

СЕТЬ OGC ВЕБ СЕРВИСА В КАЧЕСТВЕ ОСНОВЫ ДЛЯ РЕГИОНАЛЬНОЙ ИНФРАСТРУКТУРЫ ПРОСТРАНСТВЕННЫХ ДАННЫХ

OGC WEB SERVICES NETWORK AS THE BASIS FOR REGIONAL SPATIAL DATA INFRASTRUCTURE

Макалада мейкиндиктин маалыматтарынын инфраструктурасын киргизүү мүмкүнчүлүктөрү каралган. Ал мүмкүнчүлүктөр мейкиндик маалыматтарынын (CMS) мазмунун башкаруу системасынын жана OGC стандарттарын кармап турган түйүндөрдүн негизинде киргизилет. OGC стандарттарын түйүндөрү Жерди прикладдык изилдөө Борбор Азия институтунун (ЦАИИЗ) иштеп чыккан эмгектеринин үлгүсүнөн алынган.

Ачкыч сөздөр: региондук инфраструктура, мейкиндик маалыматтары, OGC стандарттары, башкаруу системасы, мейкиндик маалыматтар инфраструктурасы (ММС).

В этой работе рассмотрены возможности внедрения инфраструктуры пространственных данных на основе систем управления содержанием пространственных данных (CMS) и узлов, поддерживающих стандартов OGC на примере разработок Центрально-Азиатского Института прикладных Исследований Земли (ЦАИИЗ).

Ключевые слова: региональная инфраструктура, пространственные данные, OGC стандарты, система управления, ИПД.

In this paper we consider the possibility of implementing the Infrastructure of spatial data based on spatial content management systems (CMS) and nodes supporting OGC standards, by the example of some of the development of the Central Asian Institute for Applied Geosciences (CAIAG).

Keywords: regional infrastructure, spatial data, the OGC standards, the control system,
SDI.

Spatial Data Infrastructure (SDI) brings together information from various sources, tying it to the geographical location. Data sources include government agencies and institutions, private and public organizations and individuals that may be both users SDI services.

SDI is used for planning, sustainable social and economic development of the country, solve business problems, safety and environmental protection and other areas of human activity.

The servers of different organizations accumulated gigabytes data of spatial objects, remote sensing and the related information to them. Much of this data could be open to public access or regulated access rules. For this purpose and need SDI, providing society the opportunity to use such data.

Spatial Data Infrastructure includes the basic spatial data, metadata, standards and regulations, geographic information nodes, the software that implements network mapping and GIS services to ensure the availability and sharing of geographic information resources

SDI concept is already sufficiently developed and is based on the following assumptions:

1. **Units SDI.** It usually geoportals where spatial data are accumulated and maintained for convenient use SDI capabilities.
2. **SDI clients.** Standard browsers and GIS programs, support services in the OGC standards.
3. **OGC and ISO Standards.** Exchange of data between nodes, nodes and clients produced in accordance with the standards of OGC (Open Geospatial Consortium). For metadata is usually used ISO 19115/19139 (XML), and others. There are also standards for data display styles, presentation of map projections and others.
4. **SDI Services.** Search data by time, thematic and spatial queries, download / upload data, create and edit metadata and styles, the layout of multi-layer maps of map layers as the current node, and external sites, and their publication in the form of interactive web maps.

The most authoritative spatial data are created in special government organizations. For example, the creation and updating of topographic maps are in the introduction of State cartography, the administrative boundaries from the regions to the ail-aimags formed in Kyrgyzgiprozem (State Design Institute of Land Management), cadastral maps and database of property owners are in the State Registration Service of the Kyrgyz Republic, the boundaries of nature reserves , forests, hunting's determined by State Agency for Environmental protection and forestry of the Kyrgyz Republic, etc.

