



## DSL vs. EFM

8el's fully managed private DSL service offers cost effective and secure connectivity between small office home office (SOHO) and an organisations head office. Advances in DSL technology have seen bandwidths increase with up to 20Mb download and 1Mb upload. 8el provide private DSL services through gigabit interconnects with Tiscali and Cable & Wireless and have access to local loop unbundled exchanges within Tiscali and Cable & Wireless control along with BT exchanges where connections are routed into 8el through private IP Centrals. Whilst DSL remains a best effort technology it is ideally suited for small user sites with short bursty data flows. This is where careful thought must go into decisions to use ADSL for business connectivity. Whilst the price is attractive and the bandwidth available appears to be plentiful, it is not always the best choice to provide the right levels of service to all offices.

EFM (Ethernet in the First Mile) is a relatively new technology being adopted by many wholesale network suppliers. 8el currently provides EFM circuits across a private Gigabit interconnect into BT's 21CN network. EFM can provide speeds of between 200Kbps and 10Mbps synchronous and is currently limited to the exchange area in which the serving Wholesale Ethernet node is situated. Where EFM is requested within these areas BT Wholesale will determine the number of analogue lines required to meet the required bandwidth. The number of analogue lines required will vary depending on the distance from the customer site to the serving node and the bandwidth required. A maximum of 8 analogue lines can be used in providing EFM. As a result it may only be possible to provide limited bandwidth at some customer sites, and on occasion, it may not be possible to provide EFM.

Characteristic	ADSL	EFM
Bandwidth	ADSL bandwidths range from 512Kbps up to 16Mbps downstream and 256Kbps up to 1Mbps Upstream.	EFM bandwidths range from 200Kbps to 10Mbps synchronous

Availability	For lines served from exchanges that are not LLU for Tiscali or Cable & Wireless 8el can not provide a Premium service assuring up to 500Kbps assuming the line synchronises that high.	EFM is currently available from over 700 Wholesale Ethernet Nodes
Distance	Line attenuation impacts performance of a DSL line which is attributed to the distance the line terminates from the exchange. On average lines over 4km from the exchange are likely to suffer from lower line synchronisation speeds and performance issues.	Maximum distance to provide EFM is 5Km. For end points too far for EFM the service will not be available.
SLA	ADSL is a best effort service and carries no service level agreement. Round trip delays are often in excess of 50ms with no guarantees. Standard repair time for DSL circuits is up to 5 working days.	EFM circuits on BT's 21CN network are bound by the 21CN SLA along with Fiber access circuits. Sub 10ms round trip delay and sub 3ms latency. Standard repair time for EFM circuits is up to 7 working hours.
Support for real time protocols	With asynchronous bandwidths and no SLA on round trip delay and jitter, ADSL is only suitable for real time protocols when sold as a premium service which assures a small amount of backhaul (up to 500Kbps) assuming the bandwidth is sufficient for the concurrent number of conversation flows and up to 150ms latency is acceptable.	The synchronous nature of EFM and the low round trip delay and latency figures provide EFM with comparable SLA to leased lines and LES circuits delivered over fiber making EFM an ideal candidate to carry VoIP and other real time traffic, as well as offering improved performance for high bandwidth, bursty data applications.

## Summary

Whilst it may appear that ADSL offers greater download speeds the reality is EFM lines offer greater performance. The latency of a circuit determines the speed in which two hosts can transfer data, whilst the bandwidth of the pipe relates to the amount of data that can be filled within the pipe at the same time. Whilst bigger bandwidth pipes serve well for many hosts communicating across the link at once, the latency, or speed in which data is transferred, is where the performance for two or more communicating hosts is measured.