

Internet Data Tsunami

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Chisinau, 03-05.10.2011



1

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Outline

What is Broadband?
 User experience
 Broadband, GDP and limits of growth
 Improving of regulatory environment

3

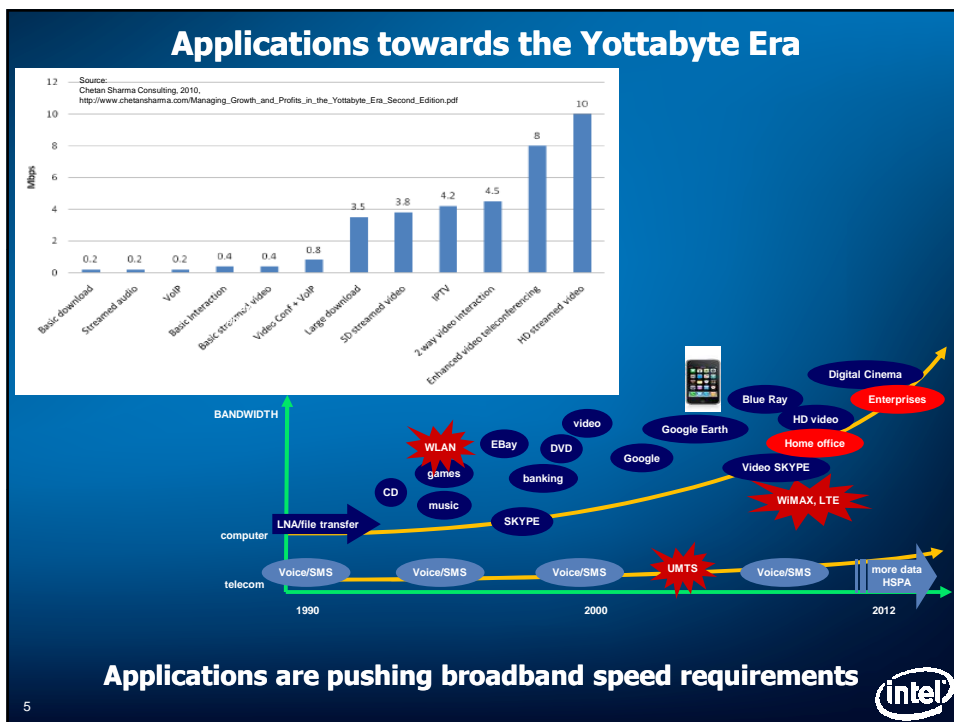


What is Broadband?

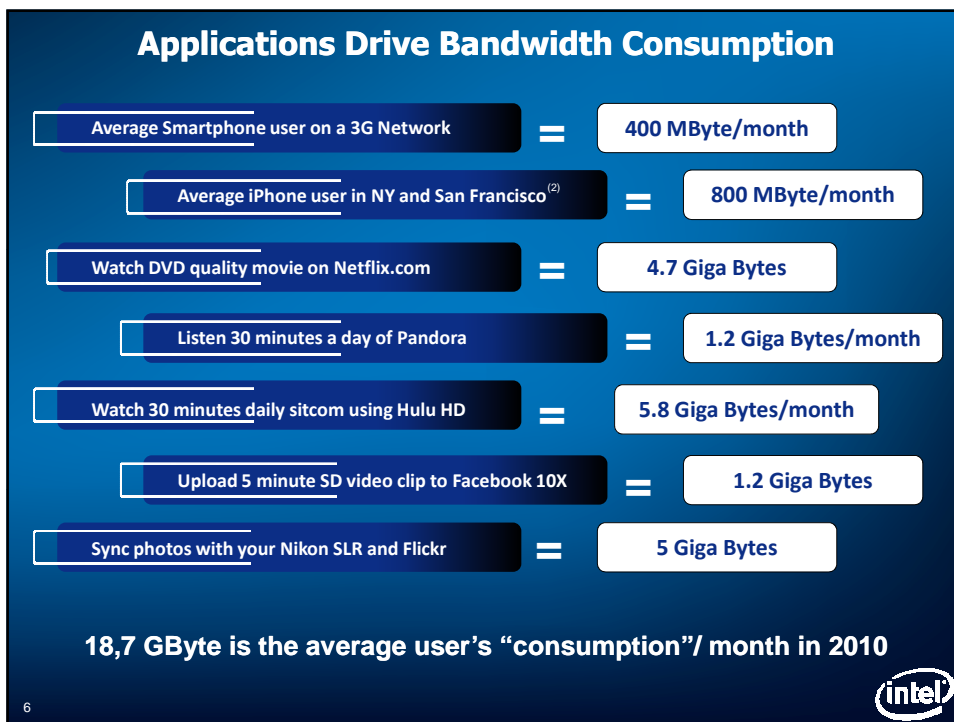
Download:	56kbps (dial-up)	256kbps	2Mbps	40Mbps	100Mbps
Google home page (160 KB)	23 seconds	5 seconds	0.64 seconds	0.03 seconds	0.01 seconds
ITU home page (750KB)	107 seconds	23 seconds	3 seconds	0.15 seconds	0.06 seconds
5MB music track	12 minutes	3 minutes	20 seconds	1 second	0.4 seconds
20MB video clip	48 minutes	10 minutes	1 minute	4 seconds	1.6 seconds
CD / low quality movie (700MB)	28 hours	6 hours	47 minutes	2 minutes	56 seconds
DVD / standard quality movie (4GB)	1 week	1.5 days	4.5 hours	13 minutes	5 minutes

