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Introduction

Genesis Hosting Solutions is a virtual infrastructure leasing company. Our company was started in 1997 as a consulting firm writing software to provide access to stand-alone and networked information systems in user friendly ways. We saw the advantages of the Internet very early and had a vision of existing information systems connecting together to provide large-scale, scalable information systems. Today, that is exactly what the Internet is, except it has gone well beyond what anyone could have predicted.

In the past few years, virtualization technology has brought significant changes to x86 based environments running common Operating Systems such as Windows Server and Linux. During this time, virtualization software and hardware has matured to the point where high-availability Enterprise systems are running within a virtualized environment. We have positioned ourselves to be a premiere virtualization provider for disaster recovery, development, and production environments that can provide a superior experience over physical machines.

Typically, highly available and scalable environments have been extremely expensive and inflexible due to the need to purchase expensive servers, storage, and networking equipment as well as the associated costs with installing, maintaining, and managing this equipment. Our virtualization environment eliminates all of these.

We are a **VMware Authorized Hosting Provider** and have been providing this service since August, 2006 and have been using VMware's ESX Server product for over 4 years.

Our capabilities

Genesis Hosting Solutions provides Enterprise-ready and reliable virtual infrastructure. Unlike most other hosting providers, we do not provide wholesale-priced services. We are, instead, aiming for customers who need highly reliable and scalable systems that need to meet stringent service levels.

We are a Microsoft Service Provider, but unlike other providers, we lease Microsoft's software running on dedicated virtual servers using VMware's Virtual Infrastructure 3. In other words, we completely segregate your application server software from other customers' application servers instead of sharing it on paravirtualized or large single-system shared-hosting environments. This provides high reliability as well as the unique ability for us to perform upgrades independently for each of our customers. Our customers have terminal services access to their application server, with full access to the management tools for Exchange and SQL Server, instead of limited web interfaces.

Service Level Agreements are also available to provide guaranteed CPU and Memory to your managed services. We use Nimsoft's NimBUS to measure the performance and reliability of your systems, and can provide a complete dashboard with drill-down statistics, web reporting, and service level reporting with a complete historical record of all monitoring probe measures.

Our customers are provided with basic services such as virtual networks of raw virtual machines with managed or un-managed firewalls. A raw virtual machine is very much like a dedicated server, but a customer can install their own operating system, access the console, perform reboots and power management functions themselves, not relying on us to do it for them, like most dedicated server providers. We will support an OS as long as it is on the VMware Virtual Infrastructure 3 compatibility list. Other OSes are allowed, but we cannot support them.

Our entire infrastructure is connected to a fiber-channel SAN, so reliability and scalability of storage is provided with the same hardware that large Enterprises use. We offer a variety of tiers of storage from high-speed to archival storage. We also offer dedicated SANs.

Our backup infrastructure consists of disk-to-disk backup to a separate SAN consisting of large 7.2k RPM SATA drives in a RAID 1+0 configuration where storage array shelves are mirrored so even in the rare case where we lose an entire shelf in the SAN, we have no downtime.

Our customers

We have customers ranging from small businesses to Enterprises, including Siemens and IBM. Our typical customer is conscious of the costs associated with downtime and requires stringent service levels to guarantee high uptimes.

Our service compared to others

Most low-cost providers use Virtuozzo or other paravirtualization technologies to create a virtual private server. A virtual private server is a “slice” of a single Operating System running on a single physical machine. It requires modifications to the OS to segregate processes, I/O, files, registries, etc. so users see only their slice of the OS. If the base OS needs to be updated, all slices will be rebooted and the updates will apply to all slices. Since most providers want to provide the latest and greatest, it is quite possible that customers’ applications running in this environment could break due to the updates. Rolling back to a previous update is virtually impossible and out of the control of the customer.

Our service provides a true x86 virtual machine which has its own BIOS, OS, and devices. All supported operating systems can be used. Any applications, drivers, etc. can be installed or updated by you on your timeline, not ours. Many benchmarking, performance monitoring, or other low-level applications may not install at all on a virtual private server. Our service supports all of these.

Some providers are now offering hosted Xen and Hyper-V virtual machines. Both have improved in performance and reliability during the past 2 years and are a major competitor to VMware’s ESX. However, when you start to look at the details, you find that VMware has had the experience to deal with many of the rare circumstances that arise in virtual infrastructure that can lead to instability or poor performance, and most Xen and Hyper-V providers lack the experience to truly provide a rock-solid service. Genesis has spent years working with VMware’s products with proven success. VMware has been widely accepted as the industry standard for virtual infrastructure and, in our opinion, will continue to be the leader for many years to come.

