sahasrat (सहस्रत्)

India's First Petascale System

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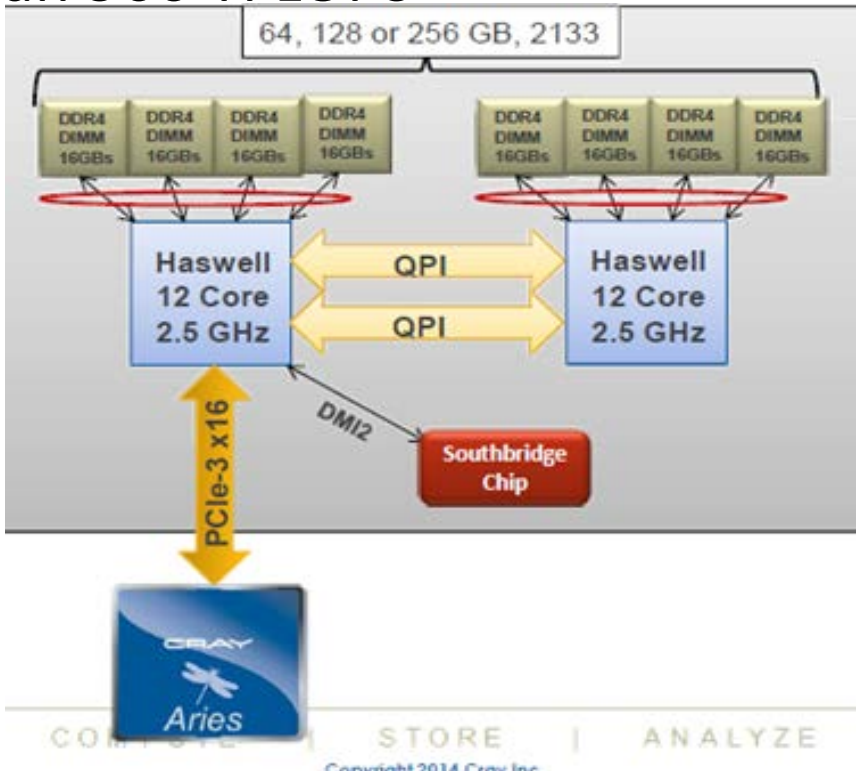
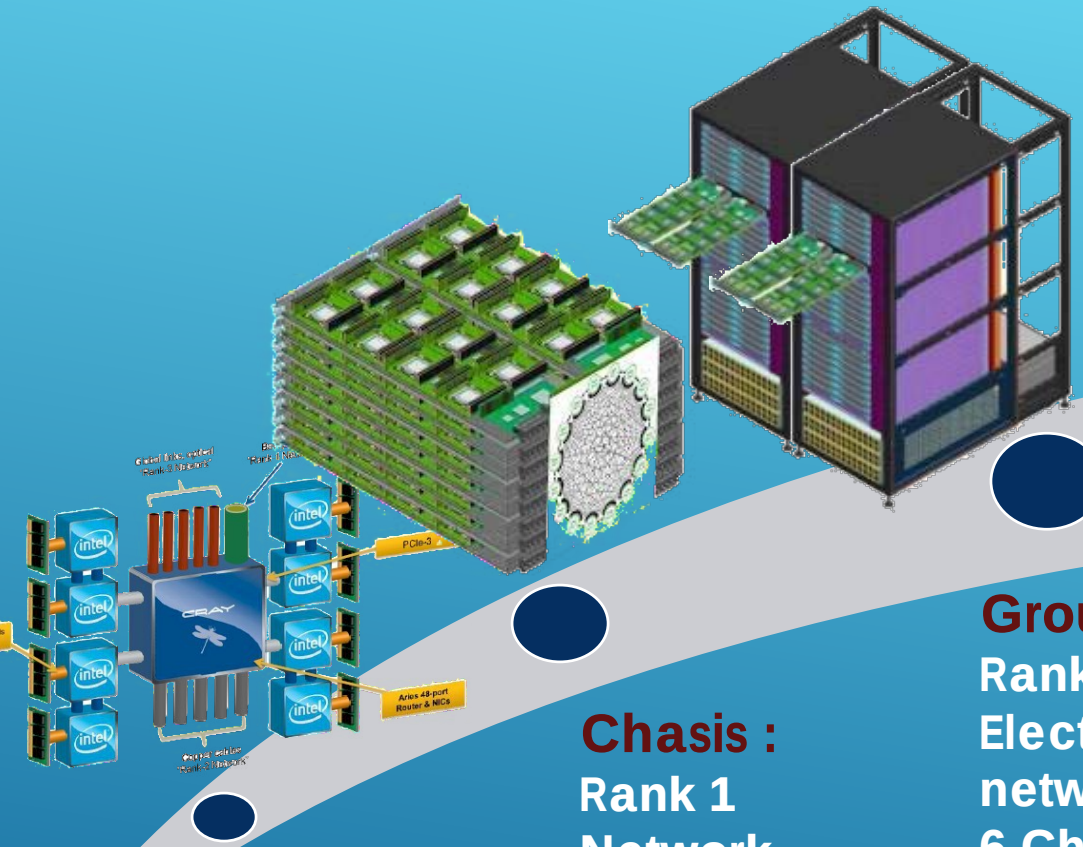
sahasrat : Petascale System

