResolveMultipleClaim_InputMessage"/>
            <wsdl:output
wsaw:Action="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveM
ultipleClaimResponse"
message="tns:IClaimProviderWebService_ResolveMultipleClaim_OutputMessage"/>
            </wsdl:operation>
        </wsdl:portType>
        <wsdl:binding name="BasicHttpBinding_IClaimProviderWebService"
type="tns:IClaimProviderWebService">
            <soap:binding transport="http://schemas.xmlsoap.org/soap/http"/>
            <wsdl:operation name="ClaimTypes">
                <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimType
s" style="document"/>
                <wsdl:input>
                    <soap:body use="literal"/>
                </wsdl:input>
                <wsdl:output>
                    <soap:body use="literal"/>
                </wsdl:output>
            </wsdl:operation>
            <wsdl:operation name="ClaimValueTypes">
                <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ClaimValu
eTypes" style="document"/>
                <wsdl:input>
                    <soap:body use="literal"/>
                </wsdl:input>
                <wsdl:output>
                    <soap:body use="literal"/>
                </wsdl:output>
            </wsdl:operation>
            <wsdl:operation name="EntityTypes">
                <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/EntityTyp
es" style="document"/>
                <wsdl:input>
                    <soap:body use="literal"/>
                </wsdl:input>
                <wsdl:output>
                    <soap:body use="literal"/>
                </wsdl:output>
            </wsdl:operation>
        </wsdl:binding>
    </wsdl:service>

```

```

</wsdl:operation>
<wsdl:operation name="ProviderSchemas">
  <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ProviderS
chemas" style="document"/>
  <wsdl:input>
    <soap:body use="literal"/>
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal"/>
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="HierarchyProviderSchema">
  <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Hierarchy
ProviderSchema" style="document"/>
  <wsdl:input>
    <soap:body use="literal"/>
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal"/>
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetHierarchyAll">
  <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierar
chyAll" style="document"/>
  <wsdl:input>
    <soap:body use="literal"/>
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal"/>
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetHierarchy">
  <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/GetHierar
chy" style="document"/>
  <wsdl:input>
    <soap:body use="literal"/>
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal"/>
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="SearchAll">
  <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/SearchAll
" style="document"/>
  <wsdl:input>
    <soap:body use="literal"/>
  </wsdl:input>
  <wsdl:output>
    <soap:body use="literal"/>
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="Search">
  <soap:operation
soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Search"
style="document"/>

```

```

        <wsdl:input>
          <soap:body use="literal"/>
        </wsdl:input>
      <wsdl:output>
        <soap:body use="literal"/>
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="Resolve">
      <soap:operation
        soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/Resolve"
        style="document"/>
      <wsdl:input>
        <soap:body use="literal"/>
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal"/>
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ResolveClaim">
      <soap:operation
        soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveCl
        aim" style="document"/>
      <wsdl:input>
        <soap:body use="literal"/>
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal"/>
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ResolveMultiple">
      <soap:operation
        soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveMu
        ltiple" style="document"/>
      <wsdl:input>
        <soap:body use="literal"/>
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal"/>
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ResolveMultipleClaim">
      <soap:operation
        soapAction="http://schemas.microsoft.com/sharepoint/claims/IClaimProviderWebService/ResolveMu
        ltipleClaim" style="document"/>
      <wsdl:input>
        <soap:body use="literal"/>
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal"/>
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
</wsdl:definitions>

```

7 Appendix B: Full XML Schema

For ease of implementation, the following is the full XML schema for this protocol.

