



# XMPP

## XEP-0455: Service Outage Status

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This document defines an XMPP protocol extension that enables server administrators to communicate issues with the server to all users in a semantic manner.

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## 1 Introduction

The XMPP Network is a network of servers which each have their own administration policies, status reports, and other peculiarities. [Contact Addresses for XMPP Services \(XEP-0157\)](#)<sup>1</sup> provides a consistent framework for reaching out to administrators and reporting abuse, incidents, or even giving feedback on the service, and the goal of this specification is to provide a similar framework for letting users (or other entities) know the server status in-band or out of band (in case of hard failures).

Centralized systems usually control both the infrastructure and client code, making it easy to hardcode information retrieval one way or the other.

The usual way of informing users of planned maintenance, partial or total outage was previously through "announce" modules that lets the admin broadcast server-wided messages. This approach has several drawbacks, as it will appear in most clients as a new discussion with the server JID, which can prove confusing. It also does not provide a way to reach the user when the XMPP server is offline.

This XEP provides:

- An informational way of exposing an external service endpoint containing machine-readable data using [Service Discovery Extensions \(XEP-0128\)](#)<sup>2</sup>
- A specification of the data this service should provide
- A normative way of providing such information in-band, when the outage is not complete
- A way to reference and archive such incidents, in a [Publish-Subscribe \(XEP-0060\)](#)<sup>3</sup> node

## 2 External status

### 2.1 Discovery

To make such discovery possible, we specify a [Service Discovery Extensions \(XEP-0128\)](#)<sup>4</sup> mechanism that a server SHOULD return in response to service discovery information ("disco#info") requests sent to the bare domain of the server. This information MUST be scoped using a FORM\_TYPE of "urn:xmpp:sos:0" (as already specified in XEP-0128) and data form fields registered for this purpose as defined in the [XMPP Registrar Considerations](#) section of this document.

Values of 'external-status-addresses' form field MUST be valid URIs, i.e. comply with the 'xs:anyURI' datatype of [XML Schema Part 2](#)<sup>5</sup>.

---

<sup>1</sup>XEP-0157: Contact Addresses for XMPP Services <<https://xmpp.org/extensions/xep-0157.html>>.

<sup>2</sup>XEP-0128: Service Discovery Extensions <<https://xmpp.org/extensions/xep-0128.html>>.

<sup>3</sup>XEP-0060: Publish-Subscribe <<https://xmpp.org/extensions/xep-0060.html>>.

<sup>4</sup>XEP-0128: Service Discovery Extensions <<https://xmpp.org/extensions/xep-0128.html>>.

<sup>5</sup>XML Schema Part 2: Datatypes <<http://www.w3.org/TR/xmlschema11-2/>>.

Listing 1: Entity queries server for information

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

Listing 2: Server communicates information

```
<iq from='shakespeare.lit'
  to='thirdwitch@shakespeare.lit/chamber'
  id='disco1'
  type='result'>
  <query xmlns='http://jabber.org/protocol/disco#info'>
    <identity category='server' type='im' />
    <feature var='http://jabber.org/protocol/disco' />
    <x xmlns='jabber:x:data' type='result'>
      <field var='FORM_TYPE' type='hidden'>
        <value>urn:xmpp:sos:0</value>
      </field>
      <field var='external-status-addresses'>
        <value>http://secondary.shakespeare.lit/status.json</value>
      </field>
    </x>
  </query>
</iq>
```

Links present inside the 'external-status-addresses' field SHOULD use HTTP/HTTPS protocol and the resources referenced MUST be available without authentication.

## 2.2 External status format

TODO: do we want this to be XML or json? I have no real preference, in any case it should be preferably generated by a tool but easy to write by hand, as this needs to be usable in situations where time is the essence.

The format used for the external status is defined here, to allow a wide range of compatibility across services and clients.

A client MUST ignore unknown extra fields present in the JSON file, to allow extensibility, and implementations MAY add other fields.

