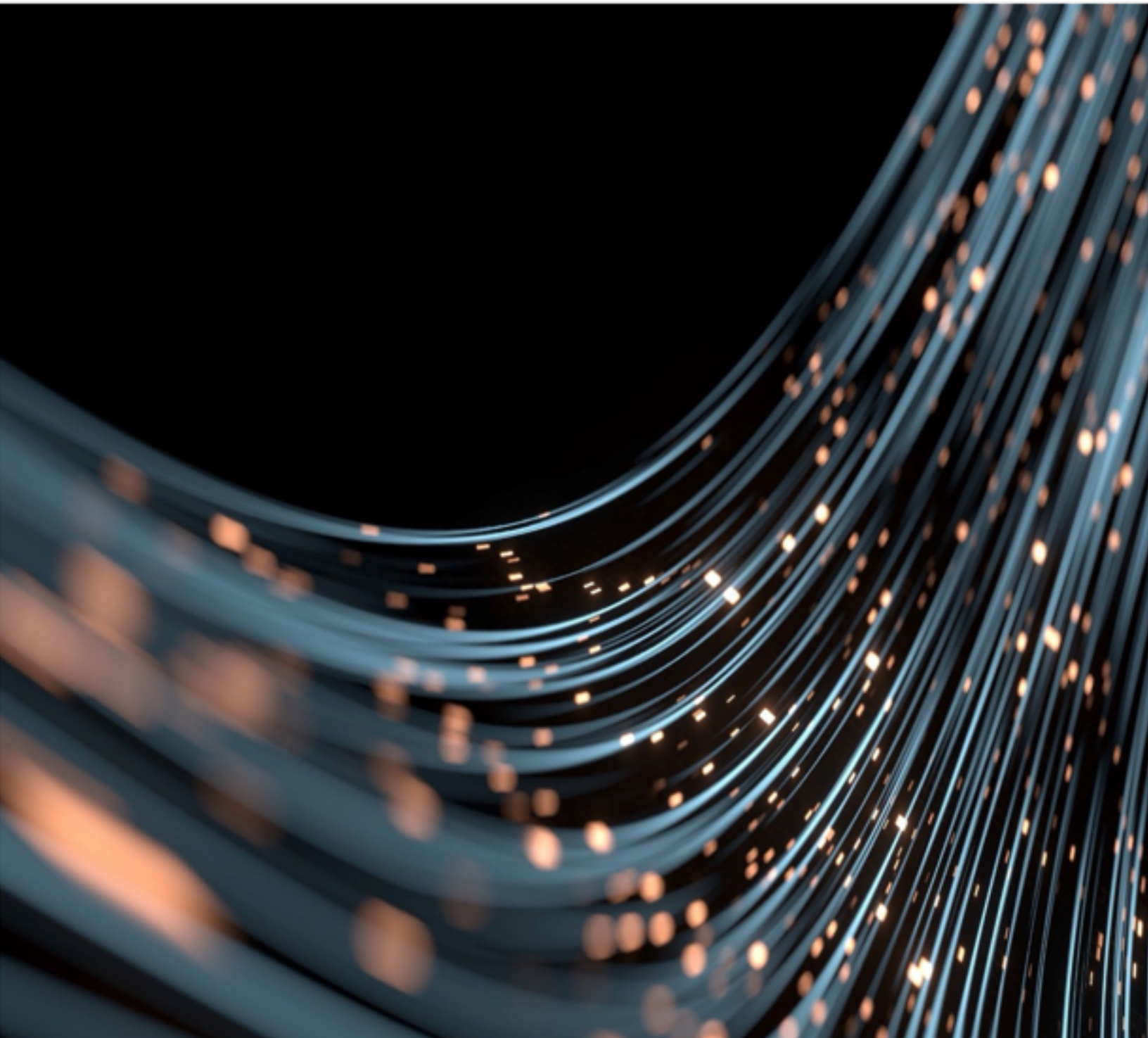
DIGITAL BUSINESS NETWORKS ALLIANCE™

SMP Profile

Version 1.0

July 2023



1 Table of Contents

2 Version History

Revision date	Version	Change description	Editor
07/20/2023	1.0	Initial version	BPC Market Pilot Technical Committee

