

# Mobile Applications And Services for Converged Networks

Russ Clark

CS 426 I/8803 IMS

Fall 2009



What are we talking about here?

## What are we talking about here?

- Mobile - not tied to your desktop
  - cell phones, pdas, tablets, watches, earbuds, etc

## What are we talking about here?

- Mobile - not tied to your desktop
  - cell phones, pdas, tablets, watches, earbuds, etc
- Applications
  - interactive, social, gaming, business, e-commerce, travel, informational, health care, etc

## What are we talking about here?

- **Mobile - not tied to your desktop**
  - cell phones, pdas, tablets, watches, earbuds, etc
- **Applications**
  - interactive, social, gaming, business, e-commerce, travel, informational, health care, etc
- **Services**
  - presence, location, identity mgmt, group mgmt, PoC, voice, text, video

## What are we talking about here?

- **Mobile - not tied to your desktop**
  - cell phones, pdas, tablets, watches, earbuds, etc
- **Applications**
  - interactive, social, gaming, business, e-commerce, travel, informational, health care, etc
- **Services**
  - presence, location, identity mgmt, group mgmt, PoC, voice, text, video
- **Networks**
  - cellular, WiFi, WiMax, 2.5 G, 3G, 4G, etc

## What are we talking about here?

- **Mobile - not tied to your desktop**
  - cell phones, pdas, tablets, watches, earbuds, etc
- **Applications**
  - interactive, social, gaming, business, e-commerce, travel, informational, health care, etc
- **Services**
  - presence, location, identity mgmt, group mgmt, PoC, voice, text, video
- **Networks**
  - cellular, WiFi, WiMax, 2.5 G, 3G, 4G, etc

**An End to End perspective on mobile applications!**



## IMS Research Competition

2007-2008



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

## Convergence Innovation Competition 2009-10

More Platforms,  
More Implementations,  
More Innovation!

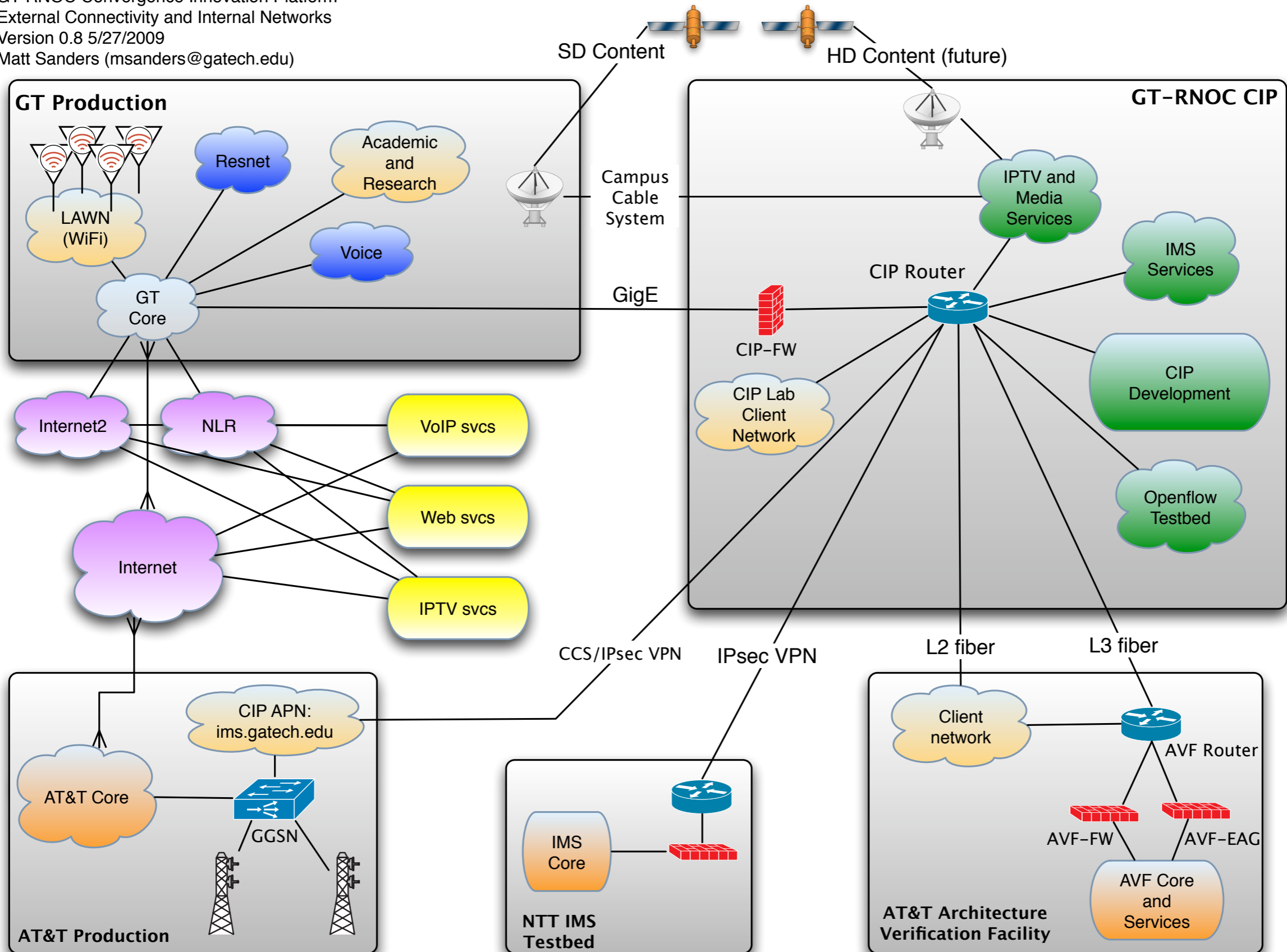
## Convergence Innovation Platform (“CIP”)

*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)



# 2010 Competition - Current Plans

## Convergence Innovation Competition - CIC

## Convergence Innovation Competition - CIC

- Focus on innovative applications in the mobile and converged space

## Convergence Innovation Competition - CIC

- Focus on innovative applications in the mobile and converged space
- Commercially viable - must have a business plan

## Convergence Innovation Competition - CIC

- Focus on innovative applications in the mobile and converged space
- Commercially viable - must have a business plan
- Winners will receive support to move their ideas to commercialization

## Convergence Innovation Competition - CIC

- Focus on innovative applications in the mobile and converged space
- Commercially viable - must have a business plan
- Winners will receive support to move their ideas to commercialization

