[MS-PBSD]:
Publication Services Data Structure

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Revision Summary

Date	Revision History	Revision Class	Comments
09/23/2011	0.1	New	Released new document
12/16/2011	0.1	No change	No changes to the meaning, language, or formatting of the technical content.
03/30/2012	1.0	No change	No changes to the meaning, language, or formatting of the technical content.
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Contents

1 Introduction

Publication Services enables computers to advertise (that is, publish) their presence and their resources as **Web services** over IP-based networks. By doing so, other computers can find (that is, discover) the Web services that have been published on the same network.

This document specifies the data, along with its structure, that computers use to describe themselves and the resources that are being offered.

Sections 1.7 and 2 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in RFC 2119. All other sections and examples in this specification are informative.

1.1 Glossary

The following terms are defined in [MS-GLOS]:

domain name
endpoint
NetBIOS
Web services

The following terms are specific to this document:

client: The sending endpoint of a Web services request message, and receiver of any resulting Web services response message.

device: The Devices Profile for Web Services (DPWS) term for a special instance of a service that is discoverable and contains other services with metadata describing those services.

Publication Services: A Microsoft Windows Devices Profile for Web Services (DPWS) service that enables computers to publish resources so that those resources can be discovered by other computers on the same network.

service: The receiving endpoint of a Web services request message, and sender of any resulting Web services response message.

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

1.2 References

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

A reference marked "(Archived)" means that the reference document was either retired and is no longer being maintained or was replaced with a new document that provides current implementation details. We archive our documents online [Windows Protocol].

1.2.1 Normative References

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

[DPWS] Chans, S., Conti, D., Schlimmer, J., et al., "Devices Profile for Web Services", February 2006, http://specs.xmlsoap.org/ws/2006/02/devprof/devicesprofile.pdf

[MSDN-PnP-X] Microsoft Corporation, "PnP X: Plug and Play Extensions for Window", http://www.microsoft.com/whdc/connect/rally/pnpx-spec.mspx

If you have any trouble finding [MSDN-PnP-X], please check here.

[MS-DPWSSN] Microsoft Corporation, "Devices Profile for Web Services (DPWS): Size Negotiation Extension".

[MS-DTYP] Microsoft Corporation, "Windows Data Types".

[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

[W3C-XSD] World Wide Web Consortium, "XML Schema Part 2: Datatypes Second Edition", October 2004, http://www.w3.org/TR/2004/REC-xmlschema-2-20041028

[WS-Discovery] Beatty, J., Kakivaya, G., Kemp D., et al., "Web Services Dynamic Discovery (WS-Discovery)", April 2005, http://specs.xmlsoap.org/ws/2005/04/discovery/ws-discovery.pdf

If you have any trouble finding [WS-Discovery], please check here.

[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/

1.2.2 Informative References

[MSDN-DPWS] Microsoft Corporation, "Understanding Devices Profile for Web Services, WS-Discovery, and SOAP-over-UDP", http://msdn.microsoft.com/en-us/library/dd179231.aspx

[MSDN-WSD] Microsoft Corporation, "Web Services on Devices", http://msdn.microsoft.com/en-us/library/bb756908.aspx

[MS-DPWSRP] Microsoft Corporation, "Devices Profile for Web Services (DPWS): Shared Resource Publishing Data Structure".

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

[MS-HGRP] Microsoft Corporation, "HomeGroup Protocol".

[WSADDR] Gudgin, M., Hadley, M., and Rogers, T., "Web Services Addressing (WS-Addressing) 1.0", W3C Recommendation, May 2006, http://www.w3.org/2005/08/addressing

1.3 Overview

The Devices Profile for Web Services (DPWS), as defined in [DPWS], specifies a well-structured messaging model that provides basic functionality such as discovery of an **endpoint** (3) [WSADDR],

metadata for that endpoint, and request/response messaging. [DPWS] specifies the role of **clients**, **devices**, and **services**. Clients discover services and communicate with their endpoints. Devices are special service endpoints that can host other services. [DPWS] defines metadata for both devices and the services hosted by those devices. Clients can request this metadata and send requests to specific endpoints described in the metadata.

This model fits the requirements of a computer. Computers are often set to be discoverable and advertise metadata that describes themselves and their resources to clients on a network. Publication Services models a computer as a DPWS device, and the resources on a computer are modeled as Web services within the same device. The information that describes a computer and the actual data associated with the resources are stored as part of the device metadata.

