

[MS-WSUSSS-Diff]:

Windows Update Services: Server-Server Protocol

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Revision Summary

Date	Revision History	Revision Class	Comments
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1 Introduction

This document specifies the Windows Update Services: Server-Server Protocol, which enables a hierarchically organized collection of servers to synchronize **metadata** and **content** associated with software updates over the Internet by using the **SOAP** and HTTP protocols.

Sections 1.5, 1.8, 1.9, 2, and 3 of this specification are normative ~~and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in [RFC2119]. Sections 1.5 and 1.9 are also normative but do not contain those terms.~~ All other sections and examples in this specification are informative.

1.1 Glossary

~~The~~This document uses the following terms ~~are specific to this document:~~

anchor: An opaque data element generated by an **update server** to identify the occurrence of a software **update**-related event in a manner that distinguishes temporally separate occurrences of the event.

autonomous DSS: A downstream server (DSS) that obtains updates from its upstream server (USS) but manages the deployments of the updates to its client computers independently from its USS.

base64 encoding: A binary-to-text encoding scheme whereby an arbitrary sequence of bytes is converted to a sequence of printable ASCII characters, as described in [RFC4648].

category: A logical grouping of **updates** identified by a **GUID** and described by **metadata**. A category can be treated as an **update** with no associated **content**.

client computer: A computer that instigates a connection to a well-known port on a server.

content: A package that contains all the associated files for an **update** that is to be installed on a **client computer**.

deployment: An administratively specified decision to make a specific **update revision** available to a specific **target group**.

detectoid: A logical condition that is evaluated on a **client computer** to detect the presence of software, drivers, or their **updates**. A **detectoid** is identified by a **GUID** and described by **metadata**. It is represented as an **update** with no associated **content**.

Domain Name System (DNS): A hierarchical, distributed database that contains mappings of domain names (1) to various types of data, such as IP addresses. DNS enables the location of computers and services by user-friendly names, and it also enables the discovery of other information stored in the database.

downstream server (DSS): An **update server** that synchronizes its **updates** from another **update server**.

DSS Authorization Web Service: A web service on the upstream server (USS) used to authorize the release of updates to downstream servers (DSSs).

End User License Agreement (EULA): A textual description of the terms that a user or administrator ~~must accept~~accepts before an **update** is installed. Each **EULA** is identified by a **GUID**, and each update **revision** ~~may~~might be associated with a **EULA**.

fully qualified domain name (FQDN): An unambiguous domain name (2) that gives an absolute location in the **Domain Name System's (DNS)** hierarchy tree, as defined in [RFC1035] section 3.1 and [RFC2181] section 11.

globally unique identifier (GUID): A term used interchangeably with universally unique identifier (UUID) in Microsoft protocol technical documents (TDs). Interchanging the usage of these terms does not imply or require a specific algorithm or mechanism to generate the value. Specifically, the use of this term does not imply or require that the algorithms described in [RFC4122] or [C706] must be used for generating the **GUID**. See also universally unique identifier (UUID).

metadata: XML-formatted data that defines the characteristics of an **update**, including its title, description, rules for determining whether the **update** is applicable to a **client computer**, and instructions for installing the **update** content.

Microsoft Update: A Microsoft-hosted website located at <http://update.microsoft.com>.

patch storage format (PSF): A version of a content file that includes only changes in binary content from a previous version of a software/driver binary.

replica DSS: A **DSS** that obtains both **updates** and update **deployments** from its **USS**.

revision: A specific version of an **update** that is identified by a combination of an UpdateID **GUID** and a 32-bit revision number.

Server Sync Web Service: A web service on the upstream server (USS) that provides updates of metadata and deployment information to the downstream servers (DSSs).

SHA-1 hash: A hashing algorithm as specified in [FIPS180-2] that was developed by the National Institute of Standards and Technology (NIST) and the National Security Agency (NSA).

SOAP: A lightweight protocol for exchanging structured information in a decentralized, distributed environment. **SOAP** uses XML technologies to define an extensible messaging framework, which provides a message construct that can be exchanged over a variety of underlying protocols. The framework has been designed to be independent of any particular programming model and other implementation-specific semantics. SOAP 1.2 supersedes SOAP 1.1. See [SOAP1.2-1/2003].

SOAP fault: A container for error and status information within a **SOAP message**. See [SOAP1.2-1/2007] section 5.4 for more information.

SOAP message: An XML document consisting of a mandatory SOAP envelope, an optional SOAP header, and a mandatory SOAP body. See [SOAP1.2-1/2007] section 5 for more information.

target group: A named collection of **client computers** whose members are defined administratively.

update: An add, modify, or delete of one or more objects or attribute values. See originating update, replicated update.

update classification: A scheme to classify **updates** such as Critical, Security, Service Pack, and so on. An **update classification** is identified by a **GUID** and described by **metadata**. It can be treated as an **update** with no associated **content**.

update server: A computer that implements the Windows Update Services: Server-Server Protocol or the Windows Server Update Services: Client-Server Protocol to provide **updates** to **client computers** and other **update servers**.

upstream server (USS): An **update server** that provides **updates** to other **update servers**.

web method: A discrete operation exposed by a web service, called using a single SOAP message.

web service: (1) A unit of application logic that provides data and services to other applications and can be called by using standard Internet transport protocols such as HTTP, Simple Mail

Transfer Protocol (SMTP), or File Transfer Protocol (FTP). Web services can perform functions that range from simple requests to complicated business processes.

(2) A software entity that responds to SOAP messages ([SOAP1.1],[WSDL]).

Web Services Description Language (WSDL): An XML format for describing network services as a set of endpoints that operate on messages that contain either document-oriented or procedure-oriented information. The operations and messages are described abstractly and are bound to a concrete network protocol and message format in order to define an endpoint. Related concrete endpoints are combined into abstract endpoints, which describe a network service. WSDL is extensible, which allows the description of endpoints and their messages regardless of the message formats or network protocols that are used.

Windows Server Update Services (WSUS): An optional component of Windows Server operating system (starting with Windows 2000 Server operating system) that enables a machine to operate as an **update server**.

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

1.2 References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the Errata.

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.

[MS-DRSR] Microsoft Corporation, "Directory Replication Service (DRS) Remote Protocol".

[MS-LCID] Microsoft Corporation, "Windows Language Code Identifier (LCID) Reference".

[MS-WUSP] Microsoft Corporation, "Windows Update Services: Client-Server Protocol".

[RFC1035] Mockapetris, P., "Domain Names - Implementation and Specification", STD 13, RFC 1035, November 1987, <http://www.ietf.org/rfc/rfc1035.txt>

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

[RFC2616] Fielding, R., Gettys, J., Mogul, J., et al., "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, June 1999, <http://www.rfc-editor.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/>

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

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

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

[XML Namespaces] Bray, T., Hollander, D., and Layman, A., "Namespaces in XML", W3C Recommendation, January 1999, <http://www.w3.org/TR/1999/REC-xml-names-19990114/>

[XMLNS-2ED] World Wide Web Consortium, "Namespaces in XML 1.0 (Second Edition)", August 2006, <http://www.w3.org/TR/2006/REC-xml-names-20060816/>

~~[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., Beech, D., Maloney, M., and Mendelsohn, N., Eds., "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/>~~

[XPATh] Clark, J., and DeRose, S., "XML Path Language (XPath), Version 1.0", W3C Recommendation, November 1999, <http://www.w3.org/TR/xpath/>

1.2.2 Informative References

[\[MC-BUP\] Microsoft Corporation, "Background Intelligent Transfer Service \(BITS\) Upload Protocol".](#)

[MSDN-BITS] Microsoft Corporation, "Background Intelligent Transfer Service", [http://msdn.microsoft.com/en-us/library/bb968799\(VS.85\).aspx](http://msdn.microsoft.com/en-us/library/bb968799(VS.85).aspx)

[MSDN-CAB] Microsoft Corporation, "Microsoft Cabinet Format", March 1997, <http://msdn.microsoft.com/en-us/library/bb417343.aspx>

1.3 Overview

The **Windows Server Update Services (WSUS)** protocols provides support for central publication and distribution of software components and software **updates** from server machines to client machines, and for hierarchical synchronization of available software components between servers.

This specification defines the Windows Update Services: Server-Server Protocol, which enables synchronization of updates within a hierarchical topology of **update servers**.

The Windows Update Services: Server-Server Protocol is a SOAP-based protocol that uses HTTP 1.1 as its transport.

The following figure shows a typical hierarchical topology of update servers and **client computers**. An **upstream server (USS)** in a hierarchy provides information on software and drivers to **downstream servers (DSSs)**. Any update server in the hierarchy can serve simultaneously as a DSS with respect to its upstream server and as a USS with respect to its downstream servers. For example, in the following figure, update server C acts as a DSS when communicating with its upstream server A and acts as a USS when communicating with its downstream server D or E.

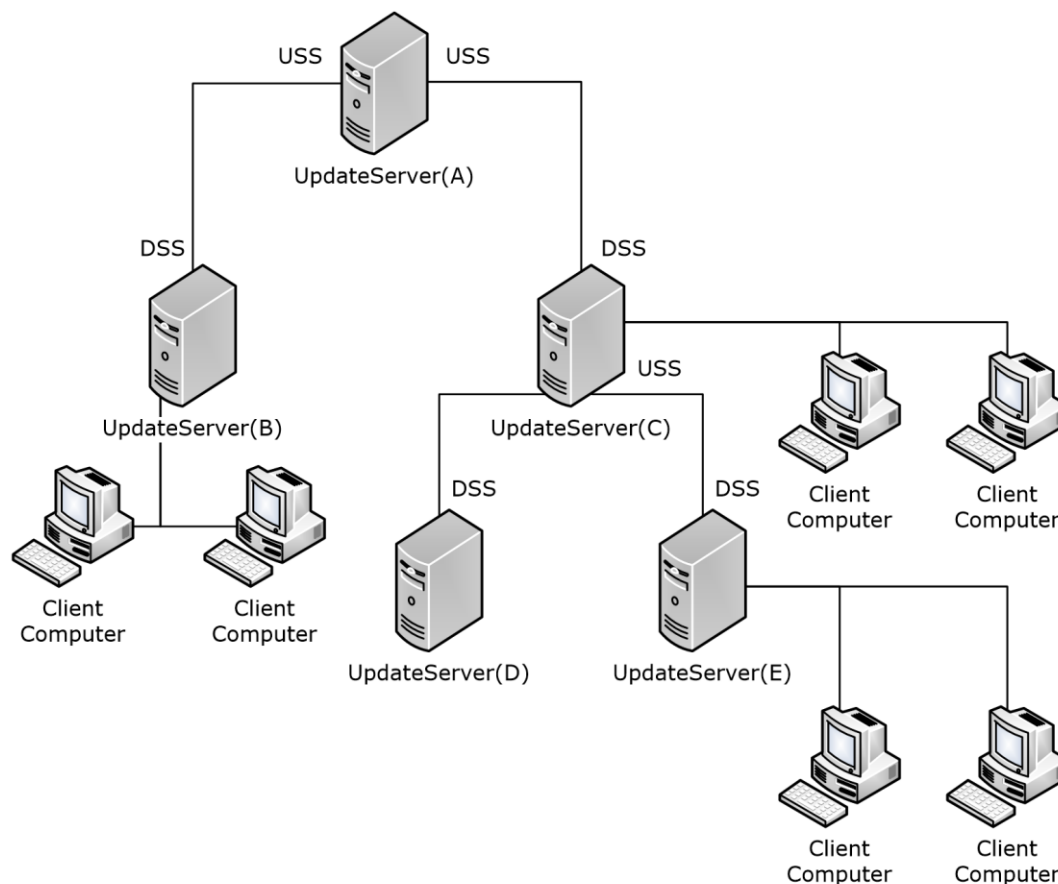


Figure 1: Typical hierarchical topology of update servers and client computers

An update server groups its client computers into **target groups**. An update server can be configured to deploy the updates to its client computers by assigning the updates to the target groups for **deployment** and, optionally, by specifying an installation or removal deadline. This mapping of the individual update **revisions** to target groups is known as a deployment.

There are two types of DSS defined by this protocol: autonomous and replica. Either type of DSS gets its updates from the USS. However, only a **replica DSS** gets the deployments from its USS. The **autonomous DSS** manages its deployments independently from the USS.

This specification describes the communication between two adjacent update servers in such a hierarchy.

This specification does not cover the format of self-update binaries, update metadata, and update content.<1>

1.4 Relationship to Other Protocols

The **web services (2)** application protocol uses SOAP over HTTP or Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS), as specified in [SOAP1.1], for communication. The content files are downloaded using HTTP 1.1, as specified in [RFC2616].

Windows Update Services: Web Services Application	Content Download Website
SOAP	BITS Upload Protocol (Optional)
HTTP(S)	
TCP	
IP	

Industry standard
MS - Protocol
This protocol

Figure 2: Windows Update Services: Server-Server Protocol relationship to other protocols

Content download can be accomplished using the Background Intelligent Transfer Service ([BITS Upload](#)) protocol described in [[MSDN-BITSMC-BUP](#)]. This can also be accomplished using HTTP 1.1 Byte Range requests, as specified in [RFC2616] section 14.35, or simple HTTP GET requests, as specified in [RFC2616] section 9.3.

This Windows Update Services Server-Server Protocol is closely related to the Windows Update Services: Client-Server Protocol, as specified in [MS-WUSP], which is used for communication between update servers and client computers.

To resolve **fully qualified domain names (FQDNs)** into IP addresses, the implementer of this protocol either provides or uses an implementation of the **Domain Name System** as defined in [RFC1035].

1.5 Prerequisites/Preconditions

The Windows Update Services: Server-Server Protocol imposes the following requirement on update server implementations:

- This document specifies how the binaries and metadata are distributed using the server-server communications protocol. It does not specify the format of the binaries or metadata themselves, but it assumes that the metadata is well-formed XML that is compatible with the XPATH queries, as specified in section 3.1.1.1, for populating the update server data model. In all other respects, the binaries and metadata are treated as opaque by update servers.

The Windows Update Services: Server-Server Protocol imposes the following requirements on DSS implementations:

- An implementation-specific way of learning the FQDN or IP address and the TCP/IP port of the USS.
- This protocol does not mandate the use of HTTPS. However, when a USS is configured to require HTTPS, the DSS needs an implementation-specific way of learning the root X509 certificate to be used for verifying the server.
- The protocol does not require the authentication of a DSS. However, when a USS is configured to require authentication, the DSS requires an implementation-specific way of learning the authentication scheme to be used and the identity information to be passed to USS for authenticating the DSS.

1.6 Applicability Statement

The Windows Update Services: Server-Server Protocol is applicable in environments in which there is a need to synchronize software updates within a hierarchical topology of update servers.

1.7 Versioning and Capability Negotiation

~~Note: Some of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview in the Product Behavior appendix.~~

This document covers versioning issues in the following areas.

Supported Transports: The Windows Update Services: Server-Server Protocol is implemented on top of HTTP and HTTPS, as specified in section 2.1. The protocol supports the use of either SOAP 1.2 ([SOAP1.2-1/2003] and [SOAP1.2-2/2003]) or SOAP 1.1 ([SOAP1.1]). This configuration option **MUST** has to match on both ends of the communication, and is not negotiated within the protocol.

Protocol Versions: There are six versions of this protocol, as shown in the following table. <2>

Protocol version	WSUS version implementing this protocol version	Number of update languages supported (see section 2.2.4.4)	Perform reporting data synchronization (see section 3.2.5)
1.1	WSUS 2.0	63	No
1.2	WSUS 2.0 SP1	511	No
1.3	WSUS 3.0	511	Yes
1.6	WSUS 3.0 SP1	511	Yes
1.8	WSUS 3.0 SP2	511	Yes
1.20	WSUS 10.0	511	Yes

1.8 Vendor-Extensible Fields

The Windows Update Services: Server-Server Protocol does not define any vendor-extensible fields.

1.9 Standards Assignments

The following standard XML namespaces (as specified in [XML Namespaces]) are used in this protocol:

- <http://schemas.xmlsoap.org/wsdl/http/>
- <http://www.w3.org/2001/XMLSchema>
- <http://schemas.xmlsoap.org/wsdl/soap/>
- <http://schemas.xmlsoap.org/wsdl/soap12/>
- <http://schemas.xmlsoap.org/soap/encoding/>
- <http://schemas.xmlsoap.org/wsdl/>

In addition, Microsoft defines the following new XML namespaces for use within this protocol:

- <http://microsoft.com/wsdl/types/>
- <http://www.microsoft.com/SoftwareDistribution/>
- <http://www.microsoft.com/SoftwareDistribution/Server/DssAuthWebService>

2 Messages

The Windows Update Services: Server-Server Protocol consists of a set of SOAP-based Web services (1) and a content download service that enables content to be downloaded from the USS using HTTP, as specified in [RFC2616] section 5.

2.1 Transport

The Windows Updated Services: Server-Server Protocol operates over the following transports:

- Web Services: SOAP 1.1 ([SOAP1.1]) or SOAP 1.2 ([SOAP1.2-1/2003] and [SOAP1.2-2/2003]) over HTTP or HTTPS over TCP/IP ([RFC2616])
- USS Content Download: HTTP over TCP/IP ([RFC2616])

The web services MUST operate on the following URI endpoints.

Web service	Location
Server Sync Web Service	http://<server>:<server port>/ServerSyncWebService/ServerSyncWebService.asmx
DSS Authorization Web Service	http://<server>:<server port>/dssauthWebService/dssauthWebService.asmx
Reporting Web Service	http://<server>:<server port>/ReportingWebService/ReportingWebService.asmx

Each web service MUST be bound to the HTTP transport, as specified in the following **Web Services Description Language (WSDL)** element.

```
<soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
```

Each web service MUST support SOAP over HTTP, as specified in [RFC2616]. Each Web service SHOULD support HTTPS for securing its communication with clients.<3>

To optimize network bandwidth, the DSS MAY request that the reply be compressed by specifying the encoding format in the HTTP **Accept-Encoding** request-header field (as specified in [RFC2616] section 14.3).<4> The USS SHOULD compress the reply in the requested format.

USS Content Download

The USS Content Download MUST operate on the following URI endpoints.

http://<server>:<server port>/Content/<folder name>/<content file name>

where:

- <server> is the IP address or FQDN of the USS.
- <server port> is the TCP/IP port on which the USS supports this protocol.
- <folder name> is the last two hexadecimal digits of the SHA1 hash for the file to be downloaded. The SHA1 hash is sent down in the GetUpdateData (section 3.1.4.6) call.
- <content file name> is the name of the content file.

The following rules MUST be applied to the configuration of the USS Content Download transport based on the configuration of the USS Web Services transport: <5>

- If USS Web Services uses HTTP, USS Content Download uses HTTP over TCP port 80.
- If USS Web Services uses HTTPS over TCP port 443, USS Content Download uses HTTP over port 80.
- If USS Web Services uses HTTPS over TCP port N, where N is not 443, USS Content Download uses HTTP over port N-1.

A USS Content Download SHOULD<6> support HTTP 1.1 Byte Range requests, as specified in [RFC2616] section 14.35. The downloaded content files are binary.

2.2 Common Message Syntax

This section specifies the syntax of **SOAP messages** exchanged by the protocol. The following rules apply to all SOAP messages in the protocol:

- The <soap:header> element ([SOAP1.1] section 4.2 and [SOAP1.2-1/2003] section 5.2) MUST NOT be used.
- The <soap:binding> element of the WSDL MUST specify style="document", as specified in [WSDL] section 3.3.
- The <soap:body> element of the WSDL MUST specify use="literal", as specified in [WSDL] section 3.5.

In the sections that follow, excerpts are given from the WSDL file for this protocol. In the WSDL file, the minOccurs and maxOccurs attributes are used to specify options and cardinality of all elements, except where otherwise specified.

For certain WSDL elements, the protocol specifies additional restrictions beyond those specified by the WSDL syntax of the elements. For instance, in some cases, the protocol always requires the presence of an element in a message, even though its WSDL specification has a minOccurs attribute set to 0. In other cases, the protocol requires stronger typing on elements than is specified by the WSDL for the elements.

In all such cases, the additional restrictions are described immediately after the WSDL is given.

2.2.1 Namespaces

~~Note: Some of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview in the Product Behavior appendix.~~

This specification defines and references various XML namespaces using the mechanisms specified in [XMLNS-2ED]. 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
tns	http://www.microsoft.com/SoftwareDistribution	
xsd	http://www.w3.org/2001/XMLSchema	

Prefix	NameSpaces URI	Reference
http	http://schemas.xmlsoap.org/wsdl/http/	
S	http://www.w3.org/2001/XMLSchema	
Soap	http://schemas.xmlsoap.org/wsdl/soap/	
soap12	http://schemas.xmlsoap.org/wsdl/soap12/	
soapenc	http://schemas.xmlsoap.org/soap/encoding/	
WSDL	http://schemas.xmlsoap.org/wsdl/	

The following table shows the Microsoft-defined XML namespaces used within this protocol and the alias (prefix) used in the remaining sections of this protocol specification.

Prefix	Namespace URI	Reference
s1	http://microsoft.com/wsdl/types/	
s2	The target namespace. The XML namespace it refers to depends on the WSDL file it is used in. For DSS Authorization Web Service WSDL, Server Sync Web Service WSDL, and Reporting Web Service WSDL, it is http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable	

The following sections define the common data types that are used in this protocol.

2.2.2 Messages

None.

2.2.3 Elements

None.

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
ArrayOfAuthorizationCookie	An array of AuthorizationCookie objects.
ArrayOfBase64Binary	An array of binary values encoded in base64 .
ArrayOfGuid	An array of GUIDs used in messages within this protocol.
ArrayOfInt	An array of integer values used in messages within the protocol.
ArrayOfString	An array of strings used in messages within this protocol.
ArrayOfUpdateIdentity	An array of UpdateIdentity objects used in messages within the protocol.
AuthorizationCookie	An object returned by the USS on successful completion of the GetAuthorizationCookie operation.

Complex type	Description
Cookie	An object generated by the USS to opaquely capture USS protocol state for submission by the DSS in subsequent protocol operations.
UpdateIdentity	A GUID for a specific revision of an update.

2.2.4.1 ArrayOfAuthorizationCookie

This is an array of AuthorizationCookie objects that is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

```
<s:complexType name="ArrayOfAuthorizationCookie">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="AuthorizationCookie" nillable="true"
      type="s1:AuthorizationCookie" />
  </s:sequence>
</s:complexType>
```

2.2.4.2 ArrayOfBase64Binary

This is an array of binary values encoded in base64.

It is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

```
<s:complexType name="ArrayOfBase64Binary">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="base64Binary" nillable="true"
      type="s:base64Binary" />
  </s:sequence>
</s:complexType>
```

2.2.4.3 ArrayOfGuid

This complex type is an array of **GUIDs** used in messages within this protocol. It is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

```
<s:complexType name="ArrayOfGuid">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="guid"
      type="s2:guid" />
  </s:sequence>
</s:complexType>
```

2.2.4.4 ArrayOfInt

This complex type is an array of integer values used in messages within the protocol. It is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

```
<s:complexType name="ArrayOfInt">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="int"
```

```
        type="s:int" />
    </s:sequence>
</s:complexType>
```

2.2.4.5 ArrayOfString

This complex type is an array of strings used in messages within this protocol. It is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

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

2.2.4.6 ArrayOfUpdateIdentity

This complex type is an array of UpdateIdentity objects used in messages within the protocol. It is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

```
<s:complexType name="ArrayOfUpdateIdentity">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="UpdateIdentity" nillable="true"
      type="sl:UpdateIdentity" />
  </s:sequence>
</s:complexType>
```

2.2.4.7 AuthorizationCookie

This complex type is an object returned by the USS on successful completion of the GetAuthorizationCookie operation. It is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

```
<s:complexType name="AuthorizationCookie">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="PlugInId"
      type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="CookieData"
      type="s:base64Binary" />
  </s:sequence>
</s:complexType>
```

PlugInId: The name identifying the Authorization PlugIn issuing the AuthorizationCookie.

CookieData: An opaque sequence of bytes constituting the data for the authorization cookie. The USS creates the data and interprets its content. The DSS does not interpret the content of this element. The format of the data is implementation-dependent; however, the USS that generated this data MUST be able to obtain the following information from the data: <7>

- Globally unique identifier (GUID) identifying the DSS
- List of target groups to which the DSS belongs
- Cookie expiration time

2.2.4.8 Cookie

This complex type is an object generated by the USS to opaquely capture USS protocol state for submission by the DSS in subsequent protocol operations. It is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

```
<s:complexType name="Cookie">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="Expiration"
      type="s:dateTime" />
    <s:element minOccurs="0" maxOccurs="1" name="EncryptedData"
      type="s:base64Binary" />
  </s:sequence>
</s:complexType>
```

Expiration: Coordinated Universal Time (UTC) date/time when the cookie expires.

EncryptedData: An opaque sequence of bytes constituting the data for the cookie. The USS creates the data and interprets its content. The DSS does not interpret the content of this element. The format of the data is implementation-dependent; however, the USS that generated this data **MUST** be able to obtain the following information from the data: <8>

- GUID identifying the DSS
- List of target groups to which the DSS belongs
- Cookie expiration time
- Protocol version
- GUID identifying the USS

2.2.4.9 UpdateIdentity

This complex type is a GUID for a specific revision of an update. It is defined in the namespace: <http://www.microsoft.com/SoftwareDistribution>.

```
<s:complexType name="UpdateIdentity">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="UpdateID"
      type="s2:guid" />
    <s:element minOccurs="1" maxOccurs="1"
      name="RevisionNumber" type="s:int" />
  </s:sequence>
</s:complexType>
```

UpdateID: A GUID that uniquely identifies an update.

RevisionNumber: A number that specifies the version of the update identified by this revision.

2.2.5 Simple Types

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

Simple type	Description
GUID	A globally unique identifier (GUID) of an object or entity within the protocol. For example, each update has a unique ID that is a GUID.

2.2.5.1 GUID

A globally unique identifier (GUID) of an object or entity within the protocol. For example, each update has a unique ID that is a GUID.

Defined in the namespace: <http://www.microsoft.com/wsdl/types>.

```

<s:schema elementFormDefault="qualified"
  "targetNamespace=http://microsoft.com/wsdl/types/">
  <s:simpleType name="guid">
    <s:restriction base="s:string">
      <s:pattern value="[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-
9a-fA-F]{4}-[0-9a-fA-F]{12}" />
    </s:restriction>
  </s:simpleType>
</s:schema>

```

2.2.6 Attributes

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

2.2.7 Groups

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

2.2.8 Attribute Groups

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

2.2.9 SOAP Faults

This protocol allows a USS to notify a DSS of application-level faults by generating **SOAP faults**. Not all SOAP faults returned by the USS contain application-level fault information. Details are specified in sections 3.1.4 and 3.2.4.

For SOAP faults containing application-level fault information, the format specified in the following sections is used. The format varies depending on the SOAP version that is being used.

2.2.9.1 Format for SOAP 1.1

When using SOAP 1.1, the Detail subelement under the Fault element **MUST** contain the following child elements:

- <ErrorCode>: A case-sensitive string that identifies the type of exception being thrown. The valid values and their descriptions are given in the table in section 2.2.9.3.
- <Message>: A human-readable message describing the error.

- <ID>: A GUID that identifies this instance of the fault.

These element names MUST NOT be qualified by a namespace.

The other subelements of the Fault element MUST be set as specified in [SOAP1.1] section 4.4, SOAP Fault.

2.2.9.2 Format for SOAP 1.2

When using SOAP 1.2, the Fault element MUST contain a child element named Detail, with no namespace name. This Detail element MUST contain <ErrorCode>, <Message>, and <ID> subelements, as specified in section 2.2.9.1. This Detail element is distinct from the Detail element specified in [SOAP1.2-1/2003] section 5.4, SOAP Fault.

The other subelements of the Fault element MUST be set as specified in [SOAP1.2-1/2003] section 5.4.5, SOAP Detail element.

2.2.9.3 ErrorCode Values

When present, the <ErrorCode> element MUST contain one of the following values. If a DSS receives a SOAP fault with one of the following ErrorCode values, it MUST react to the fault as defined in the following table.

ErrorCode	Description
InvalidParameters	Parameters passed to a web method are not valid. The message part of the exception MUST contain the parameter name. The DSS MAY retry the operation with a new set of valid parameters, if available. Otherwise, the DSS MUST stop the protocol.<9>
InvalidCookie	The EncryptedData field of the cookie has a syntax, formatting, or other error. The DSS MUST restart the protocol from the beginning for the protocol to succeed.
InternalServerError	An internal error occurred on the server. The DSS MUST stop the protocol.
IncompatibleProtocolVersion	The version of the protocol used by DSS is incompatible with the version used by USS. The DSS MUST stop the protocol.
InvalidAuthorizationCookie	The authorization cookie submitted by the DSS is not valid. The DSS MUST restart the protocol from the beginning for the protocol to succeed.
FileDigestsMissing	Some or all of the requested FileDigest values are not known to the USS. This is possibly due to deletion of unneeded updates on the USS.
ServerChanged	The USS has changed. The DSS MUST reset the ConfigAnchor, SyncAnchor, and DeploymentAnchor as defined in section 3.1.1 and continue the protocol.
ServerBusy	The USS is too busy to handle this request. The DSS MAY back off and try again later. Otherwise, the DSS MUST stop the protocol.<10>

3 Protocol Details

This protocol operates between two update servers acting in the following roles:

- DSS: This update server initiates all communication with the USS.
- USS: This update server responds to requests received from the DSS.

The protocol incorporates support for the following capabilities:

- Discovering and synchronizing software and driver updates metadata.
- Downloading content for the updates synchronized by the DSS from the USS.
- Discovering and synchronizing target groups when the DSS is configured as a replica of the USS.
- Discovering and synchronizing deployments of the updates to target groups when the DSS is configured as a replica of the USS.
- Reporting the status of updates on client computers by the DSS to the USS.

The protocol is intended to be stateless wherever possible. However, due to the requirements of authorization and the interrelationships between deployments, updates, and target groups, the DSS MUST execute the steps of this protocol in a specific order. A high-level sequence figure, as specified in section 3.2.4, summarizes the working of the protocol. Further details are provided in the following sections. This section first specifies details that are common between both roles. It then provides additional USS-specific and DSS-specific behavior, respectively.

Information about updates, target groups, and deployments is maintained on each USS, and each DSS obtains this information through a series of SOAP message exchanges that comprise the USS Web Services.

Similarly, information on descendant DSSs, client computers, and the status of updates on those client computers is maintained on each DSS, and the DSS sends this information to its USS through a series of SOAP message exchanges with USS.

A USS can also be configured to store the content associated with updates. In such a configuration, each DSS obtains content from its USS through a series of HTTP operations that comprise the USS Content Download.

If the content is not available from the USS, the DSS obtains content from an Internet website through a series of HTTP operations using the file location URLs obtained from the USS.

3.1 USS Details

An update server in the USS role provides a downstream update server with the capability to synchronize update metadata, update content, target groups, and deployments. The USS provides web services (2) for DSS to communicate using SOAP message exchange; it can also be configured to provide update content via HTTP download requests. This section provides the processing details of the USS role.

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.

Both the DSS and the USS maintain the following information regarding updates, target computers, target groups, and deployments.

Server Configuration: A set of configuration elements specified administratively for the server.

- **ServerID:** A self-generated GUID that identifies the update server.
- **Replication Mode:** Autonomous or replica, as specified in section 1.1.
- **CatalogOnlySync:** A flag that indicates if the server stores the content files locally and exposes them as the USS content Download service. When set to FALSE, the server stores the content files locally and supports the USS content Download service. When set to TRUE, it specifies that the USS only supports the USS Web Services and does not support the USS content Download service.
- **LazySync:** A flag that indicates when the content files are downloaded. This flag is ignored if **CatalogOnlySync** is set to TRUE. It can be one of the following:
 - TRUE: Content files are downloaded when the update is approved for install.
 - FALSE: Content files are downloaded when the update metadata is synchronized from a parent USS.
- **ServerHostsPsfFiles:** A flag that indicates if the server will store the patch storage format (PSF) versions of content files if available for an update.
- **MaxNumberOfUpdatesPerRequest:** The maximum number of revision IDs that the DSS is allowed to submit in the GetUpdateData (section 3.1.4.6) operation.
- **Languages Support:** The list of languages known to the update server and a flag for each language indicating whether the update server supports the language.
 - **All Languages:** A flag indicating that the update server supports all languages. When All Languages is set to TRUE, the specific language settings MUST be ignored. If set to FALSE, the specific language settings define what languages are supported by the update server.
 - **Specific Language Settings:** Each supported language MUST include the following elements:
 - Language ID
 - Short name
 - Long name
 - Enabled state (TRUE/FALSE)
- **DoDetailedRollup:** A flag that indicates if this update server allows DSSs to report detailed information about client computers that get updates from them.
 - TRUE: This update server allows DSSs to report detailed information about client computers that get updates from them.
 - FALSE: This update server does not allow DSSs to report detailed information about client computers that get updates from them as described in the RollupComputers, GetOutOfSyncComputers, and RollupComputerStatus methods.

Server State: A set of information about this server's runtime state.

- **ConfigAnchor:** An **anchor** that identifies the last change in the configuration for the server.

Synchronization History Table: A table that tracks the completion time stamp of each successful synchronization with the USS. If this update server is configured as a replica server, a new entry MUST be added following the successful completion of the Deployments Synchronization (section

3.2.4.3) step. If this update server is configured as an Autonomous Server, a new entry MUST be added following the successful completion of the Metadata Synchronization (section 3.2.4.2) step. Existing entries in the table MAY be removed at any time. However, entries SHOULD NOT be removed until they are at least 15 days old.

- **SynchronizationTime:** A time stamp that identifies the time when this update server successfully completed the Deployments Synchronization (section 3.2.4.3) step if this server is a replica server, or completed the Metadata Synchronization (section 3.2.4.2) step if this server is an Autonomous Server.

Parent USS Configuration: Each update server has at most one parent USS. The following information on the parent USS is configured by an administrator and maintained by the update server:

- Server FQDN or IP address where the USS Web Services is provided.
- Server port on which the USS Web Services is provided.

Parent USS State: A set of information regarding the state of this server's communication with its USS. This information is received from the USS and is maintained for use within the protocol.

- Last AuthorizationCookie received from the parent USS in a GetAuthorizationCookie (section 3.1.4.2) response.
- Last Cookie received from the parent USS in a GetCookie (section 3.1.4.3) response.
- Last **ConfigAnchor** received from the parent in a GetConfigData (section 3.1.4.4) response.
- Last Sync anchor received from the parent USS in a GetRevisionIdList (section 3.1.4.5) response.
- Last Deployment anchor received from the USS in a GetDeployments (section 3.1.4.10) response.
- **MaxNumberOfUpdatesPerRequest** received from the parent USS in a GetConfigData (section 3.1.4.4) response.
- List of languages supported by the USS. This is received from the parent USS in a GetConfigData (section 3.1.4.4) response.
- **CatalogOnlySync:** A flag that indicates if the USS stores the content files locally. This is received from the parent USS in a GetConfigData (section 3.1.4.4).
- **LazySync:** A flag that indicates when the content files are downloaded. This is received from the parent USS in a GetConfigData (section 3.1.4.4). This flag is ignored if **CatalogOnlySync** is set to TRUE. It can be one of the following:
 - TRUE: Download content when the update is approved for install.
 - FALSE: Download content immediately.
- **ServerHostsPsfFiles:** Set to TRUE if the server stores the **patch storage format (PSF)** versions of content files when available; otherwise, set to FALSE. This is received from the parent USS in a GetConfigData (section 3.1.4.4).

TargetGroup Table: A table of entries that correspond to each target group that is configured on the update server. The entries in this table are administratively configured if the update server is an autonomous DSS of its parent USS. Otherwise, the entries in this table are received from the parent USS in response to invocations of the GetDeployments (section 3.1.4.10) method. Each entry is indexed by its **TargetGroupID** and MUST include the following elements:

- **TargetGroupID:** A GUID that identifies this target group.
- **TargetGroupName:** The name of the target group given as a string value.

- **IsBuiltin:** A flag indicating whether this target group is provided by the implementation of the server or is created by a user.
- **ParentGroupID:** Target groups can be nested. The ParentGroupID is the GUID of another target group from this table that is the parent of this target group in the nesting hierarchy.

DSS Table: A table that stores the information about each DSS and descendant DSSs that synchronize with this update of this update server.

A new entry is added to this table when a GetAuthorizationCookie message is received for the first time from a DSS. New entries are also added to this table when the USS receives a RollupDownstreamServers message that contains information on new DSSs. Existing entries can be modified or removed at any time. When an entry is deleted from this table, all entries in the client computers table with a **ParentServerID** value matching the **ServerID** value of the deleted entry MUST be deleted.<12>

Each entry is keyed by the **ServerID** and MUST include the following elements:

- **ServerID:** The GUID that identifies this DSS.
- FQDN of the DSS.
- **ParentServerID:** The **ServerID** of the USS that this DSS synchronizes with.
- **LastRollupTime:** A time stamp that indicates the time when this DSS last reported information on itself to its USS by calling the RollupDownstreamServers method. The value MUST be initialized to NULL.
- **LastSyncTime:** A time stamp that identifies when this DSS last synchronized with its parent USS. The value MUST be initialized to NULL.
- **Version:** The version number of the software on the DSS that gives it the capability to synchronize with the USS.<13>
- **IsReplica:** A flag indicating whether this DSS is configured to be an Autonomous DSS or a Replica DSS of its parent USS.
- **UpdateCount:** The number of updates known to the DSS.
- **DeclinedUpdateCount:** The number updates that have been marked as hidden on the DSS.
- **ApprovedUpdateCount:** The number of updates that have at least one Deployment with an Action of Install or Uninstall on the DSS.
- **NotApprovedUpdateCount:** The number of updates that are not marked as hidden and have no Deployments with an Action of Install or Uninstall on the DSS.
- **UpdatesWithStaleUpdateApprovalsCount:** The number of updates that have at least one Deployment with an Action of Install or Uninstall on the DSS where the deployment is associated with a revision of the update other than the latest revision.
- **ExpiredUpdateCount:** The number of updates on the DSS that are no longer useful and ~~should~~ not have any deployments.
- **CriticalOrSecurityUpdatesNotApprovedForInstallCount:** The number of updates that are related to the security of the client computers or are otherwise considered critical that have no Deployments with an Action of Install on the DSS.
- **WsusInfrastructureUpdatesNotApprovedForInstallCount:** The number of updates that the client computers installs to enable them to continue to get updates from the DSS, which have no Deployments with an Action of Install on the DSS.

- **UpdatesWithClientErrorsCount:** The number of updates on the DSS that at least one client computer has attempted and failed to install.
- **UpdatesWithServerErrorsCount:** The number of updates on the DSS for which the DSS has attempted to download content but was unable to complete the download due to an error.
- **UpdatesNeedingFilesCount:** The number of updates on the DSS for which the DSS downloads content but has not completed the download.
- **UpdatesNeededByComputersCount:** The number of updates on the DSS that have at least one client computer that it is applicable to but not yet installed on.
- **UpdatesUpToDateCount:** The number updates on the DSS that are known to be installed on all client computers that it is applicable to.
- **CustomComputerTargetGroupCount:** The number of target groups on the DSS that have been created administratively on the DSS or have been received from its USS.
- **ComputerTargetCount:** The number of client computers that get updates from this DSS.
- **ComputerTargetsNeedingUpdatesCount:** The number of client computers that get updates from this DSS, on which at least one update is known to be applicable, but not yet installed.
- **ComputerTargetsWithUpdateErrorsCount:** The number of client computers that get updates from this DSS that has tried and failed to install at least one update.
- **ComputersUpToDateCount:** The number of client computers that get updates from this DSS that are known to have successfully installed all updates that are applicable to it.

Client computers table: A table that stores the information on each client computer that gets updates from this update server or from a descendant DSS. New entries are added to this table on the USS when a DSS reports information on new client computers to the USS using the RollupComputers method. New entries can be added to this table when new client computers are discovered through other implementation-specific means. Existing entries MAY be modified or removed at any time. <14>

Each entry is indexed by the ComputerID and MUST include the following elements:

- **ComputerID:** A globally unique string that identifies this client computer.
- **ParentServerID:** The **ServerID** of the update server that the client computer gets updates from.
- **LastSyncTime:** A time stamp that identifies when this client computer last contacted the update server to get updates. The value MUST be initialized to NULL.
- **LastSyncResult:** The result of the last attempt by this client computer to get updates from the update server. The valid values are the following:
 - Unknown/not applicable: The result is unknown, or the client computer has never attempted to get updates from the update server.
 - Succeeded: The client computer successfully retrieved updates from the update server.
 - Failed: The client computer failed to retrieve updates from the update server.
- **LastSentStatusRollupNumber:** The **RollupNumber** value that was used when this update server last sent information about this client computer to the USS using the RollupComputerStatus method.
- **LastReceivedStatusRollupNumber:** The **RollupNumber** value that was used when this update server last received information about this client computer from a DSS.

- **LastReportedRebootTime:** A time stamp that identifies when this client computer notified the update server that it has rebooted. The value MUST be initialized to NULL.
- **LastInventoryTime:** A time stamp indicating the last time this client computer reported software and hardware inventory information to the update server. The value MUST be initialized to NULL.
- **RequestedTargetGroupNames:** A list of strings listing the target groups of which the client computer has been configured to be a member.
- **IPAddress:** The IP address of the client computer.
- **FullDomainName:** The FQDN of the client computer.
- **OSMajorVersion, OSMinorVersion, OSBuildNumber, OSServicePackMajorVersionNumber, OSServicePackMinorVersionNumber, OSLocale, SuiteMask, NewProductType, OldProductType,** and **SystemMetrics:** These values are used to identify the operating system used by the client computer.

This protocol provides a mechanism for transporting these values between update servers but does not specify how these values are initialized or how they are consumed. An implementation that consumes these values needs to have an out-of-band mechanism for determining their meaning.<15>

- Computer manufacturer and model names.
- Basic input/output system (BIOS) name, version, and release date.
- Version number of the client software that gives the client computer the ability to get updates from the update server.
- **TargetGroupIDList:** The list of GUIDs identifying the target groups that this client computer belongs to. Each GUID in the list corresponds to the **TargetGroupID** value from an entry in the TargetGroup Table.
- **HasDetailsChanged:** A flag that indicates if the value of the **RequestedTargetGroupNames, IPAddress, FullDomainName,** operating system version number, computer manufacturer/model, BIOS name/version/release date, or the **TargetGroupID** element has changed since the last time information about this client computer was sent to the USS in a RollupComputers request. This value is set to TRUE when the value of one or more of these other elements is changed.
- **LastStatusRollupTime:** A time stamp indicating when the status of updates on this client computer was last reported to the USS. The value MUST be initialized to NULL.
- **EffectiveLastDetectionTime:** A time stamp indicating the time when the newest update that the client computer has reported status for was made available on the update server. This value MUST be initialized to NULL.

This value is updated on the USS as part of the Reporting Data Synchronization step. If the implementation has the ability to receive messages from client computers describing the state of all updates on the client computer, then this field SHOULD<16> be updated at the same time these messages are processed.

Update Status Table: A table that tracks the status of each update on each client computer. Entries are added to, and removed from, this table on the USS when a DSS reports information regarding the status of updates on its client computers using the RollupComputerStatus method.

