

Whitepaper

Hosting options defined

Shared
Dedicated
VPS
Collocation
Cloud

By Sean McDonald – ICONZ CEO

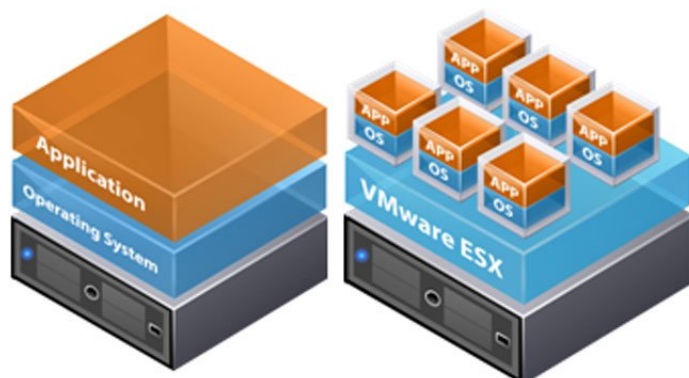


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1. Introduction

This white paper provides a roadmap for companies who are in the process of choosing a hosting option and a provider. It is also designed to provide a definitional framework of the solution set and to address some of the common misconceptions about hosting. Because there are no industry standards around what to expect from a managed hosting service provider, this white paper explores some issues to consider when interviewing prospective providers.

2. Overview

The hosting world is awash with acronyms and ‘plans’ that attempt to provide a panacea to all ills. The truth of course is far from that and, like everything, the old adage of ‘horses for courses’ certainly apply.

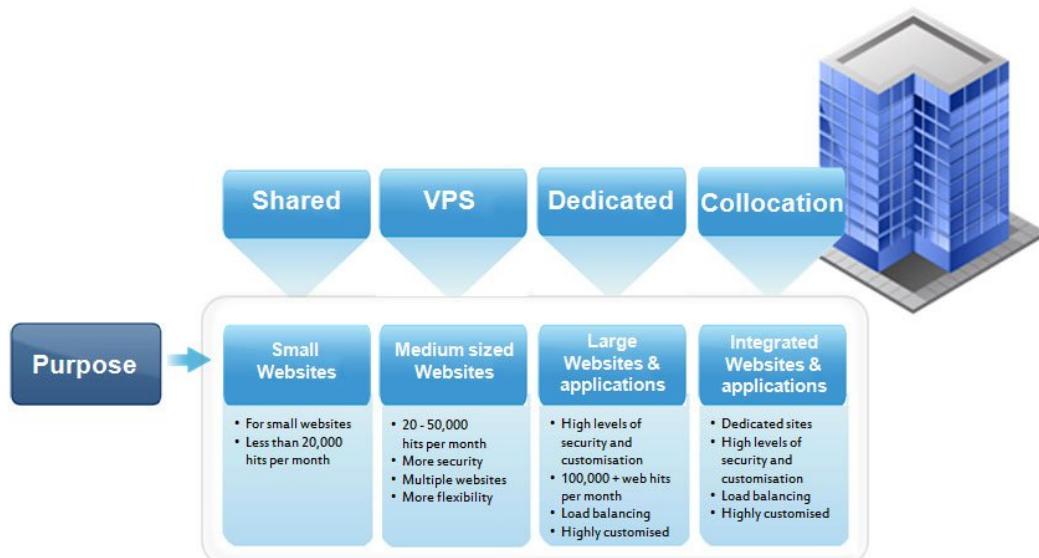
Without wanting to state the obvious, first and foremost, the business requirements come first. Without this underlying premise, you may end up with a hosting solution well under-specified that delivers poor performance and reliability or worse, a hosting solution that is over-specified, not fit for purpose, forever burning a hole in your operating budgets.

Notwithstanding that, and to add further confusion to the potentially confused, the other consideration should be: with whom to host and where are they located? Does this matter in the modern world of the Internet? You bet!

This paper will not delve into this in great detail other than to describe ‘at a high level’ the health checks that one should consider when choosing a hosting provider: that is, after having chosen the hosting solution and, of course, having defined the business requirements.

3. The traditional hosting world

This model is predicated on your having a direct relationship with your host provider, knowing where they are located, knowing where your files and data reside and, sometimes, being able to visit the host data centre to make changes to your servers (dedicated server model or collocation).



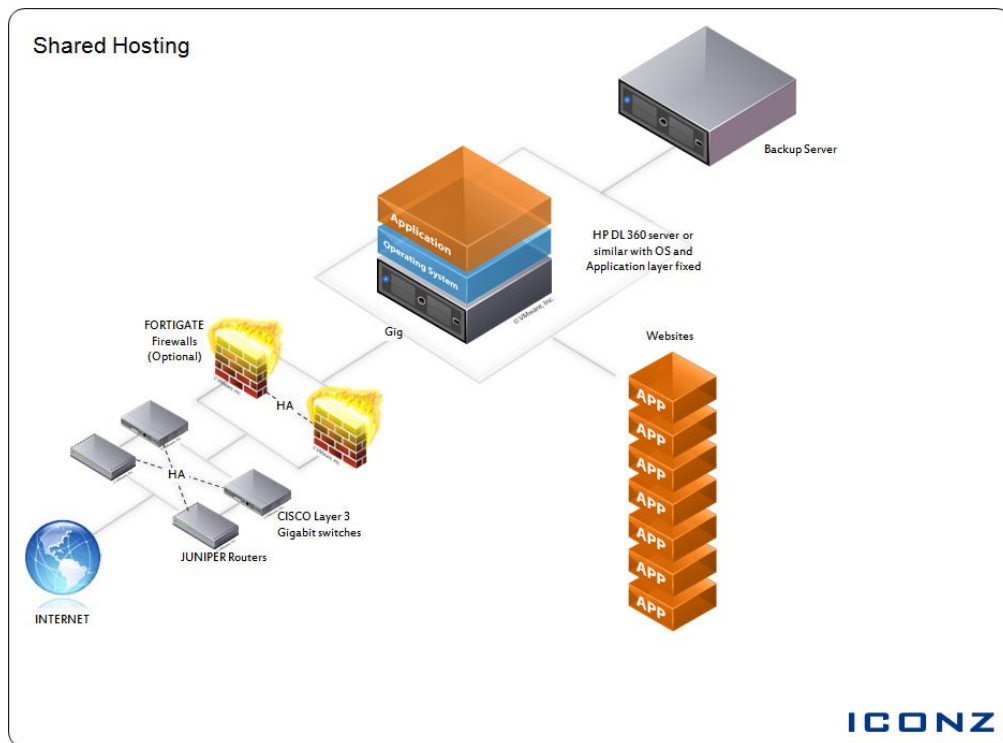
To the uninitiated, the plethora of traditional hosting options must present a very complex picture. Faced with hundreds of options and price plans, how does one choose the right hosting platform? Like all things, hosting comes down to the business requirement first, followed closely by the expected transactional volumes (web hits).

