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ANSA Phase III

CORBA Limitations - slides

List of author names goes here

Abstract

Need some instructions here.

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Request for Comments (confidential to ANSA consortium for 2 years)

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CORBA Limitations - slides



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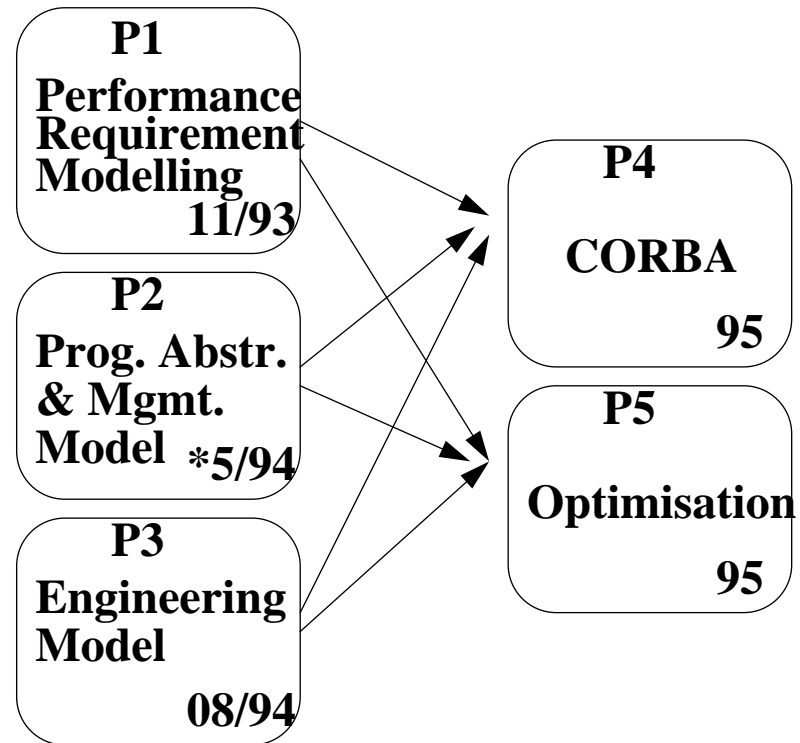
Programming and Management Model for Performance and Timeliness

(Work in Progress Report)

Nicola J. Howarth

Performance Group


Group Activities



*Depending on effort diverted to TINA



A Performance Framework 

Extension to ANSA
Computational Model 

Resource Management
for Performance 

Programming Language
Extension & Tools 

Engineering Model 

Nucleus Design 



Performance Functions
Add Onto CORBA 


Recommend Changes
to CORBA 

Optimising the Nucleus
& the Tools 


 **Document**

 **Software**



Objectives

- **Provide support for architectural work**
- **Investigate problems of implementing a real-time system**
- **Make use of existing language support**
- **Promote discussion on required facilities and how these may be provided**
- **Current Status - APM.1130**

Lack of engineering model indicates that problems encountered are incomplete. Focus of work here revolves around programmer's interface to nucleus, not implementation of real-time facilities within nucleus.



Starting point

- **ANSA testbench**
- **Corba -> Orbix -> C++**

When looking at a possible implementation of real-time facilities within the ANSA architecture, a logical starting point is that of the existing testbench. However several tasks in the Phase III workplan are predicated on the success of additions to Corba, so a real-time implementation of Corba might seem a more likely starting point.

Work on a comparison of currently available Corba-compliant platforms had indicated that the Orbix system developed by Iona provided the most complete Corba implementation to date, although even this does not support the full Corba specification. Orbix is a C++ implementation, thus provides an object oriented approach, which has advantage, in particular in its modularity.

The investigation into the ease with which a programmer's interface for real-time could be implemented in Orbix, identified several principle problem areas.