Entries MAY be added or removed through additional implementation-specific means.<17>

Each entry is indexed by the pair (ComputerID, UpdateID) and MUST include the following elements:

- **ComputerID:** A globally unique string that identifies this client computer.
- **UpdateID:** A GUID that identifies the update. This corresponds to the GUID portion of the UpdateIdentifier element in the Revision Table.
- **Status:** The status of the update on the client computer. The valid values are shown in the following table.

Value	
0	The status of the update on the client computer is unknown.
1	The update is not applicable to the client computer (the software that the update is intended to update is not present).
2	The update is applicable to the client computer, but it has not yet been downloaded or installed.
3	The update is applicable to the client computer, and the client computer has downloaded all files required to install the update, but it has not installed the update yet.
4	The update is applicable to the client computer, and the update has been installed.
5	The update is applicable to the client computer, but the client computer either has failed to download the files required to install the update or has completed the download but has failed to install the update.
6	The update is applicable to the client computer, and the update has been installed, but the client computer is required to reboot before the update can take effect.

- **LastChangeTime:** A time stamp indicating when the status of this update last changed on this client computer.

Client computer activity summary table: A table that tracks the number of times an update has been installed, successfully and unsuccessfully, by client computers. The client computers are grouped based on the update server that they get updates from, and the operating system used by the client computer. Entries are added, modified, and removed as part of the Reporting Data Synchronization step of this protocol.

Update server implementations **MUST** have the capability to receive notifications from client computers on which they have installed an update (or have failed to do so). The mechanism for receiving such notifications is implementation-dependent; however, when such notifications are received, this table **SHOULD** be modified at that time as follows:

1. Use the client computers table to determine the operating system version number of the client computer and the ServerID of the update server it gets updates from.
2. Find the entry in this table with the corresponding operating system version number and ServerID. If no such entry exists, insert one.
3. If the client computer has successfully installed an update, increment the InstallSuccessCount value of this entry. Otherwise, if the client computer failed to successfully complete the install, increment the InstallFailureCount value.

Each entry is indexed by the **UpdateID**, the **ServerID**, and the operating system version elements and **MUST** include the following elements:

- **UpdateID:** A GUID that identifies the update. This corresponds to the GUID portion of the UpdateIdentifier element in the Revision Table.
- **ServerID:** The **ServerID** of the update server that the client computers get updates from.

- Operating system version: Consists of the **OSMajorVersion**, **OSMinorVersion**, **OSBuildNumber**, **OSServicePackMajorVersionNumber**, **OSServicePackMinorVersionNumber**, **OSLocale**, **SuiteMask**, **NewProductType**, **OldProductType**, and **SystemMetrics** values, corresponding to elements in the client computers table.
- **InstallSuccessCount**: The number of times that client computers, running the operating system described by the operating system version elements, have successfully installed the update specified by the UpdateID element.
- **InstallFailureCount**: The number of times that client computers, running the operating system described by the operating system version elements, have attempted unsuccessfully to install the update specified by the UpdateID element.

The **InstallSuccessCount** and **InstallFailureCount** values MUST be initialized to 0 and incremented accordingly whenever a client computer (using an operating system with version numbers matching the operating system version fields) notifies the update server that it has successfully or unsuccessfully installed this update. The mechanism used by client computers to notify the update server is implementation-dependent. <19>

The value is also modified, on both the USS and DSS, as part of the Reporting Data Synchronization (section 3.2.4.5) step of this protocol.

Categories Table: A table of entries corresponding to each **category** with which an update can be associated. Each entry is indexed by the CategoryIdentity and MUST include the following elements:

- CategoryIdentity: This consists of a GUID that identifies the category and a revision number for each version of the category.
- XMLMetaData: The metadata for the category.
- LastChangedAnchor: An anchor that identifies when this entry was changed.

Update Classifications Table: A table of entries corresponding to each **update classification** that can be assigned to an update. The entries in this table are generated at runtime when this update server synchronizes its updates from its parent USS. Each entry is indexed/identified by the ClassificationIdentity and MUST include the following elements:

- ClassificationIdentity: This consists of a GUID that identifies the update classification and a revision number for each version of the update classification.
- XMLMetaData: The metadata for the update classification.
- LastChangedAnchor: An anchor that identifies when this entry was changed.

Detectoids Table: A table of entries corresponding to each **Detectoid**. The entries in this table are generated at runtime when this update server synchronizes its updates from its parent USS. Each entry is indexed/identified by DetectoidIdentity and MUST include the following elements:

- DetectoidIdentity: This consists of a GUID that identifies the Detectoid and a revision number for each version of the detectoid.
- XMLMetaData: The metadata for the Detectoid.
- LastChangedAnchor: An anchor that identifies when this entry was changed.

Revision Table: A table of entries corresponding to the revisions that exist for each update. The entries in this table are generated at runtime when this update server synchronizes its updates from its parent USS. Each entry is indexed/identified by UpdateIdentity and MUST include the following elements:

- **UpdateIdentity:** This consists of a GUID that identifies the update and a revision number for each revision of the update.
- **XMLMetaData:** The metadata for the update revision.
- **Hidden:** A flag indicating if the administrator has chosen to hide this update. Hidden updates are assumed to be declined and will not be offered for deployment. When configured as a replica, a DSS gets information on hidden updates from its parent USS in the response to GetDeployments (section 3.1.4.10).
- **LastChangedAnchor:** An anchor that identifies when this entry was changed.
- **Classification:** An index into the update classification table identifying the update classification for this update revision.
- For each content file associated with this revision:
 - **FileDigest:** An SHA-1 hash of the content file.
 - **MUUrl:** An HTTP URL specifying the location of this file on the **Microsoft Update** HTTP service. This field is NULL for updates that do not originate from the Microsoft Update website.
 - **IsSecure:** A bit field indicating whether the file uses a secure URL.<20>
 - **IsEncrypted:** A bit field indicating whether the file is encrypted.<21>
 - **DecryptionKey:** The key that is used to decrypt the file, if it is encrypted.<22>
 - If available, an **AdditionalDigest** element. The digest algorithm is specified by the Algorithm attribute. The digest value is specified as text within the **AdditionalDigest** element.<23>

EULAs Table: A table of entries corresponding to the **End User License Agreement (EULA)** for the software and driver update revisions. The entries in this table are populated at run time from the metadata associated with this revision using the EulaID property, as specified in section 3.1.1.1. The Accepted flag of each entry can be updated by administrative action. Each entry is uniquely identified by its EulaID and MUST include the following elements:

- **EulaID:** This is a GUID that identifies the EULA.
- **Accepted:** A flag indicating if this EULA was accepted by the administrator of this update server or its parent or ancestor update server.

Deployment Table: A table of entries corresponding to each deployment that is administratively approved for distribution to client computers and DSSs. The entries in this table are administratively configured if the update server is an autonomous DSS of its parent USS. Otherwise, the entries in this table are received from the parent USS using GetDeployments (section 3.1.4.10). Each entry is uniquely identified by DeploymentID and MUST include the following elements:

- **DeploymentID:** This is a GUID that identifies the deployment.
- **UpdateIdentity:** This consists of a GUID that identifies the update and a revision number for the update revision that is deployed by this deployment.
- **TargetGroupID:** An index into the TargetGroup Table identifying the group of client computers to be targeted by this deployment.
- **Action:** This field specifies the specific action defined by this deployment. The following are valid values for Action.

Value	Meaning
0	Install the update revision.
1	Uninstall the update revision.
2	Scan for the presence of the update revision.
3	Block.

- AdminName: The login name of the administrator that created this deployment.
- LastChangedAnchor: An anchor that identifies when this entry was changed.
- All other deployment options as given in the **ServerSyncDeployment** structure specified in GetDeployments (section 3.1.4.10).

Content Store: A data store where content files are stored. The names of the files are as specified by the parent USS. The Content Store is empty if the **CatalogOnlySync** flag is set to FALSE for this update server. Each file is uniquely identified by the SHA-1 hash value. The Content Store stores the file by organizing them into folders with two character names that match the last two characters of the SHA-1 hash for files stored in that folder.

3.1.1.1 Populating the Data Model

The server implementation needs to extract information for the data model from the update metadata. Except as specified in the following table, the update metadata does not need to be interpreted by the server. Because the metadata is well-formed XML, the properties specified in the following table can all be extracted using XPATH queries, as specified in [XPATH].

The following properties are extracted from the metadata by using the XPATH queries shown in the following table. The other sections of this document indicate what property is being extracted from the metadata.

Property	XPATH
UpdateType	/Update/Properties/@UpdateType
CategoryType	/Update/HandlerSpecificData/CategoryInformation/@CategoryType
EulaID	/Update/Properties/@EulaID
FileDigest	/Update/Files/File[]/@Digest
PatchingType	/Update/Files/File[]/@PatchingType
FileName	/Update/Files/File[]/@FileName
<u>FragmentType<24></u>	<u>/Update/Properties/SecuredFragment</u>
<u>IsEncrypted<25></u>	<u>/Update/Files/File[]/@IsEncrypted</u>

3.1.2 Timers

None.

3.1.3 Initialization

The following initialization steps MUST be performed:

1. All tables in section 3.1.1 except the Last AuthorizationCookie in the USS Parent State table contain persistent data that MUST be retrieved from persistent storage at initialization time.
2. Each field of the USS Parent State Table MUST be initialized to NULL.
3. Each web service (2) within the server MUST begin listening for requests at the respective URL addresses specified in section 2.1.
4. If the USS is configured to store content files locally (see the CatalogOnlySync flag as specified in section 3.1.1 in "Server Configuration"), the USS Content Download service MUST be started at the URL address as specified in section 2.1.

3.1.4 Message Processing Events and Sequencing Rules

When a message arrives, the first XML element inside <soap:body> identifies the operation that is requested by the DSS. The message is then handled based on this operation name as specified in the following sections.

The following table summarizes the list of all WSDL operations as defined by this specification.

Operation	Description
DownloadFiles	Called by the DSS to request the server to download a file or set of files from the parent of the USS.
GetAuthConfig	Requests the server's authorization configuration.
GetAuthorizationCookie	Called by the DSS to authenticate to the server and request an authorization cookie that is used in the GetCookie operation.
GetConfigData	Returns the server's configuration data, which the DSS uses to manage metadata and content synchronization from the server.
GetCookie	Request a cookie from the server, which is then used by most other server operations.
GetDeployments	Returns the list of new or changed deployments to a replica DSS server.
GetRelatedRevisionsForUpdates	Unused method.
GetRevisionIdList	Returns the revision IDs for new updates based on the filters provided by the DSS to prune the list of revisions.
GetRollupConfiguration	Returns the server's reporting rollup configuration settings.
GetOutOfSyncComputers	Called by the DSS to determine what data needs to be reported to the USS.
GetUpdateData	Returns the full metadata for a set of requested revision IDs.
Ping	Unused method.
RollupComputers	Called by the DSS to send information about client computers from itself and recursive DSS servers to the USS.
RollupComputerStatus	Called by the DSS to send information about update status on client computers.
RollupDownstreamServers	Called by the DSS to send information about itself and recursive DSS servers to

Operation	Description
	the USS.

3.1.4.1 GetAuthConfig

A DSS calls the GetAuthConfig method to get information about the authorization service to use to get the authorization cookie.

```
<wsdl:operation name="GetAuthConfig">
  <wsdl:input message="tns:GetAuthConfigSoapIn" />
  <wsdl:output message="tns:GetAuthConfigSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/GetAuthConfig" style="document" />
```

Request validation:

None.

Data processing:

The USS MUST compose a GetAuthConfigResponse message in response, as follows:

- **AuthInfo:** MUST contain exactly one element, and its fields MUST be set as the following:
 - **PlugInID:** Set to "DssTargeting".
 - **ServiceUrl:** Set to "DssAuthWebService/DssAuthWebService.asmx".
 - **Parameter:** This MUST NOT be included.

Response:

If no errors occur during processing, the USS MUST return the response to the DSS.

The following SOAP fault MAY be returned by this operation.

ErrorCode	Description
InternalServerError	An internal error occurred on the server. The error is implementation-specific. The DSS MUST stop the protocol.

3.1.4.1.1 Messages

Message	Description
GetAuthConfigSoapIn	Requests the server authorization configuration.
GetAuthConfigSoapOut	A response containing the server authorization configuration.

3.1.4.1.1.1 GetAuthConfigSoapIn

```
<wsdl:message name="GetAuthConfigSoapIn">
  <wsdl:part name="parameters" element="tns:GetAuthConfig" />
</wsdl:message>
```

GetAuthConfig: The <GetAuthConfig> element, as specified in section 3.1.4.1.2.1.

3.1.4.1.1.2 GetAuthConfigSoapOut

```
<wsdl:message name="GetAuthConfigSoapOut">
  <wsdl:part name="parameters" element="tns:GetAuthConfigResponse" />
</wsdl:message>
```

GetAuthConfigResponse: The <GetAuthConfigResponse> element, as specified in section 3.1.4.1.2.2.

3.1.4.1.2 Elements

Element	Description
GetAuthConfig	Contains the request for the GetAuthConfig operation.
GetAuthConfigResponse	Contains the response for the GetAuthConfig operation.

3.1.4.1.2.1 GetAuthConfig

```
<s:element name="GetAuthConfig">
  <s:complexType />
</s:element>
```

This type has no fields.

3.1.4.1.2.2 GetAuthConfigResponse

```
<s:element name="GetAuthConfigResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1"
        name="GetAuthConfigResult"
        type="s1:ServerAuthConfig" />
    </s:sequence>
  </s:complexType>
</s:element>
```

GetAuthConfigResult: On successful execution of this operation, this object MUST be returned. The ServerAuthConfig complex type is defined by the schema in section 3.1.4.1.3.1.

3.1.4.1.3 Complex Types

Complex type	Description
ServerAuthConfig	Contains the authorization configuration information.

Complex type	Description
ArrayOfAuthPlugInInfo	Contains the AuthPlugInInfo elements.
AuthPlugInInfo	Contains the AuthPlugInInfo data.

3.1.4.1.3.1 ServerAuthConfig

```
<s:complexType name="ServerAuthConfig">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1"
      name="LastChange" type="s:dateTime" />
    <s:element minOccurs="0" maxOccurs="1" name="AuthInfo"
      type="s1:ArrayOfAuthPlugInInfo" />
    <s:element minOccurs="0" maxOccurs="1"
      name="AllowedEventIds" type="s1:ArrayOfInt" />
  </s:sequence>
</s:complexType>
```

LastChange: This field is not used. The DSS MUST ignore this field.

AuthInfo: Contains the Authorization PlugIn information on the USS. On successful execution of this operation, this array MUST contain exactly one element. Its format (ArrayOfAuthPlugInInfo) is shown in the following code.

AllowedEventIds: Unused. It SHOULD NOT be present and MUST be ignored on receipt if present.<26>

3.1.4.1.3.2 ArrayOfAuthPlugInInfo

```
<s:complexType name="ArrayOfAuthPlugInInfo">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="AuthPlugInInfo" nillable="true"
      type="s1:AuthPlugInInfo" />
  </s:sequence>
</s:complexType>
```

AuthPlugInInfo: This field MUST be present and MUST contain exactly one element in the array. It provides information on the Authorization PlugIn available on the USS. Its format is as specified in section 3.1.4.1.3.3.

3.1.4.1.3.3 AuthPlugInInfo

```
<s:complexType name="AuthPlugInInfo">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="PlugInID"
      type="s:string" />
    <s:element minOccurs="0" maxOccurs="1"
      name="ServiceUrl" type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="Parameter"
      type="s:string" />
  </s:sequence>
</s:complexType>
```

PlugInID: This MUST be set to "DssTargeting".

ServiceUrl: This MUST be set to "DssAuthWebService/DssAuthWebService.asmx". It is a partial URL that can be appended to http://<server>:<server port>/ to form the full URL to be used for DSS Authorization Web Service.

Parameter: Unused. It SHOULD NOT be present, and MUST be ignored upon receipt.<27>

3.1.4.2 GetAuthorizationCookie

A DSS calls the GetAuthorizationCookie method to authenticate and authorize access to the Server Sync Web Service. The USS sends back an authorization cookie that is used in the GetCookie operation.

```
<wsdl:operation name="GetAuthorizationCookie">
  <wsdl:input message="tns:GetAuthorizationCookieSoapIn" />
  <wsdl:output message="tns:GetAuthorizationCookieSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows:

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/Server/DssAuthWebService/GetAuthorizationCookie" style="document" />
```

Request validation:

The USS validates inputs as specified in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS with the <ErrorCode> set, as shown in the table.<28>

Parameter	Validation conditions	ErrorCode
<i>accountName</i>	MUST not be NULL or a zero-length string. The format of this field MUST be consistent with FQDN requirements (that is, it does not contain characters that are not valid for a FQDN, as specified in [RFC1035] section 2.3).	InvalidParameters
<i>accountGuid</i>	MUST not be NULL or a zero-length string. The format of this field MUST be consistent with the GUID format, as specified in section 2.2.5.1.	InvalidParameters

Data processing:

The USS MUST process this message as follows:

1. Locate the entry identified by the **accountGuid** element in the DSS Table.
2. If not found, initialize and insert a new entry in the DSS Table containing the **accountGuid** and **accountName** elements.
3. The USS MUST compose a GetAuthorizationCookieResponse message in response to the DSS, as follows:
 - Generate an AuthorizationCookie element for the DSS.
 - Initialize the *PlugInId* element to "DssTargeting".
 - Initialize the *CookieData* element to a sequence of bytes, as defined in section 2.2.4.7.

Response:

If no errors occur during processing, the USS MUST return the response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as defined in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If the DSS receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault as described in the following table. If the DSS receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

ErrorCode	Description
InternalServerError	An internal error occurred on the server. The error is implementation specific. The DSS MUST stop the protocol.
InvalidParameters	Parameters passed to a web method are not valid. The "message" part of the exception will contain the parameter name. The DSS MUST stop the protocol.

3.1.4.2.1 Messages

Message	Description
GetAuthorizationCookieSoapIn	Requests the server authorization cookie.
GetAuthorizationCookieSoapOut	A response containing the server authorization cookie.

3.1.4.2.1.1 GetAuthorizationCookieSoapIn

```
<wsdl:message name="GetAuthorizationCookieSoapIn">
  <wsdl:part name="parameters" element="tns:GetAuthorizationCookie" />
</wsdl:message>
```

GetAuthorizationCookie: As specified in section 3.1.4.2.2.1.

3.1.4.2.1.2 GetAuthorizationCookieSoapOut

```
<wsdl:message name="GetAuthorizationCookieSoapOut">
  <wsdl:part name="parameters" element="tns:GetAuthorizationCookieResponse" />
</wsdl:message>
```

GetAuthorizationCookieResponse: As specified in section 3.1.4.2.2.2.

3.1.4.2.2 Elements

Element	Description
GetAuthorizationCookie	Contains the request for the GetAuthorizationCookie operation.
GetAuthorizationCookieResponse	Contains the response for the GetAuthorizationCookie operation.

3.1.4.2.2.1 GetAuthorizationCookie

```
<s:element name="GetAuthorizationCookie">
```

```

<s:complexType>
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1"
      name="accountName" type="s:string" />
    <s:element minOccurs="0" maxOccurs="1"
      name="accountGuid" type="s:string" />
    <s:element minOccurs="0" maxOccurs="1"
      name="programKeys" type="tns:ArrayOfGuid"
    />
  </s:sequence>
</s:complexType>
</s:element>

```

accountName: This field MUST be present. It MUST be set to the FQDN of the DSS.

accountGuid: This field MUST be present. It MUST be a GUID that identifies the DSS.

programKeys: This field is reserved for future use and MUST be set to empty.

3.1.4.2.2 GetAuthorizationCookieResponse

```

<s:element name="GetAuthorizationCookieResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1"
        name="GetAuthorizationCookieResult"
        type="s1:AuthorizationCookie" />
    </s:sequence>
  </s:complexType>
</s:element>

```

GetAuthorizationCookieResult: On successful completion of this operation, this field MUST be returned. It MUST be an AuthorizationCookie structure, as defined in section 2.2.4.7, and the **PlugInId** field on the structure MUST be set to "DssTargeting".

3.1.4.3 GetCookie

A DSS calls the GetCookie method to obtain a cookie containing an opaque sequence of bytes that encode implementation-specific authorization, authentication, and runtime information for use by the USS.

```

<wsdl:operation name="GetCookie">
  <wsdl:input message="tns: GetCookieSoapIn" />
  <wsdl:output message=" tns:GetCookieSoapOut" />
</wsdl:operation>

```

The SOAP operation is defined as follows.

```

<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/GetCookie" style="document" />

```

Request validation:

The USS validates inputs, as specified in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS with the <ErrorCode> set, as shown in the table.

Input	Validation conditions	ErrorCode
authCookies	MUST contain exactly one AuthorizationCookie element.	InvalidParameters
authCookies	The CookieData field MUST be of the correct format such that the USS can read values out of it, as specified in section 2.2.4.7.	InvalidAuthorizationCookie
protocolVersion	MUST be of the format "x.y", where x is the Major Version and y is the Minor Version number.	InvalidParameters
protocolVersion	Major Version MUST be "1".	IncompatibleProtocolVersion

Data processing:

The USS MUST process this message as follows:

1. Parse the *CookieData* in the AuthorizationCookie and extract the ExpirationTime, target groups list, and DSS account GUID.
2. If the cookie has a syntax, formatting, or other error preventing the necessary information from being read out of the **EncryptedData** field, return SOAP fault with <ErrorCode> set to InvalidAuthorizationCookie.
3. Create a Cookie with the *Expiration* set to an implementation-specific cookie expiration interval sometime in the future.<29>
4. Initialize the **EncryptedData** field of the Cookie to a sequence of bytes, as defined in section 2.2.4.8.

Response:

If no errors occur during processing, the USS MUST return the response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as defined in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If the DSS receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault, as described in the following table. If the DSS receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

ErrorCode	Description
InvalidParameters	Parameters passed to a web method are not valid. The message part of the exception will contain the parameter name. The DSS MUST stop the protocol.
InternalServerError	An internal error occurred on the server. The DSS MUST stop the protocol.
IncompatibleProtocolVersion	The version of the protocol used by DSS is incompatible with the version used by USS. The DSS MUST abort the protocol.
InvalidAuthorizationCookie	The authorization cookie submitted by the DSS is not valid. The DSS MUST restart the protocol from the beginning.

3.1.4.3.1 Messages

Message	Description
GetCookieSoapIn	Requests the cookie.
GetCookieSoapOut	A response containing the cookie.

3.1.4.3.1.1 GetCookieSoapIn

```
<wsdl:message name="GetCookieSoapIn">
  <wsdl:part name="parameters" element="tns:GetCookie" />
</wsdl:message>
```

GetCookie: As specified in section 3.1.4.3.2.1.

3.1.4.3.1.2 GetCookieSoapOut

```
<wsdl:message name="GetCookieSoapOut">
  <wsdl:part name="parameters" element="tns:GetCookieResponse" />
</wsdl:message>
```

GetCookieResponse: As specified in section 3.1.4.3.2.2.

3.1.4.3.2 Elements

Element	Description
GetCookie	Contains the request for the GetCookie operation.
GetCookieResponse	Contains the response for the GetCookie operation.

3.1.4.3.2.1 GetCookie

```
<s:element name="GetCookie">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1"
        name="authCookies"
        type="s1:ArrayOfAuthorizationCookie" />
      <s:element minOccurs="0" maxOccurs="1" name="oldCookie"
        type="s1:Cookie" />
      <s:element minOccurs="0" maxOccurs="1"
        name="protocolVersion" type="s:string" />
    </s:sequence>
  </s:complexType>
</s:element>
```

authCookies: This field **MUST** be present. It provides the list of Authorization Cookies received via the GetAuthorizationCookie (section 3.1.4.2) method. Because only one Authorization PlugIn is defined within this protocol, the array **MUST** contain exactly one element.

oldCookie: This field **MUST** be set to the cookie returned in the last successful GetCookie operation response. The **oldCookie** field **MUST** be set to NULL/empty when DSS calls the GetCookie method for the first time.

protocolVersion: This field MUST be present. It identifies the version of the protocol that the DSS supports, as specified in section 1.7. Its values can be 1.1, 1.2, 1.3, 1.6, or 1.8.

3.1.4.3.2.2 GetCookieResponse

```
<s:element name="GetCookieResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1"
        name="GetCookieResult" type="s1:Cookie" />
    </s:sequence>
  </s:complexType>
</s:element>
```

GetCookieResult: On successful completion of this operation, this field MUST be returned. It MUST be a Cookie structure, as defined in section 2.2.4.8.

3.1.4.4 GetConfigData

~~Note: Some of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview in the Product Behavior appendix.~~

A DSS calls the GetConfigData method to obtain configuration data that governs the metadata and content synchronization phases of the protocol, as specified in section 3.2.4.2.

```
<wsdl:operation name="GetConfigData">
  <wsdl:input message="tns:GetConfigDataSoapIn" />
  <wsdl:output message="tns:GetConfigDataSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/GetConfigData" style="document" />
```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS with the <ErrorCode> set, as shown in the table.

Input	Validation conditions	ErrorCode
cookie	MUST be present and not empty.	InvalidCookie
cookie	The EncryptedData MUST be the correct format such that the USS can read values out of it, as specified in section 2.2.4.8.	InvalidCookie
protocolVersion in the cookie EncryptedData	MUST be of the format "x.y" where x is the Major Version and y is the Minor Version number.	InvalidParameters
protocolVersion in the cookie EncryptedData	Major Version MUST be "1".	IncompatibleProtocolVersion

Data processing:

The USS MUST compose a GetConfigDataResponse message in response, as follows:

1. Copy the following Server Configuration Table entries into the ServerSyncConfigData structure of the response:
 - **CatalogOnlySync**
 - **LazySync**
 - **ServerHostsPsfFiles**
 - **MaxNumberOfUpdatesPerRequest**
 - **MaxNumberOfDriverSetsPerRequest**
 - **MaxNumberOfComputerIdsInRequest**
 - **MaxNumberOfPnpHardwareIdsInRequest**
 - **MaxUpdatesPerRequestInGetUpdateDecryptionData<30>**
2. Copy the following Server State Table entries into the ServerSyncConfigData structure of the response:
 - **ConfigAnchor**
3. Add an entry to the **LanguageUpdateList** element of the ServerSyncConfigData structure of the response:
 - **LanguageID** = 0.
 - **ShortLanguage** = "all".
 - **LongLanguage** = "all".
 - **Enabled** = "All Languages" flag value from the Languages Support element in the Server Configuration Table.
4. Copy the Specific Language Settings from the Server Configuration Table entries into the **LanguageUpdateList** element of the ServerSyncConfigData structure.

Response:

If no errors occur during processing, the USS MUST return the response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as described in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If the DSS receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault with one of the following errors. These are described in section 2.2.9.3.

- InvalidParameters
- InternalServerError
- InvalidCookie
- IncompatibleProtocolVersion

If the DSS receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

3.1.4.4.1 Messages

Message	Description
GetConfigDataSoapIn	Requests the configuration data.
GetConfigDataSoapOut	A response containing the configuration data.

3.1.4.4.1.1 GetConfigDataSoapIn

```
<wsdl:message name="GetConfigDataSoapIn">  
  <wsdl:part name="parameters" element="tns:GetConfigData" />  
</wsdl:message>
```

GetConfigData: As specified in section 3.1.4.4.2.1.

3.1.4.4.1.2 GetConfigDataSoapOut

```
<wsdl:message name="GetConfigDataSoapOut">  
  <wsdl:part name="parameters" element="tns:GetConfigDataResponse" />  
</wsdl:message>
```

GetConfigDataResponse: As specified in section 3.1.4.4.2.2.

3.1.4.4.2 Elements

Element	Description
GetConfigData	Contains the request for the GetConfigData operation.
GetConfigDataResponse	Contains the response for the GetConfigData operation.

3.1.4.4.2.1 GetConfigData

```
<s:element name="GetConfigData">  
  <s:complexType>  
    <s:sequence>  
      <s:element minOccurs="0" maxOccurs="1" name="cookie"  
        type="s1:Cookie" />  
      <s:element minOccurs="0" maxOccurs="1"  
        name="configAnchor" type="s:string" />  
    </s:sequence>  
  </s:complexType>  
</s:element>
```

cookie: This field MUST be present and set to the Cookie returned by the most recent invocation of the GetCookie method. The Cookie MUST NOT be expired.

configAnchor: If the DSS is calling GetConfigData for the first time, this field MUST NOT be present.

If the DSS has successfully called GetConfigData in the past, this field MUST contain the NewConfigAnchor value returned by the USS during the last successful call.

3.1.4.4.2.2 GetConfigDataResponse

```

<s:element name="GetConfigDataResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1"
        name="GetConfigDataResult"
        type="s1:ServerSyncConfigData" />
    </s:sequence>
  </s:complexType>
</s:element>

```

GetConfigDataResult: On successful execution of this operation, this object MUST be returned. Its format is specified in section 3.1.4.4.3.1, ServerSyncConfigData.

LanguageID: Identifies the language corresponding to this entry. This MUST be set to 0 (which is a special value that refers to all languages) or to a language ID referring to a specific language, as specified in [MS-LCID].

ShortLanguage: This field MUST be present. It provides a short name for the language. The value "all" refers to "All languages". All other language short names are as specified in [MS-LCID].

LongLanguage: This field MUST be present. It provides a long name for the language. The value "all" refers to "All languages". All other language long names are as specified in [MS-LCID].

Enabled: MUST be set to TRUE if the USS currently supports updates in the specified language. Otherwise, MUST be set to FALSE.

3.1.4.4.3 Complex Types

Complex type	Description
ServerSyncConfigData	Contains the server synchronization configuration data.
ArrayOfServerSyncLanguageData	Contains an array of the server synchronization language data.
ServerSyncLanguageData	Contains the server synchronization language data.

3.1.4.4.3.1 ServerSyncConfigData

~~Note: Some of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview in the Product Behavior appendix.~~

```

<s:complexType name="ServerSyncConfigData">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1"
      name="CatalogOnlySync" type="s:boolean" />
    <s:element minOccurs="1" maxOccurs="1" name="LazySync"
      type="s:boolean" />
    <s:element minOccurs="1" maxOccurs="1"
      name="ServerHostsPsfFiles" type="s:boolean" />
    <s:element minOccurs="1" maxOccurs="1"
      name="MaxNumberOfUpdatesPerRequest" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1"
      name="MaxNumberOfDriverSetsPerRequest" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1"
      name="MaxNumberOfComputerIdsInRequest" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1"

```



```

name="MaxNumberOfPnpHardwareIdsInRequest" type="s:int" />
<s:element minOccurs="0" maxOccurs="1"
name="NewConfigAnchor" type="s:string" />
<s:element minOccurs="0" maxOccurs="1"
name="ProtocolVersion" type="s:string" />
<s:element minOccurs="0" maxOccurs="1"
name="LanguageUpdateList"
type="s1:ArrayOfServerSyncLanguageData" />
<s:element minOccurs="1" maxOccurs="1"
name="MaxUpdatesPerRequestInGetUpdateDecryptionData"
type="s:int" />
</s:sequence>
</s:complexType>

```

CatalogOnlySync: This field MUST be present. Set to TRUE indicates that the USS supports the web services (2) but does not support the USS Content Download for downloading the content files. Otherwise, set to FALSE.

LazySync: This field MUST be present. Set to TRUE if the USS defers the download of content for updates until they are needed by its client computers or its DSSs. Otherwise, set to FALSE.

ServerHostsPsfFiles: This field MUST be present. It indicates that the USS also hosts the patch storage format (PSF) version of the content files if available for an update revision.

MaxNumberOfUpdatesPerRequest: Specifies the maximum number of revisions that can be requested in the GetUpdateData (section 3.1.4.6) operation.

MaxNumberOfDriverSetsPerRequest: Specifies the maximum number of DriverSetIds that can be requested in the GetDriverSetData (section 3.1.4.8) operation.

MaxNumberOfComputerIdsInRequest: Specifies the maximum number of computer hardware Ids that can be requested in the GetDriverIdList (section 3.1.4.7) operation.

MaxNumberOfPnpHardwareIdsInRequest: Specifies the maximum number of device hardware Ids that can be requested in the GetDriverIdList operation.

NewConfigAnchor: This field MUST be present. It identifies the point in time that this operation was completed successfully. It is an opaque string that is not interpreted by the DSS. The format of the string is implementation specific. <31>

ProtocolVersion: This field SHOULD<32> be present and SHOULD be set to the protocol version supported by the USS. The possible values are as specified in section 1.7.

LanguageUpdateList: This field MUST be present. It identifies the list of languages that are supported by the USS. The array contains only the list of languages whose settings have changed since the time identified by the **configAnchor**. Its format is specified in section 3.1.4.4.3.2.

MaxUpdatesPerRequestInGetUpdateDecryptionData: Specifies the maximum number of revisions that can be requested in the GetUpdateDecryptionData (section 3.1.4.18) operation.<33>

3.1.4.4.3.2 ArrayOfServerSyncLanguageData

```

<s:complexType name="ArrayOfServerSyncLanguageData">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
name="ServerSyncLanguageData"
nillable="true"
type="s1:ServerSyncLanguageData" />
  </s:sequence>
</s:complexType>

```

An array structure, each element of which provides information on a language setting on the USS. The format of each element is as specified in section 3.1.4.4.3.3.

3.1.4.4.3.3 ServerSyncLanguageData

```
<s:complexType name="ServerSyncLanguageData"> <s:sequence>
  <s:element minOccurs="1" maxOccurs="1"
    name="LanguageID" type="s:int" />
  <s:element minOccurs="0" maxOccurs="1"
    name="ShortLanguage" type="s:string" />
  <s:element minOccurs="0" maxOccurs="1"
    name="LongLanguage" type="s:string" />
  <s:element minOccurs="1" maxOccurs="1" name="Enabled"
    type="s:boolean" />
</s:sequence>
</s:complexType>
```

LanguageID: Identifies the language corresponding to this entry. This MUST be set to 0 (which is a special value that refers to all languages) or to a language ID referring to a specific language, as specified in [MS-LCID].

ShortLanguage: This field MUST be present. It provides a short name for the language. The value "all" refers to "All languages". All other language short names are as specified in [MS-LCID].

LongLanguage: This field MUST be present. It provides a long name for the language. The value "all" refers to "All languages". All other language long names are as specified in [MS-LCID].

Enabled: MUST be set to TRUE if the USS currently supports updates in the specified language. Otherwise, MUST be set to FALSE.

3.1.4.5 GetRevisionIdList

A DSS calls the GetRevisionIdList method to get the revision IDs for new updates. The DSS provides filters to be used to prune the list of revisions.

```
<wsdl:operation name="GetRevisionIdList">
  <wsdl:input message="tns:GetRevisionIdListSoapIn" />
  <wsdl:output message="tns:GetRevisionIdListSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/GetRevisionIdList" style="document" />
```

Request validation:

The USS validates inputs as specified in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS with the <ErrorCode> set, as shown in the table.

Input	Validation conditions	ErrorCode
cookie	MUST be present and not empty.	InvalidCookie
cookie	The EncryptedData MUST be the correct format such that the USS can read values out of it, as specified in section 2.2.4.8.	InvalidCookie

Input	Validation conditions	ErrorCode
protocolVersion in the cookie EncryptedData	MUST be of the format x.y where x is the Major Version and y is the Minor Version number.	InvalidParameters
protocolVersion in the cookie EncryptedData	Major Version MUST be 1.	IncompatibleProtocolVersion
filter:Anchor	MUST be valid format or NULL or empty string. The format of the anchor is implementation specific and not defined by the protocol.<34>	InvalidParameters

Data processing:

The USS MUST compose a GetRevisionIdListResponse message in response, as follows:

1. If the DSS protocol version is 1.1, and the USS protocol version is 1.2, force-set the filter's **Get63LanguageOnly** field to TRUE.
2. If **GetConfig** is set to TRUE in the filter, create the **NewRevisions** list in the response as follows:
 1. Select entries from the Categories, Update Classifications, and Detectoids Tables using the following rules:
 - If the GUID portion of the ID for multiple entries is the same, select only the entry with the highest Revision Number.
 - The LastChangedAnchor in the entry is newer than the anchor specified in the GetRevisionIdList request.
 2. Add the selected entry to the **NewRevisions** field of the response.
3. If **GetConfig** is set to FALSE in the filter, create the **NewRevisions** list in the response as follows:
 1. Select entries from the Revision Table using the following rules:
 - If the GUID portion of the ID for multiple entries is the same, select only the entry with the highest Revision Number.
 - The LastChangedAnchor in the entry is newer than the anchor specified in the GetRevisionIdList request.
 2. Add the selected entry to the **NewRevisions** field of the response.
4. Set the **Anchor** field in the response to mark the time this operation was completed.

Response:

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as described in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If the DSS receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault with one of the following error codes, which are defined in section 2.2.9.3.

- InvalidParameters
- InternalServerError

- InvalidCookie
- IncompatibleProtocolVersion

If the DSS receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

3.1.4.5.1 Messages

Message	Description
GetRevisionIdListSoapIn	Requests the revision ID list.
GetRevisionIdListSoapOut	A response containing the revision ID list.

3.1.4.5.1.1 GetRevisionIdListSoapIn

```
<wsdl:message name="GetRevisionIdListSoapIn">
  <wsdl:part name="parameters" element="tns:GetRevisionIdList" />
</wsdl:message>
```

GetRevisionIdList: As specified in section 3.1.4.5.2.1.

3.1.4.5.1.2 GetRevisionIdListSoapOut

```
<wsdl:message name="GetRevisionIdListSoapOut">
  <wsdl:part name="parameters" element="tns:GetRevisionIdListResponse" />
</wsdl:message>
```

GetRevisionIdListResponse: As specified in section 3.1.4.5.2.2.

3.1.4.5.2 Elements

Element	Description
GetRevisionIdList	Contains the request for the GetRevisionIdList operation.
GetRevisionIdListResponse	Contains the response for the GetRevisionIdList operation.

3.1.4.5.2.1 GetRevisionIdList

```
<s:element name="GetRevisionIdList">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie"
        type="s1:Cookie" />
      <s:element minOccurs="0" maxOccurs="1" name="filter"
        type="s1:ServerSyncFilter" />
    </s:sequence>
  </s:complexType>
</s:element>
```

cookie: This field MUST be present and set to the Cookie returned by the GetCookie operation. The Cookie MUST NOT be expired.

filter: This field MUST be present. It describes the revisions for which the DSS is searching. Its format is as specified in section 3.1.4.5.3.1.

3.1.4.5.2.2 GetRevisionIdListResponse

```
<s:element name="GetRevisionIdListResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1"
        name="GetRevisionIdListResult"
        type="s1:RevisionIdList" />
    </s:sequence>
  </s:complexType>
</s:element>
```

GetRevisionIdListResult: On successful execution of this operation, this object MUST be returned. Its format is specified in section 3.1.4.5.3.6.

3.1.4.5.3 Complex Types

Complex type	Description
ServerSyncFilter	Contains the server synchronization filter data.
ArrayOfIdAndDelta	Contains an array of the Id and Delta data.
IdAndDelta	Contains the Id and Delta data.
ArrayOfLanguageAndDelta	Contains an array of the Language and Delta data.
LanguageAndDelta	Contains the LanguageAndDelta data.
RevisionIdList	Contains the RevisionIdList data.

3.1.4.5.3.1 ServerSyncFilter

```
<s:complexType name="ServerSyncFilter">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="DssProtocolVersion"
      type="s1:Version" />
    <s:element minOccurs="0" maxOccurs="1" name="Anchor"
      type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="GetConfig"
      type="s:boolean" />
    <s:element minOccurs="1" maxOccurs="1"
      name="Get63LanguageOnly" type="s:boolean" />
    <s:element minOccurs="0" maxOccurs="1" name="Categories"
      type="s1:ArrayOfIdAndDelta" />
    <s:element minOccurs="0" maxOccurs="1"
      name="Classifications" type="s1:ArrayOfIdAndDelta" />
    <s:element minOccurs="0" maxOccurs="1" name="Languages"
      type="s1:ArrayOfLanguageAndDelta" />
  </s:sequence>
</s:complexType>
```

DssProtocolVersion: This field is reserved for future use. It MUST NOT be sent by the DSS.

Anchor: This field MUST not be present for the first call to this operation. It SHOULD be set to the anchor returned in the last successful response from this operation. It identifies the point in time

that the last GetRevisionIdList operation was completed successfully. This field is an opaque string that is not interpreted by the DSS.<35>

GetConfig: This field MUST be present. Set to TRUE if the DSS is requesting categories, update classifications, and detectoids that have changed since the time denoted by the anchor. MUST be set to FALSE if the DSS is requesting software updates.

Get63LanguageOnly: This field MUST be present if a DSS supports version 1.2 or higher of the protocol. This element is not defined in the ServerSyncFilter type for protocol version 1.1. It MUST NOT be present if the DSS supports version 1.1 of the protocol. MUST be set to TRUE if the DSS is requesting up to 63 languages, as specified in section 1.7. A USS implementing version 1.1 of the protocol MUST silently ignore this field.

Categories: This field MAY be present. The USS MUST ignore this field if the **GetConfig** field is set to TRUE. The format of the field is specified in section 3.1.4.5.3.2. If the array is not empty, it specifies a list of category IDs. In this case, the Classifications array MUST also contain at least one classification in order for the filter to work. The USS MUST only return update revisions for updates that belong to at least one of the categories and at least one of the classifications specified.

Classifications: This field MAY be present. The USS MUST ignore this field if the **GetConfig** field is set to TRUE. The format of the field is specified in section 3.1.4.5.3.2. If the array is not empty, it specifies a list of classification IDs. In this case, the Categories array MUST also contain at least one category in order for the filter to work. The USS MUST only return update revisions for updates that belong to at least one of the classifications and at least one of the categories specified.

Languages: This field SHOULD be present if the DSS supports version 1.3 or later of the protocol. This field MUST NOT be present if the DSS supports either 1.1 or 1.2 of the protocol. Its format is specified in section 3.1.4.5.3.4.

3.1.4.5.3.2 ArrayOfIdAndDelta

An array structure, each element of which identifies one category for which update revisions are requested. It also specifies if only newer update revisions are requested.

```
<s:complexType name="ArrayOfIdAndDelta">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="IdAndDelta" nillable="true"
      type="s1:IdAndDelta" />
  </s:sequence>
</s:complexType>
```

IdAndDelta: The format of each element is as specified in section 3.1.4.5.3.3.

3.1.4.5.3.3 IdAndDelta

```
<s:complexType name="IdAndDelta">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="Id"
      type="s2:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="Delta"
      type="s:boolean" />
  </s:sequence>
</s:complexType>
```

Id: Identifies the category or classification for which update revisions are requested.

Delta: Specifies if only update revisions newer than the time denoted by the anchor are requested.

3.1.4.5.3.4 ArrayOfLanguageAndDelta

An array structure, each element of which identifies one language for which update revisions are requested. It also specifies if only newer update revisions are requested. The format of each element is as follows.

```
<s:complexType name="ArrayOfLanguageAndDelta">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="LanguageAndDelta" nillable="true"
      type="s1:LanguageAndDelta" />
  </s:sequence>
</s:complexType>
```

LanguageAndDelta: as specified in section 3.1.4.5.3.5.

