

Making sure the internet delivers

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European researchers have developed affordable test suites that businesses can use to check whether their software will work with the next-generation internet.

Internet applications across the globe are currently being re-engineered in anticipation of the transition to Internet Protocol version 6 (IPv6) from version 4 over the next three to four years. But before companies can make their IPv6 products commercially available, they will have to thoroughly test performance, standards-compatibility and interoperability.

The IP protocol, or standard, allows internet users to use different software applications and technologies when accessing the network. While plenty of commercial software already exists to test complex telecom protocols, these are often proprietary and all are expensive. For

example, a GSM test system can cost about €2 million.

The researchers on the EU-funded Go4IT project have developed software suites and services that dramatically lower the cost of such testing for Europe's businesses by providing IPv6 test suites available for free from the project's website site.

Other test software developments

In addition to the IP test suites, the researchers have proposed new Testing and Test Control Notation-3 (TTCN-3) specifications for IPv6 compatible Dynamic Host Configuration Protocol (DHCP) type servers.

DHCP is a protocol that automates the assignment of IP addresses and other parameters to networked devices.

TTCN-3 is a computer language developed to test telecommunications software. The specification has received the backing of major commercial companies, including Ericsson and Nokia.

Go4IT's TTCN-3 test suites will also be useful to a range of other industry sectors, such as car manufacturing.

The Go4IT project team's work has won the interest of government test centres in China, the US and India, which also face the challenges of IPv6 transition.

In a further initiative, the Go4IT team has established a global open source community devoted to the development of TTCN-3 tests. The community includes researchers at universities in Inner Mongolia and Uruguay.

Encouraging the transition

By working as an open source community, the team has accelerated the development and acceptance of TTCN-3. Robust, easy-to-use and free testing suites, in turn, encourage the transition to IPv6.

The open source approach to TTCN-3 development allows small and medium sized enterprises and academics to easily participate in the development of the standard without facing prohibitive cost barriers.

“At the beginning of the project we saw that there was strong interest in TTCN testing and no free tools available,” says Go4IT project coordinator Franck Le Gall. “Our open source components for TTCN-3 testing are just a starting point.”

The transition to IPv6 from IPv4 is necessary because the internet is running out of addresses, he says.

“Of course, as IPv6 was engineered after IPv4, some other improvements have been built in,” says Le Gall, who participated last year in Europe’s impact assessment of IPv6 and is a manager with European strategic management consultants, the inno group. “But the need for more address space is the one compelling reason for the transition.”

The move from IPv4’s 32-bit addressing system to IPv6’s 128-bit system provides for virtually unlimited IP addresses and a greater flexibility in addressing systems.

The internet community incorporated IPv4 after agreeing to the standard in 1981, before anyone even dreamed about the scale of today’s internet. IPv4 has a 32-bit addressing system, allowing the creation of almost 4.3 billion individual addresses.

By 1991, it was clear that 4.3 billion addresses would be insufficient for any global internet. By 1996, the standards setters designed the main components of IPv6 and started working on the challenges of implementation.

While preparation for the transition has taken a long time, more and more manufacturers are building IPv6 compatibility into the server equipment and software that handles global internet traffic.

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