IP Multimedia Subsystem - A core technology but not the only one



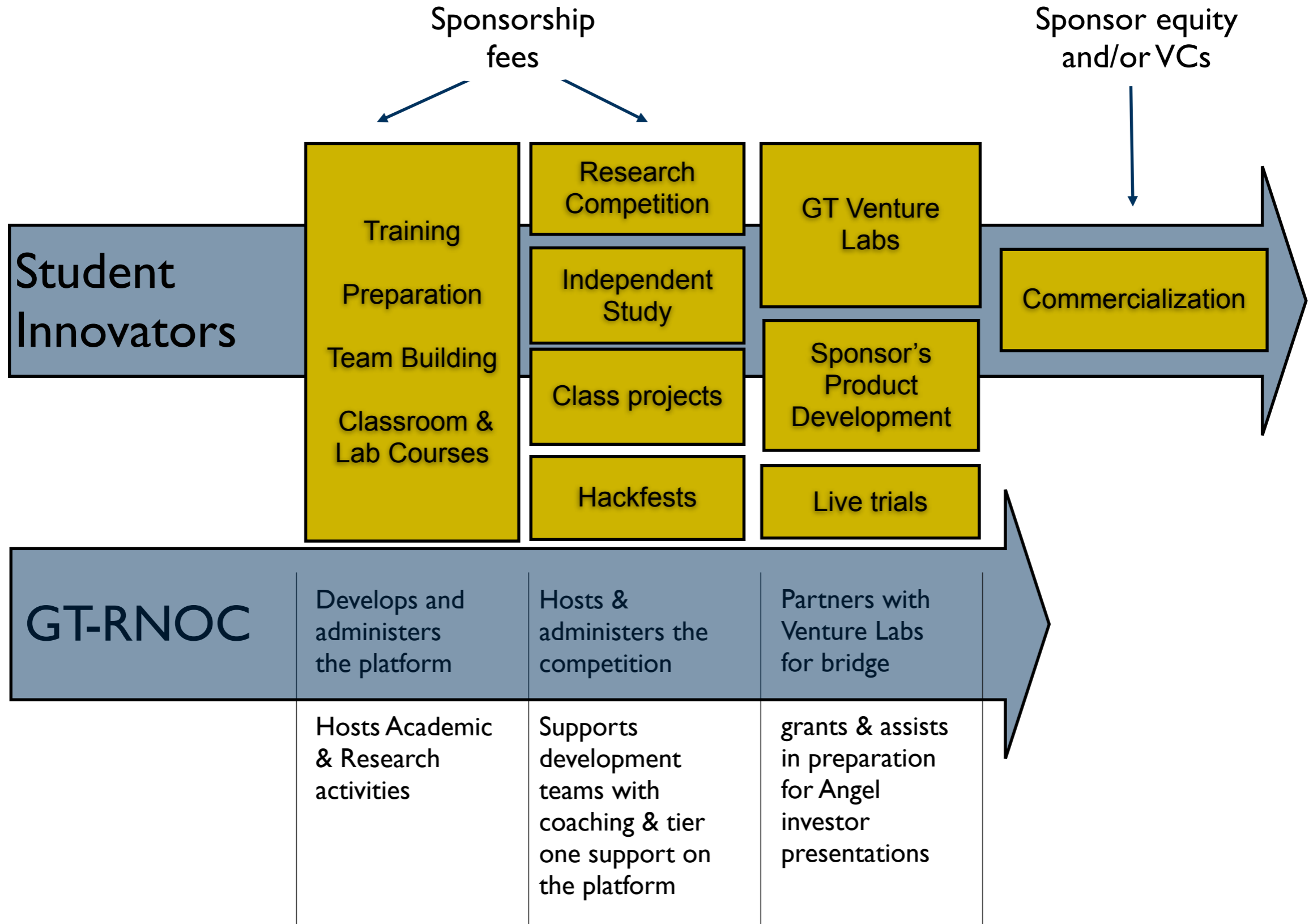
## Convergence Innovation Competition - CIC

- Focus on innovative applications in the mobile and converged space
- Commercially viable - must have a business plan
- Winners will receive support to move their ideas to commercialization

IP Multimedia Subsystem - A core technology but not the only one

- Convergence around IP - including VoIP, IPTV and Web

# Commercialization Pipeline



# CIC Team Building

- Generally teams of 2 to 4 people

- Generally teams of 2 to 4 people
- The most successful teams will have a mix of skill sets
  - marketing, business,
  - networking, handset development
  - not necessarily all from this class

- Generally teams of 2 to 4 people
- The most successful teams will have a mix of skill sets
  - marketing, business,
  - networking, handset development
  - not necessarily all from this class
- We will facilitate team building through the lab and web site

# Back To This Class

# Back To This Class

- Two primary goals for this class are:



- Two primary goals for this class are:
  - Build your expertise in the area of Mobile Apps and Services

- Two primary goals for this class are:
  - Build your expertise in the area of Mobile Apps and Services
  - Enhance the knowledge and resources in the GT lab - This is your “*Platform Contribution*”

- Two primary goals for this class are:
  - Build your expertise in the area of Mobile Apps and Services
  - Enhance the knowledge and resources in the GT lab - This is your “*Platform Contribution*”
- Your active participation will be critical

- Two primary goals for this class are:
  - Build your expertise in the area of Mobile Apps and Services
  - Enhance the knowledge and resources in the GT lab - This is your “*Platform Contribution*”
- Your active participation will be critical
  - Working on your group projects

- Two primary goals for this class are:
  - Build your expertise in the area of Mobile Apps and Services
  - Enhance the knowledge and resources in the GT lab - This is your “*Platform Contribution*”
- Your active participation will be critical
  - Working on your group projects
  - Group presentations

- Two primary goals for this class are:
  - Build your expertise in the area of Mobile Apps and Services
  - Enhance the knowledge and resources in the GT lab - This is your “*Platform Contribution*”
- Your active participation will be critical
  - Working on your group projects
  - Group presentations
  - Discussions in-class and all over campus

# Class vs Competition

# Class vs Competition

- 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



- 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
- **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.