3.1.4.5.3.5 LanguageAndDelta

```
<s:complexType name="LanguageAndDelta">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="Id"
      type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="Delta"
      type="s:boolean" />
  </s:sequence>
</s:complexType>
```

Id: Identifies the language for which update revisions are requested, as specified in [MS-LCID].

Delta: Set TRUE to indicate that only update revisions newer than the time denoted by the anchor are requested. Set FALSE to indicate that all update revisions are requested.

3.1.4.5.3.6 RevisionIdList

```
<s:complexType name="RevisionIdList">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="Anchor"
      type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="NewRevisions"
      type="s1:ArrayOfUpdateIdentity" />
  </s:sequence>
</s:complexType>
```

Anchor: This field MUST be returned. It identifies the point in time that this operation was completed successfully.

NewRevisions: This field MUST be present. It identifies the list of update revisions that match the filter specified in the request and are new since the anchor specified in the filter. The list MUST be empty if there are no new revisions.

3.1.4.6 GetUpdateData

A DSS calls the **GetUpdateData** method to get the full update metadata for the list of revision IDs requested.

```
<wsdl:operation name="GetUpdateData">
```

```

    <wsdl:input message="tns:GetUpdateDataSoapIn" />
    <wsdl:output message="tns:GetUpdateDataSoapOut" />
</wsdl:operation>

```

The SOAP operation is defined as follows.

```

<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/GetUpdateData" style="document" />

```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS with the <ErrorCode> set, as shown in the table.

Input	Validation conditions	ErrorCode
cookie	MUST be present and nonempty.	InvalidCookie
cookie	The EncryptedData MUST be the correct format such that the USS can read values out of it, as specified in section 2.2.4.8.	InvalidCookie
protocolVersion in the cookie EncryptedData	MUST be of the format x.y where x is the Major Version and y is the Minor Version number.	InvalidParameters
protocolVersion in the cookie EncryptedData	Major Version MUST be 1.	IncompatibleProtocolVersion
updateIds	MUST not be NULL.	InvalidParameters
updateIds	Number of elements in the array MUST NOT be greater than the MaxNumberOfUpdatesPerRequest value returned in the GetConfigData (section 3.1.4.4) response message.	InvalidParameters

Data processing:

The USS MUST process this message as follows:

1. Search for the requested **updateIds** in the Categories Table, Update Classifications Table, Detectoids Table, and Update Revision Table.
2. For each entry found in step 1, create an entry in the ArrayOfServerSyncUpdateData element of the response. Initialize the entry as follows:
 1. For categories, update classifications, and detectoids, set the UpdateIdentity element to the CategoryIdentity, ClassificationIdentity, and DetectoidIdentity, respectively, and the XML metadata from the table.
 2. For update Revisions found in the Revision Table, set the UpdateIdentity to the UpdateIdentity from the table.
 3. For each ServerSyncUpdateData entry, initialize the **XmlUpdateBlob** or the **XmlUpdateBlobCompressed** element with the XML metadata stored in the table.<36>
 4. For each update Revision, initialize the **FileDigestList** element of the ServerSyncUpdateData with the **FileDigest** of the content files associated with the Revision Table entry.

- For each content file of an update Revision found in the Revision Table in step 2, create an entry in the ArrayOfServerSyncUrlData element of the response. Initialize the **FileDigest** and **MUUrl** fields of this entry from the information in the Revision Table.

Response:

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as defined in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If the DSS receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault with one of the following error codes, which are defined in section 2.2.9.3.

- InvalidParameters
- InternalServerError
- InvalidCookie
- IncompatibleProtocolVersion

If the DSS receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

3.1.4.6.1 Messages

Message	Description
GetUpdateDataSoapIn	Requests the update data.
GetUpdateDataSoapOut	A response containing the update data.

3.1.4.6.1.1 GetUpdateDataSoapIn

```
<wsdl:message name="GetUpdateDataSoapIn">
  <wsdl:part name="parameters" element="tns:GetUpdateData" />
</wsdl:message>
```

GetUpdateData: As specified in section 3.1.4.6.2.1.

3.1.4.6.1.2 GetUpdateDataSoapOut

```
<wsdl:message name="GetUpdateDataSoapOut">
  <wsdl:part name="parameters" element="tns:GetUpdateDataResponse" />
</wsdl:message>
```

GetUpdateData: As specified in section 3.1.4.6.2.2.

3.1.4.6.2 Elements

Element	Description
GetUpdateData	Contains the request for the GetUpdateData operation.

Element	Description
GetUpdateDataResponse	Contains the response for the GetUpdateData operation.

3.1.4.6.2.1 GetUpdateData

```
<s:element name="GetUpdateData">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie"
        type="s1:Cookie" />
      <s:element minOccurs="0" maxOccurs="1" name="updateIds"
        type="s1:ArrayOfUpdateIdentity" />
    </s:sequence>
  </s:complexType>
</s:element>
```

cookie: This field MUST be present and set to the Cookie returned by the GetCookie operation. The Cookie MUST NOT be expired.

updateIds: This field MUST be present. The array MUST contain at least one element. The array MUST contain a maximum number of elements as specified by the **MaxNumberOfUpdatesPerRequest** field returned by the GetConfigData (section 3.1.4.4) operation. It contains a list of update identities, each identifying a specific update revision for which update metadata is requested, as specified in section 2.2.4.6.

3.1.4.6.2.2 GetUpdateDataResponse

```
<s:element name="GetUpdateDataResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1"
        name="GetUpdateDataResult"
        type="s1:ServerUpdateData" />
    </s:sequence>
  </s:complexType>
</s:element>
```

GetUpdateDataResult: On successful execution of this operation, this object MUST be returned. Its format is as specified in section 3.1.4.6.3.1.

3.1.4.6.3 Complex Types

Complex type	Description
ServerUpdateData	Contains the server update data.
ArrayOfServerSyncUpdateData	Contains an array of the server synchronization update data.
ServerSyncUpdateData	Contains the server synchronization update data.
ArrayOfServerSyncUrlData	Contains an array of the server synchronization URL data.
ServerSyncUrlData	Contains the server synchronization URL data.

3.1.4.6.3.1 ServerUpdateData

```

<s:complexType name="ServerUpdateData">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="updates"
      type="s1:ArrayOfServerSyncUpdateData" />
    <s:element minOccurs="0" maxOccurs="1" name="fileUrls"
      type="s1:ArrayOfServerSyncUrlData" />
  </s:sequence>
</s:complexType>

```

updates: This field MUST be present. Each element in the array contains the update metadata. Its type is **ArrayOfServerSyncUpdateData**, whose format is as specified in section 3.1.4.6.3.2.

fileUrls: This field MUST be present. It provides information on the content files referenced by the updates field. Its format is given as specified in section 3.1.4.6.3.4.

3.1.4.6.3.2 ArrayOfServerSyncUpdateData

```

<s:complexType name="ArrayOfServerSyncUpdateData">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="ServerSyncUpdateData" nillable="true"
      type="s1:ServerSyncUpdateData" />
  </s:sequence>
</s:complexType>

```

An array structure, each element of which provides information on an update revision. The format of each element is as specified in section 3.1.4.6.3.3.

3.1.4.6.3.3 ServerSyncUpdateData

```

<s:complexType name="ServerSyncUpdateData">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="Id"
      type="s1:UpdateIdentity" />
    <s:element minOccurs="0" maxOccurs="1"
      name="XmlUpdateBlob" type="s:string" />
    <s:element minOccurs="0" maxOccurs="1"
      name="FileDigestList"
      type="s1:ArrayOfBase64Binary" />
    <s:element minOccurs="0" maxOccurs="1"
      name="XmlUpdateBlobCompressed"
      type="s:base64Binary" />
  </s:sequence>
</s:complexType>

```

Id: This field MUST be present. It identifies the update revision that is described in this structure. The details of UpdateIdentity are specified in section 2.2.4.9.

XmlUpdateBlob: This field MUST be present if **XmlUpdateBlobCompressed** is absent. This field MUST be absent if **XmlUpdateBlobCompressed** is present. The field contains the metadata associated with the update.

FileDigestList: Contains an array of file digests, one for each content file associated with the update revision. The file digest is an SHA-1 hash of the content of the file. If the update revision does not have any associated content file, this field MUST be absent.

XmlUpdateBlobCompressed: This field MUST be absent if **XmlUpdateBlob** is present. It contains metadata associated with the update, compressed using a LZX variant of the Lempel-Ziv compression algorithm. For more information, see [MSDN-CAB]. The LZX window size used for compressing this field is 2 megabytes.

3.1.4.6.3.4 ArrayOfServerSyncUrlData

```
<s:complexType name="ArrayOfServerSyncUrlData">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="ServerSyncUrlData" nillable="true"
      type="s1:ServerSyncUrlData" />
  </s:sequence>
</s:complexType>
```

An array structure, each element of which provides information on an update revision. The format of each element is as specified in section 3.1.4.6.3.5.

3.1.4.6.3.5 ServerSyncUrlData

```
<s:complexType name="ServerSyncUrlData">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="FileDigest"
      type="s:base64Binary" />
    <s:element minOccurs="0" maxOccurs="1" name="MUUrl"
      type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="UssUrl"
      type="s:string" />
  </s:sequence>
</s:complexType>
```

FileDigest: An SHA-1 hash of the content file.

MUUrl: An HTTP URL specifying the location on the Internet from which client computers can download this file. This field **MUST NOT** be present if no such location is available. <37>

UssUrl: Unused. This field **SHOULD NOT** be present, and **MUST** be ignored on receipt. <38>

3.1.4.7 GetDriverIdList

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

~~A DSS **SHOULD** <32> call the The GetDriverIdList method ~~to~~ **SHOULD** <39> get driver revisions and driver sets for new driver updates. ~~The DSS provides filters to be used to prune the list of revisions~~ This method is invoked only when an upstream server (USS) syncs with Microsoft Update.~~

```
<wsdl:operation name="GetRevisionIdList">
  <wsdl:input message="tns:GetDriverIdListSoapIn" />
  <wsdl:output message="tns:GetDriverIdListSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<wsdl:operation name="GetDriverIdList">
  <soap:operation
    soapAction="http://www.microsoft.com/SoftwareDistribution/GetDriverIdList" style="document"
  />
</wsdl:operation>
```

Request validation:

The USS validates inputs as specified in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to [the DSSMicrosoft Update](#) with the ErrorCode set, as shown in the table.

Input	Validation conditions	ErrorCode
Cookie	MUST be present and not empty.	InvalidCookie
Cookie	The EncryptedData MUST be the correct format such that the USS can read values out of it, as specified in section 2.2.4.4.	InvalidCookie
protocolVersion in the cookie EncryptedData	MUST be of the format x.y where x is the Major Version and y is the Minor Version number.	InvalidParameters
protocolVersion in the cookie EncryptedData	Major Version MUST be 1.	IncompatibleProtocolVersion
filter: Anchor	MUST be a valid format, NULL or empty string. The format of the anchor is implementation specific and not defined by the protocol.<40>	InvalidParameters
ComputerIds in the ServerSyncDriverFilter parameter	Must be less than or equal to the value defined in the MaxNumberOfComputerIdsInRequest config value.	InvalidParameters
PnpHardwareIds in the ServerSyncDriverFilter parameter	Must be less than or equal to the value defined in the MaxNumberOfPnpHardwareIdsInRequest config value.	InvalidParameters

Data processing:

The USS MUST compose a GetDriverIdListResponse message as follows:

1. The method checks that the number of computer Ids and device hardware Ids is not greater than the maximum configuration value that is returned to the caller in the **GetConfigData** method.
2. If the caller specifies more Ids, FaultException is returned.
3. The method looks at computer hardware Ids and PNP hardware Ids specified by [the DSSMicrosoft Update](#) and sends the corresponding driver set identities and the referenced driver identities back.
4. If categories are specified and no values are valid, the method returns an empty result (no exception).
5. When only some categories are invalid, the invalid categories are ignored and the method continues to return driver sets/drivers matching ComputerIds and PnpHardwareIds with the correct operating system and category prerequisites.
6. If ComputerIds contains a computer Id that the system is unaware of, that computer Id is ignored.
7. Set the **Anchor** field in the response to mark the time this operation completed.

Response:

If no errors occur during processing, the USS MUST return the success response ~~to the DSS~~.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as described in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If ~~the DSS~~[Microsoft Update](#) receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault, with one of the following errors defined in section 2.2.9.3.

- InvalidParameters
- InternalServerError
- InvalidCookie
- IncompatibleProtocolVersion

If ~~the DSS receives~~ a fault that does not contain an <ErrorCode> element, ~~it MUST stop is received,~~ the protocol MUST be stopped.

3.1.4.7.1 Messages

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

The following WSDL messages are specific to this operation:

Message	Description
GetDriverIdListSoapIn	Requests the Driver ID list.
GetDriverIdListSoapOut	A response containing the Driver ID List.

3.1.4.7.1.1 GetDriverIdListSoapIn

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This message contains the request for **GetDriverIdList** WSDL operation.

```
<wsdl:message name="GetDriverIdListSoapIn">  
  <wsdl:part name="parameters" element="tns:GetDriverIdList" />  
</wsdl:message>
```

GetRevisionIdList: As specified in section

3.1.4.7.1.2 GetDriverIdListSoapOut

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This message contains the response for **GetDriverIdList** WSDL operation.

```
<wsdl:message name="GetDriverIdListSoapOut">  
  <wsdl:part name="parameters" element="tns:GetDriverIdListResponse" />  
</wsdl:message>
```

GetDriverIdListResponse: As specified in section 3.1.4.7.2.2.

3.1.4.7.2 Elements

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

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

Element	Description
GetDriverIdList	Contains the body for the request of the GetDriverIdList WSDL operation.
GetDriverIdListResponse	Contains the body for the response of the GetDriverIdList WSDL operation.

3.1.4.7.2.1 GetDriverIdList

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This element contains the body of the request for the GetDriverIdList WSDL operation. The format is defined in section 3.1.4.7.3.1.

```
<s:element name="GetDriverIdList">  
  <s:complexType>  
    <s:sequence>  
      <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />  
  
      <s:element minOccurs="0" maxOccurs="1" name="filter"  
type="tns:ServerSyncDriverFilter" />  
    </s:sequence>  
  </s:complexType>  
</s:element>
```

cookie: This field **MUST** be present and set to the Cookie returned by the **GetCookie** operation. The Cookie **MUST NOT** be expired.

filter: This field **MUST** be present. It describes the revisions for which ~~the DSS~~Microsoft Update is searching. Its format is as specified in ServerSyncDriverFilter (section 3.1.4.7.3.4).

3.1.4.7.2.2 GetDriverIdListResponse

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This element contains the body of the response for the GetDriverIdList WSDL operation. The format is defined in section 3.1.4.7.3.2.

```
<s:element name="GetDriverIdListResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="GetDriverIdListResult"
type="tns:DriverSetAndRevisionIdList" />
    </s:sequence>
  </s:complexType>
</s:element>
```

GetDriverIdListResult: On successful execution of this operation, this object MUST be returned. Its format is specified in section 3.1.4.7.3.1.

3.1.4.7.3 Complex Types

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

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

Complex type	Description
DriverSetAndRevisionIdList	Contains a collection of driver set identities.
ArrayOfHardwareIdAndDelta	Contains collection of PNP driver hardware Ids.
HardwareIdAndDelta	Contains PNP driver hardware Ids and identifies if newer revisions are requested.
ServerSyncDriverFilter	Contains driver synchronization filter data.

3.1.4.7.3.1 DriverSetAndRevisionIdList

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This complex type contains a collection of driver set identities.

```
<s:complexType name="DriverSetAndRevisionIdList">
  <s:sequence>

  <s:element minOccurs="0" maxOccurs="1" name="Anchor" type="s:string" />
```



```

<s:element minOccurs="0" maxOccurs="1" name="NewRevisions" type="tns:ArrayOfUpdateIdentity"
/>
<s:element minOccurs="0" maxOccurs="1" name="NewDriverSets" type="tns:ArrayOfGuid" />
<s:element minOccurs="0" maxOccurs="1" name="RemovedDriverSets" type="tns:ArrayOfGuid" />

</s:sequence>
</s:complexType>

```

Anchor: This field MUST be returned. It identifies the point in time that the operation completed successfully. Note that the GetDriverIdList can be called multiple times for different groups of Ids (since there is a maximum limit on number of Ids). If called more than once, the method needs to be called with the same anchor that was returned from the first method result. The first anchor is persisted and used the next time the method is called.

NewRevisions: This field MUST be present. It identifies the list of driver update revisions that are new since the anchor specified in the filter. This field also includes the drivers corresponding to the driver sets in the **NewDriverSets** array. The list MUST be empty if there are no new revisions.

NewDriverSets: A list of driver sets that match the computer hardware Ids that were sent in the request and are new since the anchor specified in the filter.

RemovedDriverSets: A list of driver sets that were removed since the anchor specified in the filter. For removed driver sets, the method does not add the corresponding driver revisions to the NewRevisions collection. The fact that the driver set is removed does not mean that corresponding drivers are expired. It is up to [the DSSMicrosoft Update](#) to determine whether any of the drivers that were referenced by the removed driver set are referenced by any other driver set. If not, then the information can be removed from its data store.

3.1.4.7.3.2 ArrayOfHardwareIdAndDelta

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

In this array structure, each element identifies one device hardware Id for which driver updates are requested. It also specifies whether newer update revisions only are requested.

```

<s:complexType name="ArrayOfHardwareIdAndDelta">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="HardwareIdAndDelta"
nillable="true" type="tns:HardwareIdAndDelta" />
  </s:sequence>
</s:complexType>

```

HardwareIdAndDelta: The format of each element is specified in section 3.1.4.7.3.3.

3.1.4.7.3.3 HardwareIdAndDelta

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This complex type contains device driver hardware Ids and specifies whether newer revisions are requested.

```

<s:complexType name="HardwareIdAndDelta">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="Id" type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="Delta" type="s:boolean" />
  </s:sequence>
</s:complexType>

```

Id: Identifies the device hardware ID for which driver update revisions are requested. This field **MUST** be present.

Delta: Specifies if only driver update revisions newer than the time denoted by the anchor are requested. This field **MUST** be present.

3.1.4.7.3.4 ServerSyncDriverFilter

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This complex type contains driver synchronization filter data.

```

<s:complexType name="ServerSyncDriverFilter">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="DssProtocolVersion" type="tns:Version" />
    <s:element minOccurs="0" maxOccurs="1" name="Anchor" type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="Categories" type="tns:ArrayOfIdAndDelta" />
    <s:element minOccurs="0" maxOccurs="1" name="ComputerIds" type="tns:ArrayOfIdAndDelta" />
    <s:element minOccurs="0" maxOccurs="1" name="PnpHardwareIds" type="tns:ArrayOfHardwareIdAndDelta" />
  </s:sequence>
</s:complexType>

```

DssProtocolVersion: This field **MUST** be sent but is ignored by the server.

Anchor: This field **SHOULD** be set to the anchor returned in the first successful response from this operation. It identifies the point in time that the last GetDriverIdList operation was completed successfully. This field is an opaque string that is not interpreted by ~~the DSS. If the DSS~~[Microsoft Update. If Microsoft Update](#) has never called the USS before, this field **MUST NOT** be present for the first call to this operation.

Categories: This field **MUST** be present. The format of the field is specified in section 3.1.4.5.3.2. If the array is not empty, it specifies a list of category IDs and whether or not delta-synchronization is to be applied for each update. If empty, then USS will return all matching driver sets/drivers irrespective of OS/category prerequisites. When specified, USS filters only driver sets/drivers that have the correct OS/category prerequisite.

For a category in the array, if the Delta field is set to TRUE, the update server **MUST** only return driver updates in that category that have changed since the last sync and that match the other filter criteria specified by the **ComputerIds** and **PnpHardwareIds** fields. Otherwise, all updates in that categories **MUST** be returned that match the other criteria specified by the **ComputerIds** and **PnpHardwareIds** fields.

ComputerIds: A List of computer hardware Ids that represent a combination of the system management BIOS values put in the device by the OEMs. (Manufacturer, Family, ProductName,

SKUNumber, BIOS Vendor, BIOS Version, BIOS Major Release, BIOS Minor Release). This is different from the Categories field, in that the USS MUST return driver sets only if the specified Ids match something. If the array is empty, no driver sets are returned.

PnpHardwareIds: This field MUST be present. It is a list of device driver hardware Ids that represent the different hardware components available on the client devices. The USS only returns drivers if ~~the DSS~~Microsoft Update specifies PNP Ids in the array and the USS has driver updates for those IDs. If the array is empty, no driver updates are returned.

3.1.4.8 GetDriverSetData

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

~~A DSS SHOULD<35>~~ call the The **GetDriverSetData** method ~~to~~SHOULD<42> get a list of driver set identities and their corresponding driver targeting XMLs. ~~The DSS~~This method is only invoked when an upstream server (USS) syncs with Microsoft Update, which provides a list of driver set identities as input.

```
<wsdl:operation name="GetDriverSetData">
  <wsdl:input message="tns:GetDriverSetDataSoapIn" />
  <wsdl:output message="tns:GetDriverSetDataSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<wsdl:operation name="GetDriverSetData">
  <soap:operation
    soapAction="http://www.microsoft.com/SoftwareDistribution/GetDriverSetData" style="document"
  />
</wsdl:operation>
```

Request validation:

The USS validates inputs as specified in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message ~~to the DSS~~ with the <ErrorCode> set, as shown in the table.

Input	Validation conditions	ErrorCode
Cookie	MUST be present and not empty.	InvalidCookie
Cookie	The EncryptedData MUST be the correct format such that the USS can read values out of it, as specified in section 2.2.4.4.	InvalidCookie
protocolVersion in the cookie EncryptedData	MUST be of the format x.y where x is the Major Version and y is the Minor Version number.	InvalidParameters
protocolVersion in the cookie EncryptedData	Major Version MUST be 1.	IncompatibleProtocolVersion

Input	Validation conditions	ErrorCode
driverSets in the GetDriverSetData method	Should not be greater than the max defined in the MaxNumberOfDriverSetsPerRequest config value.	InvalidParameters

Data processing:

The method takes an array of **DriverSetIds**. The USS MUST compose a GetDriverSetDataResponse message in response, as follows:

1. The method checks that the number of driver set ids is not bigger than the maximum configuration value that is returned to the caller in GetConfigData method.
2. If the caller specifies more ids, FaultException is returned.
3. If matching driver sets are found, return an array of **ServerSyncDriverSetData** (section 3.1.4.8.3.2) where each one contains driver set identity and driver targeting XML.

Response:

If no errors occur during processing, the USS MUST return the success response ~~to the DSS~~.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as described in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If ~~the DSS~~ **Microsoft Update** receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault, as described in the following table. If ~~the DSS~~ **it** receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

ErrorCode	Description
InvalidParameters	Parameters passed to a web method are not valid. The "message" part of the exception will contain the parameter name. The DSS MUST stop the protocol <u>MUST be stopped</u> .
InternalServerError	An internal error occurred on the server. The DSS MUST stop the protocol <u>MUST be stopped</u> .
InvalidCookie	The cookie has a syntax, formatting, or other error. The DSS MUST restart the protocol <u>is restarted</u> from the beginning.
IncompatibleProtocolVersion	The version of the protocol used by DSS Microsoft Update is incompatible with the version used by USS. The DSS MUST stop the protocol <u>MUST be stopped</u> .
TooManyIds	When the # of driver set ids specified is greater than defined by the MaxNumberOfDriverSetsPerRequest configuration value

3.1.4.8.1 Messages

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

The WSDL messages specific to this operation are as follows:

Message	Description
GetDriverSetDataSoapIn	Contains the request for the GetDriverSetData WSDL operation.
GetDriverSetDataSoapOut	Contains the response for the GetDriverSetData WSDL operation.

3.1.4.8.1.1 GetDriverSetDataSoapIn

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This WSDL message contains the request for the **GetDriverSetData** WSDL operation.

```
<wsdl:message name="GetDriverSetDataSoapIn">
  <wsdl:part name="parameters" element="tns:GetDriverSetData" />
</wsdl:message>
```

GetDriverSetData: As specified in section 3.1.4.8.2.1

3.1.4.8.1.2 GetDriverSetDataSoapOut

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This WSDL message contains the response for the **GetDriverSetData** WSDL operation.

The SOAP action value is:

```
<wsdl:message name="GetDriverSetDataSoapOut">
  <wsdl:part name="parameters" element="tns:GetDriverSetDataResponse" />
</wsdl:message>
```

GetDriverSetDataResponse: As specified in section 3.1.4.8.2.2

3.1.4.8.2 Elements

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

The XML schema element definitions for this operation are as follows:

Element	Description
GetDriverSetData	Contains the body for the request of the GetDriverSetData WSDL operation.

Element	Description
GetDriverSetDataResponse	Contains the body for the response of the GetDriverSetData WSDL operation.

3.1.4.8.2.1 GetDriverSetData

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This element contains the body of the request message for the **GetDriverSetData** operation.

```
<s:element name="GetDriverSetData">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />
      <s:element minOccurs="0" maxOccurs="1" name="driverSets" type="tns:ArrayOfGuid" />
    </s:sequence>
  </s:complexType>
</s:element>
```

cookie: This field **MUST** be present and set to the Cookie returned by the GetCookie operation. The Cookie **MUST NOT** be expired.

driverSets: This field **MUST** be present. The array **MUST NOT** contain more than the maximum number of elements specified by the **MaxNumberOfDriverSetsPerRequest** field returned by the GetConfigData (section 3.1.4.4) operation. It contains a list of driver set identities, each identifying the specific driver-targeting-XML update metadata that was requested. If the array is NULL, a SOAP fault (InvalidParameters) is returned. If it is empty, no error message or data is returned.

3.1.4.8.2.2 GetDriverSetDataResponse

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This element contains the body of the response message for the GetDriverSetData operation.

```
<s:element name="GetDriverSetDataResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="GetDriverSetDataResult" type="tns:ServerDriverSetData" />
    </s:sequence>
  </s:complexType>
</s:element>
```

ServerDriverSetData: Contains an array of ServerSyncDriverSetData and each contain driver set identity and driver targeting XML.

3.1.4.8.3 Complex Types

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

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

Complex type	Description
ServerDriverSetData	Contains an array of ServerSyncDriverSetData.
ServerSyncDriverSetData	Contains driver set identity and driver targeting XML.

3.1.4.8.3.1 ServerDriverSetData

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This complex type contains an array of ServerSyncDriverSetData.

```
<s:complexType name="ServerDriverSetData">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="DriverSets"
type="tns:ArrayOfServerSyncDriverSetData" />
  </s:sequence>
</s:complexType>
```

DriverSets: Contains an array of Driver Sets.

3.1.4.8.3.2 ServerSyncDriverSetData

~~Note: All of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

This complex type contains driver set identity and driver targeting XML.

```
<s:complexType name="ServerSyncDriverSetData">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="DriverSetId" type="s1:guid" />
    <s:element minOccurs="0" maxOccurs="1" name="DriverSetXml" type="s:string" />
  </s:sequence>
</s:complexType>
```

DriverSetId: A GUID that uniquely identifies a driver set.

DriverSetXml: A driver set targeting XML that represents the metadata for a driver set. It contains the following information:

- Matching computer hardware Id
- SMBIOS fields that make up the computer hardware Id
- Update Ids of the drivers that are part of this set
- Operating system and architecture prerequisites

3.1.4.9 GetRelatedRevisionsForUpdates

This method is not used in the protocol. The USS MUST ignore it if called.

3.1.4.10 GetDeployments

A DSS calls the GetDeployments method to get the list of deployments that are new or changed since the last successful GetDeployments call made by this DSS. This call MUST NOT be invoked unless the DSS is configured to be a "Replica Server", as specified in section 3.1.1.

```
<wsdl:operation name="GetDeployments">
  <wsdl:input message="tns:GetDeploymentsSoapIn" />
  <wsdl:output message="tns:GetDeploymentsSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/GetDeployments" style="document" />
```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS with the <ErrorCode> set, as shown in the table.

Input	Validation conditions	ErrorCode
cookie	MUST be present and not empty.	InvalidCookie
cookie	The EncryptedData MUST be the correct format such that the USS can read values out of it, as specified in section 2.2.4.8.	InvalidCookie
protocolVersion in the cookie EncryptedData	MUST be of the format x.y where x is the Major Version and y is the Minor Version number.	InvalidParameters
protocolVersion in the cookie EncryptedData	Major Version MUST be 1.	IncompatibleProtocolVersion
deploymentAnchor	MUST be a string with the correct format, an empty string, or not present. The format of the anchor is implementation-specific and not defined by the protocol.<43>	InvalidParameters
syncAnchor	MUST be a valid format and not NULL and not an empty string. The format of the anchor is	InvalidParameters

Input	Validation conditions	ErrorCode
	implementation-specific and not defined by the protocol.<44>	

Data processing:

The USS MUST compose a GetDeploymentsResponse message in response, as follows:

1. Search the TargetGroup Table for all target groups defined on the USS. For each entry found in the table, create a **ServerSyncTargetGroup** entry in the **Groups** field of the response. Initialize the **ServerSyncTargetGroup** entry from the entry in the Targets Group Table.
2. Search the Deployment Table for all deployments that have been added between the time identified by the **deploymentAnchor** and the time identified by the sync anchor. For each entry found in the Deployment Table, create a ServerSyncDeployment entry in the **Deployments** field of the response. Initialize the ServerSyncDeployment entry from the entry in the Deployment Table.
3. Search the Deployment Table for all deployments that have been deleted between the time identified by the **deploymentAnchor** and the time identified by the **syncAnchor** and add their GUIDs to the **DeadDeployments** array in the response.
4. Search the Revision Table for all entries whose **Hidden** field is set to TRUE and add their GUIDs to the **HiddenUpdates** array in the response.
5. Search the EULAs Table for all entries whose **Accepted** field is set to TRUE and add their GUIDs to the **AcceptedEulas** array in the response.

Response:

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as described in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If the DSS receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault with one of the following error codes, which are defined in section 2.2.9.3.

- InvalidParameters
- InternalServerError
- InvalidCookie
- IncompatibleProtocolVersion

If the DSS receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

3.1.4.10.1 Messages

Message	Description
GetDeploymentsSoapIn	Requests the deployment data.
GetDeploymentsSoapOut	A response containing the deployment data.

3.1.4.10.1.1 GetDeploymentsSoapIn

```
<wsdl:message name="GetDeploymentsSoapIn">
  <wsdl:part name="parameters" element="tns:GetDeployments" />
</wsdl:message>
```

GetDeployments: As specified in 3.1.4.10.2.1.

3.1.4.10.1.2 GetDeploymentsSoapOut

```
<wsdl:message name="GetDeploymentsSoapOut">
  <wsdl:part name="parameters" element="tns:GetDeploymentsResponse" />
</wsdl:message>
```

GetDeploymentsResponse: As specified in 3.1.4.10.2.2.

3.1.4.10.2 Elements

Element	Description
GetDeployments	Contains the request for the GetDeployments operation.
GetDeploymentsResponse	Contains the response for the GetDeployments operation.

3.1.4.10.2.1 GetDeployments

```
<s:element name="GetDeployments">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie"
        type="s1:Cookie" />
      <s:element minOccurs="0" maxOccurs="1"
        name="deploymentAnchor" type="s:string" />
      <s:element minOccurs="0" maxOccurs="1" name="syncAnchor"
        type="s:string" />
    </s:sequence>
  </s:complexType>
</s:element>
```

cookie: This field MUST be present and set to the Cookie returned by the GetCookie operation. The Cookie MUST NOT be expired.

deploymentAnchor: This identifies the point in time that the last GetDeployments operation was completed successfully. If this is the first time the GetDeployments operation is called, this field MUST NOT be present. For subsequent calls to GetDeployments, it MUST be set to the anchor returned in the last GetDeployments call.

syncAnchor: This field MUST be present. It MUST be set to the anchor returned in the last successful GetRevisionIdList operation response. It identifies the point in time that the last GetRevisionIdList operation was completed successfully.

3.1.4.10.2.2 GetDeploymentsResponse

```
<s:element name="GetDeploymentsResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" />
    </s:sequence>
  </s:complexType>
</s:element>
```

```

        name="GetDeploymentsResult"
        type="s1:ServerSyncDeploymentResult" />
    </s:sequence>
</s:complexType>
</s:element>

```

GetDeploymentsResult: On successful execution of this operation, this object MUST be returned. Its format is as specified in section 3.1.4.10.3.1.

3.1.4.10.3 Complex Types

Complex type	Description
ServerSyncDeploymentResult	Contains the server update data.
ArrayOf ServerSyncTargetGroup	Contains an array of the ServerSyncTargetGroup data.
ServerSyncTargetGroup	Contains the ServerSyncTargetGroup data.
ArrayOf ServerSyncDeployment IData	Contains an array of the ServerSyncDeployment data.
ServerSyncDeployment	Contains the ServerSyncDeployment data.

3.1.4.10.3.1 ServerSyncDeploymentResult

```

<s:complexType name="ServerSyncDeploymentResult">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="Anchor"
      type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="Groups"
      type="s1:ArrayOfServerSyncTargetGroup" />
    <s:element minOccurs="0" maxOccurs="1" name="Deployments"
      type="s1:ArrayOfServerSyncDeployment" />
    <s:element minOccurs="0" maxOccurs="1"
      name="DeadDeployments" type="s1:ArrayOfGuid" />
    <s:element minOccurs="0" maxOccurs="1"
      name="HiddenUpdates" type="s1:ArrayOfGuid" />
    <s:element minOccurs="0" maxOccurs="1"
      name="AcceptedEulas" type="s1:ArrayOfGuid" />
  </s:sequence>
</s:complexType>

```

Anchor: This field MUST be present. It identifies the point in time that the last GetDeployments operation was completed successfully.

Groups: This field MUST be present. It provides information on all client computer target groups configured on the USS. The target group information is as specified in the **ServerSyncTargetGroup** data type in this section.

Deployments: This field MUST be present, but it MAY contain zero elements in the array. It provides information on all the deployments that have been added to the USS between the time identified by the **deploymentAnchor** and the time identified by the **syncAnchor** inputs passed in the request. The deployment information is as specified in the **ServerSyncDeployment** data type in this section.

DeadDeployments: This field MUST be present, but it MAY contain zero elements in the array. It provides information on the list of deployments that have been removed from the USS between the time identified by the **deploymentAnchor** and the time identified by the **syncAnchor** inputs passed in the request.

HiddenUpdates: This field MUST be present, but it MAY contain zero elements in the array. It lists all of the updates that have been hidden by the administrator on the USS and are therefore unavailable for deployment on client computers. Unlike deployments and **DeadDeployments**, this is a full list rather than a list of the elements changed since the last time identified by the **deploymentAnchor**.

AcceptedEulas: This field MUST be present, but it MAY contain zero elements in the array. It lists all the EULAs that have been accepted by the administrator on the USS. Unlike deployments and **DeadDeployments**, this is a full list that does not take the **deploymentAnchor** into account.

3.1.4.10.3.2 ArrayOfServerSyncTargetGroup

```
<s:complexType name="ArrayOfServerSyncTargetGroup">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="ServerSyncTargetGroup" nillable="true"
      type="s1:ServerSyncTargetGroup" />
  </s:sequence>
</s:complexType>
```

An array structure, each element of which provides information on one target group. The format of each element is as specified in section 3.1.4.10.3.3.

3.1.4.10.3.3 ServerSyncTargetGroup

```
<s:complexType name="ServerSyncTargetGroup">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1"
      name="TargetGroupId" type="s2:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="ParentGroupId"
      type="s1:guid" />
    <s:element minOccurs="0" maxOccurs="1" name="Name"
      type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="IsBuiltin"
      type="s:boolean" />
  </s:sequence>
</s:complexType>
```

TargetGroupID: This field uniquely identifies the target group.

ParentGroupID: This field MUST be present. This field is a GUID identifying the parent group of this target group. For the target group at top of the group hierarchy, the value MUST be set to a GUID containing all zeros.

Name: This field MUST be present. It specifies a human-readable text name for the target group.

IsBuiltin: This field is set to FALSE for a target group that is created by an administrator. Otherwise, it is set to TRUE.

3.1.4.10.3.4 ArrayOfServerSyncDeployment

```
<s:complexType name="ArrayOfServerSyncDeployment">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="ServerSyncDeployment" nillable="true"
      type="s1:ServerSyncDeployment" />
  </s:sequence>
</s:complexType>
```

An array structure, each element of which provides information on one deployment. The format of each element is as specified in section 3.1.4.10.3.5.

3.1.4.10.3.5 ServerSyncDeployment

```
<s:complexType name="ServerSyncDeployment">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="UpdateId"
      type="s2:guid" />
    <s:element minOccurs="1" maxOccurs="1"
      name="RevisionNumber" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="Action"
      type="s:int" />
    <s:element minOccurs="0" maxOccurs="1" name="AdminName"
      type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="Deadline"
      type="s:dateTime" />
    <s:element minOccurs="1" maxOccurs="1" name="IsAssigned"
      type="s:boolean" />
    <s:element minOccurs="1" maxOccurs="1" name="GoLiveTime"
      type="s:dateTime" />
    <s:element minOccurs="1" maxOccurs="1"
      name="DeploymentGuid" type="s2:guid" />
    <s:element minOccurs="1" maxOccurs="1"
      name="TargetGroupId" type="s2:guid" />
    <s:element minOccurs="1" maxOccurs="1"
      name="DownloadPriority" type="s:unsignedByte" />
  </s:sequence>
</s:complexType>
```

UpdateId: This field identifies the update that is referred to in this deployment.

RevisionNumber: This field identifies the specific revision of the update referred to in this deployment.

Action: This field specifies the specific action defined by this deployment. The value MUST be one of the following.

Value	Action
0	Install the update revision.
1	Uninstall the update revision.
2	Scan for the presence of the update revision.
3	Block.

AdminName: This field specifies the login name of the administrator that created this deployment.

Deadline: Specifies the date/time by which the update revision referred to in this deployment is be installed on the computers in the target group referred to in this deployment. If there is no deadline associated with this deployment, the deadline value MUST be set to the following.

Date (Year-Month-Date) = 9999-12-31

Time (Hours:Minutes:Seconds)= 23:59:59.9999999

IsAssigned: This field is not used within this protocol and is used when client computers communicate with the update server. The value in this field MUST be preserved for use with client computers. It specifies whether the update revision is installed by the Automatic Update component of the client, as specified in [MS-WUSP].

GoLiveTime: This field specifies the date/time after which the update revision MUST be made available for deployment.

DeploymentGuid: This field MUST be set to a GUID that uniquely identifies this deployment.

TargetGroupId: This field identifies the target group for which this deployment action applies.

DownloadPriority: This field specifies a value indicating how the client computer prioritizes its download of content for this deployment relative to other deployments. The value MUST be an integer value between 1 and 3, inclusive, where 1 indicates the lowest priority, and 3 indicates the highest priority.

3.1.4.11 DownloadFiles

A DSS calls the DownloadFiles method to initiate the Content Download process on a USS for a set of files from the parent of the USS. This method is typically called by a DSS after a Content Download attempt from the USS fails with a "File Not Found" condition.

```
<wsdl:operation name="DownloadFiles">
  <wsdl:input message="tns:DownloadFilesSoapIn" />
  <wsdl:output message="tns:DownloadFilesSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribution/DownloadFiles" style="document" />
```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS with the <ErrorCode> set, as shown in the following table.

Input	Validation conditions	ErrorCode
cookie	MUST be present and not empty.	InvalidCookie
cookie	The EncryptedData MUST be the correct format such that the USS can read values out of it, as specified in section 2.2.4.8.	InvalidCookie
protocolVersion in the cookie EncryptedData	MUST be of the format x.y where x is the Major Version and y is the Minor Version number.	InvalidParameters
protocolVersion in the cookie EncryptedData	Major Version MUST be 1.	IncompatibleProtocolVersion
fileDigestList	MUST be present, and the number of elements in the array MUST NOT be greater than 100.	InvalidParameters

Data processing:

The USS MUST process this message as follows:

1. Locate the entry corresponding to each requested **FileDigest** in the Revision Table.

2. For all **FileDigest** values not found in the table, report back a SOAP fault to the DSS with **ErrorCode** set to "FileDigestsMissing" and the <Message> XML element within the <soap:Fault><detail> element containing the list of missing **FileDigest** values, each separated by a "|" character.
3. For each entry found in the Revision Table, initiate an HTTP download as follows:
 - If the Parent Server State's **CatalogOnlySync** flag is set to FALSE, construct the URL as given below and initiate the download.
 - If the Parent Server State's **CatalogOnlySync** flag is TRUE, initiate the download from using the **MUUrl** for the file.
4. If the download fails, silently ignore the error.
5. If the download succeeds, verify that the **FileDigest** field of the corresponding entry in the Content Store matches the SHA-1 hash value computed over the contents of the file. If the values do not match, delete the downloaded file. Otherwise, store the file in the Content Store.

Response:

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as described in section 2.2.9. If the SOAP fault contains an <ErrorCode> element, its value MUST be one of the following.

If the DSS receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault, as described in the following table. If the DSS receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

ErrorCode	Description
InvalidParameters	Parameters passed to a web method are not valid. The message part of the exception will contain the parameter name. The DSS MUST stop the protocol.
InternalServerError	An internal error occurred on the server. The DSS MUST stop the protocol.
InvalidCookie	The cookie has a syntax, formatting, or other error. The DSS MUST restart the protocol from the beginning.
IncompatibleProtocolVersion	The version of the protocol used by DSS is incompatible with the version used by USS. The DSS MUST stop the protocol.
FileDigestsMissing	Some or all of the requested FileDigest values are not known to the USS. This could be due to deletion of unneeded updates on the USS. The DSS MUST restart the protocol from the beginning.

3.1.4.11.1 Messages

Message	Description
DownloadFilesSoapIn	Requests the file download data.
DownloadFilesSoapOut	Response containing the file download data.

3.1.4.11.1.1 DownloadFilesSoapIn

```
<wsdl:message name="DownloadFilesSoapIn">
  <wsdl:part name="parameters" element="tns:DownloadFiles" />
</wsdl:message>
```

DownloadFiles: As specified in section 3.1.4.11.2.1.

3.1.4.11.1.2 DownloadFilesSoapOut

```
<wsdl:message name="DownloadFilesSoapOut">
  <wsdl:part name="parameters" element="tns:DownloadFilesResponse" />
</wsdl:message>
```

DownloadFilesResponse: As specified in section 3.1.4.11.2.2.

3.1.4.11.2 Elements

Element	Description
DownloadFiles	Contains the request for the DownloadFiles operation.
DownloadFilesResponse	Contains the response for the DownloadFiles operation.

3.1.4.11.2.1 DownloadFiles

```
<s:element name="DownloadFiles">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie"
        type="s1:Cookie" />
      <s:element minOccurs="0" maxOccurs="1"
        name="fileDigestList"
        type="s1:ArrayOfBase64Binary" />
    </s:sequence>
  </s:complexType>
</s:element>
```

cookie: This field **MUST** be present and set to the Cookie returned by the GetCookie operation. The Cookie **MUST NOT** be expired.

fileDigestList: This field **MUST** be present. The array **MUST** contain at least one element and, at most, 100 elements. Each element contains the SHA-1 hash value for an update content file. The hash value is one of those returned by the USS in GetUpdateData operation.