Broadband is speed!!

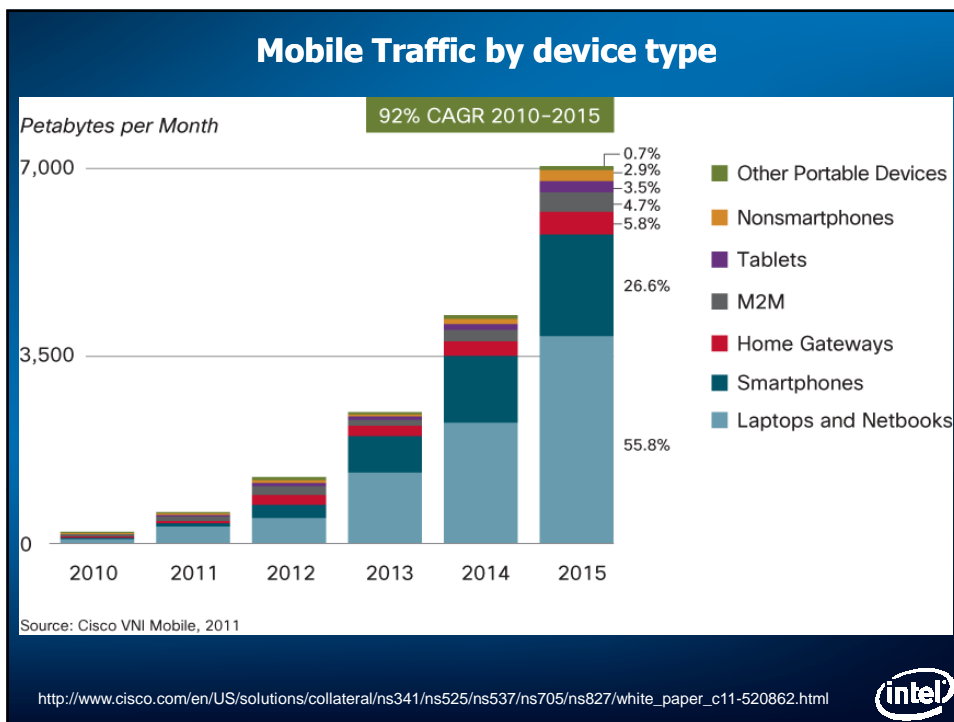
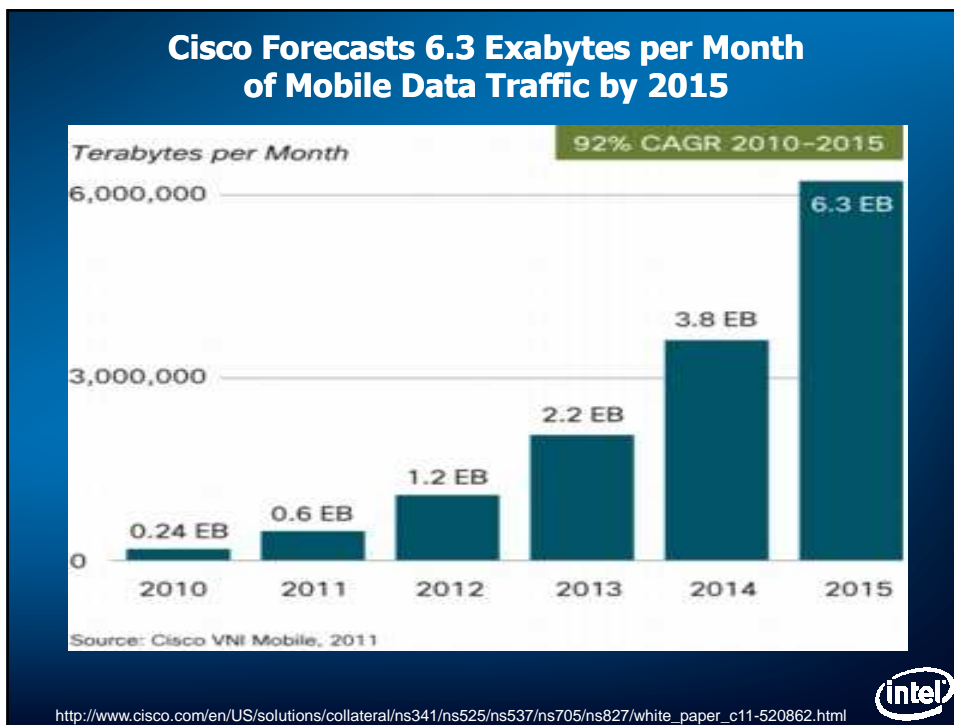


