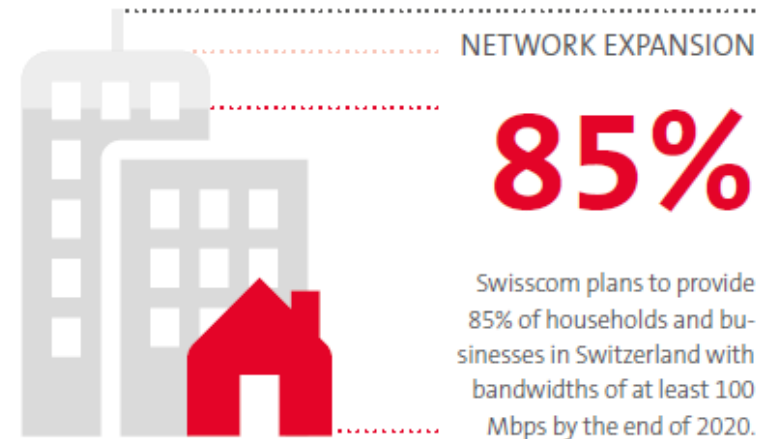# Promises, Expectations & Disappointment – why WiFi has become an emotional customer issue

Andreas Martschitsch, Swisscom
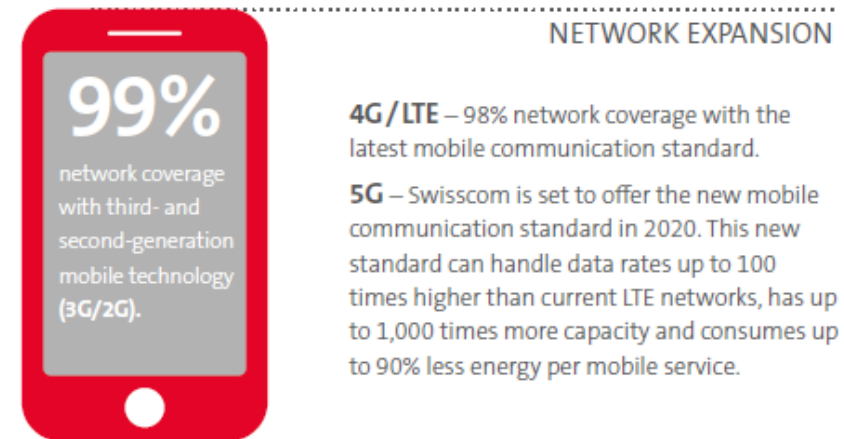
Key figures 2015 and ambitions

Net revenue	CHF 11678 m
Total CapEx	CHF 2409 m
Net income	CHF 1362 m
FTE's	21637

NETWORK EXPANSION

85%

Swisscom plans to provide 85% of households and businesses in Switzerland with bandwidths of at least 100 Mbps by the end of 2020.

1 m
ALL IP

As at the end of 2015, Swisscom already had more than 1 million customers on IP. With All IP, which means "all via the Internet Protocol", services such as TV, data and now also fixed-line telephony run over a single IP-based network. All IP thus forms the basis for the digitisation of communication and for future services.

NETWORK EXPANSION

99%
network coverage with third- and second-generation mobile technology (3G/2G).

4G / LTE – 98% network coverage with the latest mobile communication standard.

5G – Swisscom is set to offer the new mobile communication standard in 2020. This new standard can handle data rates up to 100 times higher than current LTE networks, has up to 1,000 times more capacity and consumes up to 90% less energy per mobile service.

- What has changed and made WiFi become a source of stress for customers?
- Why is WiFi not as good as it should be?
- What is needed to make a better WiFi?
- A Vision about the future of WiFi

Router 2006
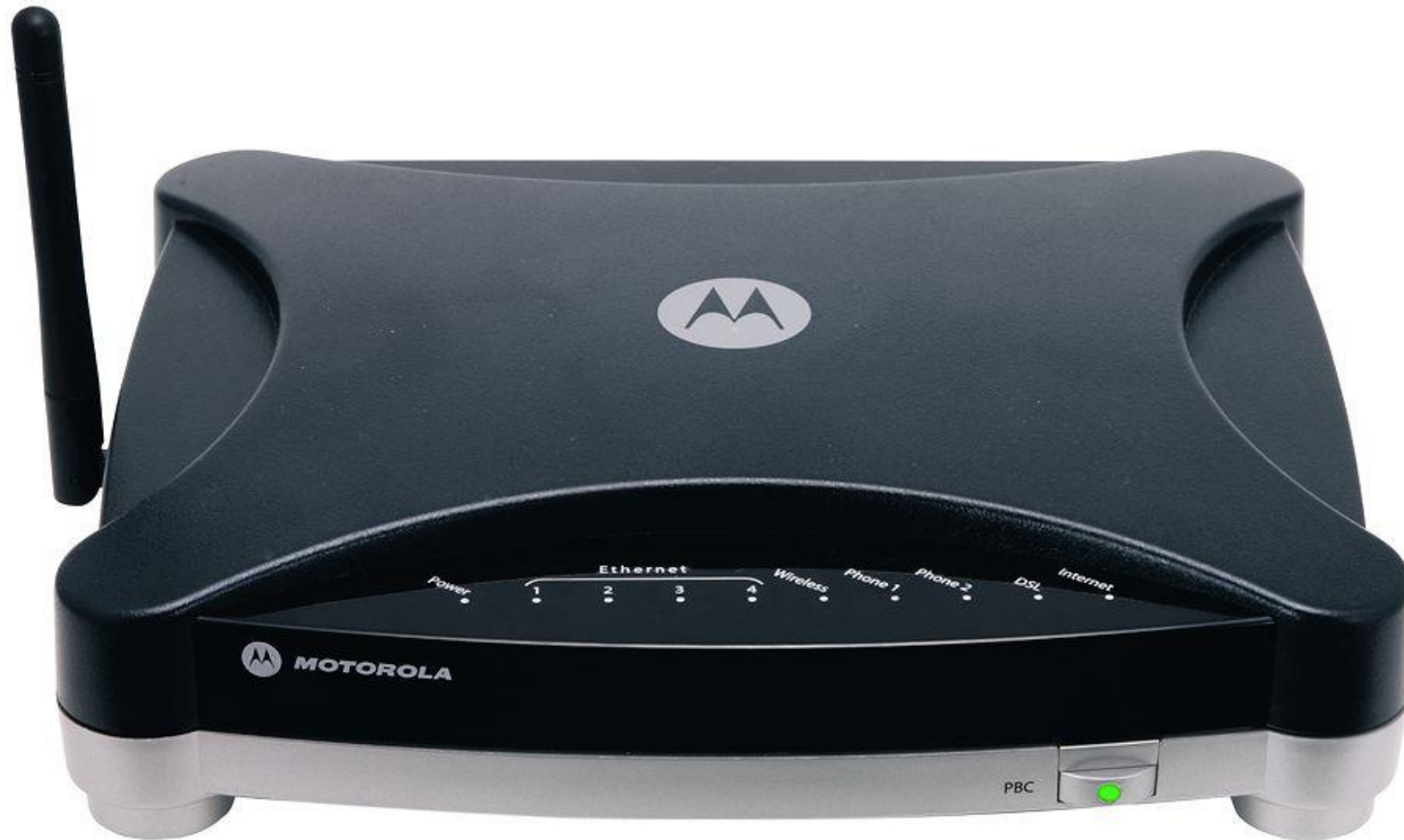
Router 2016

Something has definitely changed !!

