Integration of GRID Approaches into the Geographic Web Service Domain

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SUMMARY

Within the geographic data processing domain, a broad range of problems exists that are not or only insufficiently solvable using existing local computational resources. With the continuous set up of international spatial data infrastructures, the problem of intensive data exchange grows. Whereas network capacities have reached enormous scales in the industrial countries, the exchange of large XML encoded geographic data sets is still an obstacle in large parts of Asia, Africa, and South- and Central America.

Today, more and more complex chains are used to extract valid information out of raw data sets. Workflow description languages are under development allowing a dynamic set up of complex chains, implying multiple steps of data accessing, data processing, and data visualization. Each step causes network traffic. If we measure the distance a single date has to cover before being delivered to the final user in number of geographically dispersed Web Services, it could be certified that it extends continuously.

The Grid provides an approach for sharing geographically and organizationally dispersed heterogeneous computational resources. Grid technology has been used in many disciplines, although very few exist in the geographic domain. Merged with agent-based technologies Grid services can dynamically move within a network and perform their tasks at those locations where the best performance is guaranteed respectively the network traffic can be minimized. This paper will describe how the three approaches, standardized Web-based Geo-Information Services, agent-based services and Grid could be integrated.

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