Proximity Networking

Barbara Denny
USC/ISI PCEN

Julio Escobar
Centauri
Technologies
Corporation

Venkata Pingali
USC/ISI PCEN

Acknowledgements

- 3Com Corporation

- USC/ISI Postel Center for Experimental Networking

What is a Proximity Network?

Networks where the physical proximity of a user to a network makes **immediately** available a local service environment
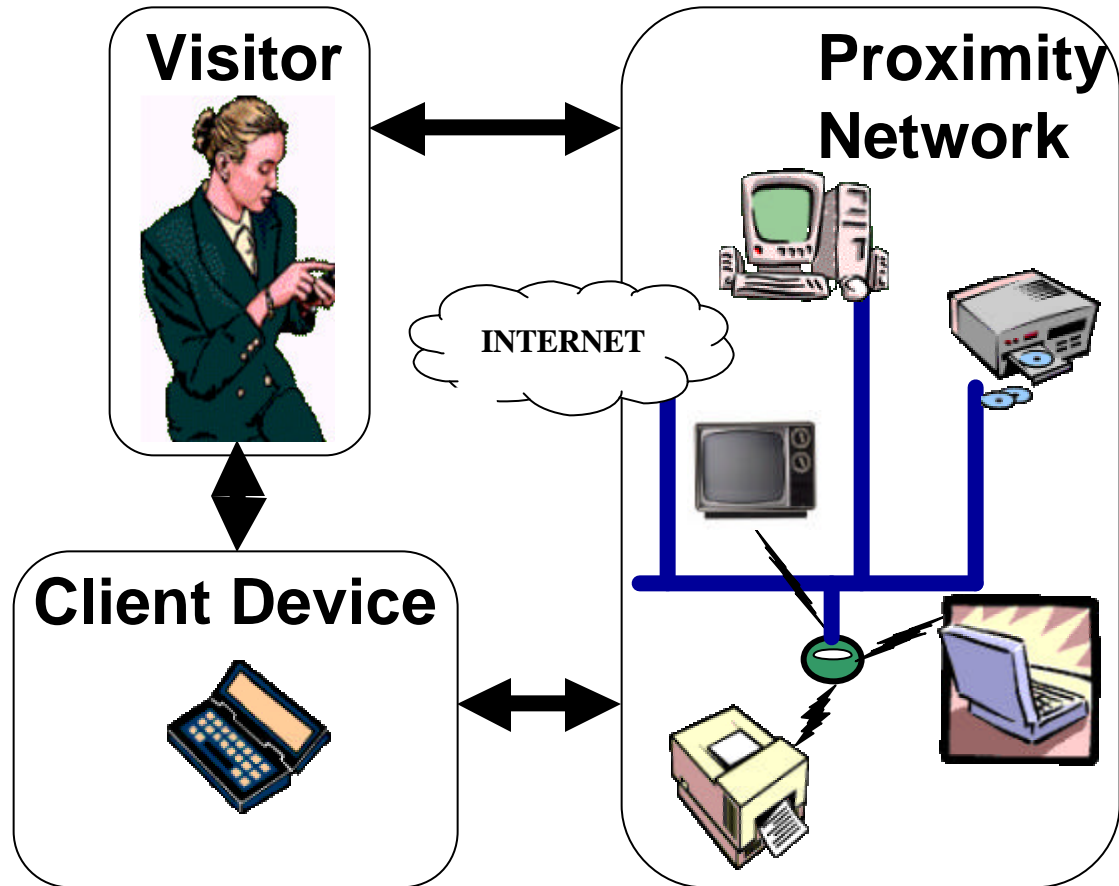
Why a Proximity Network?

Drivers:
- Ubiquitous computing
- Ubiquitous communications
- Everyday applications

Proximity Network:
Promote simple integration of client devices into a Networked Services environment
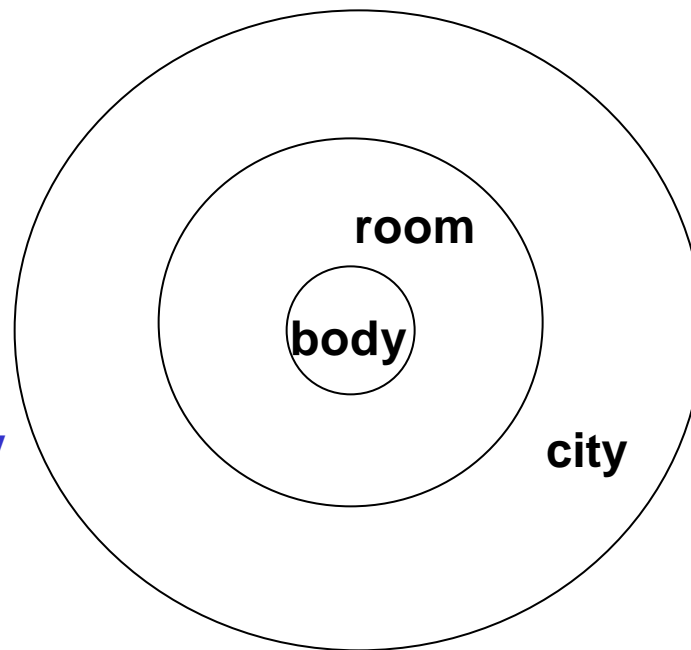

