ObjectWeb & ProActive

Grid@Work Conference, Thursday Oct. 13th 2005.

Christophe NEY
ObjectWeb Executive Director
Development Project Director, INRIA Rhône-Alpes

ObjectWeb
Open Source Middleware

WELCOME

Welcome to ObjectWeb !

ShortCuts

Ambition & Scope
Members
Press Room
Join Us

Downloads
Professional Services
Success Stories
Online Demos

What's Middleware?
Meetings & Events
Working Groups
ObjectWebCon05

Project List
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HOT TOPICS

GRID Computing at ObjectWeb: Life Broadcasting of 2nd ProActive User Group, Monday Oct. 10-11

The Second ProActive User Group will be held on Monday Oct. 10: General Presentations from Developers and Users Sessions will be broadcasted in real time (from 9:00 to 19:00, French time). Tuesday Oct. 11: Tutorial and Hands-On Grid Programming Tutorials will be recorded and made available in video streaming later on. The Broadcasting will be accessible from http://www.etsi.org/webcast/.

ObjectWeb Supports the Middleware 2005 Conference

ACM/IFIP/USENIX 6th International Middleware Conference - November 28-December 2, 2005 - Grenoble, FRANCE - The Middleware conference is a forum for the discussion of important innovations and recent advances in the design and construction of middleware. Following the success of past conferences in this series, the 6th International Middleware Conference will be the premier event for middleware research and technology in 2005.[Read More]

ObjectWeb Supports COSGov Vietnam

COSGov Vietnam
building cooperation via open-source for eGovernance

COSGov Vietnam - September 28-30, 2005 - Hanoi - More than 300 IT-Experts, governmental representatives and entrepreneurs gathered in Hanoi for the international conference "COSGov Vietnam - Building cooperation via open-source for eGovernance".During the three days of exchange and discussions on open-source software, more than 30 international and national experts and policy makers presented global and local solutions to e-government challenges, FOSS-based business models and market opportunities. Presentations are available at www.cosgov.org.

NewsLetter

your email subscribe

Archive...

ComingUp

- Fall 2005 Architecture Meeting, October 3,4,5
- Grids at work, 10 - 14 October 2005, ETSI, Sofia (Nice), France
- OSGi Developer Forum, Paris, France, Oct. 11-14, 2005
- LinuxWorld Expo & Conference, Frankfurt, Germany, November 15-17, 2005

More...

LatestNews

- **Oct 07:** Life Broadcasting of 2nd ProActive User Group
- **Oct 06:** Sync4j 2.3 beta 2 is out!
- **Oct 03:** CNRS Joins ObjectWeb Consortium
- **Sep 27:** ObjectWeb Celtix Project Achieves Key Milestone

Post a News - More... - RSS

TopDownloads

For the last 7 days:

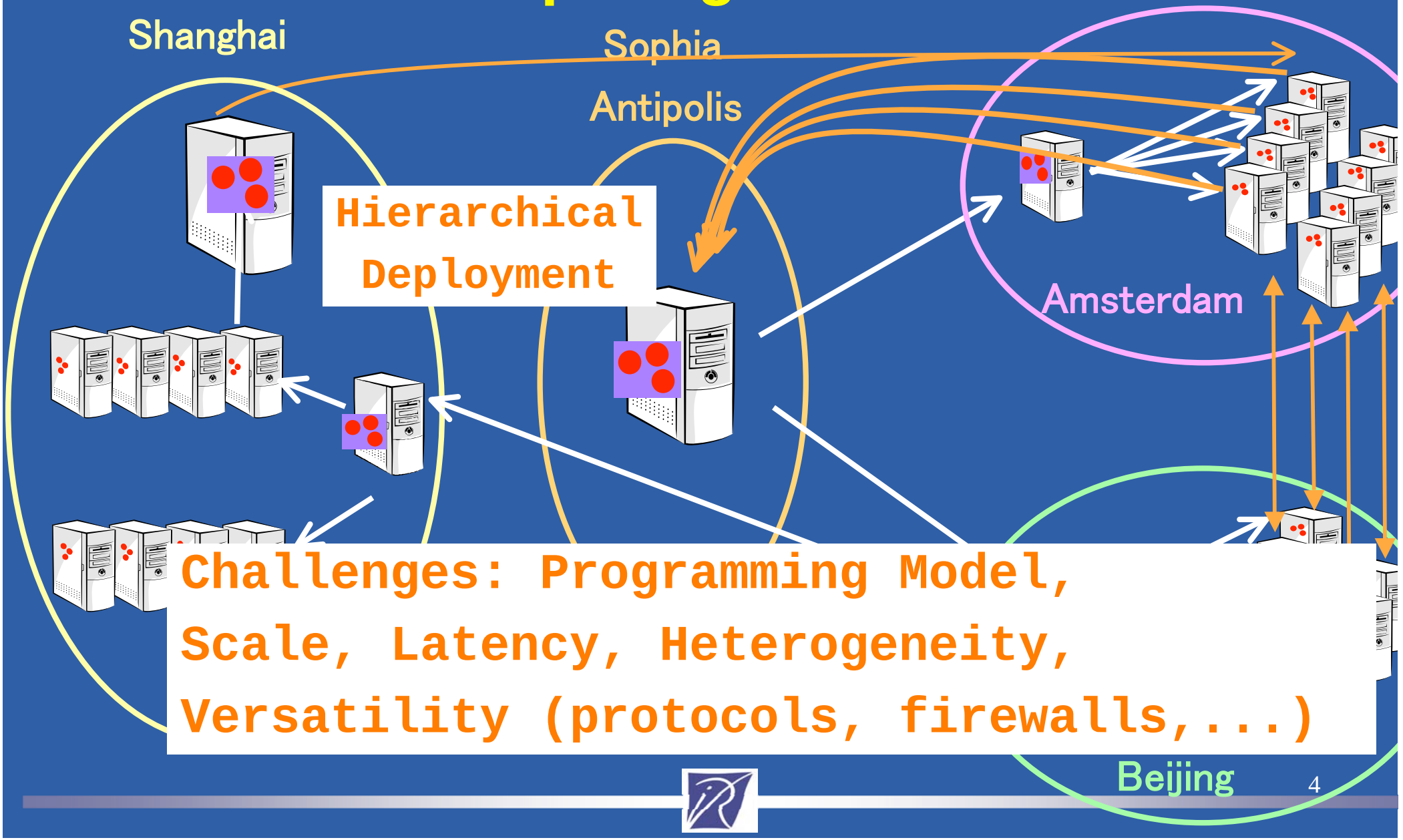
ObjectWeb
Open Source Middleware

ProActive
Programming, Composing, Deploying on the Grid

A GLOBAL SOLUTION FOR THE GRID

PROGRAMING COMPOSING
WRAPPING DEPLOYING

Grid Computing with *ProActive*



Challenges: Programming Model,
Scale, Latency, Heterogeneity,
Versatility (protocols, firewalls,...)

ProActive:

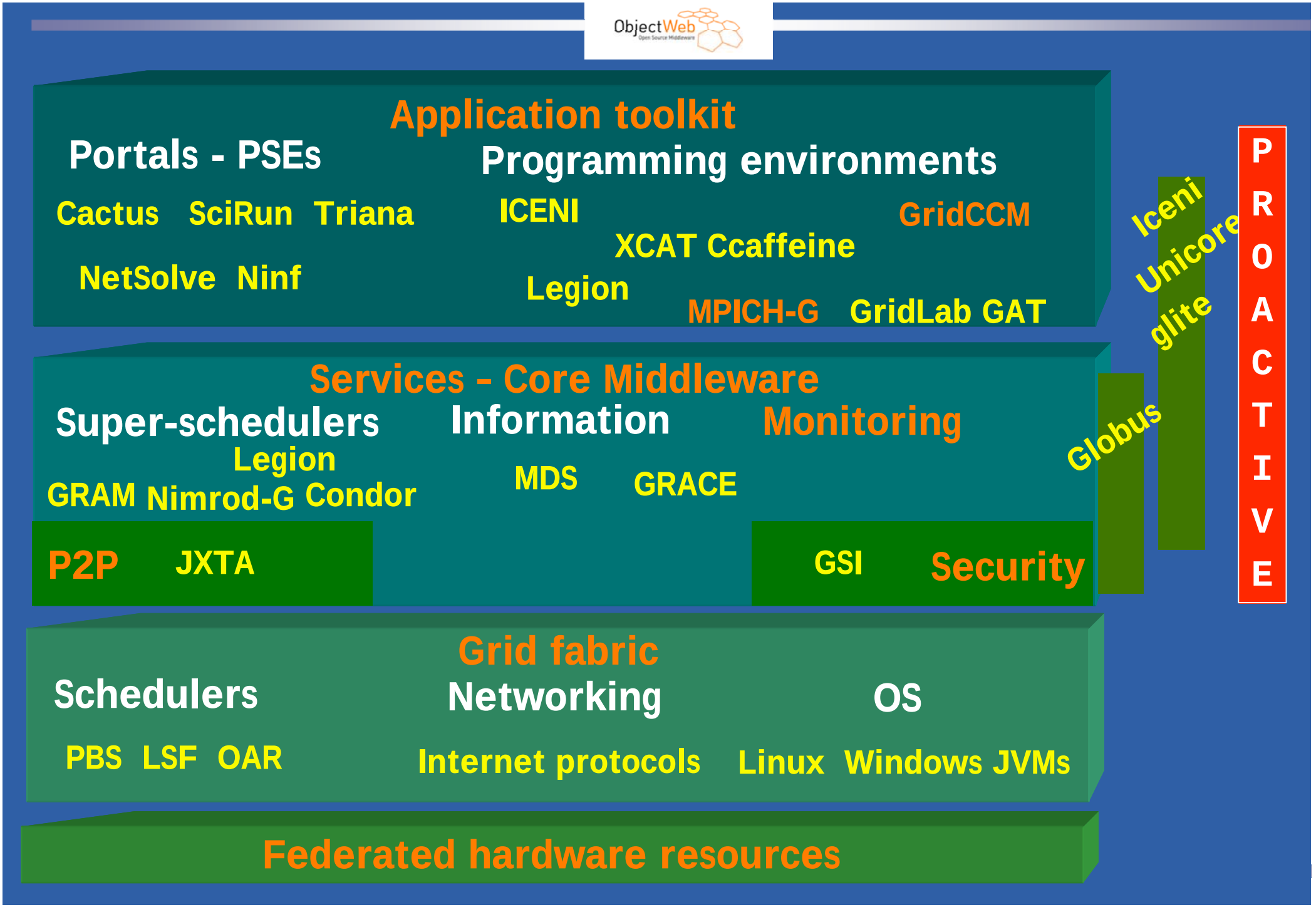
A Java API + Tools for Parallel, Distributed Computing

