This is a simple barebones tutorial of XMPP in python.

Note: This tutorial does not cover use of parallel execution like light threads, posix threads or subprocessed. For the didatic purposes we will be building a blocking application.

### 1.1 Client TCP Connection

Let's start by creating a simple TCP connection to a XMPP server.

The XMPP toolkit provides the `XMPPConnection` that performs all the TCP socket management and exposes simple events.

Also you should never write XML manually, instead use a `XMLStream` bound to a connection in order to send

#### 1.1.1 code

Notice the `debug=True` in the connection creation, that tells the lib to print the traffic in the `stderr`, this can be useful for debugging your application.

```python
from xmpp import XMPPConnection
from xmpp import XMLStream
from xmpp import JID

class Application(object):
    def __init__(self, jid, password):
        self.user = JID(jid)
        self.password = password
        self.connection = XMPPConnection(self.user.domain, 5222, debug=True)
        self.stream = XMLStream(self.connection, debug=True)
        self.setup_handlers()

    def setup_handlers(self):
        self.connection.on.tcp_established(self.do_open_stream)
        self.connection.on.read(self.do_disconnect)
```

```
```python
def do_open_stream(self, *args, **kw):
    self.stream.open_client(self.user.domain)

def do_disconnect(self, *args, **kw):
    self.connection.close()

def run_forever(self):
    self.connection.connect()

    while self.connection.is_active():
        self.connection.loop_once()

if __name__ == '__main__':
    app = Application('romeo@capulet.com', 'juli3t')
    app.run_forever()
```

would output something like this

XMPP SEND: <?xml version='1.0'?><stream:stream
    from='romeo@capulet.com'
    to='capulet.com'
    version='1.0'
    xml:lang='en'
    xmlns='jabber:client'
    xmlns:stream='http://etherx.jabber.org/streams'>
XMPP RECV: <?xml version='1.0'?><stream:stream
    xmlns:stream='http://etherx.jabber.org/streams'
    version='1.0'
    from='capulet.com'
    id='c1a2cc21-a35d-4545-807b-2b368e567e4e'
    xml:lang='en'
    xmlns='jabber:client'>
    <stream:features>
        <starttls xmlns='urn:ietf:params:xml:ns:xmpp-tls'/>
        <register xmlns='http://jabber.org/features/iq-register'/>
        <mechanisms xmlns='urn:ietf:params:xml:ns:xmpp-sasl'>
            <mechanism>SCRAM-SHA-1</mechanism>
        </mechanisms>
    </stream:features>
TCP DISCONNECT: intentional
CHAPTER 2

XMPP Connection

2.1 Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>tcp_established</td>
<td>the TCP connection was established</td>
</tr>
<tr>
<td>tcp_reestablished</td>
<td>the TCP connection was lost and restablished</td>
</tr>
<tr>
<td>tcp_downgraded</td>
<td>the TLS connection was downgraded to TCP</td>
</tr>
<tr>
<td>tcp_disconnect</td>
<td>the TCP connection was lost</td>
</tr>
<tr>
<td>tcp_failed</td>
<td>the TCP connection failed to be established</td>
</tr>
<tr>
<td>tls_established</td>
<td>the TLS connection was established</td>
</tr>
<tr>
<td>tls_invalid_chain</td>
<td>the TLS handshake failed for invalid chain</td>
</tr>
<tr>
<td>tls_invalid_cert</td>
<td>the TLS handshake failed for invalid server cert</td>
</tr>
<tr>
<td>tls_failed</td>
<td>failed to establish a TLS connection</td>
</tr>
<tr>
<td>tls_start</td>
<td>started SSL negotiation</td>
</tr>
<tr>
<td>write</td>
<td>the TCP/TLS connection is ready to send data</td>
</tr>
<tr>
<td>read</td>
<td>the TCP/TLS connection is ready to receive data</td>
</tr>
<tr>
<td>ready_to_write</td>
<td>the TCP/TLS connection is ready to send data</td>
</tr>
<tr>
<td>ready_to_read</td>
<td>the TCP/TLS connection is ready to receive data</td>
</tr>
</tbody>
</table>

2.2 API

