

Symbian 2007



Symbian OS Architecture

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symbian



Audience

- Operating System Knowledge
- Design patterns Concept
- Some Programming Experience
- Need S60 / UIQ Programming Experiences ? No



Agenda

- Overview
- Layers
- Kernel
- Design Patterns
- Summary



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Overview

- History
 - ... 1998 - Symbian was formed by Psion, Nokia, Ericsson and Motorola.
 - ... First Symbian phone was released in 2000
 - Ericsson R380
 - ... 2.5G phone released early 2002
 - Nokia 7650
 - ... 3G phone released in December 2002
 - 3G FOMA F2051 from Fujitsu
 - ... EKA2 was announced in 2004
 - ... Security Platform was introduced in 2005 on v9



Overview (continued)

- Development Languages
 - ... C++
 - ... Java
 - ... Flash Lite
 - ... Python, Ruby
 - ... OPL
 - ... PIPS



Overview (continued)

- Symbian C++
 - ... Leaves
 - ... Cleanup
 - ... Descriptors
 - ... Active Object



Overview (continued)

- Versions
 - ... v6.0, v6.1, v7.0, v7.0s, v8.0, v8.1a, v8.1b, v9.1...v9.5
- True Micro-Kernel
 - ... User Mode & Kernel Mode
 - ... Only a minimal parts of system runs as kernel mode
 - ... Real-Time OS



Overview (continued)

- Features
 - ... GUI
 - ... Telephony
 - ... Multimedia
 - ... Messaging
 - ... Networking
 - ... Short link (USB, Bluetooth, IR)
 - ... Security



Agenda

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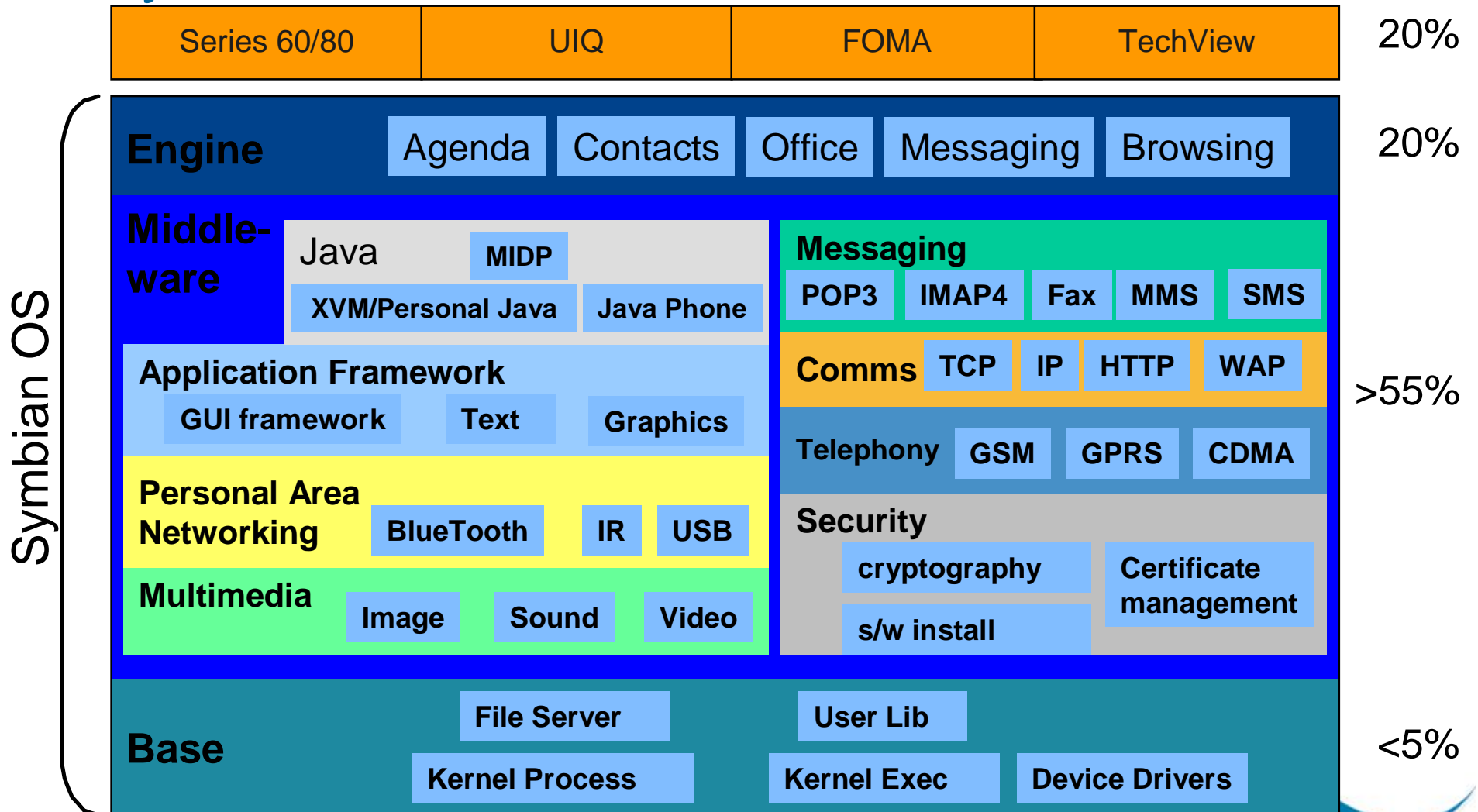


Layers

- 5 Layers
- Design Patterns
- C++ Component Based
- DLL

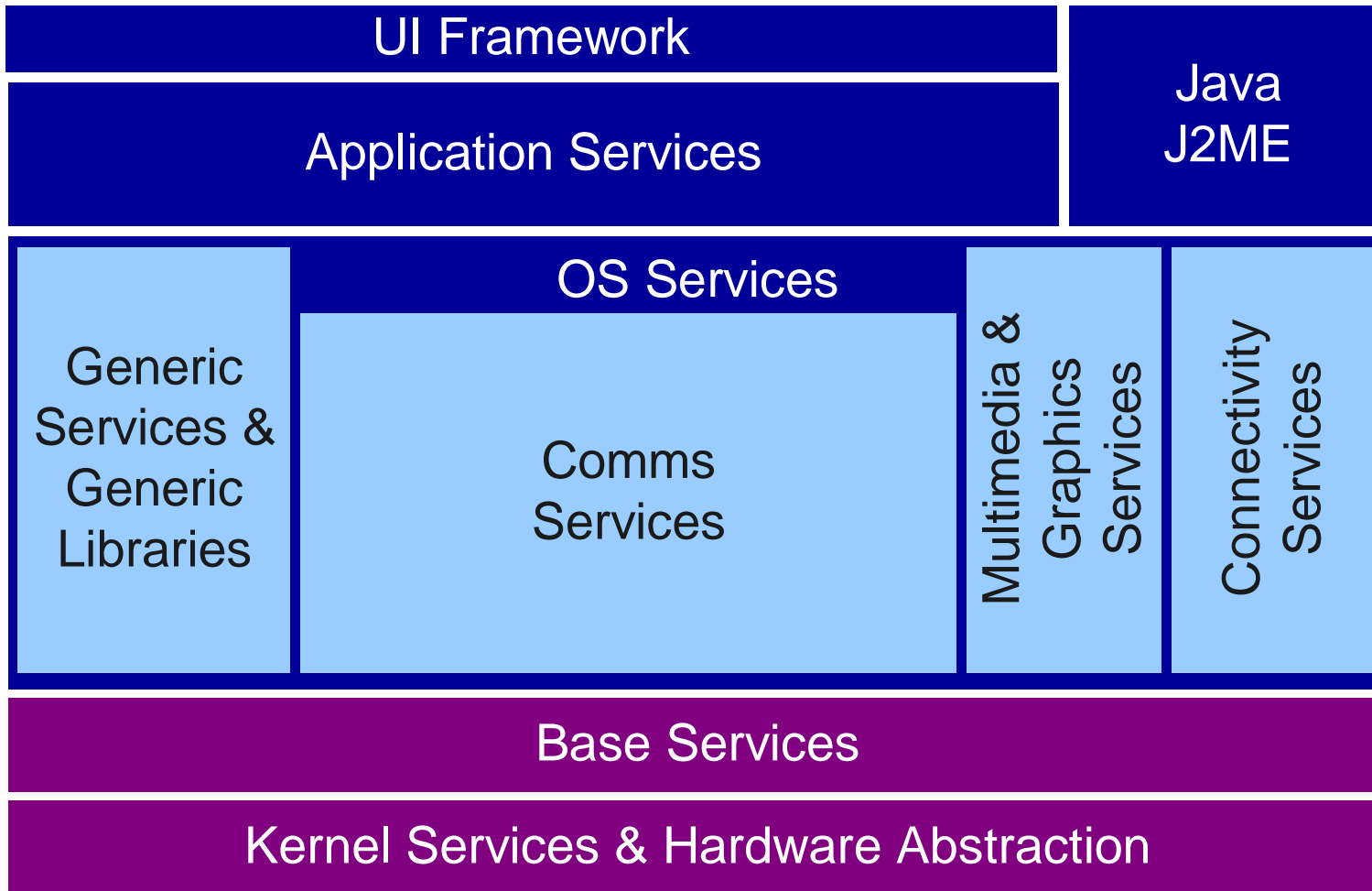


Layers (Continued)





Layers (Continued)



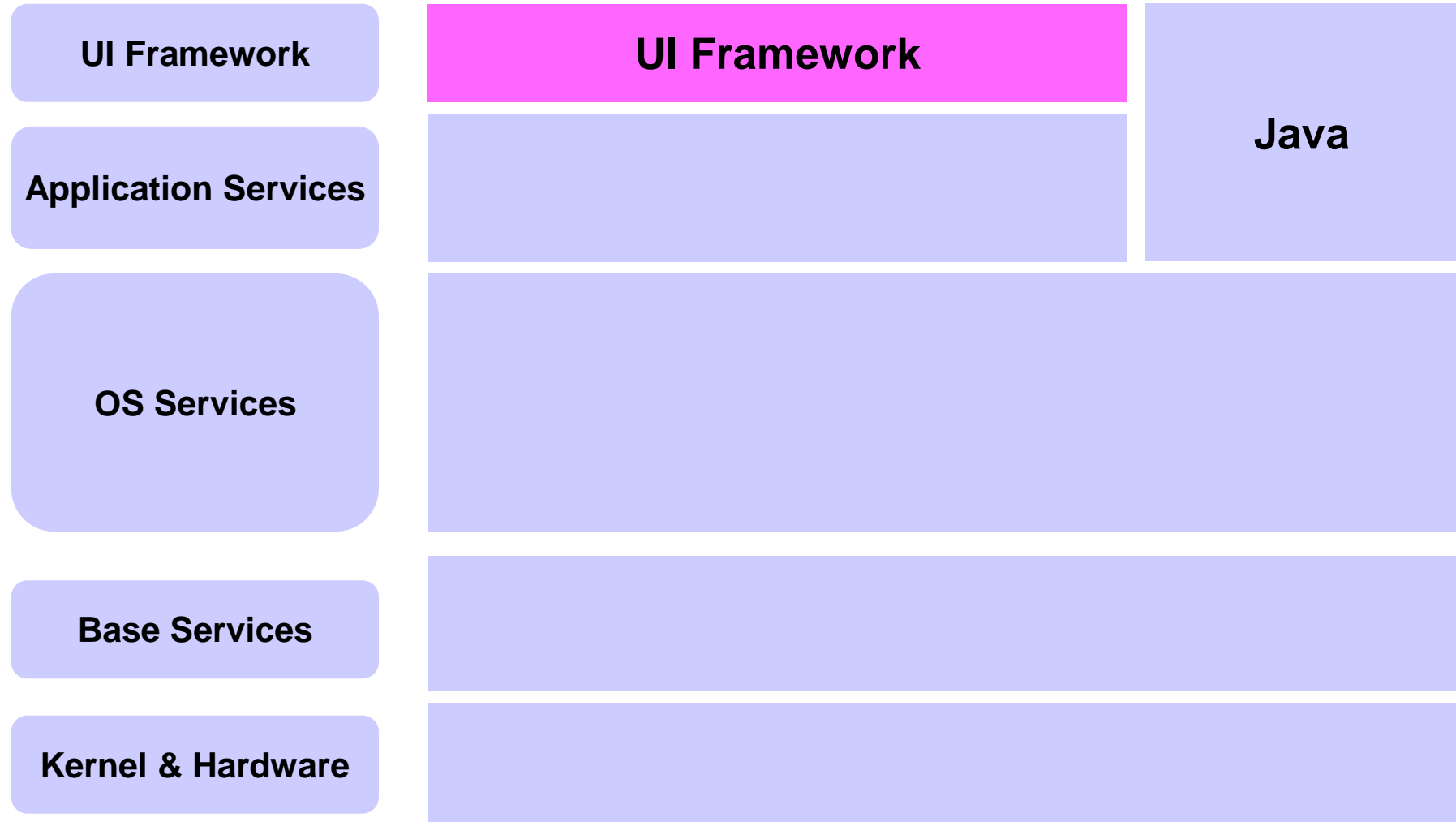


Layers (Continued)

- What are in every layers ?

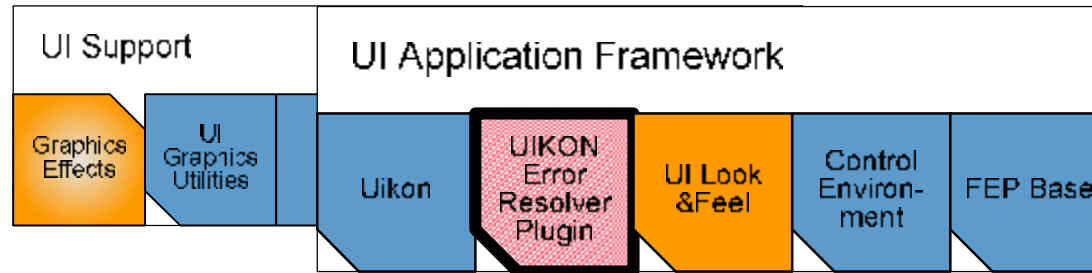


Layers – UI Framework

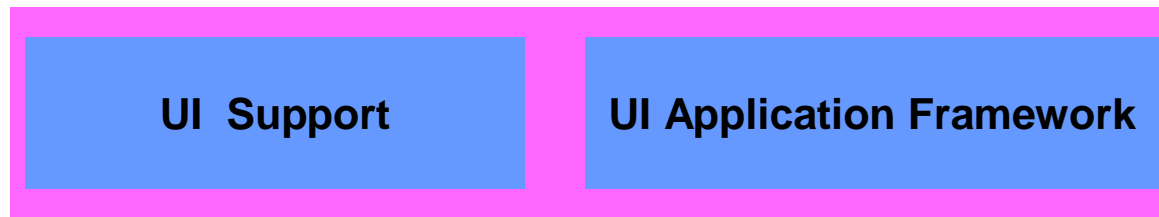




Layers – UI Framework (continued)