3 Introduction

3.1 Scope

This specification is a profile of the Service Metadata Publishing (SMP) Version 2.0 OASIS Standard (OASIS SMP 2.0) published here:

https://docs.oasis-open.org/bdxr/bdx-smp/v2.0/os/bdx-smp-v2.0-os.html

This document describes the technical and functional requirements of both SMP clients and services. In addition to the policies specified in this document, all SMP clients and services in the DBNAlliance network MUST conform to all conformance clauses of the OASIS SMP 2.0 specification.

3.2 Conformance

The keywords 'MUST', 'MUST NOT', 'REQUIRED', 'SHALL', 'SHALL NOT', 'SHOULD', 'SHOULD NOT', 'RECOMMENDED', 'MAY', and 'OPTIONAL' in this specification are to be interpreted as described in RFC2119 and RFC 8174 when, and only when, they appear in all capitals, as shown here.

3.3 Terms and Definitions

For the purpose of this specification, all terms shall have the definitions defined in the document Terms and Definitions of the DBNAlliance version 1.0.

3.4 Disclaimers and Copyright

Views expressed here are not necessarily those of, and should not be attributed to, any particular DBNAlliance participant or organization. They are not intended to provide business or legal advice, nor are they intended to promote or advocate a specific action, payment strategy, or product. Readers should consult with their own business and legal advisors.

This specification is the work product of the DBNAlliance, and readers are free to republish this specification in whole or in part without further permission, as long as the work is attributed to the DBNAlliance, and in no way suggests the DBNAlliance sponsors, endorses or recommends any organization or its services or products. Other product names and company names referenced within this document may be either trademarks or service marks of their respective owners.

4 REST Interface

4.1 HTTP and security

SMP services MUST use HTTPS and MUST use TLS/SSL certificates in accordance with DBNAlliance policies. SMP services MUST NOT make SMP resources available through unsecured HTTP connections.

SMP services MUST use the standard HTTPS port 443.

TLS/SSL client authentication MUST NOT be required when accessing SMP resources.

4.2 SMP REST API

Client and server REST communication MUST be implemented as specified in section 5.2 of the OASIS SMP 2.0 standard.

An SMP client SHOULD always call the `ServiceGroup` resource first to discover if a given service or document type is supported. In other words, an SMP client SHOULD NOT assume that a given `ServiceMetadata` resource exists without first performing a `ServiceGroup` discovery.

An SMP client MUST NOT use trial and error methods for capability discovery.

4.3 Caching

4.3.1 SMP services

SMP services SHOULD support "`If-Modified-Since`" request headers as specified in RFC 7232 and SHOULD respond with an HTTP 304 (Not Modified) status code if the requested resource exists and has not been modified since the date in the "`If-Modified-Since`" header.

SMP services MUST respond with an HTTP 200 (OK) status code if the requested resource exists and:

- has been modified since the date in the "If-Modified-Since" header, *or*
- an "`If-Modified-Since`" header was not included in the request, *or*
- the SMP service does not support "`If-Modified-Since`" headers.

SMP services MUST include a "`Last-Modified`" header with every HTTP 200 (OK) response as specified in RFC 7232.

4.3.2 SMP clients

SMP clients SHOULD cache responses from SMP services and SHOULD implement "`If-Modified-Since`" requests and responses as specified in RFC 7232 and as follows:

- When an SMP resource is already cached by the SMP client, the SMP client SHOULD include a "`If-Modified-Since`" header in the HTTP request. For the date value of the "`If-Modified-Since`" header, the SMP client MAY use either a local date of when the resource was cached, or the date value returned by the SMP service for the cached resource.

