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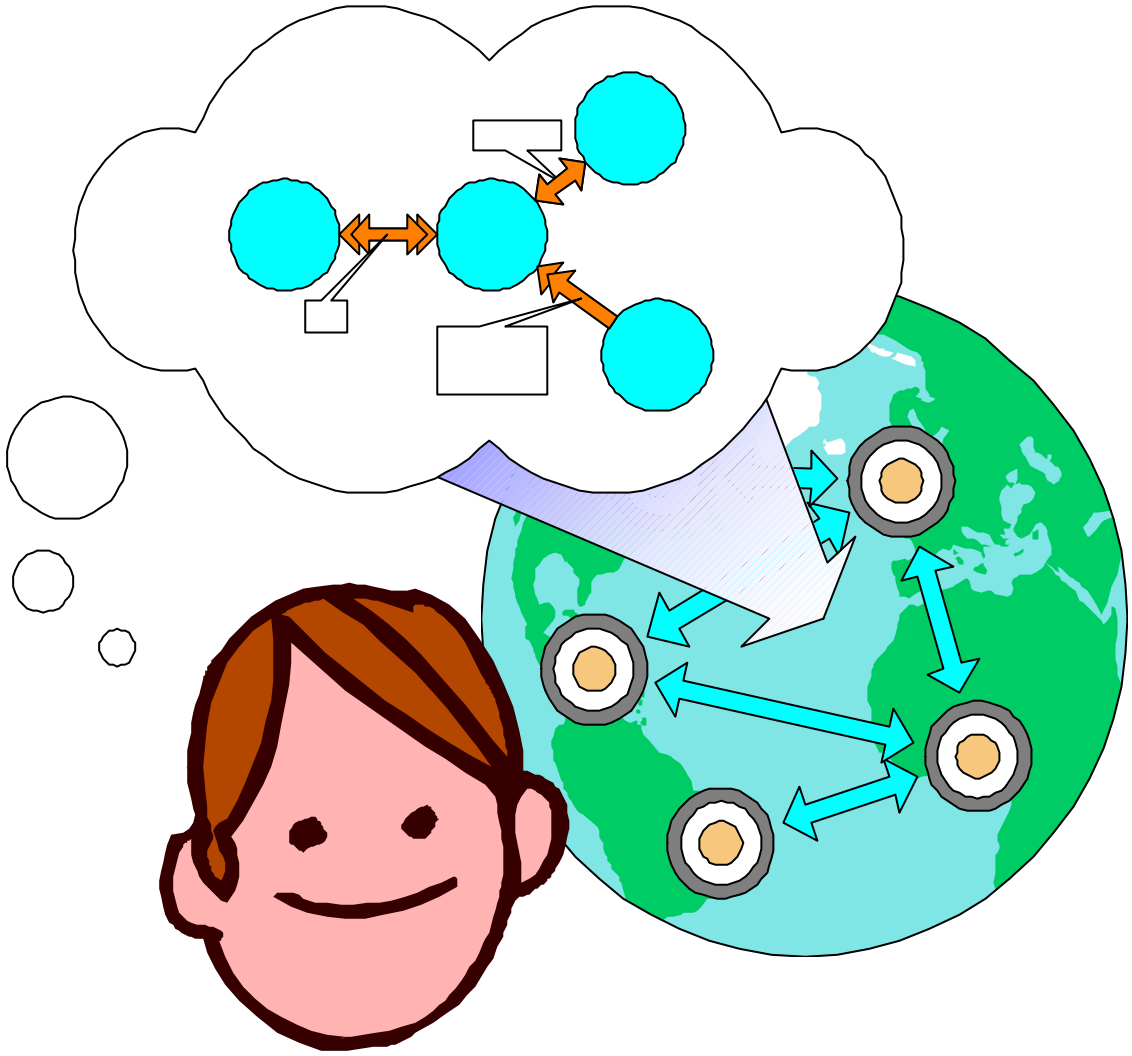
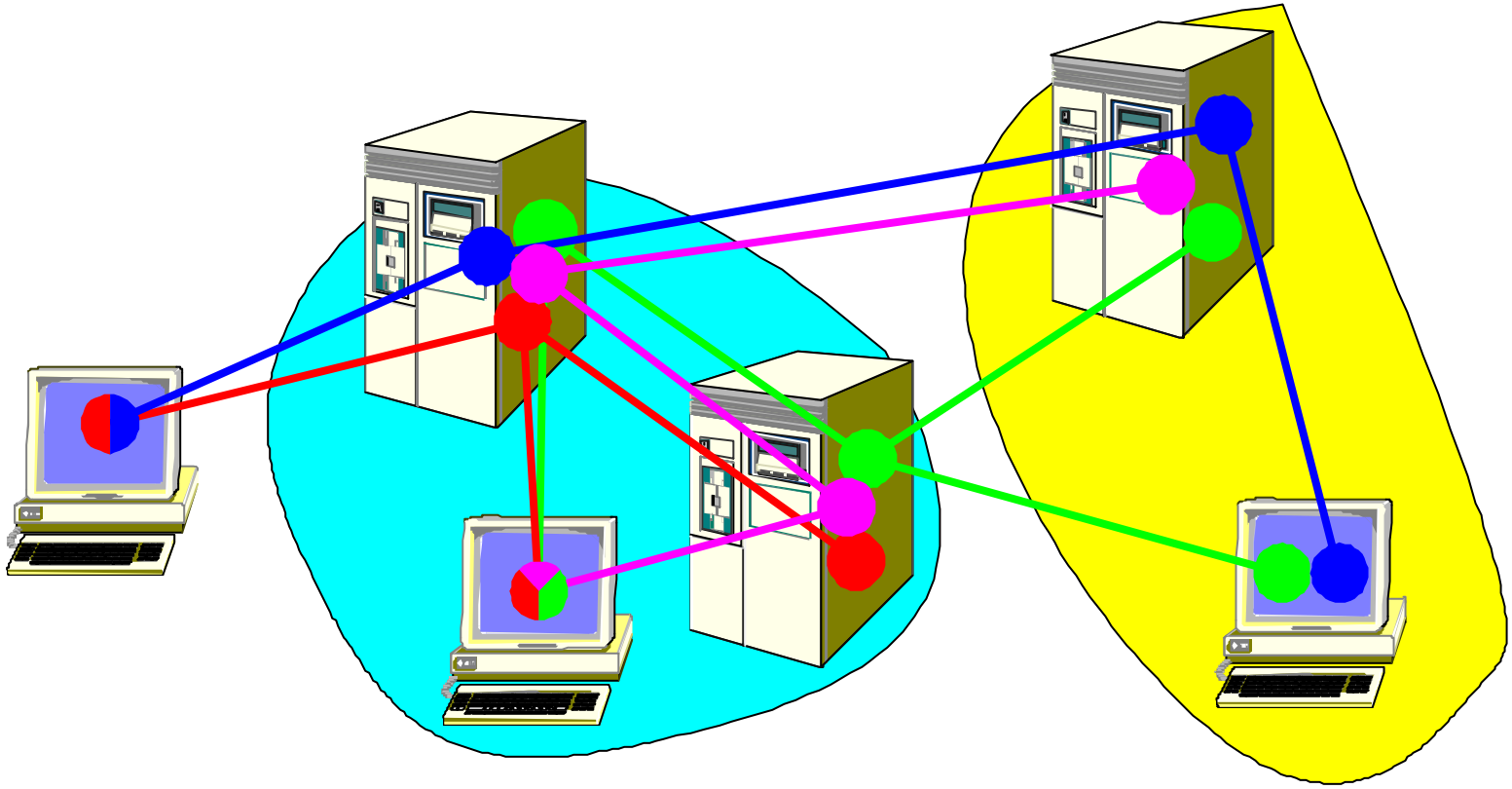


