This document defines a data format whereby basic information of an XMPP domain can be expressed and exposed over pub-sub.
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1 Introduction

To facilitate discovery of information of individual domains in an XMPP-based network, this specification defines a data format to define basic information for individual XMPP domains. By leveraging Publish-Subscribe (XEP-0060) this information can efficiently be shared with applications that compose an overview of the larger XMPP network.

2 Requirements

- Describe links between nodes in an XMPP-based network, by enumerating connections used for federation between XMPP domains.

- An extensible data format, allowing additional data (such as that defined in Software Version (XEP-0092) to be retrievable without requiring additional round-trips.

3 Discovering Support

Domains supporting the publication of Server Information data, as described in this document, MUST advertise the fact by announcing a Service Discovery (XEP-0030) feature of 'urn:xmpp:serverinfo:0'. This signifies that an administrative entity approved the publication of data, which is important for the opt-in mechanism described in Privacy Considerations section of this document.

The pub-sub service address and node in which Server Information data is advertised SHOULD be specified using a Service Discovery Extensions (XEP-0128), using an URI as specified in section 12.22 of XEP-0060. These pub-sub coordinates MUST be scoped using a FORM_TYPE of "http://jabber.org/network/serverinfo" (as specified in XEP-0157) and data form field registered for this purpose as defined in the XMPP Registrar Considerations section of this document.

When the 'urn:xmpp:serverinfo:0' feature but no corresponding Service Discovery Extension is advertised, the node that is used will be a first-level leaf node using the name 'serverinfo' on the first pub-sub service advertised through service discovery.

Listing 1: Service Discovery information request

```xml
<iq type='get'
    from='francisco@denmark.lit/barracks'
    to='shakespeare.lit'
    id='disco1'>
  <query xmlns='http://jabber.org/protocol/disco#info'/>
</iq>
```

3 DISCOVERING SUPPORT

Listing 2: Service Discovery information response

```xml
<iq type='result' from='shakespeare.lit' to='francisco@denmark.lit/barracks' id='disco1'>
<query xmlns='http://jabber.org/protocol/disco#info'>
...
<feature var='urn:xmpp:serverinfo:0'/>
...
<x xmlns='jabber:x:data' type='result'>
  <field var='FORM_TYPE' type='hidden'>
    <value>http://jabber.org/network/serverinfo</value>
  </field>
  <field var='serverinfo-pubsub-node'>
    <value>xmpp:pubsub.shakespeare.lit?;node=serverinfo</value>
  </field>
</x>
</query>
</iq>
```

The node MUST reference a first-level leaf node on a pub-sub service.

Listing 3: Entity queries root node for information

```xml
<iq type='get' from='francisco@denmark.lit/barracks' to='pubsub.shakespeare.lit' id='info1'>
<query xmlns='http://jabber.org/protocol/disco#info' node='serverinfo'/>
</iq>
```

Listing 4: Service responds with identity of pubsub/leaf

```xml
<iq type='result' from='pubsub.shakespeare.lit' to='francisco@denmark.lit/barracks' id='info1'>
<query xmlns='http://jabber.org/protocol/disco#info' node='serverinfo'>
...
<identity category='pubsub' type='leaf'/>
...
</query>
</iq>
```
4 Data Format

The data format uses an element named 'serverinfo' in the namespace 'urn:xmpp:serverinfo:0'. In its minimal form, it defines each XMPP domain name served by the local server in an attribute named 'name'.

Listing 5: Minimal Data Format

```xml
<serverinfo xmlns='urn:xmpp:serverinfo:0'>
  <domain name='shakespeare.lit'/>
</serverinfo>
```

The optional 'federation' child element is used to denote remote XMPP domains with which the local domain is federating. Each of them are represented by an element named 'remote-domain'. The domain name of the peer in an optional attribute named 'name'. Optionally, each actual (e.g. TCP) connection from the local server to the peer is added as a 'connection' child-element to the 'remote-domain' element, that has an optional 'type' attribute, defining the directionality of the connection (one of 'incoming', 'outgoing' and 'bidi'). The name of a remote domain MUST only be included if the remote server advertises support for this XEP. This acts as an opt-in mechanism, to address the privacy concern defined in the Privacy Considerations section of this document.

Listing 6: Data Format with Federated Domains

```xml
<serverinfo xmlns='urn:xmpp:serverinfo:0'>
  <domain name='shakespeare.lit'>
    <federation>
      <remote-domain name='denmark.lit'>
        <connection type='incoming'/>
        <connection type='outgoing'/>
      </remote-domain>
      <remote-domain name='montague.net'>
        <connection type='bidi'/>
      </remote-domain>
    </federation>
  </domain>
</serverinfo>
```

Additional data MAY be included as child-elements of the 'serverinfo' element or any of the 'domain' elements. Such data MUST be namedpaced appropriately. The example below uses the 'query' element defined in Software Version (XEP-0092) \(^5\) to include information about the software application associated with the local server.

Listing 7: Data Format with Software Version

```
```
5 Publication

The data is to be published using a pub-sub node named 'serverinfo' that MUST be a first-level leaf node of a pub-sub service for the domain. It is RECOMMENDED that the leaf-node is configured to have an open access model and contain a maximum of 1 item.