3.1.4.11.2.2 DownloadFilesResponse

```
<s:element name="DownloadFilesResponse">
  <s:complexType />
</s:element>
```

This type has no fields.

3.1.4.12 Ping

This method is not used in the Windows Update Services: Server-Server Protocol. The DSS MUST NOT call it.

3.1.4.13 GetRollupConfiguration

A DSS calls the GetRollupConfiguration method to obtain information on the USS's report rollup configuration settings.

```
<wsdl:operation name="GetRollupConfiguration">
  <wsdl:input message="tns:GetRollupConfigurationSoapIn" />
  <wsdl:output message="tns:GetRollupConfigurationSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/GetRollupConfiguration" style="document" />
```

Request validation:

The USS performs no input validation.

Data processing:

The USS MUST compose a GetRollupConfigurationResponse message in response, as follows:

1. **DoDetailedRollup**: Set to the **DoDetailedRollup** value stored in the Server Configuration Table.
2. **RollupResetGuid**: Set to the RollupResetGuid value stored in the Server Configuration Table.
3. **ServerId**: Set to the **ServerID** value stored in the Server Configuration Table.
4. **RollupDownstreamServersMaxBatchSize**: Set to the maximum number of DownstreamServerRollupClientSummary structures the USS will accept in a single RollupDownstreamServers request, summed across all DownstreamServerRollupInfo structures in the request. The value is implementation-specific. <45>
5. **RollupComputersMaxBatchSize**: Set to the maximum number of ComputerRollupInfo structures the USS will accept in a single RollupComputers request. The value is implementation-specific. <46>
6. **GetOutOfSyncComputersMaxBatchSize**: Set to the maximum number of ComputerLastRollupNumber structures the USS will accept in a single GetOutOfSyncComputers request. The value is implementation-specific. <47>
7. **RollupComputerStatusMaxBatchSize**: Set to the maximum number of ComputerStatusRollupInfo structures the USS will accept in a single RollupComputerStatus request. The value is implementation-specific. <48>

Response:

If no errors occur during processing, the USS MUST return the response to the DSS. If an error occurs during processing, the USS MUST return a SOAP fault indicating that an error occurred. This protocol does not define a mechanism for returning information on the cause of the failure. The DSS MUST stop the protocol when a SOAP fault is received.

3.1.4.13.1 Messages

Message	Description
GetRollupConfigurationSoapIn	Requests the rollup configuration data.
GetRollupConfigurationSoapOut	Response containing the rollup configuration data.

3.1.4.13.1.1 GetRollupConfigurationSoapIn

```
<wsdl:message name="GetRollupConfigurationSoapIn">  
  <wsdl:part name="parameters" element="tns:GetRollupConfiguration" />  
</wsdl:message>
```

GetRollupConfiguration: As specified in section 3.1.4.13.2.1.

3.1.4.13.1.2 GetRollupConfigurationSoapOut

```
<wsdl:message name="GetRollupConfigurationSoapOut">  
  <wsdl:part name="parameters" element="tns:GetRollupConfigurationResponse" />  
</wsdl:message>
```

GetRollupConfigurationResponse: As specified in section 3.1.4.13.2.2.

3.1.4.13.2 Elements

Element	Description
<GetRollupConfiguration>	Contains the request for the GetRollupConfiguration operation.
<GetRollupConfigurationResponse>	Contains the response for the GetRollupConfiguration operation.

3.1.4.13.2.1 GetRollupConfiguration

```
<s:element name="GetRollupConfiguration">  
  <s:complexType>  
    <s:sequence>  
      <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />  
    </s:sequence>  
  </s:complexType>  
</s:element>
```

cookie: This field is reserved for future use. This field MUST be present, and the value MUST be set to the following:

Expiration (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999

EncryptedData = zero length array

3.1.4.13.2.2 GetRollupConfigurationResponse

```
<s:element name="GetRollupConfigurationResponse">  
  <s:complexType>  
    <s:sequence>
```

```

    <s:element minOccurs="0" maxOccurs="1" name="GetRollupConfigurat
ionResult" type="tns:RollupConfiguration" />
  </s:sequence>
</s:complexType>
</s:element>

```

GetRollupConfigurationResult: On successful execution of this operation, this object MUST be returned. Its format is as specified in section 3.1.4.13.3.1.

3.1.4.13.3 Complex Types

Complex type	Description
RollupConfiguration	Contains the RollupConfiguration data.

3.1.4.13.3.1 RollupConfiguration

```

<s:complexType name="RollupConfiguration">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="DoDetailedRollup"
type="s:boolean" />
    <s:element minOccurs="1" maxOccurs="1" name="RollupResetGuid"
type="sl:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="ServerId"
type="sl:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="RollupDownstreamS
erversMaxBatchSize" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="RollupComputersMax
BatchSize" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="GetOutOfSyncComputers
MaxBatchSize" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="RollupComputerStatus
MaxBatchSize" type="s:int" />
  </s:sequence>
</s:complexType>

```

DoDetailedRollup: This field MUST be present. It MUST be set to TRUE if the USS has been configured to collect detailed information on client computers from the DSS. Otherwise, it MUST be set to FALSE.

RollupResetGuid: This field MUST be present and MUST contain a well-formed GUID, adhering to the schema of the guid type as defined in section 2.2.5.1. The DSS uses this value to compare against a saved rollup configuration. If the configuration value does not match the value from the saved rollup configuration, the DSS SHOULD save the new rollup configuration value and mark data for full rollup to a new USS; otherwise, it can continue with the GetOutOfSyncComputers operation.

ServerId: This field MUST be present. It MUST be a GUID that identifies the USS.

RollupDownstreamServersMaxBatchSize: This field MUST be present. It specifies the maximum number of DownstreamServerRollupInfo elements the DSS can pass in a call to RollupDownstreamServers. The value MUST be greater than zero.

RollupComputersMaxBatchSize: This field MUST be present. It specifies the maximum number of ComputerRollupInfo elements the DSS can pass in a call to RollupComputers. The value MUST be greater than zero.

GetOutOfSyncComputersMaxBatchSize: This field MUST be present. It specifies the maximum number of ComputerLastRollupNumber elements the DSS can pass in a call to GetOutOfSyncComputers. The value MUST be greater than zero.

RollupComputerStatusMaxBatchSize: This field MUST be present. It specifies the maximum number of ComputerStatusRollupInfo elements the DSS can pass in a call to RollupComputerStatus. The value MUST be greater than zero.

3.1.4.14 RollupDownstreamServers

A DSS calls the RollupDownstreamServers method to send information on itself (and on DSSs that synchronize updates from it) to the USS.

```
<wsdl:operation name="RollupDownstreamServers">
  <wsdl:input message="tns:RollupDownstreamServersSoapIn" />
  <wsdl:output message="tns:RollupDownstreamServersSoapOut" />
</wsdl:operation>
```

The SOAP operation is defined as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/RollupDownstreamServers" style="document" />
```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS.

Input	Validation conditions
downstreamServers	MUST be present, and the total number of DownstreamServerRollupClientSummary structures in the request (summed across all DownstreamServerRollupInfo structures in the request) MUST NOT exceed the RollupDownstreamServersMaxBatchSize value returned by the USS in the preceding GetRollupConfiguration call.

Data processing:

The USS MUST process this message as follows:

1. The USS MAY use the clientTime value passed by the DSS to determine the difference between the USS system clock and DSS system clock, and adjust the other input time stamps to compensate for the difference.<49>
2. For each DownstreamServerRollupInfo structure in the request:
 1. Get the **ParentServerId** value and search the DSS Table for an entry with a **ServerID** matching this value. If no such entry is found, return a SOAP fault message and stop processing this request.
 2. Get the **ServerId** value and search the DSS Table for an entry with a **ServerID** matching this value.
 1. If no entry is found, create a new entry, initializing all values in the entry using values from the DownstreamServerRollupInfo structure.

If the DownstreamServerRollupInfo structure contains a **ParentServerId** value of "00000000-0000-0000-0000-000000000000", the **ParentServerId** value MUST instead use the **ServerID** value from the Server Configuration Table.

2. If an existing entry is found, and the **LastRollupTime** value from this entry in the table is less than or equal to the **LastRollupTime** value from the DownstreamServerRollupInfo structure, then do the following:
 1. Update the entry using the values from the DownstreamServerRollupInfo structure. If the DownstreamServerRollupInfo structure contains a **ParentServerId** value of "00000000-0000-0000-0000-000000000000", the **ParentServerID** value MUST instead use the **ServerID** value from the Server Configuration Table.
 2. For each DownstreamServerRollupClientSummary structure in the **ClientSummaries** array, search the Client Computer Activity Summaries Table for an entry with UpdateID, ServerID, and OS version values matching those from the DownstreamServerRollupInfo and DownstreamServerRollupClientSummary structures.
 1. If an existing entry is found, increment the **InstallSuccessCount** and **InstallFailureCount** values in the table entry by the corresponding value from the DownstreamServerRollupClientSummary structure.
 2. Else add a new entry to the table using the values from the DownstreamServerRollupInfo and DownstreamServerRollupClientSummary structure.
3. Else ignore this DownstreamServerRollupInfo structure.

Response:

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault indicating that an error occurred. This protocol does not define a mechanism for returning information on the cause of the failure.

3.1.4.14.1 Messages

Message	Description
RollupDownstreamServersSoapIn	Requests the downstream servers rollup data.
RollupDownstreamServersSoapOut	A response containing the downstream servers rollup data.

3.1.4.14.1.1 RollupDownstreamServersSoapIn

```
<wsdl:message name="RollupDownstreamServersSoapIn">
  <wsdl:part name="parameters" element="tns:RollupDownstreamServers" />
</wsdl:message>
```

RollupDownstreamServers: As specified in section 3.1.4.14.2.1.

3.1.4.14.1.2 RollupDownstreamServersSoapOut

```
<wsdl:message name="RollupDownstreamServersSoapOut">
  <wsdl:part name="parameters"
    element="tns:RollupDownstreamServersResponse" />
</wsdl:message>
```

RollupDownstreamServersResponse: As specified in section 3.1.4.14.2.2.

3.1.4.14.2 Elements

Element	Description
<RollupDownstreamServers>	Contains the request for the RollupDownstreamServers operation.
<RollupDownstreamServersResponse>	Contains the response for the RollupDownstreamServers operation.

3.1.4.14.2.1 RollupDownstreamServers

```
<s:element name="RollupDownstreamServers">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:C
cookie" />
      <s:element minOccurs="1" maxOccurs="1" name="clientTime" type="s
:dateTime" />
      <s:element minOccurs="0" maxOccurs="1" name="downstreamServers"
type="tns:ArrayOfDownstreamServerRollupInfo" />
    </s:sequence>
  </s:complexType>
</s:element>
```

cookie: This field is reserved for future use. This field MUST be present, and the value MUST be set to the following:

- Expiration (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999
- EncryptedData = zero length array

clientTime: This field MUST be present and set to the current time on the DSS.

downstreamServers: This field MUST be present, but MAY contain zero elements in the array. Each element in the array contains information on an update server. Its format is specified in section 3.1.4.14.3.1.

3.1.4.14.2.2 RollupDownstreamServersResponse

```
<s:element name="RollupDownstreamServersResponse">
  <s:complexType />
</s:element>
```

This type has no fields.

3.1.4.14.3 Complex Types

Complex type	Description
ArrayOfDownstreamServerRollupInfo	Contains the ArrayOfDownstreamServerRollupInfo data.
DownstreamServerRollupInfo	Contains the DownstreamServerRollupInfo data.
DownstreamServerRollupServerSummary	Contains the DownstreamServerRollupServerSummary data.
ArrayOfDownstreamServerRollupClientSummary	Contains the ArrayOfDownstreamServerRollupClientSummary data.

Complex type	Description
DownstreamServerRollupClientSummary	Contains the ArrayOfDownstreamServerRollupClientSummary data.
ArrayOfDownstreamServerRollupClientActivitySummary	Contains the ArrayOfDownstreamServerRollupClientActivitySummary data.
DownstreamServerRollupClientActivitySummary	Contains the DownstreamServerRollupClientActivitySummary data.

3.1.4.14.3.1 ArrayOfDownstreamServerRollupInfo

```
<s:complexType name="ArrayOfDownstreamServerRollupInfo">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="DownstreamServerRollupInfo" nillable="true" type="tns:DownstreamServerRollupInfo" />
  </s:sequence>
</s:complexType>
```

An array structure, each element of which contains information on one update server (either the update server sending the request or one of its descendant DSSs). The format of each element is specified in section 3.1.4.14.3.2.

3.1.4.14.3.2 DownstreamServerRollupInfo

```
<s:complexType name="DownstreamServerRollupInfo">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="ServerId" type="s1:guid" />
    <s:element minOccurs="0" maxOccurs="1" name="FullDomainName" type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="LastSyncTime" type="s:dateTime" />
    <s:element minOccurs="1" maxOccurs="1" name="ParentServerId" type="s1:guid" />
    <s:element minOccurs="0" maxOccurs="1" name="Version" type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="IsReplica" type="s:boolean" />
    <s:element minOccurs="1" maxOccurs="1" name="LastRollupTime" type="s:dateTime" />
    <s:element minOccurs="0" maxOccurs="1" name="ServerSummary" type="tns:DownstreamServerRollupServerSummary" />
    <s:element minOccurs="0" maxOccurs="1" name="ClientSummaries" type="tns:ArrayOfDownstreamServerRollupClientSummary" />
  </s:sequence>
</s:complexType>
```

ServerId: This field MUST be present. It MUST be a GUID that identifies the update server being described.

FullDomainName: This field MUST be present. It MUST be set to the FQDN of the update server.

LastSyncTime: This field MUST be present. It MUST be set to the time when the update server last synchronized updates from its USS. If the update server has never synchronized with its USS, this value MUST be set to the following:

Date (Year-Month-Date) = 1753-01-01

Time (Hours:Minutes:Seconds)= 00:00:00

ParentServerId: This field MUST be present. It MUST be a GUID that identifies the update server's parent USS. If the update server's parent USS is the update server receiving the RollupDownstreamServers request, this field MUST be set to "00000000-0000-0000-0000-000000000000".

Version: This field MUST be present. It MUST be a string that identifies the version number of the update server. The string MUST contain no more than 32 characters and MUST consist of one to four integers that are separated by periods (".").<50>

IsReplica: This field MUST be present. It MUST be TRUE if the update server is a Replica DSS; otherwise, it MUST be FALSE.

LastRollupTime: This field MUST be present. If the update server has previously reported information on itself to its parent USS using RollupDownstreamServers, this field MUST be set to the time when it last reported. Otherwise, if the update server has never reported information on itself to its parent USS, this value MUST be set to the following:

Date (Year-Month-Date) = 1753-01-01

Time (Hours:Minutes:Seconds)= 00:00:00

ServerSummary: This field MUST be present. It contains aggregate summary information on the update server, the updates available on it, and the client computers that get updates from it. Its format is specified in section 3.1.4.14.3.3.

ClientSummaries: This field MUST be present, but it MAY contain zero elements in the array. Each element in the array contains summary information on the client computers that get updates from the update server. This information comes from the Client computer activity summary table as defined in the abstract data model section 3.1.1. Its format is specified in section 3.1.4.14.3.4.

3.1.4.14.3.3 DownstreamServerRollupServerSummary

A structure that contains summary information on the update server, the updates available on the update server, and the client computers that receive updates from it.

```
<s:complexType name="DownstreamServerRollupServerSummary">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="UpdateCount" type="s:
int" />
    <s:element minOccurs="1" maxOccurs="1" name="DeclinedUpdateCount"
type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="ApprovedUpdateCount"
type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="NotApprovedUpdateCoun
t" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="UpdatesWithStaleUpdat
eApprovalsCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="ExpiredUpdateCount" t
ype="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="CriticalOrSecurityUpd
atesNotApprovedForInstallCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="WsusInfrastructureUpd
atesNotApprovedForInstallCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="UpdatesWithClientErro
rsCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="UpdatesWithServerErro
rsCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="UpdatesNeedingFilesCo
unt" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="UpdatesNeededByComput
ersCount" type="s:int" />
  </s:sequence>
</s:complexType>
```



```

    <s:element minOccurs="1" maxOccurs="1" name="UpdatesUpToDateCount"
type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="CustomComputerTargetG
roupCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="ComputerTargetCount"
type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="ComputerTargetsNeedin
gUpdatesCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="ComputerTargetsWithUp
dateErrorsCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="ComputersUpToDateCoun
t" type="s:int" />
  </s:sequence>
</s:complexType>

```

A structure that contains summary information on the update server, the updates available on it, and the client computers that get updates from it.

UpdateCount: This field **MUST** be present. It indicates the number of updates available on the update server. The value **MUST** be 0 or greater.

DeclinedUpdateCount: This field **MUST** be present. It indicates the number updates that have been marked as hidden on the update server. The value **MUST** be 0 or greater.

ApprovedUpdateCount: This field **MUST** be present. It indicates the number of updates for which there exists at least one deployment with an Action of 0 (Install) or 1 (Uninstall) on the update server. The value **MUST** be 0 or greater.

NotApprovedUpdateCount: This field **MUST** be present. It indicates the number of updates that are neither marked as hidden nor have any deployments with an Action of 0 (Install) or 1 (Uninstall) on the update server. The value **MUST** be 0 or greater.

UpdatesWithStaleUpdateApprovalsCount: This field **MUST** be present. It indicates the number of updates that have at least one deployment with an Action of 0 (Install) or 1 (Uninstall) on the update server where the Deployment is associated with a revision of the update other than the latest revision. The value **MUST** be 0 or greater.

ExpiredUpdateCount: This field **MUST** be present. It indicates the number of updates on the DSS that are no longer useful and **should** not have any deployments. The value **MUST** be 0 or greater.

CriticalOrSecurityUpdatesNotApprovedForInstallCount: This field **MUST** be present. It indicates the number of updates that are intended to repair a security issue on the client computers, or are otherwise considered critical to the operation of the client computers, that have no Deployments with an Action of 0 (Install) on the update server. The value **MUST** be 0 or greater.

WsusInfrastructureUpdatesNotApprovedForInstallCount: This field **MUST** be present. It indicates the number of updates that client computers need to have installed to continue to get updates from the update server, and that have no deployments with an Action of 0 (Install) on the update server. The value **MUST** be 0 or greater.

UpdatesWithClientErrorsCount: This field **MUST** be present. It indicates the number of updates that at least one client computer has attempted and failed to install. The value **MUST** be 0 or greater.

UpdatesWithServerErrorsCount: This field **MUST** be present. It indicates the number of updates for which the update server has attempted to download content but was unable to complete the download due to an error. The value **MUST** be 0 or greater.

UpdatesNeedingFilesCount: This field MUST be present. It indicates the number of updates for which the update server downloads content but has not completed the download. The value MUST be 0 or greater.

UpdatesNeededByComputersCount: This field MUST be present. It indicates the number of updates that have at least one client computer to which it is applicable but not yet installed on. The value MUST be 0 or greater.

UpdatesUpToDateCount: This field MUST be present. It indicates the number of updates that are known to be installed on all client computers to which it is applicable. The value MUST be 0 or greater.

CustomComputerTargetGroupCount: This field MUST be present. It indicates the number of target groups that have been created on this update server or that have been received from the USS. This count MUST NOT include target groups that were created during the initial setup of the update server. The value MUST be 0 or greater. <51>

ComputerTargetCount: This field MUST be present. It indicates the number of client computers that get updates from this update server. The value MUST be 0 or greater.

ComputerTargetsNeedingUpdatesCount: This field MUST be present. It indicates the number of client computers that get updates from this update server, on which at least one update is known to be applicable, but that has not yet attempted to install the update. The value MUST be 0 or greater.

ComputerTargetsWithUpdateErrorsCount: This field MUST be present. It indicates the number (of client computers) that gets updates from this update server (which failed in its last attempt to successfully complete the install of at least one update). The value MUST be 0 or greater.

ComputersUpToDateCount: This field MUST be present. It indicates the number of client computers known to have successfully installed all updates that are applicable to them. The value MUST be 0 or greater.

3.1.4.14.3.4 ArrayOfDownstreamServerRollupClientSummary

An array structure, each element of which contains summary information on a group (of client computers) that gets updates from the update server or its descendant update servers, identified by operating system version and locale. The format of each element is specified in section 3.1.4.14.3.5.

```
<s:complexType name="ArrayOfDownstreamServerRollupClientSummary">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="DownstreamServerRollupClientSummary" nillable="true" type="tns:DownstreamServerRollupClientSummary" />
  </s:sequence>
</s:complexType>
```

3.1.4.14.3.5 DownstreamServerRollupClientSummary

```
<s:complexType name="DownstreamServerRollupClientSummary">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="OSMajorVersion" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="OSMinorVersion" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="OSBuildNumber" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="OSServicePackMajorNumber" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="OSServicePackMinorNumber" type="s:int" />
  </s:sequence>
</s:complexType>
```

```

ber" type="s:int" />
  <s:element minOccurs="0" maxOccurs="1" name="OSLocale" type="s:string" />
  <s:element minOccurs="1" maxOccurs="1" name="SuiteMask" type="s:short" />
  <s:element minOccurs="1" maxOccurs="1" name="OldProductType" type="s:unsignedByte" />
  <s:element minOccurs="1" maxOccurs="1" name="NewProductType" type="s:int" />
  <s:element minOccurs="1" maxOccurs="1" name="SystemMetrics" type="s:int" />
  <s:element minOccurs="0" maxOccurs="1" name="ProcessorArchitecture" type="s:string" />
  <s:element minOccurs="1" maxOccurs="1" name="Count" type="s:int" />
  <s:element minOccurs="0" maxOccurs="1" name="ActivitySummaries" type="tns:ArrayOfDownstreamServerRollupClientActivitySummary" />
</s:sequence>
</s:complexType>

```

OSMajorVersion: This field MUST be present. It indicates the operating system major version number of the client computers. The value MUST be 0 or greater.

OSMinorVersion: This field MUST be present. It indicates the operating system minor version number of the client computers. The value MUST be 0 or greater.

OSBuildNumber: This field MUST be present. It indicates the operating system build number of the client computers. The value MUST be 0 or greater.

OSServicePackMajorNumber: This field MUST be present. It indicates the operating system service pack major version number of the client computers. The value MUST be 0 or greater.

OSServicePackMinorNumber: This field MUST be present. It indicates the operating system service pack minor version number of the client computers. The value MUST be 0 or greater.

OSLocale: This field MUST be present. It MUST indicate the operating system locale of the client computers, using language IDs, as specified in [MS-LCID].

SuiteMask: This field MUST be present. It MAY contain additional data to be used to identify the operating system used by the client computers.

OldProductType: This field MUST be present. It MAY contain additional data to be used to identify the operating system used by the client computers.

NewProductType: This field MUST be present. It MAY contain additional data to be used to identify the operating system used by the client computers.

SystemMetrics: This field MUST be present. It MAY contain additional data to be used to identify the operating system used by the client computers.

ProcessorArchitecture: This field MUST be present. It indicates the CPU architecture for which the operating system on the client computers is built. <52>

Count: This field MUST be present. It indicates the number of client computers in this group.

ActivitySummaries: This field MUST be present, but it MAY contain zero elements in the array. Each element in the array contains summary information describing the activity of the client computers in this group with respect to a single update. Its format is specified in section 3.1.4.14.3.6.

3.1.4.14.3.6 ArrayOfDownstreamServerRollupClientActivitySummary

An array structure, each element of which contains summary information describing the activity of the client computers in this group with respect to a single update. The format of each element is specified in section 3.1.4.14.3.7.

```
<s:complexType name="ArrayOfDownstreamServerRollupClientActivitySummary">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="DownstreamServerRollupClientActivitySummary" nillable="true" type="tns:DownstreamServerRollupClientActivitySummary" />
  </s:sequence>
</s:complexType>
```

3.1.4.14.3.7 DownstreamServerRollupClientActivitySummary

```
<s:complexType name="DownstreamServerRollupClientActivitySummary">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="UpdateId" type="s1:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="RevisionNumber" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="InstallSuccessCount" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="InstallFailureCount" type="s:int" />
  </s:sequence>
</s:complexType>
```

UpdateId: This field MUST be present. It identifies the update for which the client computer's activity is being described.

RevisionNumber: This field MUST be present. It identifies the specific Revision of the update for which the client computer's activity is being described.

InstallSuccessCount: This field MUST be present. It indicates the number of times this update has been installed successfully on client computers in this group since the last time information on this update server was reported to its parent using the RollupDownstreamServers method. Note that this is the number of successful install operations, not the number of client computers that have installed the update. If a single client computer has installed the update multiple times, it is counted multiple times, once per successful install operation.

InstallFailureCount: This field MUST be present. It indicates the number of times client computers in this group attempted to install this update but failed since the last time information on this update server was reported to its parent using the RollupDownstreamServers method. Note that this is the number of unsuccessful install attempts, not the number of client computers that have failed. If a single client computer attempts unsuccessfully to install the update multiple times, it is counted multiple times, once per failed install attempt.

3.1.4.15 RollupComputers

A DSS calls the RollupComputers method to send information on client computers that get updates from it, or from any descendant update server, to the USS.

```
<wsdl:operation name="RollupComputers">
  <wsdl:input message="tns:RollupComputersSoapIn" />
  <wsdl:output message="tns:RollupComputersSoapOut" />
</wsdl:operation>
```

The SOAP operation is as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribut
ion/RollupComputers" style="document" />
```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS.

Input	Validation conditions
computers	MUST be present, and the total number of ComputerRollupInfo structures in the request MUST NOT exceed the RollupComputersMaxBatchSize value returned by the USS in the preceding GetRollupConfiguration call.

Data processing:

The USS MUST process this message as follows:

1. If the **DoDetailedRollup** value in the Server Configuration Table is FALSE, return a SOAP fault message to the DSS and stop processing the request.
2. For each ComputerRollupInfo structure in the request, get the **ParentServerId** value and search the DSS Table for an entry with a matching **ServerID**. If no entry is found, return a SOAP fault message to the DSS with an <ErrorCode> of InternalServerError and stop processing the request.
3. The USS MAY use the clientTime value passed by the DSS to determine the difference between the USS system clock and DSS system clock, and adjust the other input time stamps to compensate for the difference.<53>
4. For each ComputerRollupInfo structure in the request, get the **ComputerId** value and search the client computers table for an entry with a matching **ComputerId**.
 1. If no entry is found, create a new entry, initializing all values using values from the ComputerRollupInfo structure.
 2. If an existing entry is found, and the **LastSyncTime** value from this entry in the table is less than or equal to the **LastSyncTime** value from the ComputerRollupInfo structure, replace the values in the entry using the values from the ComputerRollupInfo structure.
 3. Else ignore this ComputerRollupInfo structure.
5. The USS MUST compose a RollupComputersResponse message in response, as follows:
 1. The **RollupComputersResult** array is initialized to an empty array.
 2. For each ComputerRollupInfo structure in the request, if the Details field does not exist and one of the following is true:
 1. A new entry was added to the client computers table in step 4.1 for this ComputerRollupInfo structure.
 2. An existing entry in the client computers table was updated in step 4.2 for this ComputerRollupInfo structure, and the **ParentServerID** value was changed to a new value.

The USS MUST add an entry to the **RollupComputersResult** array with the following:

1. **ComputerId**: Set to the **ComputerId** value from the ComputerRollupInfo structure.
2. **Change**: Set to NewParent.

This notifies the caller that it MUST populate the Details field the next time it reports information about this client computer to this USS.

3. For each ComputerRollupInfo structure in the request, the USS MAY add an entry to the **RollupComputersResult** array with the following:
 1. **ComputerId**: Set to the **ComputerId** value from the ComputerRollupInfo structure.
 2. **Change**: Set to Deleted.

This notifies the caller that the USS is no longer interested in receiving information about this client computer.<54>

The same **ComputerId** MUST NOT appear more than once in the **RollupComputersResult** array. If the **ComputerId** already exists in the array as a result of step 5.2, the same **ComputerId** MUST NOT be added in step 5.3.

Response

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault indicating that an error occurred. This protocol does not define a mechanism for returning information on the cause of the failure. The DSS MUST stop the protocol when a SOAP fault is received.

3.1.4.15.1 Messages

Message	Description
RollupComputersSoapIn	Requests the computer rollup data.
RollupComputersSoapOut	A response containing the computer rollup data.

3.1.4.15.1.1 RollupComputersSoapIn

```
<wsdl:message name="RollupComputersSoapIn">  
  <wsdl:part name="parameters" element="tns:RollupComputers" />  
</wsdl:message>
```

RollupComputers: As specified in section 3.1.4.15.2.1.

3.1.4.15.1.2 RollupComputersSoapOut

```
<wsdl:message name="RollupComputersSoapOut">  
  <wsdl:part name="parameters" element="tns:RollupComputersResponse" />  
</wsdl:message>
```

RollupComputersResponse: As specified in section 3.1.4.15.2.2.

3.1.4.15.2 Elements

Element	Description
RollupComputers	Contains the request for the RollupComputers operation.

Element	Description
RollupComputersResponse	Contains the response for the RollupComputers operation.

3.1.4.15.2.1 RollupComputers

```
<s:element name="RollupComputers">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:C
cookie" />
      <s:element minOccurs="1" maxOccurs="1" name="clientTime" type="s
:dateTime" />
      <s:element minOccurs="0" maxOccurs="1" name="computers" type="tn
s:ArrayOfComputerRollupInfo" />
    </s:sequence>
  </s:complexType>
</s:element>
```

cookie: This field is reserved for future use. This field MUST be present, and the value MUST be set to the following:

Expiration (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999

EncryptedData = zero length array

clientTime: This field MUST be present and set to the current time on the DSS.

computers: This field MUST be present, but it MAY contain zero elements in the array. Each element in the array contains information on an update server. Its format is as follows.

ArrayOfComputerRollupInfo: An array structure, each element of which contains information about one client computer. The format of each element is specified in section 3.1.4.15.3.1.

3.1.4.15.2.2 RollupComputersResponse

```
<s:element name="RollupComputersResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="RollupComputersResu
lt" type="tns:ArrayOfChangedComputer" />
    </s:sequence>
  </s:complexType>
</s:element>
```

RollupComputersResult: On successful execution of this operation, this object MUST be returned.

ArrayOfChangedComputer: An array structure, each element of which defines a client computer and a ComputerChangeType value indicating an action that the DSS takes on this client computer. Details of how the DSS reacts are specified in section 3.2.4.5.

ComputerId: This field MUST be present, and it MUST match a **ComputerId** from the request sent by the DSS. It indicates the client computer that the instruction MUST be applied to.

ComputerChangeType: This field MUST be present. It specifies the action that the DSS MUST take for the specified client computer. The valid values for this field are specified in section 3.1.4.15.4.1.

3.1.4.15.3 Complex Types

Complex type	Description
ArrayOfComputerRollupInfo	Contains the ArrayOfComputerRollupInfo data.
ComputerRollupInfo	Contains the ComputerRollupInfo data.
ComputerRollupDetails	Contains the ComputerRollupDetails data.
ArrayOfChangedComputer	Contains the ArrayOfChangedComputer data.
ChangedComputer	Contains the ChangedComputer data.

3.1.4.15.3.1 ArrayOfComputerRollupInfo

An array structure, each element of which contains information about one client computer. The format of each element is specified in section 3.1.4.15.3.2.

```
<s:complexType name="ArrayOfComputerRollupInfo">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="ComputerRollupInfo" nillable="true" type="tns:ComputerRollupInfo" />
  </s:sequence>
</s:complexType>
```

3.1.4.15.3.2 ComputerRollupInfo

```
<s:complexType name="ComputerRollupInfo">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="Details" type="tns:ComputerRollupDetails" />
  </s:sequence>
  <s:attribute name="ComputerId" type="s:string" />
  <s:attribute name="LastSyncTime" type="s:dateTime" use="required" />
  <s:attribute name="LastSyncResult" type="s:int" use="required" />
  <s:attribute name="LastReportedRebootTime" type="s:dateTime" use="required" />
  <s:attribute name="LastReportedStatusTime" type="s:dateTime" use="required" />
  <s:attribute name="LastInventoryTime" type="s:dateTime" use="required" />
  <s:attribute name="ParentServerId" type="s1:guid" use="required" />
</s:complexType>
```

Details: This field MUST be present if this DSS is reporting information on this client computer for the first time. This field MAY be present in subsequent calls. It contains detailed information on the client computer. Its format is specified in section 3.1.4.15.3.3.

ComputerId: This field MUST be present. It indicates the globally unique string that is used to identify the client computer.

LastSyncTime: This field MUST be present. It indicates the time when the client computer last contacted the update server to check for new updates. If the client computer has never contacted the update server to check for updates, this value MUST be set to the following:

- Date (Year-Month-Date) = 1753-01-01

- Time (Hours:Minutes:Seconds)= 00:00:00

LastSyncResult: This field MUST be present. It indicates the result of the client computer's last attempt to get updates from the update server. The valid values for this field are shown in the following table.

Value	Meaning
0	Unknown/client computer has never contacted the update server.
1	Succeeded.
2	Failed.

LastReportedRebootTime: This field MUST be present. It indicates the time when the client computer last started, and then notified the update server that it has started (the time stamp indicates the time it started, not the time when the update server was notified). If the client computer has never notified the update server that it has started, this value MUST be set to the following:

- Date (Year-Month-Date) = 1753-01-01
- Time (Hours:Minutes:Seconds)= 00:00:00

LastReportedStatusTime: This field MUST be present. It indicates the time when the client computer last reported the status of updates on the client computer to the update server. If the client computer has never reported the status of updates, this value MUST be set to the following:

- Date (Year-Month-Date) = 1753-01-01
- Time (Hours:Minutes:Seconds)= 00:00:00

LastInventoryTime: This field MUST be present. It indicates the time when the client computer last reported software and hardware inventory information to the update server. If the client computer has never reported inventory information, this value MUST be set to the following:

- Date (Year-Month-Date) = 1753-01-01
- Time (Hours:Minutes:Seconds)= 00:00:00

ParentServerId: This field MUST be present. It indicates the GUID that identifies the update server that the client computer gets updates from.

3.1.4.15.3.3 ComputerRollupDetails

```
<s:complexType name="ComputerRollupDetails">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="TargetGroupIdList" type="tns:ArrayOfGuid" />
    <s:element minOccurs="0" maxOccurs="1" name="RequestedTargetGroupNames" type="tns:ArrayOfString" />
  </s:sequence>
  <s:attribute name="IPAddress" type="s:string" />
  <s:attribute name="FullDomainName" type="s:string" />
  <s:attribute name="OSMajorVersion" type="s:int" use="required" />
  <s:attribute name="OSMinorVersion" type="s:int" use="required" />
  <s:attribute name="OSBuildNumber" type="s:int" use="required" />
  <s:attribute name="OSServicePackMajorNumber" type="s:int" use="required" />
  <s:attribute name="OSServicePackMinorNumber" type="s:int" use="required" />
  <s:attribute name="OSLocale" type="s:string" />
  <s:attribute name="OSFamily" type="s:string" />
</s:complexType>
```

```

    <s:attribute name="OSDescription" type="s:string" />
    <s:attribute name="ComputerMake" type="s:string" />
    <s:attribute name="ComputerModel" type="s:string" />
    <s:attribute name="BiosVersion" type="s:string" />
    <s:attribute name="BiosName" type="s:string" />
    <s:attribute name="BiosReleaseDate" type="s:dateTime" use="required"
/>
    <s:attribute name="ProcessorArchitecture" type="s:string" />
    <s:attribute name="SuiteMask" type="s:short" use="required" />
    <s:attribute name="OldProductType" type="s:unsignedByte" use="required" />
    <s:attribute name="NewProductType" type="s:int" use="required" />
    <s:attribute name="SystemMetrics" type="s:int" use="required" />
    <s:attribute name="ClientVersion" type="s:string" />
</s:complexType>

```

TargetGroupIdList: This field MUST be present, but it MAY contain zero elements in the array. It contains a list of GUIDs that identify the list of target groups that the client computer belongs to.

RequestedTargetGroupNames: This field MUST be present, but it MAY contain zero elements in the array. It lists the names of the target groups of which the client computer has been configured to be a member, regardless of whether or not the named target group exists. Individual strings in this array MUST NOT exceed 256 characters.

IPAddress: This field MUST be present. It indicates the client computer's IP address.

FullDomainName: This field MUST be present. It indicates the FQDN of the client computer.

OSMajorVersion: This field MUST be present. It indicates the operating system major version number of the client computer.

OSMinorVersion: This field MUST be present. It indicates the operating system minor version number of the client computer.

OSBuildNumber: This field MUST be present. It indicates the operating system build number of the client computer.

OSServicePackMajorNumber: This field MUST be present. It indicates the operating system service pack major version number of the client computer.

OSServicePackMinorNumber: This field MUST be present. It indicates the operating system service pack minor version number of the client computer.

OSLocale: This field MUST be present. It indicates the operating system locale of the client computer. Details are specified in [MS-LCID].

OSFamily: This field SHOULD be present and it SHOULD be set to the operating system dependent family name of the client computer. <56>

OSDescription: This field SHOULD be present and it SHOULD be set to the operating system dependent description. <57>

ComputerMake: This field MUST be present. It indicates the name of the client computer's manufacturer. The string MUST contain no more than 64 characters.

ComputerModel: This field MUST be present. It indicates the name of the client computer's model. The string MUST contain no more than 64 characters.

BiosVersion: This field MUST be present. It indicates the version number of the client computer's BIOS. The string MUST contain no more than 64 characters.

BiosName: This field MUST be present. It indicates the name of the client computer's BIOS. The string MUST contain no more than 64 characters.

BiosReleaseDate: This field MUST be present. It indicates the release date of the client computer's BIOS.

ProcessorArchitecture: This field MUST be present. It is a string indicating the CPU architecture that the operating system on the client computer is built for. The string MUST contain no more than 50 characters.

SuiteMask: This field MUST be present. It contains additional integer data to be used to identify the operating system used by the client computer.

OldProductType: This field MUST be present. It contains additional integer data to be used to identify the operating system used by the client computer.

NewProductType: This field MUST be present. It contains additional integer data to be used to identify the operating system used by the client computer.

SystemMetrics: This field MUST be present. It contains additional integer data to be used to identify the operating system used by the client computer.

ClientVersion: This field MUST be present. It indicates the version number of the client software on the client computer that is communicating with the update server. The string MUST contain no more than 20 characters.<58>

3.1.4.15.3.4 ArrayOfChangedComputer

An array structure, each element of which defines a client computer and a ComputerChangeType value, as specified in section 3.1.4.15.3.5.

```
<s:complexType name="ArrayOfChangedComputer">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="ChangedComputer" nillable="true" type="tns:ChangedComputer" />
  </s:sequence>
</s:complexType>
```

3.1.4.15.3.5 ChangedComputer

```
<s:complexType name="ChangedComputer">
  <s:attribute name="ComputerId" type="s:string" />
  <s:attribute name="Change" type="tns:ComputerChangeType" use="required" />
</s:complexType>
```

ComputerChangeType: as specified in section 3.1.4.15.4.1.

3.1.4.15.4 Simple Types

Simple type	Description
ComputerChangeType	Contains the ComputerChangeType data.

3.1.4.15.4.1 ComputerChangeType

```
<s:simpleType name="ComputerChangeType">
```

```

    <s:restriction base="s:string">
      <s:enumeration value="Deleted" />
      <s:enumeration value="NewParent" />
    </s:restriction>
  </s:simpleType>

```

3.1.4.16 GetOutOfSyncComputers

A DSS calls the GetOutOfSyncComputers method to determine what data needs to be reported to the USS.

```

<wsdl:operation name="GetOutOfSyncComputers">
  <wsdl:input message="tns:GetOutOfSyncComputersSoapIn" />
  <wsdl:output message="tns:GetOutOfSyncComputersSoapOut" />
</wsdl:operation>

```

The SOAP operation is as follows.

```

<soap:operation
  soapAction="http://www.microsoft.com/SoftwareDistribution/GetOutOfSyncComputers" style="document" />

```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS.

Input	Validation conditions
lastRollupNumbers	MUST be present, and the total number of ComputerLastRollupNumber structures in the request MUST NOT exceed the GetOutOfSyncComputersMaxBatchSize value returned by the USS in the preceding GetRollupConfiguration call.

Data processing:

The USS MUST process this message as follows:

1. If the **DoDetailedRollup** value in the Server Configuration Table is FALSE, return a SOAP fault message to the DSS and stop processing the request.
2. If the DSS Table does not contain an entry with **ServerID** equal to the parentServerId value from the request, compose and return a GetOutOfSyncComputersResponse message containing an empty **GetOutOfSyncComputersResult** array.
3. Else, the USS MUST compose a GetOutOfSyncComputersResponse message in response, as follows:
 1. The **GetOutOfSyncComputersResult** array is initialized to an empty array.
 2. Use the entries in the DSS Table to construct a list containing the **ServerID** values of all DSSs synchronized with the update server identified by parentServerId or with one of its descendant DSSs.
 3. For each ComputerLastRollupNumber structure in the request, get the **ComputerId** value and search the client computers table for an entry with a matching **ComputerId** value.

1. If an entry is found, the **ParentServerID** value from the entry appears on the list constructed in step 3b, and the **LastReceivedRollupNumber** value from the entry does not match the **RollupNumber** value from ComputerLastRollupNumber structure, then add the **ComputerId** to the **GetOutOfSyncComputersResult** array.
2. Else ignore this ComputerLastRollupNumber structure.

Response:

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault indicating that an error occurred. This protocol does not define a mechanism for returning information on the cause of the failure. The DSS MUST stop the protocol when a SOAP fault is received.

3.1.4.16.1 Messages

Message	Description
GetOutOfSyncComputersSoapIn	Requests the out-of-sync computer data.
GetOutOfSyncComputersSoapOut	Response containing the out-of-sync computer data.

3.1.4.16.1.1 GetOutOfSyncComputersSoapIn

```
<wsdl:message name="GetOutOfSyncComputersSoapIn">
  <wsdl:part name="parameters" element="tns:GetOutOfSyncComputers" />
</wsdl:message>
```

GetOutOfSyncComputers: As specified in section 3.1.4.16.2.1.

3.1.4.16.1.2 GetOutOfSyncComputersSoapOut

```
<wsdl:message name="GetOutOfSyncComputersSoapOut">
  <wsdl:part name="parameters" element="tns:GetOutOfSyncComputersResponse" />
</wsdl:message>
```

GetOutOfSyncComputersResponse: As specified in section 3.1.4.16.2.2.

3.1.4.16.2 Elements

Element	Description
GetOutOfSyncComputers	Contains the request for the GetOutOfSyncComputers operation.
GetOutOfSyncComputersResponse	Contains the response for the GetOutOfSyncComputers operation.

3.1.4.16.2.1 GetOutOfSyncComputers

```
<s:element name="GetOutOfSyncComputers">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:C
```

```

cookie" />
  <s:element minOccurs="1" maxOccurs="1" name="parentServerId" type="s1:guid" />
  <s:element minOccurs="0" maxOccurs="1" name="lastRollupNumbers" type="tns:ArrayOfComputerLastRollupNumber" />
</s:sequence>
</s:complexType>
</s:element>

```

cookie: This field is reserved for future use. This field **MUST** be present, and the value **MUST** be set to the following:

- Expiration (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999
- EncryptedData = zero length array

parentServerId: This field **MUST** be present. It indicates the GUID that identifies the DSS making the call.

lastRollupNumbers: This field **MUST** be present, but it **MAY** contain zero elements in the array. Each element in the array contains information that determines what information DSS reports for each client computer. Its format is specified in section 3.1.4.16.3.1.