The Publication Services Data Structure document defines the organization used for the information that describes how a computer and its resources are represented within the DPWS device metadata.

For additional explanatory information about DPWS, see [MSDN-DPWS]. For information about the Microsoft implementation of DPWS, which is called Web Services for Devices (WSD), see [MSDN-WSD].

1.4 Relationship to Protocols and Other Structures

The Publication Services data structure is built on [DPWS] and relies on the Microsoft implementation of DPWS. For more information, see [MSDN-WSD].

Because the number of resources on a computer and the data associated with them can increase over time, clients should also implement the Size Negotiation Extension as specified in [MS-DPWSSN] to be able to retrieve resources completely.<1>

The HomeGroup Protocol [MS-HGRP], which is used to create a trust relationship that facilitates the advertising and publishing of content between machines in a home environment, and the Shell Publishing data structure [MS-DPWSRP] use the Publication Services data structure to advertise their content and resources.

1.5 Applicability Statement

Use of this data structure is suitable for clients if:

- The client is a compliant DPWS implementation.
- The client requires communication with the DPWS representation of a computer and its resources.
- The client supports the Size Negotiation Extension [MS-DPWSSN] and can receive messages longer than 32767 octets ([MS-DTYP] section 2.1.5).

Use of this protocol is suitable for **service** implementations if:

- The service will represent itself as a DPWS-compliant computer on the network.
- The service supports the Size Negotiation Extension [MS-DPWSSN] and can send messages longer than 32767 octets.

1.6 Versioning and Localization

This data structure is not versioned and it does not explicitly support localization.

1.7 Vendor-Extensible Fields

This data structure does not define any additional vendor-extensible fields.

2 Structures

2.1 Namespaces

This document defines and references various XML namespaces using the mechanisms specified in [XMLNS]. Even though this document associates a specific XML namespace prefix for each XML namespace that is used, the choice of any particular XML namespace prefix is implementation-specific and not significant for interoperability.

Prefix	Namespace URI	Reference
pub	http://schemas.microsoft.com/windows/pub/2005/07	This document
pnpx	http://schemas.microsoft.com/windows/pnpx/2005/10	[MSDN-PnP-X]
wsd	http://schemas.xmlsoap.org/ws/2005/04/discovery	[WS-Discovery]
wsdp	http://schemas.xmlsoap.org/ws/2006/02/devprof	[DPWS]
xs	http://www.w3.org/2001/XMLSchema	[W3C-XSD]

2.2 Computer Information

The Publication Services Data Structure advertises three pieces of information about a computer:

- A type indicating that the device represents a computer
- The **NetBIOS domain name** (3) for the computer
- The NetBIOS computer name

```
<xs:simpleType name="DiscoveryTypeValues">
  <xs:restriction base="xs:QName">
    <xs:enumeration value="Computer" />
  </xs:restriction>
</xs:simpleType>

<xs:element name="Computer" type="xs:string" minOccurs="0" />
```

Element	Description
wsdp:Relationship/wsdp:Host/wsdp:Types	Indicator type for a device representation of a Publication Services-enabled computer (pub:Computer).
wsdp:Relationship/wsdp:Host/pub:Computer	NetBIOS information for the computer.

NetBIOS information for the computer is formatted as follows:

- If the computer is domain joined:

```
<NetBIOS_Computer_Name>\Domain:<NetBIOS_Domain_Name>
```

- If the computer is in a workgroup:

```
<NetBIOS_Computer_Name>\Workgroup:<Workgroup_Name>
```

- Otherwise:

```
<NetBIOS_Computer_Name>\NotJoined
```

Note The pub:Computer element replaces the <any> element wildcard of the HostServiceType complex type, which is instantiated through the <Host> element of the DPWS schema.

2.3 Resource

Each resource to be advertised by a Publication Services device host as a service consists of two fields:

- Type
- Actual data

The resource type is used as the Types (wsdp:Relationship/wsdp:Hosted/wsdp:Types) implemented by a Host Service (see [WS-Discovery]).

