GOVERNMENT CLOUD(ESTONIA)

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Background

- Estonia: A small Baltic nation with a big digital vision
- Pioneered in digital governance
- 99% of public services are available online
- Government cloud plays a central role in Estonia's e-state infrastructure (Invisible storage)

What is a Government Cloud?

- A cloud computing platform used by government institutions
- Offers secure, scalable, and efficient data storage and services
- Enables digital governance, service delivery, and inter-agency collaboration
- Eg: AWS GovCloud(US), Estonian Government Cloud (Riigipiliv)

Why Estonia Adopted Government Cloud?

- Improve service efficiency and reduce bureaucracy
- Enable synergy between public institutions
- Increase cyber security and data sovereignty
- Support innovation and digital identity infrastructure

Key Components of Estonia's Government Cloud

- **X-Road** – Secure data exchange layer connecting all government systems
- **Data Embassies** – Cloud-based servers hosted outside Estonia (e.g., in Luxembourg)
- **e-ID** – Digital identity system enabling access to all services
- **e-Residency** – Digital citizenship for global entrepreneurs
- **Cybersecurity Framework** – Advanced protocols and real-time monitoring

Technical Architecture

Distributed cloud infrastructure across public and private data centers

Integration with block chain for data integrity (e.g., KSI block chain)

Standardized APIs for service development

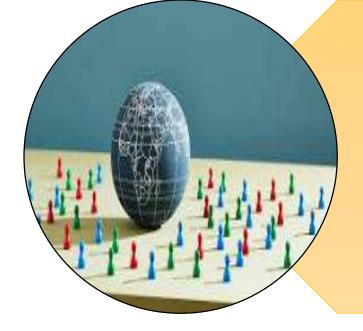Strong access control and encryption measures

Cyber security and Trust

Central Information System Authority (RIA) monitors and manages infrastructure

Frequent stress tests and cyber drills

Multi-layered authentication and block chain time stamping

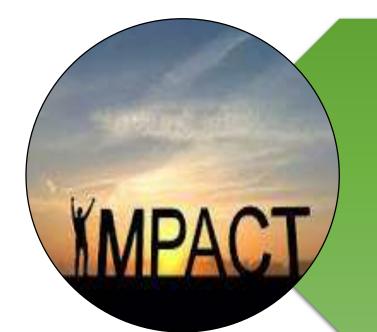Transparent digital logs and citizen control over data access

Data Embassies: Estonia's Global Cloud Backup

First country to establish *data embassies*

Located in friendly foreign countries (e.g., Luxembourg)

Ensures continuity in case of national disasters or cyber attacks

Impact of Government Cloud

Saved millions in administrative costs

Boosted public trust and participation

Attracted international businesses via e-Residency

Inspired digital policies across Europe and the world

Challenges and Criticisms

- Dependence on digital infrastructure
- Data privacy concerns
- Cyber security threats evolving rapidly
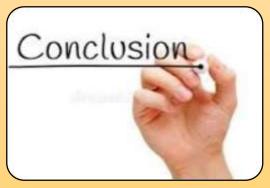- Ensuring digital inclusion for all citizens

Lessons for Other Nations (Including Nepal)

- Importance of legal and digital infrastructure
- Public-private collaboration
- Invest in digital literacy
- Start small and scale gradually
- Emphasize trust, transparency, and resilience

In Context of Nepal

- Initiation phase
- Facility hosted at the Government Integrated Data Center within the National Information Technology Center designed to provide cloud service to various government agencies
- Adoption of G-Cloud was announced for the Budget Fiscal year 2014/15

Conclusion

- Estonia's government cloud is a model for digital governance
- Shows how small countries can lead in digital transformation
- Future of governance lies in secure, accessible, and integrated digital services