Peer-to-peer heart monitoring

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The possibility of remote monitoring for chronically ill patients will soon become a reality. Now, researchers in South Africa and Australia have devised a decentralized system to avoid medical data overload. They describe the peer-to-peer system in a forthcoming issue of the *International Journal of Computer Applications in Technology*.

People with a range of chronic illnesses, including diabetes, high blood pressure, and heart problems can benefit from advances in monitoring technology. Such devices could send data on a person's symptoms directly to a centralized computer server at their health center. This would allow healthcare workers to take appropriate action, whether in an emergency or simply to boost or reduce medication in response to changes in the patient's symptoms.

However, as tele-monitoring is set to become widespread, there will inevitably be an issue of data overload with which a centralized computer will not be able to cope. Computer scientists Hanh Le, Nina Schiff, and Johan du Plessis at the University of Cape Town, working with Doan Hoang at the University of Technology, Sydney, suggest a decentralized approach.

Computer users are familiar with the concept of peer-to-peer (P2P) networks in which individual users share the workload across equivalent personal computers on a network. This avoids overloading any single server or swamping bandwidth on individual connections. The P2P approach is commonly employed by software companies and others to distribute large digital files, such as operating system updates, and high-

definition movies.

A P2P network overlays a network on the individual peers, known as nodes, without a central control point and uses their idle processing cycles, storage, and bandwidth via the internet.

Le and colleagues have developed an application to demonstrate proof of principle of how a P2P network could incorporate patient sensors including thermometers, blood-pressure units and electrocardiograms (ECG). It is the latter on which the team has focused to build a P2P heart-monitoring network.

The system builds on the team's concept of a physically-aware reference model (a PARM). Their PARM acts as a small-scale, but scalable model of the kind of network overlay that could be built on the internet. Tests have already demonstrated that a continual and unintrusive heart monitoring application could be developed into a working e-health system quickly and simply at low cost using P2P.

More information: "A pervasive tele-health system for continual and low intrusive monitoring using peer-to-peer networks" in Int. J. Computer Applications in Technology, 2009, 34, 330-334.

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