ICN Panel: Internet at Crossroads!

- bandwidth
- speed
- protocols (IPv6, new TCP ?)
- scalability
- autoconfiguration
- Access, availability
- Energy / green internet
- New Internet (IoT, …)

- **Guest panelists:**

  Benoit Escrig, Université de Toulouse, France
  Mingmei Li, KDDI R&D Labs., Japan
  Fanilo Harivelo, Université de la Réunion, France
  Katsuhiro Naito, Mie University, Japan

KDDI R&D LABS

Mobile Data Collection-Applications &Technologies

ICN 2012 Panel

Mingmei Li, Kazuyuki Tasaka, Kiyohito Yoshihara

KDDI R&D Labs., Japan

Mobile Data Collection- Applications

KDDI R&D LABS

Personal Data
(smart-phone, tablet user)

- Smartphone application / network log
- Health, breath record, sports data,
- Tracking, location based services GPS, wifi,
- Purchasing data, barcode scanning, environment data, air Pollution

Data Center
・Market/commercial
・Contents recommendation
(Amazon, Yahoo, Facebook, ISP,)

Hospital / Health Center
・Healthy monitoring, management, consulting , supporting
Google, Microsoft, KDDI , docomo, etc,)

Designing The Future
KDDI

NTT docomo

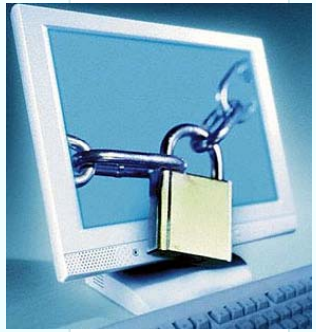
Mobile Data Collection- Technologies

Challenges& status

End-user
(smart-phone, tablet user)

Anonymous collection
personal information
security/ privacy

User context information
collection
(e.g., camera, RFIF, GPS,
wifi, phone built-in sensors
(KDDI labs.)) energy/
memory constraint



Challenges & status

Data center
(Platform)

Cloud computing
Virtualization

Business Modeling
(automatically)

Prediction possibility

Robust (adaptively to
other field)

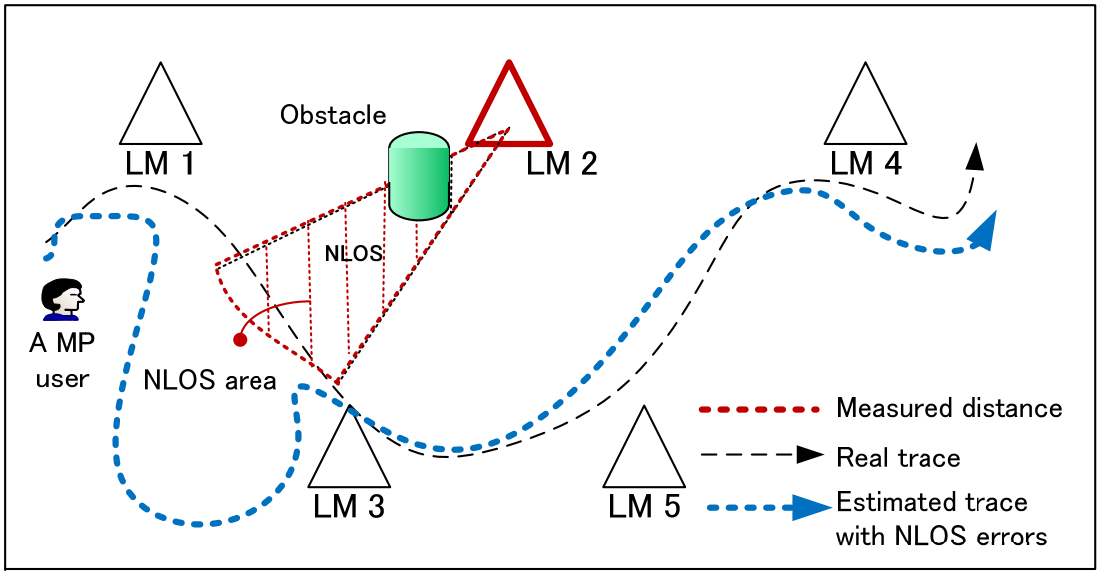
Effectiveness (low cost)

Mobile Data Collection- Technologies

KDDI R&D LABS

Our proposal
obtain Location Data with High Accuracy (Indoor environments)

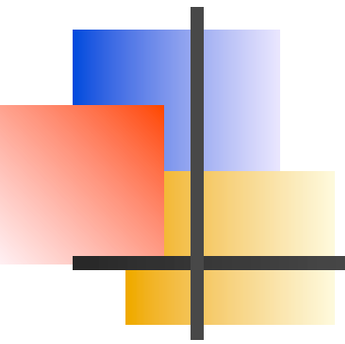
To obtain location data with high accuracy, we use reference information from phone built-in sensors.



e.g. HTC Touch Diamond's built in accelerometer, with .NET CF 2.0, allows user to know steps, distance, etc.

