



Enabling Grids for E-science

South East Europe resources in EGEE

Emanouil Atanassov, Todor Gurov IPP-BAS, Bulgaria
Ognjen Prnjat, Kostas Koumantaros, Ioannis Liabotis
GRNET, Greece

www.eu-egee.org



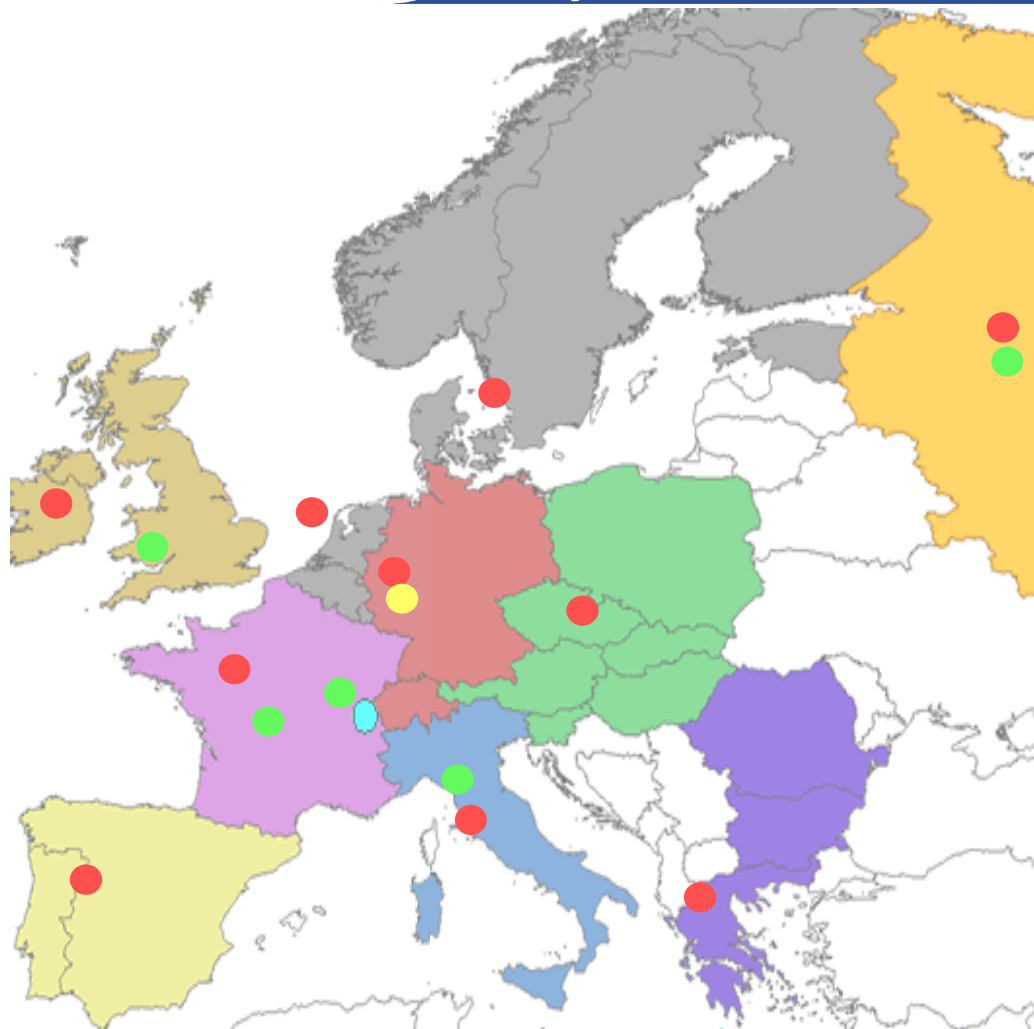
Information Society



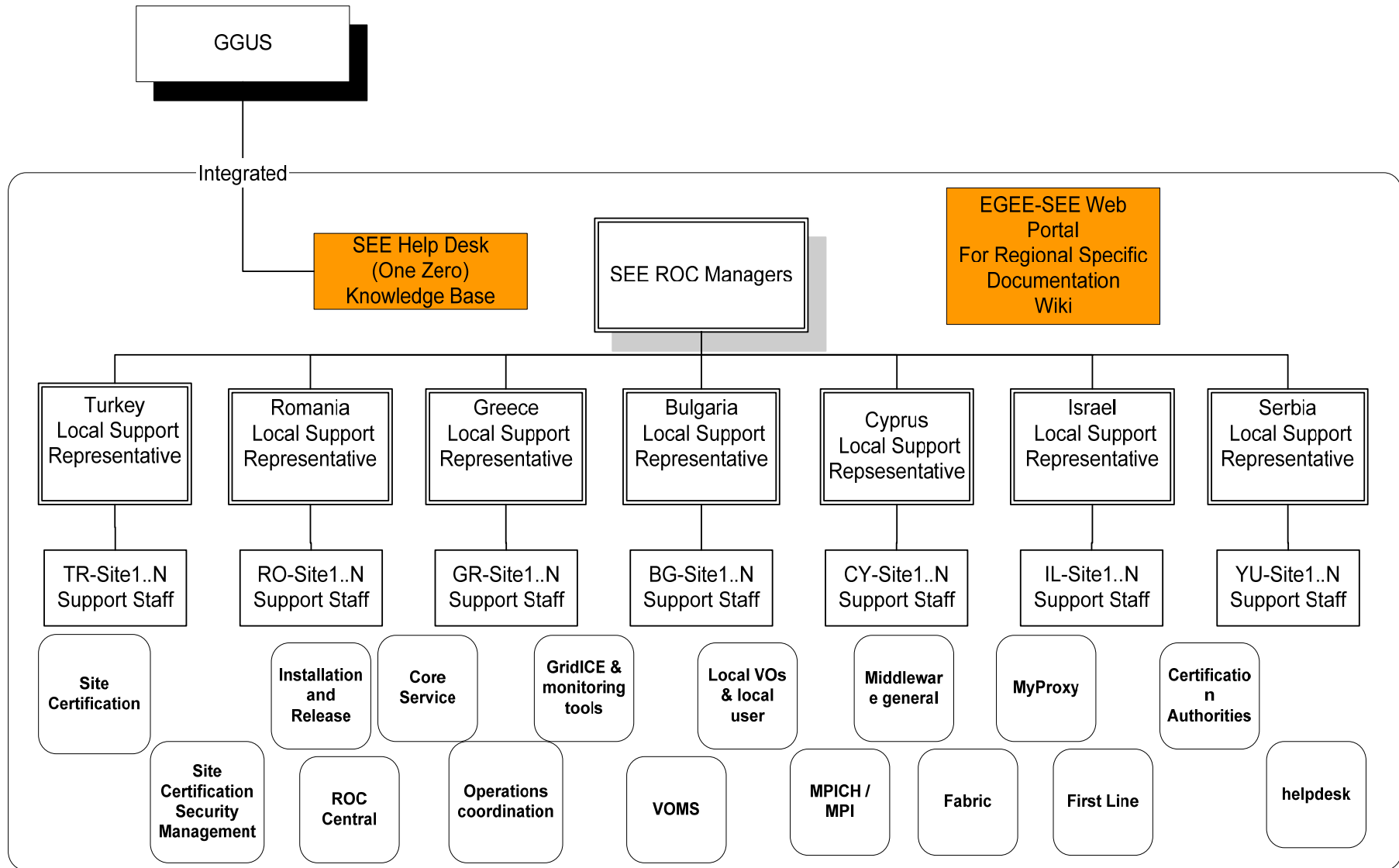
- **Organization of EGEE project**
- **Organization of EGEE SEE ROC**
- **Authorization/Authentication resources**
- **Information system resources**
- **Workload Management System resources**
- **Monitoring Tools**
- **Bulgarian sites in EGEE**
- **Bulgarian RB/WMS/BDII combination**
- **Other servers available for BG users**

- The EGEE project brings together experts from over 27 countries with the common aim of building on recent advances in Grid technology and developing a service Grid infrastructure which is available to scientists 24 hours-a-day.
- The project provides researchers in academia and industry with access to a production level Grid infrastructure, independent of their geographic location. The EGEE project also focuses on attracting a wide range of new users to the Grid.
- The EGEE II project is organized in 12 federations. Bulgaria is a member of the South Eastern Federation