Key Facts:
- A uniform framework : The Active Object pattern
- A formal model behind : Determinism (POPL'04)

Programming Model:
- Remote Objects
- Asynchronous Communications, Wait-By-Necessity
- Groups, Mobility, Components, Security, Fault-Tolerance

Environment:
- XML Deployment Descriptors
- Interfaced with: `ssh, LSF, PBS, Globus, gLite, Unicore, …`
- Graphical Visualization and monitoring: IC2D

Open-Source:
- Project of the ObjectWeb Consortium (http://www.objectweb.org)
- LGPL License


ObjectWeb
Application toolkit
Portals - PSEs
Programming environments
Cactus SciRun Triana
ICENI
GridCCM
XCAT Ccaffeine
NetSolve Ninf
Legion
MPICH-G GridLab GAT
Iceni
Unicore
glite
PROACTIVE
Services – Core Middleware
Super-schedulers
Information
Monitoring
Legion
GRAM Nimrod-G Condor
MDS
GRACE
Globus
P2P JXTA
GSI Security
Grid fabric
Schedulers
Networking
OS
PBS LSF OAR
Internet protocols
Linux Windows JVMs
Federated hardware resources

ProActive and (De Facto) Standards

ProActive Supports

- RMI, RMI-Ibis, Jini, HTTP
- rsh, ssh, scp
- Globus GTx, sshGSI, Unicore, EGEE gLite
- LSF, PBS, OAR, Sun Grid Engine

ProActive Integrates

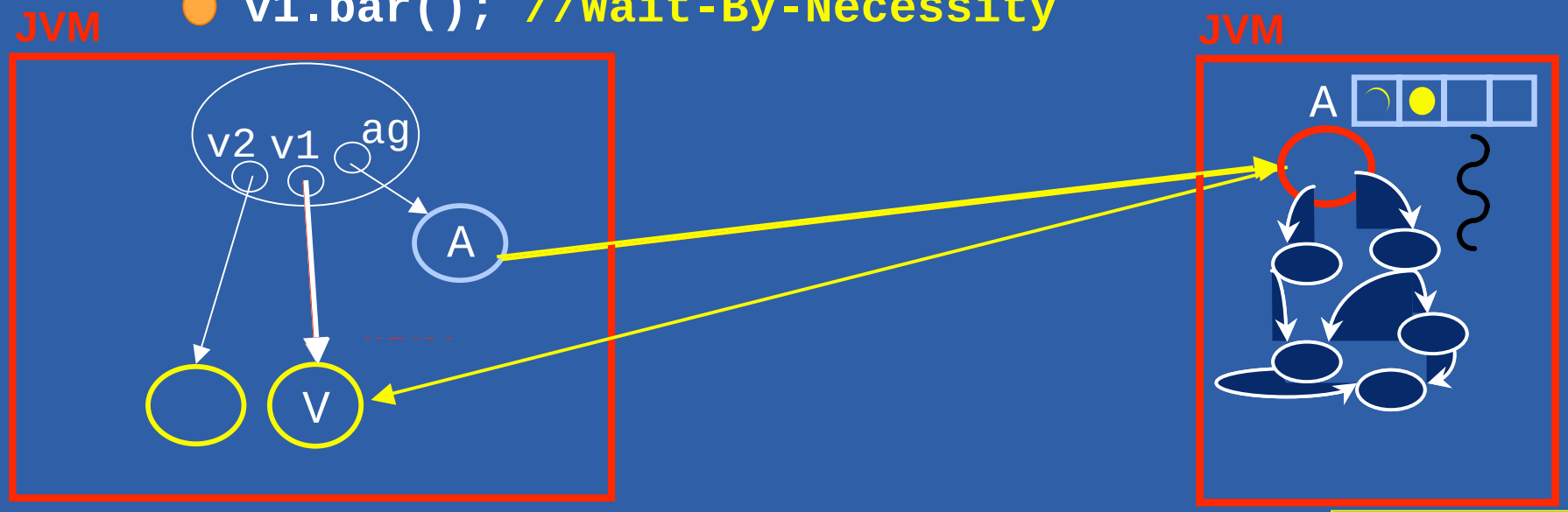
- Fractal Components
- Web Services
- OSGi

features

ACTIVE OBJECTS & ASYNCHRONY

ProActive : Active objects

```
A ag = newActive ("A", […], VirtualNode)
V v1 = ag.foo (param);
V v2 = ag.bar (param);
...
v1.bar(); //Wait-By-Necessity
```



Java Object

Active Object

Req. Queue

Future Object

Proxy

Request

Thread

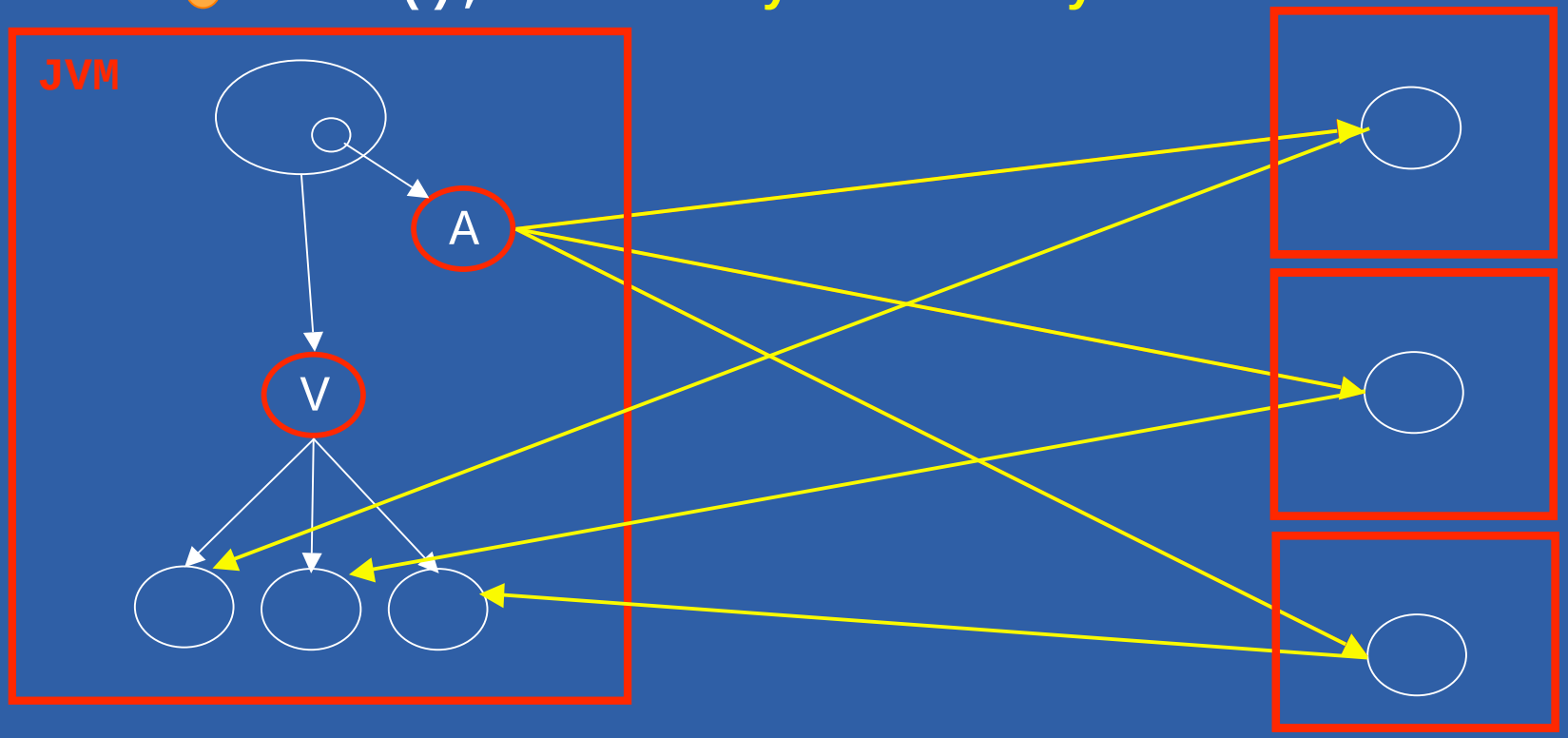
Wait-By-Necessity is a Dataflow Synchronization