Visitor

Proximity Network

INTERNET

Client Device

Proximity

Why is "Proximity" interesting
- Paradigm for interaction with physical world

There are different scales of Proximity

room

body
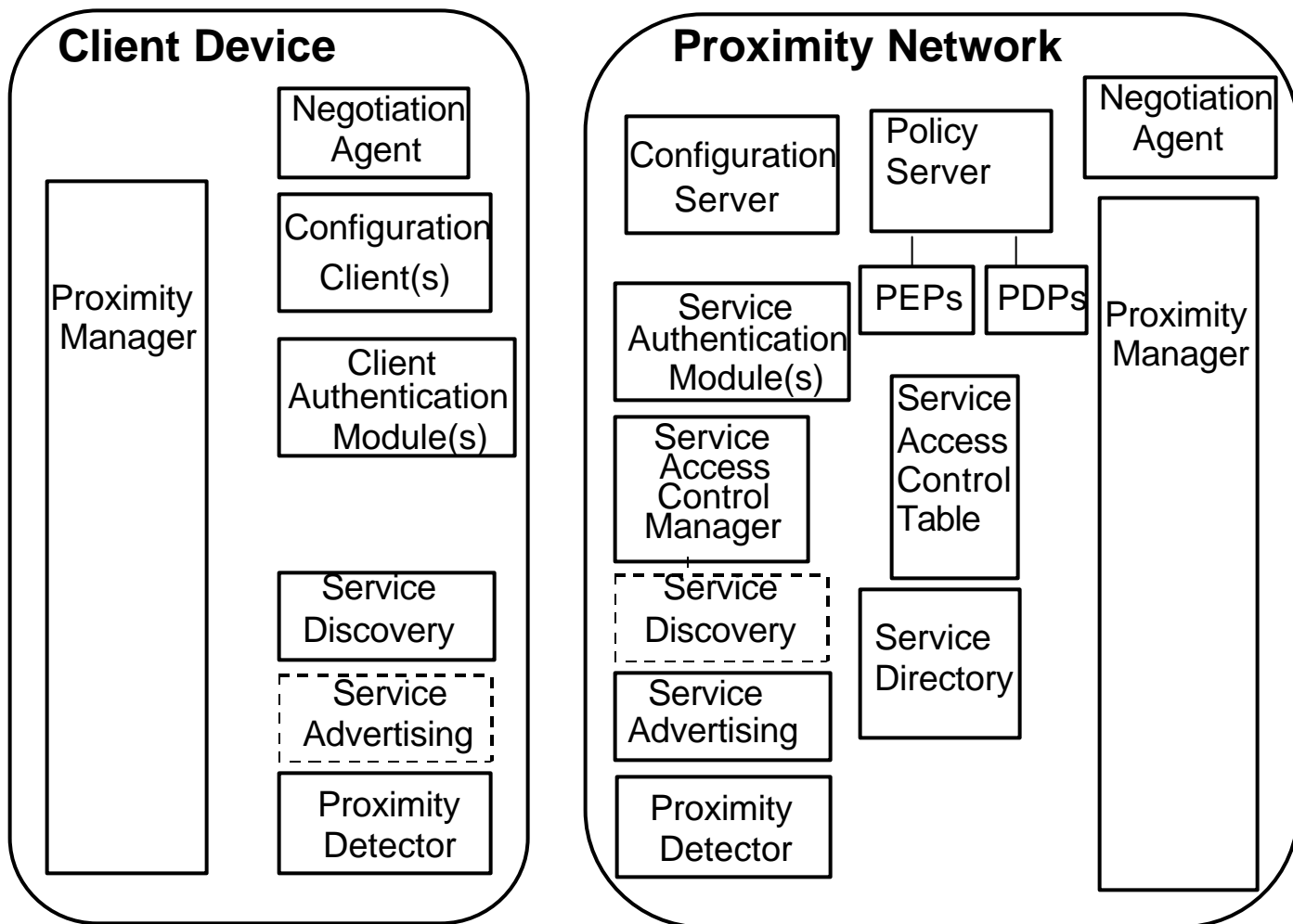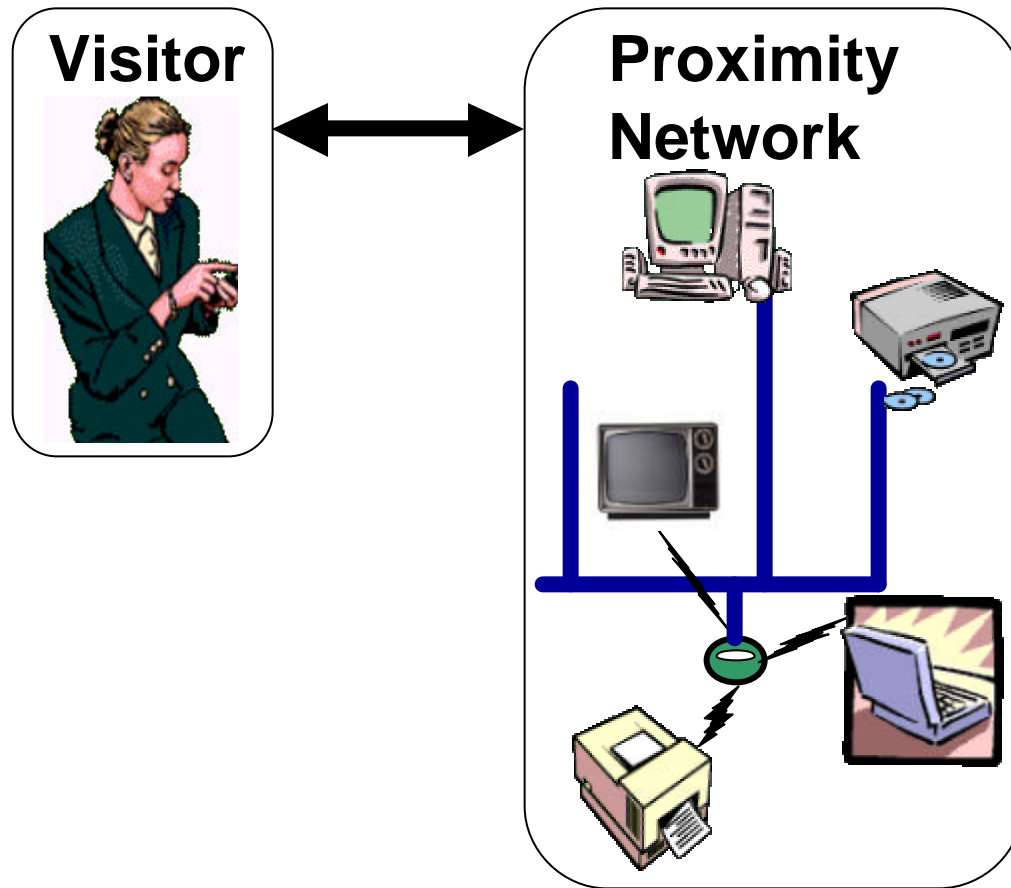
city