- If an "`If-Modified-Since`" header is included in a request and the SMP service responds with an HTTP 304 (Not Modified) status code, then the SMP client MUST use its last cached resource in lieu of a resource returned by the SMP service.

5 Data model

5.1 General

SMP services and clients MUST implement the elements in the tables specified below. Other network profiles and specifications MAY identify and specify the use of additional elements and/or change cardinality of elements described in the tables in the sections 5.2 and 5.3 below.

SMP services MAY implement additional SMP elements, including the use of extensions, however they MUST NOT require that an SMP client can understand them. Such elements and extensions, if any, MUST NOT conflict or contradict any use of SMP specified by the network.

5.2 ServiceGroup Resource

Element or attribute	Cardinality	Definition and use
ServiceGroup	1..1	Root element of the SMP `ServiceGroup` resource.
└ SMPVersionID	1..1	The version of the OASIS SMP specification in use. This value MUST be set to: `2.0`
└ ParticipantID	1..1	The Participant Identifier as specified in the DBNAlliance Policy for Using Identifiers. SMP clients SHOULD check that the value returned by the SMP service matches the queried value.
└ ParticipantID/@schemeID	1..1	The identifier of the scheme to which the Participant Identifier belongs, as specified in the DBNAlliance Policy for Using Identifiers. SMP clients SHOULD check that the value returned by the SMP service matches the queried value.
└ ServiceReference	0..n	Contains information about a supported document type. The `ServiceGroup` resource SHALL have exactly one `ServiceReference` occurrence for each document type supported, i.e., it MUST NOT have two or more `ServiceReference` elements describing identical document types. A `ServiceGroup` MUST NOT include `ServiceReference` elements describing document types that are not supported by the end user. Each `ServiceReference` document type MUST have a corresponding `ServiceMetadata` resource available (see section 5.3).
└└ ID	1..1	The document type identifier as specified in the corresponding business document profile or specification, in accordance with the DBNAlliance Policy for Using Identifiers.
└└ ID/@schemeID	1..1	The document type identifier scheme as specified in the corresponding business document profile or specification, in accordance with the DBNAlliance Policy for Using Identifiers.

Element or attribute	Cardinality	Definition and use
└└ ID/@schemeName	0..1	An OPTIONAL descriptive name of the document type identifier scheme to aid understanding the context of the document type identifier and scheme identifier. If used, then the scheme name MUST contain an accurate description of the `schemeID` attribute and MUST NOT contradict the `schemeID` value. *As a non-normative example:* *When used with the* `bdx-docid-qns` *identifier scheme, the* `schemeName` *attribute could be set to:* *`QName/Subtype Identifier`*
└└ Process	0..n	A supported business process within which the document type is used. The `ServiceReference` container SHALL have exactly one `Process` occurrence for each business process supported, i.e., it MUST NOT have two or more `Process` elements describing identical business processes. A `ServiceReference` MUST NOT include `Process` elements describing business processes that are not supported by the end user. The value of this element is specified in the business document type documentation. It is left optional to accommodate document types that use different means to signal business process relations.
└└└ ID	1..1	The business process identifier as specified in the corresponding business process or business document profile or specification, in accordance with the DBNAlliance Policy for Using Identifiers.

5.3 ServiceMetadata Resource

Element or attribute	Cardinality	Definition and use
ServiceMetadata	1..1	Root element of the SMP ServiceMetadata resource.
└ SMPVersionID	1..1	The version of the OASIS SMP specification in use. This value MUST be set to: `2.0`
└ ID	1..1	The document type identifier as specified in the corresponding business document profile or specification, in accordance with the DBNAlliance Policy for Using Identifiers. SMP clients SHOULD check that the value returned by the SMP service matches the queried value.
└ ID/@schemeID	1..1	The document type identifier scheme as specified in the corresponding business document profile or specification, in accordance with the DBNAlliance Policy for Using Identifiers.
└ ID/@schemeName	0..1	An OPTIONAL descriptive name of the document type identifier scheme to aid understanding the context of the document type identifier and scheme identifier.