```
<?xml version="1.0"?>
<xs:schema xmlns:tns="http://schemas.microsoft.com/sharepoint/claims/"
  elementFormDefault="qualified"
  targetNamespace="http://schemas.microsoft.com/sharepoint/claims/"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="ClaimTypes">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
          type="tns:ArrayOfString"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <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="ClaimTypesResponse">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="ClaimTypesResult"
          type="tns:ArrayOfString"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="ClaimValueTypes">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
          type="tns:ArrayOfString"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="ClaimValueTypesResponse">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="ClaimValueTypesResult"
          type="tns:ArrayOfString"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="EntityTypes">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
          type="tns:ArrayOfString"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="EntityTypesResponse">
    <xs:complexType>
      <xs:sequence>
```

```

        <xs:element minOccurs="0" maxOccurs="1" name="EntityTypesResult"
type="tns:ArrayOfString"/>
    </xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="ProviderSchemas">
    <xs:complexType>
        <xs:sequence>
            <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
type="tns:ArrayOfString"/>
                </xs:sequence>
            </xs:complexType>
        </xs:element>
        <xs:element name="ProviderSchemasResponse">
            <xs:complexType>
                <xs:sequence>
                    <xs:element minOccurs="0" maxOccurs="1" name="ProviderSchemasResult"
type="tns:ArrayOfSPPProviderSchema"/>
                        </xs:sequence>
                    </xs:complexType>
                </xs:element>
                <xs:complexType name="ArrayOfSPPProviderSchema">
                    <xs:sequence>
                        <xs:element minOccurs="0" maxOccurs="unbounded" name="SPPProviderSchema" nillable="true"
type="tns:SPPProviderSchema"/>
                            </xs:sequence>
                        </xs:complexType>
                    <xs:complexType name="SPPProviderSchema">
                        <xs:sequence>
                            <xs:element minOccurs="0" maxOccurs="1" name="DisplayName" type="xs:string"/>
                            <xs:element minOccurs="0" maxOccurs="1" name="ProviderName" type="xs:string"/>
                            <xs:element minOccurs="0" maxOccurs="1" name="ProviderSchema"
type="tns:ArrayOfSPSchemaElement"/>
                                <xs:element minOccurs="1" maxOccurs="1" name="SupportsHierarchy" type="xs:boolean"/>
                                    </xs:sequence>
                                </xs:complexType>
                            <xs:complexType name="ArrayOfSPSchemaElement">
                                <xs:sequence>
                                    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPSchemaElement" nillable="true"
type="tns:SPSchemaElement"/>
                                        </xs:sequence>
                                    </xs:complexType>
                                <xs:complexType name="SPSchemaElement">
                                    <xs:sequence>
                                        <xs:element minOccurs="0" maxOccurs="1" name="Name" type="xs:string"/>
                                        <xs:element minOccurs="0" maxOccurs="1" name="DisplayName" type="xs:string"/>
                                        <xs:element minOccurs="1" maxOccurs="1" name="Type" type="tns:SPSchemaElementType"/>
                                            </xs:sequence>
                                        </xs:complexType>
                                    <xs:simpleType name="SPSchemaElementType">
                                        <xs:restriction base="xs:string">
                                            <xs:enumeration value="None"/>
                                            <xs:enumeration value="TableViewOnly"/>
                                            <xs:enumeration value="DetailViewOnly"/>
                                            <xs:enumeration value="Both"/>
                                                </xs:restriction>
                                            </xs:simpleType>
                                        <xs:element name="HierarchyProviderSchema">
                                            <xs:complexType/>

```

```

</xs:element>
<xs:element name="HierarchyProviderSchemaResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="HierarchyProviderSchemaResult"
type="tns:SPPProviderSchema"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="GetHierarchyAll">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPPrincipalType"/>
      <xs:element minOccurs="1" maxOccurs="1" name="numberOfLevels" type="xs:int"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:simpleType name="SPPPrincipalType">
  <xs:list>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="None"/>
        <xs:enumeration value="User"/>
        <xs:enumeration value="DistributionList"/>
        <xs:enumeration value="SecurityGroup"/>
        <xs:enumeration value="SharePointGroup"/>
        <xs:enumeration value="All"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:list>
</xs:simpleType>
<xs:element name="GetHierarchyAllResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="GetHierarchyAllResult"
type="tns:ArrayOfSPPProviderHierarchyTree"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:complexType name="ArrayOfSPPProviderHierarchyTree">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPPProviderHierarchyTree"
nillable="true" type="tns:SPPProviderHierarchyTree"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="SPPProviderHierarchyTree">
  <xs:complexContent mixed="false">
    <xs:extension base="tns:SPPProviderHierarchyElement">
      <xs:sequence>
        <xs:element minOccurs="1" maxOccurs="1" name="IsRoot" type="xs:boolean"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="SPPProviderHierarchyElement">
  <xs:sequence>

```