```python
class xmpp.networking.core.XMPPConnection(host, port=5222, debug=False, auto_reconnect=False, queue_class=Queue.Queue, hwm_in=256, hwm_out=256, recv_chunk_size=65536)
```

Event-based TCP/TLS connection.

It buffers up received messages and also the messages to be sent.

Parameters

- **host** – a string containing a domain or ip address. If a domain is given the name will be resolved before connecting.
- **port** – defaults to 5222. If you are using a component you might point to 5347 or something else.
- **debug** – bool defaults to False: whether to print the XML traffic on stderr
- **queue_class** – bool defaults to :py:class`Queue.Queue`
- **hwm_in** – int defaults to 256: how many incomming messages to buffer before blocking
- **hwm_out** – int defaults to 256: how many outgoing messages to buffer before blocking
• **hwm_out** – int defaults to 256: how many incoming messages to buffer before blocking

• **recv_chunk_size** – int defaults to 65536: how many bytes to read at a time.

**connect**(timeout_in_seconds=3)
connects

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeout_in_seconds</td>
<td>connecting timeout</td>
</tr>
</tbody>
</table>

**disconnect**()

disconnects the socket

**published events:**

• *tcp_disconnect("intentional")* - when succeeded

**Parameters**

<table>
<thead>
<tr>
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<tr>
<td>timeout_in_seconds</td>
<td>connecting timeout</td>
</tr>
</tbody>
</table>

**is_alive**()

**Returns**

True if the connection is alive

**loop_once**(timeout=3)

entrypoint for any mainloop.

basically call this continuously to keep the connection up

**perform_read**(connection)

reads from the socket and populates the read queue

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>connection</td>
<td>a socket that is ready to write</td>
</tr>
</tbody>
</table>

**perform_write**(connection)

consumes the write queue and writes to the given socket

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>connection</td>
<td>a socket that is ready to write</td>
</tr>
</tbody>
</table>

**receive**(timeout=3)

retrieves a message from the queue, returns None if there are no messages.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeout</td>
<td>int in seconds</td>
</tr>
</tbody>
</table>

**reconnect**(timeout_in_seconds=3)

reconnects the socket

**published events:**

• *tcp_reconnected(host)* - when succeeded

• *tcp_failed(host)* - when failed

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeout_in_seconds</td>
<td>connecting timeout</td>
</tr>
</tbody>
</table>

**resolve_dns**()

resolves the given host

**send**(data, timeout=3)

adds bytes to the be sent in the next time the socket is ready

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>data</td>
<td>the data to be sent</td>
</tr>
<tr>
<td>timeout</td>
<td>int in seconds</td>
</tr>
</tbody>
</table>
send_whitespace_keepalive\( (timeout=3) \)
sends a whitespace keepalive to avoid connection timeouts and dead connections

Published events:

- tcp_disconnect("intentional") - when succeeded

Parameters timeout_in_seconds –
3.1 Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>feed</td>
<td>the XMLStream has just been fed with xml</td>
</tr>
<tr>
<td>open</td>
<td>the XMLStream is open</td>
</tr>
<tr>
<td>closed</td>
<td>the XMLStream has been closed</td>
</tr>
<tr>
<td>error</td>
<td>received a <a href="">stream:error/</a>&lt;/stream:error&gt; from the server</td>
</tr>
<tr>
<td>unhandled_xml</td>
<td>the XMLStream failed to feed the incremental XML parser with the given value</td>
</tr>
<tr>
<td>node</td>
<td>a new xmpp.Node was just parsed by the stream and is available to use</td>
</tr>
<tr>
<td>iq</td>
<td>a new xmpp.IQ was node was received</td>
</tr>
<tr>
<td>message</td>
<td>a new xmpp.Message node was received</td>
</tr>
<tr>
<td>presence</td>
<td>a new xmpp.Presence node was received</td>
</tr>
<tr>
<td>start_stream</td>
<td>a new stream is being negotiated</td>
</tr>
<tr>
<td>start_tls</td>
<td>server sent &lt;starttls /&gt;</td>
</tr>
<tr>
<td>tls_proceed</td>
<td>the peer allowed the TCP connection to upgrade to TLS</td>
</tr>
<tr>
<td>sasl_challenge</td>
<td>the peer sent a SASL challenge</td>
</tr>
<tr>
<td>sasl_success</td>
<td>the peer sent a SASL success</td>
</tr>
<tr>
<td>sasl_failure</td>
<td>the peer sent a SASL failure</td>
</tr>
<tr>
<td>sasl_response</td>
<td>the peer sent a SASL response</td>
</tr>
<tr>
<td>sasl_support</td>
<td>the peer says it supports SASL</td>
</tr>
<tr>
<td>bind_support</td>
<td>the peer says it supports binding resource</td>
</tr>
<tr>
<td>iq_result</td>
<td>the peer returned a &lt;iq type=&quot;result&quot;/&gt;&lt;/iq&gt;</td>
</tr>
<tr>
<td>iq_set</td>
<td>the peer returned a &lt;iq type=&quot;set&quot;/&gt;&lt;/iq&gt;</td>
</tr>
<tr>
<td>iq_get</td>
<td>the peer returned a &lt;iq type=&quot;get&quot;/&gt;&lt;/iq&gt;</td>
</tr>
<tr>
<td>iq_error</td>
<td>the peer returned a &lt;iq type=&quot;error&quot;/&gt;&lt;/iq&gt;</td>
</tr>
<tr>
<td>user_registration</td>
<td>the peer supports user registration</td>
</tr>
<tr>
<td>bound_jid</td>
<td>the peer returned a &lt;jid&gt;username@domain/resource/&gt;&lt;/jid&gt; that should be used in the from-of stanzas</td>
</tr>
</tbody>
</table>

3.2 API

