

[MS-OCDISCWS]: Lync Autodiscover Web Service Protocol Specification

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1 Introduction

The Lync Autodiscover Web Service Protocol Specification defines a set of operations that allows a client to discover its home server information.

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 [\[MS-GLOS\]](#):

fully qualified domain name (FQDN)

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

Session Initiation Protocol (SIP)

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.

[MS-OCAUTHWS] Microsoft Corporation, "[OC Authentication Web Service Protocol Specification](#)".

[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>

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

1.3 Overview

This protocol allows clients to discover web services on their home server and general topology information.

1.4 Relationship to Other Protocols

The Autodiscover protocol relies on Hypertext Transfer Protocol (HTTP) and Hypertext Transfer Protocol over Secure Sockets (HTTPS) as the transmission protocols.

The Autodiscover protocol is dependent on [MS-OCAUTHWS] to authenticate users.

1.5 Prerequisites/Preconditions

Prior to the protocol execution, it is required that DNS entries are configured for both the internal and external Autodiscover services. The DNS entries should be CNAME entries of the format `lyncdiscover.<sipdomain>` and `lyncdiscoverinternal.<sipdomain>` whose entries point to the primary Autodiscover service for the deployment's **Session Initiation Protocol (SIP)** domain. These DNS entries will allow the protocol client to discover the first hop Autodiscover service in the protocol execution. Further client details are described in Section 3.2.

1.6 Applicability Statement

This protocol is applicable to clients that need to discover their home server information.

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

The Autodiscover protocol is a RESTful protocol transported via standard RFC 2616 HTTP/HTTPS. The service SHOULD be served on ports 80 and 443, but MAY be served on other ports.

Protocol messages are text-based and MUST be UTF-8 encoded. Messages MUST NOT contain a Byte Order Mark.

2.2 Message Syntax

This section contains common definitions used by this protocol.

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	NameSpaces URI	Reference
xs	http://www.w3.org/2001/XMLSchema	

2.2.2 Custom HTTP Methods

None.

2.2.3 Custom HTTP Headers

The messages exchanged in this protocol use the following HTTP headers in addition to the existing set of standard HTTP headers.

Header	Description
Authorization	Specifies the client authentication header for requests to the OAuth Resource defined in section 3.1.5.5 .
X-Ms-WebTicket	Specifies the client authentication header for requests to the User Resource defined in section 3.1.5.3 .
X-Ms-WebTicketUrl	Specifies the webticket service location where client can retrieve the web ticket.

2.2.3.1 Authorization Header

The request to the OAuth resource MUST contain this authorization header. If the request does not include the authorization header, the request will be rejected with a 401 Unauthorized error code. The specification [\[MS-OCAUTHWS\]](#) defines the semantics regarding this authorization header.

2.2.3.2 X-Ms-WebTicket Header

The request to the User resource MUST contain the X-Ms-WebTicket header. If the request does not include this header, the request will be rejected with a 401 Unauthorized error code. The specification [\[MS-OCAUTHWS\]](#) defines the semantics regarding this header

2.2.3.3 X-Ms-WebTicketUrl Header

If the request to the user resource does not contain an X-Ms-WebTicket header, the 401 response will contain the X-Ms-WebTicketUrl header with the value being the URL of the webticket service. Details can be found in [\[MS-OCAUTHWS\]](#).

2.2.4 Common URI Parameters

The following table summarizes the set of common URI parameters defined by this specification.

URI parameter	Description
sipuri	The Session Initiation Protocol (SIP) URI of the user whose home server information is being discovered.

2.2.4.1 Sipuri URI Parameter

The request to the root resource MUST contain the *sipuri* parameter. If the request does not contain this parameter, the client MAY eventually receive a 404 error code when proceeding with the rest of the protocol.

2.2.5 Complex Types

The following table summarizes the set of common XML Schema complex type definitions defined by this specification.

Complex Type	Description
link	Element that contains an href attribute which indicates the URL to access the resource identified by its corresponding token attribute.
AutodiscoverResponse	This is the top level type that will always be returned in every Autodiscover response.
Domain	This type contains links that define topology information of the current server.
Root	This type contains a collection of links that identify resources exposed by the current server.
User	This type contains topology information of the user's home server.

