

1. INFRASTRUCTURE FOR MICROSOFT DYNAMICS 365® BUSINESS CENTRAL

1.1. OVERVIEW

The System Requirements Document, whilst being useful for determining versions of software to be used, is somewhat less useful when determining the hardware requirements on which to run your solution. In general, the System Requirements will give you minimum specifications, and in some instances, these are perfectly adequate, but in others they simply will not do.

In an ideal world, we could simply say, lots of processors, lots of memory, fast hard-drives, ultra-fast network and more redundancy than you can shake a P45 at, but the real world has budgets to worry about, and infrastructure does not come cheap.

There is rarely one single right answer with infrastructure, but there are some wrong ones. This short guide attempts to give you an overview of our recommendations for Business Central infrastructure based on our experience, both on-premise and on Azure, whilst giving you the knowledge to make your own decision based on your budget and risk profiles. We will also point out what areas will make the biggest difference for your money and will provide some suggestions for different sizes of implementation.

Remember, this is just a guide, ultimately the decision is yours!

NOTE: If you are moving to SaaS, then the infrastructure is taken care of by Microsoft, but there are database considerations (if over 80GB), and network considerations still apply.

1.2. SERVER OPERATING SYSTEMS

1.2.1. ON-PREMISE

This is the easy one, install your Business Central server components on the latest Microsoft Windows® Server Operating System and keep it patched up to date. Anything else is just false economy.

1.2.2. AZURE

Your Azure VMs will come installed with the latest version of Windows when you provision them, so all good here.

1.3. MICROSOFT SQL SERVER® – EDITIONS

There are 3 main choices here, SQL Express, Standard and Enterprise Editions – available both on-premise and in Azure, you also have the option of SQL Azure

1.3.1. SQL EXPRESS

SQL Express is a free version, ideal for the frugal buyer, but as a result is limited on what resources it can use. It is limited to a single core of the processor, 1GB of RAM and a 10GB database size, as a result SQL Express is not suitable for all but the smallest of installations with a handful of relatively light users. If you think you can start on SQL Express, then put a contingency to one side should you need to upgrade in the future. SQL Express is also missing the SQL Agent, which allows tasks such as backups to be easily scheduled.

1.3.2. SQL STANDARD

SQL Standard is by far the most commonly used of the SQL versions with Business Central due its wide range of capabilities and comparatively keen pricing (compared to the Enterprise edition) and is suitable for all but the largest of implementations and those who need almost guaranteed uptime.

SQL Standard is licensed either per named user or per core and our recommendation is the latter, especially if you are looking to extend functionality to others in the organisation such as reporting, expenses, approvals etc., or have portal access for your customers or if you want to integrate a web shop where named users are not allowed.

SQL Standard per core licensing is sold in 2-core license packs and requires a minimum of 4 cores making a 4-core implementation the most cost effective. A 4-core SQL Server is very capable, and the extra money should be spent on more memory, quicker disks and faster processors before considering increasing to 6 or 8 cores.

For those who would like some degree of redundancy, SQL Standard can be configured with Always-on with a primary and a single secondary. The secondary can be a SQL Server on an Azure VM or on-prem and does not need a second SQL Server license if it is passive (not used for any reason other than as a failover in disaster recovery situations).

1.3.3. SQL ENTERPRISE

This is licensed per core too ... but they just so happen to be around 4 times the price of corresponding SQL Standard license. This is the option if you are going larger with your data, have a serious number of users or need that five 9s uptime target. SQL Enterprise allows always on with 4 servers, allowing you to report against the secondaries for example, but beware extra licensing costs apply. Only go this route if you are sure you need it and that you have given the FD/CFO fair warning.

See the [SQL Server Licensing Guide](#) for more detailed information.

1.3.4. SQL AZURE

SQL Azure is a low-cost alternative to having a SQL Virtual Machine (VM). With SQL Azure you can get a SQL database for a very reasonable price, however, additional databases such as test databases also cost a similar amount, although you can opt for a lower performance tier on those. If you are looking at many databases, then the SQL VM will likely become more cost effective.

From a performance point of view, you purchase SQL Azure databases by Database Transaction Units (DTUs) which is a hybrid measure of processor, memory and database I/O use and effectively puts an upper limit on database performance.

Relatively small standard databases with only a few users can get by with an S1 or an S2 database, but as your requirements grow, so can the required number of DTUs and in so doing the cost, or you'll face a performance issue. It is hard to judge what level of SQL Azure database you may need or what effect customisations may have, so if you go this route have it in mind that you may need to increase the database level or migrate to a VM as your database grows.

If you are migrating from your existing SQL Server to SQL Azure, there is a [DTU Calculator](#) available to provide a guide to your SQL Azure service tier requirements.

1.4. SQL SERVER – THE HARDWARE

If you are not going SQL Azure, and you have settled on your SQL edition, the next thing to decide on is hardware. In reality that means what resources are you going to make available for your VM, whether that is on-premise or in Azure, but for now we'll just call it hardware.

