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INVENTORY OF APPROACHES & STRATEGIES FOR THE DEVELOPMENT OF CLOUD INFRASTRUCTURE IN EUROPEAN COUNTRIES

The document gathers an inventory of approaches and strategies for the development of cloud infrastructure (different than GovCloud) as they have been/are implemented in European countries, with legislative references provided as a support. The goal of the document is to support Romanian authorities to develop a proper framework and strategy for cloud infrastructure, in line with the commitments assumed under the digital transition pillar of the National Recovery and Resilience Plan. The paper is elaborated as a follow-up to previous AmCham recommendations regarding the digital transformation of the country, and the development of the Government cloud.

CONTEXT & EXECUTIVE SUMMARY

The digital transition pillar of the National Recovery and Resilience Plan (NRRP) of Romania features the development of cloud infrastructure among the key reforms and investments for the digital transformation of of public services and of the country overall.

Previous AmCham recommendations outline the following principles to be considered for the development of the Government cloud – use of the hybrid cloud/multicloud models, definition of a catalogue for services/digital market place, compliance, safety, easy management/ automation, efficiency from energy and environmental standpoints.[1]

A review of existing best practice models for the development of cloud infrastructure could be a useful resource for national authorities for designing a model towards the development and implementation of a nation-wide cloud infrastructure. Therefore, the current paper gathers an inventory of approaches and strategies (including legislative references) with similarities and differences, implemented in **10 European countries**, as follows:

1. United Kingdom (UK) – has a Cloud First strategy;
2. Czech Republic (CZ) – has a 'Cloud where it makes sense' approach;

[1] Principles are detailed in the following document: https://www.amcham.ro/download?file=committeePaper/uE9gD30.pdf&filename=Position%20Paper%20regarding%20the%20Development%20and%20Implementation%20of%20the%20Government%20Cloud

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3. Slovakia (SK) – has a Hybrid Cloud model – including both GovCloud and commercial cloud providers;
4. Hungary (HU) – has a Limited Public Cloud model – entities must apply for permission to the National Security Agency;
5. Estonia (EE) – has a GovCloud extensions approach – including both Public Cloud Providers and the Data Embassy;
6. Greece (GR) – cloud strategy recently adopted;
7. Italy (IT) – has a hybrid model of cloud services in the Italian Public Administration;
8. Lithuania (LT) – has a public cloud;
9. Netherlands (NL) – has a cloud first approach;
10. Bulgaria (BG) – has a Hybrid Cloud model – meaning both GovCloud and commercial cloud providers.

The current analysis identified several common pillars that are essential for the development of an effective framework for Cloud adoption in the public administration, namely:

(a) procurement framework – including the model of framework agreements with suppliers allowing public sector entities to acquire services (e.g. without needing to run a full tender of standard procurement process);

(b) cloud services catalogue – allowing public sector bodies to map cloud services within the cloud procurement framework;

(c) ownership of the cloud-first initiative – institutionalizing a body (national agency/ working group) having ownership of the cloud-first initiative;

(d) citizen-centred approach – focusing the strategy on citizens' needs and the right to use digital public services, as the main enabler for using cloud services in the public sector;

(e) data classification and management – as a way to enforce appropriate labelling, management, hosting and use of data

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UNITED KINGDOM – CLOUD FIRST STRATEGY

1. Cloud First Approach

The UK Government established a "Cloud First" approach to technology policy in May 2013, mandating that central government purchases IT services through the cloud unless it can be proven that an alternative is more cost-effective. Purchases through the cloud should be the first option considered by public sector buyers of IT products and services.

The formal introduction of a "Cloud First" policy was aimed to drive wider adoption of cloud computing in the public sector, boosting business – and furthering savings and efficiencies – through the Government Digital Marketplace, which is a quicker, cheaper and more competitive way for the public sector to acquire digital solutions.[2]

According to the Cloud First policy, ***when procuring new or existing services, public sector entities should consider and fully evaluate potential cloud solutions first – before they consider any other option*** – and source a cloud provider that fits their needs. This approach is mandatory for the central government and strongly recommended to the wider public sector. Departments will remain free to choose an alternative to the cloud if they can demonstrate that it offers better value for money, defined as "securing the best mix of quality and effectiveness for the least outlay over the period of the use of the goods or services bought".

In February 2017 the UK published a clarification from the Government Digital Services regarding its Cloud First commitment[3] , that establishes the move from Cloud First to Cloud Native and also from simply Cloud First to Public Cloud First.