3.1.4.16.2.2 GetOutOfSyncComputersResponse

```

<s:element name="GetOutOfSyncComputersResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="GetOutOfSyncComputersResult" type="tns:ArrayOfString" />
    </s:sequence>
  </s:complexType>
</s:element>

```

GetOutOfSyncComputersResult: This field **MUST** be present, but it **MAY** contain zero elements in the array. Every string in the array **MUST** match a **ComputerId** from the request sent by the DSS. This array indicates the list of client computers for which the DSS **MUST** send all available information in a following call to RollupComputerStatus.

3.1.4.16.3 Complex Types

Complex type	Description
ArrayOfComputerLastRollupNumber	Contains the ArrayOfComputerLastRollupNumber data.
ComputerLastRollupNumber	Contains the ComputerLastRollupNumber data.

3.1.4.16.3.1 ArrayOfComputerLastRollupNumber

In this array structure, each element contains information that is used to determine what information DSS reports for a client computer. The format of each element is specified in section 3.1.4.16.3.2.

```

<s:complexType name="ArrayOfComputerLastRollupNumber">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="ComputerLastRollupNumber" nillable="true" type="tns:ComputerLastRollupNumber" />
  </s:sequence>

```

```
</s:complexType>
```

3.1.4.16.3.2 ComputerLastRollupNumber

```
<s:complexType name="ComputerLastRollupNumber">  
  <s:sequence>  
    <s:element minOccurs="0" maxOccurs="1" name="ComputerId" type="s:string" />  
    <s:element minOccurs="1" maxOccurs="1" name="RollupNumber" type="s:int" />  
  </s:sequence>  
</s:complexType>
```

ComputerId: This field MUST be present. It indicates the globally unique string that is used to identify the client computer.

RollupNumber: This field MUST be present. It indicates the **RollupNumber** value that was used when the DSS last sent information about this client computer to the USS using RollupComputerStatus. If the DSS has never sent information about this client computer to the USS using RollupComputerStatus, the value MUST be 0. This value MUST be 0 or greater.

3.1.4.17 RollupComputerStatus

A DSS calls the RollupComputerStatus method to send information on the status of updates on each of the client computers that get updates from it (or from any descendant update server) to the USS.

```
<wsdl:operation name="RollupComputerStatus">  
  <wsdl:input message="tns:RollupComputerStatusSoapIn" />  
  <wsdl:output message="tns:RollupComputerStatusSoapOut" />  
</wsdl:operation>
```

The SOAP operation is as follows.

```
<soap:operation soapAction="http://www.microsoft.com/SoftwareDistribution/RollupComputerStatus" style="document" />
```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs are not valid, the USS MUST return a SOAP fault message to the DSS.

Input	Validation conditions
computers	MUST be present, and the total number of ComputerStatusRollupInfo structures in the request MUST NOT exceed the RollupComputerStatusMaxBatchSize value returned by the USS in the preceding GetRollupConfiguration call.

Data processing:

The USS MUST process this message as follows:

1. If the **DoDetailedRollup** value in the Server Configuration Table is FALSE, return a SOAP fault message to the DSS and stop processing the request.

2. If the USS is under heavy load, the USS MAY return RollupComputerStatusResponse message with **RollupComputerStatusResult** set to FALSE, and stop processing the request. This notifies the DSS that it SHOULD wait and resend the request at a later time.<59>
3. The USS MAY use the clientTime value passed by the DSS to determine the difference between the USS system clock and DSS system clock, and adjust the other input time stamps to compensate for the difference.<60>
4. For each ComputerStatusRollupInfo structure in the request, get the **ComputerId** value and search the Client Computers Table for an entry with a matching **ComputerId** value.
 1. If an entry is found, do the following:
 1. Set the **LastReceivedRollupNumber** value in the table entry to the **RollupNumber** value from the ComputerStatusRollupInfo structure.
 2. Set the **EffectiveLastDetectionTime** value in the table entry to the **EffectiveLastDetectionTime** value from the ComputerStatusRollupInfo structure.
 3. If the **IsFullRollup** value from the ComputerStatusRollupInfo structure is TRUE, remove all entries from the Update Status Table with a **ComputerId** value matching the **ComputerId** value from the ComputerStatusRollupInfo structure.
 4. For each ComputerStatusRollupUpdateStatus structure in the **UpdateStatus** array from the ComputerStatusRollupInfo structure, search the Update Status Table for an entry with **ComputerId** and UpdateID values matching the **ComputerId** value from the ComputerStatusRollupInfo structure, and the UpdateId value from the ComputerStatusRollupUpdateStatus structure, respectively.
 1. If an entry is found, compare the **LastChangeTime** value from the entry with the **LastChangeTime** value from the ComputerStatusRollupUpdateStatus structure.
 1. If the **LastChangeTime** value from the table entry is greater, ignore this ComputerStatusRollupUpdateStatus structure.
 2. Else update the State and LastChangeTime values in the table entry using the **SummarizationState** and **LastChangeTime** values, respectively, from the ComputerStatusRollupUpdateStatus structure.
 2. If no entry is found, add a new entry to the Update Status table, initializing the values as follows:
 1. Set **ComputerId** to the **ComputerId** value from the ComputerStatusRollupInfo structure.
 2. Set UpdateID, State, and **LastChangeTime** values to the **UpdateId**, **SummarizationState**, and **LastChangeTime** values from the ComputerStatusRollupUpdateStatus structure, respectively.
 2. Else ignore this ComputerStatusRollupInfo structure.

Response:

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault indicating that an error occurred. This protocol does not define a mechanism for returning information on the cause of the failure. The DSS MUST stop the protocol when a SOAP fault is received.

3.1.4.17.1 Messages

Message	Description
RollupComputerStatus SoapIn	Requests the RollupComputerStatus data.
RollupComputerStatus SoapOut	Response containing the RollupComputerStatus data.

3.1.4.17.1.1 RollupComputerStatusSoapIn

```
<wsdl:message name="RollupComputerStatusSoapIn">
  <wsdl:part name="parameters" element="tns:RollupComputerStatus" />
</wsdl:message>
```

RollupComputerStatus: As specified in section 3.1.4.17.2.1.

3.1.4.17.1.2 RollupComputerStatusSoapOut

```
<wsdl:message name="RollupComputerStatusSoapOut">
  <wsdl:part name="parameters" element="tns:RollupComputerStatusResponse" />
</wsdl:message>
```

RollupComputerStatusResponse: As specified in section 3.1.4.17.2.2.

3.1.4.17.2 Elements

Element	Description
RollupComputerStatus	Contains the request for the RollupComputerStatus operation.
RollupComputerStatusResponse	Contains the response for the RollupComputerStatus operation.

3.1.4.17.2.1 RollupComputerStatus

```
<s:element name="RollupComputerStatus">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:C
cookie" />
      <s:element minOccurs="1" maxOccurs="1" name="clientTime" type="s
:dateTime" />
      <s:element minOccurs="1" maxOccurs="1" name="parentServerId" typ
e="s1:guid" />
      <s:element minOccurs="0" maxOccurs="1" name="computers" type="tn
s:ArrayOfComputerStatusRollupInfo" />
    </s:sequence>
  </s:complexType>
</s:element>
```

cookie: This field is reserved for future use. This field MUST be present, and the value MUST be set to the following:

- Expiration (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999
- EncryptedData = zero length array

clientTime: This field MUST be present and set to the current time on the DSS.

parentServerId: This field MUST be present. It indicates the GUID that identifies the DSS making the call.

computers: This field MUST be present, but it MAY contain zero elements in the array. Each element in the array contains information about the status of updates on a client computer. Its format is specified in section 3.1.4.17.3.1.

3.1.4.17.2.2 RollupComputerStatusResponse

```
<s:element name="RollupComputerStatusResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="RollupComputerStatusResult"
type="s:boolean" />
    </s:sequence>
  </s:complexType>
</s:element>
```

RollupComputerStatusResult: This field MUST be present. The value MUST be TRUE if the USS successfully received and processed the request. If the USS was too busy or otherwise was unable to process the request, the value MUST be FALSE.

3.1.4.17.3 Complex Types

Complex type	Description
ArrayOfComputerStatusRollupInfo	Contains the ArrayOfComputerStatusRollupInfo data.
ComputerStatusRollupInfo	Contains the ComputerStatusRollupInfo data.
ArrayOfComputerStatusRollupUpdateStatus	Contains the ArrayOfComputerStatusRollupUpdateStatus data.
ComputerStatusRollupUpdateStatus	Contains the ComputerStatusRollupUpdateStatus data.

3.1.4.17.3.1 ArrayOfComputerStatusRollupInfo

An array structure, each element of which contains information about the status of updates on a client computer, as specified in section 3.1.4.17.3.2.

```
<s:complexType name="ArrayOfComputerStatusRollupInfo">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="ComputerStatu sRollupInfo"
nillable="true" type="tns:ComputerStatusRollupInfo" />
  </s:sequence>
</s:complexType>
```

3.1.4.17.3.2 ComputerStatusRollupInfo

```
<s:complexType name="ComputerStatusRollupInfo">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="InstanceId" type="s1:
guid" />
    <s:element minOccurs="0" maxOccurs="1" name="ComputerId" type="s:s
tring" />
    <s:element minOccurs="1" maxOccurs="1" name="EffectiveLastDetectio
nTime" type="s:dateTime" />
  </s:sequence>
</s:complexType>
```

```

    <s:element minOccurs="1" maxOccurs="1" name="RollupNumber" type="s
:int" />
    <s:element minOccurs="1" maxOccurs="1" name="IsFullRollup" type="s
:boolean" />
    <s:element minOccurs="0" maxOccurs="1" name="UpdateStatus" type="t
ns:ArrayOfComputerStatusRollupUpdateStatus" />
  </s:sequence>
</s:complexType>

```

InstanceId: This field MUST be present. It MUST be a new GUID.

ComputerId: This field MUST be present. It indicates the globally unique string that is used to identify the client computer.

EffectiveLastDetectionTime: This field MUST be present. It indicates the time when the newest update (that the client computer has reported status for) was made available on the update server (this is the time when the update was made available, not when the status was reported). If the client computer has never reported the status of updates on the client computer, or if the update server did not have any updates available at the time the client computer reported status, this value MUST be set to the following:

- Date (Year-Month-Date) = 1753-01-01
- Time (Hours:Minutes:Seconds)= 00:00:00

RollupNumber: This field MUST be present. This value MUST be greater than the **RollupNumber** that was previously used for this client computer in the last RollupComputerStatus call.

If the update server has not previously sent information about this client computer to the USS using RollupComputerStatus, the value MUST be 1.

This value MUST be 1 or greater.

IsFullRollup: This field MUST be present. Set to TRUE if this ComputerRollupInfo structure describes the status of all updates on the client computer. Set to FALSE if this ComputerRollupInfo structure contains information only for updates for which there have been changes on the client computer. An update is considered to have changed if the status of the update on the client computer has changed at least once since the last time information on this client was reported. Note that if the status has changed to a new value, and then changed back again, it is considered to have changed.

UpdateStatus: This field MUST be present, but it MAY contain zero elements in the array. Each element in the array describes the status of a single update on the client computer. Its format is specified in section 3.1.4.17.3.3.

3.1.4.17.3.3 ArrayOfComputerStatusRollupUpdateStatus

An array structure, each element of which describes the status of a single update on the client computer.

```

<s:complexType name="ArrayOfComputerStatusRollupUpdateStatus">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="ComputerStatu
sRollupUpdateStatus"
nillable="true" type="tns:ComputerStatusRollupUpd
ateStatus" />
  </s:sequence>
</s:complexType>

```

3.1.4.17.3.4 ComputerStatusRollupUpdateStatus

```

<s:complexType name="ComputerStatusRollupUpdateStatus">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="UpdateId" type="s1:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="SummarizationState" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="LastChangeTime" type="s:dateTime" />
  </s:sequence>
</s:complexType>

```

UpdateId: This field MUST be present. It identifies the update for which the status on the client computer is being described.

SummarizationState: This field MUST be present. It indicates the status of the update on the client computer. The valid values are shown in the following table.

Value	Meaning
0	Not applicable
2	Not installed
3	Downloaded, but not yet installed
4	Installed
5	Failed
6	Installed, but requires starting

LastChangeTime: This field MUST be present. It indicates the time when the status of the update on the client computer was changed to its current value.

3.1.4.18 GetUpdateDecryptionData

A DSS SHOULD call the GetUpdateDecryptionData method to get the decryption data for the list of update IDs requested.

```

<wsdl:operation name="GetUpdateDecryptionData">
  <wsdl:input message="tns:GetUpdateDecryptionDataSoapIn" />
  <wsdl:output message="tns:GetUpdateDecryptionDataSoapOut" />
</wsdl:operation>

```

The SOAP operation is defined as follows:

```

<soap:operation
  soapAction="http://www.microsoft.com/SoftwareDistribution/GetUpdateDecryptionData"
  style="document" />

```

Request validation:

The USS validates inputs as given in the following table. If any of the inputs is not valid, the USS MUST return a SOAP fault message to the DSS with the <ErrorCode> set, as shown in the table.

Input	Validation conditions	ErrorCode
cookie	<u>MUST be present and nonempty.</u> <u>The EncryptedData MUST be the correct format such that the USS can read values out of it, as specified in section 2.2.4.8.</u>	<u>InvalidCookie</u>
protocolVersion in the cookie EncryptedData	<u>MUST be of the format x.y where x is the major version and y is the minor version number.</u>	<u>InvalidParameters</u>
protocolVersion in the cookie EncryptedData	<u>Major version MUST be 1.</u>	<u>IncompatibleProtocolVersion</u>
updateIds	<u>MUST NOT be NULL.</u> <u>The number of elements in the array MUST NOT be greater than the</u> MaxUpdatesPerRequestInGetUpdateDecryptionData <u>value returned in the GetConfigData (section 3.1.4.4) response message.</u>	<u>InvalidParameters</u>

Data processing:

The USS MUST process this message as follows:

1. For each UpdateIdentity requested, search for the file(s) associated with the requested UpdateIdentity, in the File Table. For each file found, create an entry in the ArrayOfServerSyncUpdateFileDecryption element of the response. Initialize the entry as follows:
 1. Set the **UpdateId** element to the requested UpdateIdentity.
 2. Create a **ServerSyncFileDecryption** entry in the **ArrayOfServerSyncFileDecryption** element. Initialize the entry as follows:
 1. Initialize the FileDigest element with the FileDigest retrieved from the File Table.
 2. Initialize the DecryptionKey element with the DecryptionKey retrieved from the File Table. This value MAY be NULL.

Response:

If no errors occur during processing, the USS MUST return the success response to the DSS.

If an error occurs during processing, the USS MUST return a SOAP fault. The SOAP fault SHOULD contain an <ErrorCode> element, as defined in section 2.2.9.

If the DSS receives a SOAP fault containing an <ErrorCode> element, it MUST react to the fault with one of the following error codes, which are defined in section 2.2.9.3.

- InvalidParameters
- InternalServerError
- InvalidCookie
- IncompatibleProtocolVersion

If the DSS receives a fault that does not contain an <ErrorCode> element, it MUST stop the protocol.

3.1.4.18.1 Messages

Message	Description
GetUpdateDecryptionDataSoapIn	Requests the update data.
GetUpdateDecryptionDataSoapOut	A response containing the update data.

3.1.4.18.1.1 GetUpdateDecryptionDataSoapIn

[<wsdl:message name="GetUpdateDecryptionDataSoapIn">](#)

```
    <wsdl:part name="parameters" element="tns:GetUpdateDecryptionData" />
  </wsdl:message>
```

GetUpdateDecryptionData: As specified in section 3.1.4.18.2.1.

3.1.4.18.1.2 GetUpdateDecryptionDataSoapOut

[<wsdl:message name="GetUpdateDecryptionDataSoapOut">](#)

```
    <wsdl:part name="parameters" element="tns:GetUpdateDecryptionDataResponse" />
  </wsdl:message>
```

GetUpdateDecryptionDataResponse: As specified in section 3.1.4.18.2.2.

3.1.4.18.2 Elements

Element	Description
GetUpdateDecryptionData	Contains the request for the GetUpdateDecryptionData operation.
GetUpdateDecryptionDataResponse	Contains the response for the GetUpdateDecryptionData operation.

3.1.4.18.2.1 GetUpdateDecryptionData

[<s:element name="GetUpdateDecryptionData">](#)

```
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />
        <s:element minOccurs="0" maxOccurs="1" name="updateIds"
          type="tns:ArrayOfUpdateIdentity" />
      </s:sequence>
    </s:complexType>
  </s:element>
```

cookie: This field **MUST** be present and set to the Cookie returned by the GetCookie operation. The Cookie **MUST NOT** be expired.

updateIds: This field MUST be present. The array MUST contain at least one element. The array MUST contain a maximum number of elements as specified by the **MaxUpdatesPerRequestInGetUpdateDecryptionData** field returned by the GetConfigData (section 3.1.4.4) operation. It contains a list of update identities, each identifying a specific update revision for which decryption data is requested, as specified in section 2.2.4.6.

3.1.4.18.2 GetUpdateDecryptionDataResponse

<s:element name="GetUpdateDecryptionDataResponse">

```

<s:complexType>
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="GetUpdateDecryptionDataResult"
      type="tns:ServerDecryptionData" />
    </s:sequence>
  </s:complexType>
</s:element>

```

GetUpdateDecryptionDataResult: On successful execution of this operation, this object MUST be returned. Its format is as specified in section 3.1.4.18.3.1.

3.1.4.18.3 Complex Types

<u>Complex type</u>	<u>Description</u>
<u>ServerDecryptionData</u>	<u>Contains the server update decryption data.</u>
<u>ArrayOfServerSyncUpdateFileDecryption</u>	<u>Contains an array of the server synchronization update file decryption data.</u>
<u>ServerSyncUpdateFileDecryption</u>	<u>Contains the server synchronization file decryption data associated with a requested update ID.</u>
<u>ArrayOfServerSyncFileDecryption</u>	<u>Contains an array of server synchronization file decryption data.</u>
<u>ServerSyncFileDecryption</u>	<u>Contains the server synchronization file decryption data.</u>

3.1.4.18.3.1 ServerDecryptionData

<s:complexType name="ServerDecryptionData">

```

  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="UpdateFileDecryptionData"
      type="tns:ArrayOfServerSyncUpdateFileDecryption" />
    </s:sequence>
  </s:complexType>

```

UpdateFileDecryptionData: This field MUST be present. Each element in the array contains the update decryption data. Its type is ArrayOfServerSyncUpdateFileDecryption, as specified in section 3.1.4.18.3.2.

3.1.4.18.3.2 ArrayOfServerSyncUpdateFileDecryption

<s:complexType name="ArrayOfServerSyncUpdateFileDecryption">

```
<s:sequence>
  <s:element minOccurs="0" maxOccurs="unbounded" name="ServerSyncUpdateFileDecryption"
    nillable="true" type="tns:ServerSyncUpdateFileDecryption" />
</s:sequence>
</s:complexType>
```

ServerSyncUpdateFileDecryption: An array structure, each element of which provides information on file decryption data associated with an update. The format of each element is specified in section 3.1.4.18.3.3.

3.1.4.18.3.3 ServerSyncUpdateFileDecryption

<s:complexType name="ServerSyncUpdateFileDecryption">

```
<s:sequence>
  <s:element minOccurs="0" maxOccurs="1" name="UpdateId" type="tns:UpdateIdentity" />
  <s:element minOccurs="0" maxOccurs="1" name="FileDecryptionData"
    type="tns:ArrayOfServerSyncFileDecryption" />
</s:sequence>
</s:complexType>
```

UpdateId: This field MUST be present. It identifies the update revision associated with the file decryption data that is described in this structure. The details of **UpdateIdentity** are specified in section 2.2.4.9.

FileDecryptionData: Contains an array of **ServerSyncFileDecryption**, as specified in section 3.1.4.18.3.5.

3.1.4.18.3.4 ArrayOfServerSyncFileDecryption

<s:complexType name="ArrayOfServerSyncFileDecryption">

```
<s:sequence>
  <s:element minOccurs="0" maxOccurs="unbounded" name="ServerSyncFileDecryption"
    nillable="true" type="tns:ServerSyncFileDecryption" />
</s:sequence>
</s:complexType>
```

ServerSyncFileDecryption: Contains an array of the server synchronization update file decryption data, as specified in section 3.1.4.18.3.5.

3.1.4.18.3.5 ServerSyncFileDecryption

<s:complexType name="ServerSyncFileDecryption">

```
<s:sequence>
  <s:element minOccurs="0" maxOccurs="1" name="FileDigest" type="s:base64Binary" />
  <s:element minOccurs="0" maxOccurs="1" name="DecryptionKey" type="s:base64Binary" />
</s:sequence>
</s:complexType>
```

FileDigest: The **SHA-1 hash** of the content file.

DecryptionKey: The hash representing the decryption key associated with an encrypted file. This field MUST be present if the associated file metadata indicates the file is encrypted.

3.1.5 Timer Events

None.

3.1.6 Other Local Events

None.

3.2 DSS Details

The DSS Authorization Web Service on the USS is used to authorize the release of updates to DSSs.

On failure, all methods specified in this section MUST return a SOAP fault (section 2.2.9) message that contains error information.

3.2.1 Abstract Data Model

The data model used by the DSS is the same as USS.

3.2.2 Timers

None.

3.2.3 Initialization

A DSS MUST have some implementation-specific way of learning the FQDN or IP address and the TCP/IP port of the USS that it is configured to synchronize from (for example, manual configuration or specified as part of the Start Synchronization trigger). No other actions are taken until an event is triggered by a higher layer, as described below.<62>

1. Start Synchronization trigger: The DSS MUST provide at least one way to trigger the start of the synchronization process that uses this protocol. The DSS implementation MAY use timer events to trigger the protocol initiation.<63>
2. On receipt of the Start Synchronization trigger, the DSS MUST start the Authorization step given in section 3.2.4.1.
3. Cancel Synchronization trigger: The DSS implementation MAY provide a higher layer with the capability to cancel a synchronization that is in progress. This protocol does not define when such a Cancel request is honored by the DSS and how to effect the cancellation. If the steps and message sequencing given in section 3.2.4 are followed, the protocol is designed to ensure that the DSS data store integrity is maintained after every step in the synchronization until processing is completed at the DSS.<64>
4. Start Reporting Data Synchronization trigger: The DSS MAY provide an additional way to trigger the start of the reporting process that uses this protocol but skips the Deployments Synchronization and Content Synchronization steps.<65>

A DSS MUST have an implementation-specific way of learning its FQDN. It MUST also have an implementation-specific way of creating a GUID to identify itself.

3.2.4 Message Processing Events and Sequencing Rules

The DSS MUST perform the following sequential steps (phases) every time it synchronizes with the USS:

1. Authorization

The DSS provides credentials to the USS to obtain a Cookie from the USS during this step.

2. Metadata Synchronization

The DSS uses the Cookie from the Authorization phase and gets information about new updates from the USS during this step.

3. Deployments Synchronization

This step is applicable only if the DSS is configured as a replica server. The DSS gets the list of target groups and deployments from the USS during this step.

4. Content Synchronization

The DSS downloads the content files associated with the updates from the USS during this step. This is performed asynchronously. This step is applicable only if the **CatalogOnlySync** flag in the Server Configuration for this DSS is set to FALSE.

5. Reporting Data Synchronization

During this step, the DSS sends (to the USS) information on the update servers that synchronize from it and on the client computers that get updates from it.

This step is performed only if both the USS and DSS support version 1.3 or higher of the protocol.

The following sequence diagram shows the details of the message exchange. The content download step is carried out asynchronously. For simplicity, it is shown in sequence.

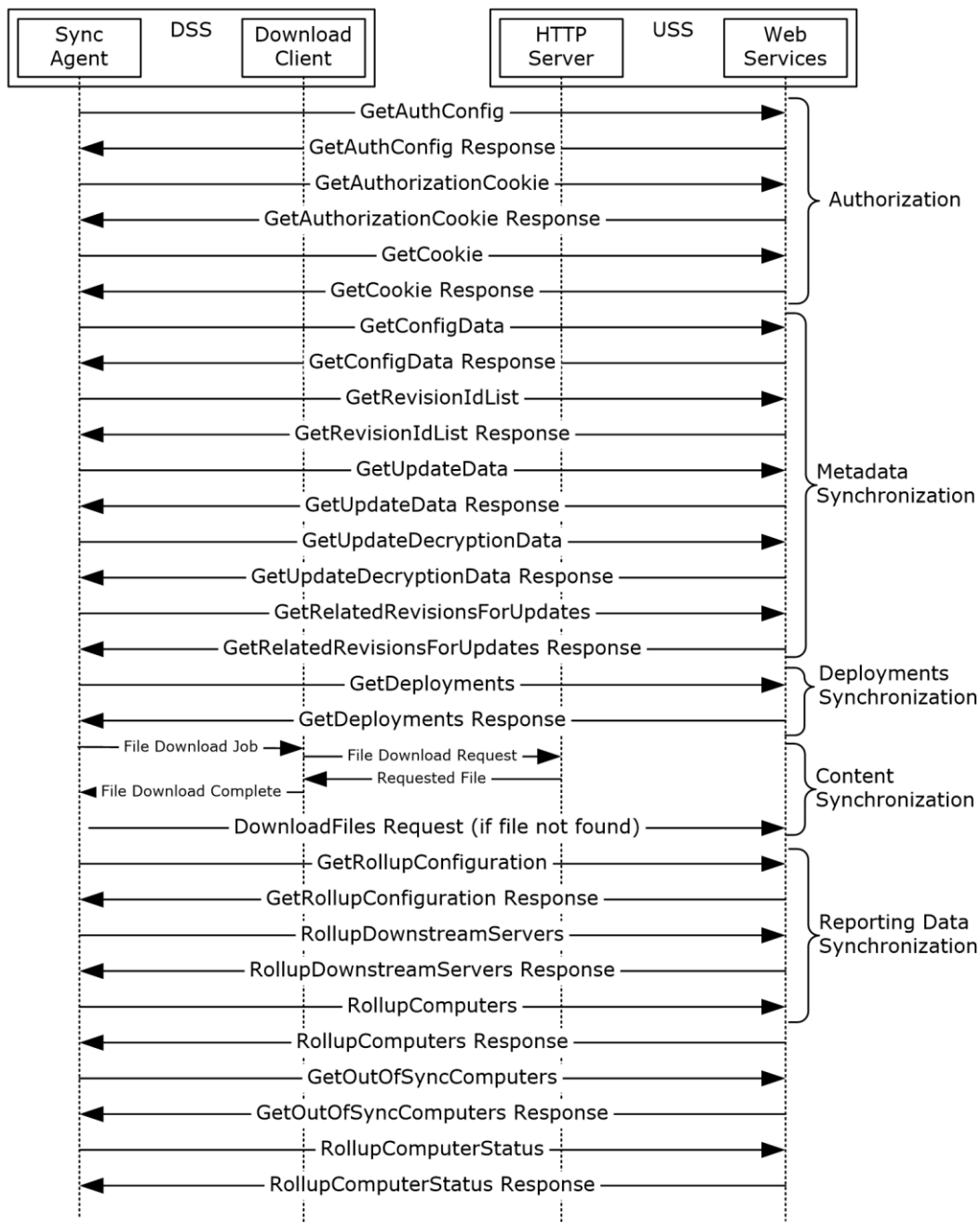


Figure 3: Message exchange

If the DSS receives a SOAP fault in response to a web service (2) call, it MUST attempt to parse the SOAP fault using the format specified in section 2.2.9, and then extract the **ErrorCode** value. If an **ErrorCode** value is available, the DSS MUST react to the error, as specified in section 2.2.9.3. If no **ErrorCode** value is available, the DSS MUST stop the protocol.

The following table summarizes the WSDL operations as defined by this specification.

Operation	Description
Authorization	Provides credentials to the USS.

Operation	Description
Metadata Synchronization	Synchronizes metadata.
Deployments Synchronization	Synchronizes deployments for replica servers.
Content Synchronization	Synchronizes content.
Reporting Data Synchronization	Synchronizes reporting data.

3.2.4.1 Authorization

The DSS provides credentials to the USS to obtain a Cookie from the USS during this step.

The DSS MUST obtain a Cookie from the USS as follows:

1. Compose and transmit a GetAuthConfig message to the USS.
2. Receive a GetAuthConfigResponse from the USS, extract the AuthPlugIn.ServiceUrl, and save it in the Parent USS State Table.
3. Compose a GetAuthorizationCookie message by doing the following:
 1. Copy the **Account Name** field of the Server Configuration Table to the GetAuthorizationCookie request.
 2. Copy the **Account GUID** field of the Server Configuration Table to the GetAuthorizationCookie request.
4. Transmit the GetAuthorizationCookie request to the USS and receive a response from the USS.
5. Save the AuthorizationCookie received from GetAuthorizationCookie response into the Parent USS State.
6. Compose a GetCookie message as follows:
 1. Add an entry into the **authCookies** array of the request message by copying the AuthorizationCookie from the Parent USS State data store.
 2. Initialize the **oldCookie** element of the request message from the Last Cookie stored in the USS Parent State data store.
 3. Initialize the protocol version to the version being implemented by the DSS.
7. Transmit the GetCookie request to the USS and receive a response from the USS.
8. Save the Cookie returned in the GetCookie response in the Last Cookie field of the USS Parent State data store.

The DSS MUST treat the **CookieData** field of the AuthorizationCookie and the **EncryptedData** field of the Cookie as an opaque object. It is to be interpreted by the USS only. The **Expiration** field of the Cookie indicates whether it is expired. The DSS MUST NOT use an expired Cookie in any method calls in the following sections.

3.2.4.2 Metadata Synchronization

The DSS first synchronizes configuration settings, supported languages, categories, classifications, and detectoids during this step. It then synchronizes the update revisions information from the USS. Each

request sent during this processing step uses the Cookie returned by GetCookie as an input parameter to various operations.

The DSS MUST synchronize metadata from the USS as follows:

1. **SendsSend** a GetConfigData request to get configuration settings and languages supported by the USS. The request message is composed as follows:
 1. Last Cookie from the Parent USS State is copied to the request message.
 2. Last **ConfigAnchor** from the Parent USS State is copied to the request message.
2. Store the following information in the returned response in the Parent USS State for future use:
 - **CatalogOnlySync**
 - **LazySync**
 - **ServerHostsPsfFiles**
 - **MaxNumberOfUpdatesPerRequest**
 - **NewConfigAnchor**
 - **LanguageUpdateList**
3. Send a GetRevisionIdList request to the USS with the following filter:
 - **GetConfig**: Set to TRUE to get Categories, Update Classifications, Detectoids.
 - **Get63LanguageOnly**: Omit if the DSS implements version 1.1 of the protocol. Set to TRUE if the DSS implements versions 1.2 or higher of the protocol (as specified in section 1.7) but does not intend to support more than 63 languages. Otherwise, set to FALSE.
4. Store the Anchor returned by this operation response in the **Last SyncAnchor** field of the USS Parent State for future use within the protocol.
5. Compose a GetUpdateData request by copying the Revision IDs returned in the GetRevisionIdList response into the updateIDs element of the GetUpdateData request.

The number of items requested in this operation MUST NOT exceed **MaxNumberOfUpdatesPerRequest**, as specified in GetConfigData (section 3.1.4.4).
6. Send the GetUpdateData request to the USS to obtain the metadata related to any new categories and detectoids using the GetUpdateData operation. If the metadata is received in the **XmlUpdateBlobCompressed** field of the response, it MUST be decompressed before storing it in the data model, as specified in GetUpdateData (section 3.1.4.6).

If the number of revisions in the GetRevisionIdList response in the previous step exceeds the **MaxNumberOfUpdatesPerRequest** limit, then the DSS MUST repeat steps 5 and 6 in batches not exceeding the above limit until the metadata for all the revisions is obtained.
7. On successful completion of this operation, store the revision IDs and the metadata in the Categories, Update Classifications, and Detectoid Tables. The DSS MUST use the following properties in the XML metadata to detect if a revision is a category, update classification, or a detectoid, as specified in section 3.1.1:
 - Detectoid: UpdateType = "Detectoid"
 - Update Classification: UpdateType = "Category" and CategoryType="UpdateClassification"

- Category: UpdateType = "Category" and CategoryType="Company", "ProductFamily", or "Product".
8. Send a GetRevisionIdList request to the USS to get the software/driver update revisions IDs. The input filter is used, as specified in the following list:
 - **GetConfig**: Set to false.
 - **Get63LanguageOnly**: Omit if the DSS implements version 1.1 of the protocol. Set to TRUE if the DSS implements versions 1.2 or higher of the protocol (as specified in section 1.7) but does not intend to support more than 63 languages. Otherwise, set to FALSE.
 9. Store the Anchor returned by this operation response in the **Last SyncAnchor** field of the USS Parent State for future use within the protocol.
 10. Compose a GetUpdateData request by copying the revision IDs returned in the GetRevisionIdList response into the updateIDs element of the GetUpdateData request.

The number of items requested in this operation MUST NOT exceed **MaxNumberOfUpdatesPerRequest**, as specified in GetConfigData (section 3.1.4.4).

11. Send the GetUpdateData request to the USS to obtain the metadata related to the new update revisions returned in the GetRevisionIdList. If the metadata is received in the **XmlUpdateBlobCompressed** field of the response, it MUST be decompressed before storing it in the data model, as specified in section 3.1.4.6. Store the metadata in the Revision Table.

If the number of revisions in the GetRevisionIdList response in the previous step exceeds the **MaxNumberOfUpdatesPerRequest** limit, then the DSS MUST repeat steps 10 and 11 in batches not exceeding the above limit until the metadata for all the revisions is obtained.

12. From each metadata for an update revision, extract the following elements (as specified in section 3.1.1.1) for each file associated with this update revision and store the extracted data in the Revision Table:

- FileName
- FileDigest
- PatchingType

13. From each metadata for an update revision, extract the **EulaID** (as specified in section 3.1.1.1) and store it in the EULAs Table.

14. From each metadata for an update revision, extract the **FragmentType**, and **IsEncrypted** (as specified in section 3.1.1.1). If **FragmentType** matches "FileURL", then set the **IsSecure** field (section 3.1.1) to 1 in the Revision Table. If **IsEncrypted** is true, set the value of the **IsEncrypted** field to 1 in the Revision Table.

15. From each metadata for an update revision, extract the **FragmentType** (as specified in section 3.1.1.1). If **FragmentType** is "FileDecryption", then the update contains additional decryption information. For all such updates, compose a GetUpdateDecryptionData (section 3.1.4.18) request.

The number of items requested in this operation MUST NOT exceed **MaxUpdatesPerRequestInGetUpdateDecryptionData**, as specified in section 3.1.4.4).

16. Send the GetUpdateDecryptionData request to the USS to obtain the decryption data related to the updates. For each file associated with the update, store the **DecryptionKey** in the Revision Table.

[14.17.](#) After all update revision metadata is received, continue with the Deployments Synchronization step if the Replication Mode in DSS's Server Configuration is set to "Replica". Otherwise, go to the Content Synchronization step as given in section 3.2.4.4.

3.2.4.3 Deployments Synchronization

This step is applicable only if the DSS is configured as a replica server. The DSS gets the list of target groups and deployments from the USS during this step.

The DSS MUST synchronize the target groups and deployments from the USS as follows:

1. Compose and send a GetDeployments request to the USS that is initialized as follows:
 1. Last Cookie from the Parent USS State is copied to the request message.
 2. Last Deployment Anchor from the Parent USS State is copied to the request message.
 3. Last Sync Anchor from the Parent USS State is copied to the request message.
2. Store the Anchor in the returned response in the Parent USS State as Last Deployment Anchor.
3. Update the TargetGroup Table using the Groups array returned in the response:
 1. Update the target group entry if it already exists in the table.
 2. Add a new entry into the TargetGroup Table if it does not exist.
 3. Delete the target group entry in the table if it does not exist in the Groups returned. All deployments in the Deployment Table that refer to the deleted target group MUST also be deleted.
4. For each entry in the **DeadDeployments** array in the response, locate the entry in the Deployment Table and set the Dead flag to TRUE.
5. For each entry in the **Deployments** array in the response:
 1. Update the Deployment entry if it already exists in the Deployment Table.
 2. Add the Deployment entry if it does not exist in the Deployment Table.
6. For each entry in the **HiddenUpdates** array of the response locate the update in the Revision Table and set the Hidden flag to TRUE.
7. Set the Accepted flag to TRUE in the EULAs Table for every entry found in the **AcceptedEulas** array in the response.
8. Add a new entry to the Synchronization History Table with the LastSyncTime value set to the current time.

3.2.4.4 Content Synchronization

The DSS downloads the content files associated with the updates from the USS during this step. The protocol does not define when the file download is started. It is considered to be implementation-specific. However, the following rules MUST be followed by the DSS to determine the need to download a file:

- **CatalogOnlySync** flag in the Server Configuration for this DSS is set to FALSE.
- The file does not already exist in the Content Store.
- Either the **LazySync** flag in the Server Configuration for this DSS is set to FALSE.

OR

If the **LazySync** flag is set to TRUE, the update revision associated with this file has an associated Deployment in the Deployment Table whose Action is set to "Install".

OR

A DownloadFiles request is received by this Update Server for this file.

- If the file's PatchingType is "Express and" the ServerHostsPsfFiles flag in the Server Configuration for this DSS is set to TRUE.<66>

The DSS MUST synchronize content for each file that it needs to download as follows:

1. If the **CatalogOnlySync** flag of the Parent USS State is set to FALSE, construct the URL as follows and download the file using the USS Content Download service:
 1. Use the USS Content Download service URL, as specified in section 2.1, and fill the server and server port, using values stored in the Parent USS Configuration data store.
 2. Set the <folder name> of the URL to the last two characters of the **FileDigest** that is represented in Base64.
 3. Set the <content file name> to the name of the file as given in the Revision Table.
2. If the **CatalogOnlySync** flag of the Parent USS State is set to TRUE, download the file using the **MUUrl** for the file.
3. When downloading from the USS, if a "File Not Found" HTTP error is received, request the USS to download the file by sending the **FileDigest** of the file in the DownloadFiles (section 3.1.4.11) request. An implementation MAY choose to batch multiple such failed requests within a single method call for DownloadFiles.<67>
4. For any other error during the HTTP download of the file, the recovery action is implementation-specific and not defined by the protocol.<68>

3.2.4.5 Reporting Data Synchronization

The DSS reports information on its descendant DSSs and their client computers to the USS during this step. This step is performed only if both the USS and the DSS support version 1.3 or higher of the protocol.

This step MAY<69> run before or in parallel with the Content Synchronization step. Also, this step MAY be triggered and run on its own without running the previous steps in the protocol.<61>.

The DSS MUST send information on its descendant DSSs and their client computers to the USS as follows:

1. The DSS sends a GetRollupConfiguration request to obtain information on the USS's report rollup requirements. The request message is composed as follows:
 - **cookie**: Set to a **Cookie** structure with the following fields:
 1. **Expiration** (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999
 2. **EncryptedData** = zero length array

The response is stored for use in the steps ~~of the protocol~~ that follow.

2. The DSS reports information on itself and any descendant DSSs to the USS as follows:

1. The DSS constructs a **DownstreamServerInfo** structure representing itself, as follows:
 1. **ServerId**: The self-generated GUID identifying the DSS.
 2. **FullDomainName**: The FQDN of the DSS.
 3. **LastRollupTime**: The current time.
 4. **ParentServerId**: "00000000-0000-0000-0000-000000000000".
 5. **IsReplica**: TRUE if the DSS is configured as a replica server; otherwise, false.
 6. **LastSyncTime**: The **LastSyncTime** value from the Server State Table. If the value in the table is NULL, use 1753-01-01 00:00:00 (Year-Month-Date Hours:Minutes:Seconds).
 7. **ServerSummary**: Set to a DownstreamServerRollupServerSummary structure describing the status of updates on the DSS, and of client computers that get updates from the DSS. The member fields are set as follows:
 1. **UpdateCount**: The number of unique UpdateIdentity GUID values in the Revision Table (the Revision Number portion is ignored).
 2. **DeclinedUpdateCount**: The number of unique UpdateIdentity GUID values in the Revision Table, for which all entries with that UpdateIdentity GUID have the Hidden element set to TRUE.
 - ~~3.~~ **ApprovedUpdateCount**: The number of unique UpdateIdentity GUID values in the Revision Table, for which:
 - ~~1.~~ ~~At at~~ least one entry with that UpdateIdentity GUID has the Hidden element set to FALSE.
 - ~~4.~~ ~~3.~~ ~~There is, and~~ at least one entry in the Deployment Table **withhas** a matching UpdateIdentity GUID and an Action value of 0.
 - ~~5.~~ **NotApprovedUpdateCount**: The number of unique UpdateIdentity GUID values in the Revision Table, for which:
 - ~~1.~~ ~~At at~~ least one entry with that UpdateIdentity GUID has the Hidden element set to FALSE.
 - ~~6.~~ ~~4.~~ ~~There is and~~ no entry in the Deployment Table **withhas** a matching UpdateIdentity GUID and an Action value of 0.
 - ~~7.~~ ~~5.~~ **ApprovedUpdateCount**: The number of entries in the Revision Table for which:
 1. At least one entry with that UpdateIdentity GUID has the Hidden element set to FALSE.
 2. ~~There exists atAt~~ least one other entry in the Revision Table **withhas** the same UpdateIdentity GUID but a larger UpdateIdentity Revision Number.
 3. ~~There exists anAn~~ entry in the Deployment Table **withhas** the same UpdateIdentity value and an Action value of 0.
 - ~~8.~~ ~~6.~~ **CriticalOrSecurityUpdatesNotApprovedForInstallCount**: The number of unique UpdateIdentity GUID values in the Revision Table, for which:
 1. At least one entry with that UpdateIdentity GUID has the Hidden element set to FALSE.

2. There is no entry in the Deployment Table with a matching UpdateIdentity GUID and an Action value of 0.
3. The update that this entry represents is intended to repair a security issue on the client computers, or is otherwise considered to be critical to the operation of the client computers. How this determination is made is implementation-dependent.<70>

9-7. WsusInfrastructureUpdatesNotApprovedForInstallCount: The number of unique UpdateIdentity GUID values in the Revision Table, for which:

1. At least one entry with that UpdateIdentity GUID has the Hidden element set to FALSE.
2. There is no entry in the Deployment Table with a matching UpdateIdentity GUID and an Action value of 0.
3. The update that this entry represents is required for the client computers to continue to get updates from this DSS. How this determination is made is implementation dependent.<71>

10-8. CustomComputerTargetGroupCount: The number of entries in the TargetGroup Table for which the **IsBuiltin** value is FALSE.

11-9. UpdatesWithClientErrorsCount: The number of updates available on the DSS that at least one client computer has attempted and failed to install.

12-10. UpdatesWithServerErrorsCount: The number of updates available on the DSS for which the DSS has failed to download content.

13-11. UpdatesNeedingFilesCount: The number of updates for which the DSS downloads content but has not completed the download.

