

15th Annual

Broadband

WORLD FORUM 2015

CONFERENCE HIGHLIGHTS AND KEY LEARNINGS APPLICABLE TO THE
NEW ZEALAND BROADBAND MARKET ENVIRONMENT.

INTRODUCTION

The Broadband World Forum 2015 combined a conference with an exhibition hall accommodating over 150 exhibitors. The conference and exhibition attracted over 8000 attendees itself covered five work-streams.

- VIRTUALISATION AND THE CLOUD.
- NETWORK INTELLIGENCE
- FIXED ACCESS EVOLUTION
- FIXED-MOBILE CONVERGENCE
- CONNECTED WORLD.



TOWARDS A GIGABIT FUTURE.

Networks worldwide are seeing the widespread adoption of online video driving huge increases in bandwidth consumption across networks.

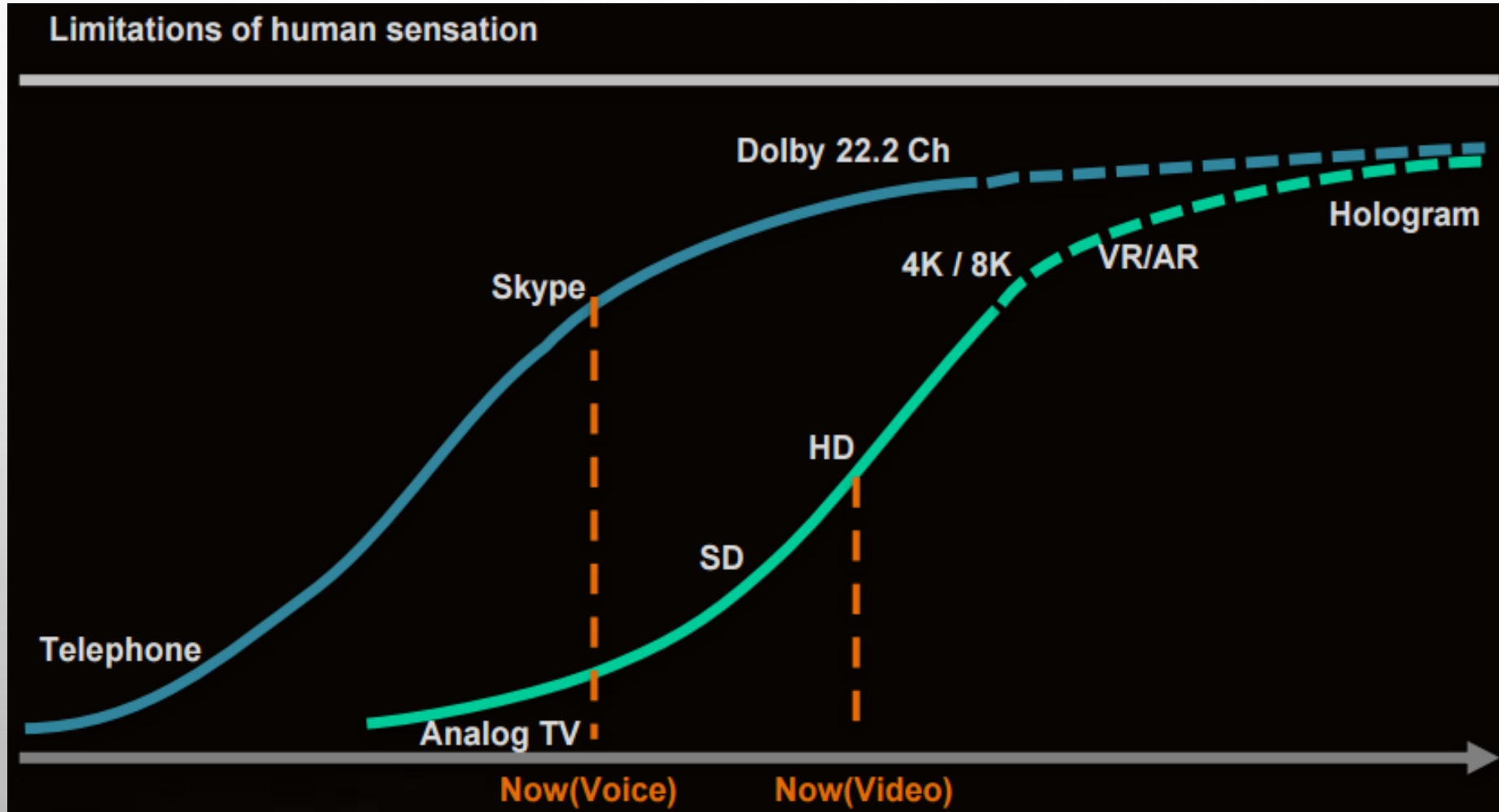
The EU has adopted a digital Agenda with a 2020 Target:

- 50% HOUSEHOLDS (>100MBPS)
- 100% COVERAGE (>30MBPS)

Compared to NZ Government Targets.

- 80% HOUSEHOLD FTTH (>100MBPS) BY 2022.
- 99 % COVERAGE (>50 MBPS) BY 2025

BANDWIDTH – HOW MUCH IS “ENOUGH”?



NEXT GENERATION VIDEO FORMATS

Standard	Entry-Level 4K	Basic 4K	IMAX 4K	IMAX 8K
<i>Frame Rate</i>	30P	60P	120P	120P
<i>Average Bit Rate</i>	~20Mbps	~50Mbps	~100Mbps	~420Mbps
<i>Home Bandwidth (Multi-Device/Room)</i>	~50Mbps	~100Mbps	~200Mbps	~1000Mbps

BROADBAND TRENDS

Several keynote speakers on Day 1 looked at trends that they are seeing in the market. These were Neil McRae's (from BT) picks:

- OTT Video
- IOT devices
- Companion Devices
- Multi User Households
- High Service Expectations

BROADBAND TRENDS Continued

Federico Guillen from Alcatel Lucent had his take on top 5 trends, with suggestions on how Service Providers can take advantage of these trends:

- 5G
- INTERNET OF THINGS
- NFV, SDN (Network Function Virtualisation / Software Defined Networking)
- UNLICENSED WIRELESS
- CLOUD

MAJOR INDUSTRY SHIFTS

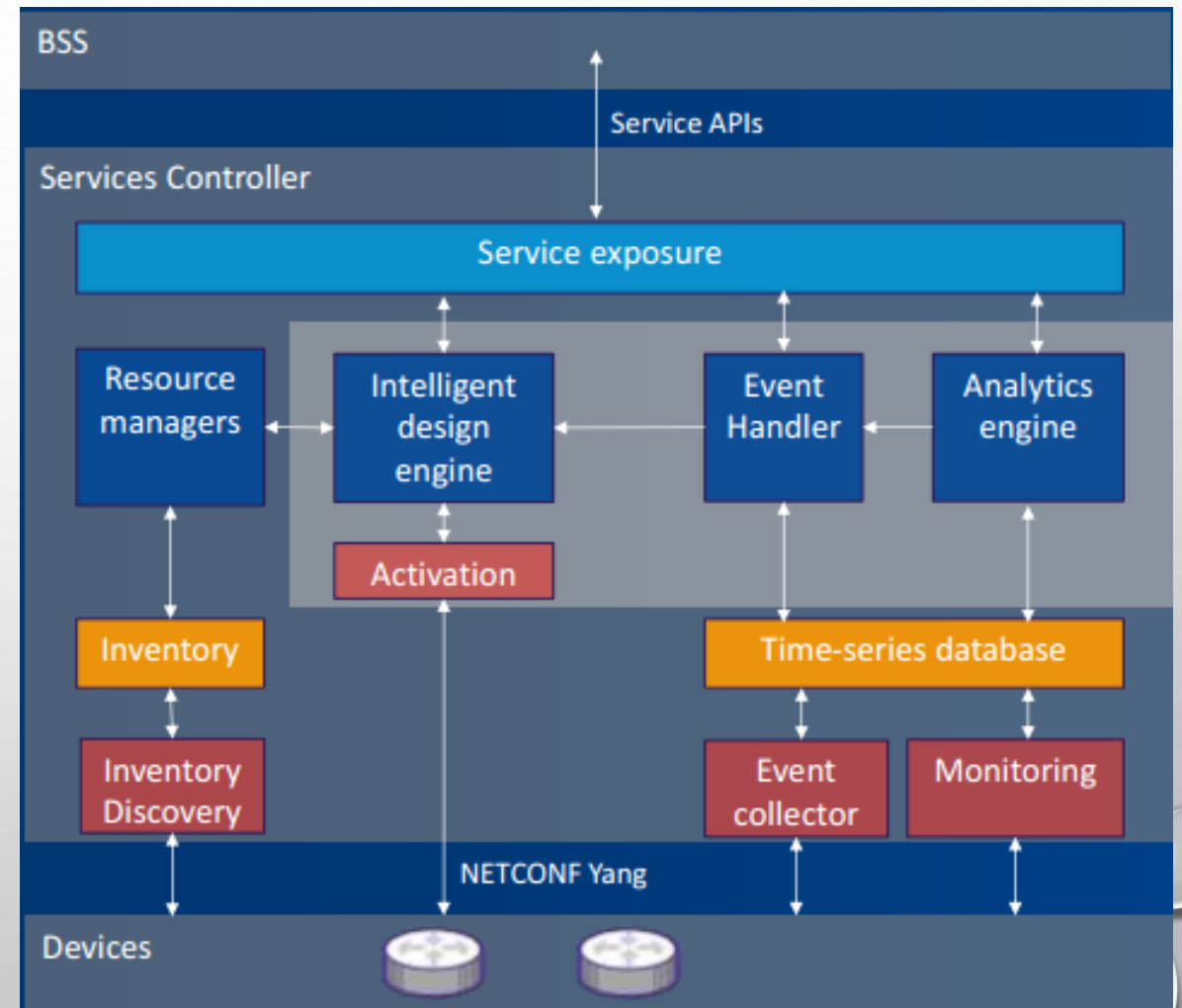
Håkan Djuphammar - Head of Technology Business Unit Cloud & IP at Ericsson saw three major shifts happening in the industry:

- IP on all Layers
- Virtualisation
- Accelerating IoT rollout and uptake via “Capillary Networks”



SOFTWARE DEFINED NETWORKING (SDN)

- Networks today - standardised data-plane and control plane protocols.
- But a change to network infrastructure = change to service logic.
- SDN architecture introduces a network abstraction layer and defines the services in software.
- [OpenConfig](#) industry group is working to create standardised service models using [NETCONF](#). Members include BT, Google, AT&T, Verizon, Comcast, Apple.



SDN: CHANGING NETWORK DELIVERY

- From a “waterfall” product development to thinking like agile software developer companies.



- Hard-wired vendors ... to creating an open environment that can be rapidly extended into new vendors and industries
- From confronting regional limitations... to running a global infrastructure.
- From being constrained by corporate boundaries... to providing a seamless connection to third-party cloud ecosystems.
- From employing a workforce that “maintains”... to empowering a workforce that innovates.
- From being pigeonholed as a “dumb pipe”... to inventing the intelligent, self-learning digital platform that makes you the best choice for your customers in the future.

SDN: CHANGING AN ORGANISATION'S CULTURE

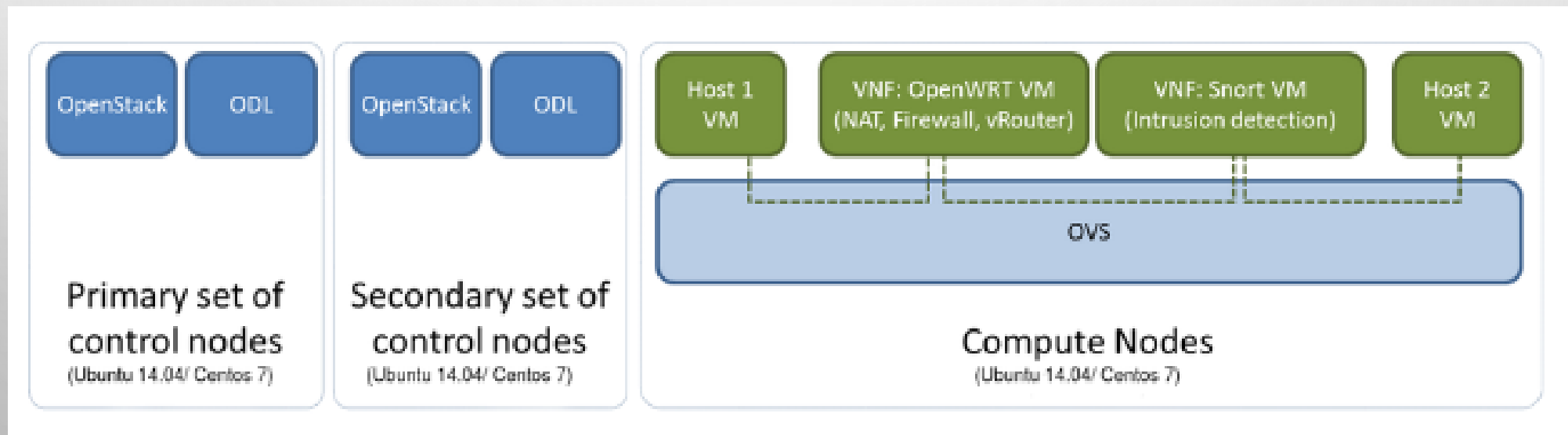
- No new “killer apps”. But provides ability to transform an organisation's ability to deploy and scale new services.
- Technical agility through SDN deployment will not give an organisation Service agility.
- Deep rooted process and cultural change is required within an organisation to embrace the changes that SDN/NFV will bring.

VIRTUALISING NETWORK FUNCTIONS

- As more customers take advantage of cloud services, this is in turn driving automation & flexibility in networking these services together.
- Operators are looking to implement network functions in software using x86 computing architectures rather than traditional hardware appliances. This is known as Network Function Virtualisation (NFV).
- Typical applications include firewalls, load balancers, virtual switching, intrusion detection, CGN.

VIRTUALISATION OPEN STANDARDS

- Many different vendor driven eco-systems, but all using open-source software foundations.
 - OPEN PLATFORM FOR NFV (OPNFV) – REFERENCE IMPLEMENTATION FOR NFV INFRASTRUCTURE.
 - OPENDAYLIGHT (ODL) – NETWORK RESOURCE CONTROLLER
 - OPENSTACK IS AN OS FOR BUILDING AND MANAGING PRIVATE, HYBRID, PUBLIC CLOUDS.



CONTAINERS

- Containers are growing in popularity in Service Provider and Cloud Provider Networks
- Light-weight version of Virtual Machines.
- They provide:
 - ELASTIC COMPUTE – SPIN UP AN APPLICATION IN SECONDS, NOT MINUTES.
 - MORE BARE METAL –
 - FAULT TOLERANCE THRU CLUSTER TECHNOLOGY E.G. DOCKER SWARM
 - VIRTUAL NETWORKING VIA VXLAN CONNECTIONS (L2 OVER L3) . E.G. NEUTRON
- Projects: Docker Containers, Apache Mesos, VMWare VIC.