```python
class xmpp.stream.XMLStream(connection, debug=False)
    XML Stream behavior class.

    Parameters
    * connection – a XMPPConnection instance
```

CHAPTER 3

The XML Stream
• **debug** – whether to print errors to the stderr

**add_contact**(*contact_jid*, *from_jid=*
*None*, *groups=*
*None*)
adds a contact to the roster of the bound_jid or the provided from_jid parameter.
Automatically sends a `<presence type="subscribe">` with a subsequent `<iq type="set">`.

**Parameters**

- **contact_jid** – the jid to add in the roster
- **from_jid** – custom from= field to designate the owner of the roster
- **groups** – a list of strings with group names to categorize this contact in the roster

**bind_to_resource**(*name*)
sends an `<iq type="set">\<resource>name</resource></iq>` in order to bind the resource

**Parameters**

- **name** – the name of the resource

**bound_jid**
a JID or None
Automatically captured from the XML traffic.

**close**(disconnect=*
*True*)
sends a final `<stream:stream>` to the server then immediately closes the bound TCP connection, disposes it and resets the minimum state kept by the stream, so it can be reutilized right away.

**feed**(data, attempt=*
*1*)
feeds the stream with incoming data from the XMPP server. This is the basic entrypoint for usage with the XML received from the `XMPPConnection`

**Parameters**

- **data** – the XML string

**id**
returns the stream id provided by the server. `<stream:stream id="SOMETHING">`
Mainly used by the `authenticate()` when crafting the secret.

**load_extensions**()
reloads all the available extensions bound to this stream

**open_client**(domain)
Sends a `<stream:stream xmlns="jabber:client">` to the given domain

**Parameters**

- **domain** – the FQDN of the XMPP server

**parse**()
attempts to parse whatever is in the buffer of the incremental XML parser and creates a new parser.

**ready_to_read**(__.connection)
event handler for the on.ready_to_read event of a XMPP Connection.
You should probably never have to call this by hand, use `bind()` instead

**ready_to_write**(__.connection)
even handler for the on.ready_to_write event of a XMPP Connection.
You should probably never have to call this by hand, use `bind()` instead

**reset**()
resets the minimal state of the XML Stream, that is: * attributes of the `<stream>` sent by the server during negotiation, used by `id()` * a bound JID sent by the server * a successful sasl result node to leverage `has_gone_through_sasl()`
send (node)
sends a XML serialized Node through the bound XMPP connection

Parameters node – the Node

send_message (message, to, **params)

Parameters

• message – the string with the message
• to – the jid to send the message to
• **params – keyword args for designating attributes of the message

send_presence (to=None, delay=None, priority=10, **params)
sends presence

Parameters

• to – jid to receive presence.
• delay – if set, it must be a ISO compatible date string
• priority – the priority of this resource

send_sasl_auth (mechanism, message)
sends a SASL response to the server in order to proceed with authentication handshakes

Parameters mechanism – the name of SASL mechanism (i.e. SCRAM-SHA-1, PLAIN, EXTERNAL)

send_sasl_response (mechanism, message)
sends a SASL response to the server in order to proceed with authentication handshakes

Parameters mechanism – the name of SASL mechanism (i.e. SCRAM-SHA-1, PLAIN, EXTERNAL)
class xmpp.networking.XMPPConnection(host, port=5222, debug=False, auto_reconnect=False, queue_class=\class Queue.Queue, hwm_in=256, hwm_out=256, recv_chunk_size=65536)

Event-based TCP/TLS connection.

It buffers up received messages and also the messages to be sent.

Parameters