How we price our service

We are unique in the hosting industry in that we price our service similar to the way a grid company does. A customer purchases a “monthly lease” of our infrastructure that guarantees resources within our infrastructure. We break this down to CPU, Memory, Disk, and Internet resources. We do not measure internal network utilization. Pricing for CPU guarantees are measured in MHz, where we guarantee that your leased CPU resources are always available. Memory guarantees are measured in MB of guaranteed memory (reserved memory). Disk resources are leased per-GB and are available in 5 tiers from high-speed to archive-speed. We also offer dedicated SAN LUNs.

Internet data transfer can be purchased either per-GB of data transfer, or similar to the way a fractional T1 or T3 line is measured, using the 95% method.

If additional CPU or Memory capacity is available within our cluster, we do NOT limit customers the ability to use these resources, nevertheless, a customer is only guaranteed their leased resources.

FAQs

Why don't I just pay for a dedicated server from the many hosting companies out there?

This is a very common question, and there is no easy answer since there are advantages and disadvantages of both and it depends on what you are trying to accomplish. One of the main advantages of a dedicated server is CPU performance and cost, but we believe that's where the advantages end. Some of the disadvantages include:

- low guaranteed availability
- no ability to snapshot the environment
- lack of highly-available and scalable SAN storage for large installations
- lack of the ability to provide a private network protected by a managed or un-managed firewall
- few guaranteed network resource plans
- no ability to constantly, and non-intrusively, monitor CPU and various Memory utilization parameters

We would be happy to discuss your project to see if we're the right fit, or if you would be better off with a dedicated server.

We offer only premium bandwidth and invite you to test our capabilities.

What hardware do you use?

We are an HP-only shop so all of our equipment consists of HP switches, servers, and SAN equipment. However, we have recently added an IBM SAN. Our router is an HP server cluster running OpenBSD.

What kind of performance can I expect?

Performance depends on the workload, but you can expect very good performance from our systems compared to dedicated servers with similar specifications. As with physical systems, scalability should be determined by how well an application can be distributed among systems. High-volume applications should always be designed for load-balancing. If an application is not load-balance-ready, it will have the same limitations with physical systems as with virtual systems since physical systems can only scale-up so far. The benefit of our systems is that as load increases among multiple virtual machines, we can easily duplicate virtual machines and they'll spread out among our cluster to provide the best performance possible.

We suggest you try our service to determine whether it will fit your needs. We have confidence that it will, but we offer a free trial to determine whether your needs will be met.

Do you offer the leasing of entire ESX clusters?

Yes. We offer both dedicated ESX hosts and dedicated ESX clusters that can be either managed or unmanaged, depending on your needs.

How are CPU resources purchased?

CPU reservation is specified in MHz. A reservation of 1,200MHz (or 1.2GHz) would reserve the equivalent of half of a 2.4GHz processor core to your pool. This means that you are "guaranteed" this amount of a CPU, but "can" exceed this if spare CPU resources are available. In most cases, spare CPU resources will be available, unless all customers are peaking their CPU utilization to their purchased limit and are using all remaining unused resources in the cluster.

If one of your virtual machines starts to use more memory and the physical host it is currently running on doesn't have enough, ESX will move the virtual machine to another machine that does. The move will happen without affecting the uptime of the virtual machine.

How are memory resources purchased?

Memory reservation is similar to CPU reservation. A reservation of 1,024MB (or 1GB) of memory would guarantee 1GB of physical memory be available to your resource pool, however, you may use more physical memory if it is available. In most cases, spare memory resources will be available, unless all customers are peaking their memory utilization to their purchased limit and all spare memory capacity in the cluster has been used. If one of your virtual machines starts to use more memory and the physical host it is currently running on doesn't have enough, ESX will move the virtual machine to another machine that does. The move will happen unnoticed and without affecting the uptime of the virtual machine.

How are public IP addresses assigned?

We can assign small subnets within our own IP block, or request larger public IP blocks from our data center, but we need you to fill out an ARIN form with justification for the IP addresses.

Can we co-locate equipment at your facility?

