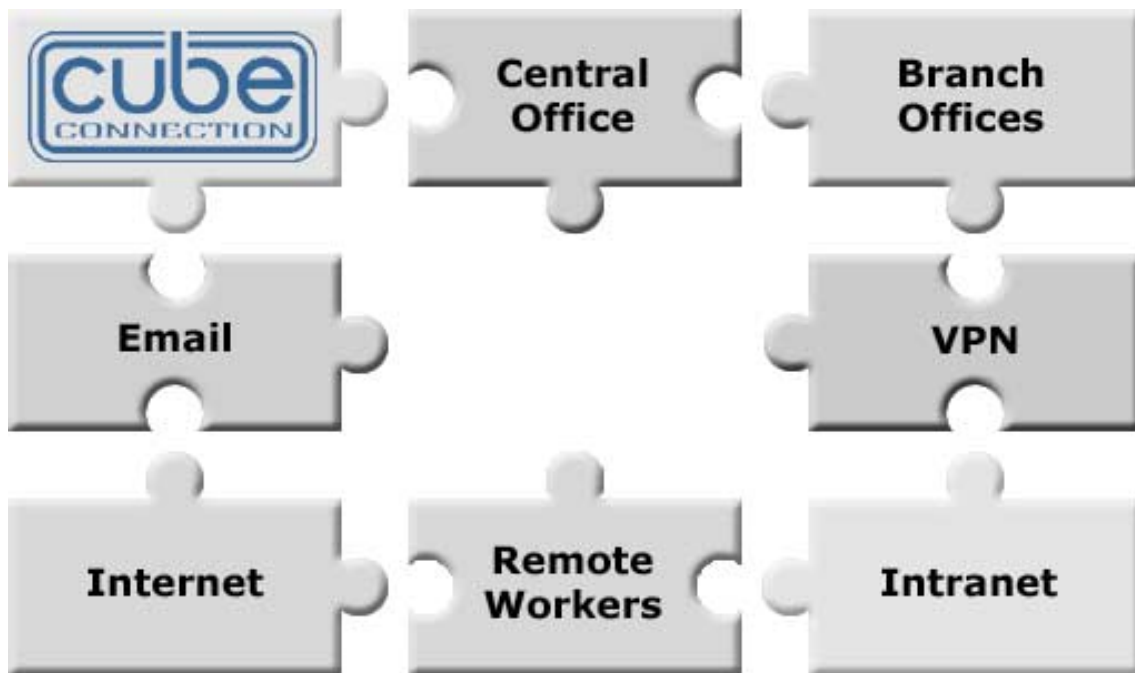


# ADSL Broadband:

Helping Your Organisation Work As One.



**The missing piece of the puzzle?**

## **Section 1 – Introduction**

### **Why is this of interest to me?**

All companies that use Information Technology (IT) and have branch offices or remote workers, should be aware of the benefits of an ADSL Internet connection (also referred to as a Broadband connection – see “What is ADSL?” below for more details).

For Small to Medium sized Enterprises (SME) with multiple locations, prior to ADSL broadband, centralising IT proved too expensive, to make it cost effective.

With the introduction of ADSL, this has now changed, with 512Kb ‘always on’ Internet connections possible from only a few hundred pounds a year. If you have existing dial up connections on a pay-as-you-go basis, this will probably **save you money**, based on 45 minutes usage per day.

### **What is ADSL?**

ADSL (“Asymmetric Digital Subscriber Line”) works by splitting your existing telephone line signal into two, one for voice and the other for data. ADSL technology can work at up to 8Mbps download. The most popular services in the UK at the moment are running at speeds of 512Kbps (approx. 10 times faster than a modem), although speeds of up to 2Mbps can be obtained. Upload speeds are 256Kbps on all products and hence this is why it is “asymmetric”, because the download speed is different to the upload speed.

### **Access to the Internet - how does that help?**

Before ADSL, to connect branch offices to your own internal network, required the installation of *your own* point-to-point connection, usually a leased line. This was expensive.

With permanent Internet connections via ADSL, your remote users use the existing Internet infrastructure to route their data connections back to your own server, a cheap Wide Area Network.

Well not quite. As you are using a public network from your own means, what is to stop anyone eaves dropping on your valuable communications or sneaking around your server? This is where Virtual Private Networking (VPN) and Firewalls come into play. VPN will encrypt your data as it passes over the Internet, so even if it is intercepted, it will be very hard to de-encrypt and hence read. Firewall’s will protect your Local Area Network (LAN) from unauthorised or other malicious users.

