WLAN Roaming - How to Make It Happen

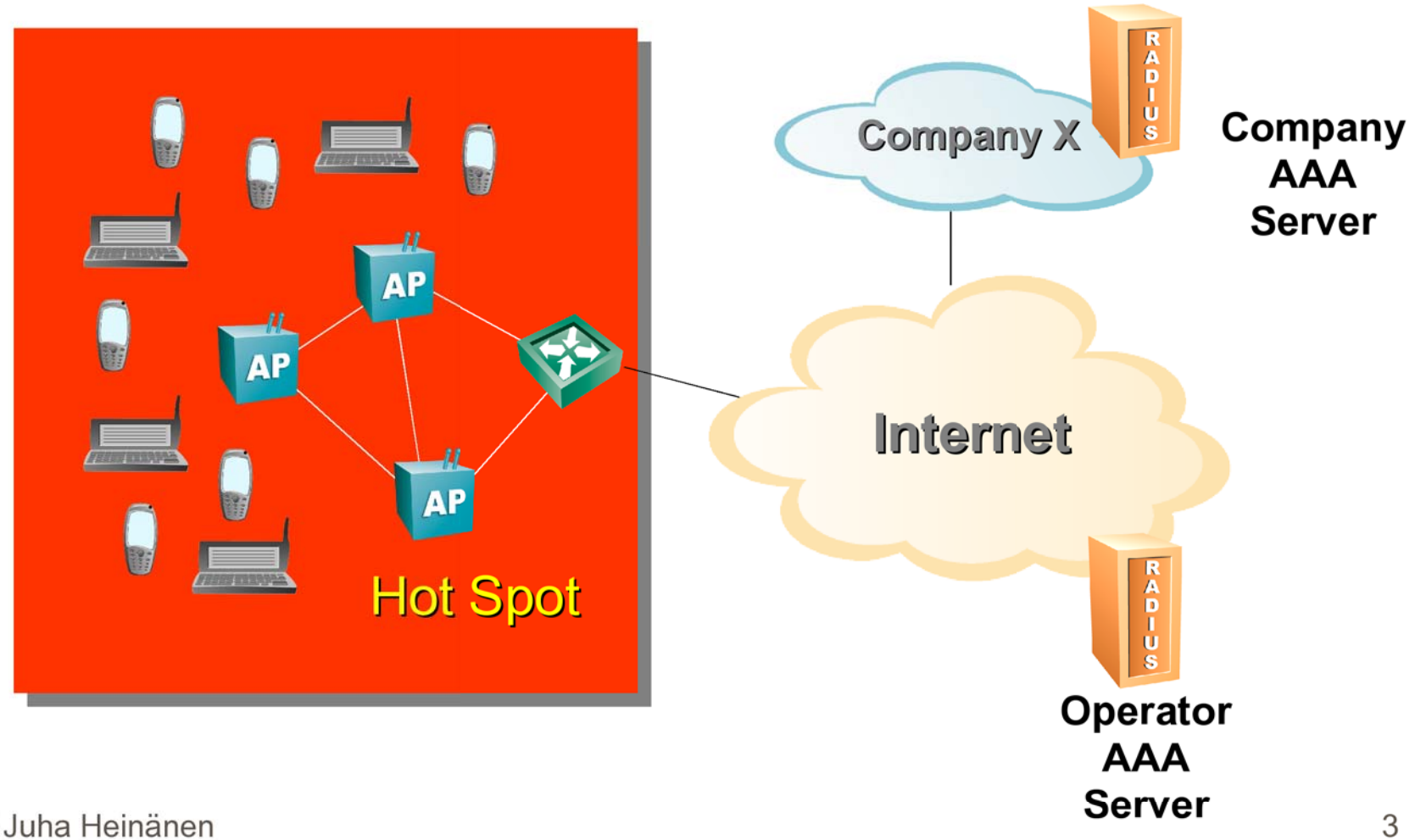
Juha Heinänen

jh@tutpro.com

Why WLAN?

