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**APM Business Unit**

## **An Introduction to DIMMA**

**Chris Mayers**

### **Abstract**

Organization wish to exploit distributed systems technology in demanding real-time environments.

This is a brief overview of the ANSA Phase 3 DIMMA (Distributed Interactive MultiMedia) workplan, originally presented as part of a BT Performance Workshop on 4 October 1995 at APM.

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**Approved**  
Briefing Note

3rd October 1995

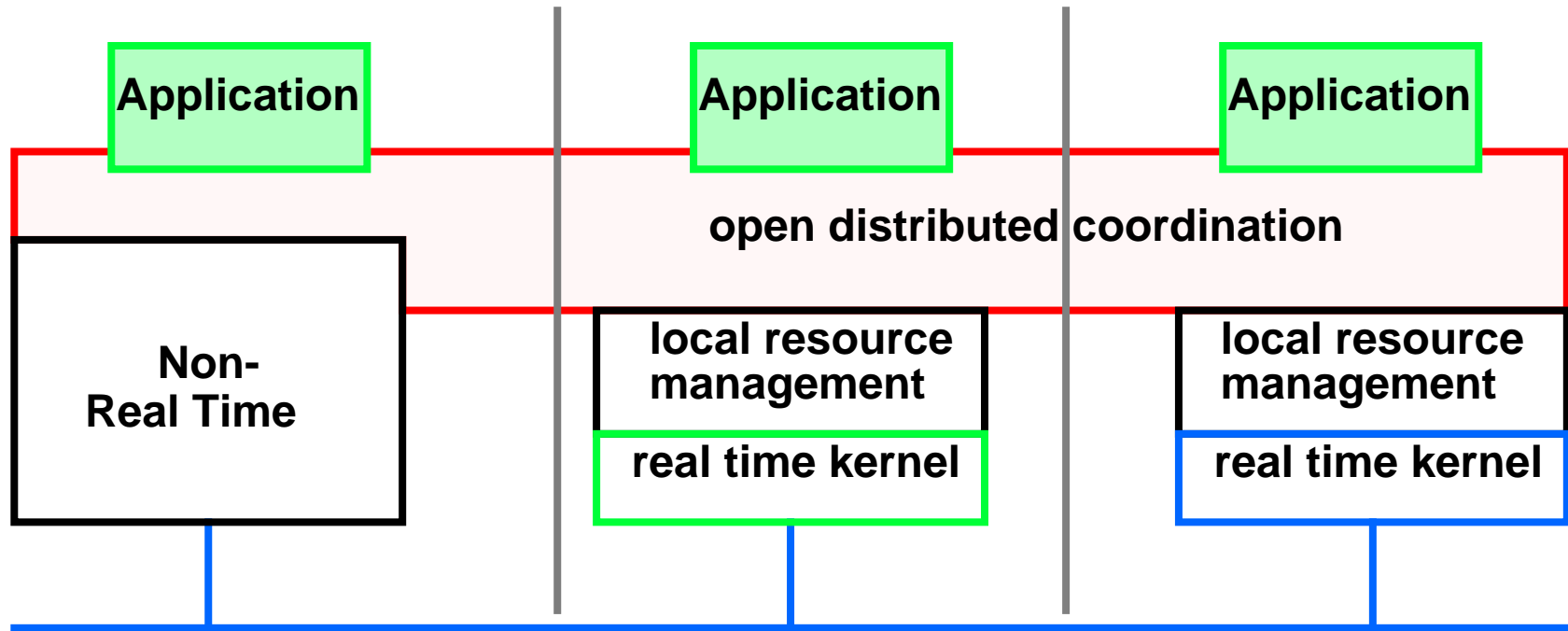
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**Distribution:**  
**Supersedes:**  
**Superseded by:**





# An Introduction to DIMMA (Distributed Interactive MultiMedia Architecture)





## Requirements for a Real-Time Distributed Infrastructure

- **Add real-time capabilities to the ANSA/ODP architecture**
  - preserving its ability to cope with: federation, heterogeneity, scaling
- **Provide interoperability between real-time and non real-time objects and between real-time and non real-time distributed infrastructures**
- **Provide a flexible modular framework that can be used to build optimised infrastructures for specialised applications**
- **Provide real-time guarantees in an asynchronous distributed system**
  - predictable islands in an unpredictable sea



## ANSAware/RT - proof of concept

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- **ANSAware/RT**
  - added prototype real-time mechanisms to ANSAware 4.1 with Posix Threads
  - added resource separation, pre-allocation, deadlines, priorities, real-time scheduling, QoS, and explicit binding
- **Performance gain (measured against ANSAware 4.1)**
  - null RPC 30% faster, 1000 byte RPC 16% faster
- **Available now over OSF/1**
- **Being ported to NT**



## Conclusions

- **ANSAware is not lightweight enough**
  - designed for efficient resource usage [ too much sharing & multiplexing ]
- **ODP Computational model is now an ISO standard**
  - this has exactly the right semantics
- **CORBA is becoming the “standard” product**
  - but we need to remain vendor neutral
  - and CORBA products also suffer from the same problems as ANSAware
- **There is a requirement for a lightweight ORB with Real-Time capabilities**
- **C++ provides the functionality needed for distributed programming**



