Keeping up with your peers, securely

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Mobile peer-to-peer (P2P) applications allow a team or group to create new levels of ad hoc co-operation and collaboration around a specific, real-time goal. But developing compelling and secure applications is a challenge. Now a platform developed by European researchers rises to that challenge.

Many business sectors could benefit enormously from secure P2P mobile communications, but developing applications tailored to specific needs is expensive, time-consuming and not necessarily reliable. Security, in particular, is a difficult issue to resolve.

But now researchers at the EU-funded PEPERS project are putting the final touches to a mobile P2P development platform for secure applications. The platform could mean a rapid rise in the number of secure, industry specific P2P mobile applications, helping to increase the competitiveness of European business.

P2P applications allow decentralised companies to more effectively manage a dispersed and highly mobile workforce. Journalists will be able to work more collaboratively on breaking news, and security guards will coordinate responses to situations, increasing security and personal safety.

P2P applications are a powerful innovation enabled by the internet. Essentially, P2P allows individuals to connect and work together, rather than having to go through a central communications unit first.

P2P can allow thousands of people to collaborate around a specific long-term or ad hoc goal. The technology gave rise to Wikipedia, the online encyclopaedia written by thousands of volunteers. It enabled the creation of Digg, Stumble-Upon and del.ico.us, all phenomenally successful bookmarking services.

From virtual to real

But these are all desktop examples. By creating a platform to develop secure mobile P2P applications easily, the PEPERS team helped to move P2P from the virtual to the real.

“The goal of the project was to enable the development of secure mobile P2P applications,” says Vasilios Tountopoulos, coordinator of the PEPERS project. “So we created a platform to help develop, and run, secure applications on mobile devices. It means people can set up an ad hoc group to tackle an emerging task.”

The platform can be used to create secure, mobile, seamless P2P applications for specific domains.

Peer-to-peer for physical security

Security guards, for example, transfer large sums of cash or patrol a client’s premises. They need to keep in touch and organise themselves on-the-fly to complete their day-to-day tasks. Currently coordination is handled by a central dispatch, but that solution is beset with problems.

Firstly, it takes time to query dispatch, and more time for them to send another guard who might be only a couple of dozen metres away. And if dispatch is fielding queries from dozens of personnel, scattered around a city, the process takes longer, and the risk of error increases.

With an application developed through the PEPERS platform, guards can communicate directly, quickly and securely.

Breaking news

The PEPERS platform has also been used to develop an application that allows reporters and photographers to collaborate on a breaking news story. An editor first assigns a story to a team of reporters and photographers. Through P2P they can co-operate and share information on the ground, compile a report and send it with photographs to the editor once complete.

Such an application makes collaborative reporting easier and faster and helps the newspaper to break news before its competitors.

These are only examples of what the platform can do. As a first step, the PEPERS team only set out to prove that a platform supporting the development of secure mobile P2P applications was feasible.

Challenging tasks

“There were many challenges,” says Tountopoulos. “Making a secure system on a lightweight platform like a mobile device was a challenge. We had to optimise the software for mobile devices.”

The project chose to develop the platform on mobile devices based on the well-established, open-source Symbian operating system for mobile use.

“And developing software that responded to all the security constraints was tough, too,” adds Tountopoulos. “We had the rules in place, but then you need to adapt those rules to a specific situation.”

The team solved the problem by isolating the P2P application from the rest of the host operating system, which increased its security. Finally, responding to all of the business constraints was a tough problem to crack.

“But from our experience we were able to develop a platform that can be easily adapted to specific applications,” Tountopoulos says.

The platform can be developed further by those who need to adapt it for their specific needs.

“We designed a complete system, but we only developed the core platform because there were many elements in the design that were peripheral,” says Tountopoulos. “Still, the overall design is there if people want to add further components.” The upshot is that secure and customised mobile P2P applications can be easily developed for specific business goals.

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