2.2.5.1 Link

The **link** element is used to identify the URL to access a server resource. The URL which the **link** element gives access to is present in the **href** attribute. The **token** attribute of the link is a unique string that identifies the type of resource to which the corresponding href will give access. The **token** and **href** attributes MUST be present in every **link** element.

XML Schema:

```
<xs:complexType name="link">
  <xs:attribute name="token" type="xs:string"/>
  <xs:attribute name="href" type="xs:string"/>
</xs:complexType>
```

JSON Schema:

```
"items": {
  "id": "Link",
  "type": [
    "object",
    "null"
  ],
  "properties": {
    "token": {
      "required": true,
      "type": [
        "string",
        "null"
      ]
    },
    "href": {
      "required": true,
      "type": [
        "string",
        "null"
      ]
    }
  }
}
```

2.2.5.1.1 Tokens

The following table summarizes the set of possible tokens and their descriptions. For every **token** attribute, there **MUST** be a corresponding **href** attribute. The **href** attribute contains a URL that the client can use to access related services. Semantics on the entry points to each URL can be found in the following table, however no details are provided beyond the entry points.

Token	Description
"Internal/Autodiscover"	Identifies the Autodiscover Service's Root entry point that can be accessed from the internal network. See section 3.1.5.1 for semantics on this URL.
"External/Autodiscover"	Identifies the Autodiscover Service's Root entry point that can be accessed from the external network. See section 3.1.5.1 for semantics on this URL.
"Internal/AuthBroker"	Identifies the AuthBroker Service's entry point that can be accessed from the internal network. This services exposes a SOAP endpoint and publishes a MEX document.
"External/AuthBroker"	Identifies the AuthBroker Service's entry point that can be accessed from the external network. This services exposes a SOAP endpoint and publishes a MEX document.
"Internal/Mcx"	Identifies the Mcx Service's entry point that can be accessed from the internal network. This services exposes a SOAP endpoint and publishes a MEX document.

Token	Description
"External/Mcx"	Identifies the Mcx Service's entry point that can be accessed from the external network. This service exposes a SOAP endpoint and publishes a MEX document.
"Internal/Ucwa"	Identifies the Ucwa Service's entry point that can be accessed from the internal network. This service exposes a REST endpoint that supports a GET operation.
"External/Ucwa"	Identifies the Ucwa Service's entry point that can be accessed from the external network. This service exposes a REST endpoint that supports a GET operation.
"Redirect"	Identifies an Autodiscover Service URL which is the Root entry point of the next hop in the discovery flow. See section 3.1.5.2 for semantics on this URL.
"User"	Identifies the Autodiscover Service URL for the User entry point. Semantics on this URL can be found in section 3.1.5.3 .
"Domain"	Identifies the Autodiscover Service URL for the Domain entry point. Semantics on this URL can be found in section 3.1.5.4 .
"OAuth"	Identifies the Autodiscover Service URL for the OAuth entry point. Semantics on this URL can be found in section 3.1.5.5 .

2.2.5.2 AutodiscoverResponse

The **AutodiscoverResponse** type is the top level element that MUST be returned in every Autodiscover response where a body is present. This type MUST contain one and only of the possible sub-elements: **Domain**, **Root**, or **User**.

The **AccessLocation** attribute MUST be present. This attribute MUST have values of either internal or external. The value "internal" indicates that the current server is hosting internal network traffic, while the value "external" indicates that the current server is hosting external network traffic.

XML Schema:

```
<xs:complexType name="AutodiscoverResponse">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Root" nillable="true" type="tns:Root"/>
    <xs:element minOccurs="0" maxOccurs="1" name="User" nillable="true" type="tns:User"/>
    <xs:element minOccurs="0" maxOccurs="1" name="Domain" nillable="true" type="tns:Domain"/>
  </xs:sequence>
  <xs:attribute minOccurs="0" maxOccurs="1" name="AccessLocation" nillable="false"
type="xs:string"/>
</xs:complexType>
```

JSON Schema:

```
AutodiscoverResponse
{
  "id": " AutodiscoverResponse",
  "type": "object",
  "properties": {
    "AccessLocation": {
      "required": true,
```

```

    "type": [
      "string",
      "null"
    ]
  },
  "Root": {
    "id": "Root",
    "required": true,
    "type": [
      "object",
      "null"
    ],
  },
},
"User": {
  "id": "User",
  "required": true,
  "type": [
    "object",
    "null"
  ],
},
},
"Domain": {
  "id": "Domain",
  "required": true,
  "type": [
    "object",
    "null"
  ],
},
}
}

```

2.2.5.3 Domain

The **Domain** type contains links that define topology information of the current server.

