Model-Driven Configuration and Deployment of Publisher/Subscriber Services

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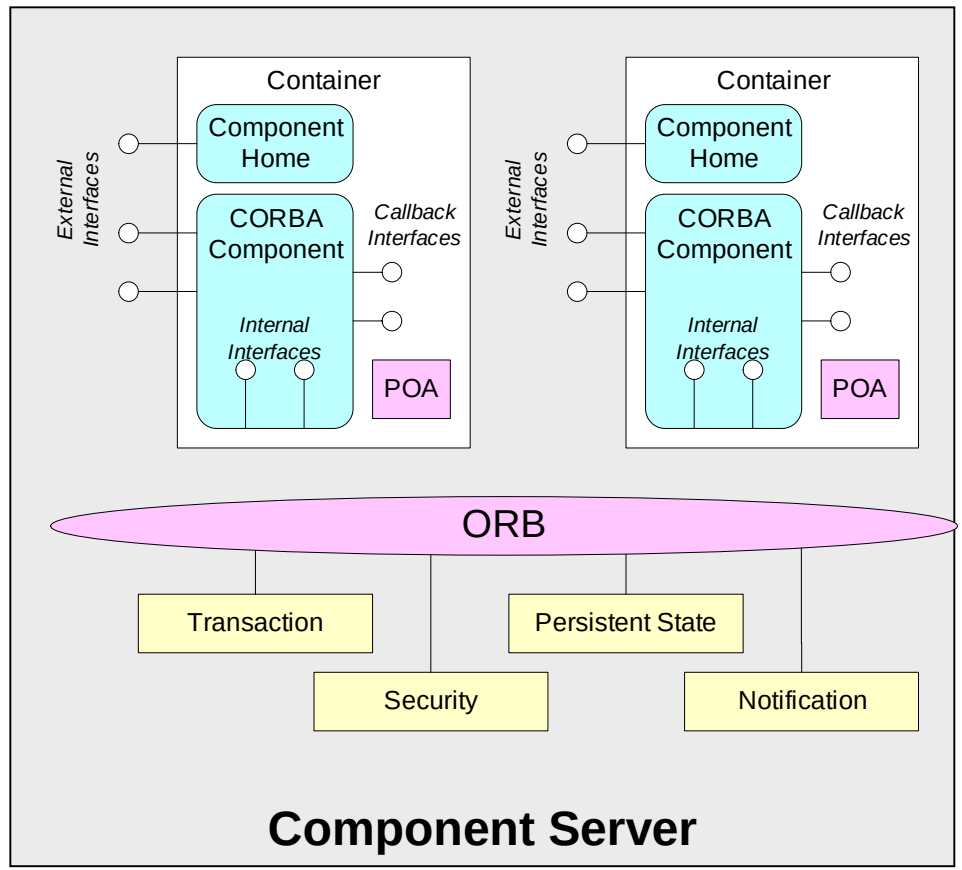
Presentation Outline

1. Challenges of Component Middleware Publisher/Subscriber Services
2. The Component-based Publisher/Subscriber Service Framework
3. The MDA Compliant Modeling Tool
4. Evaluate the Merits of the MDA Compliant Tool
5. Concluding Remarks