*"**Public cloud first.** By Cloud First, we mean the public cloud rather than a community, hybrid or private deployment model. There are circumstances where the other deployment models are appropriate but the primary benefits for government come when we embrace the public cloud."*

2. This clarification to state that Cloud First means Public Cloud First is a key one. The importance of scale cannot be underestimated when it comes to realizing the benefits of cloud computing, and a private or community cloud cannot come close to matching the massive scale (and associated benefits of scale) of the public cloud.**UK Cloud Framework Summary**

[2] https://www.digitalmarketplace.service.gov.uk/
[3] https://governmenttechnology.blog.gov.uk/2017/02/03/clarifying-our-cloud-first-commitment/

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G-Cloud is the UK Government's procurement framework and digital marketplace for cloud services. The UK Government G-Cloud is an initiative targeted at easing procurement by public-sector bodies in departments of the United Kingdom Government of commodity information technology services that use cloud computing. The G-Cloud consists of:

- A series of framework agreements with suppliers, from which public sector organizations can buy services without needing to run a full tender or competition procurement process;
- An online store – the "Digital Marketplace" (previously "CloudStore") that allows public sector bodies to search for services that are covered by the G-Cloud frameworks;

3. Procurement Process

That **digital marketplace** is owned and managed by UK Government Digital Services. The Digital Marketplace procurement processes handle selection and procurement of services. They do not replace internal processes for securing funds. However, assuming funds are available, procurement from the Digital Marketplace does not require a full tender or mini-competition.

4. Cloud Services Classifications

Cloud services are classified into 3 lots:

- Lot 1/Cloud Hosting (IaaS) and (PaaS): Cloud platform or infrastructure services that can help buyers do at least one of the following processes – deploy, manage and run software and provision and use processing, storage or networking resources;
- Lot 2/Cloud Software (SaaS): Applications that are typically accessed over a public or private network – e.g. the internet and hosted in the cloud;
- Lot 3/Cloud Support.

5. Data Classification

The UK government has also established a data classification scheme for public sector data, using a three-tiered classification with the majority of public sector data classified in the two lowest tiers. The three information classification levels are: OFFICIAL, SECRET and TOP SECRET. There is no accreditation or certification required for data classified at OFFICIAL, and ownership for risk management lays with U.K. Departments. The U.K. government has traditionally categorized approximately 90 percent of its data as OFFICIAL, and most U.K. government agencies have determined that it is appropriate to use reputable, hyper-scale CSPs when

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running workloads with OFFICIAL data. This 'cloud-centric' U.K. approach (as defined by U.K. National Cyber Security Center's (NCSC) Cloud Security Principles published under the Cloud Security Guidance) removes unnecessary burdens from both government customers and cloud providers, allowing for:

- o Greater agility for government
- o Reduced complexity for all parties
- o Improved security through reduced complexity
- o Ownership for risk management on the departments

Table 1 – Example of other types of Three-tier Classification Scheme

Data Classification	System Security Categorization	Cloud Deployment Model Options
Unclassified	Low to High	Accredited Public Cloud
Official	Moderate to High	Accredited Public Cloud
Secret and Above	Moderate to High	Accredited private/hybrid/community cloud/ tightly controlled public cloud

ADDITIONAL DOCUMENTATION RESOURCES

Links to Legislation

- Cloud Guide for the public sector: https://www.gov.uk/government/publications/cloud-guide-for-the-public-sector/cloud-guide-for-the-public-sector

Other related links

- Press Release Cloud First
- List of reliable UK Government bodies: customers are local governments and agencies, universities and charities
- Suppliers

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CZECH REPUBLIC – CLOUD STRATEGY

1. Cloud where it makes sense Approach (rather than Cloud First)

The Czech Government approach to Cloud policy falls under the main theme of cost optimization. The key message that can be found in policy documents is: ***Pick a solution with best price/performance ratio. If a cloud solution can satisfy the requirements and wins an open public tender, then let's choose the cloud solution. If on premise is better, then let's choose on premise*** – designated as the "Cloud where it makes sense approach".

