Peer-to-peer networking takes internet out of the equation

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(PhysOrg.com) -- When people working on a project get together with their laptops and PDAs, they share information via the internet and a client server. But new software developed by European researchers allows independent, ad hoc, secure networking anywhere.

The power and reach of the internet in today's world is such that people have, in a short space of time, become over-reliant on it for many tasks both in business and personal life.

If a group of people are gathered together with their laptops in a conference room and are working together on a project, they need to use the web as a communications medium and a central server to store the data they are working on.

If the internet connection is unavailable, congested or even just unaffordable, it has a serious impact on the productivity of the group.

To overcome this, we need to move away from the centralised, rigid client-server paradigm and fixed communications infrastructure. This is just what researchers on the EU-funded POPEYE project have been doing.

Power in unity

The researchers realised that when a group of people gather for a

business meeting, be it on the sidelines of a conference, or in airports or hotels, they all carry laptops or PDAs which have vast processing power. They also have the built-in ability to wirelessly network, although this is usually used to connect to the internet.

“We decided you could use the combined computing power of whatever portable devices are present to conduct meetings in a productive manner,” says project coordinator Nicolas Berthet.

Apart from the advantages of being able to collaborate in any environment without the need for the usual fixed infrastructure, using just the portable personal devices of the people present has other advantages.

“Even if you do have access to the internet, that can often be a distraction if a group are gathered together to work on a project. While one person is doing his presentation, or providing his input, others could be checking their email or performing other tasks while waiting their turn, instead of concentrating on the task at hand,” he says. “But using peer-to-peer networking allows everybody to focus,” he says.

Standards don’t matter

The researchers have taken advantage of the technology embedded into today’s portable computing devices by developing new software which is able to cope with different hardware standards. A variety of devices can seamlessly slot into a spontaneously created network.

“It doesn’t matter if there are different brands of Wi-Fi cards or laptops, if they have a small amount of storage space and small screens, or plenty of memory and a big screen, the POPEYE system can bring them all together,” he says.

The software creates a shared repository which everybody in the network can tap into, moving documents and other files to and from their individual hard drives. Because the resources of all the devices are being shared to create the repository, somebody with a small PDA will get exactly the same access to the material as somebody with a powerful laptop.

“Using peer-to-peer in this way means there is no particular node or site where everything is stored for reference,” Berthet says. “You don’t get to download files as such, but to open any file or access any data in the shared space and use it.

There is a common repository that only exists because the community exists, and it ceases to exist when the community ceases to exist.”

No centralised control

Even though there is no centralised control or storage point, people can opt in and out of the network without any adverse effect, as it automatically readapts. This even applies to the person who created the network in the first place or the network manager, if there is one.

How does it work in practical terms? First, you would have to install POPEYE via online download, CD, memory stick, or at the conference itself, via an infrared port or bluetooth.

The researchers have included many of the applications available with standard online collaborative systems in POPEYE, including polling, instant messaging, notice boards, file sharing, screen sharing, collaborative maps and even an anagram game.

Everything is open source, so anybody can develop their own applications to run on POPEYE. According to Berthet, more bandwidth-

hungry functions, such as video streaming, may be the subject of future research.

While the initial focus of the project was to allow people to work on collaborative projects using personal IT devices independent of the internet, the applications of POPEYE go beyond business meetings and the need for corporate infrastructural support.

“In a disaster situation, it can take days or weeks to get power and communications restored, and POPEYE could help emergency services and relief workers to share information,” Berthet offers as an example.

“In the EU, where the ultimate aim is a laptop for every child, the potential for small interest groups and neighbourhood groups to network is enormous.”

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