For more complex hosting, there are a few more things to consider but that covers the basics. The diagram on the previous page illustrates in general terms the various options available and also across which environment and application they are best suited.

3.1 What is 'shared hosting'?

Shared web hosting is the 'bread and butter' hosting platform of the web development world. Most small websites start out life on a shared hosting platform. In a shared hosting environment, many different clients (100s) share the same server and the same resources. While each client has their own limits on certain things (storage space, allowed email accounts, allowed bandwidth per month, allowed FTP accounts), the same Apache server, MySQL server, and even physical memory are shared.

Shared hosting is a core service offered by many companies within the ICONZ group.



What are the advantages of shared hosting?

While it may sound like sharing resources with other clients could be a disadvantage, shared hosting is a popular, economical and resourceful solution for many clients. Because you are sharing resources, it's possible to use the server's hardware and resources to their full potential; this translates into cost-effective, affordable web hosting..

Another advantage to shared web hosting is that the end-user (client) is responsible for very little, if any, server maintenance or management. The provider manages the server for you, so things like routine maintenance, tuning and upgrades are handled for you.

Additionally, any scripts and applications you may need to run your site can generally be installed by your provider.

Is shared hosting right for my needs?

Because of the limited resources and economical price of a shared web hosting plan, it is often the first place a client will look when they are starting out with their first website. Shared web hosting is often a good place to start, especially when you are unsure of exactly what your needs are, how many visitors you will get or how much storage space you require.

With a shared web hosting account, you can start out slowly, and upgrade your hosting plan to meet your needs as they arise. As your needs grow and as your website becomes more popular, you can select from a wider range of hosting options including:

- Virtual private servers (VPS)
- Dedicated servers
- Cloud servers/Utility computing platforms (e.g. ICONZ VERSA Cloud Service).

Are there any disadvantages of shared hosting?

Sharing anything can be difficult at the best of times. Sharing computing resources can be problematic when you start growing your website and require more computing power than the platform can supply.

The type of servers used in the 'shared computing pool' by the hosting provider will make a difference to the online experience, so too will the geographic location of the provider (US and European-based web hosting companies will deliver very high latency (time to load web pages) times compared to New Zealand-based providers, if your customers are in New Zealand, and vice versa).

The easiest way to experience less-than-optimal latency is to access a North American website (normally a '.com' domain, but not always). The first thing you will notice is the load times of the web pages. This problem is compounded as the complexity of your site increases. Assessing your end-user market is critical when assessing the various hosting options available.

Last of all, being able to speak with trained technical resources when things stop working is paramount. A hosting plan at \$5.95 per month is worthless if the only point of communication is email or, at best, or a phone call in the middle of the night, during which you have to wait 40 to 60 minutes or longer to speak with someone in a far-flung corner of the world who has a modest grasp of your native language.

Also, when signing up for shared hosting, be sure to sign up for a dedicated IP address, as explained below.

Do I need a dedicated IP address on a shared server?

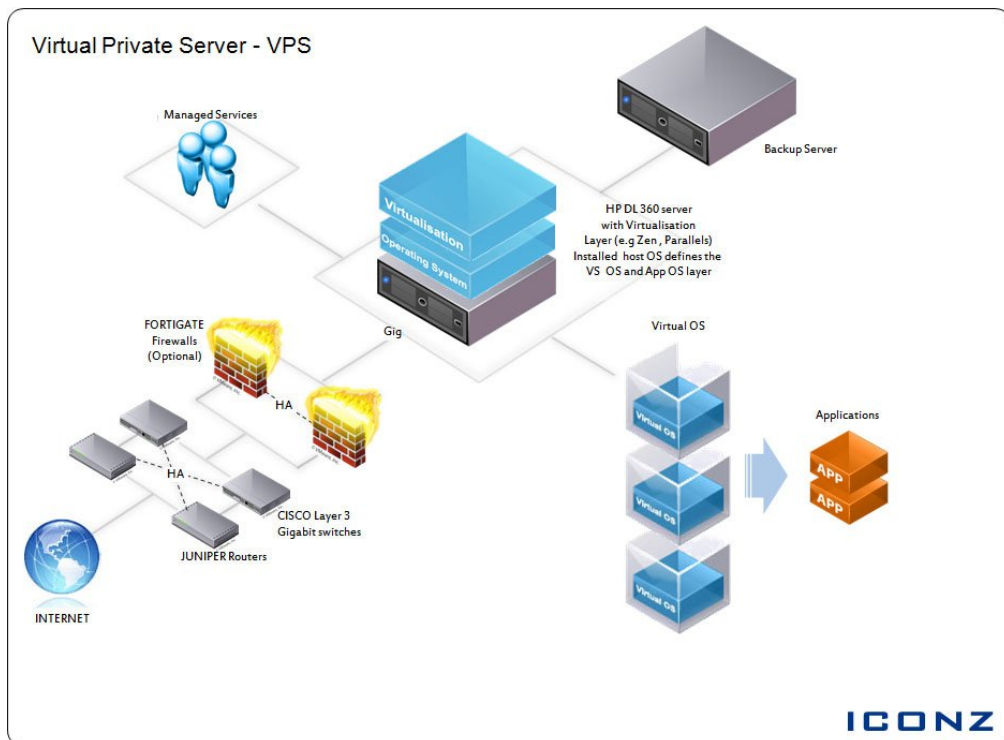
An IP address is a unique address given to each computer, including web servers. Dedicated servers usually have a single dedicated IP address unique to the server device (unless you're a reseller). Shared servers, however, often share a single IP address across multiple websites on the server.

This can lead to many problems since search engines often identify websites by each site's IP address. For example, let's say that you share server space with www.bobthebuilder.co.nz and Google decides to ban www.bobthebuilder.co.nz from its search engine (Bob could have been spamming the engine or doing something else that Google prohibits). Google will ban Bob by the website's IP address, not by the site's URL (domain name). Unfortunately, since you share the same server IP address with Bob's site, your website will be banned from Google as well, because the search engines ban by IP address, not by URL. In that case, when signing up for a shared server, be sure to choose a hosting company that allows you to have a dedicated IP address. This can cost a little more but it is highly advised.

3.2 What is a virtual private server (VPS)?

A virtual private server (VPS) simulates a private server in that you, the site owner, can deploy whatever software you want or need to continue growing your web presence. The caveat to this is that the host VPS will dictate the operating system (sometimes they have an option for both windows and linux) which will dictate application types that can be accepted onto the VPS host machine. This isn't possible with shared hosting plans, as they limit you to the software options offered by the hosting company, thus limiting the database, checkout and other software you use.

