

GEM can be configured to run in many different ways. From simple stand-alone PC's or Mac's, through Client Server on your local area network and remote Clients using a VPN connection, to a Terminal Server serving multiple 'Thin Clients'.

Whilst working remotely you can work on-line over the Internet, or even off-line whilst you have no internet connection. (By comparison a 'Cloud' solution only gives you access to the system whilst you are connected to the Internet – no internet, no system.)

Stand Alone PC's

These can be either Windows PC's or Apple Mac's. GEM consists of two main parts – the **GEM** front-end and an **SQL Server** back-end. In a Stand-Alone PC both parts are installed and run on the same PC. If you are using an Apple Mac, you will also need to run Windows emulation software, so that it can run Windows software.

Stand-Alone PC's still allow you to replicate your data to a notebook so that it can be taken out of the office. Or your office machine can be accessed remotely using remote access software. (See the discussion on 'Remote Access Options' below.)

Windows Stand-Alone PC

Will need to run:

- **GEM** front-end
- **SQL Server** back-end.



You don't need to worry that it's in two bits, as both are installed automatically for you. But there are several different versions of **SQL Server** available, each with their own pros and cons. So see 'Which SQL Server should I use' below.

Stand-Alone Apple Mac

GEM was developed for PC running Microsoft Windows. So it needs Windows emulation software such as:

- **VM Ware's Fusion**, or
- **Parallels' Virtual PC**

as well as:

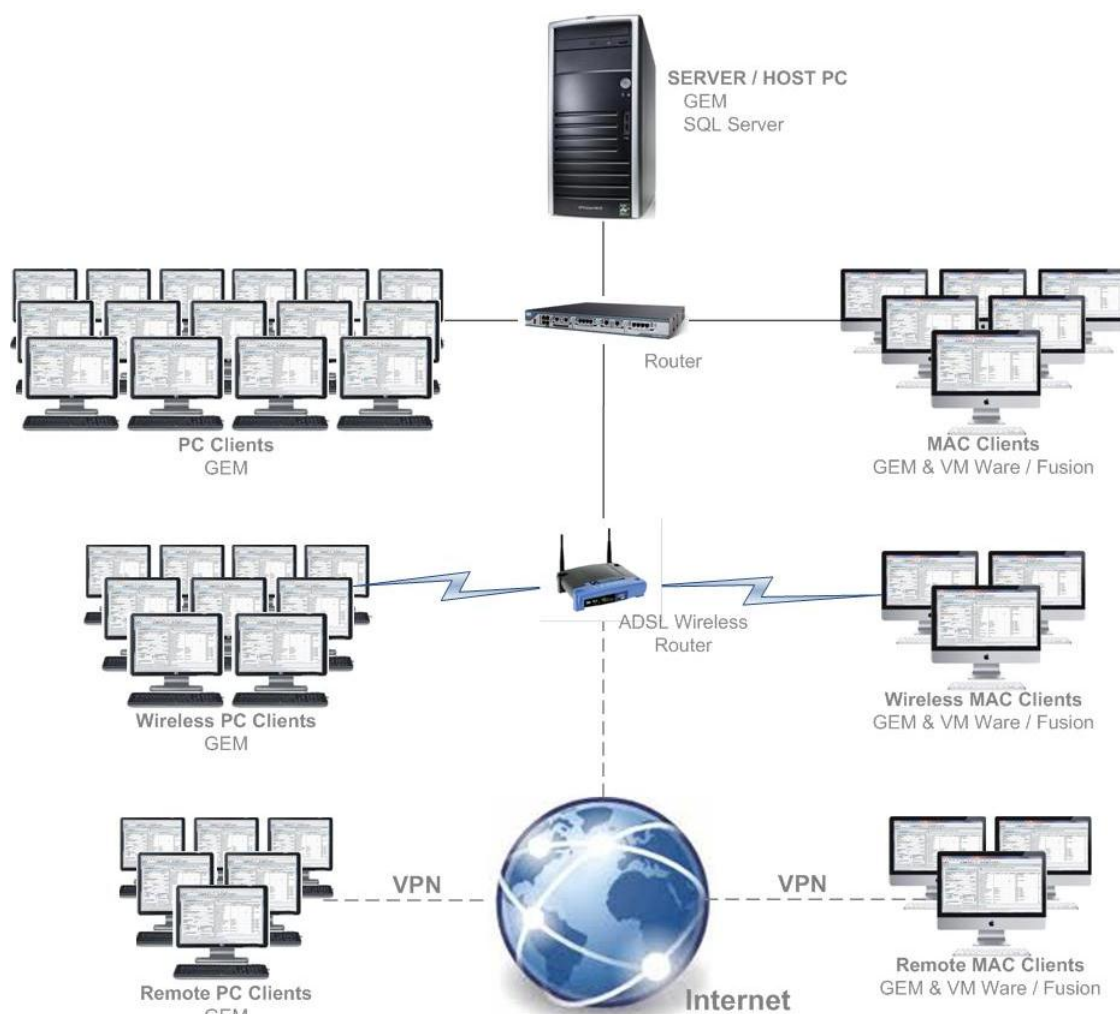
- **GEM** front-end
- **SQL Server** back-end.