The World has changed

Les Iphone 2007 à 2014

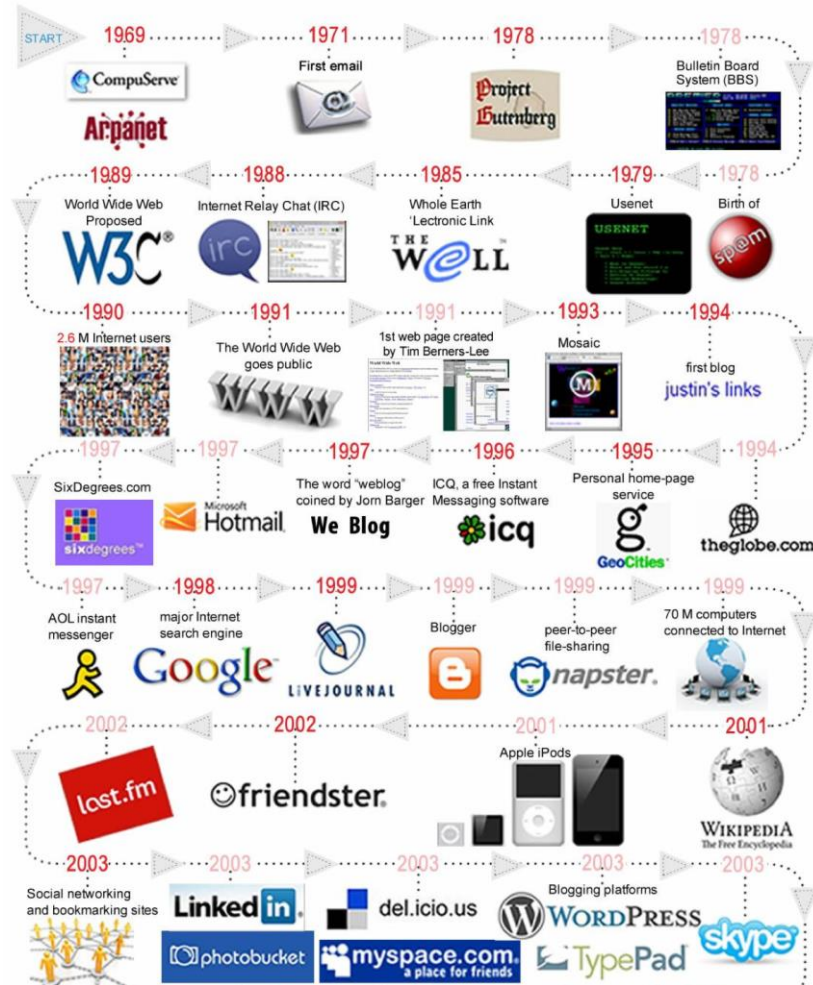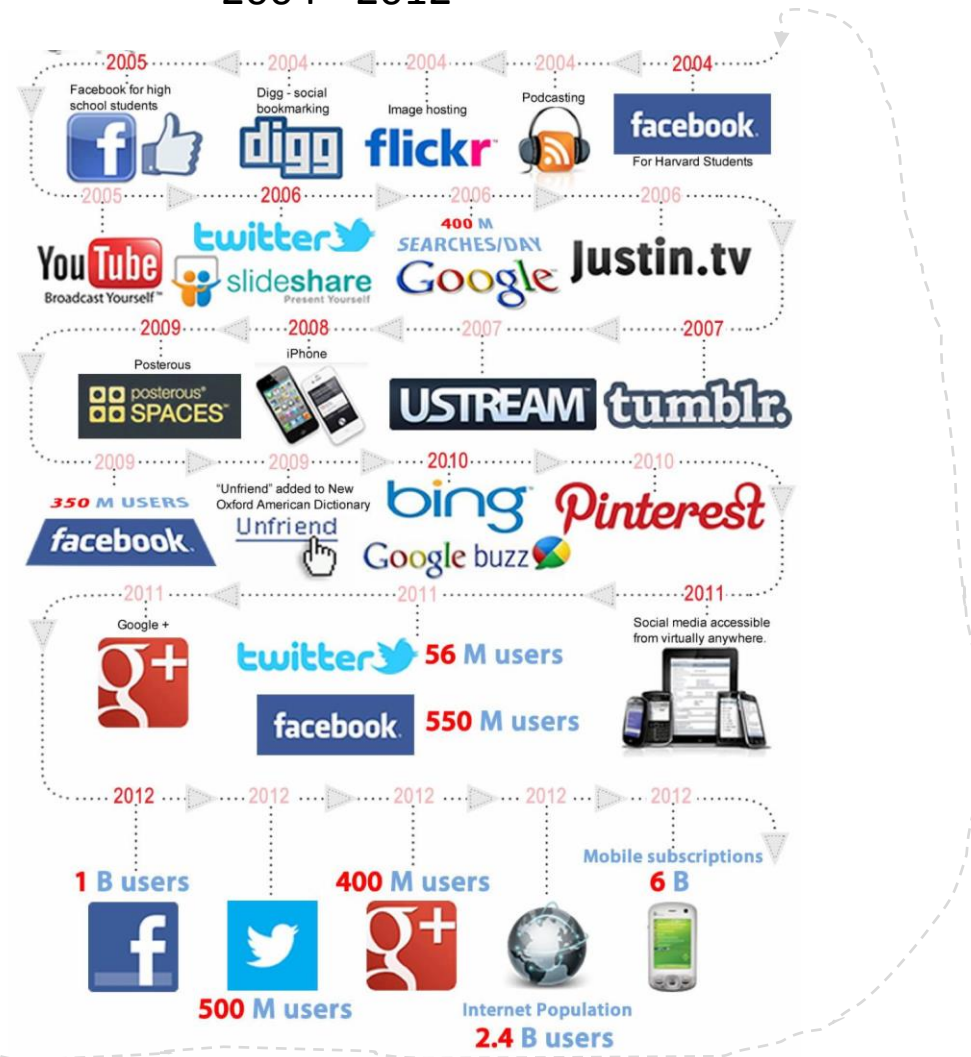|	Apple iPhone	Apple iPhone 3	Apple iPhone 3GS	Apple iPhone 4	Apple iPhone 4S	Apple iPhone 5S	Apple iPhone 5C	Apple iPhone 6	Apple iPhone 6 Plus
Taille de l'écran*	8,9 cm	8,9 cm	8,9 cm	8,9 cm	8,9 cm	10,16 cm	10,16 cm	11,6 cm	14 cm
Résolution (en pixels)	480 x 320	480 x 320	480 x 320	960 x 640	960 x 640	1 136 x 640	1 136 x 640	1334 X 750	1920 X 1080
Poids	135 g	135 g	135 g	137 g	140 g	112 g	132 g	129 g	172 g
Taille (H x L x H)	115 x 61 x 11,6 mm	115 x 61 x 11,6 mm	115,5 x 62,1 x12,3 mm	115,2 x 58,6 x 9,3 cm	115,2 x 58,6 x ? mm	123,8 x 58,6 x 7,6 mm	124,4 x 59,2 x 8,97 mm	138,1x 67x 6,9 mm	158,1x 77,8x 7,1 mm
Système d'exploitation	Mac OS1	Mac OS2	iOS3	iOS4	iOS5	iOS 7	iOS 7	IOS8	IOS8
Mémoire vive	128 Mo	128 Mo	256	1 Go	1 Go	1 Go	1 Go	1 Go	1 Go
Processeur	60 Mhz	60 Mhz	833 Mhz	A4	A5 double cœur	A7 / M7 (coprocesseur)	A6 (coprocesseur)	A8/M8 (coprocesseur)	A8/M8 (coprocesseur)
Capacité de stockage	4 / 8 Go (flash)	4 / 8 Go (flash)	8 Go	16 / 32 Go	16 / 32 / 64 Go	16 / 32 / 64 Go	16 / 32 Go	16 / 64 /128 Go	16 / 64 /128 Go
Autonomie	8h conversation	8h conversation	5h converstion (3G)	7h converstion (3G)	8h converstion (3G)	8h converstion (3G)	10h converstion (3G)	10h convesration (3G)	12h convesration (3G)
App. photo (arrière/avant)	2 MP	2 MP	3 MP	5 MP / VGA en façade	8 MP / VGA en façade	8 MP / 1.2 MP	8 MP / 1.2 MP	8 MP /2,1 MP	8 MP
Enregistrement vidéo	640 x 480 pixels	640 x 480 pixels	640 x 480 pixels	1080 pixels	1 080 pixels	1 080 p / 30 i/s	1 080 p / 30 i/s	1 080 p/ 30-60 i/s	1 080 p/ 30-60 i/s
Batterie	1400 mAh	1150 mAh	1 219 mAh	1420 mAh	14040 mAh	1 560 mAh	1 560 mAh	Li-Po	Li-Po
Lancement	9 janvier 2007	9 janvier 2008	7 juillet 2009	7 juin 2010	4 octobre 2011	16 septembre 2013	16 septembre 2013	9 septembre 2014	9 septembre 2014

