National Supercomputing Mission

French technology firm **Atos** will build a network of 70 supercomputers across India under the **National Supercomputing Mission.**

- The supercomputers will be **manufactured and designed in India**, and will boost India's supercomputing capabilities. However, in terms of the speed, they will **greatly lag those built by China**, the world's largest supercomputer powerhouse.
- The **first three supercomputers** will be set up in **IIT BHU, IIT Kharagpur and IIITM Pune**. While IIT BHU will get a one Petaflop supercomputer, the other two institutes will have 650 Teraflops each.

National Supercomputing Mission

- The National Supercomputing Mission was **announced in March 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 crore** over the period of **seven years.**
- It supports the government's vision of '**Digital India**' and '**Make in India**' initiatives.
- The mission will be 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) and Indian Institute of Science (IISc), Bengaluru.**
- 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.
- **PARAM Shavak** is one such machine that has been deployed to provide training.

Advantages

- These supercomputers will **meet the increasing computing demand of the scientific and academic community** in the country, international technology trends and roadmaps of leading countries in the area, strategic importance and emergence of supercomputing as a benchmark for Scientific & Technological advancements.
- These machines will be part of the **National Supercomputing grid over the National Knowledge Network (NKN),** which will have wide-scale applications in the fields of **climate modelling, weather prediction, aerospace engineering , computational biology, molecular dynamics, atomic energy simulations, national security and defence applications, seismic analysis, disaster prediction and management, computational chemistry, big data analytics, finance and more.**

Supercomputers in India

- India's supercomputer program was started in **late 1980s because Cray supercomputers** could

not be imported into India due to an **arms embargo imposed on India,** as it was a dual-use technology and could be used for developing nuclear weapons.

- This led to setting up the **Centre for Development of Advanced Computing (C-DAC) in March 1988** with the clear mandate to develop an indigenous supercomputer to meet high-speed computational needs.
- **PARAM 8000,** considered to be India's first supercomputer was **indigenously built in 1991** by the Centre for Development of Advanced Computing (C-DAC).
- Presently, **Pratyush, a Cray XC40 system -** an array of computers that can deliver a **peak power of 6.8 petaflops,** installed at the **Indian Institute of Tropical Meteorology (IITM), Pune,** is the fastest supercomputer in India. Launched in January 2018, it is the **fourth fastest High Performance Computer (HPC) dedicated to climate modelling in the world.**

Way Forward

- The biggest challenge for India is **limited funding.** Limited investments and delayed release of funds slowed things down further.
- This is one of the main reasons why India, which has the capacity to build a world-class system, has never reached the top position in the rankings.
- While India's stronghold is in the field of software development, it has to depend on imports to procure the hardware components required for building supercomputers.
- But the situation is changing, with India now venturing into design, manufacture and assembly of hardware components. This will not only cut down import costs, it will also ensure that while assembling supercomputers, applications are tailored to address problems that are specific to India.