There is also a collection of links contained in the **Domain** type. These **link** elements indicate the web service URL for the corresponding tokens. The possible tokens are defined in section [3](#).

Information regarding the **SipAccess** type is in section [2.2.5.6](#).

XML Schema:

```

<xs:complexType name="Domain">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="SipServerInternalAccess" type="SipAccess" />
    <xs:element minOccurs="0" maxOccurs="1" name="SipClientInternalAccess" type="SipAccess" />
    <xs:element minOccurs="0" maxOccurs="1" name="SipServerExternalAccess" type="SipAccess" />
    <xs:element minOccurs="0" maxOccurs="1" name="SipClientExternalAccess" type="SipAccess" />
    <xs:element minOccurs="0" maxOccurs="unbounded" name="link" nillable="true" type="tns:link"/>
  </xs:sequence>
</xs:complexType>

```

JSON Schema:

```

"Domain": {

```

```

    "id": " Domain",
    "required": true,
    "type": [
      "object",
      "null"
    ],
    "properties": {
      "SipServerInternalAccess": {
        "$ref": "SipAccess"
      },
      "SipClientInternalAccess": {
        "$ref": "SipAccess"
      },
      "SipServerExternalAccess": {
        "$ref": "SipAccess"
      },
      "SipClientExternalAccess": {
        "$ref": "SipAccess"
      },
      "Links": {
        "$ref": "Link[]"
      }
    }
  }
}

```

2.2.5.4 Root

The **Root** type contains links that define URLs that are served by the responding Autodiscover service. The corresponding tokens that identify these links are defined in section [3](#).

XML Schema:

```

<xs:complexType name="Root">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="link" nillable="true"
type="tns:link"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

```

JSON Schema:

```

"Root": {
  "id": "Root",
  "required": true,
  "type": [
    "object",
    "null"
  ],
  "properties": {
    "Links": {
      "id": "Link[]",
      "required": true,
      "type": [
        "array",
        "null"
      ],
      "items": {

```

```

        "id": "Link",
        "type": [
            "object",
            "null"
        ],
        "properties": {
            "token": {
                "required": true,
                "type": [
                    "string",
                    "null"
                ]
            },
            "href": {
                "required": true,
                "type": [
                    "string",
                    "null"
                ]
            }
        }
    }
}
}
}
}

```

2.2.5.5 User

The **User** type contains links that define topology information for the current user.

There is also a collection of links contained in the **User** type. These **link** elements indicate the web service URL for the corresponding tokens. The possible tokens are defined in section [3](#).

Information regarding the **SipAccess** type is found in section [2.2.5.6](#).

XML Schema:

```

<xs:complexType name="User">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="SipServerInternalAccess" type="SipAccess" />
    <xs:element minOccurs="0" maxOccurs="1" name="SipClientInternalAccess" type="SipAccess" />
    <xs:element minOccurs="0" maxOccurs="1" name="SipServerExternalAccess" type="SipAccess" />
    <xs:element minOccurs="0" maxOccurs="1" name="SipClientExternalAccess" type="SipAccess" />
    <xs:element minOccurs="0" maxOccurs="unbounded" name="link" nillable="true" type="tns:link"/>
  </xs:sequence>
</xs:complexType>

```

Json Schema:

```

"User": {
  "id": "User",
  "required": true,
  "type": [
    "object",
    "null"
  ],
  "properties": {

```

```

    "SipServerInternalAccess": {
      "id": "SipAccess",
      "required": true,
      "type": [
        "object",
        "null"
      ],
    },
    "properties": {
      "fqdn": {
        "required": true,
        "type": [
          "string",
          "null"
        ]
      },
      "port": {
        "required": true,
        "type": [
          "string",
          "null"
        ]
      }
    }
  },
  "SipClientInternalAccess": {
    "$ref": "SipAccess"
  },
  "SipServerExternalAccess": {
    "$ref": "SipAccess"
  },
  "SipClientExternalAccess": {
    "$ref": "SipAccess"
  },
  "Links": {
    "$ref": "Link[]"
  }
}
}
}