Crédits: Didier Lorge-Etienne Scholasse Sources: Apple-Wikipédia
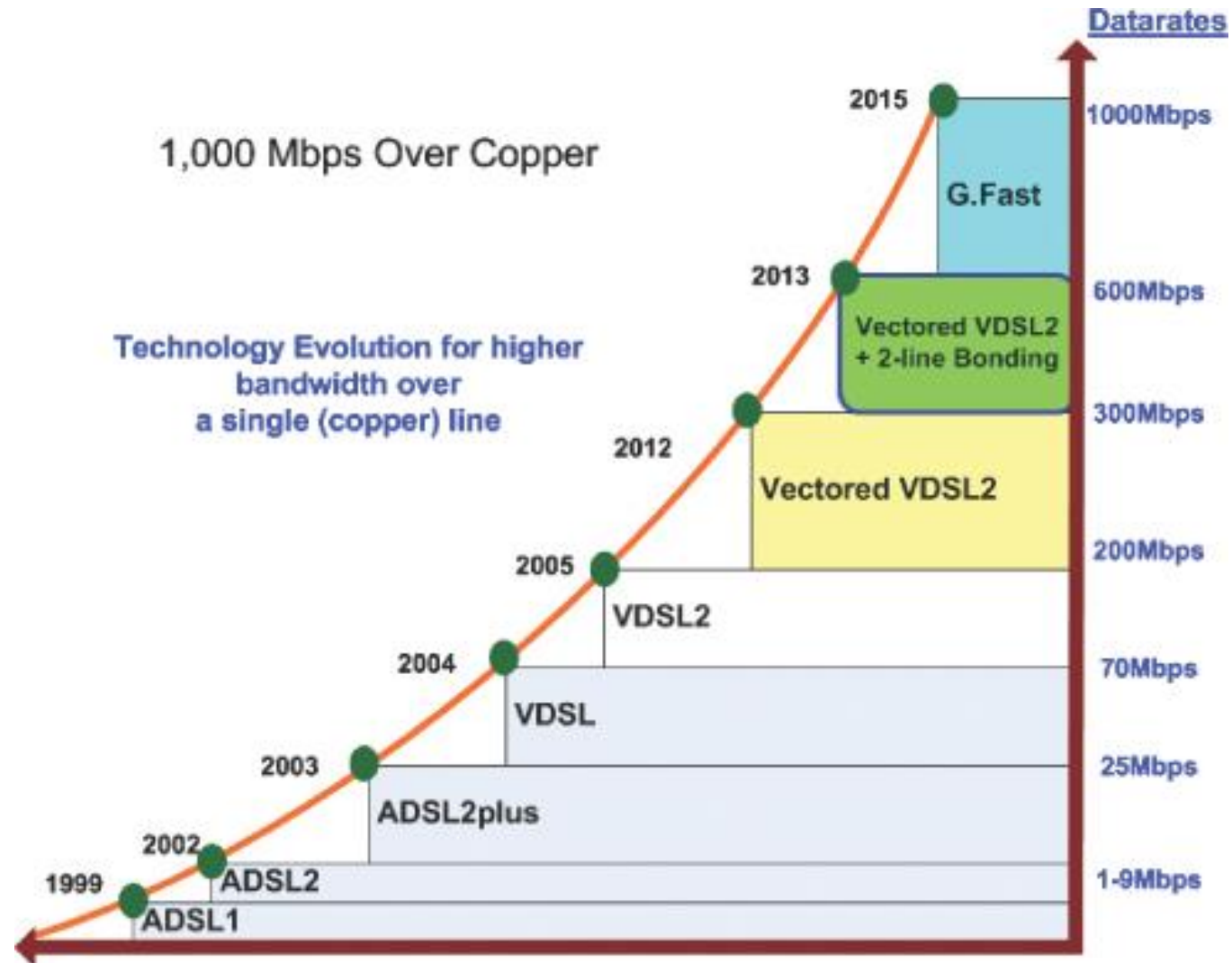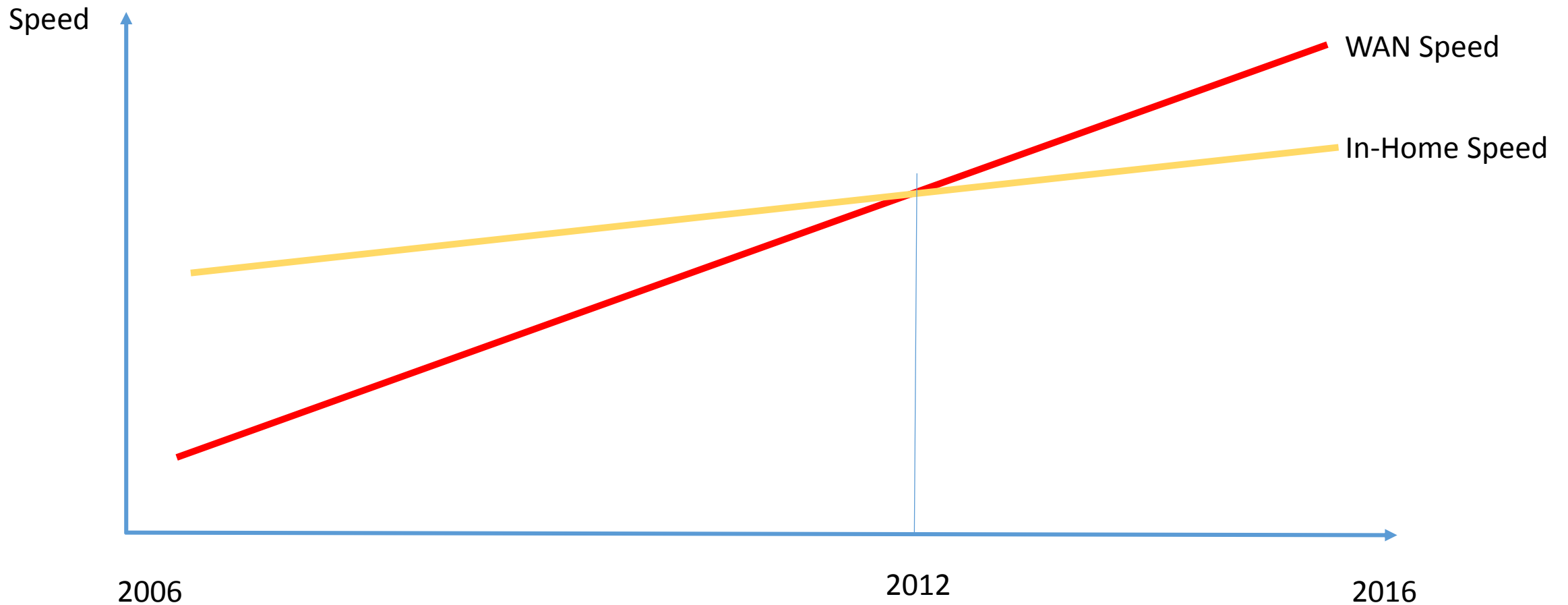
We have changed

