सी डैक
CDAC

Performance
on the move...

PARAM SHAVAK

A Compact & Power Efficient
Supercomputing Solution from C-DAC

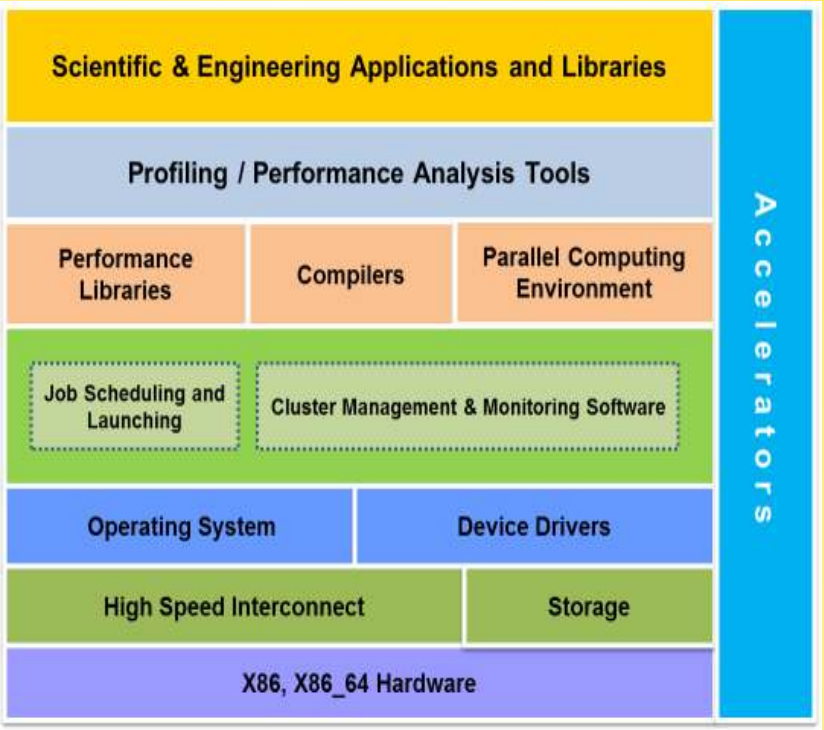
PARAM Shavak is a ready-to-use HPC system pre-loaded with all the required system software and applications from selected scientific domains. The system is designed to be enabling tool for research organizations as well as academic institutions that are on the verge of adopting HPC culture and skill sets generation.

Supercomputing Solution in a Box

Need

There is a growing recognition worldwide that information technology especially High Performance Computing (HPC) or supercomputing is the key resource for computational simulation and modelling leading to the economic growth of the nation. Several countries are taking initiatives to provide computing resources for their scientists and engineers for high –end educational and research purposes.

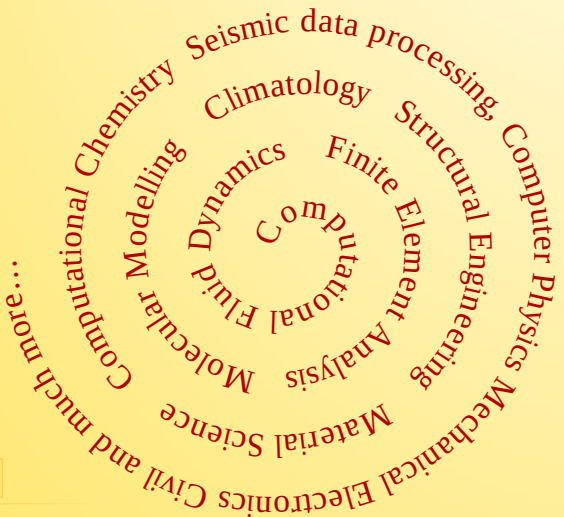
In order to contribute to the nation's R&D activities, C-DAC has developed a affordable 'Supercomputing in a Box' solution, christened as "PARAM Shavak". This solution is composed of hybrid computational hardware along with C-DAC's indigenously developed CHReME and Onama software packages along with several open source tools and applications. PARAM Shavak offers a affordable and yet computationally intensive solution to enable the creation of HPC aware skilled manpower for promoting R&D in the field of scientific and engineering domain.

