

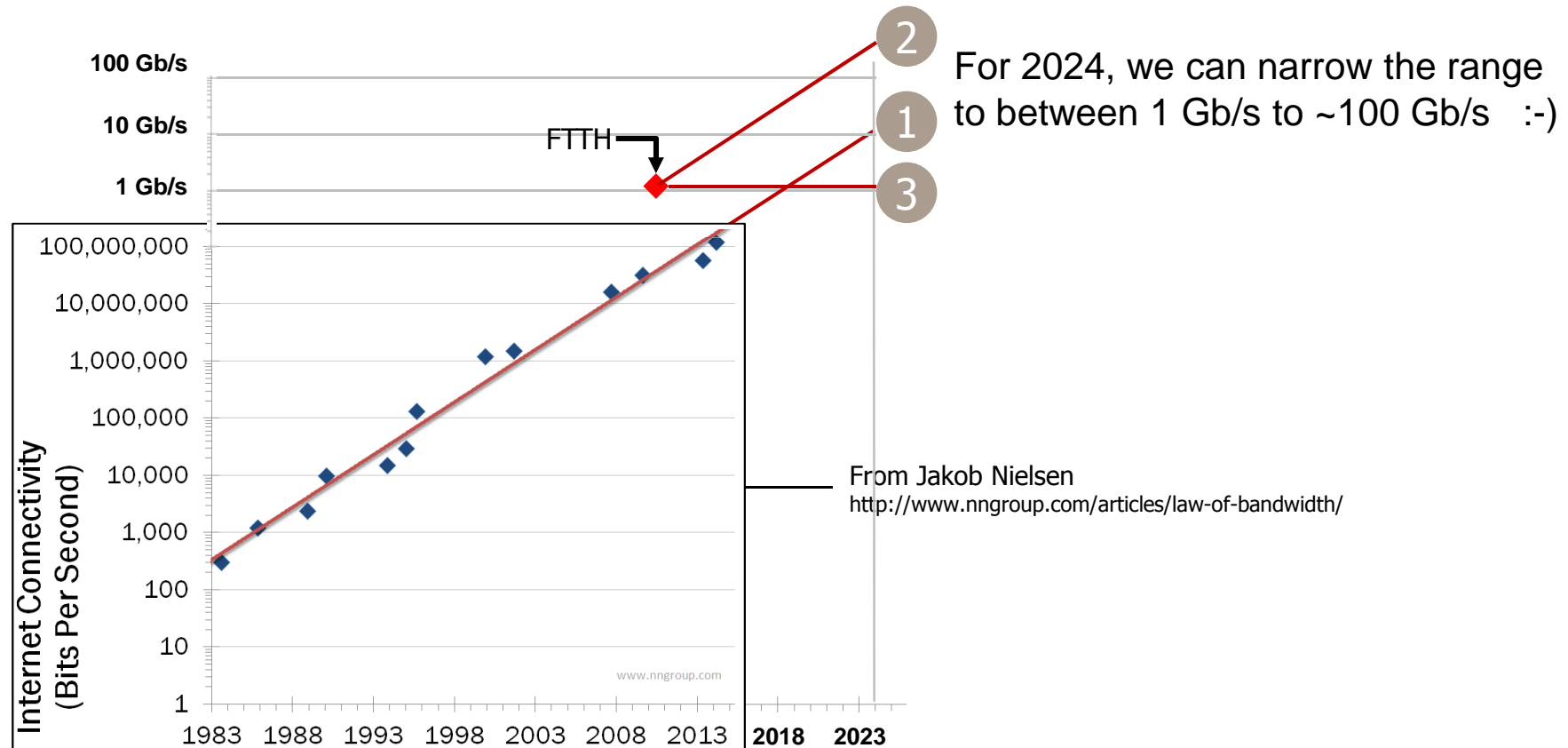
Offered bandwidth forecasting for NG EPON

Ed Harstead & Randy Sharpe, members of Fixed Networks CTO, Alcatel-Lucent
October 2014