```

    <xs:element minOccurs="0" maxOccurs="1" name="Nm" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ProviderName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="HierarchyNodeID" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="IsLeaf" type="xs:boolean"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Children"
type="tns:ArrayOfSPPProviderHierarchyNode"/>
    <xs:element minOccurs="0" maxOccurs="1" name="EntityData"
type="tns:ArrayOfPickerEntity"/>
    <xs:element minOccurs="1" maxOccurs="1" name="Count" type="xs:int"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="ArrayOfSPPProviderHierarchyNode">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPPProviderHierarchyNode"
nillable="true" type="tns:SPPProviderHierarchyNode"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="SPPProviderHierarchyNode">
  <xs:complexContent mixed="false">
    <xs:extension base="tns:SPPProviderHierarchyElement"/>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="ArrayOfPickerEntity">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="PickerEntity" nillable="true"
type="tns:PickerEntity"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="PickerEntity">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Key" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="DisplayText" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="IsResolved" type="xs:boolean"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Description" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="EntityType" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="EntityGroupName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="HierarchyIdentifier"/>
    <xs:element minOccurs="0" maxOccurs="1" name="EntityDataElements"
type="tns:ArrayOfPair"/>
    <xs:element minOccurs="0" maxOccurs="1" name="MultipleMatches"
type="tns:ArrayOfAnyType"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ProviderName" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="ArrayOfPair">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Pair" nillable="true"
type="tns:Pair"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="Pair">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="First"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Second"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="ArrayOfAnyType">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="anyType" nillable="true"/>
  </xs:sequence>
</xs:complexType>

```

```

    </xs:sequence>
  </xs:complexType>
  <xs:element name="GetHierarchy">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="providerName" type="xs:string"/>
        <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPPrincipalType"/>
        <xs:element minOccurs="0" maxOccurs="1" name="hierarchyNodeID" type="xs:string"/>
        <xs:element minOccurs="1" maxOccurs="1" name="numberOfLevels" type="xs:int"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="GetHierarchyResponse">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="GetHierarchyResult"
type="tns:SPPProviderHierarchyTree"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="SearchAll">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
type="tns:ArrayOfString"/>
        <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPPrincipalType"/>
        <xs:element minOccurs="0" maxOccurs="1" name="searchPattern" type="xs:string"/>
        <xs:element minOccurs="1" maxOccurs="1" name="maxCount" type="xs:int"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="SearchAllResponse">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="SearchAllResult"
type="tns:ArrayOfSPPProviderHierarchyTree"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="Search">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="providerSearchArguments"
type="tns:ArrayOfSPPProviderSearchArguments"/>
        <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPPrincipalType"/>
        <xs:element minOccurs="0" maxOccurs="1" name="searchPattern" type="xs:string"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="ArrayOfSPPProviderSearchArguments">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="unbounded" name="SPPProviderSearchArguments"
nillable="true" type="tns:SPPProviderSearchArguments"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="SPPProviderSearchArguments">
    <xs:sequence>

```



