SPECIFYING THE EXPERIMENTAL SCENARIOS FOR SIMULATED CLOUD STUDIES

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BACKGROUND

- Background
- Contribution
- Evaluation

- Background
- Cloud Structure
- Dealing with Fluctuating Workload
- Typical Experimental Methodologies
CLOUD STRUCTURE

LE CLOUD COMPUTING

Stockage
Applications
Serveur de calcul

Internet
ou réseau privé

Entreprise
Ordinateur personnel
Mobile

Fournisseur
Utilisateurs

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DEALING WITH FLUCTUATING WORKLOAD

Dynamic management: horizontal scaling, vertical scaling, etc.

Typical cloud studies: when to trigger these actions, how to perform them, etc.
TYPICAL EXPERIMENTAL METHODOLOGIES

Traditional experiments steps: what are they evaluating, setup, scenario, the results and their analysis.

Simulation has many advantages but real experiments are still more used.
CONTRIBUTION

Defining the needs to represent all possible kinds of workloads.
Discrete workloads representation.
Elastic Tasks: Repeating identical microtasks (aka tasks, cloudlet) with fixed size.
List of hosts to split workload.
Hosts overusage detection.
**TECHNICAL NEEDS**

- Output function (for tasks workflows).
- Real traces of requests (e.g. apache).
- Detailed platform description (core feature of SimGrid).
Evaluation

Implementation as a SimGrid Plugin.

~400 lines of C++. Hosts overusage detection not fully implemented yet.
RAW PERFORMANCES

![Graph showing memory usage over time](image)

- Background
- Contribution
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- Raw Performances
- Real Traces
RAW PERFORMANCES

1 ET per host, 100 seconds, 1 trigger per sec

Number of ElasticTasks vs Memory used in GB

Platform upgrade
REAL TRACES

Tested with the WorldCup 98 data access logs.

One day with ~6 million requests is simulated in ~4 minutes.

The parsing of the trace may be what takes a long time (file size: 43MB).
SPECIFYING THE EXPERIMENTAL SCENARIOS FOR SIMULATED CLOUD STUDIES

- Proposed a description of workloads to approach and ease the process of cloud simulations.
- Implemented the proposition and showed it was usable.

Further work:

- Finish implementation of all functionalities.
- Reproduce papers' experiments.
- Simulate more complex applications like tasks workflow.