Range of forecasted offered residential bandwidths

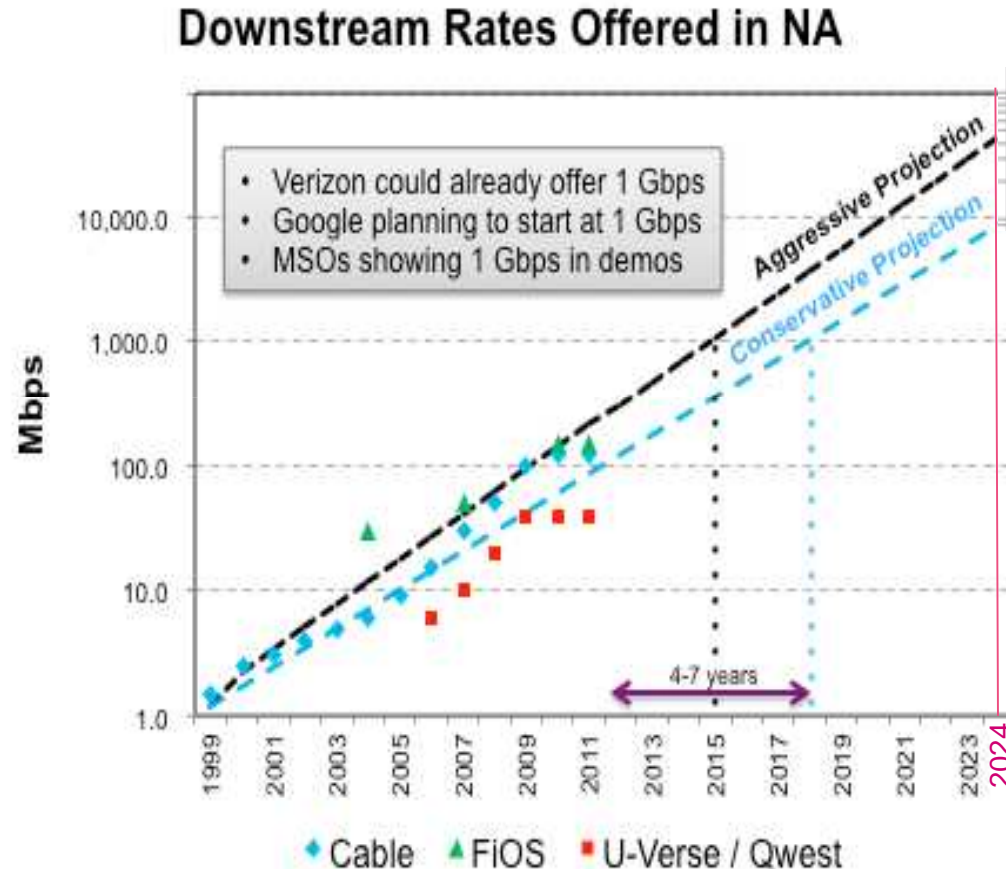
3 methodologies:

- 1 Extrapolating Nielsen: 10 Gb/s in 2024
- 2 FTTH: extrapolate using Nielsen's 50% growth rate: >100 Gb/s in 2024
- 3 The world concludes that 1 Gb/s is enough after all, even in 2024.



Range of forecasted offered residential bandwidths

4th methodology: Extrapolate trends from HFC and FTTH



In 2024:

- Conservative: ~9 Gb/s (about the same as extrapolated Nielsen, as one would expect)
- Aggressive: ~40 Gb/s