- <http://www.cc.gatech.edu/fac/Russell.Clark/Classes/09/MAS-fall/index.html>

# Technologies and Examples

# Technologies and Examples

Some stuff we'll be talking about this semester

Some stuff we'll be talking about this semester

- SIP - Session Initiation Protocol - VoIP

Some stuff we'll be talking about this semester

- SIP - Session Initiation Protocol - VoIP
- IMS - IP Multimedia Subsystem

Some stuff we'll be talking about this semester

- SIP - Session Initiation Protocol - VoIP
- IMS - IP Multimedia Subsystem
- Location Services

Some stuff we'll be talking about this semester

- SIP - Session Initiation Protocol - VoIP
- IMS - IP Multimedia Subsystem
- Location Services
- Presence Services



## Some stuff we'll be talking about this semester

- SIP - Session Initiation Protocol - VoIP
- IMS - IP Multimedia Subsystem
- Location Services
- Presence Services
- SIP and Web A/S - Application Servers

## Some stuff we'll be talking about this semester

- SIP - Session Initiation Protocol - VoIP
- IMS - IP Multimedia Subsystem
- Location Services
- Presence Services
- SIP and Web A/S - Application Servers
- Interactive TV - IPTV

# IMS Benefits - Official Story

# IMS Benefits - Official Story

- Access Independence - not just Cellular: wired, WiFi, WiMax, etc

# IMS Benefits - Official Story

- Access Independence - not just Cellular: wired, WiFi, WiMax, etc
- Standards Based - IP, SIP, portable across providers

# IMS Benefits - Official Story

- Access Independence - not just Cellular: wired, WiFi, WiMax, etc
- Standards Based - IP, SIP, portable across providers
- QoS - ability to link application needs to provisioning

- Access Independence - not just Cellular: wired, WiFi, WiMax, etc
- Standards Based - IP, SIP, portable across providers
- QoS - ability to link application needs to provisioning
- Billing/Charging - for commercial viability, carrier ROI, “one bill”

- Access Independence - not just Cellular: wired, WiFi, WiMax, etc
- Standards Based - IP, SIP, portable across providers
- QoS - ability to link application needs to provisioning
- Billing/Charging - for commercial viability, carrier ROI, “one bill”
- Integration of new services - no more stovepipe applications



- Access Independence - not just Cellular: wired, WiFi, WiMax, etc
- Standards Based - IP, SIP, portable across providers
- QoS - ability to link application needs to provisioning
- Billing/Charging - for commercial viability, carrier ROI, “one bill”
- Integration of new services - no more stovepipe applications
  - presence, location, group management, PoC, voice, text, video

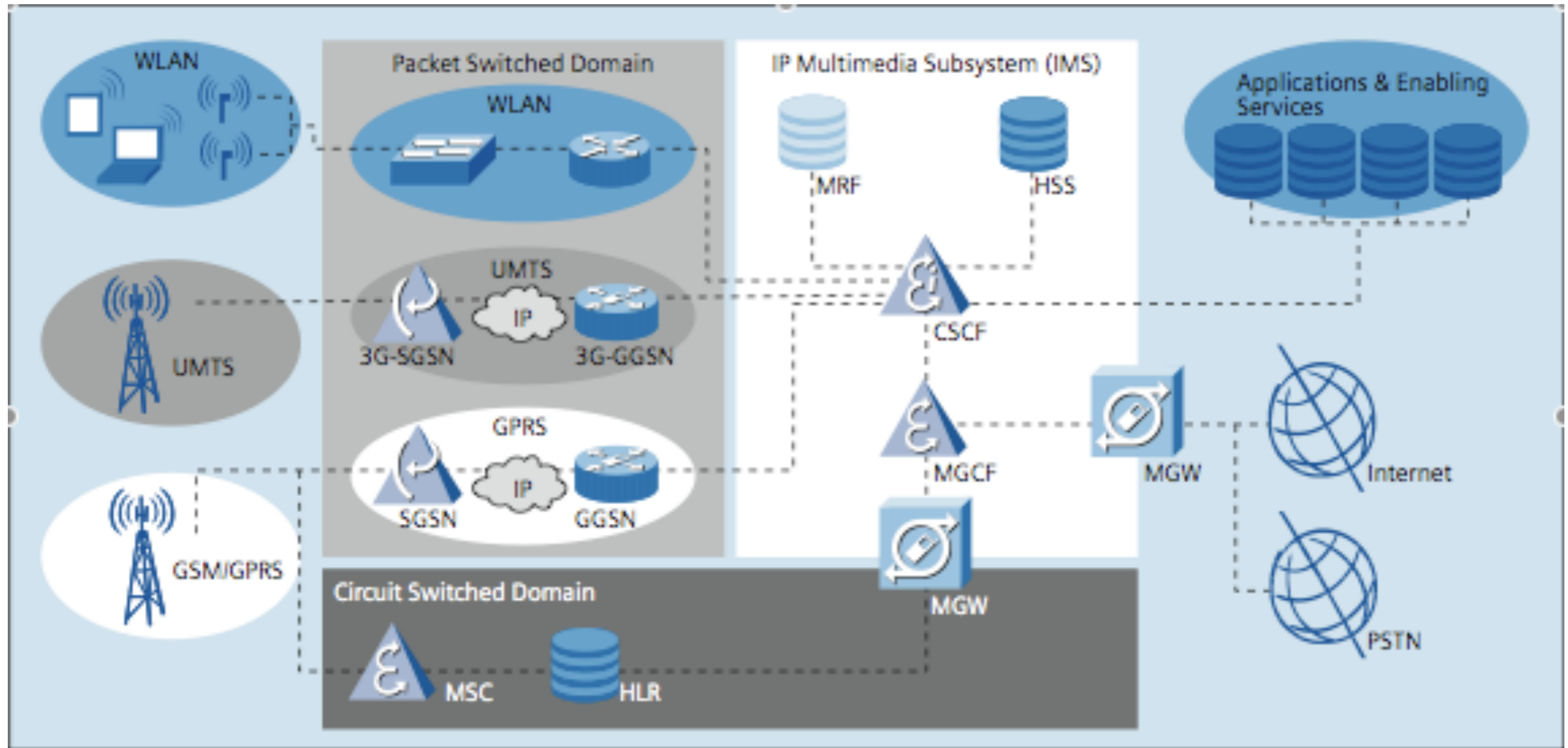


Figure 1: Position of the IP Multimedia Subsystem within a mobile network

IMS - S stands for *SUB*system

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?

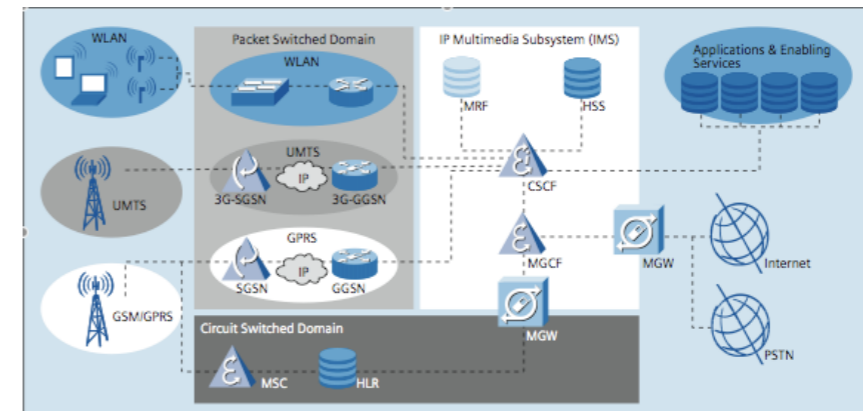


Figure 1: Position of the IP Multimedia Subsystem within a mobile network

# 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!

# 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!

# All Those Web Applications

- And they're using Web APIs for Network Services
- They've made it fun and easy!

