WiFi Connectivity at High Speed

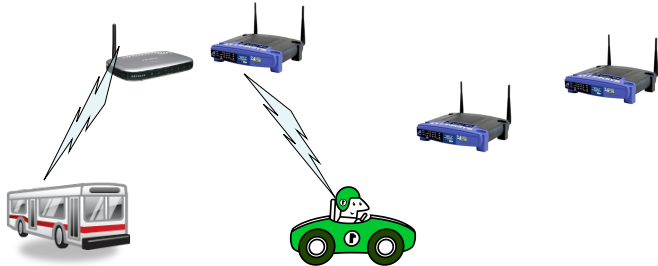Nick Frangiadakis, Danila Kuklov, Nick Roussopoulos

WiFi: Ubiquitous & Pervasive

- Ubiquitous AP presence
- USA: 14.3 million WiFi
  . (65% of online
ds) and growing
- All kinds of WiFi enabled devices
- 802.11n : 248 Mbit/s, ×2 Range

Utilize "in-situ" APs to support Mobile users
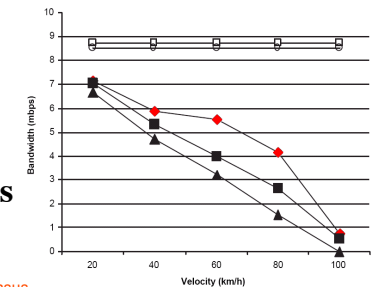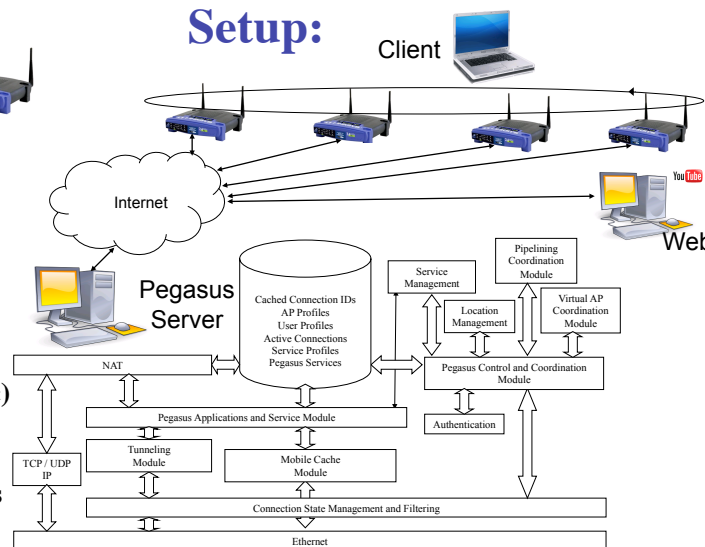
However:

- Significant time to establish connection (≈10 sec)
- 250m: 30mph ≈ 18 sec , 50mph ≈ 11 sec
- A new IP for every connection
  (In a campus / large company, per group of APs
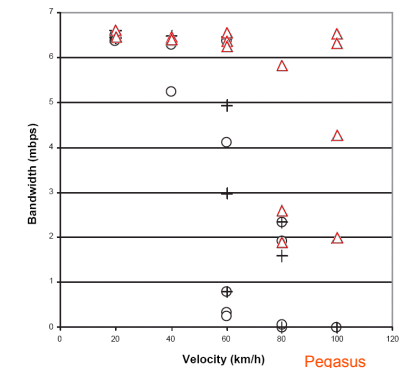   & Level 2 re-associations)

Pegasus:

-Persistent IP

-Connection IDs Stored in Pegasus DB

-Fast re-associations: Reuse connection IDs

-Able to balance the AP load

-Efficient AP selection

-Robust under intermittent connectivity

-Supports "secured" Access Points

-Can support multiple interfaces

-End-To-End Solution: no changes at APs

Setup:

Client

Internet

Web

Pegasus Server

Cached Connection IDs
AP Profiles
User Profiles
Active Connections
Service Profiles
Pegasus Services

Service Management

Pipelining Coordination Module

Location Management

Virtual AP Coordination Module

Pegasus Control and Coordination Module

NAT

Authentication

Pegasus Applications and Service Module

TCP / UDP IP

Tunneling Module

Mobile Cache Module

Connection State Management and Filtering

Ethernet

Pegasus

No DHCP Requests	50% DHCP Requests
100% DHCP Requests	No Connection Switches No PEGASUS
No Connection Switches	

Client TCP performance for continuous transfers

Pegasus

○ 100% DHCP Requests + 50% DHCP Requests △ No DHCP Requests

Client TCP performance for short transfers

References:

Frangiadakis N., Kuklov D., Roussopoulos N.,
"PEGASUS: 802.11 connectivity at high speed",
Globecom Workshops,2007 IEEE

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