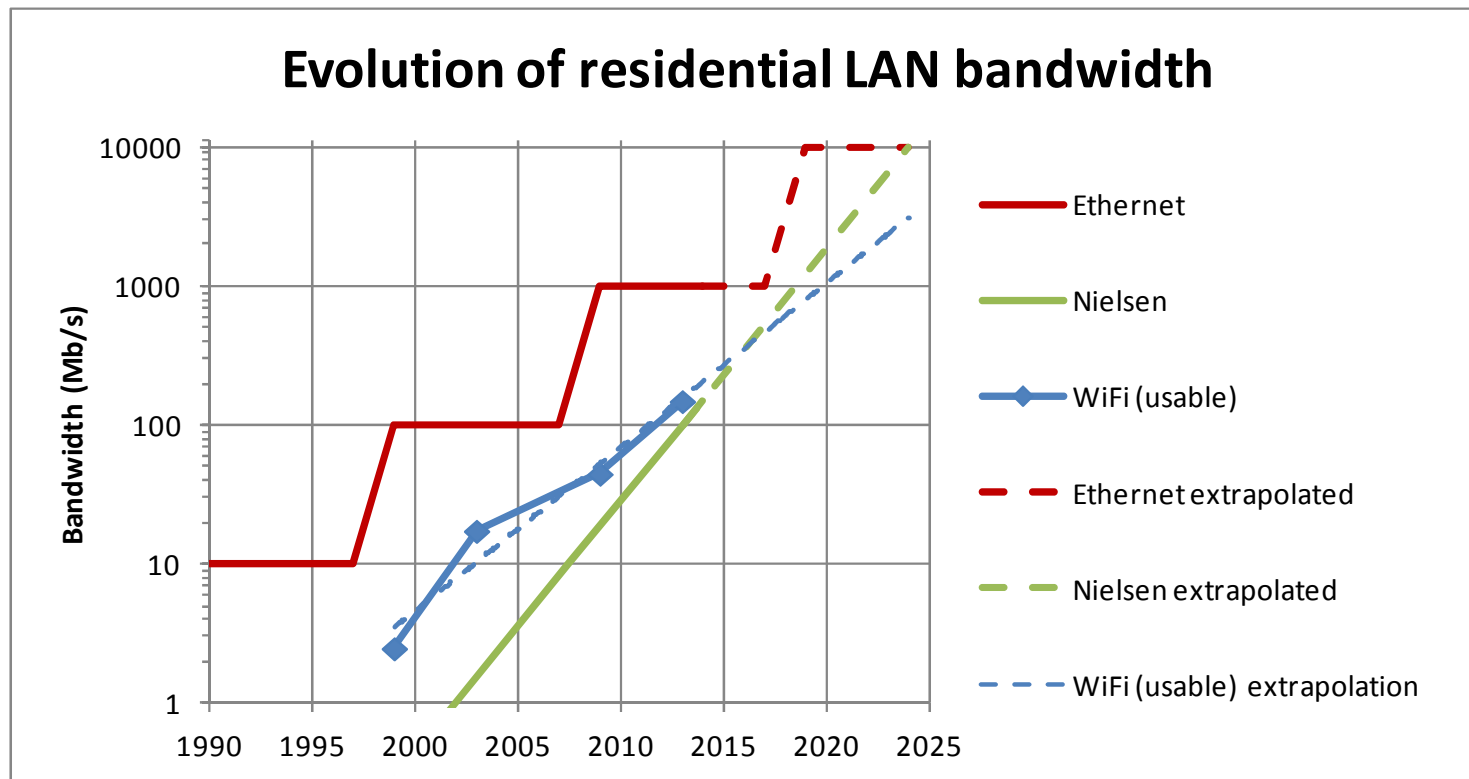
Jorge Salinger, "Access Network Perspectives", ICTC 2012

A new methodology proposed for offered bandwidth forecasting

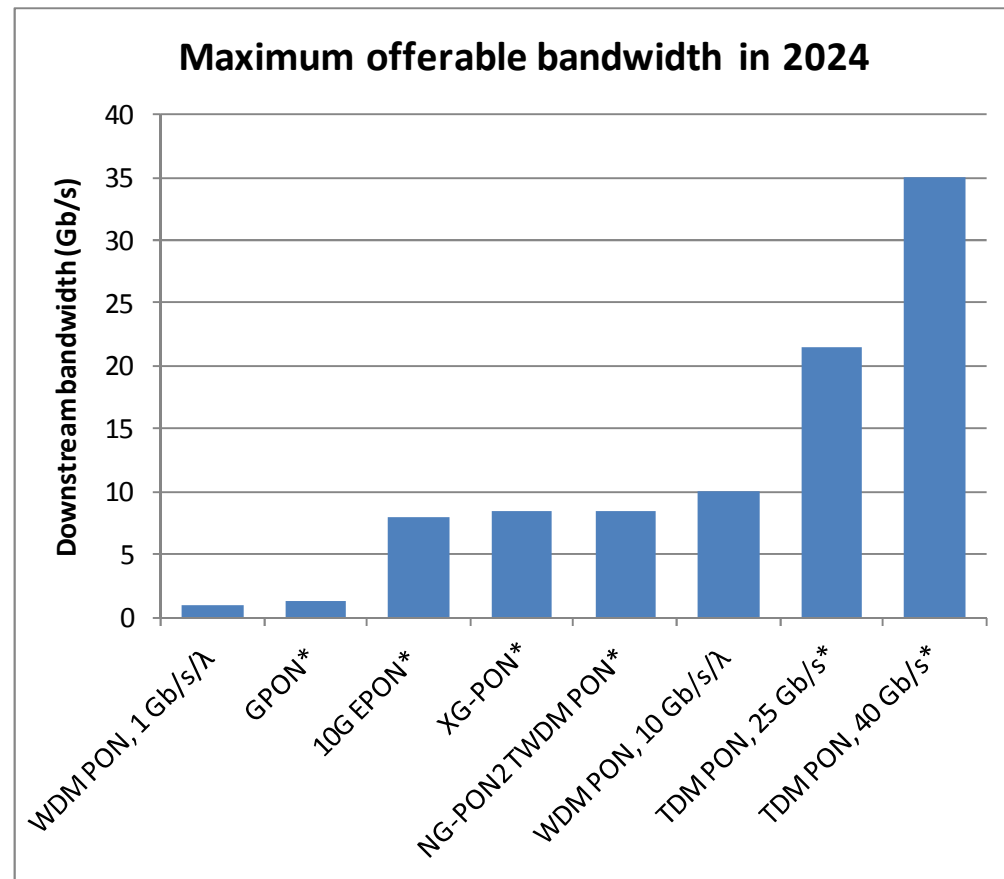
- Operators won't offer speeds that can't be realized and tested by subscriber end terminals in the home network.
- Gigabit service: the first time offered bandwidth equaled the capability of subscriber end terminals in the home network.
- More than Gigabit service won't be offered until there is something faster than Gigabit Ethernet in the home. Because it can't be tested in a speed test.
- **We posit this rule: Once offered bandwidths reach the maximum capability of subscriber end terminals in the home network, the offered bandwidth growth rate will be governed by the growth rate of the maximum capability of subscriber end terminals in the home network.**

