

## ANALYSIS OF THE METHODS OF CHOOSING NETWORK STRUCTURE OF THE INTERNET OF THINGS

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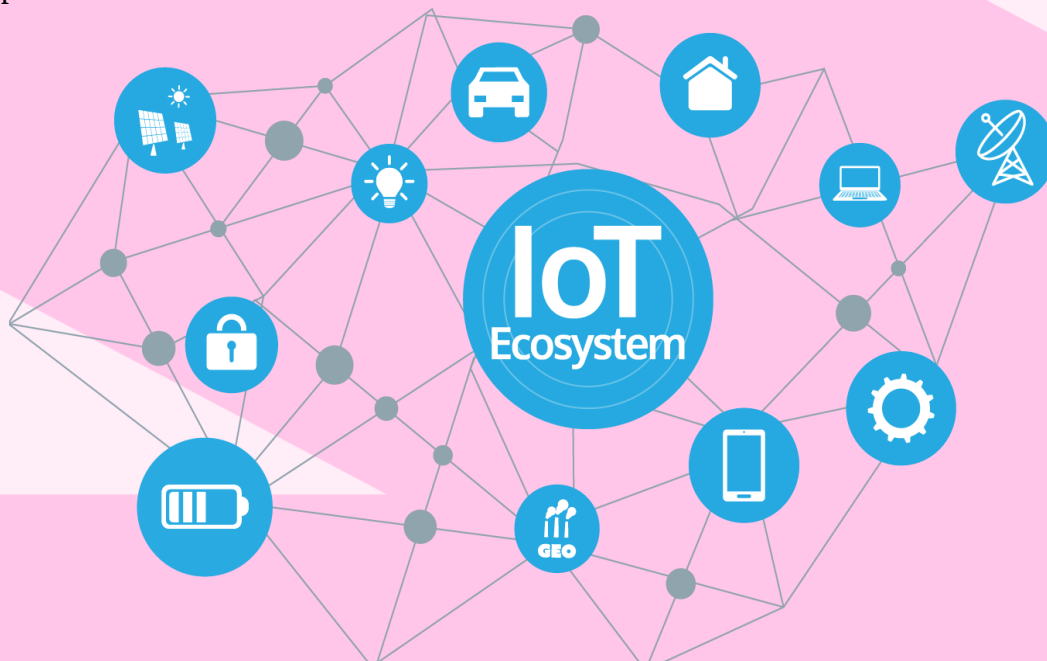
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**Annotation:** The most common are three- and five-level models of architectures. The first of them is basic and includes the perception level, network and application levels. This model defines the basic idea of IoT, but it is not detailed enough, which is necessary for deeper research. Therefore, architectures with a large number of levels are proposed in the literature. For example, a five-level model that additionally includes processing levels and a transport layer.

**Key words:** Processing levels and a transport layer, rapidly developing complex concept that includes

The Internet of Things is a rapidly developing complex concept that includes research in the field of computer science, network technologies, and microelectronics and sensor technology. This paradigm represents the main direction of the development of network technologies in the future and will allow solving many routine tasks of mankind, starting from measuring environmental indicators and ending with increasing production efficiency.

In this article, we will get acquainted with the basic definitions of the Internet of Things and its characteristics, analyze the area and highlight the main problems and challenges facing the implementation of this concept.



The Internet of Things (IoT) is defined as a concept in which most of the devices used by people will be equipped with microcontrollers for control and network interfaces for digital data transmission and communication among themselves. The RFID Group defines IoT as a worldwide network of accessible objects whose unique addressing is based on standard communication protocols.

The following areas of use of the Internet of Things can be distinguished: industry and manufacturing; transport and transportation; control of the technical condition of building structures, air quality, background noise and energy consumption; waste management; smart parking and provision of traffic jam data; smart street lighting and use in everyday life.

From a technical point of view, IoT is not a new technology, but a set of already existing tools that provide the following features:

Communication and interaction - objects can create a connection with Internet resources or with each other and update their state. Of paramount importance are wireless technologies such as GSM and UMTS, Wi-Fi, Bluetooth, ZigBee and other wireless network standards currently being developed.

Addressability — In the Internet of Things, objects are distributed in space and must have unambiguous addressing.

Identification allows you to uniquely associate data with a specific object and extract them. RFID and NFC standards are examples of technologies that can be used to identify even passive objects that do not have built-in energy resources.

Sensing - IoT devices collect information about the environment using sensors, exchange it or change their state under its influence.

Integrated information processing - objects can be equipped with a processor or microcontroller for instant analysis and processing of information.

Localization - devices are aware of their physical location, which is achieved through the use of GPS or a mobile network, as well as radio beacons (for example, WLAN or RFID readers with known coordinates).

The fundamental task of IoT is to develop and choose the right system architecture, since the entire further development process will depend on the decisions at the initial stages of research. At the moment, there is no specific agreement on the IoT architecture that would be approved and used everywhere.

Other examples are cloud and fog architectures. According to the researchers, there has recently been a trend in the development of fog computing, in which sensors and network gateways perform part of the tasks of data processing and analysis.

Fog and cloud computing are often used together, as it is necessary for optimal performance of IoT applications. To implement foggy computing, a gateway can be embedded between local networks and the "cloud". A multi-level approach is used here, in which monitoring functions are provided (control of the power and resources used), preprocessing (filtering, processing and analysis of data), storage (data replication, distribution and storage) and data security (encryption and ensuring the integrity and confidentiality of data). At the moment, this architecture is of the greatest interest, and according to researchers, it is the most promising.