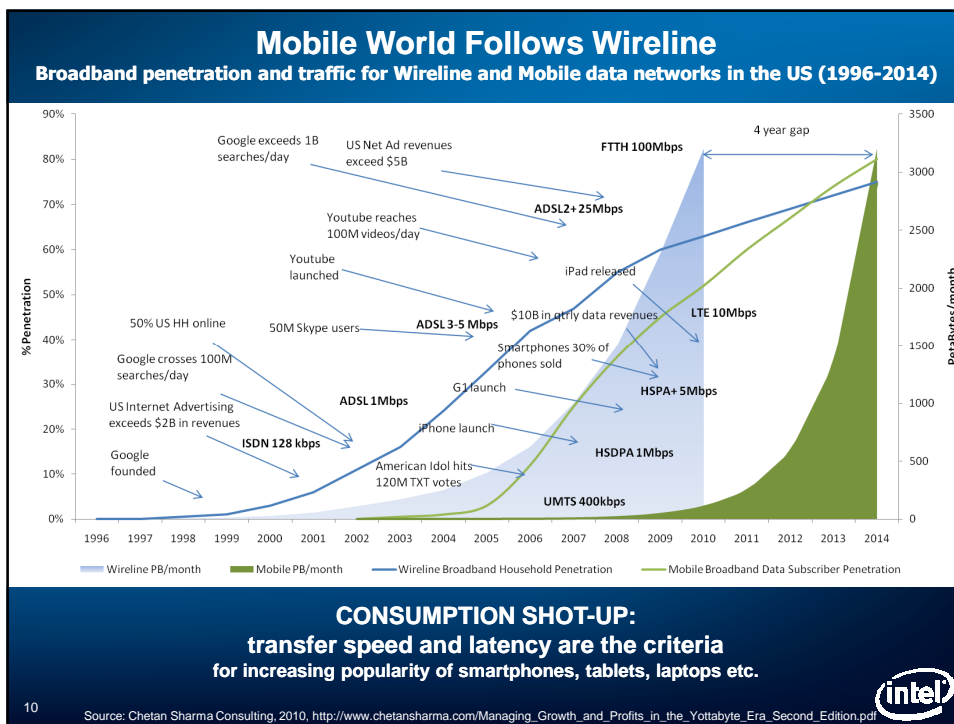
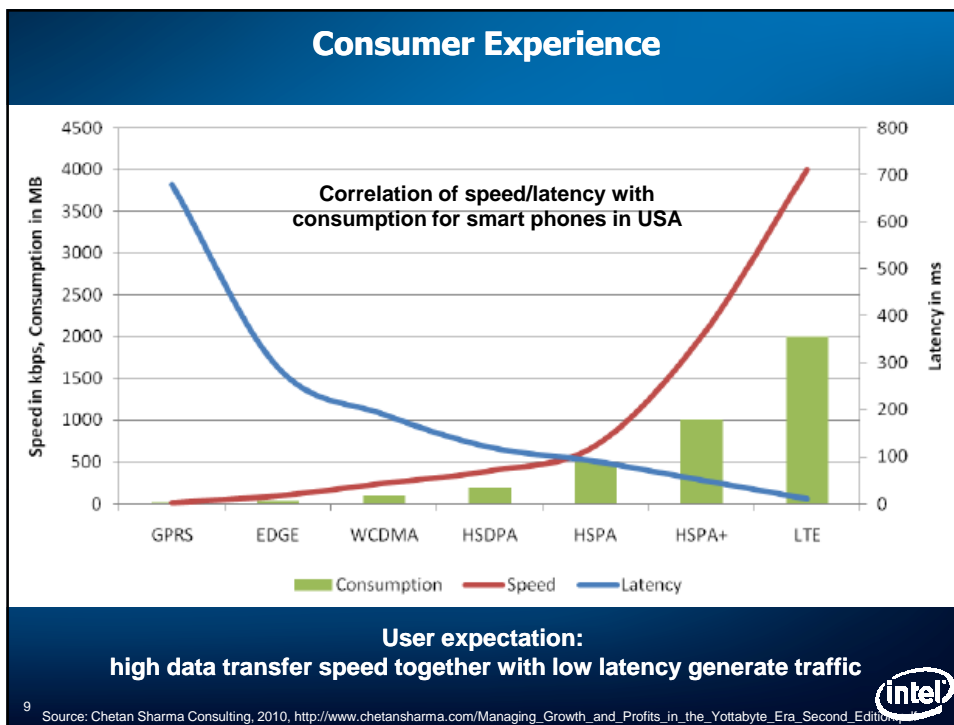


