

Ubiquity for Everyone; Are we There ?

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Panelists:

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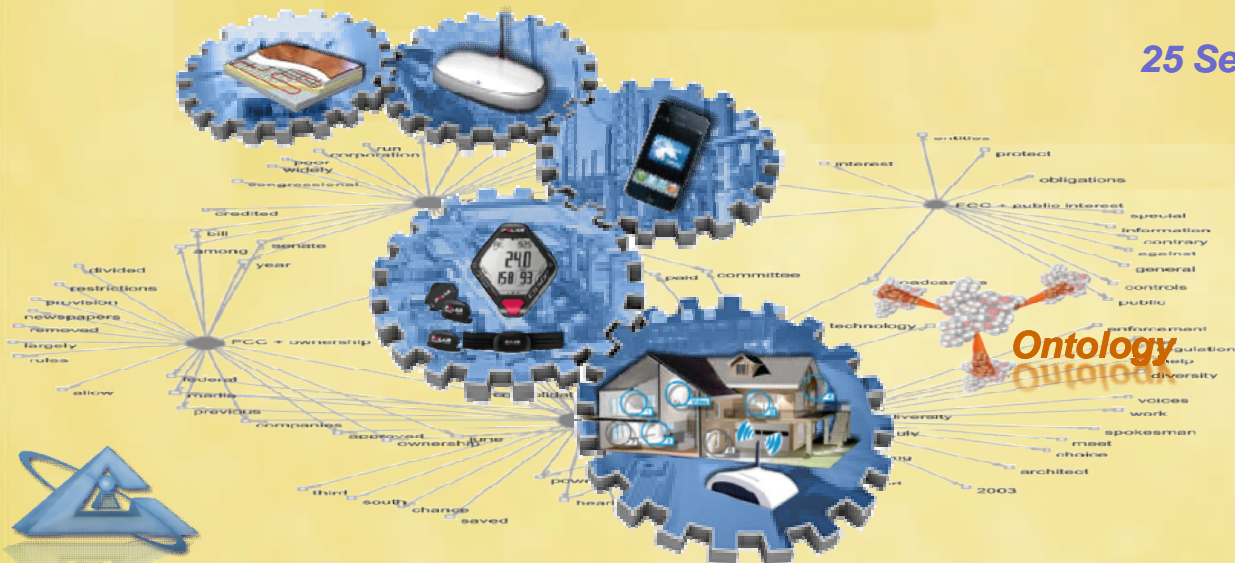


*IARIA the Sixth International Conference on Mobile
Ubiquitous Computing, Systems and Technologies
UBICOMM 2012*

***PANEL UBICOMM:
Ubiquity & Interoperability – are we ready?***

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Industrial Ontologies Group



University of Jyväskylä



Where are we with our needs?

For ubiquitous servicing via ubiquitous information exchange and processing we would need wide-scale systems interoperability, availability and accessibility of data...

Are we close to that right now?

Availability of data

- unavailability of data limits us to develop new useful service;*
- became available later, data may cause reimplementing of a service that might cost for provider too much and user will be left without improvement of the service;*
- human orientation of data formats slows down the process of intelligent autonomous service creation;*
- limited data availability whittles away context-awareness of applications and services.*

