

**High-Performance Computing Infrastructure for
South East Europe's Research Communities**
8th e-Infrastructure Concertation Meeting, November 2010

HP-SEE
www.hp-see.eu



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High-Performance Computing Infrastructure
for South East Europe's Research Communities



- ❑ **Contract n°:** RI-261499
- ❑ **Project type:** CP & CSA
- ❑ **Call:** INFRA-2010-1.2.3: VRCs
- ❑ **Start date:** 01/09/2010
- ❑ **Duration:** 24 months
- ❑ **Total budget:** 3 885 196 €
- ❑ **Funding from the EC:** 2 100 000 €
- ❑ **Total funded effort, PMs:** 539.5
- ❑ **Web site:** www.hp-see.eu



HP-SEE Partnership



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High-Performance Computing Infrastructure
for South East Europe's Research Communities

Contractors (14)

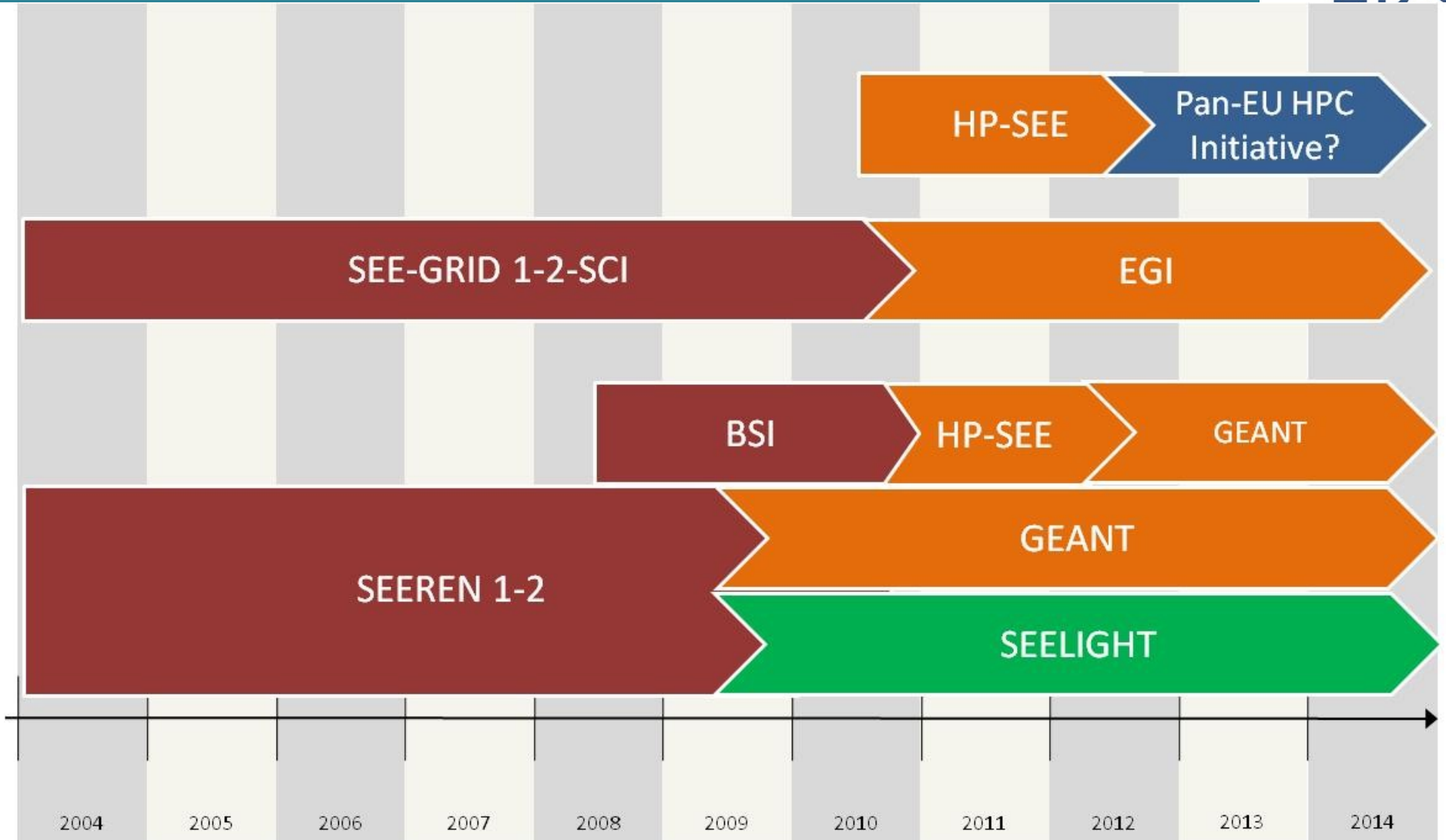
GRNET	Coordinating Contractor	Greece
IPP-BAS	Contractor	Bulgaria
IFIN-HH	Contractor	Romania
TUBITAK ULAKBIM	Contractor	Turkey
NIIFI	Contractor	Hungary
IPB	Contractor	Serbia
UPT	Contractor	Albania
UOBL ETF	Contractor	Bosnia-Herzegovina
UKIM	Contractor	FYROM
UOM	Contractor	Montenegro
RENAM	Contractor	Moldova (Republic of)
IIAP NAS RA	Contractor	Armenia
GRENA	Contractor	Georgia
AZRENA	Contractor	Azerbaijan

