This document specifies a standards-track XMPP protocol extension that enables server components to connect to XMPP servers.
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1 Introduction

Jabber Component Protocol (XEP-0114) \(^1\) defines a protocol that enables a server component to connect to an XMPP server. However, there are a number of perceived limitations with that protocol:

- It does not support Transport Layer Security (TLS; see RFC 5246 \(^2\)) for channel encryption.
- It does not support the Simple Authentication and Security Layer (SASL; see RFC 4422 \(^3\)) for authentication.
- It does not enable a component to bind multiple hostnames to one stream (as, for example, a client can bind multiple resource identifiers).
- It multiplies namespaces beyond necessity, adding the "jabber:component:accept" and "jabber:component:connect" namespaces to "jabber:client" and "jabber:server".

This document specifies a standards-track protocol that addresses the basic requirements for component connections. In the future, additional documents may specify more advanced features on top of the protocol defined herein.

2 Requirements

This document addresses the following requirements:

3. Enable a component to bind multiple hostnames to one stream.
4. Use one of the existing default namespaces for XML streams between components and servers.

3 Stream Establishment

XML streams are established between a component and a server exactly as they are between a client and a server as specified in XMPP Core \(^4\), with the following exceptions:

---

1. The 'from' address of the initial stream header SHOULD be the "default" hostname of the component.

2. The JID asserted by the end entity (in this case a component) during STARTTLS negotiation and SASL negotiation MUST be of the form <domain> in conformance with the definition of a domain identifier from XMPP Core.

3. If a "simple user name" is included in accordance with the chosen SASL mechanism, it MUST be of the form <domain> in conformance with the definition of a domain identifier from XMPP Core.

4 Hostname Binding

The protocol defined in XEP-0114 depended on use of the 'to' address in the stream header to specify the hostname of the component. By contrast, client-to-server connections use stream establishment is followed by binding of a resource to the stream (in fact multiple resources can be bound to the stream). This protocol emulates client-to-server connections by using a hostname binding process that is similar to the resource binding process specified in XMPP Core.

If a server offers component binding over a stream, it MUST advertise a feature of "urn:ietf:xml:stream-mapping:urn:xmpp:component:0".

Listing 1: Stream Feature

```
S: <stream:stream
   from='example.com'
   id='gPybzaOzBmaADgKXx9UClbprp0='
   to='chat.example.com'
   version='1.0'
   xml:lang='en'
   xmlns='jabber:client'
   xmlns:stream='http://etherx.jabber.org/streams'>

S: <stream:features>
   <bind xmlns='urn:xmpp:component:0'>
     <required/>
   </bind>
</stream:features>
```

In order to bind a hostname, the component sends a bind request to the server.

Listing 2: Bind Request

```
C: <iq id='bind_1' type='set'>
   <bind xmlns='urn:xmpp:component:0'>
     <hostname>chat.example.com</hostname>
   </bind>
</iq>
```
If the hostname can be bound, the server MUST return an IQ-result specifying the exact hostname that was bound.

**Listing 3: Bind Result**

```
S: <iq id='bind_1' type='result'>
  <bind xmlns='urn:xmpp:component:0'>
    <hostname>chat.example.com</hostname>
  </bind>
</iq>
```

If the hostname cannot be bound, the server MUST return an IQ-error, which SHOULD be `<bad-request/>`, `<conflict/>`, `<not-allowed/>`, or `<resource-constraint/>`, just as with client resource binding as specified in RFC 3920.

Note: Although the JID asserted during STARTTLS and SASL negotiation MUST be of the form `<domain>` (i.e., an XMPP domain identifier), the `<hostname/>` element MAY be of the form `<domain/resource>`. This form can be used for application-specific functionality (e.g., load balancing), but such functionality is out of scope for this specification.

A component can send a subsequent bind request to bind another hostname (a server MUST support binding of multiple hostnames).

**Listing 4: Another Bind Request**

```
C: <iq id='bind_2' type='set'>
  <bind xmlns='urn:xmpp:component:0'>
    <hostname>foo.example.com</hostname>
  </bind>
</iq>
```

If the server cannot process the bind request (e.g., because the component has already bound the desired hostname), the server MUST return an IQ-error (e.g., `<conflict/>`).

A component can also unbind a resource that has already been bound (a server MUST support unbinding).

**Listing 5: Unbind Request**

```
C: <iq id='unbind_1' type='set'>
  <unbind xmlns='urn:xmpp:component:0'>
    <hostname>foo.example.com</hostname>
  </unbind>
</iq>
```

If the hostname can be unbound, the server MUST return an IQ-result.
5 Security Considerations

This protocol improves upon the earlier component protocol defined in XEP-0114 by specifying the use of Transport Layer Security (TLS) for channel encryption and the Simple Authentication and Security Layer (SASL) for authentication. Because this protocol re-uses the XML stream establishment processes defined in XMPP Core, the security considerations from RFC 3920 and RFC 6120 apply to this protocol as well.

6 IANA Considerations

This document requires no interaction with the Internet Assigned Numbers Authority (IANA).

7 XMPP Registrar Considerations

7.1 Protocol Namespaces

This specification defines the following XML namespace:

- urn:xmpp:component:0

Upon advancement of this specification from a status of Experimental to a status of Draft, 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).

7.2 Protocol Versioning

If the protocol defined in this specification undergoes a revision that is not fully backwards-compatible with an older version, the XMPP Registrar shall increment the protocol version.
number found at the end of the XML namespaces defined herein, as described in Section 4 of XEP-0053.

8 XML Schema

```xml
<?xml version='1.0' encoding='UTF-8'?>
<xs:schema
    xmlns:xs='http://www.w3.org/2001/XMLSchema'
    targetNamespace='urn:xmpp:component:0'
    xmlns='urn:xmpp:component:0'
    elementFormDefault='qualified'>

    <xs:element name='bind'>
        <xs:complexType>
            <xs:sequence>
                <xs:choice minOccurs='0' maxOccurs='1'>
                    <xs:element name='hostname' type='xs:string'/>
                </xs:choice>
                <xs:element name='required' minOccurs='0' maxOccurs='1' type='empty'/>
            </xs:sequence>
        </xs:complexType>
    </xs:element>

    <xs:element name='unbind'>
        <xs:complexType>
            <xs:sequence minOccurs='0'>
                <xs:element name='hostname' type='xs:string'/>
            </xs:sequence>
        </xs:complexType>
    </xs:element>

</xs:schema>
```