- Cray-XC40, an Massively Parallel Processing class machine
- Petascale compute capability with
  - CPU Clusters with 33024 Intel-Haswell processor cores achieving more than 900 TFLOPS
  - 44 node GPU clusters with Intel Ivybridge processor and Tesla K40 GPU, delivering 52 TFLOPS
  - 48 node Intel Xeon Phi Cluster (5120D) giving 28 TFLOPS



SYSTEM BUILDING BLOCKS



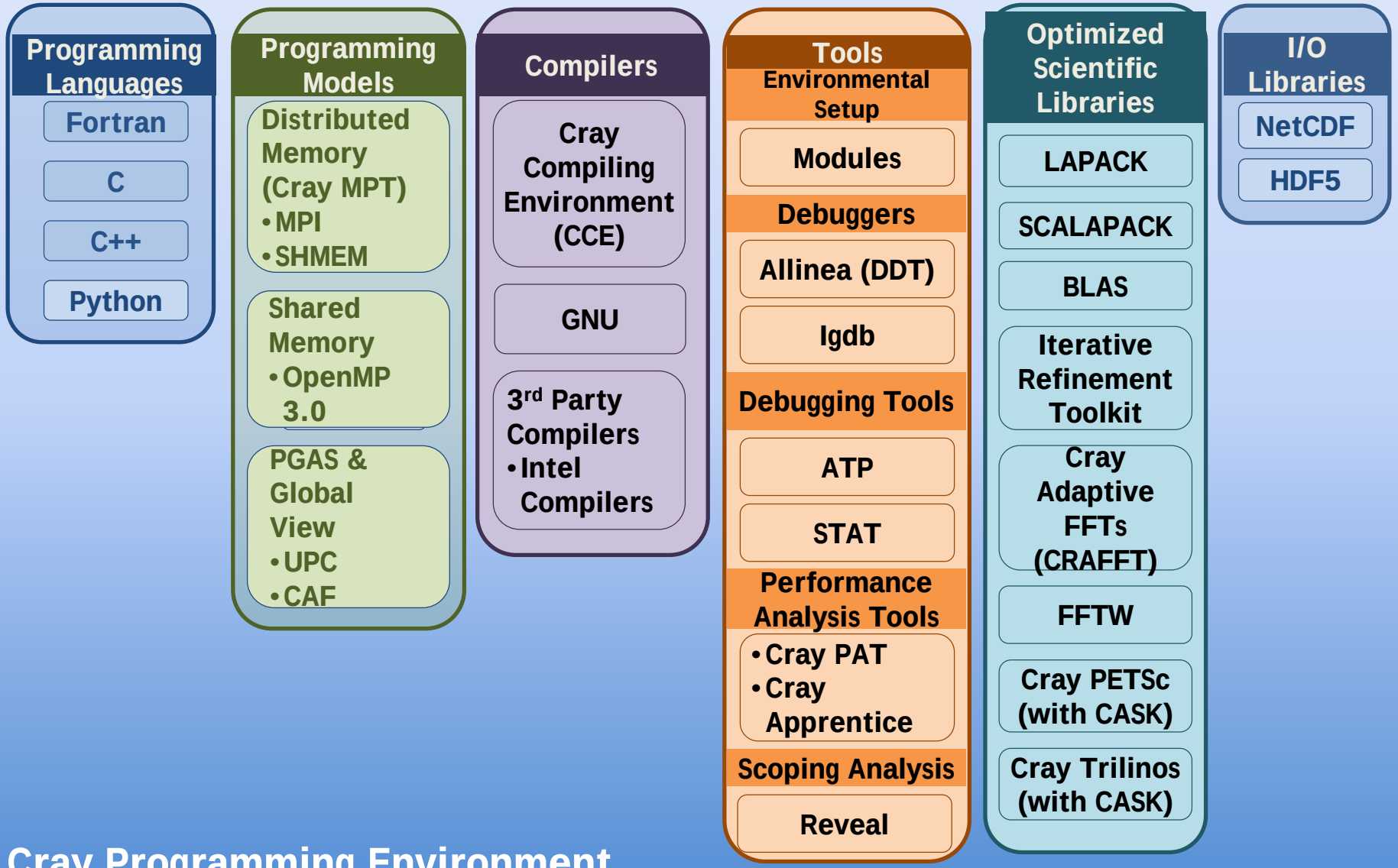
Compute Blade :
Each having 4 nodes or 96 cores