Virtual private servers are not actually private in the physical sense, like a dedicated or true private server. The 'virtual' in VPS enables web hosts to host numerous online companies on a single, physical 'host' server, so with VPS you still share the same physical hard drive with other sites. However, each virtual server is kept isolated from its neighbours (that's where the 'private' in VPS comes from) and access by a site to hardware resources such as RAM, CPU and disk space is managed by the web host at the server level.



With shared hosting, all companies on a single server (remember, there can be hundreds of them) are competing for these hardware resources. So, if a number of the companies on your shared server are performing CPU-intense activities, your site's access and response time may be impacted when consumers actually try to visit the site. With VPS hosting, hardware assets are either divided up equally among the companies on that VPS or managed by server-side software. In either case, you'll be assured of having the bandwidth you need to accommodate all the visitors that stop by your site.

What are the advantages of VPS hosting?

A virtual server is a way to gain many of the benefits of having your own physical server, but without many of the added costs.

A virtual server will benefit you in terms of security – you will be completely isolated from other users of the system. You will also benefit in terms of flexibility – because a virtual server is like having your own server and this means you can install anything you like on it. Having your own 'physical' server can be costly and difficult to administer – you will need to buy the hardware and keep it running by upgrading and replacing it regularly; you will need to install and configure all of the software as well as keep it up to date with the latest security patches. A virtual private server can provide you with all the benefits of having your own server without the associated costs.

Are there any disadvantages of using VPS?

Virtual private servers are not suitable for every site owner. VPS hosting packages are generally more expensive than are shared hosting packages but the cost difference isn't all that significant – usually less than an extra \$200.00 to \$300.00 per year. So the higher costs are one downside. There are others:

- More responsibility
- With a shared hosting plan, you are renting shared server space from your hosting provider by the month. With a VPS package, you move up a notch and rent disk space too. However, because it's your digital territory, you are in control.
- That means you are responsible for many of the software installations, site maintenance, site security, security updates and many other responsibilities that come with online business ownership. That means you should anticipate having to deal with software incompatibilities and other technological issues.
- Whilst this may not be a problem for tech-savvy individuals, if you don't know much about server-side administration, a VPS solution may be a bit more than you want to take on yourself.
- Shared hardware
- VPS gives you much more latitude to use whatever software you select – the software you're used to. However, you still share hardware assets, whether these assets are evenly distributed across the host server or managed by server-side software.

- For most of us, this doesn't pose a problem. But it is important to note that you may not always have access to the entire resources you need at a given moment due to data logjams. It's not common but it can happen and, if it's simply unacceptable to your online business plan, you're better off going with a dedicated server or, better still, a virtual utility computing solution (e.g. ICONZ VERSA or Amazon EC2) where you are guaranteed access to all computing resource whenever your application needs it.

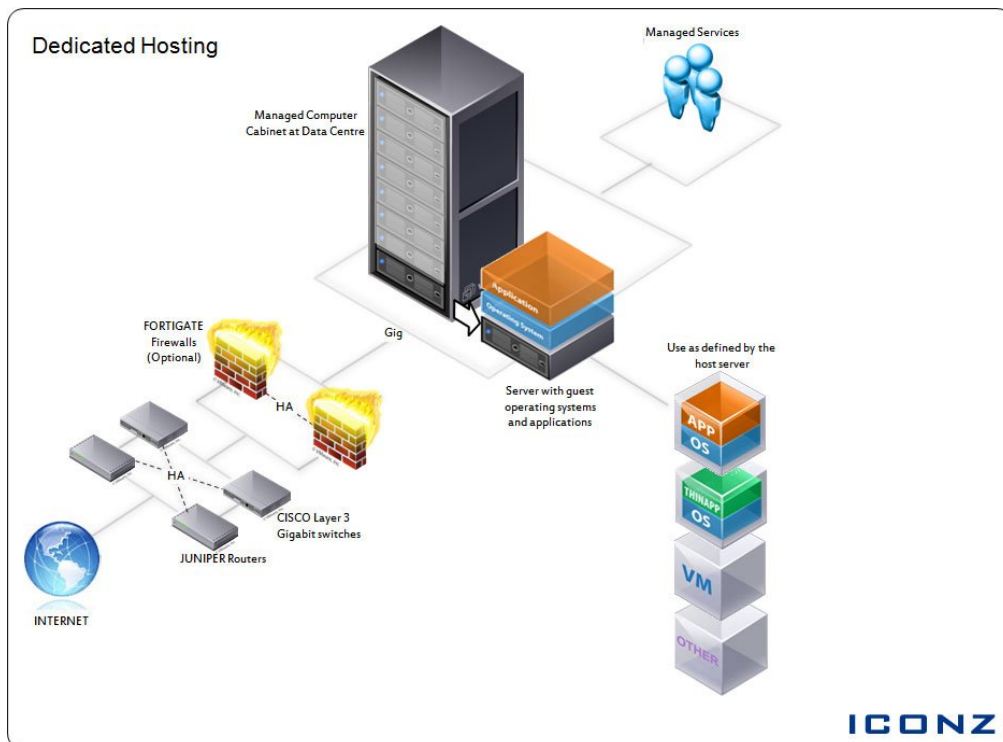
Can you upgrade from shared hosting to VPS?

Most hosting companies, and certainly ICONZ, will help you migrate from your shared account to a VPS account without any breakdowns or hassles. There is generally a small charge for this service.

3.3 What is dedicated server hosting?

A dedicated hosting service or 'dedicated server' is a form of web hosting in which the client leases an entire server, not shared with anyone. This is generally more flexible than is shared hosting or a VPS plan as an organisation has full control over its hardware, including choice of operating system, hardware configurations, etc. Server administration is generally offered as an add-on service as are the many 'managed services' on offer from the host provider such as managed firewalls, load balancing, managed security, reboots, monitoring and other such services.

A dedicated server is usually needed for a website (or set of related company sites) that may develop a considerable amount of traffic – for example, a site that must handle up to 5,000 to two million hits a day. The server can usually be configured and operated remotely from the client company.



Typically, a dedicated server is rented that provides a stated amount of memory, hard disk space and bandwidth (here meaning the number of gigabytes of data that can be delivered each month).

One of the downsides of dedicated server hosting is the inability to move and adjust hardware configurations to meet fluctuating demands. How many times does one hear of instances where websites have gone down due to high demand? Generally this is caused by servers that run out of computing power because of unexpected or high levels of user demand. This is where 'cloud server' or 'utility computing' platforms come into play. Their ability to scale 'on demand' to meet any levels of performance is exceptional.

What are the advantages of a dedicated server hosting solution?

With a dedicated server solution you gain added security because you are not sharing the server with anybody else. You also eliminate many potential server problems.

The immediate and visible result is that your web pages will load much more quickly, since the server is not loaded up with somebody else's information that you do not need and is instead totally dedicated to you and your needs and requirements.

A dedicated server solution reduces the reliance on the host provider and provides the customer with round-the-clock access to the server to make changes and supply services to their clients.

