National Supercomputing Mission

Part of: GS Prelims and GS-III- S&T

India has produced just three supercomputers since 2015 under the National Supercomputing Mission (NSM).

National Supercomputing Mission

- The National Supercomputing Mission was announced in 2015, with an aim to connect national academic and R&D institutions with a grid of more than 70 high-performance computing facilities at an estimated cost of ₹4,500 crores over the period of seven years.
- It supports the government’s vision of ‘Digital India’ and ‘Make in India’ initiatives.
- The mission is being implemented by the Department of Science and Technology (Ministry of Science and Technology) and Ministry of Electronics and Information Technology (MeitY), through the Centre for Development of Advanced Computing (C-DAC), Pune and Indian Institute of Science (IISc), Bengaluru.
- It is also an effort to improve the number of supercomputers owned by India.
  - These supercomputers will also be networked on the National Supercomputing grid over the National Knowledge Network (NKN). The NKN connects academic institutions and R&D labs over a high-speed network.
- Under NSM, the long-term plan is to build a strong base of 20,000 skilled persons over the next five years who will be equipped to handle the complexities of supercomputers.

Key Points

- Progress of NSM:
  - NSM’s first supercomputer named Param Shivay has been installed in IIT-BHU, Varanasi, in 2019. It has 837 TeraFlop High-Performance Computing (HPC) capacity.
  - The second supercomputer with a capacity of 1.66 PetaFlop has been installed at IIT-Kharagpur.
  - The third system, Param Brahma, has been installed at IISER-Pune, which has a capacity of 797 TeraFlop.

- Incomplete Utilization of Funds allocated to NSM:
  - The NSM envisaged setting up a network of 70 high-performance computing facilities in the country but skewed funding for the mission during the initial years slowed down the overall pace of building supercomputers.
  - Only 16.67 % of the total budget of Rs 4,500 crore, has been utilised during the last four-and-a-half years for execution of the mission.

- Global Scenario:
  - Globally, China has the maximum number of supercomputers and maintains the top position in the world, followed by the US, Japan, France, Germany, Netherlands, Ireland and the United Kingdom.

PT SHOTS:

- Teraflops: It is a unit of computing speed equal to one million million (10^12) floating-point operations per second (FLOPS).
**Petaflops**: It is a unit of computing speed equal to one thousand million million ($10^{15}$) floating-point operations per second (FLOPS).

### India’s Super computers

- Bhabha Atomic Research Centre  **ANUPAM-AGANYA**
- Centre for Development of Advanced Computing, Pune **PARAM Yuva**
- CSIR Fourth Paradigm Institute, Bangalore **Cluster Platform**
- Indian Institute of Science, Bangalore **SahasraT**
- Indian Institute of Technology (BHU) Varanasi **Param Shivay**
- Indian Institute of Technology Delhi **PADUM**
- Indian Institute of Technology Guwahati **PARAM ISHAN**
- Indian Institute of Technology Kanpur **HPC 2013**
- Indian Institute of Technology Madras, Chennai **VIRGO Cluster**
- Indian Institute of Tropical Meteorology, Pune **Aaditya**
- Physical Research Laboratory, Ahmedabad **VIKRAM-100**
- Tata Consultancy Services, Pune **EKA**
- Tata Institute of Fundamental Research, Mumbai **Cray XC30**
- Vikram Sarabhai Space Centre, Indian Space Research Organisation **SAGA**

**Recent:**

- Indian Institute of Tropical Meteorology **Pratyush (Cray XC40)**
- National Centre for Medium Range Weather Forecasting **Mihir (Cray XC40)**