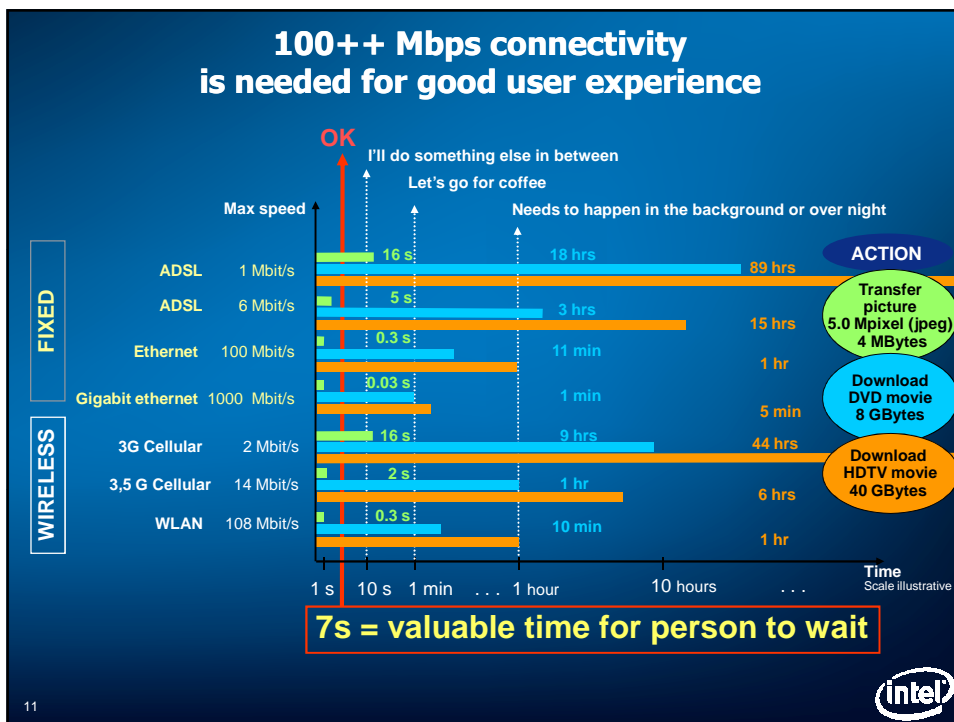
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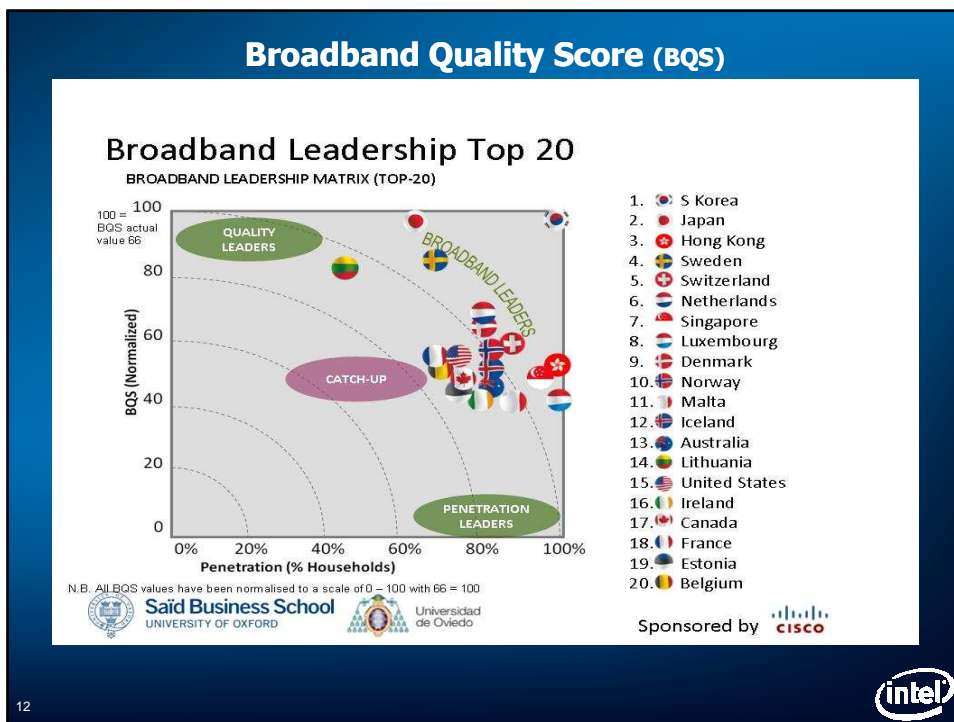