- host – a string containing a domain or ip address. If a domain is given the name will be resolved before connecting.
- port – defaults to 5222. If you are using a component you might point to 5347 or something else.
- debug – bool defaults to False: whether to print the XML traffic on stderr
- queue_class – bool defaults to :py:class'Queue.Queue'
- hwm_in – int defaults to 256: how many incoming messages to buffer before blocking
- hwm_out – int defaults to 256: how many outgoing messages to buffer before blocking
- recv_chunk_size – int defaults to 65536: how many bytes to read at a time.

connect (timeout_in_seconds=3)

connects

Parameters timeout_in_seconds –

disconnect ()

disconnects the socket

published events:

- tcp_disconnect ("intentional") - when succeeded

Parameters timeout_in_seconds –

is_alive ()

Returns True if the connection is alive

loop_once (timeout=3)

entrypoint for any mainloop.

basically call this continuously to keep the connection up
**perform_read** *(connection)*
reads from the socket and populates the read queue.
:param connection: a socket that is ready to write

**perform_write** *(connection)*
consumes the write queue and writes to the given socket

Parameters **connection** – a socket that is ready to write

**receive** *(timeout=3)*
retrieves a message from the queue, returns **None** if there are no messages.

Parameters **timeout** – int in seconds

**reconnect** *(timeout_in_seconds=3)*
reconnects the socket

Published events:

- tcp_reestablished(host) - when succeeded
- tcp_failed(host) - when failed

Parameters **timeout_in_seconds** –

**resolve_dns** ()
resolves the given host

**send** *(data, timeout=3)*
adds bytes to the be sent in the next time the socket is ready

Parameters

- **data** – the data to be sent
- **timeout** – int in seconds

**send_whitespace_keepalive** *(timeout=3)*
sends a whitespace keepalive to avoid connection timeouts and dead connections

Published events:

- tcp_disconnect("intentional") - when succeeded

Parameters **timeout_in_seconds** –

**class** `xmpp.stream.XMLStream` *(connection, debug=False)*
XML Stream behavior class.

Parameters

- **connection** – a `XMPPConnection` instance
- **debug** – whether to print errors to the stderr

**add_contact** *(contact_jid, from_jid=None, groups=None)*
adds a contact to the roster of the bound_jid or the provided from_jid parameter.

Automatically sends a `<presence type="subscribe">` with a subsequent `<iq type="set">`.

Parameters

- **contact_jid** – the jid to add in the roster
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bind_to_resource(name)
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    Parameters name – the name of the resource

bound_jid
    a JID or None

    Automatically captured from the XML traffic.

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feed(data, attempt=1)
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    Mainly used by the authenticate() when crafting the secret.

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    reloads all the available extensions bound to this stream

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    Parameters domain – the FQDN of the XMPP server

parse()
    attempts to parse whatever is in the buffer of the incremental XML parser and creates a new parser.

ready_to_read(_, connection)
    event handler for the on.ready_to_read event of a XMPP Connection.

    You should probably never have to call this by hand, use bind() instead

ready_to_write(_, connection)
    event handler for the on.ready_to_write event of a XMPP Connection.

    You should probably never have to call this by hand, use bind() instead

reset()
    resets the minimal state of the XML Stream, that is: *
