Digital India RISC-V (DIR-V) Program

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Why in News?

Recently, the **Union Minister of Electronics & IT** addressed the **Digital India RISC-V (DIR-V) Symposium** organized by IIT Madras in Chennai.

- The one-day symposium, organized by IIT Madras, emphasized the government's vision for DIR-V which currently aims to build a robust **ecosystem for RISC-V** with effective **public-private partnerships** and collaborations with premiere academic institutions.

What is the Digital India RISC-V (DIR-V) Program?

- **About:**
  - The DIR-V Program is a forward-looking initiative that aims to **uplift India's** semiconductor ecosystem.
  - Its primary goal is to promote **indigenous innovation in the field of** microprocessors, laying the foundation for self-reliance.
  - The program emphasizes three key principles: **innovation, functionality, and performance,** shaping its direction for the future.
- **Navigating Complex Digital Realities:**
  - The program acknowledges the increasing demand for **silicon chips in today's digitized world.**
  - As emerging technologies like 5G **and** 6G **reshape the digital landscape,** DIR-V anticipates finding applications in various areas such as **cloud services**, Internet of Things **(IoT), and sensors.**
- **Integral Role in High-Performance Computing:**
  - DIR-V is positioned at the heart of India's aspirations for high-performance computing.
  - Collaborations with organizations like the **Center for Development of Advance Computing (C-DAC)** and public-private partnerships will ensure that DIR-V plays a pivotal role in these ambitious goals.

RISC-V:

- The term RISC stands for **"reduced instruction set computer"** which executes few computer instructions whereas **'V' stands for the 5th generation.**
- It is an **open-source hardware ISA (instruction set architecture)** used for the development of **custom processors targeting a variety of end applications.**
- It also enables designers to **create thousands of potential custom processors, facilitating faster time to market.** The commonality of the processor IP also saves on software development time.
- RISC-V processors find versatile applications in **wearables, IoT, smartphones, automotive, aerospace,** and more, offering power efficiency, performance customization, and security. They excel in space-constrained designs and complex computational tasks.
  - The RISC was invented by **Prof. David Patterson around 1980 at the University of California, Berkeley.**

Centre for Development of Advanced Computing (C-DAC):

- It is the leading R&D institution under the **Ministry of Electronics and Information Technology (MeitY),** specializing in IT, Electronics, and related areas.
- Established in 1988 to counter the denial of supercomputer imports, C-DAC's journey began with the development of **India's first Supercomputers PARAM.**
- C-DAC plays a pivotal role in **India's IT revolution by continuously innovating and leveraging its expertise** to develop and deploy IT products and solutions aligned with the nation's policies and market needs.