The Publication Services Data Structure defines a new element to enclose the actual data associated with the resource as follows.

```
<xs:element name="Resource" type="xs:string" minOccurs="0" />
```

Element	Description
wsdp:Relationship/wsdp:Hosted/pub:Resource	Resource data
wsdp:Relationship/wsdp:Hosted/pub:Resource1	Resource data continued
...	...
wsdp:Relationship/wsdp:Hosted/pub:ResourceN	Resource data continued

If the data is more than 8192 octets ([MS-DTYP] section 2.1.5), it can be split into multiple Resource elements. Clients that want to retrieve the full resource data must combine the data in the order implied by the element names.

Note The pub:Resource* elements replace the <any> element wildcard of the HostServiceType complex type, which is instantiated through the <Hosted> element of the DPWS schema.

3 Structure Examples

3.1 Publication Services Data with no Listed Services

This section contains an example of the Publication Services data associated with a computer (that is, a device). The example data indicates that there are no services being advertised by the computer.

```
<?xml version="1.0" encoding="utf-8" ?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsx="http://schemas.xmlsoap.org/ws/2004/09/mex"
xmlns:wsdp="http://schemas.xmlsoap.org/ws/2006/02/devprof"
xmlns:pnpx="http://schemas.microsoft.com/windows/pnpx/2005/10"
xmlns:pub="http://schemas.microsoft.com/windows/pub/2005/07">
  <soap:Header>
    <wsa:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
    <wsa:Action>http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse</wsa:Action>
    <wsa:MessageID>urn:uuid:8a07696e-8128-456c-af85-9a5008aa0446</wsa:MessageID>
    <wsa:RelatesTo>urn:uuid:bac3eeec-5488-4a27-99c9-795d0651d914</wsa:RelatesTo>
  </soap:Header>
  <soap:Body>
    <wsx:Metadata>
      <wsx:MetadataSection
Dialect="http://schemas.xmlsoap.org/ws/2006/02/devprof/ThisDevice">
        <wsdp:ThisDevice>
          <wsdp:FriendlyName>Contoso Publication Service Device Host</wsdp:FriendlyName>
          <wsdp:FirmwareVersion>1.0</wsdp:FirmwareVersion>
          <wsdp:SerialNumber>20050718</wsdp:SerialNumber>
        </wsdp:ThisDevice>
      </wsx:MetadataSection>
      <wsx:MetadataSection Dialect="http://schemas.xmlsoap.org/ws/2006/02/devprof/ThisModel">
        <wsdp:ThisModel>
          <wsdp:Manufacturer>Contoso, Ltd</wsdp:Manufacturer>
          <wsdp:ManufacturerUrl>http://www.contoso.com</wsdp:ManufacturerUrl>
          <wsdp:ModelName>Contoso Publication Service</wsdp:ModelName>
          <wsdp:ModelNumber>1</wsdp:ModelNumber>
          <wsdp:ModelUrl>http://www.contoso.com</wsdp:ModelUrl>
          <wsdp:PresentationUrl>http://www.contoso.com</wsdp:PresentationUrl>
          <pnpx:DeviceCategory>Computers</pnpx:DeviceCategory>
        </wsdp:ThisModel>
      </wsx:MetadataSection>
      <wsx:MetadataSection
Dialect="http://schemas.xmlsoap.org/ws/2006/02/devprof/Relationship">
       <wsdp:Relationship Type="http://schemas.xmlsoap.org/ws/2006/02/devprof/host">
        <wsdp:Host>
          <wsa:EndpointReference>
            <wsa:Address>urn:uuid:95ce917d-9e37-4099-aee4-db3292041ea6</wsa:Address>
          </wsa:EndpointReference>
          <wsdp:Types>pub:Computer</wsdp:Types>
          <wsdp:ServiceId>urn:uuid:95ce917d-9e37-4099-aee4-db3292041ea6</wsdp:ServiceId>
          <pub:Computer>D-HAMILTON-1/Domain:CONTOSO_DOMAIN1</pub:Computer>
        </wsdp:Host>
      </wsdp:Relationship>
      </wsx:MetadataSection>
    </wsx:Metadata>
  </soap:Body>
```

```
</soap:Envelope>
```

From the example data, the following lines make use of the Computer Information structure (section 2.2):

```
          <wsdp:Types>pub:Computer</wsdp:Types>
...
          <pub:Computer>D-HAMILTON-1/Domain:CONTOSO_DOMAIN1</pub:Computer>
```

3.2 Publication Services Data with Listed Resources

This section contains an example of the Publication Services data associated with a computer (that is, a device) along with one service that is being advertised by that computer.

