A Small Company is a Dynamic Company

Avinash Jayaraman is Co-Founder and Managing Director of **Innove Technologies**, a Singapore-based company that has developed advanced networking technologies. He spoke to *InnovAsia*'s **Murli Ravi** about emerging technologies in the wireless industry.

Avinash and his business partner, **Samir Kuthiala**, conducted research together at the **Centre for Wireless Communications** (CWC; now known as I^2R), a research lab affiliated with the National University of Singapore. The duo had a vision, along with **Prof Winston Seah** of CWC, of developing what is known as "dynamic protocols" for wireless environments.

Protocols: A Primer

Before talking specifically about dynamic protocols, it is worthwhile to gain a brief understanding of device communication: When two devices "talk" in a network, they do so via a special language known as a "protocol".

There are several protocols in common use, such as the Internet Protocol, a vital basis of all Internet communications. Other protocols may be much more specialised and proprietary to particular devices, such as those used in satellite communications or military applications.

If two devices do not share the appropriate protocol, they cannot communicate. It is analogous to two people trying to talk to each other without sharing a common language.

Today's protocols are, in general, "static" protocols, meaning that their features do not change constantly. Reimplementations or updates are thus relatively infrequent.

One of the drawbacks of static protocols is that, if I knew the protocol that you use with your friends, I could potentially listen in on your communications (one form of hacking). Encryption is one approach to solve this problem but it has its own deficiencies.

Another drawback for custom protocols in particular is that modification of protocols can be a painful process, especially when the number of interacting devices is very large (think mobile phones) or when devices are not easily accessible (satellites, for example). Some protocols are also highly customised to a particular hardware architecture, meaning that device architecture and protocol design need to be modified hand-in-hand.

Dynamic Protocols: Why Bother?

Dynamic protocols solve these two big problems by allowing protocols to be generated, downloaded and installed on the fly irrespective of the underlying hardware. In fact, Avinash compares Innove's dynamic protocol technology, Mobeus, to Java technology, describing it as the "wireless protocol equivalent of the Java virtual machine". Like Java, Mobeus is platform-independent, meaning that developers can work with Mobeus (and Java) without worrying about the underlying hardware structure.

What are the implications of this technology? First of all, device communications would never have to be encrypted since dynamic protocols would ensure that only authorised devices speak the same language. Protocols could theoretically be randomly generated by the server for each login attempt by each client. So even if communications were intercepted by an unauthorised party, data would be unintelligible.

The other big advantage of dynamic protocols is that they enable protocols to be updated remotely and on the fly. Neither expensive redesigns of customised device architectures nor onsite updates are required.

Judging by the increasing number of networked devices in the world, this then sounds like a prime candidate for Next Big Thing status. Avinash is enthusiastic but pragmatic. His aim is to target niche applications of dynamic protocol technology (such as in ocean mapping or expensive specific-purpose hardware) and slowly build momentum from that base.

Globally, he says, there are only about 6 teams researching this topic, none of which are close to commercialising their work. Mobeus, however, seems to be further on in the development process than the others. Avinash says that a patent is expected to be filed for the technology in the near future.

Mobeus is also the only project focused on wireless devices. This has a few effects, such as constraining implementation to a small "footprint" for low-resource devices and focusing design on a simpler server-client architecture without routers.

This being a niche area, Innove also faces the hurdle of having no appropriate standards to benchmark Mobeus against. Avinash and Samir have found that they need to invest time and effort in educating their customers and partners as to the nature and viability of the technology. Their current challenge is getting to the standardisation stage and promoting the implementation of these standards industry-wide.

Future of the Indian Wireless Industry

Avinash also spoke more generally about the wireless sector in India. Numerous small, innovative companies exist in India today that offer mobile application programming and interface design services. According to Avinash, the number of small companies in this and related spaces will explode over the next couple of years, particularly via spin-offs from the Indian Institutes of Technology (IITs) and other engineering institutions in India.

Support for development in the wireless arena is also coming from the big players. Companies such as Motorola, Texas Instruments, Intel and Reliance (an Indian industrial conglomerate) are investing large sums in developing new technologies in India.

External links (open in a new window):

1. Innove Technologies