Distributed and Decentralized Location-Aware Architecture

Researchers at the University of South Florida have developed a technology that has the ability to interpret and collaborate transmitted location data from cell phones, laptop computers, or similar GPS transmitters from multiple distributed and decentralized servers into one output GPS map screen.

The scaling of a centralized server system has been the recent focus of many researchers. However, this approach presents numerous problems. By scaling up a centralized server, more cumbersome infrastructure and more server PCs are required. Another problem with a single centralized server is that if the server were to be compromised in any fashion then the entire system would be destroyed.

Our researchers have taken a different approach to addressing the enlargement of server systems. Instead of using a high capacity centralized system, our researchers have adopted the use of multiple decentralized server systems to track GPS transmissions from multiple transmitters. The novel technology that our inventors present is a software algorithm that transmits data in real-time between the transmitters and multiple decentralized servers. The software program interprets location transmissions onto a map and makes the location information available via any one of the server locations. Titled “Geotella,” the software is a derivative of the P2P file sharing program Gnutella. However, instead of sharing media files, Geotella shares the GPS location information of the transmitters and the other servers.

Some of the benefits of our inventors’ software program in combination with a decentralized and distributed server system include: less system clogging, fewer system crashes, and the ability of the system to remain relatively unchanged if one individual server becomes physically compromised.

**ADVANTAGES:**
- Experience less server clogging
- Experience fewer server crashes
- Combine GPS data transmissions from multiple servers onto a single system
- View active transmitters and server locations on one Google map

**Connects Distributed & Decentralized Servers**

The above figure shows two active servers in the system. There are two circumferences that describe the current covering area of each of the servers. In this figure, the server on the right-hand side (131.247.3.140) has a greater area than the other server. That is because there is at least one user that is within that area. This area contracts and expands as field clients that are connected to that particular server move.

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