1969 - 2003

2004 - 2012

The In-Home mobility has increased

The networks are evolving

And the operators thought, cool, now we are faster than the In-Home Network, its not our problem anymore
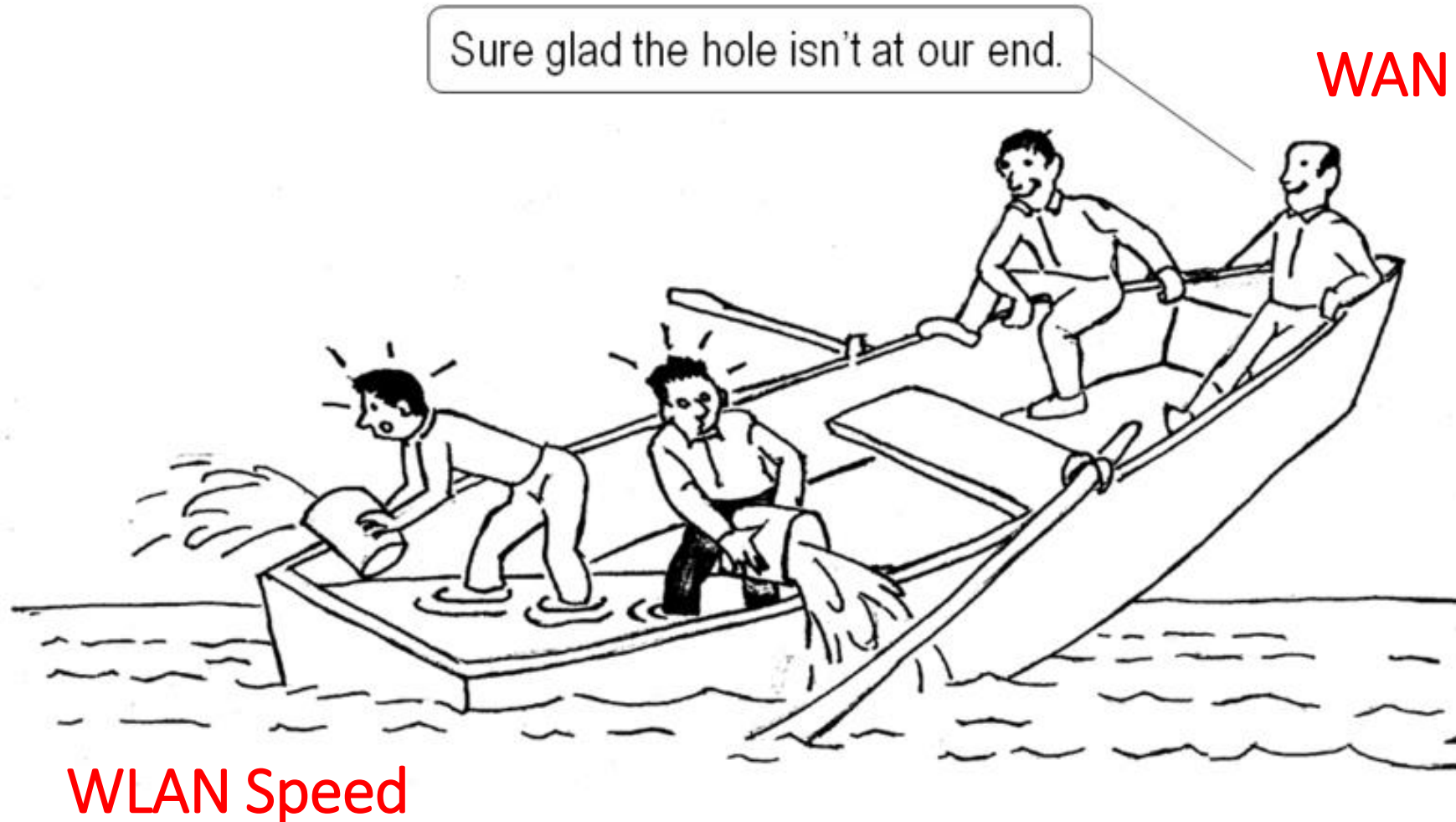
BUT THEY WERE WRONG !

Customers buy a service e.g. 1 gigabit speed

- They want 1 gigabit
- They do not understand why they do not get it
- They blame the one they bought it from – **the Telecom Operator**

