

Prelim Bits 24-01-2024 | UPSC Daily Current Affairs

End To End Encryption (E2EE)

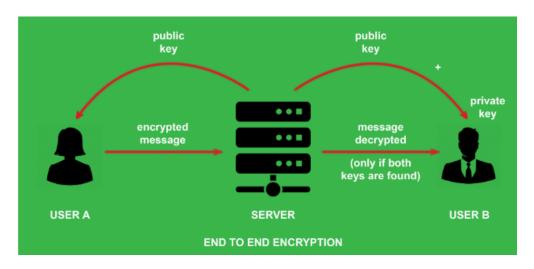
In the digital era, information is wealth and so encryption is an important way to protect it.

Encryption

- It is the act of *changing some consumable information into an inconsumable form* based on some rules.
- **Key** A data using which a computer can 'unlock' (decrypt) some 'locked' (encrypted) text, knowing the set of rules used to 'lock' it.
- **Types** Encryption-in-transit and E2E encryption.
- **Encryption-in-transit** It is encryption before a message is relayed from the server to you (or vice versa).
 - **E2E** <u>End-to-End encryption</u> refers to encryption of particular locations between which information moves.
 - Here, the message is *encrypted both in transit and at rest* i.e. when being relayed from your phone to the server (or vice versa) and when is inside the server.
 - Ways of encryption It depends on the level of secrecy and protection required.
 - Symmetric encryption A way of using the same key for encryption and decryption, useful when the sender and the recipient are the same person.

The Advanced Encryption Standard (AES) which is seen while setting your WiFi password, is also a symmetric encryption algorithm.

- Asymmetric encryption A way of using <u>different keys for encryption and</u> <u>decryption</u>.
 - **Public key** It is the encryption key
 - **Private key** It is the decryption key.



End to End Encryption (E2E) is a type of asymmetric encryption.

- **Challenges** A *potent malware can 'snoop'* on the messages by infiltrating the device and reading them before they are encrypted.
- In case of *man-in-the-middle (MITM) attack*, the attacker acquires the key by hacking either of end devices.
- *Illegal use of backdoor or exceptions* installed by the parent company for legal purposes.

Hash Function

- It is responsible *for encrypting a message*.
- **3 functions** It will accept an input message and produce an <u>encrypted version called</u> <u>the digest</u>.
- It should accept a message of any length and *produce a digest of a fixed length*, irrespective of how long or short the message is.
- It should produce *unique digests for unique messages*.

Reference

The Hindu | Working of End to End Encryption

Indian National Army (INA)

In 2024, January 23rd marks the 127th anniversary of Netaji Subhas Chandra Bose.

- **INA** It is also known as **Azad Hind Fauj** (*Free Indian Army*).
- **Formation** *In 1942 by Mohan Singh*, mostly comprised Indian prisoners of war (PoWs) captured by the Japanese during their Southeast Asia campaign during WWII.
- **Aim** To secure Indian independence from British rule.
- **Headquarters** Singapore, later **shifted to Rangoon** in Myanmar (since January 1944).
- **Fighting brigades** They were named after Gandhi, Azad, Nehru, Bose and the *Rani Jhansi brigade* (an exclusive women force).
- Revival In 1943 by Subhas Chandra Bose.
- 12,000-strong INA eventually grew to more than 40,000 personnel.
- Many civilian volunteers from the *Indian expatriate population in Malaya (Malaysia)* and *Burma* also joined.
- It had its *own currency, postage stamps and symbols* portraying a vision of a liberated India.
- Successful activities INA <u>crossed the Burma border</u>, and stood on Indian soil by March, 1944 and <u>hoisted the tricolour flag</u> and subsequently advanced up to Kohima and Imphal.
- It *controlled the Andaman Islands* and parts of Manipur briefly.

The 2 slogans 'Delhi Chalo' and 'Jai Hind' were the war cry of the INA.

- Downfall They failed to take Imphal and Kohima, was forced to retreat.
- By 1945, the British had retaken Burma, many perished or surrendered and it got completely vanished after Bose death and Japan surrender.
- **Positive impact** Though *INA was disbanded in 1945*, it made a significant impact in Indian freedom struggle.
- It ignited the Indian soldiers, led to the <u>revolt of Royal Indian Navy and Royal</u> <u>Indian Airforce in 1946.</u>

Shah Nawaz Khan, Prem Sahgal and Gurbaksh Singh Dhillon, faced the 1st and most high-profile of court martials (**INA trails**), became a potent symbol of the unity of Indians.

- INA were <u>not at all affected by communal divisions.</u>
- They demonstrated the <u>capabilities of Indian Women waging armed struggle</u> and also the <u>enthusiasm and concern of overseas Indians for the freedom of their motherland.</u>

Reference

The Indian Express INA's struggle for Indian Independence

Centre of Excellence in AI for sustainable cities

15 consortiums have applied for the chance to set up a Centre of Excellence in AI to help Indian cities achieve demonstrable improvements in the SDGs that are relevant to them.

2023 Union budget of India had announced to set up **3 AI Centres of Excellence** targeting agriculture, health and sustainable cities domain as a part of 'Make AI in India' and 'Make AI Work for India' initiatives.