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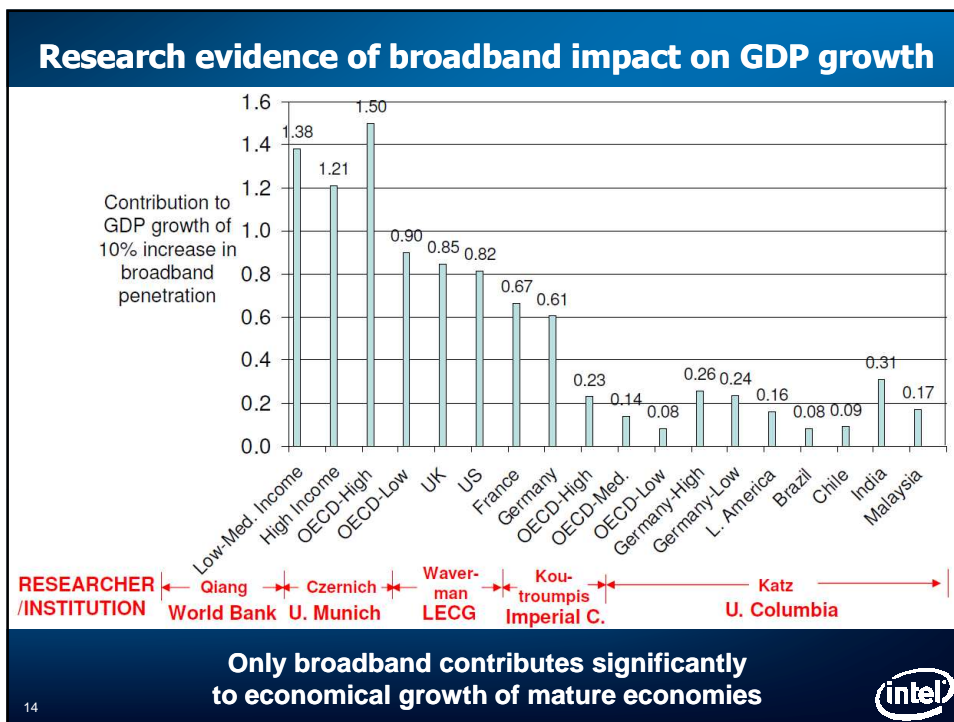
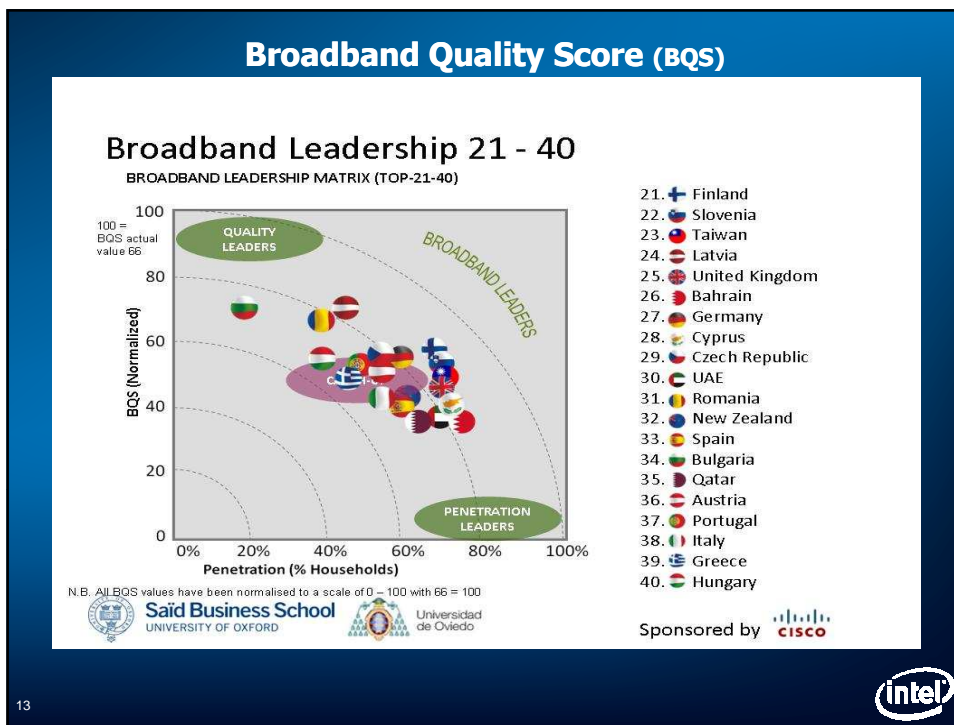