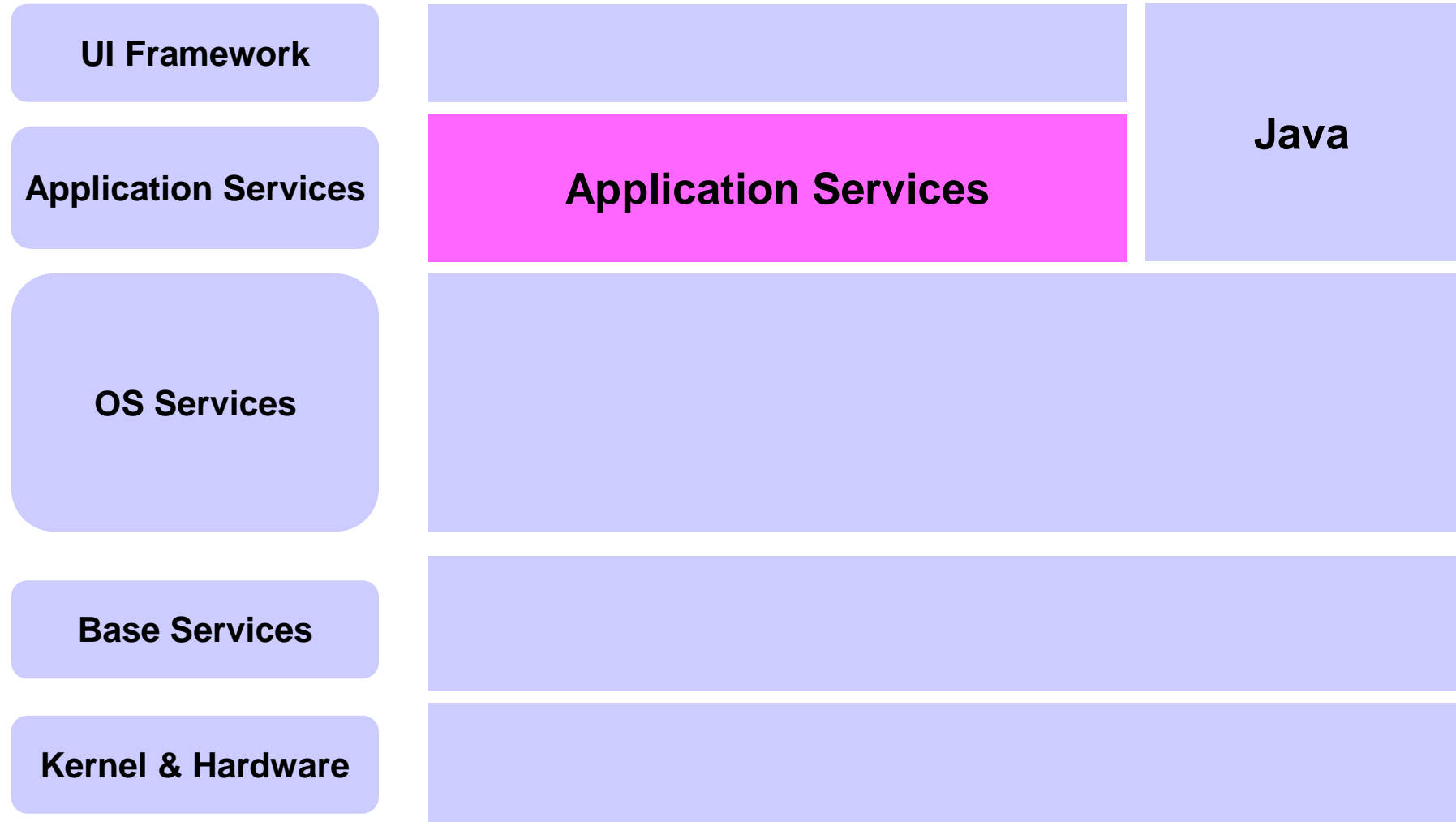


**IU
Framework**





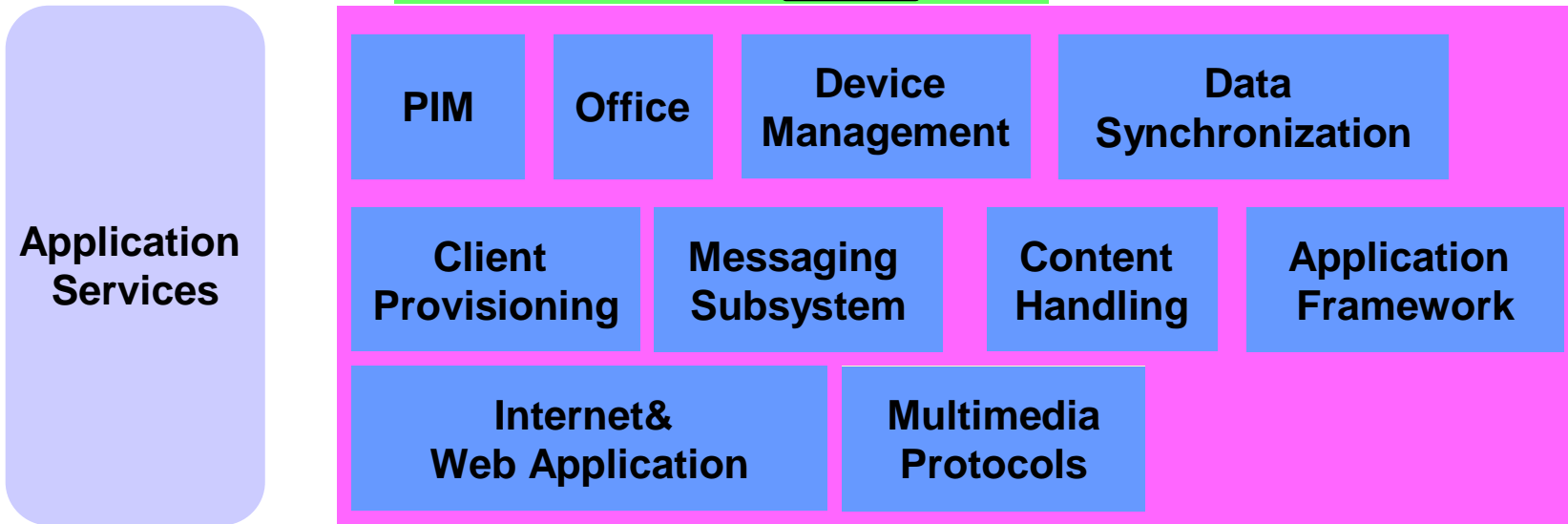
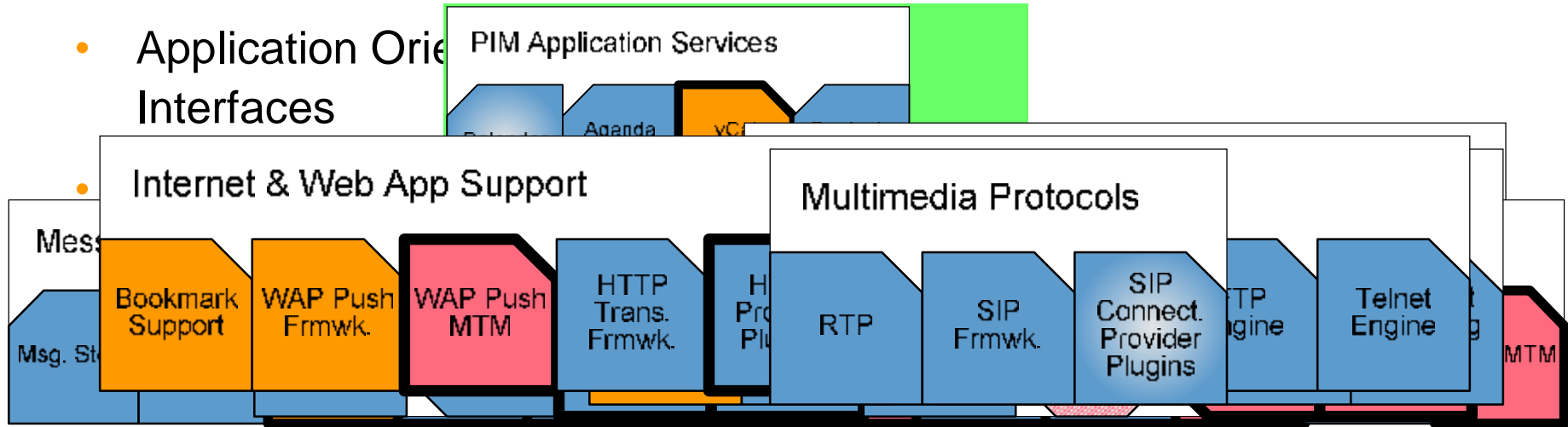
Layers – Application Services





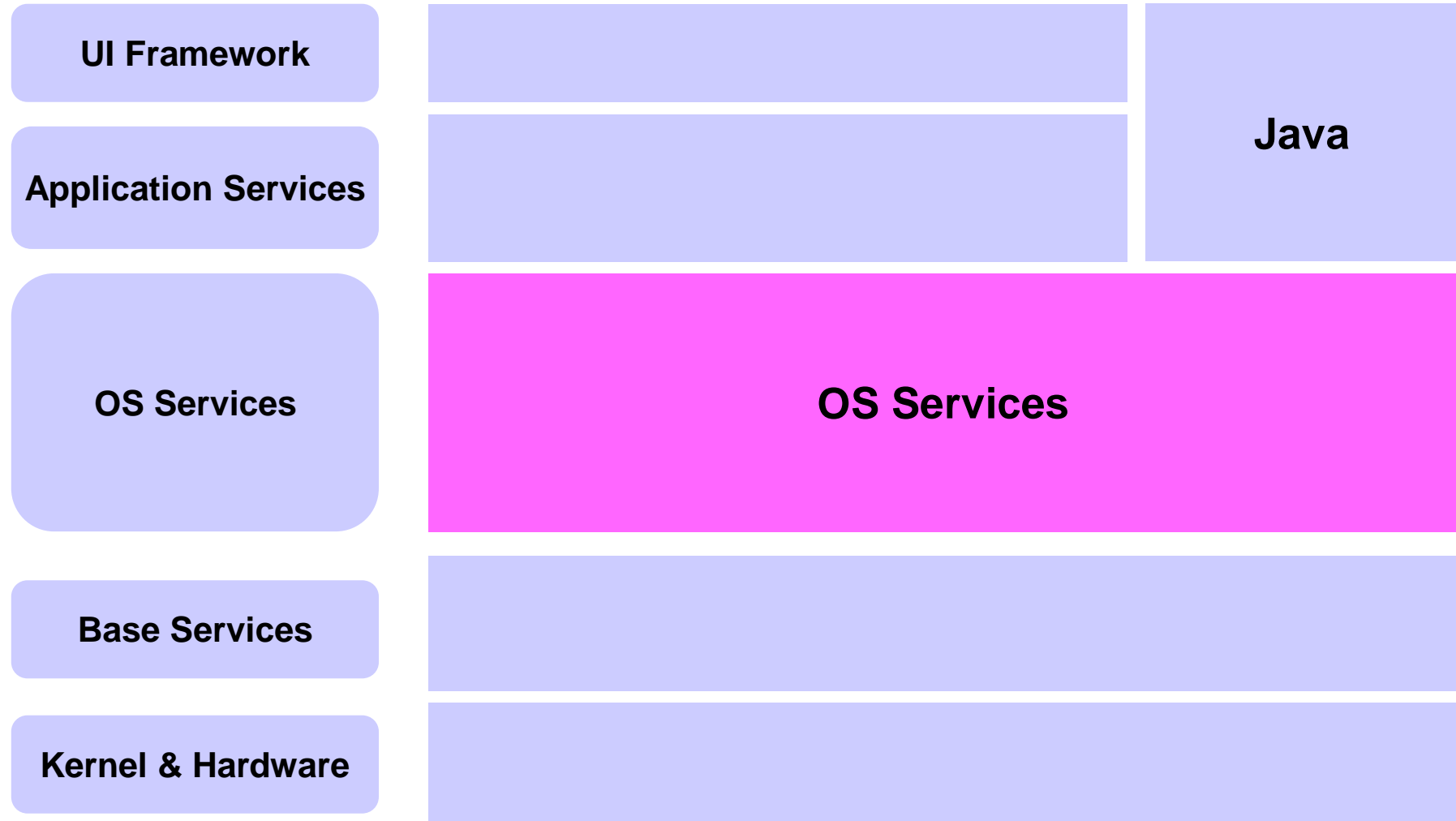
Layers – Application Services

- Application Oriented Interfaces





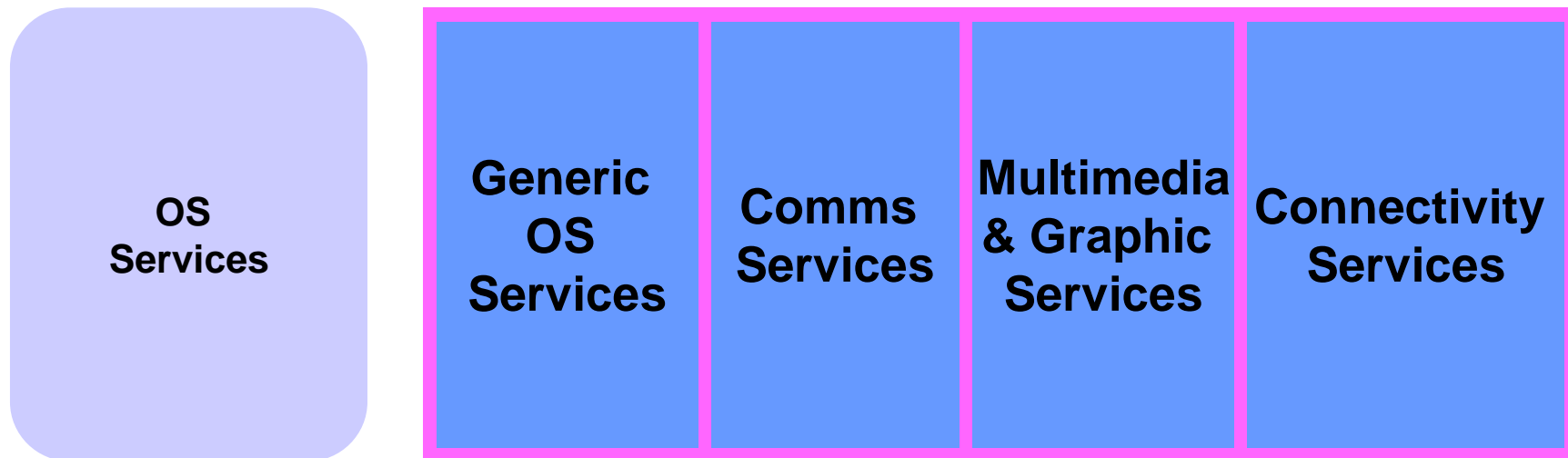
Layers – OS Services





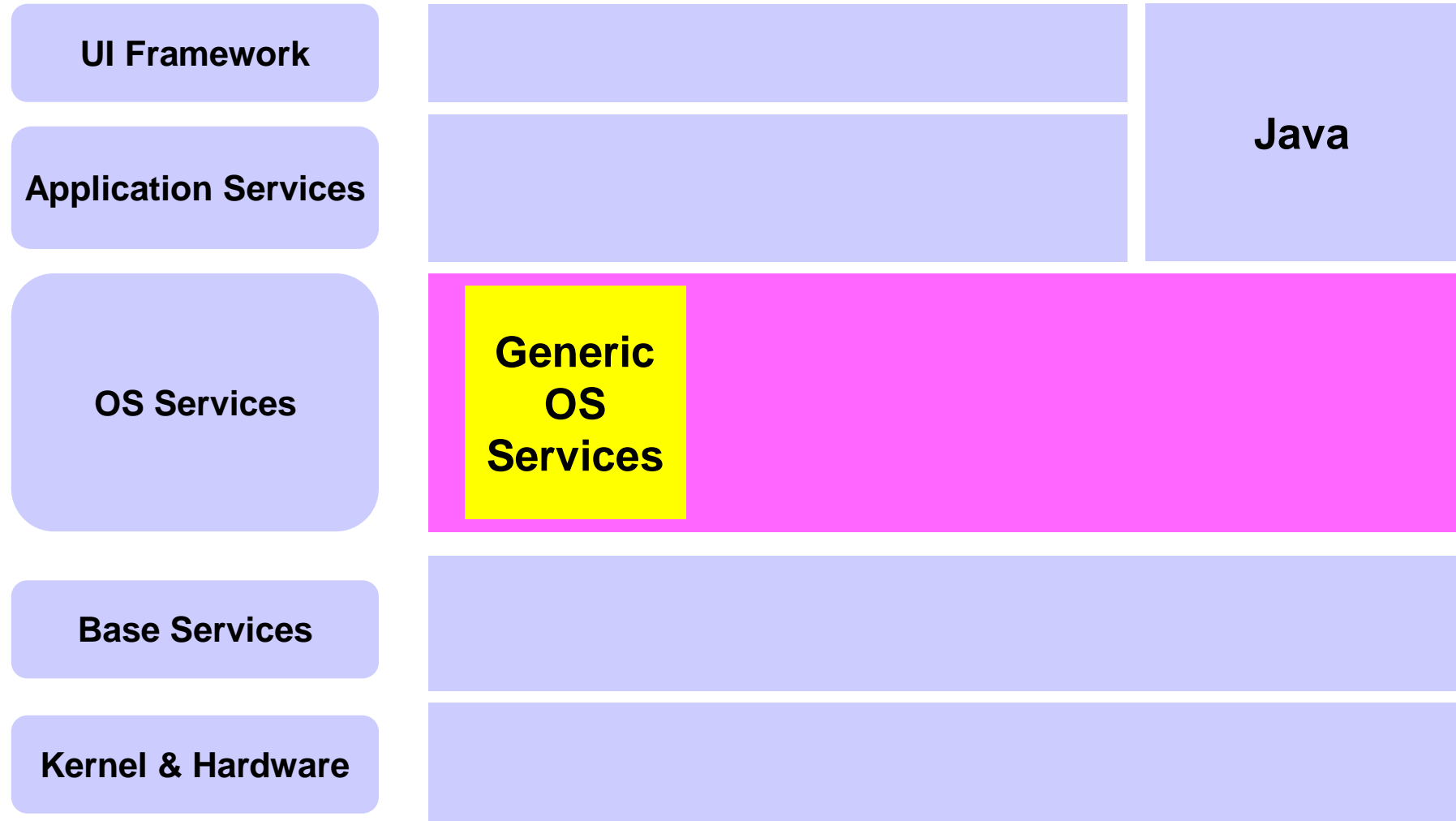
Layers – OS Services (continued)