Data source accessibility

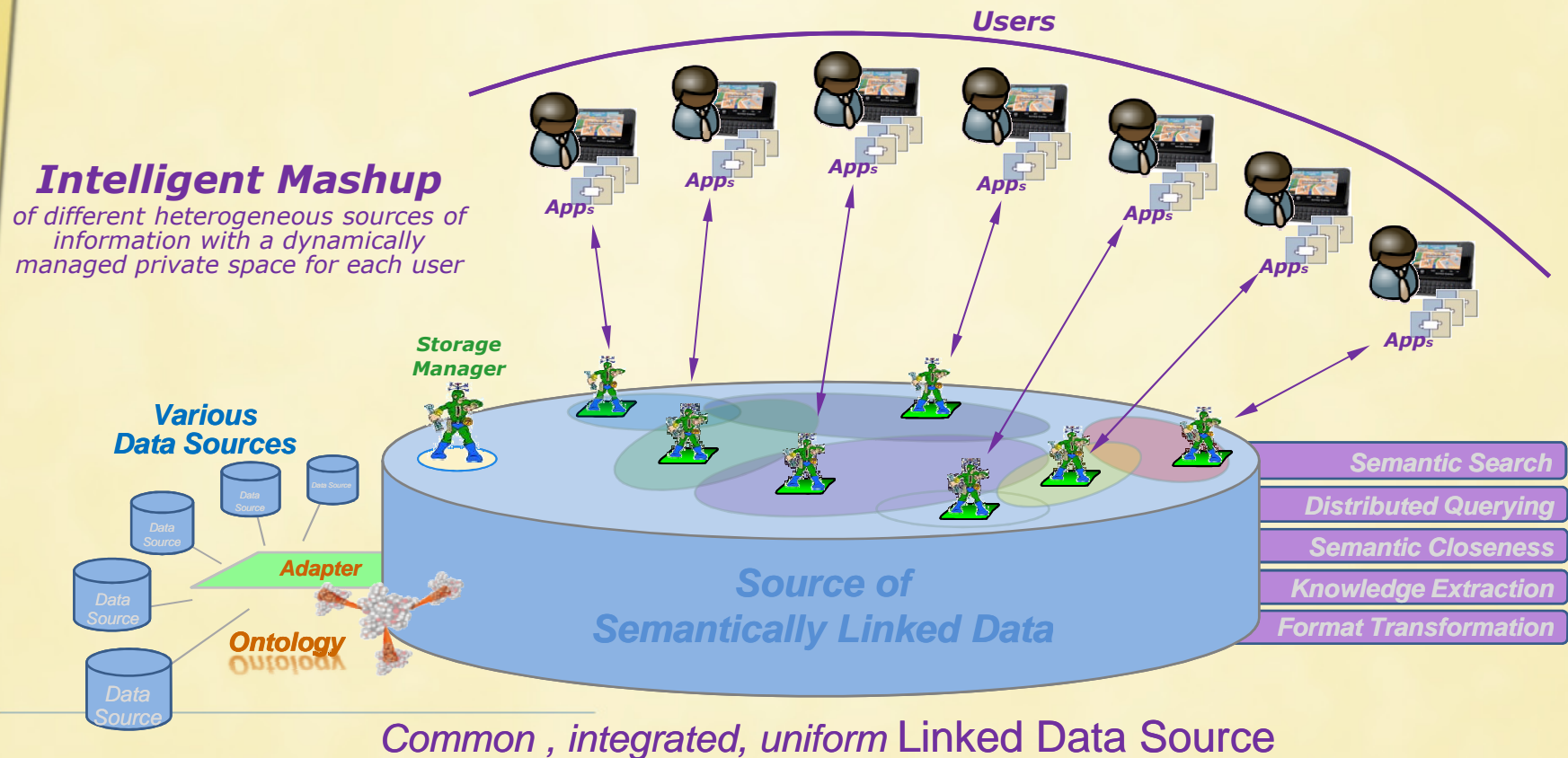
- complex accessibility and heterogeneity of data sources limits consumption of data by applications and services;*
- passiveness of data sources, lack of handy channels to provide and manage data minimizes amount of possible data providers and complicates the process of data creation and update.*

Limited flexibility of applications and services

- being bounded to certain data source, service is limited with possibility to access other data sources, to get more fresh and updated information;*
- being based on limited (closed) data model, service is not able to utilize data produced by another services and be interoperable.*

Intelligent Data Aggregation

We have huge amount of information and data sources with different level of readiness to be widely consumed by intelligent services. All of them could be considered as heterogeneous Data Content Providers. Nowadays, we extremely need more **Data Aggregators** (that are able to provide uniform semantically linked data to be consumed by third parties) and data-independent, flexible and context-sensitive **Intelligent Services and Application** (that operate with available data on the semantic level).





How to proceed?

What are the sufficient business models around open and ubiquitous data provisioning?

How to encourage people and organizations (data providers, application/services developers, users, etc.) to provide semantic annotation to the produced/provided entities? How to facilitate and automate the process of Linked data creation?

Is it enough to follow unsupervised semantic annotation approach and only facilitate the automation of heterogeneous ontology alignment process or do we need to provide supportive infrastructure with more control/supervising of that process?

???



Ubiquity for Everyone; Are we There?