- Offers affordable mobile Intranet or Internet access at Hot Spots
  - homes, offices, public places
- reduces need to recable buildings
- a MUST for mobile broadband applications
  - high-quality voice, video, music, etc.

WLAN 'Hot Spot'



WLAN Technology Trends

- faster radio access
  - 22 Mbps @ 2.4 GHz (802.11g)
  - 55 Mbps @ 5.4 GHz (802.11a/h)
- safe authentication process
  - 802.1x over TTLS
- strong protection of traffic
  - TKIP re-keying, AEP encryption

WLAN Challenges

- sharing of access points between operators/companies
- authentication in multi-operator/company Hot Spots
- roaming between operators
- sharing of revenues between operators and companies

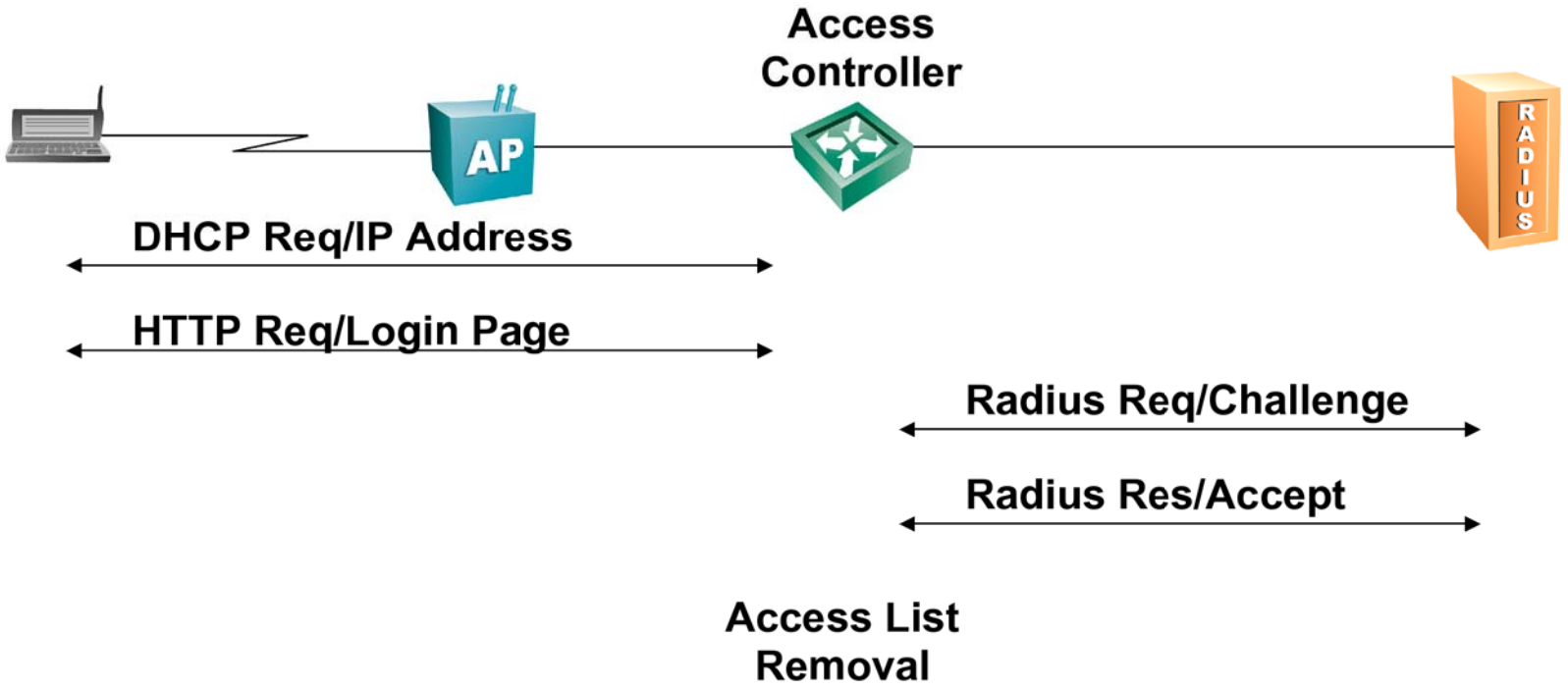
Why Should We Care?

