- Tycoon (J.M. Dana)
- Resource allocation (X. Grehant)
Contents

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Summary

- Collaborations
- Tycoon-gLite integration
- Scalability tests
- Conferences & reports
- The cloud computing initiative
Several collaborations were initiated regarding Tycoon:

- HP Labs (Palo Alto)
- EGEE
- BalticGrid
- Constellation Technologies
Tycoon-gLite integration

- This implementation was our solution for the integration Tycoon/EGEE
Several tests were carried out in order to measure Tycoon’s scalability.
Tycoon was presented in:

- EGEE Conference ’06
- EGEE Conference ’07
- EGEE User Forum ’07
- Distributed Computing Workshop 08

Two reports have been written:

- Technical report written and sent to HP Labs (Palo Alto) in January 2008
- Final report with all the technical information regarding Tycoon finished in January 2009
"Cloud Computing" is a style of computing where IT-related capabilities are provided "as a service", allowing users to access technology-enabled services "in the cloud" without knowledge of, expertise with, or control over the technology infrastructure that supports them.

- Tycoon is being used as a resource allocation system in "the cloud".
- We believe that our collaboration with HP Labs has helped Tycoon to be part of this new research initiative.
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Hindsight on Grid Scheduling


- Identify the efficiency problem when multiple organizations share resources
- Are we doing it the right way at CERN?
  - Condor tools with Globus paradigms
  - Users converge towards more control with Late Binding
  - New ideas clash with de facto architecture
- Influence of HP Labs research
  - Tycoon, the auction-based alternative
  - Full flexibility of utility computing, e.g. SoftUDC
A new architecture

- **Symmetric Mapping:** *an architectural pattern for resource supply in Grids and Clouds, SMTPS'09*

- Cost-effectiveness of the allocation
  - With several independent participants
  - Based on separation of supply and usage

- Containers are contract descriptions

- Implementation with Condor and some elements we developed
Deploying execution environments

Xen Management with SmartFrog, VHPC'06

- Allocation of resources to containers
  - Under the responsibility of each provider
  - Consists in the deployment of environments from descriptions

- Implementation: SmartDomains
  - Initially used for distributed tests at CERN
  - Xen virtual machines
  - SmartFrog by HP Labs
    - Description language
    - Configuration, deployment, lifecycle mngt
    - Distribution, synchronization
Maintaining sustained services

- **Allocation of tasks to containers**
  - Under the responsibility of each user (Virtual Organization or application scheduler)
  - Requires sustained services on transient containers

- **Container election and service deployment**
  - Container termination triggers re-election
  - Service re-deployed on newly elected container

- **Proof of concept: SmartCitizens**
  - Leader election algorithms (mobile networks)
  - Deployment by SmartFrog (HP Labs)
Performance model

- Lightweight task analysis for cache-aware scheduling on heterogeneous clusters, PDPTA'08

- + work in progress

- Performance of task - container allocation
  - Resource stalls, parallelism
  - Fast and precise prediction model in validation

- To evaluate and drive allocation by users

- Influence from openlab PCC, Intel, and mathematicians from CERN and ENST
Conclusion

- Bad luck: financing discontinued
  - Labs restructuration changed initial plans
  - Financial crisis killed second option
- Work continued to finish what we started
  - With ENST, CERN openlab and HP Labs
- HP Labs: thank you for financing 3 years
- Thank you for your trust, and the opportunity to learn and do good research