- Resource centres (RC) are controlled by the Regional Operation Centres (ROC)
- Bulgaria is a member of South East European ROC, which comprises:
 - Greece
 - Bulgaria
 - Romania
 - Turkey
 - Serbia
 - Cyprus
 - Israel
- ROC managers are located at GRNET, Greece
- Every country has country representative in SEE ROC
- Bulgaria is represented by Emanouil Atanassov



- Regional web site – <http://www.egee-see.org>
- Regional SEE helpdesk: <http://helpdesk.egee-see.org>
- SEE wiki pages: <http://wiki.egee-see.org>
- Country web sites – <http://www.grid.bas.bg> for Bulgaria
- Country representatives: Emanouil Atanassov for Bulgaria
- Security contact for SEE: Eddie Aronovich - **eddiea** at **cs.tau.ac.il**

In order to access the Grid, every user needs a valid certificate from an accepted Certification Authority (CA)

A certification authority – BG.Acad, is in the process of being accepted

Until this happens, we use the SEE-GRID catch-all CA:

<http://www.grid.auth.gr/pki/seegrid-ca>

The procedure requires a Memorandum of Agreement between IPP-BAS and the respective institute, before the certificate can be issued.

A certificate request is created on a UI computer, using correct values for the organization's name. Follow

<http://www.grid.auth.gr/pki/seegrid-ca/services/GenConfig>

The certificate request is sent to the RA for SEE-GRID (Emanouil Atanassov) and if approved, the user receives a certificate signed by SEE-GRID CA.

It is extremely important that the user sends back signed e-mail stating that he or she accepts the SEE-GRID CA policy. In order to do this the user must now know how to import the certificate into a browser or e-mail client. See:

<http://www.grid.auth.gr/pki/seegrid-ca/documents/>

and also

`man pkcs12`

on your UI

After the user has a valid certificate, the next step is to request membership in the appropriate VO

Users from areas like biomedicine and high-energy physics are advised to join the respective EGEE-wide VOs:

<http://lcg.web.cern.ch/LCG/users/registration/registration.html>

For users that can not locate an appropriate VO, we provide membership in SEE VO:

<https://www.grid.auth.gr/services/voms/SEE/request.php>

In order to join SEE VO the user must submit a description of the application that he or she is going to develop and/or use to the BG country representative in SEE ROC.

- Upon approval of the request, the user joins the SEE-GRID VO and can submit jobs and perform data management.
- Users are advised to always use voms-proxy-init instead of grid-proxy-init command. The SEE VO VOMS server is located at:

voms.grid.auth.gr

The command voms-proxy-init –voms see uses automatically this VOMS server

The main myproxy server for SEE VO is located at
myproxy.grid.auth.gr

See: https://www.grid.auth.gr/services/myproxy/user_guide.php

Always check if the RB/WMS you are using works correctly with the MyProxy server that you specify!

- In order to submit jobs in EGEE SEE sites using SEE VO, one can use:
 - the production RB: rb.isabella.grnet.gr
 - The production WMS: wms.egee-see.org

- In order to locate resources in SEE ROC, one can use the BDII `bdii.isabella.grnet.gr`
- Changing the BDII used on a UI is accomplished by changing `LCG_GFAL_INFOSYS` in `/etc/profile.d/lcgenv.sh` and `/etc/profile.d/lcgenv.csh`
- Example: `LCG_GFAL_INFOSYS=bdii.isabella.grnet.gr:2170`
- Using the BDII for finding information about available resources:
 - `lcg-infosites -vo see ce` – for computing elements
 - `lcg-infosites -vo see se` – for storage resources
 - `lcg-infosites -vo see lfc` – the name of the LFC server for SEE VO

The picture of SEE ROC sites and their status is obtained from:

<http://goc.grid.sinica.edu.tw/gstat//SouthEasternEurope.html>

We can see there that in SEE ROC there are 30 production sites with a total number of CPUs 1390 right now, and the total storage 30 TB.

Advanced users must understand the meaning of the gstat report.