Element or attribute	Cardinality	Definition and use
		If used, then the scheme name MUST contain an accurate description of the `schemeID` attribute and MUST NOT contradict the `schemeID` value. *As a non-normative example:* *When used with the `bdx-docid-qns` identifier scheme, the `schemeName` attribute could be set to:* *`QName/Subtype Identifier`*
└ ParticipantID	1..1	The Participant Identifier as specified in the DBNAlliance Policy for Using Identifiers. SMP clients SHOULD check that the value returned by the SMP service matches the queried value.
└ ParticipantID/@schemeID	1..1	The identifier of the scheme to which the Participant Identifier belongs, as specified in the DBNAlliance Policy for Using Identifiers. SMP clients SHOULD check that the value returned by the SMP service matches the queried value.
└ ProcessMetadata	1..1	
└└ Process	0..n	A supported business process that the document type is part of. The `ProcessMetadata` container SHALL have exactly one `Process` occurrence for each business process supported, i.e., it MUST NOT have two or more `Process` elements describing identical business processes. The `ProcessMetadata` MUST NOT include `Process` elements describing business processes that are not supported by the end user. The value of this element is specified in the business document type documentation. It is left optional to accommodate document types that use different means to signal business process relations.
└└└ ID	1..1	The business process identifier as specified in the corresponding business process or business document profile or specification, in accordance with the DBNAlliance Policy for Using Identifiers.
└└ Endpoint	0..n	The technical endpoint of the Access Point to where business documents of this document type must be sent. A `ServiceMetadata` resource MUST have either one `Redirect` element or one or more `Endpoint` elements, i.e., it MUST NOT have both and it MUST NOT have none. A `ServiceMetadata` resource MUST only contain one activated and not expired endpoint with the same `TransportProfileID`.

Element or attribute	Cardinality	Definition and use
└└└ TransportProfileID	1..1	The identifier for the transport profile or protocol that the endpoint will expect senders to use when sending business documents.
└└└ Description	0..1	An OPTIONAL human readable description of the endpoint.
└└└ Contact	1..1	Information for contacting the technical personnel operating the endpoint, such as an email address or a phone number.
└└└ AddressURI	1..1	The absolute URL where business documents of this document type shall be sent.
└└└ Certificate	1..n	A public key certificate as defined in the protocol or transport profile specification, used to validate the communication and identity of the endpoint. SMP clients MUST ignore endpoints without a valid certificate.
└└└└ TypeCode	1..1	The type and/or use of the certificate, as defined by the protocol or transport profile specification. If an Endpoint element has more than one certificate with the same `TypeCode` codes, the periods defined by their respective `ActivationDate` and `ExpirationDate` dates MUST NOT overlap.
└└└└ Description	0..1	An OPTIONAL human readable description of the certificate.
└└└└ ActivationDate	1..1	The date from which the endpoint will use this certificate. The `ActivationDate` date MUST be the same or a later date than the activation date of the certificate itself. The `ActivationDate` date MUST be an earlier date than the `ExpirationDate` date. SMP clients MUST ignore certificates if the `ActivationDate` date is later than today's date.
└└└└ ExpirationDate	1..1	The date from which the endpoint will no longer use this certificate. The `ExpirationDate` date MUST be the same or an earlier date than the expiration date of the certificate itself. The `ExpirationDate` date MUST be a later date than the `ActivationDate` date. SMP clients MUST ignore certificates if the `ExpirationDate` date is the same or earlier than today's date.
└└└└ ContentBinaryObject	1..1	The complete *base64 portion* (i.e., not including the PEM header or footer) of the PEM formatted X.509 public key certificate.
└└└└ ContentBinaryObject /@mimeCode	1..1	An attribute specifying the MIME code of the data contained in the `ContentBinaryObject`. This value MUST be set to exactly:

Element or attribute	Cardinality	Definition and use
		`application/base64`
└└ Redirect	0..1	An instruction that the request is redirected to another SMP service. The `ServiceMetadata` resource MUST have either one `Redirect` element or one or more `Endpoint` elements, i.e., it MUST NOT have both and it MUST NOT have none.
└└└ PublisherURI	1..1	The absolute URL of the SMP service being redirected to. The `PublisherURI` MUST only contain the base URL of the new SMP service and MUST NOT contain the resource part. Consequently, when redirected to a new SMP service, an SMP client must therefore construct the complete URL by combining the base URL provided in the `PublishURI` element with the path to the `ServiceMetadata` resource as specified in section 5.4 of the OASIS SMP 2.0 specification.
└└└ Certificate	0..1	The OPTIONAL X.509v3 Certificate of the redirected SMP service.
└ Signature	1..1	The XML signature, as specified in section 7 below.

6 Redirection

An SMP service MAY redirect a request to another SMP service. This is useful for example when a participant uses multiple SMP services and when migrating from one SMP service to another.

Redirection MUST be done in the manner specified in OASIS SMP 2.0 section 2.1.3. An SMP service MUST NOT use HTTP codes 3xx to redirect to another SMP service. An SMP client MUST NOT follow an HTTP code 3xx redirection to another SMP service.

An SMP client request MUST NOT be redirected more than once. Therefore, an SMP service MUST NOT redirect to another SMP service if the request was already redirected.

Likewise, an SMP client MUST NOT follow the Redirect instruction if already redirected from another SMP service. The SMP client MUST instead abort the operation and report the incompliance in accordance with DBNAlliance policies.

An SMP service MAY include a redirect certificate, however an SMP client is NOT REQUIRED to validate the redirection certificate.

7 Signing

The `ServiceMetadata` resource MUST be signed by the SMP service using a valid certificate issued to the SMP service provider as specified in the DBNAlliance Certificate Policy. The SMP service MUST sign the `ServiceMetadata` resource in the manner specified in section 5.6.2.1 of the OASIS SMP 2.0 specification.

An SMP client MUST validate the signature of the `ServiceMetadata` resource in the manner specified in section 5.6.2.2 of the OASIS SMP 2.0 specification. An SMP client MUST NOT send information to any of the endpoints in the SMP service response unless the `ServiceMetadata` resource is signed using a valid certificate as specified above.

8 Referencing from SML records

When referencing an SMP service from an SML record using OASIS BDXL 1.0, the following identifier MUST be used in the service field of the NAPTR record:

```
oasis-bdxr-smp-2#dbnalliance-1.1
```

Appendix A: Example ServiceGroup resource (non-normative)

```
<?xml version="1.0" encoding="UTF-8"?>
<ServiceGroup xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns="http://docs.oasis-open.org/bdxr/ns/SMP/2/ServiceGroup"
  xmlns:ext="http://docs.oasis-open.org/bdxr/ns/SMP/2/ExtensionComponents"
  xmlns:sma="http://docs.oasis-open.org/bdxr/ns/SMP/2/AggregateComponents"
  xmlns:smb="http://docs.oasis-open.org/bdxr/ns/SMP/2/BasicComponents">
  <smb:SMPVersionID>2.0</smb:SMPVersionID>
  <smb:ParticipantID schemeID="GLN">1234567890123</smb:ParticipantID>
  <sma:ServiceReference>
    <smb:ID schemeID="bdx-docid-qns" schemeName="QName/Subtype
Identifier">urn:oasis:names:specification:ubl:schema:xsd:Invoice
2::Invoice##DBNAlliance-1.0-data-Core</smb:ID>
    <sma:Process>
      <smb:ID>dbnalliance-process-invoicing-1.0</smb:ID>
    </sma:Process>
    <sma:Process>
      <smb:ID>dbnalliance-process-procurement-1.0</smb:ID>
    </sma:Process>
  </sma:ServiceReference>
  <sma:ServiceReference>
    <smb:ID schemeID="bdx-docid-qns" schemeName="QName/Subtype
Identifier">urn:oasis:names:specification:ubl:schema:xsd:Order-2::Order##dbnalliance-
1.0-data-core</smb:ID>
    <sma:Process>
      <smb:ID>dbnalliance-process-procurement-1.0</smb:ID>
    </sma:Process>
  </sma:ServiceReference>
</ServiceGroup>
```