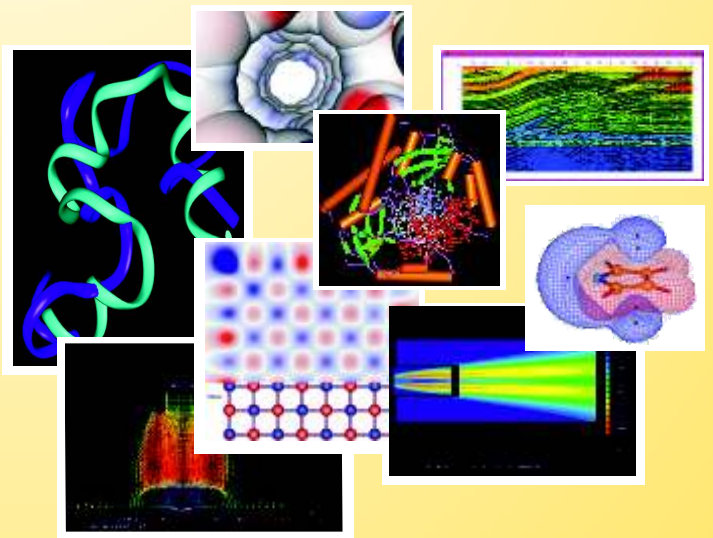


PARAM Shavak - Supercomputer in a box with unbound performance features

- HPC system in a table top model.
- Powered with minimum of 2 multicore CPUs each with at least 10 cores along with either one or two number of many core or GPU accelerator cards.
- Phenomenal solution for academic, scientific and research institutions that are on the verge of adopting high performance computing culture.
- Equipped with C-DAC's indigenously developed software technologies for HPC applications in academic and scientific domains.
- Easy to deploy solution with minimal datacentre infrastructure.
- Pre-loaded with parallel programming development environment.
- 2 TF and above computing power.
- Customizable as per the user hardware and software requirement.
- Scalable model.
- Pre-loaded with Accelerator (GPGPU/MIC) enabled parallel applications and development tools
- Access to C-DAC PARAM Yuva II at National Param Supercomputing Facility for computations on a larger scale as per the NPSF usage policy.
- Support for C-DAC's Reconfigurable Computing System technology to speed up applications through hardware.
- Resource for parallel programming training and workshops.
- Affordable computing environment for the faculty, students – both undergraduate and post graduate, PhD scholars.

Application Domains





Indigenous tools along with PARAM Shavak

Onama

Onama has been specially designed for the scientific and research institutions to inculcate and escalate HPC into the education curriculum at the early stage, thereby promoting high end research at the academic level with huge generation of HPC professional. It consists of HPC enabled open source and freeware tools in engineering domain. In the current scenario engineering students can augment their skill from practical to theoretical concepts with Onama.

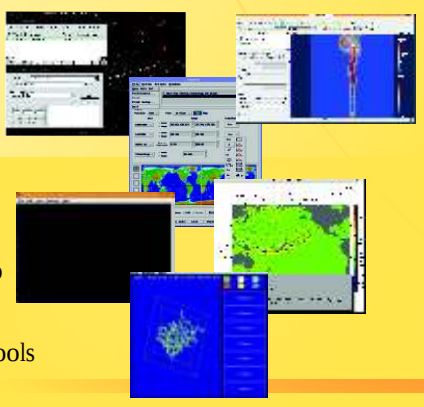
Salient Features

- A well selected set of parallel as well as serial applications and tools across various engineering disciplines. In addition to this it consists of accelerator enabled applications in several domains namely molecular dynamics, bio-informatics, life sciences and physics.
- Onama comes with built-in applications and execution model which allows the execution of desired applications with minimal efforts.
- It also provides access to various libraries like parallel libraries, performance libraries and engineering domain specific libraries that can be used to develop programs to solve the user's problems.
- Onama offers unique opportunity to the faculty members of the engineering colleges to go beyond their conventional teaching practices and experiment with innovative learning techniques.

