



IT Support, Equipment
& System Development

Your guide to virtual servers



Guide to virtual servers

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Introduction



Everybody's talking about 'virtualisation', 'virtual servers' or 'cloud computing' these days. As more big brands invest in these new technologies, many business owners and IT managers are starting to review their systems.

Virtual Services are a fantastic business resource because they can:

- Increase system reliability and stability
- Make your systems easier to manage
- Reduce your management overheads
- Save energy costs.

They're also highly scalable, and suit companies from 50 employees upwards.

So far, so good. But unless you're something of an expert, there's a lot of technical jargon to get through. So we developed this guide to talk you through some of the basics and explain what a few of the key terms mean.

We've also created a dedicated IT suite with virtual servers and live demonstrations. That way, you can see for yourself how the technology works in a real business environment. And with some of the UK's most highly-qualified consultants on hand to offer free advice, what more could you need?

Get in touch

We hope you enjoy reading this guide. To book a free demo – or just chat things through with someone who talks your language - please [email PCS](#) or call our friendly team on **08452 41 41 55**.

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Virtualisation - the basics

If you're familiar with a traditional computer setup, you'll know that there are five key components:

- **Data** - Information you need (such as payroll, customer details and so on)
- **Application** - Program doing the work (such as Microsoft Office or Exchange)
- **Operating System (OS)** - System (Windows Server, Mac OS, IOS or Linux) that talks to the BIOS
- **Basic Input Output System (BIOS)** - Piece of software that lets your machine talk to the hardware
- **Hardware** - The physical stuff in your machine (hard drive, mother board, CD drive, etc).

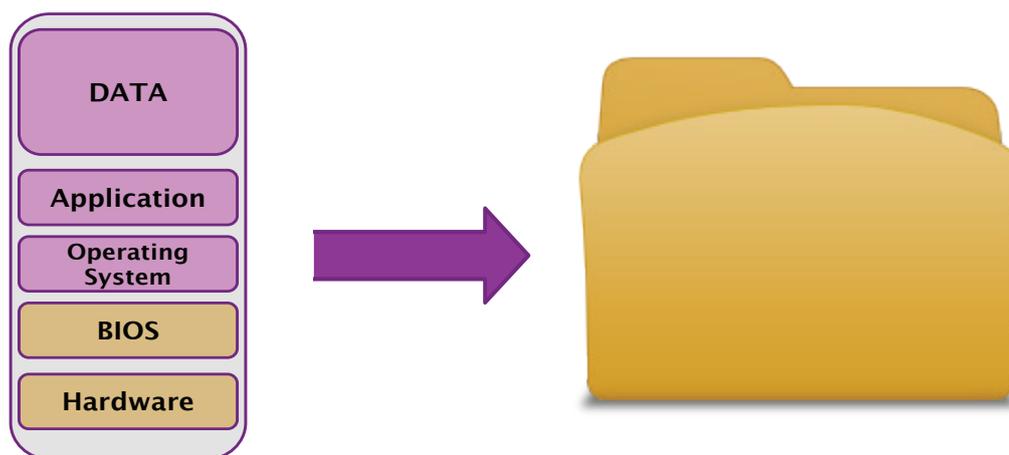
Whether you use a PC, laptop, tablet or phone, these five elements are still part of the setup.

But these days you can pull all the above parts together, using **virtual servers** and a method called **encapsulation**.

A virtual server is a collection of files, including details of your software, application and underlying hardware. It's a bit like creating a new folder on your computer; imagine taking your data, application, OS, BIOS and hardware and turning them into a set of files. You can then package the folder up, pop it on a memory stick, or send it anywhere in the world. Whoever you send the data to will then have an exact copy of what's on your server.

With a traditional system, the operating system would normally talk directly to the BIOS. But in a virtual environment, we use something called a hypervisor. Without getting into the technicalities, the hypervisor sort of simulates computer hardware, so you can store your applications and data on the top.

If you've got a physical server, you can run more than one virtual server on it too. So if your business uses a lot of physical servers, there's scope for saving a lot of space and energy costs.



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Virtualisation - the benefits



Research shows that 99 per cent of FTSE 1000 companies use Virtualisation nowadays. But why has the technology become so popular? Well, switching to a virtual setup generates plenty of benefits. Here's a summary of the things that PCS customers like best...

Security

Virtual servers are more secure than the average physical server. That's because you can set security policies at group level. So you could designate one virtual server with very high security for your accounts system and another for your web servers at a lower level. You decide the group level, which makes it easier to set policy and group permissions.

Also, once a physical server is on the network you can't set it to a higher level of security; but with software you can because you're assigning security policies to the software.

Productivity

Virtualisation can help you maximise system uptime and significantly reduce costs, by reshaping your IT system. PCS can help you to consolidate any number of existing servers into a secure virtual environment. Then, if a hardware failure does occur, these servers can be automatically moved and quickly reinstated.

The technology is exceptionally reliable and can be scaled to suit your future business requirements. By running numerous servers on the same hardware platform, you can also save space and cut costs associated with the purchasing, running and cooling of equipment.

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Virtualisation - key features



With a virtual server, you can run multiple independent machines on top of the original box. These machines won't be attached – actually, neither will know the other exists because they run on their own piece of 'virtual' hardware. So the machines can't communicate and if one was infected with a virus, it couldn't transfer to the other; it's like keeping two or more files in a central storage rack.