Third Party / JRU mechanism used
associate universities / research centres

Context: the Timeline



HP SEE
Building Infrastructure
for Research Communities



SEE eInfrastructure activities – past 6 years



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High-Performance Computing Infrastructure
for South East Europe's Research Communities

- ❑ **SEEREN1/2:** regional inter-NREN connectivity and GEANT links [DGINFSO]
- ❑ **BSI:** Southern Caucasus links [DGINFSO]
- ❑ **SEELIGHT:** lambda facility in SEE [Greek HiperB]
- ❑ Result: sustainable national & regional networks, most countries in GEANT

- ❑ **SEEGRID1/2:** regional Grid infrastructure, building NGIs and user communities
- ❑ **SEE-GRID-SCI:** eInfrastructure for large-scale environmental science user communities: meteorology, seismology, environmental protection. Inclusion of Caucasus. [DGINFSO]
- ❑ Result: sustainable national Grids, all countries within European Grid Initiative

- ❑ **HP-SEE:** regional HPC interconnection and 2nd generation Caucasus link
- ❑ Expected result: sustainable national HPC centers, long-term sustainable (hierarchical) model in collaboration with PRACE and DEISA

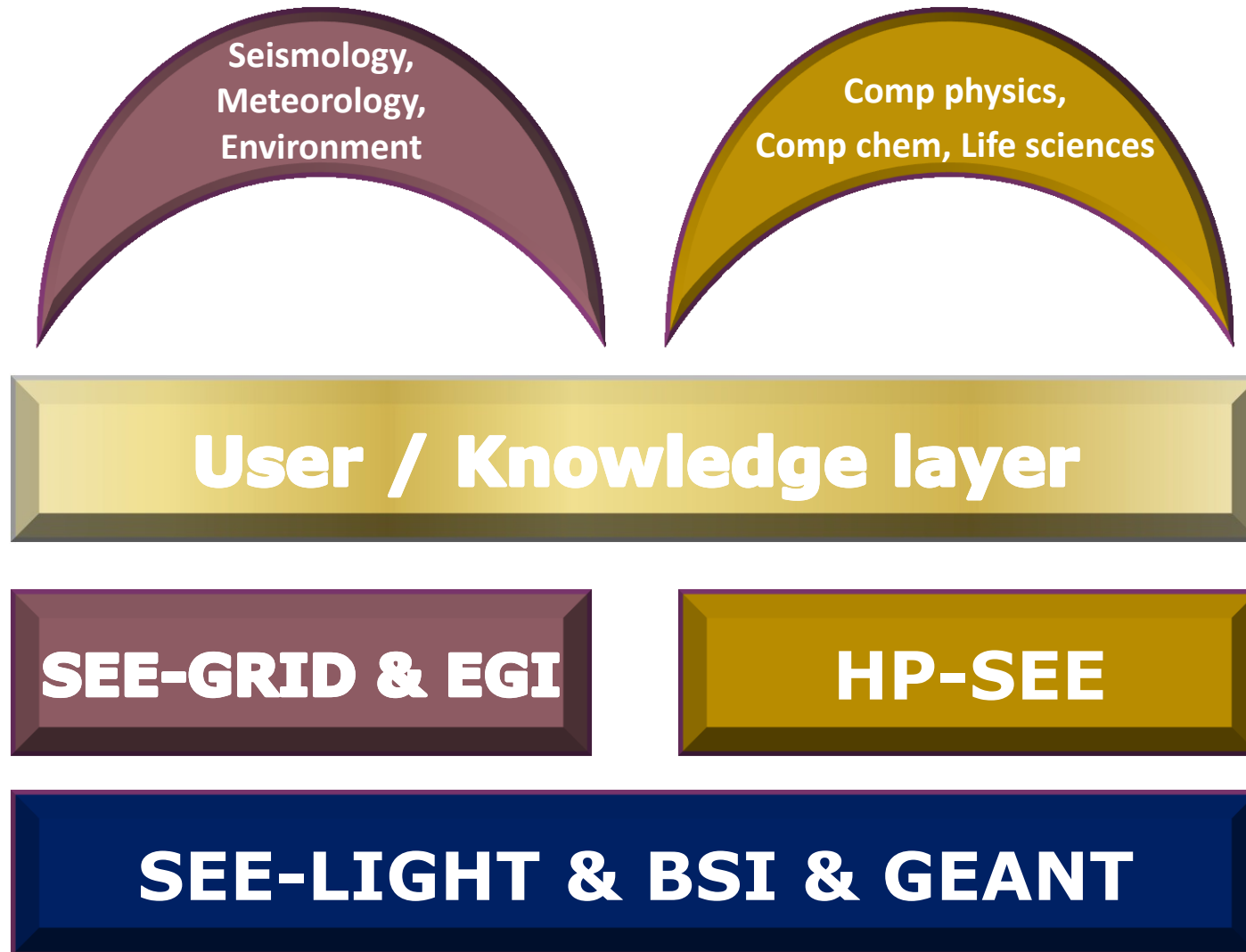
- ❑ **SEERA-EI:** regional programme managers collaboration towards common eInfrastructure vision, strategy and regional funds [DGRTD]
- ❑ Result: ensuring long-term national-level funds and regional funds to complement EC funds

Context: the Model: Converged communication & service infrastructure for South-East Europe



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HP-SEE Project Objectives



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High-Performance Computing Infrastructure
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- ❑ Objective 1 – Empowering multi-disciplinary virtual research communities

- ❑ Objective 2 – Deploying integrated infrastructure for virtual research communities
 - ❑ Including a GEANT link to Southern Caucasus

