Abstract

Thesis contains: 104 pages, 73 figures, 4 tables, 16 references.

The thesis compares the most common protocols of the transport level and their shortcomings. Despite all the advantages of the UDP protocol over TCP, in modern networks, the UDP protocol does not meet the requirements for speed. The main area where the UDP protocol is used is closed corporate networks. Currently, in such networks, companies are modifying the UDP protocol according to their requirements. However, there are no standards and recommendations for modifying the UDP protocol, so developers take risks at their own expense.

TCP protocol guarantees delivery due to the fact that at the protocol level there is a confirmation of delivery by the receiving party and if there is no confirmation of delivery, the sender repeats the sending of packets on timeout, if not received in time.

Delivery guarantee is not the main criterion for selecting a protocol. The question arises as to the cost of providing delivery guarantees. TCP requires a connection, this process consists of exchanging three packets. Once the connection is established, periodic acknowledgments of receiving information and resending are used during data transmission. To do this, the kernel of the operating system must remember the state of all open TCP connections and maintain a buffer for received / transmitted information. And with the application it is necessary to use a separate connection to communicate with each client, although in most OS there are serious restrictions on the number of simultaneously open process descriptors of files / connections (in most OS 255). For example, Windows XP defaults to up to 5 open connections at a time.

However, UDP does not guarantee delivery at the protocol level, all control is performed at the application level, which has no restrictions on controlling the maximum number of open connections.

The paper describes the method of modification of the UDP protocol for small private networks and identifies the parameters that need to be changed to achieve higher data rates with minimal loss of datagrams in the network. And also the scalable network for the future testing of the UDP protocol with the changed parameters is constructed.

The main criterion when modifying the UDP protocol is to achieve the required transmission speeds with low network losses. The problem is to determine such parameters of the UDP protocol at which a higher speed of message transmission will be provided. In this case, such parameters as guaranteeing the delivery of the message, recovery of lost packets, re-sending messages are not considered. Because these parameters are irrelevant given the peculiarities of the UDP protocol and the specifics of the use of the protocol in closed corporate networks.