    * attributes of the `<stream>` sent by the server during negotiation, used by id() *
    * a bound JID sent by the server *
    * a successful sasl result node to leverage has_gone_through_sasl()

send(node)
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    Parameters

    • message – the string with the message
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    • **params – keyword args for designating attributes of the message
send_presence (to=None, delay=None, priority=10, **params)
    sends presence

Parameters
    • to – jid to receive presence.
    • delay – if set, it must be a ISO compatible date string
    • priority – the priority of this resource

send_sasl_auth (mechanism, message)
    sends a SASL response to the server in order to proceed with authentication handshakes

Parameters mechanism – the name of SASL mechanism (i.e. SCRAM-SHA-1, PLAIN, EXTERNAL)

send_sasl_response (mechanism, message)
    sends a SASL response to the server in order to proceed with authentication handshakes

Parameters mechanism – the name of SASL mechanism (i.e. SCRAM-SHA-1, PLAIN, EXTERNAL)

class xmpp.models.node.Node (element, closed=False)
    Base class for all XML node definitions.

    The xmpp library only supports XML tags that are explicitly defined as python classes that inherit from this one.

classmethod create (_stringcontent=None, **kw)
    creates a node instance

Parameters
    • _stringcontent – the content text of the tag, if any
    • **kw – keyword arguments that will become tag attributes

class xmpp.models.core.ClientStream (element, closed=False)
    <stream:stream xmlns='jabber:client' version='1.0' xmlns:stream='http://etherx.jabber.org/streams'/>

class xmpp.models.core.IQ (element, closed=False)
    <iq/>

class xmpp.models.core.IQRegister (element, closed=False)
    <register xmlns='http://jabber.org/features/iq-register' />

class xmpp.models.core.Message (element, closed=False)
    <message type='chat'/>

exception xmpp.models.core.MissingJID
    raised when trying to send a stanza but it is missing either the “to” or “from” fields

class xmpp.models.core.Presence (element, closed=False)
    <presence/>

class xmpp.models.core.ProceedTLS (element, closed=False)
    <proceed xmlns='urn:ietf:params:xml:ns:xmpp-tls'/>

class xmpp.models.core.SASLMechanism (element, closed=False)
    <mechanism/>

class xmpp.models.core.SASLMechanismSet (element, closed=False)
    <mechanisms xmlns='urn:ietf:params:xml:ns:xmpp-sasl'/>

Chapter 4. API Reference
class xmpp.models.core.StartTLS(element, closed=False)
    <starttls xmlns="urn:ietf:params:xml:ns:xmpp-tls" />

class xmpp.models.core.StreamFeatures(element, closed=False)
    <stream:features></stream:features>

SASL authentication implementation for PyXMPP.

Normative reference:
  • RFC 4422

xmpp.sasl.filter_mechanism_list(mechanisms, properties, allow_insecure=False, server_side=False)
    Filter a mechanisms list only to include those mechanisms that can succeed with the provided properties and
    are secure enough.

    Parameters
    • mechanisms: list of the mechanisms names
    • properties: available authentication properties
    • allow_insecure: allow insecure mechanisms

    Types
    • mechanisms: sequence of unicode
    • properties: mapping
    • allow_insecure: bool

    Returntype list of unicode

xmpp.sasl.server_authenticator_factory(mechanism, password_database)
    Create a server authenticator object for given SASL mechanism and password database.

    Parameters
    • mechanism: name of the SASL mechanism ("PLAIN", "DIGEST-MD5" or "GSSAPI").
    • password_database: name of the password database object to be used for authentication
      credentials verification.

    Types
    • mechanism: str