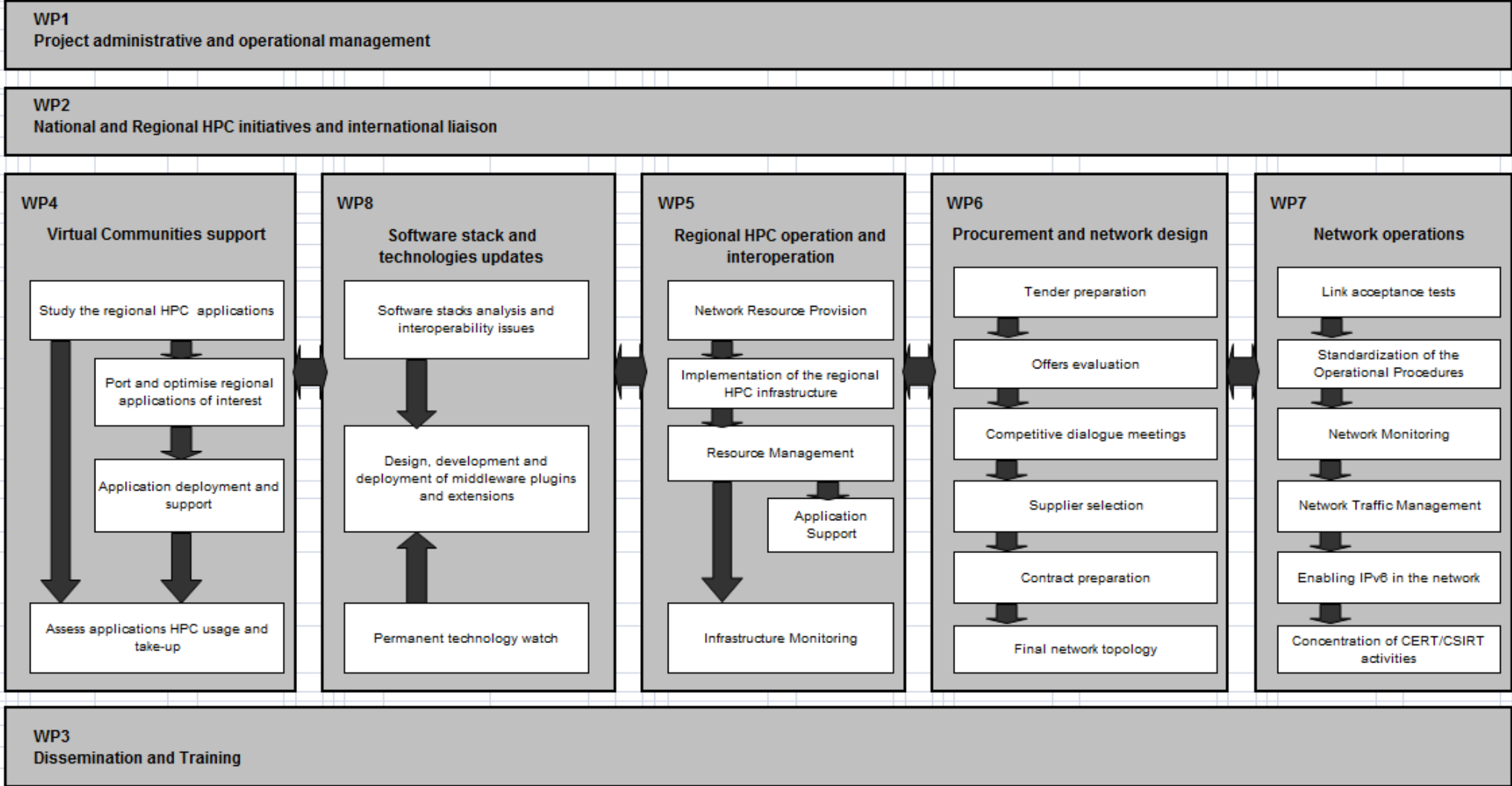
- ❑ Objective 3 – Policy development and stimulating regional inclusion in pan-European HPC trends

- ❑ Objective 4 – Strengthening the regional and national human network

Work Organization - PERT



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Existing infrastructure – Blue Gene/P



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High-Performance Computing Infrastructure
for South East Europe's Research Communities

- ❑ IBM Blue Gene/P –**two racks**, 2048 *PowerPC 450*processors (32 bits, 850 MHz), a total of **8192 cores**;
- ❑ Double-precision, dual pipe floating-point acceleration on each core;
- ❑ A total of **4 TB** random access memory;
- ❑ 16 I/O nodes currently connected via fiber optics to 10 Gb/s Ethernet switch;
- ❑ Theoretical peak performance: R_{peak} =**27.85 Tflops**;
- ❑ **Energy efficiency: 371.67 MFlops/W: Green top 10**

- ❑ Smaller HPC machines in **Romania, Bulgaria, Hungary**
- ❑ Upcoming purchases in **Hungary, Serbia and Greece**