WiFi is becoming the weakest link

Service Providers have an end-to-end responsibility

The Cut Your Bill
IN HALF
EVENT

Bring us your
Verizon or AT&T bill and
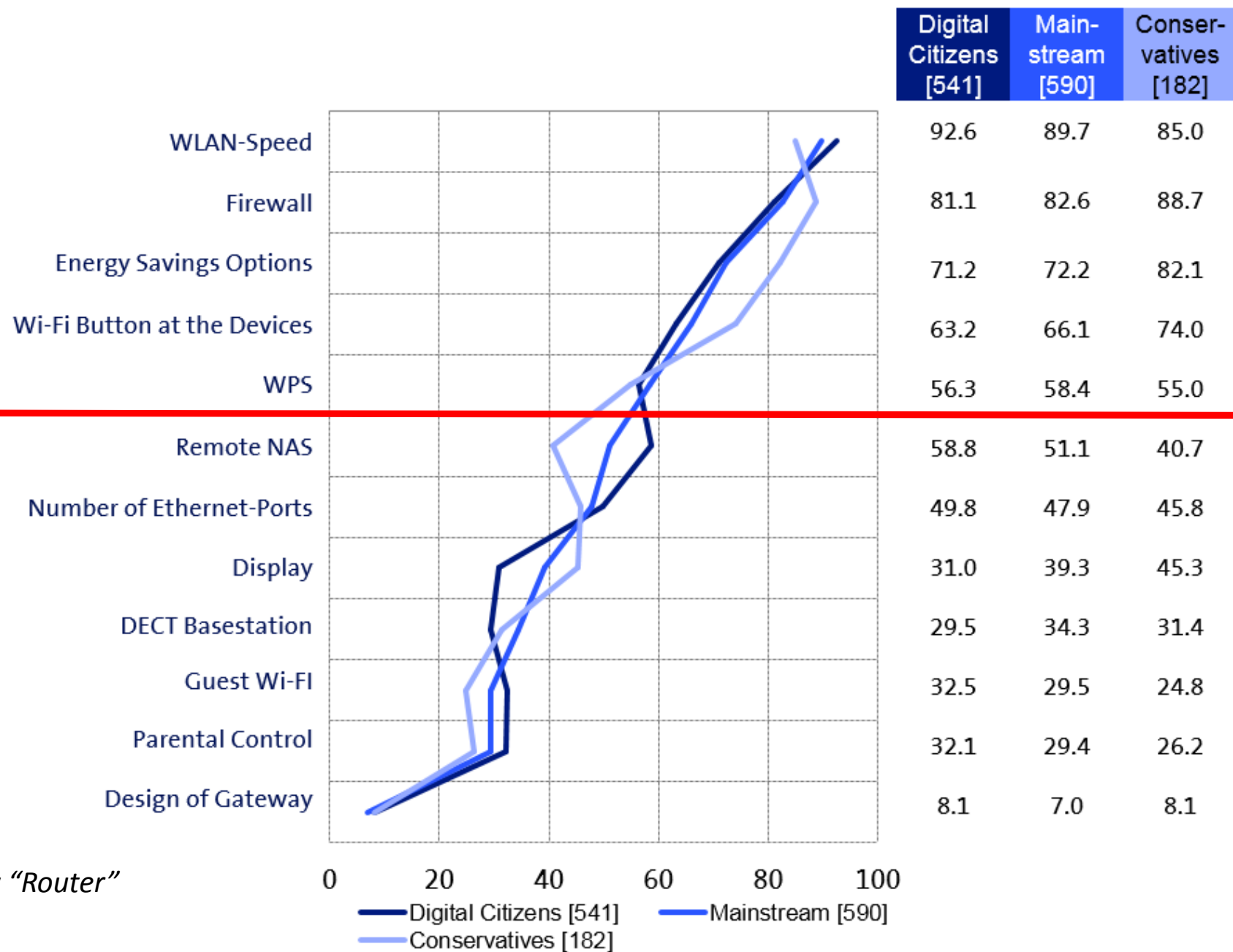**we'll cut your rate plan in half**

81% - customers are willing to pay more for a superior customer experience.
89% - customers switched brands after a poor customer experience.
20% - annual percentage revenue losses due to poor customer experiences.
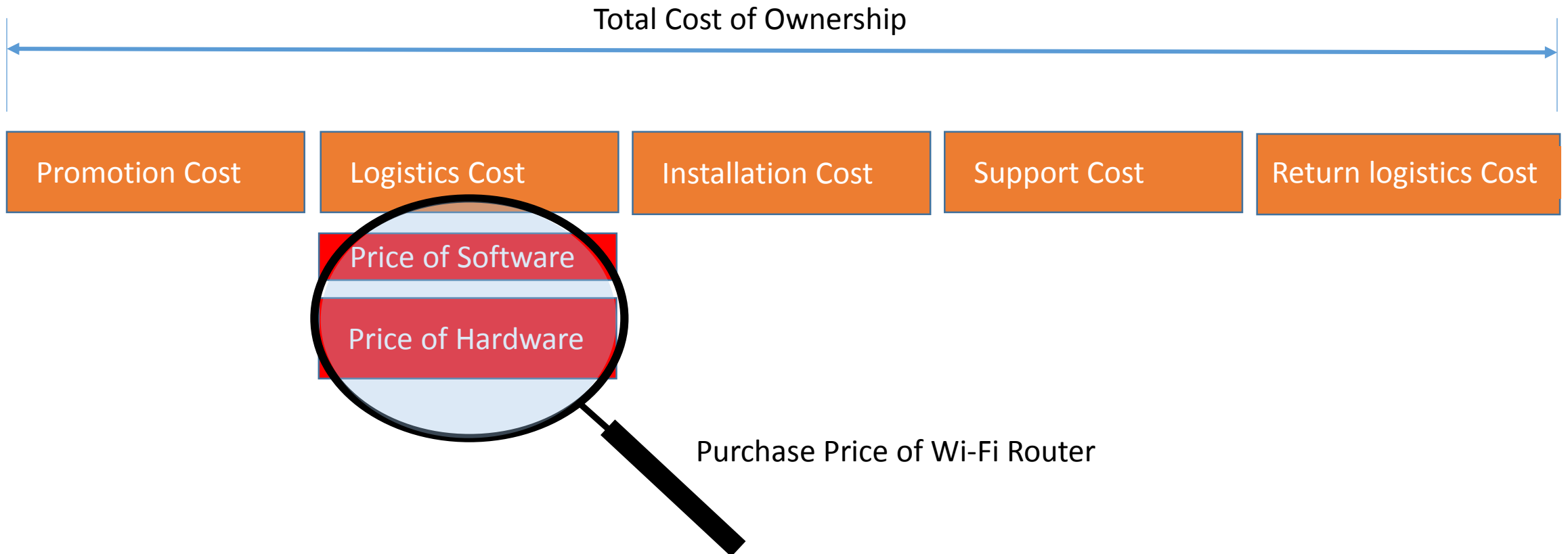*(Oracle Corp Figures)*

	Digital Citizens [541]	Main-stream [590]	Conser-vatives [182]
WLAN-Speed	92.6	89.7	85.0
Firewall	81.1	82.6	88.7
Energy Savings Options	71.2	72.2	82.1
Wi-Fi Button at the Devices	63.2	66.1	74.0
WPS	56.3	58.4	55.0
Remote NAS	58.8	51.1	40.7
Number of Ethernet-Ports	49.8	47.9	45.8
Display	31.0	39.3	45.3
DECT Basestation	29.5	34.3	31.4
Guest Wi-FI	32.5	29.5	24.8
Parental Control	32.1	29.4	26.2
Design of Gateway	8.1	7.0	8.1

Swisscom Survey "Router"
2.6.2014
n=1313

A Service Provider or
Operator needs
to invest in good WiFi

✓ Resources
✓ Know-how
✓ Money

TCO leads from short-term thinking to a more holistic, sustainable view

Total Cost of Ownership

| Promotion Cost | Logistics Cost | Installation Cost | Support Cost | Return logistics Cost |