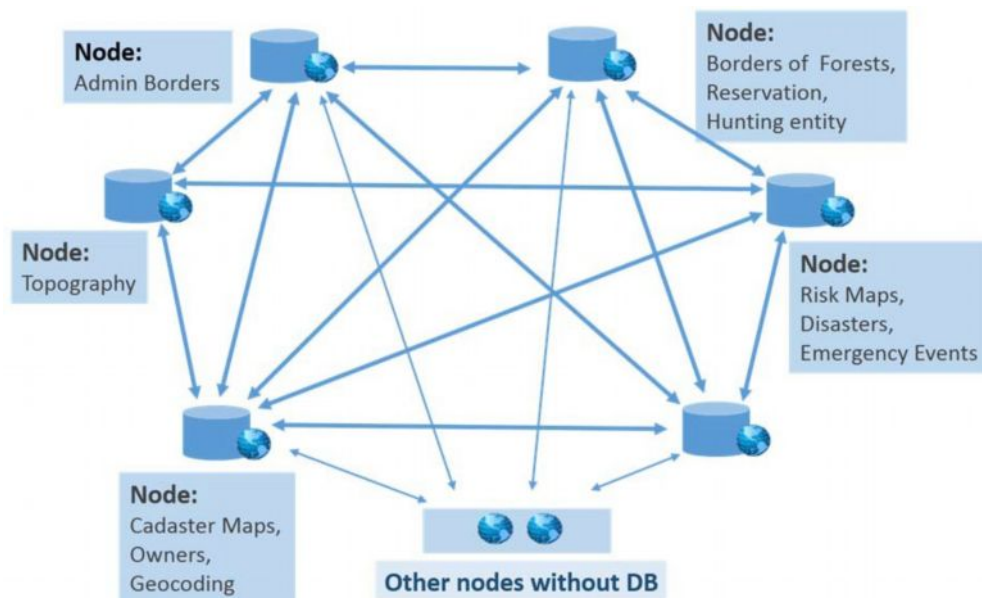


Figure 1. Regional SDI as distributed geodatabases

These organizations are competent in their area, make timely updating and are responsible for the correctness and quality of their data. Naturally, if they distribute their data by providing access to the general public it in accordance with the state policy of access to data and taking into account the generally accepted norms and rules of spatial data distribution. The servers of these organizations could create Web sites that support the execution of the exchange of geo data services in the OGC standards, and shape user interfaces for ease of use of these services. The Web site can be designed as a geoportal or a single page interface access to services on the existing site of the organization.

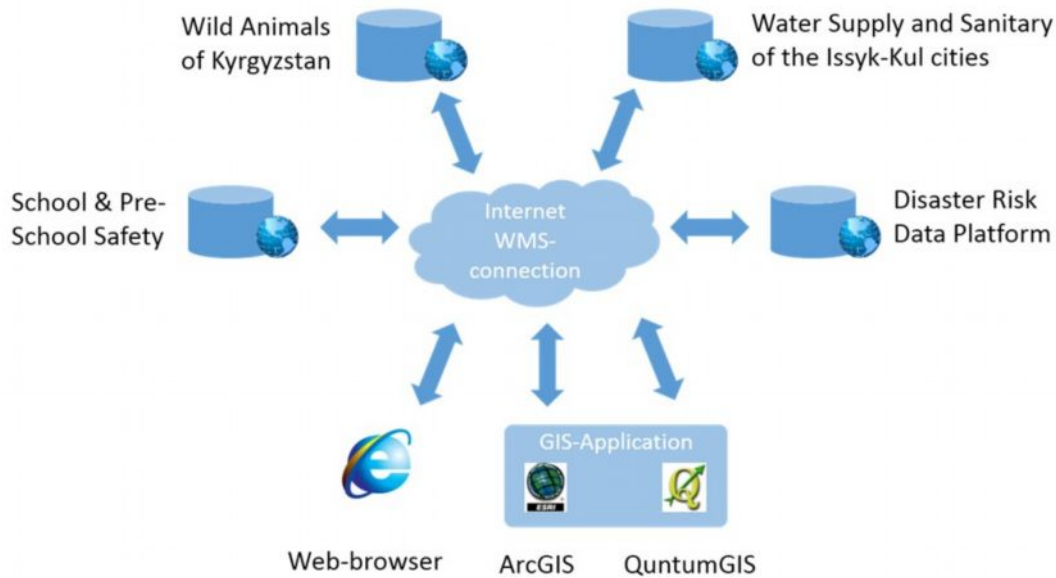


Figure 2. Network of OGC-node CAIAG as an example of a spatial data infrastructure

Organizations stored geodata in its servers, and OGC-services provide their external nodes

in the form and amount of which are specified in the request parameters and policies are allowed access to the data for external users.

Figure 2 shows the network of SDI, as the nodes which acted individual websites of CAIAG. These nodes have a different purpose and fulfillment. The nodes Disaster Risk Data Platform are based on CMS GeoNode. The nodes on the security of schools and pre-school

educational institutions (School Safety) and Water Supply and Sanitary is based on the UNM Map Server web server also supports WMS/WFS services. Node Database wildlife Kyrgyzstan (Wild Animals of Kyrgyzstan) operates under the control of CMS Drupal to support the OGC service GeoServer. Each of the nodes has a fixed IP and domain name, and is part of the information network of SDI. Databases of all units are based on the PostgreSQL database with PostGIS extension to support spatial data types.

Further, the CMS GeoNode - a web-based data platform for the development of

geographic information systems, through which it is possible to build separate units of the regional SDI.