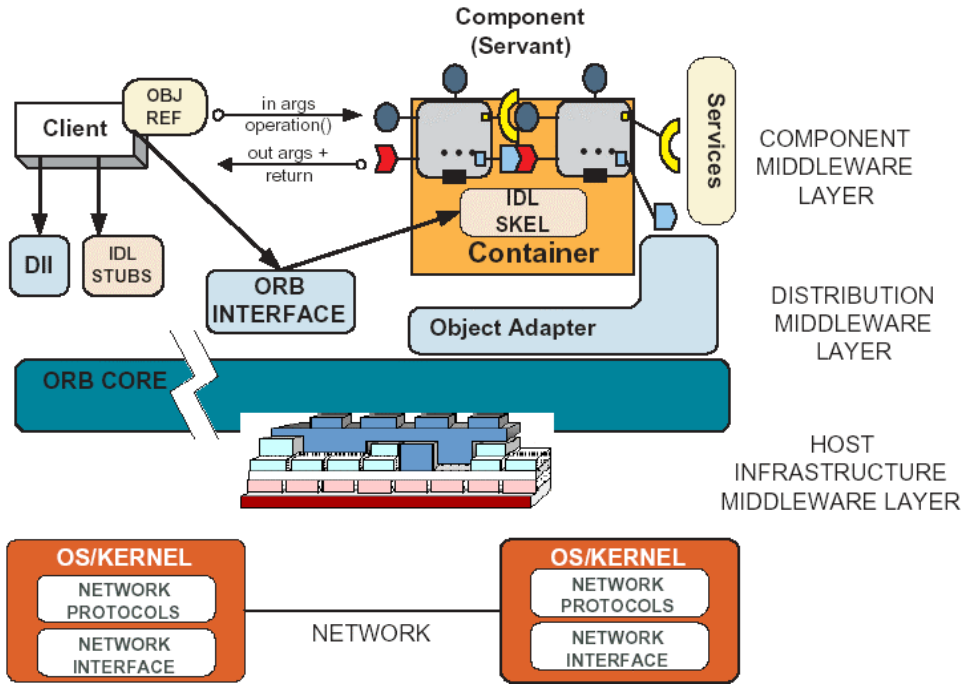
Publisher/Subscriber Service Integration Challenges

- Context
  - The *container* manages application component access to common middleware services
- Problems
  - Prevents access to advanced publisher/subscriber service capabilities
  - No way to select among various publisher/subscriber services
- Solution
  - Enhance containers to encapsulate, implement, and configure a family of services.



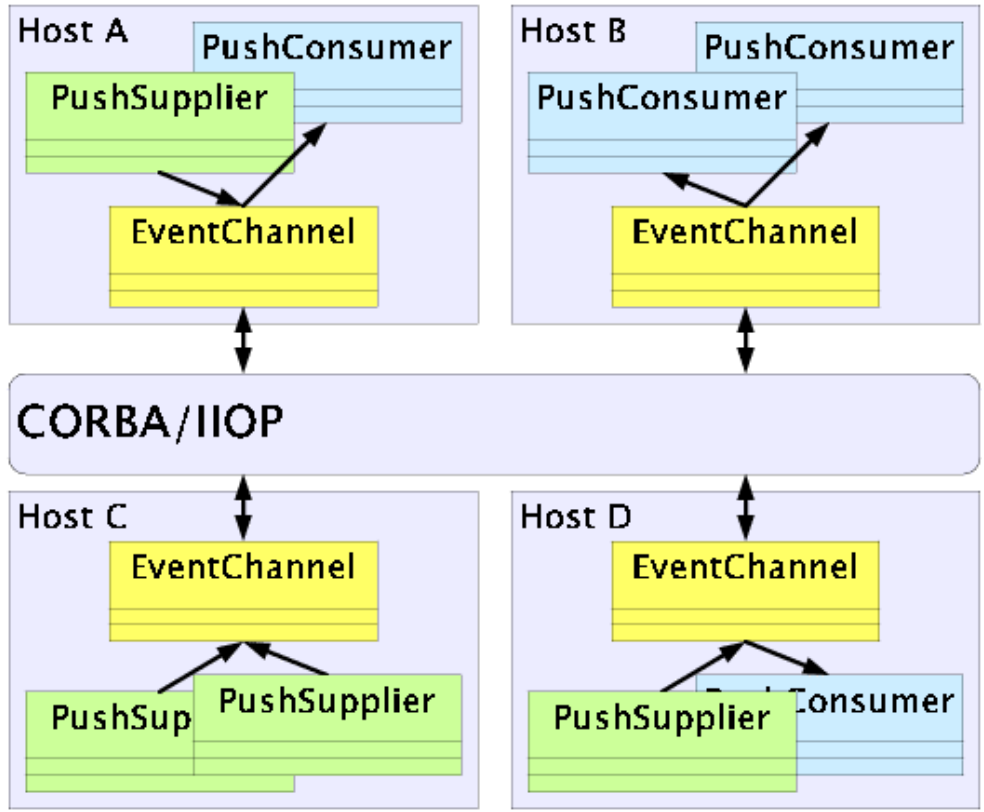
Publisher/Subscriber Service Configuration Challenges