- Core System Services and Frameworks



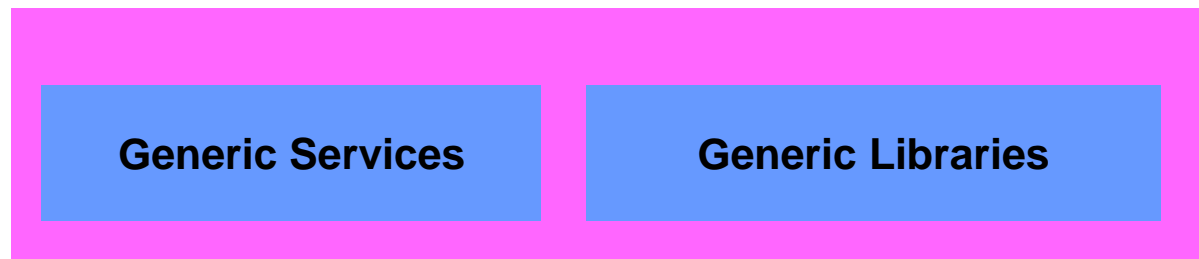
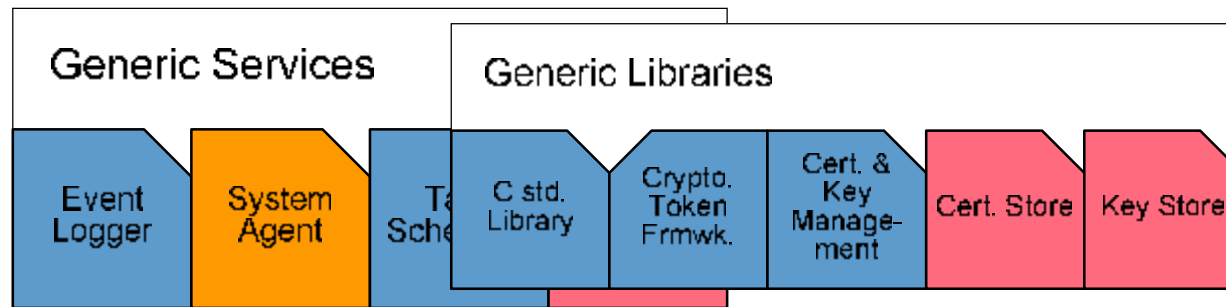


Layers – OS Services (continued)



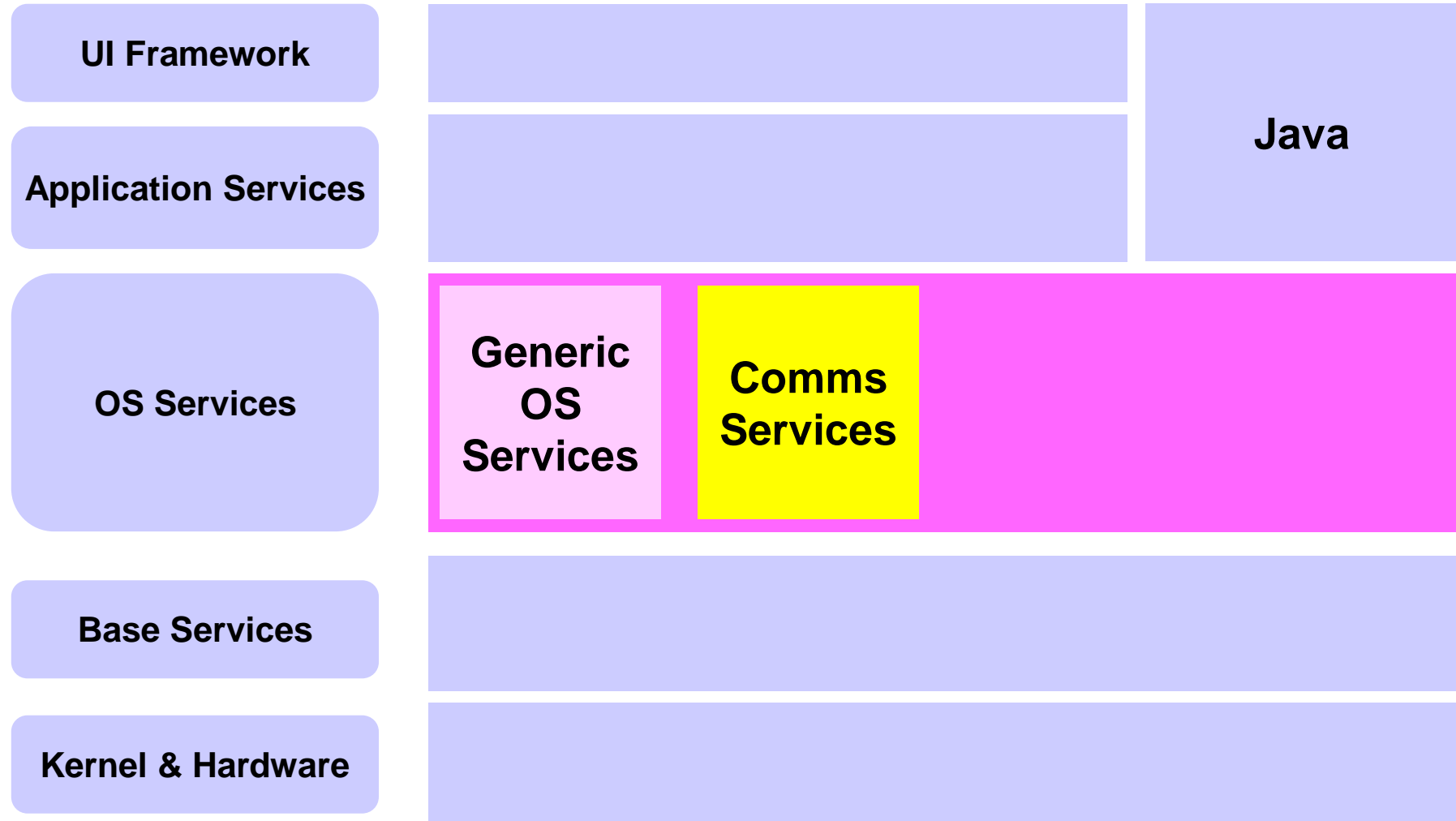


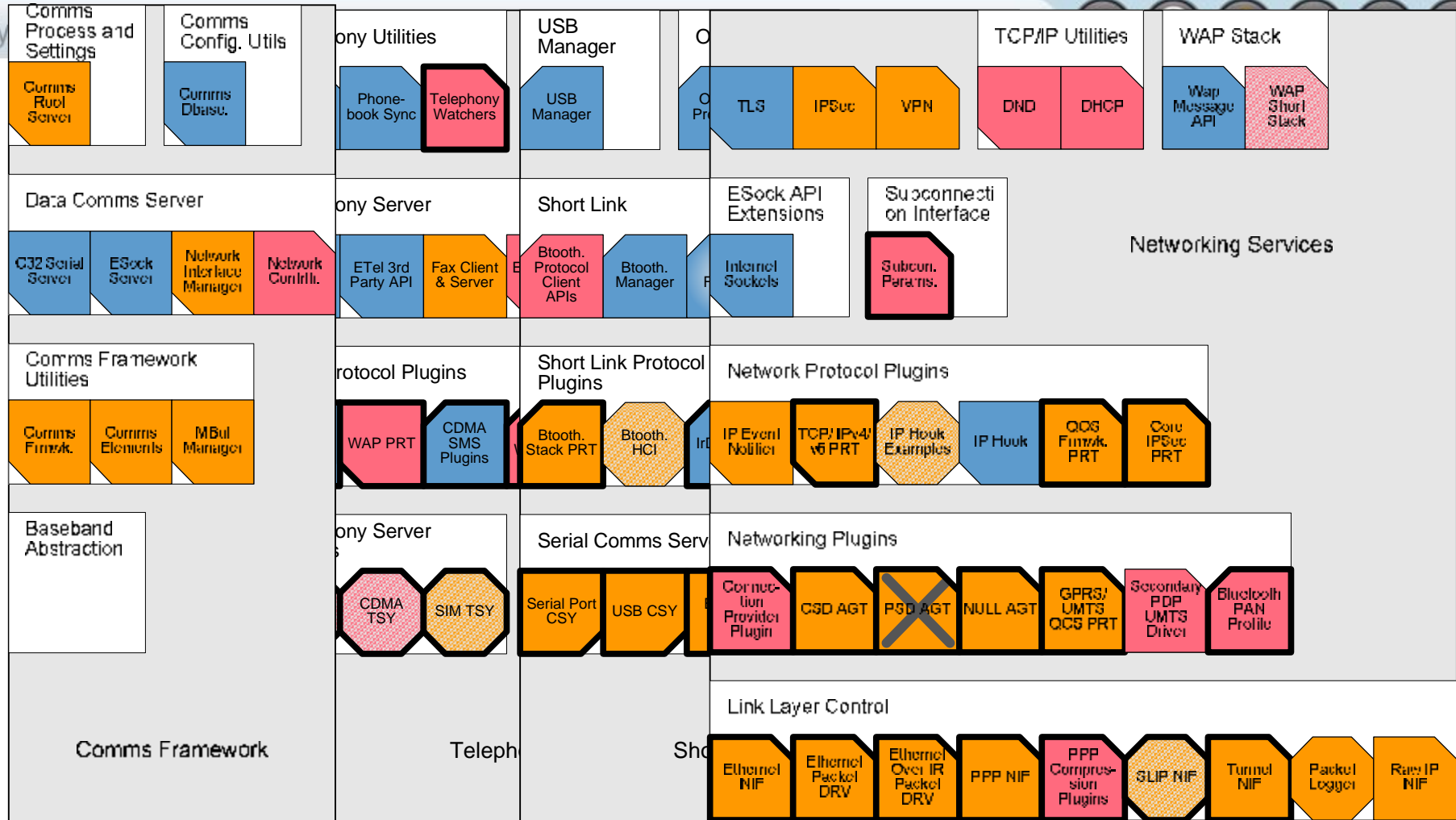
Layers – OS Services (continued)





Layers – OS Services (continued)





Comms Framework

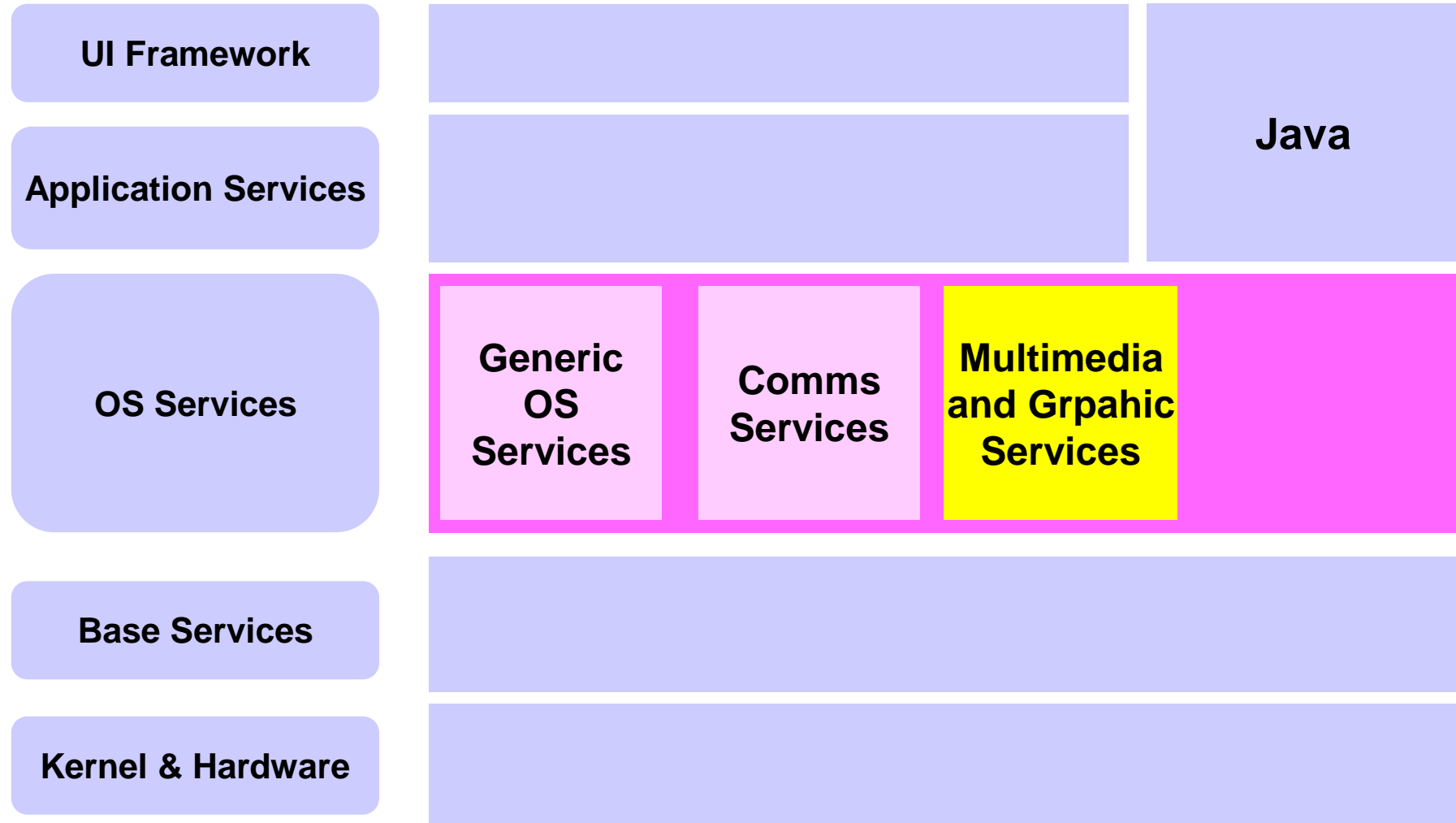
Telephony Services

Short Link Services

Networking Services

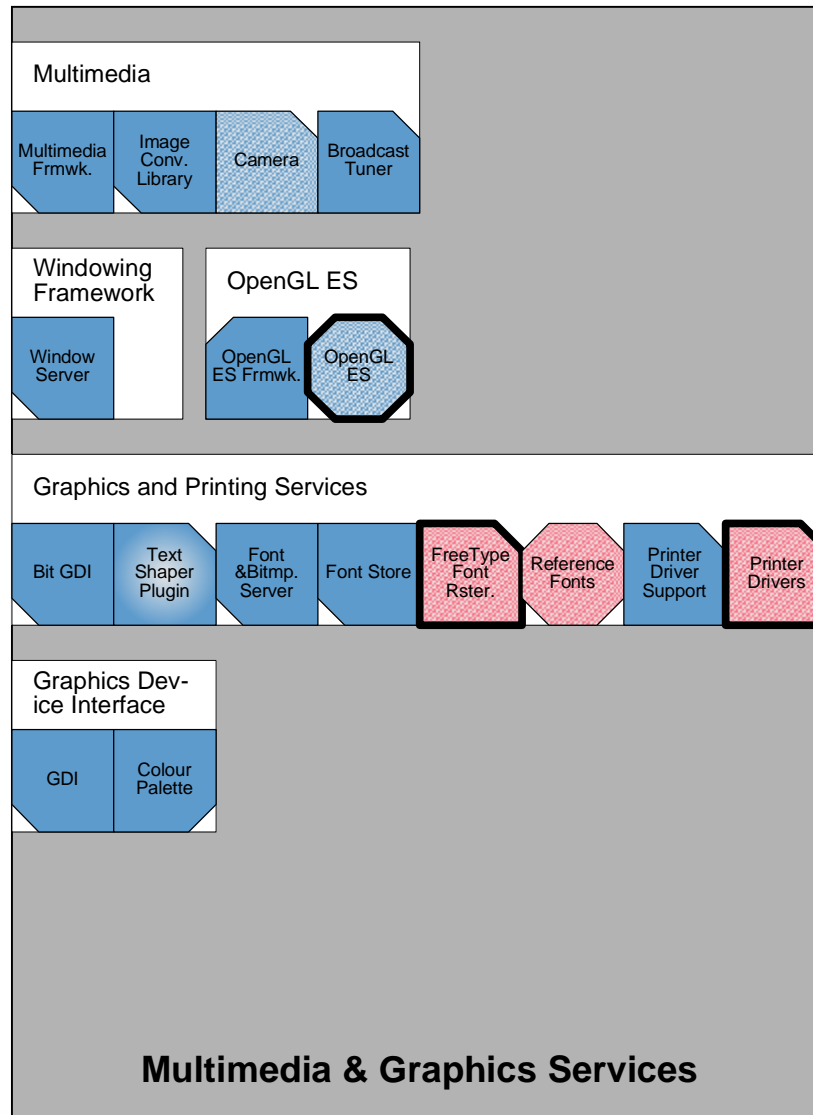


Layers – OS Services (continued)