```

    <xs:element minOccurs="0" maxOccurs="1" name="ProviderName" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="HierarchyNodeID" type="xs:string"/>
    <xs:element minOccurs="1" maxOccurs="1" name="MaxCount" type="xs:int"/>
  </xs:sequence>
</xs:complexType>
<xs:element name="SearchResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="SearchResult"
type="tns:ArrayOfSPPProviderHierarchyTree"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="Resolve">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="resolveInput" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="ResolveResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ResolveResult"
type="tns:ArrayOfPickerEntity"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="ResolveClaim">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="resolveInput" type="tns:SPClaim"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:complexType name="SPClaim">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="ClaimType" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Value" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="ValueType" type="xs:string"/>
    <xs:element minOccurs="0" maxOccurs="1" name="OriginalIssuer" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
<xs:element name="ResolveClaimResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ResolveClaimResult"
type="tns:ArrayOfPickerEntity"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

```

```

<xs:element name="ResolveMultiple">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="resolveInput"
type="tns:ArrayOfString"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="ResolveMultipleResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ResolveMultipleResult"
type="tns:ArrayOfPickerEntity"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="ResolveMultipleClaim">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="providerNames"
type="tns:ArrayOfString"/>
      <xs:element minOccurs="1" maxOccurs="1" name="principalType"
type="tns:SPPrincipalType"/>
      <xs:element minOccurs="0" maxOccurs="1" name="resolveInput"
type="tns:ArrayOfSPClaim"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:complexType name="ArrayOfSPClaim">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="SPClaim" nillable="true"
type="tns:SPClaim"/>
  </xs:sequence>
</xs:complexType>
<xs:element name="ResolveMultipleClaimResponse">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="ResolveMultipleClaimResult"
type="tns:ArrayOfPickerEntity"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
</xs:schema>

```

8 Appendix C: 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® Lync™ 2010
- Microsoft® FAST™ Search Server 2010
- Microsoft® Office 2010 suites
- Microsoft® SharePoint® Designer 2010
- Microsoft® SharePoint® Foundation 2010
- Microsoft® SharePoint® Workspace 2010
- Microsoft® Visio® 2010
- Microsoft® Lync 15 Technical Preview
- Microsoft® Office 15 Technical Preview
- Microsoft® SharePoint® Designer 15 Technical Preview
- Microsoft® Visio® 15 Technical Preview
- Microsoft® SharePoint® Foundation 15 Technical Preview

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.

9 Change Tracking

This section identifies changes that were made to the [MS-CPSWS] protocol document between the March 2011 and January 2012 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

The revision class **Major** means that the technical content in the document was significantly revised. 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.
- The removal of a document from the documentation set.
- Changes made for template compliance.

The revision class **Minor** means that the meaning of the technical content was clarified. Minor changes do not affect protocol interoperability or implementation. Examples of minor changes are updates to clarify ambiguity at the sentence, paragraph, or table level.