The cloud strategy in Czech Republic acknowledges that the cloud architecture is the most agile and cost efficient and that it should be seriously considered. The most important driver for digitization and cloud adoption in public sector seems to be the Law on the right to receive a digital service, passed by the Czech Parliament in 2018 and governed the right of Czech citizens to be provided with digital services by public authorities, the obligation of public authorities to provide digital Services and other rights and obligations therein related.[4]

2. CZ Cloud Framework Summary

Working group for design of eGovernment cloud has been established in December 2016. Two years later (November 2018) – Detailed analytical report has been produced by the group and approved by the government. Main outputs from the analytical report:

- Basic architecture concept of eGov Cloud
- TCO Model for evaluation of financial aspects of a cloud solution
- Definition of 4 levels of security/confidentiality
  - 4 – top secret; 1 – fully public, no GDPR issues
  - List of norms/certifications a potential eGov cloud provider must meet/fulfill
- High level implementation plan - until 2021
- Governance

3. CZ Cloud Architecture

Architecture of National Cloud in CZ is a combination of "state cloud" (SeGC) and "commercial cloud" (KeGC)

[4] https://joinup.ec.europa.eu/sites/default/files/inline-files/Digital_Government_Factsheets_Czech%20Republic_2019.pdf

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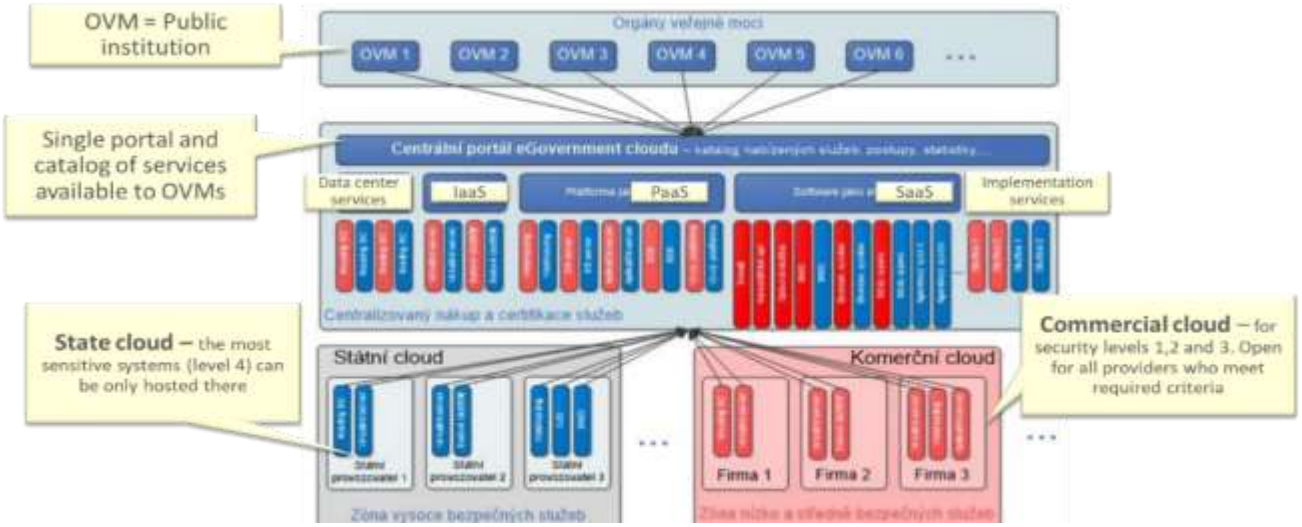

ADDITIONAL DOCUMENTATION RESOURCES

Links to Legislation

- Digital Czechia - This is a very high-level framework for digitization of the country
- eGov Cloud Document: Creation of this document was mandated by the "Digital Czechia" concept
- **Law #12/2020 – Right to receive a digital service from a public institution**
  - Main enabler for using cloud services in the public sector
  - By 2025, each public institution in CZ must be able to provide its services to citizens digitally if a citizen will prefer this approach
  - This law also lays a groundwork for the certification of commercial cloud services
  - Text of the law: https://www.zakonyprolidi.cz/cs/2020-12

Other related laws/regulations for offering cloud services in the public sector:

- **Law #365/2000 – Law about information systems in a public sector**
  - Basic framework for using information technologies in the public sector;
  - Rules of public procurement of information technologies;

- **Law #181/2014 – Cybersecurity law**
  - Requirements for information protection and security of information systems in the public institutions;
  - Establishes „National Cyber Security Agency" – NUKIB;
  - Amends GDPR with more strict and specific regulations.

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SLOVAKIA – HYBRID CLOUD STRATEGY

1. Hybrid Cloud Model

In September 2016, the Government of the Slovak Republic approved National concept of public informatization, under the framework of which the Government cloud is a strategic priority not only for central public administration but for the whole public administration.

Slovakia is moving towards a hybrid model, which – after the involvement of commercial providers – will ease the need for intensive private cloud investment.

2. SK Hybrid Cloud Mission

The intention is to address:

- Typical situations in which the end-user can expect cloud services economic advantage of using a hybrid scheme of government cloud (Use Cases),
- Recommended standards for communication and exchange of data in the hybrid government cloud,
- The processes and basic functions to be performed by the service provider in government cloud,

for *the purpose of the controlled introduction of commercial cloud service providers to the service catalogue of government cloud*.