Dr. Javier Rubio-Loyola

**CENTRE FOR RESEARCH AND ADVANCED STUDIES
OF THE NATIONAL POLYTECHNIC INSTITUTE - CINVESTAV**

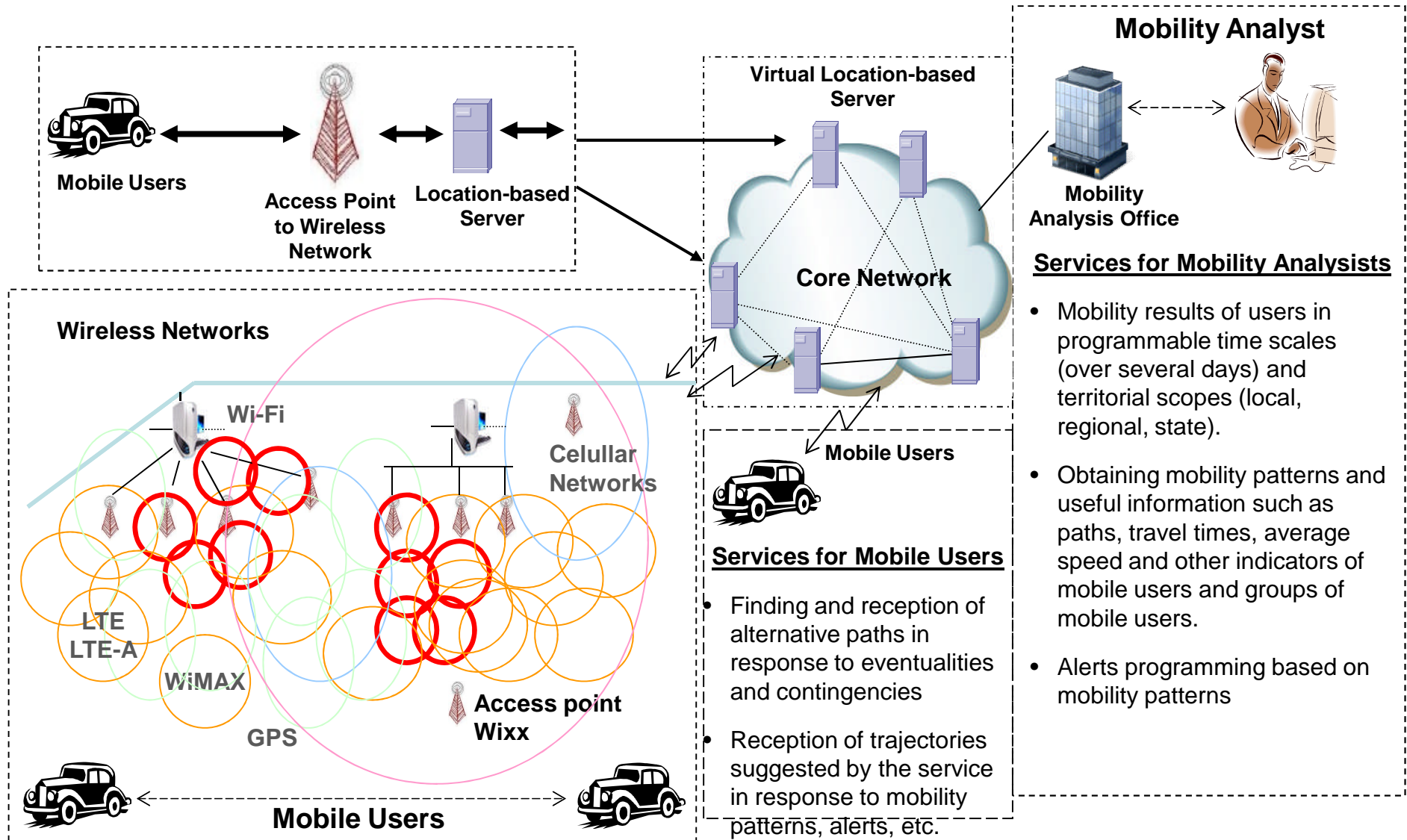
