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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** – End-to-End encryption 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 ***different keys for encryption and decryption***.
  - **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 *encrypted version called the digest*. • 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 *crossed the Burma border*, and stood on Indian soil by March, 1944 and ***hoisted the tricolour flag*** 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 ***revolt of Royal Indian Navy and Royal Indian Airforce in 1946.***

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

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** – *City planning, traffic management, water and sewage network systems*, 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 4th 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 *income support of Rs. 6,000 per year* to farmers in 3 equal instalments of *Rs.2000 each, every 4 months*.
- To *supplement financial needs* for procuring various inputs related to agriculture and allied activities as well as *domestic needs*.
- ***Beneficiaries*** – ***All land-holding farmer families***, *irrespective of the size of their landholdings*.
- A landholder farmer's family is defined as "a family comprising of *husband, wife and minor children* who own cultivable land as per the land records of the concerned State/UT".
- **DBT** – The amount is *directly transferred to the bank accounts* 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 *one or more of its members belong to* following categories
- Former and present holders of *constitutional posts*
- Former and present *members of legislature*, *mayors* of municipal corporations and chairpersons of District Panchayats.
- All *serving or retired officers of government*, 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
- *Professionals* 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 *all intended beneficiaries are covered* under various flagship schemes of the Central government and thereby *achieving beneficiary saturation* 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 *ultra-large superstructure* in the sky, about ***9.2 billion light-years away from Earth***.
- 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** – B*oth 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 cosmic microwave background (CMB) radiation, the so-called "fireball of the Big Bang" that scientists observe filling the universe.
- **Baryonic Acoustic Oscillations (BAOs)** – They are *acoustic waves from the early universe*, and statistically, they should appear as spherical shells in the arrangement of

galaxies.

- **Cosmic strings** – They are *hypothetical 1D topological defects* believed to have formed *from the remnants of the cosmic fabric*, 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. • The yearly average global temperature approached ***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 ***1st time*** the games are being held in ***South India***.
• 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 ***3rd 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 *ancient biblical nation (in Hebrew Bible)*, 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 "***Genocide: A Commandment of the Torah***," 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***.

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