Another perspective is the alignment with the EU strategy for the development of national cloud services which emphasizes that priority should be given to the hybrid government cloud services usage of government clouds of other EU member states, whereas there is a strong presumption that cloud services developed by and operated by individual EU Member States will be largely similar and will meet strict criteria not only for safety but also for specific requirements of public administration.

3. Overview of SK Cloud Architecture Directions

- National Hybrid Cloud Services:
  - IaaS - current status of IaaS services of the private government cloud, proposal further development
  - PaaS - evaluation of the state of platforms, proposals for the PaaS catalog, automation, SLA division, ways of solving license management

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  - SaaS - solutions
- Value of Hybrid government cloud - how to take advantage of commercial opportunities from cloud service providers, use cases, solutions
- Certification and accreditation of services - a proposal for how to achieve it trusted cloud environment in the context of multiple (also commercial) cloud service providers

4. Expected benefits from PaaS Cloud services

- Simplification of planning: Pre-arranged services with knowhow - they reduce SLA and architecture complexity
- Acceleration of development: Development and testing environments are available in a very short time
- Scalability and flexibility: Key cloud characteristics
- Stability and cheaper operation: New practices like DevOps with support for PaaS automation enables faster and safer solution for change requests and incidents

ADDITIONAL DOCUMENTATION RESOURCES

Links to Legislation

- Cloud Strategy
- Cloud Services Catalog:
- List of hybrid cloud certified services

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HUNGARY – LIMITED PUBLIC CLOUD MODEL

1. Framework for Centralized Procurement

In addition to governmental private cloud in Hungary (called gov.datacenter – KAK2), there is also a ***framework for centralized public procurement of cloud/technology services***:

- Centralized public procurement is managed by a central gov. entity;
- This entity is periodically renewing public procurement lists in many categories, some of these categories covering IT products and services;
- The big IT vendors regularly renewing their approved procurement list;
- These centralized procurement lists contain both on-premise products and cloud services and other services provided by these vendors, like support and consulting services;
- These centralized public procurement possibilities simplify the procurement processes, decrease the competitive risks and shorten the procurement time.

2. Public Cloud Usage in Hungary

- There is a gov. IT security law 2013/L. specifying how gov. IT systems have to be classified from security point of view (similar to Czech Republic)
- But unfortunatelly this classification is not updated with public cloud addendum, so there are no criterias defined, fulfillment of which could permit public cloud usage
- There is a general regulation, which says, that if a public sector entity is willing to use public cloud, they have to apply for permission to the National Security Agency:
  - There is no daily practice for this procedure
  - IT and legal departments of the PS institutions are not motivated to start such an application procedure

ADDITIONAL DOCUMENTATION RESOURCES

Links to Legislation

- gov. decree about the centralization of the gov. IT and comms. infrastructure, putting NISZ into central position „309/2011. (XII. 23.) Korm. rendelet"
- gov. decree about the operation of the governmental datacenter (also mentioning projects and tenants) „467/2017. (XII. 28.) Korm. rendelet"

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ESTONIA – GOVCLOUD EXTENSIONS

1. GovCloud Extensions Approach:

In addition to the Government Cloud on Estonian Territory, ***the national approach to cloud services includes the following extensions:***

- ***Using International Public Clouds***

Constant budgetary pressure and the more flexible licensing conditions offered by major vendors make it necessary to assess the possibility that software is used from the public cloud.

Estonia offers a state infrastructure for data encryption, any information generated by a private person, company or government entity can be securely encrypted, if necessary. In terms of data protection, clear instructions are needed on how to handle information (including sensitive information) produced in municipalities.

All this requires specific guidance from the Ministry of Economic Affairs and Communications (MKM) for the conditions under which it is reasonable to purchase server resources or cloud applications from the private sector, and which factors must be considered. Also, the Data Protection Inspectorate has to develop guidelines for ministries, municipalities and agencies to consult in order to ensure data integrity and protection.

- ***Data Embassy***

Data Embassy is an extension in the cloud of the Estonian government, which means the state owns server resources outside its territorial boundaries. This is an innovative concept for handling state information, since states usually store their information within their physical boundaries. Data Embassy resources are under Estonian state control, secured against cyberattacks or crisis situations with KSI blockchain technology, and are capable not only providing data backups, but also operating the most critical services.

When we say "data embassy", we mean a data centre. It is located in Luxembourg under a Tier 4 level of security – the highest level for data facilities. It is fully under the control of Estonia, but has the same rights as physical embassies such as immunity.

