



PROGRAM: COST 804 TRAINING SCHOOL on ENERGY EFFICIENCY IN LARGE SCALE DISTRIBUTED SYSTEMS, 08-10 March 2011

L-F Pau, 2011-01-31, v2

LOCATION : Hotel Rina Vista, Valea Sticlariei, Postal code 500001, **Poiana Brasov, Romania**

Telephone +40 268417866, Mobile: +40 753550055. Web site: <http://www.poiana-brasov.com/en/accommodation/hotels/rina-vista-hotel.html> , and <http://www.rinahotels.ro/tirol/tur/extt.html>

GOAL: The COST 804 training school aims at presenting to European early stage researchers (as defined under COST rules, less than PhD+ 8 years' experience) a comprehensive multidisciplinary state of the art relevant to the field of energy efficiency in distributed networks. It also aims at enabling the networking of these researchers amongst themselves and with the COST 804 community www.cost804.org . The participants should expect to get an overview of the field represented by the COST 804 Action, and detailed knowledge supplementing their focussed research topics. The Training school's scope is to address energy efficiency in design, modeling and operations, starting from the hardware/software level, to the functional level, to operations and adaptation, and finally to adoption of the proposed measures, in a wide diversity of networks with associated facilities. Will be highlighted the main approaches, the state of the art in research and industry, and the performance/ QoS / cost trade-offs.

DELIVERABLE:

Each set of lectures will have a time window in which the trainees, interacting with the trainers, will be asked to identify some research questions and approaches (with their proponents) , which will be minuted to become a deliverable to COST 804 from the Training school. Two volunteers will be asked to write these short minutes for electronic distribution to all attendees at the end of the Training school. This document will also be attached to the report to the COST Secretariat about the Training school.

FACILITIES:

A computer with projector, USB and Microsoft PowerPoint 2003 will be available for the lectures, the short presentations and the panel. As a matter of precaution, use the *.ppt format and not *.pptx.

LOCAL ORGANIZER

Prof Paul Borza, *Dept. Electronics and computers, Faculty of electrical engineering and computer science, Transilvania University of Brasov*, **Address:** B-dul Eroilor nr.29, 500036 Brasov, Romania Tel: +40 268 413000 Fax: +40 268 410525
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ORGANIZERS

Prof L-F Pau, Prof P. Borza

07 March 2011:

- Hotel check-in: till xx h
- Dinner times at hotel: 19:00-21:00
- Registration with Training school local organizers: from xx h till xx h

08 March 2011:

07:00-09:00: Hotel breakfast

08:30- 09:00: Registration with Training school local organizers, Signature of attendance sheet (every day), Planning of departure arrangements and shuttle to Bucharest airport

09:00-09:30: -Presentation of Training school (P.Borza, L-F Pau)

- Mutual presentations by trainees and trainers (all)
- Nomination of two rapporteurs
- Logistics announcements, incl. WiFi access details (P.Borza)

09:30-10:30: Methods for efficient consumption of energy in IT infrastructure (Part 1), Dr Andrei Vlad, IBM Romania

Abstract: This subject could include: 1.Design and infrastructure management for IT systems; 2.Design methodology -hardware aspects - of complex computer systems: hybrid technologies, virtualization, monitoring, provisioning, back-up and retrieve processing, self-management and healing 3.Cloud systems

10:30-11:00: Coffee break

11:00-12:30: Methods for efficient consumption of energy in IT infrastructure (Part 2), Dr Andrei Vlad, IBM Romania
with from 12:00 discussion and identification by trainees of research questions

12:30-14:00: Lunch in hotel

14:00-15:30: Thermal emissions in electronic systems, Dr Werner Escher, IBM Research Zürich (Advanced thermal packaging)

with from 15:00 discussion and identification of research questions

Abstract: This will be a tutorial on thermal emissions and management in electronic systems.

15:30-16:00: Coffee break

16:00-17:30: Direct Waste Heat Utilization from Liquid-Cooled Supercomputers, Dr Werner Escher, IBM Research Zürich (Advanced thermal packaging)

with from 17:00 discussion and identification of research questions.

Abstract: Chip micro scale liquid-cooling reduces conductive and convective resistance thereby improving the efficiency of datacenters by allowing coolant temperatures above the free cooling limit in all climates. This eliminates the need for chillers and allows the thermal energy to be re-used in cold climates. Replacing the combustion processes for secondary users with recycled heat from the datacenter effectively eliminates carbon dioxide emission during the winter season and reduces operating cost throughout the year. Hot water cooled datacenters reduce the effective energy cost by almost a factor of two compared to a current datacenter and reduce the carbon footprint by an even larger factor. Our energy re-use concept has been demonstrated in terms of cost and energy savings in a 60 °C liquid cooled supercomputer. Additional alternative energy re-use schemes in hot climates for desalination and adsorption cooling allow close to full use of datacenter heat in all climates and all seasons. Output temperatures for these applications compared to space heating need to be 10-20 °C higher which becomes possible through hotspot adapted cooling that eliminates mixing of fluids with different temperatures. In addition, interlayer cooled chip stacks allow double sided hotspot optimized cooling even closer to the heat source with low flow rates and low pumping power. That improves the large efficiency gain that becomes possible through 3D chip stacking.

