Building a Generic Broker for Location Retrieval

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Presentation Structure

- Introduction
- Positioning Techniques & Architectures
- PoLoS Overview & Architecture
- PoLoS Positioning Component (POS) Overview
- POS Architectural Design
- POS Interfaces
- Conclusion

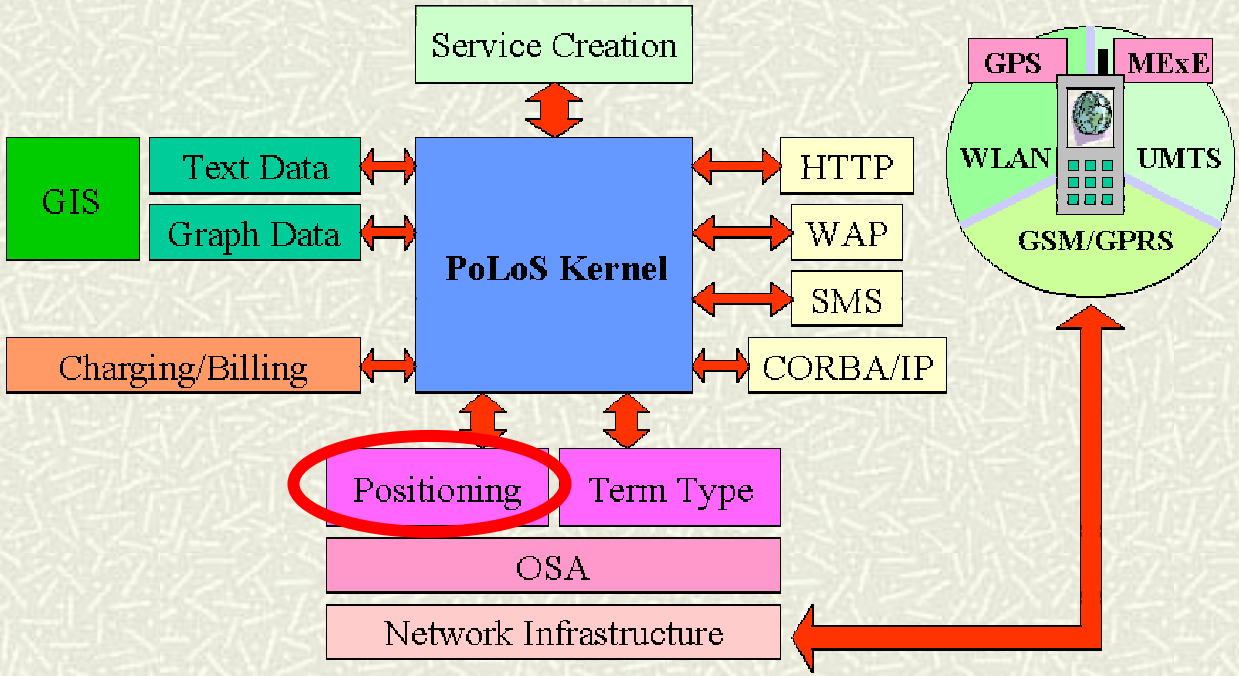
Introduction

- Location Based Services (**LBS**) and Applications such as:
  - Emergency Services as defined by the E911 mandate
  - Points of Interest (POIs)
  - Navigation & Routing
  - Geocoding & Reverse Geocoding
  - Towards context aware computing
- PoLoS IST project addresses the needs of network operators-providers towards a generic, re-usable environment for LBS development, deployment and provision.
- LBS Systems require a “Positioning” entity for retrieving information pertaining to a user’s position