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2. Legislation

e-Governance does not entail a comprehensive system of specialized legislation. Actually, it might even be dangerous to have too many regulations, because it runs the risk of creating a parallel system of governance, and might lock in technologies when they would actually need flexibility in order to facilitate on-going development.

The regulations should address the nature of transactions, and the sensitivity of data, while leaving the technology itself relatively untouched. The essential legal work lies in analyzing existing legislation and identifying gaps as well as areas where law may pose obstacles to the development of e-governance.

The following principles outline the key elements related to the legal side of e-governance:

- avoid over-regulation, because it entails the risk of creating parallel governance structures
- it is essential to review existing laws to ensure that e-governance methods are applicable
- it is important to legally determine the responsible authority (i.e. for carrying out reforms, monitoring the quality and accessibility of services and for receiving complaints, etc.)
- stipulation of data protection rules and also a system of enforcement
- the law must establish a secure form of online identification
- information and communication technology (ICT) law as well as competition law (sector specific and/or general) is important to ensure that proper access to the internet is secured
- e-governance can be an important tool for ensuring better access to information and facilitating democratic participation, but the technology should be seen primarily as the tool and not the determining factor for how to structure such access and participation

ADDITIONAL DOCUMENTATION RESOURCES

- Digital Society in Estonia
- eEstonia – eGovernance in Practice
- Data Embassy

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GREECE – CLOUD STRATEGY

1. Strategy for Digital Transformation & Cloud-First Policy

Greece has recently adopted a strategic plan for its digital transformation, inclouding among others goals, objectives and policy remarks related to the usage of cloud technologies by public and private sector.

The Strategic Plan of Greece's digital trasformation ("Bible of digital trasformation") has been adopted by the Minister of Digital Trasfomation (Ministerial Degree no. 120301 ΕΞ 2021/18-06-2021) in the 5th of July 2021 (Greek Goverment Gazzete of 5 July 2021, No. B/2894). The Bible of digital trasformation sets a general framework for the usage of Cloud Services by Public and Private Entities, for the development of Governmental Cloud Infrastracture, for the usage of cloud services in the educational sector (RE-Cloud), in the healthcare sector (H-cloud) and in the enviromental sector as well, for the accreditation of public entities that provide cloud infrastructure and services to the public sector (criteria set by ISO 27001), and finally for the adoption of Disaster Recovery policies as well as the development of a Disaster Recovery Data Center. It has to be menioned that ***a „Cloud-First Policy" is adopted, entailing that any IT system developed on behalf of a public authority should be designed in Cloud Native architectures, allowing thus, hosting of both On-premise and Public-Cloud infrastructure, following a Hybrid Cloud model***, which gives flexibility in terms of more efficient and uninterrupted production operation but also the rapid expansion and upgrade of its operation (flexibility, scalability, business continuity).

2. Legislation

a. Article 87 Law 4727/2020
b. Ministerial Degree no. 120301 ΕΞ 2021/18-06-2021
c. Law 4577/2018 implementing Directive (EU) 2016/1148

ADDITIONAL DOCUMENTATION RESOURCES

There are few resources on cloud regulation, whereas most of them are in Greek, eg.:

- https://www.pkm.gov.gr/inst/pkm/gallery/PKM%20files/2Synedrio2021/2021_10_14/13_%CE%9C%CE%B5%CE%BB%CE%B5%CF%84%CE%AF%CE%BF%CF%85_14102021.pdf
- https://www.infocom.gr/2020/09/18/cloud-first-policy-sto-dimosio-nees-rythmiseis/52181/

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ITALY – HYBRID CLOUD MODEL & CLOUD FIRST

1. Cloud services in the Italian Public Administration - Hybrid model

Cloud services in the Italian public administration are a characterized by a "hybrid" model which involves the following types of infrastructures and services:

(a) ***Public Cloud***, including the Public Cloud Service Providers qualified by the Italian Digital Government Agency;

(b) ***Private Cloud***, including the infrastructures and the services provided directly by the Poli Nazionali Strategici ("**National Strategic Poles**")

(c) ***Community Cloud***, including SPC Cloud.

As of April 1, 2019, the Public Administration may only purchase IaaS, PaaS and SaaS services that have been qualified by the Italian Digital Agency and have been placed on the Cloud Marketplace.

2. Cloud first approach

The Italian Public Administration Model is based on a Cloud First approach which aims at preferring the use of cloud solutions over traditional solutions (*i.e.* hosting or housing services).

