The Zorilla Peer-to-Peer Middleware system

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Current Middleware

- Hard to install
- Hard to maintain
- Centralized (not very fault tolerant)
- Usually no Co-Allocation
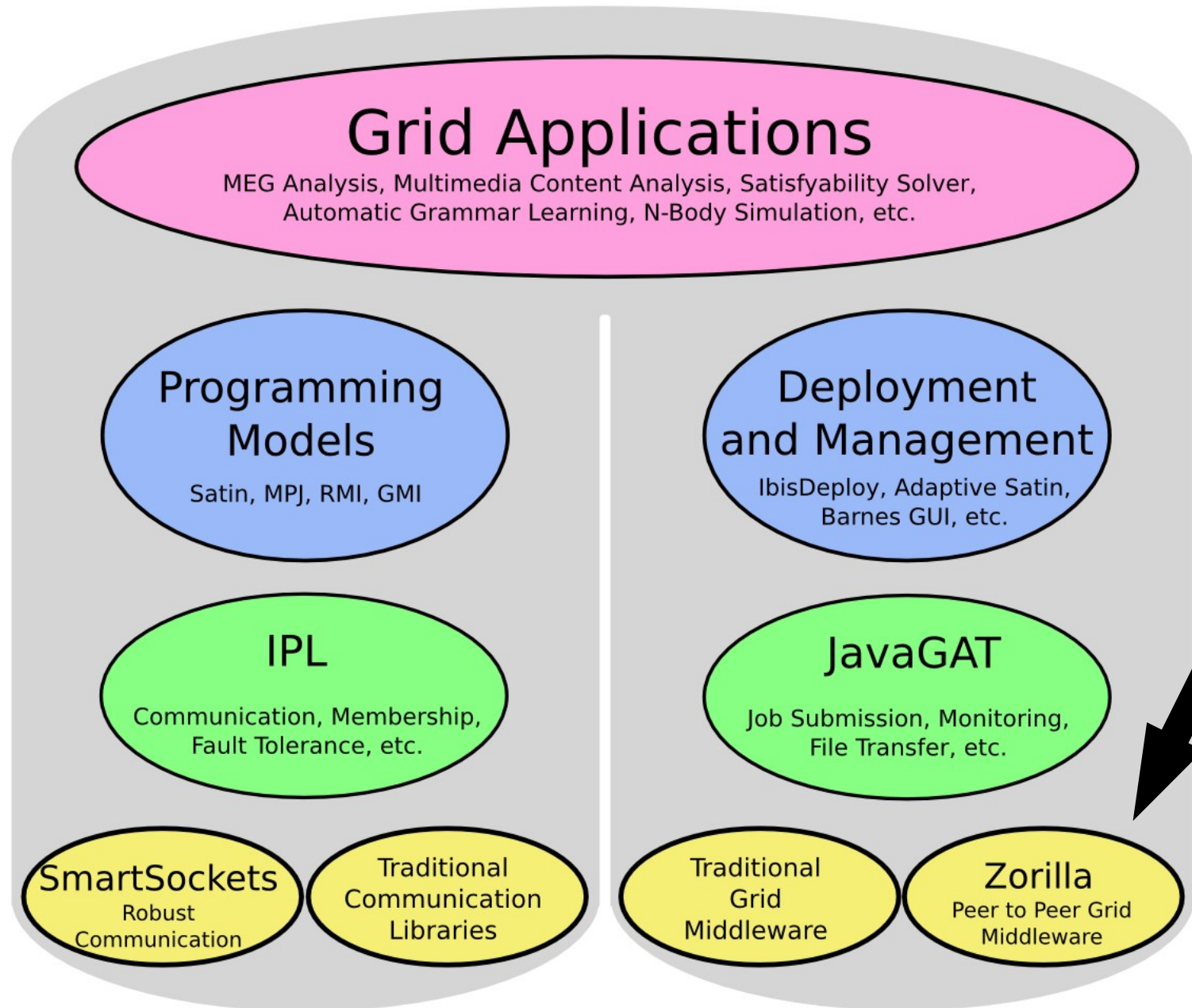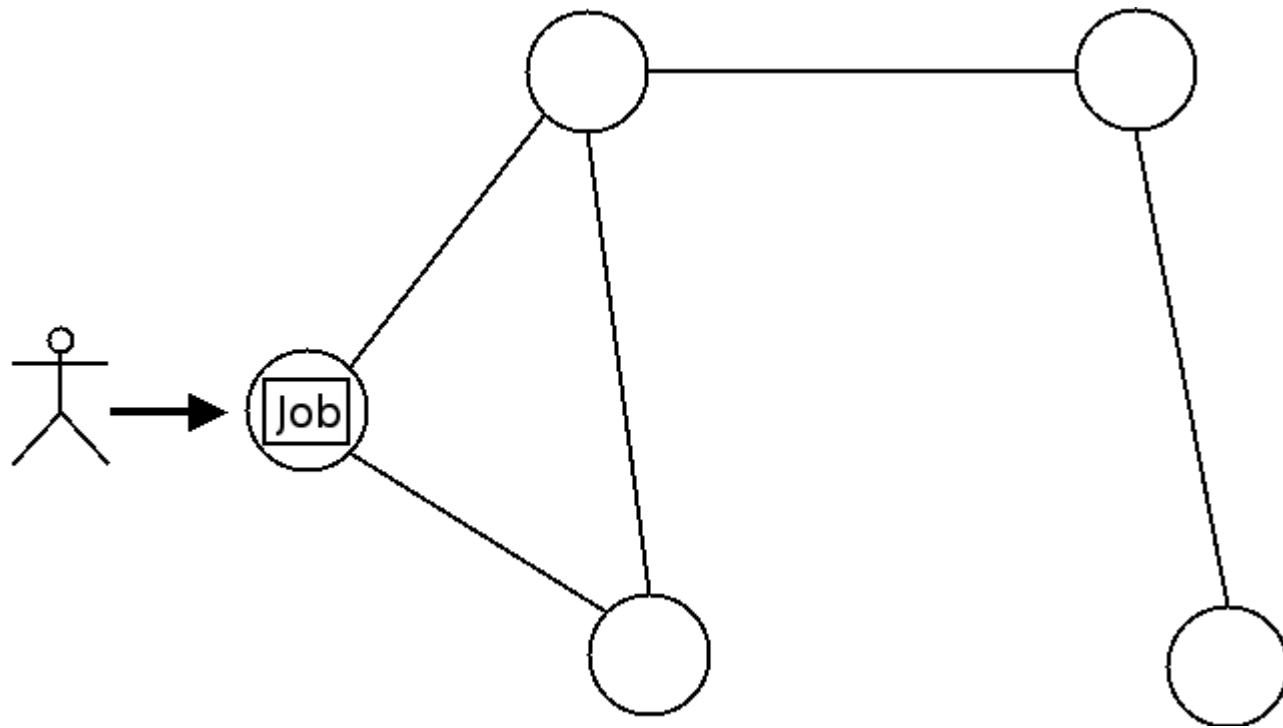
Alternative: Zorilla