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsx="http://schemas.xmlsoap.org/ws/2004/09/mex"
xmlns:wsdp="http://schemas.xmlsoap.org/ws/2006/02/devprof"
xmlns:pnpx="http://schemas.microsoft.com/windows/pnpx/2005/10"
xmlns:pub="http://schemas.microsoft.com/windows/pub/2005/07">
  <soap:Header>
    <wsa:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
    <wsa:Action>http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse</wsa:Action>
    <wsa:MessageID>urn:uuid:009c39c2-5835-4660-a4bf-53c6fd9b96fd</wsa:MessageID>
    <wsa:RelatesTo>urn:uuid:fc7cdb58-30b4-4e0d-a309-5bd7db689a0c</wsa:RelatesTo>
  </soap:Header>
  <soap:Body>
    <wsx:Metadata>
      <wsx:MetadataSection
Dialect="http://schemas.xmlsoap.org/ws/2006/02/devprof/ThisDevice">
        <wsdp:ThisDevice>
          <wsdp:FriendlyName>Contoso Publication Service Device Host</wsdp:FriendlyName>
          <wsdp:FirmwareVersion>1.0</wsdp:FirmwareVersion>
          <wsdp:SerialNumber>20050718</wsdp:SerialNumber>
        </wsdp:ThisDevice>
      </wsx:MetadataSection>
      <wsx:MetadataSection Dialect="http://schemas.xmlsoap.org/ws/2006/02/devprof/ThisModel">
        <wsdp:ThisModel>
          <wsdp:Manufacturer>Contoso, Ltd</wsdp:Manufacturer>
          <wsdp:ManufacturerUrl>http://www.contoso.com</wsdp:ManufacturerUrl>
          <wsdp:ModelName>Contoso Publication Service</wsdp:ModelName>
          <wsdp:ModelNumber>1</wsdp:ModelNumber>
          <wsdp:ModelUrl>http://www.contoso.com</wsdp:ModelUrl>
          <wsdp:PresentationUrl>http://www.contoso.com</wsdp:PresentationUrl>
          <pnpx:DeviceCategory>Computers</pnpx:DeviceCategory>
        </wsdp:ThisModel>
      </wsx:MetadataSection>
      <wsx:MetadataSection
Dialect="http://schemas.xmlsoap.org/ws/2006/02/devprof/Relationship">
        <wsdp:Relationship Type="http://schemas.xmlsoap.org/ws/2006/02/devprof/host">
          <wsdp:Host>
            <wsa:EndpointReference>
              <wsa:Address>urn:uuid:95ce917d-9e37-4099-aee4-db3292041ea6</wsa:Address>
            </wsa:EndpointReference>
            <wsdp:Types>pub:Computer</wsdp:Types>
```

```
            <wsdp:ServiceId>urn:uuid:95ce917d-9e37-4099-aee4-db3292041ea6</wsdp:ServiceId>
            <pub:Computer>D-HAMILTON-1/Domain:CONTOSO_DOMAIN1</pub:Computer>
          </wsdp:Host>
          <wsdp:Hosted>
            <wsa:EndpointReference>
              <wsa:Address>urn:uuid:95ce917d-9e37-4099-aee4-db3292041ea6</wsa:Address>
            </wsa:EndpointReference>
            <wsdp:Types>pub:ShellPublishing</wsdp:Types>

<wsdp:ServiceId>fdid:Provider%5CMicrosoft.Base.Publication/Publication%5CExplorer/C692EF15-
7F02-42E9-9FA9-D5F313749B04_S-1-5-21-738895527-329673414-497557404-1000</wsdp:ServiceId>