Based on this model, the Public Administrations' selection for services usually applies a SaaS First preference method, directing the choice on the SaaS services already present and active in the Cloud Marketplace, assuming they meet specific needs of Public Administration. This choice represents the best way for the Public Administration to take full advantage of the cloud model and cut costs. Nonetheless, if specific SaaS services are not available, the choice of IaaS and PaaS services can always be made through the Cloud Marketplace.

3. Procurement Framework

a. Qualification of Cloud Services

Procedures for procurement and qualification cloud services are based on simple and rapid procedures. In addition, most of the requirements for qualification of the Cloud Service may be provided in the form of self-certification.

- Qualification of SaaS services ensures:
    - Application securities;
    - Adequate technical support for the client;

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  - Transparency and detailed information on the services;
  - Availability of incident reports and monitoring tools;
  - Data protection and portability ;
  - API interoperability based on best practices;
  - Limited lock in risks.
- For qualification, IaaS and PaaS services require:
  - An extended security management on all aspects of the infrastructure;
  - Management of configuration and changes;
  - Incident management;
  - Interoperability with other services and infrastructures.
- Qualification requires that the provider ensure that the services conform to all the applicable best practices and industry standards, including, if applicable, specific ISO certifications.

b. Qualification of Infrastructures

Physical and virtual IT infrastructures that will be used by the Italian Public Administration must present the specific requirements such as:

- Organizational requirements – this includes certified procedures for provision of the services, management of resources and processes; technical support.
- Security requirements – this includes definition of Service Level Agreement and data protection measures.
- Performance and interoperability requirement – this includes warranties on the infrastructure's performance and capability to interoperate with other similar infrastructures.

As mentioned above, the infrastructures that are qualified to provide cloud services to the Italian Public Administration are:

1. Cloud Service Provider;
2. SPC Cloud Lotto 2;
3. Poli Nazionali Strategici ("**National Strategic Poles**")

ADDITIONAL DOCUMENTATION RESOURCES

- **Cloud services in the Public Administration**

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LITHUANIA

1. Approach

In 2012, the Government of the Republic of Lithuania adopted the resolution "On the Approval of the State Progress Strategy "Lithuania 2030" and the resolution "On the Approval of the National Progress Programme 2014-2020" that gave have ben shaping the development of cloud services in Lithuania.

The Information Society Development Committee (ICDS) under the Ministry of Transport and Communications is responsible for the development of the information and communication technologies and coordinating its implementation.
All the activities and work of the ISDC are aimed at contributing to smooth and even development of the State's three priorities in the area of information society development:

- E-infrastructure – advanced, modern, safe, ensuring the use by all relevant actors;
- E-content – technologically advanced, user oriented e-services and e-content;
- E-skills – the development in Lithuanian society ICT skills needed to succeed under the condition of an information society.

2. Public cloud usage in Lithuania

E-Gov

Since 2008 the State Information Resources Interoperability Platform was created and implemented. It consisting of two main parts: the data exchange platform and the central electronic services portal "Electronic Government Gateway".[5] This national interoperability platform allows service providers to accommodate and create e-services, and for service recipients to order different e-services in one place flexibly and easily.

E-Public Procurement

In Lithuania all electronic public procurement procedures take place on a single portal - the Central Public Procurement Information System (CPPIS). The use of the CPPIS is mandatory for every public procurement procedure, above and below European thresholds, with the

[5] www.epaslaugos.lt, www.evaldzia.lt, www.govonline.lt

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exception of procedures that, under the national law and European directives, may be performed without prior publication.

ADDITIONAL DOCUMENTATION RESOURCES

Links to Legislation:

- XI-2015 Dėl Valstybės pažangos strategijos "Lietuvos pažangos strategija "Lietuva 2030" patvirtinimo (lrs.lt)
- XI-1807 Lietuvos Respublikos valstybės informacinių išteklių valdymo įstatymas (e-tar.lt)
- VIII-1524 Lietuvos Respublikos teisės gauti informaciją ir duomenų pakartotinio naudojimo įstatymas (e-tar.lt)
- I-1491 Republic of Lithuania Law on Public Procurement (lrs.lt)

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NETHERLANDS – CLOUD FIRST APPROACH

1. Cloud approach – Cloud first approach

Cloud Strategy (iStrategy) was introduced by the Dutch government in 2011. In 2013, the Goal Architecture of the Closed Governmental Cloud was approved. In 2016, the concept of 'cloud computing' was introduced into the Dutch legal landscape by the Directive (EU) 2016/1148 concerning measures for a high common level of security of network and information systems across the Union. The Dutch government releases a new digitalization Strategy every three years.