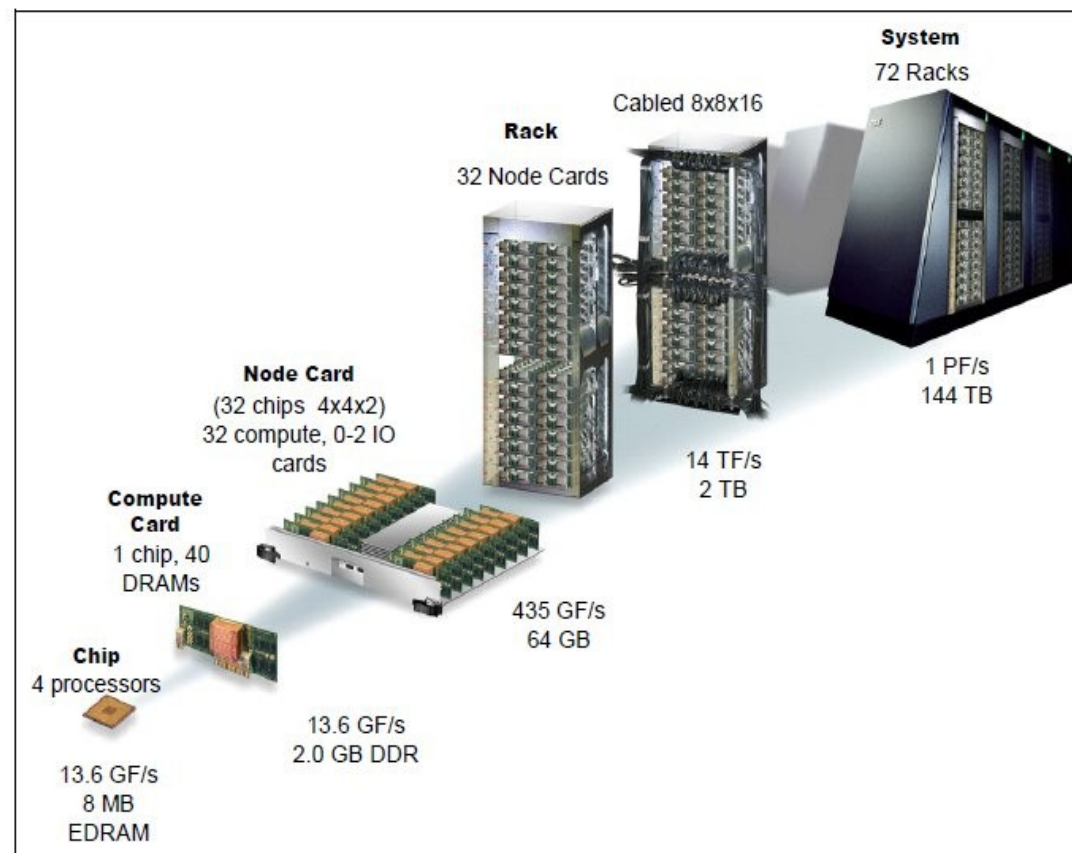


Figure 1-2 Blue Gene/P packaging

Introduction to VRCs



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High-Performance Computing Infrastructure
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- ❑ **Comp. Physics**
6 countries,
8 apps.
- ❑ **Comp. Chemistry**
6 countries,
7 apps.
- ❑ **Life Sciences**
5 countries,
7 apps.

Country	Physics	Chemistry	Life Sciences	TOTAL
Albania	1			1
Armenia			1	1
Bosnia-Herzegovina		1		1
Bulgaria	2	2		4
Georgia			1	1
Greece		1	2	3
Hungary			2	2
Moldova	1			1
Montenegro			1	1
FYR of Macedonia	1	1		2
Romania	2	1		3
Serbia	1	1		2
TOTAL	8	7	7	22

Long-term vision...



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High-Performance Computing Infrastructure
for South East Europe's Research Communities

- ❑ Being on the technological par with the rest of Europe
- ❑ Enabling local scientists to use their potential
- ❑ Role-model for regional developments
- ❑ Leading the way in wider contexts