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Analyses of modeling methods of local and global networks.

Annotation:

This article devotes to method analyses of local and global networks which allow to increase the efficiency of parallel computing.

Key words: OPNET, Local network, Global network .

Review of modeling methods of local and global networks**.**

Prophesy (company Abstraction Software) –is a simple system for modeling of local and global networks. It allows to asses the time of computer reaction to enquiry message, amount of "hits" on www server, number of working stations for active equipment maintenance, reserve of network productivity in case of designated equipment damage.   Community CANE (Image Net company) – designing and reengineering of computing system, assessment of different options, scenario "what if". Modeling on different levels of OSI models. Developed library of devices includes physical, electrical, temperature and other characteristics of objects.

It is possible to create personal libraries. Communities COMNET (company Comp ware; CACI Products Company)—object-based modeling of local and global networks. It allows to modeling the levels of applications: transportation, network, and channel. It applied all known for today technologies and protocols and also systems client-server. It is easy adjusted on equipment model and technology. It is possible to import and export the date regarding technology and network traffic. Modeling of hierarchical networks, multiprotocol networks and global networks; recording routing algorithm. Communities OPNET (OPNET Technologies company) – tool for designing and modeling of local and global networks, computers systems, applications and distribution systems. It is possible to import and export the data of topology and network traffic. Analyses of influence of applications type client-server and new technology to network operation .

Modeling of hierarchical network, multiprotocol local and global networks; recording of routing algorithms. Object-oriented approach.

Exhaustive library of protocols and objects. The following products are included: Netbiz (designing and optimization of computation system), Modeler (modeling and analyses of system efficiency, computer system, applications and distribution systems), IT Guru (assessment of communication network and distribution systems).Stress magic (Net Magic Systems company) – support of standard tests of efficiency; imitation of maximum load on fail server and print server. It is possible to simulate cooperation of different users with fail server. 87 efficiency tests are included.

Local network should serve the company staff – in small companies it is several personal computers, in large companies there are up to several tens of thousands work positions and several hundredth servers.

Global network serves thousands of corporate clients and millions (and even thousand of millions) personal computers.

Methods of access to communication environment.

Local networks:

carrier sense with collision detection – Ethernet , Econet;
token passing – TokenRing , Arcnet;
centralized - Switched Ethernet, ATM.

Global networks are "omnivorous" and are able to apply practically all communication environment: local and territory networks, channels – all the possible even switched telephone lines. Actually the access to switched telephone lines, channels –everything possible including switched telephone line. Generally speaking, local and territory networks apply the access on switched telephone line but it is mostly exoticism here; DialUp- access is the most popular in the internet for personal users and small companies (however starting from 2000 in large cities it is displaced by high powered continuous connections on assigned lines, local networks or ADSL over telephone pair) and in FIFDO Net –in general it is essential.

Method of window switching over is a new method created based on ISDN specification. Method of window switching over simplifies and improves packet switching and eliminates network level processing connected with X.25. Multiplexing and elimination of logical links is made on the level of data connection. This method is widely used in social and private nets. Based on improved safety of modern lines it eliminates some   disbursements X.25.

For example in X.25 the data moves from the source via two or more intermediated nodes and every nod should confirm the receiving by sending the confirmation to transferred nod. When package achieves the recipient at the end he should send the confirmation of source. Method of window switching requires only this last step. As the result this method provides better data throughput. Method of window switching does not require a status table, which is applied in X.25 on every intermediated node for checking the mistakes, control of data flow. Compuserve, Tymenet, Williams

Telecommunications and other companies provide recourses with method of window switching.

2.1.Basic terms of data transportation network , connection channels and transfer protocols.

Network is a group of computers connected with each other on communication line. This channel provides the data exchange within network (i.e. data exchange between computers of this group). The network may consist of two-three computers or it can joint several thousands of personal computers. Physically the data exchange between   computers is to be made on special cable of telephone line, fibre-optic cable or via radio channel. It is possible to connect computers in the network directly to each other (as it is called point to point connection) ;
via intermediate communication nodes .

Computers connected with the network can perform two functions:
They can act as working stations or servers.

Working station is any computer in the network which is not server, as usually users are working on this computer. Requirements to the working stations are specified by station scope of functions. Usually the basic requirement is requirement to speed of operation and to volume of core memory.

Server is a computer which operates the whole network and stores all data of working stations. Servers can work in automatic mode – they stay without keyboard and sometimes even without monitor, but in any case servers perform the functions to operate the network and concentrate the data. Network administrator is a person responsible for issues regarding the network adjustment and operation and network users' rights and possibilities. Usually the biggest and the most powerful computer is being chosen as server. However the development of computer development obviously leads to reduction of internal components – computer becomes faster and efficient. Due to it within short period of time the server can get old than usual computers where such high requirements are not specified. We shall distinguish local and global networks. Basically the main difference between them is evident because of their name but there are some significant technological differences.

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