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Net2Compute: VPDC based Cloud Computing

Power Your Enterprise With the Power and Flexibility of Virtual Computing and Provisioning

Net2Compute™

KEY FEATURES & BENEFITS

- Full data center provisioning through the VPDC concept
- Fast, self-service data center provisioning through Web-based drag-and-drop topology designer or application programming interface (API)
- Multi-tiered Service profiles with policy enforcement
- Enterprise-grade security, platform redundancy, and high-performance information lifecycle management (ILM) storage
- Massive scalability for all data center services
- Pay-As-You-Go pricing model. Pay only for what you will need to use, with greater flexibility
- Full Data Center provisioning in less than one hour

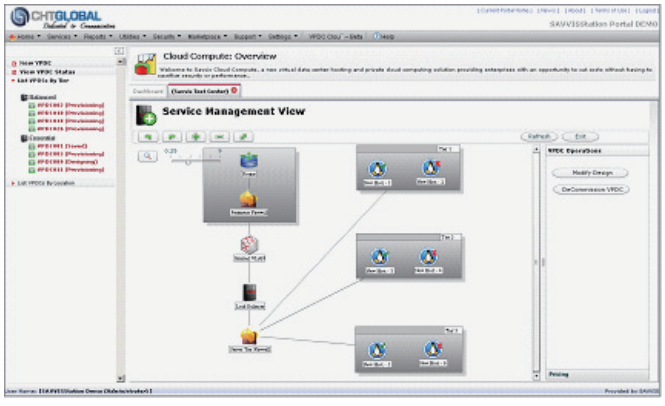
CHT Global Net2Compute VPDC Solution provides a number of dramatic enhancements to deliver on the true promise of cloud computing. The VPDC delivers a powerful capability for defining, configuring, and deploying a full virtual data center without having to procure, install, configure, or manage any hardware. A VPDC can contain a complete set of enterprise data center services, including compute instances of varying sizes, multiple tiers of storage, a wide variety of security features, high-performance, redundant bandwidth, and load balancing. This provides a major leap from virtual hosting environments that emphasize just the compute instances.

The Net2Compute VPDC also introduces multi-tiered service profiles that provide a set of predefined, selectable service levels to optimize the cloud for a variety of applications, features, complete redundancy, and storage. This provides a key enabler for the application lifecycle: Test/development, quality assurance (QA), Web hosting, and enterprise mission-critical applications all have unique requirements. Each VPDC can be created with a specified service level that is optimized for its intended use case. As the application in the VPDC later progresses in its lifecycle, it can be promoted to a higher service level to address new production requirements.

Built on cutting edge VMware® virtualization technology, Cisco virtual fabric technologies, and a best-of-breed hardware platform, CHT Global's Net2Compute VPDC is designed to deliver what other vendors' cloud computing services have not — true enterprise-class computing, massive scale, and advanced enterprise services — but achieved at the cost points promised by a shared virtual cloud solution. the 24x7 Support Center team provides the proactive monitoring, alerting and support to provide a cloud solution that delivers reliable service for the most demanding enterprise applications.

The VPDC

A VPDC provides a virtual data center inside a shared cloud. The VPDC portal is a simple, Web-based drag-and-drop interface designer, integrated into the Net2Compute Portal. The Net2Compute VPDC portal provides users with self-service access to data center creation, configuration, and ongoing management. The system provides access to a rich suite of data center services, including virtual hosts with a selection of pre-loaded operating systems such as Microsoft Windows® and Red Hat® Enterprise Linux®, virtual security appliances such as firewalls, utilities such as load balancers, and virtual storage devices. The user simply drags and drops the desired objects onto his or her designer palette, configures custom parameters such as host names and storage pool sizes, and activates and deploys the data center when complete.



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CHT GLOBAL'S CLOUD COMPUTE ADVANTAGE

- Gain greater financial flexibility by transferring CapEx to OpEx IT procurement model

- Curtail overbuying and server sprawl

- Address variable demand such as seasonal or event driven spikes

- Scale resource usage up and down based upon demand and usage

- Increase speed of time to market through fast provisioning and optimizing test environments

- Consolidate IT resources, infrastructure, physical buildings and equipment to transition to a greener corporate model

- Gain a competitive advantage by adopting new technology, reducing product launch time, and minimizing expenditure loss from physical equipment investment and wasted resources

- Full VPDC with multi-tier profiles for varying stages of application life cycle

In addition to the VPDC portal Web interface, Net2Compute VPDC provides a RESTful API to enable access to cloud services from popular scripting and programming environments. This enables independent software vendors (ISVs) and corporations to easily embed Net2Compute VPDC services in their cloud-enabled applications.

Security

The system is designed on the established Security Architecture, which is a set of processes and architecture designed to provide end-to-end security on the Net2Compute virtual platform. The system provides well-defined security policies and procedures, and ensures compatibility between newer security protections designed specifically for virtualized environments and more traditional, physical security controls. This enables the system to address the unique security challenges of a virtualized environment, such as those introduced for VM mobility, VM patching, and inter-VM network traffic.