features

TYPED ASYNCHRONOUS GROUPS

Creating AO and Groups

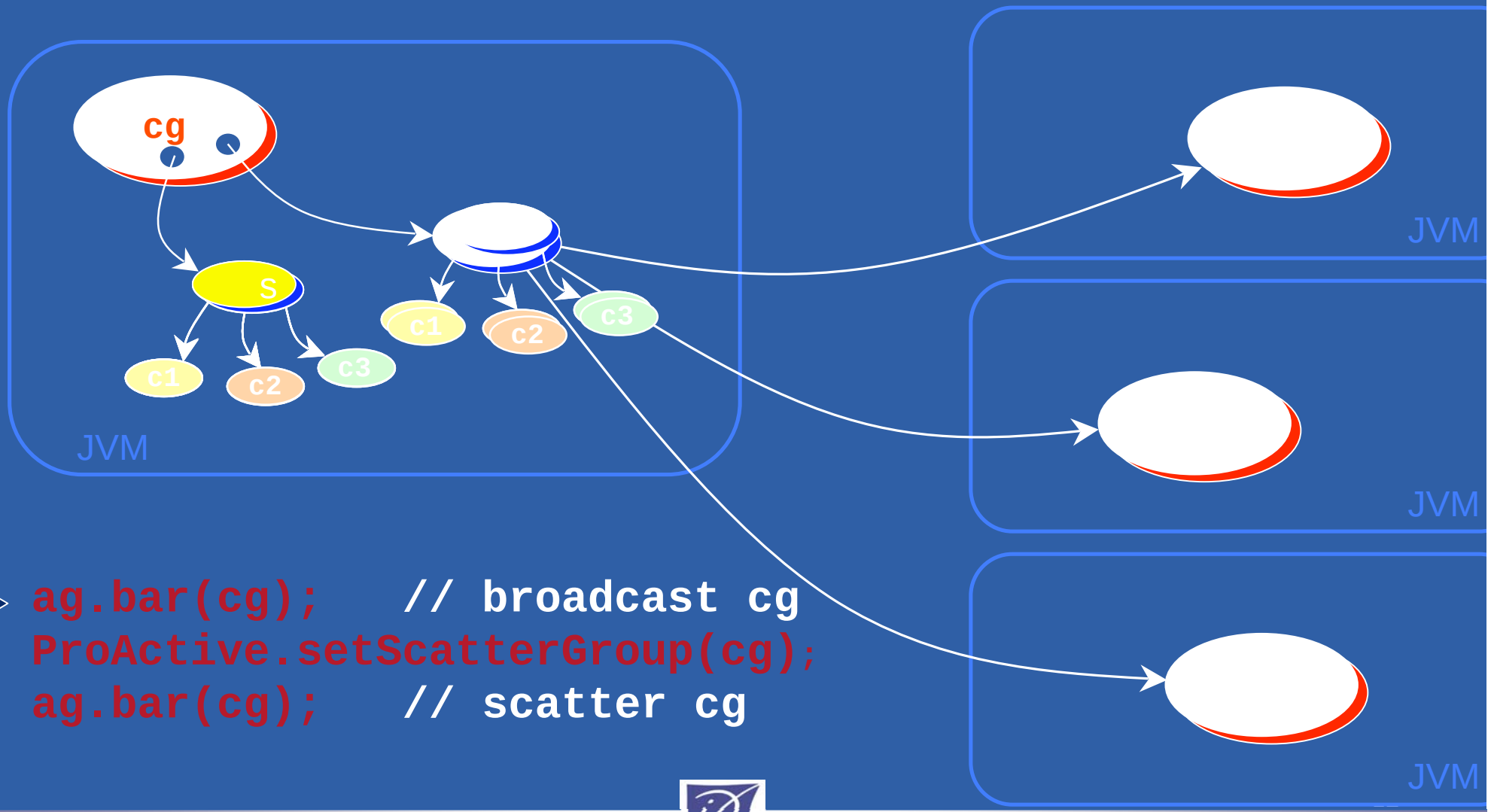
- `A ag = newActiveGroup (“A”, […], VirtualNode)`
- `V v = ag.foo(param);`
- …
- `v.bar(); //Wait-by-necessity`



Typed Group Java or Active Object

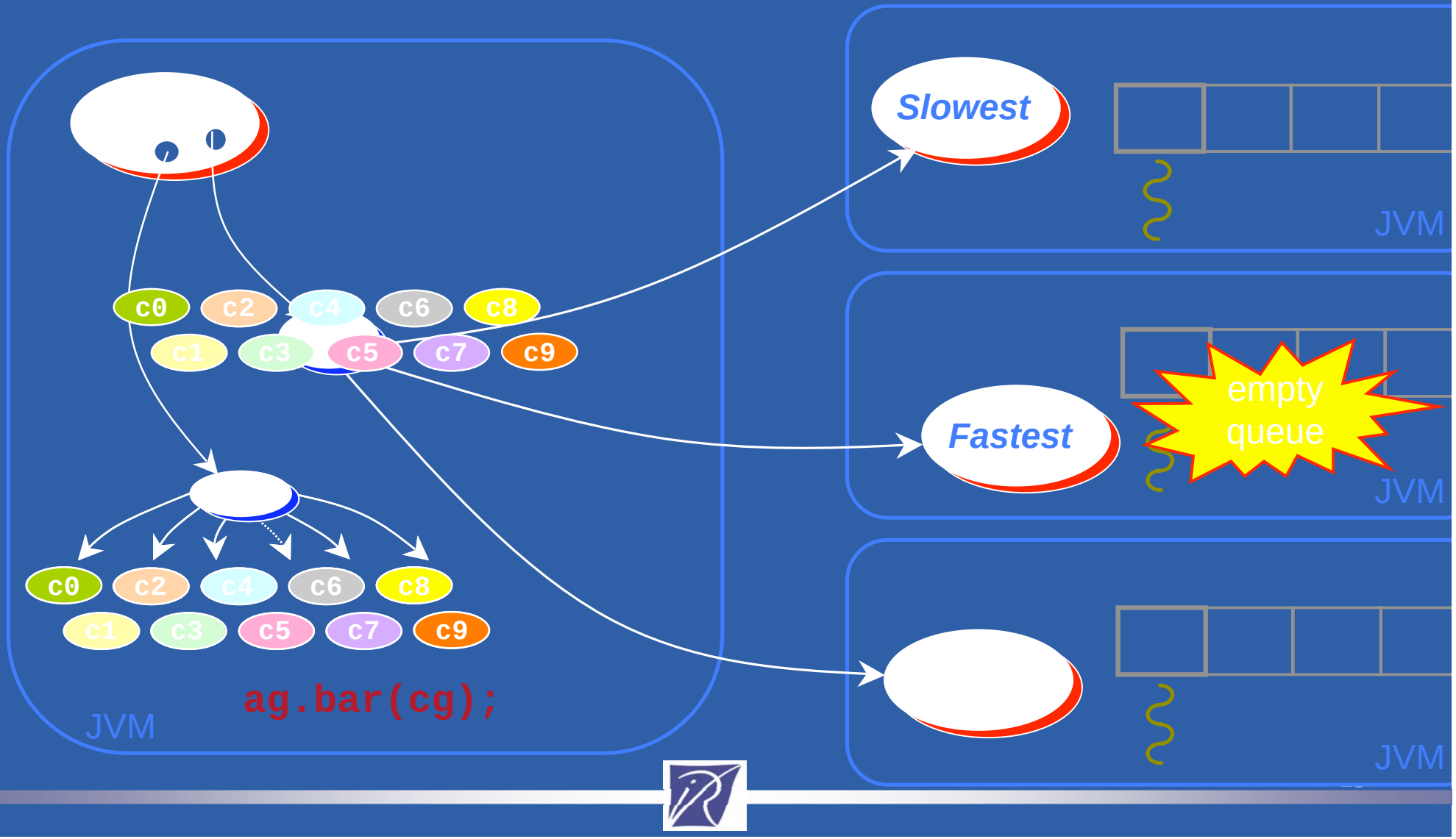
Group, Type, and Asynchrony are crucial for Cpt. and GRID

Broadcast and Scatter

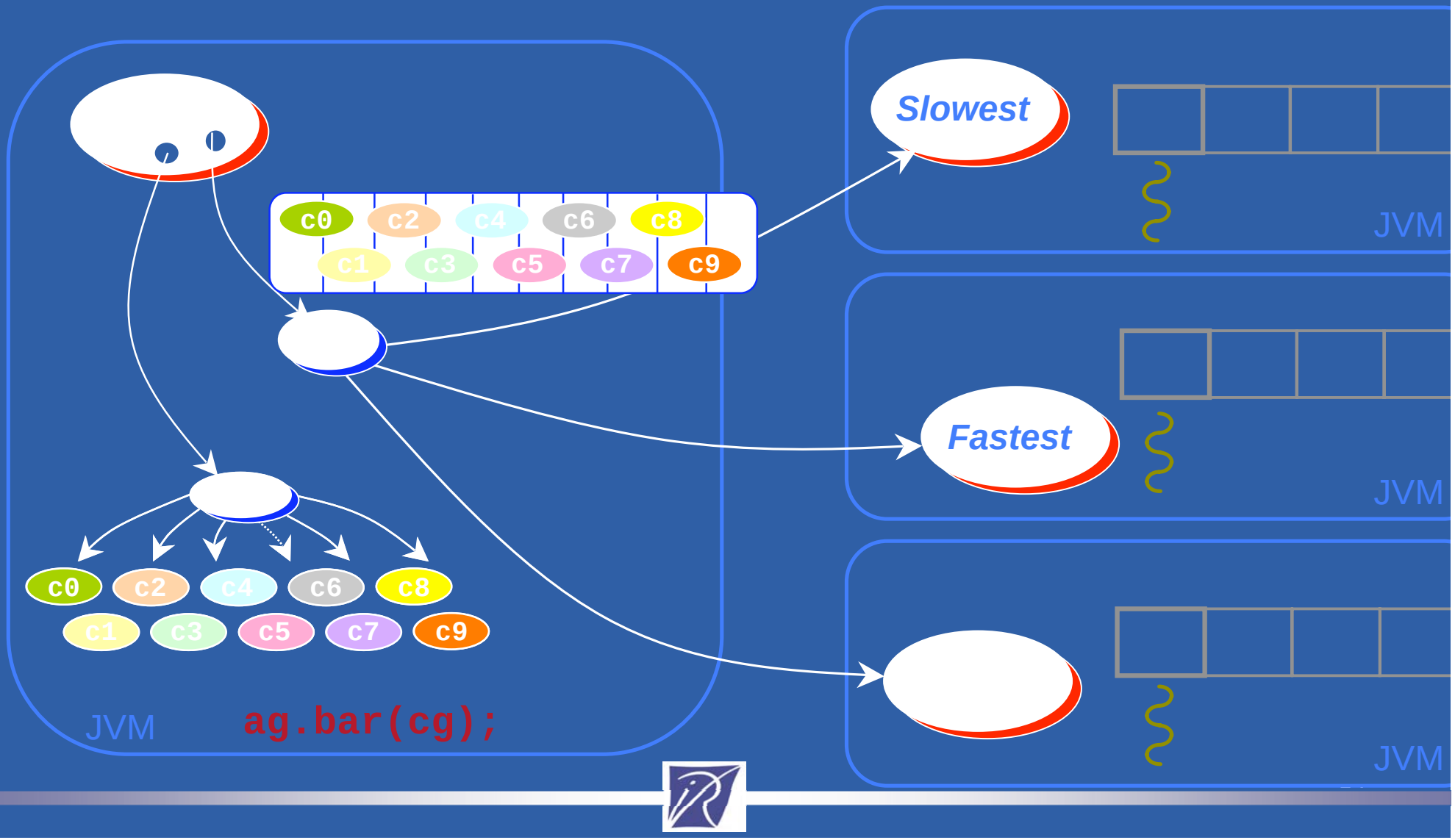



```
ag.bar(cg);    // broadcast cg
ProActive.setScatterGroup(cg);
ag.bar(cg);    // scatter cg
```