- Our result: location data can be obtained with less error, about 20%-40% , with less reference landmarks in indoor environment.
- Effects: supports a mother find her children in a shopping more accurately

ICN 2012, Reunion Island



Cooperative communication and Seamless mobility at Crossroads

Katsuhiro Naito

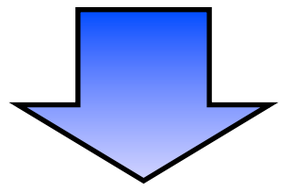
Mie University, Japan

March 3, 2012

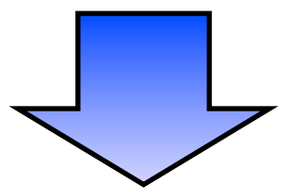
Communication at Crossroads

Tough communication is required

- High packet delivery ratio
- Short transmission delay
- High scalability



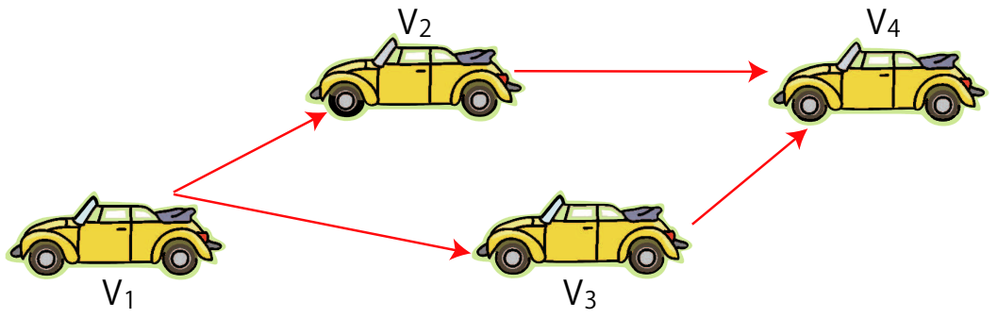
Physical layer performance is important to improve these requirements