FlexiNet

Richard Hayton

Utilising WWW increases Complexity

Global Organizations - Electronic Commerce - Devolved Management



★ *Policy based deployment across enterprise boundaries is the key issue*

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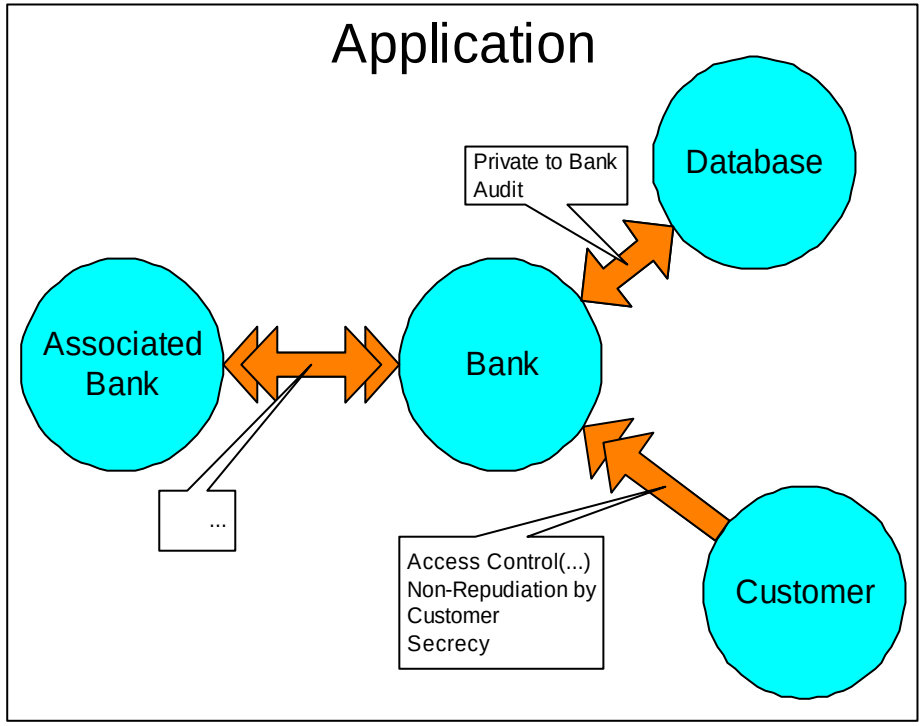
Applications are more than Components

Function

Environment

Policies

Costs



✓ *Application*

✓ *Deployment Policy*

Deployable Application

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Characteristics of FlexiNet Applications

- Large and Long Lived
  - potentially complex and poorly understood
- Distributed
  - many interconnected processes (both clients and servers)
- Multi-Organisation
  - No single point of policy control
- Heterogeneous Environment
  - different organisations
  - different facilities
  - different security domains
  - different costing factors

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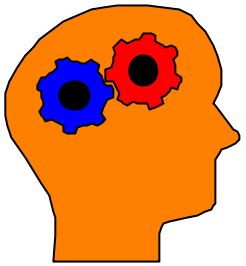
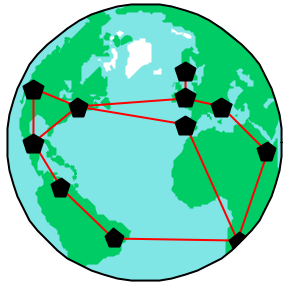
Policy is not static

