Contribution ID: **111**   Type: **Sectional reports**

The graph diameter of a distributed system with a given dominant set

Thursday, 8 July 2021 14:45 (15 minutes)

In this work consider a distributed computing system in which the control functions are dispersed in several dominant nodes that are directly connected to all the others. This configuration reduces the vulnerability of the entire network, since the failure of a single control element immediately disrupts its operation. On the other hand, the large length of the maximum shortest chain (diameter) increases the data transfer time, which is bad for the functioning of the entire system.

The connection of the maximum shortest chain of a distributed network graph with the size of a certain dominant set is investigated. The structure of a graph with a maximum diameter on the set of all graphs with a given dominant set is presented, a diametric chain is constructed, and the value of the extreme diameter is estimated.

Based on this construction, it is possible to generate various network graphs with a given dominant set and a diameter that takes certain values. To do this, we propose a number of operations that change the set of edges of the original graph. As a result, this method provides a way to construct graph structures with given metric characteristics.

Summary

Primary authors: Dr RAPPOPORT, Alexander (Itpi named after A.A. Harkevich RAS);   KUROCHKIN, Ilya (IITP RAS)

Presenter: KUROCHKIN, Ilya (IITP RAS)

Session Classification: Distributed computing systems

Track Classification: 1. Distributed computing systems