

HP-SEE

**High-Performance Computing Infrastructure for
South East Europe's Research Communities**
EGI technical forum, September 2010

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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Contractors (14)

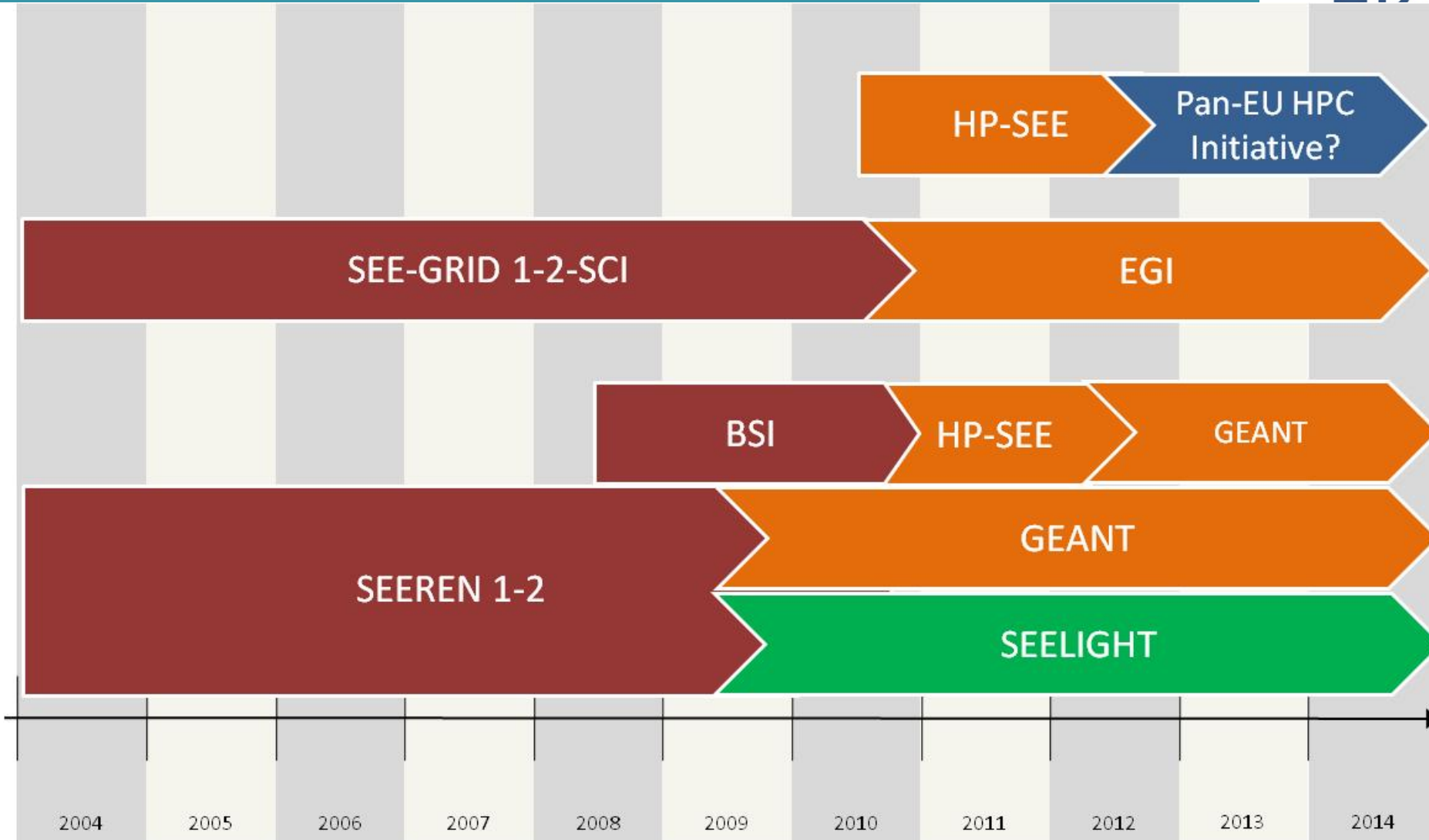
GRNET	Coordinating Contractor	Greece
IPP-BAS	Contractor	Bulgaria
IFIN-HH	Contractor	Romania
TUBITAK ULAKBIM	Contractor	Turkey
NIIFI	Contractor	Hungary
IPB	Contractor	Serbia
UPT	Contractor	Albania
UOBL ETF	Contractor	Bosnia-Herzegovina
UKIM	Contractor	FYROM
UOM	Contractor	Montenegro
RENAM	Contractor	Moldova (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