- WLAN service must be affordable for everyone
  - this is impossible if every operator builds full coverage for itself only
- WLAN service must cover all public places in dense areas
  - this is impossible if customer is not able to roam to networks of all WLAN operators

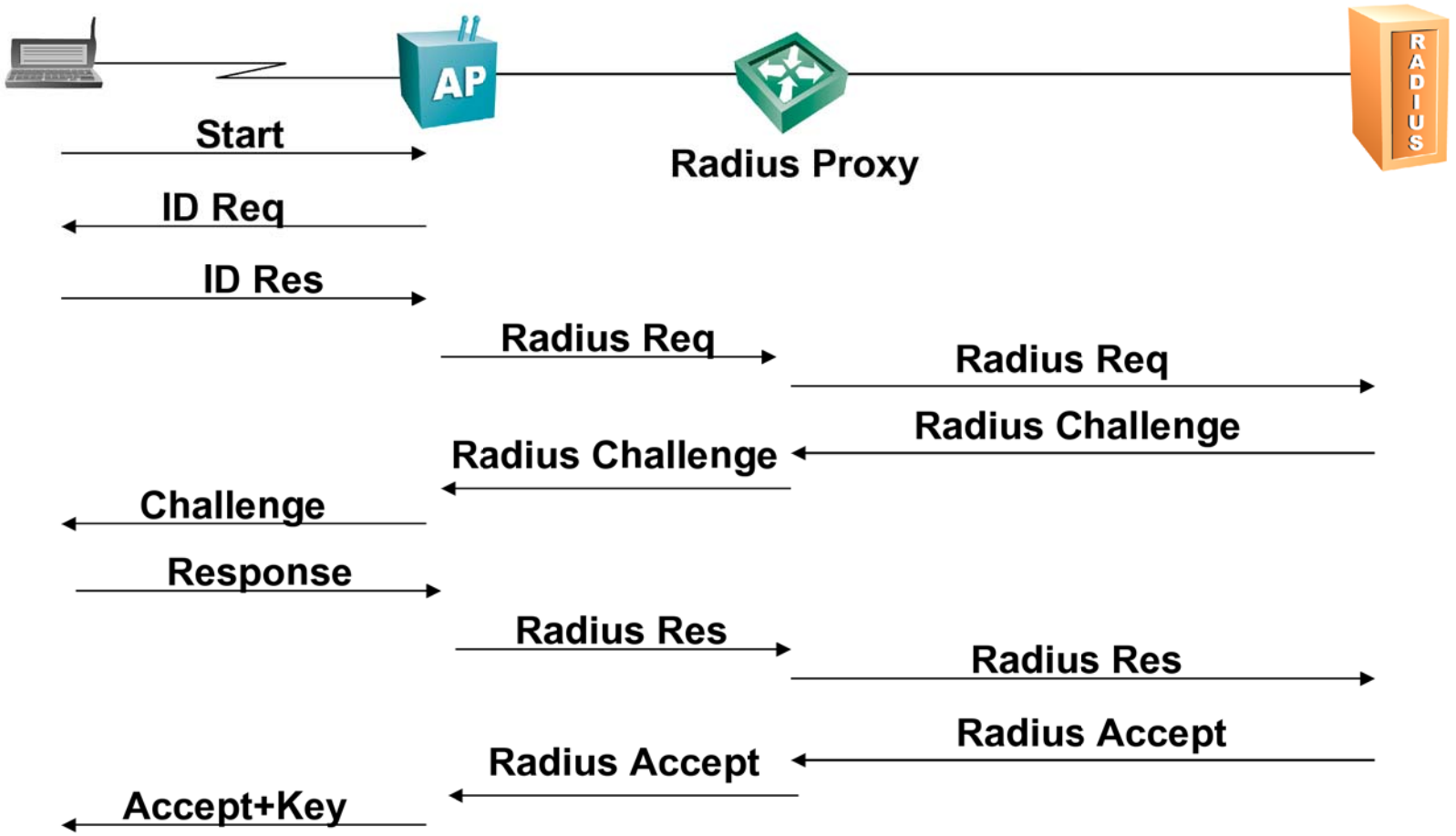
Autentication Choises

- WLAN specific WEP keys
  - in practise impossible key management
- Web based username/password or SIM authentication by Access Controller
  - unprotected WLAN, easy IP/MAC spoofing
- 802.1x over TTLS authentication by access point
  - protected WLAN, no IP/MAC spoofing

