

Programmable Handoff



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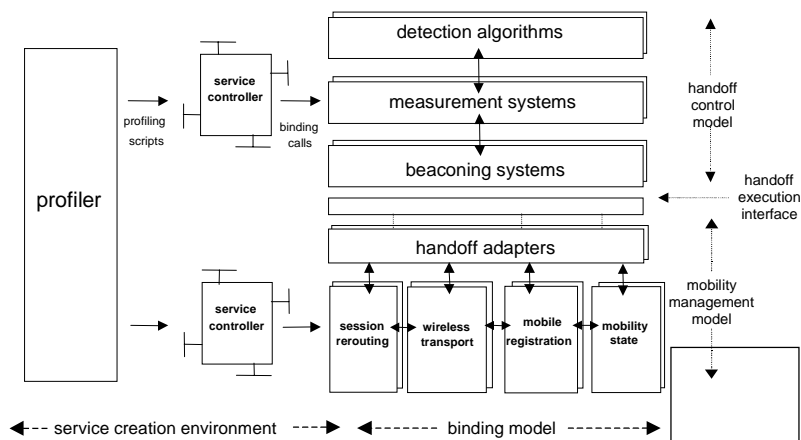
Motivation

- service creation
- seamless roaming
- support for multiple styles of handoff
- ability to architect handoff services

Approach

- open mobile telecommunications hardware
- separate handoff control from mobility management
- decompose handoff control

Architecture



Binding Model

- handoff control model
 - programmable detection algorithms, measurement, and beaconing systems
- mobility management model
 - supports the design space of different architectures
- handoff execution interface
 - separates handoff control from mobility management

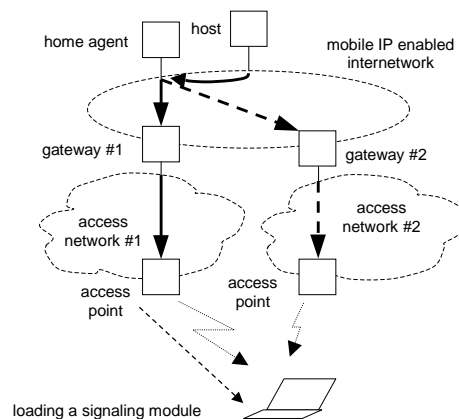
Service Creation Environment

- CORBA-based
- supports dynamic deployment of services
- comprises profilers and service controllers
- uses simple profiling language

Applications

- **Multi-service Access Networks**
 - support multiple styles of handoff simultaneously
 - network is used as a common pool of resources
- **Reflective Handoff**
 - allows mobile devices to roam between heterogeneous access networks
 - access networks load signaling system support dynamically

Reflective Handoff



Design

- beacons carry unique identifiers characterizing mobility management architectures
- mobile devices maintain signaling module caches
- if a module is not cached it is loaded dynamically

Implementation

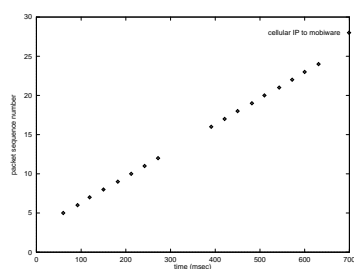
- access network initiates inter-gateway handoffs
- reflective handoff deployed over MobWare and Cellular IP access networks
- soft state module caches are used

Remarks

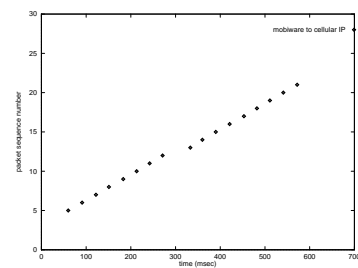
- signaling module loading latencies affect testbed performance
- inter-gateway handoffs should be initiated before wireless data-link transfer
- forwarding delay at the new access network compensates for the handoff completion time

Example

- 350 Kbps video application



Cellular IP to Mobiware



Mobiware to Cellular IP

Further Work

- extent reflective handoff to the physical and data-link layers
- scalability and performance evaluation

Conclusion

- handoff can be made completely programmable
- mobile devices can re-program their behavior to interact with different access networks
- early results show that the approach is promising!