## Extensible Messaging and Presence Protocol (XMPP)

### Introduction:

- XMPP is an open and XML- based client - server protocol.
- It is widely used for instant messaging, voice and video conferencing, gaming etc. in near real time.
- XMPP uses presence information. Presence is the status indicator that conveys the willingness of a potential communicating partner.

### XMPP Core

- **Architecture:**


- **XMPP protocol structure:**
  In XMPP data is exchanged in XML, organized as a pair of streams, in each direction.
  - ***XML stream:*** is the container for exchanging the XML elements over a network. It simply works as an envelope for the XML stanza.
  - ***XML stanza:*** an unit of structured information sent over an XML stream.

    Presence: from one to multiple entities.
    Message: from one entity to another.
    IQ: request information from one entity to another.

    Example:

```
<stream>
        <iq..>...</iq>
        <presence/>
                <message...</message>
        <presence.../>
</stream>
```

  The streams for server and client are same except that one is jabber:server and the other is jabber:client.

- **XMPP Addressing:**

    JID (Jabber identifiers)
    - Local : particular user in the domain, optional (eg. ila)
    - Domain : addresses a server , required. (eg. bloomsbury.com)
    - Resource: particular XMPP connection of a client, optional. (eg. office)

    Example: ila@bloomsbury.com/office

- **XMPP Network:**
  Server: Eg. Ejabberd
  Client:
  Component:
  Server Plug-in:

**How instant messaging works with XMPP:**

When a XMPP client connects to the server, its presence is registered. The XMPP server has the presence information for all local clients. Each client maintains a roster or contact list on the XMPP server. The XMPP servers query and share their own clients' presence status and service records (SRV) between them.

When a XMPP client sends a message, it is simply sent to a local server. The local XMPP server then forwards the message to the recipient's XMPP server. Almost similar to e-mail network, but the two XMPP servers directly communicate with each other, not through DNS.

**XMPP features:**

Security:

- XMPP supports encrypted communication.
- uses TLS (Transport layer Security)

Authentication:

- Authentication method for XMPP is SASL (Simple Authentication and Security Layer) that enables a client to authenticate with a server or for one server to authenticate with a peer server.

References:

[1] J. Moffitt, *Professional XMPP Programming with JavaScript® and jQuery* Indianapolis, Indiana, Wiley publishing Inc., 2010