



# Virtual Private Network

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## Why in News?

Russia's tightening grip on **online content** in recent years has led to a significant surge in [Virtual Private Network \(VPN\) usage](#) among citizens seeking unrestricted access to information and media platforms.

## What is a VPN?

- **About:** A **VPN** is a technology that establishes a **secure and private connection between a user's device and the internet**. VPNs encrypt the internet traffic and disguise the user's online identity.
  - VPNs can **bypass geo-restrictions** and censorship. By connecting to a VPN server in a different location, users can access content and websites that may be restricted or blocked in their region.
- **Mechanism:**
  - **Encryption:** When a user connects to a VPN, all data transmitted and received is encrypted.
    - Encryption **converts data into a code** that only the user's device and the VPN server can decipher using a decryption key.
  - **Secure Tunneling:** Encrypted data travels through a **secure tunnel to the VPN server**.
    - This tunnel prevents unauthorised parties like [Internet Service Providers \(ISP\)](#), hackers or government agencies from intercepting or monitoring the user's online activities.
  - **IP Address Masking:** The user's real IP address, which can reveal their location and device information, is **replaced with the IP address of the VPN server**.
    - This masking process enhances user privacy and makes it difficult for websites to track the user's actual location.

## What are Other Key Technologies Similar to VPN?

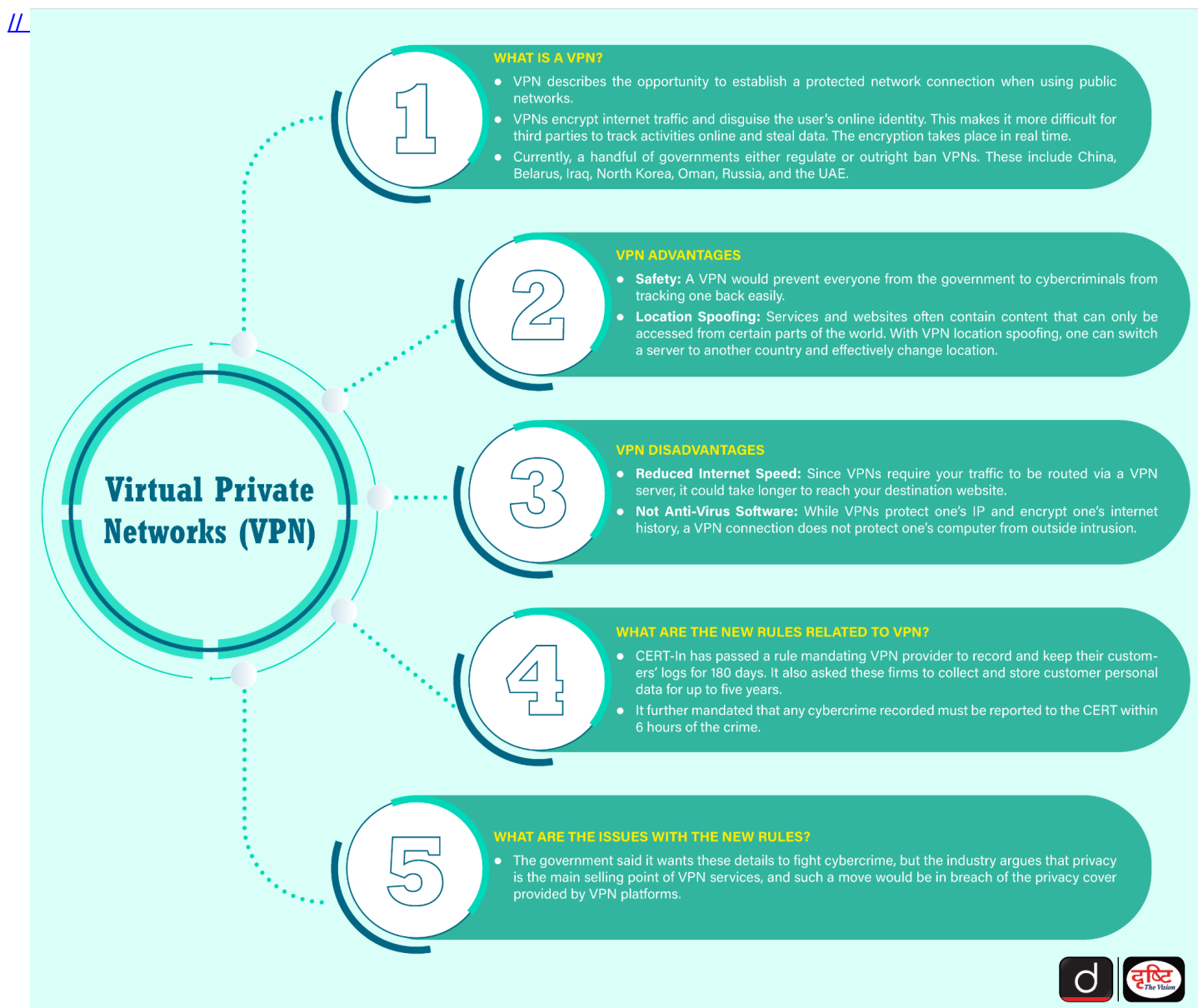
- [Smart Domain Name System \(DNS\)](#): It provides a proxy server resource for additional protection of a user's identity by masking a **user's ISP-generated DNS address** with a different address, generated by the Smart DNS device, before sending the user request to the internet.
- [The Onion Router](#): It protects user data by encapsulating the data in **multiple layers of secure encryption**, using the **Onion Protocol**, as it routes the data from sender to receiver.
  - The process ensures that a user's identity is protected from ISPs and advertisers.
- **Proxy Servers:** Proxy servers act as intermediaries between a user's device and the internet.
  - They can be used to hide the user's IP address, bypass content filters, and improve speed by caching frequently accessed web pages.

## Note:

- In 2022, the **Indian Ministry of Electronics and Information Technology** introduced

regulations mandating VPN providers, data centres, virtual service networks, and cloud providers to record users' personal details for five years.

- They must also log usage patterns, and service purposes, and report cybersecurity incidents to CERT-In within six hours.



## UPSC Civil Services Examination, Previous Year Question

**Q. What is “Virtual Private Network”? (2011)**

**(a)** It is a private computer network of an organization where the remote users can transmit encrypted information through the server of the organization.

**(b)** It is a computer network across a public internet that provides users access to their organization's network while maintaining the security of the information transmitted.

**(c)** It is a computer network in which users can access a shared pool of computing resources through a service provider.

**(d)** None of the statements (a), (b) and (c) given above is a correct description of Virtual Private Network.

**Ans: (b)**

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