Price of Software

Price of Hardware

Purchase Price of Wi-Fi Router
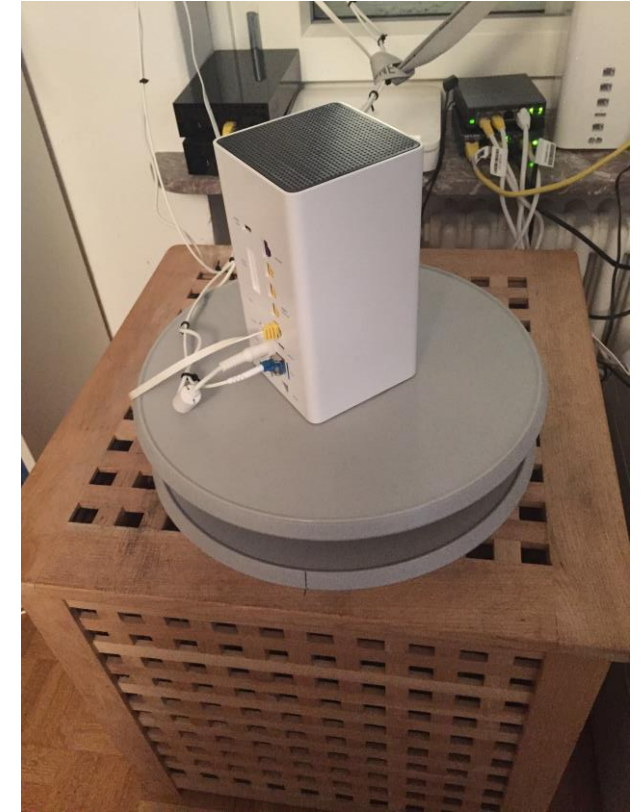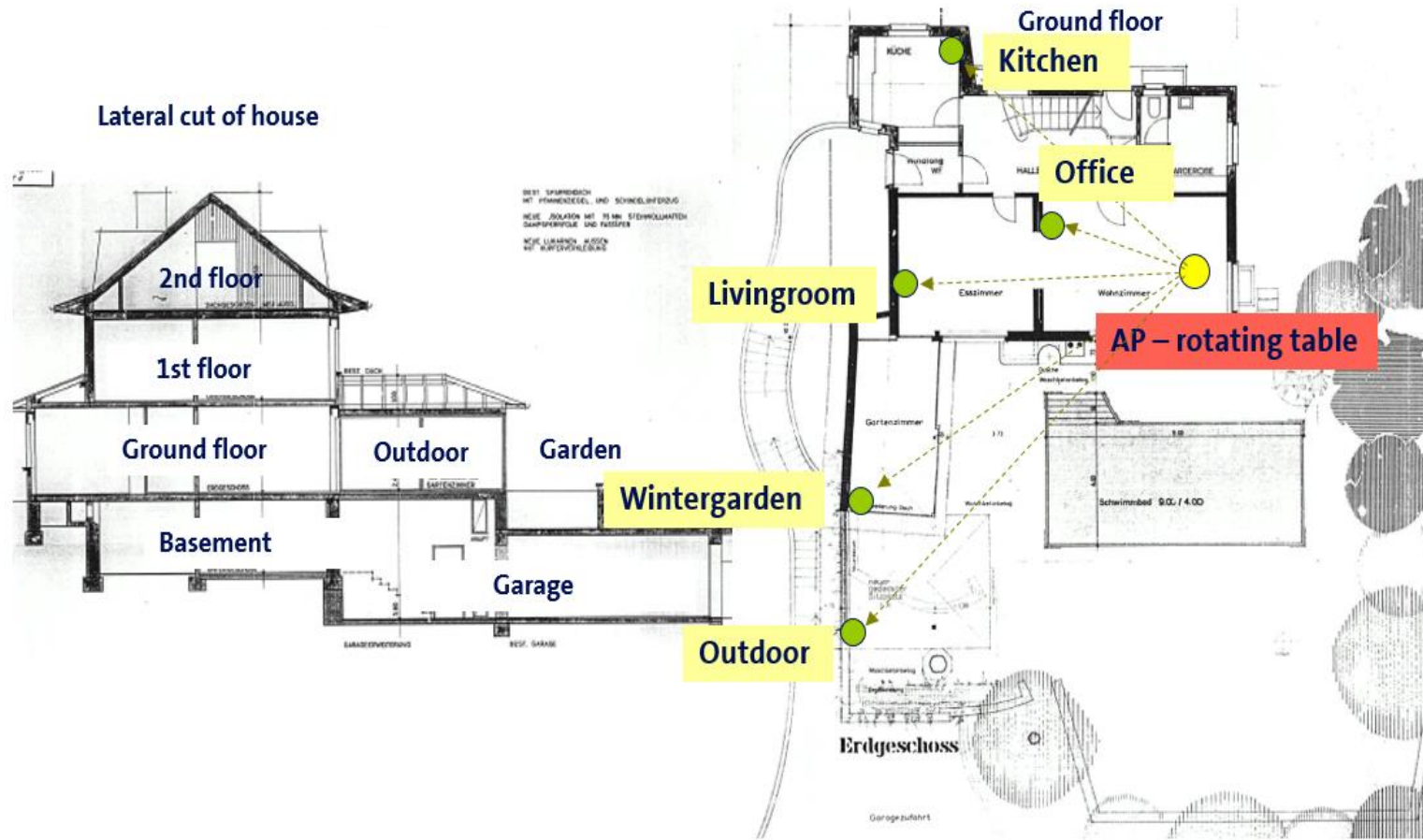
Good Wi-Fi or Bad Wi-Fi

Negative influencers

- Focus only on purchasing price of CPE
- Telco operator who do not know Wi-Fi
- Operators who do not test by themselves

- Cheap components
- No shielding / RF Filtering
- Cheap antennas with spiky patterns
- Bad connectors
- Output Power far below maximum
- Bad Software
- Onboard noise = bad Signal to Noise
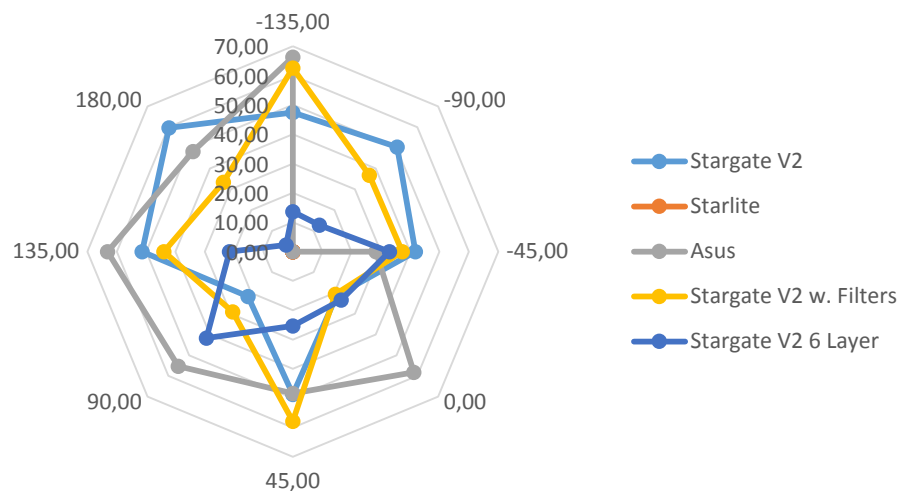- Chaotic Spectrum management

Positive influencers

- Telco operator who understands its end 2 end responsibility
- Operators who focus on TCO instead of CPE price
- Telco Operator who test by themselves