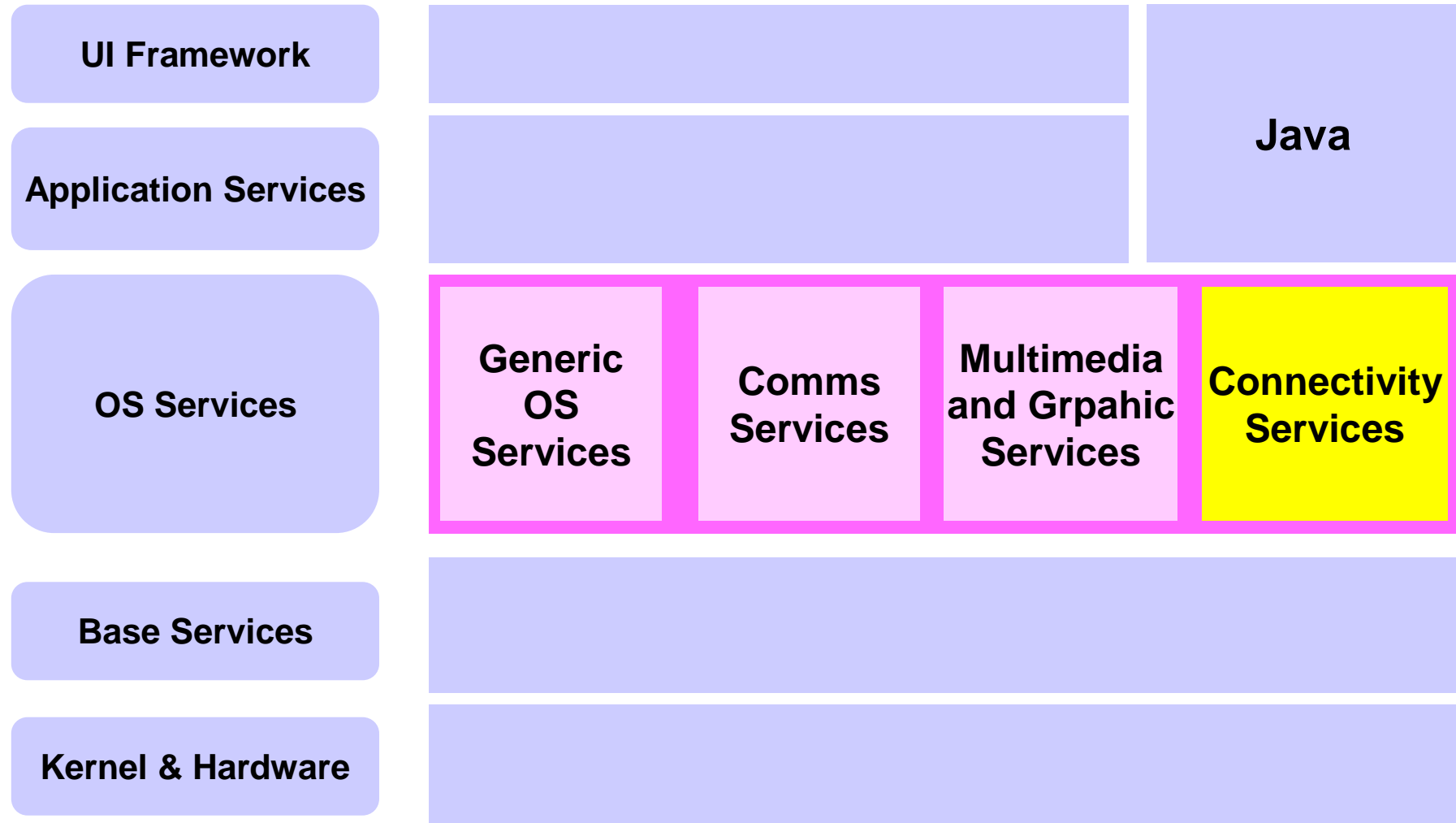


Layers – OS Services (continued)



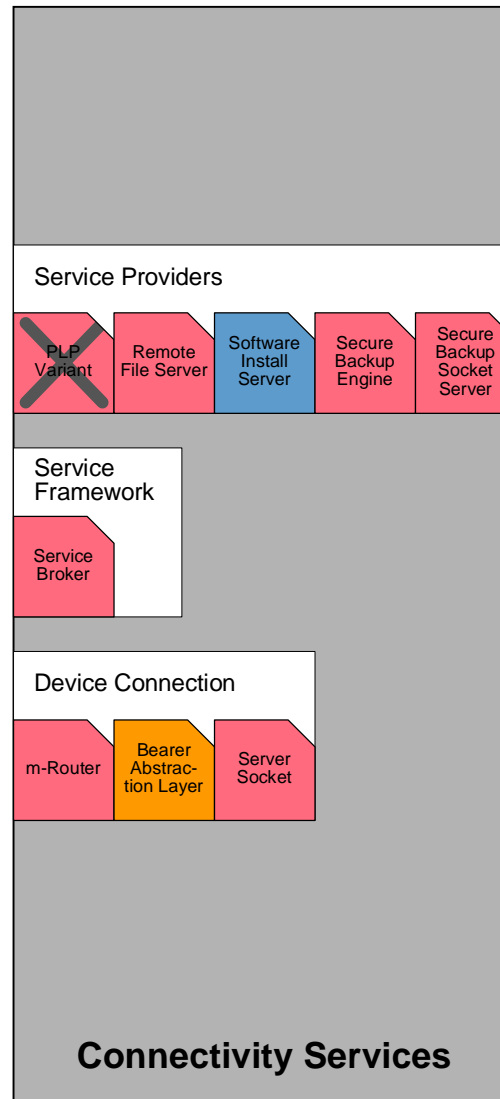


Layers – OS Services (continued)



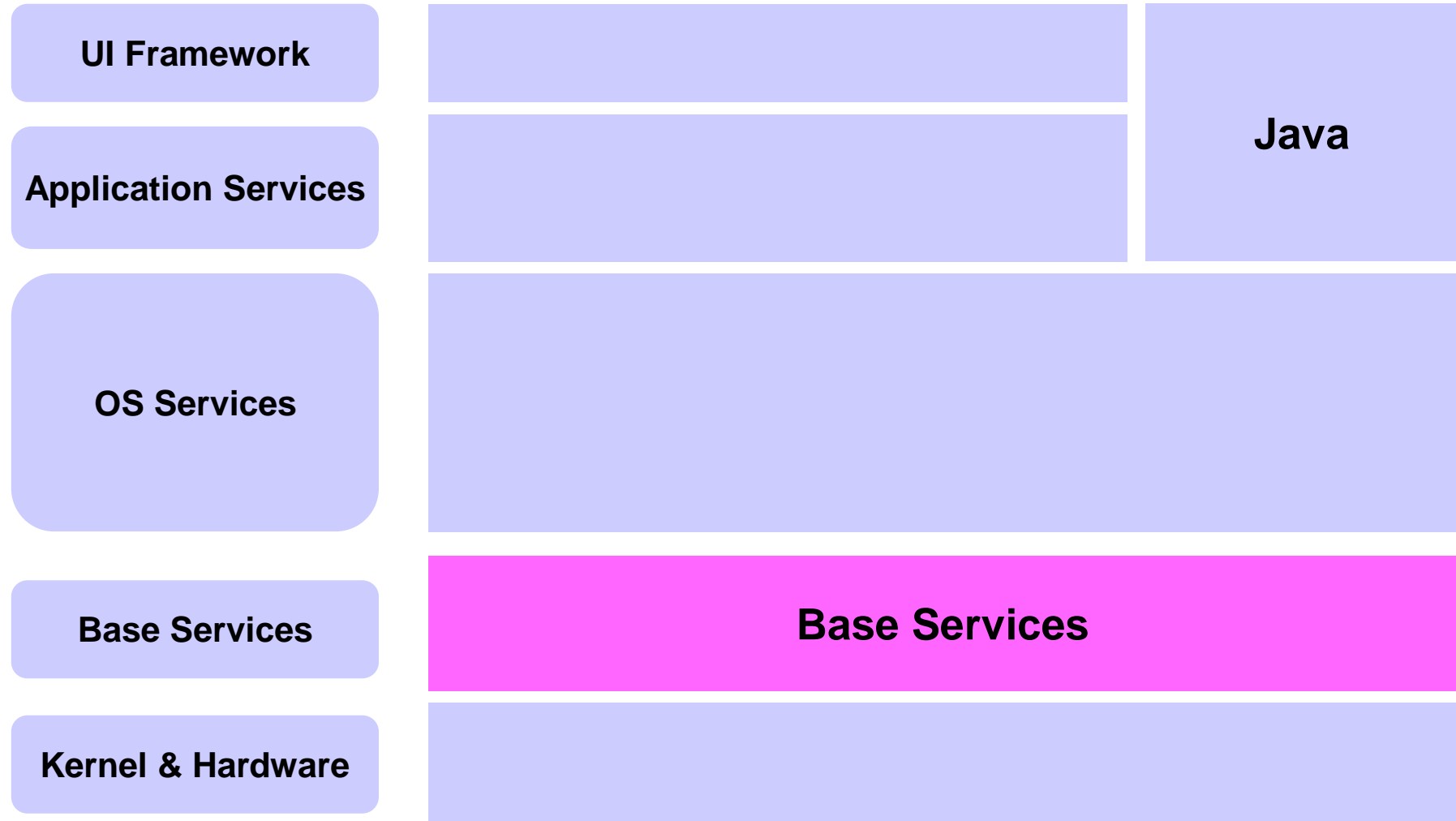


Layers – OS Services (continued)





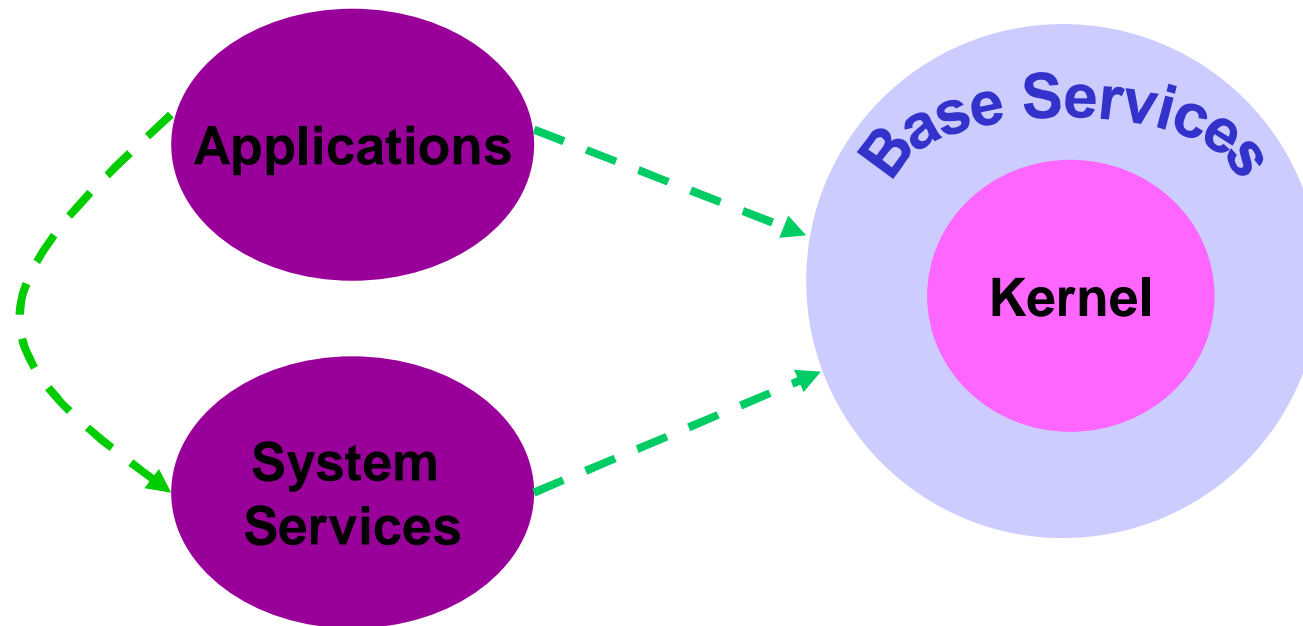
Layers – Base Services





Layers – Base Services (continued)

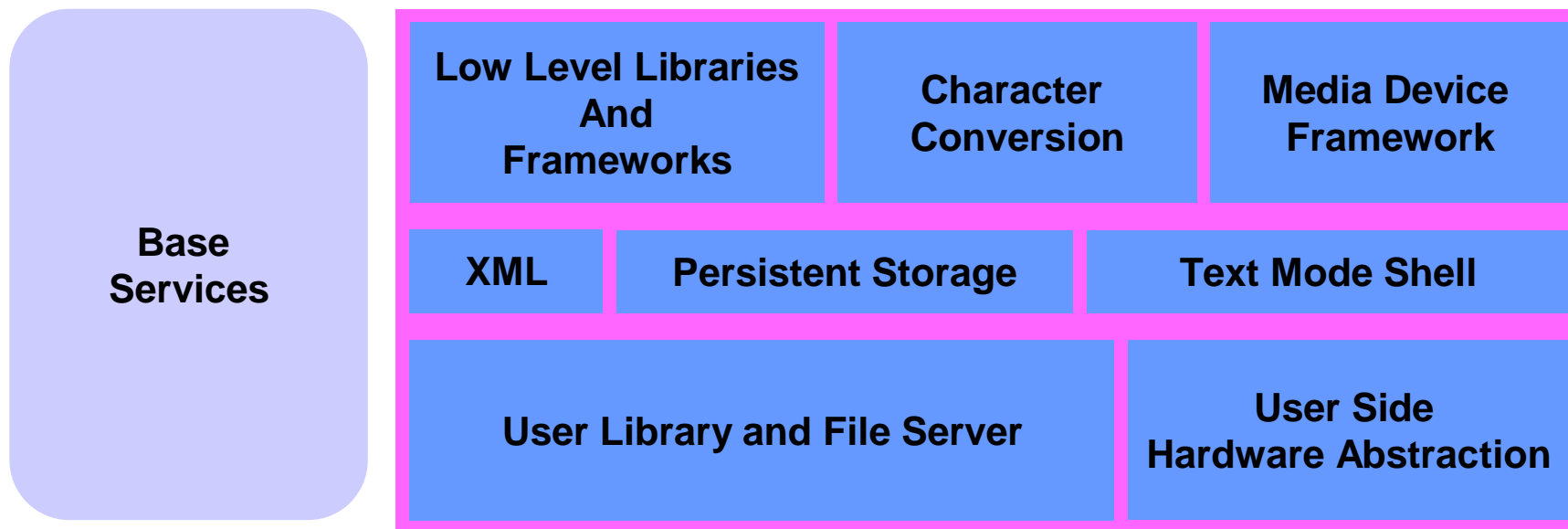
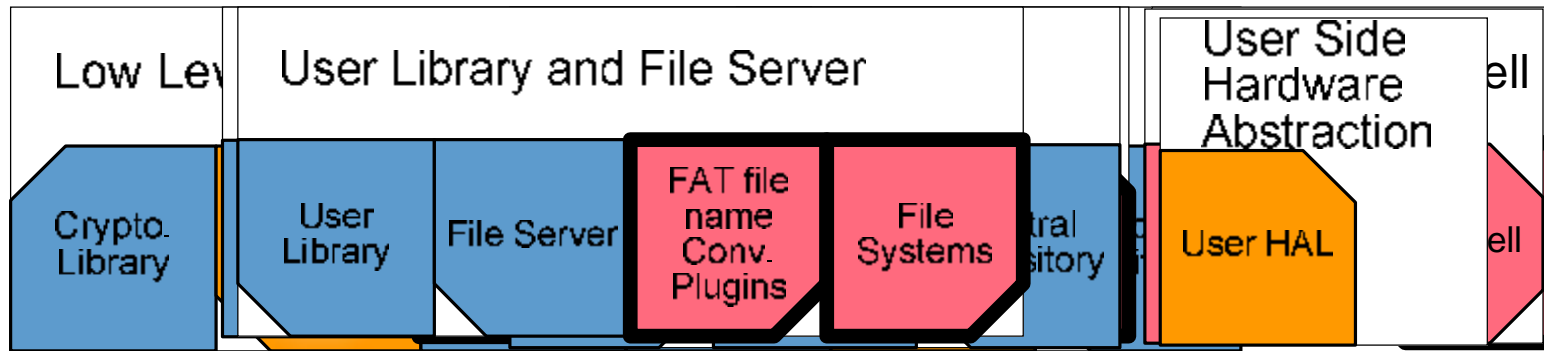
- Extend the Kernel
- User Side of Operating System