Legislation

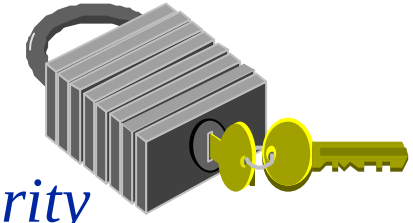
Contracts and Partnerships



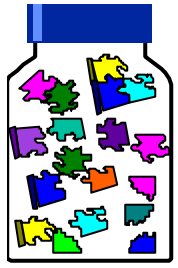
Business Practices



Networks and Infrastructure



Security Mechanisms



Component Systems

V3.0

New Facilities

New Opportunities

Unforeseen Problems

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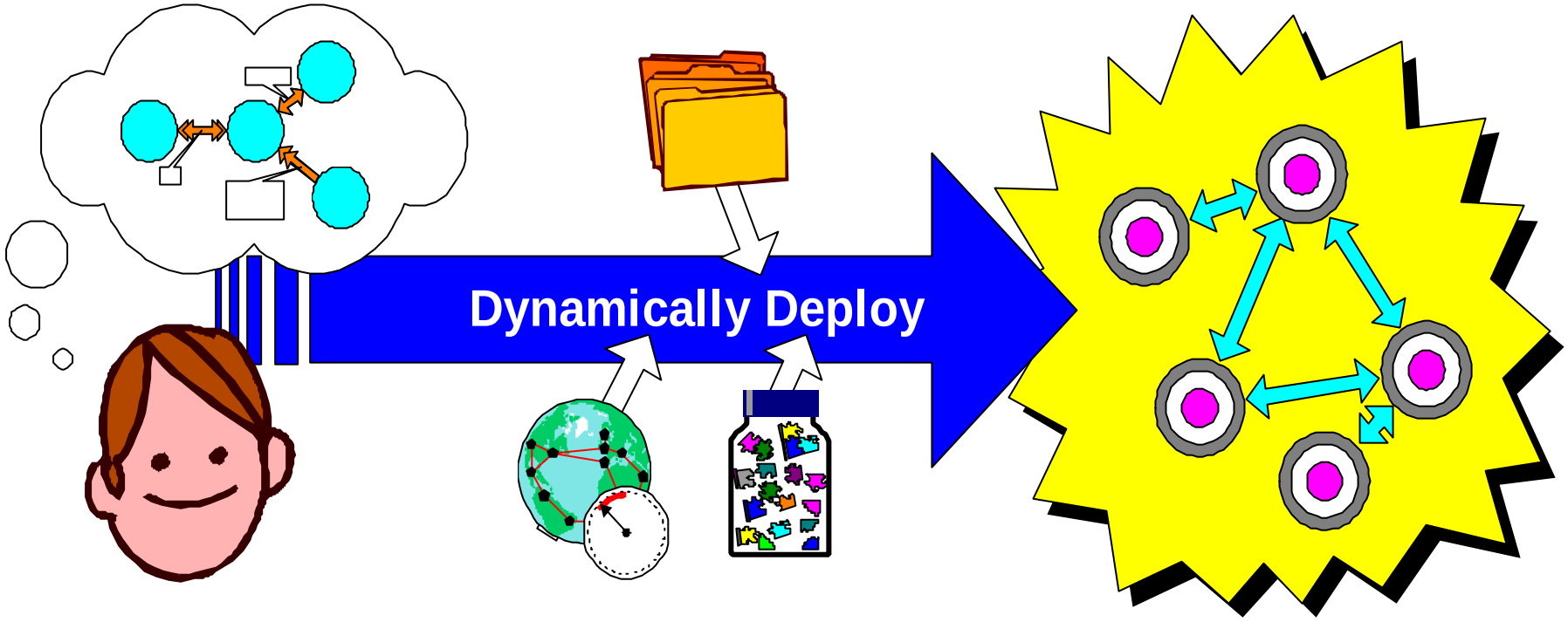
FlexiNet: Application deployment driven by policy



- *FlexiNet framework for wrapping applications*
- *Policy selects components to populate framework*

  ⇒*component orientated middleware*

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Aims

- Support Development
  - reduce domain of knowledge of developers - separation of concerns
  - make errors easier to spot - leverage strong typing
- Support Deployment
  - aid engineering decisions - declarative specification
  - enable reusable code/services - component based
- Support Evolution
  - of application - function / policy
  - of infrastructure - new mechanisms
  - of environment - changing costs

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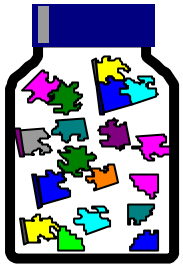
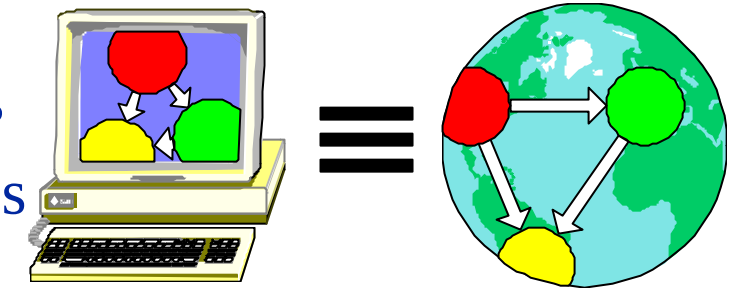
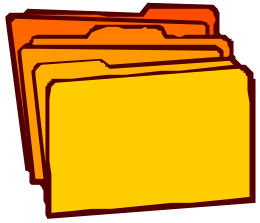
Approach



- Components for selective transparency
  - reusable units for management/mobility/checkpointing etc.
- Modular Engineering
  - simple API for high level abstractions
  - external control of reflective interfaces



- Declarative Descriptions
  - describe requirements and resources
  - drives selection and configuration of transparency components



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Programmer's view of an interaction