Using VM Ware's Fusion, GEM seems to run just as well on a Mac as it does on a PC. (We have not tried Parallels' Virtual PC as yet.)

Client Server

This enables many 'Clients' to access the same database held on a 'Server'. This does not need to be a full-blown Server running a Server O/S. Any Windows PC can host GEM. (Sorry we've not tried hosting GEM on a MAC yet.)



The Server/Host PC needs to run:

- **GEM**, so that Administrators can use 'GEM Admin'.
- **SQL Server** back-end.

Windows Clients only need to run:

- **GEM** front-end,

Mac Clients need to run suitable emulation software as well such as:

- **VM Ware / Fusion**, or
- **Parallels / Virtual PC**.

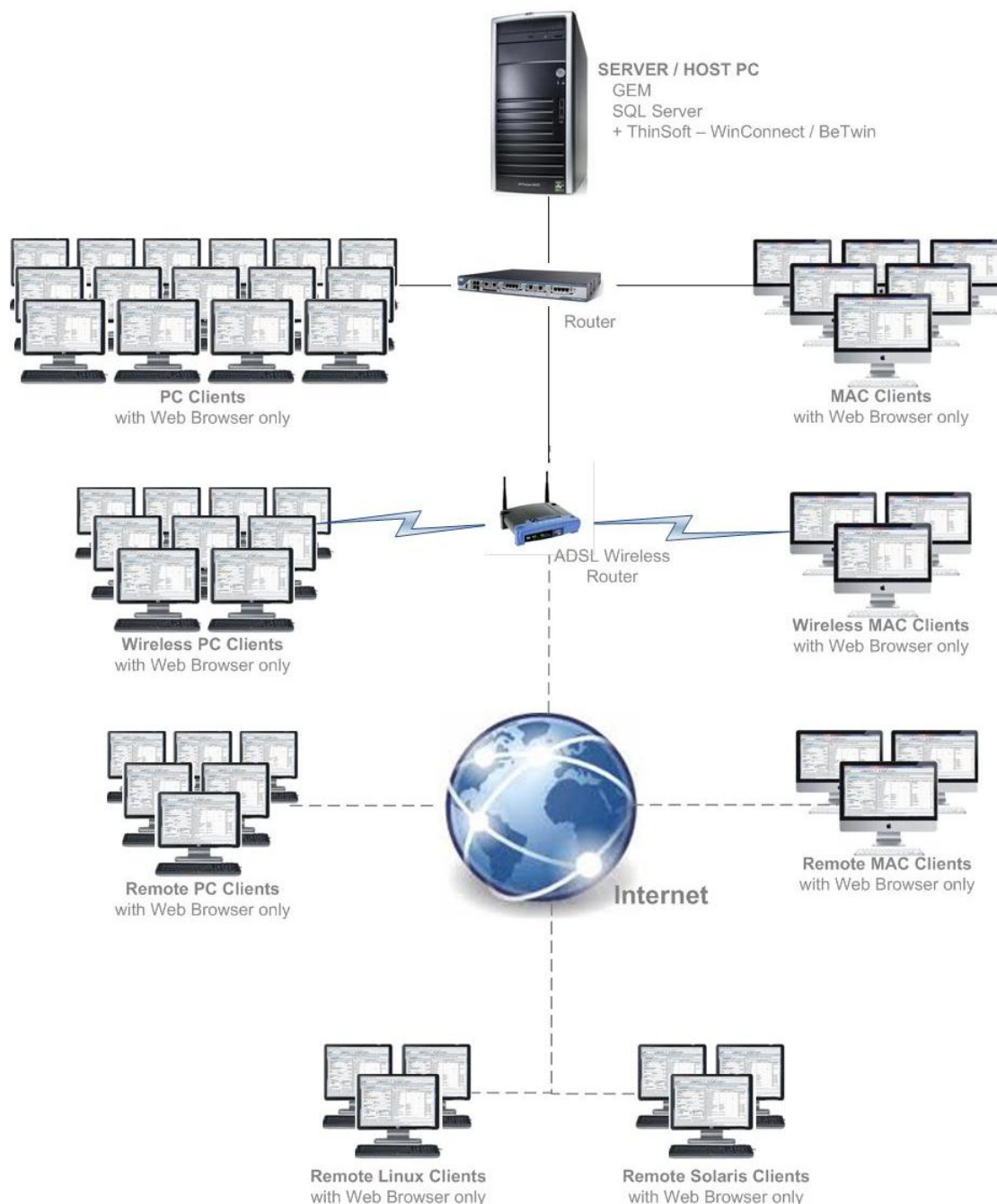
Access to the Server can be via:

- **LAN** (Local Area Network), which can be either :
 - **wired**,
 - **wireless**
- or **over the Internet** via VPN (Virtual Private Network).

Thin Clients

At first sight this looks exactly like the Client Server setup. The significant difference is the software that is installed on each machine.

By adding suitable 'Terminal Server' Software to the Server setup, such as **WinConnectServer / BeTwin** from www.ThinsoftInc.com, access to GEM on your server can be through any Web Browser on any machine anywhere on your local area network, or indeed the Internet.



This means you can run the system on even Linux or Solaris Clients if you need to. It can also mean considerably simplified administration, as no special software needs to be installed on any of the 'Clients'.

Remote Access Options

Before we go on and consider the pros and cons of each option we need to cover the other remote access options to a shared database other than 'Client Server' or 'Thin Clients', as discussed above.

Remote Control Software

Perhaps the easiest way to gain access to a remote Network is to use 'Remote Control Software' or 'Remote Desktop Software' to take control of a Machine that is already connected to the Network.



There are two broad classes of this kind of software. Those, such as **TeamViewer** and **LogMeIn**, that let the User of the machine on the Network see what's going on, and those like Microsoft's **Remote Desktop Connection** that don't. For details see http://en.wikipedia.org/wiki/Remote_control_software.

TeamViewer and LogMeIn are really designed for remote support, so that someone on a Help Desk can see what's going on, on a user's PC and vice-versa. Whereas Microsoft's 'Remote Desktop Connection' is designed for remote administration of say a Server, where there is no User at the other end.