A new methodology proposed for offered bandwidth forecasting

- Extrapolating from Ethernet history, there may be an evolution to 10G Ethernet over UTP in the home by 2024.
- Extrapolating from WiFi history, 3 Gb/s peak usable downstream bandwidth is forecasted by 2024. But beyond ~500 Mb/s it won't be easy; there is no plan to get to 3 Gb/s peak.
- Therefore, the maximum offerable service level will be between 1 and 10 Gb/s in 2024.



Maximum offerable bandwidth of access technologies



* (32 subscribers)

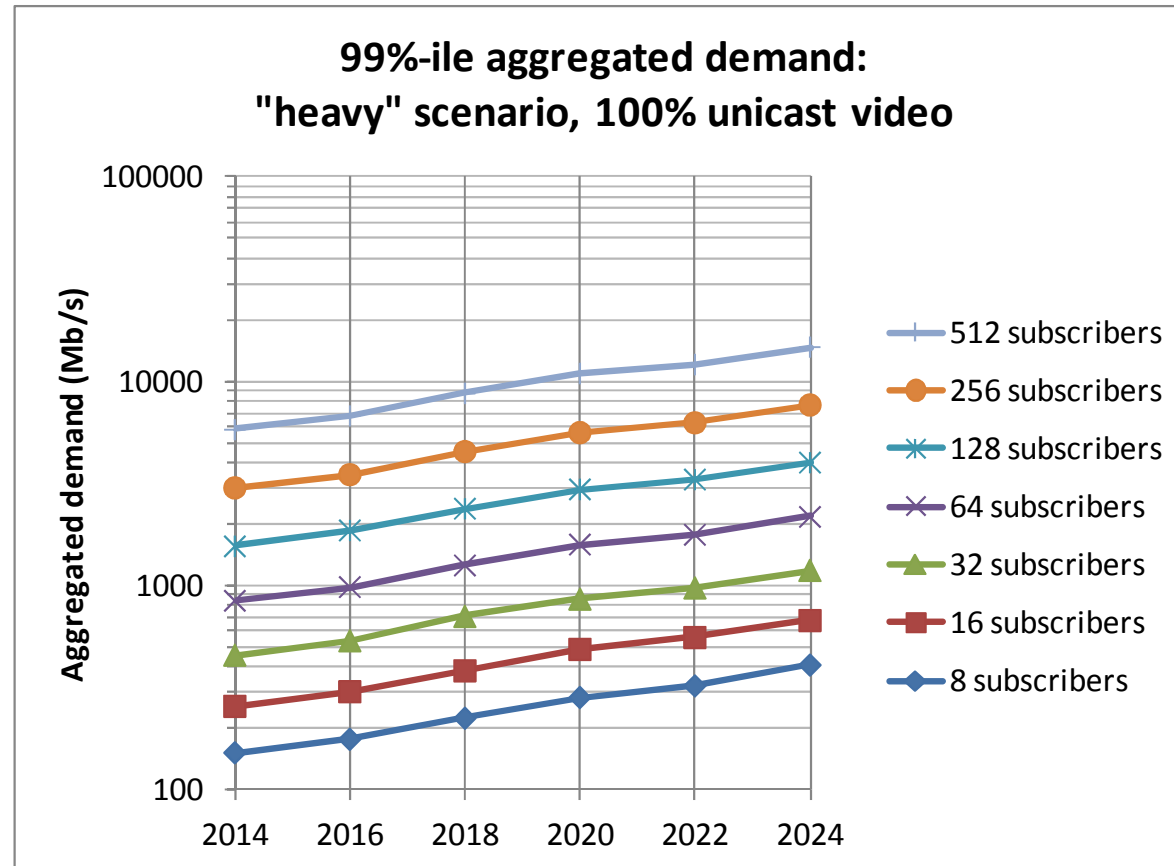
Based on methodology in contribution to Ottawa meeting, "Bandwidth demand forecasting (for section 4.2.2)"