Cinvestav Tamaulipas, Mexico

<https://www.tamps.cinvestav.mx/~jrubio/>
jrubio@tamps.cinvestav.mx

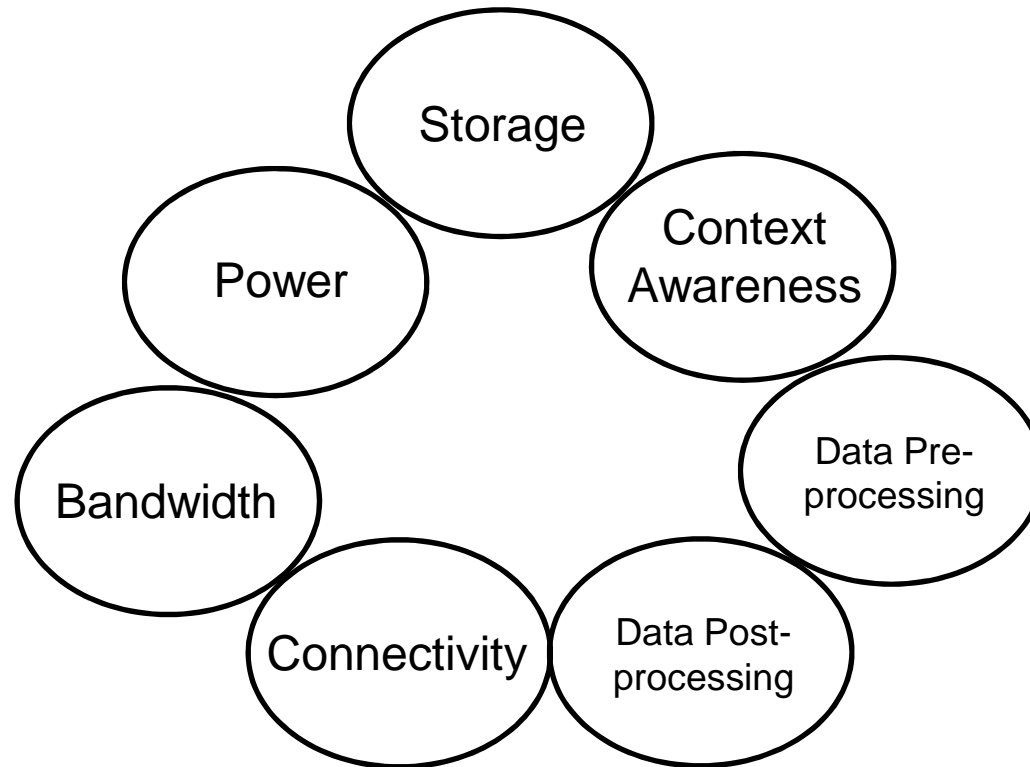
An Ubiquitous Location-based Service



