KGS IAS

Science & Technology

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Topics

1) Super Computing
2) Quantum Computing

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1) Super Computing
2) Quantum Computing

1. Super computers

The most powerful Computers available at any point of time

The present requirement:

Min. performance

↓

10^9 FLOPS

(Floating Operations Per Second)

more resource demanding
for a computing system

→ FLOPS is a reliable indicator of
a computer's performance

mark)

→ one of the earliest run programmes on supercomputers → to establish FLOPS

- Super computers = HPCs
  (High performance Computers)

# of Super Computers

(1) Very high performance → 10^9 FLOPS & Higher

10^6 → Mega
10^9 → Giga
10^{12} → Tera
10^{15} → Peta
10^{18} → Exa

is carried out.

Breaking a complex problem into several parts

Handling each part
- Independently
- Parallelly

4. Scalability
5. Very high level of memory
6. Excellent data flow & networking
7. Different operating systems
8. Dedicated physical infrastructure & Cooling system

→ Top-500 project → ranks the 500 most powerful Computers at any time globally

- based on LINPACK SCORE
- updated twice a yr.
- Since 1993

- Latest → 62nd Ed. Nov. 2023

2. Aurora (Intel)	USA	~585 x 10	~1 x 10
3. Eagle (Intel+NVIDIA)	USA	~561 x 10^{15}	~846 x 10^{15}
4. Fugaku (Fujitsu)	Japan	~442 x 10^{15}	~537 x 10^{15}
5. Lumi (AMD)	Finland	~379 x 10^{15}	~531 x 10^{15}
6. Leonardo (Intel +NVIDIA)	Italy	~238 x 10^{15}	~304 x 10^{15}

HPC	Top-500 Rank	Performance	Role
Airawat	90	~13 PF	AI Supercomputer
Paramsiddhi	163	5.27 PF	Multi-purpose Complex Scientific Research
Pratyush	201	4 PF	Weather Forecasting & Climate Change studies
Mihir	354	2.8	,, ,,

(4) Business &
Industrial Applications
- ↳ Automobile Design
- ↳ Aerospace Design
- ↳ Business Analytics (Risk Analysis)
- ↳ High volume trading

(5) Space studies

(6) Large scale data-processing

(7) " " service delivery