<pub:Resource>m9CAAwzP41GbgYXZyNXav5WPiEjLwICIl52YvRWaudWPiUFVG1COi8jPNoAPwlmPNoAIgwTdzVmczZU
asV2cEV2cjJXawRXav5mPNoAIgACI88GI15WPic2br1WZuJCIh1jIn92atVmbiAyc9IyQ2kjMFZUM10yNGBjMtQjMFlTL
5YUQ50CR1Y0MxMzN0kjQwQzXT1SMtUTLyETL3MDO4kTN1IzNtMjM5YzNzQTM00CN5cTN1cDNwQTLxADMwICIv4TDKACIg
ACPpxmPNoAIgACIgACPp5TDKACIgACIgACI8AnPcV1clJ3ccd2br1WZuxVQwBHRhRXYcJ1bh1WaudGXNl2Yy92cvZGdcd
VauR2b3NHXMlmYyFmcpV2ccR0bjVXbl5Gdz5CbpJmchJXet02c88Cc+0gCgACIgACIgACPzxmPNJUQBFURBZ0QBFUQBFU
QBFERBFUQBFUQBl1anFUQEJ0ZBFUQBF0YwgUbYJmb3NWQwZWYvg0KL1UTIFlT0MzLoZ3QEpnQ4QzRBFUQBFUQBFkQBFUQ
BFUQBFUQBFUQBFUQBFUQBF0dJFUQBFESBFUQBNUQBFUQBFUQBFUQBFUQBF0YBFUQBFVRBFUQBtUQBFUQDFUQBFUUCFUQB
FUQBFUQBFUQnFUQ3ZEWIlDMT5kVrRVSOZlUNpVRYZlTWJ1UOZUQuljMhRnVtJ2YGV0Y3JVVZBjRHh1U5cVW0xWbi5GeWR
FcO12Y250Mi1mUIhFWs1mYrljMkpHeGRFcK12YopEWhxmTIhVR5ITWxEzVaVnUzMWd3dVYppEWZlHbYxEdOhUQU9UQBF0
dBFUQBtkRBhjQX50bCx0dIlmdR5URpd3TzoFOiVzN4MGTBFUQRNXQzdjcUVnevFUUBFUQBFUQBBzQBFUQR1EVCFTV65UV
1sEN3EFdrUFar52Rzc0TE1WdGJUQBF0dDFUQBFUQzFUQBF0dv8CRBFUQBFUQBVVRBFUQR1EVCFTV3VkZKNzKrIVYBJFc4
xUQZ1kN1YzctNUQBF0ZDFUQBFUQ4IUQBFUQEFUQBFESCdHVBNXRB5kQRJVQ0UUQJJ0dVFUVFFUTCdmUBFUQBFUQBFUQwM
UQBFUUNRlQxUlNRFmdlB1NOR0TVtmbUVUbh52UsJ3RCFUQBdXQBFUQBFUTCFUQBFUQBFUQBFUQBFUQBFUQBFUQBFENDFE
RIFFejhXMSBFdVRlR1U0UUZVRUdEeWZleW12Y6JUUUBnTtNmdONjYtJFSJ9kVHR2M502YyJUQBNUQBVVQFRUQBFUQBF0b
zB1QidURBNmMiJXMXpVdCFUQ2EUQDFUUBFkd3IXersmcat0NqdXbwNUQBF0ZoFUQBFUQBdWQBFUQBFUQBFUQBFUQBFUQB
FUQBFkbCdnYBN3RBRnQRpVQ0cUQBF0ZGFUSGFEeBFUQBFUQBt0NEZXbKJUQCJESjVkRHRGaCFEUBdWQBVUQ3dzKxNHU1E
Wb5tydypVcBFUQBVkSBFUQBFUQJFUQBFUQBFUQBFUQBFUQBFUQRFVQBhUQ3JUQSFURHFEMCFVWBFUQBdVQnVVQFRU
QBFUQBF0ZzBldzYURBlUMihWMXFWdkdUQ4EUQDFUUBFkd3IXersmcat0NUVXbwNUQBF0ZrFUQBFUQBdWQBFUQBFUQBFUQ
BFUQBFUQBFUQBF0UCdnYBV0RBRnQRFWQ0cUQuJUQBFUWCFUWCFVTBFUQBFUQnFzKFBFUVFUUUpkTrVFUOxmZ4FUQBFkQB
NUQRFUQ2djc5tyayp1V3QFO482QBFUQ3tWQBFUQBF0ZBFUQBFUQBFUQBFUQBFUQBFUQBFUQOJUUhFUTHFUeCdnYB1ESBZ
nQnpVQRhUQBFUQHFUSGFEeBFUQBFUQBt0NElXbCJUQYxWbitWOyQmeCFEUBdWQBVUQ3dzKxNHU1EWb5tyZzpVcBFUQBFl