What are the disadvantages of a dedicated server hosting solution?

There are a few disadvantages to a dedicated server hosting arrangement. The first is the price difference between shared and VPS hosting. This is the trade-off between cheap and shared versus the freedom of free, dedicated and exclusive hosting.

You will need to have very good technical skills to be able to run the server and solve all the technical problems as they occur or contract a range of managed service offerings from your host provider. This may also prove to be very time consuming. If you choose to hire somebody to do it for you, this will obviously incur cost, which means that you will also incur certain maintenance costs that you would not ordinarily incur with shared hosting.

Dedicated server hosting should really be considered only by websites that have heavy traffic (i.e. >100,000 hits per month) and high revenues to support the costs that are associated with dedicated server hosting.

4. Collocated Hosting

In collocated hosting you supply the servers, built and configured yourself to suit your specific needs. You are paying for the dedicated connection, backup power, and physical security of the server environment. You are responsible for the management of the server. All server level tasks are up to you, including upgrading or replacing hardware, keeping software up to date, custom configuration of the server hardware and software. This type of hosting is much like having the server in your own office but the location of the server and the network it is on is better designed for hosting than most offices are capable of providing.

5. Moving into the ‘cloud’

‘Cloud’ (computing) means different things to different people and few IT experts can agree on what it is. There are as many varieties of cloud computing as there are clouds in the sky. So how does one make sense of this new buzz word?

In essence, most agree that in any situation where computing is done in a remote location (‘in the cloud’) as against on your desktop or by a local server then this can be referred to as ‘cloud computing’. This whole concept becomes very muddled when you hear vendors, providers and media commentators talking about ‘private cloud’, ‘hybrid cloud’ and everything in between.

“Cloud is a style of computing where scalable and elastic IT-enabled capabilities are delivered as a service to internal and external customer using internet technologies”

Gartner – Nov 2009

Where did this all start?

As far back as 1963, Ross Perot rented computing resources to other companies on a ‘time’ basis from other companies which had invested in IBM mainframes. Generally, the spare computing power was used after-hours when the mainframes were idle.

In the 1980s, the world saw the emergence of IT outsourcing companies such as UNISYS, IBM and EDS which provided ‘outsourced’ computing services. This service provided a data centre environment where companies could house their internal servers and have them managed by the provider.

This eventually extended into what became known as ‘fully managed outsourcing’ where a complete IT service was provided to companies for a monthly fixed fee. This included even the staffing resources required to run and manage the IT operations.

In the 1990s, the industry took a massive leap forward in the computing power of servers and operating systems and various software than could run in a ‘multi-tenanted’ environment on one machine. This is where one or two different applications (e.g. CRM and Accounting) from different companies could run on the same computer, effectively sharing common resources (RAM, CPU and Disk). A new acronym was born, that of the Application Service Provider, and from here the race to become known as an ASP (Application Service Provider). Most of the early entrants failed, were acquired or morphed into server hosting providers or SaaS providers (Software as a service) as we know them today. The hype in this instance did not live up to the early promise and expectations but we cannot really apportion all the blame to the marketers. In this era, broadband and access to broadband were in their infancy and it is only today that we have them available at a reasonable price.

ASPs were the precursor to the world of shared, dedicated and application (SaaS) hosting as we know it today.

So what is so special then about cloud computing?

Well nothing really! It is merely an extension of the many concepts that have passed before us over the years presented as something new. In essence, new computing technology (HP, IBM Blade hardware, etc.) and virtualisation software (VMware and Microsoft HyperV) coupled with the lower cost of bandwidth and the power of the Internet have provided the catalyst for 'cloud computing'

Cloud computing is akin to services provided by utility companies in that you have the ability to pay a small base fee and then pay for electricity and water as you use them. It is for this reason that cloud computing started life as 'utility computing' but that was probably deemed not 'sexy' enough; hence the creation of the phrase 'cloud computing'.

6. The core elements of cloud computing services

Cloud computing can encompass fairly much everything, from pay-as-you-go software subscriptions (Software as a Service or SaaS) to renting raw computing power in much the same way (Infrastructure as a Service or IaaS).



The range of applications for cloud-type services is endless. Here are a few:

- Complex and high-traffic website hosting
- Application hosting
- Project-testing environments
- Project-development environments
- e-commerce servers

- Mail systems
- Billing
- Video streaming

Within the cloud, customers can choose shared and dedicated resource pools much as you would for other hosting options (shared or dedicated servers). These environments are often referred to as Hybrid Cloud!

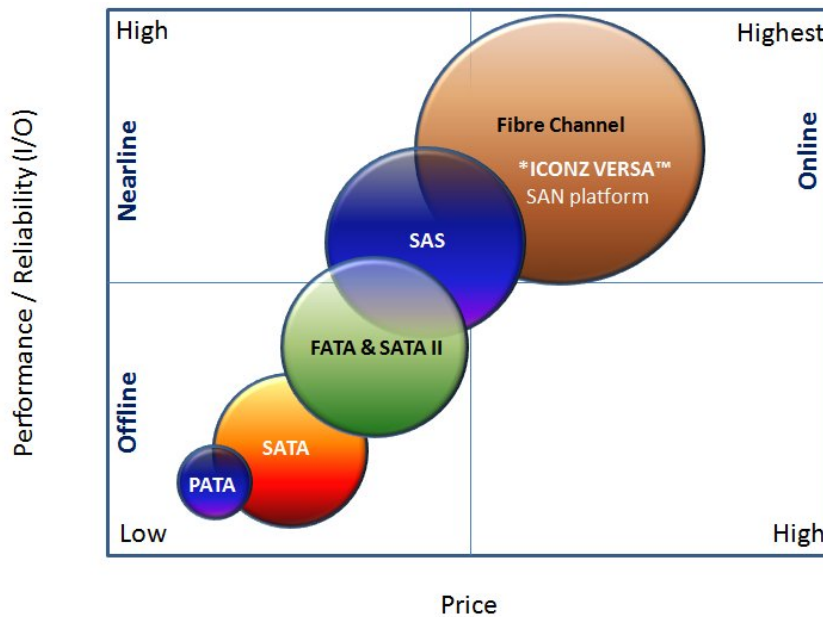
Now, if there were not enough acronyms floating around already, here are three of the core elements that describe cloud-based services: IaaS (Infrastructure as a service), PaaS (Platform as a service) and SaaS (Software as a service).

6.1 Beware the pretenders!

One of the darker problems presenting itself with the availability of today's technology is that virtually anyone with a pretty website, a few clustered servers and a smattering of virtualisation software can pretend to be a market participant and therefore a potential suitor to unsuspecting businesses.