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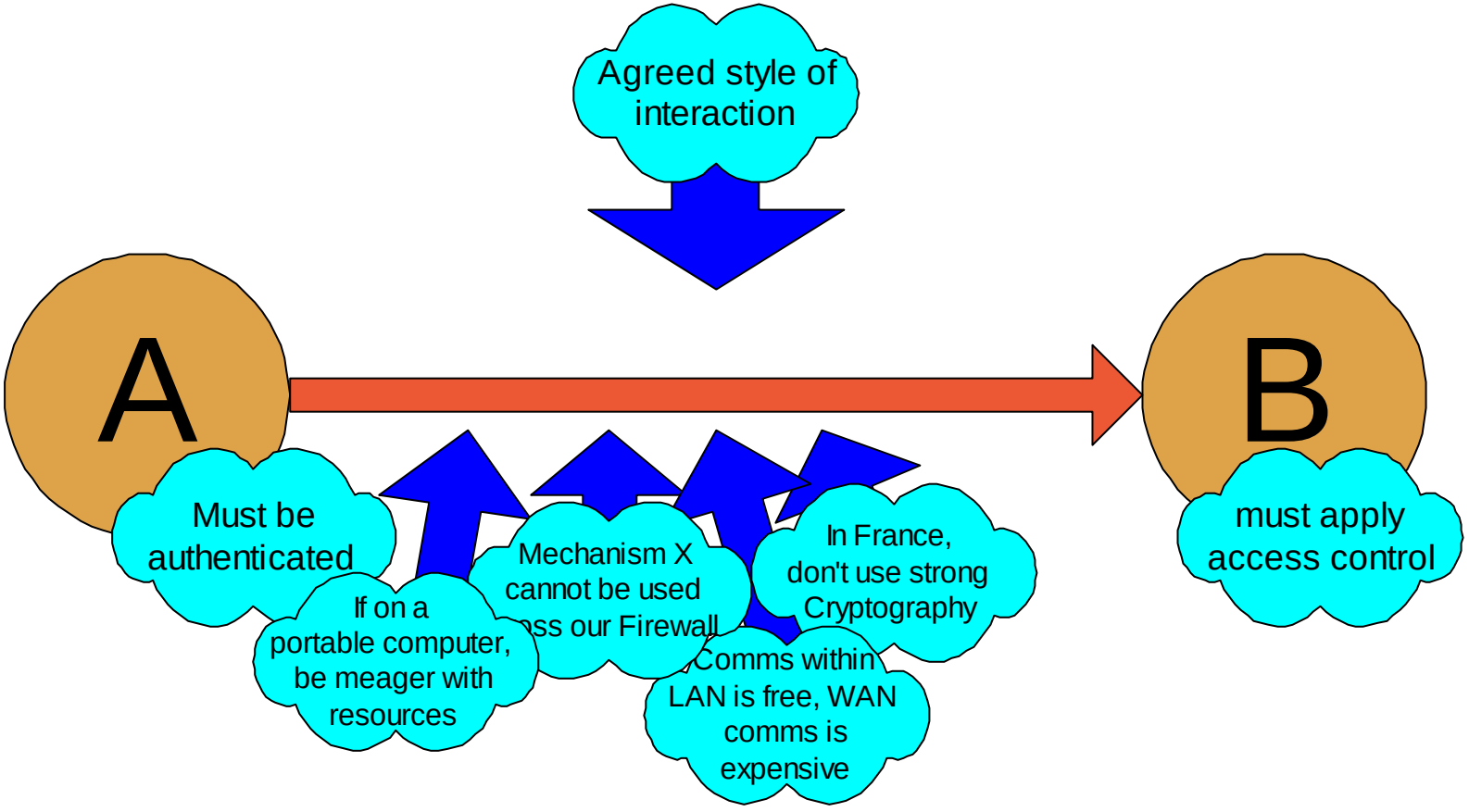
Engineering requirements of an interaction



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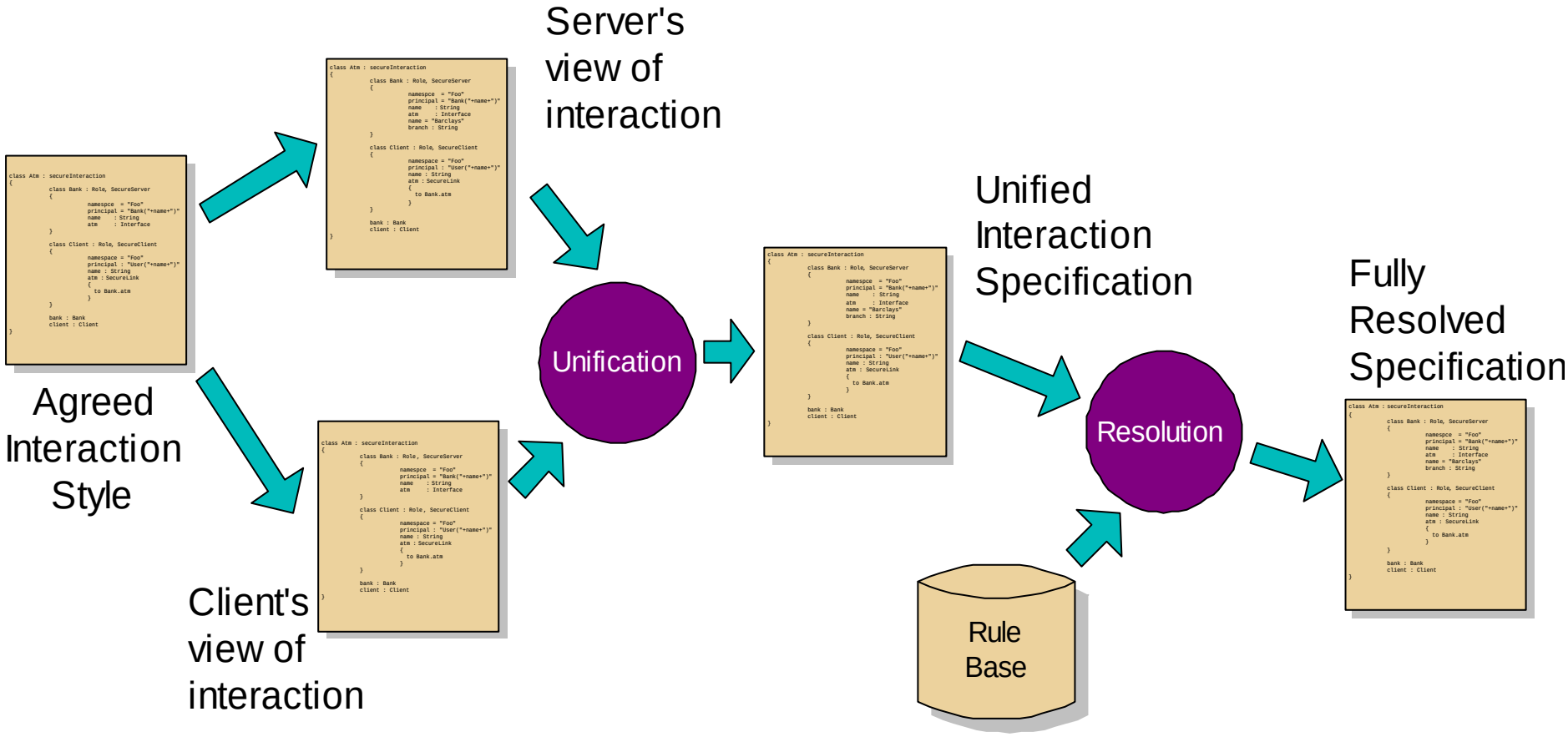
Choosing a binding mechanism via Resolution



