Initiatives of National Internet Exchange of India

Why in News

Recently, the **Ministry of Electronics and Information Technology (MeitY)** has inaugurated **three new initiatives/services** of **National Internet Exchange of India (NIXI).**

- **IP Guru, NIXI Academy, NIXI-IP-INDEX** have been launched to facilitate adoption of IPv6 and create an environment to ensure smooth transition from IPv4 to IPv6.

Key Points

- **About the National Internet Exchange of India (NIXI):**
    - NIXI is a **not-for-profit organization** (**section 8** of the Companies Act 2013) working **since 2003** for **spreading the internet infrastructure** to the citizens of India through the following activities:
        - **Internet Exchanges** through which the internet data is exchanged amongst Internet Service Providers (ISP's), Data Centers and Content Delivery Network (CDNs).
        - .IN Registry, **managing and operation of .IN country code domain** and .BHARAT IDN (Internationalized Domain Name) domain for India.
        - Indian Registry for Internet **Names and Numbers** (IRINN), managing and operating Internet Protocol **(IPv4/IPv6).**
- **About the Three New Initiatives:**
    - **IPv6 Expert Panel (IP Guru):**
        - It is **a group to extend support to all the Indian entities** who are finding it technically challenging **to migrate and adopt IPv6.** It will be **offering its services free of cost.**
        - It's a joint effort of the Department of Telecom **(DOT), MeitY** and industry.
- **NIXI Academy:**
    - NIXI Academy is created **to educate technical/non-technical people** in India to learn and relearn technologies like IPv6 which are normally not taught in Educational Institutes.
    - Successful candidates (after passing examination) **can take a certificate from NIXI**, which will be useful to find/upgrade jobs in the Industry.
- **NIXI-IP-INDEX:**
    - NIXI has developed **an IPv6 index portal** for the Internet community.
    - NIXI-IP-INDEX portal will **showcase the IPv6 adoption rate in India and across the world.** It can be used to compare IPv6 Indian adoption rate with other economies in the world.
    - It will also include **details about web adoption in IPv6, IPv6 traffic etc.**

Transition from IPv4 to IPv6

- **IP:** 'IP' stands for 'Internet Protocol'. It is a **set of rules** that dictate how data should be delivered over the public network (Internet).
- **IPv4:**
    - IPv4 was the first major version of IP. It was deployed for production in the ARPANET in 1983.
    - It is the most widely used IP version. It is used to identify devices on a network using an addressing system.
    - The IPv4 **uses a 32-bit address scheme.** Till date, it is considered the primary Internet Protocol and carries 94% of Internet traffic.
    - It provides **an addressing capability of approximately 4.3 billion addresses.**
- **IPv6:**
    - It is the **most recent version of the Internet Protocol.** The Internet Engineer Task Force initiated it in early 1994. The design and development of that suite is now called IPv6.
    - This new IP address version is being deployed to fulfill the need for more Internet addresses.
    - IPv6 is **also called IPng (Internet Protocol next generation).**
    - It has the **capability to provide an infinite number of addresses.**
    - With **128-bit address space**, it allows 340 undecillion unique address space. It can easily accommodate the growing number of networks worldwide and help solve the IP address exhaustion problem.
- **Benefit of Transitioning to IPv6:**
    - The most well-known benefit that IPv6 offers is the **exponential address space**, practically inexhaustible in the foreseeable future. Therefore, it allows **simple, seamless, and cost-effective connectivity** for service providers, enterprises and end-users.
        - It is considered especially important with the impending move to **5G**, which will massively increase the total number of devices connecting to the Internet.
    - The IPv6 operating systems **automatically create two IPv6 addresses.** One IPv6 with randomised MAC address in the suffix to hide the device identity and another IPv6 with real MAC address which is only used for end-to-end encrypted applications.
    - IPv6 has **a privacy protocol** to protect end-user privacy. The current internet (v4) lacks effective privacy and effective authentication mechanisms.
- **Importance for India:**
    - The sustainable development and evolution of internet infrastructure is **essential to the global cyberspace and digital economy**, and IPv6 root server, which controls and manages the internet, can serve as a great tool.
    - Creating such critical infrastructure at the national level is important. As a critical internet resource, the IPv6 root server system is **pivotal to manage the security and stability of the internet.**
    - It will **contribute to in-country expertise building on critical information infrastructure** as well as promoting 'a major technological knowledge base within the country', and having a root server within the country would facilitate surveillance by Indian legal authorities.

Source: PIB