Google™



flickr™





# 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?



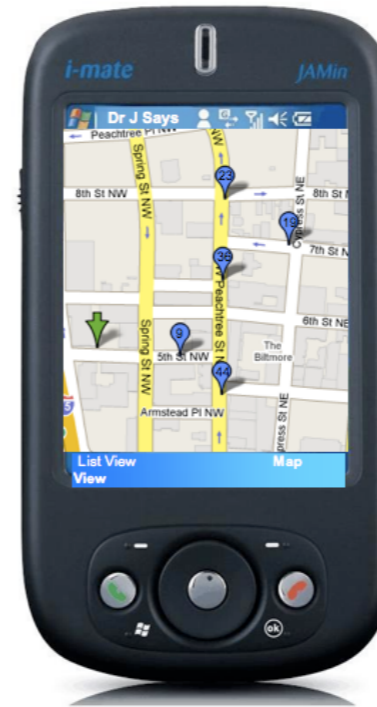
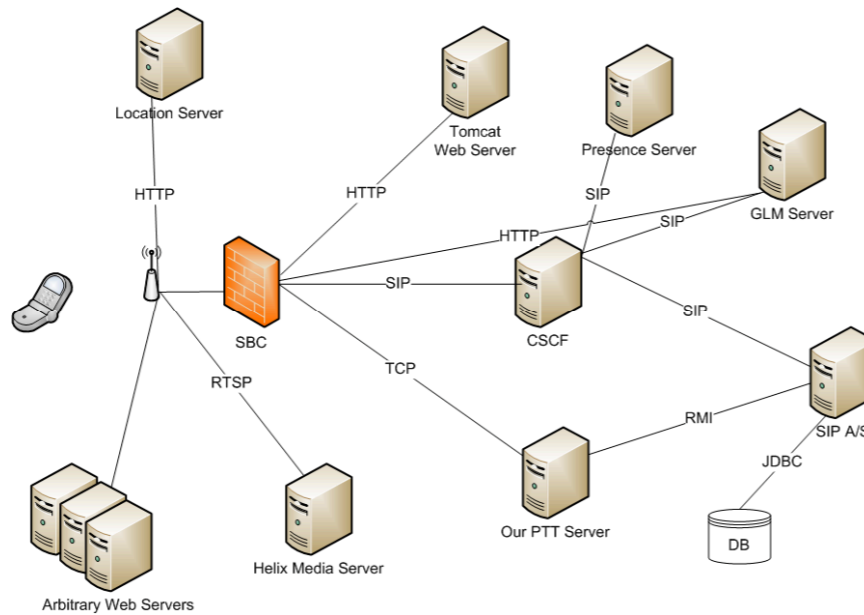
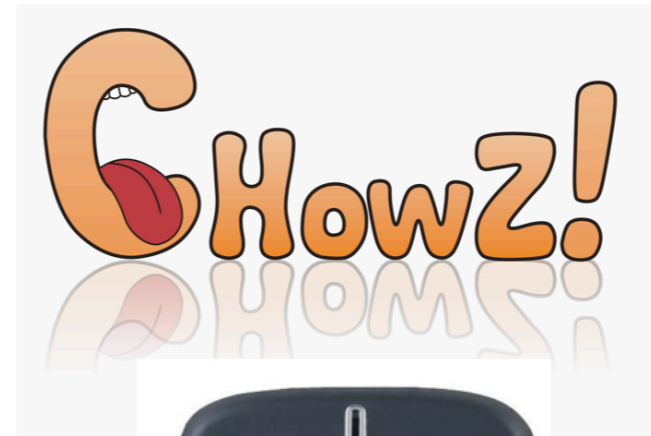
- lessons from the iPod
- have to account for diversity
  - handsets, I/O, and networks
- location services case study .... “coupon spam”
- can't assume *always on* connections (problem of Mobile Google Maps)

- 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

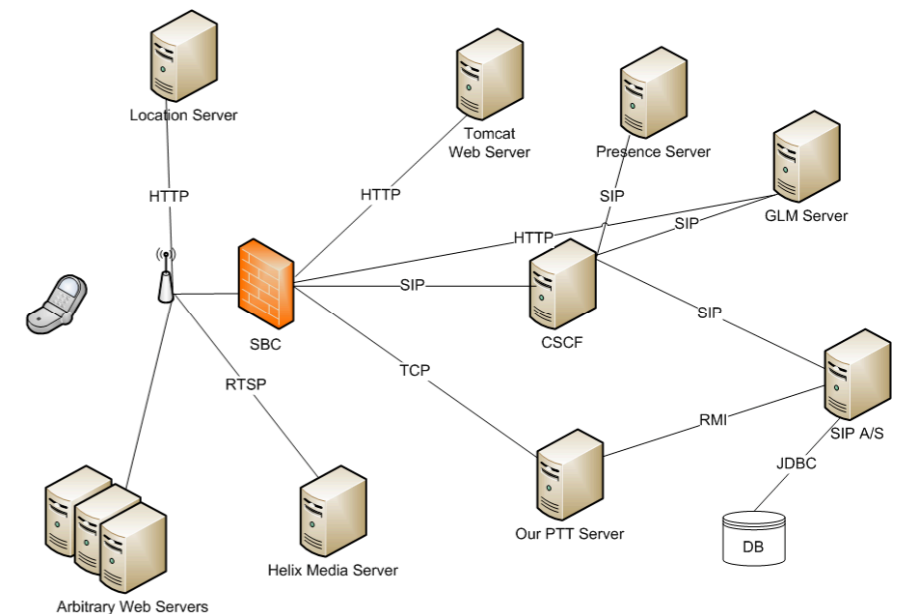
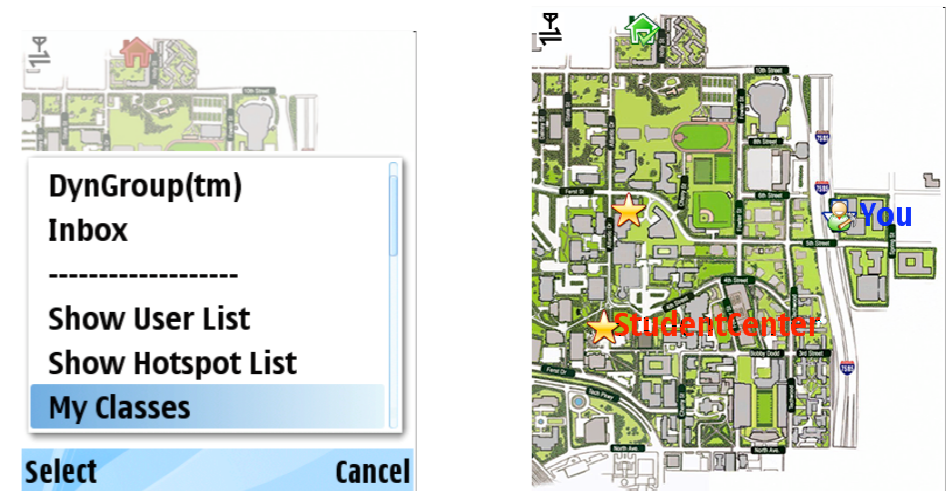
*Nils Kjellin, Christian Menkens, Matthew Rhodes, Anders Davoust*