14-12. UpdatesNeededByComputersCount: The number of updates available on the DSS to which at least one client computer is applicable but not yet installed on.

15-13. UpdatesUpToDateCount: The number of updates available on the DSS known to be installed on all client computers to which it is applicable.

16-14. ComputerTargetCount: The number of client computers that gets updates from this DSS.

17-15. ComputerTargetsNeedingUpdatesCount: The number of client computers that gets updates from this DSS on which at least one update is known to be applicable but not yet installed.

18-16. ComputerTargetsWithUpdateErrorsCount: The number of client computers that gets updates from this DSS and that has tried and failed to install at least one update.

19-17. ComputersUpToDateCount: The number of client computers that is known to have successfully installed all updates available on this DSS that are applicable to it.

The values for steps 2.1.7.9–2.1.7.17 are all computed from the values stored in the Revision Table, Deployment Table, and Update Status Table.

8. **ClientSummary:** Set to an array of DownstreamServerRollupClientSummary structures. The array is populated by constructing one DownstreamServerRollupClientSummary structure for each entry in the Client Computer Activity Summary Table with a ServerID value equal to the GUID identifying this DSS.

The fields of the structure are populated by copying the corresponding values from the table entry.

2. The DSS constructs a list of DownstreamServerInfo structures, one for each entry in the DSS Table. The list MUST be ordered ~~in a way~~ such that if one DSS synchronizes with another, the structure corresponding to the parent DSS appears before that of the child DSS.

The fields in the DownstreamServerInfo structures are initialized using values from the corresponding DSS Table entry.

The **ClientSummary** array is populated by searching the Client Computer Activity Summary Table for entries with a ServerID value matching the ServerID from the DSS Table entry, and then constructing a DownstreamServerRollupClientSummary for each such entry by copying the values from the table entry.

3. The DSS appends the DownstreamServerInfo structure from step 1 to the end of the list constructed in step 2.
4. If the number of DownstreamServerRollupClientSummary structures in any one member of the resulting list is greater than the **RollupDownstreamServersMaxBatchSize** value received from the USS in step 1, split the offending DownstreamServerInfo structure into two or more structures as follows:
 1. Split the **ClientSummary** array of the original DownstreamServerInfo structure into two or more subarrays, each containing at least one member, such that the number of DownstreamServerRollupClientSummary structures in any one subarray does not exceed the **RollupDownstreamServersMaxBatchSize** value from step 1.
 2. For each subarray, construct a new DownstreamServerInfo structure. All fields in this structure, excluding the **ClientSummary** array, are set to the value of the corresponding field in the original DownstreamServerInfo structure. The **ClientSummary** array is set to the subarray created in step 4.1.
 3. Remove the original DownstreamServerInfo structure from the list, and insert the new DownstreamServerInfo structures created in step 3 in its place.
5. The DSS sends the DownstreamServerInfo structures to the USS using RollupDownstreamServers messages. Each request is composed as follows:
 1. **cookie**: Set to a Cookie structure with the following fields:
 1. **Expiration** (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999
 2. **EncryptedData** = zero length array
 2. **clientTime**: Set to the current time.
 3. **downstreamServers**: Populate the array using one or more DownstreamServerInfo structures from the list.

An implementation ~~MAY choose to can~~ send the DownstreamServerInfo structures one at a time, or it ~~MAY choose to can~~ send them in batches. In either case, ordering MUST be preserved.

Example: If structure A appears before structure B in the list, the request containing structure B MUST NOT be sent before the request containing structure A is sent. They MAY be sent in the same request; however, in this example, structure A MUST appear before structure B in the **downstreamServers** array.

Furthermore, the number of DownstreamServerRollupClientSummary structures in one request, summed across all DownstreamServerInfo structures in the request, MUST NOT exceed the **RollupDownstreamServersMaxBatchSize** value.<72>

For each RollupDownstreamServers request sent, the USS ~~will respond~~responds with a RollupDownstreamServers message. Upon receiving this response, the DSS removes from the Client Activity Summary Table all rows corresponding to the **ServerID** values that were sent as part of the request.

3. If the **DoDetailedRollup** value from the GetRollupConfigurationResponse structure (received from the USS in step 1) is FALSE, stop. The following steps in the protocol MUST NOT be run. If the value is TRUE, continue.
4. The DSS reports information on client computers that get updates from it or from any of its descendant DSSs as follows:

1. For each entry in the Client Computers Table, the DSS constructs a ComputerRollupInfo structure, populating the fields as follows:

1. **ComputerId, LastSyncTime, LastSyncResult, LastReportedRebootTime, LastReportedStatusTime, LastInventoryTime, and ParentServerId**: Use the corresponding value from the table entry. If a time stamp value in the table is NULL, use 1753-01-01 00:00:00 (Year-Month-Date Hours:Minutes:Seconds) instead.
2. The **Details** field MUST NOT be added if the HasDetailsChanged element of the table entry is FALSE. If the HasDetailsChanged element is TRUE, the **Details** field MUST be populated as follows:

TargetGroupIdList, RequestedTargetGroupNames, IPAddress, FullDomainName, OSMajorVersion, OSMinorVersion, OSBuildNumber, OSServicePackMajorNumber, OSServicePackMinorNumber, OSLocale, ComputerMake, ComputerModel, BiosVersion, BiosName, BiosReleaseDate, ProcessorArchitecture, SuiteMask, OldProductType, NewProductType, SystemMetrics, and ClientVersion: Use the corresponding value from the table entry.

2. The DSS sends the ComputerRollupInfo structures to the USS using RollupComputers messages. Each request is composed as follows:

1. **cookie**: Set to a Cookie structure with the following fields:

1. **Expiration** (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999

2. **EncryptedData** = zero length array

2. **clientTime**: Set to the current time.

3. **computers**: Populate the array using one or more of the ComputerRollupInfo structures.

An implementation MAY ~~choose to~~ send the ComputerRollupInfo structures one at a time, or it MAY ~~choose to~~ send them in batches. If the implementation chooses to send them in batches, the number of ComputerRollupInfo structures sent in a single request MUST NOT exceed the **RollupComputersMaxBatchSize** value obtained from the GetRollupConfigurationResponse.<65>

73>

For each RollupComputers message sent, the USS ~~will respond~~responds with a RollupComputersResponse message, with the **RollupComputersResult** field set to an

array of zero or more ChangedComputer structures. The DSS MUST process each ChangedComputer structure in each response as follows:

4. If the value of the Change field is deleted, get the **ComputerId** value from the ChangedComputer structure, find the entry in the Client Computers Table with the matching **ComputerId** value, and remove it from the table.

If the entry is not found in the table, do nothing.

5. If the value of the Change field is NewParent, get the **ComputerId** value from the ChangedComputer structure, find the entry in the Client Computers Table with the matching ComputerId value, and set the **HasDetailsChanged** value to TRUE.

If the entry is not found in the table, do nothing.

3. Repeat step 4.1, but only for entries in the Client Computers Table having a **HasDetailsChanged** value of TRUE. Repeat step 4.2, using the resulting list of ComputerRollupInfo structures; repeat step 4.3 for the resulting responses.
5. The DSS reports the status of each update on each client computer to the USS as follows:
 1. For each entry in the Client Computers Table, the DSS constructs a ComputerLastRollupNumber structure, populating the fields as follows:
 1. **ComputerId**: Use the **ComputerId** value from the table entry.
 2. **RollupNumber**: Use the LastSentStatusRollupNumber value from the table entry.
 2. For client computers that have reported their status, the DSS MUST send the ComputerLastRollupNumber structures to the USS using GetOutOfSyncComputers messages. This message is only sent when the DSS is aware of computers that are potentially out of sync. If no clients have reported their status, the implementation MAY skip this step.

Each request is composed as follows:

1. **cookie**: Set to a Cookie structure with the following fields:
 - **Expiration** (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999
 - **EncryptedData** = zero length array
2. **parentServerId**: Set to the **ServerID** value from the Server Configuration Table.
3. **lastRollupNumbers**: Populate the array using one or more of the ComputerLastRollupNumber structures.

An implementation MAY ~~choose to~~ send the ComputerLastRollupNumber structures one at a time, or it MAY ~~choose to~~ send them in batches. If the implementation chooses to send them in batches, the number of ComputerLastRollupNumber structures sent in a single request MUST NOT exceed the **GetOutOfSyncComputersMaxBatchSize** value obtained from the GetRollupConfigurationResponse.<74>

For each GetOutOfSyncComputers message sent, the USS ~~will respond~~responds with a GetOutOfSyncComputersResponse message with the **GetOutOfSyncComputersResult** field set to an array of zero or more strings, each identifying a client computer.

For each string, the DSS MUST search the Client Computers Table for an entry with the matching ComputerId value. If an entry is found, set the **LastStatusRollupTime** to NULL. If no entry is found, do nothing.

3. For each entry in the Client Computers Table, the DSS constructs a ComputerStatusRollupInfo structure, populating the fields as follows:
 1. **InstanceId**: Set to a new, randomly generated GUID.
 2. **ComputerId**: Set to the **ComputerId** value from the table entry.
 3. **EffectiveLastDetectionTime**: Search the Synchronization History Table for the row with the largest **SynchronizationTime** value that is less than the **EffectiveLastDetectionTime** value from the Client Computers Table row. If such a row is found, then use the **SynchronizationTime** value from that row; if no row is found, use 1753-01-01 00:00:00 (Year-Month-Date Hours:Minutes:Seconds).
 4. **RollupNumber**: Use the **LastSentStatusRollupNumber** value from the table entry, plus 1.
 5. **IsFullRollup**: If the LastStatusRollupTime value is NULL, set this to TRUE; else set this to FALSE.
 6. **UpdateStatus**: If the **LastStatusRollupTime** value is NULL, find all entries in the Update Status Table with a **ComputerId** value matching the **ComputerId** value from the Client Computer Table entry. If the **LastStatusRollupTime** value is not NULL, find all matching Update Status Table entries having a **LastChangeTime** value greater than the **LastStatusRollupTime**.

For each entry, construct a ComputerStatusRollupUpdateStatus structure as follows. Set this field to an array containing the resulting ComputerStatusRollupUpdateStatus structures:

1. **UpdateId**: Set to the **UpdateID** value from the Update Status Table entry.
 2. **SummarizationState**: Set to the **State** value from the Update Status Table entry.
 3. **LastChangeTime**: Set to the **LastChangeTime** value from the Update Status Table entry.
4. The DSS sends the ComputerStatusRollupInfo structures to the USS using RollupComputerStatus messages. Each request is composed as follows:
 1. **cookie**: Set to a Cookie structure with the following fields:
 1. **Expiration** (Year-Month-Date Hours:Minutes:Seconds) = 9999-12-31 23:59:59.9999999
 2. **EncryptedData** = zero length array
 2. **clientTime**: Set to the current time.
 3. **parentServerId**: Set to the **ServerID** value from the Server Configuration Table.
 4. **computers**: Populate the array using one or more of the ComputerStatusRollupInfo structures.

An implementation MAY ~~choose to~~ send the ComputerStatusRollupInfo structures one at a time, or it MAY ~~choose to~~<75> send them in batches. If the implementation chooses to send them in batches, the number of ComputerStatusRollupInfo structures sent in a single request MUST NOT exceed the **RollupComputerStatusMaxBatchSize** value obtained from the GetRollupConfigurationResponse.<67>.

For each RollupComputerStatus message sent, the USS ~~will respond~~responds with a RollupComputerStatusResponse message, each containing a Boolean **RollupComputerStatusResult** value.

If the **RollupComputerStatusResult** value is FALSE, this indicates that the USS was too busy to accept the request, and the DSS MUST wait at least 1 minute before sending another request. The DSS MAY resend the same request (with the **clientTime** value updated to reflect the current time) after waiting. <76>

If the **RollupComputerStatusResult** value is TRUE, this indicates that the USS successfully received the message. For each ComputerStatusRollupInfo structure that was sent as part of the request, the DSS MUST find the corresponding entry in the Client Computers Table and update the entry as follows:

1. **LastStatusRollupTime**: Search the **UpdateStatus** array in the ComputerStatusRollupInfo structure for the entry with the largest **LastChangeTime**, and use this **LastChangeTime**.
2. **LastSentStatusRollupNumber**: Set to the current **LastSentStatusRollupNumber**, plus 1.

3.2.5 Timer Events

None.

3.2.6 Other Local Events

None.

4 Protocol Examples

The following samples show sequences of messages exchanged in various steps within the protocol. All protocol messages are wrapped inside the <soap:Envelope> and <soap:Body> elements. To simplify the examples, only the first two messages, GetAuthConfig Request and GetAuthConfig Response, in sample 1 and the SOAP fault in sample 3 illustrate the use of these SOAP elements.

Sample 1: Authorization

The following sample message sequence shows how the Authorization step is performed between a DSS and a USS. All requests flow from the DSS to the USS, and all responses flow from the USS to the DSS. This sample shows three request-response exchanges.

- GetAuthConfig
- GetAuthorizationCookie
- GetCookie

```
<!-- AUTHORIZATION PHASE: GetAuthConfig() Request -->
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetAuthConfig
      xmlns="http://www.microsoft.com/SoftwareDistribution" />
  </soap:Body>
</soap:Envelope>
<!-- AUTHORIZATION PHASE: GetAuthConfig() Response - Success -->
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetAuthConfigResponse
      xmlns="http://www.microsoft.com/SoftwareDistribution">
      <GetAuthConfigResult>
        <LastChange>2006-06-07T20:41:50.883Z</LastChange>
        <AuthInfo>
          <AuthPlugInInfo>
            <PlugInID>DssTargeting</PlugInID>
            <ServiceUrl>DssAuthWebService/DssAuthWebService.asmx</ServiceUrl>
            <Parameter />
          </AuthPlugInInfo>
        </AuthInfo>
      </GetAuthConfigResult>
    </GetAuthConfigResponse>
  </soap:Body>
</soap:Envelope>
<!-- AUTHORIZATION PHASE: GetAuthorizationCookie() Request -->
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetAuthorizationCookiexmlnsGetAuthorizationCookie
      xmlns="http://www.microsoft.com/SoftwareDistribution/Server/DssAuthWebService">
      <accountName>HemantTest.redmond.microsoft.com</accountName>
      <accountGuid>ADB2FE48-0B2E-451e-8FC8-44B29845B0C6</accountGuid>
    </GetAuthorizationCookie>
  </soap:Body>
</soap:Envelope>
<!-- AUTHORIZATION PHASE: GetAuthorizationCookie() Response - Success -->
<GetAuthorizationCookieResponse
  xmlns="http://www.microsoft.com/SoftwareDistribution/Server/DssAuthWebService">
  <GetAuthorizationCookieResult>
    <PlugInId>DssTargeting</PlugInId>
    <CookieData>4VEGgCdh/cuG4BSwhzLDomn2BAcYK145Po5CmuBb0lRXfwhmBopYbLUHLWP
  <!--..... -->
```



```

                <!--.....CookieData BLOB TRIMMED..... -->
                <!--..... -->
EHsBFG</CookieData>
        </GetAuthorizationCookieResult>
        </GetAuthorizationCookieResponse>
    </soap:Body>
</soap:Envelope>
<!-- AUTHORIZATION PHASE: GetCookie() Request -->
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <soap:Body>
        <GetCookie xmlns="http://www.microsoft.com/SoftwareDistribution">
            <authCookies>
                <AuthorizationCookie>
                    <PlugInId>DssTargeting</PlugInId>
                    <CookieData>4VEGgCdh/cuG4BSwhzLDown2BACyK145Po5CmuBb0lRXfwhmBopYbLUHLW
                <!--..... -->
                <!--.....CookieData BLOB TRIMMED..... -->
                <!--..... -->
EHsBFG</CookieData>
                </AuthorizationCookie>
            </authCookies>
            <protocolVersion>1.2</protocolVersion>
        </GetCookie>
    </soap:Body>
</soap:Envelope>
<!-- AUTHORIZATION PHASE: GetCookie() Response - Success -->
<GetCookieResponse xmlns="http://www.microsoft.com/SoftwareDistribution">
    <GetCookieResult>
        <Expiration>2006-06-08T19:32:23.7190987Z</Expiration>
        <EncryptedData>edzLnPhI/Rjr6CBMlcP+fuCRNBKREotAw9yEMe6EF3oXXvU/N67oNV/AnL5eN3ZAA+jOoJzdcJmc9za5M3B0jqBSnZsWch8waYEVNqd+eLx1EMBCK2v91b+oXtMGw05PgQJAhtZPRk5h4bCN4hxaCaI7JJaN7VWiWBQLh9HAKoBEm7WpOyJgnr7acYoEf64KOrB+aRc0QFuNnLsNYPNQKmx17R+cGkS</EncryptedData>
    </GetCookieResult>
</GetCookieResponse>
</soap:Body>
</soap:Envelope>

```

Sample 2: Metadata and Deployments Synchronization

The following sample message sequences show how this protocol is used during the Metadata Synchronization and Deployments Synchronization phases. This is not a complete conversation between a DSS and a USS. Specifically, the array fields in the content of the message are trimmed to reduce the space required for this illustration. All requests flow from the DSS to the USS, and all responses flow from the USS to the DSS.

This sample shows four request-response exchanges.

- GetConfigData
- GetRevisionIdList
- GetUpdateData
- GetDeployments

```

<?xml version="1.0" encoding="utf-8"?>
<!-- META-DATA SYNC PHASE: GetConfigData() Request -->
    <GetConfigData xmlns="http://www.microsoft.com/SoftwareDistribution">
        <cookie>
            <Expiration>2006-06-08T19:32:23.7190987Z</Expiration>
        <EncryptedData>edzLnPhI/Rjr6CBMlcP+fuCRNBKREotAw9yEMe6EF3oXXvU/N67oNV/AnL5eN3ZAA
        +jOoJzdcJmc9za5M3B0jqBSnZsWch8waYEVNqd+eLx1EMBCK2v91b+oXtMGw05PgQJAhtZPRk5h4bCN
        4hxaCaI7JJaN7VWiWBQLh9HAKoBEm7WpOyJgnr7acYoEf64KOrB+aRc0QFuNnLsNYPNQKmx17R+cGkS<
        /EncryptedData>
    </GetConfigData>

```

```

    </cookie>
  </GetConfigData>
<!-- META-DATA SYNC PHASE: GetConfigData() Response -->
  <GetConfigDataResponse
    xmlns="http://www.microsoft.com/SoftwareDistribution">
    <GetConfigDataResult>
      <CatalogOnlySync>true</CatalogOnlySync>
      <LazySync>true</LazySync>
      <ServerHostsPsfFiles>false</ServerHostsPsfFiles>
      <MaxNumberOfUpdatesPerRequest>100</MaxNumberOfUpdatesPerRequest>
      <NewConfigAnchor>14030,2006-06-08 15:38:16.022</NewConfigAnchor>
      <LanguageUpdateList>
        <ServerSyncLanguageData>
          <LanguageID>0</LanguageID>
          <ShortLanguage>all</ShortLanguage>
          <LongLanguage>all</LongLanguage>
          <Enabled>true</Enabled>
        </ServerSyncLanguageData>
        <ServerSyncLanguageData>
          <LanguageID>1033</LanguageID>
          <ShortLanguage>en</ShortLanguage>
          <LongLanguage>English</LongLanguage>
          <Enabled>false</Enabled>
        </ServerSyncLanguageData>
      </LanguageUpdateList>
    </GetConfigDataResult>
  </GetConfigDataResponse>
<!-- META-DATA SYNC PHASE: GetRevisionIdList() Request -->
  <GetRevisionIdList xmlns="http://www.microsoft.com/SoftwareDistribution">
    <cookie>
      <Expiration>2006-05-26T22:59:25.1296674Z</Expiration>
      <EncryptedData>c7jG7GX4Czeg+uO8twkF3uNyVfDX6G2bXwIUKk114C+B0180eXz9YToko
+KAMp050h16kmztwMUn4i7bJ7AQw64t05Xtgfmf9F42JG1mADwLmRUSAIxnWEpKJe4fmdUzHPKjUWbKB
Pi2UijbE2jz4y177B3vafHo3RtM7NM21Mi/VWXxHw1NKvMYvzOrOvXPNUdJtTM3A0HGzW2M1Z4da7T
Usd5m6g</EncryptedData>
    </cookie>
    <filter>
      <GetConfig>true</GetConfig>
      <Get63LanguageOnly>false</Get63LanguageOnly>
    </filter>
  </GetRevisionIdList>
<!-- META-DATA SYNC PHASE: GetRevisionIdList() Response -->
  <GetRevisionIdListResponse
    xmlns="http://www.microsoft.com/SoftwareDistribution">
    <GetRevisionIdListResult>
      <Anchor>4742,2006-05-26 18:59:26.192</Anchor>
      <NewRevisions>
        <UpdateIdentity>
          <UpdateID>0287014e-6772-4b4d-81f7-42063ac26e8a</UpdateID>
          <RevisionNumber>100</RevisionNumber>
        </UpdateIdentity>
        <!--..... -->
        <!--.....ARRAY TRIMMED..... -->
        <!--..... -->
        <UpdateIdentity>
          <UpdateID>ff2a96fb-cc89-4e5e-83b2-7d48aa179840</UpdateID>
          <RevisionNumber>101</RevisionNumber>
        </UpdateIdentity>
      </NewRevisions>
    </GetRevisionIdListResult>
  </GetRevisionIdListResponse>
<!-- META-DATA SYNC PHASE: GetUpdateData() Request -->
  <GetUpdateData xmlns="http://www.microsoft.com/SoftwareDistribution">
    <cookie>
      <Expiration>2006-05-27T22:42:23.0632331Z</Expiration>
      <EncryptedData>XXRQXVUzH9NX5Qvos3I14F31UmlUgdVSVFm450d+O9A32AyPyTo66g4V1
MA48PRBtRsvajGUYA+CDNeF/ylHxuy48MUWiTJK68AJHO1V+Z6sfBDDnCTV1Fc8z7UUQHguLLTx0B4h
kHhm5FSRmH03ei7mDjnhGstnEhu2hjASXU8uvespc7yt5BtoPCamiNEJQR2WgCImaw3S96AubSSKxDv9
yEAChj0</EncryptedData>
    </cookie>
  </GetUpdateData>

```

```

<updateIds>
  <UpdateIdentity>
    <UpdateID>0287014e-6772-4b4d-81f7-42063ac26e8a</UpdateID>
    <RevisionNumber>100</RevisionNumber>
  </UpdateIdentity>
  <!--..... -->
  <!--.....ARRAY TRIMMED..... -->
  <!--..... -->
  <UpdateIdentity>
    <UpdateID>36b1c48e-c741-4047-9b09-d38698ed34b3</UpdateID>
    <RevisionNumber>101</RevisionNumber>
  </UpdateIdentity>
</updateIds>
</GetUpdateData>
<!-- META-DATA SYNC PHASE: GetUpdateData() Response -->
<GetUpdateDataResponse
  xmlns="http://www.microsoft.com/SoftwareDistribution">
  <GetUpdateDataResult>
    <updates>
      <ServerSyncUpdateData>
        <Id>
          <UpdateID>0fal201d-4330-4fa8-8ae9-b877473b6441</UpdateID>
          <RevisionNumber>1</RevisionNumber>
        </Id>
        <XmlUpdateBlobCompressed>TVNDRgAAAABfCwAAAAAAACwAAAAAAAawEBAAEAAAA
AAAAAQAAAAEAxU2NgAAAAAAXAAAAAAXAAAAAAXmXvYgBLKmjgFgs2NluAgI0
        <!--..... -->
        <!--.....COMPRESSED BLOB TRIMMED..... -->
        <!--..... -->
COEqHYXEGOORfjDFecM5DTHmuLzJUxYNb5WUkHxosEldCv1cNwrigJVvwU8EsqzX2z0UOqAxw==</Xml
UpdateBlobCompressed>
      </ServerSyncUpdateData>
      <!--..... -->
      <!--.....ARRAY TRIMMED..... -->
      <!--..... -->
      <ServerSyncUpdateData>
        <Id>
          <UpdateID>17e993cd-cf5a-4276-9944-6af62ff7139c</UpdateID>
          <RevisionNumber>100</RevisionNumber>
        </Id>
        <XmlUpdateBlob>
          <upd:Update
xmlns:pub="http://schemas.microsoft.com/msus/2002/12/Publishing"
xmlns:mar="http://schemas.microsoft.com/msus/2002/12/MsiApplicabilityRules"
xmlns:upd="http://schemas.microsoft.com/msus/2002/12/Update">
            <upd:UpdateIdentity
                UpdateID="17e993cd-cf5a-4276-9944-6af62ff7139c"
                RevisionNumber="100" />
            <upd:Properties
                DefaultPropertiesLanguage="en"
                UpdateType="Detectoid"
                ExplicitlyDeployable="false"
                IsPublic="false"
                DetectoidType="Application Locale"
                PublicationState="Published"
                CreationDate="2006-05-22T19:10:10.172Z"
                PublisherID="dd79a08b-c3c2-4e05-9862-ee90f9585e33" />
            <upd:LocalizedPropertiesCollection>
              <upd:LocalizedProperties>
                <upd:Language>en</upd:Language>
                <upd:Title>SQL 2005 English ia64</upd:Title>
              </upd:LocalizedProperties>
            </upd:LocalizedPropertiesCollection>
            <upd:Relationships>
              <upd:Prerequisites>
                <upd:UpdateIdentity
                    UpdateID="60916385-7546-4e9b-836e-79d65e517bab" />
              </upd:Prerequisites>
            </upd:Relationships>
          </upd:Update
        </XmlUpdateBlob>
      </ServerSyncUpdateData>
    </updates>
  </GetUpdateDataResult>
</GetUpdateDataResponse>

```

```

        <upd:IsInstalled>
            <mar:MsiProductInstalled
ProductCode="{3c4a397d-22b2-4ab0-849f-f5e12672caca}"
ExcludeVersionMax="true"
VersionMin="9.00.1399.06"
Language="1033"
xmlns:mar="http://schemas.microsoft.com/msus/2002/12/MsiApplicabilityRules" />
            </upd:IsInstalled>
        </upd:ApplicabilityRules>
    </upd:Update>
</XmlUpdateBlob>
</ServerSyncUpdateData>
</updates>
<fileUrls />
</GetUpdateDataResult>
</GetUpdateDataResponse>
<!-- DEPLOYMENTS SYNC PHASE: GetDeployments() Request -->
<GetDeployments xmlns="http://www.microsoft.com/SoftwareDistribution">
    <cookie>
        <Expiration>2006-05-26T22:59:25.1296674Z</Expiration>
        <EncryptedData>c7jG7GX4Czeq+u08twkF3uNyVfDX6G2bXwIUkkl14C+BO180eXz9YTok
+KAMp050h16kmztwMUn4i7bJ7AQw64t05Xtgfmf9F42JG1mADwLmRUSAIxnWEpKJe4fmdUzHPKjUWbKB
Pi2UijibE2jZ4y177B3vafHo3RtM7NM21Mi/VWXxHwlnKvMYvzOrOvXPNUdJtTM3AOHGzW2M1Z4daT7T
Usd5m6g</EncryptedData>
    </cookie>
    <syncAnchor>4742,2006-05-26 18:59:26.192</syncAnchor>
</GetDeployments>
<!-- DEPLOYMENTS SYNC PHASE: GetDeployments() Response -->
<GetDeploymentsResponse
xmlns="http://www.microsoft.com/SoftwareDistribution">
    <GetDeploymentsResult>
        <Anchor>4742,2006-05-26 18:59:26.192</Anchor>
        <Groups>
            <ServerSyncTargetGroup>
                <TargetGroupId>a0a08746-4dbe-4a37-9adf-9e7652c0b421</TargetGroupId>
                <ParentGroupId>00000000-0000-0000-0000-000000000000</ParentGroupId>
                <Name>All Computers</Name>
                <IsBuiltin>true</IsBuiltin>
            </ServerSyncTargetGroup>
            <ServerSyncTargetGroup>
                <TargetGroupId>b73ca6ed-5727-47f3-84de-015e03f6a88a</TargetGroupId>
                <Name>Unassigned Computers</Name>
                <IsBuiltin>true</IsBuiltin>
            </ServerSyncTargetGroup>
        </Groups>
        <Deployments>
            <ServerSyncDeployment>
                <UpdateId>4b62aa32-52f6-4c15-b739-1c8e696eb33e</UpdateId>
                <RevisionNumber>100</RevisionNumber>
                <Action>0</Action>
                <AdminName>WUS Server</AdminName>
                <Deadline>9999-12-31T23:59:59.9999999</Deadline>
                <IsAssigned>true</IsAssigned>
                <GoLiveTime>2006-05-24T15:37:08.887</GoLiveTime>
                <DeploymentGuid>c2f2ca62-5413-419a-bdee-275a23087758</DeploymentGuid>
            </ServerSyncDeployment>
            <ServerSyncDeployment>
                <UpdateId>52bdd083-4169-4094-8eea-6230c7c1520d</UpdateId>
                <RevisionNumber>102</RevisionNumber>
                <Action>0</Action>
                <AdminName>WUS Server</AdminName>
                <Deadline>9999-12-31T23:59:59.9999999</Deadline>
                <IsAssigned>true</IsAssigned>
                <GoLiveTime>2006-05-24T15:59:33.063</GoLiveTime>
            </ServerSyncDeployment>
        </Deployments>
    </GetDeploymentsResult>
</GetDeploymentsResponse>
</GetUpdateDataResponse>
</GetUpdateDataResult>
</fileUrls>
</XmlUpdateBlob>
</ServerSyncUpdateData>
</updates>
</GetUpdateDataResult>
</GetUpdateDataResponse>

```

```

    <DeploymentGuid>10a2030d-0ac1-434a-9c37-732fc36f9838</DeploymentGuid>
  >
    <TargetGroupId>b73ca6ed-5727-47f3-84de-015e03f6a88a</TargetGroupId>
    <DownloadPriority>1</DownloadPriority>
  </ServerSyncDeployment>
</Deployments>
<DeadDeployments />
<HiddenUpdates>
  <guid>9a9baf2-fbfc-4b0b-8479-49a2bb08cd5a</guid>
  <!--..... -->
  <!--.....ARRAY TRIMMED..... -->
  <!--..... -->
  <guid>6c9d9217-0e1d-434a-a938-d9918703c361</guid>
</HiddenUpdates>
<AcceptedEulas />
</GetDeploymentsResult>
</GetDeploymentsResponse>

```

Sample 3: Reporting Data Synchronization

The following sample message sequences show how this protocol is used during the Reporting Data Synchronization phase. This is not a complete conversation between a DSS and a USS. Specifically, the array fields in the content of the message are trimmed to reduce the space required for this illustration. Furthermore, the sample only shows one message for each of the following: RollupDownstreamServers, RollupComputers, GetOutOfSyncComputers, and RollupComputerStatus; a complete conversation can consist of any number of calls being made to each of these methods.

All requests flow from the DSS to the USS, and all responses flow from the USS to the DSS.

This sample shows five request-response exchanges.

1. GetRollupConfiguration
2. RollupDownstreamServers
3. RollupComputers
4. GetOutOfSyncComputers
5. RollupComputerStatus

```

<!-- REPORTING DATA SYNC PHASE: GetRollupConfiguration request -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetRollupConfiguration
      xmlns="http://www.microsoft.com/SoftwareDistribution">
      <cookie>
        <Expiration>9999-12-31T23:59:59.9999999</Expiration>
        <EncryptedData />
      </cookie>
    </GetRollupConfiguration>
  </soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: GetRollupConfiguration response -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetRollupConfigurationResponse
      xmlns="http://www.microsoft.com/SoftwareDistribution">
      <GetRollupConfigurationResult>

```

```

        <DoDetailedRollup>true</DoDetailedRollup>
        <RollupResetGuid>3277f62c-fa08-468f-873f-2f9867bcf9e5</RollupResetGuid>
        <ServerId>059ab167-8a19-4bab-befc-daaab5b1d82b</ServerId>
        <RollupDownstreamServersMaxBatchSize>5000</RollupDownstreamServersMaxBat
chSize>
        <RollupComputersMaxBatchSize>1500</RollupComputersMaxBatchSize>
        <GetOutOfSyncComputersMaxBatchSize>20000</GetOutOfSyncComputersMaxBatchS
ize>
        <RollupComputerStatusMaxBatchSize>500</RollupComputerStatusMaxBatchSize>
    </GetRollupConfigurationResult>
    </GetRollupConfigurationResponse>
  </soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: RollupDownstreamServers request -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <RollupDownstreamServers
      xmlns="http://www.microsoft.com/SoftwareDistribution">
      <cookie>
        <Expiration>9999-12-31T23:59:59.9999999</Expiration>
        <EncryptedData />
      </cookie>
      <clientTime>2007-03-06T03:28:02.5507362Z</clientTime>
      <downstreamServers>
        <DownstreamServerRollupInfo>
          <ServerId>050cee4a-aaff-470c-8fc3-7a94cb3a4293</ServerId>
          <FullDomainName>yasufsf64.ntdev.corp.microsoft.com</FullDomainName>
          <LastSyncTime>0001-01-01T00:00:00</LastSyncTime>
          <ParentServerId>00000000-0000-0000-0000-000000000000</ParentServerId>
          <Version>3.0.6000.354</Version>
          <IsReplica>true</IsReplica>
          <LastRollupTime>2007-03-06T03:28:01.894503Z</LastRollupTime>
          <ServerSummary>
            <UpdateCount>1002</UpdateCount>
            <DeclinedUpdateCount>29</DeclinedUpdateCount>
            <ApprovedUpdateCount>2</ApprovedUpdateCount>
            <NotApprovedUpdateCount>971</NotApprovedUpdateCount>
            <UpdatesWithStaleUpdateApprovalsCount>0</UpdatesWithStaleUpdateAppro
valsCount>
            <ExpiredUpdateCount>1</ExpiredUpdateCount>
            <CriticalOrSecurityUpdatesNotApprovedForInstallCount>953</CriticalOr
SecurityUpdatesNotApprovedForInstallCount>
            <WsusInfrastructureUpdatesNotApprovedForInstallCount>3</WsusInfrastr
uctureUpdatesNotApprovedForInstallCount>
            <UpdatesWithClientErrorsCount>0</UpdatesWithClientErrorsCount>
            <UpdatesWithServerErrorsCount>0</UpdatesWithServerErrorsCount>
            <UpdatesNeedingFilesCount>0</UpdatesNeedingFilesCount>
            <UpdatesNeedingByComputersCount>1</UpdatesNeedingByComputersCount>
            <UpdatesUpToDateCount>972</UpdatesUpToDateCount>
            <CustomComputerTargetGroupCount>0</CustomComputerTargetGroupCount>
            <ComputerTargetCount>1</ComputerTargetCount>
            <ComputerTargetsNeedingUpdatesCount>1</ComputerTargetsNeedingUpdates
Count>
            <ComputerTargetsWithUpdateErrorsCount>0</ComputerTargetsWithUpdateEr
rorsCount>
            <ComputersUpToDateCount>0</ComputersUpToDateCount>
          </ServerSummary>
          <ClientSummaries>
            <DownstreamServerRollupClientSummary>
              <OSMajorVersion>5</OSMajorVersion>
              <OSMinorVersion>2</OSMinorVersion>
              <OSBuildNumber>3790</OSBuildNumber>
              <OSServicePackMajorNumber>1</OSServicePackMajorNumber>
              <OSServicePackMinorNumber>0</OSServicePackMinorNumber>
              <OSLocale>en-US</OSLocale>
              <SuiteMask>272</SuiteMask>
              <OldProductType>3</OldProductType>
            </DownstreamServerRollupClientSummary>
          </ClientSummaries>
        </DownstreamServerRollupInfo>
      </downstreamServers>
    </RollupDownstreamServers>
  </soap:Body>
</soap:Envelope>

```

```

<NewProductType>0</NewProductType>
<SystemMetrics>0</SystemMetrics>
<ProcessorArchitecture>AMD64</ProcessorArchitecture>
<Count>1</Count>
<ActivitySummaries>
  <DownstreamServerRollupClientActivitySummary>
    <UpdateId>63ee225f-897d-42ae-841e-4a383c92f350</UpdateId>
    <RevisionNumber>101</RevisionNumber>
    <InstallSuccessCount>1</InstallSuccessCount>
    <InstallFailureCount>0</InstallFailureCount>
  </DownstreamServerRollupClientActivitySummary>
</ActivitySummaries>
</DownstreamServerRollupClientSummary>
</ClientSummaries>
</DownstreamServerRollupInfo>
</downstreamServers>
</RollupDownstreamServers>
</soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: RollupDownstreamServers response -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <RollupDownstreamServersResponse
      xmlns="http://www.microsoft.com/SoftwareDistribution" />
  </soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: RollupComputers request -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <RollupComputers xmlns="http://www.microsoft.com/SoftwareDistribution">
      <cookie>
        <Expiration>9999-12-31T23:59:59.9999999</Expiration>
        <EncryptedData />
      </cookie>
      <clientTime>2007-03-06T03:28:02.9726004Z</clientTime>
      <computers>
        <ComputerRollupInfo
          ComputerId="d07a4d51-7cb2-46d1-ad86-91195cb4325a"
          LastSyncTime="2007-03-06T03:22:28.137Z"
          LastSyncResult="1"
          LastReportedRebootTime="0001-01-01T00:00:00"
          LastReportedStatusTime="2007-03-06T03:27:59.377Z"
          LastInventoryTime="0001-01-01T00:00:00"
          ParentServerId="050cee4a-aaff-470c-8fc3-7a94cb3a4293">
          <Details
            IPAddress="127.0.0.1"
            FullDomainName="yasufsf64.ntdev.corp.microsoft.com"
            OSMajorVersion="5"
            OSMinorVersion="2"
            OSBuildNumber="3790"
            OSServicePackMajorNumber="1"
            OSServicePackMinorNumber="0"
            OSLocale="en-US"
            ComputerMake="Hewlett-Packard"
            ComputerModel="HP Compaq dc7600 Convertible Minitower"
            BiosVersion="786D1 v01.03"
            BiosName="Default System BIOS"
            BiosReleaseDate="2005-05-18T00:00:00Z"
            ProcessorArchitecture="AMD64"
            SuiteMask="272"
            OldProductType="3"
            NewProductType="0"
            SystemMetrics="0"
            ClientVersion="7.0.6000.354">

```

```

        <TargetGroupIdList>
          <guid>b73ca6ed-5727-47f3-84de-015e03f6a88a</guid>
        </TargetGroupIdList>
        <RequestedTargetGroupNames>
          <string>Windows Server 2003</string>
          <string>Servers</string>
        </RequestedTargetGroupNames>
      </Details>
    </ComputerRollupInfo>
  </computers>
</RollupComputers>
</soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: RollupComputers response -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <RollupComputersResponse
      xmlns="http://www.microsoft.com/SoftwareDistribution">
      <RollupComputersResult />
    </RollupComputersResponse>
  </soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: GetOutOfSyncComputers request -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetOutOfSyncComputers
      xmlns="http://www.microsoft.com/SoftwareDistribution">
      <cookie>
        <Expiration>9999-12-31T23:59:59.9999999</Expiration>
        <EncryptedData />
      </cookie>
      <parentServerId>050cee4a-aaff-470c-8fc3-7a94cb3a4293</parentServerId>
      <lastRollupNumbers>
        <ComputerLastRollupNumber>
          <ComputerId>d07a4d51-7cb2-46d1-ad86-91195cb4325a</ComputerId>
          <RollupNumber>2</RollupNumber>
        </ComputerLastRollupNumber>
      </lastRollupNumbers>
    </GetOutOfSyncComputers>
  </soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: GetOutOfSyncComputers response -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetOutOfSyncComputersResponse
      xmlns="http://www.microsoft.com/SoftwareDistribution">
      <GetOutOfSyncComputersResult />
    </GetOutOfSyncComputersResponse>
  </soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: RollupComputerStatus request -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <RollupComputerStatus xmlns="http://www.microsoft.com/SoftwareDistribution">
      <cookie>
        <Expiration>9999-12-31T23:59:59.9999999</Expiration>
        <EncryptedData />
      </cookie>

```



```

<clientTime>2007-03-06T03:39:24.2520342Z</clientTime>
<parentServerId>050cee4a-aaff-470c-8fc3-7a94cb3a4293</parentServerId>
<computers>
  <ComputerStatusRollupInfo>
    <InstanceId>14720b83-5998-41f7-b586-6088cd8acd0c</InstanceId>
    <ComputerId>d07a4d51-7cb2-46d1-ad86-91195cb4325a</ComputerId>
    <EffectiveLastDetectionTime>2007-03-06T01:47:46.42Z</EffectiveLastDete
ctionTime>
    <RollupNumber>3</RollupNumber>
    <IsFullRollup>true</IsFullRollup>
    <UpdateStatus>
      <ComputerStatusRollupUpdateStatus>
        <UpdateId>09de7a79-5c09-4f3a-972e-cc1bbb7ca7e4</UpdateId>
        <SummarizationState>4</SummarizationState>
        <LastChangeTime>2007-03-05T22:25:11.64Z</LastChangeTime>
      </ComputerStatusRollupUpdateStatus>
      <ComputerStatusRollupUpdateStatus>
        <UpdateId>5eb6225f-5d33-4213-a6b4-fcdd9f672d75</UpdateId>
        <SummarizationState>5</SummarizationState>
        <LastChangeTime>2007-03-05T22:25:11.64Z</LastChangeTime>
      </ComputerStatusRollupUpdateStatus>
      <!--.....-->
      <!--.....ARRAY TRIMMED.....-->
      <!--.....-->
    </UpdateStatus>
  </ComputerStatusRollupInfo>
</computers>
</RollupComputerStatus>
</soap:Body>
</soap:Envelope>
<!-- REPORTING DATA SYNC PHASE: RollupComputerStatus response -->
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <RollupComputerStatusResponse
      xmlns="http://www.microsoft.com/SoftwareDistribution">
      <RollupComputerStatusResult>true</RollupComputerStatusResult>
    </RollupComputerStatusResponse>
  </soap:Body>
</soap:Envelope>

```

Sample 4: SOAP Fault

The following sample message shows a SOAP fault response from the USS to the DSS when the DSS sent an invalid cookie. It shows the <detail> section of the SOAP fault filled with <ErrorCode> "InvalidCookie". The <Method> element also shows the operation that returned this error: "GetDeployments".

```

<!-- DEPLOYMENTS SYNC PHASE: GetDeployments() Failure Response - InvalidCookie -
->
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <soap:Fault>
      <faultcode>soap:Client</faultcode>
      <faultstring>System.Web.Services.Protocols.SoapException: Fault occurred a
t Microsoft.UpdateServices.Internal.SoapUtilities.ThrowException(Error Code error
Code, String message) at Microsoft.UpdateServices.Internal.Authorization.Authori
zationManager.CrackCookieInServerSync(Cookie cookie) at Microsoft.UpdateServices
.Internal.ServerImplementation.GetDeployments(Cookie cookie, String deploymentAn
chor, String syncAnchor) at Microsoft.UpdateServices.Internal.ServerSyncProxy.Ge
tDeployments(Cookie cookie, String deploymentAnchor, String syncAnchor)</faultst
ring>
      <faultactor>http://HemantTest:8530/serversyncWebService/serversyncWebServi

```

```
ce.asmx</faultfactor>
  <detail>
    <ErrorCode>InvalidCookie</ErrorCode>
    <Message />
    <ID>247dffffd-a6b4-4a57-b9d4-2e464b668cd3</ID>
    <Method>"http://www.microsoft.com/SoftwareDistribution/GetDeployments"</
Method>
  </detail>
</soap:Fault>
</soap:Body>
</soap:Envelope>
```

5 Security

5.1 Security Considerations for Implementers

The USS provides the DSS with all updates that ultimately are intended for client computers. It is important to prevent man-in-the-middle or other forms of spoofing attacks from providing the DSS with invalid or malformed metadata and rogue content. To ensure secure download of all data from the USS, the DSS performs these checks:

- It accepts only updates that are signed by Microsoft certificates.
- Depending on the operating system, it accepts only content files whose SHA hash matches the SHA hash specified by the USS in the update metadata.<77>

As a result, it is strongly recommended that the USS be configured so that all metadata communication is done over HTTPS instead of HTTP. Using Secure Sockets Layer (SSL) server certificate verification ensures that the client is talking to the real server and closes any possible man-in-the-middle attacks.