Yes, we can arrange to have co-located equipment installed at our facility either in a shared rack or a dedicated full rack. Expect some lead-time for the reservation of the rack-space if you have a large amount of equipment to be co-located.

We currently have production servers that we would like to virtualize. Can you do this for us?

Yes, we offer this as one of our services, but only to virtualize your systems to run on our virtual infrastructure. We also provide this as a disaster recovery service, where we'll make a snapshot of your server periodically (without affecting its uptime) and send the incremental changes to a virtual machine running in our infrastructure. We also provide high-availability services that include block-level replication and fail-over.

What if we want to move our virtual machines back to physical machines? Can you do this?

Yes, we offer this as one of our services, but only from our virtual infrastructure to your servers. If you need us to co-locate your servers, please let us know and we can prepare a quote.

What Service Level Agreements do you have?

We offer Service Level Agreements for both our service and support. Please contact us for a copy of our SLA.

How fast can you set up a lease for us?

We can typically set up an account in hours, but ask for at least 2 business days so we can have some time to discuss your environment and propose a solution. Adding additional resources to your pool(s) is quite easy and we can do that in less than an hour, depending on your support agreement.

Can we scale up or out quickly?

Yes, that is one of the benefits of our service. You can request additional resources in your pool and within a short period of time, we can provide it to you. If you need additional virtual servers set up very quickly, we can also help configure this process, or you can create additional virtual servers yourself using templates.

I need a large amount of disk space (multi-Terabytes). Can I get it at a discount?

Yes. We offer a number of tiers of SAN storage. Discounts do exist. Please contact us about your needs.

I need to run CPU-intensive applications for computational purposes. Is your environment practical for this?

Although we do support this configuration, there are probably better ways to get more CPU cycles for your buck, especially if you don't need the uptime requirements we offer or need the consistency of virtual hardware. Most computational environments support the failing of a computational node since the cluster can simply continue its work units on additional nodes until that node is replaced.

We don't have the human resources to manage our servers. Can you?

We partner with a few companies to provide this type of service, but we don't have the resources to do this ourselves.

How do you accept payment for your service?

We currently accept payment by check, Visa, MasterCard, Discover, or American Express. Payments are due before service begins or continues. To jump-start your service, we suggest you use a credit card even if you later plan on paying by check.

How do you charge for bandwidth?

We only charge for data to/from the Internet passing through our routers. Bandwidth used between virtual machines, to our ISO image library, and local backups is not measured.

We have 2 ways of billing for bandwidth, either per-GB or the 95th percentile method. To find the 95th percent sample, we drop the top 5% of all bandwidth samples, ordered from largest to smallest, measured every 5 minutes, and the remaining "top" sample is used for billing.

Do you offer monthly commitments or only annual commitments?

We offer both! For those small projects that might need short-term, but large, distributed CPU resources, we offer the ability to ramp-up quickly and shut-down just as quick. Pricing for quarterly agreements are discounted 5% and annual agreements are discounted 10%. For large dedicated resources, we may ask for a longer-term agreement than a single month. We also ask for at least a 2-month advance on larger leases.

Will my virtual machines be shared on the same machine as other customers' virtual machines?

In most cases, yes. The objective of our service is to provide you with highly available, high performance computing and storage resources without the large cost of dedicated clustered servers, switches, a SAN,

and the labor required to manage this infrastructure. In order to keep costs lower, we shared resources between customers.

Do you offer tape backup?

Not currently. Disk-to-disk backup is more practical, cost-effective, and reliable for our environment. It is also random-access, extremely fast, and highly-available. For off-site backups of your on-premise systems, we recommend using our disaster recovery service.

Can I run clustered services in virtual machines?

There are many problems running clustered systems inside current virtual infrastructure. Although it's possible, and supported under certain circumstances, we do not offer this as an available supported solution. Our systems are highly-available, however. We use clustered routers, firewalls, and virtual machines running on a host that fails will be powered-on on the other hosts in the cluster. This is equivalent to a crash-consistent reboot.

Do you support USB devices connected to a virtual machine?

Yes, but it must be done using a device such as AnywhereUSB from Digi (<http://www.digi.com/>) since you won't have direct access to USB ports on physical machines. You can connect this remotely at your facility, or if you have problems doing this, we can house your Digi device in our data center for a minor fee.

Do copy-protection/licensing USB dongles work with virtual machines?