```

2.2.5.6 SipAccess

The **SipAccess** type reveals the **fully qualified domain name (FQDN)** and port of the Session Initiation Protocol (SIP) server. Protocol clients can use the `fqdn` and `port` attributes to connect to the SIP server front-end. The **SipAccess** type is contained in the User and Domain resources under the elements. The type can be defined in four different elements that give different meanings to how the contents should be used. The behavior is described in the following table:

Type	Description
SipServerInternalAccess	This element reveals the SIP server FQDN and listening port to be used by SIP servers in the internal network.
SipServerExternalAccess	This element defines the SIP server FQDN and listening port to be used by SIP servers in the external network.
SipClientInternalAccess	This element defines the SIP server FQDN and listening port to be used by SIP clients in the internal network.

Type	Description
SipClientExternalAccess	This element defines the SIP server FQDN and listening port to be used by SIP clients in the external network.

XML Schema:

```
<xs:complexType name="SipAccess">
  <xs:attribute name="fqdn" type="xs:string" />
  <xs:attribute name="port" type="xs:string" />
</xs:complexType>
```

JSON Schema:

```
"properties": {
  "SipAccess": {
    "id": "SipAccess",
    "required": true,
    "type": [
      "object",
      "null"
    ],
    "properties": {
      "fqdn": {
        "required": true,
        "type": [
          "string",
          "null"
        ]
      },
      "port": {
        "required": true,
        "type": [
          "string",
          "null"
        ]
      }
    }
  }
}
```

2.2.6 Simple Types

None.

2.2.7 Attributes

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

Attribute	Description
href	A URL that is relative to the service's root URL

Attribute	Description
token	A classification that is used to infer the purpose and use of the attributed item. Somewhat analogous to a type in traditional, compiled programming languages
AccessLocation	An indicator of whether the client is connecting from inside or outside of the network.
Fqdn	The fully qualified domain name (FQDN) of the Session Initiation Protocol (SIP) server.
Port	The listening port of the SIP server.

2.2.8 Groups

None.

2.2.9 Attribute Groups

None.

2.2.10 Common Data Structures

None.

2.3 Directory Service Schema Elements

None.

3 Protocol Details

3.1 Server Details

This section specifies details that pertain the protocol server behavior.

3.1.1 Abstract Data Model

None.

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Higher-Layer Triggered Events

3.1.5 Message Processing Events and Sequencing Rules

The following table lists all the exposed resources by the Autodiscover Service.

Resource	Description
Root	Service entry point that allows navigation to child resources.
User	Provides user home server information.
Domain	Provides general topology information about the current server.
OAuth	Provides user home server information.

3.1.5.1 Common Processing Details

The following table lists all the possible Accept headers handled by the Server, and the Content-Type returned in the response.

Accept Header Values	Returned Content-Type
No Accept header specified	application/vnd.microsoft.rtc.autodiscover+json;v=1
application/vnd.microsoft.rtc.autodiscover+xml;v=1	application/vnd.microsoft.rtc.autodiscover+xml;v=1
Application/vnd.microsoft.rtc.autodiscover+json;v=1	application/vnd.microsoft.rtc.autodiscover+json;v=1
/	application/vnd.microsoft.rtc.autodiscover+json;v=1

If none of the accept headers listed in the table are sent with any request, the server will respond with a 406 response.

If the returned Content-Type is "application/vnd.microsoft.rtc.autodiscover+xml;v=1", then the response will be in XML format and must be de-serialized according to the schemas in section [2.2.5](#).

If the returned Content-Type is "application/vnd.microsoft.rtc.autodiscover+json;v=1", then the response will be in JSON format and must be de-serialized according to the schemas in section [2.2.5.6](#).

3.1.5.2 Root

The Root resource is the entry point to an instance of the Autodiscover Service. All requests to this resource MUST contain the *sipuri* query parameter defined in section [2.2.4.1](#).

The resource URL for this parameter is `https://<fqdn>/autodiscover/autodiscover.service.svc/root?sipuri=<sipuri>`. The server MAY also listen on HTTP depending on the server configuration. If a request is made to the HTTP ROOT resource, the server MUST respond with a 200 OK and a **Root** element that contains a single **link** element with token named "Redirect" and an **href** that points to the next hop URL that the client should request.