Listing 8: Publish ServerInfo Item

```xml
<serverinfo xmlns="urn:xmpp:serverinfo:0">
  <domain name="shakespeare.lit">
    <federation>
      <remote-domain name='montague.net'>
        <connection_type="bidi"/>
      </remote-domain>
    </federation>
  </domain>
  <query xmlns='jabber:iq:version'>
    <name>Openfire</name>
    <version>4.8.0</version>
    <os>Windows 11</os>
  </query>
</serverinfo>
```
6 Implementation Notes

As certain information can be expected to be updated continuously and frequently, the server MAY choose to reduce the frequency of updates of the 'serverinfo' pub-sub node.

7 Privacy Considerations

When multiple domains publish their connections to named remote domains, an information leak occurs: by collecting these public statistics, behavioral data of those remote domains can be deduced. To prevent undesired privacy-sensitive information leaks, a domain MUST NOT publish the name of a remote domain, unless that domain advertises support for this XEP, as defined in the Discovering Support section of this document.

This way, the service discovery mechanism doubles as an opt-in mechanism. Domains that advertise support for this XEP allow other domains to reference them by domain-name in the data that they publish. The mere presence of an applicable pub-sub node MUST NOT be used for Service Discovery purposes, as under common service configuration, non-administrative users are allowed to create such nodes.

8 XMPP Registrar Considerations

Upon advancement of this specification from a status of Experimental to a status of Draft, the XMPP Registrar shall include the following information in its registries.

8.1 Protocol Namespaces

This specification defines the following XML namespaces:

- urn:xmpp:serverinfo:0

The XMPP Registrar shall add the foregoing namespace to the registry located at <https://xmpp.org/registrar/namespaces.html>, as described in Section 4 of XMPP Registrar Function (XEP-0053).
8.2 Field Standardization

Field Standardization for Data Forms (XEP-0068)\(^9\) defines a process for standardizing the fields used within Data Forms qualified by a particular namespace, and XEP-0128 describes how to use field standardization in the context of service discovery. This section registers fields for server information scoped by the "http://jabber.org/network/serverinfo" FORM_TYPE.

```xml
<form_type>
  <name>http://jabber.org/network/serverinfo</name>
  <doc>XEP-0XXX</doc>
  <desc>
    Forms advertising the coordinates of a pub-sub service and node for publication of Server Information data.
  </desc>
  <field
    var='serverinfo-pubsub-node'
    type='text-single'
    label='An URI (per XEP-0060_section_12.22) identifying the pub-sub_node_on_which_Server_Information_data_is_published.'/>
</form_type>
```

Note that the FORM_TYPE used by Contact Addresses for XMPP Services (XEP-0157)\(^{10}\) is purposefully re-used by this XEP, to circumvent the restriction of having at most one XMPP Standards Foundation defined FORM_TYPE for a service discovery identity, as defined in Service Discovery Extensions (XEP-0128)\(^{11}\). When a service supports both features, the data in both forms SHOULD be merged into one form.

9 XML Schema

```xml
<?xml version='1.0' encoding='UTF-8'?>
<xs:schema
  xmlns:xs='http://www.w3.org/2001/XMLSchema'
  targetNamespace='urn:xmpp:serverinfo:0'
  xmlns='urn:xmpp:serverinfo:0'
  elementFormDefault='qualified'>
  <xs:annotation>
    <xs:documentation>
      The protocol documented by this schema is defined in XEP-0XXX: http://www.xmpp.org/extensions/xep-0XXX.html
    </xs:documentation>
  </xs:documentation>
</xs:schema>
```

\(^{10}\)XEP-0157: Contact Addresses for XMPP Services <https://xmpp.org/extensions/xep-0157.html>.
<xs:element name="serverinfo" type="urn:serverinfoType" xmlns:urn="urn:xmpp:serverinfo:0"/>

<xs:simpleType name="directionType" final="restriction">
  <xs:restriction base="xs:string">
    <xs:enumeration value="incoming" />
    <xs:enumeration value="outgoing" />
    <xs:enumeration value="bidi" />
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="connectionType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute type="directionType" name="type" use="optional" />
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

<xs:complexType name="remote-domainType">
  <xs:sequence>
    <xs:element type="urn:connectionType" name="connection" maxOccurs="unbounded" minOccurs="0" xmlns:urn="urn:xmpp:serverinfo:0" />
  </xs:sequence>
  <xs:attribute type="xs:string" name="name" use="optional" />
</xs:complexType>

<xs:complexType name="federationType">
  <xs:sequence>
    <xs:element type="urn:remote-domainType" name="remote-domain" maxOccurs="unbounded" minOccurs="0" xmlns:urn="urn:xmpp:serverinfo:0" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="domainType">
  <xs:sequence>
    <xs:element type="urn:federationType" name="federation" xmlns:urn="urn:xmpp:serverinfo:0" />
  </xs:sequence>
  <xs:attribute type="xs:string" name="name" />
</xs:complexType>

<xs:complexType name="serverinfoType">
  <xs:sequence>
    <xs:element type="urn:serverinfoType" name="serverinfo" type="urn:serverinfoType" xmlns:urn="urn:xmpp:serverinfo:0" />
  </xs:sequence>
</xs:complexType>
10 Acknowledgements

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