There are two strategies one can use to reduce the impact of Denial Of Service (DOS) attacks against the USS:

- Turn on authentication, and deny access to unauthenticated DSS. This will allow one to quickly disable access to rogue DSS machines.
- Be sure no single operation takes too much processing time on the USS. This will require an attacker to keep up a steady stream of requests to deny access to the server, so a simple network trace will identify the offending machine and shut it down. This applies to requests sent by "spoof clients" (for example, a virus emulating a client that tries to pass an unbounded set of parameters to various methods).

If the USS implementation stores and displays any data passed to it from DSS, it is important to ensure the data is not malformed, especially if it is displayed in the context of a scripting language (for example, from JScript, from within a webpage, or used within SQL).

5.2 Index of Security Parameters

None.

6 Appendix A: Full WSDL

6.1 Server Sync Web Service

```
<?xml version="1.0" encoding="utf-8"?>

<wsdl:definitions xmlns:s="http://www.w3.org/2001/XMLSchema"
  xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
  xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
  xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
  xmlns:tns="http://www.microsoft.com/SoftwareDistribution"
  xmlns:s2="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable"
  xmlns:s1="http://microsoft.com/wsdl/types/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
  xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
  xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
  xmlns:tns="http://www.microsoft.com/SoftwareDistribution"
  xmlns:s1="http://microsoft.com/wsdl/types/"
  xmlns:s="http://www.w3.org/2001/XMLSchema"
  xmlns:s2="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable"
  xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
  xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"

  targetNamespace="http://www.microsoft.com/SoftwareDistribution"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
      targetNamespace="http://www.microsoft.com/SoftwareDistribution">
      <s:import namespace="http://microsoft.com/wsdl/types/" />
      <s:element name="GetAuthConfig">
        <s:complexType />
      </s:element>
      <s:element name="GetAuthConfigResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetAuthConfigResult"
              type="tns:ServerAuthConfig" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ServerAuthConfig">
        <s:complexType />
      </s:element>
      <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="LastChange" type="s:dateTime" />
        <s:element minOccurs="0" maxOccurs="1" name="AuthInfo"
          type="tns:ArrayOfAuthPlugInInfo" />
        <s:element minOccurs="0" maxOccurs="1" name="AllowedEventIds"
          type="tns:ArrayOfInt" />
      </s:sequence>
      <s:complexType name="ArrayOfAuthPlugInInfo">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="AuthPlugInInfo"
            nillable="true" type="tns:AuthPlugInInfo" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="AuthPlugInInfo">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="PlugInID" type="s:string" />
        </s:sequence>
      </s:complexType>
    </s:schema>
  </wsdl:types>

```

```

-----type="s:string" />
--
    <s:element minOccurs="0" maxOccurs="1" name="ServiceUrl" type="s:string" />
-----type="s:string" />
--
    <s:element minOccurs="0" maxOccurs="1" name="Parameter" type="s:string" />
-----type="s:string" />
--
    </s:sequence>
  </s:complexType>
  <s:complexType name="ArrayOfInt">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="unbounded" name="int" type="s:int" />
    </s:sequence>
  </s:complexType>
  <s:element name="GetCookie">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="authCookies"
type="tns:ArrayOfAuthorizationCookie" />
        <s:element minOccurs="0" maxOccurs="1" name="oldCookie" type="tns:Cookie" />
        <s:element minOccurs="0" maxOccurs="1" name="protocolVersion" type="s:string"
/>
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:complexType name="ArrayOfAuthorizationCookie">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="unbounded" name="AuthorizationCookie"
nillable="true" type="tns:AuthorizationCookie" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="AuthorizationCookie">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="PlugInId" type="s:string" />
      <s:element minOccurs="0" maxOccurs="1" name="CookieData" type="s:base64Binary"
/>
    </s:sequence>
  </s:complexType>
  <s:complexType name="Cookie">
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="Expiration" type="s:dateTime" />
      <s:element minOccurs="0" maxOccurs="1" name="EncryptedData"
type="s:base64Binary" />
    </s:sequence>
  </s:complexType>
  <s:element name="GetCookieResponse">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="GetCookieResult"
type="tns:Cookie" />
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:element name="GetConfigData">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />
        <s:element minOccurs="0" maxOccurs="1" name="configAnchor" type="s:string" />
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:element name="GetConfigDataResponse">
    <s:complexType>

```

```

        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="GetConfigDataResult"
type="tns:ServerSyncConfigData" />
        </s:sequence>
      </s:complexType>
    </s:element>
    <s:complexType name="ServerSyncConfigData">
      <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="CatalogOnlySync" type="s:boolean"
/>
        <s:element minOccurs="1" maxOccurs="1" name="LazySync" type="s:boolean" />
        <s:element minOccurs="1" maxOccurs="1" name="ServerHostsPsfFiles"
type="s:boolean" />
        -----type="s:boolean" />
        -----
        <s:element minOccurs="1" maxOccurs="1" name="MaxNumberOfComputerIdsInRequest"
type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="MaxNumberOfDriverSetsPerRequest"
type="s:int" />
        <s:element minOccurs="1" maxOccurs="1"
name="MaxNumberOfPnpHardwareIdsInRequest" type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="MaxNumberOfUpdatesPerRequest"
type="s:int" />
        <s:element minOccurs="0" maxOccurs="1" name="NewConfigAnchor" type="s:string"
/>
        <s:element minOccurs="0" maxOccurs="1" name="ProtocolVersion" type="s:string"
/>
        <s:element minOccurs="0" maxOccurs="1" name="LanguageUpdateList"
type="tns:ArrayOfServerSyncLanguageData" />
        <s:element minOccurs="1" maxOccurs="1"
name="MaxUpdatesPerRequestInGetUpdateDecryptionData" type="s:int" />
      </s:sequence>
    </s:complexType>
    <s:complexType name="ArrayOfServerSyncLanguageData">
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="ServerSyncLanguageData"
nillable="true" type="tns:ServerSyncLanguageData" />
      </s:sequence>
    </s:complexType>
    <s:complexType name="ServerSyncLanguageData">
      <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="LanguageID" type="s:int" />
        -----type="s:int" />
        -----
        <s:element minOccurs="0" maxOccurs="1" name="ShortLanguage" type="s:string"
/>
        <s:element minOccurs="0" maxOccurs="1" name="LongLanguage" type="s:string" />
        <s:element minOccurs="1" maxOccurs="1" name="Enabled" type="s:boolean" />
      </s:sequence>
    </s:complexType>
    <s:element name="GetRevisionIdList">
      <s:complexType>
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />
          <s:element minOccurs="0" maxOccurs="1" name="filter"
type="tns:ServerSyncFilter" />
        </s:sequence>
      </s:complexType>
    </s:element>
    <s:complexType name="ServerSyncFilter">
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="DssProtocolVersion"
type="tns:Version" />
        <s:element minOccurs="0" maxOccurs="1" name="Anchor" type="s:string" />
        <s:element minOccurs="1" maxOccurs="1" name="GetConfig" type="s:boolean" />

```

```

        <s:element minOccurs="1" maxOccurs="1" name="Get63LanguageOnly"
type="s:boolean" />
        <s:element minOccurs="0" maxOccurs="1" name="Categories"
type="tns:ArrayOfIdAndDelta" />
        <s:element minOccurs="0" maxOccurs="1" name="Classifications"
type="tns:ArrayOfIdAndDelta" />
        <s:element minOccurs="0" maxOccurs="1" name="Languages"
type="tns:ArrayOfLanguageAndDelta" />
    </s:sequence>
</s:complexType>
<s:complexType name="Version" />
<s:complexType name="ArrayOfIdAndDelta">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="IdAndDelta"
nillable="true" type="tns:IdAndDelta" />
    </s:sequence>
</s:complexType>
<s:complexType name="IdAndDelta">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="Id" type="s1:guid" />
        <s:element minOccurs="1" maxOccurs="1" name="Delta" type="s:boolean" />
    </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfLanguageAndDelta">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="LanguageAndDelta"
nillable="true" type="tns:LanguageAndDelta" />
    </s:sequence>
</s:complexType>
<s:complexType name="LanguageAndDelta">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="Id" type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="Delta" type="s:boolean" />
    </s:sequence>
</s:complexType>
<s:element name="GetRevisionIdListResponse">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetRevisionIdListResult"
type="tns:RevisionIdList" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:complexType name="RevisionIdList">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="Anchor" type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="NewRevisions"
type="tns:ArrayOfUpdateIdentity" />
    </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfUpdateIdentity">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="UpdateIdentity"
nillable="true" type="tns:UpdateIdentity" />
    </s:sequence>
</s:complexType>
<s:complexType name="UpdateIdentity">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="UpdateID" type="s1:guid" />
        <s:element minOccurs="1" maxOccurs="1" name="RevisionNumber" type="s:int" />
    </s:sequence>
</s:complexType>
</s:sequence>
</s:complexType>
<s:element name="GetUpdateData">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />

```

```

        <s:element minOccurs="0" maxOccurs="1" name="updateIds"
type="tns:ArrayOfUpdateIdentity" />
    </s:sequence>
</s:complexType>
</s:element>
<s:element name="GetUpdateDataResponse">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetUpdateDataResult"
type="tns:ServerUpdateData" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:complexType name="ServerUpdateData">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="updates"
type="tns:ArrayOfServerSyncUpdateData" />
        <s:element minOccurs="0" maxOccurs="1" name="fileUrls"
type="tns:ArrayOfServerSyncUrlData" />
    </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfServerSyncUpdateData">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="ServerSyncUpdateData"
nillable="true" type="tns:ServerSyncUpdateData" />
    </s:sequence>
</s:complexType>
<s:complexType name="ServerSyncUpdateData">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="Id" type="tns:UpdateIdentity" />
        <s:element minOccurs="0" maxOccurs="1" name="XmlUpdateBlob" type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="FileDigestList"
type="tns:ArrayOfBase64Binary" />
        <s:element minOccurs="0" maxOccurs="1" name="XmlUpdateBlobCompressed"
type="s:base64Binary" />
    </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfBase64Binary">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="base64Binary"
nillable="true" type="s:base64Binary" />
    </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfServerSyncUrlData">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="ServerSyncUrlData"
nillable="true" type="tns:ServerSyncUrlData" />
    </s:sequence>
</s:complexType>
<s:complexType name="ServerSyncUrlData">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="FileDigest" type="s:base64Binary"
/>
        <s:element minOccurs="0" maxOccurs="1" name="MUUrl" type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="UssUrl" type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="DecryptionKey"
type="s:base64Binary" />
    </s:sequence>
</s:complexType>
<s:element name="DownloadFilesGetUpdateDecryptionData">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />
            <s:element minOccurs="0" maxOccurs="1" name="updateIds"
type="tns:ArrayOfUpdateIdentity" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:element name="GetUpdateDecryptionDataResponse">
    <s:complexType>

```



```

        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetUpdateDecryptionDataResult"
type="tns:ServerDecryptionData" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:complexType name="ServerDecryptionData">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="UpdateFileDecryptionData"
type="tns:ArrayOfServerSyncUpdateFileDecryption" />
    </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfServerSyncUpdateFileDecryption">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded"
name="ServerSyncUpdateFileDecryption" nillable="true"
type="tns:ServerSyncUpdateFileDecryption" />
    </s:sequence>
</s:complexType>
<s:complexType name="ServerSyncUpdateFileDecryption">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="UpdateId"
type="tns:UpdateIdentity" />
        <s:element minOccurs="0" maxOccurs="1" name="FileDecryptionData"
type="tns:ArrayOfServerSyncFileDecryption" />
    </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfServerSyncFileDecryption">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="ServerSyncFileDecryption"
nillable="true" type="tns:ServerSyncFileDecryption" />
    </s:sequence>
</s:complexType>
<s:complexType name="ServerSyncFileDecryption">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="FileDigest" type="s:base64Binary"
/>
        <s:element minOccurs="0" maxOccurs="1" name="DecryptionKey"
type="s:base64Binary" />
    </s:sequence>
</s:complexType>
<s:element name="DownloadFiles">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />
            <s:element minOccurs="0" maxOccurs="1" name="fileDigestList"
type="tns:ArrayOfBase64Binary" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:element name="DownloadFilesResponse">
    <s:complexType />
</s:element>
<s:element name="GetDeployments">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />
            <s:element minOccurs="0" maxOccurs="1" name="deploymentAnchor"
type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="syncAnchor" type="s:string" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:element name="GetDeploymentsResponse">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetDeploymentsResult"
type="tns:ServerSyncDeploymentResult" />
        </s:sequence>
    </s:complexType>

```

```

</s:element>
<s:complexType name="ServerSyncDeploymentResult">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="Anchor" type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="Groups"
type="tns:ArrayOfServerSyncTargetGroup" />
    <s:element minOccurs="0" maxOccurs="1" name="Deployments"
type="tns:ArrayOfServerSyncDeployment" />
    <s:element minOccurs="0" maxOccurs="1" name="DeadDeployments"
type="tns:ArrayOfGuid" />
    <s:element minOccurs="0" maxOccurs="1" name="HiddenUpdates"
type="tns:ArrayOfGuid" />
    <s:element minOccurs="0" maxOccurs="1" name="AcceptedEulas"
type="tns:ArrayOfGuid" />
  </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfServerSyncTargetGroup">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="ServerSyncTargetGroup"
nillable="true" type="tns:ServerSyncTargetGroup" />
  </s:sequence>
</s:complexType>
<s:complexType name="ServerSyncTargetGroup">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="TargetGroupId" type="s1:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="ParentGroupId" type="s1:guid" />
    <s:element minOccurs="0" maxOccurs="1" name="Name" type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="IsBuiltin" type="s:boolean" />
  </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfServerSyncDeployment">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="ServerSyncDeployment"
nillable="true" type="tns:ServerSyncDeployment" />
  </s:sequence>
</s:complexType>
<s:complexType name="ServerSyncDeployment">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="UpdateId" type="s1:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="RevisionNumber" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="Action" type="s:int" />
    <s:element minOccurs="0" maxOccurs="1" name="AdminName" type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="Deadline" type="s:dateTime" />
    <s:element minOccurs="1" maxOccurs="1" name="IsAssigned" type="s:boolean" />
    <s:element minOccurs="1" maxOccurs="1" name="GoLiveTime" type="s:dateTime" />
    <s:element minOccurs="1" maxOccurs="1" name="DeploymentGuid" type="s1:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="TargetGroupId" type="s1:guid" />
    <s:element minOccurs="1" maxOccurs="1" name="DownloadPriority"
type="s:unsignedByte" />
  </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfGuid">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded" name="guid" type="s1:guid" />
  </s:sequence>
</s:complexType>
<s:element name="GetRelatedRevisionsForUpdates">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie" type="tns:Cookie" />
      <s:element minOccurs="0" maxOccurs="1" name="updateIDs"
type="tns:ArrayOfGuid" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="GetRelatedRevisionsForUpdatesResponse">

```

```

        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1"
name="GetRelatedRevisionsForUpdatesResult" type="tns:ArrayOfUpdateIdentity" />
            _____ type="tns:ArrayOfUpdateIdentity" />
          _____
          </s:sequence>
        </s:complexType>
      </s:element>
    </s:schema>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://microsoft.com/wsd1/types/">
      <s:simpleType name="guid">
        <s:restriction base="s:string">
          <s:pattern value="[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}" />
        </s:restriction>
      </s:simpleType>
    </s:schema>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable">
      <s:element name="Ping">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="pingLevel" type="s:int" />
            _____ type="s:int" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="PingResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="PingResult"
type="s2:MonitoredServicesResponse" />
            </s:sequence>
          </s:complexType>
        </s:element>
        <s:complexType name="MonitoredServicesResponse">
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="SuccessFlag" type="s:boolean" />
            _____ type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="ServicesTime" type="s:dateTime" />
            <s:element minOccurs="0" maxOccurs="1" name="ServicesName" type="s:string" />
            _____ type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="ServicesMachine" type="s:string" />
            _____ type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="IsHttps" type="s:boolean" />
            _____ type="s:boolean" />
            <s:element minOccurs="0" maxOccurs="1" name="RequestContentType"
type="s:string" />

```

```
        <s:element minOccurs="0" maxOccurs="1" name="ConfigFilePath" type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="ConfigFileProjectName"
type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="ConfigFileEnvironmentName"
type="s:string" />
        <s:element minOccurs="1" maxOccurs="1" name="ConfigFileLastModifiedTime"
type="s:dateTime" />
        <s:element minOccurs="0" maxOccurs="1" name="ConfigFileVersion" type="s:string"
/>
```

~~type="s:string" />~~

```
        <s:element minOccurs="1" maxOccurs="1" name="ConfigFileNextExpirationTime"
type="s:dateTime" />
        <s:element minOccurs="1" maxOccurs="1"
name="ConfigFileExpirationModuloInMinutes" type="s:int" />
        <s:element minOccurs="0" maxOccurs="1" name="DatabaseInfo" type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="CustomInfo" type="s:string" />
    </s:sequence>
</s:complexType>
</s:schema>
</wsdl:types>
<wsdl:message name="GetAuthConfigSoapIn">
    <wsdl:part name="parameters" element="tns:GetAuthConfig" />
</wsdl:message>
<wsdl:message name="GetAuthConfigSoapOut">
    <wsdl:part name="parameters" element="tns:GetAuthConfigResponse" />
</wsdl:message>
<wsdl:message name="GetCookieSoapIn">
    <wsdl:part name="parameters" element="tns:GetCookie" />
</wsdl:message>
<wsdl:message name="GetCookieSoapOut">
    <wsdl:part name="parameters" element="tns:GetCookieResponse" />
</wsdl:message>
<wsdl:message name="GetConfigDataSoapIn">
    <wsdl:part name="parameters" element="tns:GetConfigData" />
</wsdl:message>
<wsdl:message name="GetConfigDataSoapOut">
    <wsdl:part name="parameters" element="tns:GetConfigDataResponse" />
</wsdl:message>
<wsdl:message name="GetRevisionIdListSoapIn">
    <wsdl:part name="parameters" element="tns:GetRevisionIdList" />
</wsdl:message>
<wsdl:message name="GetRevisionIdListSoapOut">
    <wsdl:part name="parameters" element="tns:GetRevisionIdListResponse" />
</wsdl:message>
<wsdl:message name="GetUpdateDataSoapIn">
    <wsdl:part name="parameters" element="tns:GetUpdateData" />
</wsdl:message>
<wsdl:message name="GetUpdateDataSoapOut">
    <wsdl:part name="parameters" element="tns:GetUpdateDataResponse" />
</wsdl:message>
<wsdl:message name="GetUpdateDecryptionDataSoapIn">
    <wsdl:part name="parameters" element="tns:GetUpdateDecryptionData" />
</wsdl:message>
<wsdl:message name="GetUpdateDecryptionDataSoapOut">
    <wsdl:part name="parameters" element="tns:GetUpdateDecryptionDataResponse" />
</wsdl:message>
<wsdl:message name="DownloadFilesSoapIn">
    <wsdl:part name="parameters" element="tns:DownloadFiles" />
</wsdl:message>
<wsdl:message name="DownloadFilesSoapOut">
    <wsdl:part name="parameters" element="tns:DownloadFilesResponse" />
</wsdl:message>
<wsdl:message name="GetDeploymentsSoapIn">
    <wsdl:part name="parameters" element="tns:GetDeployments" />
</wsdl:message>
<wsdl:message name="GetDeploymentsSoapOut">
    <wsdl:part name="parameters" element="tns:GetDeploymentsResponse" />
```

```

</wsdl:message>
<wsdl:message name="GetRelatedRevisionsForUpdatesSoapIn">
  <wsdl:part name="parameters" element="tns:GetRelatedRevisionsForUpdates" />
</wsdl:message>
<wsdl:message name="GetRelatedRevisionsForUpdatesSoapOut">
  <wsdl:part name="parameters" element="tns:GetRelatedRevisionsForUpdatesResponse" />
</wsdl:message>
<wsdl:message name="PingSoapIn">
  <wsdl:part name="parameters" element="s2:Ping" />
</wsdl:message>
<wsdl:message name="PingSoapOut">
  <wsdl:part name="parameters" element="s2:PingResponse" />
</wsdl:message>
<wsdl:portType name="ServerSyncProxySoap">
  <wsdl:operation name="GetAuthConfig">
    <wsdl:input message="tns:GetAuthConfigSoapIn" />
    <wsdl:output message="tns:GetAuthConfigSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetCookie">
    <wsdl:input message="tns:GetCookieSoapIn" />
    <wsdl:output message="tns:GetCookieSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetConfigData">
    <wsdl:input message="tns:GetConfigDataSoapIn" />
    <wsdl:output message="tns:GetConfigDataSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetRevisionIdList">
    <wsdl:input message="tns:GetRevisionIdListSoapIn" />
    <wsdl:output message="tns:GetRevisionIdListSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetUpdateData">
    <wsdl:input message="tns:GetUpdateDataSoapIn" />
    <wsdl:output message="tns:GetUpdateDataSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetUpdateDecryptionData">
    <wsdl:input message="tns:GetUpdateDecryptionDataSoapIn" />
    <wsdl:output message="tns:GetUpdateDecryptionDataSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="DownloadFiles">
    <wsdl:input message="tns:DownloadFilesSoapIn" />
    <wsdl:output message="tns:DownloadFilesSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetDeployments">
    <wsdl:input message="tns:GetDeploymentsSoapIn" />
    <wsdl:output message="tns:GetDeploymentsSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="GetRelatedRevisionsForUpdates">
    <wsdl:input message="tns:GetRelatedRevisionsForUpdatesSoapIn" />
    <wsdl:output message="tns:GetRelatedRevisionsForUpdatesSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="Ping">
    <wsdl:input message="tns:PingSoapIn" />
    <wsdl:output message="tns:PingSoapOut" />
  </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="ServerSyncProxySoap" type="tns:ServerSyncProxySoap">
  <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="GetAuthConfig">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetAuthConfig" style="document"
/>
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
<wsdl:operation name="GetCookie">

```

```

    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetCookie" style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetConfigData">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetConfigData" style="document"
/>
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetRevisionIdList">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetRevisionIdList"
style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetUpdateData">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetUpdateData" style="document"
/>
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetUpdateDecryptionData">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetUpdateDecryptionData"
style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="DownloadFiles">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/DownloadFiles" style="document"
/>
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetDeployments">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetDeployments"
style="document" />
    <wsdl:input>
        <soap:body use="literal" />

```

```

    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="GetRelatedRevisionsForUpdates">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetRelatedRevisionsForUpdates"
style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="Ping">
    <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable/Ping"
style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
</wsdl:binding>
<wsdl:binding name="ServerSyncProxySoap12" type="tns:ServerSyncProxySoap">
  <soap12:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="GetAuthConfig">
    <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetAuthConfig" style="document"
/>

```

```

-----soapAction="http://www.microsoft.com/SoftwareDistribution/GetAuthConfig"
-----style="document" />

```

```

  <wsdl:input>
    <soap12:body use="literal" />
  </wsdl:input>
  <wsdl:output>
    <soap12:body use="literal" />
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetCookie">
  <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetCookie" style="document" />

```

```

-----soapAction="http://www.microsoft.com/SoftwareDistribution/GetCookie"
-----style="document" />

```

```

  <wsdl:input>
    <soap12:body use="literal" />
  </wsdl:input>
  <wsdl:output>
    <soap12:body use="literal" />
  </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetConfigData">
  <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetConfigData" style="document"
/>

```

```

-----soapAction="http://www.microsoft.com/SoftwareDistribution/GetConfigData"
-----style="document" />

```

```

    <wsdl:input>
      <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap12:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="GetRevisionIdList">
    <soap12:operation
      soapAction="http://www.microsoft.com/SoftwareDistribution/GetRevisionIdList"
      style="document" />
    </soap12:operation>
  </wsdl:operation>
  <wsdl:operation name="GetUpdateData">
    <soap12:operation
      soapAction="http://www.microsoft.com/SoftwareDistribution/GetUpdateData" style="document"
      />
    </soap12:operation>
  </wsdl:operation>
  <wsdl:operation name="GetUpdateDecryptionData">
    <soap12:operation
      soapAction="http://www.microsoft.com/SoftwareDistribution/GetUpdateDecryptionData"
      style="document" />
    </soap12:operation>
  </wsdl:operation>
  <wsdl:operation name="DownloadFiles">
    <soap12:operation
      soapAction="http://www.microsoft.com/SoftwareDistribution/DownloadFiles" style="document"
      />
    </soap12:operation>
  </wsdl:operation>
  <wsdl:operation name="GetDeployments">
    <soap12:operation
      soapAction="http://www.microsoft.com/SoftwareDistribution/GetDeployments"
      style="document" />
    </soap12:operation>
  </wsdl:operation>

```



```

        <soap12:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetRelatedRevisionsForUpdates">
    <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetRelatedRevisionsForUpdates"
style="document" />
    <wsdl:input>
        <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap12:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="Ping">
    <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable/Ping"
style="document" />
    <wsdl:input>
        <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap12:body use="literal" />
    </wsdl:output>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="ServerSyncProxy">
    <wsdl:port name="ServerSyncProxySoap" binding="tns:ServerSyncProxySoap">
        <soap:address location="http://localhost/serversyncwebservice/ServerSyncProxy.asmx"
/>
    </wsdl:port>
    <wsdl:port name="ServerSyncProxySoap12" binding="tns:ServerSyncProxySoap12">
        <soap12:address
location="http://localhost/serversyncwebservice/ServerSyncProxy.asmx" />
    </wsdl:port>
</wsdl:service>

</wsdl:definitions>

```

6.2 DSS Authorization Web Service

```

<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
    xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
    xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
    xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"

    xmlns:tns="http://www.microsoft.com/SoftwareDistribution/Server/DssAuthWebService"
    xmlns:s1="http://microsoft.com/wsdl/types/"
    xmlns:s="http://www.w3.org/2001/XMLSchema"

    xmlns:s2="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable"
    xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
    xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"

    targetNamespace="http://www.microsoft.com/SoftwareDistribution/Server/DssAuthWebService"
    xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
    <wsdl:types>
        <s:schema elementFormDefault="qualified"
targetNamespace="http://www.microsoft.com/SoftwareDistribution/Server/DssAuthWebService">
            <s:import namespace="http://microsoft.com/wsdl/types/" />
            <s:element name="GetAuthorizationCookie">
                <s:complexType>
                    <s:sequence>
                        <s:element minOccurs="0" maxOccurs="1" name="accountName"
type="s:string" />
                        <s:element minOccurs="0" maxOccurs="1" name="accountGuid"

```

```

        type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="programKeys"
            type="tns:ArrayOfGuid" />
    </s:sequence>
</s:complexType>
</s:element>
<s:complexType name="ArrayOfGuid">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="guid"
            type="s1:guid" />
    </s:sequence>
</s:complexType>
<s:element name="GetAuthorizationCookieResponse">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1"
                name="GetAuthorizationCookieResult"
                type="tns:AuthorizationCookie" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:complexType name="AuthorizationCookie">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="PlugInId"
            type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="CookieData"
            type="s:base64Binary" />
    </s:sequence>
</s:complexType>
</s:schema>
<s:schema elementFormDefault="qualified"
    targetNamespace="http://microsoft.com/wsdl/types/">
    <s:simpleType name="guid">
        <s:restriction base="s:string">
            <s:pattern
value="[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}" />
            </s:restriction>
        </s:simpleType>
    </s:schema>
<s:schema elementFormDefault="qualified"
targetNamespace="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable">
    <s:element name="Ping">
        <s:complexType>
            <s:sequence>
                <s:element minOccurs="1" maxOccurs="1" name="pingLevel"
                    type="s:int" />
            </s:sequence>
        </s:complexType>
    </s:element>
    <s:element name="PingResponse">
        <s:complexType>
            <s:sequence>
                <s:element minOccurs="0" maxOccurs="1" name="PingResult"
                    type="s2:MonitoredServicesResponse" />
            </s:sequence>
        </s:complexType>
    </s:element>
    <s:complexType name="MonitoredServicesResponse">
        <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="SuccessFlag"
                type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="ServicesTime"
                type="s:dateTime" />
            <s:element minOccurs="0" maxOccurs="1" name="ServicesName"
                type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="ServicesMachine"
                type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="IsHttps"
                type="s:boolean" />
            <s:element minOccurs="0" maxOccurs="1" name="RequestContentType"

```

```

        type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="ConfigFilePath"
        type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="ConfigFileProjectName"
        type="s:string" />
    <s:element minOccurs="0" maxOccurs="1"
        name="ConfigFileEnvironmentName" type="s:string" />
    <s:element minOccurs="1" maxOccurs="1"
        name="ConfigFileLastModifiedTime" type="s:dateTime" />
    <s:element minOccurs="0" maxOccurs="1" name="ConfigFileVersion"
        type="s:string" />
    <s:element minOccurs="1" maxOccurs="1"
        name="ConfigFileNextExpirationTime" type="s:dateTime" />
    <s:element minOccurs="1" maxOccurs="1"
        name="ConfigFileExpirationModuloInMinutes" type="s:int" />
    <s:element minOccurs="0" maxOccurs="1" name="DatabaseInfo"
        type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="CustomInfo"
        type="s:string" />
    </s:sequence>
</s:complexType>
</s:schema>
</wsdl:types>
<wsdl:message name="GetAuthorizationCookieSoapIn">
    <wsdl:part name="parameters" element="tns:GetAuthorizationCookie" />
</wsdl:message>
<wsdl:message name="GetAuthorizationCookieSoapOut">
    <wsdl:part name="parameters" element="tns:GetAuthorizationCookieResponse" />
</wsdl:message>
<wsdl:message name="PingSoapIn">
    <wsdl:part name="parameters" element="s2:Ping" />
</wsdl:message>
<wsdl:message name="PingSoapOut">
    <wsdl:part name="parameters" element="s2:PingResponse" />
</wsdl:message>
<wsdl:portType name="DssAuthWebServiceSoap">
    <wsdl:operation name="GetAuthorizationCookie">
        <wsdl:input message="tns:GetAuthorizationCookieSoapIn" />
        <wsdl:output message="tns:GetAuthorizationCookieSoapOut" />
    </wsdl:operation>
    <wsdl:operation name="Ping">
        <wsdl:input message="tns:PingSoapIn" />
        <wsdl:output message="tns:PingSoapOut" />
    </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="DssAuthWebServiceSoap" type="tns:DssAuthWebServiceSoap">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
    <wsdl:operation name="GetAuthorizationCookie">
        <soap:operation
            soapAction="http://www.microsoft.com/SoftwareDistribution/Server/DssAuthWebService/GetAuthori
            zationCookie" style="document" />
        <wsdl:input>
            <soap:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="Ping">
        <soap:operation
            soapAction="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable/Ping"
            style="document" />
        <wsdl:input>
            <soap:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
</wsdl:binding>

```

```

    <wsdl:binding name="DssAuthWebServiceSoap12" type="tns:DssAuthWebServiceSoap">
      <soap12:binding transport="http://schemas.xmlsoap.org/soap/http" />
      <wsdl:operation name="GetAuthorizationCookie">
        <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/Server/DssAuthWebService/GetAuthori
zationCookie" style="document" />
          <wsdl:input>
            <soap12:body use="literal" />
          </wsdl:input>
          <wsdl:output>
            <soap12:body use="literal" />
          </wsdl:output>
        </wsdl:operation>
        <wsdl:operation name="Ping">
          <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable/Ping"
style="document" />
            <wsdl:input>
              <soap12:body use="literal" />
            </wsdl:input>
            <wsdl:output>
              <soap12:body use="literal" />
            </wsdl:output>
          </wsdl:operation>
        </wsdl:binding>
      <wsdl:service name="DssAuthWebService">
        <wsdl:port name="DssAuthWebServiceSoap" binding="tns:DssAuthWebServiceSoap">
          <soap:address
location="http://localhost/DssAuthWebService/DssAuthWebService.asmx" />
        </wsdl:port>
        <wsdl:port name="DssAuthWebServiceSoap12"
binding="tns:DssAuthWebServiceSoap12">
          <soap12:address
location="http://localhost/DssAuthWebService/DssAuthWebService.asmx" />
        </wsdl:port>
      </wsdl:service>
    </wsdl:definitions>

```

6.3 Reporting Web Service

```

<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://www.microsoft.com/SoftwareDistribution"
xmlns:s1="http://microsoft.com/wsdl/types/"
xmlns:s="http://www.w3.org/2001/XMLSchema"

xmlns:s2="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
targetNamespace="http://www.microsoft.com/SoftwareDistribution"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.microsoft.com/SoftwareDistribution">
      <s:import namespace="http://microsoft.com/wsdl/types/" />
      <s:element name="ReportEventBatch">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="cookie"
type="tns:Cookie" />
            <s:element minOccurs="1" maxOccurs="1" name="clientTime"
type="s:dateTime" />
            <s:element minOccurs="0" maxOccurs="1" name="eventBatch"
type="tns:ArrayOfReportingEvent" />
          </s:sequence>
        </s:complexType>
      </s:element>
    </s:schema>
  </wsdl:types>

```

```

    </s:complexType>
  </s:element>
  <s:complexType name="Cookie">
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="Expiration"
        type="s:dateTime" />
      <s:element minOccurs="0" maxOccurs="1" name="EncryptedData"
        type="s:base64Binary" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="ArrayOfReportingEvent">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="unbounded" name="ReportingEvent"
        nillable="true" type="tns:ReportingEvent" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="ReportingEvent">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="BasicData"
        type="tns:BasicData" />
      <s:element minOccurs="0" maxOccurs="1" name="ExtendedData"
        type="tns:ExtendedData" />
      <s:element minOccurs="0" maxOccurs="1" name="PrivateData"
        type="tns:PrivateData" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="BasicData">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="TargetID"
        type="tns:ComputerTargetIdentifier" />
      <s:element minOccurs="1" maxOccurs="1" name="SequenceNumber"
        type="s:int" />
      <s:element minOccurs="1" maxOccurs="1" name="TimeAtTarget"
        type="s:dateTime" />
      <s:element minOccurs="1" maxOccurs="1" name="EventInstanceID"
        type="s1:guid" />
      <s:element minOccurs="1" maxOccurs="1" name="NamespaceID"
        type="s:int" />
      <s:element minOccurs="1" maxOccurs="1" name="EventID"
        type="s:short" />
      <s:element minOccurs="1" maxOccurs="1" name="SourceID"
        type="s:short" />
      <s:element minOccurs="0" maxOccurs="1" name="UpdateID"
        type="tns:UpdateRevisionIdentifier" />
      <s:element minOccurs="1" maxOccurs="1" name="Win32HResult"
        type="s:int" />
      <s:element minOccurs="0" maxOccurs="1" name="AppName"
        type="s:string" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="ComputerTargetIdentifier">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="Sid" type="s:string" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="UpdateRevisionIdentifier">
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="UpdateID"
        type="s1:guid" />
      <s:element minOccurs="1" maxOccurs="1" name="RevisionNumber"
        type="s:int" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="ExtendedData">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="ReplacementStrings"
        type="tns:ArrayOfString" />
      <s:element minOccurs="0" maxOccurs="1" name="MiscData"
        type="tns:ArrayOfString" />
      <s:element minOccurs="0" maxOccurs="1" name="ComputerBrand"

```

```

        type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="ComputerModel"
        type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="BiosRevision"
        type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="ProcessorArchitecture"
        type="tns:ProcessorArchitecture" />
    <s:element minOccurs="1" maxOccurs="1" name="OSVersion"
        type="tns:DetailedVersion" />
    <s:element minOccurs="1" maxOccurs="1" name="OSLocaleID"
        type="s:int" />
    <s:element minOccurs="0" maxOccurs="1" name="DeviceID"
        type="s:string" />
</s:sequence>
</s:complexType>
<s:complexType name="ArrayOfString">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded" name="string"
            nillable="true" type="s:string" />
    </s:sequence>
</s:complexType>
<s:simpleType name="ProcessorArchitecture">
    <s:restriction base="s:string">
        <s:enumeration value="Unknown" />
        <s:enumeration value="X86Compatible" />
        <s:enumeration value="IA64Compatible" />
        <s:enumeration value="Amd64Compatible" />
    </s:restriction>
</s:simpleType>
<s:complexType name="DetailedVersion">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="Major" type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="Minor" type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="Build" type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="Revision"
            type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="ServicePackMajor"
            type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="ServicePackMinor"
            type="s:int" />
    </s:sequence>
</s:complexType>
<s:complexType name="PrivateData">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="ComputerDnsName"
            type="s:string" />
        <s:element minOccurs="0" maxOccurs="1" name="UserAccountName"
            type="s:string" />
    </s:sequence>
</s:complexType>
<s:element name="ReportEventBatchResponse">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="1" maxOccurs="1"
                name="ReportEventBatchResult" type="s:boolean" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:element name="ReportEventBatch2">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="computerId"
                type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="clientTime"
                type="s:dateTime" />
            <s:element minOccurs="0" maxOccurs="1" name="eventBatch"
                type="tns:ArrayOfReportingEvent" />
        </s:sequence>
    </s:complexType>
</s:element>

```

```

<s:element name="ReportEventBatch2Response">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1"
        name="ReportEventBatch2Result" type="s:boolean" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="GetRequiredInventoryType">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie"
        type="tns:Cookie" />
      <s:element minOccurs="1" maxOccurs="1" name="rulesId"
        type="s1:guid" />
      <s:element minOccurs="0" maxOccurs="1" name="rulesVersion"
        type="s:string" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="GetRequiredInventoryTypeResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1"
        name="GetRequiredInventoryTypeResult" type="s:int" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="ReportInventory">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie"
        type="tns:Cookie" />
      <s:element minOccurs="1" maxOccurs="1" name="clientTime"
        type="s:dateTime" />
      <s:element minOccurs="0" maxOccurs="1" name="inventory"
        type="tns:ReportingInventory" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:complexType name="ReportingInventory">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="IsCompressed"
      type="s:boolean" />
    <s:element minOccurs="0" maxOccurs="1" name="RawXml"
      type="s:string" />
    <s:element minOccurs="0" maxOccurs="1" name="CompressedXml"
      type="s:base64Binary" />
  </s:sequence>
</s:complexType>
<s:element name="ReportInventoryResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="ReportInventoryResult"
        type="s:boolean" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="GetRollupConfiguration">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="cookie"
        type="tns:Cookie" />
    </s:sequence>
  </s:complexType>
</s:element>
<s:element name="GetRollupConfigurationResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1"

```

```

        name="GetRollupConfigurationResult"
        type="tns:RollupConfiguration" />
    </s:sequence>
</s:complexType>
</s:element>
<s:complexType name="RollupConfiguration">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="DoDetailedRollup"
            type="s:boolean" />
        <s:element minOccurs="1" maxOccurs="1" name="RollupResetGuid"
            type="s1:guid" />
        <s:element minOccurs="1" maxOccurs="1" name="ServerId"
            type="s1:guid" />
        <s:element minOccurs="1" maxOccurs="1"
            name="RollupDownstreamServersMaxBatchSize" type="s:int" />
        <s:element minOccurs="1" maxOccurs="1"
            name="RollupComputersMaxBatchSize" type="s:int" />
        <s:element minOccurs="1" maxOccurs="1"
            name="GetOutOfSyncComputersMaxBatchSize" type="s:int" />
        <s:element minOccurs="1" maxOccurs="1"
            name="RollupComputerStatusMaxBatchSize" type="s:int" />
    </s:sequence>
</s:complexType>
<s:element name="RollupDownstreamServers">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="cookie"
                type="tns:Cookie" />
            <s:element minOccurs="1" maxOccurs="1" name="clientTime"
                type="s:dateTime" />
            <s:element minOccurs="0" maxOccurs="1" name="downstreamServers"
                type="tns:ArrayOfDownstreamServerRollupInfo" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:complexType name="ArrayOfDownstreamServerRollupInfo">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded"
            name="DownstreamServerRollupInfo" nillable="true"
            type="tns:DownstreamServerRollupInfo" />
    </s:sequence>
</s:complexType>
<s:complexType name="DownstreamServerRollupInfo">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="ServerId"
            type="s1:guid" />
        <s:element minOccurs="0" maxOccurs="1" name="FullDomainName"
            type="s:string" />
        <s:element minOccurs="1" maxOccurs="1" name="LastSyncTime"
            type="s:dateTime" />
        <s:element minOccurs="1" maxOccurs="1" name="ParentServerId"
            type="s1:guid" />
        <s:element minOccurs="0" maxOccurs="1" name="Version"
            type="s:string" />
        <s:element minOccurs="1" maxOccurs="1" name="IsReplica"
            type="s:boolean" />
        <s:element minOccurs="1" maxOccurs="1" name="LastRollupTime"
            type="s:dateTime" />
        <s:element minOccurs="0" maxOccurs="1" name="ServerSummary"
            type="tns:DownstreamServerRollupServerSummary" />
        <s:element minOccurs="0" maxOccurs="1" name="ClientSummaries"
            type="tns:ArrayOfDownstreamServerRollupClientSummary" />
    </s:sequence>
</s:complexType>
<s:complexType name="DownstreamServerRollupServerSummary">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="UpdateCount"
            type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="DeclinedUpdateCount"
            type="s:int" />
    </s:sequence>
</s:complexType>