    • password_database: PasswordDatabase

    Raises KeyError – if no server authenticator is available for this mechanism

    Returns new authenticator.

    Returntype sasl.core.ServerAuthenticator

xmpp.sasl.client_authenticator_factory(mechanism)
    Create a client authenticator object for given SASL mechanism.

    Parameters
    • mechanism: name of the SASL mechanism ("PLAIN", "DIGEST-MD5" or "GSSAPI").

    Types
    • mechanism: unicode

    Raises KeyError – if no client authenticator is available for this mechanism
Returns new authenticator.

Returntype sasl.core.ClientAuthenticator

class xmpp.sasl.Success(properties=None, data=None)
The success SASL message (sent by the server on authentication success).

class xmpp.sasl.Failure(reason)
The failure SASL message.

Ivariables
  • reason: the failure reason.

Types
  • reason: unicode.

class xmpp.sasl.Challenge(data)
The challenge SASL message (server’s challenge for the client).

class xmpp.sasl.Response(data)
The response SASL message (client’s reply the server’s challenge).

class xmpp.sasl.Reply(data=None)
Base class for SASL authentication reply objects.

Ivariables
  • data: optional reply data.

Types
  • data: bytes

eencode()
  Base64-encode the data contained in the reply when appropriate.

Returns encoded data.

Returntype unicode

class xmpp.sasl.PasswordDatabase
Password database interface.

PasswordDatabase object is responsible for providing or verification of user authentication credentials on a server.

All the methods of the PasswordDatabase may be overridden in derived classes for specific authentication and authorization policy.

check_password(username, password, properties)
Check the password validity.

Used by plain-text authentication mechanisms.

Default implementation: retrieve a “plain” password for the username and realm using self.get_password and compare it with the password provided.

May be overridden e.g. to check the password against some external authentication mechanism (PAM, LDAP, etc.).

Parameters
  • username: the username for which the password verification is requested.
  • password: the password to verify.
• properties: mapping with authentication properties (those provided to the authenticator’s `start()` method plus some already obtained via the mechanism).

Types
• username: unicode
• password: unicode
• properties: mapping

Returns True if the password is valid.

Returntype bool

`get_password(username, acceptable_formats, properties)`
Get the password for user authentication.

By default returns (None, None) providing no password. Should be overridden in derived classes unless only `check_password` functionality is available.

Parameters
• username: the username for which the password is requested.
• acceptable_formats: a sequence of acceptable formats of the password data. Could be “plain” (plain text password), “md5:user:realm:password” (MD5 hex digest of user:realm:password) or any other mechanism-specific encoding. This allows non-plain-text storage of passwords. But only “plain” format will work with all password authentication mechanisms.
• properties: mapping with authentication properties (those provided to the authenticator’s `start()` method plus some already obtained via the mechanism).

Types
• username: unicode
• acceptable_formats: sequence of unicode
• properties: mapping

Returns the password and its encoding (format).

Returntype unicode,’unicode’ tuple.
CHAPTER 5

Extensions for XEPs

5.1 Service Discovery (0030)

5.1.1 Events

<table>
<thead>
<tr>
<th>query_items</th>
<th>the server returned a list of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>query_info</td>
<td>the server returned a list of identities and features</td>
</tr>
</tbody>
</table>

5.1.2 API

