



The OurGrid Project

<http://www.ourgrid.org/>

Universidade Federal de Campina Grande



OurGrid Goals and Scope

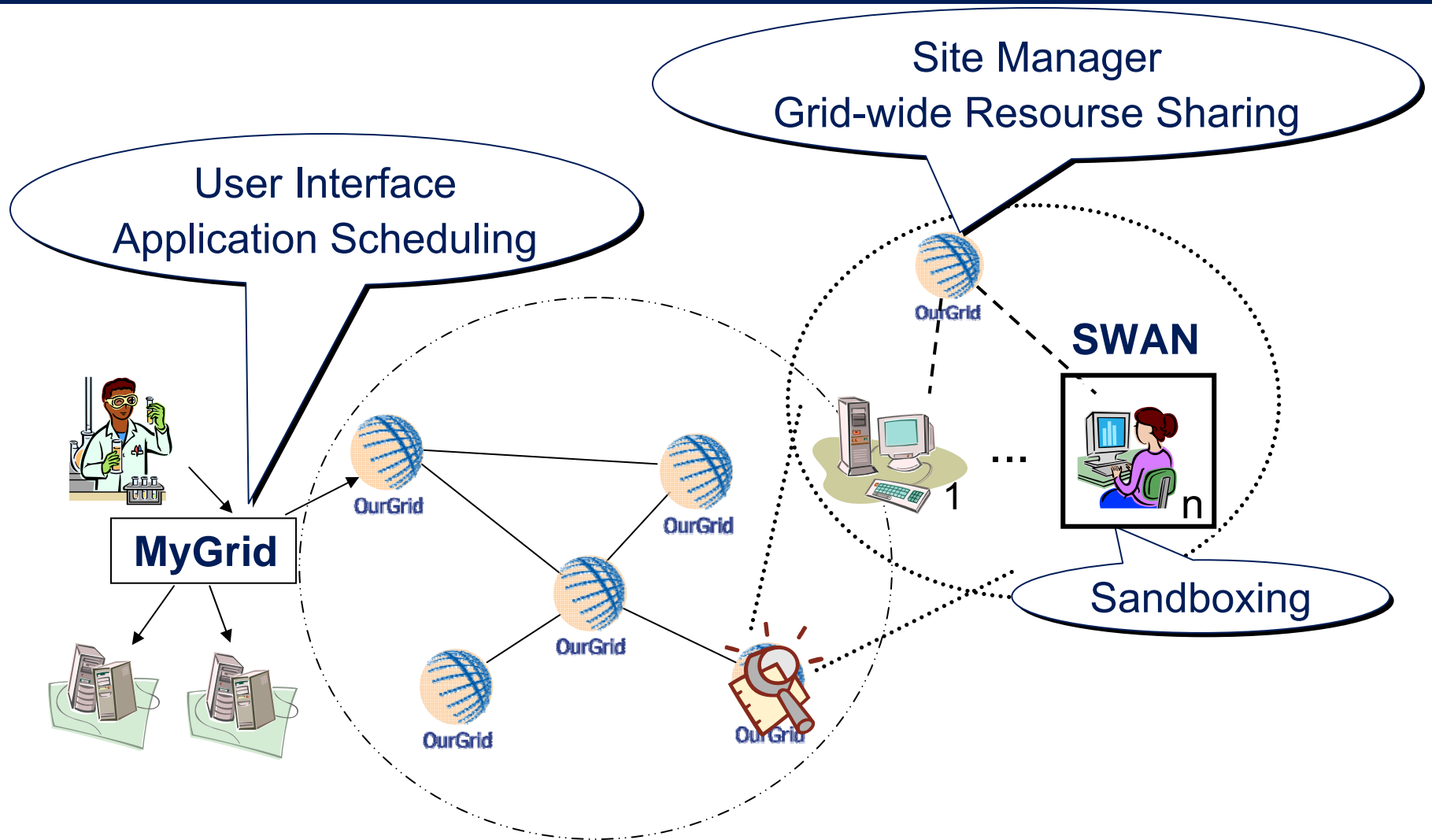
- Research open questions on Grid Computing
- Provide a real solution to real people
- Focus on Bag-of-Tasks (BoT) applications
 - Bag-of-Tasks applications are those parallel applications whose tasks are independent



OurGrid Results

- A way to automatically join a grid, sharing resources in a fair manner
 - Human intervention is not needed
- Schedulers that achieve good performance with no information about the grid nor the application
- A **free-to-join** grid for Bag-of-Tasks applications
 - You can join at <http://www.ourgrid.org>