Listing 3: Example status

```
{
  "outage": "complete",
  "planned": true,
  "beginning": "2021-01-12T01:01:01Z",
```

```

"expected_end": "2021-01-12T05:00:00Z",
"message": {
  "default": "Mise_à_jour_du_serveur",
  "en": "The_server_is_being_updated"
}
}

```

The "message" field MUST contain at least a message on the "default" key, that will be used by the client if the current user language is not found. It is left to the operator to determine which language is more relevant as a default, according to the server's user base. When the outage is over, the file SHOULD be replaced with an empty JSON object.

Listing 4: Empty file after resolution of the issue

```
{}
```

The following JSON schema is provided as a means to describe and validate the file exposed by the external service:

```

{
  "$id": "http://xmpp.org/server-outage-schema.json",
  "$schema": "http://json-schema.org/draft-07/schema#",
  "title": "XMPP_Server_Outage_Format",
  "type": "object",
  "required": ["beginning"],
  "additionalProperties": true,
  "properties": {
    "outage": {
      "type": "string",
      "enum": ["partial", "complete"],
      "description": "The_outage_status_(partial_or_complete)."
    },
    "planned": {
      "type": "boolean",
      "description": "If_the_outage_was_planned_or_not."
    },
    "beginning": {
      "type": "string",
      "format": "date-time",
      "description": "Approximate_time_of_the_start_of_the_outage."
    },
    "expected_end": {
      "type": "string",
      "format": "date-time",
      "description": "Estimated_time_of_the_end_of_the_outage_(if_known)."
    },
    "message": {

```

```

    "type": "object",
    "description": "Textual_message_to_service_users,_each_key_being
      _'default'_or_a_BCP47_language_tag.",
    "required": ["default"],
    "properties": {
      "default": { "type": "string"
    },
    "patternProperties": {
      "default": {"type": "string"},
      ".*": {"type": "string"}
    }
  }
}
}
}

```

### 3 In-band status

#### 3.1 PubSub Node

For in-band notifications of server issues, a service with this extension SHOULD expose a 'urn:xmpp:sos:0' pubsub node with the access model defined in [Best Practices for Persistent Storage of Public Data via Publish-Subscribe \(XEP-0222\)](#)<sup>6</sup> on its bare JID. This pubsub node contains items describing outages and outage resolutions, and each item MUST have an 'id' attribute value containing the outage date and time, in [XMPP Date and Time Profiles \(XEP-0082\)](#)<sup>7</sup> format.

Clients implementing this extension SHOULD subscribe to the '+notify' on that node, as defined in [Publish-Subscribe \(XEP-0060\)](#)<sup>8</sup>.

Entities from other servers MAY be allowed to subscribe to other server nodes, to allow external services to monitor the server. Doing so allows aggregation of XMPP outage events across the network, for a better transparency.

#### 3.2 Outage event

Listing 5: Server operator publishes an outage event

```

<iq from='firstwitch@shakespeare.lit/broom' to='shakespeare.lit' type=
  'set' id='pub1'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <publish node='urn:xmpp:sos:0'>
      <item id="2021-01-01T01:01:01Z">
        <outage xmlns='urn:xmpp:sos:0'>

```

<sup>6</sup>XEP-0222: Best Practices for Persistent Storage of Public Data via Publish-Subscribe <<https://xmpp.org/extensions/xep-0222.html>>.

<sup>7</sup>XEP-0082: XMPP Date and Time Profiles <<https://xmpp.org/extensions/xep-0082.html>>.

<sup>8</sup>XEP-0060: Publish-Subscribe <<https://xmpp.org/extensions/xep-0060.html>>.

```

    <description xml:lang='en'>The ICQ and MSN gateways are down
      </description>
    <description xml:lang='fr'>Les passerelles ICQ et MSN sont
      mortes</description>
    <planned>>false</planned>
    <expected_end>2021-01-01T05:00:00Z</expected_end>
  </outage>
</item>
</publish>
</pubsub>
</iq>

