Hybrid Data Networks

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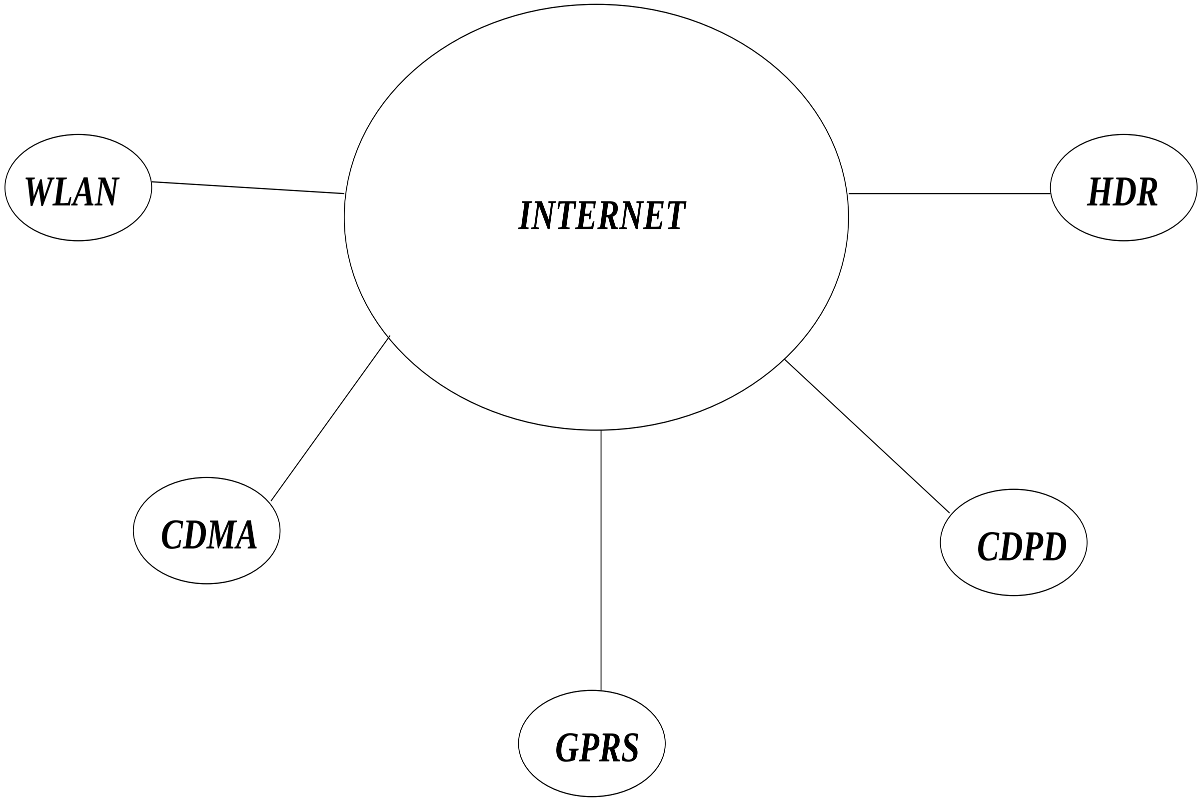
November 1, 2000

Introduction

- A variety of wireless technologies are available these days - GPRS, IS-2000, WaveLan, Bluetooth, Ricochet etc
- These technologies offer variable coverage, bandwidth etc and usually either overlay on top or intersect each other
- A user equipped with multiple wireless interfaces can roam among these technologies and use the services offered to improve on his performance