OurGrid Architecture

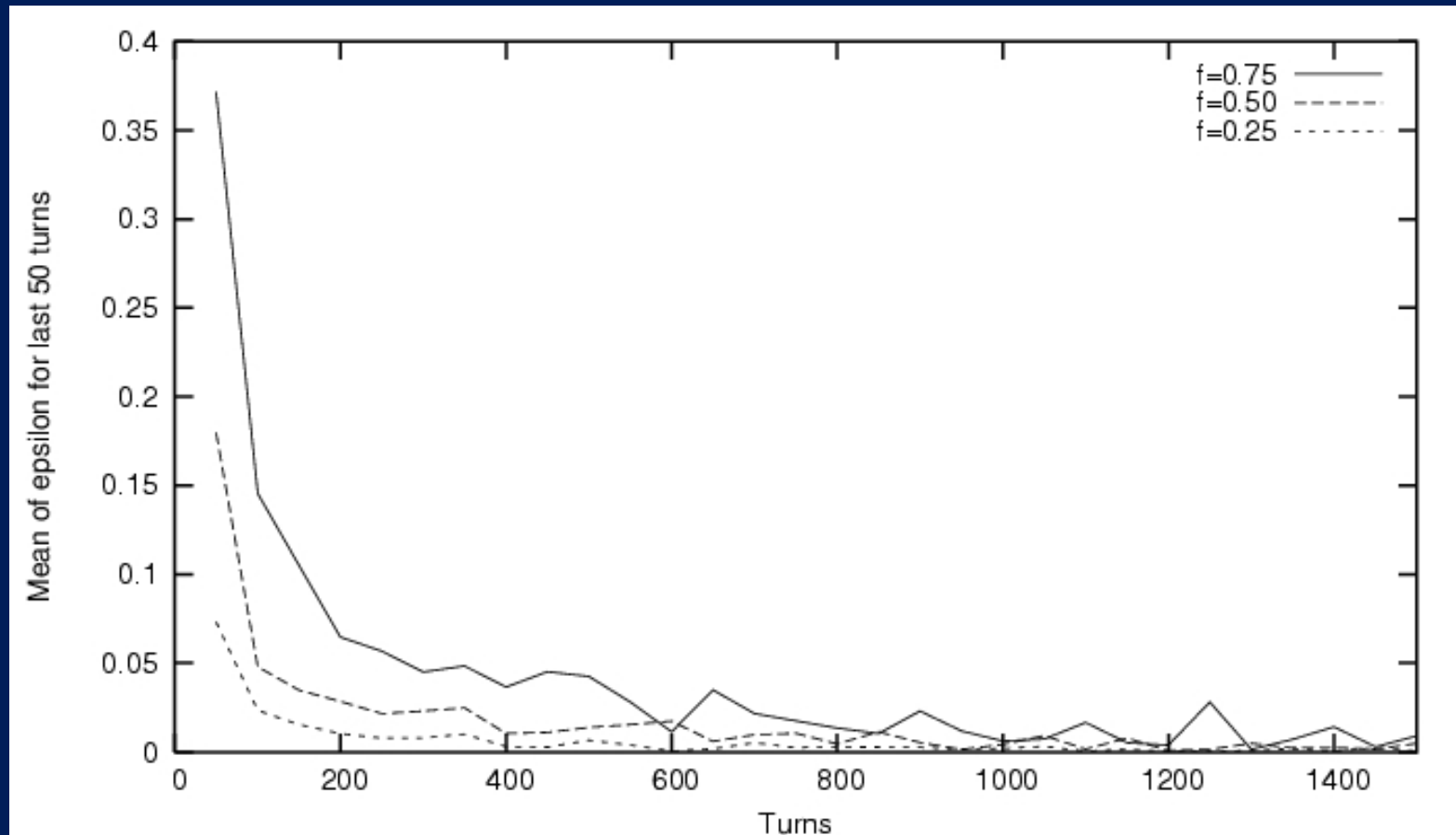




Network of Favors

- OurGrid forms a peer-to-peer community in which **peers are free to join**
- It's important to encourage collaboration within OurGrid (i.e., resource sharing)
 - In file-sharing, most users **freeride**
- OurGrid uses the **Network of Favor**
 - All peers maintain a **local** balance for all known peers
 - Peers with greater balances have priority
 - The emergent behavior of the system is that by donating more, you get more resources
 - **No additional infrastructure is needed**

Free-rider Consumption



- Epsilon is the fraction of resources consumed by free-riders



Scheduling with No Information

- Grid scheduling typically depends on information about the grid (e.g. machine speed and load) and the application (e.g. task size)
- However, getting good information is hard
- **Can we schedule without information and deploy the system now?**
- Work-queue with Replication
 - Tasks are sent to idle processors
 - When there are no more tasks, running tasks are replicated on idle processors
 - The first replica to finish is the official execution
 - Other replicas are cancelled



Work-queue with Replication

- 8000 experiments, varying scenarios
- Performance summary:

	Sufferage	DFPLTF	Workqueue	WQR 2x	WQR 3x	WQR 4x
Average	13530.26	12901.78	23066.99	12835.70	12123.66	11652.80
Std. Dev.	9556.55	9714.08	32655.85	10739.50	9434.70	8603.06

- Obviously, the drawback in WQR is cycles wasted by the cancelled replicas
- Wasted cycles:

	WQR 2x	WQR 3x	WQR 4x
Average	23.55%	36.32%	48.87%
Std. Dev.	22.29%	34.79%	48.93%



OurGrid Status

- OurGrid is **open source** (GPL) and is available at <http://www.ourgrid.org>
 - OurGrid status is available at <http://status.ourgrid.org>
- OurGrid latest version is 3.3.2
 - It contains the 12th version of MyGrid
 - The Network of Favors is available since version 3.0
 - We've had around 300 downloads