### **Where do I go from here?**

The short guide below expands upon this brief introduction and if you do nothing else, we hope that it at least starts you thinking about how your IT may be improved by making your offices work together. Remember ADSL is not an option everywhere at the moment, especially rural areas, so a check would need to be done to confirm availability.

If some of the document does not make sense, or you would like further explanation of the topics discussed, then we would of course be more than happy to visit you, talk to you on the phone and / or set-up a demonstration. There is no cost to you, obligation or hard sell – just useful advice that we hope will help your employees work better together and maybe even help you cut some costs.

---

#### **Norfolk Office (Contact Robert Bird)**

✉ 26 St Anne's Road, Framingham Earl, Norwich NR14 7TH  
☎ 01508 494415 / 07900 477423

#### **Suffolk Office (Contact Terry Browning)**

✉ 17 Lakeside Park Drive, Reydon, Suffolk IP18 6YB  
☎ 01502 725374 / 07900 111602

## **Section 2 – Cube Connection Company Profile**

### **Overview**

Cube Connection Ltd was originally incorporated on 20/01/1993 under the name of Quasar Computer Services Limited. At this time it primarily provided IT support to the Oil and Gas Industry and was, for instance, heavily involved in the design and implementation of a mail system and Microsoft Terminal Server usage for offshore gas platforms.

In January 2001 it was decided to widen the customer base and offer the same knowledge and good practices learnt in the Oil and Gas Industry to Small and Medium size organisations. At this time the company name was changed to Cube Connection Limited. Also the scope of the company was increased to include web design / programming and Health and Safety assessments.

The aim of the company is to provide **high quality professional services, at a realistic price.** With this in mind Cube only supplies or recommends branded equipment (e.g. IBM, Compaq etc), all of which is on Microsoft compatibility lists. Cube uses large national IT resellers to source hardware and software for the best price. Should you wish to acquire this hardware through your own purchasing procedures, direct, we are happy to supply full part lists to enable you to do so.

### **Key Staff Skills**

The principal partners in the company are Rob Bird and Terry Browning who between them have over 20 years experience in IT support. Key skills include in-depth knowledge of Network Technologies with particular emphasis on Microsoft products including Windows (all Server and Client versions), Small Business Server, Exchange, Internet Security and Acceleration Server, Terminal Server, and the range of Office applications. The company subscribes to Microsoft Technet, enabling it to keep up-to-date with the latest patches and service releases.

Rob and Terry's experience in the Oil and Gas Industry has exposed them to a wide range of technologies, enabling them to have an understanding of these technologies and their limitations.

### **Similar Installations**

Cube's aim in all its installations is to provide a robust and reliable system that requires little on-going support apart from service updates released by Microsoft to address problems or security issues. Systems can be configured so that they can be supported remotely. Examples of installations are:

**Adamac Group, Lowestoft:** Microsoft Small Business Server / Internet Connection.

**City Dwellings, London:** Microsoft Small Business Server / ADSL connection / VPN.

**Semco Technology, Gt. Yarmouth:** Windows 2000 Server / Internet Connection.

**St Martins Housing, Norwich:** Microsoft Backoffice server / ADSL connection / VPN.

**Shell EXPRO, Lowestoft:** Installation of Terminal Server for approximately 60 offshore users.

**KYE, Teesside:** Microsoft Windows 2000 server / Internet Connection.

We also have our own in-house use of Small Business Server 2000, with 2 offices linked over the Internet on a Secure Connection (PPTP – Point to Point Protocol).

---

#### **Norfolk Office (Contact Robert Bird)**

✉ 26 St Anne's Road, Framingham Earl, Norwich NR14 7TH  
☎ 01508 494415 / 07900 477423

#### **Suffolk Office (Contact Terry Browning)**

✉ 17 Lakeside Park Drive, Reydon, Suffolk IP18 6YB  
☎ 01502 725374 / 07900 111602

## **Section 3 – Methodology**

### **Background – Requirement**

Your head office requires a centralised IT system, that allows local users to share data, send email, connect to the internet, print etc. in a controlled way. This will also allow easy control of well-defined security policies and principles, centralised anti-virus measures and centralised backup of company data. With this in place first, your organisation can then progress to allowing remote access (WAN connections) from outlying locations.

The remote locations will, through the Internet, be able to access centralised email / groupware applications, access shared documents and also manually backup their local documents, in a secure manner.