Static Dispatch Group



Dynamic Dispatch Group



features

MOBILITY

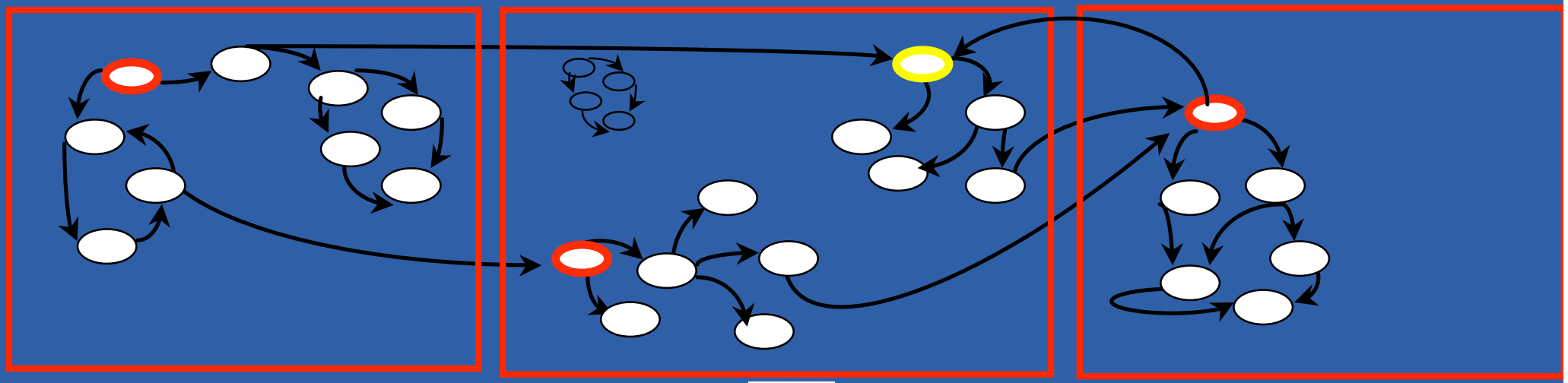
Principles and optimizations

Same semantics guaranteed (RDV, FIFO order point to point, asynchronous)

Safe migration (no agent in the air!)

Local references if possible when arriving within a VM

Tensionning (removal of forwarder)



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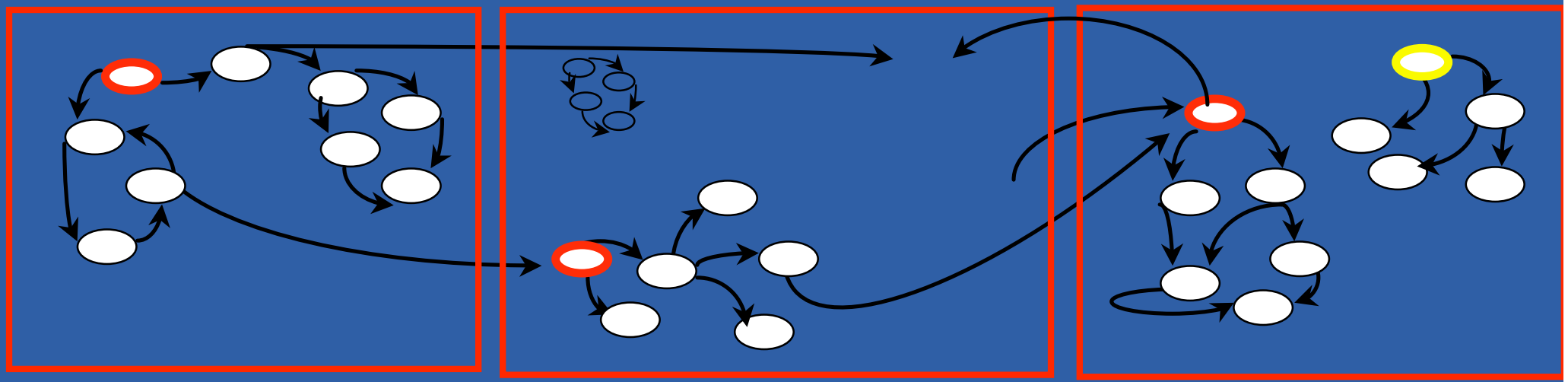

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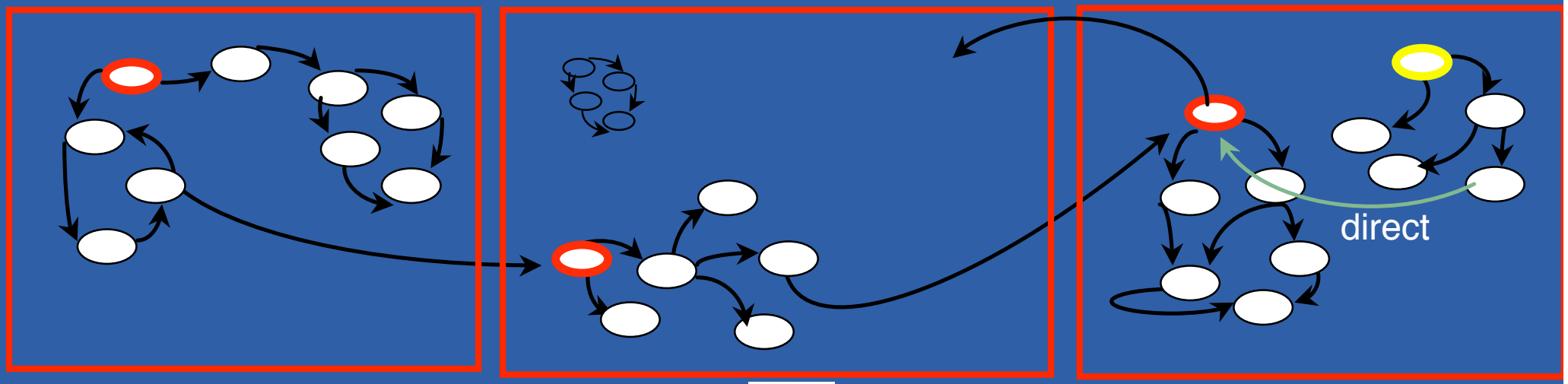

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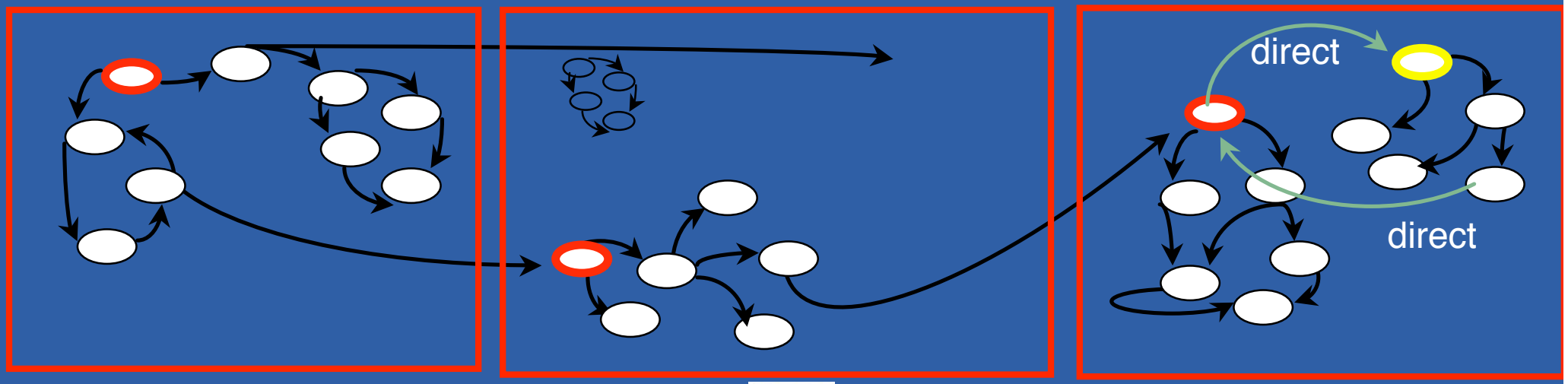