The revision class **Editorial** means that the language and formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical or language changes were introduced. The technical content of the document is identical to the last released version, but minor editorial and formatting changes, as well as updates to the header and footer information, and to the revision summary, may have been made.

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

- New content added.
- Content updated.
- 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 are always classified with the change type **Editorially updated**.

Some important terms used in the change 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.

The changes made to this document are listed in the following table. For more information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
1 Introduction	Added information about the normative and informative sections.	N	Content updated.
1.2 References	Added information about the publishing year.	N	Content updated.
2 Messages	Added information about differences versus restrictions and changed "protocol behavior" to "actual Microsoft product behavior".	N	Content updated.
2.2.1 Namespaces	Added the tns1 and wsaw prefixes to the table.	Y	Content updated.
2.2.4.1 ArrayOfAnyType	Added the namespace.	N	Content updated.
2.2.4.2 ArrayOfPair	Added the namespace.	N	Content updated.
2.2.4.3 ArrayOfPickerEntity	Added the namespace.	N	Content updated.
2.2.4.4 ArrayOfSPPProviderHierarchyNode	Added the namespace.	N	Content updated.
2.2.4.5 ArrayOfSPPProviderHierarchyTree	Added the namespace.	N	Content updated.
2.2.4.6	Added the namespace.	N	Content

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
ArrayOfSPSchemaElement			updated.
2.2.4.7 ArrayOfString	Added the namespace.	N	Content updated.
2.2.4.8 Pair	Added the namespace.	N	Content updated.
2.2.4.9 PickerEntity	Added the namespace.	N	Content updated.
2.2.4.10 SPClaim	Added the namespace.	N	Content updated.
2.2.4.11 SPProviderHierarchyElement	Added the namespace.	N	Content updated.
2.2.4.12 SPProviderHierarchyNode	Added the namespace.	N	Content updated.
2.2.4.13 SPProviderHierarchyTree	Added the namespace.	N	Content updated.
2.2.4.14 SPProviderSchema	Added the namespace.	N	Content updated.
2.2.4.15 SPSchemaElement	Added the namespace.	N	Content updated.
2.2.5.1 SPPrincipalType	Added the namespace.	N	Content updated.
2.2.5.2 SPSchemaElementType	Added the namespace.	N	Content updated.
3.1.4.1 ClaimTypes	Updated the operation.	N	Content updated.
3.1.4.1.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.1.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.1.2.1 ClaimTypes	Updated the operation.	N	Content updated.
3.1.4.1.2.2 ClaimTypesResponse	Updated the operation.	N	Content updated.
3.1.4.2.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.2.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
3.1.4.2.2.1 ClaimValueTypes	Updated the operation.	N	Content updated.
3.1.4.2.2.2 ClaimValueTypesResponse	Updated the operation.	N	Content updated.
3.1.4.3.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.3.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.3.2.1 EntityTypes	Updated the operation.	N	Content updated.
3.1.4.3.2.2 EntityTypesResponse	Updated the operation.	N	Content updated.
3.1.4.4.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.4.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.4.2.1 GetHierarchy	Updated the operation.	N	Content updated.
3.1.4.4.2.2 GetHierarchyResponse	Updated the operation.	N	Content updated.
3.1.4.5.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.5.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.5.2.1 GetHierarchyAll	Updated the operation.	N	Content updated.
3.1.4.5.2.2 GetHierarchyAllResponse	Updated the operation.	N	Content updated.
3.1.4.6.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.6.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.6.2.1 HierarchyProviderSchema	Updated the operation.	N	Content updated.
3.1.4.6.2.2 HierarchyProviderSchemaResponse	Updated the operation.	N	Content updated.