Before embarking on a relationship with a hosting provider (cloud or otherwise), the layered components below must be fully interrogated. Gartner, the world-renowned IT research and advisory company, suggests specific criteria that customers should raise with vendors before selecting a cloud/hosting provider:

- **Depth of experience** in data hosting and high-availability (HA) data-centre operations – does your provider own and manage their own data centres or are they relying on a provider for this critical component?
- **Service level agreements** (standard and customised) – does your provider have these and what are the penalties for non-performance?
- **Security** – where is your application and data located? What levels of security does your provider have and how robust are their internal security processes? Obtain as much information as you can about the people who manage your data. Ask providers to supply specific information on the hiring and oversight of privileged administrators, and the controls over their access.
- **Flexibility of billing options** – are you locked into a contract or can you vary your charges as demands dictate?
- Platform **virtualisation environment** for running client-specified virtual machines – is this to the industry standard and do they have trained and qualified staff to manage this critical component of the infrastructure?
- Solid and **enterprise-class computer hardware** (should be architected for massive horizontal and vertical scalability) – does your provider have redundancy at every level?
- The **disk class powering the platform** (e.g. Fibre Channel SAN versus SATA, FATA, etc.). – This can make a huge difference to the level of performance you will receive from the service. Is the disk service SAN or merely clustered, low-level and cheap disk?



- **Network** – what level of redundancy does your provider have on their network and what bandwidth capacity do they have on their network that is not oversubscribed?
- **Backup and recovery** – what happens when things go wrong, as they invariably will? Does your provider have robust backup solutions directly connected to their virtual server platform and, rather than just ‘simple backup’ tape procedures, what retention policies are available from your provider? What guarantees do they have around their backup service and for complete restoration? How long will it take?
- **Data location** – ask providers if they will commit to storing and processing data in specific jurisdictions, and whether they will make a contractual commitment to obey local privacy requirements on behalf of their customers.
- **Data segregation** – your data is typically in a shared environment alongside data from other customers. Find out what is done to segregate data at rest. The cloud provider should provide evidence that encryption schemes were designed and tested by experienced specialists.
- **Investigative support** – investigating inappropriate or illegal activity may be difficult or near on impossible with an IaaS provider. If you can’t get a contractual commitment to support specific forms of investigation then your only safe assumption is that investigation and discovery requests will be impossible.

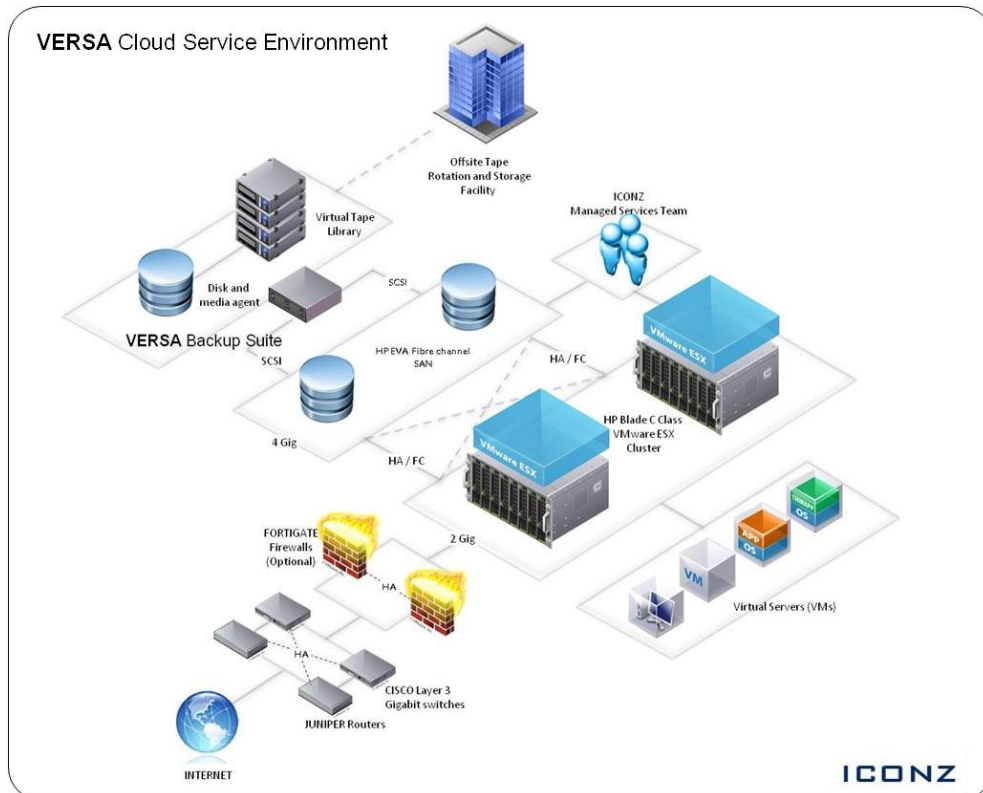
6.2 What is IaaS (Infrastructure as a service)?

Infrastructure as a service (IaaS). The proposition here is the offering of compute power and storage space on demand.

The difference between this and the other two categories of cloud is that the software that executes is essentially yours. In practical terms, the model is based on the same principles of virtualisation that we are all familiar with in the context of server partitioning or flexible storage.

Rather than running a virtual image on a partition existing on a physical server in your data centre, you spin it up on a virtual machine that you have created in the cloud. Virtual disks can be created in a similar manner, to deal with the storage side of things

In the IaaS environment such as with ICONZ VERSA, and Amazon EC2 on the other hand, hardware and software are no longer bound to the other. Each layer is virtualised – designed so that it doesn't need to be configured for specific systems – and assigned, in real-time, to whichever task most needs the resource.



IaaS consists of a virtualised pool of computing resources (servers and SAN) that can be dynamically provisioned to ensure that these resources are easily and continually reallocated in a way that addresses the organisation's changing business and service needs. Most premium-level hosting providers provision their cloud (virtual) servers on trusted industry benchmarked hardware such as HP/IBM blade servers and fast-access fibre channel clustered SAN. Low-level providers will typically run a few low-spec servers with dish arrays, all of which are virtualised with open source software. Regardless of the hardware and software platforms, all of this should be mirrored for redundancy and, better still, offer geographic replication at another facility. Your provider should also run management systems supported by specialised staff members who understand this unique and complex environment.

A very typical example of the high relevance of cloud IaaS is the way in which software development projects benefit from this service.

Prior to IaaS, project managers faced with the daunting task of seeking budget for test, development and production server hardware often overlooked 'test and dev' in favour of hardware that would run the live production environment. Test and dev would be relegated to backroom and aged servers that produce far different results from those of production servers. It's no wonder that so many live systems have problems then under this scenario.

The poor project manager, though, should not be blamed for this outcome generally as, in a business context, the cost of buying 'same' specification hardware for 'test and dev' is uneconomic if not prohibitive.