Problem areas

- **Lack of constraint matching facilities on binding**
- **No access to underlying communications**
- **No facility for private channels**
- **No direct provision for resource management**
- **No provision for synchronisation**
- **No provision for timing**

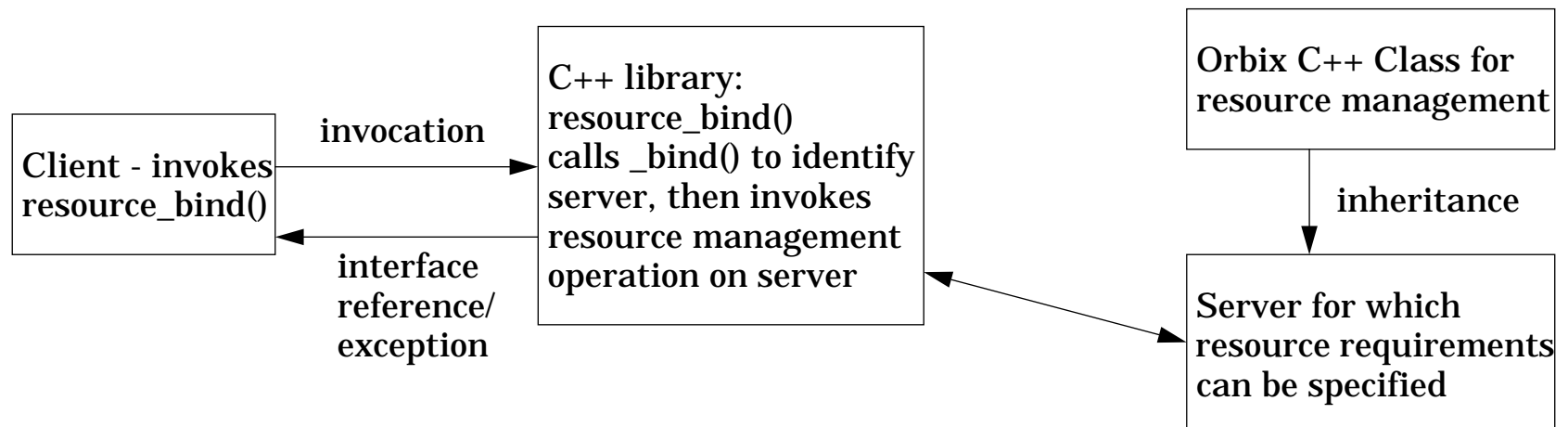


Provision of constraint matching facilities

see final two slides for info on markers, if required, also for filters

- **the “trader” solution**
 - on creation an object passes information to a trader on QoS that it is able to support, along with its “marker”
 - a client asks the trader for a server which matches its requirements, and is given the “marker”
 - the client then binds to the server using the “marker”
- **the pre-filter solution**
 - the pre-filter is executed after operation invocation but prior to the operation itself
 - pre-filter checks with trader for marker name, and creates thread to handle request
 - problem - threads not yet implemented correctly in Orbix
- **problems**
 - use of “trader” in addition to Corba locator duplicates effort and reduces efficiency