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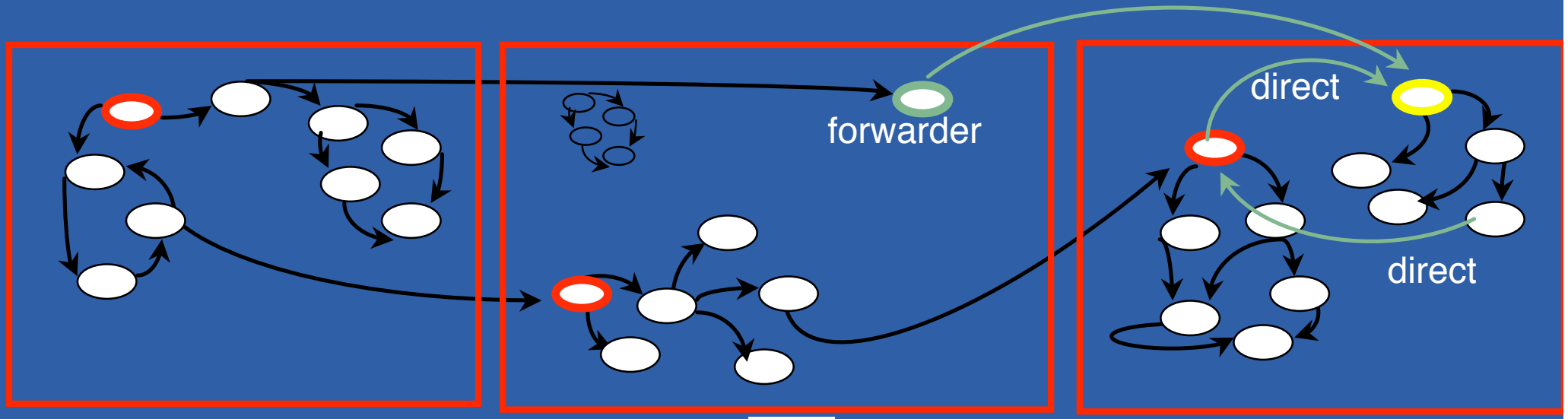

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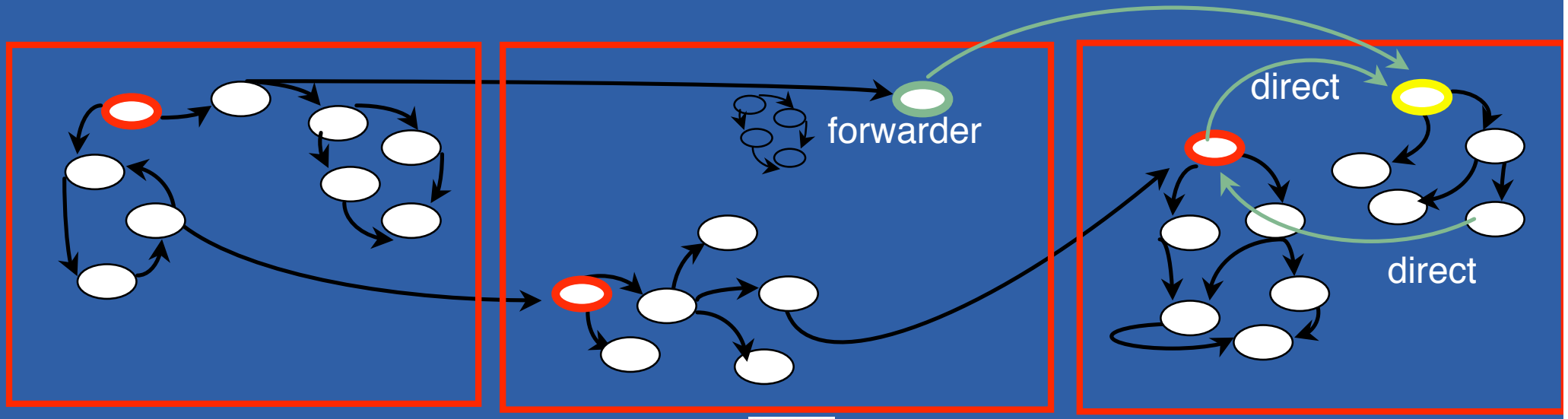

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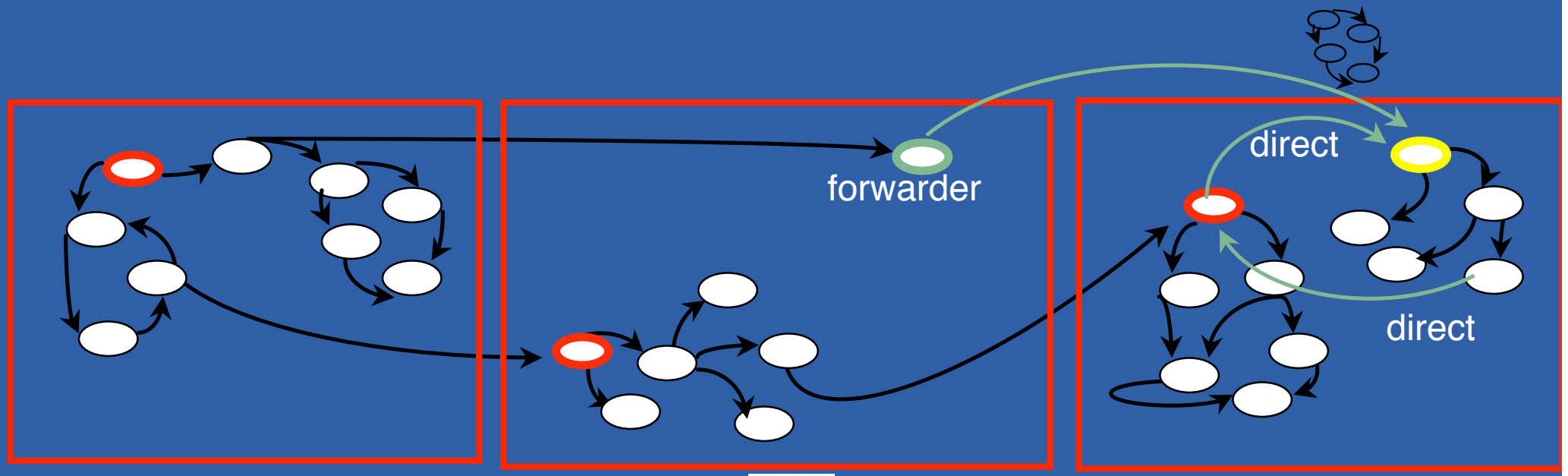

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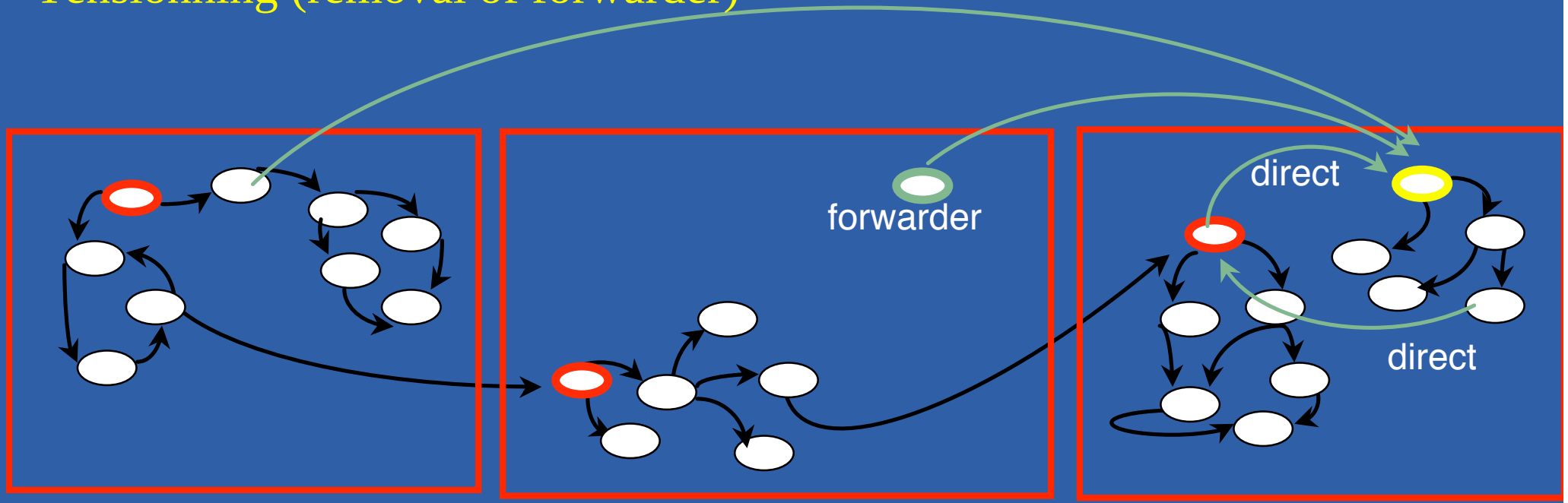
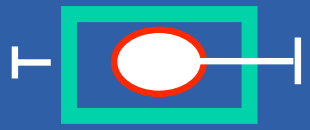