That all changes with IaaS. Now, not only does the business and project manager have the ability to access production computing power 'on demand' without capital outlay but, during the project, identical 'test and dev' servers can be 'run-up' and used for the duration of the project, and payment is needed only when these resources are required. When the project goes live, the 'test and dev' resources are archived for later use when it is necessary to make system changes. Most IaaS providers provide a 'free park' or charge a nominal amount for this facility.

The advantages of IaaS

- It enables IT departments to become more agile, adaptive and flexible, and, more importantly, able to treat IT as an increasingly variable cost. The aim of IaaS is to reduce IT costs.
- It can be supplied in small, incremental bites that deliver fast, demonstrable, significant return on investment, so companies don't have to wait for the full implementation to achieve payoffs. There is a much shorter time to market.
- The option for monthly and flexible term contracts exists. With IaaS providers such as ICONZ you can either 'pay as you go' on a monthly basis or by signing up for contract terms you can access various discount levels depending on the term. With or without contract terms, the client still has the ability to scale up and down as needs dictate during the contract term.
- New servers can be provided in minutes not hours and snapshots of servers can be taken for use at a later time. These stored servers can be called upon as and when they are needed (e.g. in test and development environments) and paid for only when they are used.
- Access to enterprise class security is provided..
- There is access to highly skilled technical engineers, on call 24x7x365.

Our consumer utilities such as gas, water and electricity all arrive on demand and independent of the uses to which they are intended. This makes for a relatively easy billing structure – consistent infrastructure (pipe, wire) whose capital costs and maintenance are embedded in the usage rate. Exchange is simple: product in via infrastructure, invoice and payment on separate channels. Computing power can be bought the same way. This is the basic premise of IaaS, which delivers processing power when you need it, where you need it, at the cost of how much you use.

The disadvantages of IaaS

- Your IaaS data centre or service provider should have robust and redundant connectivity to the Internet. If this goes down, your business can be offline until they are back online. A minimum of Tier 2+ (see www.uptimeinstitute.org for data centre tier categories) should be demanded by your IaaS provider. If not proven, move along!
- High levels of service and availability come at a price. Make sure that you fully understand the level of service to which you are subscribing in order to ensure that there are no grey areas.
- You are relying on the level of technical expertise held by your IaaS provider.
- You are reliant on the back-to-back service levels that your IaaS provider has with their providers. 24x7 support is useless unless your IaaS provider has same-business-day cover with their 'upstream' partners.
- You are depending on a third party to ensure the security and confidentiality of your data and information.

6.3 What is PaaS (Platform as a service)?

Platform as a service (PaaS) is all about providing, a platform in the cloud, upon which applications can be developed and executed. Companies like Google, again Salesforce.com (this time with Force.com), and Microsoft (with Azure) exist in this space. Facilities provided include things like database management, security, workflow management, application serving, and so on.

PaaS providers host development platforms for which the development tool itself is hosted in the cloud and accessed through a browser. With PaaS, developers can build web applications without installing any tools on their computers and then deploy those applications without any specialised systems administration skills.

McKinsey & Company, in their 2008 report 'Emerging Platform Wars', defined Platform as a service as "cloud-based IDEs that not only incorporate traditional programming languages but include tools for mash-up-based development".

What makes PaaS different?

The alternative to PaaS is to develop web applications using desktop development tools like Eclipse or Microsoft Access, and then manually deploy those applications to an IaaS or cloud provider such as ICONZ, Unisys or Amazon EC2.

PaaS platforms also have functional differences from traditional development platforms. These include:

- Multi-tenant development tools – traditional development tools are single user; a cloud-based studio must support multiple users, each with multiple active projects.
- Multi-tenant deployment architecture – scalability is often not a concern of the initial development effort and is left instead for the systems administrator to deal with when the project deploys. In PaaS, scalability of the application and data tiers must be built in (e.g. load balancing and failover need to be basic elements of the dev platform itself).

- Integrated management – traditional development solutions usually do not concern themselves with runtime monitoring but, in PaaS, the monitoring ability needs to be baked into the development platform.
- Integrated billing – PaaS offerings require mechanisms for billing based on usage that are unique to the SaaS world.

When is PaaS not a PaaS – how to check!

At a minimum, a PaaS solution should include the following elements:

1. Browser-based development studio – if you have to install something on your computer to develop applications, that's not PaaS!
2. Seamless deployment to hosted runtime environment – ideally, a developer should be able to deploy a PaaS application with one click. If you have to talk to a person to get your app deployed, that's not PaaS!
3. Management and monitoring tools – while cloud-based solutions are very cost effective, they can be tricky to manage and scale without good tools. If you have to bolt on DIY monitoring to scale your cloud app, that's not PaaS!
4. Pay-as-you-go billing – avoiding upfront costs has made PaaS popular. If you can't pay with your credit card based on usage, that's not PaaS!

The advantages of PaaS

The benefits of PaaS lie in greatly increasing the number of people who can develop, maintain and deploy web applications. In short, PaaS offers to democratise development of web applications much the same way that Microsoft Access democratised development of client/server applications.

The disadvantages of PaaS

PaaS is an innovative way of developing and deploying applications online; however, the downsides are vendor lock-in, reduced flexibility, data issues, and minimal or zero portability among other limitations. In general, PaaS models are well suited for an application that does not deal with sensitive or important data.

6.4 What is SaaS (Software as a service)?

SaaS is essentially based on the concept of renting application functionality from a service provider rather than buying, installing and running software yourself. Offerings within this range include services such as Salesforce.com at one end, delivering the equivalent of a complete application suite, to players like MessageLabs at the other, whose services are designed to complement your operational infrastructure.

SaaS began life began in the early 1990s as Application Service Providers (ASP). Companies like Unisys, Corio, USinternetworking and hundreds of others joined the ranks of new entrants but, sadly, hardware, software and telecommunications technology could not deliver on the promise. Today though, SaaS has come of age and is now relatively common and widely assessed by IT practitioners. Some of the most common and most widely used examples of SaaS include, Gmail, Yahoo mail, Salesforce.com, Xero, Microsoft Azure, Picassa and GoogleApps to name just a few.

The two main SaaS categories

1. Firstly, there is **'line of business' SaaS** services. These refer to business solutions offered to companies and sold or made available on a subscription basis. Applications covered under this category include business processes such as those mentioned above e.g. Salesforce.com, Xero, SAP and hundreds of others.
2. **Customer-oriented services** which are offered to the general public either on a subscription basis or (more often than not) offered for free but supported by advertising. Web-based email services such as those cited above fall into this general category. The Internet is awash with these applications and services, delivering a rich portfolio of offerings to home and business users alike.

Traditional licensing versus SaaS

Traditionally, the user purchases a software package and licence by paying a one-time fee. The software thereby becomes the property of the user who made the purchase. Software support and updates are provided by the vendor or developer under the terms of the licence agreement.

