

GANDALF conjures up faster, seamless Internet technique

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As the white wizard of Middle Earth in Lord of the Rings, Gandalf had some astounding abilities. As his modern namesake, the GANDALF project is set to cast a spell over the Internet world by offering unprecedented data transfer rates seamlessly over both fixed-line and wireless.

GANDALF has developed a groundbreaking technique to increase data rates by a thousand-fold compared to existing DSL and a hundred-fold compared to WiFi. The technology also allows data to flow seamlessly over both wireless and fixed-line communications, making the project the only initiative in the world to progress so far in both areas.

“Why not use the same technology for both fixed-line and wireless? That was the fundamental question that drove the project,” explains GANDALF coordinator Javier Martí in Spain. “We also saw the need to address the additional challenge of obtaining high rates of data transfer – exceeding 1 gigabit per second – over both cable and radio.”

“The major advantage for operators is that the cost of implementing GANDALF is minimal,” Martí says. “We estimate that it would not cost more than say 50,000 or 60,000 euros to implement it across an entire network, which is peanuts for operators.”

Most significantly perhaps, the system would give operators access to more clients without having to undergo costly public works projects to lay new fibre optic cable. Existing cable could be used to relay data to

the closest access node to clients' homes before being converted into a wireless signal.

In areas where both fixed-line and wireless accessibility exists, the GANDALF system offers additional advantages. "The duality of the communications channels increases reliability," the coordinator notes. "For businesses or public administrations this is particularly important. Banks and other companies carry out a process called disk mirroring, for example, where they copy the databases from all their branches. Lost connectivity during mirroring can cause major problems but with dual connectivity the reliability is greatly increased."

With the GANDALF technique, data transmissions switch seamlessly between fixed-line and wireless. "It is completely transparent to users," Martí notes.

Similarly, the system can also be used to connect two fixed-line local area networks by radio without the need for new fixed infrastructure, something that the project partners are currently testing at the campus of the Technical University of Valencia. The same site will also be used for other field trials before the project ends in December.

In-lab tests have so far achieved a data transfer rate over both fixed-line and wireless of 1.25 Gb/s and the project partners are currently studying other capabilities of the system.

"We're planning to test the capabilities of creating wireless access at double radio bands using both the base-band and intermediate frequency. So far we have managed WiFi at 5 GHz and WiMax at 40 GHz. That makes sense in hotspots which could become very crowded very quickly, say in a football stadium during a soccer match. The technique would allow additional bandwidth to be added immediately as and where needed," Martí explains.

One of the partners, Fibernet is also looking to use the system in disaster situations where cable communications are one of the first things to be destroyed.

“With our system in place they could send out mobile units that would relay the signal of the last functioning node to maintain communications for emergency services,” Martí says.

Another partner, Spanish cable operator ONO is also due to start rolling out the technology across Spain to boost its coverage and offer clients increased bandwidth.

“The technology is here and it works, the only thing remaining is standardisation, depending on how well that goes I imagine a product will be on the market within a year from now,” Martí says. “So in the coming years you can expect, with confidence, that many companies will start using this technology and many people will be receiving data over it in their homes, probably in Spain through ONO at first and then across the rest of the world.”

Source: [IST Results](#)

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