Developing a Mobile Infrastructure for Heterogeneous Services

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Overview

- The future computing model.
- What are the problems?
- What is Centaurus?
- What have we done?

The Future Computing Model

Singer Sewing Machine & Game Boy

Casio MP3 Watch

Casio Wrist Cam

Palm V with Omnisky

Nokia 9210 Communicator

Old Good desktop

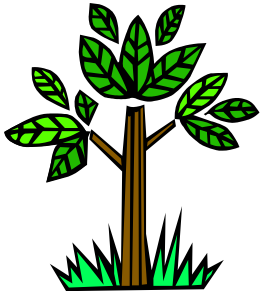
Toaster + Jini

What are the Problems?

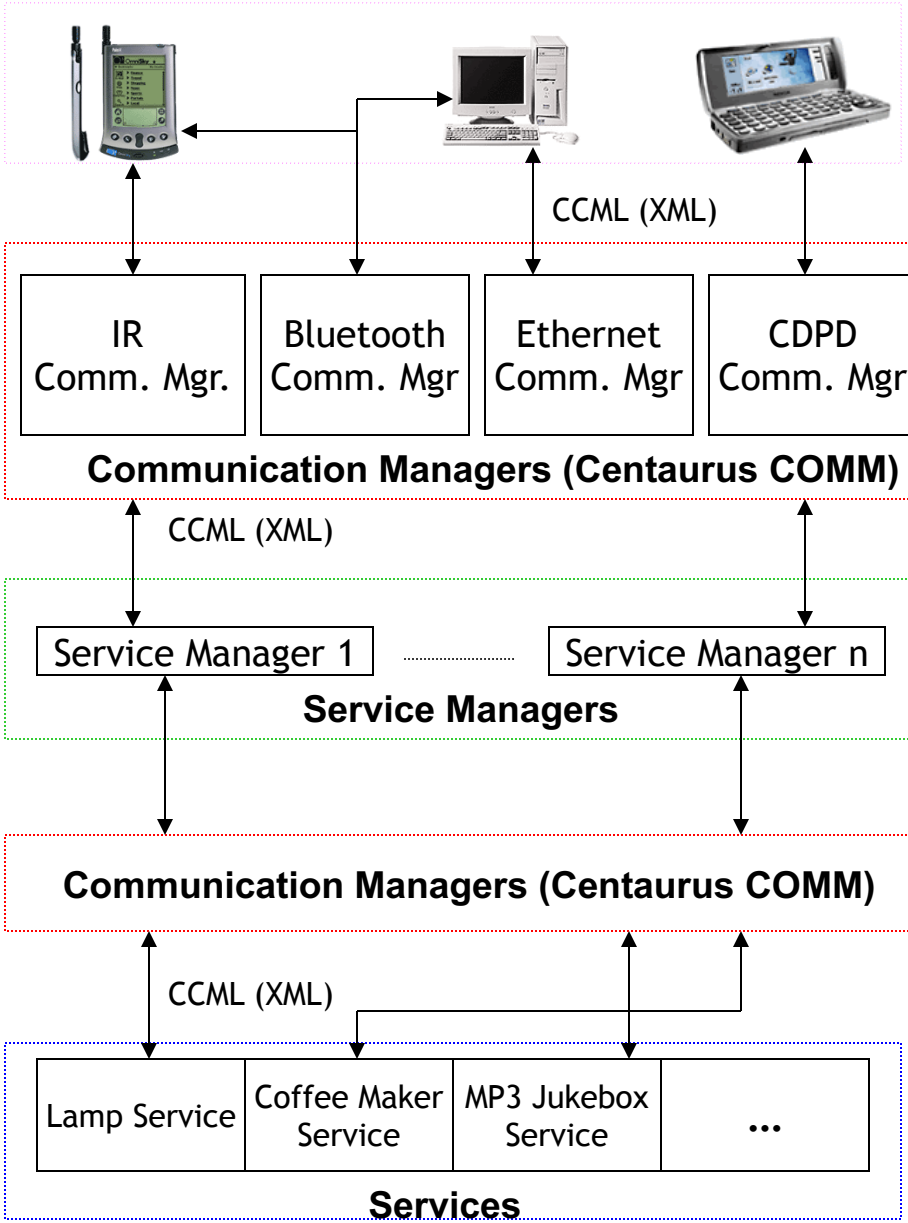
1. Computers and devices are facing interoperatability problems.
   - PDAs want to talk to printers, lamps, toasters etc.
2. The computing platforms are less likely to be uniform.
   - Palm OS, Windows CE, UNIX, Windows etc.
3. The communication mediums between devices are less likely to be uniform.
   - Infrared, Bluetooth, Wired cables, Wireless LAN etc.