The basic functions of the platform:

- Storage / import / export and management of geodata: publication of raster, vector and tabular data, metadata management and documentation, dissemination of data in accordance with the access policy to edit geo database versioning
- Search geodata: a powerful engine to search for geodata, the OGC services metadata catalog.
- To create of interactive maps: Geo Explorer as an internal GIS client, editing styles, creating a multilayered interactive map, embed maps into web pages, maps printing in PDF.
- Teamwork: review, evaluation and commenting on the data, the creation of user groups, accounting activities, announcements and notifications.
- Appointment of a data access rights: multilevel access ranking, installed by author

Thus, Geo Node provides all the necessary services for its functioning as a node of SDI. The user can download in GeoNode mapping layer to adjust the display style, fill out the metadata and assign the level of access to it by other users.

You can also upload documents in the form of texts, tables, images, and archive files. This document is loaded "tied" to the layers or maps so that when working with layers or maps always seen that there are documents for them belonging to them.

Uploaded in GeoNode layers and documents can be downloaded to the local computer if the owner of the data set permission to do so.

Because of the integrated online editor Geo Explorer map, the user can create multilayered maps available to him the layers have been added to this node, as well as layers of external sites. Maps can be saved in PDF format and then printed. Possible and their publication in the form of interactive online Web maps on the pages of other sites.

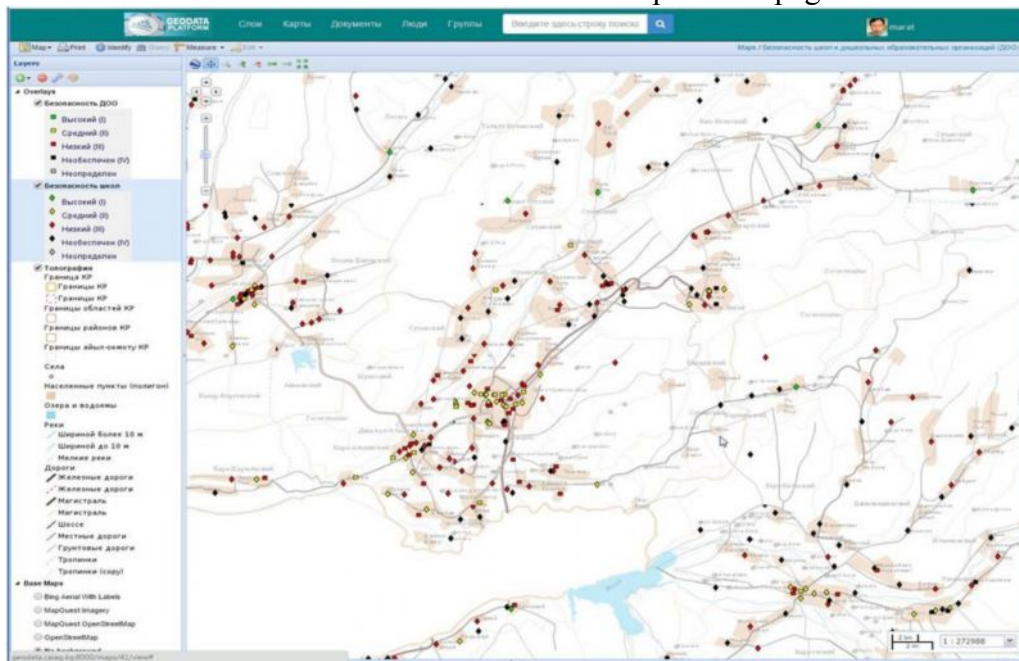


Figure 3. Compiled map in Geo Node with using layers from the current and external sites

Using GeoNode as nodes distributed geo database, you can deploy a regional SDI and provide authorities quickly for organizations, individual professionals and the general public spatial data corresponding to the modern standards.

Built-developed mechanisms to establish roles and access rights to data enforce copyright owners at that level, as they wish. Accompanying each set of metadata provides a clear understanding of the origin, quality, time of creation, thematic focus, the authorship

and the ability to perform a quick search.

GeoNode is a product of Open Source. Any organization that has its own spatial data, it can install and administrate according to their own information dissemination policy.

**Links to CAIAG OGC-nodes:*

1. *School and Pre-School Safety: <http://schooldb.caiag.kg/>*
2. *Wild Animals of Kyrgyzstan: http://wildlife.caiag.kg/drupal_wa/?q=ru*
3. *Water Supply and Sanitary of the Issyk-Kul cities: <http://85.113.21.30:8080/>*
4. *Disaster Risk Data Platform of the Kyrgyzstan: <http://geonode.mes.kg/>*