### **Background – LAN vs WAN (and ADSL)**

A WAN is not the same as a LAN in terms of performance; speed is significantly less (e.g. a typical 512Kb ADSL connection is only 5% of the speed of most modern LAN's running at 100Mb). Delays over a WAN are significantly greater than over a LAN. This is not a problem for applications such as e-mail, however database applications do not run well over a WAN unless specifically written for a WAN environment.

For the proposed application of access to central email / groupware / company policy documentation etc, then ADSL is proving to be a cost effective connection method for smaller companies, with geographically separated offices.

Do note that ADSL has no Service Level Agreement (SLA) tied to it – i.e. there is no come back if the service goes down for any time. ADSL is also a 'Contended' service, meaning that you share the 512Kb connection bandwidth, with up to 20 other people, on a business service level. This may mean that on heavily used lines, the connection speed may drop.

### **Connection Speeds – The Reality**

With a head office acting as the 'hub' and remote offices accessing this, then the slowest point in the chain will limit the maximum download speed. If you are using ISDN or dial-up from remote offices then these are obviously the slowest link. What must not be overlooked, however, is installing ADSL at remote offices will not raise your inter office connection above 256Kb, no matter what speed connection you have installed (see "What is ADSL" in Section 1 for why). Since in two-way communication both sites will have inbound and outbound traffic the effective speed will be limited by this outbound speed, which on ADSL is 256Kb.

It can be seen that exact requirements need to be determined carefully, in order to meet expectations.

### **The Cube Solution**

We have broken this down into 2 areas:

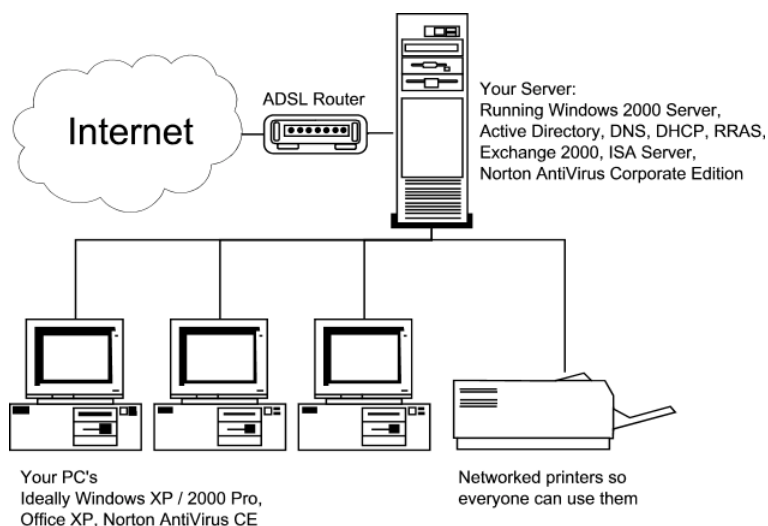
- The head office centralised system
- The remote office connections to head office

### **The Head Office:**

We would recommend a LAN based on industry standard hardware and running Microsoft software for both Server and clients. This would then connect to the Internet over a business class ADSL link. ADSL at the head office is required to give the always-on connection for the remote offices to connect into. Also the service provider chosen will need to give a SMTP email feed for the Exchange email server. We have used Demon Internet for our connectivity so far.

The Standard Server solution uses an IBM x220 Server, with a single 18Gb Hard Disk Drive (HDD), 512Kb RAM, 12/24Gb DAT Backup, 3 Year Manufacture Warranty. This is a good small workgroup server for those that do not see themselves expanding too much within the next few years. There are options for increasing HDD space and memory if required. As this is a

single HDD, the failure of this, could result in data loss and increased downtime while replacements are installed. **Enhanced server options are available that can avoid this.**



The server runs the following software:

- Windows 2000 Server: This is the core operating system and allows all the basic functions, from file security to Intranet provision.
- Exchange 2000 - this is the email / groupware system.
- ISA server - routes your traffic to the Internet and also protects your LAN from the same! Allows reports so you can see top users, viewed sites, etc.
- Norton AntiVirus Corporate Edition – centralised antivirus measures. Keeps itself up-to-date via the Internet.

If all client PC's run Windows 2000 / XP Professional, the benefits of your LAN are maximised, as security and other settings can be automated, however this is not necessary for the system to function.

### The Remote Offices:

Remote offices can access the Internet via ADSL, ISDN or modem. The exact choice will be down to availability and cost.