3.1.4.7.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
3.1.4.7.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.7.2.1 ProviderSchemas	Updated the operation.	N	Content updated.
3.1.4.7.2.2 ProviderSchemasResponse	Updated the operation.	N	Content updated.
3.1.4.7.3 Complex Types	Added a table that summarizes the XML schema complex type definitions.	N	Content updated.
3.1.4.7.3.1 ArrayOfSPProviderSchema	Added the namespace and updated the schema.	N	Content updated.
3.1.4.8.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.8.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.8.2.1 Resolve	Updated the operation.	N	Content updated.
3.1.4.8.2.2 ResolveResponse	Updated the operation.	N	Content updated.
3.1.4.9.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.9.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.9.2.1 ResolveClaim	Updated the operation.	N	Content updated.
3.1.4.9.2.2 ResolveClaimResponse	Updated the operation.	N	Content updated.
3.1.4.10.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.10.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.10.2.1 ResolveMultiple	Updated the operation.	N	Content updated.
3.1.4.10.2.2 ResolveMultipleResponse	Updated the operation.	N	Content updated.
3.1.4.11.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.11.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
3.1.4.11.2.1 ResolveMultipleClaim	Updated the operation.	N	Content updated.
3.1.4.11.2.2 ResolveMultipleClaimResponse	Updated the operation.	N	Content updated.
3.1.4.11.3 Complex Types	Added a table that summarizes the XML schema complex type definitions.	N	Content updated.
3.1.4.11.3.1 ArrayOfSPClaim	Added the namespace and updated the schema.	N	Content updated.
3.1.4.12.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.12.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.12.2.1 Search	Updated the operation.	N	Content updated.
3.1.4.12.2.2 SearchResponse	Updated the operation.	N	Content updated.
3.1.4.12.3 Complex Types	Added a table that summarizes the XML schema complex type definitions.	N	Content updated.
3.1.4.12.3.1 ArrayOfSPProviderSearchArguments	Added the namespace and updated the schema.	N	Content updated.
3.1.4.12.3.2 SPProviderSearchArguments	Added the namespace and updated the schema.	N	Content updated.
3.1.4.13.1 Messages	Added a table that summarizes the set of WSDL message definitions.	N	Content updated.
3.1.4.13.2 Elements	Added a table that summarizes the XML schema element definitions.	N	Content updated.
3.1.4.13.2.1 SearchAll	Updated the operation.	N	Content updated.
3.1.4.13.2.2 SearchAllResponse	Updated the operation.	N	Content updated.
6 Appendix A: Full WSDL	Updated the the full WSDL by adding, moving, and deleting information.	Y	Content updated.
7 Appendix B: Full XML Schema	Added the the full XML schema.	Y	Content updated.
8 Appendix C: Product Behavior	Updated the product list.	Y	Content updated.

10 Index

A

Abstract data model
 [server](#) 21
[Applicability](#) 10
[ArrayOfAnyType complex type](#) 12
[ArrayOfPair complex type](#) 12
[ArrayOfPickerEntity complex type](#) 13
[ArrayOfSPPProviderHierarchyNode complex type](#) 13
[ArrayOfSPPProviderHierarchyTree complex type](#) 13
[ArrayOfSPSchemaElement complex type](#) 14
[ArrayOfString complex type](#) 14
[Attribute groups](#) 20
[Attributes](#) 20

C

[Capability negotiation](#) 10
[Change tracking](#) 84
[ClaimTypes example](#) 63
[ClaimValueTypes example](#) 64
Client

[overview](#) 21
[Complex types](#) 12
 [ArrayOfAnyType](#) 12
 [ArrayOfPair](#) 12
 [ArrayOfPickerEntity](#) 13
 [ArrayOfSPPProviderHierarchyNode](#) 13
 [ArrayOfSPPProviderHierarchyTree](#) 13
 [ArrayOfSPSchemaElement](#) 14
 [ArrayOfString](#) 14
 [Pair](#) 14
 [PickerEntity](#) 15
 [SPClaim](#) 15
 [SPPProviderHierarchyElement](#) 16
 [SPPProviderHierarchyNode](#) 17
 [SPPProviderHierarchyTree](#) 17
 [SPPProviderSchema](#) 17
 [SPSchemaElement](#) 18

D

Data model - abstract
 [server](#) 21

E

[EntityTypes example](#) 62
Events
 [local - server](#) 55
 [timer - server](#) 55