## Objectives

- **Develop a portable ODP conforming computational API in C++**
  - with a portable engineering API
  - which is protocol- and platform-independent
- **Develop a modular lightweight distributed infrastructure framework**
  - with generic infrastructure components
- **Develop a flexible set of multi-IDL stub generators and IDL translators**
  - based around a conformance type checking AST
- **Understand, explain and map the semantic differences between different APIs, IDLs and Distributed Infrastructures**



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## Distributed Infrastructure Compatibility

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- **Provide compatibility with CORBA and TINA**
  - **interoperability by mapping IDLs and protocols**
  - **application portability by mapping APIs**
  - **engineering portability by adapting to different underlying DPEs**





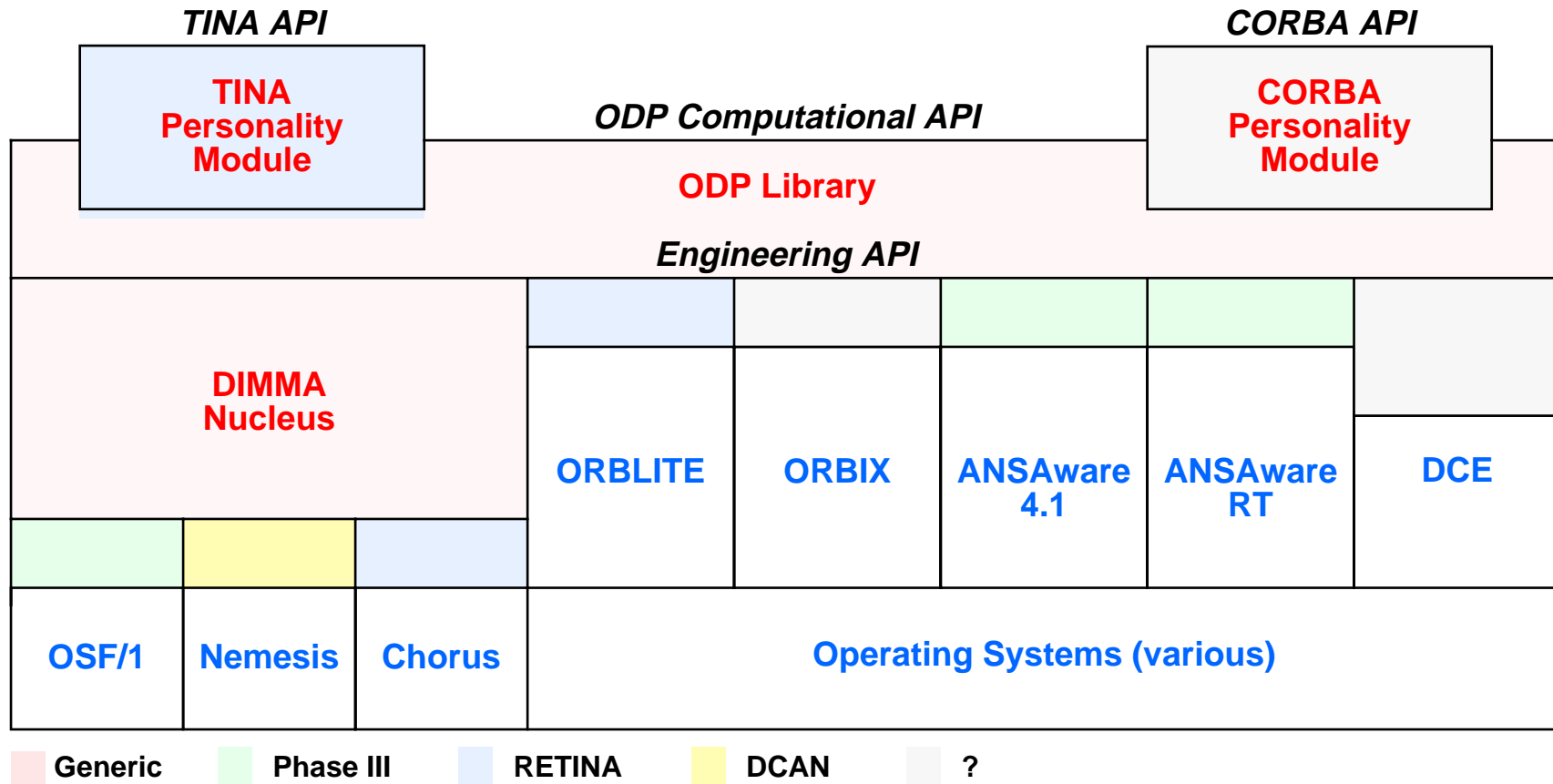
## Why a framework ORB?

- **real world needs many ORBs**
  - high performance, downsize, scalable
  - transactional, reliable, real-time, multimedia
- **technology advances - must be reflected in future ORBs**
  - more functional scheduling support
  - more powerful communication support
  - other tools
- **connectivity**
  - many protocols, many existing ORBs, alternative object APIs

**-> a microkernel ORB!**



# Master Plan



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## Related Activities

- **RETINA**
  - TINA computational API, engineering API, DIMMA Nucleus, Chorus and ORBLITE Adapters, stub generator
- **DCAN**
  - ODP computational API, engineering API, DIMMA Nucleus, OSF/1 and Nemesis adapters, stub generator
- **other sponsors**
  - ODP computational API, engineering API, DIMMA Nucleus, stub generator
- **ICL**
  - DIMMA Nucleus, Stub generator, CORBA computational API