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Enhancing the technical architecture of the Unified State Ocean Information System (ESIMO) through the use of a cloud platform and digital technologies

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Unified state ocean information system (ESIMO)

11 ministries & agencies

16 centres

Rosco smos corpor ation

14 data providers

- System management
- Information security
- Service
- Data processing and analysis
- Integration

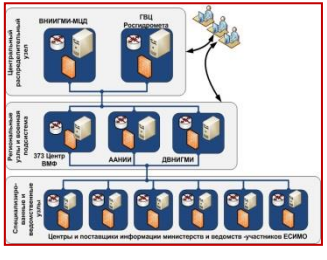
USERS

2 350 unique visits daily

4 443 registered users

100 Гб downloaded information on average per month

195 deliveries per day within the framework of interdepartmental exchange



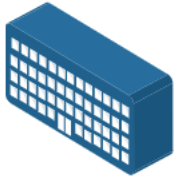
As of 2020, ESIMO is integrating more than **250 databases** on more than **450 environment parameters** in the World Ocean (more than **3,500** so-called "**information resources**") provided by over 20 departmental information systems. Total amount of data from the ESIMO information resources is about **15 terabytes**.

System is composed of a global node (Moscow, Roshydromet), two regional nodes (Far East regional node in Vladivostok and northwestern node in Saint-Petersburg responsible for the Arctic region), several specialized nodes in ministries, and departmental nodes around the country in data provider organizations.

ESIMO – infrastructure

170 hardware units

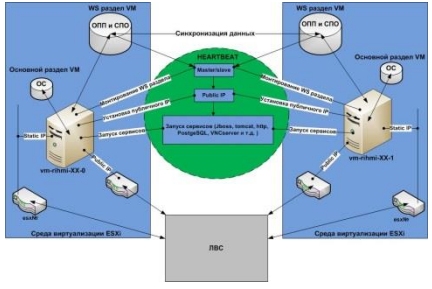
24 hardware kits



32 geographically distributed nodes

30% of the equipment is out of order, the software is not supported by the manufacturer

central node - destruction of storage, high availability cluster, node degradation

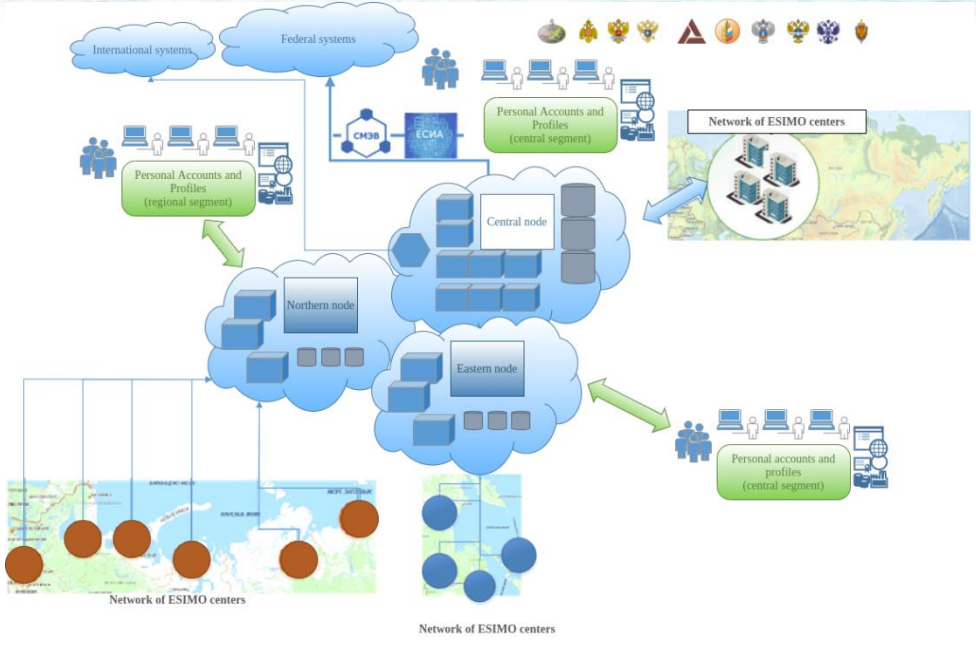


Development stack: *Java, PostgreSQL, PostGIS, GeoServer, GRASS, GITBlit, FishEye, Jenkins, Selenium, Sonar, DokuWiki*

Operational stack: *CentOS Linux, Apache, Tomcat, Jboss*

Standards: *ISO 19115 for metadata, NetCDF 2/3 for data, SOAP, REST, OGC, and SPARQL*

New ESIMO – digital platform in the cloud



Transformation of ESIMO into the interdisciplinary digital platform

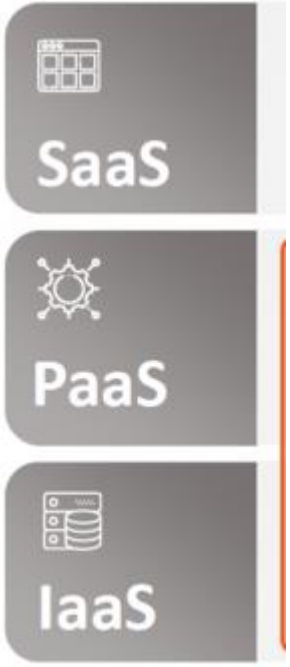
Placement of all nodes in the cloud platform (*SaaS model*)

New digital ecosystem – set of interoperable web services and protocols (SemanticWeb, LinkedData, BigData (ML, data mining, spatial analysis, etc.)

Security, high availability and robustness

Wider use of national hardware & software solutions

State unified cloud platform



- **Infrastructure services (Colocation, IaaS)**
  - Data Center Infrastructure Services
  - Rent of computing power and communication channels
- **Platform as a Service (PaaS)**
  - Operating Systems
  - DBMS (database management systems)
  - management of cloud (virtual) resources.
- **Software as a Service (SaaS).**
  - AD. Service of catalogs of accounts and workplaces with identification and authorization subsystem.
  - Email.
  - Exchange of electronic messages.
  - File service.
  - File storage and exchange.
  - Instant messaging service.
  - Real-time messaging.
  - Task management (assignments) audio and video conferencing.
- **The next level is e-government services (eGaaS)**
  - electronic document management systems
  - national data management system (NMSS)
  - system of interdepartmental electronic interaction (SMEV)
  - unified identification and authorization system (ESIA)

thank you
danke
謝謝
ngiyabonga
teşekkür ederim
gracias
merci
obrigado
bedankt
dziękuję
спасибо
go raibh maith agat
sukriya
kop khun krap
mochchakkeram
terima kasih
감사합니다
grazie
arigatō
dakujem
takk
tapadh leat
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mauruuru
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рахмат
Баярлалаа
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tack
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dank je
misaontra
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Questions?