According to the OECD **E-governance barometer,** Netherlands, *rather than pursuing e-government as an end in itself, is seeking to use ICT tools to reduce administrative burdens and improve service delivery. Internationally, the Netherlands is at the forefront of administrative burden reduction, which is a major political priority and an important justification for e-government development. In order to simplify the relationship with citizens and businesses, and develop new electronic services, the Dutch government depends heavily on using common public sector e-government building blocks. In order to simplify the relationship with citizens and businesses, and develop new electronic services, the Dutch government depends heavily on using common public sector e-government building blocks.*

2. Procurement Framework

Public Procurement and Cloud (i.e. ICT) products and services are governed by general procurement, data protection, consumer protection, information security, telecommunication law. Sectoral specific regulation has emerged on use of cloud services e.g. Financial Supervision Act. Furthermore, the Dutch principle of freedom of contract together with many non-mandatory rules in the Dutch Civil Code provide default rules for various situations.

Dutch public procurement law is based on the general principles of European procurement law (i.e. non-discrimination, objectivity and transparency). Government authorities are expected to honour these principles for any contract, even those that do not have to be publicly procured. The procurement framework consists of following legislations and guidelines:

- Dutch Public Procurement Act 2012, which implements the EU Directives (2014/23/EU, 2014/24/EU and 2014/25/EU);
- The Decree on Public Procurement;
- Guidelines (e.g. Proportionality Guide and the Works Procurement Regulations 2016);

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- N.B. Separate Procurement Act applicable for defense and national security (implementing Directive 2009/81/EC).

3. Legislation

- Procurement Act
- Network and Information Systems Security Act
- Network and Information Systems Security Decree
- Dutch GDPR Implementation Act text
- Dutch Telecommunications Act text
- The Collective Act Data Protection text

ADDITIONAL DOCUMENTATION RESOURCES

- The Dutch Digilatization Strategy 2018
- The Dutch Digitalization Strategy 2021
- I-strategie Rijk 2021 - 2025 (digitaleoverheid.nl)
- European Commission Cloud Strategy (europa.eu)
- Website Dutch Data Protection Authority
- Regels voor aanbesteden door de overheid | Aanbesteden | Rijksoverheid.nl
- ICT en aanbesteden - Europa decentraal

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BULGARIA – CLOUD POLICY. STATE HYBRID PRIVATE CLOUD

1. State Hybrid Private Cloud Approach

The State Hybrid Private Cloud was established with the adoption of changes to the Bulgarian Electronic Government Act, in force as of 13 June 2008 (latest amendments and supplements in State Gazette 15/2022, in force as of 22 February 2022). The State Hybrid Private Cloud represents a centralised state-owned information infrastructure, which stimulates the provision of virtual resource of the administrative services for the needs of the e-Government.

In Bulgaria there are several private providers of cloud services. They also contribute to the development of the cloud infrastructure in the country.

2. State Hybrid Private Cloud Priorities

The intention is:

- To upgrade the e-Government data centres until the full functionality and capacity of the State Hybrid Private Cloud is reached,
- Migration of departmental information and communication systems and services to the cloud organization of use, development, and administration,
- Modernization of the Unified Electronic Communications Network to provide high-speed connectivity to the resources of the State Hybrid Private Cloud and to reach the highest speeds for next-generation Internet access to e-Government services,
- Creating a high level of cyber resilience of the e-Government ecosystem and providing a service to protect against DDoS attacks from an international provider.

3. Expected benefits from State Hybrid Private Cloud

- To upgrade the e-Government data centres until the full functionality and capacity of the State Hybrid Private Cloud is reached,
- Savings from investments in technical infrastructure (local server rooms and equipment for them),
- Energy savings for power and cooling,
- Savings from maintenance and system administration,
- To reduce the time for providing new resources,
- Centralized data archiving, information security protection and increased cyber security,
- Centralized maintenance of the IT infrastructure by highly qualified specialists,

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- Centralized capacity and investment planning, visibility for real needs.