- Context
  - Publisher/subscriber services are highly configurable
  - XML-based specification of QoS properties
- Problems
  - Multiple dissimilar services
  - Semantically invalid operating policies
  - Error-prone handwritten XML
- Solution
  - Use models to enforce policy constraints and synthesize configuration files



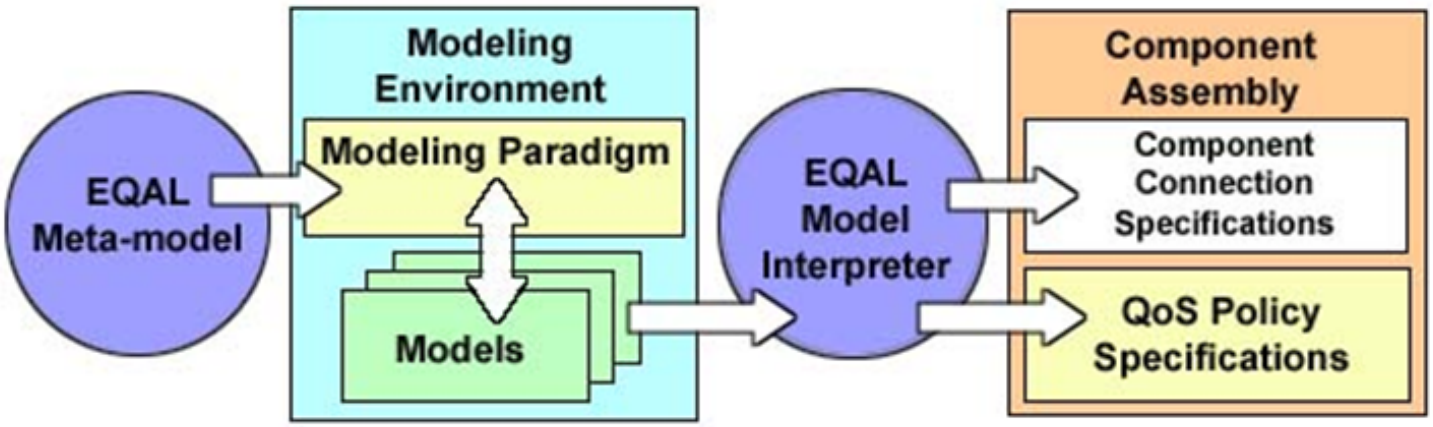
Publisher/Subscriber Service Deployment Challenges

- Context
  - Federated publisher/subscriber services provide *scalability*
    - Optimize placement of event channels
- Problems
  - Multiple types of federations
  - Assignment of channels to hosts
  - Error-prone handwritten XML
- Solution
  - Use models to synthesize deployment descriptors



The MDA Compliant Modeling Tool

- It is a *Model-Driven Middleware* (MDM) tool
  - Addresses publisher/subscriber service configuration and deployment challenges
    - *Models* specify service configurations and deployments
    - *Aspects* decouple D&C concerns
    - *Constraints* ensure semantic validity
    - *Interpreters* generate descriptor files



Evaluating the Merits of MDA Tool

- Eliminates the need to write some C++ code
  - Manages event channel lifecycles
  - Initializes suppliers, consumers, and gateways
  - Specifies service properties
- Alleviates key sources of complexity
  - Modularizes *cross-cutting* concerns
    - Service configuration vs. component functionality
  - Reduces *ad-hoc* component development
    - Provides a methodology for creating specifications
  - Identifies *design flaws* earlier
    - Developers are notified of invalid configurations
  - Provides a *reusable* and *maintainable* representation of application properties
    - Models are easy to understand and evolve