If the sipuri of the user cannot be processed by the current Autodiscover Service, the Autodiscover Service MUST respond with a 200 OK with a **Root** element that contains a link with a "Redirect" whose href points to the next hop URL that can handle the request.

If the current Autodiscover Service can handle the request, then the server must respond with a 200 OK and a **Root** element that contains a list of Links to child resources of the current Autodiscover Service. See section [2.2.5.4](#) for the schema of the **Root** element. If there is no "Redirect" link present in the **Root** element, then there MUST be "User" and "Domain" tokens present. The "OAuth" token MAY be present depending on the server version.

3.1.5.2.1 GET

This section details the Request and Response body for the supported GET HTTP operation to the Root resource.

3.1.5.2.1.1 Request Body

None.

3.1.5.2.1.2 Response Body

The Autodiscover Service MUST respond with an **AutodiscoverResponse** element that contains a **Root** element. These elements are defined in sections [2.2.5.2](#) and [2.2.5.4](#).

3.1.5.3 User

The User resource exposes topology information of a user's home server. The client MUST discover the User URL by parsing the href of the **link** element in the GET response from the Root resource.

If the request to the User resource does not contain a valid X-Ms-WebTicket header as specified in valid X-Ms-WebTicket, the server MUST respond with a 401 Unauthorized response.

If a valid X-Ms-WebTicket header is provided and the user's home server information is unknown, the server MUST respond with a 404 response code and an empty body.

If a valid X-Ms-WebTicket header is provided and the user's home server information exists on a separate server, the server must respond with a 200 response code and a **User** element. The **User** element MUST contain only one **link** element with a "Redirect" Token. Semantics of the "Redirect" Token are defined in section [2.2.5.1.1](#).

If a valid X-Ms-WebTicket header is provided and the user's home server information exists on the current server, the server must respond with a 200 response code and a **User** element in the body. The **User** element MAY contain any of the following links depending on what is configured in the topology.

1. Internal/Autodiscover
2. External/Autodiscover
3. Internal/AuthBroker
4. External/AuthBroker
5. Internal/Mcx
6. External/Mcx
7. Internal/Ucwa
8. External/Ucwa

The **SipAccess** types MAY also be present in the response depending on what is configured in the topology.

3.1.5.3.1 GET

This section details the Request and Response body for the supported GET HTTP operation to the User resource.

3.1.5.3.1.1 Request Body

None.

3.1.5.3.1.2 Response Body

If the response code is 200 OK, then the response MUST contain an **AutodiscoverResponse** element that contains a **User** element. These elements are defined in sections [2.2.5.2](#) and [2.2.5.5](#).

If the response code is 401 Unauthorized, then there will be an HTML formatted body.

If the response code is 404 Not Found, then there will be an empty body.

3.1.5.4 Domain

The Domain resource exposes information about the topology information of the current server to the client. The client MUST discover the Domain URL by parsing the **link** element in the GET request to the Root resource.

The Domain resource MUST respond with a 200 OK to every request and contain a **Domain** element in the body. The **Domain** element is defined in section [2.2.5.3](#).

The **Domain** element MAY contain any of the following links, depending on what is configured in the topology. The links are identified by they are tokens whose semantics are defined in section [2.2.5.1.1](#).

1. Internal/Autodiscover

2. External/Autodiscover
3. Internal/AuthBroker
4. External/AuthBroker
5. Internal/Mcx
6. External/Mcx
7. Internal/Ucwa
8. External/Ucwa

The **SipAccess** types MAY also be present in the response depending on what is configured in the topology

3.1.5.4.1 GET

This section details the Request and Response body for the supported GET HTTP operation to the Domain resource.

3.1.5.4.1.1 Request Body

None.

3.1.5.4.1.2 Response Body

The response MUST contain an **AutodiscoverResponse** element that contains a **Domain** element. These elements are defined in sections [2.2.5.2](#) and [2.2.5.3](#).

3.1.5.5 OAuth

The OAuth resource exposes topology information of a user's home server. The client MUST discover the OAuth URL by parsing the href of the **link** element in the GET response from the Root resource.

If the request to the OAuth resource does not contain an Authorization header as specified in section [2.2.3.1](#), the server MUST respond with a 401 Unauthorized response.

If the request to the OAuth resource contains an invalid Authorization header as specified in section [2.2.3.1](#), the server MUST respond with a 403 Forbidden response.

