Mobile Applications And Services for Converged Networks

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CS 4261/8803 IMS

Fall 2009
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  - cellular, WiFi, WiMax, 2.5 G, 3G, 4G, etc
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An End to End perspective on mobile applications!
IMS Research Competition

- Focus on Converged & Mobile Applications
- Multidisciplinary student teams
- Prototypes & Business Cases

Convergence Innovation Competition 2009-10


Convergence Innovation Platform ("CIP")

End-to-End

- IMS core and enablers, IPTV
- Carrier and Campus integration
- Industry support & co-management
- Broadly accessible for academics and research
- Enabling application development and testing in an environment that is relevant to industry
Convergence Innovation Platform

GT-RNOC Convergence Innovation Platform
External Connectivity and Internal Networks
Version 0.8 5/27/2009
Matt Sanders (msanders@gatech.edu)

GT Production

Internet

GT Core

LAWN (WiFi)

Resnet

Academic and Research

Voice

Internet2

NLR

VoIP svc

Web svc

IPTV svc

CIP APN: ims.gatech.edu

AT&T Core

GGSN

AT&T Production

CIP APN: ims.gatech.edu

AT&T Production

CIP Router

SD Content

HD Content (future)

GigE

CIP-FW

CIP Lab Client Network

IMS Services

CIP Development

Openflow Testbed

SD content

IPsec VPN

L2 fiber

L3 fiber

CIP-FW

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GT-RNOC CIP

Monday, August 24, 2009
Convergence Innovation Competition - CIC
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IP Multimedia Subsystem - A core technology but not the only one

• Convergence around IP - including VoIP, IPTV and Web
CIC Team Building
• Generally teams of 2 to 4 people
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  • networking, handset development
  • not necessarily all from this class
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• We will facilitate team building through the lab and web site
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  • Group presentations
  • Discussions in-class and all over campus
Class vs Competition
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- So how does this class relate to the competition?
  - We approach the planning for the course with the upcoming competition in mind
  - Our goal is to prepare you as best we can for the competition next semester
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  • We approach the planning for the course with the upcoming competition in mind
  • Our goal is to prepare you as best we can for the competition next semester
  • However, the course is independent of the competition!
    • You will get a lot out of this class even if you decide the competition isn’t for you!
    • You can participate in the competition even if you don’t take the course.
Technologies and Examples
Some stuff we’ll be talking about this semester
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- SIP and Web A/S - Application Servers
- Interactive TV - IPTV
• Access Independence - not just Cellular: wired, WiFi, WiMax, etc
IMS Benefits - Official Story

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Figure 1: Position of the IP Multimedia Subsystem within a mobile network
IMS - S stands for SUBsystem

SIP is just about signaling
• call and session management

What about:
• legacy telephone systems?
• other carriers and their services?
• ISPs, cable and satellite operators?
• content providers?
• service providers?
• large enterprises?
All Those Mobile Applications

• I keep seeing articles about thousands of new mobile applications.
  • iPhone
  • Java
  • Android
• Yes, but how many of them leverage real network services? - very few
• Still lacking simple things like shared presence, address book, identity
• Still too many silos!
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All Those Web Applications

• And they’re using Web APIs for Network Services
• They’ve made it fun and easy!
Still Many Challenges

There are lots of challenges to putting it all together.

And a whole lot of opportunities!!!
“Primary barriers to deployment are company culture and structure, not technical.” - IMS FOKUS Workshop

• IPR and product realization
• access and control
• content ownership
• custom solutions
  • generalized platforms with significant investment (SAP/Oracle)
  • financial transactions (banking, stock market, etc)
  • Security (video, alarming)
  • travel (schedules, coordination, reservations, etc)
  • ...plenty of other large verticals

• In short, who makes money and how?
Human Factors Integration
Challenges

- lessons from the iPod
- have to account for diversity
  - handsets, I/O, and networks
- location services case study .... “coupon spam”
- can’t assume always on connections (problem of Mobile Google Maps)
Technical Integration Challenges

• What is the relationship between IMS and Web 2.0?

• congruent and consistent scale, resolution, and access controls

• exposing IMS services to web applications

• leveraging web services in IMS applications

• converged web and IMS services
• Let’s look at some videos
• Some questions you should be asking are:
  • What is doable?
  • What is the scope?
  • What tools and resources will we have?
• Today, let’s answer this with some examples:
  • Some previous projects
  • Some ideas we have
Research Competition Results
SoCoNet - Social Community Network
Nils Kjellin, Christian Menkens, Matthew Rhodes, Anders Davoust

Idea: Provide a social community network application that enables individuals to interact, inform, and communicate using IMS enabled mobile phones.
“…your whole community in your pocket”

Features:
- Profiles (buddies and hotspots)
- Communication
  - Text Chat, Text Message, Picture Message, Voice Call, Video Call, Wall, Blog
  - Push-to-Talk IMS enabling service
- Multimedia
  - Photo Albums, Video / Audio Clips
- Lectures
  - Class Information, Lecture Material, Class Interaction, Announcements, Live / Recorded Lecture
- Events, Ticketing and News
  - Event Information, Reservations
- Subscriptions and Notifications
  - Community updates
Kinship

Devin Hunt, David Jimison

Idea: Instant video sharing with live interaction through chat and location-based collaboration.

