

DEPARTMENT OF
ELECTRICAL ENGINEERING
& COMPUTER SCIENCES
UNIVERSITY OF CALIFORNIA, BERKELEY

Mobile Applications for PDAs

Computation by Proxy

Steven Gribble and Eric A. Brewer
glomop@full-sail.cs.berkeley.edu

Outline

- Wireless Data Infrastructures
- PDA hardware and OS capabilities
- Computation by proxy (review)
- Desktop integration - “access is the killer app”
- Avoiding complexity

Wireless Data Infrastructures

- Low-bandwidth, prohibitive cost
 - ARDIS, Mobile RAM, CDPD, cell-phone modem
 - 4.8 - 19.2 kb/s, metered rates
- “IP dialtone” vs. proprietary protocols
- Future direction
 - low-bandwidth, moderate cost , eg.
Metricom (fixed cost, 19.2 - 40 kb/s)

Wireless data network performance will continue to lag wireline data networks.

PDA Capabilities

- Hardware

- 1 - 4 MB SRAM
- 16 - 25 MHz CPUs
- B&W or 2-bit greyscale
- 160x160 - 480x320 pixels



- OS

- OO, rich class libraries for conventional apps
- high degree of hardware abstraction
- cooperative multitasking, aggressive memory mgmt
- limited or proprietary networking capabilities

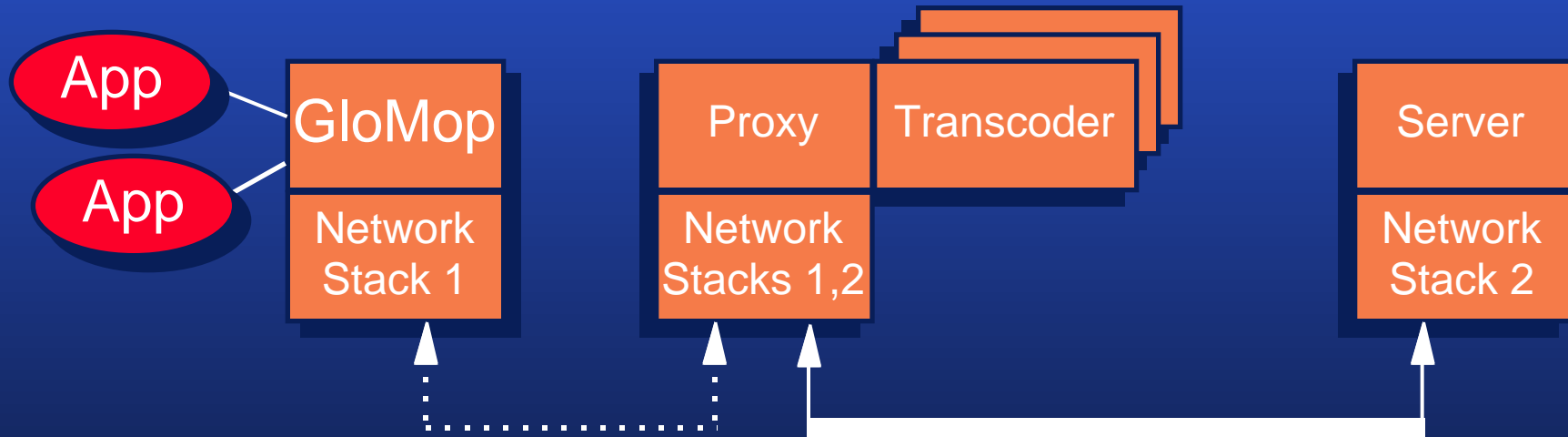
PDA Capabilities

- Future directions
 - Tomorrow's PDA CPUs today's desktop CPUs
 - Tomorrow's desktop CPUs will continue exponential performance improvement trends
 - Similar trends for PDAs' RAM and screens

PDA characteristics will continue to lag desktop computer or workstation characteristics.

