



Creating a brighter future

The FTTH journey

**A White Paper by the
World of Applications Committee**

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From Internet's infancy to tomorrow's world

Many predictions for our near future would have been considered impossible just a few years ago. Would you have believed you may soon be watching 3D movies at home in ultra-high quality? Listening to music at better-than-CD-quality anywhere - without having to download it first? Being operated on by a surgeon thousands of miles away? Taking part in genuinely immersive virtual reality adventures? Living in a home that monitors and actually looks after the people inside it? Owning a holographic TV set? A housekeeping robot?

Bizarre predictions? Maybe. But just consider this: fifteen years ago, did you think that you'd be sending people messages via WhatsApp using a mobile phone? Watching the news during a train journey? Chatting with people on the other side of the world by video? Sitting down with a coffee - at home or anywhere else - watching a movie or working on a tablet, with the help of a Wi-Fi connection and the omnipresent cloud? Driving from town to town using a tiny computer to navigate and warn you of roadworks and traffic jams?

We'd like to take a look at the history of the Internet with you - just to establish that what seemed impossible at any given time often became commonplace just a few years later. Cast your mind back to some two decades ago, when Netscape was the leading web browser, and Excite and Lycos were the top search engines. Do you recall dialing up an Internet connection using your phone line and one of those noisy 14k modems? Remember how annoying it was when somebody else picked up the telephone and interrupted your connection? Remember trying to call someone yourself and being greeted by what sounded like a fax machine gone insane? Remember having to negotiate with family members who could go on the net, when, and for how long?

In 1990, downloading one single movie would have taken well over a month - if your connection stayed up for that long! At the time, the idea of downloading several films in an hour or so would have seemed like a totally ridiculous prospect. So just how likely would video streaming and video chatting - which we now take for granted - have seemed to you then?

THE 90'S DREADED DIAL-UP



Figure 1: The 90's Dreaded Dial-up

The arrival of 'Always On' Internet

Although downloading a 3MB photo took approximately 33 minutes in 1990 - if the connection didn't cut out half way through - within a decade this was reduced to 'just' nine minutes. In around 2000 it became possible to stay on the Internet non-stop, opening the door to massive downloads. We were finally able to make phone calls and surf the Internet at the same time. You could suddenly download MP3s and even transfer them to CDs. Online gaming actually became fun, as there was no vast latency.

Jump to five years later and music and video streaming and file sharing services start to appear. Games consoles such as the Playstation2 and Xbox were able to integrate Wi-Fi modules for online connectivity and an enhanced experience. Social networking was beginning to take shape with the advent of YouTube and Facebook. Towards the end of the decade, we also saw IP TV and IP HD TV arrive.

BROADBAND 1.0 ALWAYS ON

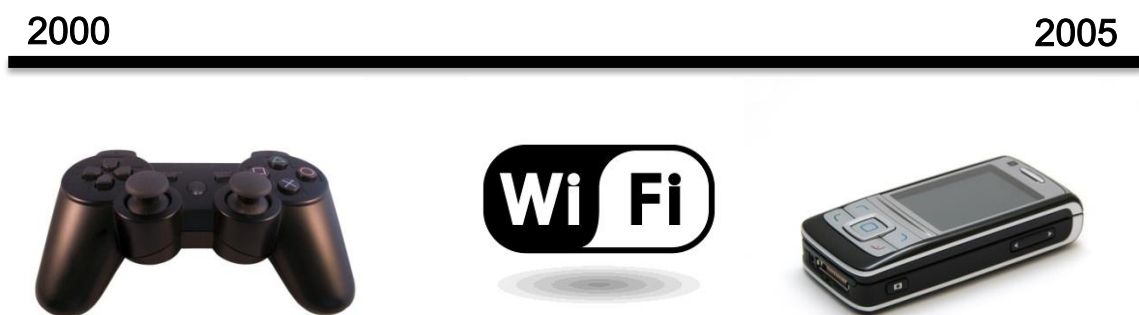


Figure 2: Broadband 1.0 Always On 2000 – 2005

The Fibre Broadband Era

With the arrival of Fibre to the Home (FTTH), many services that had already been around for years finally began to work as they were originally intended. Video on Demand (VOD), for example, is now really 'live' without any image freezing, and Vimeo videos don't need to buffer every few seconds. This has brought about massive changes in media distribution, the way we think about privacy, collaboration, and data sharing. It is also changing the role of the 'classic' service provider, who is now becoming more of a bandwidth distributor.

Today, many systems and technologies that might seem futuristic are, in fact, already here. Smart cities, for example, or smart grids and other such systems with vast built-in intelligence. More and more devices - from printers and phones to household appliances and medical equipment - now come with their own IP addresses, and the fast-evolving 'Internet of things' is radically changing countless 'ways of doing things'.

Faster connections and the ubiquitous Cloud might even mean that computers and mobile devices will soon no longer have any storage capacity. As 3D printers become increasingly affordable, we may see some big changes arise in online shopping, too. This will lead to more traditional retail businesses having to rethink their business models. Ultra High Definition (UHD) TV is expected to be adopted by consumers even more rapidly than existing HD TV, largely driven by a wealth of UHD content sources online.

BROADBAND 2.0 BRING ON THE BANDWIDTH



Figure 3: Broadband 2.0 Bring on the Bandwidth 2006 – 2012

The world in your pocket....

In the not-so-distant future, one major step ahead will be the move from being able, 'in theory', to go online nearly everywhere to simply never having to think about connection again. Being online everywhere, all the time, will simply be something we take for granted. It will be a basic necessity, just like the countless inventions which will make our lives easier, more productive, healthier, safer and more fun.

Now, remember that photo that took more than half an hour to download in the nineties? With a 1Gbps service, which should be widespread in a few years' time, it will only take 0.02 seconds. That's nearly TEN THOUSAND times faster. And you can also upload at the same speed!

When considering this example, which shows how quickly the Internet has changed in just over two decades, that remote-location surgeon suddenly might not appear quite so futuristic after all. In a few years' time, we may well be laughing at the fact that we once found this difficult to imagine. Just like our grandchildren will laugh when we tell them about those strange old dialup modems. Or how we had to leave the house to rent something called a DVD. Or when we explain that 'newspapers' were once really made of paper and physically delivered to our doorsteps...

BROADBAND 3.0 FIBRE TO THE HOME NO-LIMITS-EVER



Figure 4: Broadband 3.0 Fibre To The Home No-Limits-Ever



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