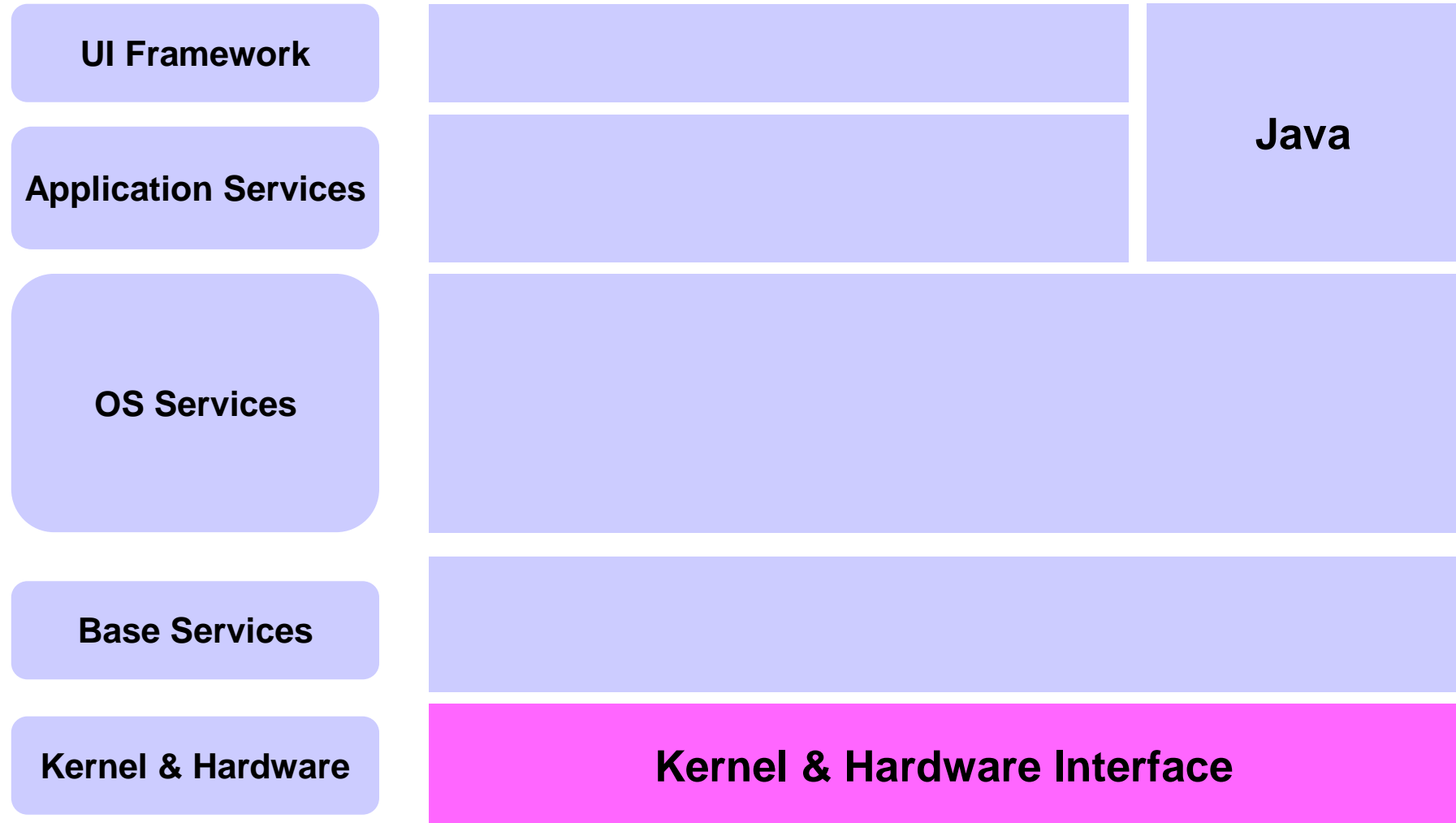
Layers – Base Services (continued)

- Base Services



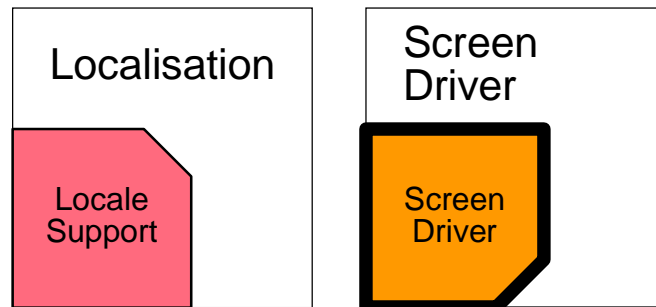
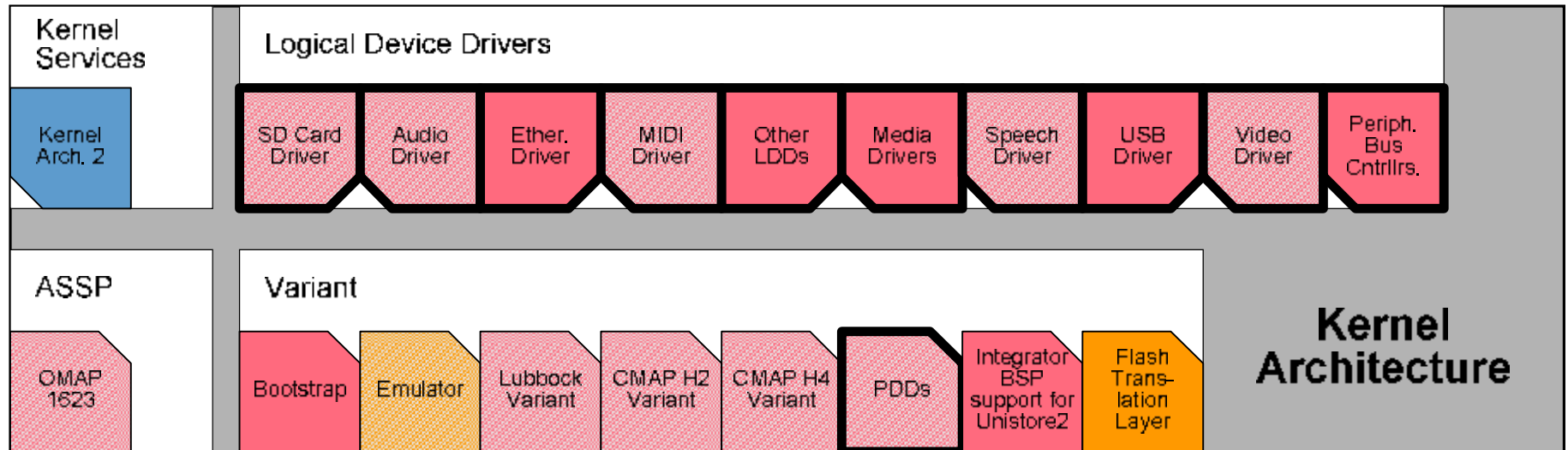


Layers – Kernel & Hardware Interface





Layers – Kernel & Hardware Interface (Continued)





Layers (Continued)

UI Framework

Application Services

OS Services

Base Services

Kernel & Hardware

- **Pure C++ Component Based**
- **Frameworks**
- **Plug-Ins**
- **Server (process) / Client (process)**
- **Extensibility**

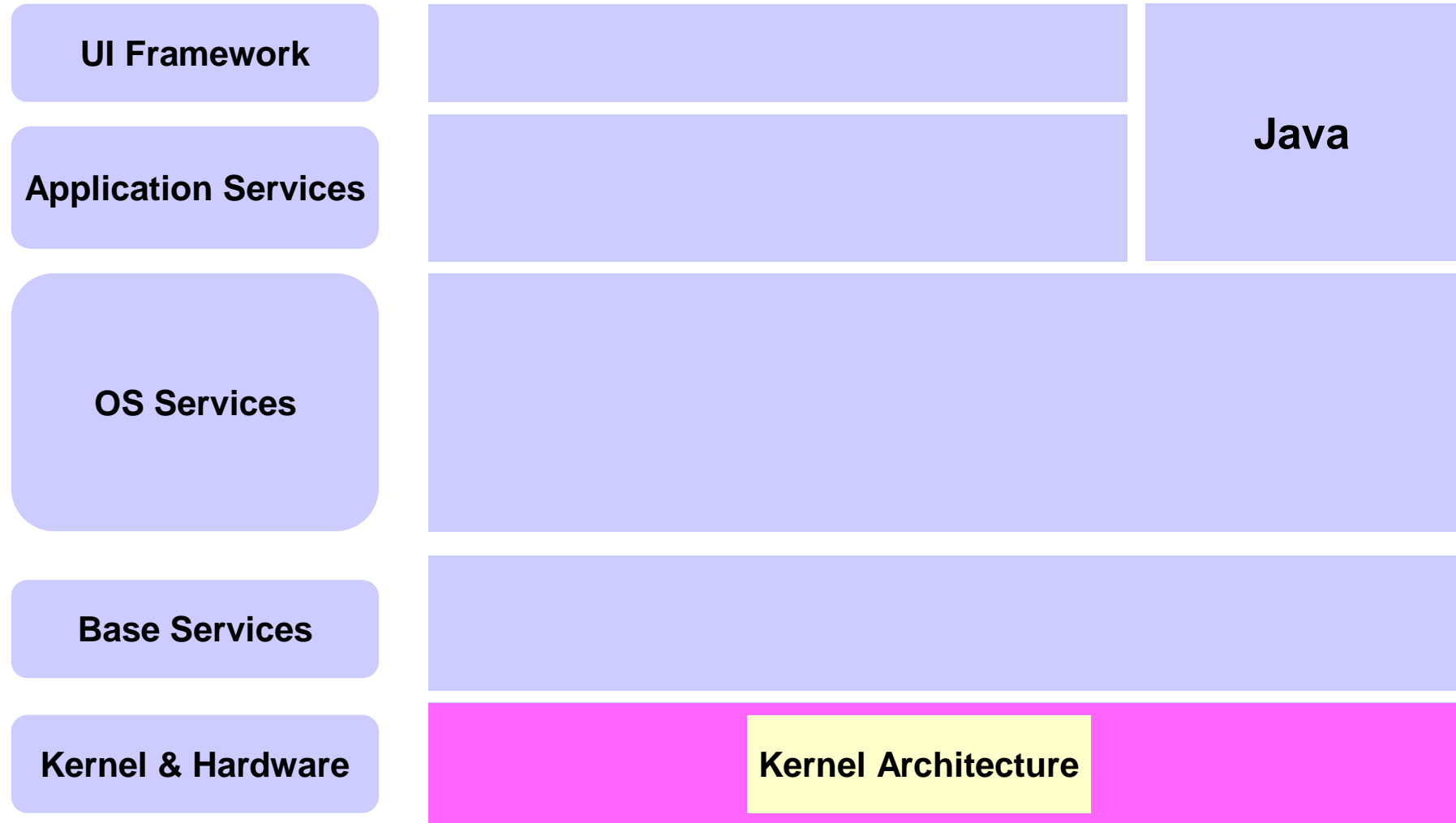


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Kernel





Kernel (Continued)

Features

Privilege

RTOS

Multi-Tasking

Pre-Emptive

**Hardware
Independent**

XIP



Kernel (Continued)

Services

Process

Thread

Memory

Device

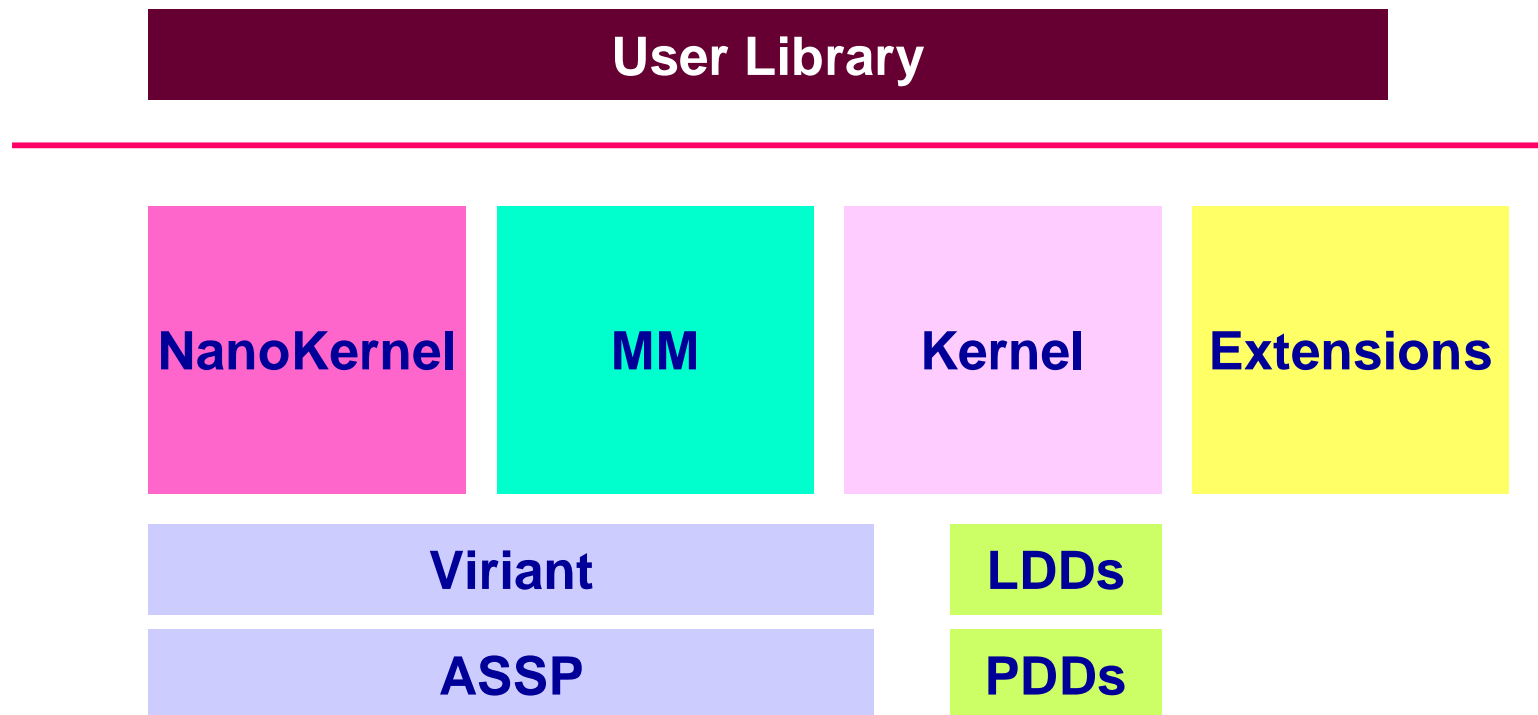
Interrupt

Power



Kernel (Continued)