- **Set up by** *Ministry of Education*, collaboration with the Ministry of Housing and Urban Affairs.
- Union budget Rs. 300 crore.
- **Objectives** To help *create AI-based applications* and scalable solutions and products that have a disproportionate societal impact.
- **Focus** <u>City planning, traffic management, water and sewage network systems,</u> effective distribution of gas and electricity, etc.
- **Data** From *GIS maps, sensors deployed in public spaces, and satellite feeds*.
- It could be reduced down to the level of a household and can be aggregated at street, city/village, taluk, district, state, and country level.
- **AI inspired tool** It could p*redict the need for a resource at a particular place* or design of a public space.
- **Significance** They will strive to help the Smart Cities
 - Reduce energy consumption in target sectors by 15%
 - Reduce air and water pollution by 10% and reduce pollutant levels in rivers and

seas

- Improve sewage and garbage disposal outcomes by 25%
- Increase the *reclamation of water and solid waste*
- *Improve access to transportation*, leading to a 20% reduction in commuting time.

Ministry of Education has established a central project management unit (CPMU) at IIT-Jammu for establishing 3 AI centres of excellence.

References

- 1. The Hindu AI for improving sustainability of Indian Cities
- 2. Communications Today 3 AI centres of excellence

PM-KISAN Scheme

According to recent data from Ministry of Agriculture and Farmers' Welfare, every 4^{th} beneficiary added under PM-Kisan scheme over the past 2 months is a woman.

- **PM-KISAN** Pradhan Mantri Kisan Samman Nidhi is a *Central Sector scheme* with 100% funding from Government of India.
- Launched in 2019, retrospectively operational from 2018.
- **Objective** To provide <u>income support of Rs. 6,000 per year</u> to farmers in 3 equal instalments of <u>Rs.2000 each</u>, <u>every 4 months</u>.
- To <u>supplement financial needs</u> for procuring various inputs related to agriculture and allied activities as well as *domestic needs*.
- Beneficiaries <u>All land-holding farmer families</u>, <u>irrespective of the size of their landholdings</u>.
- A landholder farmer's family is defined as "a family comprising of <u>husband</u>, <u>wife and minor children</u> who own cultivable land as per the land records of the concerned State/UT".
- **DBT** The amount is <u>directly transferred to the bank accounts</u> of the beneficiaries without intermediaries.

PM-KISAN is the largest Direct Benefit Transfer (DBT) scheme for farmers in the world. While the beneficiaries rose sharply, hitting a peak of 10.47 crore in April-July 2022, it dropped to 8.12 Cr during August-November 2023.

Exclusion criteria under PM-KISAN Scheme

- It excludes all institutional land holders.
- It excludes farmer families in which <u>one or more of its members belong to</u> following categories
 - Former and present holders of *constitutional posts*
- Former and present <u>members of legislature</u>, <u>mayors</u> of municipal corporations and chairpersons of District Panchayats.
- All <u>serving or retired officers of government</u>, attached offices and autonomous institutions under government.
- All superannuated or retired *pensioners Rs.10,000/-or more*(Excluding Multi-Tasking staff employees)
 - All Persons who paid income Tax in last assessment year
- <u>Professionals</u> like Doctors, Engineers' Lawyers and more registered with Professional bodies.

Viksit Bharat Sankalp Yatra (VBSY)

- It is centre's flagship initiative to *raise awareness on its schemes*.
- Launched in December 2023, will run till January 2024.
- **Aim** To ensure that <u>all intended beneficiaries are covered</u> under various flagship schemes of the Central government and thereby <u>achieving beneficiary saturation</u> under government schemes.

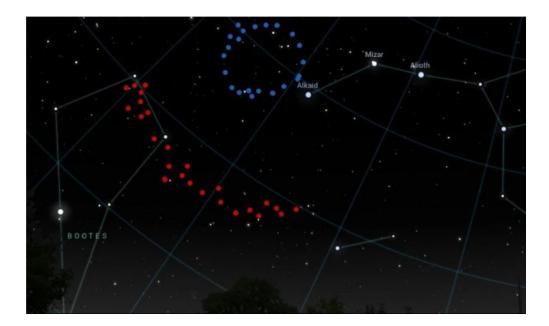
References

- 1. The Indian Express Increase in Beneficiaries under PM-KISAN
- 2. PM KISAN PM-KISAN Scheme

Big Ring

Recently, scientists have discovered massive superstructures in space and named it as Big Ring.

- **Big Ring** They are <u>ultra-large superstructure</u> in the sky, about <u>**9.2 billion light-years away from Earth**</u>.
- It isn't actually even a ring, it's coiled sort of like a slinky.
- Formation It is made up of *galaxies and galaxy clusters*.
- **Diameter** About 1.3 billion light years.
- **Circumference** About 4 billion light-years.
 - It would *take 15 full Moon to cover it* despite being millions of times farther away than the natural satellite.



Giant Arc is the previously discovered super structure which is even more massive, with a diameter of 3.3 billion light-years. Both the Big Ring and the Giant Arc are cosmic neighbours and are only about 12 degrees apart from the time.