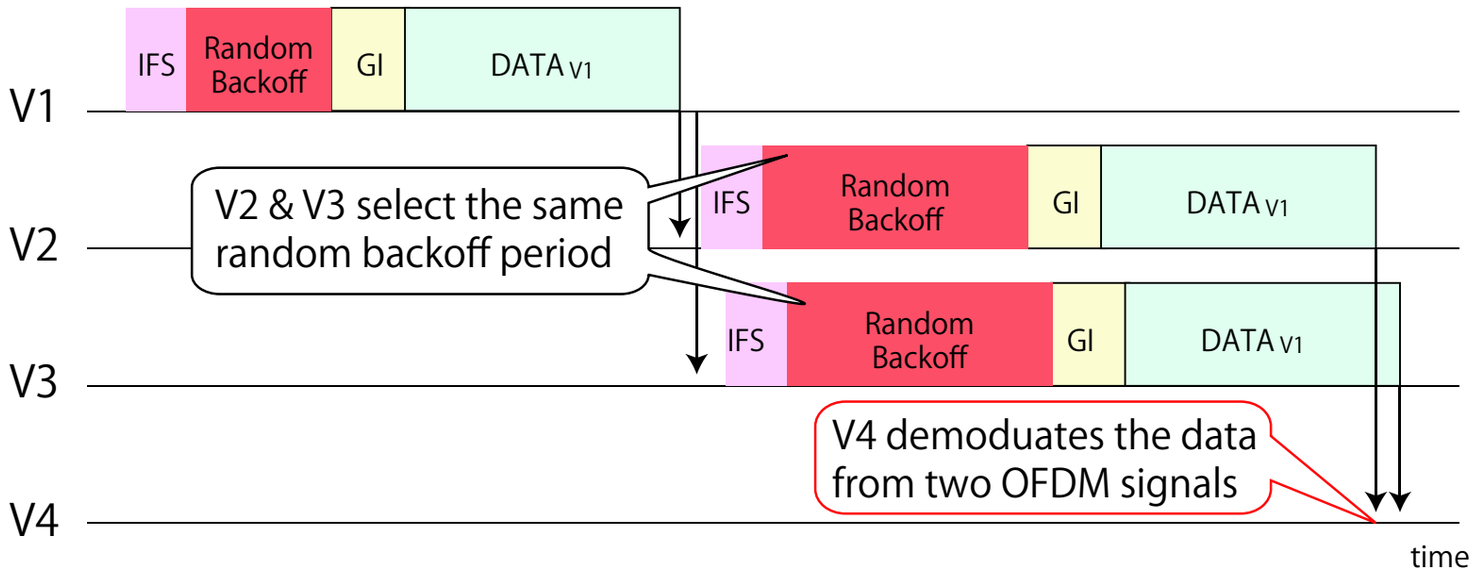


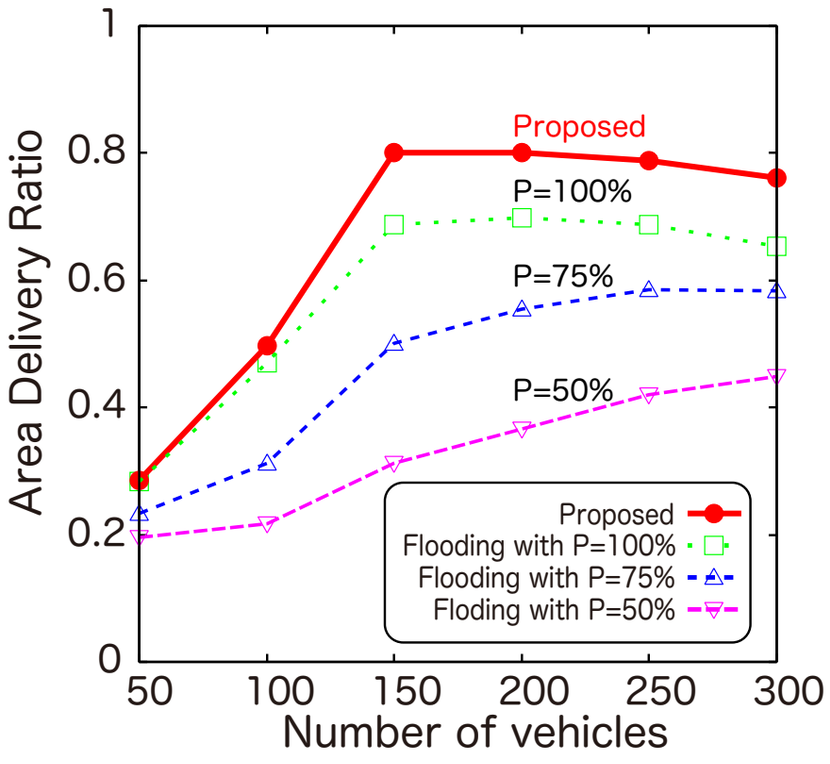
OFDM based cooperative communication has good benefit at Crossroads

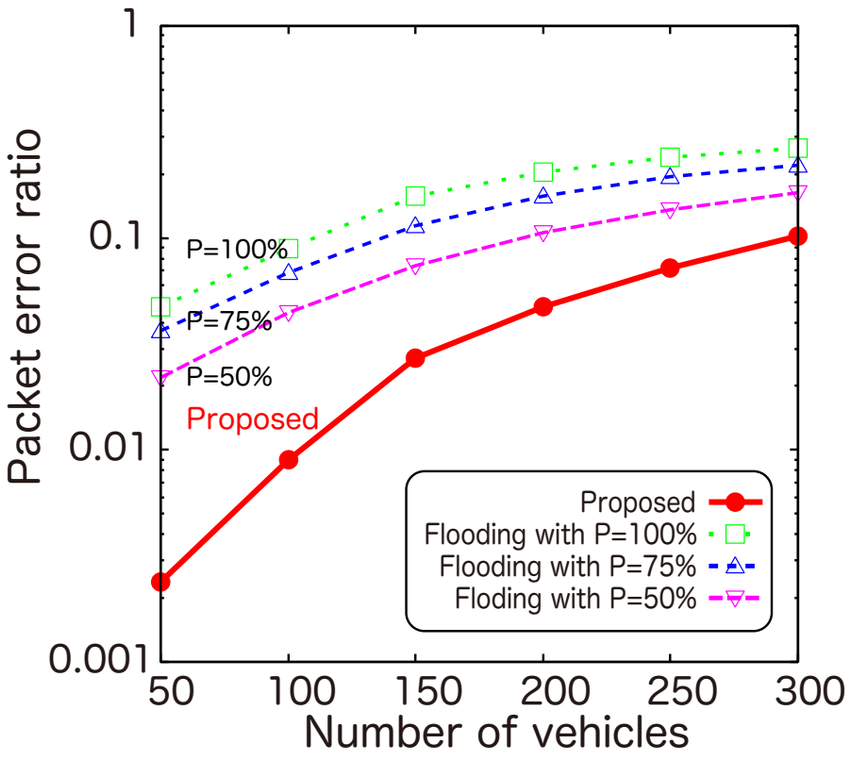
OFDM(Orthogonal Frequency Division Multiplexing) based cooperative communication scheme

