

27. 11. 2023

Session - 32

ICT & Computing

(... continued)

World's Top-6 Supercomputers

61st edition of Top 500 list

→ June 2023

Supercomputers	Country	R Peak
1. Frontier	USA	1.67 $\frac{\text{Exa FLOPs}}{10^{18}}$
2. Fugaku	Japan	537 $\frac{\text{PFLOPs}}{10^{15}}$
3. Lumi	Finland	427 PF
4. Leonardo	Italy	304 PF
5. Summit	USA	200 PF
6. Sierra	USA	125 PF

India's most powerful supercomputers

	Airavat AI	Param Siddhi AI	Pratyush	Mihir
R_{Peak}	13.17 PF	5.27 PF	4.0 PF	2.8 PF
<u>Top500 Ranking</u>	75	131	169	316
where	CDAC - Pune	CDAC - Pune	Indian Institute of Tropical Meteorology, Pune	National Centre for Medium Range Weather Forecasting, NOIDA

Purpose of deployment of Indian Supercomputers

AI Algorithm
AI Model

development

1) AI Airavat

2) AI ParamSiddhi

(जलवायु परिवर्तन मूल्यांकन)

Meteorological
Research (मौसम
अनुसंधान) + Climate
Change Assessment

Pratyush & Mihir (also interconnected: 6.8 PF)

TeraFLOP
grade
Super
Computers
(P.T.O.)

TF grade supercomputers in India

e.g. Param Series Computers from
2018 onwards

Space
Research

Pharma
& Medical
Research

Pure Sc.
Research

Nanotech.
Research

Financial
Institutions

Private
Sector
Users

National Supercomputing Mission

- 2015 → धन कर तैयार
- 2016 → मंजूरी + क्रियान्वयन

3 main objectives

(1) भारत में HPC
अनुसंधान एवं
विकास को
बढ़ावा देना

+
भारत में और भी
HPC स्वायत्त रूप से विकसित करना

(2) HPC के क्षेत्र
में निजी सेक्टर
की भागीदारी बढ़ाना

(3) औद्योगिक
अनुसंधान के लिए
HPC को उपलब्ध
कराना.

4 Stakeholders / 4 मुख्य भागीदार

- (1) Department of Science & Technology
- (2) Ministry of Electronics & I T
- (3) C-DAC, Pune
- (4) IISc, Bengaluru

Major Steps taken

(1) नयी पीढ़ी के PF grade HPC का विकास

(2) उच्च शिक्षा संस्थानों को HPC उपलब्ध कराने की पहल

Airavat ParamSiddhi

→ local
→ remote

(3) अगले 2 वर्षों में 9 supercomputers को विकसित करने की योजना

7 major application areas

(1) Scientific research : Particle Physics, Genomic Studies, Nanoscience Research

(2) Development of Advanced Computing →

- 1) AI development
- 2) Blockchain development
- 3) Cryptological research
- 4) IoT research
- 5) Big Data Analytics

(3) Space Research

(4) Nuclear Energy, Isotope and Nuclear
Weapon Research

(5) Medical & Pharmaceutical Research

(6) Business & Financial Analysis

(7) Large scale gaming, social platform operation
etc.

Quantum Computing

0100100
QBit

0 या 1 Bit



0
0.00000001
0.001
0.000000000000000001

Q-Bit

< 400 qBit