Our approach
- Link Layer Proximity by default
- Augment it with Location Service

Components of the Proximity Network Architecture

Client Device

Negotiation Agent

Configuration Client(s)

Client Authentication Module(s)

Proximity Manager

Service Discovery

Service Advertising

Proximity Detector

Proximity Network

Configuration Server

Policy Server

Negotiation Agent

PEPs

PDPs

Service Authentication Module(s)

Proximity Manager

Service Access Control Manager

Service Access Control Table

Service Discovery

Service Directory

Service Advertising

Proximity Detector

Sample Execution of Skeletal Prototype

Visitor

Proximity Network

Entering a New Proximity


```
TIMER No cards found or card being initialized
TIMER No cards found or card being initialized
Trying to get interface name
Testing: eth0
card supports device private ioctls
Device eth0: No IP address
ORIG MII = yes , LINK = no ADDR = no
link came alive
Device eth0: Has IP address "128.9.112.90"
px.pl do DO
service:acap://128.9.112.65,65535
SLP ENTRY = service:acap://128.9.112.65,65535
ACAP SERVER = 128.9.112.65
HOST = 128.9.112.65
Error. Could not connect to 128.9.112.65

service:acap://128.9.160.99,65535
SLP ENTRY = service:acap://128.9.160.99,65535
ACAP SERVER = 128.9.160.99
HOST = 128.9.160.99
Connected to acap server....

modtime : 20020104211450000001
entry :
dataset.owner : anonymous
dataset.acl : $anyone    xrwia

modtime : 20020104211450000002
entry : anonymous
config.url : http://action.isi.edu
config.proxy : 128.9.128.8
id = 0x180045d, url = http://action.isi.edu

modtime : 20020104211550000000
entry : anonymous
config.url : http://www.isi.edu/~pingali/webpages/visitor.html
config.proxy : 128.9.160.161
config.dns : 128.9.160.161
id = 0x180045d, url = http://www.isi.edu/~pingali/webpages/visitor.html
TIMER MII = yes , LINK = yes ADDR = yes
TIMER MII = yes , LINK = yes ADDR = yes
TIMER MII = yes , LINK = yes ADDR = yes
```
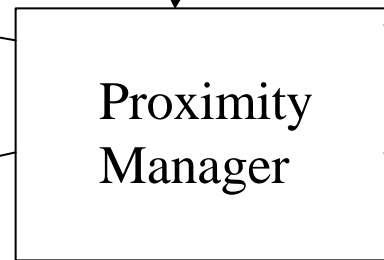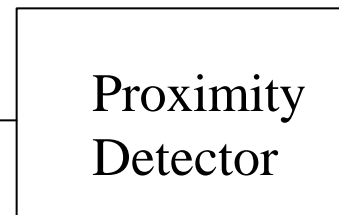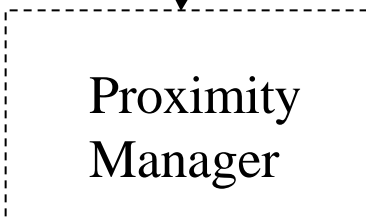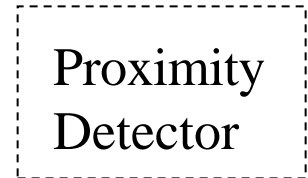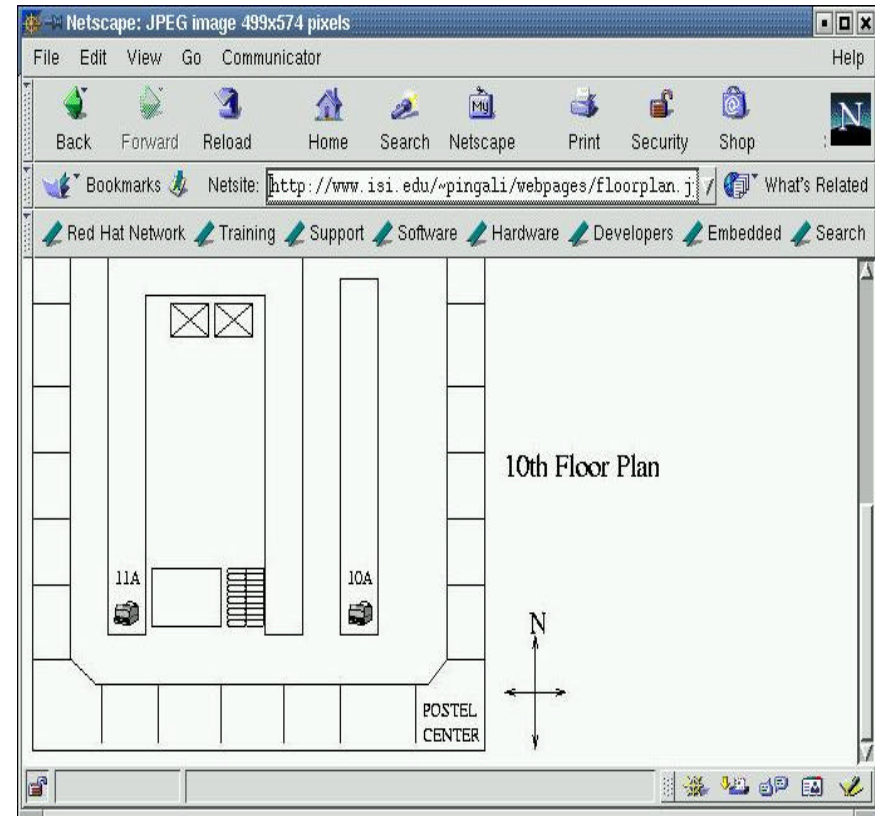
Proximity Detector

Proximity Manager

Client

Proximity Detector

Proximity Manager

SLP

ACAP

Proximity Network

Client Learns About Local Environment and Services

Future Work

- Location Services
- Automated Configuration
- Negotiation
- "Smart" Proximity Managers
- Personalization
- Architecture Implementation, Experimentation, and Evaluation