Provision for resource management



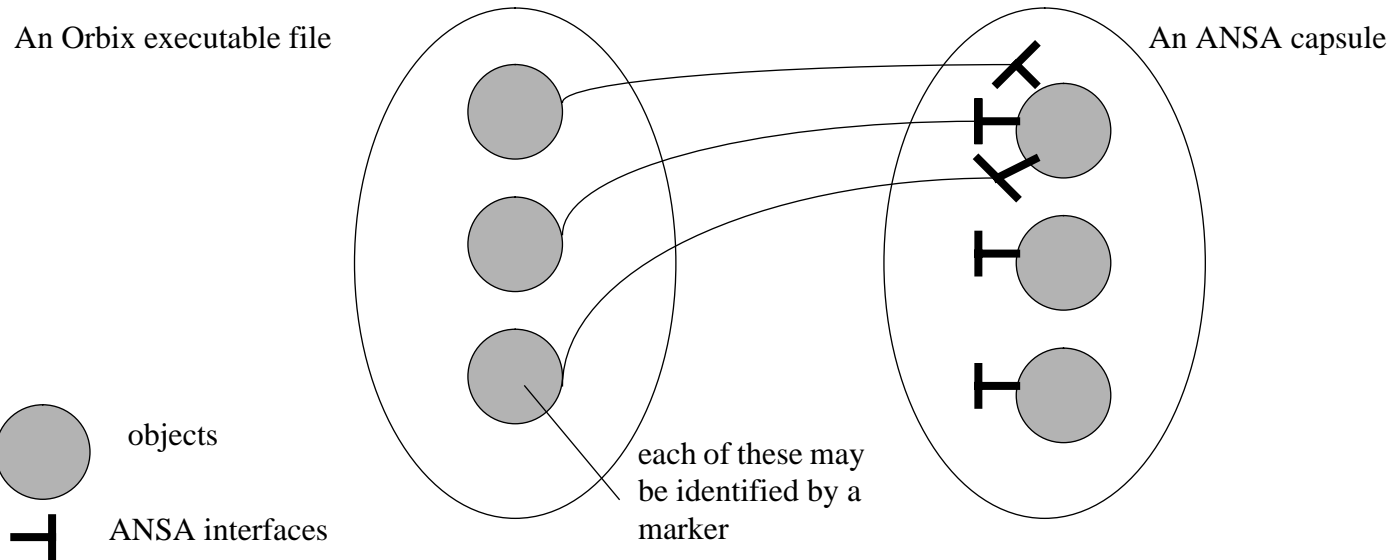
- **solution is complex, and may additionally require use of “trader” for constraint matching**



Access to underlying comms, provision for timing, synchronisation etc.

- **with current Corba implementations, all the above require access to source code**
- **results in complex non-standard systems, with problems of support and maintenance**

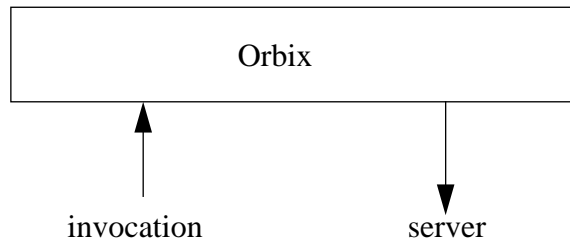
Markers



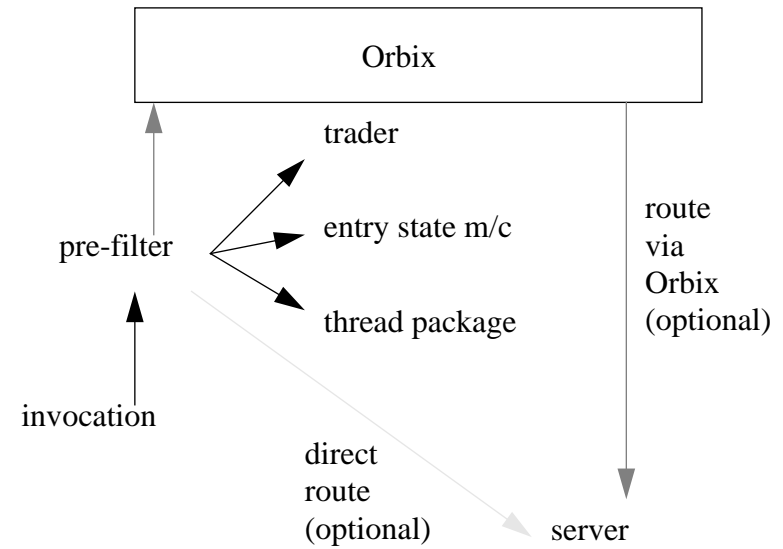
slide for background info only

A marker identifies a specific object within the specified server, and indicates that unshared activation mode should be used. In this mode individual objects of a server are registered with the Implementation Repository. As each object is invoked, an individual process is created to run its code - one process is created for each active registered object. Each object managed by a server can be registered with a different executable file, or they can share the same executable file.

Filtering



no pre-filter



using a pre-filter

optional slide for filters

References

[ANSA 91]

ANSA: A Systems Designer's Introduction to the Architecture, APM Ltd.,
Cambridge U.K., April 1991.