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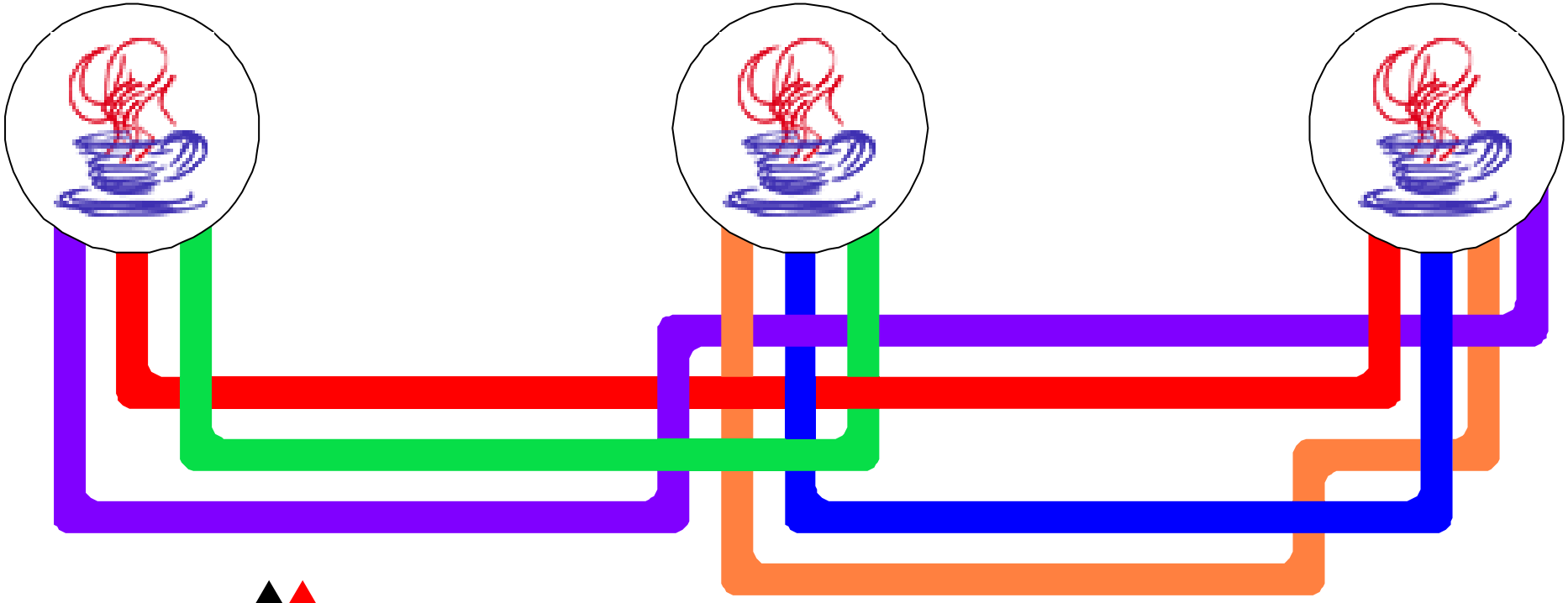
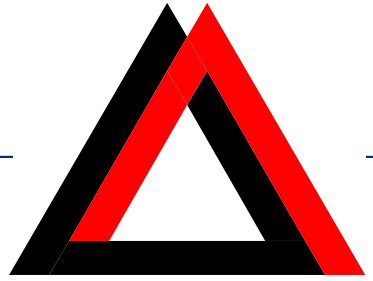
FlexiNet Open ORB Framework





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Engineering Framework Overview

- Core FlexiNet framework
  - future work will be built on this
- Provides transparent binding
  - For local or remote interconnection
- Open binding architecture
  - To allow general reflection or communication
- Minimalist API
  - External control via reflection

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Generic Communications

- Transparent but Powerful
  - No special compiler - stub generated on the fly
- Utilise Java Core Reflection
  - Standard representation of a method call
  - Use Java generic method invocation
- Flexible Reflection
  - Can apply any transformations or restrictions on call
  - Stub is not dependant on interconnect mechanism
- Evolvable: engineering can change under the feet of API