4. Spectrum of cloud services

According to the Bulgarian authorities the following services are available:

- Infrastructure as a Service-IaaS
  - Service status: Available
  - Service options:
  1. VMware virtualization,
  2. Hyper-V virtualization.
  - The service provides virtual servers with various operating systems and parameters (RAM, virtual processors, and virtual disks). It is offered through the Virtual Data Centre service and is available in the Catalog of Services in the Self-Service Portals.
- Platform as a Service-PaaS
  - Service status: Not available
  - The offering of this service and respectively how to build the platform is the subject of the development of a future project for expansion and provision of services to State Hybrid Private Cloud, with interest from potential users.
- Software as a Service-SaaS
  - Service status: Not available
  - The offering of this service and respectively how to build the platform is the subject of the development of a future project for expansion and provision of services to State Hybrid Private Cloud, with interest from potential users.
  - Alternatives: By using the "Infrastructure as a Service" service, users can build their own systems to provide software. For example, through the capabilities of Microsoft Remote App and Desktop Services or similar solutions from other manufacturers. This option does not commit State Hybrid Private Cloud to provide the necessary licenses.
  - The distribution of responsibilities between the Provider and the Lessee for IaaS, PaaS and SaaS services is in accordance with the following scheme:

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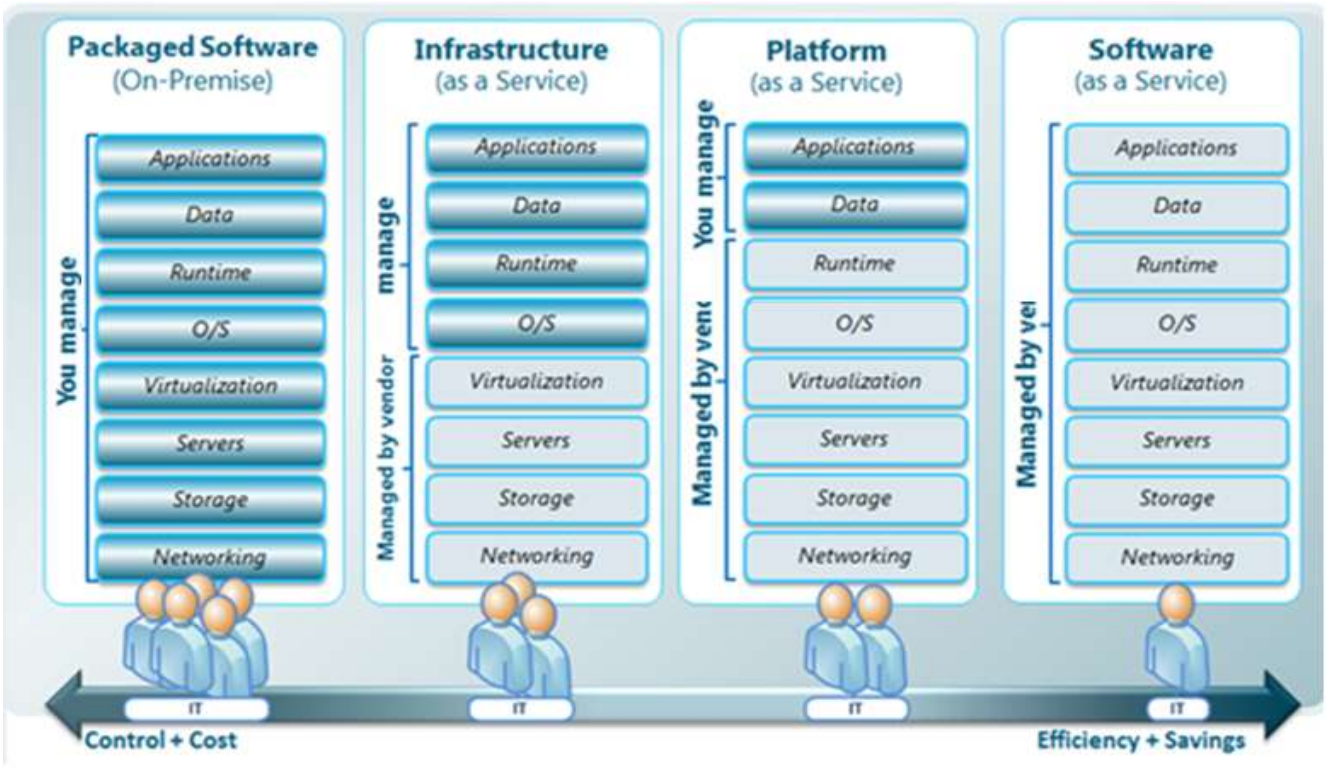

ADDITIONAL DOCUMENTATION RESOURCES

Links to Legislation

- Electronic Government Act (available in Bulgarian)
- Architecture of the electronic government of the Republic of Bulgaria (available in Bulgarian)
- Updated Strategy for the development of e-Government in the Republic of Bulgaria 2019-2025 (available in Bulgarian)
- Ordinance on the general requirements for information systems, registers and electronic administrative services (available in Bulgarian)
- Cybersecurity Act (available in Bulgarian)
- Ordinance for the minimum network and information security requirements (available in Bulgarian)