GreenDays@Paris 2011
Efficacité énergétique : comment appliquer nos modèles et solutions sur des environnements de production ?

Paris – 31 Mai et 1er Juin 2011

Laurent Lefèvre (INRIA)

J-Marc Menaud (EMN Nantes)

Jean-Marc Pierson (IRIT)

INRIA RHÔNE-ALPES

IRIT
CNRS
INPT
UPS
UT1
Institut de Recherche en Informatique de Toulouse

ECOLE DES MINES DE NANTES

Thanks to all sponsoring organizations !

INRIA RHÔNE-ALPES

IRIT Institut de Recherche en Informatique de Toulouse
CNRS INPT UPS UT1

ECOLE DES MINES DE NANTES

acm

Pôle Système du GDR ASR

Action d'envergure Hemera

Action Interfaces Recherche en Grilles : "Energy efficiency in Grids from experimental to operationnal platforms" (Institut des Grilles du CNRS - Action Aladdin INRIA)
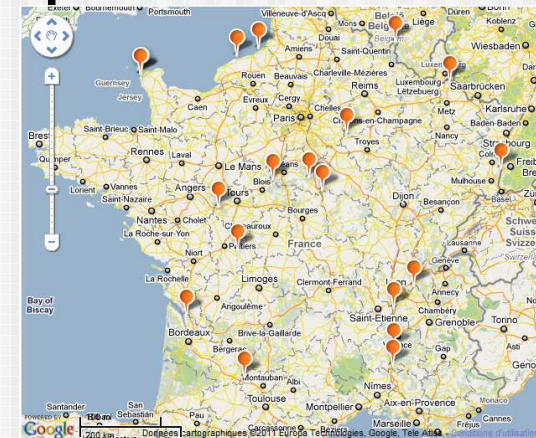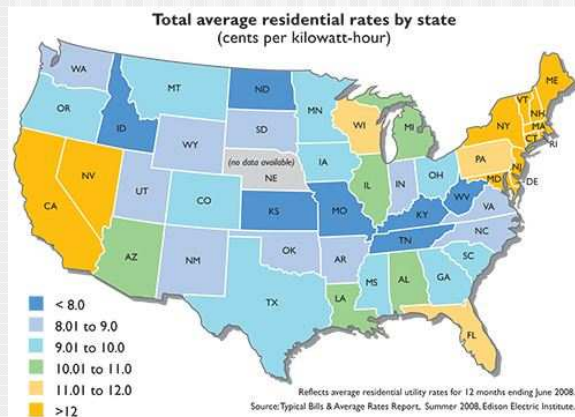
Hemera

- INRIA Large Wingspan Project – leaded by Christian Perez

- http://www.grid5000.fr/Hemera

- Set of WG and challenges

- WG : Energy Effcient Large Scale Experimental Distributed Systems (Green) (leaded by Laurent Lefevre (RESO), Jean-Marc Menaud (ASCOLA))

- Challenge : Energy proling of large scale applications (leaded byLaurent Lefevre (RESO), Jean-Marc Pierson (IRIT), Jean-Marc Menaud (ASCOLA))

Action Interfaces

- Action Interfaces Recherche en Grilles : "Energy efficiency in Grids from experimental to operationnal platforms" (Institut des Grilles du CNRS - Action Aladdin INRIA)

- Involed partners : APO, ASTRE, GRAAL, MESCAL, RESO

- Face academic models of energy efficiency to operationnal realities

- Experimental measurements and validations : Grid5000, CIMENT, GridMIP, PireGrid

- Seed for larger coordinated projects

We need electricity for our research (and our life)

- Increasing costs : France (6-13c)

- Germany (23c) – Spain (14c) – Austria (8c) – Italy (7c) – UK (12c) – Japan (15-21c) – USA (6-10c)

- Nuclear / « Green » energy production

Total average residential rates by state
(cents per kilowatt-hour)

< 8.0
8.01 to 9.0
9.01 to 10.0
10.01 to 11.0
11.01 to 12.0
>12

Reflects average residential utility rates for 12 months ending June 2008.
Source: Typical Bills & Average Rates Report, Summer 2008, Edison Electric Institute.

Differences

Between incentive and reality :

2010 : record year in CO_2 emission : 30.6 Gigatons (+5% previous record in 2008) IEA

44% coal – 36% petrol – 20% natural gas

Temperature increasing (2°C – 2100) -> 4°C (50% chance – 2100)

Leverages : steps

- Big role for IT: Green for IT and IT for Green
- Need to take out energy efficient models from the lab and put them in operationnal conditions
- Increase research in energy efficient systems
- Adress all levels from hardware to software – production and usage
- Support coordinated/large scale academic/industry initiatives
  - Ecoinfo group
  - European COST Action IC 804
  - GreenGrid / GreenTouch

Plan de l'après-midi

- 14:15-15:15 : "The Costs of Science in the Exascale Era", Thomas Ludwig (Director & CEO, Deutsches Klimarechenzentrum, Allemagne)
- 15:15-15:45 : Pause
- 15:45-16:15 : "Energy efficient low level dvfs for HPC applications", Georges Da Costa (IRIT Toulouse)
- 16:15-16:45 : "Modeles et mesures visant a evaluer et reduire la consommation d'energie dans les reseaux a commutation par paquets", Erol Gelenbe, Professor in the Dennis Gabor Chair, Imperial College, Londres
- 16:45-17:15 : "Optimisation multi-critère pour l'allocation de ressources sur Clouds distribués avec prise en compte de l'énergie", Yacine Kessaci (Equipe Dolphin Lille)
- 17:15-17:45 : "ERIDIS: Energy-efficient Reservation Infrastructure for large-scale DIstributed Systems", Anne-Cécile Orgerie (Equipe RESO, Ecole Normale Supérieure de Lyon)