SBFUQBFUQJFUQBFUQBFUQBFUQBFUQBFUQBFUQ3ZVQrdUQ1JUQaFEOHF0MCd3YBFUQBdVQBdVQFRUQBFUQBFUW0BVe6RVR
BdXVTNkSWF1U1gVTBFUQRF0ZBFURBd3NrE3cQNkYtFzKJBFUxFUQBFUUwUUQBFUQB1UQBFUQBFUQBFUQBFUQBFUQBFUQB
FEVBt2RBlmQnNWQFdUQ5JUUhFUVHFkeCFUQBdmQBF2Qn1UQ4QzRBF0ZxsSSQB1ZBFkUQ5UVW5kVrZGe0MEVKpURBFENIF
USBFkQBhTd2t0NqdXbaRHU5pnaLFUQBFUN1NVQBFUQBNUQBFUQBFUQBFUQBFUUGFUQBFUQBFVRBZnQ3lVQVhUQ0JUUaFE
NHFEMCd3YBRzQBNnQRFWQJdUQ5JUUZFUSIFUNCFFTBBzRBpnQBFUQBVUQ6JUQhFUVHF0cCFkYB1ERBlXQnxUQRdUQzJUQ
iF0dDFEdBdXTBFFRBFTQ35UQVRUQBFUQIFUQBF0SPFUQBtWQBFUQxZGRBFUQ41kRVRlS1lWWaVkdNhmeRdTevUEVhNUb0
VzYIFUQBF0QBFUQBFUQTFUQBFEVHZ0TuZESNh0QFhmZkx0VrRlSuZzVwEUQBdXQBFUQBFURCVUQBdXTEFUQBVVQ3hUUCt
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UBFlV6ZVbjpnQBlVQnFUQFF0d3sSazBlWLxWer8WVhFXQBFUQBpWQBFUQBFURBFUQBFUQBFUQBFUQn5UQBFUQBFUUWFUT
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FkNBF0QBFVQBZ3Nyl3KrJnWLdja31GcDFUQBdGaBFUQBFUQnFUQBFUQBFUQBFUQBFUQBFUQB5mQ3JWQzdUQ0JUUaF
ENHFUQBdmRBlkRBhXQBFUQBFUQLdDR21mSCFkQCh0YFZ0RkhmQBBVQnFUQFF0d3sSczBVNh1WercncaFXQBFUQFpUQBFU
QBFUSBFUQBFUQBFUQBFUQBFUQBFUQBFUURFUQIF0dCFkUBV0RBBjQRlVQBFUQXF0ZVFUREFUQBFUQBd2cQZ3MGVUQJFjY
oFzVhVHZHFEOBF0QBFVQBZ3Nyl3KrJnWLdDV11GcDFUQBd2aBFUQBFUQnFUQBFUQBFUQBFUQBFUQBFUQBFUQBNlQ3JWQF
dUQ0JUUhFENHFkbCFUQBllQBllQR1UQBFUQBF0ZxsSRQBVVBFFVK50aVBlTsZGeBFUQBJUQDFUUBFkd3IXersmcad1NUh
DOvNUQBF0drFUQBFUQBdWQBFUQBFUQBFUQBFUQBFUQBFUQBFkTCFVYB10RBlnQ3JWQNhUQ2J0ZaFUUIFUQBF0RBlkRBhX
QBFUQBFUQLdDR51mQCFEWs1mYrljMkpnQBBVQnFUQFF0d3sSczBVNh1Werc2caFXQBFUQRpUQBFUQBFUSBFUQBFUQBFUQ
BFUQBFUQBFUQBF0dWF0aHFUdCFkWBhzRBNjQ3NWQBFUQXFUQXFUREFUQBFUQBlFdQlneUVUQ3V1UDpkVRNVNY1UQBFUUB
dWQBVUQ3dzKxNHUDJWbxsSSQBVcBFUQBFFMFFUQBFUQNFUQBFUQBFUQBFUQBFUQBFUQBFUQBRVQrdUQpJ0ZjFURHFUeCF
VYBV1RBpnQBFUQnJUQVN0ZNFUWxcUQBdWMrkEUQdWQnZlSSVlUQ5EbmhHNDRlSKVUQBdGSBlUQBJUQ4UndLdja31mW0BV
e6p2SBFUQB12TCFUQBFUQHFUQBFUQBFUQBFUQBRTRBFUQBFUQZZUQwJUQaFUVHFkdCd3YBRzQBNnQRFWQJdUQ5JUUZFUS
IFUNCFFTBBzRBpnQBFUQBVUQ6JUQhFUVHF0cCFkYB1ERBlXQnxUQRdUQzJUQiF0dDFEdBdXTBFFRBJTQn1UQBRUQBFUQI
FUQBF0RPFUQBtWQBFUQxVGRBFUQ41kRVRlS1lWWaVkdNhmeRdTevUEVhNUb0VzYIFUQBF0QBFUQBFUQTFUQBFEVHZ0TuZ