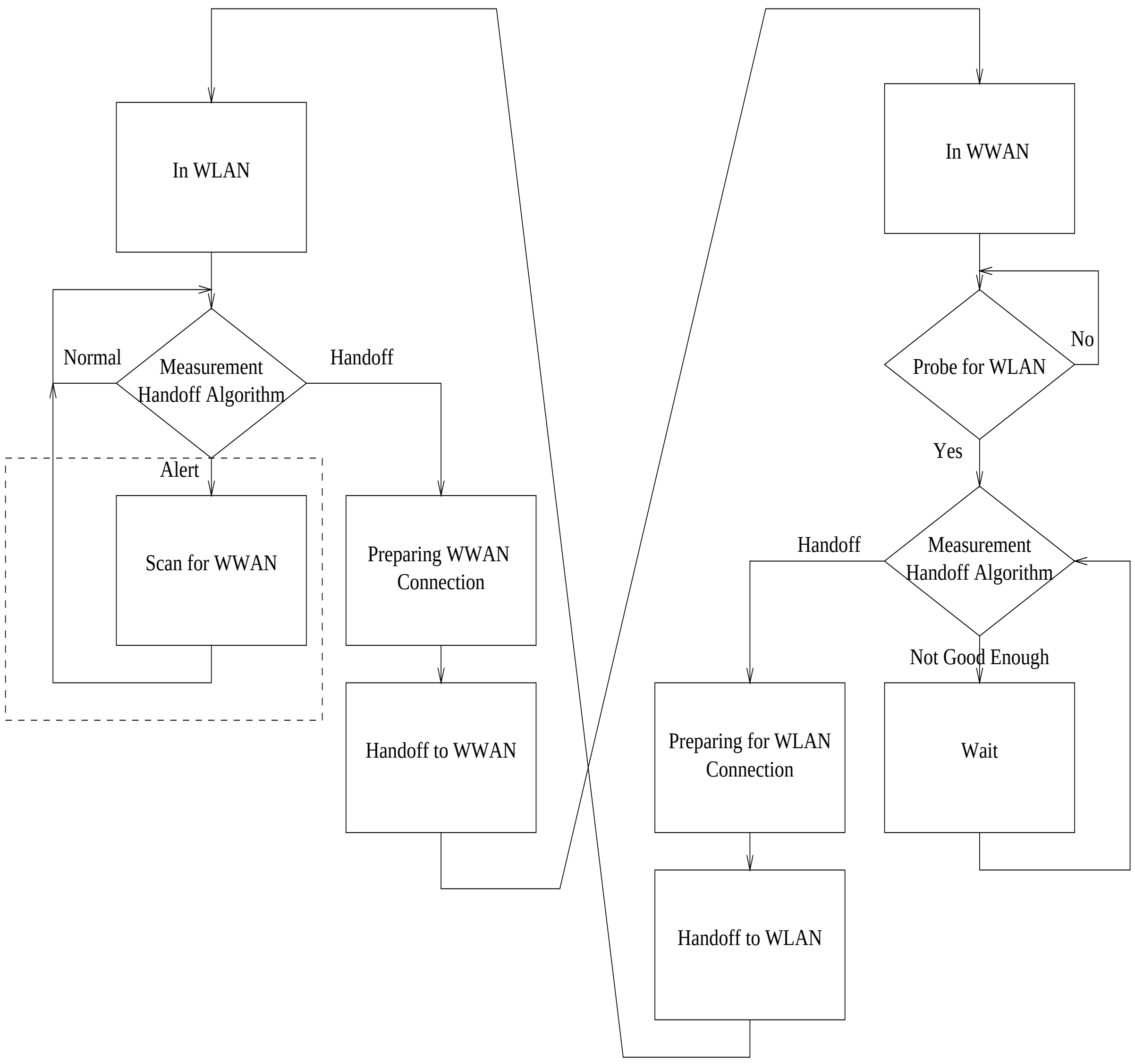
The Heterogeneous Access Network



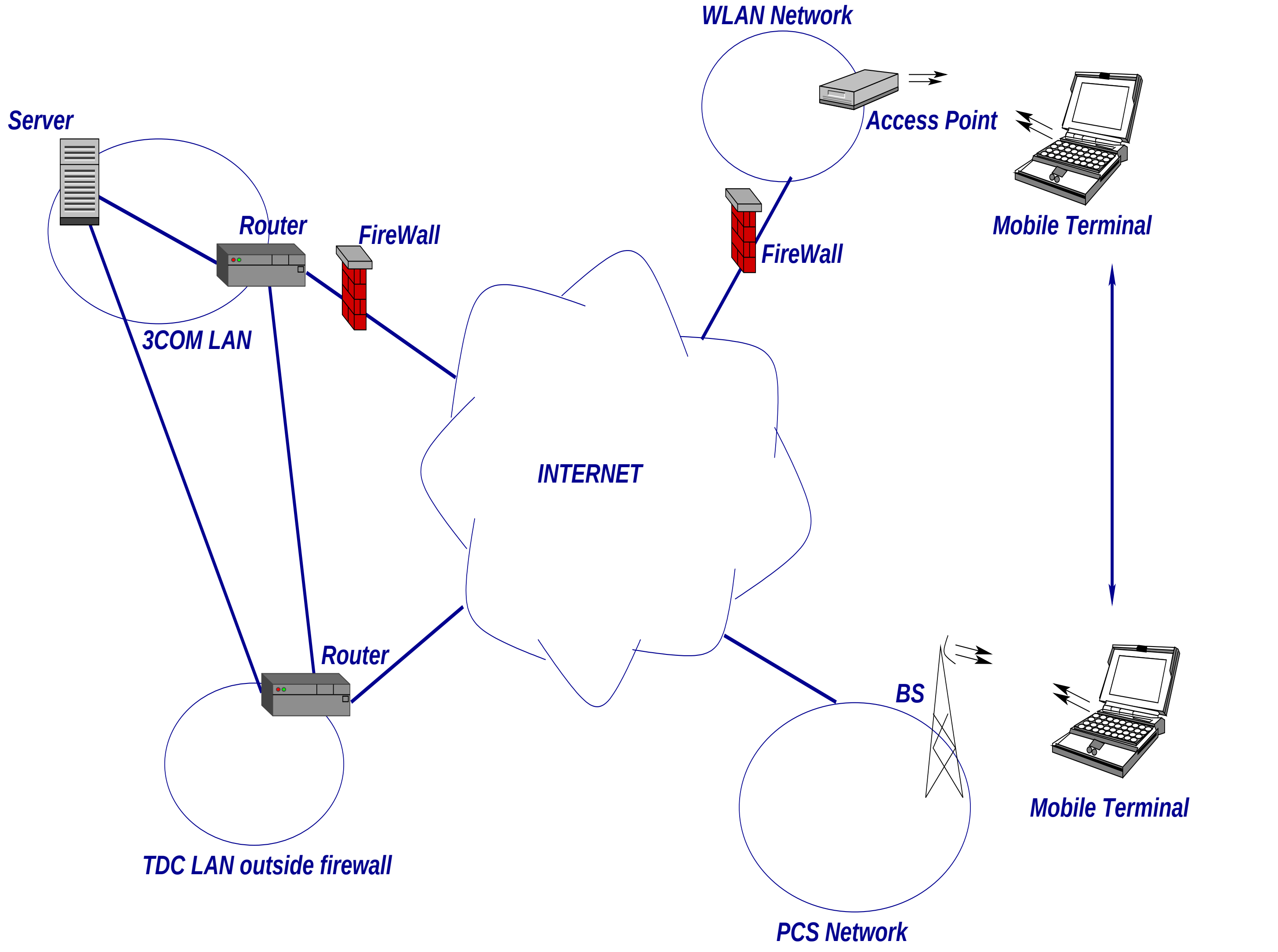
Inter-technology Handoff

- Motivation:
  - Ubiquitous access to the internet with seamless handoff between different wireless access technologies
- Our Focus
  - Identify issues related to handoff between WLAN(802.11) and CDMA(IS-95) networks and setup a testbed
- Requirements for Handoff
  - small delay
  - low packet loss

Handoff Algorithm



Test Bed


WLAN Network
Access Point
Server
Mobile Terminal
Router
FireWall
FireWall
3COM LAN
INTERNET
Router
BS
Mobile Terminal
TDC LAN outside firewall
PCS Network

Some Details

- The server is a fixed host that sends data to the mobile terminal
- The two routers act as foreign agents and provide support for seamless handoff(Mobile Ip)
- The handoff algorithm and a network layer process that deals with registration, binding updates etc is implemented on the mobile terminal
- The routers essentially forward packets to the mobile and during the handoff buffers packets and sends binding updates to the server and the other router