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





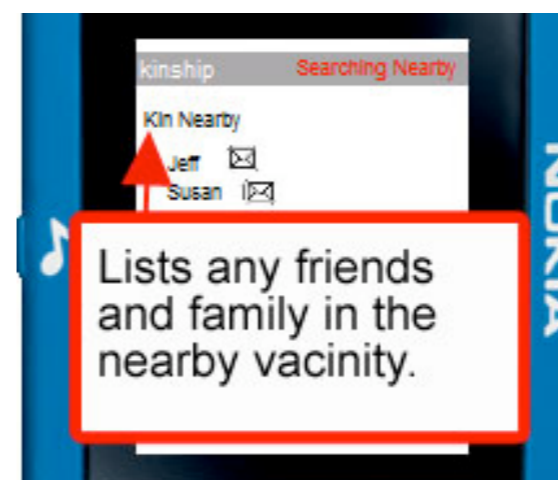
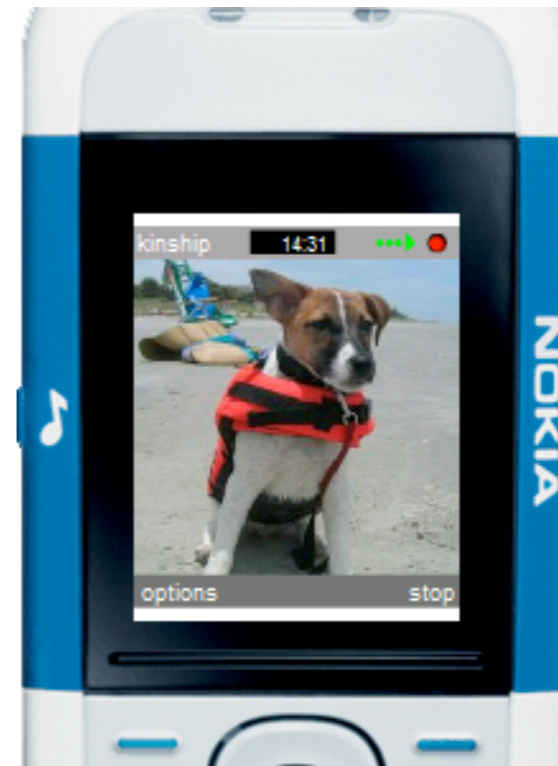
## Kinship

*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



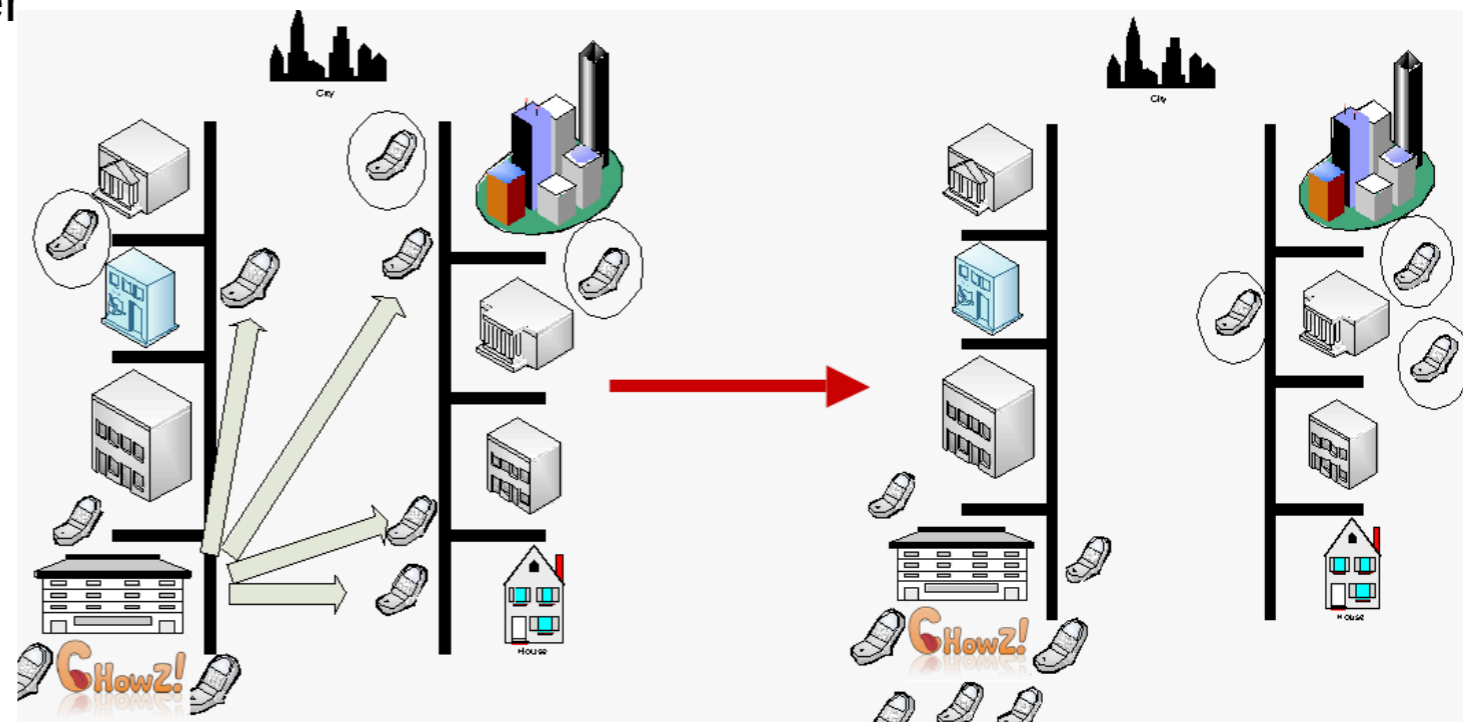
# CHOWZ!