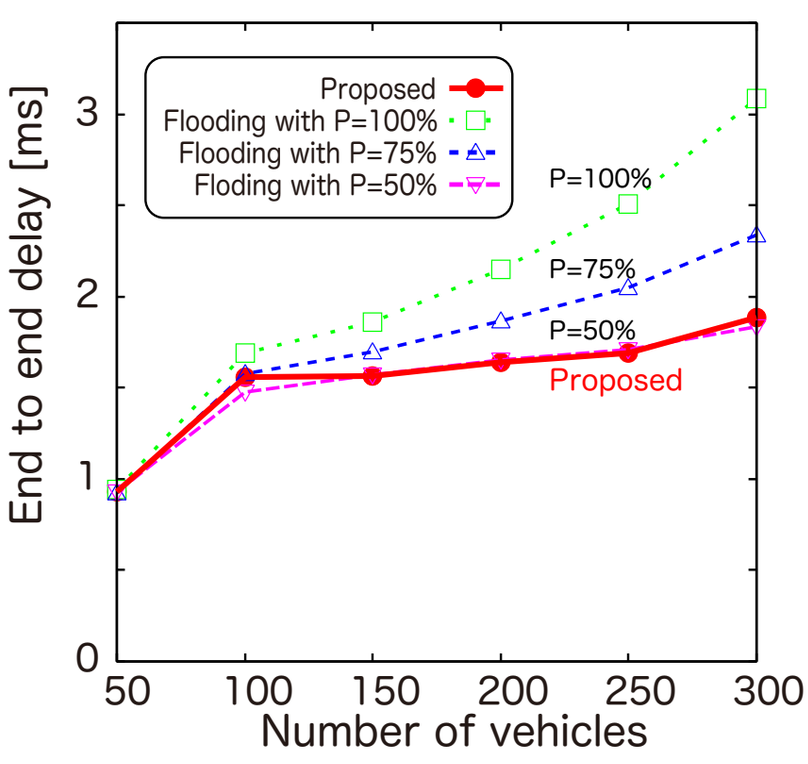
Neighbor vehicles forward same OFDM signal simultaneously





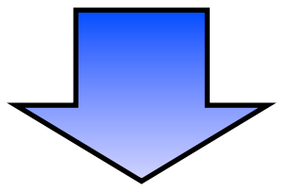




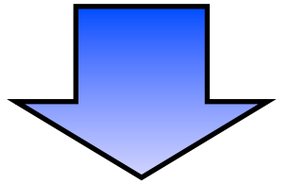


Seamless mobility at Crossroads

Vehicles switch access networks such as 3G, WiMAX, WiFi etc.