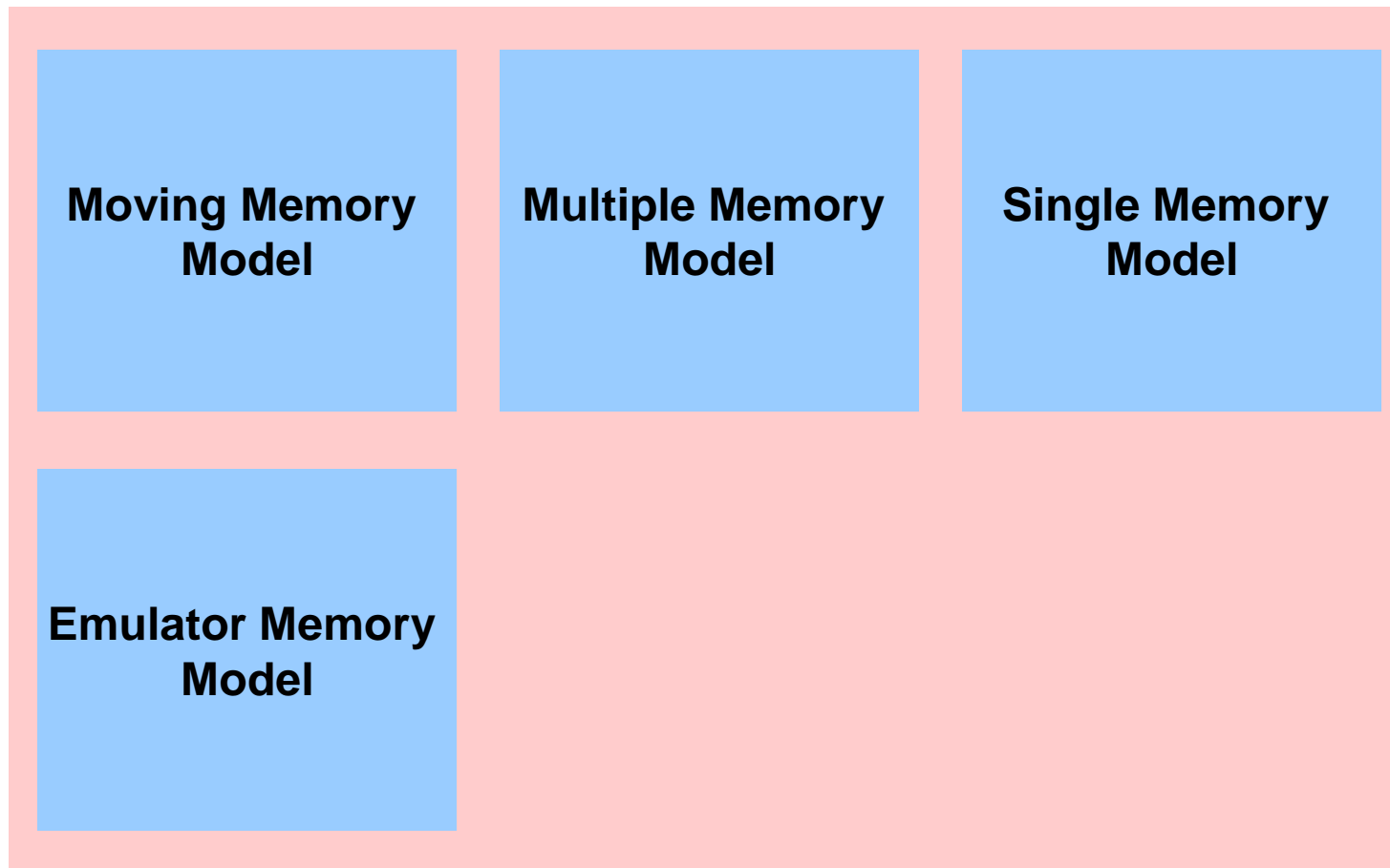
- Architecture





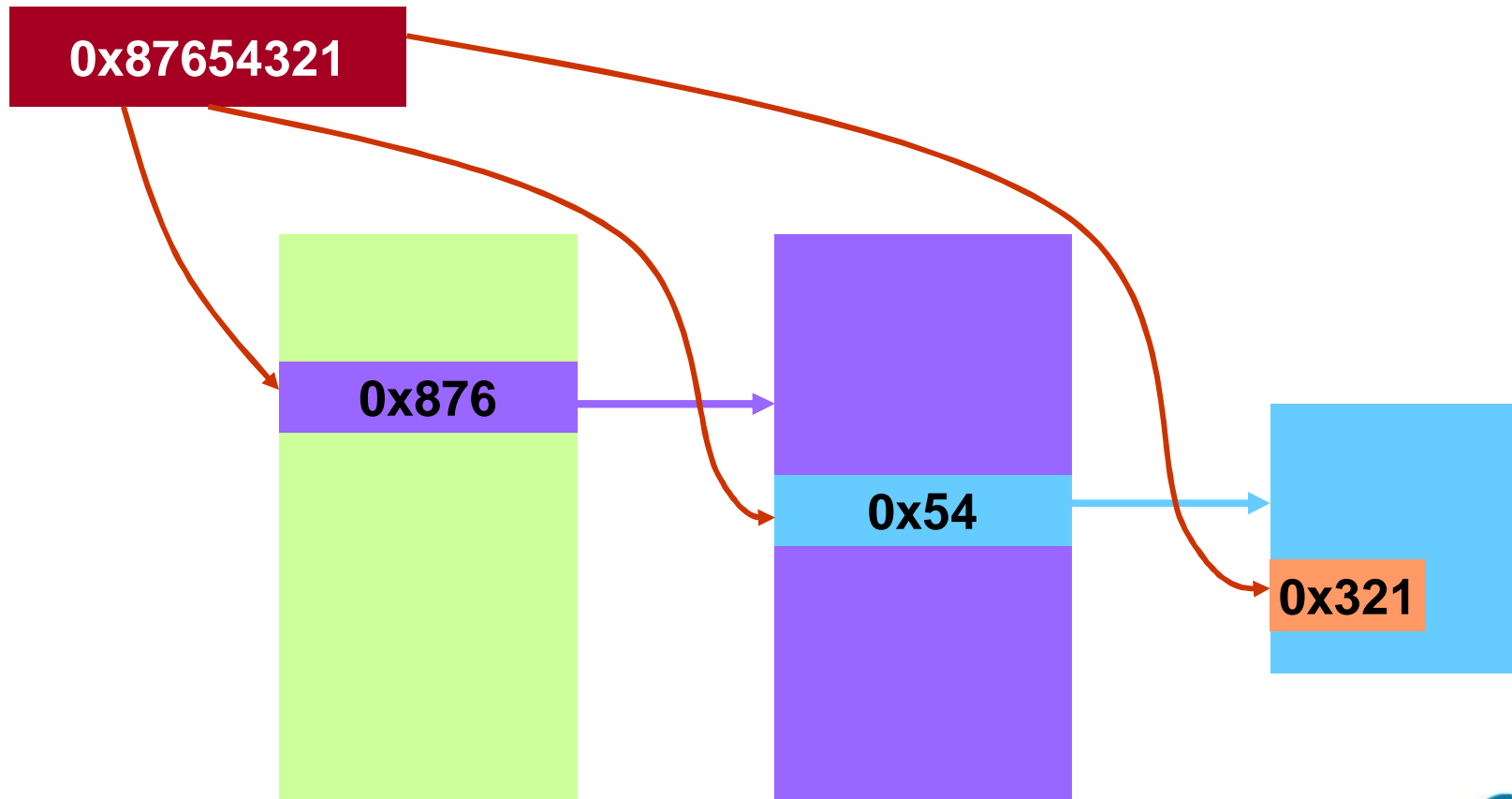
Kernel (Continued)

- Memory Model





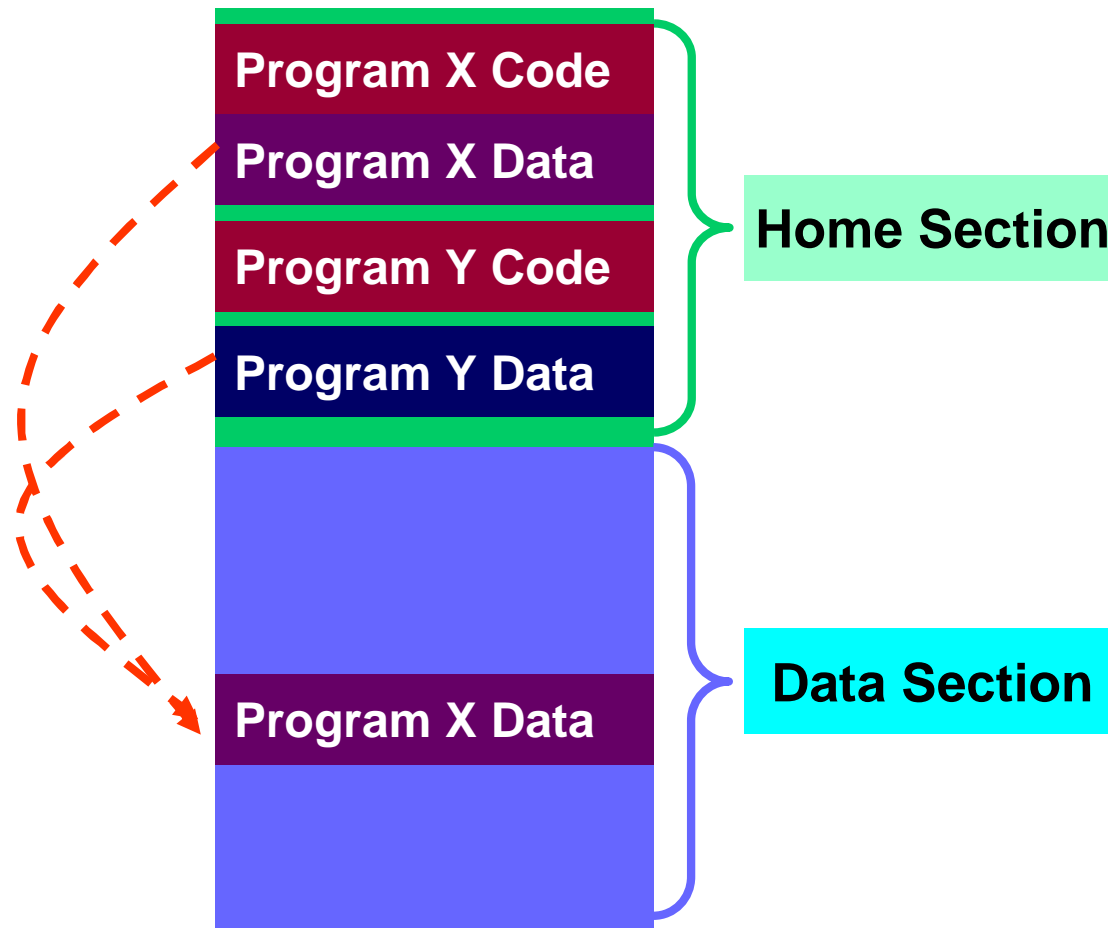
- Memory Model --- 32 Bits Flat Addressing





Kernel (Continued)

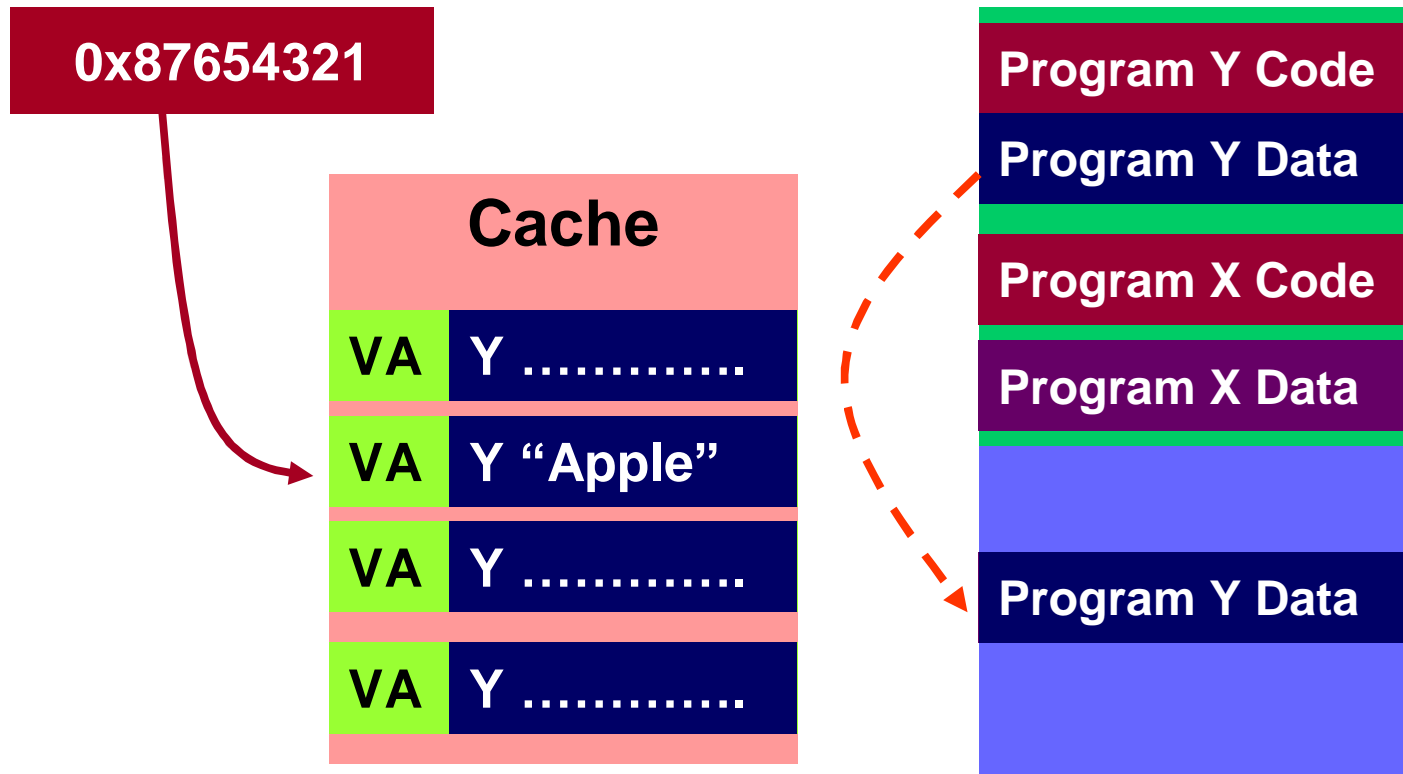
- Moving Memory Model --- Processes





Kernel (Continued)

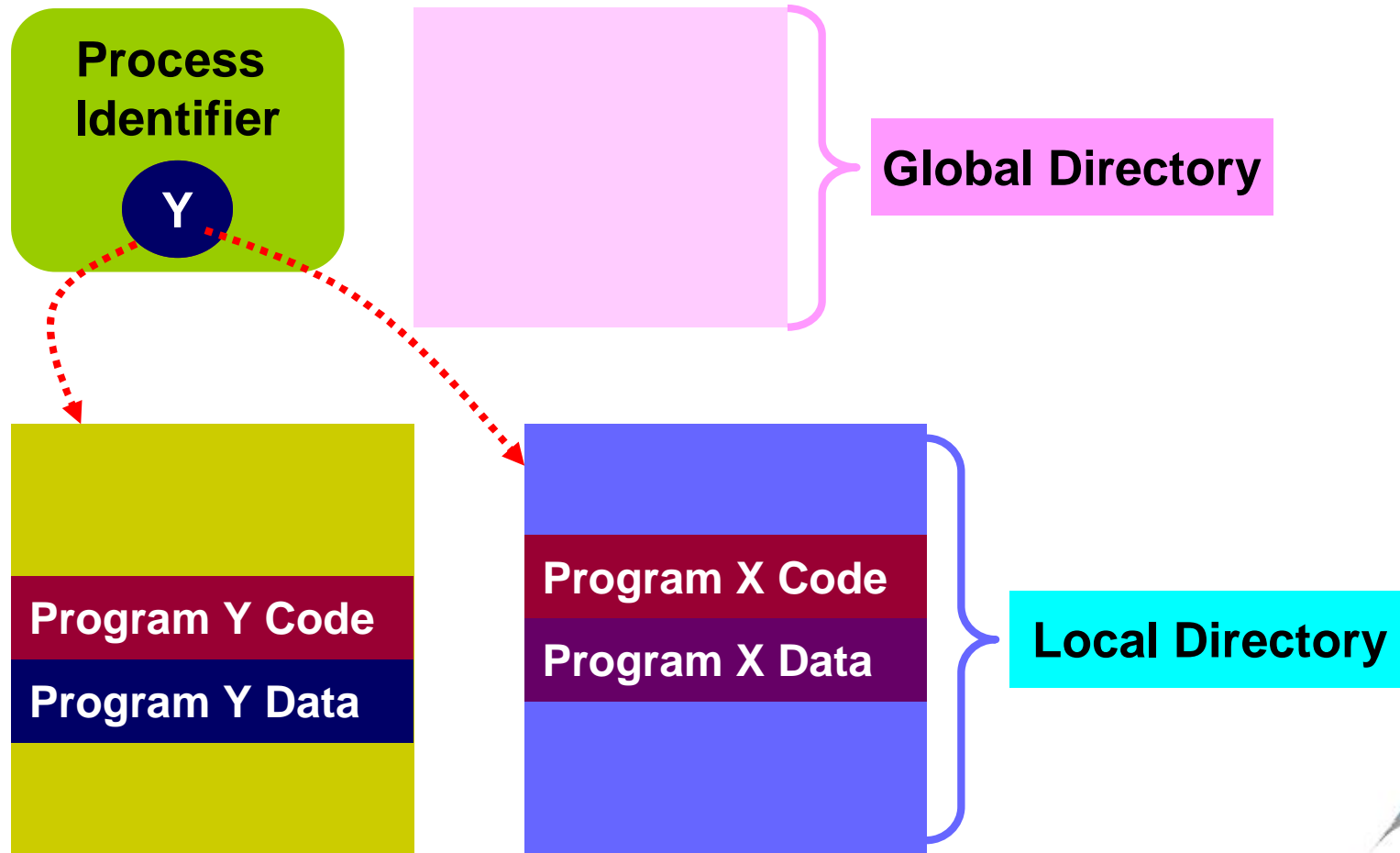
- Moving Memory Model --- Cache





Kernel (Continued)

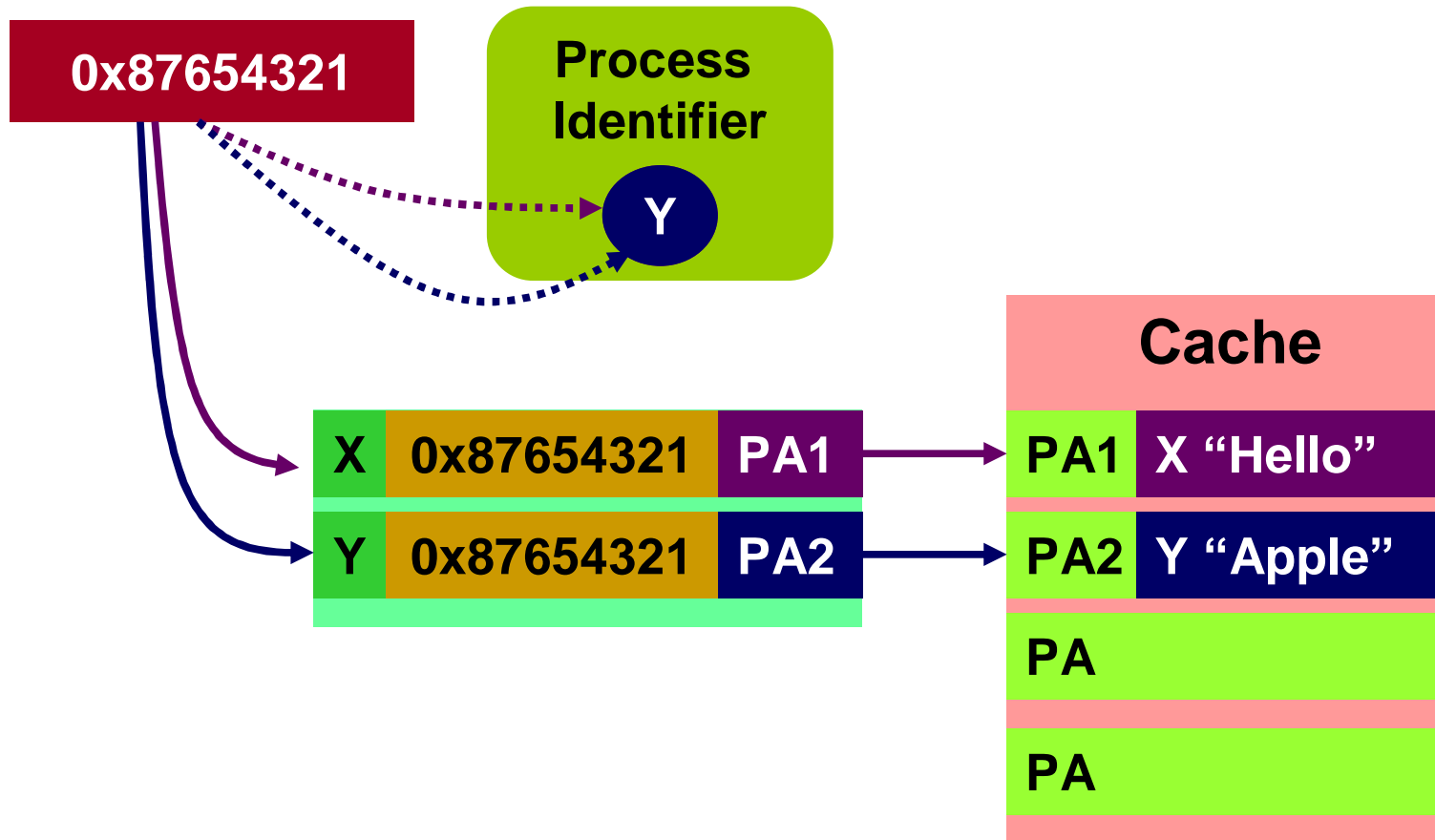
- Multiple Memory Model --- Processes





Kernel (Continued)