Web Authentication



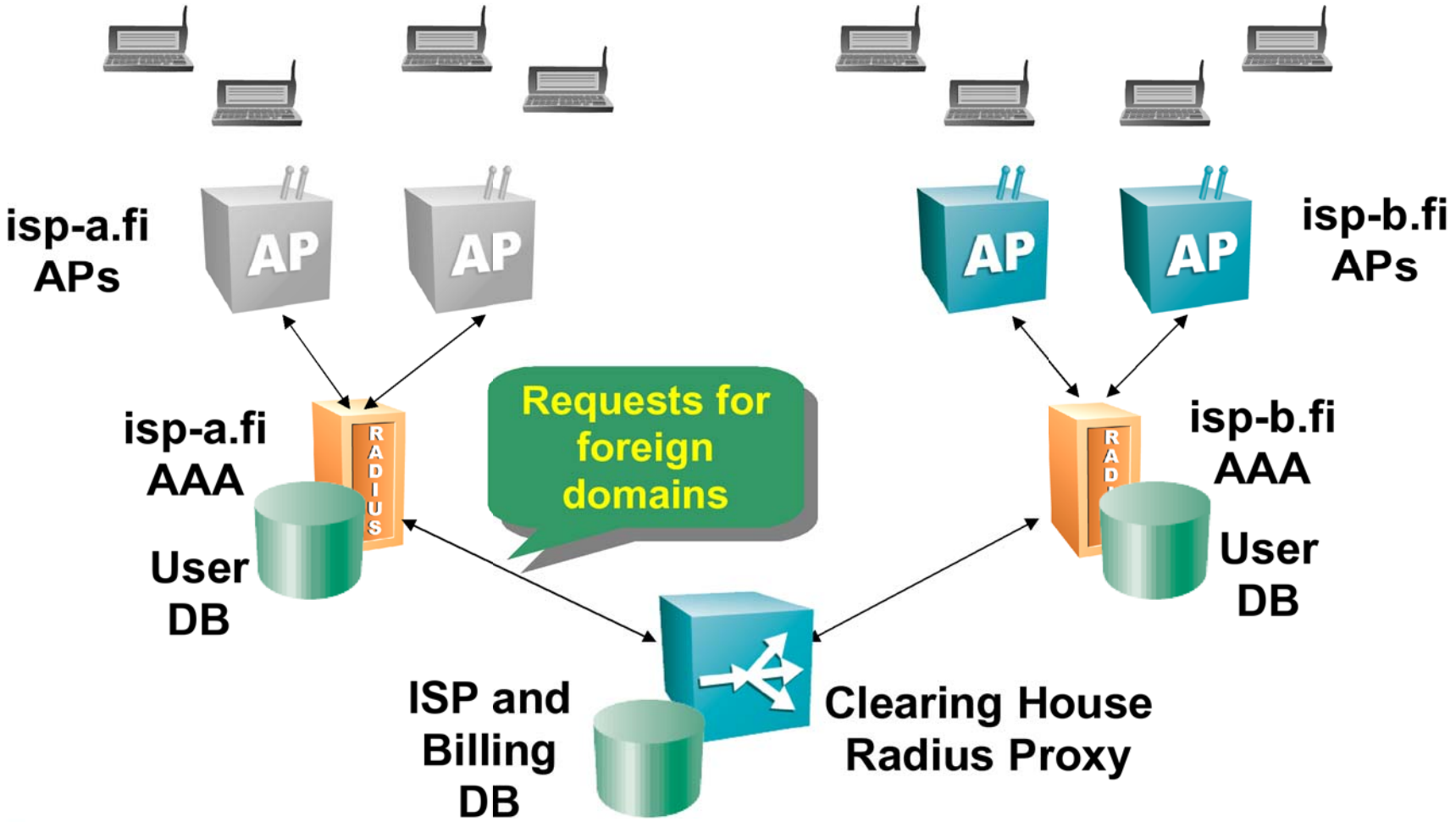
802.1x Authentication



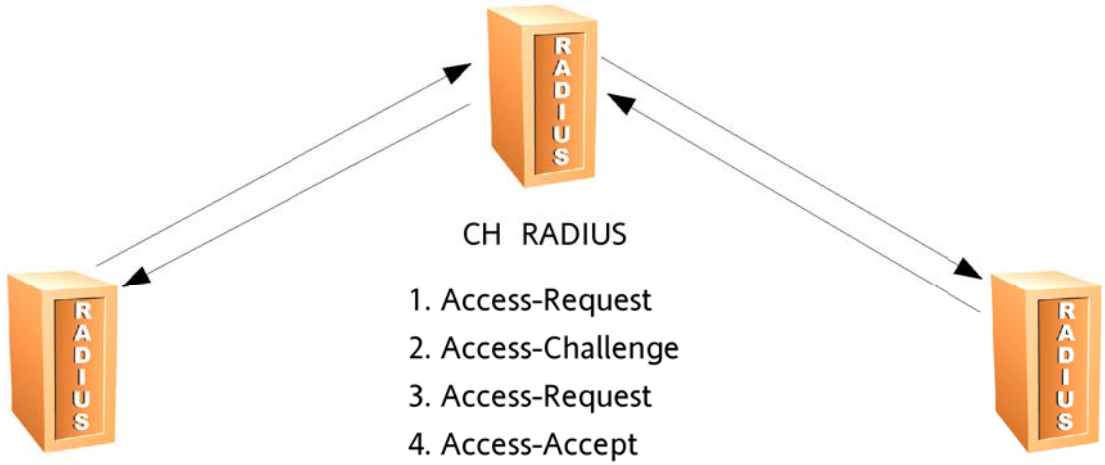
WLAN Roaming

- WLAN authentication is usually always based on Radius
- roaming is thus easy to implement using a Clearing House (CH) Radius proxy
- authenticator or local Radius server forwards requests for foreign domains to CH
- CH keeps track of sessions and forwards requests to domain specific Radius servers