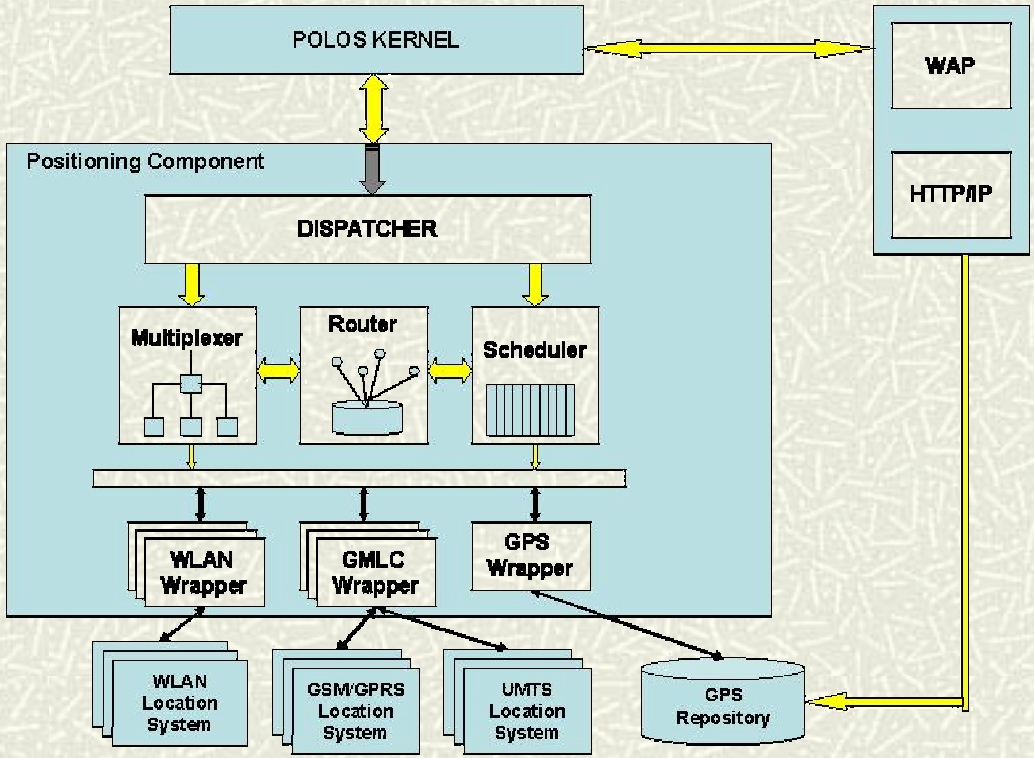
Positioning Techniques & Architectures

- Various methods for location determination (TOA, E-OTD, AOA, Cell-ID, GPS) that differ in terms of accuracy, time to first fix and network/handset impact.
- Distinction between Indoor and Outdoor Systems:
  - Outdoor System → GMLC (Gateway Mobile Location Center) based on 3GPP, LIF (OMA) specifications.
  - Indoor System → GWLC (Gateway WLAN Location Center) UoA's proposal of an indoor equivalent of GMLC.
- Existing LBS platforms lack:
  - Support of open APIs and programming homogeneity.
  - Indoor positioning support.

PoLoS Overview & Architecture



PoLoS POS Component Overview (1/2)



POS component provides

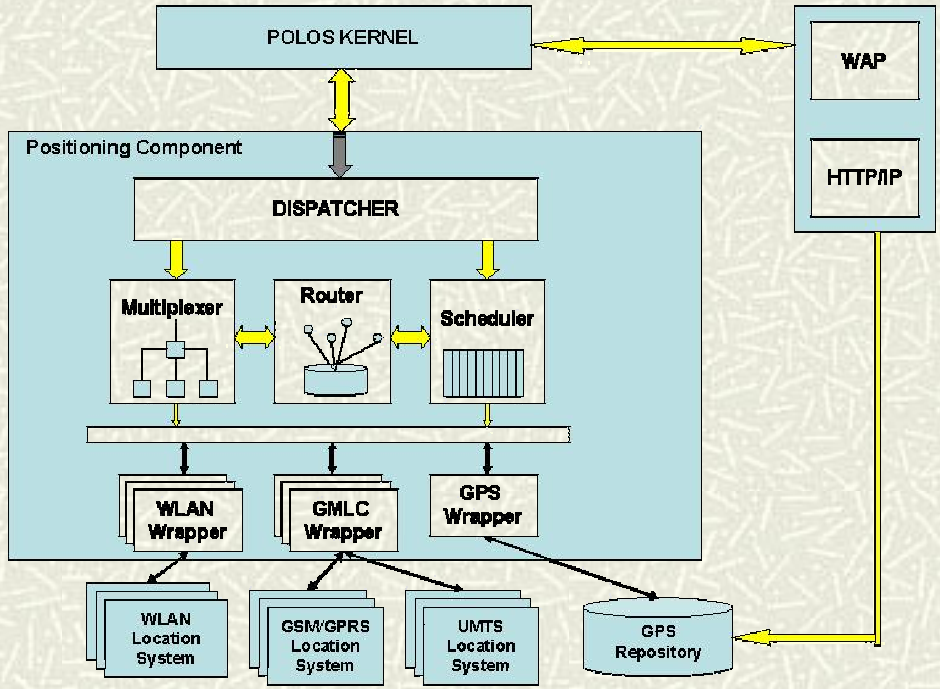
1) Positioning information to the PoLoS Kernel
2) Integrates different positioning technologies under a unified interface.