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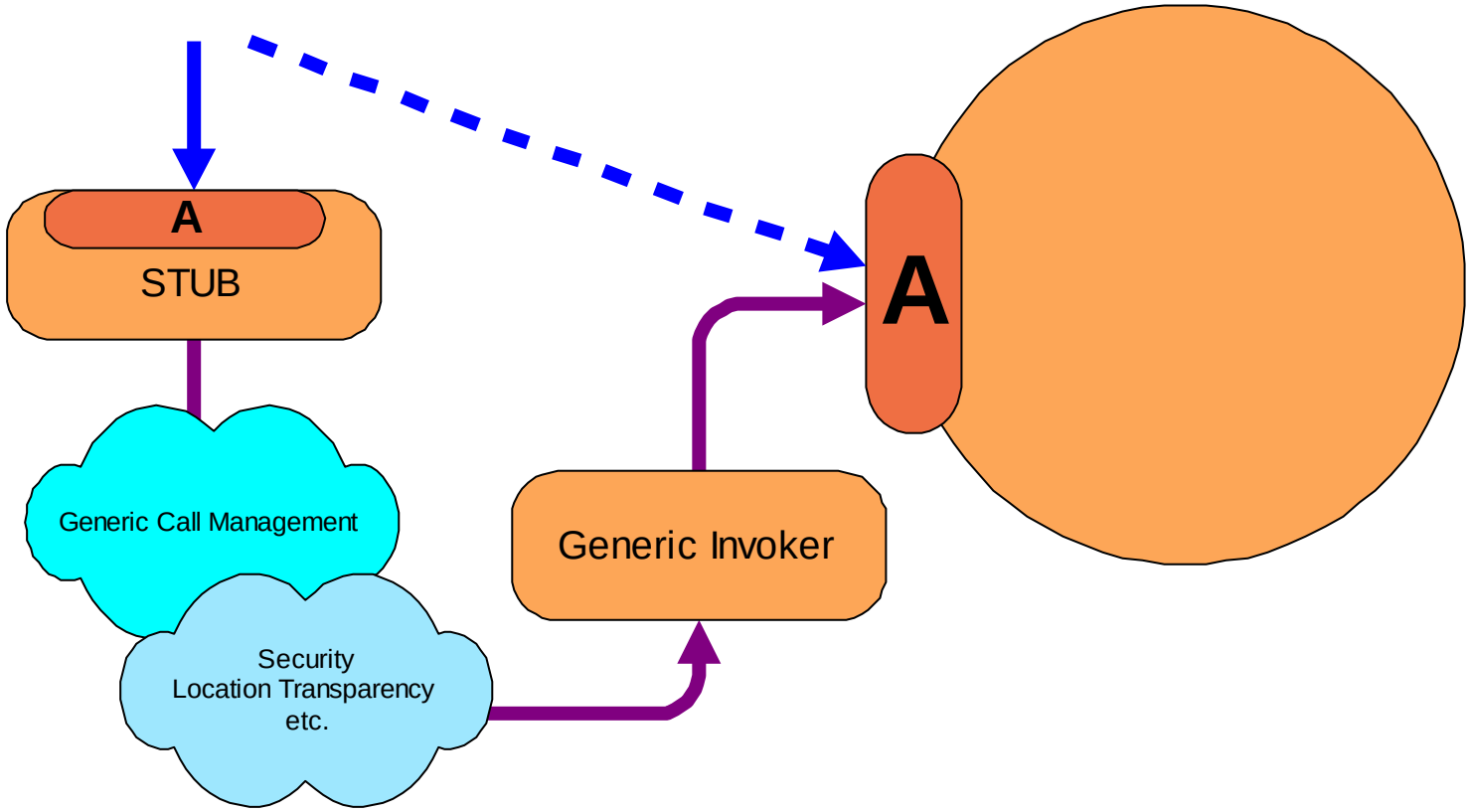
Generic Communication



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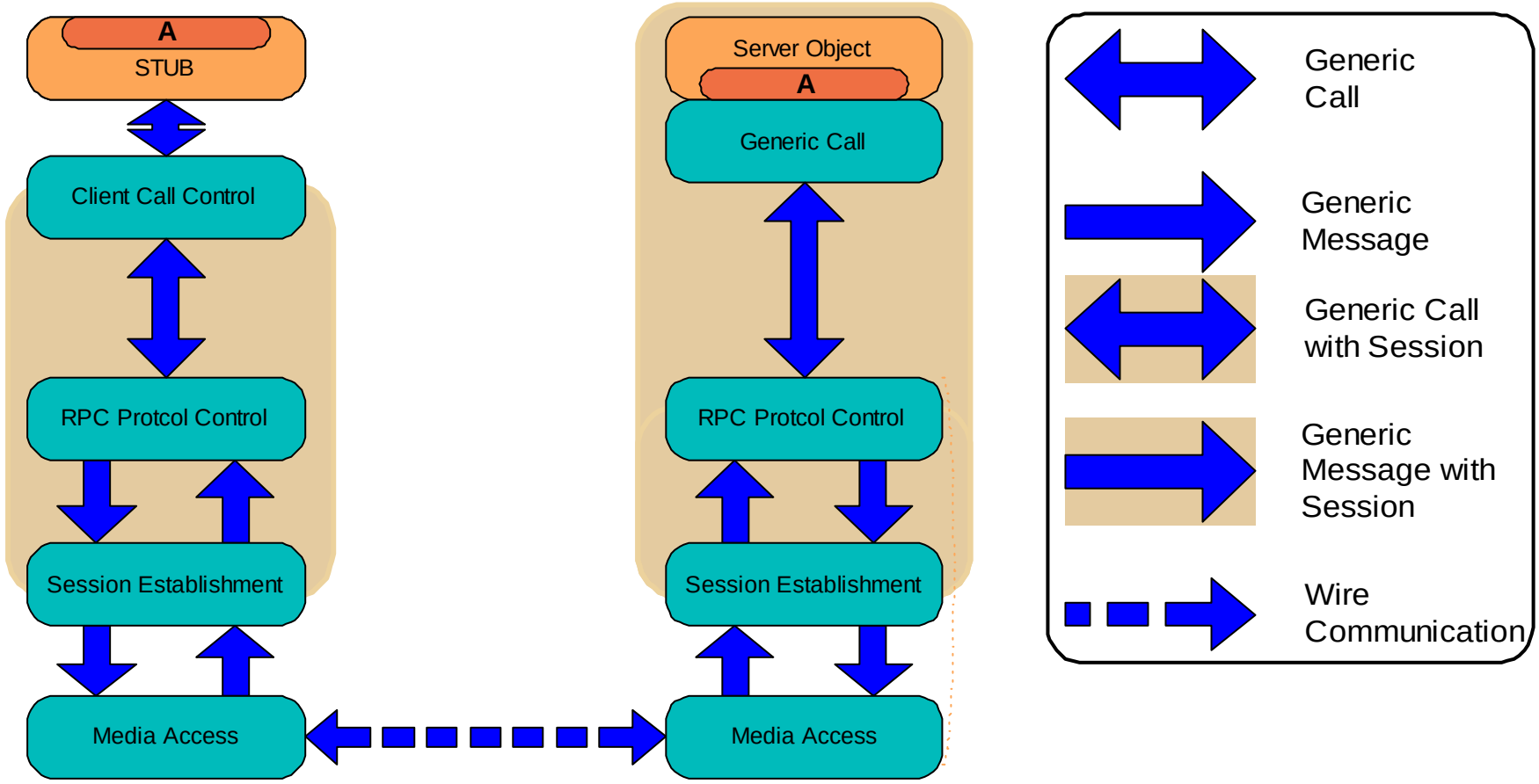
Generic Communications Stack