Observations on TR section 4.3

- We observe that the text in section 4.3 is a mix of discussions on demanded bandwidth and offered bandwidth
- The discussion about demanded bandwidth is not consistent with the new section 4.2.2 that we contributed.
- If the methodology in this contribution is accepted, we propose to contribute new text dealing exclusively with offered bandwidth trends for section 4.3 along these lines.

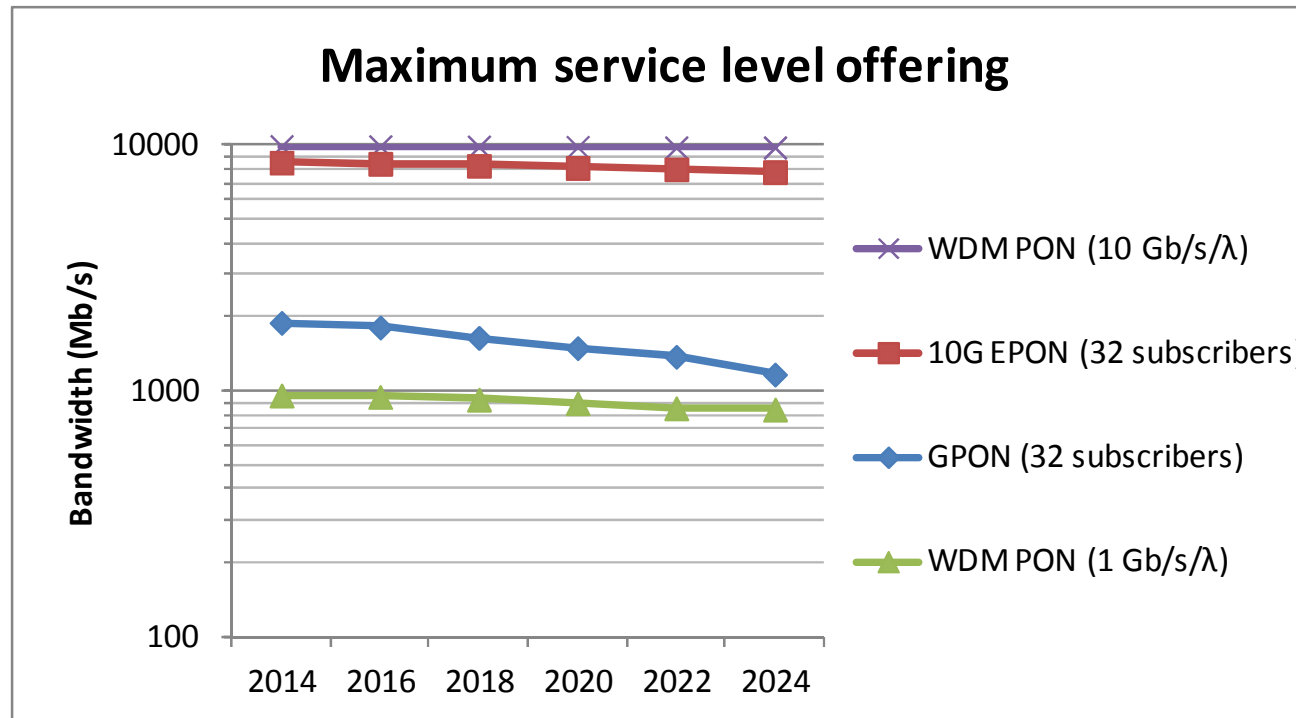
Backup

Residential aggregate bandwidth demand forecast



From contribution to Ottawa meeting, "Bandwidth demand forecasting (for section 4.2.2)"

Maximum service level that can be offered by various access technologies



From contribution to Ottawa meeting, “Bandwidth demand forecasting (for section 4.2.2)”

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