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# A Review of ALM Software in Practical Use

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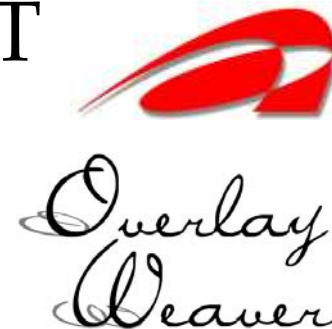


# Self Introduction: ALM-related work

- 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, Kademia, ...
- 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** ( $\leftrightarrow$  tree-based).
- Commercially provided. Achieved over  $10^5$  simultaneous viewers.

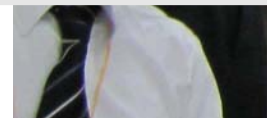


- Dec 2008 - Assoc. Prof., Tokyo Tech



# ALM in Practical Use

- PPlive, PPstream, Mysee, Roxbeam, UUuse, ...
- **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 Mr. Takayuki Saito  
CEO, Bitmedia Inc CEO, ANCL, Inc.

# UG Live

HOME TOPICS TIME TABLE MUSIC SEARCH ONDEMAND REQUEST About Suono Dolce | How to listen

Suono Dolce  
Love Songs from Marunouchi

3 TUE Jun

PLAY ▶

SPLIT SCREEN SADNESS / JOHN MAYER

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27



>> Marunouchi Sound Scape

Suono Dolceを高音質で聴いてみる >>

期間限定：6/2~6/30

Ondemand

番組を聴いてみる

オンデマンドで聴く

Suono Dolce  
TOKYO AFTER 6  
Mon-Fri 18:00~

日替わりナビゲータが3時間生放送!

Music Dolce

今週のTokyo After6

ステキなゲストが毎日生登場

MON  
TUE  
WED  
THU  
FRI

6/4 >> 齊藤花

過去の出演ゲストはこちら >>

Cinema Dolce

週のイチオシ映画

巻よこい

Blog

牧野紗弥 mariko

静香 Catherine 中塚武

Ending theme

Tokyo After6 今月のエンディングテーマ

SHINING 青木カレン / SHINING

## CD quality music

### Radio broadcasting (from June 2 to 30, 2008)

delivered by NIPPON BROADCASTING SYSTEM, Impress Imageworks, J-Stream and Utageo

# UG Live



ウタゴエ株式会社



IP LABO

同時再送信実験

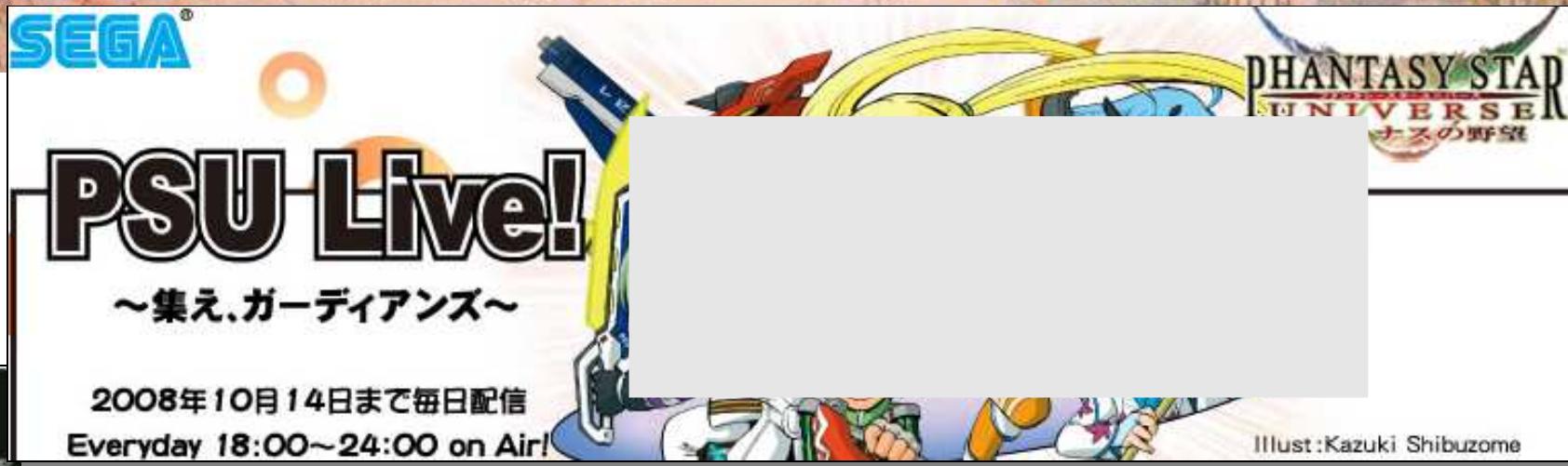
日経CNBC 視聴ページ

日経CNBCをパソコンで視聴できます

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

## Simultaneous with TV

# UG Live



SEGA®

## PSU Live!

～集え、ガーディアンズ～

2008年10月14日まで毎日配信  
Everyday 18:00~24:00 on Air!

