A Review of ALM Software in Practical Use

Kazuyuki Shudo
Tokyo Tech
(Tokyo Institute of Technology, or TITECH)
Self Introduction:
ALM-related work

• Apr 2001 – Mar 2006  Research Scientist, AIST
  • **Overlay Weaver**: An overlay construction toolkit
    - A library and an emulation toolkit for (structured) overlays.
    - Provides DHT and **ALM services**. Implements Chord, Kademlia, ...
    - Runs a DHT service on PlanetLab with about 600 nodes.
    - Provides **IP(v4) multicast router** (`bin/owmrouted`), which connects native multicast domains with Scribe-style ALM.

• Apr 2006 – Nov 2008  Director, CTO, Utagoe Inc.
  • **UG Live**: A peer-to-peer live streaming software
    - Mesh-based ALM (↔ tree-based).
    - Commercially provided. Achieved over $10^5$ simultaneous viewers.

• Dec 2008 - Assoc. Prof., Tokyo Tech
ALM in Practical Use

- PPlive, PPstream, Mysee, Roxbeam, UUsee, …
- UG Live from Utagoe Inc.
- BBbroadcast from TV Bank Corp.
  - Developed by Roxbeam and TV Bank.
  - Originated from CoolStreaming/DONet (INFOCOM 2005).
- ShareCast from Bitmedia Inc and ANCL, Inc.

Dr. Hiroshi Kawahara  
former? CTO, TV Bank

Dr. Tomo Sonoda and me  
CEO and former CTO, Utagoe

Mr. Masaharu Takano  
CEO, Bitmedia Inc

Mr. Takayuki Saito  
CEO, ANCL, Inc.
Radio broadcasting (from June 2 to 30, 2008)
delivered by NIPPON BROADCASTING SYSTEM, Impress Imageworks, J-Stream and Utagoe
UG Live

Nikkei CNBC broadcasting (from March 24 to 28, 2008)
delivered by TV Tokyo Broadband Inc. and Utagoe Inc.

Simultaneous with TV
UG Live

Live broadcasting of an Online Multiplayer Game
(from Sep 25, 2008 to Oct 14) delivered by SEGA SAMMY and Utagoe
• Professional baseball games (2009/4 -)
UG Live: Traffic reduction

- More than 90% of traffic reduced around the source
  - with Utagoe’s UG Live software

On Nov 26, 2007
“Access’ talk about”
brought by J-stream,
Castella (www.castella.jp)
and Utagoe
<table>
<thead>
<tr>
<th>Properties</th>
<th>BB广播</th>
<th>UG Live</th>
<th>ShareCast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developers</td>
<td>TV Bank &amp; Roxbeam</td>
<td>Utagoe</td>
<td>Bitmedia &amp; ANCL</td>
</tr>
<tr>
<td>ALM method</td>
<td>Mesh-based</td>
<td>Mesh-based</td>
<td>Tree-based</td>
</tr>
<tr>
<td>Prog. language</td>
<td>Python (to C++ ?)</td>
<td>Java</td>
<td>Java</td>
</tr>
<tr>
<td>Soft. installation</td>
<td>required</td>
<td>Not req (Java Applet)</td>
<td>Not req (Java Applet)</td>
</tr>
<tr>
<td>Max. simul.</td>
<td>79,227</td>
<td>10^4 -</td>
<td>10^2 - ???</td>
</tr>
<tr>
<td>Business model</td>
<td>Delivery service</td>
<td>Licensing, Delivery service, B2C tried once</td>
<td>Licensing, Delivery service, B2C planned</td>
</tr>
</tbody>
</table>

- **Common properties**
  - Overlay maintenance: pure P2P (all nodes maintain their neighbors autonomically).
    cf. Some ALM systems deploy membership servers.
  - Windows Media Codecs and Players.
    They all support Windows, but Silverlight will help on other platforms.
  - An overlay works in its own protocol. → PPSP WG ??

- **Note**
  - UG Live cooperates with a topology service (e.g. P4P, ALTO). See Kamei’s talk in P2P-RG, IETF 75.
  - I believe mesh-based ALM is much better in unstable Internet environment.
    Most (or all) commercial ALM software from China is mesh-based.
  - Number of viewers is determined by the demand of the content, not technology. Content holders rule.
    The number can be raised by providing multiple overlays.
Today and Future

• Can ALM compete with **Unicast streaming services** like Ustream.tv and Stickam?
  • Unicast biz requires plenty investment → not sustainable?

• **Install-less**
  • Achieved with Java Applet, but requires large Java runtime (JRE).
  • Does RTMFP, a peer-to-peer protocol in Flash Player help?

• **Support Flash** (**RTMP**) ? → No or requires much work
  • In case upward traffic is shut up, Windows Media works and Flash does not.
  • Lesson: ALM software is not free from video streaming protocol.