17:30-18:00: L-F Pau and all, Short briefing to prepare for the trainee presentations next day, and organize order of the presentations; discuss format of deliverable with rapporteurs

19:00-21:00: Dinner at hotel

09 March 2011:

07:00-09:00: Hotel breakfast

08:30- 09:00: Signature of attendance sheet (every day), Planning of departure arrangements and shuttle to Bucharest airport, Collection of required receipts and reimbursement forms

09:00-10:30: Energy efficiency in Computer grids, Anne-Cecile Orgerie, E.N.S. Lyon with from 10:00 discussion and identification of research questions

Abstract: While an extensive set of research projects deal with the issue of power-saving for battery-based electronic devices, few have an interest in permanently-plugged Large-Scale Distributed Systems (LSDS). However, a rapid study shows that each computer consumes a substantial quantity of power, especially when it is idle. After presenting the different techniques available to save energy in computing Grids, will be presented

EARI (Energy-Aware Reservation Infrastructure), which manages the nodes and uses an on/off algorithm involving usage prediction and reservation aggregation.

10:30-11:00: Coffee break

11:00-12:30: Framework for Green ITC technologies (Part 1), Prof L-F Pau, Copenhagen Business School and Rotterdam school of management

Abstract: Backgrounders on Green ITC technologies, environmental regulations, and emissions profiles from devices and activities. Approaches and processes to reduce energy consumption and emissions from information, computing and telecommunications systems and applications at design and usage levels, Building regulations impact as receptacles of ITC systems

12:30-14:00: Lunch at hotel

14:00-15:30: Framework for Green ITC technologies (Part 2), Prof L-F Pau, Copenhagen Business School and Rotterdam school of management
with from 15:00 discussion and identification of research questions

15:30-16:00: Coffee break

16:00-18:30: Short presentation (max 2 slides, strictly enforced) by each trainee of her/his own research, with subsequent short feedback and help by all

19:00-21:00: Dinner at hotel

10 March 2011:

07:00-09:00: Hotel breakfast

08:30- 09:00: Signature of attendance sheet (every day), Planning of departure arrangements and shuttle to Bucharest airport, Collection of required receipts and reimbursement forms, Distribution of the evaluation sheets to trainees

09:00-10:30: Energy efficiency in wired communications networks, Anne-Cécile Orgerie, E.N.S. Lyon

with from 10:00 discussion and identification of research questions

Abstract: In wired communications, the energy issue has been explored since only less than 10 years. This lecture will focus on a state of the art presenting the techniques used in wired networks to save energy: # hardware optimizations, # on/off techniques, # rate adaptation, # network-wide solutions. Secondly, the Hermes framework, dedicated to energy-efficient scheduled large data transfers in Grids, Clouds and Network overlays, will be presented.

10:30-11:00: Coffee break

11:00-12:30: “Energy and Information am Holistic Approach about computers and power networks”, Prof. Paul Borza, Dr Sanduleac, Transilvania University Brasov with discussion and identification of research questions

Abstract: Not available

12:30-14:00: Lunch at hotel

14:00-15:30: Trade-off and selection methodologies including business and user behaviours. Case presentation of a simplified version of proprietary tool for energy efficiency and emissions in wireless public networks taking service demand into account , Prof. L-F Pau, Copenhagen Business school and Rotterdam school of management with from 15:00 discussion and identification of research questions

Abstract: The presentation will be of a simplified version of unique industrial tool whereby mobile network operators design 3G/LTE wireless networks for best energy efficiency, and run these operations with minimal on-going energy consumption .It serves as a live illustration of trade-offs in an industrial setting. The full tool cannot be demonstrated as it involves heavy computations and a high performance computing environment.

15:30-16:00: Coffee break and return of the evaluation sheets by trainees

from 15:30: First shuttle departures for Bucharest airport (details pending)

16:00-18:00: Panel discussion moderated by trainers in attendance, on their views on the future research on energy efficiency in distributed systems, and of the corresponding impact; discussion with trainees

19:00-21:00: Dinner at hotel

11 March 2011:

07:00-09:00: Hotel breakfast

from 08:00: Last shuttle departures to Bucharest airport (details pending)

17 March 2011

Electronic distribution of Deliverable report to Local organizer, Trainees and Trainers

APPLICABLE RULES

- The rules applying for COST supported Training schools are given in the COST Vademecum documents downloadable from:
<http://www.cost.esf.org/participate/guidelines>.
- All trainees and trainers must have in advance registered on the e-COST system, and provided there banking details.
- Individual grants for trainees: it is the amount notified by COST 804 Grant holder to each applicant. No grant or reimbursement can exceed the normal reimbursement rates of

COST 804 ; the grants for the trainees are less than their initial requests, meaning that a high level of commitment to the Training course is expected via the individual partial funding of the participation by the mother institutions of the trainees

- General guideline : the individual grants are based on the most economic accommodation arrangement and on the most economic travel arrangement.
- Attendance by trainees receiving a grant is *mandatory to all lectures and days*, and attendance sheets must be signed each day (they will be remitted to COST Secretariat prior to payment of the grants).
- Each participant (trainee, trainee) must settle in person their full bill at the hotel; each participant must keep all receipts for travel expenses and submit copies with the reimbursement form. The rates announced by the hotel are (excluding possibly taxes):

Single	35€
Double	37€
Lunch	10€
Dinner	10€

- The COST grant to the Local organizing institution covers only: meeting rooms, use and rental of audio-visuals, WiFi setup, photocopy, coffee breaks, and local transfers to/from the training school site from Bucharest airport.
- Attendees needing a visa to enter Romania will have had to contact well in advance Prof Borza for the needed documents regarding the Training school.

EMAILS OF TRAINERS

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