Comprehensive security features and processes are integrated with the Net2Compute VPDC at all Service profiles to optimize the cost/security tradeoff for each VPDC and its use case. At the Essential level, cost is optimized for the test/development use case, so the system configures the VPDC with a single public VLAN, plus authenticated access through security access control lists (ACLs). At the Balanced level, the system additionally configures the back-end servers (application servers and database servers) onto a dedicated private VLAN, and configures a VMsafe™ virtual firewall in front of the servers. For the Premier level, the system configures three separate private VLANs, for each server tier and additionally configures dedicated physical (stateful) firewalls for each tier. In this manner, the Net2Compute VPDC provides a comprehensive end-to-end security infrastructure but optimized for each VPDC use case.

Technology

Net2Compute VPDC is built on an enterprise-grade infrastructure that provides enterprise levels of availability, reliability, and security. The platform starts with best-of-breed hardware including Cisco networking and virtual fabrics, and uses industry-leading virtualization technology from VMware. The cloud provides total platform-level redundancy at all levels of the infrastructure. The infrastructure provides compute node and network path redundancy as well as storage mirroring to ensure high availability. At higher service levels, the system configures redundancy at the virtual machine (VM) level, with VMware HA providing high-availability monitoring and automated failover.

The system has been designed from the ground up for massive scale through a modular design. With the underlying virtualization technology, new virtual machines can be provisioned instantly along with additional bandwidth and storage capacity. Users can dynamically scale their compute resources up or down, as it suits their changing requirements. Resources are pre-provisioned on demand, so applications can execute at peak efficiency. Billing for resources can be performed on an hourly or monthly basis, to best fit users' business requirements.

Net2Compute also provides one of the industry's first cloud computing architectures with the availability of high-performance, enterprise-class storage area network (SAN) storage. The system provides three tiers of storage with Information Lifecycle Management (ILM) capabilities. This provides low-latency, high I/O operations per second (IOPS) storage for the most-demanding transactional applications, mid-tier storage for Web hosting, and low-cost, low-rpm storage for backup and archival purposes. In this manner, Net2Compute VPDC can be employed for a very wide range of enterprise applications.

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Net2Compute VPDC: Cloud Computing

CLOUD CHARACTERISTICS

- Agile, on-demand provisioning of all data center resources in under an hour, through self-service access
- Multiple service levels to address the wide ranging requirements of the application lifecycle
- Fast scale-up or scale-down of resources, with usage-based billing
- Support for virtual environments and multi-tier application architectures
- Migrate existing virtual server images and workloads into the cloud
- Flexibility and option availability perfect for Enterprise IT demands: security, SLA, QoS, varying service levels...
- Built with leading Enterprise-classed Cisco and VMware technology

Multi-Tier Service Profiles

Each enterprise application has differing requirements, and each application has its own development cycle. With the Net2Compute solution, CHT Global is able to provide multi-tiered presets depending upon the given need or application product cycle. So whether you need to build and test some application or new services, or if you need to put up web hosting applications, or if you need to support mission-critical/enterprise applications, each has a preset template already optimized for each case, which can then be further modified to support your application needs. The VPDC is built to be fully redundant and to eliminate downtime due to hardware failure or constrained bandwidth / resources. Each tier is priced to provide the optimal setup, increasing in SLA end-to-end availability, security level, location proximity, network availability, and storage.

Features	Essential	Balanced	Premier*
Description	Entry-level enterprise cloud – lowest cost of entry: optimized for development	Higher-level security & SLA: optimized for eCommerce & Web Hosting	Highest level of security, redundancy, availability & performance for mission critical apps
SLA	100% infrastructure & 99.9% end-to-end availability	100% infrastructure & 99.99% end-to-end availability	100% infrastructure & 99.995% end-to-end availability
Location	N/A	Regional	Metro
Compute	• 3x4 matrix of instance sizes (up to 2 vCPU & 8GB RAM) • Server HA Best-Effort	• 4x4 matrix of instance sizes (up to 8 vCPU & 16GB RAM) • Server HA Enabled	• 4x4 matrix of instance sizes (up to 8 vCPU & 16GB RAM) • Server HA Enabled
Network	• 100Mbps bandwidth best effort QoS • 1x public VLAN • Redundant Internet Connect	• 100 Mb/sec bandwidth Enterprise Grade QoS • 1x public & 1x private VLANs • PIP Enabled • Redundant Internet Connect • Server Load Balancer (2 pools)	• 1 Gb/sec bandwidth Enterprise-grade QoS • 1x public & 3x private VLANs • PIP Enabled • Redundant Internet Connect • Server Load Balancer (8 pools)
Storage	• 1-Tier SATA on FC SAN • 1x daily snapshot (3 day retention) • 1x daily full backup to disk (14 day retention)	• High-performance FC SAN with 2-Tier ILM • 3x daily snapshot (3 day retention) • 1x daily full backup to disk (14 day retention)	• High-performance FC SAN with 3-Tier ILM • 6x daily snapshot (3 day retention) • 1x daily full backup to disk (14 day retention)
Security	• ACLs enforced on Cisco Nexus 1000v • Policy enforcement	• Enterprise Grade Virtual Perimeter Firewall • VMSafe compatible Virtual Server Tier Firewall • Private VLAN for app/db tier • Policy enforcement	• Enterprise Grade Virtual Perimeter Firewall • VMSafe compatible Virtual Server Tier Firewall • Private VLANs for all server tiers • Policy enforcement • IDS / IPS

* Premier Service profile planned for availability in 2H 2011 (features subject to change)

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WHO NEEDS CLOUD?