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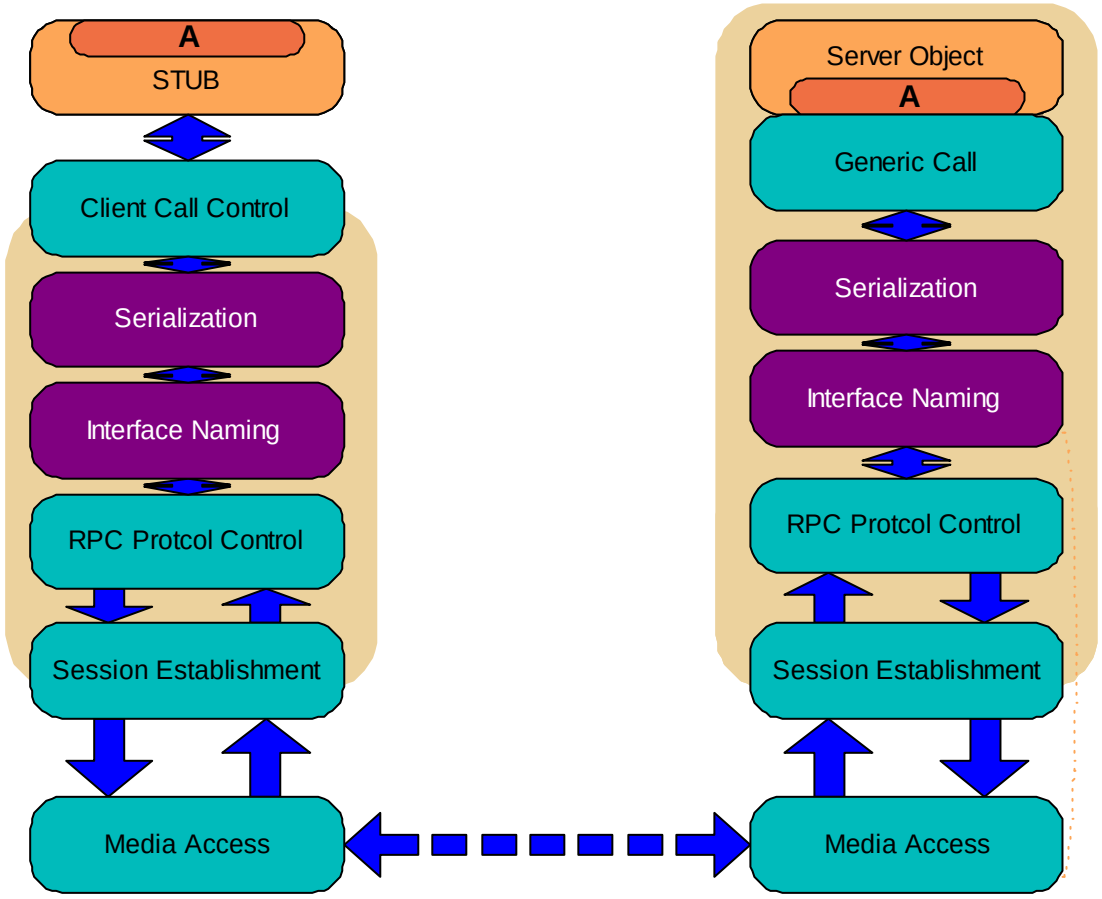
Simple Remote Invocation Stack



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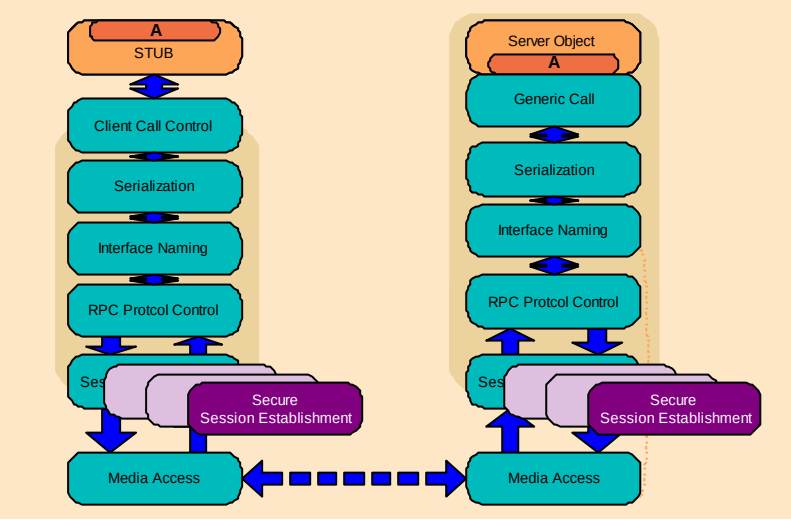
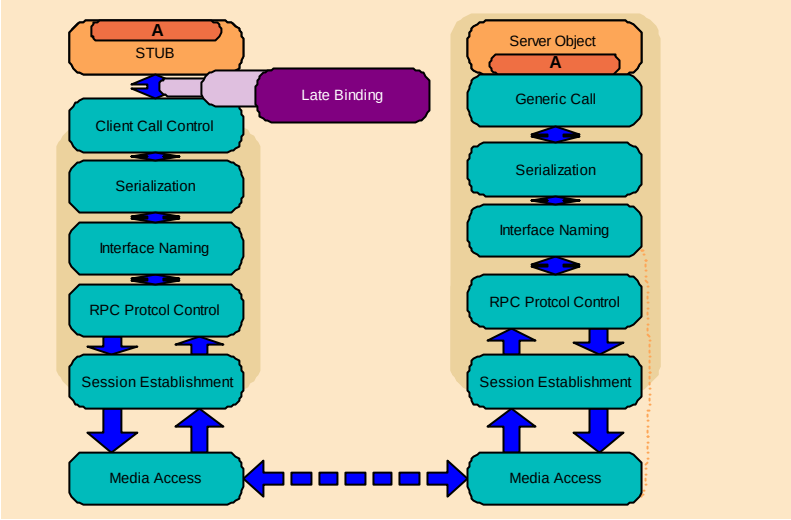
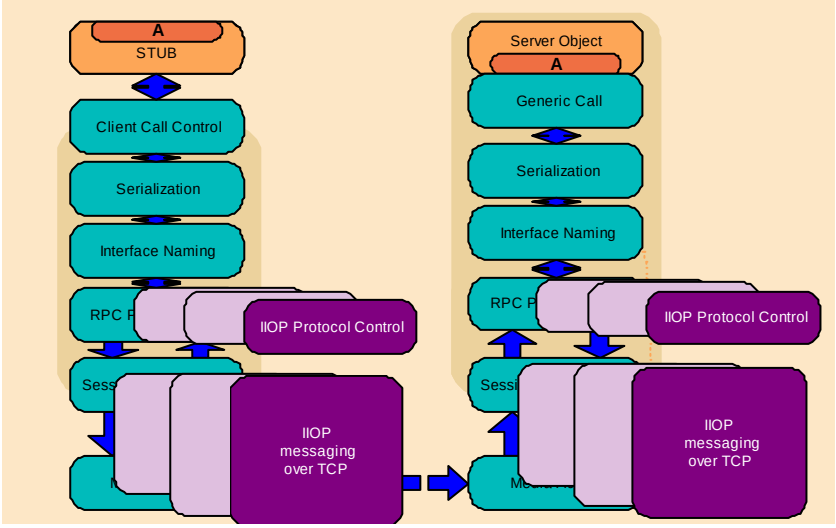
Other Remote Invocation Stacks