- Challenges Both the super structures defy cosmological theory.
- Unlike Baryonic Acoustic Oscillations (BAOs), it is too large and is not spherical and another theory is that it could be caused by cosmic strings.
- Thus, their ultra-large sizes, distinctive shapes, and cosmological proximity needs to be studied further.

Scientific concepts related to Big Ring

- **Cosmological theory** All structures in the universe can be traced back to the <u>cosmic microwave background (CMB) radiation</u>, the so-called "fireball of the Big Bang" that scientists observe filling the universe.
- Baryonic Acoustic Oscillations (BAOs) They are <u>acoustic waves from the early universe</u>, and statistically, they should appear as spherical shells in the arrangement of galaxies.
- **Cosmic strings** They are <u>hypothetical 1D topological defects</u> believed to have formed <u>from the remnants of the cosmic fabric</u>, left over from cosmic symmetry breaking shortly after the Big Bang.
- They are extremely thin and possess an immense amount of energy.
- **Quasars** They are extremely *luminous interiors of active galaxies* which are powered by supermassive black holes.

References

- 1. The Indian Express Discovery of Big Ring in Space
- 2. Space | Superstructure celestial anomaly

Other Important Topics

EXERCISE KHANJAR

- The 11th edition of *India-Kyrgyzstan* Joint Special Forces Exercise KHANJAR has commenced at the Special Forces Training School in Bakloh, Himachal Pradesh recently.
- It is an *annual event* conducted alternatively in both the countries.
- **Aim** To exchange experiences in Counter Terrorism and Special Forces Operations in Built-up Area and Mountainous Terrain under *Chapter VII* of United Nations Charter.

Subhash Chandra Bose Aapda Prabandhan Puraskar

- Subhash Chandra Bose Aapda Prabandhan Puraskar was recently announced to commemorate the birth anniversary of Netaji Subhash Chandra Bose.
- It is to recognize and honour invaluable contribution and selfless service rendered by individuals and organizations in the field of disaster management.
- It was administered by **National Disaster Management Authority (NDMA).**

Hottest Year, 2023

- The World Meteorological Organization (WMO) has officially confirmed that 2023 is the hottest year on record by a huge margin, smashing global temperature records.
- ullet The yearly average global temperature approached $\underline{\textit{1.5 degrees Celsius}}$ above pre-industrial levels.
- The *Paris Agreement* established a critical threshold, limiting global temperature change to no more than 1.5 degrees Celsius.

Investment Forum for Advancing Climate Resilient Agrifood Systems

- It is jointly launched by
 - The National Institution for Transforming India (NITI Aayog),
 - The Ministry of Agriculture and Farmers' Welfare (moa&FW), and
 - The Food and Agriculture Organization of the United Nations (FAO)
- The conclave will discuss an investment and partnership strategy to advance climate resilient agri-food systems among the government, private sectors, and farmers' organisations.

Sweden in NATO

- **Turkey** approved Sweden's application for NATO membership recently.
- Sweden and Finland applied for NATO membership in 2022 and *Finland got its membership in 2023.*
- Hungary then becomes the only NATO ally not to have ratified Sweden's accession.
- North Atlantic Treaty Organization (NATO) is a military alliance established in 1949 of states from Europe and North America to ensure collective security in Western Europe.

Daagna

- Daagna (branding) is a practice among some tribal communities of Madhya Pradesh, most prominent among the Baiga (traditionally priests), Kol, and Gond (traditionally rulers) tribes.
- It involves branding infants and children with *iron rods or hot objects* to treat undiagnosed illnesses.

Khelo India Youth Games 2023

- Prime Minister to inaugurate Khelo India Youth Games 2023 in Chennai, being held also in Madurai, Trichy, and Coimbatore.
- This is the <u>1st time</u> the games are being held in <u>South India</u>.
- For the 1st time, Tamil Nadu's Silambam is set to debut as 'demo sports'.

Malaria in Cabo Verde

- The World Health Organization (WHO) has certified Cabo Verde (also known as Cape Verde) as a *malaria-free country* recently.
- It becomes the 3^{rd} country to acquire the status in the global health organisation's African region.
- Africa has the highest malaria burden and accounted for roughly 95% of global malaria cases and 96% of related deaths in 2021.

Amalek

- The Amalekites, descendants of Amalek, were an <u>ancient biblical nation (in Hebrew Bible)</u>, were the first to attack the children of Israel (Jewish people) after their escape from Egypt into Sinai.
- In 1980, Rabbi Israel Hess wrote an article that used the story of Amalek to justify wiping out Palestinians.
- The title of the article has been translated as "<u>Genocide: A Commandment</u> <u>of the Torah</u>," as well as "The Mitzvah of Genocide in the Torah".

Treatment of sewage water into Ganga

- The **National Mission for Clean Ganga (NMCG)**, the Centre's nodal agency is responsible for abatement of pollution in river Ganga and its tributaries.
- It has assumed new powers under which it may now **permit the discharge of treated sewage** and effluent that conforms to the prescribed "norms" into the river, canal or water bodies.
- It is done by amending the **River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016**.