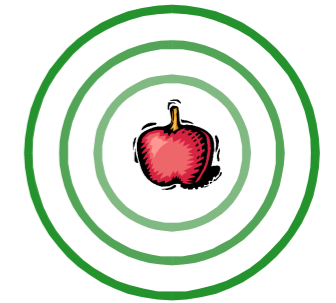
Harry Marr, Jason George

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 advice
- 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

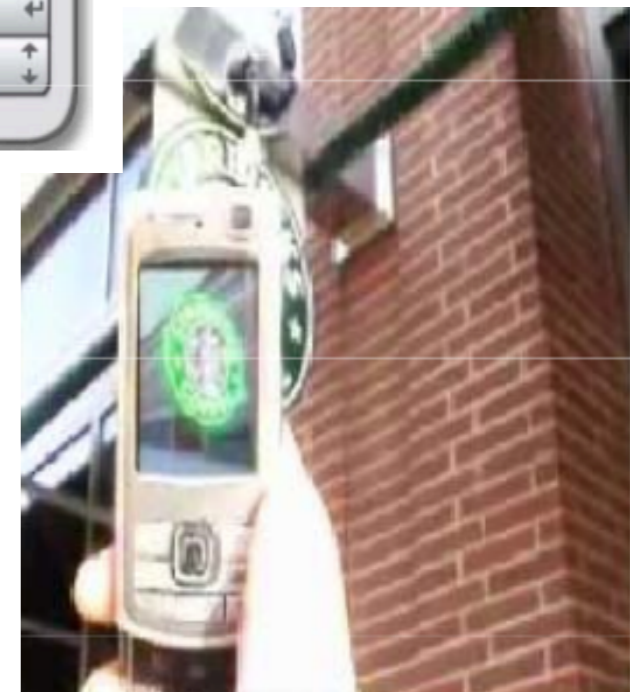
- location based ads and coupons
- enhanced 3D visual interface
- fly through capabilities
- augmented reality

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

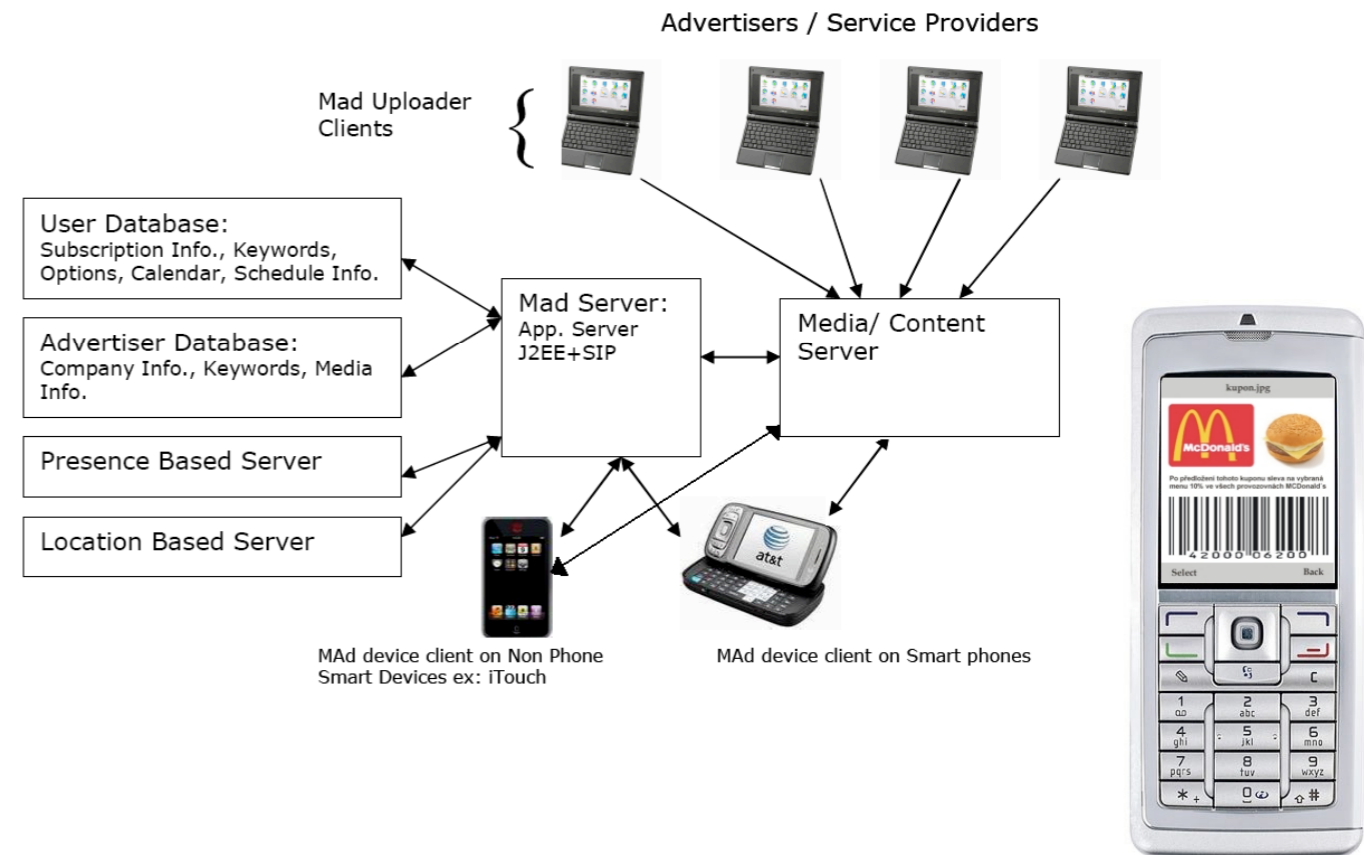
- SIP-based pre-call advertising
- universal advertising platform
- sponsored telco services
- making the process “enjoyable”

### 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 feed back through map interface
- Third party lookups and service interface
- Rich Geo-data working with campus GIS

[whereami Home](#) Using the [Association Event](#) location determination method:  
You are currently at 33.7772570005, -84.3901139999 with an accuracy of 50 meters at 2008-01-28 13:27:36.