Chasis :
Rank 1 Network
16 blades;
64 nodes;
No cables

Group:
Rank 2 Network
Electrical network cables
6 Chassis and
384 nodes

System:
- Rank 3 network
- Active Optical cable
- 4 Groups

Cray Linux Environment



Cray Programming Environment

Storage Configuration

No. of Cabi-nets	Encl. per Cabinet	Disks per Encl.	Total No. of Disks	Raw Capacity	Usable Capacity	IOR Perf.	
						Read	Write
4	5	48 x 3TB	960	2.88 PB	~2 PB	32.36 GB/ Sec	27.6 GB/ Sec

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sahasrat (सहस्रत्)

Means thousand arms or spokes

Indicative of 1000+ nodes

“SahasraT” stands for thousand TeraFLOPS

sahasrat : System Performance

Type of Node	No. of Nodes	HPL (Sustained) Performance
Compute Cluster	1296	901 TFLOPS
GPU Cluster	44	52 TFLOPS
Xeon Phi Cluster	42	28 TFLOPS

Top500 Listing (June 2015)

TOP 500 The List.

CERTIFICATE

SERC - Cray XC40, Xeon E5-2680v3 12C 2.5GHz, Aries interconnect

Supercomputer Education and Research Centre (SERC), Indian Institute of Science, India

is ranked

No. 79

among the World's TOP500 Supercomputers

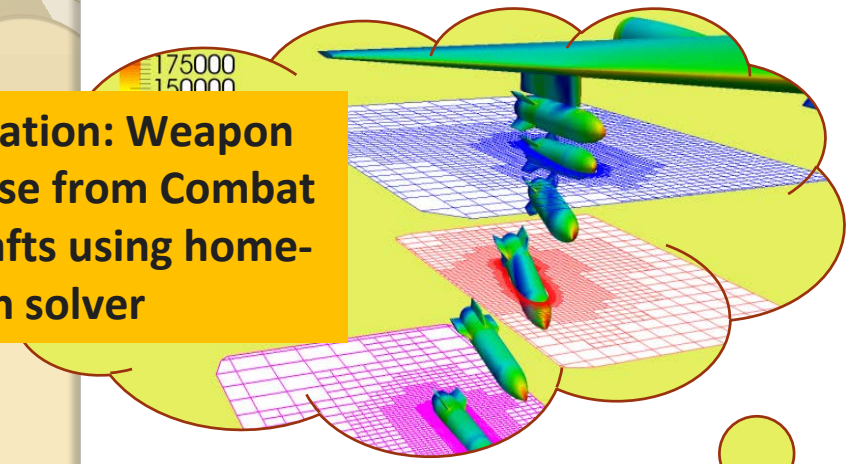
with 901.51 Tflop/s Linpack Performance

in the 45th TOP500 List published at ISC15 in Frankfurt, Germany, July 13th, 2015.