Centaurus Motivation

- Create a framework for building portals to the world of services that users can communicate with and control.
- "Things" can communicate with each other in a uniform way.

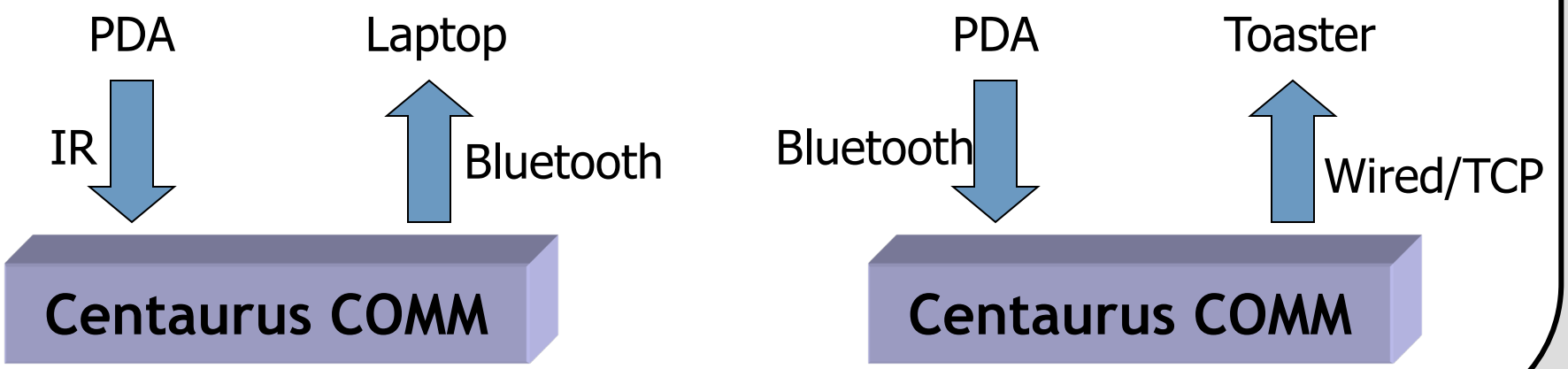


The Centaurus Architecture

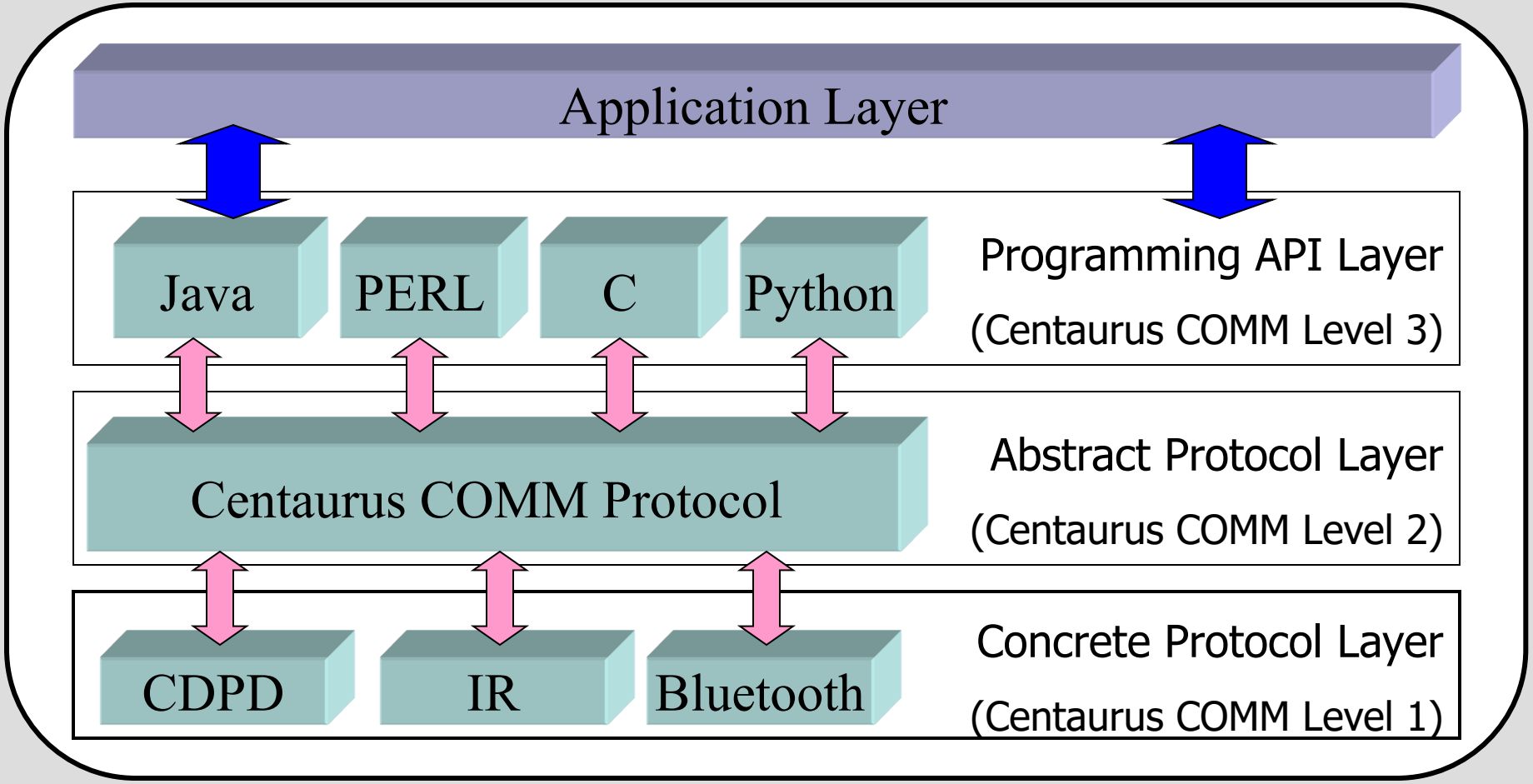


Centaurus Communication

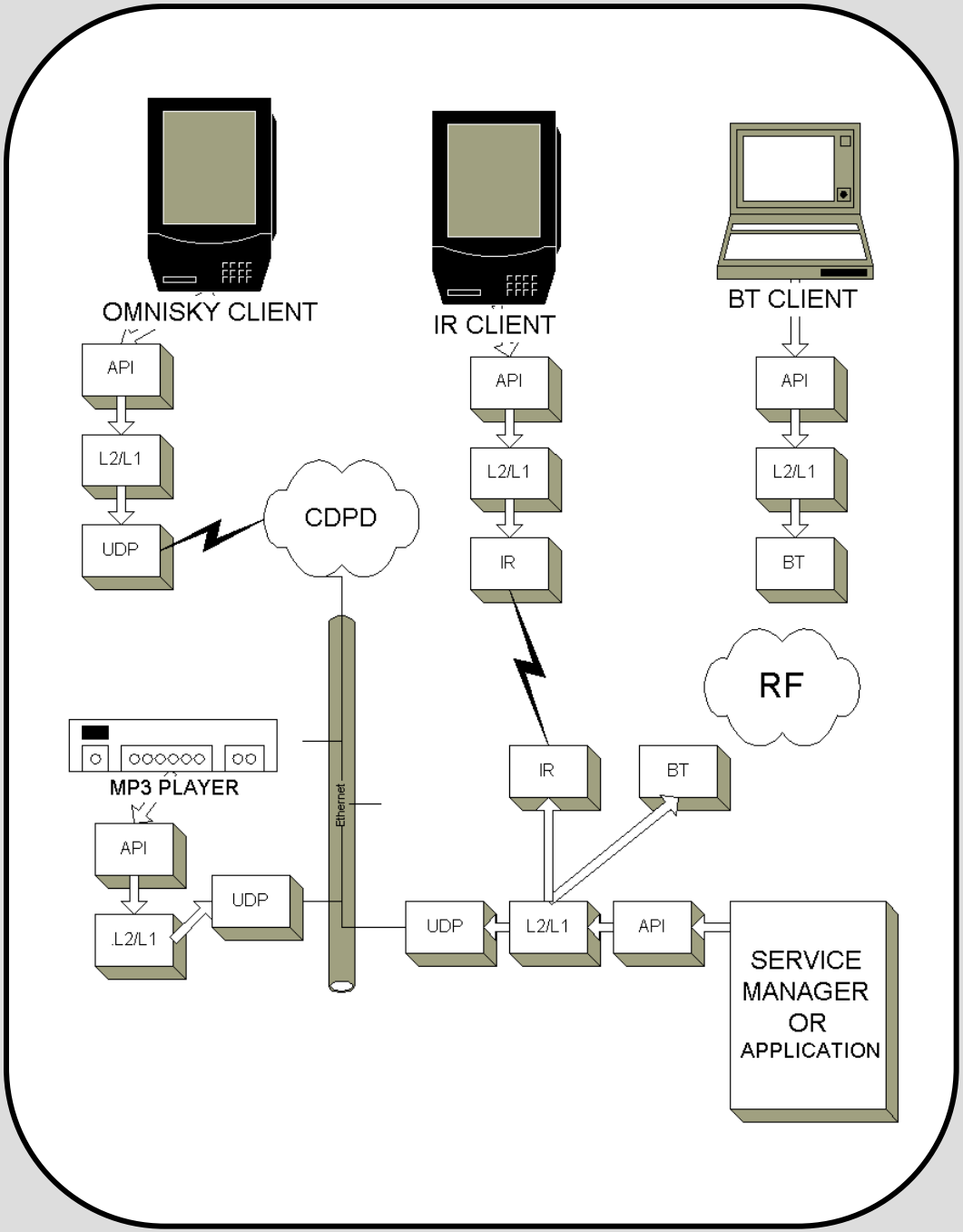
- Centaurus Communication (Centaurus COMM) provides a message passing network architecture that allows heterogeneous devices to communicate through varied communication mediums in a uniform fashion.



Centaurus Communication



An Example


OMNISKY CLIENT
IR CLIENT
BT CLIENT
API
L2/L1
UDP
CDPD
IR
BT
RF
MP3 PLAYER
Ethernet
SERVICE MANAGER OR APPLICATION

What have we done?

1. We have defined the Centaurus COMM Protocol (Layer 2).
2. We have implemented CDPD & IR modules for the Concrete Protocol Layer (Layer 1).
   - Implemented in C.
3. We have implemented the C & PERL programming API for the Programming API Layer (Layer 3).
4. We have experimented using XML-encoded objects (CCML) as the message exchange format between devices (Application Layer).

ebiquity group

Online Resource

- Centaurus Web Site
  - http://research.ebiquity.org/centaurus/
- UMBC eBiquity Research Group
  - http://research.ebiquity.org

- Harry Chen
  - Email: hchen4@cs.umbc.edu
  - Home Page: http://www.cs.umbc.edu/~hchen4