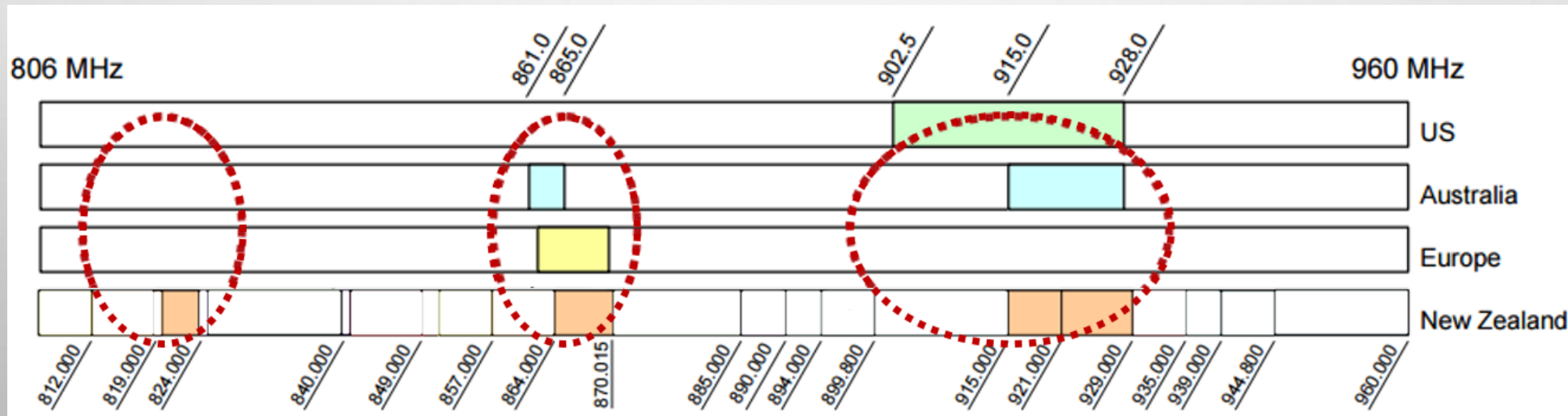
THE INTERNET OF THINGS

- IoT promises to offer connectivity of thousands of “things” to the internet, delivering a better experience and insights to consumers.
- Many different network standards with Zigbee, ZWave and Wifi being used to interconnect devices.
- Z-Wave emerging as most widely-adopted smart home protocol.



USING IOT DEVICES IN NEW ZEALAND

- The Australia/New Zealand standard power outlets.
- Radio Spectrum standards – New Zealand has recently undertaken a Spectrum Harmonisation programme to bring New Zealand Short Range Device (SRD) radio bands into line with other jurisdictions:



SMART HOME CHALLENGES

- Big potential, but limited uptake due to expense, complexity and proprietary standards – device talk to gateways but not always each other.
- From a market perspective, many customers are still to be convinced of the need for Home Automation.

TARGETING EARLY ADOPTERS

- Market research by Swisscom identified two use cases that might be interesting for the early adopter market.
 - 1) SECURITY AND SURVEILLANCE SOLUTIONS - Plug and play solution is especially attractive to renters who don't want to invest in hard-wired security solutions.
 - 2) "ASSISTED LIVING" SERVICE – Aged care monitoring and medical alarms for in-home and away-from-home monitoring.
- Adopt a modular system where consumers can self-install devices without requiring expensive (and potentially disruptive) installer visits.
- Get the user interface right. Keep them simple (less geeky).



OPPORTUNITIES FOR NEW ZEALAND OPERATORS.

- AT&T already license their Digital Life platform with operators in Europe, the Middle East and Southeast Asia for Portable home security & automation.
- Alarm.com have a wholesale platform for other operators for Smart Home Security.



EVOLUTION OF CPE

- Service Gap – Customer buying “Wi-Fi Internet Connection” - ISP selling FTTH.

“All Wi-Fi problems are the ISPs problem.”

- CPE Gateways providing improved user experience though:
 - DISCOVERY OF NEW DEVICES ON THE NETWORK USING IEEE 1905.1 PROTOCOLS
 - WI-FI BANDWIDTH PRIORITISATION.
 - BETTER REPORTING OF DEVICES AND USAGE WITHIN THE HOME.
 - WAVE 2 WI-FI TECHNOLOGY, SUCH AS MU-MIMO (MULTI-USER)
 - CONVERGENCE OF IOT GATEWAYS (Z-WAVE / ZIGBEE) INTO TRADITIONAL CPE ROUTERS.

FIXED ACCESS EVOLUTION

- Many countries still grappling with the economics of deploying fibre.
- Pressure to increase speeds driving continued R&D in copper technologies.
- G.fast delivers speeds over 100 megabits nearly 500 metres
- The first chipsets for G.fast were introduced in October 2014, with many equipment vendors having their hardware on display at the BBWF 2015.
- First deployments are planned for 2016.
- The NBN trialed G.fast delivering a total speed of 600Mbps with VDSL masking turned on.

G.FAST IN NEW ZEALAND

- Fibre to the Home deployment in NZ means G.fast technology largely redundant in NZ.
- Cross talk cancellation also called vectoring, is mandatory in G.fast, but it is not possible in an unbundled local loop environment.
- One possible application for G.fast in New Zealand is for use in difficult to fibre apartment buildings.
- Vendors such as Gemtek demonstrating 4 port and 1 port line powered G.fast DPUs.