Emerging Web Service Technology

BPEL-Mora

WS 2009/2010

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BPMN & BPEL

- both specified in 2002

- BPMN is used for modeling business processes

- BPEL is used to execute business processes

- BPM activities and structures are used in BPEL

  sequence   *while*
  switch   *flow*
  pick   *(invoke)*

- not all BPMN specified things can be mapped

BPEL

- BPEL unified different attempts to implement BPM in SOA

    -> IBM -> WSFL

    -> Microsoft -> XLANG

- key advantages

  - xml-style

  - represents itself as service too -> can be used as simple as a service

  - Oasis standard

BPEL file in detail

Existing Engines

- ActiveBPEL (now ActiveVOS)

  - visitor pattern

  - no custom activities

  - two OS threads for a new BPEL process instance

    -> OS-capability of threads limits engine functionality

- IBM Websphere

  - huge software - 1.3gb

  - at least 1gb of physical memory

- BPEL SE (openESB)

  - small, open surce, powerfull, not extendable
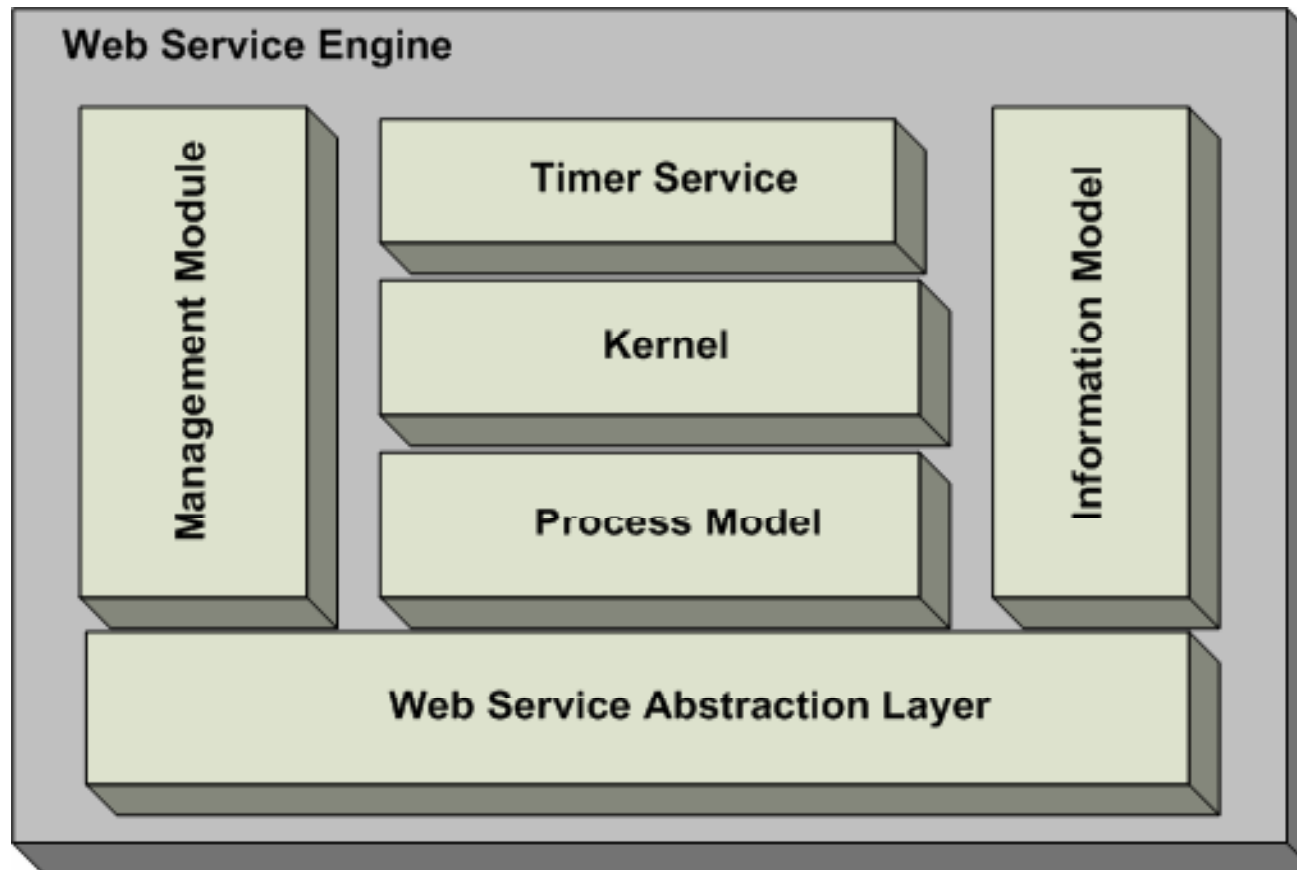
BPEL-Mora:
Aim

