THE ROLE OF NETWORK ALGORITHMS IN MODERN INFORMATION TECHNOLOGY

Axmadov Ne'mat Akbarovich
Student of Samarkand branch of Tashkent
University of Information Technologies
Scientific supervisor
Ibatova Amira Shavkatovna
Associate Professor (PhD) of the Department of "Languages"
of Samarkand branch of Tashkent
University of Information Technologies
UZBEKISTAN, Samarkand
Email id: axmadovnemat0908@gmail.com

Annotation: This article analyzes aspects such as complexity measurements and models, fundamental distributed algorithms, and routing. Today, it is a problem to keep personal data or any government data safe. In this regard, the network algorithm helps humanity. This approach allows information to reach its destination safely, efficiently, completely, and quickly on a global scale.

Key words: Network protocols, topology, IP applications, algorithm, routing, ring network, identifier.

Introduction

Today, while simple algorithms run on a single processor, network algorithms operate on a distributed system. This means that data is not stored in a single location, but is distributed across computing nodes throughout the network. The main differences are the lack of centralized control, data exchange via messages, and the fact that nodes are unaware of the network topology at the time the algorithm is run. With the advancement of modern technology, computing processes have migrated from a single device to a distributed system on a global scale. The network algorithms that underpin the modern Internet are built on mathematical logic, enabling not only data transfer but also the interconnected operation of millions of nodes

Network algorithms are written to execute on a computer network, and these algorithms include those that specify how specialized computers, called routers, send data packets through the network. The computer network is modeled as a graph, with the vertices representing processors, or routers, and the edges representing communications channels. Algorithms that run on such networks are unconventional, because the inputs to such algorithms are

typically spread throughout the network and the execution of such algorithms is distributed across the processors in the network.

2. Main part:

Distrubuted algorithms are algorithms designed to run on hardware consisting of many interconnected processors. Pieces of a distributed algorithm run concurrently and independently, each with only a limited amount of information. The algorithms are supposed to work correctly, even if the individual processors and communication channels operate at different speeds and even if some of the components fail. Distributed algorithms arise in a wide range of applications, including telecommunications, distributed information processing, scientific computing, and realtime process control. For example, today's telephone systems, airline reservation systems, banking systems, global information systems, weather prediction systems, and aircraft and nuclear power plant control systems all depend criticallyon distributed algorithms. Obviously, it is important that the algorithms run correctly and efficiently. However, because the settings in which they run are so complicated, the design of such algorithms can be an extremely difficult task.

Simulated use of IP applications on hosts spread on the internet is expensive, which leads already in simple use cases to an enormous amount of time for setting up and carrying out an experiment. Complex scenarios are only possible with an additional infrastructure. This article describes a framework with which a needed infrastructure can be implemented. This infrastructure allows an efficient use of the IP applications, even if their hosts are spread all over the WAN. Due to the most different kinds of use cases a general solution is necessary. This solution is to meet any requirements so that all necessary IP applications can be integrated. Integration means thatany application has a remote control feature.

This feature is accessible from a special host, which also offers a comfortabl remote desktop service on the internet. Supported by this remote desktop service an indirect remote control of applications in a test field is possible. Target audience for the IP application test framework, briefly IPAT framework are groups, institutes or companies engaged in pre-development research or pre-deployment activities of distributed IP applications.

3. Conclusion and Recommendation

In conclusion, in an era of rapid technological development, the importance of network algorithms is enormous. Its main goal is to ensure that data on the network reaches its owner accurately, completely, and securely. Network algorithms are not just a means of transmitting information, but the foundation of the entire digital economy. As the article shows, the IPAT framework tries to optimize complex infrastructures. The most important part

of the network algorithm is routing. The algorithms make decisions in milliseconds to ensure that each piece of information reaches its destination safely and efficiently. Network algorithms are an essential component of today's modern computer networks. By understanding the various routing algorithms, network optimization algorithms, and their applications, network administrators can optimize network performance, security, and reliability.

As networks continue to evolve and become more complex, the importance of network algorithm fundamentals will only continue to grow. What these applications have in common is that many processors or nodes are active in the system at any given time. Nodes have a certain degree of autonomy: they can have their own hardware, their own code, and sometimes their own independent tasks. However, nodes can share common resources and data and can work together to solve a problem that affects several or even all nodes.

REFERENCES

1. Goodrich M.T., Tamassia R. Algorithm Design: Foundations, Analysis, and Internet Examples. – John Wiley & Sons, 2001. – 720 p.
2. Novel Algorithms and Techniques in Telecommunications and Networking / Tarek Sobh, Khaled Elleithy, Ausif Mahmood (Eds.). – Springer Science & Business Media, 2010. – 525 p.
3. Goodrich M.T., Tamassia R. Algorithm Design: Foundations, Analysis, and Internet Examples. – John Wiley & Sons, 2001. – 720 p.