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OPEN SYSTEMS INTERACTION MODEL

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Abstract:
The article provides information about the model of interaction of open systems, which is shown as a key concept in the field of computer science and information technology. It studies how different components, subsystems, or systems interact, which may be developed by different manufacturers, used on different platforms, and may be deployed in different environments.
Keywords: *personal data, interaction model, data processing, privacy, systems*

Анотація:
У статті надано інформацію про модель взаємодії відкритих систем, яка показана, як ключове поняття у області комп'ютерних наук і інформаційних технологій. Вона вивчає способи взаємодії між різними компонентами, підсистемами або системами, які можуть бути розроблені різними виробниками, використовуються на різних платформах і можуть бути розгорнуті в різних середовищах.
Ключові слова: *персональні дані, модель взаємодії, обробка даних, конфіденційність, системи*

Introduction

Currently, interaction in computer networks is described using the open systems interaction model.

The OSI model was developed by the International Organization for Standardization as a guide for the development of standards that allow the exchange of data using heterogeneous computer devices. This model divides network communications into separate layers, which facilitate the development and implementation of networks, and also serves as a basis for the development of compatible network equipment. Each level of the model serves different stages of the interaction process. The operation of the OSI model is provided by various services, each at its own level. Services work according to certain rules - protocols. Accordingly, each level has its own protocol [1].

Results

For the correct operation of the network, a number of protocols are used: for example, a protocol for managing physical communication, establishing communication in the network, accessing resources, etc. The multi-level system was created in order to simplify and organize such a huge number of protocols and connections. The multi-level interaction model assumes real interaction only with neighboring levels and virtual interaction only with a similar level of the receiver of the communication line.

By real interaction we will understand direct interaction - the transfer of information. In this case, the information remains unchanged - it arrives at the destination in a form identical to the form at the point of departure [2].

OSI network models are divided into levels: physical, channel, network, transport, session, representative and application.

The physical layer is responsible for the physical transfer of data between devices over long and short distances. It describes types of signals and methods of their processing for various transmission media: wires, optical fiber, radio line, infrared channel. Data at this level are bits converted into electrical impulses, light, radio waves. The types of connectors and their purpose are also recorded here. Devices operating at the physical level of the OSI model: signal repeaters, hubs.

The channel layer, being above the physical layer, must drop correctly formatted data into the medium of transmission, having previously received them from the upper layer. At the receiving end, channel-level protocols "pick up" the information from physics, check the received information for errors, and transmit it higher up the protocol stack. To carry out verification procedures, it is necessary to divide data for transmission into portions and supplement them with official information.

The network layer connects entire networks. Solves global logistical tasks of data transfer between different segments of large networks: routing, filtering, optimization and quality control.

The unit of information is packets. Addressing of nodes and networks is carried out by assigning them numbers - IP - addresses, hierarchically organized, which allow you to flexibly configure the mutual logical visibility of network segments. Also, the usual symbolic names of nodes appear here, for the correspondence of which IP addresses are responsible for network level protocols. Devices operating on this floor of the OSI model are routers (routers, gateways). Implementing all three first levels of the protocol stack, they combine different networks, redirect packets from one to another, choosing their route according to certain rules, keep transmission statistics, and provide security through table filtering.

The transport layer is responsible for transportation, in this case it means logical: establishing a connection with the opposite node at the appropriate level, confirming the delivery of the received data, and controlling its quality. This is how the TCP protocol works. A portion of information is transmitted - a block or segment.

The UDP protocol is used to transmit streaming arrays. The address is the decimal number of the virtual software port of a specific workstation or server.

The session layer manages the transfer process in terms of user access. Limits the connection time of one node after another, controls access rights, synchronizes the beginning and end of exchange.

The representative layer is responsible for receiving data from the bottom - from the session - the data must be correctly presented to the end user or application. Correct decoding, data decompression, if the browser saved your traffic - these operations are performed at the penultimate step.

The application layer is responsible for surfing in the browser, receiving and sending mail, accessing other network nodes using remote access - the top of the OSI network model [3].

The OSI model is a conceptual framework that describes the rules and procedures for data exchange when organizing a communication session, which must be implemented in both hardware and software networks.

The OSI model describes only the system means of interaction, without touching end-user applications [4, p 52].

To provide the best experience and keep our users engaged in the current task, we need our programs to respond within hundreds of milliseconds. That doesn't leave us, and especially the network, much room for error. To be successful, network latency must be carefully managed and an explicit design criterion

at all stages of development [5, p 7].

Conclusions

The model of interaction of open systems is a big concept in modern information technologies. It allows different systems and components to communicate and interact with each other. The main idea of the model is that system components can be developed independently of each other, but they must be compatible and interact through open interfaces. The use of an open systems interaction model allows for flexibility, scalability, and ease of system expansion. This allows the integration of various components created by more manufacturers without the need for a complete redesign. An open systems interaction model for the development of standards and protocols that ensure compatibility and interoperability between systems. This is a deterioration of interoperability and data exchange between different systems. The use of an open system interaction model opens up opportunities for the development of new applications and services by connecting various components. This allows you to create complex systems that take the best decisions from different sources. The model of interaction of open systems is a powerful tool for the development of complex information systems, which facilitates the integration of various components and ensures their interaction through open interfaces.

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