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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

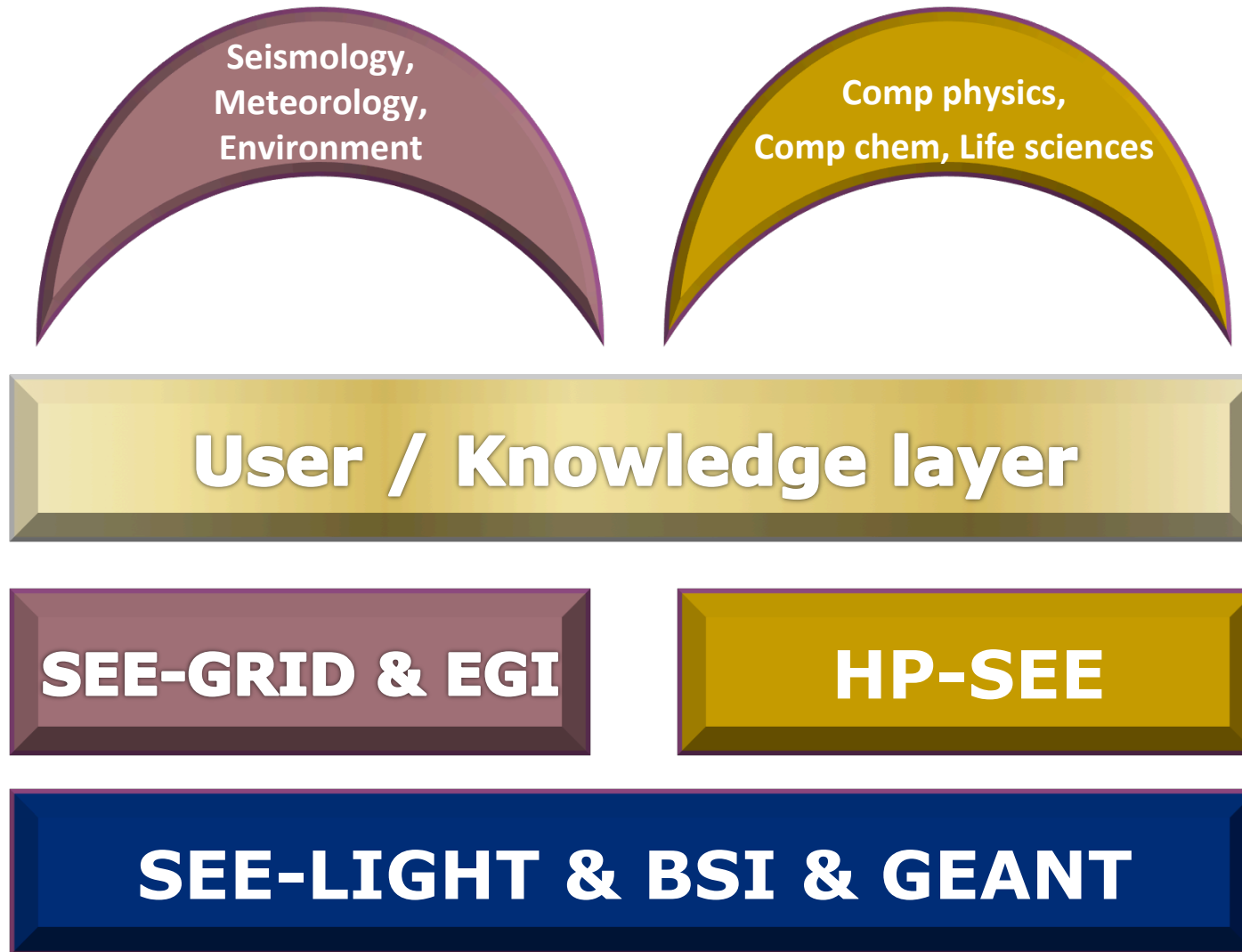
- ❑ **HP-SEE:** regional HPC interconnection and 2nd generation Caucasus link
- ❑ Expected result: sustainable national HPC centers, long-term sustainable (hierarchical) model in collaboration with PRACE and DEISA