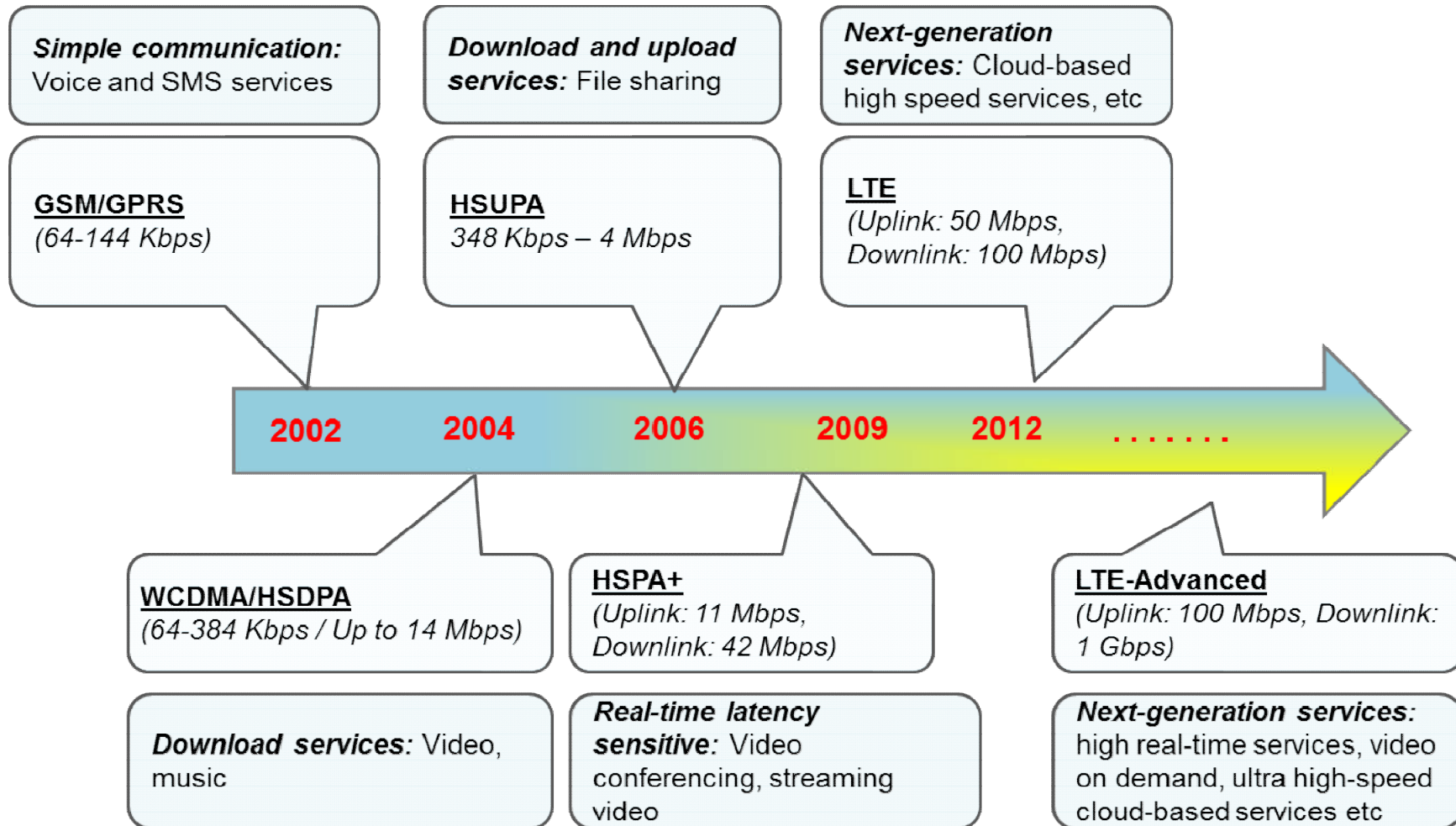
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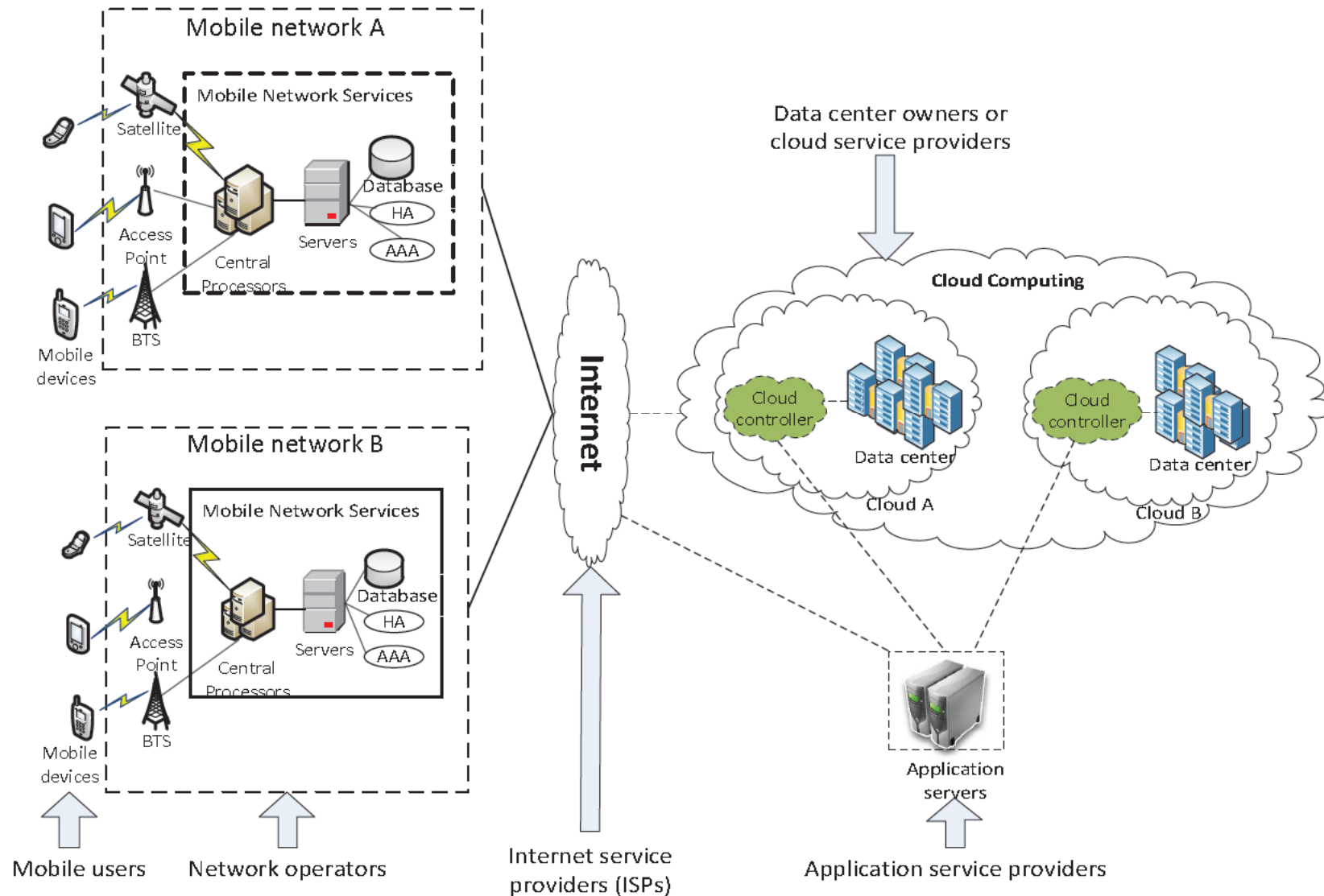
Key Technical Challenges