11



12





Physical limits to grow

Physical limits of already existing infrastructures are already achieved:

Copper pair
VDSL with ~50 Mbit/s individual per household

Coax
DOCSIS 3.0 with ~400 Mbit/s shared per cable branch (with 10 users)

Wireless
HSPA+ with ~21 Mbit/s shared per cell



**The next significant step of at least 10x improvement is needed:
Optical Fibre everywhere and radio with small cells**

15



This growth requires policies that

- Enable Innovation
- Promote Competition
- Allow sustainable operator business models



Digging challenges

**Laying on OF cable is too expensive for stock noted companies:
markets do not work properly on infrastructures**

Raisin picking – OF only for urban areas

**Old fashioned regulatory framework:
virtual unbundling - confrontation instead of cooperation**



**Europe needs new regulatory solutions to accelerate
2020: >50% of households with >100 Mbit/s**

17



Unbundling

- FCC refrains from imposing Section 251 unbundling obligations on new last mile broadband facilities, including fiber and DSL electronics deployed on the customer side of the central office.
- Continue to require incumbent local exchange carriers (ILECs) to provide collocation space and unbundled access to the legacy copper facilities

Old Wires- old rules, new wires- new rules



Technology & Service Neutrality

- Freedom to deploy any technology, subject to minimal technical and service restrictions
- Enables market forces to drive best solutions to benefit of citizens

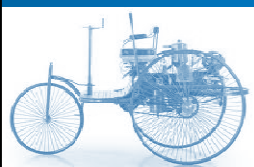


Chicken and egg dilemma



Telecommunication Chicken first - Eggs later:

1844 – first telegraph line between Washington and Baltimore then exciting services and applications have been developed



Automobile industry Eggs first - Chicken later:

1886 – Carl Benz got patent for a car with combustion motor then the roads have been constructed to enable that beautiful driving



Networks always enable applications



Conclusions

- **Broadband traffic is exploding**
- **Europe is reluctant to invest in broadband infrastructure**
- **Europe should continue reshaping the regulatory framework**
- **Technology & Service Neutrality is the key**
- **Old Wires- old rules, new wires- new rules**

21



Thank You

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22

