GIS -Technologies and Internet.

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Until recently geoinformation systems (GIS) were known to a narrow circle of persons and were used only for professional work. Last years the main advantage GIS before other information systems - an opportunity of association of the diverse data on the basis of the geographical (spatial) information - has caused general interest to use GIS in various areas of practical activities.

On the other hand, all a decade ago some physicists have started to use little-known language with strange name HTML for an establishment of connection of documents in group of servers CERN, and today we speak about is unprecedented fast development World Wide Web - a global network the Internet.

Now there is an obvious logic connection between aspiration to a wide circulation of the spatial information and the Internet allows to unite the data located in various places of virtual Internet - space in uniform information system, and for the user has no value where these sources of the information are located.

As against existing GIS within the framework of traditional decisions for local networks, GIS-on-Internet gives developers and users new opportunities:

- Creation distributed GIS, uniting the data located on various servers of a network the Internet;
- Administration complex distributed GIS becomes more natural and simple since disappears necessity to duplicate the data and the software for GIS, their updating is carried out on places at holders of this or that information where administration as the data is carried out, and programs within the framework of technical support of corresponding servers;
- The interface of the user becomes more and more unified since for work of the program on a client computer it is used standard web - a browser, sometimes - with the built - in cartographical component;
- Simplicity of installation of the software of the client, which can be established (or to be updated on newer version) automatically at an input on the Internet - page using a map;
- The minimal cost of reception of the GIS-Information for the end user.

Modern opportunities of granting to the user of the geoinformation can be classified on three basic ways of storage and transfer of the spatial data:

- Storage and transfer of the spatial data as raster images in a format.
- Storage of the spatial data in a vector format of some GIS, and their transfer to a raster format. This approach is used in most cases as allows without the additional software at the client to realize system for the Internet.
- Creation interactive GIS for the Internet on the basis of architecture Client/Server with completely vector way of storage and transfer of the spatial data. This approach has a number of advantages since provides all advantages of vector maps and comprehensible time of access to the spatial data at interactive work with an electronic map, thus allows to carry out a selective principle of protection of the information (restriction of access) at a level of separate cartographical layers that is very important at work in the Internet.

It is at present used two basic approaches to integration of GIS-Appendices and the Internet.

The first consists that the program modules of the GIS-Appendix responsible for integration about the Internet, give the client sets of the spatial information satisfying the inquiry specified by the user, without any interpretation. This information can be transferred both in a format by the used GIS-Appendix, and in more compatible format (for example, XML). And, probably, its further visualization the client appendix is engaged in interpretation by the received information. Such approach on the one hand does{makes} the module of integration by the most universal since it can be used as a usual source of the spatial information alongside with files on local disks and a DB, but

on the other hand demands presence from the user of the special software for interpretation of the received data.

The second approach consists in interpretation by the module of integration about the Internet of the spatial data of the GIS-Appendix and delivery to the client appendix of the data in a format expected by it. Such formats can be various formats of images, various formats of storage of the spatial information, used various appendices, files of format XML. Such approach on the one hand strongly limits universality of the module of integration of the GIS-Appendix and the Internet and conducts to necessity of creation of set of similar modules for one GIS-Appendix, but on the other hand does this appendix more flexible, scaled, and the main thing, excludes necessity of creation of the special client software for work with the means given by the GIS-Appendix, through the Internet. At this approach as the client software standard browsers HTML and XML which, at present, are accessible practically to any hardware-software platform can be used, that does accessible services of the GIS-Appendix using such approach, accessible to the broad audience of users the Internet.

In real existing decisions the combination of these two approaches is used.

Commercial products:
ESRI ArcGIS - the software product of American firm ESRI possessing the richest functionality which allows to solve set of the problems{tasks} connected to creation, editing, the analysis and a conclusion of the various spatial information. The set of modules for integration about the Internet in ArcGIS refers to **ArcIMS** (Internet Map Server). ArcIMS represents a set of the server and client software and combines in itself two above described approaches.

MapInfo - the software product is developed by American firm MapInfo Corp specially for processing and the analysis of the information having an address or spatial binding. Component MapInfo responsible for representation of the spatial data, stored MapInfo, in the Internet refers to **MapXtreme.**

Open Source decisions:
Grass GIS - independent GIS, giving the API to the user, including, the spelling own CGI appendices for work about the Internet is possible also.

MapServer - ready Application Server for work with the GIS-Data of format ESRI through the Internet.

GIS-Portal ATMOS - developed in Institute of Optical Monitoring the Siberian Branch of the Russian Academy of Science software product on the basis of expansion existing Open Source decisions, which:
- Possesses functionality described in requirements,
- Works under UNIX-like operational systems (in particular Linux),
- Does not demand from the user of the specialized client software,
- Uses for the work a usual HTML-browser with the minimal support of means of creation of interactive pages, such as JavaScript,
- Has the minimal system requirements.

Such decision allows to combine necessary functionality with an opportunity of simultaneous work of the big number of clients of system, high speed low system requirements, absence of requirements to the client software, availability of the stored data in various formats.