- Careful design considerations & review
- Systematic shieldings & RF Filtering
- Good antennas with 3D MiMo patterns
- Mature Software with Field proven WiFi
- Clean Noise floor = Good Signal to Noise
- Tuning Output power to reach regulation max
- Using Smart Channel selection & DFS Tuning
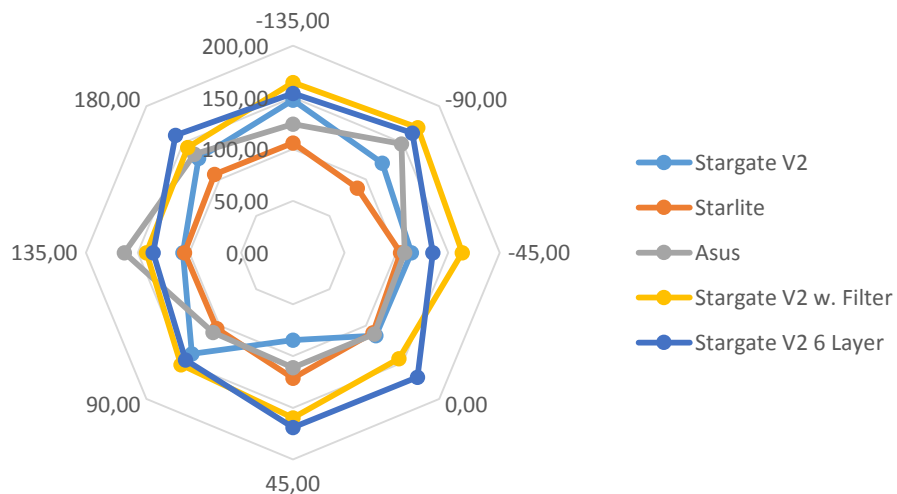- Over The Air Automatic & reproducable tests
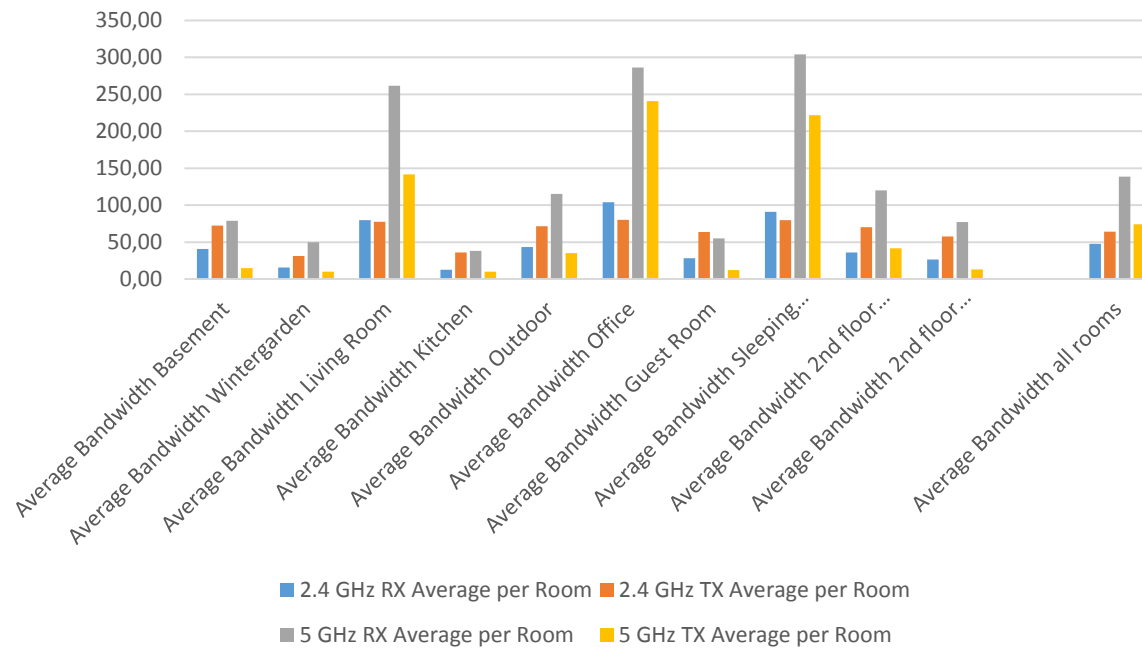
Trust is good, control is better

Lateral cut of house

2nd floor
1st floor
Ground floor
Outdoor
Garden
Basement
Garage

Ground floor
Kitchen
Office
Livingroom
AP – rotating table
Wintergarden
Outdoor

Erdgeschoss

Comparison 5 GHz Channel 100 RX Wintergarden

Legend: Stargate V2, Starlite, Asus, Stargate V2 w. Filters, Stargate V2 6 Layer

ASUS RT-AC5300 (SW 3 Average per Room and Overall Average

Legend: 2.4 GHz RX Average per Room, 2.4 GHz TX Average per Room, 5 GHz RX Average per Room, 5 GHz TX Average per Room

Comparison 5 GHz Channel 100 RX 2nd Floor vert.

Legend: Stargate V2, Starlite, Asus, Stargate V2 w. Filter, Stargate V2 6 Layer

Stargate V2 w. Filters (SW07.73.01d) Average per Room and Overall Average

Legend: 2.4 GHz RX Average per Room, 2.4 GHz TX Average per Room, 5 GHz RX Average per Room, 5 GHz TX Average per Room
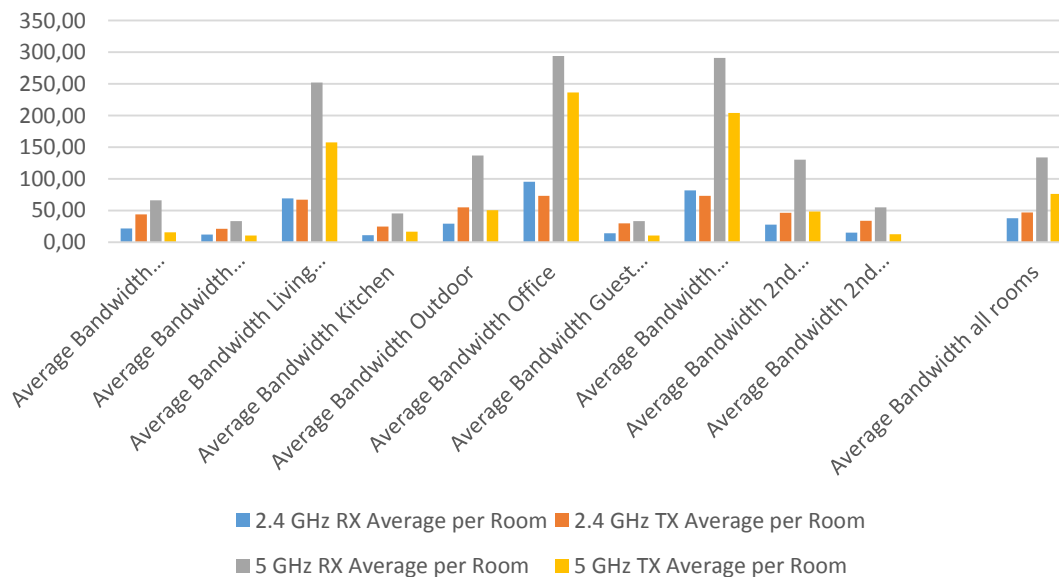
So is this the WiFi Paradise?