- Prototype Java Peer-to-Peer middleware

- Fully distributed

- Easy to setup (just add Java)

- Fault tolerant (no single point of failure)

- P2P: Limited trust/security

- Interface: JavaGAT
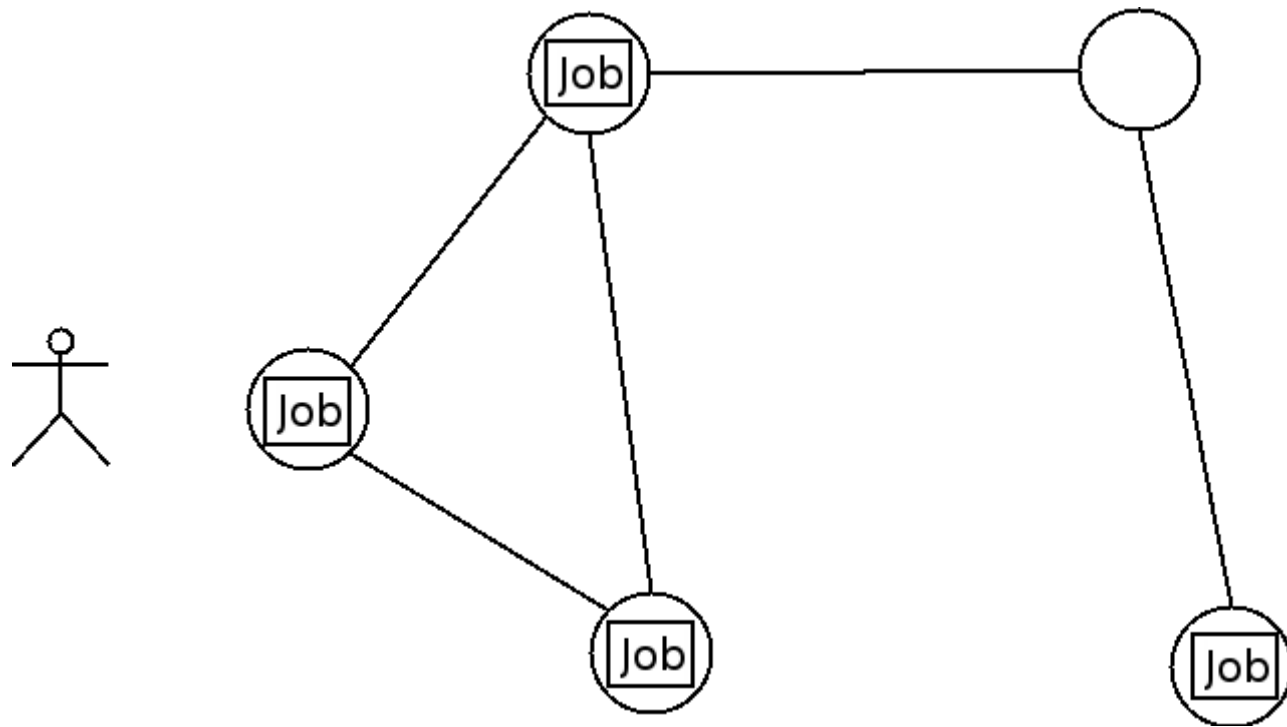
Zorilla in the Ibis project