1.4.1. PROCESSORS

As mentioned above, for SQL Server licensing purposes, go for 4 cores, this should be plenty for most scenarios unless you have lots of data / users / transaction volumes. Even then, you will get much more bang for your buck by spending extra on memory and disks.

1.4.2. MEMORY

Memory is now relatively cheap, and SQL Server has a habit of using as much as you can throw at it, so do not fall into the trap of adding more memory because it is all being used. That said, SQL Express will only use 1GB of memory, so giving it a server with 64GB of RAM will not help. There are also instances where too much memory can have a negative effect on performance because the SQL query optimiser gets 'lazy', but in general the more memory the better.

1.4.3. DISKS

Disk speed is very important. Business Central reads and writes a lot of transactions. The recommendation is multiple disks in a RAID 10 configuration with separate sets of disks for data, log, and OS / temp db. This is overkill for most scenarios, RAID 10 does improve read performance, but this configuration requires a high-end RAID controller and plenty of disks. For most implementations, RAID 5 using 3 disks for the data and a separate mirrored pair for OS, log and TempDB would be more than adequate. To give it that extra bit of zip, using Solid State SATA Drives over the more expensive SAS drives is a relatively economical way to get that high-end performance.

1.5. MIDDLE TIER SERVERS

So, what is the middle tier server? Business Central is a 3-tier architecture, the clients on one tier (the presentation tier), the database server (SQL) on another (the data tier) and the NAV Server (Business Central Server) sits in the middle and processes the business logic. Performance is improved by having the middle tier close to the database and only sending results back to the client. The performance improvement is achieved by a number of factors including reduced network traffic, caching on the middle tier and the fact that the middle tier is not rendering the results for the user.

The middle tier is generally more reliant on memory and processor than disk access, so a good processor and plenty of memory for the number of users is recommend. In terms of disks, a mirrored pair would be sufficient to help protect against failure. A second middle tier VM can be rolled out for redundancy if required and assign groups of users to each for improved performance.

It is possible to run the middle tier on the database server, but this is generally not recommended in all but the smallest implementations as issues on the middle tier could affect database performance.

1.6. CLIENTS

Go with whatever you have, as long as it meets the minimum requirements then it is more than likely up to the job (remember, the business logic is processed on the middle tier).

1.7. SOME RECOMMENDATIONS

The following table is a table giving some recommendations for various installations. Note, this is a guide and performance can vary depending on many factors, but this should be a good starting point. If performance is critical, go bigger, if cost is an issue, start off smaller and grow as you need.

Installation Type	SQL 'Box'	Middle Tier 'Box'
Tiny Implementation: Limited use of solution beyond Finance, SOP, POP and Inventory. < 5 users. Limited Budget	Quad Core, 8GB RAM, Mirrored Pair of SSDs as a minimum. SQL Express Or SQL Azure S1 or S2	Install on the SQL Box. Or 1 VM w/ Dual Core / 4GB minimum.
Small Implementation: More extensive use of the solution but not using Manufacturing or Warehousing. < 15 Users	Quad Core, 8GB RAM, Raid5 – 3 x SSD SATA or SAS SQL Server Standard, Optional SQL Always-On secondary Or SQL Azure S2 or S3	1 VM w/ Quad Core 8GB Memory Or 2 VMs w/ Dual Core 4GB Memory
Medium Implementation: More extensive use of the system. 15 – 30 Users	Quad Core, 16GB RAM, Raid5 – 3 x SSD SATA or SAS, Optional 2 x Mirrored SATA or SAS SQL Server Standard, Optional SQL Always-On secondary SQL Azure S3+	1 VM w/ Quad Core / 16GB Memory or 2 VMs w/ Quad Core 8GB Memory)
Large Implementation: 30 – 60 users	Quad Core, 32GB RAM, Raid5 – 3 x SSD SATA or SAS with 2 x Mirrored SATA or SAS. SQL Server Standard, Optional SQL Always-On secondary	2 VMs w/ Quad Core / 16GB Memory or 3-4 VMs w/ Quad Core 8GB Memory
Enterprise Implementation: 60 + Users Five 9s uptime requirement Extensive Reporting Requirements	Quad Core, 64GB RAM, Raid10 – 6 x SSD SAS + 2 x Mirrored SAS SQL Server Enterprise, SQL Always-On secondaries	3+ VMs w/ Quad Core / 16GB Memory

1.8. OTHER CONSIDERATIONS

1.8.1. NETWORKING

Networks can cause performance issues, a single user can run Business Central over a 2Mb broadband connection, but do not expect it to be quick. You need to ensure your bandwidth is sufficient for the number of users and other functionality you are running. We suggest testing on a [SaaS trial version](#) as an initial speed test.

We hope this document has been of some help ... remember it is only a guide and your infrastructure and budget should allow a level of flexibility.