

Making the right connectivity decision for your company

Executive Summary

Deciding on the right connectivity is critical in assisting with the smooth running of any business. This paper is aimed at anyone who needs to understand the differences between all the connectivity options available to allow them to decide on the correct service for their business.

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Introduction: Choices, choices, choices

When asked to choose what connectivity solution your company should order you are surrounded by many choices.

- What are the differences between the many flavours of broadband?
- What is a leased line?
- What bandwidth do you need for today and for next year?
- What resilience options are out there?

Step 1: Define what you need connectivity for

Most users immediately say they need internet connectivity, but the internet is a big and varied environment.

Break down your requirements into the following plus your own specific requirements:

- Web browsing
- Sending and receiving email
- Remote access by mobile/home workers
- Offsite backups
- Access to cloud based applications
- Video conferencing
- Voice over IP

Each requires a slightly different profile of bandwidth, reliability and responsiveness.

Service	Bandwidth	Reliability/responsiveness
Web browsing	Most traffic is downloaded from the internet in bursts. Designed to be reliable on relatively slow links	Users don't normally notice if web pages take a second or two longer to load, so basic broadband is fine
Email	Users do 'Fire-and-Forget' with email, so don't notice if you have 100Kb/s or 100Mb/s of bandwidth – unless they're emailing massive attachments	Email can handle slow links and outages with no complaints from your users
Remote Access / VPN	This is a constant use application that requires both up and down bandwidth. It doesn't need a lot of bandwidth but will cause user complaints if you flood your link with other traffic	Users won't notice several second delays in normal usage
Offsite Backups	Normally configured to run overnight or at weekends, this will take as much bandwidth you give it. Depending on the size your daily backup should run on most broadband links	Doesn't care about slow links, outages or packet loss
Cloud based services	Shouldn't require lots of bandwidth, but if it's a business critical application (i.e. accounting, CRM, Google Docs, etc.) then the more the merrier	Packet loss and slow response will create user complaints
Video Conferencing	Requires a constant amount of bandwidth for the video and audio streams. High Definition takes the requirement up even higher	Packet loss, delay and jitter will cause the video to break up and become unusable. This does require a higher quality connectivity solution.
Voice over IP	Requires a constant bandwidth allocation and priority over all other traffic or your users will start sounding like Daleks	Packet loss, delay and jitter of even tiny amounts make the voice unintelligible. High quality connectivity is a must for this service.

Obvious Point: You get what you pay for

*The more you pay the higher the quality and reliability you get.
Headline download speeds are there to attract headlines.*



Step 2:

Know the major differences between connectivity solutions

ADSL

Asymmetric Digital Subscriber Line

- Runs over a standard copper phone line
- Can provide high download speeds, but slower upload speeds
- Normally not a guaranteed service, at busy times of the day you can get lower speeds due to high usage by other clients of your ISP as you share bandwidth
- Fairly reliable
- Quality of bandwidth can vary greatly
- Cheap to install and run

SDSL

Symmetric Digital Subscriber Line

- Runs over a standard copper phone line, but one without telephone service – dedicated just to connectivity
- Provides the same upload and download speed
- Normally has a higher guarantee on service as it's aimed at businesses not home users and has dedicated bandwidth via your ISP
- Reliable
- Quality of bandwidth is good
- Several times more expensive than ADSL to install and run

VDSL

Very-High-Bitrate Digital Subscriber Line

- Runs over a standard phone line
- Can provide very high download speeds, and significant upload speeds
- Normally not a guaranteed service, at busy times of the day you can get lower speeds due to high usage by other clients of your ISP as you share bandwidth
- Fairly reliable
- Quality of bandwidth can vary greatly
- Higher install and running costs than ADSL, but cheaper than SDSL
- Currently not widely available

Cable

Broadband over Fibre or Coaxial cables

- Runs over fibre or coaxial cable from cable TV supplier
- Can provide high download speeds, but slower upload speeds
- Normally not a guaranteed service, at busy times of the day you can get lower speeds due to high usage by other clients of your ISP as you share bandwidth
- Fairly reliable
- Quality of bandwidth can vary greatly
- Cheap to install and run
- Aimed at mass consumers rather than businesses

EFM**Ethernet First Mile (leased line)**

- Runs over multiple copper telephone cables
- Can provide up to 10Mb/s of upload and download
- Excellent bandwidth quality
- Very reliable, it can cope with individual copper wires being damaged
- Large installation and setup costs, but running costs are similar to SDSL
- You can start with smaller bandwidths and easily upgrade as your requirements grow

Fibre**Fibre Optic Ethernet (leased line)**

- Runs over fibre optic cable
- Can provide up to 1000Mb/s of upload and download
- Excellent bandwidth quality
- Very reliable, except for physical damage of cable
- Large installation, setup costs and running costs
- You can start with smaller bandwidths and easily upgrade as your requirements grow

Our many years of experience in communications show that most loss of connectivity issues are resolved within 24 hours, normally within just a few hours. However, some faults that involve external line plant can take multiple days.

Step 3: How reliable do you need your connectivity?

Everyone wants their internet connectivity to be available and fast whenever they need it, but there is a trade off between uptime and costs.

As a rule of thumb work out the total lost profit if your business was offline for one day.

Take into account salaries of staff who 'need' access to outsourced applications/systems, average sales on your website (if hosted internally), possible lost sales enquiries if email is down, etc.

If this lost profit is more than the cost of having a backup connection then you should have a backup link. A one person office can probably de-camp to the local coffee shop and use their wireless connectivity for the cost of a Frappuccino.

A backup link can be as simple as an ADSL line that your staff manually connect up in the event the main line fails. Automatic failover systems can make this change within seconds or for full availability you can have multiple links all constantly connected, so one link failure has no effect on productivity. 3G failover is OK for Internet access, but not for VoIP, etc.

Step 4: **Choosing your ISP**

Not all ISP's are the same. Some may be cheaper on the bottom line, but their service is normally not on a par with slightly more expensive providers.

In a perfect world you would never need to call your ISP as everything would just work perfectly – maybe you'd call up once a month to thank them for their excellent service?

In the real world, links fail and IT equipment behaves erratically. When this happens you need to know you can contact your ISP, they respond clearly, investigate the issue urgently, keep you updated on the status and be pro active in stopping issues reoccurring in the future.

About the author



Neil Cowles is a Pre Sales Network Engineer at Spitfire Network Services Ltd, a leading UK ISP.

He has many years experience in the ISP business arena and has helped large and small businesses plan, install and grow their internet technology.

In his spare time he is teaching the family dog to sit, lie down and roll over to binary commands.