```python
class xmpp.extensions.xep0030.ServiceDiscovery(stream)
    extension for discovering information about other XMPP entities. Two kinds of information can be discovered: (1) the identity and capabilities of an entity, including the protocols and features it supports; and (2) the items associated with an entity, such as the list of rooms hosted at a multi-user chat service.
```

5.1.3 Example

```python
from xmpp import XMLStream
from xmpp import XMPPConnection
from xmpp import JID
from xmpp.auth import SASLAuthenticationHandler

DEBUG = True

DOMAIN = 'falcao.it'
jid = JID('presence1@falcao.it/xmpp-test')
password = 'presence1'
SASL_MECHANISM = 'SCRAM-SHA-1'

connection = XMPPConnection(DOMAIN, 5222, debug=DEBUG)

# create a XML stream
stream = XMLStream(connection, debug=DEBUG)

# prepare the SASL mechanism
sasl = SASLAuthenticationHandler(SASL_MECHANISM, jid, password)
sasl.bind(stream)
```
```python
@stream.on.closed
def stream_closed(event, node):
    connection.disconnect()
    connection.connect()
    stream.reset()

@stream.on.presence
def handle_presence(event, presence):
    logging.debug("presence from: %s %s (%s)", presence.attr['from'], presence.status.strip(), presence.show.strip())

@connection.on.tcp_established
def step1_open_stream(event, host_ip):
    "sends a <stream:stream> to the XMPP server"
    logging.info("connected to %s", host_ip)
    stream.open_client(jid.domain)

@stream.on.sasl_support
def step2_send_sasl_auth(event, node):
    "sends a <auth /> to the XMPP server"
    sasl.authenticate()

@sasl.on.success
def step3_handle_success(event, result):
    "the SASL authentication succeeded, it's our time to reopen the stream"
    stream.open_client(jid.domain)

@stream.on.bind_support
def step4_bind_to_a_resource_name(event, node):
    "the server said it supports binding"
    stream.bind_to_resource(jid.resource)

@stream.on.bound_jid
def step5_send_presence(event, jid):
    stream.send_presence()
    logging.info("echobot jid: %s", jid.text)

@stream.on.presence
def step6_ensure_connectivity(event, presence):
    if presence.delay:
        stream.send_presence()

@connection.on.ready_to_write
def keep_alive(event, connection):
    if stream.has_gone_through_sasl() and (time.time() % 60 == 0):
        print 'keepalive'
        connection.send_whitespace_keepalive()

@stream.on.message
def auto_reply(event, message):
    stream.send_presence()
    from_jid = JID(message.attr['from'])
    if message.is_composing():
        logging.warning("%s is composing", from_jid.nick)
    if message.is_active():
        logging.warning("%s is active", from_jid.nick)
```

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body = message.get_body()

if body:
    logging.critical("%s says: %s", from_jid.nick, body)
    stream.send_message(body, to=from_jid.text)
    stream.send_presence(to=from_jid.text)

connection.connect()

try:
    while connection.is_alive():
        connection.loop_once()

except KeyboardInterrupt as e:
    print("\r{0}".format(traceback.format_exc(e))
    raise SystemExit(1)

5.2 Component (0114)

5.2.1 Events

<table>
<thead>
<tr>
<th>success</th>
<th>the server sent a &lt;handshake /&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>error</td>
<td>the server returned a <a href="">stream:error</a></td>
</tr>
</tbody>
</table>

5.2.2 API

class xmpp.extensions.xep0114.Component(stream)
    Provides an external component API while keeping minimal state based on a single boolean flag.

    authenticate(secret)
        sends a <handshake> to the server with the encoded version of the given secret :param secret: the secret string to authenticate the component

    create_node(to, tls=False)
        creates a ComponentStream with an optional <starttls /> in it.

    is_authenticated()
        Returns True if a success handshake was received by the bound XMLStream

    open(domain, tls=False)
        sends an <stream:stream xmlns="jabber:component:accept">

5.3 Create your own

You can easily have your own implementation of a XEP by extending the class xmpp.extensions.Extension. As long as your implementation is being imported by your application, the XMPP toolkit will automatically recognize your subclass and make it available whenever a XMPPStream is instantiated.
5.3.1 XEP 9999

Let’s come up with our own XEP

1. Introduction

This document defines a protocol for communicating dummy from one user to another. Such information MUST be appended to a received_dummy_list in the receiving entity. The entity MAY also send a dummy which SHALL be appended to a sent_dummy_list in the sending entity.

2. Protocol

Sending a dummy