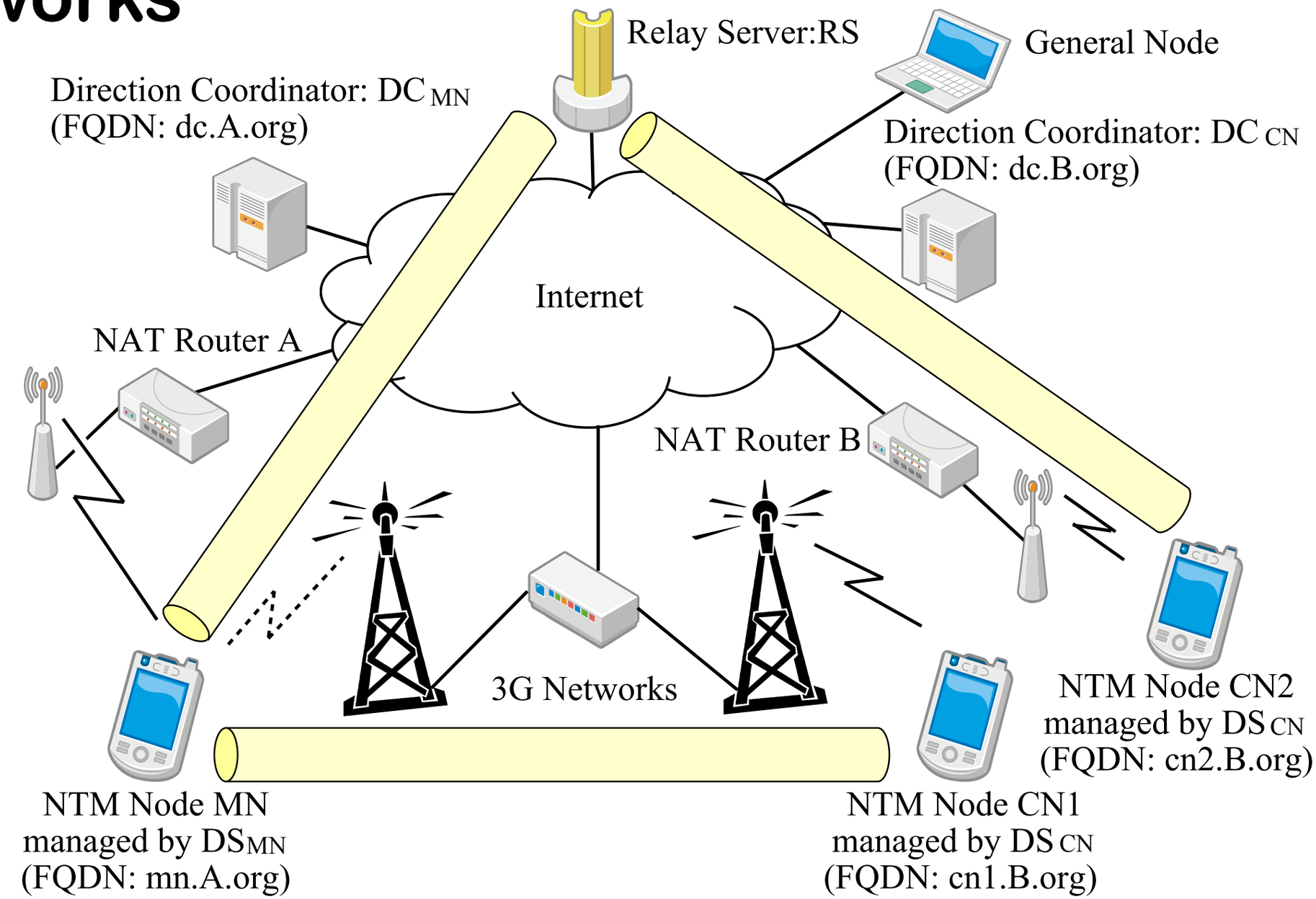
- IP address change causes connection breaks
- Seamless communication between IPv4 and IPv6 is difficult



NTMobile (Network Traversal with Mobility)

NTMobile network

Vehicles can achieve continuous communication by using virtual an IP address over IPv4 & IPv6 networks

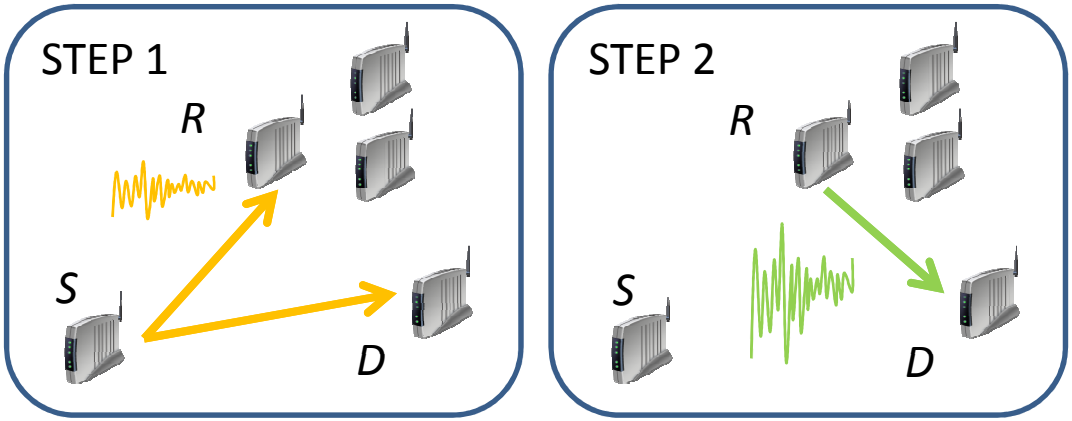


Thank you for your attention!