If a valid Authorization header is provided and the user's home server information is unknown, the server MUST respond with a 404 response code and an empty body.

If a valid Authorization header is provided and the user's home server information exists on a separate server, the server must respond with a 200 response code and a **User** element. The **User** element MUST contain only one link with a "Redirect" token. Semantics of the "Redirect" Token are in section [2.2.5.1.1](#).

If a valid Authorization header is provided and the user's home server information exists on the current server, the server must respond with a 200 response code and a **User** element in the body. The **User** element MAY contain any of the following links depending on what is configured in the topology.

1. Internal/Autodiscover

2. External/Autodiscover
3. Internal/AuthBroker
4. External/AuthBroker
5. Internal/Mcx
6. External/Mcx
7. Internal/Ucwa
8. External/Ucwa

The **SipAccess** types MAY also be present in the response depending on what is configured in the topology

3.1.5.5.1 GET

This section details the Request and Response body for the supported GET HTTP operation to the OAuth resource.

3.1.5.5.1.1 Request Body

None.

3.1.5.5.1.1.1 Response Body

If the response code is 200 OK, then the response MUST contain an **AutodiscoverResponse** element that contains a **User** element. These elements are defined in sections [2.2.5.2](#) and section.

If the response code is 401 Unauthorized, then there will be an HTML formatted body.

If the response code is 404 Not Found, then there will be an empty body.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

3.2 Client Details

This section specifies details that pertain to protocol client behavior.

3.2.1 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.

3.2.1.1 Discovery of Autodiscover

The client will usually not have the initial Autodiscover service URL to send the first HTTP request and initiate the protocol flow. The client MUST construct and send requests to as many as four URLs to discover the initial Autodiscover service. The URLs constructed are based off of the client's Session Initiation Protocol (SIP) domain and MUST contain the following:

1. http://lyncdiscoverinternal.<sipdomain>
2. https://lyncdiscoverinternal.<sipdomain>
3. http://lyncdiscover.<sipdomain>
4. https://lyncdiscover.<sipdomain>

The client MAY execute requests 1 and 2 in parallel, and MAY execute requests 3 and 4 in parallel. The client MUST wait until getting a response from both request 1 and 2 before sending a request to 3 or 4.

The client MUST process the result of the first successful request and MAY cancel any pending requests after the receiving a successful response. The body of the response to any of the previously listed requests MUST contain an **AutodiscoverResponse** element which contains a **Root** element.

3.2.1.2 Redirect Detection

The Autodiscover protocol will result in many redirects. To prevent any redirect loops, the client MUST not allow more than 10 redirects in the entirety of the flow, or the client MUST implement redirect loop detection.

3.2.1.3 Internal External Network Switching

The final response of the OAuth, User, and Domain resources will contain an **AutodiscoverResponse** element with the **AccessLocation** attribute present, as well as Internal and External links of the web services. The internal and external links are both provided in the same response to assist the client in switching between internal and external web services for times when the client is transition from inside to outside the network or vice-versa. If the AccessLocation has the value "internal", the client SHOULD use the internal links. If the AccessLocation has the value "external", the client SHOULD use the external links. The

The client also has the ability to probe the Autodiscover service to determine whether it is internal or external without executing the full protocol. After the client obtains the internal and external Autodiscover links, the client MAY cache them and probe the Root resource and determine its network location based on the AccessLocation returned in the response. If the client loses network connectivity for a brief period of time, the client MAY send a single GET request to the internal and external Autodiscover sites and then connect to the corresponding URL stored in the cache based on the returned AccessLocation.

The client SHOULD cache the returned web service URLs until the client receives an error connecting to one of the web services.

3.2.2 Timers

None.

3.2.3 Initialization

None.

3.2.4 Higher-Layer Triggered Events

None.

3.2.5 Message Processing Events and Sequencing Rules

None.

3.2.6 Timer Events

None.

3.2.7 Other Local Events

None.

4 Protocol Examples

4.1 Discover Home Server

In this scenario, the client follows the Autodiscover protocol to discover its home server URLs.