SaaS, on the other hand, does not have licences. Rather than a single fee, payment for the use of software is through subscription. The user's access and use of the software ends when he stops paying subscription fees. Moreover, the software is not downloaded to the user's computer. In the example we used, Gmail or Hotmail is not 'resident' on your computer – you access and use it through the Internet but it is not loaded and stored onto your computer.

Key advantages of SaaS

- Lower costs – the user need not pay a single (usually large) licensing fee. He needs only to pay recurring subscription fees.
- Smaller storage requirements – the user need not store software or data on his computer so he doesn't need large data storage facilities. There is also the convenience of not needing to constantly backup data; storage is the responsibility of the SaaS provider.
- Fewer IT personnel – SaaS reduces the need for specially trained IT personnel to handle maintenance, monitoring and software updates. The SaaS vendor will provide a dedicated team to handle these tasks.

The disadvantages of SaaS

There are three main disadvantages of SaaS:

1. The first, and most obvious, is that you must have a connection to the Internet in order for your SaaS applications to function. No connection, no application. For many, this isn't a problem. But if you don't have broadband at home, then you won't be able to work on your SaaS applications at home.

And, if you travel, you may find this service problematic, although some SaaS providers are starting to provide 'offline' tools that enable you to continue working when away from an Internet connection. Your connection must also keep working throughout your session. If the connection fails you are at risk of losing work.

2. The second disadvantage with SaaS applications is that users often do not have the same features as do non-SaaS applications. The functionality is often not as refined or as full.

This can be frustrating for users, especially because many of these refinements were added to make things faster and easier for their user communities.

3. The last disadvantage is speed or lack of it. This, of course, will depend on the speed of your computer and the Internet connection but, generally speaking, SaaS applications are slower than are their non-SaaS counterparts and deliver user performance levels well below that to which we have become accustomed with desktop applications.

7. Deciding what hosting option is right for you

The range of hosting options available today continues to grow in complexity and it can be extremely daunting to make a selection against these options, particularly when the technology platforms are moving so fast.

The number of 'providers' offering hosting services are as wide and varied as the range of services themselves. Whether you are looking for a simple host for your website or a Cloud service provider, here are 9 steps to consider.

There are three simple questions that help define the different hosting solutions:

- Who owns the hardware and where is it located?
- Who manages the equipment?
- Are there multiple customers on a single platform or is each customer on dedicated equipment in terms of server, networking and/or storage?

7.1 Nine Considerations

1. **The foundation of your hosting service is the data centre facility in which it is located.**

Unlike colocation services where you will need to access the facility to maintain the hardware yourself; hosting services are provided solely by the service provider – meaning you never have to visit the data center. In fact, the facility does not even have to be located near your business in order to provide you with adequate performance.

2. **Quality of the facility's infrastructure and networking is very important.**

On the most basic level, the data centre facility in which your services will be hosted needs to have redundant electrical and cooling infrastructure. A rating of N+1 means that the facility has what it needs to operate, plus one full spare. A well maintained N+1 data centre facility can be operated to achieve 99.99% availability for your hosted services, while a facility designed to a lesser N standard can have as much as 14x the downtime.

A second source of concern is the reliability and redundancy of the Internet connections, as well as the calibre of the providers to the facility. If your hosted services are powered inside a robust facility, but you are unable to send data between that location and your business or customers due to poor Internet connectivity, your business needs are not being met and your business will suffer.

3. **For security, there are two types to consider – physical and logical.**

Physical security focuses on the data centre where the actual environment is housed. There should be 24/7 security staff on site, as well as electronic or biometric scanners, and

video cameras. All access to the environment should be logged. In a dedicated managed hosting environment only the provider will have physical access to your equipment. Logical security focuses on login and access level to your environment. You want your provider to have good security practices and know that they are looking out for your best interests.

You will also want to know who has access to your servers and how passwords are given out and stored. Ask how often passwords are changed and make sure the provider always changes passwords after churn. All access to your environment should be logged as well.

4. What type of hardware will be used to host your business?

After you are satisfied that the underlying data centre is robust, well-connected to Internet transit and secured, it is important to understand what type of hardware will be used to host your business.

It is important that the equipment is reasonably new as well as being a recognized brand name. Name-brand equipment is supported by the manufacturer who will have thoroughly tested the product prior to release and who will have thousands of units in production. That manufacturer is constantly receiving updates about how their hardware performs and proactively providing updated drivers and software patches to prevent unplanned outages on your equipment. In situations where the unit goes down, getting repairs and replacement parts are in many cases easier with name brand equipment than with a “white box” solution.

Using one of the major manufacturers generally means you have their technical support behind you, as well as the hosting provider in the case of a catastrophic event. Ask questions about the specific equipment. Doing so will provide you more details on your solution, and will also tell you what your provider knows about your equipment. Ask why this equipment is right for your business and make sure you get a good answer. Finally, ask about the number of spares that are generally stocked.

5. Once you are satisfied with the physical aspects of the hosting environment, you should now consider equipment monitoring and remediation.

When it comes to monitoring, you need to understand exactly what the hosting provider will monitor. Avoid providers that simply tell you that the IP address is up or down. Look for providers who monitor CPU usage, memory and disk usage, and who allow you to check your log files, processes running and ports responding.

These features help determine if your applications are healthy and functioning properly and can often predict problems to help prevent or minimize downtime. The provider should also be able to give you historical data trends rather than snapshots so you can view the health of your environment over time and be able to predict your growth.

6. When it comes to remediation, make sure that your provider has the data centre and the support centres staffed 24/7.

Technicians should be reachable by email and by phone in the event of a problem, no matter how small. Avoid automated email attendants and make sure your tickets are immediately sent to a human being who is physically looking at your equipment to determine the nature of your problem.

As part of your due diligence, you should ask about the Tier II engineers that you could potentially find yourself working with in the event of an issue.

In the course of your research, you can (and should) ask to speak to some of these folks directly. Raise some hypothetical questions about what you might experience and see how they lay out the steps in their response process. Finally, ask for references who can attest to how they responded in a failure situation.

7. While you are investigating your technical support team, make sure you understand (and preferably get to know) who will be on your business account team.

Generally there are two different account teams: the sales team and the engineering technical support team. Understand the structure of both teams. It is best if the sales team is local to you, so you can put a face to a name. You will have someone you can hold accountable for looking after your business. Their success is tied directly to your satisfaction.

In both teams, you should look for redundancy of roles. If one person should leave you want to ensure someone else on the team can pick up easily where your former lead left off. Find out what type of knowledge-base they keep specific to each of their accounts. If a key team player leaves the vendor's employment, a good knowledge base will guarantee there is little, if any, transition period when someone new has to step in.

8. It is also important to check the financial standings of the hosting company.

Make sure that you understand the company's financial condition, how they are audited, the number of years they have been in business, and their overall performance track record. Ask the provider for both good and not-so-good references (although the latter may be difficult for many to admit to having). And then call as many references as you can.