```

Listing 6: Client subscribed receives an outage event

```

<message from='shakespeare.lit'
  to='macbeth@shakespeare.lit/throne'
  type='headline'
  id='outagefoo'>
  <event xmlns='http://jabber.org/protocol/pubsub#event'>
    <items node='urn:xmpp:sos:0'>
      <item id="2021-01-01T01:01:01Z">
        <outage xmlns='urn:xmpp:sos:0'>
          <description xml:lang='en'>The ICQ and MSN gateways are down
            </description>
          <description xml:lang='fr'>Les passerelles ICQ et MSN sont
            mortes</description>
          <planned>>false</planned>
          <expected_end>2021-01-01T05:00:00Z</expected_end>
        </outage>
      </item>
    </items>
  </event>
</message>

```

### 3.3 Outage End Event

When the outage is over, servers operators SHOULD publish an `<outage-end/>` element with the item id matching the time at which the issue was resolved. It can optionally contain a description.

Listing 7: Server operator publishes an end of outage event

```

<iq from='firstwitch@shakespeare.lit/broom' to='shakespeare.lit' type=
  'set' id='pub2'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <publish node='urn:xmpp:sos:0'>
      <item id="2021-01-01T02:05:01Z">
        <outage-end xmlns='urn:xmpp:sos:0'>

```



```
        <description xml:lang="en">Everything has been fixed!</  
            description>  
        <description xml:lang="fr">Tout a été corrigé!</description  
            >  
    </outage-end>  
</item>  
</publish>  
</pubsub>  
</iq>
```

Clients receiving this notification SHOULD remove the information about the outage from the user's view, and MAY display the new message briefly.

## 4 Use Cases

This extension has been thought for several different cases of service outages:

- A client failing to connect to a server is able to display an informative message to the user if the server is having issues.
- A server experiencing difficulties is able to communicate it to the users, and clients can display the information prominently.
- An external service can keep track of the various outages, either for a single server or a number of them, and present the information in a structured manner.

## 5 Business Rules

A client implementing this extension MUST fetch the addresses of the external service and cache it for later use. Doing so allows the client to use this information when it is impossible to connect to the server.

A client receiving an outage event for a time in the future SHOULD treat it as a planned event that is not already happening and adapt its display consequently.

When connected, a client SHOULD NOT fetch the external file as the in-band notification provides the same information, if available.

## 6 Internationalization Considerations

Both the JSON and the XML format defined in this document allow for internationalization in the fields that are expected to be presented to the user as-is. The other fields are machine-readable and their various values SHOULD be translated in the implementing applications.

## 7 Security Considerations

Client implementations MUST check the provenance of the pubsub notifications before displaying a notification, otherwise malicious entities could send fake outage events. Server administrators MUST ensure the servers provided in 'external-status-addresses' are trusted, as malicious administrators of this server could use the referenced file to display arbitrary messages to users.

## 8 IANA Considerations

This document requires no interaction with the [Internet Assigned Numbers Authority \(IANA\)](#)<sup>9</sup>.

## 9 XMPP Registrar Considerations

The [XMPP Registrar](#)<sup>10</sup> includes the following information in its registries.

### 9.1 Field Standardization

[Field Standardization for Data Forms \(XEP-0068\)](#)<sup>11</sup> 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 "urn:xmpp:sos:0" FORM\_TYPE.

```
<form_type>
  <name>urn:xmpp:sos:0</name>
  <doc>XEP-XXXXX</doc>
  <desc>
    Form enabling a the registration of a machine-readable
    external file to describe a service status.
  </desc>
  <field
    var='external-status-addresses'
    type='list-multi'
```

---

<sup>9</sup>The Internet Assigned Numbers Authority (IANA) is the central coordinator for the assignment of unique parameter values for Internet protocols, such as port numbers and URI schemes. For further information, see <http://www.iana.org/>.

<sup>10</sup>The XMPP Registrar maintains a list of reserved protocol namespaces as well as registries of parameters used in the context of XMPP extension protocols approved by the XMPP Standards Foundation. For further information, see <https://xmpp.org/registrar/>.

<sup>11</sup>XEP-0068: Field Data Standardization for Data Forms <https://xmpp.org/extensions/xep-0068.html>.

```
label='One_or_more_addresses_containing_a_file_with_the_server_
status' />
</form_type>
```

## 10 XML Schema

REQUIRED for protocol specifications.