- ❑ **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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- ❑ 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



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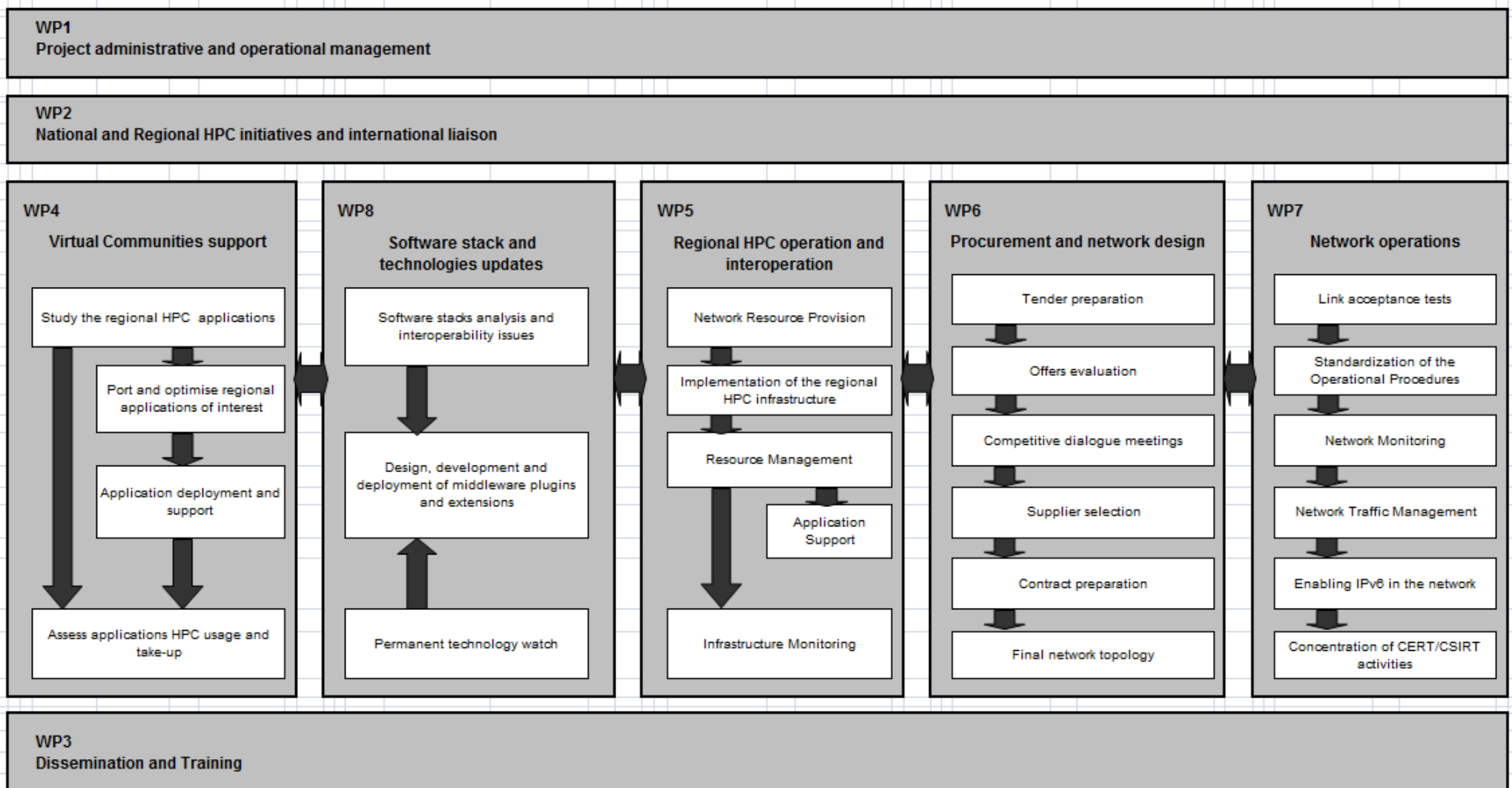
High-Performance Computing Infrastructure
for South East Europe's Research Communities