```
<iq id="23713d" type="set" from="tybalt@shakespeare.org" to="rosaline@shakespeare.org">
  <dummy xmlns="xmpp:xep:example">Romeo</dummy>
</iq>
```

Receiving a dummy

```
<iq id="23713d" type="result" from="tybalt@shakespeare.org" to="rosaline@shakespeare.org">
  <dummy xmlns="xmpp:xep:example">Juliet</dummy>
</iq>
```

Here is the implementation, notice its statelessness

```python
from speakers import Speaker as Events
from xmpp.models import Node, IQ, JID
from xmpp.extensions import Extension

class Dummy(Node):
    __tag__ = 'dummy'
    __etag__ = '{xmpp:xep:example}dummy'
    __namespaces__ = ['xmpp:xep:example']
    __children_of__ = IQ

class Fake(Extension):
    __xep__ = '9999'

    def initialize(self):
        self.on = Events('fake',
                         ['dummy',
                          # the server sent a dummy inside of an IQ
                         ])
        self.stream.on.node(self.route_nodes)

    def route_nodes(self, _, node):
        if isinstance(node, Dummy):
            self.on.dummy.shout(node)

    def send_dummy(self, to, value):
        params = {
            'to': to,
            'type': 'set',
        }
```
```python
node = IQ.with_child_and_attributes(
    Dummy.create(value),
    **params
)
self.stream.send(node)
```

Usage of your newly created extension

```python
from xmpp import XMLStream
from xmpp import XMPPConnection
from xmpp import JID
from xmpp.auth import SASLAuthenticationHandler

DEBUG = True

DOMAIN = 'shakespeare.oreg'
jid = JID('tybalt@shakespeare.oef/cahoots')
password = 'sk3tchy'

SASL_MECHANISM = 'SCRAM-SHA-1'

RECEIVED_DUMMY_LIST = []
SENT_DUMMY_LIST = []

connection = XMPPConnection(DOMAIN, 5222, debug=DEBUG)
stream = XMLStream(connection, debug=DEBUG)

sasl = SASLAuthenticationHandler(SASL_MECHANISM, jid, password)
sasl.bind(stream)

@connection.on.tcp_established
def step1_open_stream(event, host_ip):
    stream.open_client(jid.domain)

@stream.on.sasl_support
def step2_send_sasl_auth(event, node):
    sasl.authenticate()

@sasl.on.success
def step3_handle_success(event, result):
    stream.open_client(jid.domain)

@stream.on.bind_support
def step4_bind_to_a_resource_name(event, node):
    stream.bind_to_resource(jid.resource)

@stream.on.bound_jid
def step5_send_presence(event, jid):
    dummies.send_dummy(to='rosaline@shakespeare.org', value='Romeo')
    SENT_DUMMY_LIST.append('Romeo')

@dummies.on.dummy
def step6_store_dummy(event, dummy):
    RECEIVED_DUMMY_LIST.append(dummy.value)

5.3. Create your own 25
connection.connect()

try:
    while connection.is_alive():
        connection.loop_once()

except KeyboardInterrupt as e:
    print(r"\r{0}".format(traceback.format_exc(e)))
    raise SystemExit(1)
CHAPTER 6

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