lightweight

extensible

embeddable

easy to use

WS-BPEL - compliant

BPEL-Mora:
Design

Web Service Engine

- Management Module
- Timer Service
- Kernel
- Process Model
- Information Model
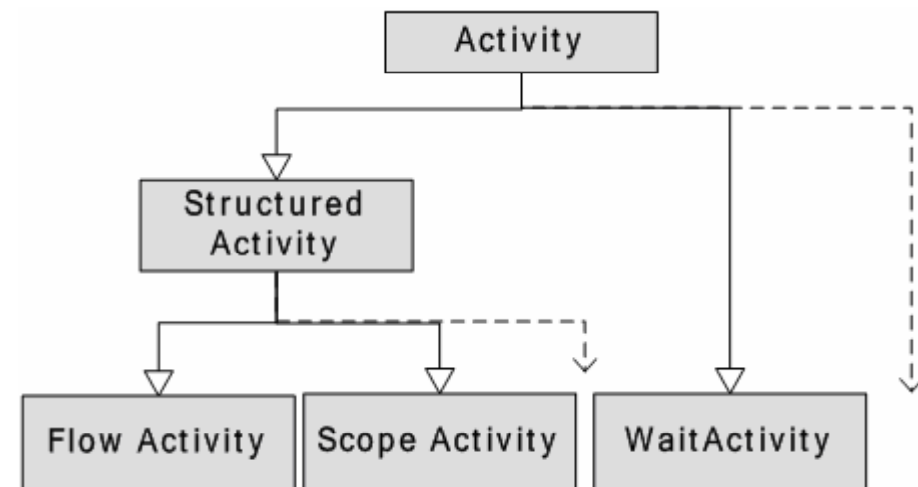- Web Service Abstraction Layer

BPEL-Mora:
Implementation

#1: Process Model

- business model representation
- defined programmatically or via BPEL file
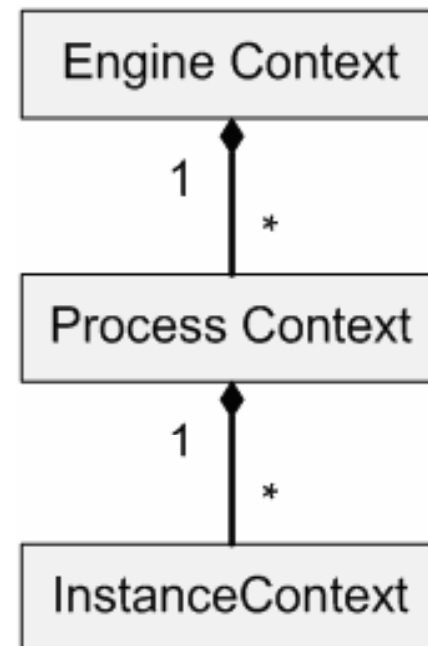- includes predefined and custom activity objects

-> extensibility

#2: <u>Information Model</u>

- context hierarchy

- runtime states

    -> lightweight
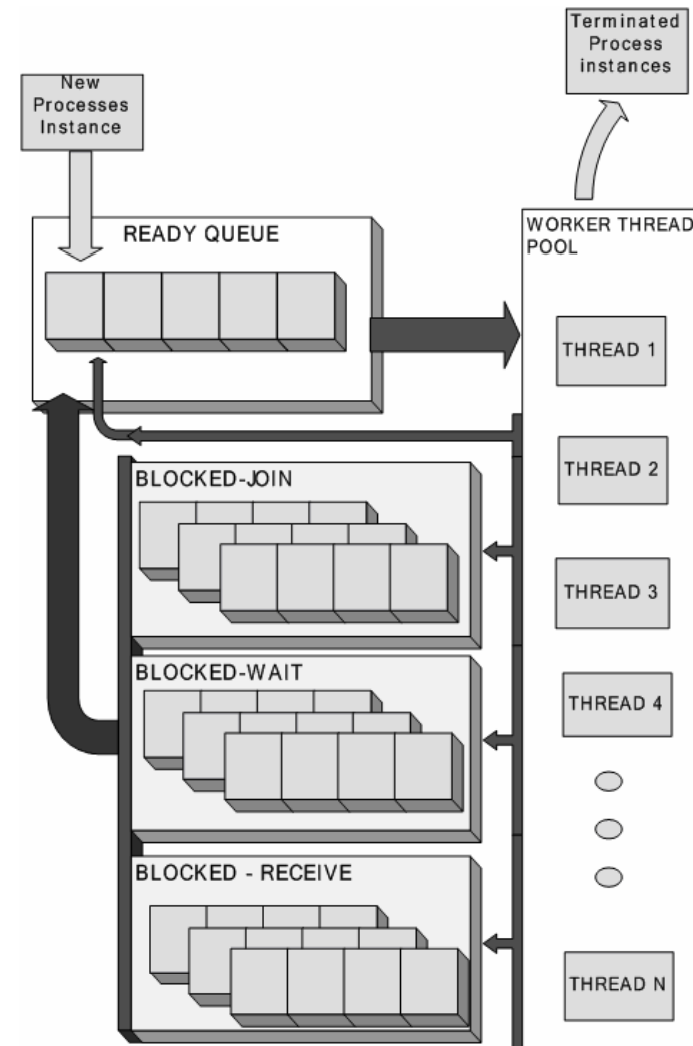
BPEL-Mora:
Implementation