To maximise the security at these remote offices we would recommend that the PC's run Windows XP Professional, which will also give basic firewall functionality.

Remote users have a choice of accessing the Central system via:

- POP3 - retrieves email from your server in the same way as a normal dial-up account, using standard software such as Outlook.
- Web Browser - over a 128bit secure connection for email access **and also** shared folders / calendars / contacts. Access your email from any Internet PC in the world!
- Virtual Private Network - as illustrated below for email / calendars / contacts **and also** remote file access such as company policy documentation.

To achieve the Virtual Private Network (VPN) between the offices, we propose using Point to Point Tunnelling Protocol or PPTP. This is opposed to L2TP / IPSec (see over for details).

VPN's use the public network (i.e. the Internet) to extend your company's LAN, over a secure point-to-point channel. PPTP and L2TP/ IPSec both encrypt the data before it leaves the company LAN, making it harder to decipher this data by anyone who wishes to try and 'catch' this data while it travels over the Internet.

---

#### Norfolk Office (Contact Robert Bird)

✉ 26 St Anne's Road, Framingham Earl, Norwich NR14 7TH  
☎ 01508 494415 / 07900 477423

#### Suffolk Office (Contact Terry Browning)

✉ 17 Lakeside Park Drive, Reydon, Suffolk IP18 6YB  
☎ 01502 725374 / 07900 111602

**On coming to this decision we have weighted the pro's and con's (Security vs Cost vs Ease of Use) of each with regard to implementation at a Small to Medium Organisation.**

Also in an article posted on the Microsoft site on 15<sup>th</sup> October 2001, we have:

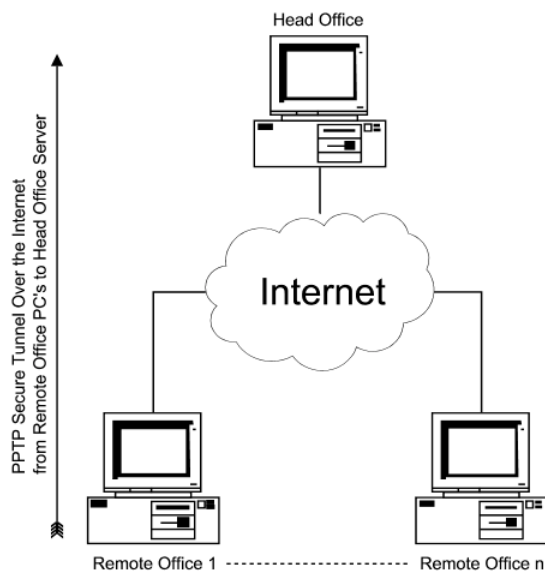
***Q. Why does Microsoft continue to support PPTP? Does PPTP have security issues compared to L2TP/IPSec?***

*A. PPTP provides a good level of security that is suitable for most companies. According to Infonetics Research, 76% of companies with VPNs use PPTP today and over 61% will continue to use PPTP in 2003.*

*PPTP has benefits compared to L2TP/IPSec and other IPSec-based VPN solutions because of the security model it uses. While IPSec has more powerful security, the deployments are usually more costly and have limitations. For example, PPTP does not require a certificate infrastructure, which many organizations are not yet ready to deploy. Rather, it relies on a user's logon credentials to establish trust to connect the tunnel and to create the encryption keys for the session. And, the management of user names and passwords is well known.*

*For customers who want stronger security than user passwords, PPTP can be used with EAP so that smart cards or token cards can be used for authentication. This increases the strength of the encryption key generation and reduces the risk of dictionary attacks. In addition, PPTP can be used through most Network Address Translators (NATs) today whereas today's IPSec-based solutions either cannot work through a NAT or can have a single connection through the NAT. Until certificate infrastructure becomes ubiquitous and IPSec product implementations are updated to support a common NAT traversal model, PPTP will remain an important protocol choice for many customers.*

<http://www.microsoft.com/windows2000/techinfo/howitworks/communications/remotearchive/vpnfaq.asp> for the full faq - frequently asked questions)



**Norfolk Office (Contact Robert Bird)**

✉ 26 St Anne's Road, Framingham Earl, Norwich NR14 7TH  
☎ 01508 494415 / 07900 477423

**Suffolk Office (Contact Terry Browning)**

✉ 17 Lakeside Park Drive, Reydon, Suffolk IP18 6YB  
☎ 01502 725374 / 07900 111602

## Section 3 – Example Costing

We have given sample prices for illustration only and were correct as of November 2002. Hardware and software prices are subject to change. If you would like a breakdown of the prices outlined below or a more accurate quotation, please contact us with your requirements and we will be happy to help.