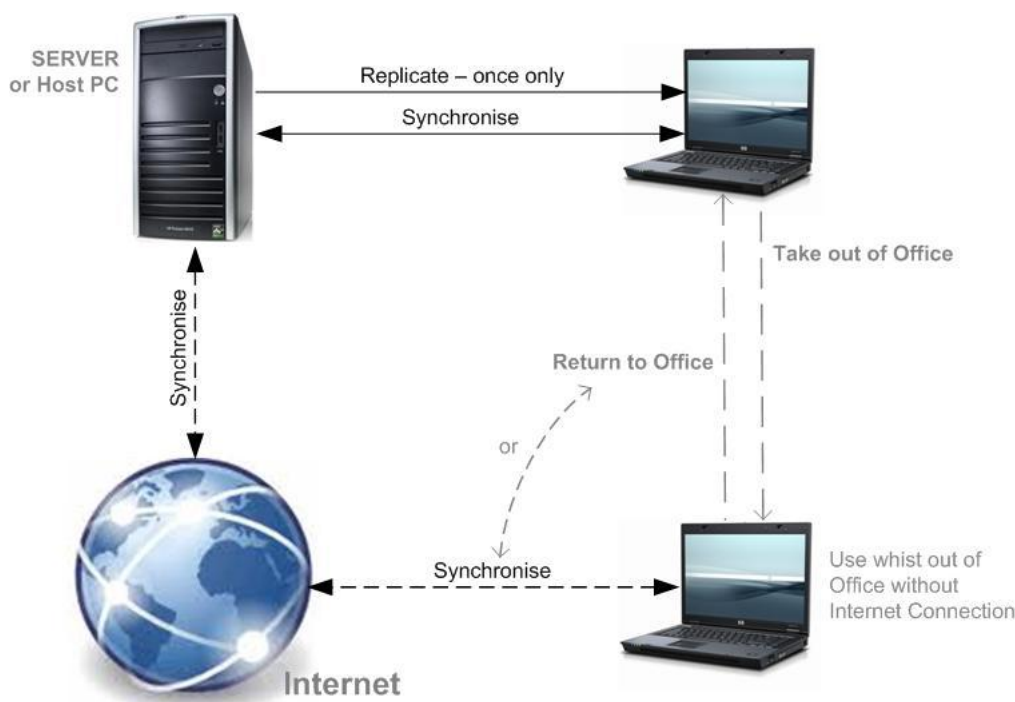
The main disadvantage of this sort of software for permanent connections to a network, are that it requires two machines – one at each end. But in an environment where someone has a Desktop PC in the Office and one at home, or a Notebook that they take home at night, then such software could be used.

At On2it Software we use TeamViewer for both on-line support and demonstrations. All we need do is, send you an email with a link on it. Once you click on it and tell us the ID and Password it generates we can see your machine to show you how to do anything you like or even do it for you.

We also use both TeamViewer and Microsoft's Remote Desktop Connection to talk to both our own Servers and, where permitted, our clients' Servers.

Replication and Synchronisation

Replication involves copying your entire database to, say, your Notebook, which you can then take out of the office and use - just as though you were still in the office.



Synchronisation then occurs when you return to the office or log into the network remotely using a VPN Connection. Synchronisation updates your Notebook with everything that happened in the office since you left. It also updates the Server with everything you've done on your Notebook whilst you were away.

Synchronisation can also be used between remote servers, say overnight, where area offices are largely independent but need to know what has transpired the following day.

If you want to use GEM without an internet connection - this is the **ONLY** option!

Which Configuration do I need?

Stand-Alone PC's

If you have only one PC or Mac then this is obviously the way to go.

Even if you have two machines, a single user licence permits you to replicate your data to a second machine and use **BOTH** machines whilst they are disconnected. If you want to use them both whilst connected you'll need a two user licence.

Client Server

If most of your machines are in the same office then Client Server is the way to go. In a Client Server network the work is shared between the Clients and the Server. So a Client that has the assistance of a Server, will out-perform the same machine if it is configured as a Stand-Alone PC, as a Stand-Alone PC has to do the work of the Server as well.

In a Client Server network the Server holds all of the data and runs most of the Queries, returning the resultant data sets to the Client over the network. Therefore it likes a fast connection, particularly if the datasets are large. A Local Area Network gives you the fastest connection speeds possible.

That having been said we have found that there is really little appreciable difference in speed, when using a VPN connection over a good broadband connection. So if the number of remote users is relatively low, a VPN solution should be more than adequate.

However if most of your Users are remote or you have hundreds of Users on your network, then a 'Thin-Client' Solution, would probably suit you better.

In a 'Thin-Client' Network the data is still held on the Server and runs all the Queries. Only this time the datasets are NOT returned to the Client. Rather they are sent to the 'Terminal Server', such as [ThinSoft's WebConnect](#), that is running GEM, either on the same Server, or in a larger network on a separate 'Terminal Server' Server. The 'Terminal Server' then transmits only the images of the screens it generates to each Client.