ESNh0QFhmZkx0VrRlSuZzRwEUQBdXQBFUQBFURCVUQBFFTEFUQBVVQ3hUUCtCVRRUa2YzaHVUap50QBN3QNdHMadUQ4kX
U2cnRBFUQBFUQBFUQBFUQBFUQBFUQBFUQBBjQR1UQBFUQBF0Z5tybVFmUBFlV6ZVbjpnQBlVQnFUQFF0d3sSazBlW
LxWer8WVhFXQBFUQBpWQBFUQBFURBFUQBFUQBFUQBFUQn5UQBFUQBFUUWFUTIFEbCd2YBlESBFUQBFVQNhUQvJUUaF0dH
F0cCdXTBlERBVXQBpVQ3dUQzJUQMFEMDFUeBFVTBdGRBhXQ31UQBFUQVFUQVFUREFUQBFUQB92cQNkYHVUQjJjYyFzVaV
nQBFkNBF0QBFVQBZ3Nyl3KrJnWLdja31GcDFUQBdGaBFUQBFUQnFUQBFUQBFUQBFUQBFUQBFUQBFUQB5mQ3JWQzdUQ0JU
UaFENHFUQBdmRBlkRBhXQBFUQBFUQLdDR21mSCFkQCh0YFZ0RkhmQBBVQnFUQFF0d3sSczBVNh1WercncaFXQBFUQFpUQ
BFUQBFUSBFUQBFUQBFUQBFUQBFUQBFUQBFUURFUQIF0dCFkUBV0RBBjQRlVQBFUQXF0ZVFUREFUQBFUQBd2cQZ3MGVUQJ
FjYoFzVhVHZHFEOBF0QBFVQBZ3Nyl3KrJnWLdDV11GcDFUQBd2aBFUQBFUQnFUQBFUQBFUQBFUQBFUQBFUQBNlQ3J
WQFdUQ0JUUhFENHFkbCFUQBllQBllQR1UQBFUQBF0ZxsSRQBVVBFFVK50aVBlTsZGeBFUQBJUQDFUUBFkd3IXersmcad1
NUhDOvNUQBF0drFUQBFUQBdWQBFUQBFUQBFUQBFUQBFUQBFkTCFVYB10RBlnQ3JWQNhUQ2J0ZaFUUIFUQBF0RBlkR
BhXQBFUQBFUQLdDR51mQCFEWs1mYrljMkpnQBBVQnFUQFF0d3sSczBVNh1Werc2caFXQBFUQRpUQBFUQBFUSBFUQBFUQB
FUQBFUQBFUQBFUQBF0dWF0aHFUdCFkWBhzRBNjQ3NWQBFUQXFUQXFUREFUQBFUQBlFdQlneUVUQ3V1UDpkVRNVNY1UQBF
UUBdWQBVUQ3dzKxNHUDJWbxsSSQBVcBFUQBFFMFFUQBFUQNFUQBFUQBFUQBFUQBFUQBFUQBFUQBRVQrdUQpJ0ZjFURHFU
eCFVYBV1RBpnQBFUQnJUQVN0ZNFUWxcUQBdWMrkEUQdWQnZlSSVlUQ5EbmhHNDRlSKVUQBdGSBlUQBJUQ4UndLdja31mW
0BVe6p2SBFUQB12TCFUQBFUQHFUQBFUQBFUQBFUQBRTRBFUQBFUQZZUQwJUQaFUVHFkdCd3YBRzQBNnQRFWQJdUQ5JUUZ
FUSIFUNCFFTBBzRBpnQBFUQBVUQ6JUQhFUVHF0cCFkYB1ERBlXQnxUQRdUQzJUQiF0dDFEdBdXTBFFRBJTQn1UQBRUQBF
UQIFUQBFUQBFUQBFUQBFUQBFUWBFUQBRUQBF0ZpZUQBFUQBFUQBFkb5ITY0ZVbi9mTYp1cadUQBFUQBF0ZvFUOh9W
RmVXWU5WahNGSvJ1LI1Gc0UXcTFGROpENSBjSn1GSCNkdUVnZJtUU2d0S45GTyADcvd0MCFGMvgmWLVncxtmMRR1QlVEZ
D9WNSd2d3s2NIFUQBFUQ88ycs5TDKACIgACIgwzLp5TDKACIgACPvkGb+0gCgACPvU3clJ3cGlGblNHRlN3YylGc0l2bu
5TDKwzLwlmPAEAAA0gjq6BIHKuQ9MtcAQzek05xoILdb7aP6FqXQcO1Wcn9/+pzK9YEARQtdmy2jY5AQUV7eI17MG6h7i
m54HXW7C+OqS2F3cOn0Cxl4l4TZXL3ldB9j8jpYTcnw1QQufPVgzKk/piBoC/qwRRQqjmtUkxcGEvq5ZBIh88rLUHEVHy
1EyG4k8XYLqP6fA3oWIAy

