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Parallel Computing in Weather Forecasting

Weather forecasting is a prime example of a real-world application that utilizes parallel computing.

Weather forecasting models require running complex simulations that involve massive amounts of data and repetitive calculations. These simulations cannot be completed in a reasonable timeframe using a single computer.

Parallel computing allows weather forecasting centres to break down the problem into smaller parts that can be computed simultaneously across multiple processors or computers. This enables them to generate accurate weather predictions within the necessary timeframe, which is critical for providing timely and useful information to the public.

The parallel architecture of modern supercomputers, with thousands of interconnected processors, is essential for running these large-scale weather simulations.

Networked Systems in Construction Planning.

Another real-world application of networked systems is in construction planning and optimization.

Construction projects involve complex logistics, material management, and energy usage that need to be carefully planned and simulated. Networked systems and high-performance computing are used to model these construction projects in detail.

By connecting multiple computers in a network, construction firms can run sophisticated simulations that optimize factors like material transport, energy efficiency, and cost. The parallel processing power of networked systems allows them to rapidly evaluate different construction scenarios and identify the most efficient plans.

This use of networked high-performance computing helps construction companies reduce costs, improve sustainability, and deliver projects more effectively. The ability to model and simulate complex construction problems in parallel is a key advantage provided by these networked systems.

In both weather forecasting and construction planning, parallel computing and networked systems are critical for handling the massive scale and complexity of the problems involved. The simultaneous processing power enables solutions that would be infeasible with traditional serial computing approaches.