The client constructs and sends an HTTP and HTTPS request to the Autodiscover service based on its Session Initiation Protocol (SIP) URI john@contoso.com.

```
GET http://lyncdiscover.contoso.com/?sipuri=sip:john@contoso.com HTTP/1.1
```

```
Host: contoso.com
```

```
Accept: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

```
GET https://lyncdiscoverinternal.contoso.com HTTP/1.1
```

```
Host: contoso.com
```

```
Accept: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

The HTTPS requests succeeds first with the following result.

```
HTTP/1.1 200 OK
```

```
Cache-Control: no-cache
```

```
Content-Type: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

```
<?xml version="1.0" encoding="utf-8"?>
<AutodiscoverResponse xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" AccessLocation="Internal">
  <Root>
    <Link href="https://contoso.com/Autodiscover/AutodiscoverService.svc/root/domain"
      token="Domain"/>
    <Link href="https://contoso.com/Autodiscover/AutodiscoverService.svc/root/user"
      token="User"/>
    <Link href="https://contoso.com/Autodiscover/AutodiscoverService.svc/root/oauth/user"
      token="OAuth"/>
  </Root>
</AutodiscoverResponse>
```

The client parses the returned links and sends an HTTP GET to the href of the link with the "OAuth" token. The client provides the json token in the Authorization header.

```
GET https://contoso.com/autodiscover/autodiscover.service.svc/root/oauth/user HTTP/1.1
Host: contoso.com
Authorization: Bearer Y4LBFdjzqXHPxYMHij9snKNWiw0lyShf+i/GU9B+scVnYB3T5BDp6w==
Accept: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

The server authenticates the client and returns Redirect response indicating the home server location of the client.

```
HTTP/1.1 200 OK
Cache-Control: no-cache
```


Content-Type: application/vnd.microsoft.rtc.autodiscover+xml;v=1

```
<?xml version="1.0" encoding="utf-8"?>
<AutodiscoverResponse xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" AccessLocation="Internal">
  <User>
    <Link href="https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root"
token="Redirect"/>
  </User>
</AutodiscoverResponse>
```

Client sends HTTPS request to redirect link.

```
GET https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root HTTP/1.1
Host: pool1.contoso.com
Accept: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

```
<?xml version="1.0" encoding="utf-8"?>
<AutodiscoverResponse xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" AccessLocation="Internal">
  <Root>
    <Link href="https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root/domain"
token="Domain"/>
    <Link href="https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root/user"
token="User"/>
    <Link
href="https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root/oauth/user"
token="OAuth"/>
  </Root>
</AutodiscoverResponse>
```

Client sends request to OAuth link with Authentication header.

```
GET https://pool1.contoso.com/autodiscover/autodiscoverService.svc/root/oauth/user HTTP/1.1
Host: contoso.com
Authorization: Bearer Y4LBFdjzqXHPxYMHij9snKNWiw0lyShf+i/GU9B+scVnYB3T5BDp6w==
Accept: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

```
<?xml version="1.0" encoding="utf-8"?>
<AutodiscoverResponse xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" AccessLocation="Internal">
  <Root>
    <Link href="https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root/domain"
token="Domain"/>
    <Link href="https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root/user"
token="User"/>
  </Root>
</AutodiscoverResponse>
```

```
<Link
href="https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root/oauth/user"
token="OAuth"/>
</Root>
</AutodiscoverResponse>
```

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/vnd.microsoft.rtc.autodiscover+xml;v=1
```