Typically, computers only use around five per cent of their capacity. But with virtualisation, you can make more of their capacity. (So if you've got a physical machine with two processors and 32MB RAM, you don't necessarily need to create the same spec with a virtual setup; you can go for something lower and it could work just as well.)

When you set up your virtual environment, you choose the features you require – everything can be tailored as much or as little as you want. So you pre-programme how you want the system to function.

There are some compelling reasons why this technology beats traditional physical servers...

Automatic diagnosis and system recovery

If you've got an Exchange server with tape backup and it fails, your systems could be down for a couple of days (or even longer). The onus is on you to identify the problem, contact the manufacturer, get the required parts, fit them and recover your data. That's not good news if computer systems are critical to the smooth running of your business.

With virtualisation, you can reduce downtime to under five minutes, because there's automatic system recovery if your system has any unexpected downtime.

Let's imagine you've got two physical servers stored centrally. If server 1 fails, the hypervisor on server 2 will notice, and move your machines automatically onto the other host. It takes between two and five minutes to do this, then your systems will be back up and running. (And when you move the server back post-repair it will cause no downtime at all!)

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Virtualisation - key features



Planned downtime

Now and again, you may need to plan data migration or system upgrades – for example, installing a faster processor to your physical server. When that happens, you can use something called **VMotion** to switch machines from one box to another.

Your physical server does all of the processing for the virtual server. All of the data it makes is stored centrally; but the actual operation of executing a command (such as storing an image, changing a file and so on) is stored on the central storage unit. This process is called 'the running state' and has to be done live on the physical hosts.

The switching process involves copying a 'snapshot' of one server and transferring it to another server. As the equipment copies the data, it automatically synchronises the two servers. Once the two are in sync, there is a 'management controller' within the virtual software that switches server 1 off – so all your machines will be updated and hosted on server 2.

The key point to note is that this is real-time, live migration – you don't have to have any system downtime, even if you're upgrading physical equipment during working hours. Your users can carry on as normal, and you won't notice any problems.

Balancing system capacity

You can also use virtualisation to manage workload across your physical machines, and make sure there's enough capacity to cope when major jobs happen (such as a large mailshot, or payroll run for example).

With virtualisation, there are features to help you manage your system 'on the fly'. You don't have to tell the system which of your 'virtual machines' should live on each of your physical servers; the system will find the best way of managing capacity.

Sounds confusing? Then [watch this YouTube video](#) demo produced by VMWare to see it in action.

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Virtualisation - key features



Flexible storage options

With traditional systems, you had to decide which system to locate a folder on. But in a virtual environment, you can automatically migrate storage from one area to another based on system performance.

This benefit – known as storage tiering – used to only be available on very high-end systems, but it's a natural feature of VMware. This means that if you need access to storage very quickly, the system can switch it to your fastest storage unit.

Disaster recovery

Most businesses have their highest-specification equipment and storage at a head office or key business location. But what about disaster recovery? Ideally you need the systems and data there for an emergency, but you don't ever expect to use it.

Rest assured. A VMware product called [Site Recovery Manager](#) means you can use lower end storage units, less servers and still keep your business safe. At the click of a button, you can 'fail over' to your emergency site and switch to your pre-determined disaster recovery plans.

You can even test your disaster recovery site as often as you like (daily if you want to!) by starting the server in a 'sandbox' environment. It's easy to manage and update, makes more efficient use of your systems and is better value for money.

Easy set-up

Virtualisation is completely modular so if you need more storage, better switches or processing power you can add what you like. For example, you can create a new machine in under two minutes or clone a server in under five minutes.

Once everything is set up, you don't need any extra skills. For example, if you've got a Windows specialist in-house, they don't need to become a VMware specialist too. You just manage your network as normal; creating new servers and network groups will be the same as before. It's just that the infrastructure your system sits on is a lot more resilient.

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Frequently asked questions



Question	Answer
How secure are virtual servers compared to my physical servers?	They're more secure, because you can assign security policies to your systems and set individual or group permissions. The machines on each virtual server can't communicate and viruses can't be transferred between them either.
What can virtual servers do that my physical server can't?	Virtual servers offer a range of extra features above their physical counterparts. Examples include automated disaster recovery and testing, upgrades with zero downtime and the ability to automatically manage system capacity.
Can I offer different levels of access to different teams or employees?	Yes. You decide the appropriate individual and group permissions for your business and set the system up to match.
What technical expertise or training will I need to manage a virtual setup?	You don't need any specialist VMware knowledge because managing your network will stay exactly the same. When you create network groups, servers and so on, it's business as usual.
How can virtual servers help me when my business grows?	The products can be scaled up or down to suit your business. So you can run multiple virtual servers on one physical server. Some businesses have reduced their server costs by up to 90 per cent.

Ready to chat?

If you'd like to see what virtualisation can do for your business, we'd love to hear from you. Just [email PCS](mailto:info@pcs-systems.com) or call us on **08453 735 018**. We can talk things through by phone, visit your premises or arrange a live demo in our IT suite.

Before you call, it would help to have a few basic details ready:

- Your company size
- Number of desktop and laptop users
- Number of servers
- Number and location of offices.

We can then tailor our advice to the things that will best suit your business.

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