Examples
 [ClaimTypes](#) 63
 [ClaimValueTypes](#) 64
 [EntityTypes](#) 62
 [GetHierarchy](#) 61
 [GetHierarchyAll](#) 56
 [Resolve](#) 64

[ResolveMultiple](#) 66
 [retrieve claim provider hierarchy trees from all available claim providers](#) 56
 [retrieve claim provider hierarchy trees from one of the claim providers](#) 57
 [Search](#) 60
 [SearchAll](#) 59

F

[Fields - vendor-extensible](#) 10
[Full WSDL](#) 70

G

[GetHierarchy example](#) 61
[GetHierarchyAll example](#) 56
[Glossary](#) 8
[Groups](#) 20

I

[Implementer - security considerations](#) 69
[Index of security parameters](#) 69
[Informative references](#) 9
Initialization
 [server](#) 22
[Introduction](#) 8

L

Local events
 [server](#) 55

M

Message processing
 [server](#) 22
[Messages](#) 11
 [ArrayOfAnyType complex type](#) 12
 [ArrayOfPair complex type](#) 12
 [ArrayOfPickerEntity complex type](#) 13
 [ArrayOfSPPProviderHierarchyNode complex type](#) 13
 [ArrayOfSPPProviderHierarchyTree complex type](#) 13
 [ArrayOfSPSchemaElement complex type](#) 14
 [ArrayOfString complex type](#) 14
 [attribute groups](#) 20
 [attributes](#) 20
 [complex types](#) 12
 [elements](#) 11
 [enumerated](#) 11
 [groups](#) 20
 [namespaces](#) 11
 [Pair complex type](#) 14
 [PickerEntity complex type](#) 15
 [simple types](#) 18
 [SPClaim complex type](#) 15

[SPPrincipalType simple type](#) 18
[SPProviderHierarchyElement complex type](#) 16
[SPProviderHierarchyNode complex type](#) 17
[SPProviderHierarchyTree complex type](#) 17
[SPProviderSchema complex type](#) 17
[SPSchemaElement complex type](#) 18
[SPSchemaElementType simple type](#) 19
[syntax](#) 11
[transport](#) 11

N

[Namespaces](#) 11
[Normative references](#) 9

O

Operations

[ClaimTypes](#) 23
[ClaimValueTypes](#) 25
[EntityTypes](#) 27
[GetHierarchy](#) 29
[GetHierarchyAll](#) 32
[HierarchyProviderSchema](#) 35
[ProviderSchemas](#) 37
[Resolve](#) 39
[ResolveClaim](#) 42
[ResolveMultiple](#) 44
[ResolveMultipleClaim](#) 46
[Search](#) 49
[SearchAll](#) 53

[Overview \(synopsis\)](#) 9

P

[Pair complex type](#) 14
[Parameters - security index](#) 69
[PickerEntity complex type](#) 15
[Preconditions](#) 10
[Prerequisites](#) 10
[Product behavior](#) 83

R

[References](#) 8
 [informative](#) 9
 [normative](#) 9
[Relationship to other protocols](#) 10
[Resolve example](#) 64
[ResolveMultiple example](#) 66
[Retrieve claim provider hierarchy trees from all available claim providers example](#) 56
[Retrieve claim provider hierarchy trees from one of the claim providers example](#) 57

S

[Search example](#) 60
[SearchAll example](#) 59
Security
 [implementer considerations](#) 69
 [parameter index](#) 69

Sequencing rules

[server](#) 22

Server

[abstract data model](#) 21
[ClaimTypes operation](#) 23
[ClaimValueTypes operation](#) 25
[EntityTypes operation](#) 27
[GetHierarchy operation](#) 29
[GetHierarchyAll operation](#) 32
[HierarchyProviderSchema operation](#) 35
[initialization](#) 22
[local events](#) 55
[message processing](#) 22
[overview](#) 21
[ProviderSchemas operation](#) 37
[Resolve operation](#) 39
[ResolveClaim operation](#) 42
[ResolveMultiple operation](#) 44
[ResolveMultipleClaim operation](#) 46
[Search operation](#) 49
[SearchAll operation](#) 53
[sequencing rules](#) 22
[timer events](#) 55
[timers](#) 22
[Server details](#) 21
[Simple types](#) 18
 [SPPrincipalType](#) 18
 [SPSchemaElementType](#) 19
[SPClaim complex type](#) 15
[SPPrincipalType simple type](#) 18
[SPProviderHierarchyElement complex type](#) 16
[SPProviderHierarchyNode complex type](#) 17
[SPProviderHierarchyTree complex type](#) 17
[SPProviderSchema complex type](#) 17
[SPSchemaElement complex type](#) 18
[SPSchemaElementType simple type](#) 19
[Standards assignments](#) 10
Syntax
 [messages - overview](#) 11

T

Timer events
 [server](#) 55
Timers
 [server](#) 22
[Tracking changes](#) 84
[Transport](#) 11
Types
 [complex](#) 12
 [simple](#) 18

V

[Vendor-extensible fields](#) 10
[Versioning](#) 10

W

[WSDL](#) 70