THE PROBLEM

In the event of natural disasters such as large-scale flooding, normal transportation routes may be cut off. Since time is critical in these situations, efficient placement of supply distribution sites, and up-to-date route planning is critical.

A system is needed to help emergency response personnel manage relief package delivery to affected households. A means to visualize disaster affected areas, package delivery points, optimized routes for package delivery, and a secondary system for calculating optimized routes on a supercomputing cluster and a method of transferring data sets to and from the visualization component is needed.

THE PROJECT

The prototype solution developed used Google Earth as the visualization component; this was updated remotely via a PostgreSQL database backed PHP web site. A raster color map algorithm processing GIS survey data files was developed and utilized in the calculation of optimized routes; data transfer between the web server and the supercomputing cluster occurred via HTTP POST transactions in conjunction with the common ‘wget’ executable available on the Linux-based supercomputing cluster.

THE OUTCOME

Utilization of freely available software packages proved effective as a low-cost solution to the problem. External evaluation of the system was favorable; an effort is being made to expand the prototype to a fully functional tool for use by emergency responders. The completed system is expected to be useful for incident commanders to help coordinate resources during disaster events.

Collaborators: Barbara Nicolai, Ge Jin, Chuck Winer,
School of Technology
Students: Jerry Dekker

Fig. 1. Simulated delivery routes in Google Earth.

Fig. 2. A portion of the system management interface.

Fig. 3. Geo-located photographs from portable devices.