Appendix B: Example ServiceMetadata resource (non-normative)

```
<?xml version="1.0" encoding="UTF-8"?>
<ServiceMetadata xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns="http://docs.oasis-open.org/bdxr/ns/SMP/2/ServiceMetadata"
  xmlns:ext="http://docs.oasis-open.org/bdxr/ns/SMP/2/ExtensionComponents"
  xmlns:sma="http://docs.oasis-open.org/bdxr/ns/SMP/2/AggregateComponents"
  xmlns:smb="http://docs.oasis-open.org/bdxr/ns/SMP/2/BasicComponents">
  <smb:SMPVersionID>2.0</smb:SMPVersionID>
  <smb:ID schemeID="bdx-docid-qns" schemeName="QName/Subtype
Identifier">urn:oasis:names:specification:ubl:schema:xsd:Invoice
2::Invoice##DBNAlliance-1.0-data-Core</smb:ID>
  <smb:ParticipantID schemeID="GLN">1234567890123</smb:ParticipantID>
  <sma:ProcessMetadata>
    <sma:Process>
      <smb:ID>dbnalliance-process-invoicing-1.0</smb:ID>
    </sma:Process>
    <sma:Process>
      <smb:ID>dbnalliance-process-procurement-1.0</smb:ID>
    </sma:Process>
    <sma:Endpoint>
      <smb:TransportProfileID>bdxr-as4-1.0#dbnalliance-1.0</smb:TransportProfileID>
      <smb:Description>AS4 access point</smb:Description>
      <smb:Contact>as4-ap@example.com</smb:Contact>
      <smb:AddressURI>https://as4.example.com</smb:AddressURI>
      <sma:Certificate>
        <smb:TypeCode>bdxr-as4-signing-encryption</smb:TypeCode>
        <smb:Description>Access Point certificate for both signing and
encryption</smb:Description>
        <smb:ActivationDate>2021-09-01Z</smb:ActivationDate>
        <smb:ExpirationDate>2023-08-31Z</smb:ExpirationDate>
        <smb:ContentBinaryObject
mimeCode="application/base64">MIIFwDCCA...</smb:ContentBinaryObject>
      </sma:Certificate>
    </sma:Endpoint>
  </sma:ProcessMetadata>
  <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
    <SignedInfo>
      <CanonicalizationMethod Algorithm="http://www.w3.org/2006/12/xml-c14n11"/>
      <SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
      <Reference URI="">
        <Transforms>
          <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-
signature"/>
        </Transforms>
        <DigestMethod Algorithm="http://www.w3.org/2001/04/xmlenc#sha256"/>
        <DigestValue>AtTvPa4...</DigestValue>
      </Reference>
    </SignedInfo>
    <SignatureValue>yDMsBn9/...</SignatureValue>
    <KeyInfo>
      <X509Data>
        <X509SubjectName>1.2.840.113549.1.9.1=#16136b62656e6774737
          36f6e4065666163742e7065,CN=smp.example.com,OU=IT,O=KH,L=Oracle
          Park,ST=CA,C=US</X509SubjectName>
        <X509Certificate>MIIFxzCCA6...</X509Certificate>
      </X509Data>
    </KeyInfo>
  </Signature>
</ServiceMetadata>
```