WLAN Clearing House



Radius Messages



1. Access-Request
2. Access-Challenge
3. Access-Request
4. Access-Accept
5. Accounting-Request
6. Accounting-Response

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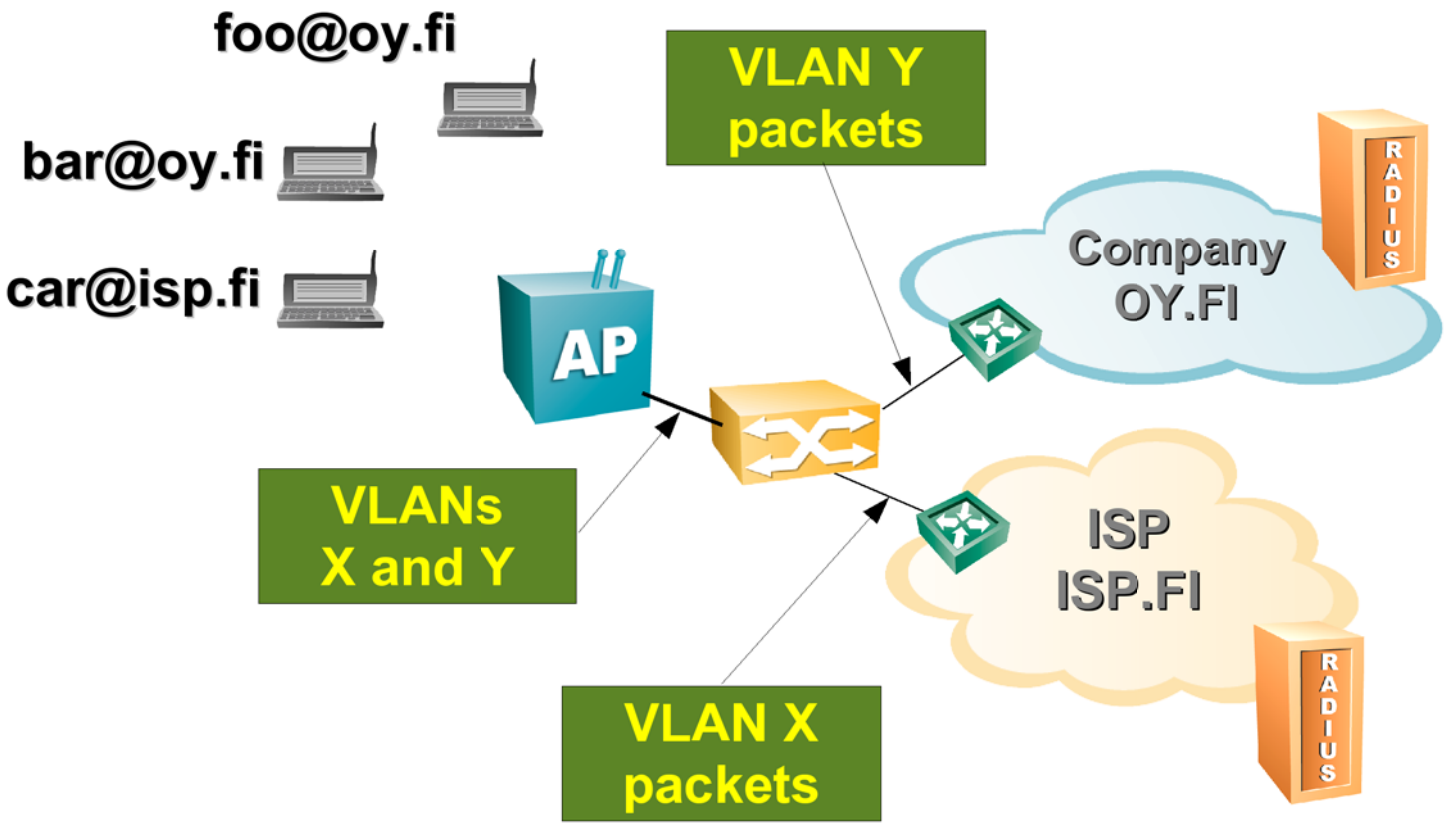
Sharing of Access Points

- one physical AP can be divided into several logical APs
- every logical AP has its own VLAN or IP tunnel to operator's or company's network
- logical AP is chosen based on user's domain
- results in savings in infrastructure expenses

Access Point Sharing Example



Revenue Distribution Model

- operators collect from their customers a common, fixed roaming charge
- operators forward roaming charges to CH
- CH produces a matrix of roaming traffic and returns roaming charges to operators accordingly
- model is fair and allows any operator to participate no matter how big or small it is

Summary

- broadband mobile applications require WLAN access
- in order to survive beyond the hype, WLAN service must be affordable and ubiquitously available
- this means flat rate and roaming with everyone