

## **Grid Analysis and Design**

**Tojidinov Azizbek Ilhomjon o'g'li, Nazirjonov Ubaydulloh Nozimjon o'g'li, Abduraximov  
Ozodbek Azimjon o'g'li**  
*Muhammad Al- Khorazmi TATU in the name of Fargana branch student*

**Abstract:** Grid analysis is an important part of statistical analysis, information technology and data measurement. This includes how the data set is ordered using spaces and rows (columns), analysis methods such as distributions, indices, ordinal calculations, and more. Grid analysis allows you to gain greater understanding, tracking, masking and other skills in data. Designing is critical for critical time, financial resources, and robust projects. This includes defining departments and their interactions for project implementation, timing each task, deciding on work to be performed and services to be provided to clients, and reporting success on work. and helps organize all stages of the project. It serves as an effective method for designing, organizing and managing projects.

Grid (eng. Grid - grid, network) is a system that distributes resources under a single control center, uses common protocols and interfaces and provides the required level of service.

Grid is a system for coordinating distributed resources through standard, open, universal protocols and interfaces to ensure quality of service.

The main areas of development of grid technologies are: computing network, grid for intensive data processing and semantic network for working with data from various databases .

Currently, there are three main types of GRID systems:

1. GRID based on the use of freely provided free resources of personal computers (optional GRID);
2. Scientific GRID - well-parallelized applications are specially programmed (for example, using the Globus Toolkit);
3. GRID is based on the provision of computing resources on demand (Enterprise GRID or commercial GRID) - common commercial applications run on a virtual computer, which in turn consists of several physical computers connected using GRID technologies.

Authentication - providing the ability to define interfaces and authentication mechanism to include different authentication mechanisms.

Authorization - providing the ability to control access based on authorization rules.

Privacy - giving both the user and the owner of the service the ability to control the rules for using resources.

Data integrity is a guarantee that unauthorized data changes are detected on the service side.

Cloud technologies are data processing technologies in which computer resources are provided to the Internet user as an Internet service. The word "cloud" is here as a metaphor for a complex infrastructure that hides all the technical details. Computer resources and capabilities are provided. The user has access to his data, but does not control it and does not have to worry about the infrastructure, operating system and software he is running. The term "cloud" is used as a metaphor based on the image of the Internet in a computer network diagram, or as a representation of a complex infrastructure in which all technical details are hidden. According to an IEEE document published in 2008, "Cloud computing is a paradigm in which information is permanently stored on Internet servers and temporarily stored by the client, for example, on personal computers, game consoles, laptops, smartphones, etc. Cloud data processing as a concept includes:

1. infrastructure as a service
2. platform as a service
3. software as a service
4. data as a service
5. workplace as a service

Other technological trends in which there is a general belief that the Internet can meet the needs of users to process data. The most important feature for cloud technologies is the uneven demand of users for Internet resources. To eliminate this unevenness, another intermediate layer is used - server virtualization. Thus, the load is distributed between virtual servers and computers.

Cloud technologies - This is one big concept that includes different concepts that provide services. For example, software, infrastructure, platform, data, workplace, etc. Why is all this necessary? What is cloud computing not called? The first is offline computing on a local computer. Second, "utility computing" (utility computing) when the service is instructed to perform particularly complex calculations or store a series of data. Thirdly, it is collective (distributed) computing (gridcomputing). In practice, the boundaries between all these types of calculations are quite blurred. However, the future of cloud computing is much larger than that of distributed systems.

Cloud data storage - An online storage model in which data is stored on many servers distributed over a network and made available for use by customers, mainly third parties. In contrast to a model that is purchased or rented specifically for these purposes in order to store data on its own dedicated servers, the number of servers or any internal structure is not visible to the client at all. Data is stored and processed in the so-called cloud, which represents one large virtual server from the client's point of view. Physically, such servers can be located far from each other, even on different continents. To understand what "cloud" is, it is necessary to start with the history of this issue. You need to understand: does this technology really belong to the category of new ideas or is this idea not so new.

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