- 5 clusters in EGEE production
- The biggest cluster is BG04-ACAD, located at IPP-BAS, with 80 CPUs. 24 CPUs are equipped with Myrinet interconnect, allowing for low-latency MPI communications

	CPU	Storage	Tape
March 06	43	1TB	-
Nov 06	145	5TB	10TB

- BG01-IPP (21 CPU)



- BG04-ACAD (80 CPU)



- **User Interface** – осигурява достъп на потребителите до Грида
- **Worker Node** – основен градивен елемент, изпълнява задачите
- **Computing Element** – разпределя задачите в рамките на клъстера
- **Workload Management System** – разпределя задачите между клъстерите
- **Berkeley Database Information Index** – поддържа моментна информация за ресурсите
- **MON** – мониторинг на клъстера
- **R-GMA** – разпределена релационна база от данни, accounting
- **Storage Element (Castor, dCache, DPM)** – осигурява стабилно съхранение на данните
- **File Transfer Service** – гарантиран бърз трансфер на данни
- **Logical File Catalogue** – информация за местоположението на файловете
- **AMGA** – каталог с metadata информация за файловете
- **MyProxy** – съхранение на сертификати
- **HYDRA** – осигурява криптиране и защита на файловете
- Портали от различен вид за по-лесен достъп до Грид ресурсите

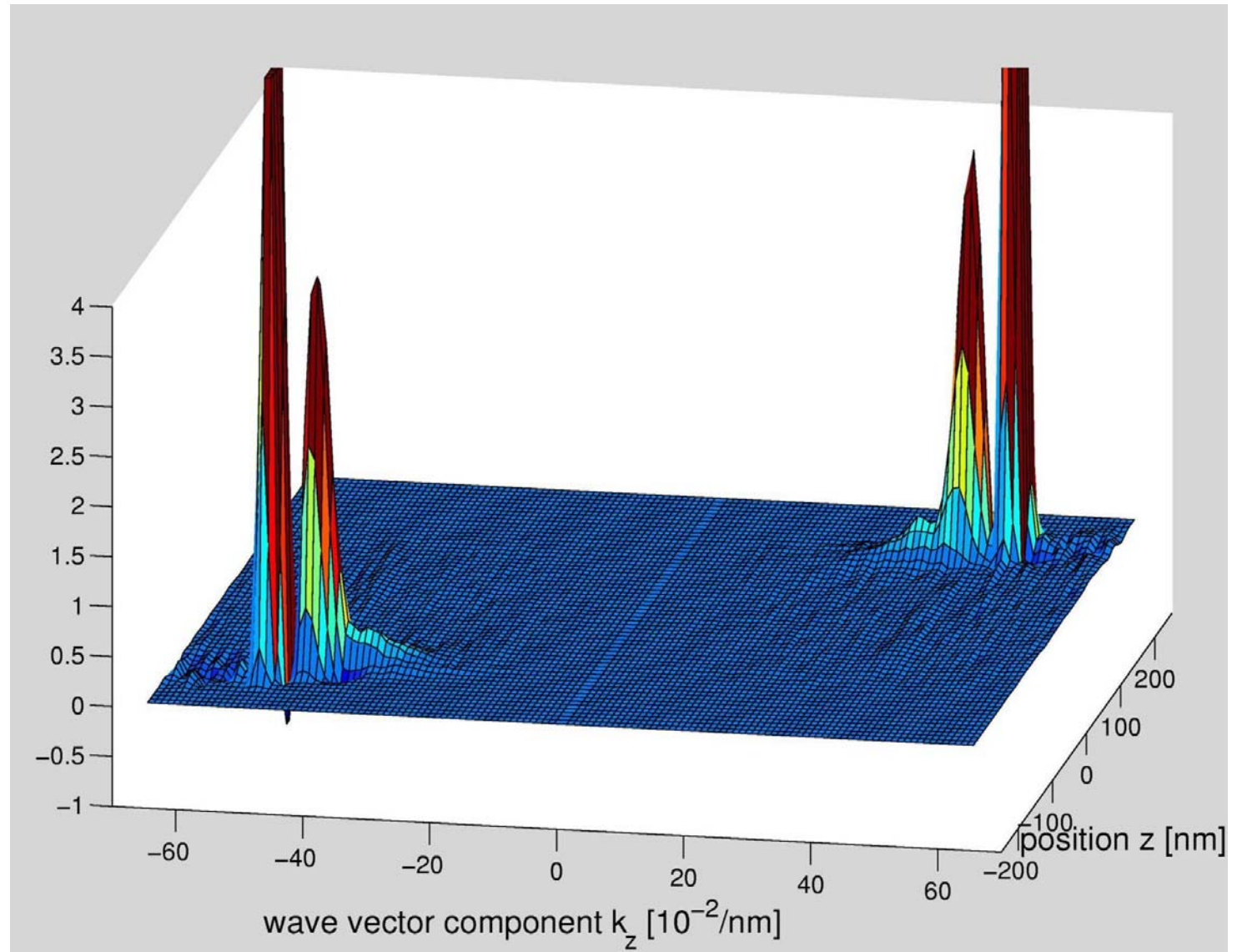
- VgGrid консорциум. Цели:
 - Обмен на ресурси и експертиза в Грид технологиите
 - Разработка на Грид приложения
- Членове на VgGrid:
 - **Основатели:**
 - **Институт за паралелна обработка на информацията**
 - **Институт за ядрени изследвания и ядрена енергия**
 - **Членове:**
 - **Институт по математика и информатика – БАН**
 - **Институт по механика – БАН**
 - **Институт по електрохимия-БАН**
 - **Институт по астрономия – БАН**
 - **Американски университет в България,**
 - **Пловдивски университет (ФМИ)**
 - **Софийски университет (ФМИ),**
 - **Минногеоложки университет**

