

How fast is BURST?

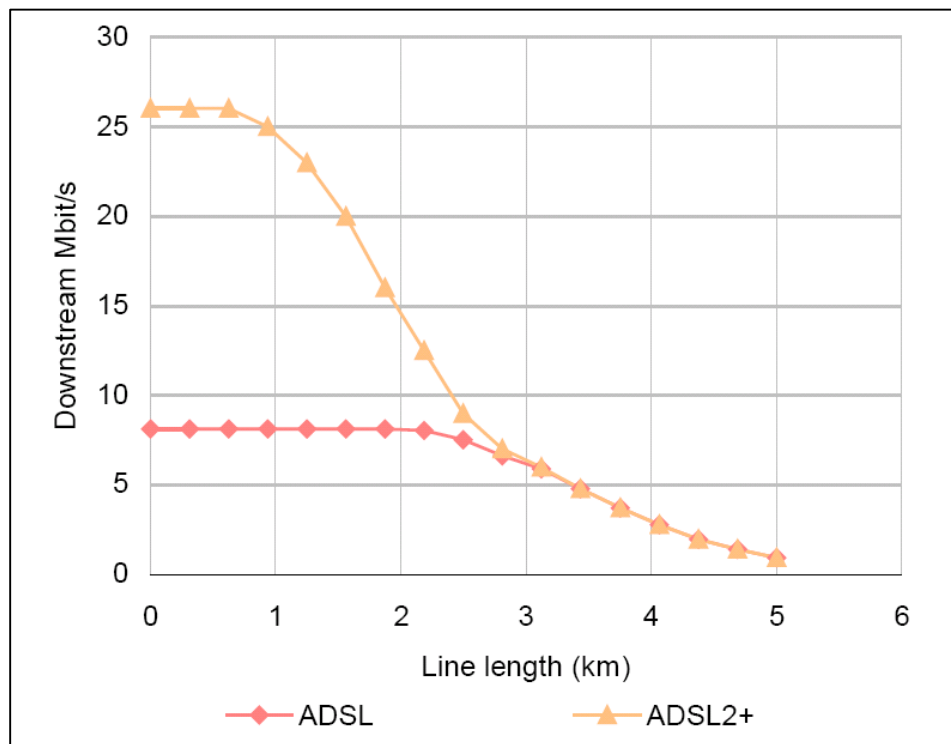
The Promise

BURST is capable of 20 Mbps download and 2 Mbps upload. It is delivered using the Annex-M variant of ADSL2+ (G.992.5) technology, which actually has theoretical download and upload bandwidth rate of 26 Mbps and 2.6 Mbps respectively. However, Fluidata recognises that no one will ever benefit from these theoretical rates because they are conditional on 2 factors: the length of the line and interference on the line.

Line Length

Line length directly affects bandwidth rates – very short line lengths will benefit from the best download and upload rates. And the longer the line the lower the bandwidth rates will be.

The theoretical distribution of ADSL 2+ download rates over line length is presented in Graph 1.



Graph 1. Theoretical maximum download bandwidth of ADSL and ADSL2+ against line length
 [Source – Analysys "Sophisticated Broadband Services" report for the Department of Trade and Industry, 11/06/2005]

Using BT line records Fluidata can usually obtain reasonably accurate estimates of the length of a line. This can then be used to predict the maximum possible download and upload rates the client can expect. However, bandwidth rates are also determined by interference on the line.

Interference

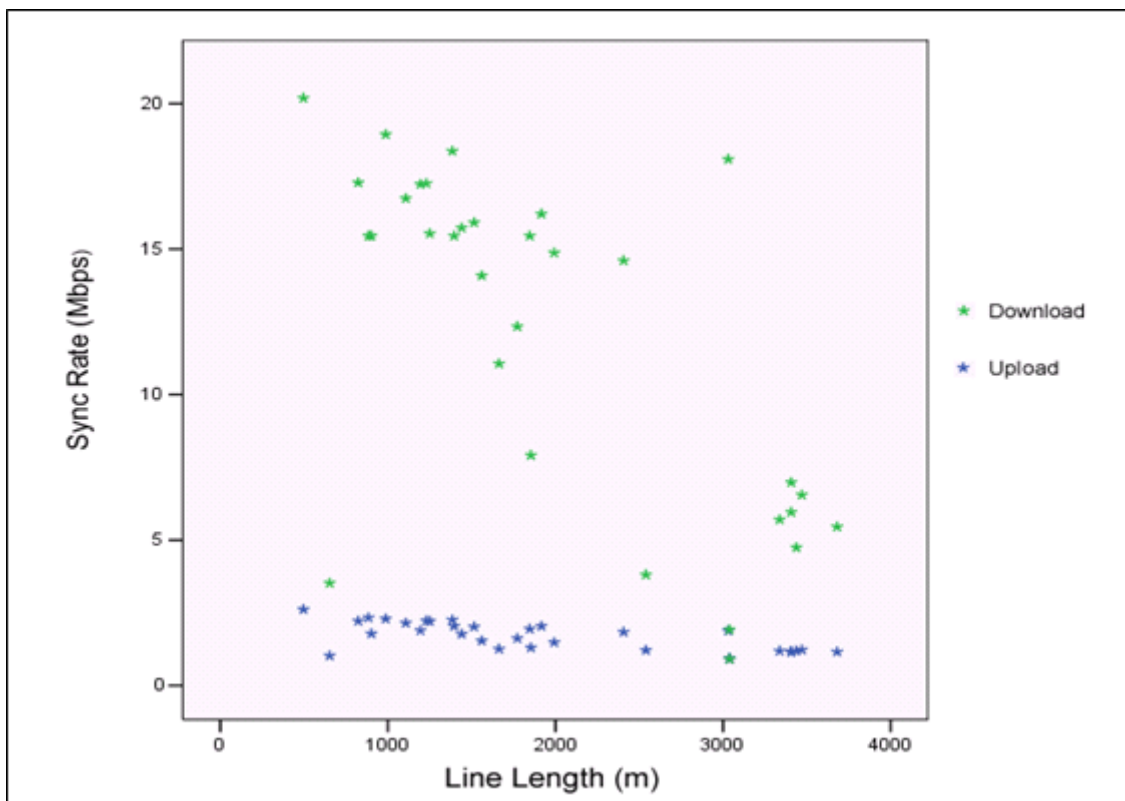
There are several factors which can cause interference on a telephone line; the most common causes are copper quality, cable joins and wall socket quality. Copper quality directly affects bandwidth rates and can vary quite significantly, as some BT copper lines were installed decades ago and have suffered from exposure to the elements. Also not all copper cables are the same thickness, with newer lines having a thinner gauge than previous generations.

