

New Internet that's 10,000 times faster

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The internet could soon be made obsolete by "the grid". The lightning-fast replacement will be capable of downloading entire feature films within seconds. At speeds about 10,000 times faster than a typical broadband connection, the grid will be able to send the entire Rolling Stones back catalogue from Britain to Japan in less than two seconds. The latest spinoff from Cern, the particle physics centre that created the web, could also provide the kind of power needed to transmit holographic images; allow instant online gaming with hundreds of thousands of players, and offer high-definition video telephony for the price of a local call.

David Britton, professor of physics at Glasgow University and a leading figure in the grid project, believes grid technologies "could revolutionize society". "With this kind of computing power, future generations can collaborate and communicate in ways older people like me cannot even imagine," he said. The power of the grid will become apparent this summer after what scientists at Cern have termed their "red button" day - the switching on of the Large Hadron Collider, the new particle accelerator built to probe the origin of the universe. The grid will be activated at the same time to capture the data it generates.

Cern, based near Geneva, started the grid computing project seven years ago when researchers realized LHC would generate annual data equivalent to 56m CDs - enough to make a stack 50 miles high. Ironically this meant that scientists at Cern - where Tim Berners-Lee invented the internet in 1989 - would no longer be able to use his creation for fear of causing a global collapse. This is because the internet has evolved by linking together a hotchpotch of cables and routing equipment, much of which was originally designed for telephone calls and which lacks the capacity for high-speed data transmission.

By contrast, the grid has been built with dedicated fibre optic cables and modern routing centers, meaning there are no outdated components to slow the deluge of data. The 55,000 servers already installed are expected to rise to 200,000 in two years.

While the web is a service for sharing information over the internet, the new system, Grid, is a service for sharing computer power and data storage capacity over the internet. It will allow online gaming with hundreds of thousands of players, and offer highdefinition video telephony for the price of a local call. In search of new drugs against malaria, it analysed 140m compounds - a task that would have taken an internet-linked PC 420 years.

The proposed lightning fast replacement for the internet will consume a lot of power. Professor Tony Doyle, technical director of the grid project, said: "We need so much processing power there would even be an issue about getting enough electricity to run the computers... The only answer was a new network powerful enough to send the data instantly to research centers in other countries." That network, effectively a parallel internet, is now built, using dedicated fibre optic cables that run from Cern to 11 centers around the world, including those in the US, Canada, east Asia and Europe. From each centre, further connections radiate out to a host of other research institutions using existing high-speed academic networks.

Ian Bird, project leader for Cern's high-speed computing project, said grid technology would make the internet so fast that people would stop using desktop computers to store information and entrust it all to the internet. "It will lead to what's known as 'cloud computing' where people keep all their data online and access them from anywhere," he said. Computers on the grid can also transmit data at lightning speed, as well as receive them. This will allow researchers facing heavy processing tasks to call on the assistance of thousands of other computers around the world. The aim is to eliminate the dreaded "frozen screen" experienced by

internet users who ask their machine to handle too much information.

The real aim of the grid is, however, to work with LHC in tracking down nature's most elusive particle, the Higgs boson. Predicted in theory but never yet found, the Higgs is supposed to be what gives matter mass. LHC has been designed to hunt out this particle - but even at its best will generate data on only a few thousand of the particles each year. It is such a large statistical task that the work will keep even the grid's huge capacity fully occupied for years to come. However, although the grid itself is unlikely to be directly available to domestic internet users, many telecoms providers and businesses are already introducing its pioneering technologies. One of the most potent is so-called dynamic switching, which creates a dedicated channel for internet users trying to download large volumes of data such as films.

In theory, this would give a standard desktop computer the ability to download a movie in five seconds rather than the current three hours or so. Additionally, the grid is being made available to dozens of other academic researchers, including astronomers and molecular biologists. It has already been used to help design new drugs against malaria which kills one million people worldwide each year. Researchers used the grid to analyze 140m compounds - a task that would have taken a standard internet-linked PC 420 years. Source: SUNDAY TIMES, LONDON.