

FCC Forum on the Future of Wireless Band Plans

Al Jette – July 16, 2012
Head of North American & cdma/4G Standards

DL Traffic 6 - 13x Greater than Uplink Traffic

NSN UL/DL IP Traffic from a Major LTE Commercial System

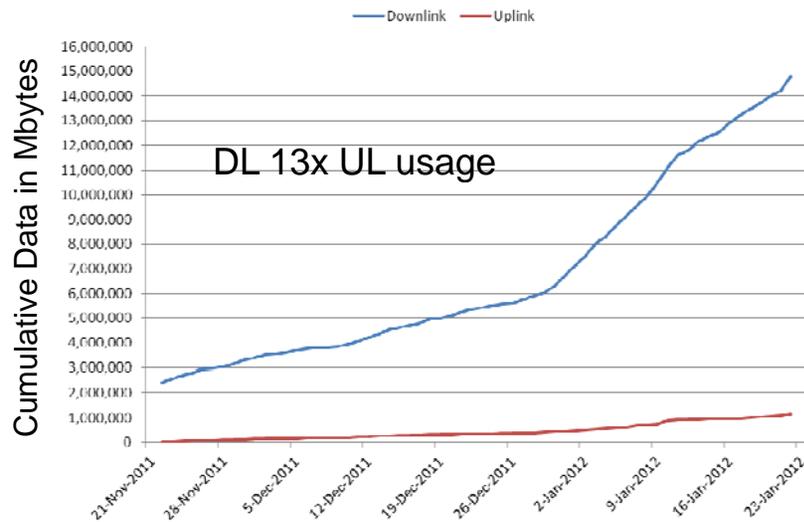


Table 3-1: The ratio of downlink to uplink traffic.

	% downlink	% Traffic Allot 2010	% Traffic Cisco 2010	% Traffic Cisco 2015
Web browsing/e-mail	80%	26%	31%	22%
Video	98%	37%	50%	66%
VoIP and IM	50%	4%	2%	1%
File sharing	80%	30%	14%	6%
Other	60%	3%	3%	5%
% in downlink		85%	88%	91%
DL/UL ratio		5.7	7.3	10.1

Sources: Plum analysis, Cisco (2011), Allot (2010)

Via: 3g4g.blogspot.com

** Note: Exceptions to these “typical” traffic pattern exist, like major events where lots of users are uploading video.

Downlink vs. Uplink Performance & Allocation

Downlink typically provides 2-3X better spectral efficiency than UL

- The demand for DL typically exceeds the UL demand
- This helps offset the asymmetrical data demand

Quanta of allocation for LTE DL & UL are in terms of Resource Blocks

- The number of resource blocks assigned depend on traffic & channel quality
- Even if the DL is heavily loaded, the UL may be lightly loaded
- Resource blocks assigned to users for UL and DL transmissions may vary significantly

3GPP Carrier Aggregation

3GPP has been working on Downlink Carrier Aggregation to improve downlink performance (Rel 10 & 11).

- This significantly increases the DL peak rate, improves DL average throughput and cell edge user experience, especially with low # users.
- A single user may experience an even greater disparity on DL/UL subframes being assigned.

For new band allocations, allocating more Downlink than Uplink spectrum should be considered.

Thank You !