HPC Applications

- mpiBLAST
- GROMACS
- WRF
- MOM
- ABINIT
- Quantum Espresso
- Open FOAM etc.

and Visualization tools



CHReME

To access Linux-based HPC environments, scientists and researchers require expertise in Linux and HPC, which is something many do not have. CHReME empowers users with an intuitive GUI to exploit HPC resources and provides a layer of abstraction to shield them from the complexity of accessing HPC resources. This enables them to concentrate on their core research/scientific work. CHReME's Web Interface makes clusters of different magnitude easy to manage and monitor, which makes things easier for the HPC systems administrator while enabling researchers and scientists of varied domains to carry out their scientific simulation with minimal efforts.

Salient Features

- User friendly web based GUI to access various HPC resources.
- Simplified and secure access to the HPC resources from the remote machine.
- Secure credential specific access on web through https.
- Optimum utilization of HPC system's resources and resource reservation.
- Creation, submission, monitoring and management of jobs through GUI. Jobs are submitted through industry standard cluster schedulers at the backend.
- Personalized job list and job status information.
- Graphical representation of the cluster resources and jobs.
- Timely e-mail notification regarding job status.
- Portal provides a layer of abstraction to the end users by freeing them from the command line mode of execution in addition to providing benefits to the end users to focus on their scientific domain areas.

About C-DAC

Centre for Development of Advanced Computing (C-DAC) is India's national initiative to mobilize indigenous human and technical resources in a bid to attain technological competency in the evolving arena of Information Technology and proliferate its inherent benefits towards the advancement of its citizens as well as society. Towards this drive, C-DAC has been actively involved in the design, development and deployment of electronics and Information Technology (IT) products and solutions since its establishment in March 1988 by the Government of India as a Scientific Society of the Ministry of Communications and Information Technology.

Since its inception, C-DAC has established its brand image as a premier R & D institution of national and international repute, working in advanced areas of electronics and Information Technology and developing and deploying IT products and solutions for diverse sectors. The technologies that C-DAC deals in, include High Performance Computing (HPC) & Grid Computing, Software Technologies (including Free & Open Source Software), Professional Electronics, Multilingual and Multimedia Computing, Cyber Security & Cyber Forensics, Health Informatics and Education & Training. The key sectors addressed by C-DAC include Finance, Healthcare, Power, Steel, Defense, Telecom, Agriculture, Industrial Controls, Broadcasting, Education and e-Governance.

Pioneers of the OpenFrame Architecture and acknowledged globally for its PARAM series of Supercomputers, C-DAC has applied its High Performance Computing and Communication (HPCC) expertise to the fields of Computational Atmospheric Sciences, Computational Fluid Dynamics, Computational Structural Mechanics, Seismic Data Processing, Bioinformatics, Quantum Chemistry, Ab-initio Molecular Dynamics, Financial Modeling and Decision Support Systems. These applications on PARAM supercomputers are powered by C-DAC's interconnect called PARAMNet providing high speeds and low latencies and its HPCC software suite, designed to provide flexible, parallel and distributed software environment for Linux and Unix based clusters. C-DAC's has set up the National PARAM Supercomputing Facility (NPSF) at Pune, and C-DAC's Terascale Supercomputing Facility (CTSF) at Bangalore. The latest supercomputer from C-DAC, PARAM Yuva II was ranked at 69th position in the list of world's Top 500 Supercomputers, which released in June 2013. Also, the system was ranked 8th in Asia and 44th in Green500 list released in June 2013.

C-DAC has the expertise and has been working on field-deployable projects in various aspects of daily life touching health care, traffic management, manufacturing, communications, environment, agriculture, food processing, energy and many more. C-DAC has vast experience in application development and deployment in various key enablers in these areas, essential for developing professional electronic products for any application vertical, and the ability to adapt to new requirements in totally new areas.

With a vision to emerge as the premier R&D institution for the design, development and deployment of world class electronic and IT solutions for economic and human advancement C-DAC is focussed strengthening national technological capabilities in the context of global developments in the field of High Performance Computing, Multilingual and Heritage Computing, Professional Electronics, VLSI and Embedded systems, Software Technologies, Cyber Security, Health Informatics, Education and Training.

C-DAC as an institute involved in research, design and development of technology, seeks to strengthen its brand equity and create a higher value for its activities in contributing to the economy and society at large.

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