The Client then displays the pictures in its Web Browser and returns the User's keystrokes to the 'Terminal Server'. This is the reason you do not need special software on the Clients – just a Web Browser. So even if you have older PC's that would not run GEM too well, you can still use them as 'Thin Clients' – as long as they can run a Web Browser.

If you have hundreds or thousands of occasional Users of your database and don't want the hassle of installing and updating GEM on all of them, then 'Thin Client' is probably the best solution.

'Thin Client' is of course slightly more expensive (about US\$100 per simultaneous user), as it needs additional software and perhaps hardware (one Server per 21 simultaneous users), but is considerably easier to administer, particularly with a large number of Clients.

It does not matter whether you have a 'Stand Alone PC', a 'Client Server' Network, a 'Thin Client' Network or a combination of the two (as they are not mutually exclusive), you can still use Replication and Synchronisation to enable you to use some machines whilst they are not connected to the network. But obviously such machines must be capable of running GEM – not just a Web Browser.

GEM Licensing Considerations

The Server that is running GEM monitors the number of Users that are connected at any one time. So it does not matter whether you use a 'Client Server' or 'Thin Client' Network, or a mixture of the two, GEM will inform you if you exceed the number of 'Simultaneous Users' in your license and prevent additional logins. (It also tells you who is currently logged in, how long they have been logged in for and who to ring to do something about it!)

Machines that have a Replica on them so that they can be used whilst not connected to the network are counted as current users when NOT connected to the Network. This is because the Server has no way of knowing whether GEM is in use or not, so it assumes it is.

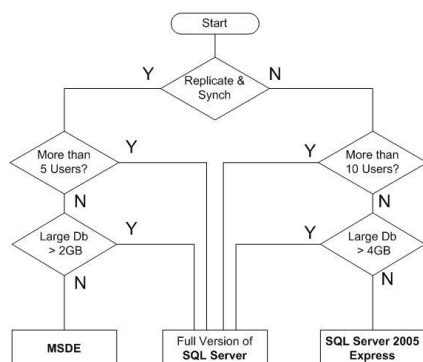
You can still use Synchronisation with a single-user licence. This means the Office copy could be used at the same time as copy on the notebook. However you will only be able to network them together to synchronise them. If you want a network of two machines, so that updates on one machine are immediately available on the other - you need a two-user licence.

Which SQL Server should I use?

GEM can be used with:

- **MSDE**, a FREE version of SQL Server released in 2000.
- **SQL Server 2005 Express** a FREE version of SQL Server released in 2005
- or full versions of **SQL Server**

The first two options are FREE of Microsoft licence fees. So we can distribute them with our software free of charge. But they are limited in the number of simultaneous users that they will support. MSDE will support up to 5 simultaneous users. Whilst SQL Server 2005 Express will support 10 simultaneous users.



So why don't we always use SQL Server 2005 Express? Well when Microsoft brought out SQL Server 2005 Express, they dropped the ability to use Replication and Synchronisation. So if you don't need it and you've 10 simultaneous Users, use SQL Server 2005 Express.

If you need Replication and Synchronisation and you've got 5 simultaneous Users or less, use MSDE. If you've got more than 5 simultaneous Users, then you will need to run a full version of SQL Server.

MSDE is limited in capacity by Microsoft to 5 Simultaneous Users and databases of no more than 2Gb. This should be more than enough for most small to medium businesses, but really large companies may well exceed 2Gb.

An SQL 2005 Express database, is limited to 4Gb in size. It does not actually have a similar restriction on the number of simultaneous users. However Microsoft have limited it to running on 1CPU using 1Gb of memory. So there is a practical upper limit caused by the limited resources it is allowed to use.

We have not yet pushed the limits with SQL Server 2005 Express, as most Clients to date want to use Replication and Synchronisation so have opted for MSDE or a full Server version. So the limit we have suggested in the above diagram is indicative only.

Whilst a full copy of SQL Server is an additional cost, most medium to large companies will already have SQL Server licences. Even small to medium businesses may have a copy if they are running Microsoft's **Small Business Server** as SQL Server is bundled with some versions of 'Small Business Server'.

If you have problems deciding what you need and how to configure your setup – contact On2it Software.