Congratulations from the TOP500 Editors

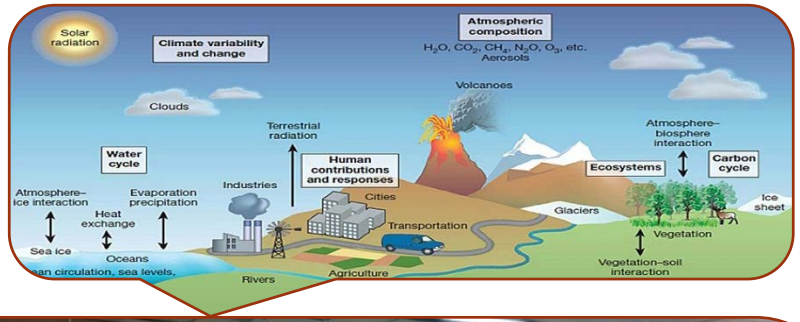
Erich Strohmaier	Jack Dongarra	Horst Simon	Martin Meuer
NERSC/Berkeley Lab	University of Tennessee	NERSC/Berkeley Lab	Prometeus

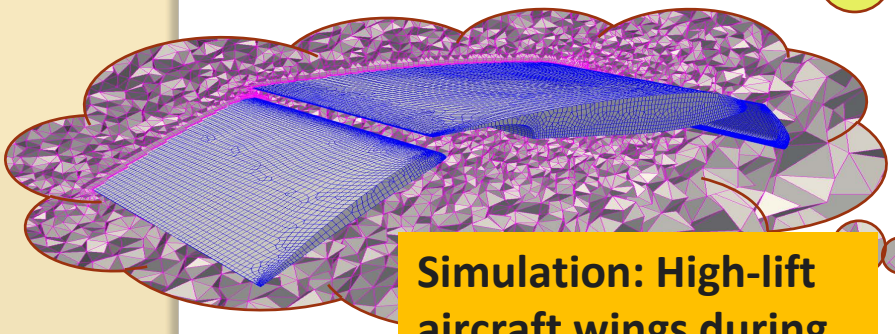
HPC Facility & Research at SERC



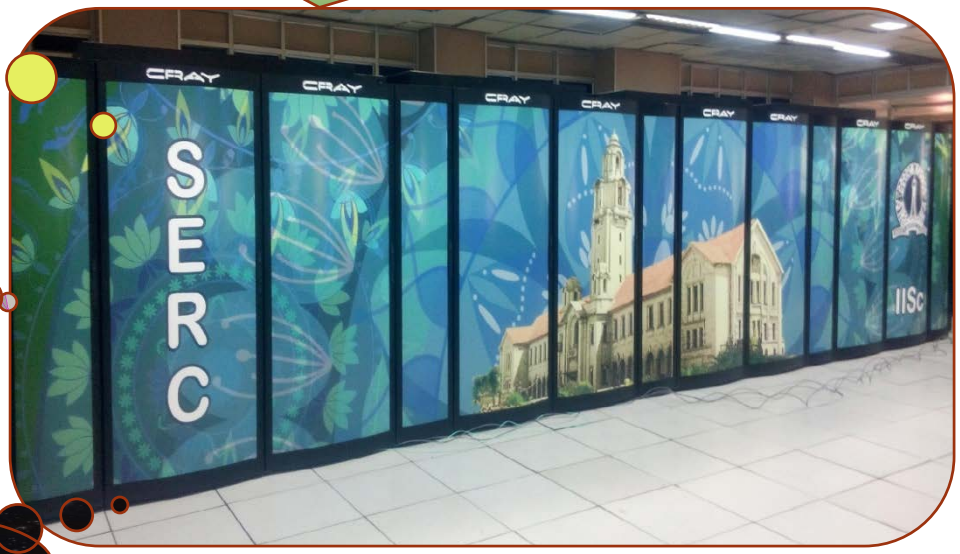
Simulation: Weapon Release from Combat Aircrafts using home-grown solver

Impact of River Discharge, Pollutants on Monsoon/ Climate





Simulation: High-lift aircraft wings during take-off and landing



Computational studies of multiple overlapping supernovae

PetaFLOP Supercomputer #1 in India (33000 processors)

Thank You!