Handoff from WWAN to WLAN

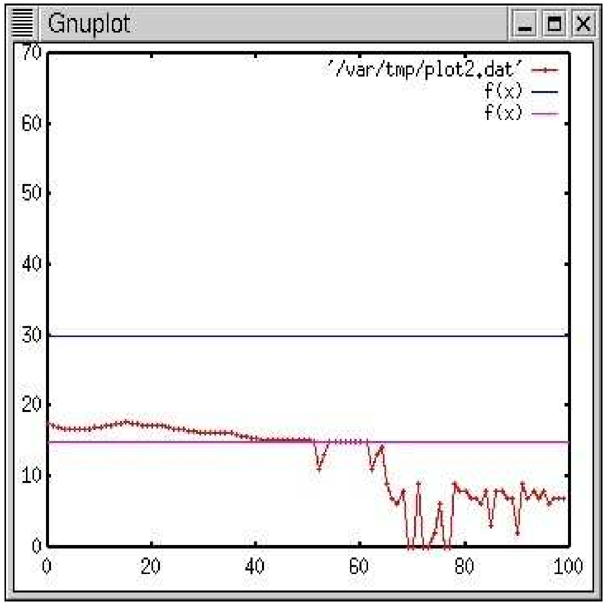


Figure 1: On WWAN

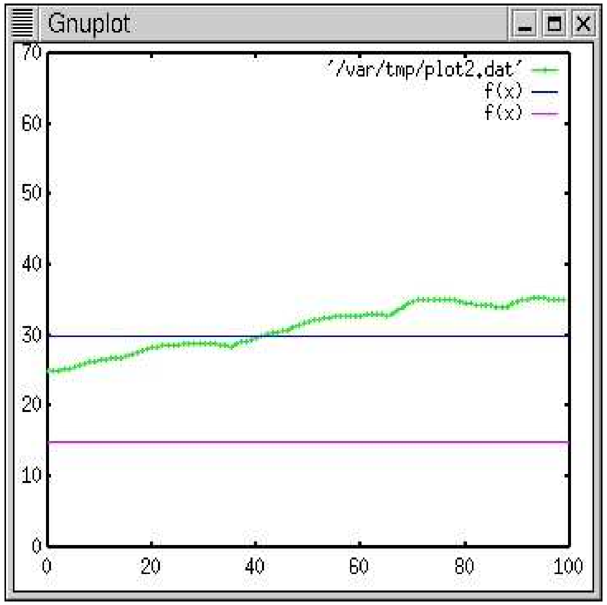


Figure 2: WWAN to WLAN

Handoff from WLAN to WWAN

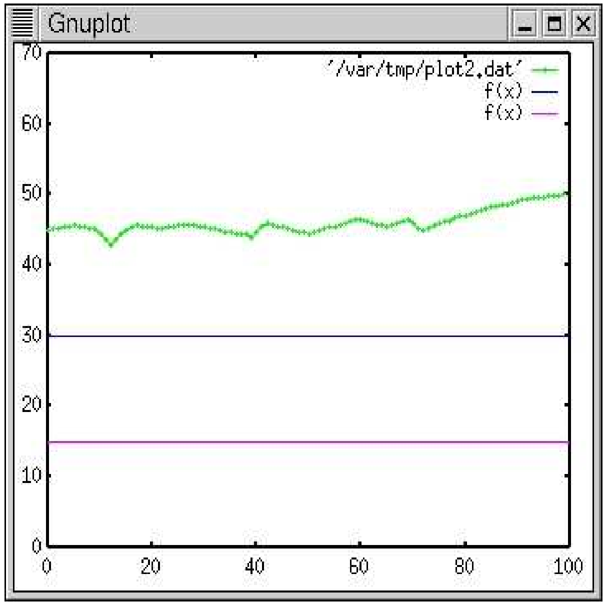


Figure 3: On WLAN

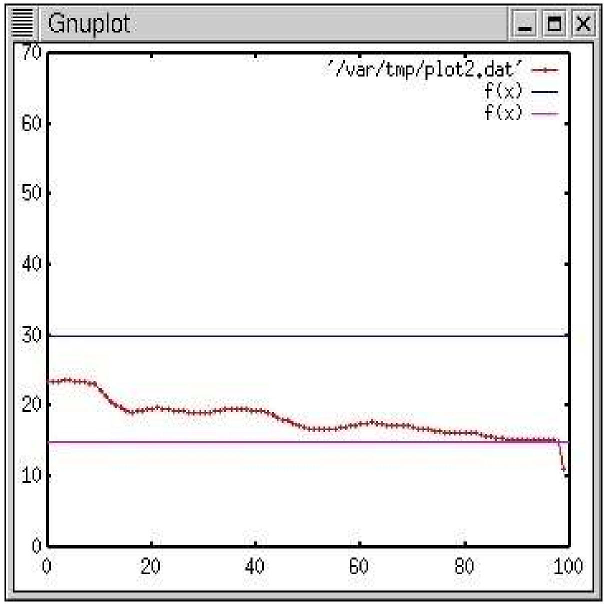


Figure 4: WLAN to WWAN

Results

- The handoff delay was about 600ms when switching from WWAN to WLAN
- The handoff delay was about 1040ms when switching from WLAN to WWAN