- ИПОИ поддържа следните критично важни core сървъри:
 - R-GMA (разпределена релационна база от данни, accounting) – gserv1.ipp.acad.bg
 - FTS (гарантиран бърз трансфер на данни) – fts001.ipp.acad.bg
 - AMGA (каталог с metadata информация за файловете) е в процес на тестване в Института по астрономия и може да се ползва – astrogrid.astro.bas.bg
- За употреба от български потребители в ИПОИ се поддържат още:
 - BDII (поддържа моментна информация за ресурсите) – bdii.ipp.acad.bg
 - WMS (разпределя задачите между клъстерите – нов стил) - wms001.ipp.acad.bg
 - RB (разпределя задачите между клъстерите – стар стил) - rb001.ipp.acad.bg
 - P-GRADE портал – portal.ipp.acad.bg – достъп до Грида през web интерфейс

- Физика на високите енергии
- Биоинформатика и биомедицина
- Екология
- Метеорология
- Астрономия

- **SALUTE (Stochastic ALgorithms for Ultra-fast Transport in sEmiconductors)** is a Grid application developed for solving computationally intensive problems in quantum transport. It consists of a bunch of Monte Carlo algorithms for solving quantum kinetic equations which describe the considered model.
- The quantum kinetic model: a femtosecond relaxation process of optically excited carriers in one-band semiconductors or quantum wires. The **electron-phonon interaction** is switched on after a laser pulse creates an initial electron distribution. Two cases are considered – with and without applied electric field.
- Using SALUTE innovative results for different materials can be obtained.