```



```

<s:element minOccurs="1" maxOccurs="1" name="ApprovedUpdateCount"
  type="s:int" />
<s:element minOccurs="1" maxOccurs="1" name="NotApprovedUpdateCount"
  type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="UpdatesWithStaleUpdateApprovalsCount" type="s:int" />
<s:element minOccurs="1" maxOccurs="1" name="ExpiredUpdateCount"
  type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="CriticalOrSecurityUpdatesNotApprovedForInstallCount"
  type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="WsusInfrastructureUpdatesNotApprovedForInstallCount"
  type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="UpdatesWithClientErrorsCount" type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="UpdatesWithServerErrorsCount" type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="UpdatesNeedingFilesCount" type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="UpdatesNeededByComputersCount" type="s:int" />
<s:element minOccurs="1" maxOccurs="1" name="UpdatesUpToDateCount"
  type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="CustomComputerTargetGroupCount" type="s:int" />
<s:element minOccurs="1" maxOccurs="1" name="ComputerTargetCount"
  type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="ComputerTargetsNeedingUpdatesCount" type="s:int" />
<s:element minOccurs="1" maxOccurs="1"
  name="ComputerTargetsWithUpdateErrorsCount" type="s:int" />
<s:element minOccurs="1" maxOccurs="1" name="ComputersUpToDateCount"
  type="s:int" />
</s:sequence>
</s:complexType>
<s:complexType name="ArrayOfDownstreamServerRollupClientSummary">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="unbounded"
      name="DownstreamServerRollupClientSummary" nillable="true"
      type="tns:DownstreamServerRollupClientSummary" />
  </s:sequence>
</s:complexType>
<s:complexType name="DownstreamServerRollupClientSummary">
  <s:sequence>
    <s:element minOccurs="1" maxOccurs="1" name="OSMajorVersion"
      type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="OSMinorVersion"
      type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="OSBuildNumber"
      type="s:int" />
    <s:element minOccurs="1" maxOccurs="1"
      name="OSServicePackMajorNumber" type="s:int" />
    <s:element minOccurs="1" maxOccurs="1"
      name="OSServicePackMinorNumber" type="s:int" />
    <s:element minOccurs="0" maxOccurs="1" name="OSLocale"
      type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="SuiteMask"
      type="s:short" />
    <s:element minOccurs="1" maxOccurs="1" name="OldProductType"
      type="s:unsignedByte" />
    <s:element minOccurs="1" maxOccurs="1" name="NewProductType"
      type="s:int" />
    <s:element minOccurs="1" maxOccurs="1" name="SystemMetrics"
      type="s:int" />
    <s:element minOccurs="0" maxOccurs="1" name="ProcessorArchitecture"
      type="s:string" />
    <s:element minOccurs="1" maxOccurs="1" name="Count" type="s:int" />
    <s:element minOccurs="0" maxOccurs="1" name="ActivitySummaries"
      type="tns:ArrayOfDownstreamServerRollupClientActivitySummary" />
  </s:sequence>

```

```

    </s:sequence>
  </s:complexType>
  <s:complexType name="ArrayOfDownstreamServerRollupClientActivitySummary">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="unbounded"
        name="DownstreamServerRollupClientActivitySummary"
        nillable="true"
        type="tns:DownstreamServerRollupClientActivitySummary" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="DownstreamServerRollupClientActivitySummary">
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="UpdateId"
        type="s1:guid" />
      <s:element minOccurs="1" maxOccurs="1" name="RevisionNumber"
        type="s:int" />
      <s:element minOccurs="1" maxOccurs="1" name="InstallSuccessCount"
        type="s:int" />
      <s:element minOccurs="1" maxOccurs="1" name="InstallFailureCount"
        type="s:int" />
    </s:sequence>
  </s:complexType>
  <s:element name="RollupDownstreamServersResponse">
    <s:complexType />
  </s:element>
  <s:element name="RollupComputers">
    <s:complexType>
      <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="cookie"
          type="tns:Cookie" />
        <s:element minOccurs="1" maxOccurs="1" name="clientTime"
          type="s:dateTime" />
        <s:element minOccurs="0" maxOccurs="1" name="computers"
          type="tns:ArrayOfComputerRollupInfo" />
      </s:sequence>
    </s:complexType>
  </s:element>
  <s:complexType name="ArrayOfComputerRollupInfo">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="unbounded"
        name="ComputerRollupInfo" nillable="true"
        type="tns:ComputerRollupInfo" />
    </s:sequence>
  </s:complexType>
  <s:complexType name="ComputerRollupInfo">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="Details"
        type="tns:ComputerRollupDetails" />
    </s:sequence>
    <s:attribute name="ComputerId" type="s:string" />
    <s:attribute name="LastSyncTime" type="s:dateTime" use="required" />
    <s:attribute name="LastSyncResult" type="s:int" use="required" />
    <s:attribute name="LastReportedRebootTime" type="s:dateTime"
      use="required" />
    <s:attribute name="LastReportedStatusTime" type="s:dateTime"
      use="required" />
    <s:attribute name="LastInventoryTime" type="s:dateTime"
      use="required" />
    <s:attribute name="ParentServerId" type="s1:guid" use="required" />
  </s:complexType>
  <s:complexType name="ComputerRollupDetails">
    <s:sequence>
      <s:element minOccurs="0" maxOccurs="1" name="TargetGroupIdList"
        type="tns:ArrayOfGuid" />
      <s:element minOccurs="0" maxOccurs="1"
        name="RequestedTargetGroupNames"
        type="tns:ArrayOfString" />
    </s:sequence>
    <s:attribute name="IPAddress" type="s:string" />
    <s:attribute name="FullDomainName" type="s:string" />

```

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<s:attribute name="OSMajorVersion" type="s:int" use="required" />
<s:attribute name="OSMinorVersion" type="s:int" use="required" />
<s:attribute name="OSBuildNumber" type="s:int" use="required" />
<s:attribute name="OSServicePackMajorNumber" type="s:int"
use="required" />
<s:attribute name="OSServicePackMinorNumber" type="s:int"
use="required" />
<s:attribute name="OSLocale" type="s:string" />
<s:attribute name="OSFamily" type="s:string" />
<s:attribute name="OSDescription" type="s:string" />
<s:attribute name="ComputerMake" type="s:string" />
<s:attribute name="ComputerModel" type="s:string" />
<s:attribute name="BiosVersion" type="s:string" />
<s:attribute name="BiosName" type="s:string" />
<s:attribute name="BiosReleaseDate" type="s:dateTime" use="required" />
<s:attribute name="ProcessorArchitecture" type="s:string" />
<s:attribute name="SuiteMask" type="s:short" use="required" />
<s:attribute name="OldProductType" type="s:unsignedByte"
use="required" />
<s:attribute name="NewProductType" type="s:int" use="required" />
<s:attribute name="SystemMetrics" type="s:int" use="required" />
<s:attribute name="ClientVersion" type="s:string" />
</s:complexType>
<s:complexType name="ArrayOfGuid">
<s:sequence>
<s:element minOccurs="0" maxOccurs="unbounded" name="guid"
type="s1:guid" />
</s:sequence>
</s:complexType>
<s:element name="RollupComputersResponse">
<s:complexType>
<s:sequence>
<s:element minOccurs="0" maxOccurs="1" name="RollupComputersResult"
type="tns:ArrayOfChangedComputer" />
</s:sequence>
</s:complexType>
</s:element>
<s:complexType name="ArrayOfChangedComputer">
<s:sequence>
<s:element minOccurs="0" maxOccurs="unbounded" name="ChangedComputer"
nillable="true" type="tns:ChangedComputer" />
</s:sequence>
</s:complexType>
<s:complexType name="ChangedComputer">
<s:attribute name="ComputerId" type="s:string" />
<s:attribute name="Change" type="tns:ComputerChangeType"
use="required" />
</s:complexType>
<s:simpleType name="ComputerChangeType">
<s:restriction base="s:string">
<s:enumeration value="Deleted" />
<s:enumeration value="NewParent" />
</s:restriction>
</s:simpleType>
<s:element name="GetOutOfSyncComputers">
<s:complexType>
<s:sequence>
<s:element minOccurs="0" maxOccurs="1" name="cookie"
type="tns:Cookie" />
<s:element minOccurs="1" maxOccurs="1" name="parentServerId"
type="s1:guid" />
<s:element minOccurs="0" maxOccurs="1" name="lastRollupNumbers"
type="tns:ArrayOfComputerLastRollupNumber" />
</s:sequence>
</s:complexType>
</s:element>
<s:complexType name="ArrayOfComputerLastRollupNumber">
<s:sequence>
<s:element minOccurs="0" maxOccurs="unbounded"
name="ComputerLastRollupNumber" nillable="true"

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```

        type="tns:ComputerLastRollupNumber" />
    </s:sequence>
</s:complexType>
<s:complexType name="ComputerLastRollupNumber">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="1" name="ComputerId"
            type="s:string" />
        <s:element minOccurs="1" maxOccurs="1" name="RollupNumber"
            type="s:int" />
    </s:sequence>
</s:complexType>
<s:element name="GetOutOfSyncComputersResponse">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1"
                name="GetOutOfSyncComputersResult"
                type="tns:ArrayOfString" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:element name="RollupComputerStatus">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="cookie"
                type="tns:Cookie" />
            <s:element minOccurs="1" maxOccurs="1" name="clientTime"
                type="s:dateTime" />
            <s:element minOccurs="1" maxOccurs="1" name="parentServerId"
                type="s1:guid" />
            <s:element minOccurs="0" maxOccurs="1" name="computers"
                type="tns:ArrayOfComputerStatusRollupInfo" />
        </s:sequence>
    </s:complexType>
</s:element>
<s:complexType name="ArrayOfComputerStatusRollupInfo">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded"
            name="ComputerStatusRollupInfo" nillable="true"
            type="tns:ComputerStatusRollupInfo" />
    </s:sequence>
</s:complexType>
<s:complexType name="ComputerStatusRollupInfo">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="InstanceId"
            type="s1:guid" />
        <s:element minOccurs="0" maxOccurs="1" name="ComputerId"
            type="s:string" />
        <s:element minOccurs="1" maxOccurs="1"
            name="EffectiveLastDetectionTime" type="s:dateTime" />
        <s:element minOccurs="1" maxOccurs="1" name="RollupNumber"
            type="s:int" />
        <s:element minOccurs="1" maxOccurs="1" name="IsFullRollup"
            type="s:boolean" />
        <s:element minOccurs="0" maxOccurs="1" name="UpdateStatus"
            type="tns:ArrayOfComputerStatusRollupUpdateStatus" />
    </s:sequence>
</s:complexType>
<s:complexType name="ArrayOfComputerStatusRollupUpdateStatus">
    <s:sequence>
        <s:element minOccurs="0" maxOccurs="unbounded"
            name="ComputerStatusRollupUpdateStatus" nillable="true"
            type="tns:ComputerStatusRollupUpdateStatus" />
    </s:sequence>
</s:complexType>
<s:complexType name="ComputerStatusRollupUpdateStatus">
    <s:sequence>
        <s:element minOccurs="1" maxOccurs="1" name="UpdateId"
            type="s1:guid" />
        <s:element minOccurs="1" maxOccurs="1" name="SummarizationState"
            type="s:int" />
    </s:sequence>
</s:complexType>

```

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        <s:element minOccurs="1" maxOccurs="1" name="LastChangeTime"
            type="s:dateTime" />
    </s:sequence>
</s:complexType>
<s:element name="RollupComputerStatusResponse">
    <s:complexType>
        <s:sequence>
            <s:element minOccurs="1" maxOccurs="1"
                name="RollupComputerStatusResult" type="s:boolean" />
        </s:sequence>
    </s:complexType>
</s:element>
</s:schema>
<s:schema elementFormDefault="qualified"
    targetNamespace="http://microsoft.com/wsdl/types/">
    <s:simpleType name="guid">
        <s:restriction base="s:string">
            <s:pattern
value="[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}" />
            </s:restriction>
        </s:simpleType>
    </s:schema>
<s:schema elementFormDefault="qualified"
targetNamespace="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable">
    <s:element name="Ping">
        <s:complexType>
            <s:sequence>
                <s:element minOccurs="1" maxOccurs="1" name="pingLevel"
                    type="s:int" />
            </s:sequence>
        </s:complexType>
    </s:element>
    <s:element name="PingResponse">
        <s:complexType>
            <s:sequence>
                <s:element minOccurs="0" maxOccurs="1" name="PingResult"
                    type="s2:MonitoredServicesResponse" />
            </s:sequence>
        </s:complexType>
    </s:element>
    <s:complexType name="MonitoredServicesResponse">
        <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="SuccessFlag"
                type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="ServicesTime"
                type="s:dateTime" />
            <s:element minOccurs="0" maxOccurs="1" name="ServicesName"
                type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="ServicesMachine"
                type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="IsHttps"
                type="s:boolean" />
            <s:element minOccurs="0" maxOccurs="1" name="RequestContentType"
                type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="ConfigFilePath"
                type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="ConfigFileProjectName"
                type="s:string" />
            <s:element minOccurs="0" maxOccurs="1"
                name="ConfigFileEnvironmentName" type="s:string" />
            <s:element minOccurs="1" maxOccurs="1"
                name="ConfigFileLastModifiedTime" type="s:dateTime" />
            <s:element minOccurs="0" maxOccurs="1" name="ConfigFileVersion"
                type="s:string" />
            <s:element minOccurs="1" maxOccurs="1"
                name="ConfigFileNextExpirationTime" type="s:dateTime" />
            <s:element minOccurs="1" maxOccurs="1"
                name="ConfigFileExpirationModuloInMinutes" type="s:int" />
            <s:element minOccurs="0" maxOccurs="1" name="DatabaseInfo"
                type="s:string" />
        </s:sequence>
    </s:complexType>

```

```

        <s:element minOccurs="0" maxOccurs="1" name="CustomInfo"
            type="s:string" />
    </s:sequence>
</s:complexType>
</s:schema>
</wsdl:types>
<wsdl:message name="ReportEventBatchSoapIn">
    <wsdl:part name="parameters" element="tns:ReportEventBatch" />
</wsdl:message>
<wsdl:message name="ReportEventBatchSoapOut">
    <wsdl:part name="parameters" element="tns:ReportEventBatchResponse" />
</wsdl:message>
<wsdl:message name="ReportEventBatch2SoapIn">
    <wsdl:part name="parameters" element="tns:ReportEventBatch2" />
</wsdl:message>
<wsdl:message name="ReportEventBatch2SoapOut">
    <wsdl:part name="parameters" element="tns:ReportEventBatch2Response" />
</wsdl:message>
<wsdl:message name="GetRequiredInventoryTypeSoapIn">
    <wsdl:part name="parameters" element="tns:GetRequiredInventoryType" />
</wsdl:message>
<wsdl:message name="GetRequiredInventoryTypeSoapOut">
    <wsdl:part name="parameters"
        element="tns:GetRequiredInventoryTypeResponse" />
</wsdl:message>
<wsdl:message name="ReportInventorySoapIn">
    <wsdl:part name="parameters" element="tns:ReportInventory" />
</wsdl:message>
<wsdl:message name="ReportInventorySoapOut">
    <wsdl:part name="parameters" element="tns:ReportInventoryResponse" />
</wsdl:message>
<wsdl:message name="GetRollupConfigurationSoapIn">
    <wsdl:part name="parameters" element="tns:GetRollupConfiguration" />
</wsdl:message>
<wsdl:message name="GetRollupConfigurationSoapOut">
    <wsdl:part name="parameters"
        element="tns:GetRollupConfigurationResponse" />
</wsdl:message>
<wsdl:message name="RollupDownstreamServersSoapIn">
    <wsdl:part name="parameters" element="tns:RollupDownstreamServers" />
</wsdl:message>
<wsdl:message name="RollupDownstreamServersSoapOut">
    <wsdl:part name="parameters"
        element="tns:RollupDownstreamServersResponse" />
</wsdl:message>
<wsdl:message name="RollupComputersSoapIn">
    <wsdl:part name="parameters" element="tns:RollupComputers" />
</wsdl:message>
<wsdl:message name="RollupComputersSoapOut">
    <wsdl:part name="parameters" element="tns:RollupComputersResponse" />
</wsdl:message>
<wsdl:message name="GetOutOfSyncComputersSoapIn">
    <wsdl:part name="parameters" element="tns:GetOutOfSyncComputers" />
</wsdl:message>
<wsdl:message name="GetOutOfSyncComputersSoapOut">
    <wsdl:part name="parameters" element="tns:GetOutOfSyncComputersResponse" />
</wsdl:message>
<wsdl:message name="RollupComputerStatusSoapIn">
    <wsdl:part name="parameters" element="tns:RollupComputerStatus" />
</wsdl:message>
<wsdl:message name="RollupComputerStatusSoapOut">
    <wsdl:part name="parameters" element="tns:RollupComputerStatusResponse" />
</wsdl:message>
<wsdl:message name="PingSoapIn">
    <wsdl:part name="parameters" element="s2:Ping" />
</wsdl:message>
<wsdl:message name="PingSoapOut">
    <wsdl:part name="parameters" element="s2:PingResponse" />
</wsdl:message>
<wsdl:portType name="WebServiceSoap">

```

```

<wsdl:operation name="ReportEventBatch">
  <wsdl:input message="tns:ReportEventBatchSoapIn" />
  <wsdl:output message="tns:ReportEventBatchSoapOut" />
</wsdl:operation>
<wsdl:operation name="ReportEventBatch2">
  <wsdl:input message="tns:ReportEventBatch2SoapIn" />
  <wsdl:output message="tns:ReportEventBatch2SoapOut" />
</wsdl:operation>
<wsdl:operation name="GetRequiredInventoryType">
  <wsdl:input message="tns:GetRequiredInventoryTypeSoapIn" />
  <wsdl:output message="tns:GetRequiredInventoryTypeSoapOut" />
</wsdl:operation>
<wsdl:operation name="ReportInventory">
  <wsdl:input message="tns:ReportInventorySoapIn" />
  <wsdl:output message="tns:ReportInventorySoapOut" />
</wsdl:operation>
<wsdl:operation name="GetRollupConfiguration">
  <wsdl:input message="tns:GetRollupConfigurationSoapIn" />
  <wsdl:output message="tns:GetRollupConfigurationSoapOut" />
</wsdl:operation>
<wsdl:operation name="RollupDownstreamServers">
  <wsdl:input message="tns:RollupDownstreamServersSoapIn" />
  <wsdl:output message="tns:RollupDownstreamServersSoapOut" />
</wsdl:operation>
<wsdl:operation name="RollupComputers">
  <wsdl:input message="tns:RollupComputersSoapIn" />
  <wsdl:output message="tns:RollupComputersSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetOutOfSyncComputers">
  <wsdl:input message="tns:GetOutOfSyncComputersSoapIn" />
  <wsdl:output message="tns:GetOutOfSyncComputersSoapOut" />
</wsdl:operation>
<wsdl:operation name="RollupComputerStatus">
  <wsdl:input message="tns:RollupComputerStatusSoapIn" />
  <wsdl:output message="tns:RollupComputerStatusSoapOut" />
</wsdl:operation>
<wsdl:operation name="Ping">
  <wsdl:input message="tns:PingSoapIn" />
  <wsdl:output message="tns:PingSoapOut" />
</wsdl:operation>
</wsdl:portType>
<wsdl:binding name="WebServiceSoap" type="tns:WebServiceSoap">
  <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="ReportEventBatch">
    <soap:operation
      soapAction="http://www.microsoft.com/SoftwareDistribution/ReportEventBatch"
      style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="ReportEventBatch2">
    <soap:operation
      soapAction="http://www.microsoft.com/SoftwareDistribution/ReportEventBatch2"
      style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="GetRequiredInventoryType">
    <soap:operation
      soapAction="http://www.microsoft.com/SoftwareDistribution/GetRequiredInventoryType"
      style="document" />
    <wsdl:input>

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        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="ReportInventory">
    <soap:operation
        soapAction="http://www.microsoft.com/SoftwareDistribution/ReportInventory"
        style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetRollupConfiguration">
    <soap:operation
        soapAction="http://www.microsoft.com/SoftwareDistribution/GetRollupConfiguration"
        style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="RollupDownstreamServers">
    <soap:operation
        soapAction="http://www.microsoft.com/SoftwareDistribution/RollupDownstreamServers"
        style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="RollupComputers">
    <soap:operation
        soapAction="http://www.microsoft.com/SoftwareDistribution/RollupComputers"
        style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="GetOutOfSyncComputers">
    <soap:operation
        soapAction="http://www.microsoft.com/SoftwareDistribution/GetOutOfSyncComputers"
        style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>
</wsdl:operation>
<wsdl:operation name="RollupComputerStatus">
    <soap:operation
        soapAction="http://www.microsoft.com/SoftwareDistribution/RollupComputerStatus"
        style="document" />
    <wsdl:input>
        <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal" />
    </wsdl:output>

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        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="Ping">
        <soap:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable/Ping"
style="document" />
        <wsdl:input>
            <soap:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
</wsdl:binding>
<wsdl:binding name="WebServiceSoap12" type="tns:WebServiceSoap">
    <soap12:binding transport="http://schemas.xmlsoap.org/soap/http" />
    <wsdl:operation name="ReportEventBatch">
        <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/ReportEventBatch"
style="document" />
        <wsdl:input>
            <soap12:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap12:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ReportEventBatch2">
        <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/ReportEventBatch2"
style="document" />
        <wsdl:input>
            <soap12:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap12:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetRequiredInventoryType">
        <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetRequiredInventoryType"
style="document" />
        <wsdl:input>
            <soap12:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap12:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ReportInventory">
        <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/ReportInventory"
style="document" />
        <wsdl:input>
            <soap12:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap12:body use="literal" />
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetRollupConfiguration">
        <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetRollupConfiguration"
style="document" />
        <wsdl:input>
            <soap12:body use="literal" />
        </wsdl:input>
        <wsdl:output>
            <soap12:body use="literal" />
        </wsdl:output>
    </wsdl:operation>

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```

    </wsdl:operation>
    <wsdl:operation name="RollupDownstreamServers">
      <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/RollupDownstreamServers"
style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="RollupComputers">
      <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/RollupComputers"
style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetOutOfSyncComputers">
      <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/GetOutOfSyncComputers"
style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="RollupComputerStatus">
      <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/RollupComputerStatus"
style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="Ping">
      <soap12:operation
soapAction="http://www.microsoft.com/SoftwareDistribution/Server/IMonitorable/Ping"
style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
  <wsdl:service name="WebService">
    <wsdl:port name="WebServiceSoap" binding="tns:WebServiceSoap">
      <soap:address
location="http://localhost/ReportingWebService/WebService.asmx" />
    </wsdl:port>
    <wsdl:port name="WebServiceSoap12" binding="tns:WebServiceSoap12">
      <soap12:address
location="http://localhost/ReportingWebService/WebService.asmx" />
    </wsdl:port>
  </wsdl:service>
</wsdl:definitions>

```

7 Appendix B: Product Behavior

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

~~Note: Some of the information in this section is subject to change because it applies to an unreleased, preliminary version of the Windows Server operating system, and thus may differ from the final version of the server software when released. All behavior notes that pertain to the unreleased, preliminary version of the Windows Server operating system contain specific references to Windows Server 2016 Technical Preview as an aid to the reader.~~

- Windows Server 2003 operating system
- Windows Server 2008 operating system
- Windows Server 2008 R2 operating system
- Windows Server 2012 operating system
- Windows Server 2012 R2 operating system
- Windows Server 2016 ~~Technical Preview~~ operating system

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.

<1> Section 1.3: This protocol is implemented by the Windows Server Update Services (WSUS) component in Windows 2000 Server operating system Service Pack 3 (SP3), Windows Server 2003, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, and Windows Server 2016 ~~Technical Preview~~.

<2> Section 1.7: The relationship between Windows versions and WSUS versions is specified as follows.

Operating system version	WSUS 2.0 supported	WSUS 2.0 SP1 supported	WSUS 3.0 supported	WSUS 3.0 SP1 supported	WSUS 3.0 SP2 supported	WSUS 10.0 supported
Windows 2000 Server SP3	X	X				
Windows Server 2003	X	X	X	X		
Windows Server 2003 operating system with Service Pack 1 (SP1)	X	X	X	X		
Windows Server 2003 operating system with Service Pack 2 (SP2) and Windows Server 2003 operating system	X	X	X	X	X	

Operating system version	WSUS 2.0 supported	WSUS 2.0 SP1 supported	WSUS 3.0 supported	WSUS 3.0 SP1 supported	WSUS 3.0 SP2 supported	WSUS 10.0 supported
with Service Pack 3 (SP3)						
Windows Server 2008				X		
Windows Server 2008 operating system with Service Pack 2 (SP2)				X	X	
Windows Server 2008 R2					X	
Windows Server 2012					X	
Windows Server 2012 R2					X	
Windows Server 2016 Technical Preview					X	X

<3> Section 2.1: All Windows implementations support HTTPS for securing ports, although SSL is not configured by default when WSUS is installed.

<4> Section 2.1: In all Windows implementations, the DSS adds "xpress" to the HTTP "Accept-Encoding" request-header to request the encoding in "Win 2K3 Compression Algorithm", as specified in [MS-DRSR]. The USS compresses the reply in the requested algorithm.

<5> Section 2.1: In Windows Server operating system implementations, ports used by the Web services are administratively configured during the initial setup of the USS.

<6> Section 2.1: Windows Server implementations support HTTP1.1 Byte Range requests.

<7> Section 2.2.4.7: Windows Server implementations construct the **EncryptedData** field by converting the DSS identity, the target groups that the DSS belongs to, and the cookie expiration time into a sequence of bytes, and then by encrypting the sequence of bytes using the TripleDES algorithm.

<8> Section 2.2.4.8: Windows Server implementations construct the **EncryptedData** field by converting the DSS identity, the target groups that the DSS belongs to, the cookie expiration time, protocol version, and server's identity into a sequence of bytes, and then by encrypting the sequence of bytes using the TripleDES algorithm.

<9> Section 2.2.9.3: Windows Server 2003, Windows Server 2008, Windows Server 2012 R2, and Windows Server 2016 ~~Technical Preview~~ implementations abort the protocol when this error is encountered. They do not automatically retry the operation.

<10> Section 2.2.9.3: Windows Server 2003, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, and Windows Server 2016 ~~Technical Preview~~ implementations stop the protocol when this error is encountered. They do not automatically retry the operation.

<11> Section 3.1.1: Windows implementations remove entries from this table after 90 days, by default. The threshold can be configured administratively, down to a minimum of 1 day.

<12> Section 3.1.1: In Windows implementations, entries are removed from this table only when specified by the administrator.

<13> Section 3.1.1: Windows Server implementations use the version number of the WSUS component. If the update server is using WSUS 3.0 RTM, the value is "3.0.6000.374". If the update server is using WSUS 3.0 SP1, the value is "3.1.6001.65". If the update server is using an earlier version, the value is "2.0.0.0".

<14> Section 3.1.1: In Windows implementations, a new entry is added to this table when a new client computer calls the **GetAuthCookie** method on the update server for the first time as part of the Windows Update Services: Client-Server Protocol (as specified in [MS-WUSP]). Existing entries are removed only when specified by the administrator.

<15> Section 3.1.1: In Windows implementations, these values are populated when the client computer calls the **RegisterComputer** method as part of the Windows Update Services: Client-Server Protocol (as specified in [MS-WUSP]), and it is assumed that the values can be interpreted as specified in [MS-WUSP]. The data in this table is made available to the administrators of the update server for informational purposes.

<16> Section 3.1.1: In Windows implementations, this field is updated when the client computer calls the **ReportEventBatch** method of the WUSP (as specified in [MS-WUSP]).

<17> Section 3.1.1: In Windows Server implementations, the update server receives such notifications from client computers when the **ReportEventBatch** method is called as part of the Windows Update Services: Client-Server Protocol specified in [MS-WUSP]. Entries are added or modified when such notifications are received.

<18> Section 3.1.1: In Windows Server implementations, the update server receives notifications from client computers when the **ReportEventBatch** method is called as part of the Windows Update Services: Client-Server Protocol specified in [MS-WUSP]. Entries are added or modified when such notifications are received.

<19> Section 3.1.1: In Windows implementations, client computers notify the update server when they have successfully installed or failed to install an update. This is done using the Windows Update Services: Client-Server Protocol specified in [MS-WUSP].

<20> Section 3.1.1: [The **IsSecure** field is not available in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.](#)

<21> Section 3.1.1: [The **IsEncrypted** field is not available in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.](#)

<22> Section 3.1.1: [The **DecryptionKey** field is not available in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.](#)

<23> Section 3.1.1: In Windows 8 operating system, Windows Server 2012, Windows Server 2012 R2, and Windows Server 2016 ~~Technical Preview~~, WUA clients authenticate the downloaded files against SHA-256 hashes prior to using their contents, in addition to the SHA-1 hashes. All other versions of WUA only authenticate the SHA-1 hashes contained in the existing Digest attribute and ignore the **AdditionalDigest** elements if they are present.

<24> Section 3.1.1.1property is not available in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.**FragmentType** The :

<25> Section 3.1.1.1: [The **IsEncrypted** property is not available in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.](#)

<26> Section 3.1.4.1.3.1: In Windows Server implementations, this field is not present.

<27> Section 3.1.4.1.3.3: In Windows Server implementations, this field is not present.

<28> Section 3.1.4.2: Windows implementations return an incorrect parameter name of *machineName* instead of *accountName* when the *accountName* parameter is invalid.

<29> Section 3.1.4.3: Windows implementations set the cookie expiration time to be 240 minutes from the time the cookie is created or the expiration time of the AuthorizationCookie, whichever is lower.

<25<30> Section 3.1.4.4: The **MaxUpdatesPerRequestInGetUpdateDecryptionData** configuration element is not available in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.

<31> Section 3.1.4.4.3.1: In Windows Server implementations, this field is of the form nnnn ',' yyyy '-' MM '-' dd ' ' hh ':' mm ':' ss '.' sss where

nnnn is a positive decimal integer value between 1 and 2,147,483,647 that is used internally to identify a point in time. The value is 1 initially and is incremented by 1 each time a Deployment is created or deleted.

yyyy, MM, dd, hh, mm, ss, and sss are the current year, month, day, hour, minute, second, and fraction of a second, respectively.

<32> Section 3.1.4.4.3.1: WSUS 2.0 omits this element. WSUS 3.0 and its service pack releases specify this element to correspond to the protocol version specified in section 1.7.

<27<33> Section 3.1.4.4.3.1: The **MaxUpdatesPerRequestInGetUpdateDecryptionData** configuration element is not available in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.

<34> Section 3.1.4.5: In Windows Server implementations, the anchor is required to follow the format described in section 3.1.4.4, under the Windows behavior description for the **NewConfigAnchor** field.

<35> Section 3.1.4.5.3.1: All Windows Server implementations set this to the anchor returned in the last successful GetRevisionIdList operation response.

<36> Section 3.1.4.6: All Windows implementations use **XmlUpdateBlobCompressed** if the size of the uncompressed XML metadata is more than 5,120 bytes.

<37> Section 3.1.4.6.3.5: In Windows Server implementations, this field is present only for updates that are available on the Microsoft Update website. For such updates, this URL points to a location on the Microsoft Update website from which the file can be downloaded.

<38> Section 3.1.4.6.3.5: In Windows Server implementations, this field is not present.

<39> Section 3.1.4.7: The GetDriverIdList method is not available in Windows Server 2003, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, and Windows Server 2012 R2.

<40> Section 3.1.4.7: In Windows Server implementations, the anchor is required to follow the format described in section 3.1.4.4.3.1, under the Windows behavior description for the **NewConfigAnchor** field.

<41> Section 3.1.4.7.3.4: All Windows Server implementations set this to the anchor returned in the first successful GetDriverIdList operation response.

<42> Section 3.1.4.8: The **GetDriverSetData** method is not available in Windows Server 2003, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, and Windows Server 2012 R2.

<43> Section 3.1.4.10: In Windows Server 2003 and Windows Server 2008 implementations, the anchor is required to follow the format defined in section 3.1.4.4 under the Windows behavior description for the **NewConfigAnchor** field.

<44> Section 3.1.4.10: In Windows Server implementations, the anchor is required to follow the format defined in section 3.1.4.4 under the Windows behavior description for the **NewConfigAnchor** field.

<45> Section 3.1.4.13: In Windows implementations, this value is always set to 5,000.

<46> Section 3.1.4.13: In Windows implementations, this value is always set to 1,500.

<47> Section 3.1.4.13: In Windows implementations, this value is always set to 20,000.

<48> Section 3.1.4.13: In Windows implementations, this value is always set to 500.

<49> Section 3.1.4.14: In Windows implementations, the USS calculates the difference between the current time (according to its system clock) and the **clientTime** value. If the absolute value of the difference is greater than 1 minute, the USS adds the difference to all other time stamps contained in the request.

<50> Section 3.1.4.14.3.2: Windows Server implementations use the version number of the WSUS component. If the update server is using WSUS 3.0, the value is "3.0.6000.374". If the update server is using an earlier version, the value is "2.0.0.0".

<51> Section 3.1.4.14.3.3: In Windows Server implementations, two target groups are created during initial setup of the WSUS component: the "All Computers" and the "Unassigned Computers" groups. Because these groups are created during the initial setup of the update server, they are not counted by this field. If any additional target groups are created (by the administrator or by an application that interacts with the update server), those groups will be counted.

<52> Section 3.1.4.14.3.5: In Windows Server implementations, the **OSMajorVersion**, **OSMinorVersion**, **OSBuildNumber**, **OSServicePackMajorNumber**, **OSServicePackMinorNumber**, **OSLocale**, **SuiteMask**, **OldProductType**, **NewProductType**, **SystemMetrics**, and **ProcessorArchitecture** fields are populated using the corresponding values passed by the client computer to the RegisterComputer method on the update server as part of the WUSP (as specified in [MS-WUSP]).

<53> Section 3.1.4.15: In Windows implementations, the USS calculates the difference between the current time (according to its system clock) and the clientTime value. If the absolute value of the difference is greater than 1 minute, the USS adds the difference to all other time stamps contained in the request.

<54> Section 3.1.4.15: In Windows implementations, the USS maintains a list containing the **ComputerId** fields of client computers whose records have recently been deleted from the persisted store.

When the USS receives a call to RollupComputers, it checks the **ComputerId** from each ComputerRollupInfo structure against this list. If the **ComputerId** is found on the list, an entry of this form is added to the **RollupComputersResult** with this **ComputerId**.

<55> Section 3.1.4.15.3.2: In Windows Server implementations, the DSS will omit this field for a given client computer if none of the values have changed.

<56> Section 3.1.4.15.3.3: WSUS 3.0 SP1 sets this field to "Windows".

<57> Section 3.1.4.15.3.3: WSUS 3.0 SP1 sets this field to an empty string.

<58> Section 3.1.4.15.3.3: In Windows Server implementations, the **OSMajorVersion**, **OSMinorVersion**, **OSBuildNumber**, **OSServicePackMajorNumber**, **OSServicePackMinorNumber**, **OSLocale**, **ComputerModel**, **BiosVersion**, **BiosName**, **BiosReleaseDate**, **SuiteMask**, **OldProductType**, **NewProductType**, and **SystemMetrics** fields are populated using the corresponding values passed by the client computer to the **RegisterComputer**

method on the update server as part of the Windows Update Services: Client-Server Protocol specified in [MS-WUSP].

The **ComputerMake** field is populated using the ComputerManufacturer value passed by the client computer to the **RegisterComputer** method.

The **ClientVersion** field is populated by combining the ClientVersionMajorNumber, ClientVersionMinorNumber, ClientVersionBuildNumber, and ClientVersionQfeNumber values passed by the client computer to the **RegisterComputer** method with "." inserted between each of the four values.

<59> Section 3.1.4.17: In Windows implementations, the USS will do this if it is under extremely heavy load.

<60> Section 3.1.4.17: In Windows implementations, the USS calculates the difference between the current time (according to its system clock) and the clientTime value. If the absolute value of the difference is greater than 1 minute, the USS adds the difference to all other time stamps contained in the request.

~~<54-61> Section 3.1.4.18: The **GetUpdateDecryptionData** method is not available in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.~~

<62> Section 3.2.3: In Windows Server implementations, the FQDN of the USS is configured by the administrator using the WSUS administration UI.

<63> Section 3.2.3: In all Windows implementations, a DSS initiates this protocol either by a configuration-defined timer event (for example, every night at 1:00 A.M.) or by a manual request from the administrator UI. It also provides an API through which other applications can trigger the synchronization.

<64> Section 3.2.3: All Windows implementations provide an option in the WSUS administrator UI that allows the administrator to cancel a synchronization that is in progress.

If a cancel request is made while a SOAP call is in progress (a request has been sent but the response has not yet been received), the update server waits until the response is received before stopping the protocol. If no call is in progress, the update server stops the protocol immediately.

<65> Section 3.2.3: All Windows implementations provide an API through which other applications can trigger reporting data synchronization.

<66> Section 3.2.4.4: In Windows Server implementations, whenever a new entry is added to the Revision Table or to the Deployment Table, the update server will determine if any of the files associated with the update meet the preceding criteria. If so, the update server will start to download all such files.

In addition, if either the CatalogSyncOnly flag or the LazySync flag in the Server Configuration is changed, the update server will reexamine all files to see if any of them need to be downloaded. It will then start the download for all files that need to be downloaded.

<67> Section 3.2.4.4: The Windows implementation does not batch multiple **FileDigest** values into a single call.

<68> Section 3.2.4.4: In Windows Server implementations, the Background Intelligent Transfer Service (for more information, see [MSDN-BITS]) is used to perform the download.

<69> Section 3.2.4.5: In Windows implementations, this step is run immediately following the completion of the Deployments Synchronization step if the DSS is configured as a replica server, or following the Metadata Synchronization step if the DSS is configured as an Autonomous Server. All Windows implementations also provide an API through which other applications can trigger Reporting Data Synchronization without running the preceding steps in this protocol.

<70> Section 3.2.4.5: An update is considered to be critical if it is a member of the "Critical Updates" or the "Security Updates" Update Classification.

<71> Section 3.2.4.5: In Windows implementations, such updates are identified by an attribute matching the XPATH query `"/Update/Property/@IsMandatory"` and having a value of TRUE.

<72> Section 3.2.4.5: Windows implementations send the `DownstreamServerInfo` structures in batches, minimizing the number of requests required to send all the information.

<73> Section 3.2.4.5: Windows implementations send the `ComputerRollupInfo` structures in batches, minimizing the number of requests required to send all the information.

<74> Section 3.2.4.5: Windows implementations send the `ComputerLastRollupNumber` structures in batches, minimizing the number of requests required to send all the information.

<75> Section 3.2.4.5: Windows implementations send the `ComputerStatusRollupInfo` structures in batches, minimizing the number of requests required to send all the information.

<76> Section 3.2.4.5: Windows implementations wait between 1 and 5 minutes (chosen randomly) and then resend the failed message. If the request is still unsuccessful after three retries (four total attempts), the protocol is stopped with a failure.

<77> Section 5.1: On Windows 2000 Server operating system and Windows Server 2003, the DSS accepts only content files whose SHA-1 hash matches the SHA-1 hash specified by the USS in the update metadata. On Windows 8, Windows Server 2012, Windows Server 2012 R2, and Windows Server 2016 ~~Technical Preview~~, it accepts only content files whose SHA-1 and SHA-256 hashes match the SHA-1 and SHA-256 hashes specified by the USS in the update metadata. On Windows 8, Windows Server 2012, Windows Server 2012 R2, and Windows Server 2016 ~~Technical Preview~~, both the SHA-1 and SHA-256 hashes are required.

8 Change Tracking

This section identifies changes that were made to this document since the last release. 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.
- The removal of a document from the documentation set.

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 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 changes were introduced. Minor editorial and formatting changes may have been made, but the technical content of the document is identical to the last released version.

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.
- 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 dochelp@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
1.7 Versioning and Capability Negotiation 3.1.1 Abstract Data Model	Updated Added content for Windows 10 and this version of Windows Server-2016 Technical Preview.	Y	Content update.
2.2.1 Namespaces 3.1.1.1 Populating the Data Model	Updated Added content for Windows 10 and this version of Windows Server-2016 Technical Preview.	Y	Content update.
3.1.4.4 GetConfigData	Added the MaxUpdatesPerRequestInGetUpdateDecryptionData configuration element.	Y	Content update.
3.1.4.4 GetConfigData	Updated Added content for Windows 10 and this version of Windows Server-2016 Technical Preview.	Y	Content update.
3.1.4.4.3.1 ServerSyncConfigData	Updated content for Windows 10 and Windows Server 2016 Technical Preview. Added the MaxUpdatesPerRequestInGetUpdateDecryptionData configuration element.	Y	Content update.
3.1.4.7 GetDriverIdList	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.	Y	New content added.
3.1.4.7.1 Messages	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.	Y	New content added.
3.1.4.7.1.1 GetDriverIdListSoapIn ServerSyncConfigData	Added section with content for Windows 10 and this version of Windows Server-2016 Technical Preview.	Y	New content added. Content update.
3.1.4.7.1.2 GetDriverIdListSoapOut GetDriverIdList	Added section with content for Windows 10 and Windows Server 2016 Technical Preview. 72834 : Revised content to note that the method is invoked only when a USS syncs with Microsoft Update.	Y	New content added. Content update.
3.1.4.7.2 Elements	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.	Y	New content added.
3.1.4.7.2.1 GetDriverIdList	Added section with content for Windows 10 and Windows Server 2016 Technical Preview. 72834 : Revised definition of the filter field to specify that it describes the revisions for which Microsoft Update is to search.	Y	New content added. Content update.
3.1.4.7.2.2 GetDriverIdListResponse	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.	Y	New content added.
3.1.4.7.3 Complex Types	Added section with content for Windows 10 and	Y	New content

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
	Windows Server 2016 Technical Preview.		added.
3.1.4.7.3.1 DriverSetAndRevisionIdList	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.72834 : Revised definition of the RemoveDriverSets field to specify that Microsoft Update determines whether removed drivers are referenced by another driver set.	Y	New content added. Content update.
3.1.4.7.3.2 ArrayOfHardwareIdAndDelta	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.	Y	New content added.
3.1.4.7.3.3 HardwareIdAndDelta	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.	Y	New content added.
3.1.4.7.3.4 ServerSyncDriverFilter	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.72834 : Revised field definitions to specify that the USS syncs with Microsoft Update.	Y	New content added. Content update.
3.1.4.8 GetDriverSetData	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.72834 : Revised content to note that the method is invoked only when a USS syncs with Microsoft Update.	Y	New content added. Content update.
3.1.4.8.1 Messages18 GetUpdateDecryptionData	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.Added the GetUpdateDecryptionData method.	Y	New content added. Content update.
3.1.4.8.1.1 GetDriverSetDataSoapIn18 GetUpdateDecryptionData	Added section with content for Windows 10 and this version of Windows Server 2016 Technical Preview.	Y	New content added.
3.1.4.8.1.2 GetDriverSetDataSoapOut3.2.4 Message Processing Events and Sequencing Rules	Added section with content for Windows 10 and this version of Windows Server 2016 Technical Preview.	Y	New content added. Content update.
3.1.4.8.2 Elements2 Metadata Synchronization	Added section with content for Windows 10 and this version of Windows Server 2016 Technical Preview.	Y	New content added. Content update.
3.1.4.8.2.1 GetDriverSetData	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.	Y	New content added.
3.1.4.8.2.2 GetDriverSetDataResponse4 Protocol Examples	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.72835 : Added ParentGroupID to ServerSyncTargetGroup in example 2.	Y	New content added. Content update.
3.1.4.8.3 Complex Types6.1 Server Sync Web Service	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.72833 : Added three elements to the ServerSyncConfigData type.	Y	New content added. Content update.
3.1.4.8.3.1 ServerDriverSetData6.1 Server Sync Web Service	Added section with content for Windows 10 and Windows Server 2016 Technical Preview.Added the GetUpdateDecryptionData method and the MaxUpdatesPerRequestInGetUpdateDecryptionD	Y	New content added. Content update.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
	ata configuration element.		
3.1.4.8.3.2 ServerSyncDriverSetData6.1 Server Sync Web Service	Added section with content for Windows 10 and this version of Windows Server 2016 Technical Preview.	Y	New content added.
7 Appendix B: Product Behavior	Updated product behavior notes for Windows Server 2016 Technical Preview.	Y	Product behavior note updated.

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