**Charities** – Special offers apply to the pricing below – call to see savings!

### Standard Server / Network System Example:

Description	Qty
<b>Server / Networking:</b> IBM xSeries 220 Intel Pentium III, 512MB ECC RAM, 1*18Gb U160 Hard Drive, 12/24Gb DAT Tape Drive, 17" monitor, CD-ROM, LAN, three year parts and labour on-site warranty etc <i>WHY? We use servers designed to be as such – devices that have to be on and available 24/7, supported by a good 3-year warranty from a top quality manufacturer. Beware of unbranded 'servers' that are basically a PC .in a big case! DAT drives are the standard reliable solution for server class system backups. Do not trust your backups to PC class devices like Travan</i>	1
DDS3 4MM 125m tapes for backup.	9
APC Smart Uninterruptible Power Supply) UPS 1000VA <i>WHY? Stops your server being switched off in short term brown out and black out situations. If power is not restored in a fixed time it will shut the server down cleanly.</i>	1
Netgear FS516 10/100Mb Switch (16 Ports) <i>WHY? This will connect up the PCs to the server at 100Mbit.</i>	1
Netgear PS110 Print Server <i>WHY? Enables 2 printers to sit directly on the network, so can be centralised away from a PC, so all users can print to them.</i>	1
Microsoft Small Business Server 2000 5 User License. <i>WHY? You will get top business software in a package designed for smaller organisations including: Windows Server 2000 - the operating System for your Server Exchange Server 2000 - fully featured groupware email / calendar. ISA Server 2000 - web proxy server / firewall. safely share the internet</i>	1*5U
Norton Antivirus Corporate Total Server Edition (5 User) <i>WHY? Automatically protect your network and email from viruses.</i>	1*5U
Installation Estimated at 3* days (Full installation at main site, setting up of PCs with software and on network (assuming up to 5 client PC's, training as time allows, documentation).	3
<b>Total (assuming 3 days install)</b>	<b>£4271.00</b>

All prices quoted are ex. VAT, which will be charged at the prevailing rate.  
Standard delivery charges apply.

\* Issues that can affect install times are unsuitable network cabling, installation of new cabling, visiting remote sites for further installation, third party suppliers (e.g. ADSL provision) performing work in the correct manner and as instructed etc.

On top of this you will have your ADSL installation and annual rental. Currently for a Consumer class 512Kb ADSL line, with Demon Internet (other suppliers and connection options exist):

- Installation is £50
- Rental is £25 / month.
- Router is around £110 + VAT

Note that this is an 'Always On' connection, so there are no calls charges associated with it. You can also use a phone or FAX on the same line, but this will incur call charges. Standard line rental applies. Minimum contract period is 12 months.

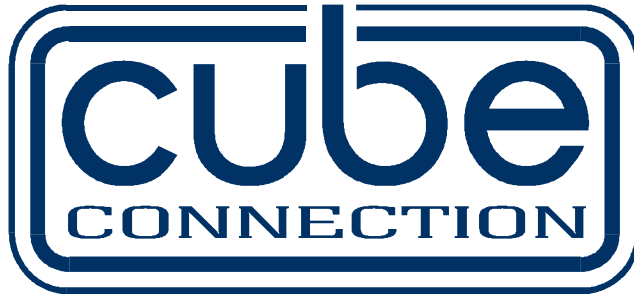
ADSL is not available in all areas, but other connection methods can be utilised.

#### Norfolk Office (Contact Robert Bird)

✉ 26 St Anne's Road, Framingham Earl, Norwich NR14 7TH  
☎ 01508 494415 / 07900 477423



#### Suffolk Office (Contact Terry Browning)

✉ 17 Lakeside Park Drive, Reydon, Suffolk IP18 6YB  
☎ 01502 725374 / 07900 111602





 <http://www.CubeConnection.co.uk>  
 [enquiries@CubeConnection.co.uk](mailto:enquiries@CubeConnection.co.uk)

**Norfolk Office (Contact Robert Bird)**

 26 St Anne's Road, Framingham Earl, Norwich NR14 7TH  
 01508 494415 / 07900 477423

**Suffolk Office (Contact Terry Browning)**

 17 Lakeside Park Drive, Reydon, Suffolk IP18 6YB  
 01502 725374 / 07900 111602