Yes, with the AnywhereUSB device from Digi (<http://www.digi.com/>). You can connect this remotely at your facility, or if you have problems doing this, we can house your Digi device in our data center for a minor fee.

How much bandwidth do you have available to your facility?

For our virtual server hosting customers, we provide one of multiple dedicated 100Mbps connections, but our facility is capable of providing large amounts of Internet bandwidth into the multi-10-Gigabit range and has over 800Gbps of direct connectivity to more than 25 providers, so it really isn't an issue if you need large amounts of bandwidth.

Is virtual infrastructure stable?

Yes. We have never had a systems crash in over 4 years running VMware's ESX Server.

Can virtual machines be dual-processor or quad-processor machines?

Yes, we support both dual-processor and quad-processor virtual machines, however, we would only suggest these configurations for SQL Server and Exchange Server. You will have to measure for yourself how fast these configurations will be.

Most people assume that dual or quad virtual CPU virtual machines are better than single CPU virtual machines. This is not always the case. The overhead of providing multi-CPU virtual machines can sometimes create latency greater than single-CPU virtual machines; however, they will be able to better support executing multiple threads simultaneously.

If I reserve 6GHz of CPU resources, does this mean that it's like I have a 6GHz machine?

No. Virtual CPUs are limited by the speed of the physical CPUs. We currently use AMD Opterons with varying clock speeds from 2.1GHz to 2.7GHz, so the CPU resources will be at most 2.7GHz per virtual CPU.

Does this mean that if I reserve 6GHz of CPU resources, that 2 of my single-processor virtual machines will run at 2.7GHz and the other at 0.6GHz (the remaining CPU available after the first 2 are reserved)?

No. CPU resources are balanced. You may adjust the share amount that each virtual machine gets compared to other virtual machines in your pool, however. So, if you want to prioritize the CPU resources to one particular virtual machine, it's very easy to do. In fact, since we don't fully load our systems, you will most likely have additional CPU resources beyond your purchased resource pool, so you may be able to exceed the 6GHz of total CPU resources you purchased.

Why don't you use Xen or Virtual Iron or other virtualization products?

We haven't ruled out the use of these products, but our focus is on VMware's products since they are the current industry leader and are very trusted in corporate America. Xen and Virtual Iron are continuing to gain momentum in the virtualization world, as is Microsoft, so where it makes sense, we would certainly consider using their technology.

If I purchased multiple storage resources, can I move virtual machines from one storage resource or tier to another without downtime?

Yes! ESX offers hot-moving virtual machines across storage resources (Storage vMotion).

Can I view the console of a virtual machine just like the console of a physical machine?

Yes. You even have access to the virtual machine's BIOS including the ability to setup PXE to network boot a virtual machine.

In fact, multiple copies of the console can be opened in different physical locations for demos, team collaboration, etc. although we don't recommend opening more than 10 copies of a console at time.

Instead, it would be better to use a service such as WebEx or GoToMeeting or provide access to a terminal session using an RDP session or VNC.

Do you have any type of performance monitoring available where we can measure how our virtual machines are performing?

Yes. We offer 2 solutions to monitor performance. The first solution is to use VirtualCenter which natively supports the monitoring of a number of parameters related to the performance of your virtual machines and resource pool utilization, providing graphs, export of performance data, and more.

Our second option is a solution we provide called our Enterprise Service Level Monitoring service based on Nimsoft's NimBUS product which can monitor almost any metric of your operating system, applications, and even the virtual infrastructure you lease. Custom dashboards, web reports, and NimBUS Enterprise Console logs and graphs are all available which can be drilled-down through to find exactly which resource is causing an alert.

We also have some partners that offer monitoring services.

What type of monitoring do you perform on your physical machines?

We use HP's Insight Manager to monitor all physical machines, storage resources, and switching equipment. Problems are reported to our NOC and technical support is dispatched.

Can we use Citrix products in virtual machines?

Yes.

Do you monitor the traffic entering/exiting our environment?

Not normally, but occasionally, we may perform basic monitoring of SMTP traffic that is exiting our network to make sure there is no spamming emails being sent from our customers' environments.

Sending spam is not allowed by our terms of use.

If we are ordered to monitor your network by a court of law, we will abide by their wishes.

Do you support 64-bit operating systems?

Yes. 64-bit operating systems are fully supported and definitely provide additional performance beyond their 32-bit counterparts in most cases.

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