

## STP Magazine – 24<sup>th</sup> July, 2014

### How do you deliver a Zettabyte of data?

What is a Zettabyte? It's one thousand billion Gigabytes!

This is equivalent to “a billion terabyte drives” or “250 billion HD movies”.

Still too tricky to comprehend? Try one of my “Manageable Measures” - if 250 billion DVDs were stacked on top of each other they would reach to the sun and back!

Network giant Cisco predicts that the annual global IP traffic will increase to this figure by 2016<sup>1</sup> – that's only the year after next!

Why is it predicted to grow so phenomenally? Well, it's all due to having to deliver Ultra HD videos for 4K TVs.

1. Cisco - The Zettabyte Era – Trends and Analysis June 2014



### 4K TV will herald the start of the Zettabyte era.

Do you know what a 4K TV is? It's also referred to as an Ultra High Definition (Ultra HD) TV. Assuming you have heard of High Definition TV (HDTV) which to all of us today means you get a better picture quality, then you will get an even better picture quality with Ultra HD or 4K TV.

Ultra HD is revolutionising image quality, and in the process is ringing the changes in everything from program production to distribution technology. Ultra HD is already available from most major TV manufacturers and is the harbinger of a new content-driven mass market.

The headline facts are dramatic: Ultra HD delivers four times the picture resolution of 1080p full HD – thus the reason for the name “4K”. It will produce up to 120 images per second, with substantially more colours and more contrast, thus improving image clarity with finer detail and greater texture.

So using my “Manageable Measure” again, an Ultra HD (4K) movie will need to be stored on four Blu Ray/DVDs because of the extra detail or resolution.

Once seen, the impact of Ultra HD is never forgotten. According to the researchers at the Ericsson Consumer Lab 2013, two thirds of consumers want to have an Ultra HD screen once they have seen it, and every fourth consumer would be ready to pay more to receive High or Ultra High quality.

So these new videos, which everyone will want to watch, are going to be the primary reason for the growth in IP traffic over the internet over the next few years. So that's it, do we just let everyone get on with it?



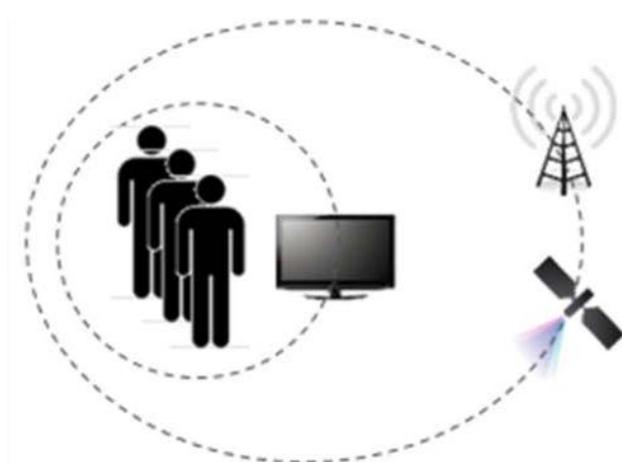
Sadly it isn't as simple as that.

There are many things to be considered, the most important of which is how to avoid the biggest traffic jam in the solar system – to the sun and back! Put simply, the data pipes are just not big enough to deliver this new content. As always we need more and wider pipes. But that's not all, in 2014 due to the "internet of everything"; people are changing their consumption habits, tools and preferences.

People no longer care from where they get their video. They want it anytime, anywhere and on any device. Video is on the way to becoming an infinite and personalised choice, and everyone wants unimpeded access. Network architectures and infrastructures have to prepare for the gigantic approaching wave of insatiable demand.

### **Satisfying the Insatiable Demand**

The days of reading the TV guide in the newspaper to decide what to watch in the evening are long gone. The change started with being able to watch and record movies on VHS tapes, then DVDs and then the first on-screen electronic program guide (EPG) and hard drives for recording appeared, all based on receiving your TV content from an antenna or satellite dish.



This was what happened a few years ago and is now deemed old fashioned!

With the advent of the internet we have created a new ecosystem where people can get their video from numerous sources using any device.



Delivery of video to multiple screens is what consumers expect, and the more screens each consumer acquires the more insatiable becomes the demand.



### How do we cope with the mother of all traffic jams?

Today it is estimated that HD-quality video throughout Europe requires 35 times more gigabytes of video per month than are currently consumed in each European household, and only just over half the population could receive this with the existing networks, leaving out 45% of the potential viewers.



Ultra HD would need 100 times more gigabytes per month per household, and this would leave out 80% of the population.

The “Manageable Measure” is that it requires 600kbps to stream low resolution video, a dedicated 2Mbps connection to stream HD-quality video, and 8Mbps to stream Ultra HD. The difference in quality is clearly noticeable and the data cost ranges from low with a land connection to significantly more expensive via satellite.

The cost to upgrade the terrestrial connections alone in order to accommodate the faster speeds would cost no less than an estimated 150 billion euros in Europe.

To this figure must be added an unquantifiable extra and ongoing operating cost over time of many more billion euros for the necessary ground installations.

Thus it will be a challenge for the private and public sector to fund and to provide the required terrestrial network infrastructure to be able to handle the demand for streaming video.

### **The future will combine delivery by “broadcast” and “streaming”**

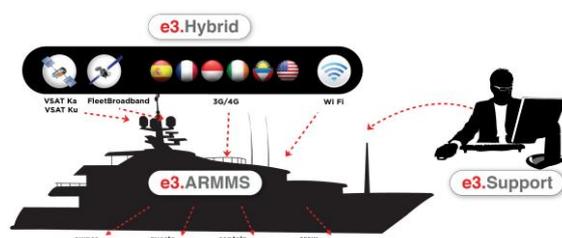
The **ONLY** solution is to combine terrestrial networks with satellite. A satellite can make an essential contribution to the need by delivering video directly to nearly half a billion households worldwide by “broadcasting” video, whereas a terrestrial network is typically used for delivering one video at a time as requested by one household at a time which is called “streaming”.

A satellite network does not slow down or cost more when additional receivers are added. The number of receiving households becomes irrelevant with broadcast. The satellite can broadcast video continuously to households and the videos will be automatically stored locally in each household in their local video cloud for playback as and when required.

### **The answer to my original question is: “The hybrid satellite-terrestrial solution”**

The only solution to the delivery issue of a Zettabyte is a hybrid solution. This hybrid of satellite and terrestrial connections will operate at a fraction of the cost. It will help off-load networks and allow for the distribution of the new digital 4K resolution video to the whole population.

The clear conclusion is that the ideal future network ashore is a hybrid. It is possible, viable and available today and is the solution we have been providing to yachts for the last five years using satellite, 3G/4G and terrestrial broadband. We have named it the “e3.Hybrid”.



This is yet another vindication that the technology we develop for yachts leads the world!

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