Open Source
VoIPv6

Hisham Ahmed Ibrahim
Ministry of Communication & Information Technology
(MCIT)
ahisham@mcit.gov.eg
Quick Over View
Open Source

Computer software for which the human-readable source code is made available under a copyright license (or arrangement such as the public domain) that meets the Open Source Definition, this permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form. It is often developed in a public, collaborative manner. Open source software is the most prominent example of open source development and often compared to user generated content.
Voice-over-Internet protocol (VoIP) is a protocol optimized for the transmission of voice through the Internet or other packet-switched networks. It is also referred to as IP telephony.

Voice-over-IP systems carry telephony signals as digital audio, typically reduced in data rate using speech data compression techniques, encapsulated in a data-packet stream over IP.

Famous protocols

• Session Initiation Protocol (SIP)

• H.323

• Media Gateway Control Protocol (MGCP)
SIP Call Establishment

INVITE

Ringing

OK

ACK

Conversation

BYE

OK
Open Source Tools
Asterisk is an open source/free software implementation of a telephone private branch exchange (PBX) originally created in 1999 by Mark Spencer of Digium.

Like any PBX, it allows a number of attached telephones to make calls to one another, and to connect to other telephone services including the public switched telephone network (PSTN). Its name comes from the asterisk symbol, *, which in Unix (and Unix-like operating systems such as Linux) and DOS environments is a wildcard character, matching any sequence of characters in a filename.

Asterisk was ported to IPv6 by Viagénie in 2007.
KPhone is a voice-over-IP softphone which uses SIP for signalling. The original version is maintained at wirlab.

The kphone-3.11-ipv6 version of KPhone was extended to support IPv6 for audio calls and user registration as a result of a project at the FOKUS institute of the Fraunhofer society.

KPhone is an application for the K Desktop environment (KDE) version 3.114 and the corresponding graphics and widget library QT version 3.1. based on the free operating system "Linux".

KPhone implements SIP for call signaling and RTP for audio streaming. KPhone is written in the C++ programming language.
Egyptian University Deployment
The Egyptian IPv6 Task Force

VoIPv6

INTERNET2

University 1

Asterix-v6 Server

SipSet Client

University 2

Kphone Client

The Egyptian IPv6 Task Force
<table>
<thead>
<tr>
<th>EUN</th>
<th>ENSTINET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cairo University</td>
<td>National institute of Astronomy and Geophysics</td>
</tr>
<tr>
<td>Alexandria University</td>
<td>National Authority of Remote Sensing &amp; Space Sciences</td>
</tr>
<tr>
<td>Ain Shams University</td>
<td>National Research Center &amp; Electronic Research</td>
</tr>
<tr>
<td>Assiut University</td>
<td>National Institute of Measures and Standardizations</td>
</tr>
<tr>
<td>Tanta University</td>
<td>National Telecommunications Institute</td>
</tr>
<tr>
<td>Mansoura University</td>
<td>Mobark City for Scientific Research and Applied Technology</td>
</tr>
<tr>
<td>Zagazig University</td>
<td>Egyptian Petroleum Research Institute</td>
</tr>
<tr>
<td>Helwan University</td>
<td>Tudoar Belhares Research Institute</td>
</tr>
<tr>
<td>Minia University</td>
<td>Eye Diesis Research Institute</td>
</tr>
<tr>
<td>Menofia University</td>
<td>Metal deployment Research Institute</td>
</tr>
<tr>
<td>Suez Canal University</td>
<td>Ministry of Communication and Information Technology</td>
</tr>
<tr>
<td>South Vally University</td>
<td>2001:4300:4300::/48</td>
</tr>
<tr>
<td>Al-Azhar University</td>
<td>2001:4300:2001::/48</td>
</tr>
<tr>
<td>Banha University</td>
<td></td>
</tr>
</tbody>
</table>
Performance Analysis
Packet Analysis Using Ethereal
# Packet Analysis Using Ethereal

<table>
<thead>
<tr>
<th>Time</th>
<th>Source</th>
<th>Destination</th>
<th>Protocol</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.36</td>
<td>2001:660:5503:276a</td>
<td>2001:4348:8000:208</td>
<td>SIP</td>
<td>Status: 401 Unauthorized (0 bindings)</td>
</tr>
<tr>
<td>5.36</td>
<td>fe80::21d:e5ff</td>
<td>2001:4348:8000:208</td>
<td>ICMPv6</td>
<td>Neighbor solicitation</td>
</tr>
<tr>
<td>5.36</td>
<td>2001:4348:8000</td>
<td>fe80::21d:e5ff:fe5a</td>
<td>ICMPv6</td>
<td>Neighbor advertisement</td>
</tr>
<tr>
<td>44.9</td>
<td>2001:4348:8000</td>
<td>2001:660:5503:276a</td>
<td>SIP</td>
<td>Status: 100 Trying</td>
</tr>
<tr>
<td>49.9</td>
<td>fe80::21d:e5ff</td>
<td>2001:4348:8000:208</td>
<td>ICMPv6</td>
<td>Neighbor solicitation</td>
</tr>
<tr>
<td>49.9</td>
<td>2001:4348:8000</td>
<td>fe80::21d:e5ff:fe5a</td>
<td>ICMPv6</td>
<td>Neighbor advertisement</td>
</tr>
</tbody>
</table>

Frame 3 (88 bytes on wire, 88 bytes captured)

Linux cooked capture
Packet Analysis Using Ethereal
Packet Analysis Using Ethereal
Distance between Cairo and Rabat

<table>
<thead>
<tr>
<th>Miles</th>
<th>2232.88</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilometers</td>
<td>3593.37</td>
</tr>
</tbody>
</table>
Thank you