Review: Computation by Proxy

- Proxy as intelligent middleware



- On demand, dynamic transcoding
- Mitigation of client and network variation

Access is the Killer App

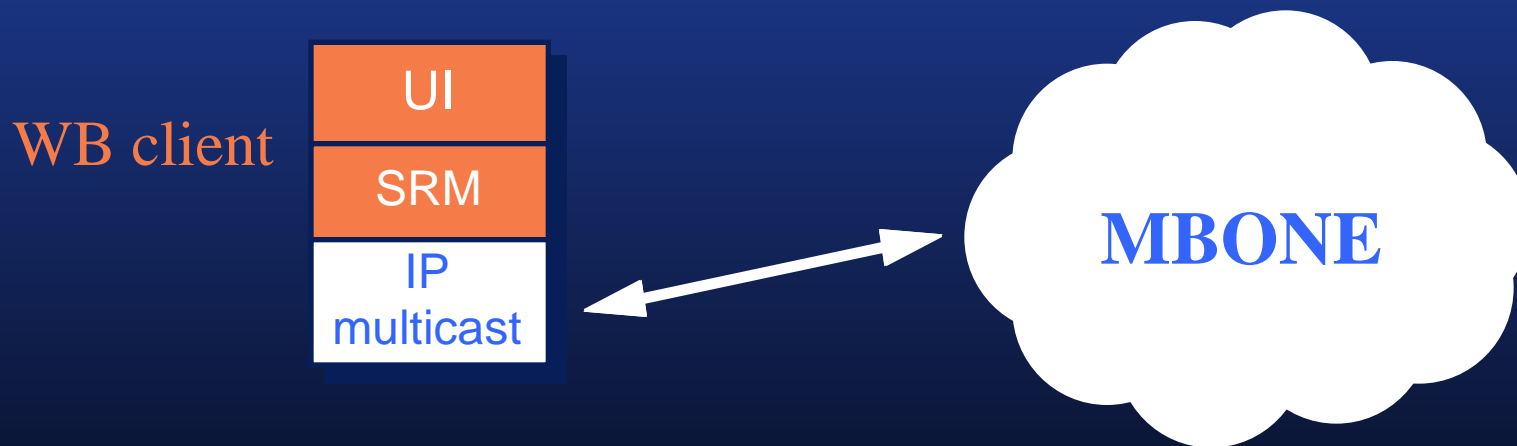
- Current PDAs are isolated islands of data
- Vision: integration with desktop/wireline world



- ProxyMail:
 - virtual folders
 - MIME images
 - graceful disconnection

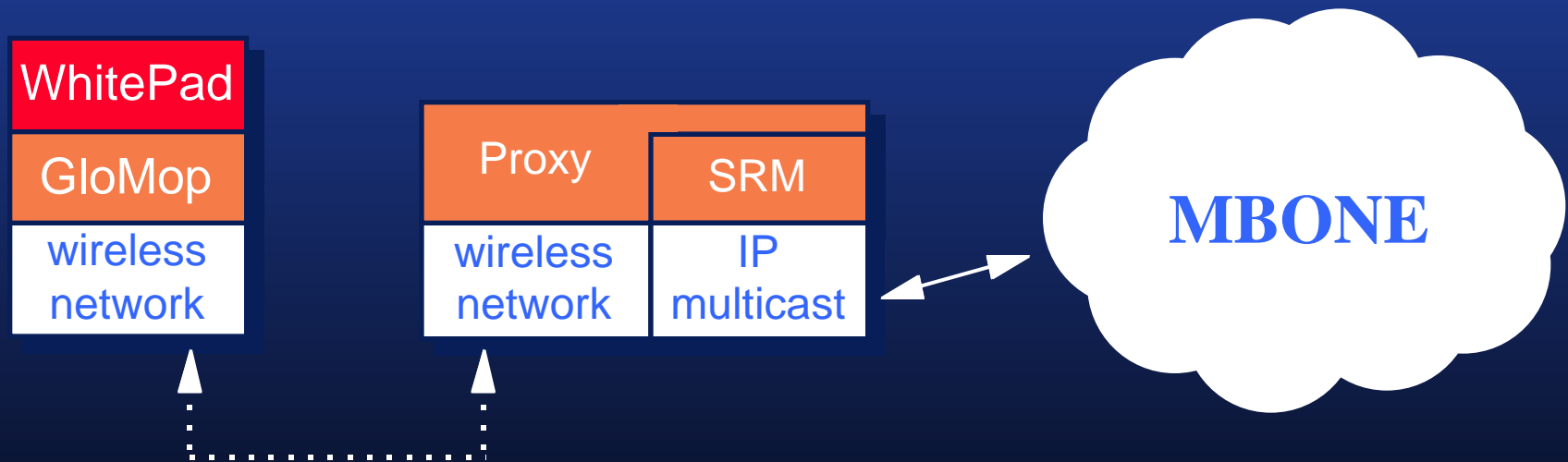
Avoiding Complexity

- Push complexity from PDA to proxy
- Example: MBONE WB client
 - Requires IP multicast infrastructure
 - Application level framing - SRM protocol designed with WB class of apps in mind



Avoiding Complexity - WhitePad

- Exploit PDA support for “notepad” paradigm
- Add proxy backend to existing MBONE WB client
- SRM, IP multicast, etc. invisible to WhitePad



Conclusions - PDAs and the Future

- Wireless networks and PDAs will continue to lag their wired, desktop counterparts
- Integration with desktop world
- Offload complexity from PDA via proxies or intelligent networks