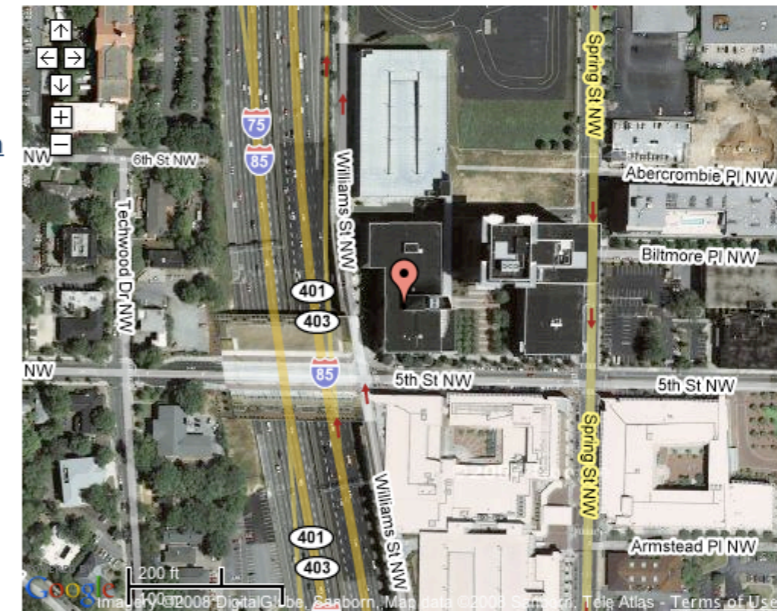
[Raw Location Data](#)

[Projects](#)

[Documentation](#)

[Programming](#)

[People](#)



If you believe the given location information to be inaccurate please let us know [where you think you should be](#).

If you have any comments or questions, please email us at [location@lists.gatech.edu](mailto:location@lists.gatech.edu)

## Conferencing via Calendars

**Your calendar sets up the conference call and calls you!**

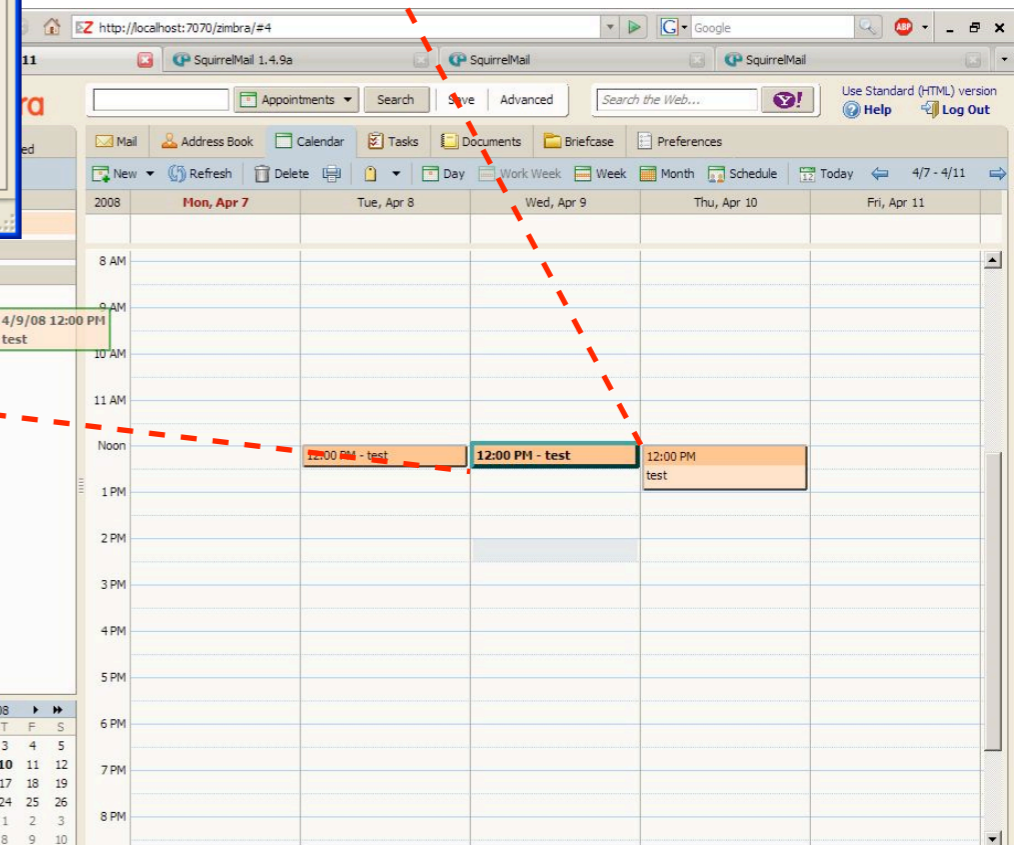
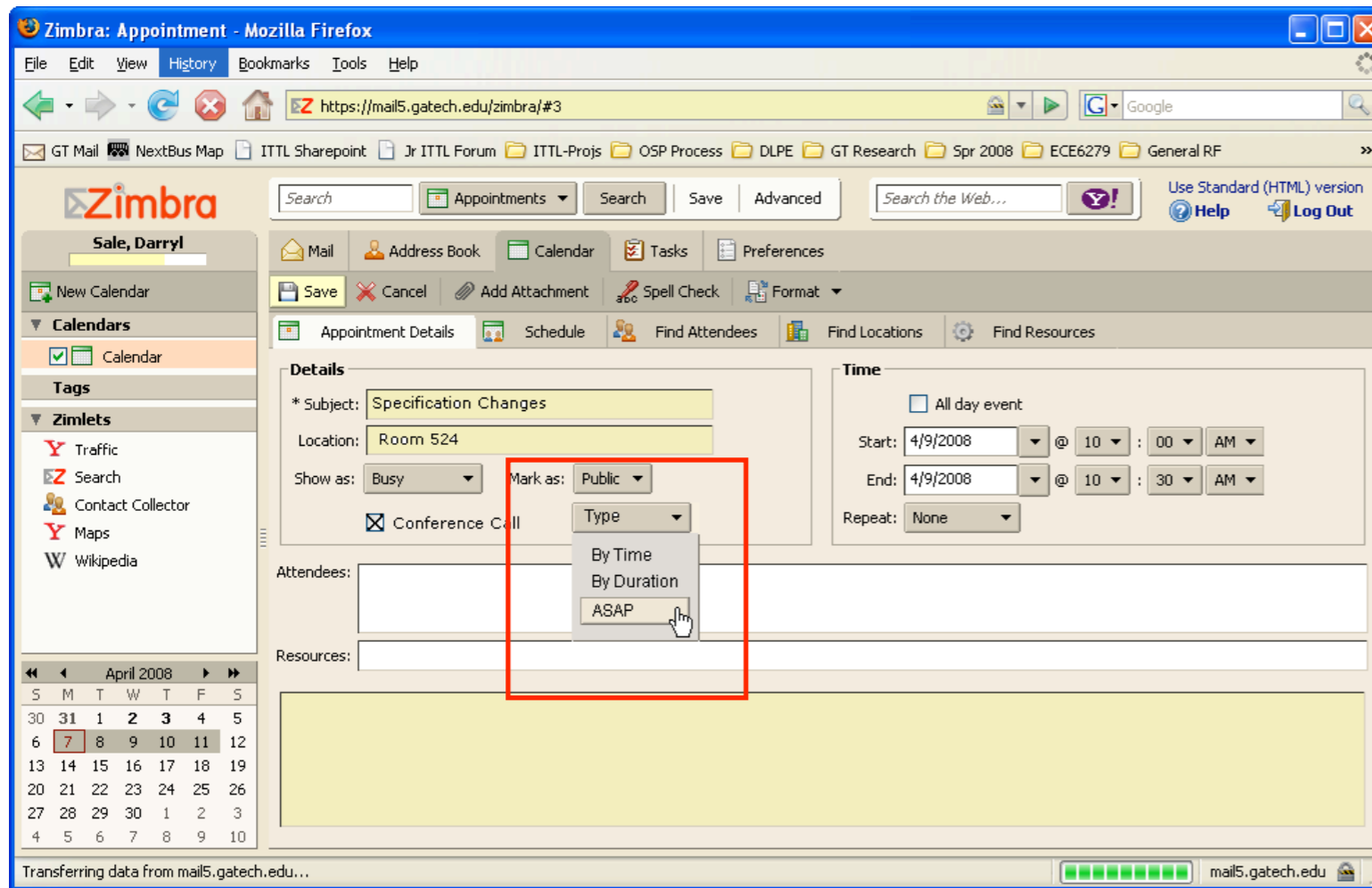
# Why ConCal?