SECURE SESSIONS

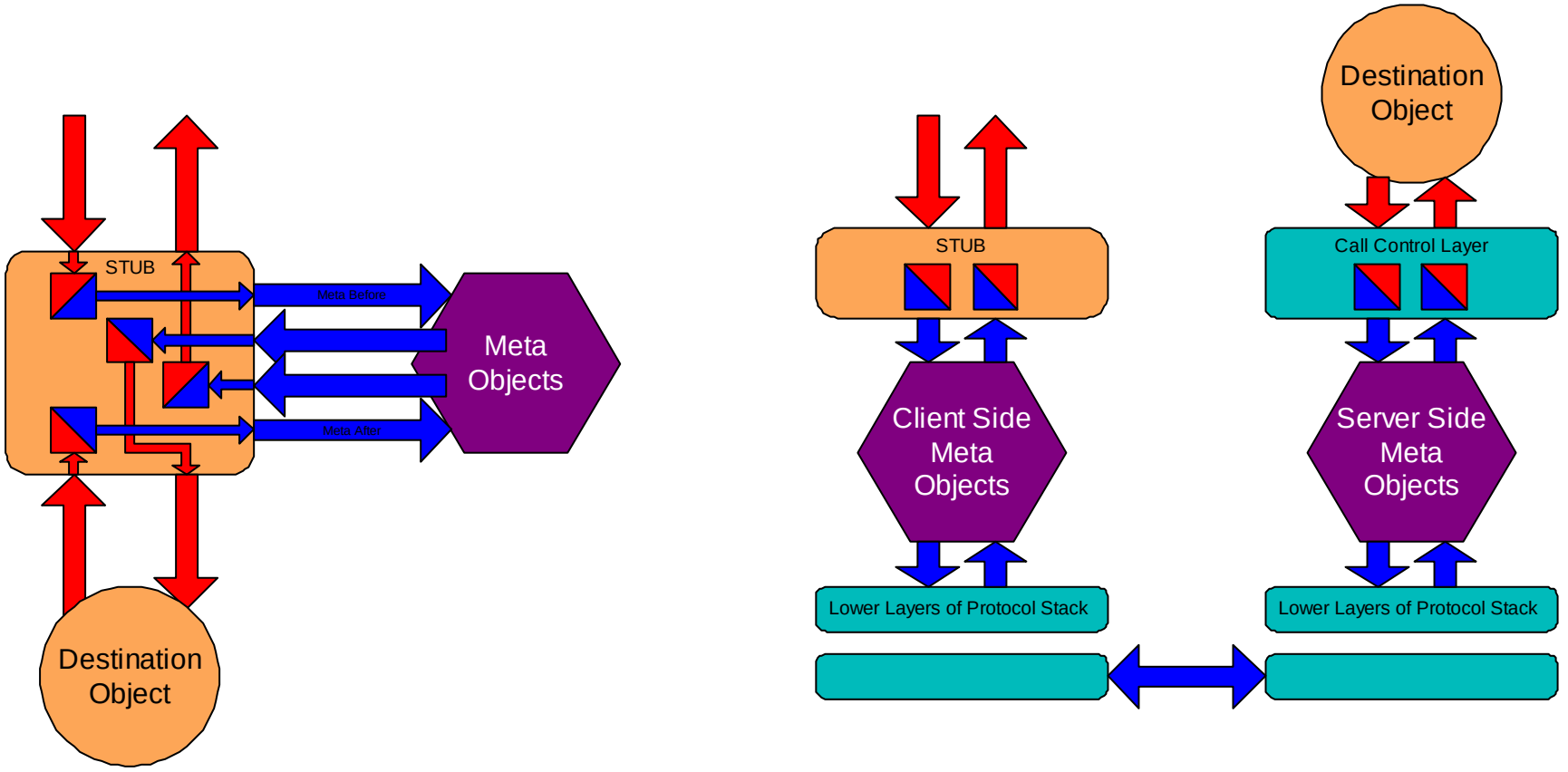


LATE BINDING



IIOP TRANSPORT

FlexiNet Reflection



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Current Status

- Engineering Framework
  - version 1.0 delivered to sponsors
  - working on mobility issues:
    - naming for mobile interfaces
    - integration with Kafka
- Declarative Specification
  - prototype language & approach to resolution
  - design for negotiation framework
- Abstractions
  - initial design of transactional framework
  - secure communications in progress

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