<pub:Resource2>WCfU3BofYTXgsXNr3ikT3JZcccgdhbCNEYS/CuMIHi5cKGLCIPDcSg7P3VRyx1VzDOW170YhGD7Pa+
NJDFeuGO73NiEaCtTljULnyYlqtQokSdeYJJJGqs6g6nd8iLGQ0857nG/PMxvCzdirzSa1hxK</pub:Resource2>

```
          </wsdp:Hosted>
        </wsdp:Relationship>
```

```
        </wsx:MetadataSection>
      </wsx:Metadata>
    </soap:Body>
  </soap:Envelope>
```

From the example data, the following lines make use of the Computer Information structure (section 2.2):

```
            <wsdp:Types>pub:Computer</wsdp:Types>
...
            <pub:Computer>D-HAMILTON-1/Domain:CONTOSO_DOMAIN1</pub:Computer>
```

Also from the example data, the Resource structure (section 2.3) is demonstrated in the lines that start with "<pub:Resource>", "<pub:Resource1>", and "<pub:Resource2>".

4 Security

4.1 Security Considerations for Implementers

Publication Services does not provide any security to protect the data that is being advertised or to ensure its authenticity. Applications that need to secure their advertised resources typically implement their security policy on top of Publication Service data structures.

4.2 Index Of Security Fields

None.

5 Appendix A: Full XML Schema

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

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema
  targetNamespace="http://schemas.microsoft.com/windows/pub/2005/07"
  xmlns:pub="http://schemas.microsoft.com/windows/pub/2005/07"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  blockDefault="#all" >

  <xs:simpleType name="DiscoveryTypeValues">
    <xs:restriction base="xs:QName">
      <xs:enumeration value="pub:Computer"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:element name="Computer" type="xs:string" minOccurs="0" />

  <xs:element name="Resource" type="xs:string" minOccurs="0" />

</xs:schema>
```

6 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:

- Windows Vista operating system
- Windows Server 2008 operating system
- Windows 7 operating system
- Windows Server 2008 R2 operating system
- Windows 8 operating system
- Windows Server 2012 operating system
- Windows 8.1 operating system
- Windows Server 2012 R2 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 1.4: On Windows Vista and Windows Server 2008, the maximum metadata size that the device representation of a computer can be is 32767 octets ([MS-DTYP] section 2.1.5). This is because the extension that is documented in [MS-DPWSSN] is not supported on these operating systems.

7 Change Tracking

This section identifies changes that were made to the [MS-PBSD] protocol document between the January 2013 and August 2013 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

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

The revision class **Major** means that the technical content in the document was significantly revised. Major changes affect protocol interoperability or implementation. Examples of major changes are:

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

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

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

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

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

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

- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.
- Content removed for template compliance.
- Obsolete document removed.

Editorial changes are always classified with the change type **Editorially updated.**

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

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

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

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
6 Appendix B: Product Behavior	Modified this section to include references to Windows 8.1 and Windows Server 2012 R2.	Y	Content updated.

8 Index