- Multiple Memory Model --- Cache





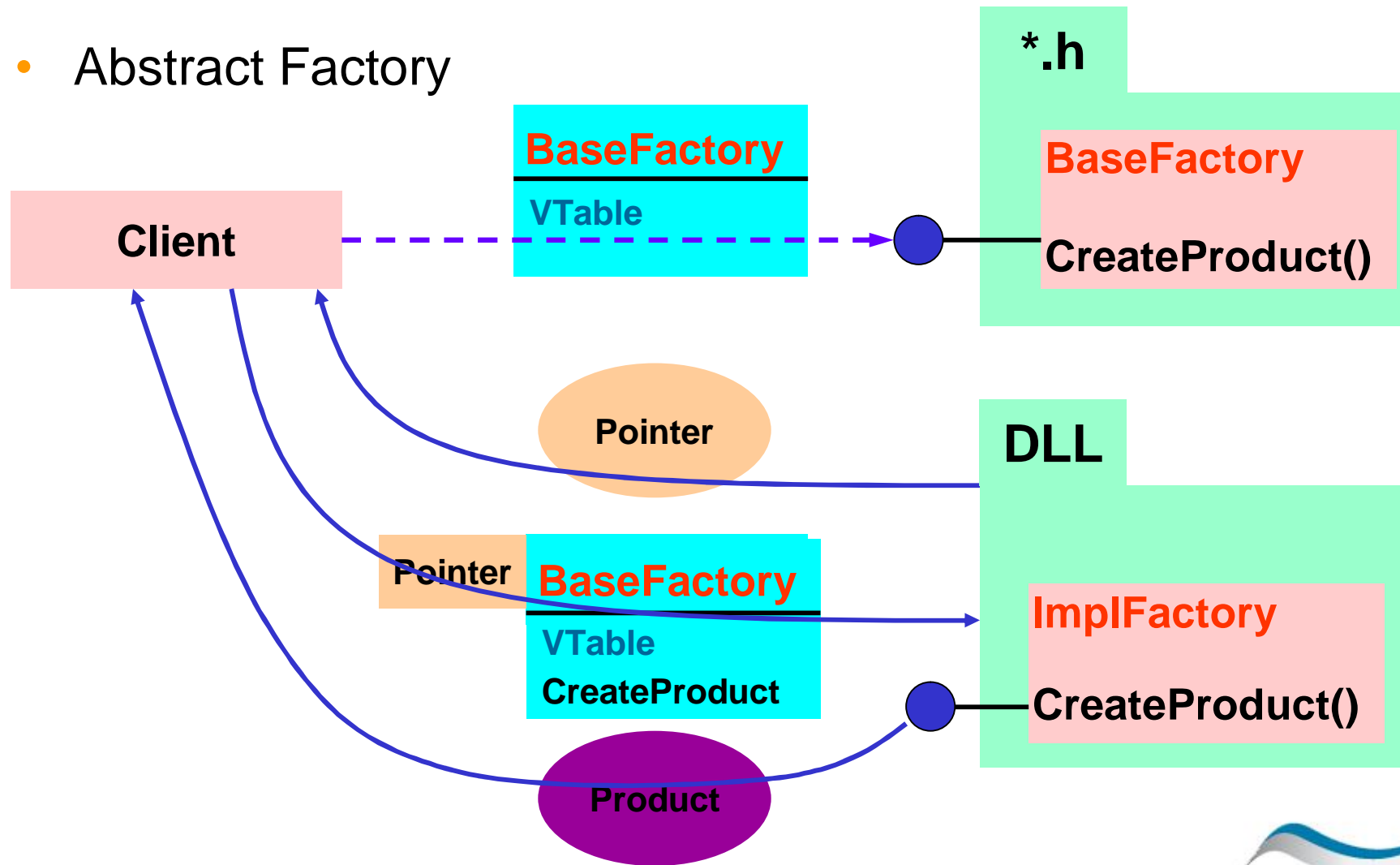
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Design Patterns

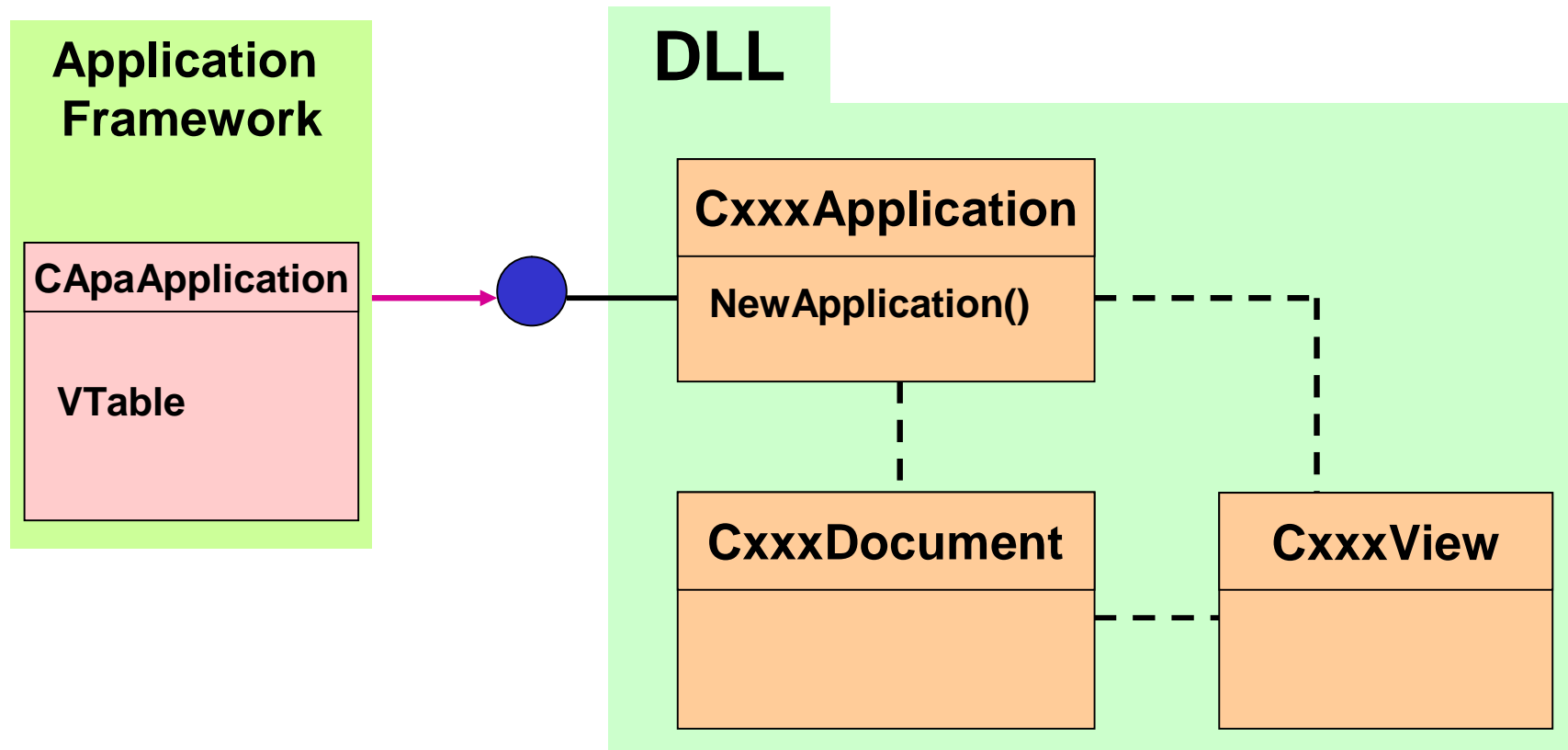
- Abstract Factory





Design Patterns (Continued)

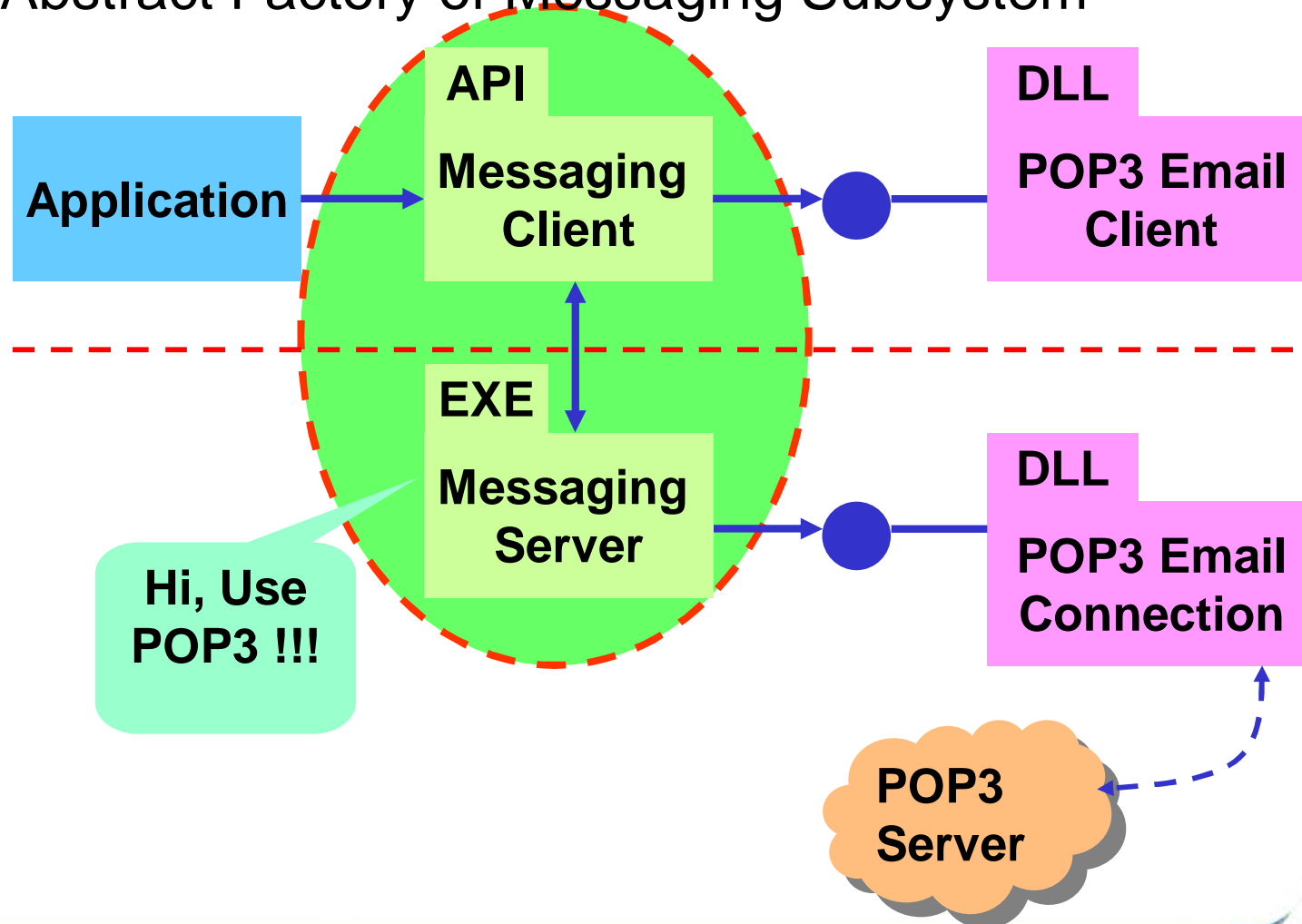
- Abstract Factory of Application Creation





Design Patterns (Continued)

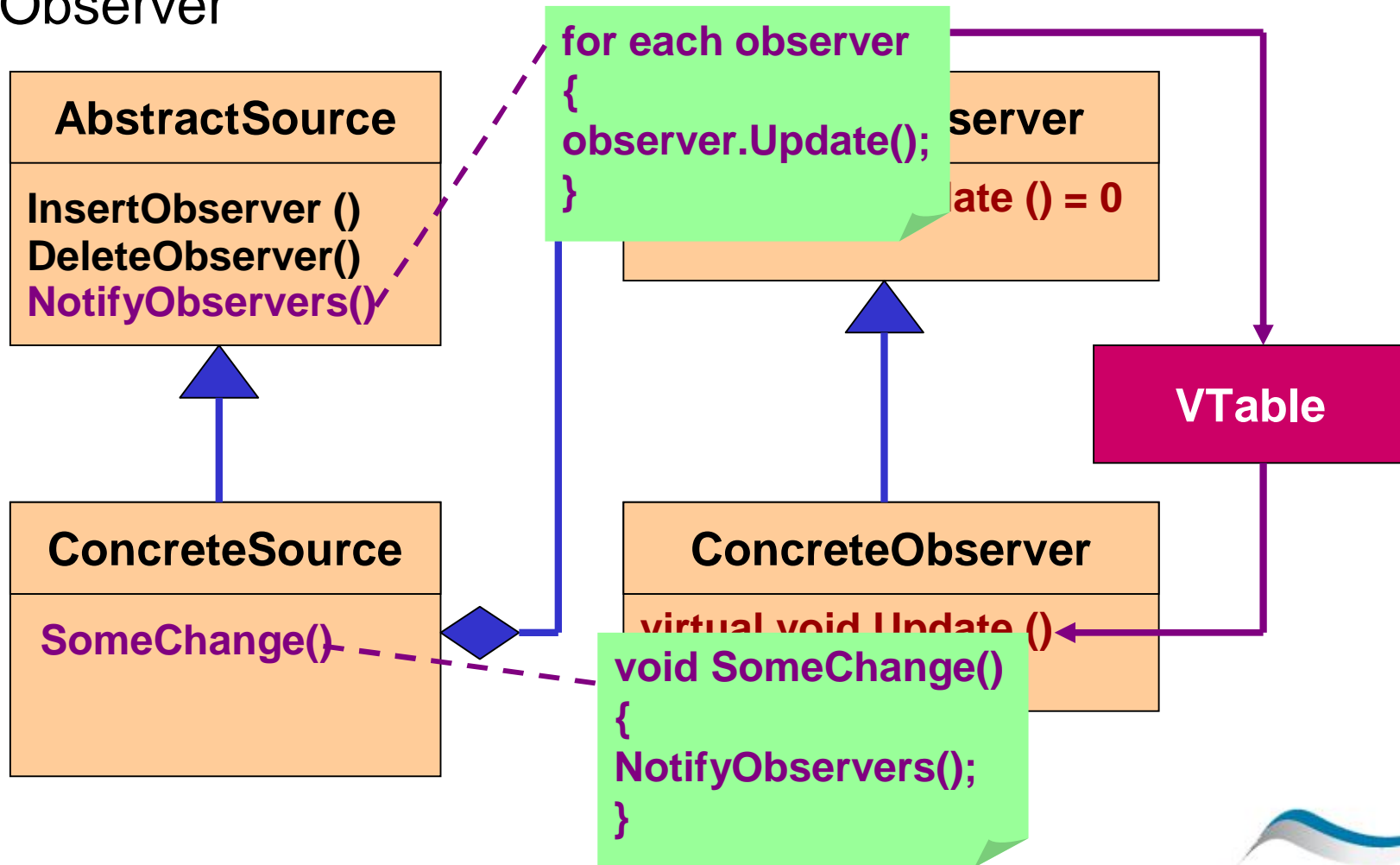
- Abstract Factory of Messaging Subsystem





Design Patterns (Continued)

