DHRUV64

Prelims: *Current events of national and international importance | Science & Technology*

Why in News?

The Ministry of Electronics and Information Technology (MEITY) announced the launch of DHRUV64, an indigenous microprocessor that would strengthen the national indigenous processor pipeline.

- **DHRUV64 –** It is India's ***1st fully indigenous 64-bit microprocessor***.

  Microprocessor *– A single semiconductor chip that combines the essential functions of a computer (arithmetic and logic, control, storage, input, and output), serving as its central processing unit (CPU).*

- **Developed by –** The Centre for Development of Advanced Computing (C-DAC) under MEITY's Microprocessor Development Programme.

Key Features

- **Technical Specifications –** A ***64-bit, dual-core*** microprocessor running at 1 GHz acts as the central "brain" of electronics.
- It is powerful enough to handle operating systems yet efficient enough for embedded deployments.
- **Performance –** Compared to consumer-grade chips -
  - It is ***far below*** smartphone/laptop processors that feature multiple cores, higher clock speeds, and integrated GPUs.
  - It ***lacks specialised blocks*** (e.g., GPUs, AI accelerators) that drive machine learning and graphics-heavy workloads.
- **Architecture –** Based on ***RISC-V***, an ***open instruction set*** that is ***publicly available,*** and anyone can design a chip that follows it without paying a license fee for the instruction set itself.
- The Governments and research groups prefer RISC-V to avoid dependence on foreign-controlled IP.

  DIR-V (*Digital India RISC-V programme) – It creates a portfolio of indigenous RISC-V–based microprocessors for use across industry, military, and consumer*

technologies.

- **Potential Applications** – Consumer electronics, telecom subsystems, industrial automation, routers and networking gear, automotive modules.
- These systems focus on reliability and strong hardware–software integration rather than raw performance.
- **India's DIR-V Chips So Far** – THEJAS32, THEJAS64, DHRUV64.
- **India's Indigenous Processor Ecosystem**

Processor	Institution	Year	Key Focus
SHAKTI	IIT-Madras	2018 onwards	General-purpose CPUs, embedded systems, secure computing, based on RISC-V
AJIT	IIT-Bombay	2018	Low-cost, low-power microprocessor for education, industrial controllers
VIKRAM	ISRO-Semiconductor Lab	2022	Spaceflight systems, mission-critical applications
THEJAS 64	C-DAC	2025	64-bit processor for industrial automation, telecom, and strategic operations

Reference

The Hindu | DHRUV64 indigenous microprocessor