Grid Applications
MEG Analysis, Multimedia Content Analysis, Satisfyability Solver,
Automatic Grammar Learning, N-Body Simulation, etc.

Programming Models
Satin, MPJ, RMI, GMI

Deployment and Management
IbisDeploy, Adaptive Satin, Barnes GUI, etc.

IPL
Communication, Membership, Fault Tolerance, etc.

JavaGAT
Job Submission, Monitoring, File Transfer, etc.

SmartSockets
Robust Communication

Traditional Communication Libraries

Traditional Grid Middleware

Zorilla
Peer to Peer Grid Middleware

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Life of a job (1/4)
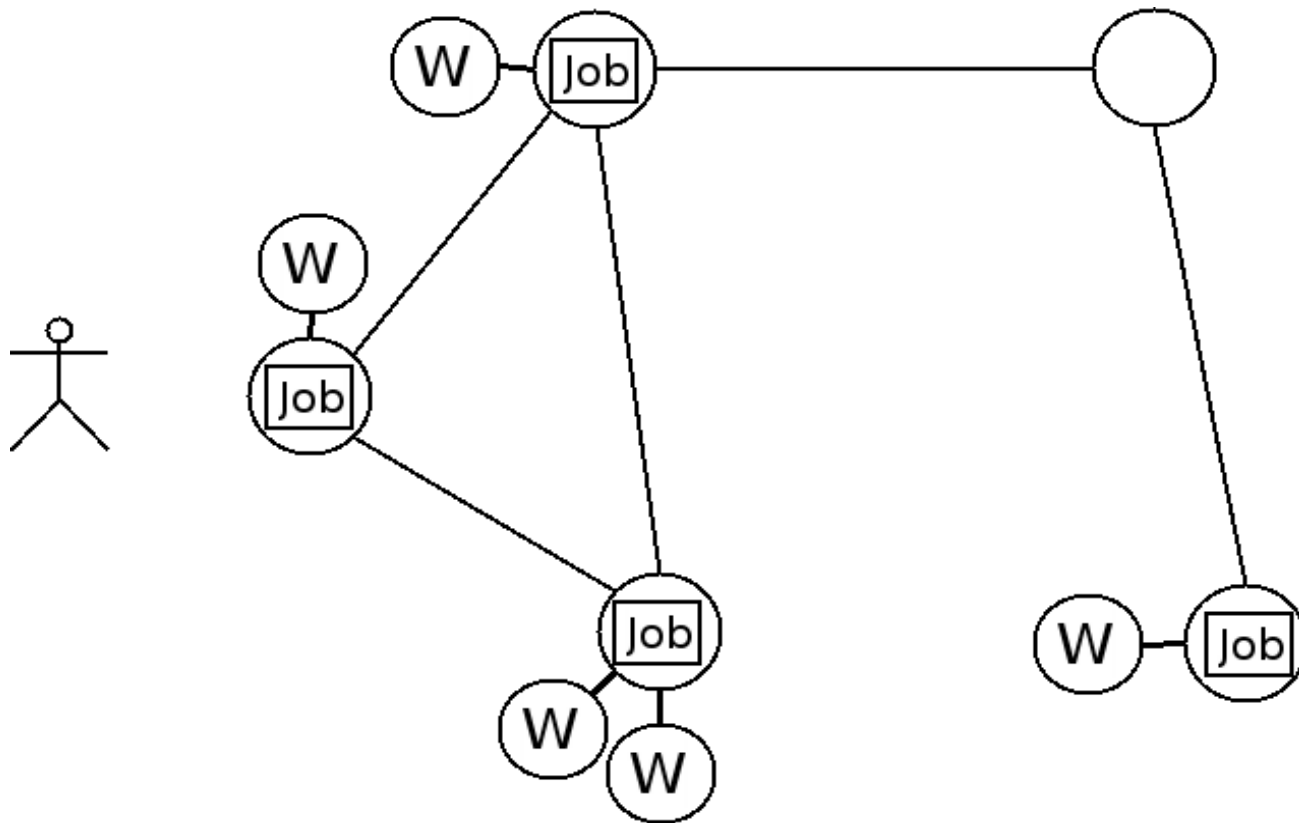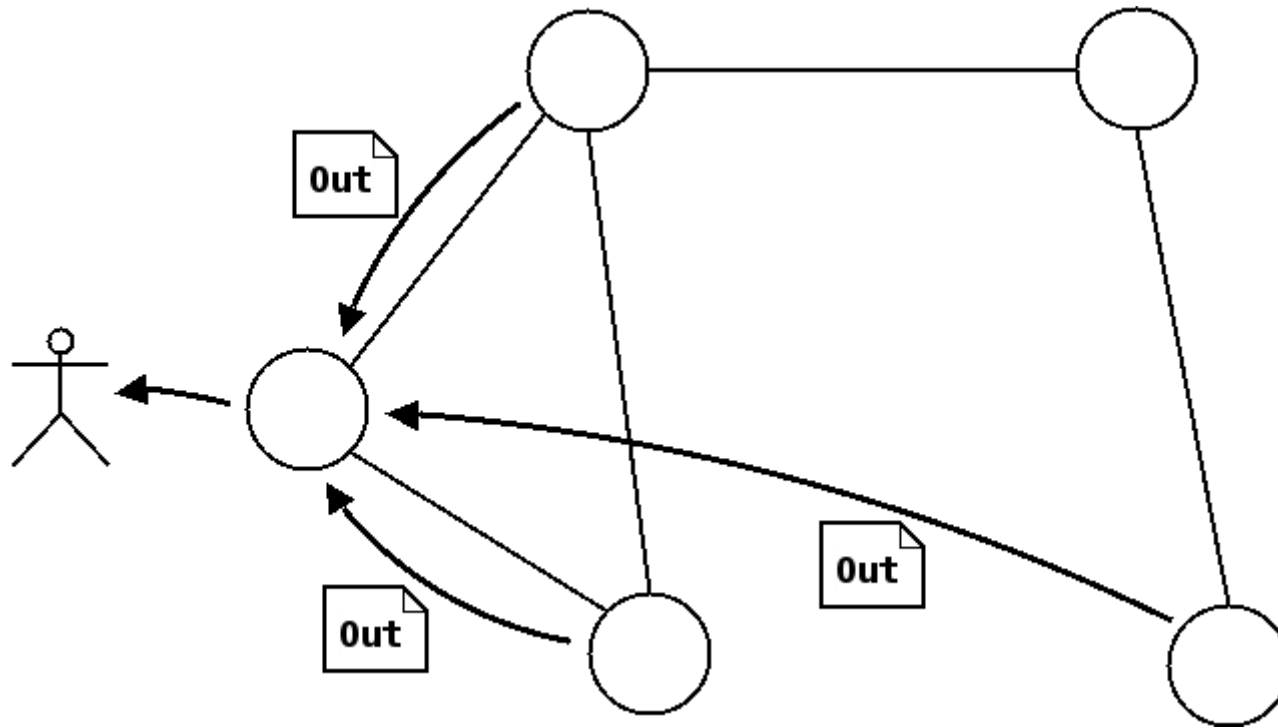

- Submit

Life of a job (2/4)

