Forecasting the Future Developmer Population Dynamics Simula

Social Processes

The Moscow State University supercomputer, Lomonosov, predicted the social and economic development of Russia for the next 50 years. The project goal was to acquire the experience of building such population dynamics simulation models in Russia. The project team was comprised of two specialists from the Central Economics and Mathematics Institute (CEMI) and three specialists from Moscow State University (MSU).

The population dynamics model was also tried on 1000 processors, and then it took only 16 seconds. In addition to Lomonosov, the evaluation was also carried out on supercomputers MVS-100K (Joint Supercomputer Center of Russian Academy of Sciences) and Chebishev (MSU). Regular computers are unable to calculate such models (top productivity of Lomonosov after its modernization is 510 TFLOPS).

Population dynamics simulation showed that in 50 years, the north territories' population will be almost completely disbanded and the Siberian and Far East populations will significantly decrease. South regions are expected to meet population growth. According to the population dynamics simulation model, GDP on the whole is expected to grow. Yet, the specialists who took part in the project warn not to take the results as an inevitable forecast, as the population dynamics model did not take into account such possible influential events as war or a huge epidemic.

The Russian population dynamics model was developed with the use of AnyLogic simulation software. To create this model, CEMI specialists used about 100 million agents. The data used in the population dynamics simulation was taken from the Federal Agency of State Statistics and from Russian monitoring of the economic situation and the health of the population.

Getting the final results, the scientists say, wasn't the only objective. They also wanted to get experience of model conversion, of transferring a model from a regular PC to a supercomputer, because there is a lack of such experience in Russia. One difficulty was the

Sweden. For example, RTI International, a research institute in the USA, used this software to simulate HIV/AIDS proliferation via drug addicts. Also, the United States Census Bureau worked with AnyLogic, using System Dynamics, for a California Hispanic population dynamics simulation.

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