PHANTASY STAR  
UNIVERSE  
オズの野望

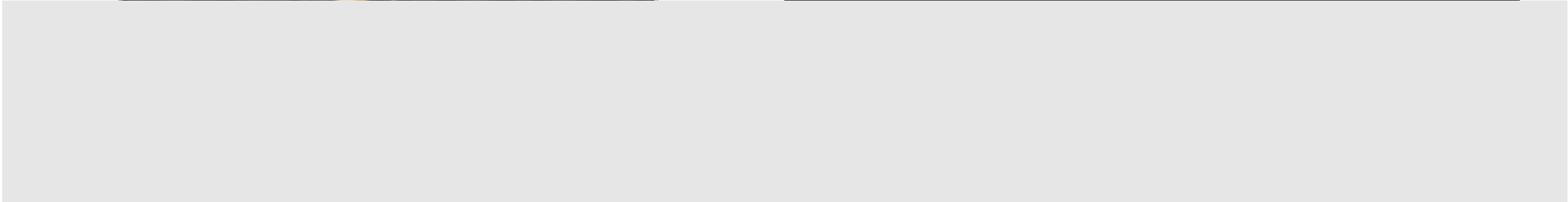
Illust: Kazuki Shibuzome



## Live broadcasting of an Online Multiplayer Game

(from Sep 25, 2008 to Oct 14) delivered by SEGA SAMMY and Utagoe

# UG Live

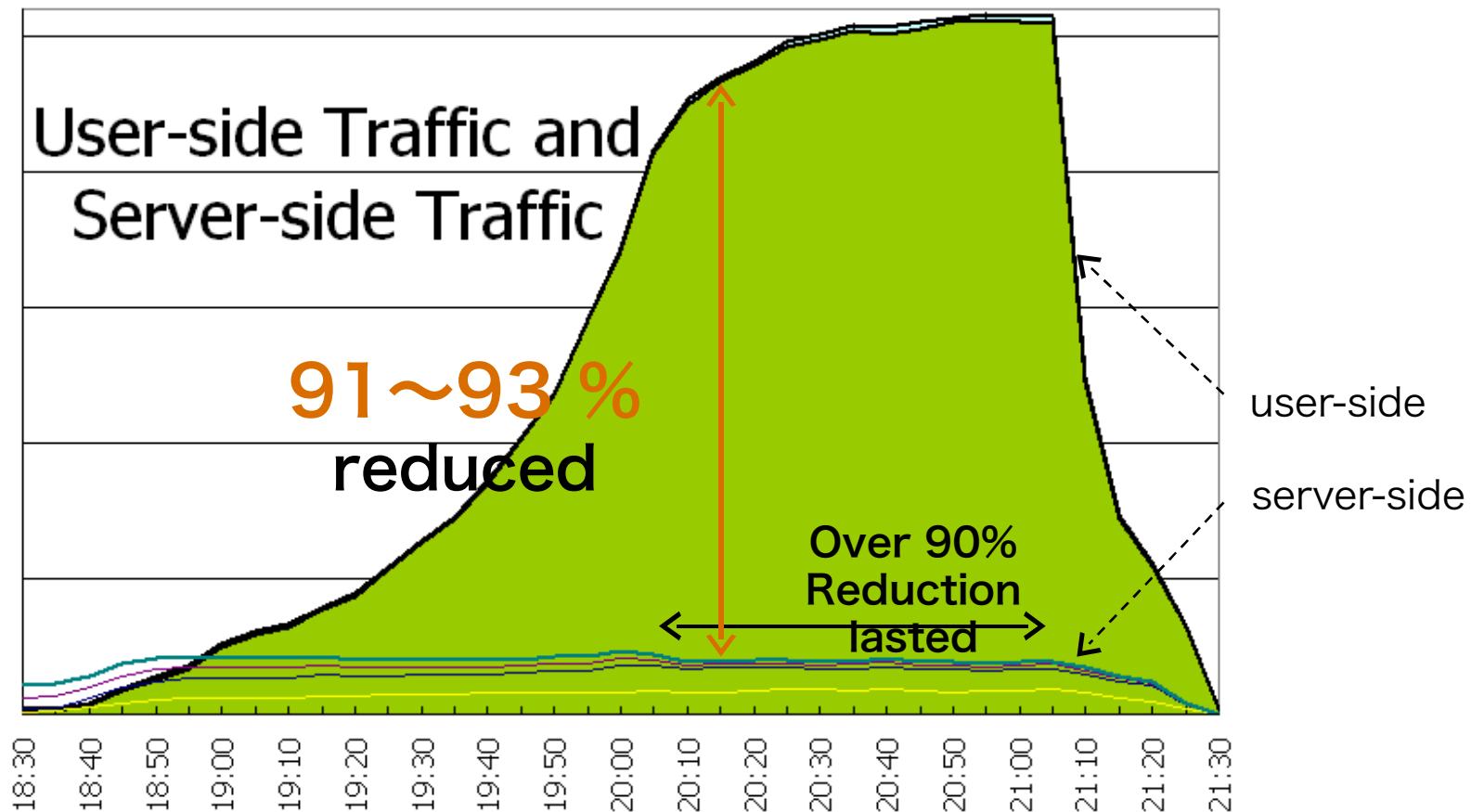


- Professional baseball games (2009/4 -)

# 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](http://www.castella.jp))  
and Utagoe





# Properties

	BBbroadcast	UG Live	ShareCast
<b>Developers</b>	TV Bank & Roxbeam	Utagoe	Bitmedia & ANCL
<b>ALM method</b>	Mesh-based	Mesh-based	Tree-based
<b>Prog. language</b>	Python (to C++ ?)	Java	Java
<b>Soft. installation</b>	required	Not req (Java Applet)	Not req (Java Applet)
<b>Max. simul.</b>	79,227	10 <sup>4</sup> -	10 <sup>2</sup> - ???
<b>Business model</b>	Delivery service	Licensing, Delivery service, B2C tried once	Licensing, Delivery service, B2C planned

- **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.