9. Cost is a key factor in choosing your hosting provider.

When comparing costs, make sure you understand what you are getting. There are many ways to save money when going with any one provider over another, but saving the most on the bottom line isn't necessarily the best for your business. Some providers, for example, will give you a very low price. However, once you start reading the fine print, you suddenly understand the non-covered items quickly add up to an amount equal or above what another vendor may have offered as a part of the solution. Low costs can mean more risks for your business: Lack of support, insufficient product line and unreliable data centre facilities can end up very costly for your business. Thus, it is important to understand the tradeoffs that you are making in addition to understanding the cost differences.

8. In Summary

You will not get the right answers nor find the most appropriate hosting solution for your business if you don't ask the right questions. This white paper was written to provide either novice or seasoned professionals the knowledge necessary to ask the right questions. Once these preliminary conditions have been satisfied, you can move to a quoting phase in your discussions with prospective vendors. With all the right line items, you should have no problem getting a quote that you can feel good about.

You should be able to pick a vendor not solely based upon the number in the "total" column of the pricing sheet, but rather based upon a combination of features provided at a price that is right for your business.

9. About ICONZ

Founded in 1992 as the Internet Company of New Zealand, ICONZ has built its reputation on being the best of its kind, offering a full range of Internet, managed hosting and data centre services to the business and government sectors.



With an understanding that any loss of connectivity and/or access to your data could have a significant effect on your business, ICONZ commits to delivering the highest level of service and support.

ICONZ pledges to give you a strategic advantage in your local business environment by assembling the right mix of people, tools and technologies to put the global power of the Internet and hosting services to work.

ICONZ delivers highly scalable and flexible co-location, dedicated and virtual hosting services to handle just about any combination of requirements. All servers are hosted within the state-of-the-art ICONZ data centre utilising the latest technologies. They benefit from stable, secure scalable solutions and redundant Internet connectivity via multiple providers allowing uninterrupted and continued access to your data.

With considerable experience in network security, ICONZ offers server support, system admin services and 24x7 monitoring of routers, websites and email servers and an integrated suite of security services which includes firewall management and access control.

Our comprehensive hosting business includes WebFarm, one of the largest web hosting providers in New Zealand, Freeparking, a popular domain name registrar, and 2day.com, an automated windows-based web hosting company.



With the recent parent group acquisition of Webvisions, our global reach to Asia has never been closer. Webvisions is Asia's premier hosting provider, serving over 20,000 businesses in over 40 countries. With its corporate headquarters in Singapore, Webvisions' global network provides its clientele with multiple hosting presences in India, Malaysia, Thailand, Philippines, Indonesia, Hong Kong, Japan, Australia, China and Vietnam.

In addition, ICONZ ensures that, regardless of where your business may be located, we have connectivity solutions to best meet your needs offering fibre optic, wireless, satellite, copper and ADSL services.

9.1 The ICONZ data centres

9.1.1 Enhanced security

ICONZ's enterprise-class data centres have multiple levels of physical security systems, including biometric palm scanners at entrances to control entry and DKS access at all interior and exterior doors. Entry to the data centres and building requires mandatory visitor registration and visitor escorts to each floor. Our strict security measures ensure a reliable, safe environment for your IT operations. Video surveillance is across the entire facility, monitoring both internal and external activities.

9.1.2 Data centre network

Combined with our sister company Webvisions, ICONZ can provide pan-Asian hosting services through any of the 12 (Wellington online early 2010) data centres managed by the group.



9.1.3 Fire protection

Our data centres have early-warning fire-detection systems with both smoke and high-temperature detectors. The systems are monitored 24x7 on-site by our Customer Care Centre.

9.1.4 Uninterrupted power

The ICONZ data centres are fed power through highly redundant and efficient power systems and are backed up by generators that can keep the site running at full load for 24 hours with hot refuel capability, without requiring power from any direct electric grid.

9.1.5 Precision environment

The data centres are well equipped with full data-grade HVAC (Heating Ventilation Air Conditioning) systems with N+1 redundancy for regulating the air temperature and humidity in the area where your equipment resides – maximising your equipment's performance and ensuring continuous operations.

9.1.6 Flexible space options

Spread over 600 square metres of usable space over two separate floors, our New Zealand data centres provide a combination of Slab-on-Grade (concrete) flooring and raised floors for cabinets. All cabinets are individually locked for security. Wider afield in Asia and Australia, our data centres have a wide range of service features to suit any environment or budget.

9.1.7 Network

ICONZ is carrier-neutral and overcomes the limitations of existing data centres, network and Internet operations through direct interconnection to both National Telco's (Telecom and Telstra) peering exchanges in Auckland and Wellington.

The ICONZ data centre is redundant with multiple circuits terminating onto the ICONZ network. The primary circuit between Auckland and Wellington is with TelstraClear. ICONZ utilises their primary backbone and also has automatic failover to the secondary TelstraClear backbone.

As ICONZ is a Telco independent company, we have every business Telco terminating onto our network including Telecom, TelstraClear, Vector Communications, CityLink, Kordia and IPSTAR.

A very unique aspect of doing business with ICONZ is the ability to employ a network strategy that can both substantially lower overall bandwidth costs while increasing performance. The ICONZ data centre core is peered with the ICONZ Network Core at 1Gbits/sec, and has the ability to provide either 100Mbit/sec or 1 Gb/sec connectivity for customers if required.

The ICONZ network core is a redundant network, based on routing equipment from Cisco Systems and Juniper Networks. Edge connectivity to the global Internet is via multiple upstream providers, and is peered via BGPv4. Domestic connectivity (inter-city within New Zealand) is similarly protected via multiple redundant providers.

9.1.8 Open peering

ICONZ believes data should take the shortest, most direct path. We advertise our IP address space over CityLink's WIX and APE (Wellington Internet Exchange and Auckland Peering Exchange) and have an open peering policy. ICONZ is peered at

both of the main neutral peering exchanges (APE and WIX) and also has direct peering arrangements with other major ISPs and many large corporations and site-hosting companies. We have agreements with both Telecom and TelstraClear; they are the main carriers in New Zealand.

9.1.9 Latency

There is minimal latency over the ICONZ national network. As an example, Auckland to Wellington should, on average, experience no less than a 12–15-millisecond response time on our backbone. ICONZ has a team of dedicated engineers available 24x7 and back-to-back Service Level Agreements with our major suppliers to provide our customers the best of our ‘industrial-strength’ backbone.

Target destination – www.google.com – max response time – 250ms.

ICONZ networks are monitored and provide one of the most reliable Internet solutions in the market exceeding our customers’ expectations on a consistent basis.

9.1.10 24x7 network operations centre

Your equipment and bandwidth are always monitored by our highly trained and certified technical staff. Our Customer Care team is available to assist you 24x7x365, with all your queries and issues.

10. Contact information

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