- Resource Location

Life of a job (3/4)
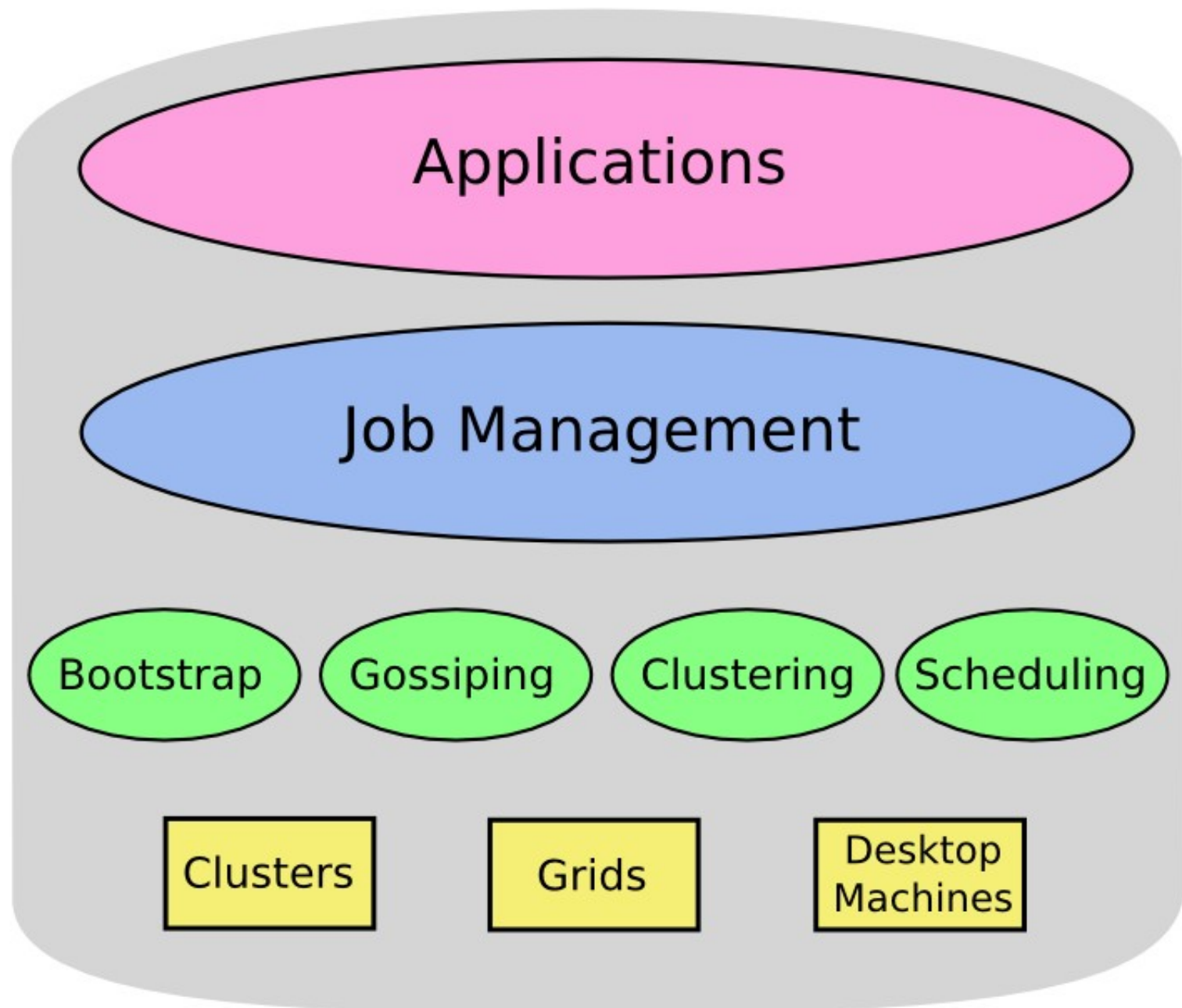

- Workers Started

W = Worker running Application

Life of a job (4/4)

- Results returned to user

Zorilla Overview

Zorilla Components

- Bootstrap

  - Initial set of contact points

  - UDP broadcast or provided by user

- Gossip overlay network

  - Actualized Robust Random Gossip (ARRG)

  - Withstands Firewalls et al.