- Contrained by slow in-house app development or deployment
- Those facing inability to scale resources quickly enough
- Too much wasted stockpiled resources "Just In Case" (Over-Buying)
- Seasonal or occasional spikes
- Geographically dispesed teams
- Seeking to gain competitive advantage and flexibility
- Hardware reaching its end life and future investment through CapEX doesn't make sense anymore
- Limited by IT resources
- Want low commitment for testing and development

CHT Global is the wholly-owned US subsidiary of Chunghwa Telecom, the largest telecommunication company in Taiwan. Since 2002, CHT Global has helped numerous enterprises achieve their targeted goals while reducing customer side complexity by providing industry leading multi-site network solutions through its global backbone infrastructure and world-class service.

For additional products and services information, please contact CHT Global at 1-877-998-1898, or visit www.chtglobal.com.

VPDC Pricing

Service	Essential	Balanced
VPDC Profile ($/Month/VPDC)	$0.00	$550.00
ILM Storage ($/Mbps/Month)*	$0.25	$6.00
HAN Internet Access ($ / Mbps/Month)*	$50.00	$50.00

* Storage and Bandwidth are montly rates, but measured for usage (BW) and allocation (storage) for the time used in a given billing period.

** Bandwidth is measured in a 95th Percentile usage billing model and is a zero Mbps commit service.

Virtual Server Pricing

Windows Enterprise 2008 Non-Outsourcing (Hourly)

Essential	1 GB	2 GB	4 GB	8 GB
.5 vCPU	$0.12	$0.17	$0.27	$0.47
1 vCPU	$0.13	$0.18	$0.28	$0.48
2 vCPU	$0.15	$0.20	$0.30	$0.50

Balanced	2 GB	4 GB	8 GB	16 GB
1 vCPU	0.262	0.392	0.652	1.172
2 vCPU	0.292	0.422	0.682	1.202
4 vCPU	0.352	0.482	0.742	1.262
8 vCPU	0.472	0.602	0.862	1.382

Windows Enterprise 2008 Outsourcing (Hourly):

Essential	1 GB	2 GB	4 GB	8 GB
.5 vCPU	0.383	0.433	0.533	0.733
1 vCPU	0.391	0.441	0.541	0.741
2 vCPU	0.406	0.456	0.556	0.756

Balanced	2 GB	4 GB	8 GB	16 GB
1 vCPU	0.522	0.652	0.912	1.432
2 vCPU	0.552	0.682	0.942	1.462
4 vCPU	0.612	0.742	1.002	1.522
8 vCPU	0.732	0.862	1.122	1.642

Red Hat Enterprise Linux (Hourly):

Essential	1 GB	2 GB	4 GB	8 GB
.5 vCPU	0.135	0.185	0.285	0.485
1 vCPU	0.142	0.192	0.292	0.492
2 vCPU	0.157	0.207	0.307	0.507

Balanced	2 GB	4 GB	8 GB	16 GB
1 vCPU	0.261	0.391	0.651	1.171
2 vCPU	0.291	0.421	0.681	1.201
4 vCPU	0.351	0.481	0.741	1.261
8 vCPU	0.471	0.601	0.861	1.381

Cloud User Example: Web App Development and Testing with the Essential VPDC

A SaaS company wants to develop and run a web hosting application using cloud for easy scalability in the future but also instant resources for a test environment now. The developer finds Net2Compute VPDC Essential service profile the perfect fit since for test/dev they don't need high security or performance, but only when they bring the app live and serve their large customer base. In testing out the multi-tier functionality he selects 4 small Linux based web servers, two Linux application servers, and one Linux database server instance through the online portal. The profile default of 50GB for instance storage is perfect for the virtual server he wants, and then he just as easily configures the database server to the 100GB he needs. Pricing is simply laid out, shown below:

Item	Description	Unit Price	Quantity	Ext. Price
Infrastructure:				
Essential VPDC		$0.00	1	$ -
Compute Instances:				
1 Core / 1 GB	Small Dev. Web Servers	$103.66	4	$414.64
Linux 0S	Small Dev. Web Servers	Included	4	$0.00
2 Core / 4GB	Dev. App Servers	$224.11	2	$448.22
Linux OS	Dev. App Servers	Included	2	$0.00
2 Core / 8GB	Dev. DB Sever	$370.11	1	$370.11
Linux OS	Dev. DB Server	Included	1	$0.00
Instance Storage:				
50 GB	Small Dev. Web Servers	$0.25	200	$50.00
50 GB	Dev. App Servers	$0.25	100	$25.00
100 GB	Dev. DB Server	$0.25	100	$25.00
Bandwidth:				
1 Mbps	1 Mbps bandwidth	$50.00	1	$50.00
Total Monthly Price				**$ 1,382.97**