features

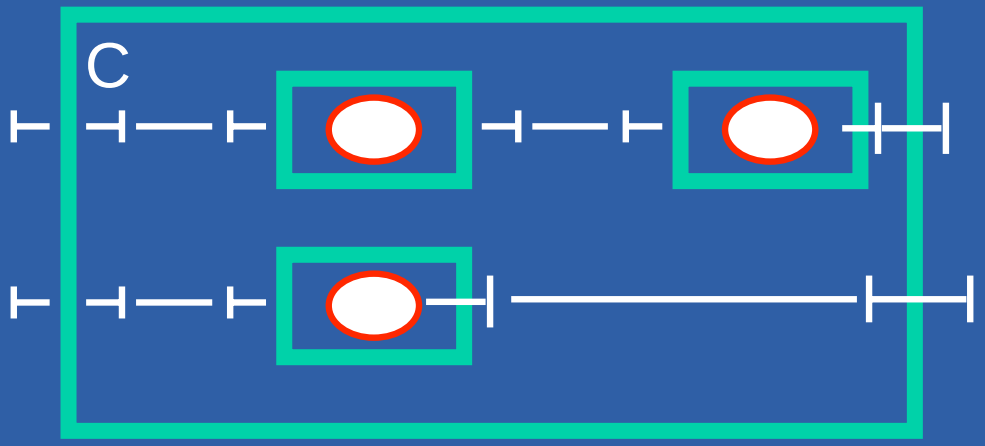
COMPONENTS

ProActive Components for the GRID

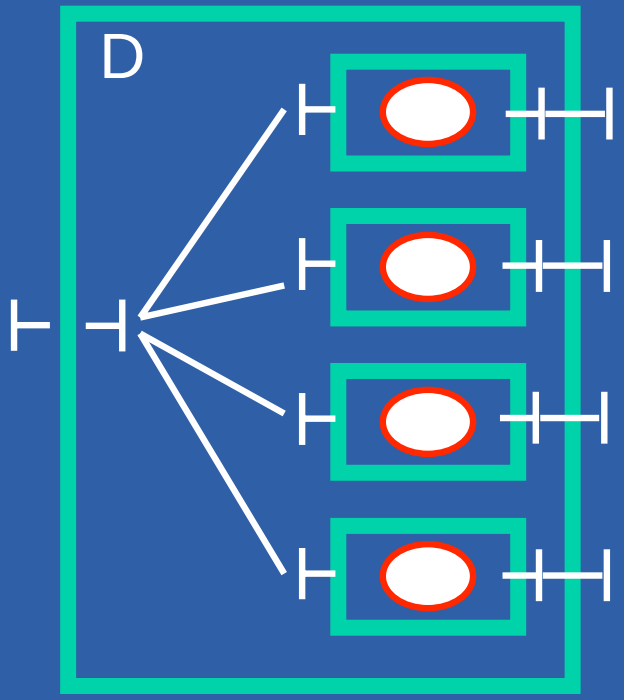
An activity, a process, …
potentially in its own JVM



1. Primitive component



2. Composite component

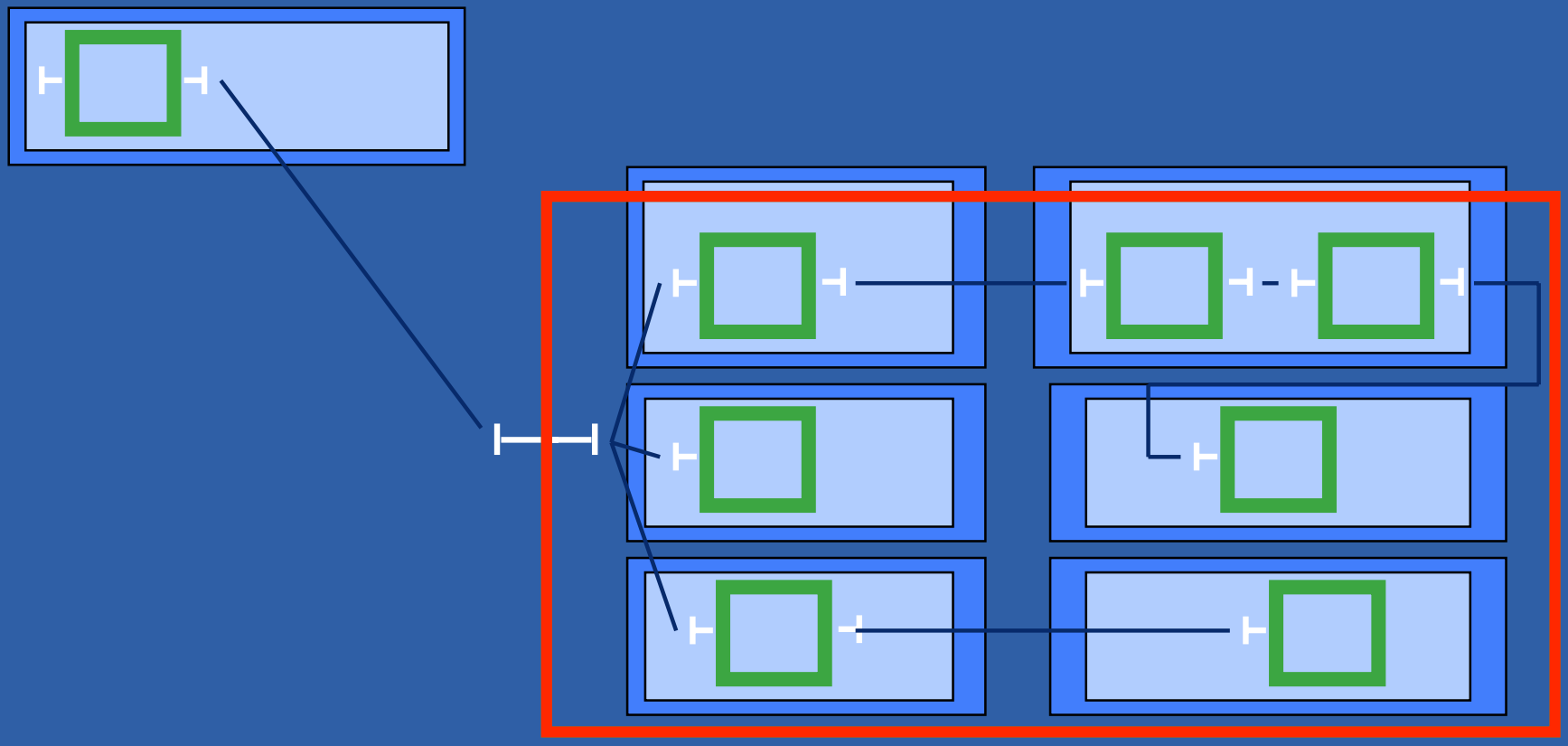


3. Parallel and composite component

Composite: Hierarchical, and Distributed over machines

Parallel: Composite + Broadcast (group)

Distributed Components



A component can be distributed over several hosts

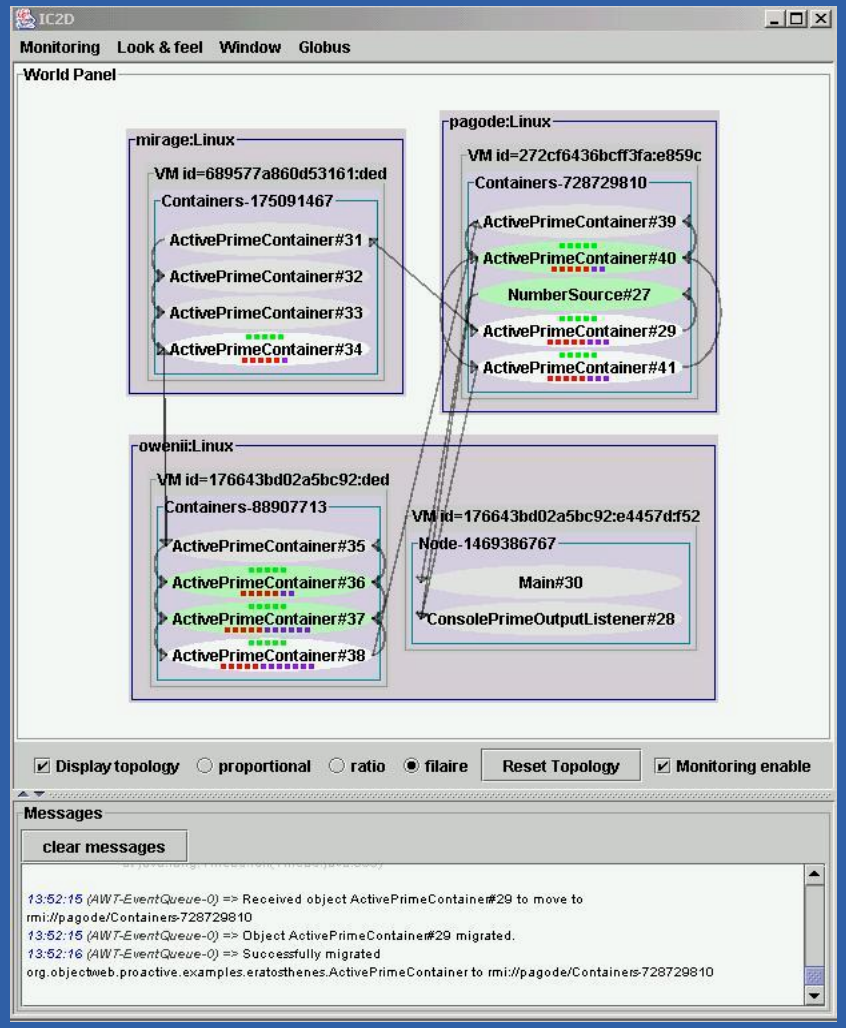
More information is available on http://fractal.objectweb.org