Cooperative Communications : Challenges for Practical Implementations

Benoît ESCRIG
IRIT Laboratory
Université de Toulouse
Toulouse, France

Cooperative Communications at the PHY Layer



Gains:
Increased SNR at the receiver
Distributed MIMO

SNR : Signal to Noise Ratio
MIMO: Multiple Input Multiple Output

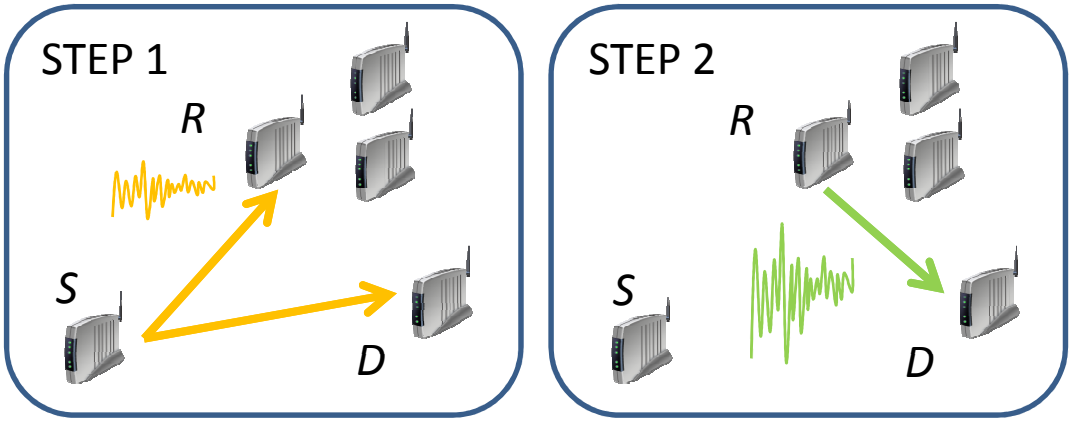
Transmission schemes:
Amplify-and-Forward
Decode-and-Forward

Options:
One or several relays
Channel and/or space-time coding

Issues:
Information Theory Issues (optimizing the Diversity/Capacity Tradeoff)

Open Issues:
Mobile relays, mesh and ad hoc networks
Joint PHY-MAC Design of Cooperative Protocols

Cooperative Communications at the MAC Layer

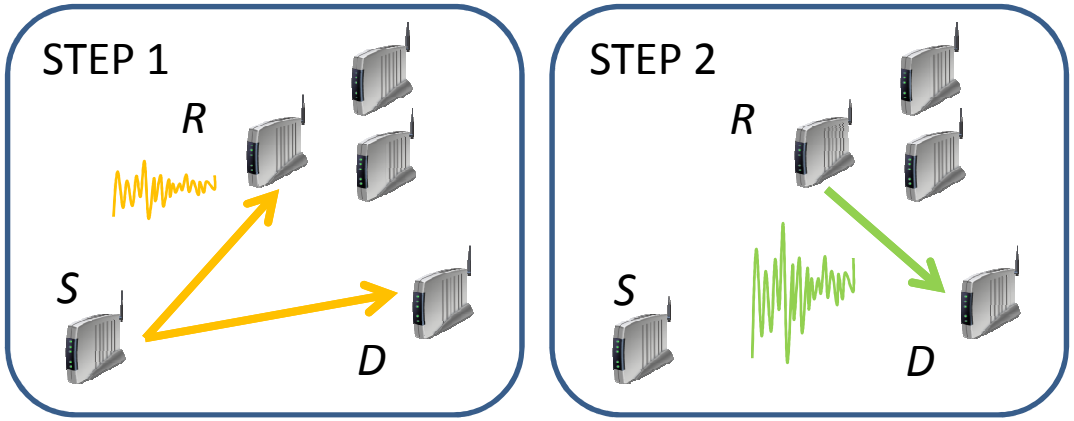


Allocating relays to a direct transmission:
collection of CSI, selection, notification of the result

Network Issues: network performance, power control, rate adaptation, fairness, interoperability

CSI : Channel State Information

Conclusion



Fixed Relays : MIMO Issues
Mobile Relays: Open Issues

Open Issues: Interactions between cooperative techniques and other optimization issues

Thank you !

ICN Panel
Benoît Escrig
escrig@enseeiht.fr
http://escrig.perso.enseeiht.fr