PoLoS POS Component Overview (2/2)

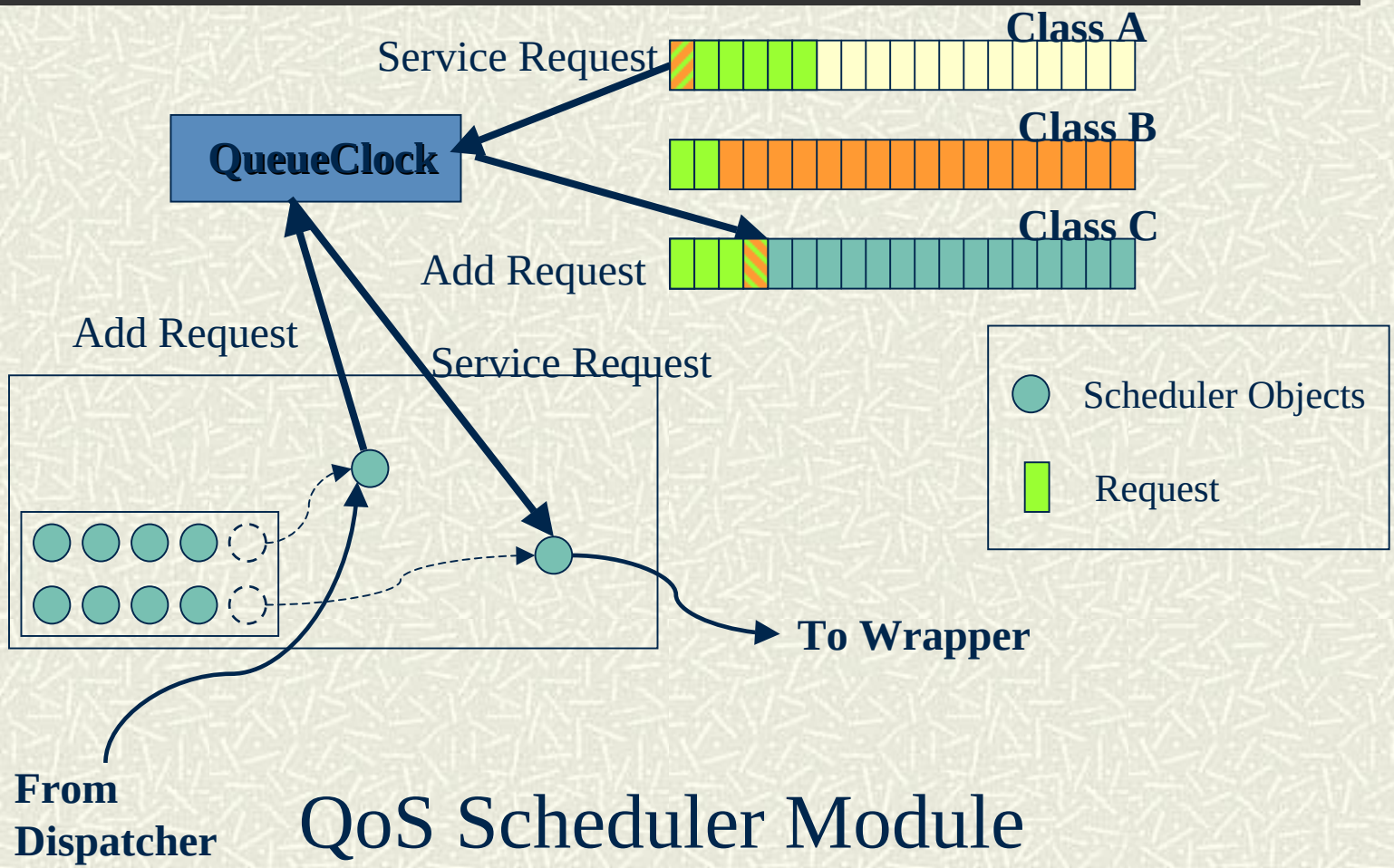
- POS Features:
  - **Generality**: support for IP and E.164 users, requests of various types (Request-Respond, Event Driven, Periodic)
  - **Portability**: Java & J2EE technology
  - **Modularity**
  - **Efficiency**: asynchronous method calls, incorporation of JMS queues
  - **Extendibility**: due to POS modular design
  - **QoS orientation**: based on certain attributes of a request (3GPP's Time to Respond, Priority)
  - **Openness**: adopted OSA interface towards the underlying networks