It is important that cable joins are carried out to a high quality, whether by BT on route to the client premises by BT or inside the premises. Use of extension leads and extension sockets within customer premises is not advised, as this exposes the line to noise and interference.

Finally, for best results the BURST router should be plugged directly into the master BT socket within the premises, as extension sockets will deliver an impaired signal which will lead to reduced bandwidth. The BURST service is provided with 2 high quality micro-filters, these must be used on the master socket, and on every extension socket for that line number in the building. Devices such as fax machines and satellite box modems cause substantial interference on the line which will cause very low bandwidth rates and intermittent loss of connectivity.

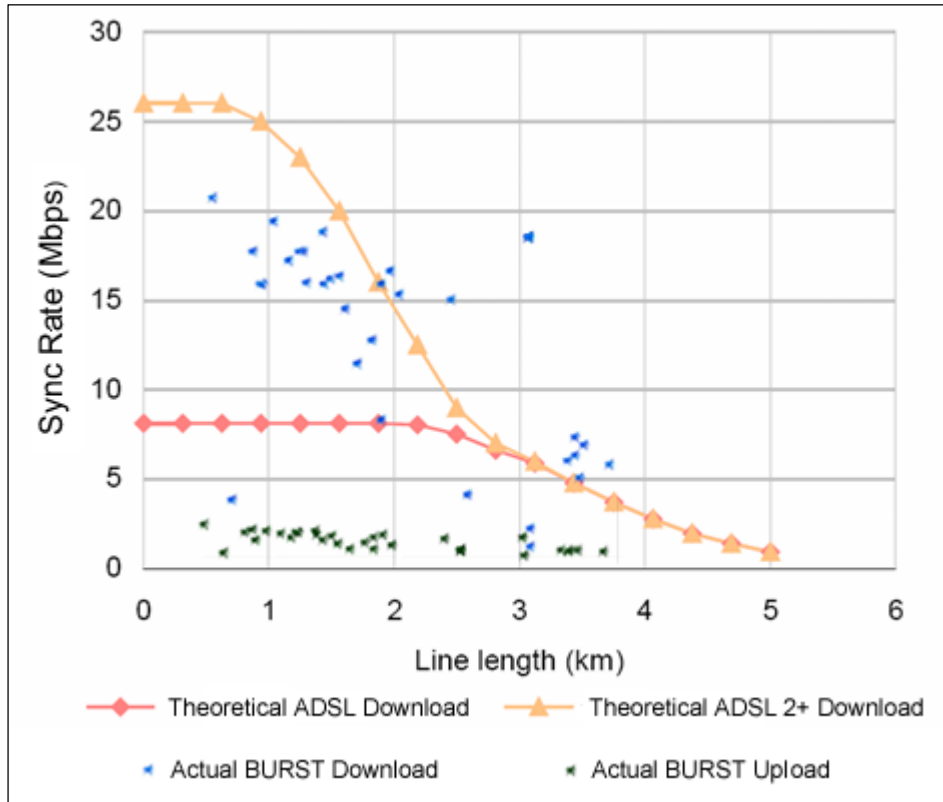
Actual Performance

The net result is that the theoretical bandwidth rates for BURST and the actual rates received will vary. To assist clients with their expectations Fluidata tested the line lengths of the first 50 BURST clients after the product launch in 2006. The stable download and upload sync rates were then measured, and these plotted against the line lengths, see Graph 2.



Graph 2. Sample of actual BURST download and upload sync rates against line length

When plotted against the optimal download rates for ADSL 2+ it is interesting to note that for users with line lengths under 2 km there is a trend in the download speed – these are consistently slightly lower than optimal; Graphs 3.



Graph 3. Theoretical ADSL download and actual BURST download and upload sync rates against line length

This download trend is due to the Annex-M profile, which operates by using some of the download bandwidth for upload.

Unlike the ADSL 2+ Annex-A profile, which can only deliver 1.3 Mbps upload bandwidth under optimal conditions, BURST can achieve 2.6 Mbps upload.

It is this trade off that has seen Fluidata describe BURST as an up to 20 Mbps download and 2 Mbps upload service, and we believe the additional upload in exchange for a little of the download is a sacrifice that most business will welcome. And for those clients who are only interested in download we can set the DSLAM profile to Annex-A instead.

The trend begins to fade after 2 km because Annex-M is less effective over a longer line length. However, over long distances BURST still fares better than its immediate competition from ADSL Max or SDSL.

ADSL Max suffers from rate adaption and stability issues over long line lengths, with poorer bandwidth rates. SDSL cannot be delivered at line lengths above 3.6km, and only at 1 Mbps up to 2.5km. However, in live testing BURST can still deliver 6 Mbps download and 1 Mbps upload at 3.6km. And as latency is not affected by bandwidth rates quality is not affected, so real-time applications such as VoIP and thin-client services are not impaired.