- 800 x 260 points
- $t=175$ fs



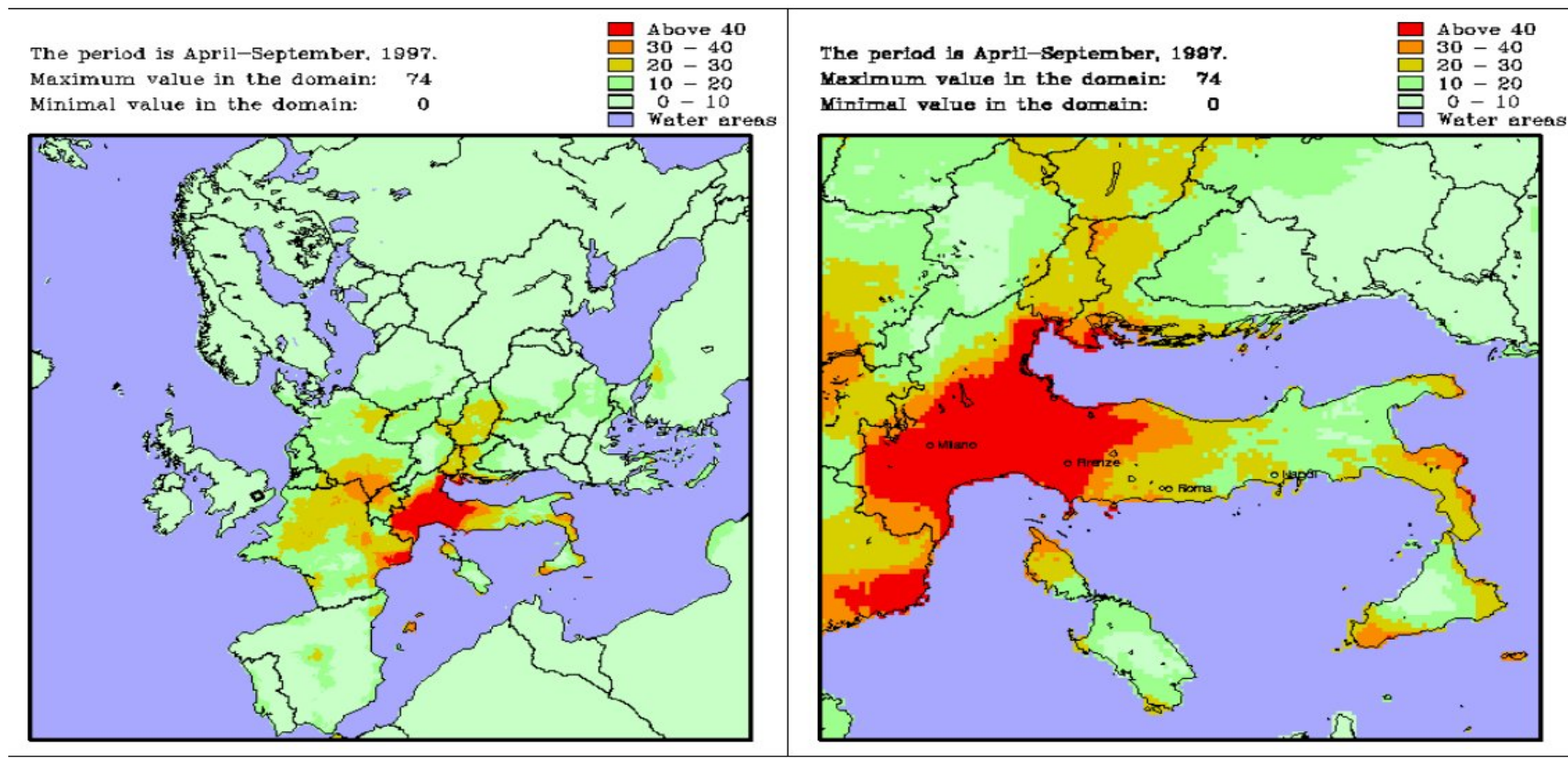


Fig.2: Number of days with an 8-hour average ozone concentration more than the critical value (60 ppb.) in 1997.

- **Обучение**
- **Получаване на Grid сертификат**
- **Присъединяване към подходяща виртулна организация**
- **Реална разработка**
- **При срещане на проблеми се обръщате отново към екипа, който работи по SA1, като може да се използва и helpdesk.egee-see.org**

- Построените Grid сайтове са отворени за потребители и приложения от българската научна общност
- Гридът създава богата среда за разработка на разнообразни приложения със сериозни изисквания към ресурсите
- Създадена е основа за изграждане и разширяване на българската е-инфраструктура, обхващаща в бъдеще не само e-Science, но впоследствие и e-Health, e-Government, e-Business
- Разработката на Грид приложения не изисква големи ресурси, а само достъп до Грид
- Гридът обединява малки и големи сайтове, като малките сайтове могат да се използват предимно за разработка и тестване на приложения.

- EGEE проект – <http://www.eu-egee.org>
- SEE-GRID проект – <http://www.see-grid.eu>
- gLite middleware – <http://www.glite.org>
- Globus toolkit – <http://www.globus.org>
- Grid café - <http://www.grid.bas.bg/gridcafe.htm>
- LCG проект - <http://lcg.web.cern.ch/LCG/>
- EGEE приложения - <http://egeena4.lal.in2p3.fr/>
- Real time monitoring - <http://gridportal.hep.ph.ic.ac.uk/rtm/>



• <http://www.grid.bas.bg/>

За контакти:

- **Кирил Боянов**,
Директор на ИПОИ-БАН
boyanov@acad.bg
- **Емануил Атанасов**,
EGEE 2 team leader
emanouil@parallel.bas.bg
- **Анета Караиванова**,
BGGC contact person
anet@parallel.bas.bg
- **Тодор Гюров**,
SEE-GRID2 team leader
gurov@parallel.bas.bg