Timeline evolution of mobile communications



Mobile Cloud Computing



Ubiquity for Everyone; Are we There?



- Key technologies (Mobile Communications and Cloud Computing) are getting more powerful to address key technical challenges: Bandwidth, connectivity, power, storage, context awareness.
- Tailored applications will need to take care of data pre- and post-processing to exploit the above technologies in favour of more complex, efficient, advanced ubiquitous services
- Ubiquity for Everyone; are we there? – we are progressing

Ubiquity and the PHY

T. Pratt

University of Notre Dame

UBICOMM 2012

Barcelona, Spain

Is the Wireless Experience Ubiquitous?

- My impression is that most would say 'No', but on the other hand would agree that we are making substantial strides in that direction
- Drawing from my personal experiences:
 - Poor cellular and internet coverage at home (rural coverage)
 - Call drops due to spotty rural coverage on the way to work
 - Lack of reliable coverage on campus during football games (density issue)
 - Poor cellular coverage in Engineering Hall, but great internet coverage
 - No coverage at some off-site work locations
- Solutions will likely draw from a wide swath of technologies and strategies

PHY+

- As a PHY researcher, I believe that avenues remain to be explored in the PHY (and crosslayers) that can be part of an overall solution to enhance the performance of systems, and contribute to wireless ubiquity
- Goal is to develop and prove these out and then bring them to bear on existing/new standards, and ultimately to have a positive influence in the development of more capable systems

Example of Current PHY+ Research (at VTC 2012, Quebec)

- Cognitive radio and spectrum sensing
- Antennas and propagation
- Adhoc mesh sensor networks
- Cooperative communications/distributed MIMO/relaying
- Mobile satellite and positioning systems
- Multiple antenna systems; space-time-frequency processing
- Multiple access techniques
- Wireless networks
- Transportation, Vehicular Electronics and Telematics
- Transmission Techniques
- Signal Processing

My Present Research Thrusts

- PHY-based overlays for range extension/improved error rate performance
- Interference suppression “front ends”
- interference avoidance through adaptive transmission techniques
- Energy detection (e.g., to support spectrum sharing)
- Investigation of architectures for power efficient communications
- Localization techniques
- Channel characterizations and modeling
- Security (PHY-based security)

Ubiquity for Everyone; Are We There?

- e-Learning anytime, everywhere
 - e-Learning is not limited to distant learning
 - that is also used in a class to support individual / collaborative learning
 - Some examples:
 - Learning Management System (LMS) provides:
 - Learning materials in several formats (HTML, Video, ...)
 - » e-Textbook
 - Questions and answers to check achievement
 - Communication facilities
 - » Discussion board, support tool for collaborative learning
 - Accessing to LMS using Smartphone, TabletPCs
 - » In classroom, at home, ...
 - Attendance management system;
 - Attendance information can be registered from a mobile phone. Sometimes come with response-analyzer

e-Learning anytime, everywhere

- To carry out lessons in which all the students use Ubiquitous devices;
 - Universities / Teachers force students to buy them
 - Universities / Teachers lend them to students
- Normally, communities which communicate by ubiquitous devices are formed by favorite friends
- Are students happy
 - to participate communications using in the group directed by the teacher?

Information that is needed when a disaster occurs

- Last year we experienced terrible earthquake and Tsunami in Japan
- Infrastructures / supply system are badly damaged
 - Buildings, roads, railways, cars, ...
 - Telephone / mobile-phone, electric power supply, water supply, food, goods, petrol, ...
- There was no violence but confusion
- We could not get general / personal information when we need it
 - Who survives? / where is survivors?
 - Panic / scare buying for food, water, petrol, ...
 - Radiation level – where to escape?
 - We need very robust system and all the people utilize information tools
 - Hopefully, such information should be automatically recorded and distributed