```
<?xml version="1.0" encoding="utf-8"?>
<AutodiscoverResponse AccessLocation="Internal" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <Domain>
    <Link token="Internal/Autodiscover"
href="https://pool1.contoso.com/Autodiscover/AutodiscoverService.svc/root"/>
    <Link token="Internal/AuthBroker" href="https://pool1.contoso.com/Reach/sip.svc"/>
    <Link token="Internal/Ucwa" href="https://pool1.contoso.com/Ucwa/discovery"/>
    <Link token="External/Autodiscover"
href="https://pool1external.contoso.com/Autodiscover/AutodiscoverService.svc/root"/>
    <Link token="External/AuthBroker"
href="https://pool1external.contoso.com/Reach/sip.svc"/>
    <Link token="External/Ucwa" href="https://pool1external.contoso.com/Ucwa/discovery"/>
    <Link token="Internal/Mcx" href="https://pool1.contoso.com/Mcx/McxService.svc"/>
    <Link token="External/Mcx" href="https://pool1external.contoso.com/Mcx/McxService.svc"/>
  </Domain>
</AutodiscoverResponse>
```

5 Security

5.1 Security Considerations for Implementers

None.

5.2 Index of Security Parameters

None.

Preliminary

6 Appendix A: Full XML Schema

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

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema elementFormDefault="qualified" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="AutodiscoverResponse" nillable="true" type="AutodiscoverResponse" />
  <xs:complexType name="AutodiscoverResponse">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="Root" type="Root" />
      <xs:element minOccurs="0" maxOccurs="1" name="User" type="User" />
      <xs:element minOccurs="0" maxOccurs="1" name="Domain" type="Domain" />
    </xs:sequence>
    <xs:attribute name="AccessLocation" type="xs:string" />
  </xs:complexType>
  <xs:complexType name="Root">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="unbounded" name="Link" type="Link" />
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="Link">
    <xs:attribute name="token" type="xs:string" />
    <xs:attribute name="href" type="xs:string" />
  </xs:complexType>
  <xs:complexType name="User">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="SipServerInternalAccess" type="SipAccess" />
      <xs:element minOccurs="0" maxOccurs="1" name="SipClientInternalAccess" type="SipAccess" />
      <xs:element minOccurs="0" maxOccurs="1" name="SipServerExternalAccess" type="SipAccess" />
      <xs:element minOccurs="0" maxOccurs="1" name="SipClientExternalAccess" type="SipAccess" />
      <xs:element minOccurs="0" maxOccurs="unbounded" name="Link" type="Link" />
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="SipAccess">
    <xs:attribute name="fqdn" type="xs:string" />
    <xs:attribute name="port" type="xs:string" />
  </xs:complexType>
  <xs:complexType name="Domain">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="SipServerInternalAccess" type="SipAccess" />
      <xs:element minOccurs="0" maxOccurs="1" name="SipClientInternalAccess" type="SipAccess" />
      <xs:element minOccurs="0" maxOccurs="1" name="SipServerExternalAccess" type="SipAccess" />
      <xs:element minOccurs="0" maxOccurs="1" name="SipClientExternalAccess" type="SipAccess" />
      <xs:element minOccurs="0" maxOccurs="unbounded" name="Link" type="Link" />
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

7 Appendix B: Full JSON Schema

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

```
{
  "id": "AutodiscoverResponse",
  "type": "object",
  "properties": {
    "AccessLocation": {
      "required": true,
      "type": [
        "string",
        "null"
      ]
    },
  },
  "Root": {
    "id": "Root",
    "required": true,
    "type": [
      "object",
      "null"
    ],
    "properties": {
      "Links": {
        "id": "Link[]",
        "required": true,
        "type": [
          "array",
          "null"
        ],
      },
      "items": {
        "id": "Link",
        "type": [
          "object",
          "null"
        ],
        "properties": {
          "token": {
            "required": true,
            "type": [
              "string",
              "null"
            ]
          },
          "href": {
            "required": true,
            "type": [
              "string",
              "null"
            ]
          }
        }
      }
    }
  },
  "User": {
```

```

    "id": "User",
    "required": true,
    "type": [
      "object",
      "null"
    ],
    "properties": {
      "SipServerInternalAccess": {
        "id": "SipAccess",
        "required": true,
        "type": [
          "object",
          "null"
        ],
        "properties": {
          "fqdn": {
            "required": true,
            "type": [
              "string",
              "null"
            ]
          },
          "port": {
            "required": true,
            "type": [
              "string",
              "null"
            ]
          }
        }
      },
      "SipClientInternalAccess": {
        "$ref": "SipAccess"
      },
      "SipServerExternalAccess": {
        "$ref": "SipAccess"
      },
      "SipClientExternalAccess": {
        "$ref": "SipAccess"
      },
      "Links": {
        "$ref": "Link[]"
      }
    }
  },
  "Domain": {
    "id": "Domain",
    "required": true,
    "type": [
      "object",
      "null"
    ],
    "properties": {
      "SipServerInternalAccess": {
        "$ref": "SipAccess"
      },
      "SipClientInternalAccess": {
        "$ref": "SipAccess"
      }
    }
  },

```

```
    "SipServerExternalAccess": {
      "$ref": "SipAccess"
    },
    "SipClientExternalAccess": {
      "$ref": "SipAccess"
    },
    "Links": {
      "$ref": "Link[]"
    }
  }
}
}
```

Preliminary

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 Server 15 Technical Preview
- Microsoft® Lync 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

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

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