Features:

• Video capture streamed to an IMS-based video service.
• Instantly accessible to multiple consumers
• Simultaneous chat for true participatory experience
• Video stored automatically - even if phone is lost
• Encourage collaborative capture and contribution of multiple users
• Videos also available to web users
MobMedia

Gaurishankar Krishnan, Shivam Goyal

Idea: Location based mixed media sharing using mobile devices.

Features:

• A medium for location-based encounters
• Discover and share media
• Drop media
• Get media recommendations and suggestions
• Create multiple avatars
• Buddy list
• Private, Protected and Public media
• Alerts, News Feed, Comments
Distributed Asset Tracking
David McCann, Dannon Baker, John Etherton

Initial Problem: current approach to asset tracking
• Infrastructure overhead
• Rigid process
• Special purpose technology

Solution
• Personal responsibility
• Natural transactions
• Extensible tracking technologies
CHOWZ!

Harry Marr, Jason George

Idea: Mobile Advertising for the Food Service Industry

Features:
- targeted advertising based on rich user profile data
- real-time response
- friends social network, social site integration
- For Patrons:
  - Discounts
  - Group coordination
  - High yield, quality leads
- For Vendors:
  - Marketplace analysis
  - Customer analysis
  - Advertisement distribution
Pervasive Healthy Diet Adviser  
*Jiten Chhabra, Daniel Serrano, Mayank Goel*

**Idea:** Personalized, Professional Dietary Advice  
- tailored to user’s diet profile  
- based on latest medical findings  
- localized, contextual

**The Problem**  
- Increasing obesity rates  
- Conflicting, confusing dietary advise  
- Difficulty matching needs to available food offerings

**The Solution**  
- Individualized dietary monitoring and analysis  
- Meal recommendations for nearby restaurants based on user’s current situation  
- Restaurants gain high value customers
3GAdS Mobile Tour Guide 3D
Karthik Halukurike, Matt Weber, Aileen Morales, Matthew Swarts

Idea: An Enhanced Direction Finder Experience
• location based ads and coupons
• enhanced 3D visual interface
• fly through capabilities
• augmented reality

Leveraging IMS
• Presence, Buddy lists, PTT, Video and Audio calls
• Streaming data services
• Content management, geo tagging

Targeted Advertising
• Individualized, based on user preferences
• Integrating social aspects
• Targeting high value customers
MAD: Mobile Advertising and Multimedia Broadcasting
Srinath Kalavichirattil, Saumil Jain, Vighnesh Venkatesan

Idea: Ad Based Mobile Phone Services
- SIP-based pre-call advertising
- universal advertising platform
- sponsored telco services
- making the process “enjoyable”

Highly targeted
- In-call ads
- Location based ads
- Event based ads
- Social network based ads

Leveraging IMS
- SIP call management entry point
- Location services
- Presence services
- Media server
• A location service for the Georgia Tech community
• A research and education enabling service
• Aggregates data from multiple determination methods
• Location information returned in multiple formats
• Allows user feedback through map interface
• Third party lookups and service interface
• Rich Geo-data working with campus GIS
ConCal

Conferencing via Calendars

Your calendar sets up the conference call and calls you!
Why ConCal?

<table>
<thead>
<tr>
<th>Without ConCal</th>
<th>With ConCal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get invited via email</td>
<td>Get invited via email</td>
</tr>
<tr>
<td>Accept via email</td>
<td>Accept via email</td>
</tr>
<tr>
<td>Remember conference time</td>
<td>Answer your phone</td>
</tr>
<tr>
<td>Call into the conference</td>
<td>talk</td>
</tr>
<tr>
<td>Enter conference ID</td>
<td>talk</td>
</tr>
<tr>
<td>Enter PIN</td>
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</tbody>
</table>
Scheduler: Zimbra Extension

Zimlet allows a meeting to become a conference call.
Components of ConCal

• This project included multiple components
  • Web services
  • Zimbra Zimlet development
  • Voice service integration - Asterisk
  • Web client UI
  • Mobile client UI - iPhone, Android, WM
Other Ideas

- **Personal Notebook**
  
  - a true replacement for the notebook, accessible everywhere, organized, easy drawings

- **Consumables Manager**
  
  - keep up with the stuff I regularly buy - filters, bags, bulbs, batteries, ink cartridges, paper
  
  - make re-ordering easy, watch for bargains

- **Augmented Serendipity**
  
  - increase the likelihood of a valuable “chance” encounter
  
  - location, calendar, interest profile
Other Ideas

- **Personal IPTV**
  - TV is generally a shared experience, how do you manage interaction? Bring in the personal mobile device.

- **Campus Life Tools**
  - open gathering place locator - not the formal schedules but where are the people right now?
  - campus navigation - open parking spaces, trolley schedule, walk paths
  - food services: what’s open, what’s crowded, what’s on the menu
Next Steps

• These are the things we’ll be working on to start bringing you next week

• Timelines and schedules

• Lab resources
  • Development tools
  • Devices
  • Expertise