

Mobility without Ad hoc Routing for Supporting Disaster Response

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Abstract:

In PICE stage II--III disasters, such as mass population displacements, emergency response is typically required over extended time periods and geographic areas. The disaster response requires the rapid deployment of a communication system and robust methods of sharing, retrieving, and updating essential information. Extremely sparse ad-hoc networks are typical in large scale disasters. Features of geography, scene hazards and obstructions, as well as power and size considerations, may limit the communication methods and range available to the radios.

We show new approaches to these problems. First, we propose to bring large collections of medical literature to the disaster using a *peer-to-peer IR* system. In the system, documents in a collection are replicated in an overlapping manner at mobile peers. This provides resilience in the face of node failures, malicious attacks, and network partitions. The system does not require ad hoc routing. Second, we address the problem of highly-partitioned ad hoc networks by developing routing protocols that exploit the resources and mobility of nodes in the network to store, carry, and forward packets between devices that are physically isolated from one-another. Our protocols adapt to the routing that is available due to non-random node movement.