POS Architectural Design

- POS sub-components:
  - Dispatcher
  - Router
  - QoS Scheduler
  - Multiplexer
  - Wrappers
    - GMLC
    - GWLC
    - GPS

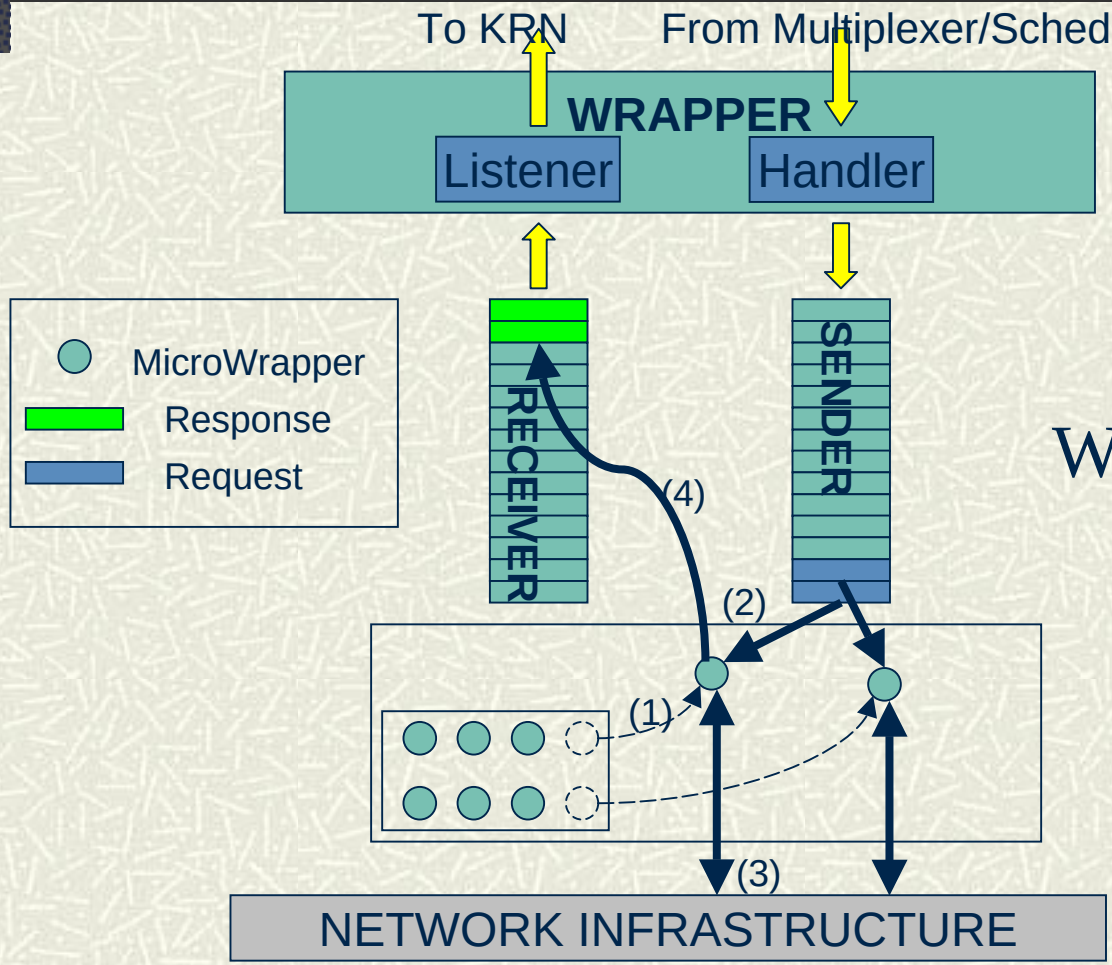


POS Architectural Design (2/3)



QoS Scheduler Module

POS Architectural Design (3/3)



Wrapper module functionality

POS Interfaces

- POS provides a unified API for communicating with the PoLoS Kernel which consists of two single methods):
  - *getLocation(serviceId, userId, attributeSet)* (generic method for issuing any type of request)
  - *stopLocationReporting(serviceId, userId)* (stops location reporting for Event Driven, and Periodic requests)
- POS exposes an OSA based interface towards the network infrastructure

Conclusions

- POS features:
  - Generic framework that can be deployed as a stand-alone or plug-in module of other core systems
  - Unified interface that hides the heterogeneity of network architecture.
  - Portability across different operational environments
  - Support for various QoS scheduling mechanisms.