MULTISERVICE NETWORK SERVICES

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Abstract:
This article provides information about the type of information transmitted in multimedia communications networks, the type of service in the exchange of information, the methods of classifying the client's connection and services to the client, Types of services and their implementation. About the quality of telecommunication services. Service agreement. Management of the level of service and monitoring of its implementation.

Keywords: RSVP, Intserv, DiffServ, frame, Jitter, traffic, header.

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Introduction

In recent years, the rapid growth of data transmission services, the emergence of multimedia traffic and its constant growth have become a serious problem for the operation of multiservice communication networks.

The provision of multimedia (voice, data and video) services imposes different requirements on the level of traffic service, therefore, the development of multi-service communication networks and the problems that arise in them are important for ensuring the quality of service. justifies its relevance.

One of the biggest challenges in providing media services in packet-switched networks is ensuring guaranteed quality of service (QoS).

In this regard, quality of service (QoS) is a key requirement for the implementation of multimedia services.

The main features for QoS are defined as follows:

* delay in package delivery. This parameter mainly plays an important role in the transmission of voice and video messages;

* jitter (dispersion) – changes in delay during packet delivery. Jitter can be measured in several ways.

* packet loss-when the network is overloaded, it is forced to drop individual packets. One of the parameters that plays a significant role in the transmission of voice and video messages.

Currently, there are various methods of ensuring the quality of service in multiservice communication networks, and the choice of one or another technology depends on the requirements for the quality of service. In addition, the quality of the provided services should be at the level required by the consumer.

The following methods of providing Kos used in multiservice networks are known:

- reserve resources (resources necessary for program execution are requested and reserved during connection);

- traffic priority (distribution of network traffic into classes with a priority order of service to some of them);
- redirection (allows to transfer traffic to a backup route during network restart, which is provided by QoS).

In modern networks, the listed methods are implemented using IntServ, DiffServ and MPLS technologies using the rsvp protocol.

The advantages of the IntServ model are clearly defined and guaranteed bandwidth, by reserving bandwidth for sharing by multiple senders.

Based on this model (depending on the service class), the necessary bandwidth can be provided in the communication channel for a certain type of traffic, as well as the minimum delay in the transmission of packets or the minimum level of their loss.

The analysis shows that the most important disadvantages of IntServ are related to the scalability of the RSVP protocol, especially in high-speed backbone networks. RSVP only makes reservations for one data stream.

Considering the importance of scalability in packet networks, DiffServ technology is proposed. In DiffServ technology, packets at the network boundary are classified, routed by a code in the packet header, and classified as a specific aggregated flow based on this code. Each aggregated flow has a priority and an expected level of service[1].

Ease of prioritizing traffic in DiffiServ, scalability, much lower implementation costs compared to IntServ, increased reliability due to the fact that classification is performed at the boundary of the DiffServ domain without performing service requests determine the flexibility and power of DiffServ. However, this technology does not provide a full guarantee for QoS, only a relative increase in bandwidth for priority flows. MPLS technology today has become one of the main ones for building large networks of operators that provide services that ensure quality of service. This technology is designed to speed up the switching of packets in transport networks. Its main difference from the previously considered is that MPLS is not a quality assurance technology at first, and only becomes so when using the rsvp-TE protocol.

At the edge of an MPLS network, routers label packets with special labels that determine the next route to their destination. As a result, short numeric tags are analyzed rather than IP addresses, which significantly reduces network latency and router performance requirements. Label distribution protocols (LDP, CR-LDP, RSVP-TE, etc.) are used for their correct interaction with each other and the exchange of information about the generated labels.

MPLS technology is highly scalable and is the most promising for IP traffic transmission.

Advantages of MPLS technology: route selection based on IP address analysis, fast switching (reduces table search time), QoS, flexible support of integrated services and virtual private networks, effective use of specific routing, separation of functionality between the core and border area of the network[2].

At the same time, the implementation of MPLS technology usually involves the organization of a high-speed backbone, which requires the installation of high-performance equipment. Despite the significant advantages of the technology in terms of providing QoS, the additional guarantee of packet delivery can cause problems in the field of scalability.

The analysis shows that currently there is no universal QoS technology that can simultaneously satisfy all requirements for building multi-service communication networks.

Service types

Additional services provided along with the main services can be equal to the benefits of the main services, and in some cases even more. In some cases, additional services may not be beneficial, and in some cases, that is, in cases where basic services are not taken into account, they may be harmful. This situation can be seen mainly in the use of attracting clients to the main service.

We will mention several such additional services.

- Setting up a switchable connection server to the Internet on its own network. This type of service is useful for operators, who receive additional benefits from Internet users depending on the type of tariff. However, calls made by all users of PTN in the operator's network are terminated in the operator's network. Therefore, for each such call, the operator will have an additional "terminated minute". This "terminated minute" is based on compatibility between operators, for which operators pay depending on which operator is compatible. That is why the "Free Internet connection" service has become popular in Europe and the USA. It is not just free, but it is done on the basis of the payment of operators, as they use additional services[3].
- The provision of intelligent services has a double benefit. First of all, these types of services are very profitable, and each such call, as we saw in our previous example, exceeds the operator's incoming traffic with additional profit.
- Hosting services, such as client Web servers, are not very profitable. However, the Web page of a large content provider may be overwhelmed by outgoing IP traffic at the expense of clients of other operators that refer to certain information. This may provide additional benefits under information sharing agreements with other Internet (Internet Service Provider) (ISP) providers. That's why usually free web hosting can also bring great benefits and increase traffic. MRK can widely use additional services both as a profitable reserve, as an attractor of clients, and as a provider of profit from the main services.

Conclusion

Currently, the services of communication operators are often classified according to the principle of one level, and currently the lists of such services can be seen IP, VPN, DSL, telephone connections. The imprecise classification of services leads to problems in commercial policy and marketing, which is reflected in the efficiency and timing of the infrastructure and capital expenditures created.

Therefore, it is appropriate to classify the services of the communication operator based on classification systems using a multidimensional structure.

The main ones are listed below in order of importance:

- classification of services (content) according to the order of the type of information being transmitted;
- classification of services according to the method of ensuring the client's connection to the service;
- service classification by client type;
- classification of services according to the type of information exchange.

In addition, in addition to the above-mentioned classifications, for each type of service, they can be divided according to the following signs:

- according to the level of application and importance - basic (main) services and additional (added services), in which the specified additional services are available only when the basic services are available;
- on the marketing function - services aimed at making a profit and services aimed at attracting the attention of clients (in which, by the method of attracting the attention of clients, profit is obtained at

the expense of the use of services by clients).

The classification of services based on the type of information transmitted is the main one. However, other methods of classification are also desirable. Because it distinguishes the characteristics of the services provided. In doing so, it clearly indicates its areas of application.

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