- Clustering

  - Nearest neighbor list

Zorilla Components (2)

- Flood scheduling
  - Incrementally search for resources at more and more distant nodes
- Job Management
  - Status (scheduling, running, done, etc)
  - File transfers
  - Malleability / crashes

Zorilla Usage

1) Install recent JVM

2) Download Zorilla at
    http://www.cs.vu.nl/ibis

3) Run "zorilla"
    (see --help for options)

4) Repeat 1-3 for all machines

5a) Start application using JavaGAT

5b) Start application using "zubmit"

Desktop Grid Experiment

- Small experimental desktop grid setup
  - Student PCs running Zorilla overnight
  - PCs with 1 CPU, 1GB memory, 1Gb/s Ethernet
- Experiment: gene sequence application
  - 16 cores of DAS-3 with Globus
  - 16 core desktop grid with Zorilla
  - Combination, using Ibis-Deploy

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Desktop Grid Experiment
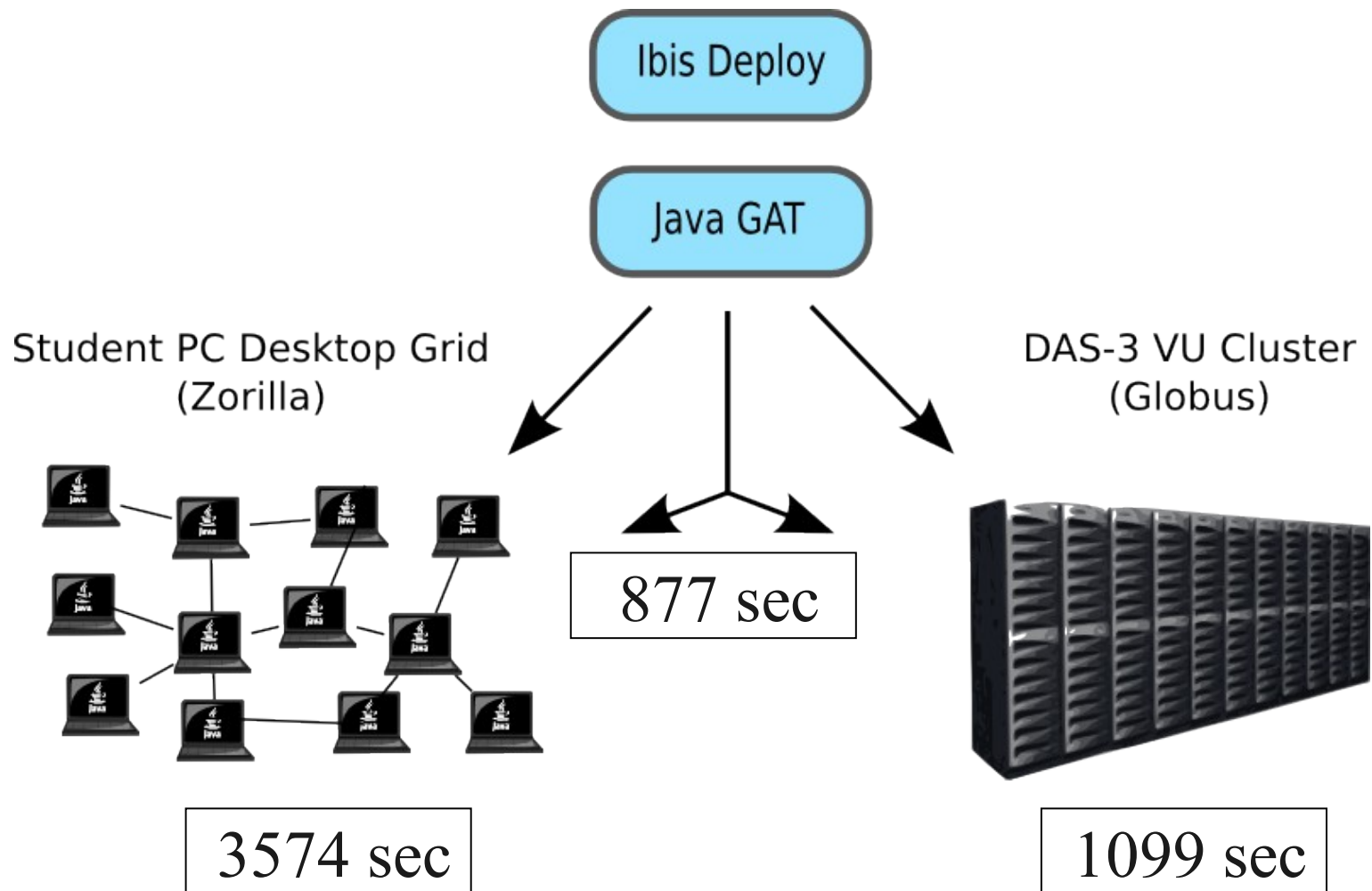
Questions ?

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downloads, more info:

www.cs.vu.nl/ibis