

# TMC'S ADVISOR

Practical Advice on Data/Voice/Video from Telecommunications Management Consultants Inc.

## Wireless Data Alternatives

By Peter Aggus

*Wireless data systems are here to stay, with the technology and speed improving almost daily. Key new developments are in the “final link” to the end user; where WAP, in the wide area application, and Bluetooth, in the short range application, seem set to become major players. The deployment of very economical wireless inter-building data transmission has been accelerated by the use of free-field laser links.*

### Microwave Radio

The **Advisor** recently reviewed data transmission techniques over Cellular Radio. Developments continue in that field with, we are pleased to note, speed increases for the current low-speed circuit switched service. The new “Wireless Access Protocol”, or WAP, is creating a new generation of internet-capable cellular phones, including units such as “blackberry” which resemble a portable digital assistant. Microwave radio systems are enjoying growth, in part because of bandwidth deregulation. On-campus inter-building links are a popular application – a pair of LAN bridges are used to link LAN segments in the two buildings using compact antenna systems. Speeds up to 10Mbit/s can be achieved, with reduction as distance increases – typically a 20km link can yield speeds

around 2Mbit/s.

Microwave frequencies are also used by the new generation Local Access providers. These use technology, known as Local Multipoint Distribution Service (LMDS), which resembles a static cellular network. Licenses were awarded earlier this year to Inukshuk Internet Inc. and Partners, and to SaskTel, to provide service in 13 designated areas across Canada. Speeds from 9.6k to 11Mbit/s will likely be offered in most areas.

### Satellite Systems

Satellite systems exist, though cellular satellite is not as buoyant as it was once expected to be; thanks, in the main, to rapidly falling terrestrial costs. We have talked in the past about VSAT systems, which typically use small dish antenna to achieve a multi-point broadcast service. Low Earth Orbit (LEO)

systems, such as the failed Iridium, were once seen as the likely way of achieving mass communication with handheld portable devices; however, as noted earlier, this field of use is now being served by the new WAP-based services. The current high cost of LEO remains a barrier, although the technology is slowly maturing as expected – at least for the remaining players.

cover LAN. See the diagram for details.

### Wireless Data Within Buildings

Within buildings, a new form of radio-based LAN is growing rapidly. The technology is capable of supporting around 1Mbit/s (being increased to 11Mbit/s) link speeds, but is claimed to be fairly compatible with the data throughput achieved on 10Mbit/s Ethernet cabling. These systems use



special interface cards, which replace the Network Interface Card normally used to access a LAN – they have a small cellular-type antenna instead of the typical RJ45 cable jack. The LAN infrastructure is provided by in-building base stations, similar to the ones used for cordless phones. Expect to see this technology being offered to business clients in hotels and conference venues.

Over very short ranges (just a few metres) a new standard is being defined, called “Bluetooth”. The aim of this standard is for equipment to have what is basically a radio LAN port capable of linking with any other similarly equipped system within range. Unlike infra-red (see later) there is no line-of-sight limitation with Bluetooth. We will watch this emerging technology with interest.

One interesting form of data communication over radio, which has never “made the grade” in North America, is known in Europe as the Radio Data Service (or RDS). It is a low bit rate data service embedded into the VHF FM broadcast station signals. It is a very effective way of carrying identification and control signals to suitably adapted receivers (and most European car radios now have RDS decoders). The data rate is hardly up to LAN rates, but is adequate to communicate with mass produced receivers and alert them to traffic

announcements, breaking news etc – as well as forming the basis for an auto-handoff tuning system that allows a receiver to remain locked onto a national station as the car move between transmitter serving areas. Shame it never caught on here – it makes tuning in an FM radio so much easier.

### *Infra-Red*

Short-range infra-red communication is covered by the IRDA standard, often provided as a “cordless serial port” on computers. Users simply point one computer at another and the protocol allows basically a LAN-type link to be established. IRDA is used for file transfer between laptops and desktop systems, for connecting a laptop to a printer and for hooking a laptop into a corporate LAN without needing to plug in cables. Its big disadvantage is its limitation to short-range line-of-sight applications. It seems likely that the emerging “Bluetooth” standard may eventually displace IRDA as the preferred short-range cordless link technology.

Over a slightly longer range, multi-node wireless systems can overcome some of the line-of-sight limitations by providing several paths for the portable unit to use. These systems can provide cordless LAN capability in an office, with a limited degree of mobility. They are of use for applications such as real-time inventory management in warehouses, linking portable

barcode scanners back to the store LAN. The basic technology will also be familiar in another use - providing the hard-of-hearing with cordless hearing aids in theatres etc.

### *Free field Laser*

Inter-building systems now exist that use lasers for longer range. These are ideal where line-of-sight exists and can now shoot very high bandwidth over a range up to a few km. Some new companies are trying to compete in the LMCS market using this technology.

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