Work Package	WP Title	Lead
WP1	Management	GRNET
WP2	National and Regional HPC initiatives and international liaison	GRNET
WP3	Dissemination and training	IPB
WP4	Virtual Research Communities support	IFIN-HH
WP5	Regional HPC infrastructure operations	IPP-BAS
WP6	Procurement and network design	GRNET
WP7	Network Operations	TUBITAK-ULAKBIM
WP8	Software stack and technologies updates	NIIFI

Work Organization - PERT



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Existing infrastructure – Blue Gene/P



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- ❑ IBM Blue Gene/P –two racks, 2048 PowerPC 450processors (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 fibre 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 Serbia and Greece

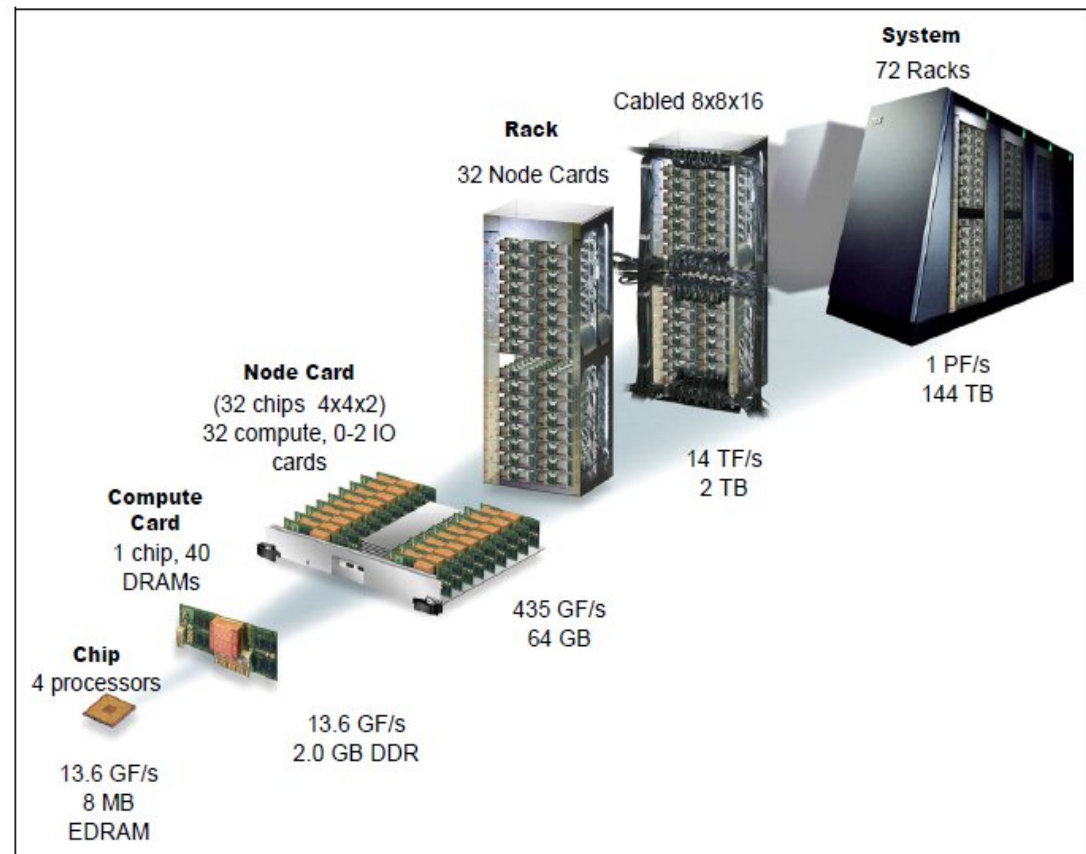


Figure 1-2 Blue Gene/P packaging

Introduction to VRCs



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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
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- ❑ 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