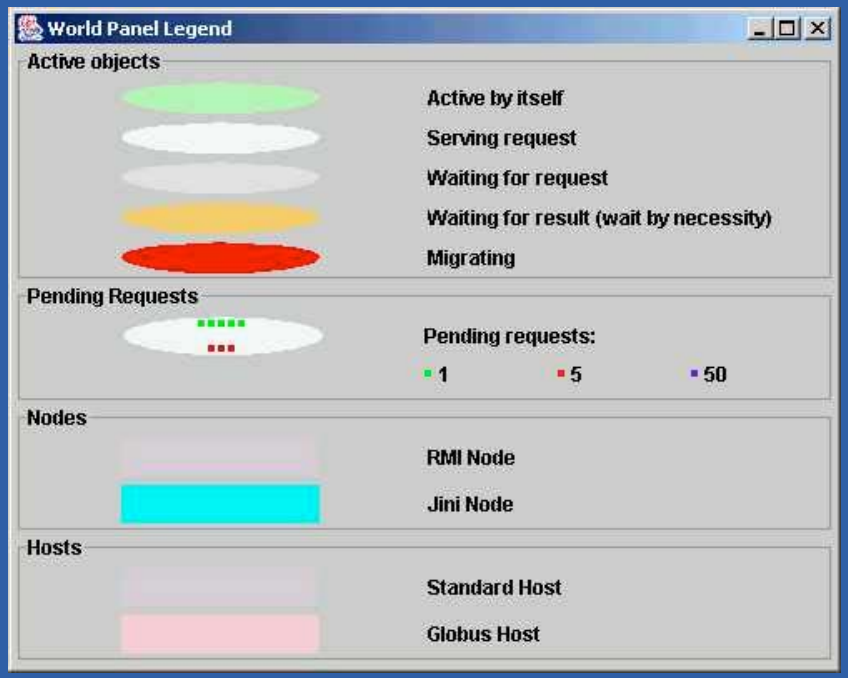
features

INTERACTIVE CONTROL & DEBUGGING TOOLS

With IC2D GUI for the GRID

IC2D: Interactive Control & Debugging of Distribution





With any ProActive application

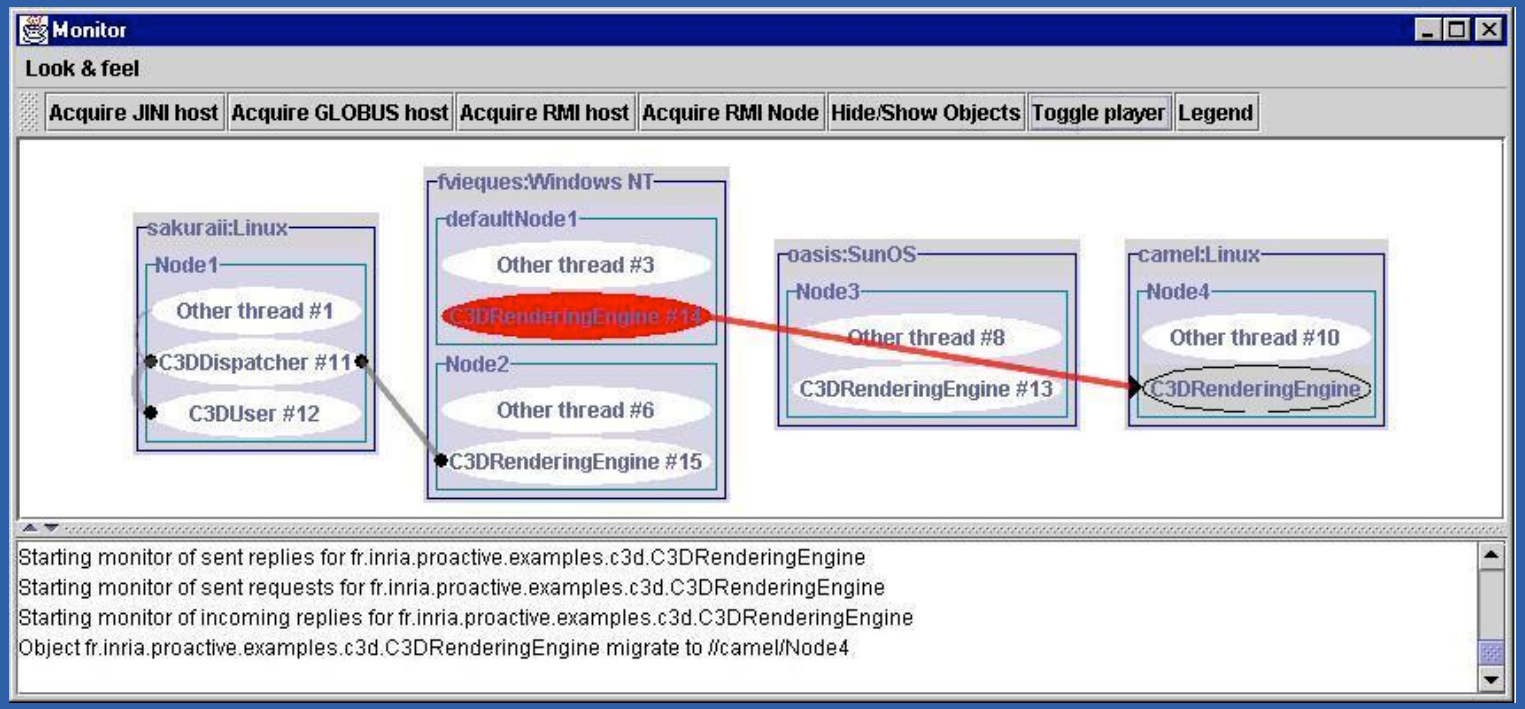
Features:

Graphical and Textual visualizatio

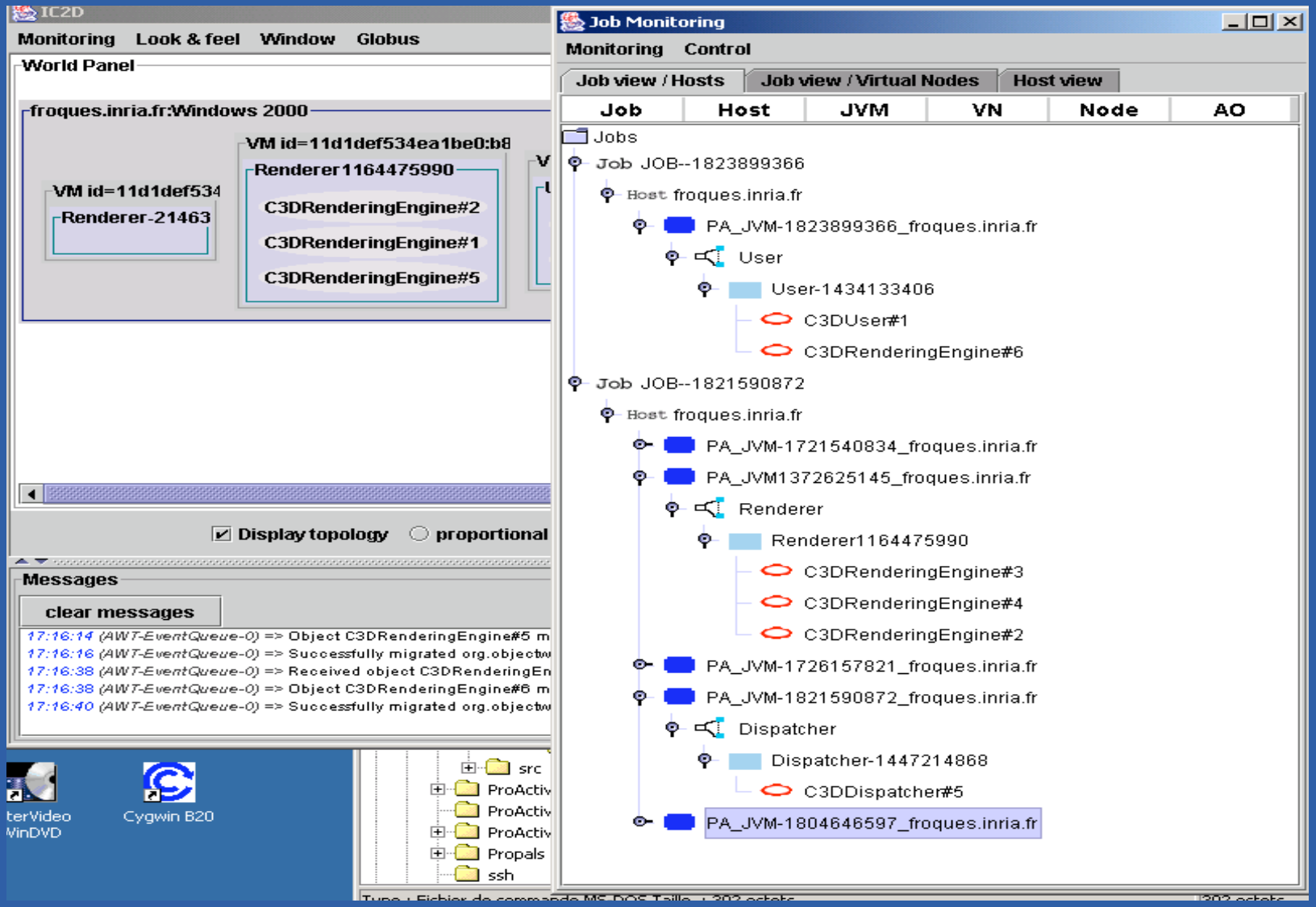
Monitoring and Control

IC2D: Dynamic change of Deployment Drag-n-Drop Migration

Drag-n-Drop tasks around the world



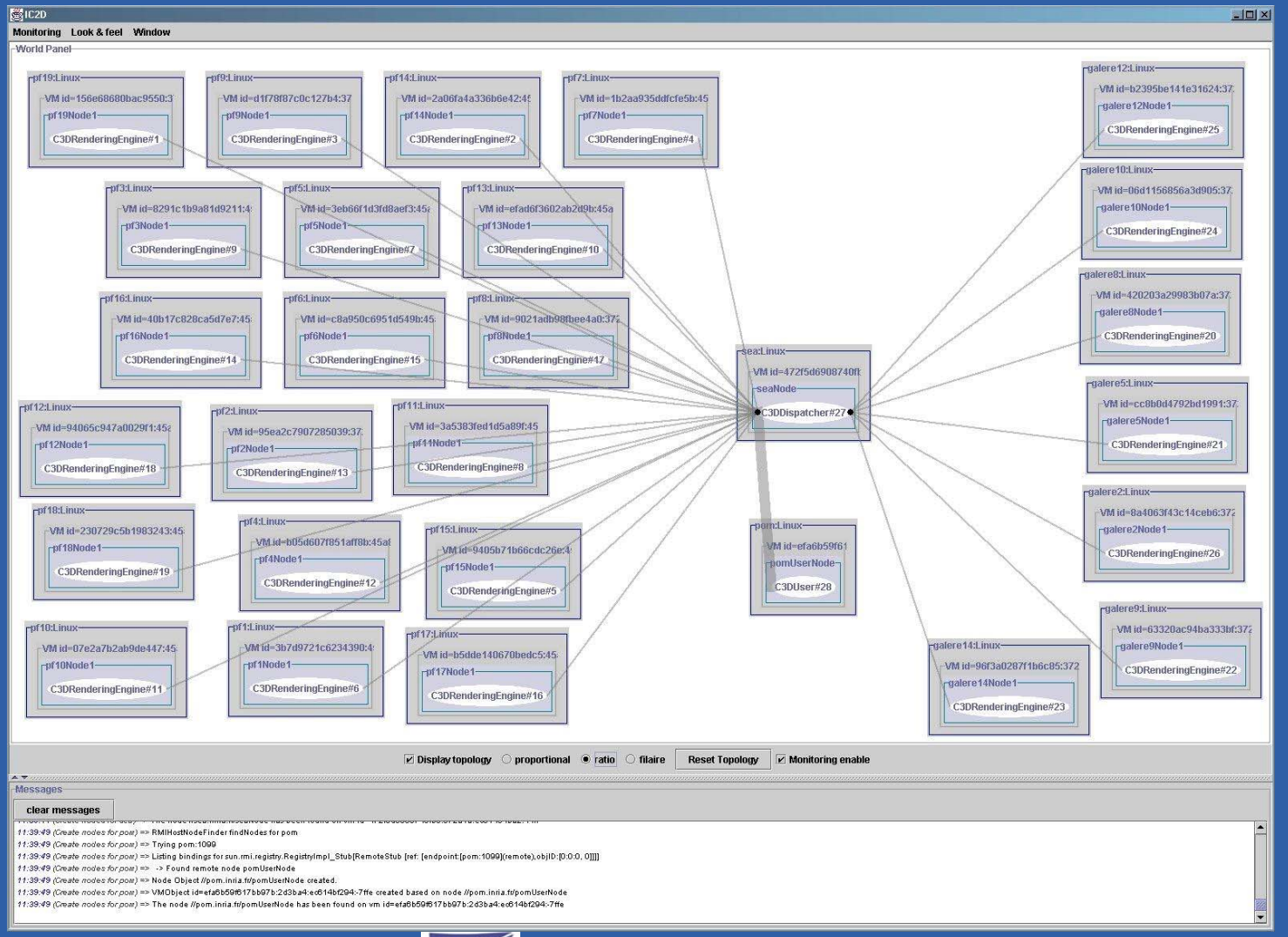
IC2D: Job Management



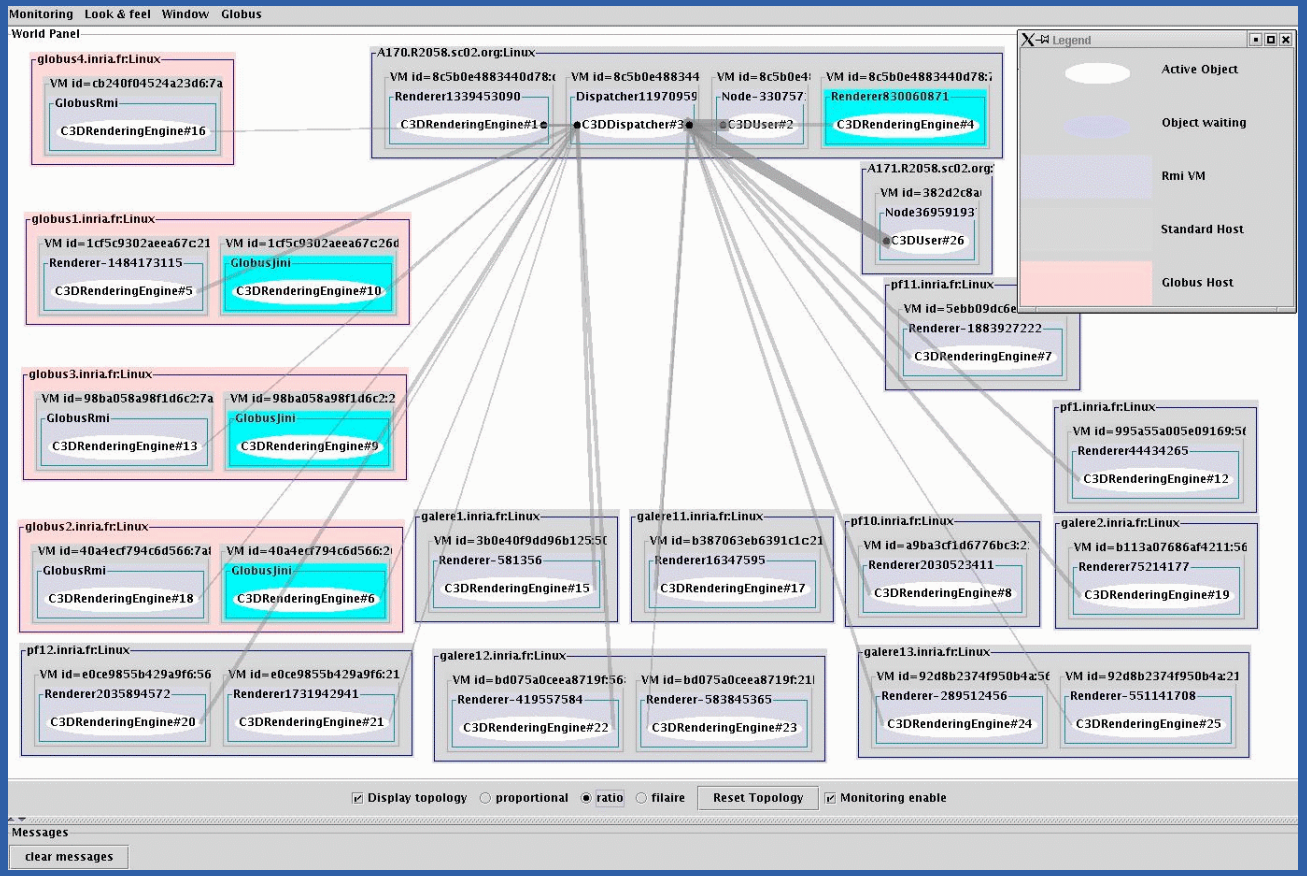
IC2D: Cluster Visualization

Visualization
of 2 clusters
(1Gbits links)

Featuring
the current
communications
(proportional)



Monitoring of RMI, Globus, Jini, LSF cluster Nice - Baltimore with IC2D



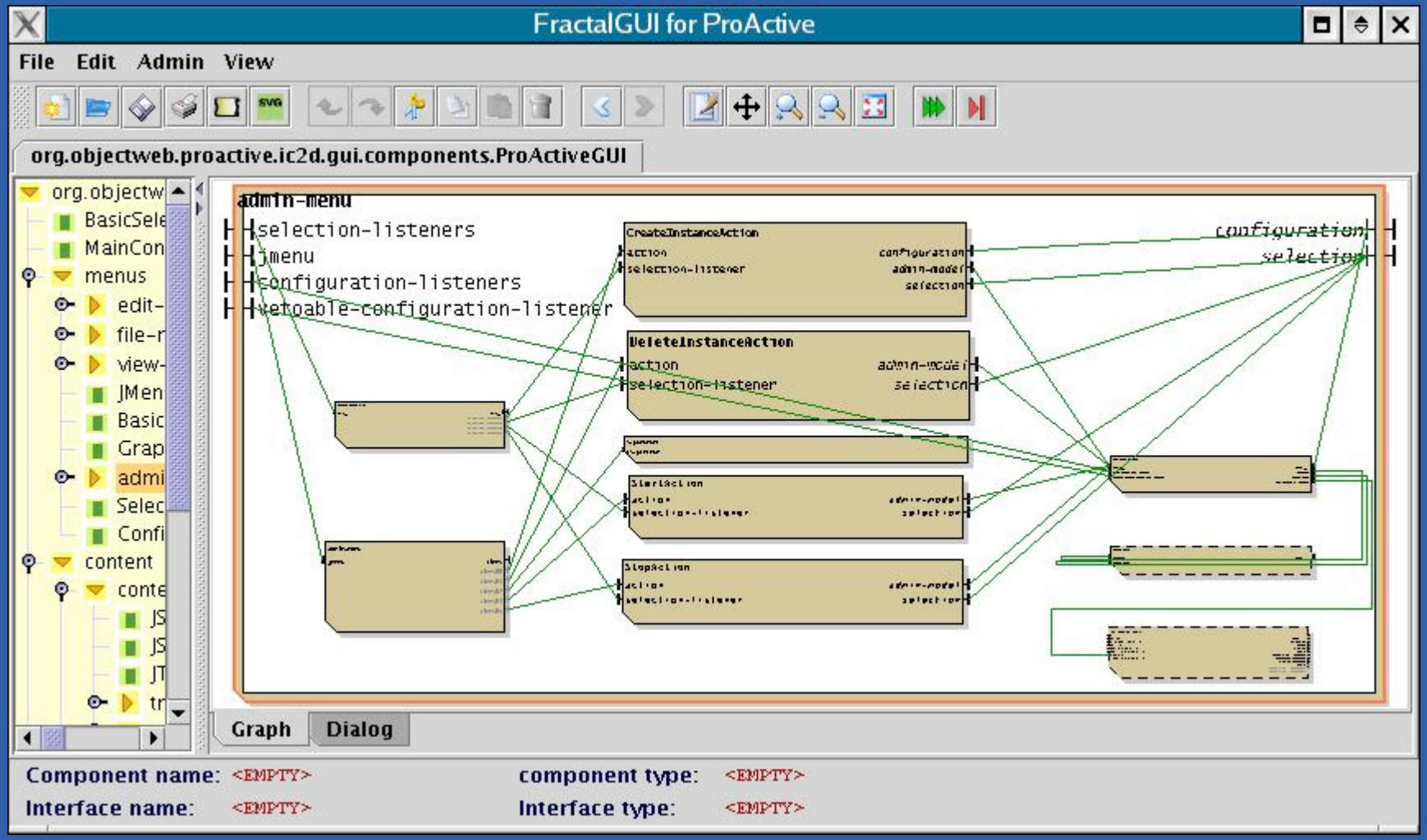
Width of links proportional to the number of communications

ObjectWeb
Open Source Middleware

AN OPEN SOLUTION FOR THE GRID

OPEN-SOURCE EASY-TO-USE
STANDARD EXTENSIBLE

On-going work : GUI for Components



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GET STARTED AT
http://proactive.objectweb.org

Thank You!