Today

Repeater — Client — Client — Client — AP

Tomorrow

Mesh AP — Mesh AP — Mesh AP — Mesh AP — Client — Client — Client — Client — AP
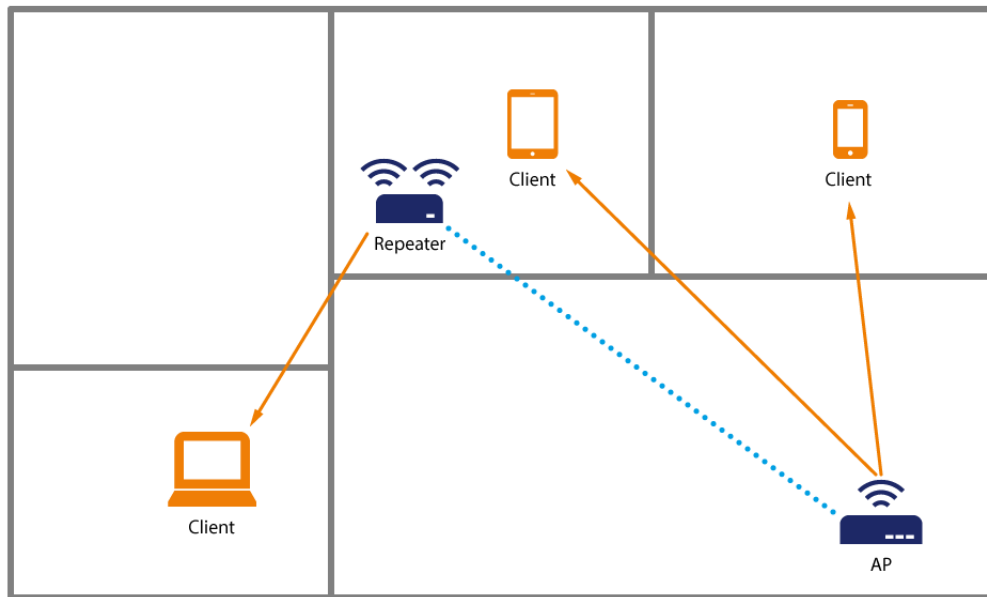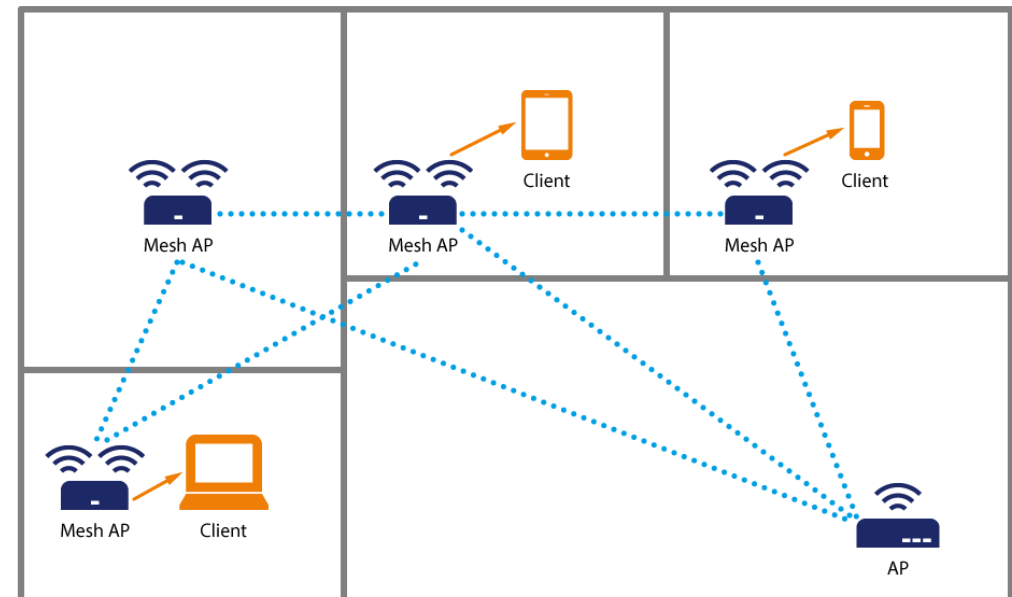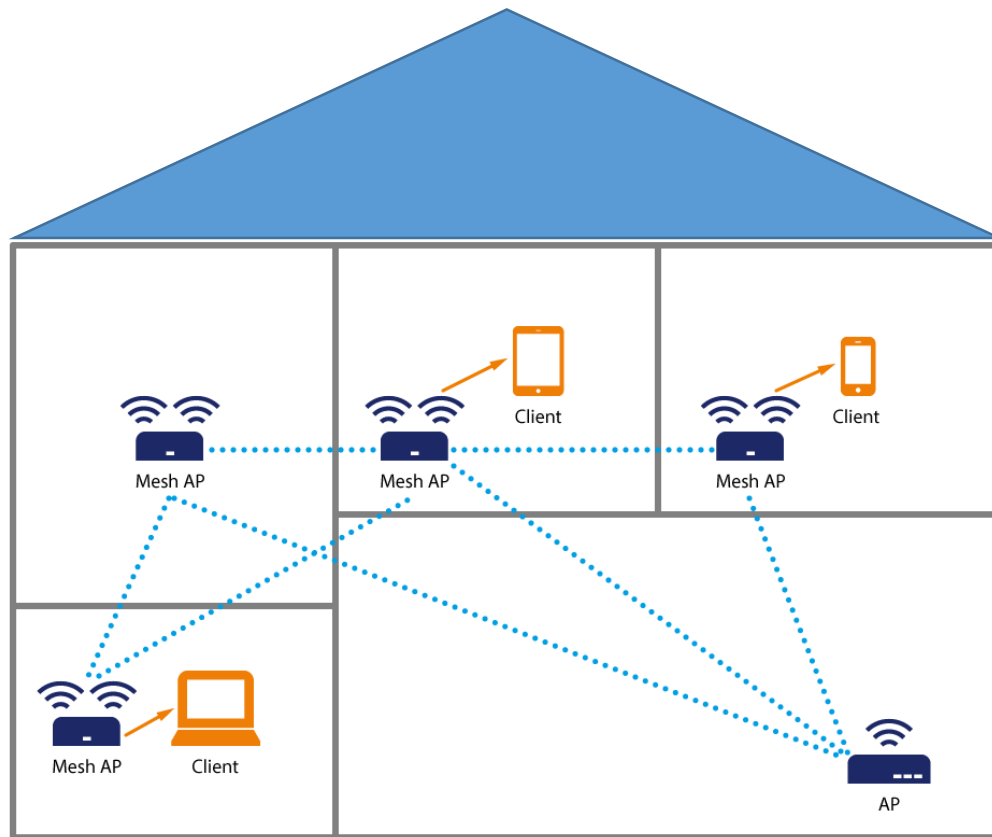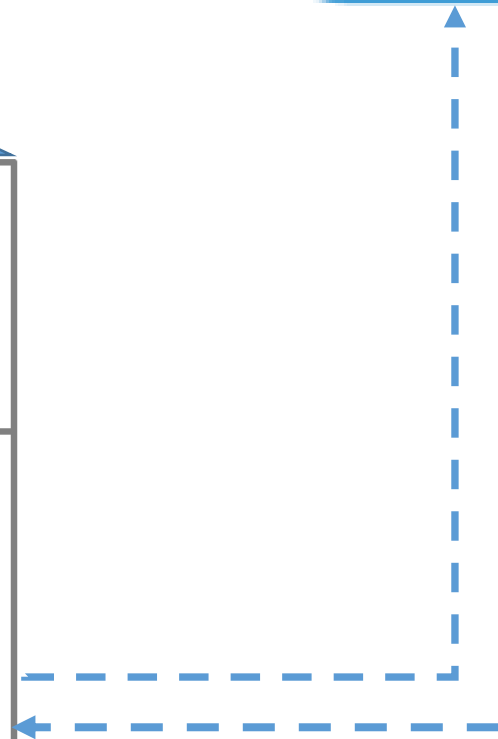
WiFi is becoming SMART

Spectral Analysis
Band steering
Airtime Fairness
Client Stickiness Management

Thank you

Andreas Martschitsch
Product Marketing, In-Home Connectivity
Swisscom

andreas.martschitsch@swisscom.com