#3: <u>Kernel</u>

- multi processor single queue scheduler
- sequential handling of activities
- predefined set of workerthreads

        -> scalability
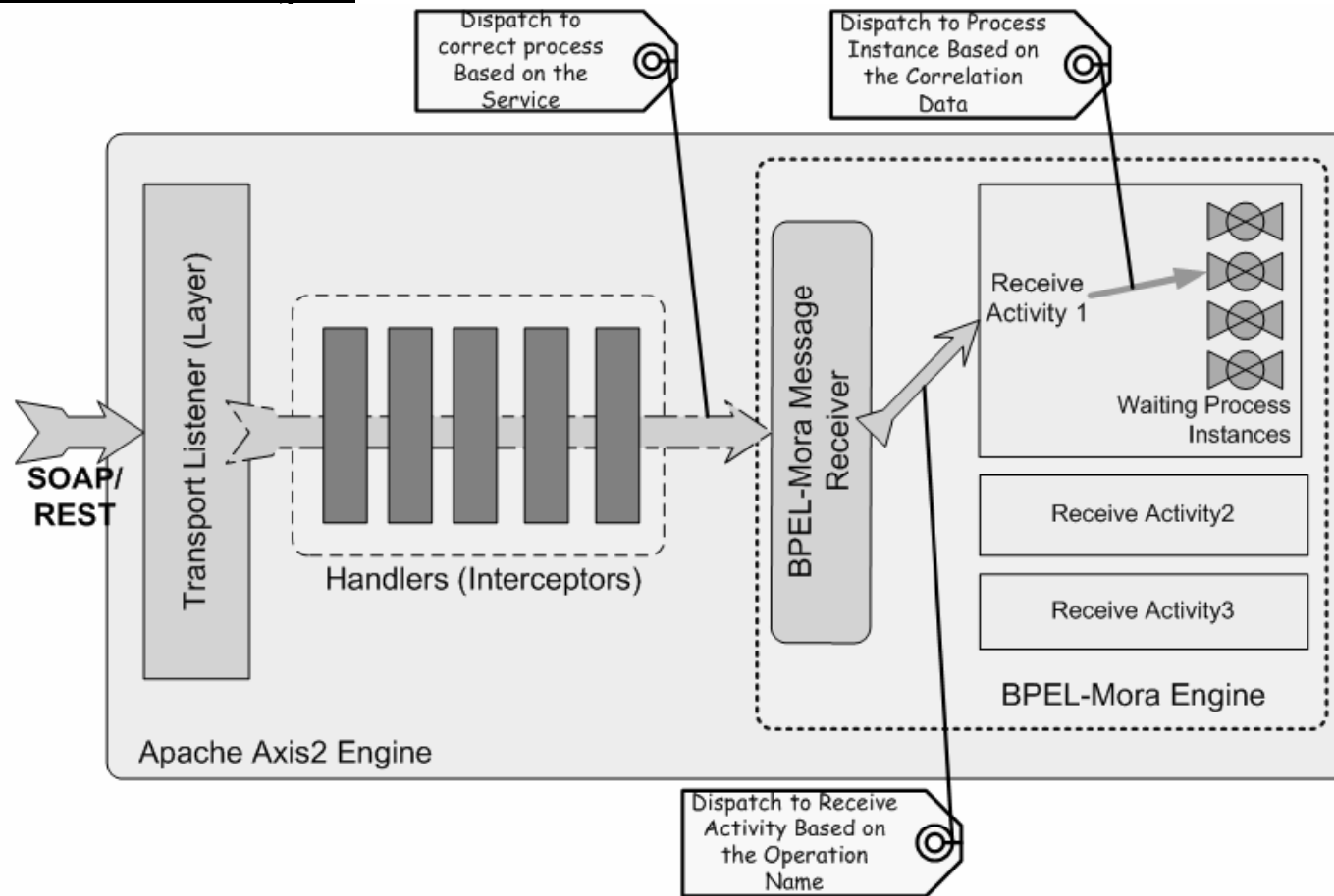
BPEL-Mora:
Implementation

#4: <u>Web Service Layer</u>

- build upon AXIS 2 interfaces
- processes registered as services to receive messages
- web service invocation via WSIF dynamical clients

BPEL-Mora: Implementation

#4: <u>Web Service Layer</u>

BPEL-Mora: Cons

- early beta
- only basic BPEL support yet
  - no fault handling
  - no event based activities
  - not compatible with all WS-* standards
- tricky configuration
- multi-CPU scheduler?
- custom activities can cause deadlocks
- outdated

BPEL-Mora: Pros

- meets all stated requirements

  - Lightweight (130kb)

  - Extensible (custom classes)

  - Embeddable (superb performance)

- resource gentle

  - memory usage:

Process Instances	1	100	200	300	400	500	600	700
BPEL-Mora Mem. Usage	2.4	10.4	25	33	41.5	48.4	61.4	66
ActiveBPEL Mem. Usage	2.6	37.3	*Reached a Thread limitation*					

Demo?

Nope.

- Project pages offline
- Project started Nov 2005, finished Jun 2006, last blog entry May 06, paper published Feb 2007