Without Concal	With Concal
Get invited via email	Get invited via email
Accept via email	Accept via email
Remember conference time	Answer your phone
Call into the conference	talk
Enter conference ID	talk
Enter PIN	talk



# Scheduler: Zimbra Extension

Zimlet allows a meeting to become a conference call



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

- **Personal Notebook**

- a true replacement for the notebook, accessible everywhere, organizable, 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

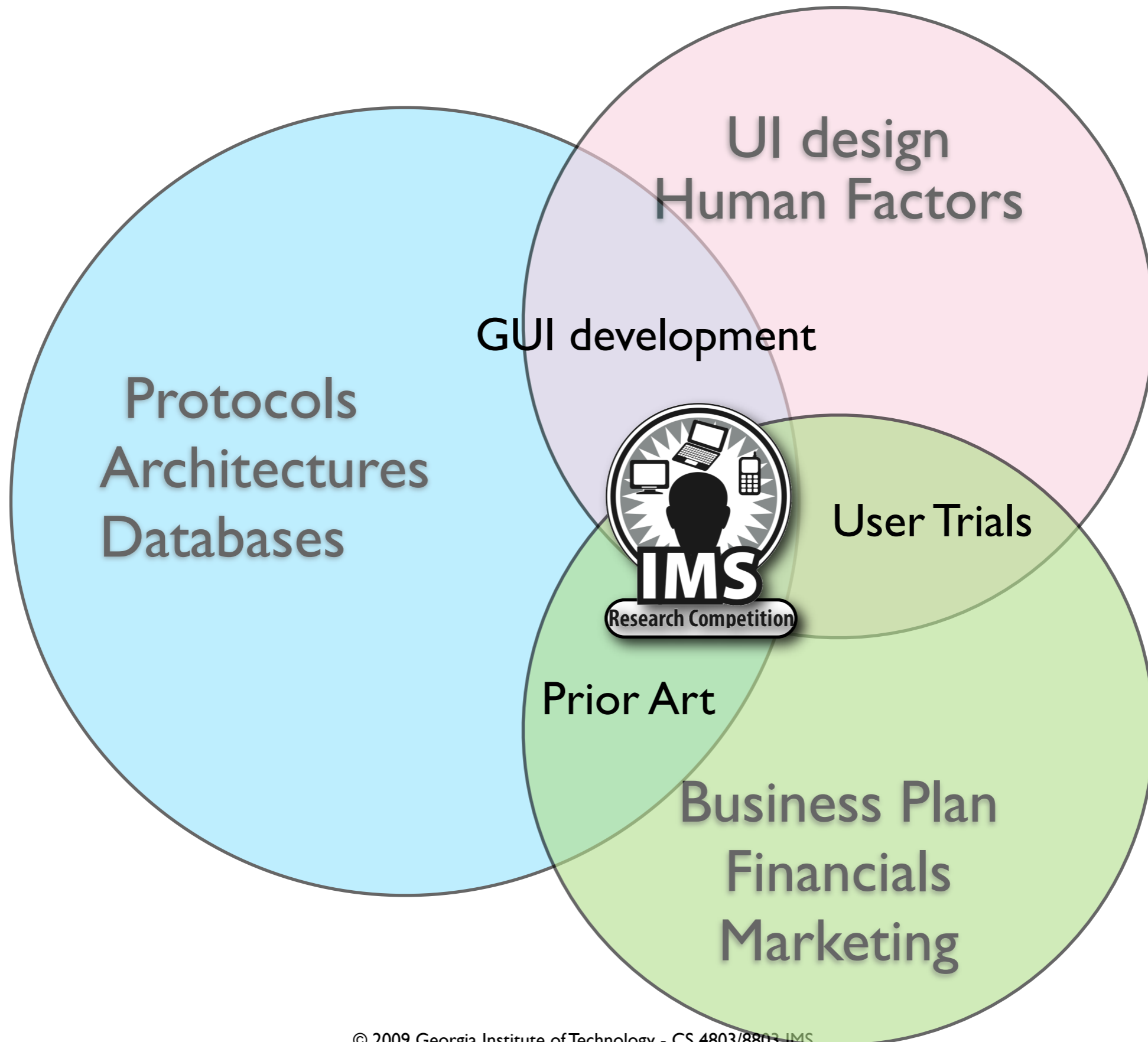
- **Personal IPTV**

- 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

# Back to the Team



- These are the things we'll be working on to start bringing you next week
- Timelines and schedules
- Lab resources
  - Development tools
  - Devices
  - Expertise