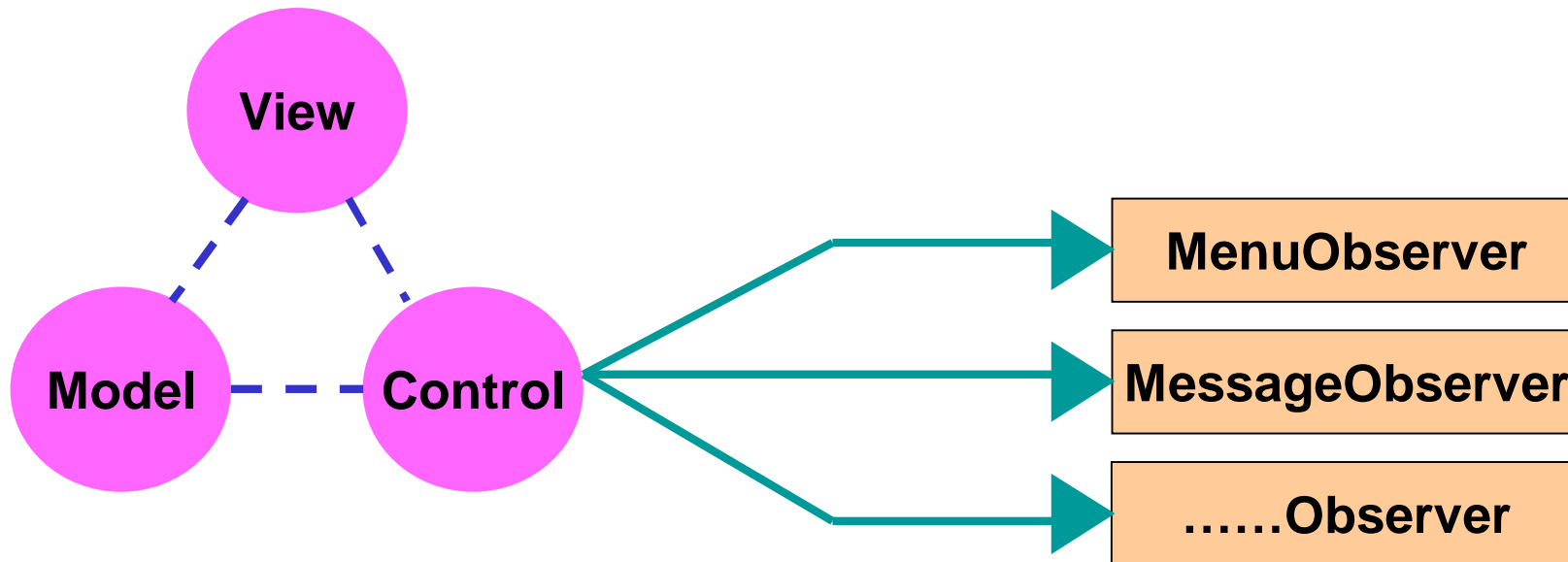
- Observer





Design Patterns (Continued)

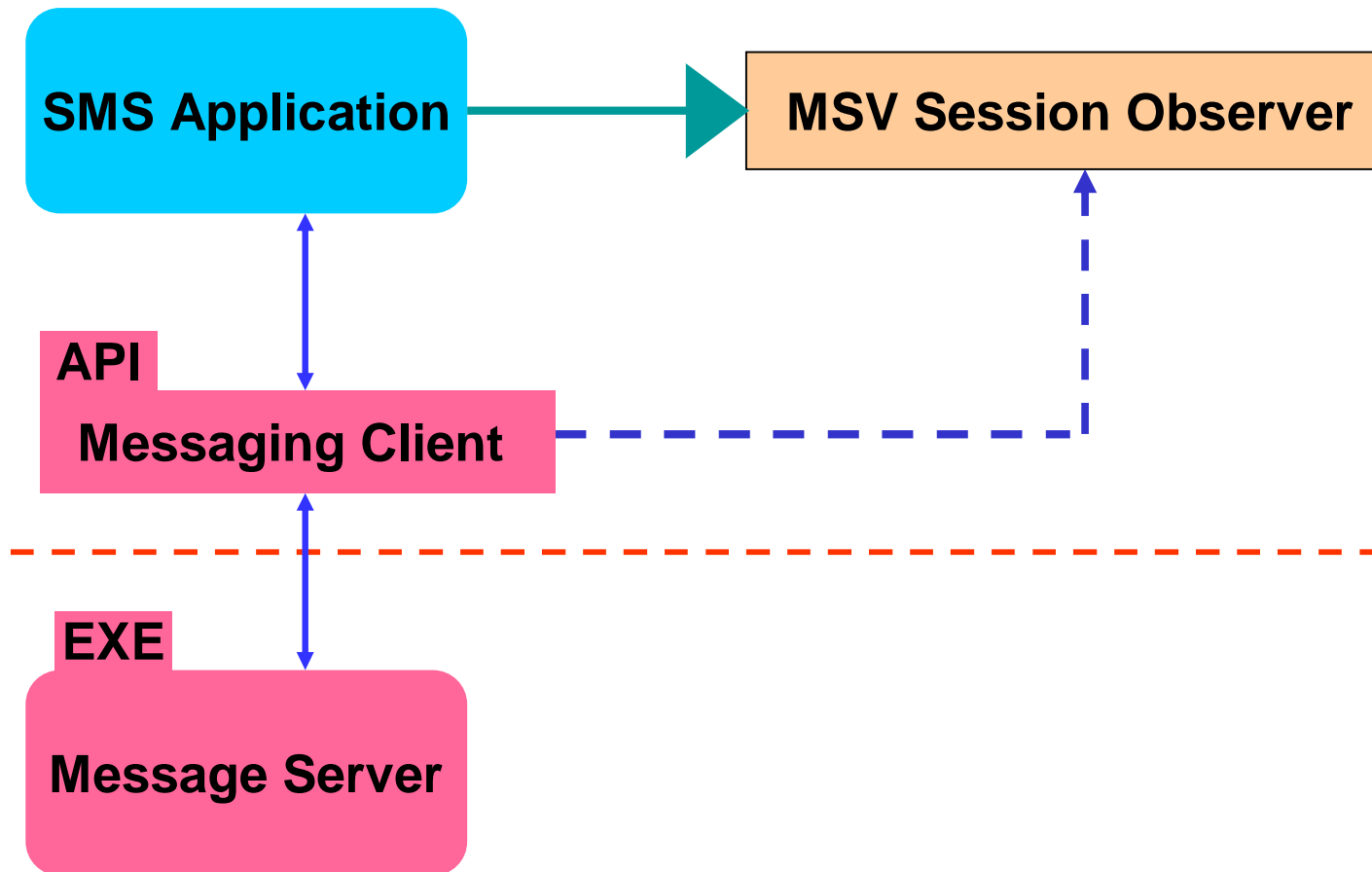
- Observer of Application





Design Patterns (Continued)

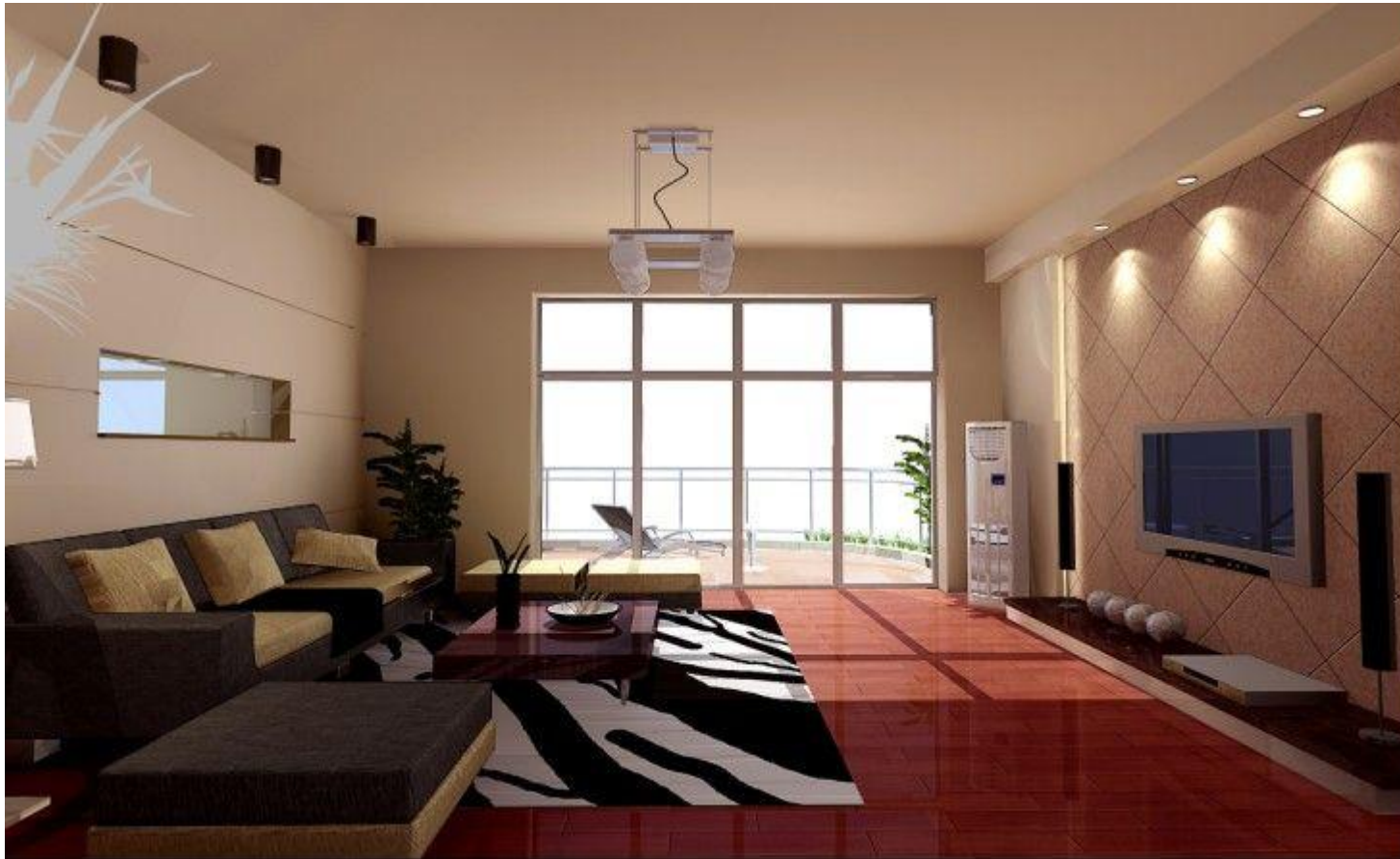
- Observer of Messaging Subsystem





Design Patterns (Continued)

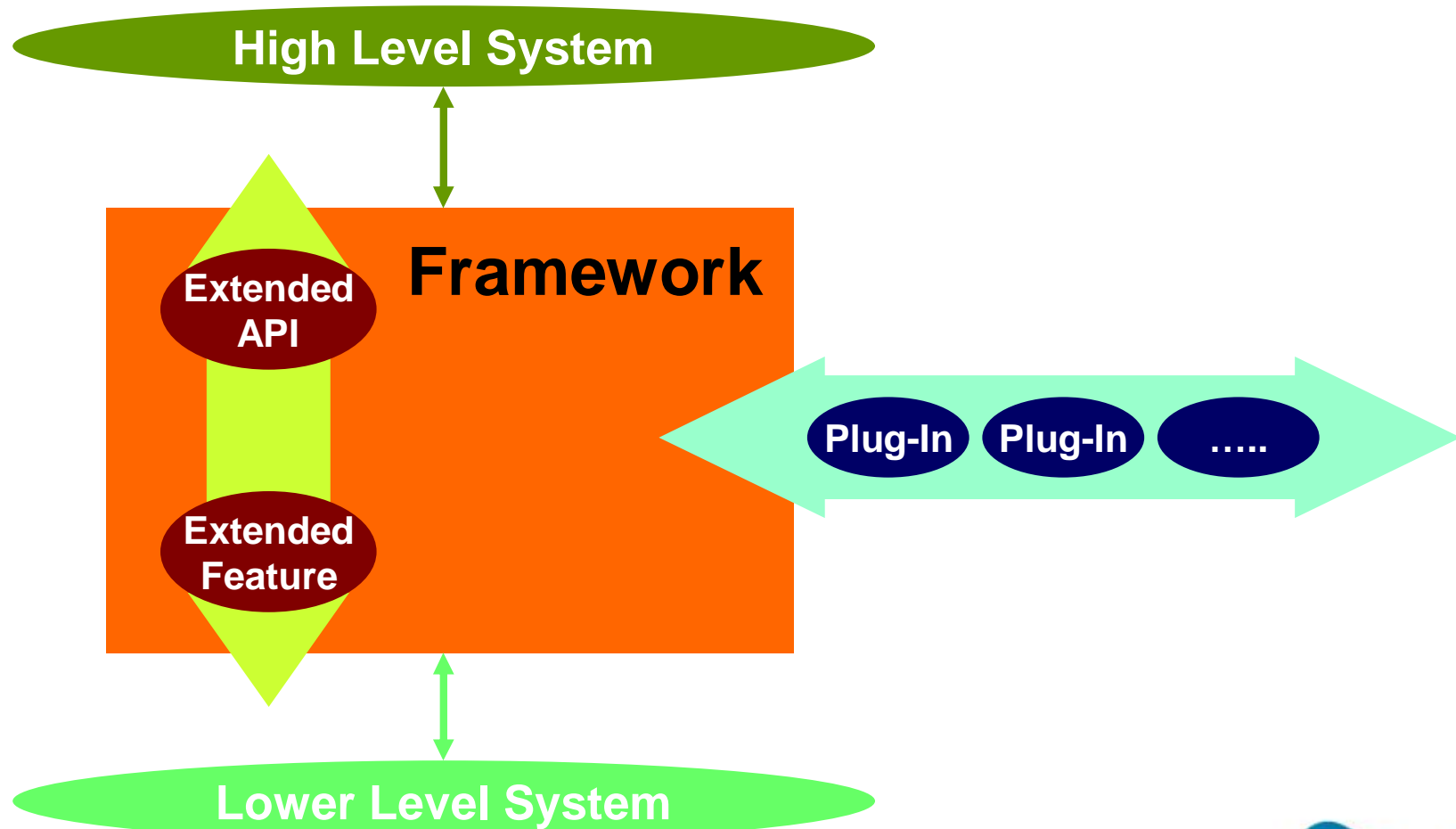
- Frameworks , What & Why





Design Patterns (Continued)

- Frameworks





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Summary

Overview

Layers



Kernel

Design Patterns

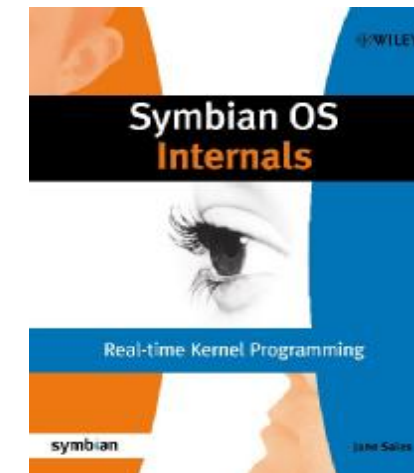
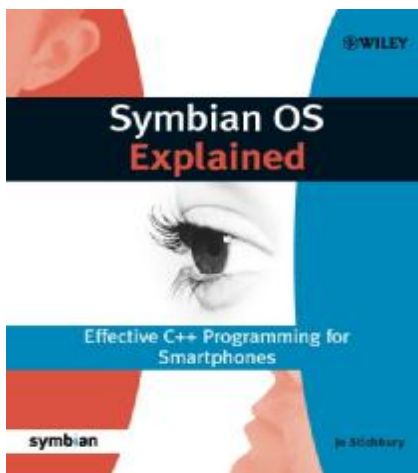
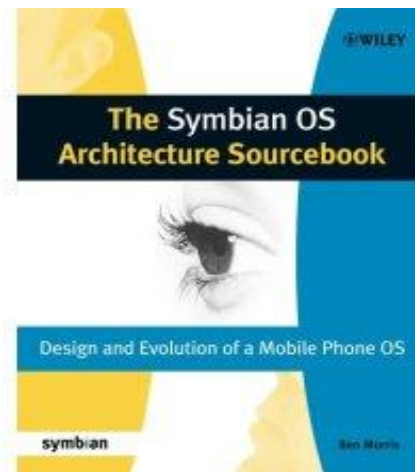
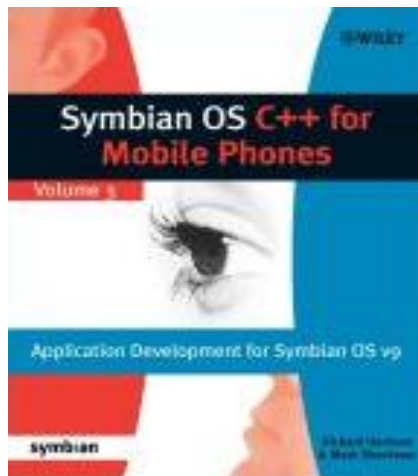
Abstract Factory

Observer

Frameworks



Symbian Press





Web Resources

- <http://www.symbian.com>
- <http://developer.symbian.com>
- <http://developer.symbian.com/forum/index.jspa>



Thanks!