

Empowering Enterprises with Efficient IT Infrastructure

Scale Your Business and Lower Your Total Cost of Ownership with Agile Infrastructure Services

SingTel PowerON Compute, enabled by VMware® vCloud™ Datacenter Service, provides enterprises with business agility and cost effectiveness of public clouds without compromising on portability, compatibility, security and control demanded by enterprise IT organisations.

› How to Empower a New Generation of Dynamic Businesses

Enterprises today require efficient and dynamic IT to respond rapidly to new market opportunities as well as IT demands from various stakeholders. In the past, most applications and services were built above tightly-coupled technology stacks – making it difficult to provision new IT services and expensive to manage changes. To make matters worse, companies today have fewer resources to support expanding business needs. Thus, the old model of rigid IT can no longer work.

To transition into a more dynamic business operation, companies are looking towards cloud computing and enabling IT as a service. This will help increase business efficiency, boost flexibility in a constantly changing business environment, and help companies achieve more cost-effective IT delivery.

› Introducing SingTel PowerON Compute

SingTel PowerON Compute, enabled by VMware® vCloud™ Datacenter Service, is an Enterprise-class

cloud service that delivers on-demand computing. In a market denominated by commodity, low performance, unprotected public cloud offerings, PowerON Compute provides businesses an avenue to a more dynamic and compatible operating environment where your datacentre can maximise scalability to take advantage of IT resources when necessary in a hybrid cloud environment.

What are the business needs?

- **Agility:** Able to self-provision resources quickly and efficiently
- **Security:** Have a multilevel security and comprehensive security framework compliant with internal IT environment
- **Portability:** Move applications to the hybrid cloud and back to internal virtual environment as and when needed
- **Interoperability:** Maximise existing investments in technology and resources

Enterprise-Level Infrastructure to Take Your Business Higher

PowerON Compute cloud service is delivered out of SingTel's latest Tier 4 data centre at Kim Chuan Telecommunications Centre-2 (KCTC2)¹ and is built using the Vblock™ Infrastructure Platform.

Vblock™ Infrastructure Platform is the industry's first completely integrated IT offering that combines the following technologies:

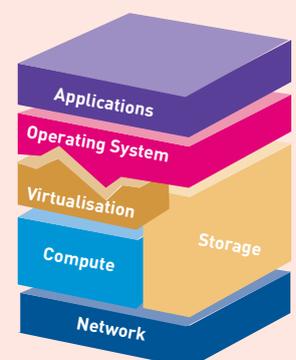
- **Networking & Computing** by Cisco
- **Virtualisation** by VMware® vCloud™ Datacenter
- **Storage** by EMC
- **Hosting & WAN** by SingTel

The infrastructure behind the PowerON Compute service – Vblock™ Infrastructure Platforms – includes state-of-the-art technology from Cisco, EMC and VMware. So businesses are assured of making good investment when they choose PowerON Compute.

Each Vblock™ platform is a standardised, integrated solution with multiple components thoroughly melded and prequalified as a unit. It is installed, configured, and managed as a single entity rather than a disparate group of components.

Vblock™ platforms are completely optimised for the applications they support. They prioritise traffic, offload network processing, and increase indexing and system cycling while ensuring the accuracy of database structures. They have been tested and validated with many major applications including:

- Microsoft Exchange
- Microsoft SharePoint
- Oracle RAC
- SAP



Vblock™ Infrastructure Platforms

¹ For more information on KCTC2, please visit www.singtel.com/kctc2

► Dedicated Network Connectivity for Enterprises

Enterprises can harness PowerON Compute service remotely through highly reliable and secure SingTel Meg@POP, ConnectPlus IP VPN, or MetroEthernet (MetroE) services.

Existing EXPAN customers can connect to the cloud via a fibre connection at SingTel's EXPAN data centres. In Singapore, SingTel Meg@POP customers can easily connect to PowerON Compute via cost-effective Ethernet Virtual Circuits (EVC).

Overseas customers can connect to PowerON Compute via ConnectPlus IP VPN with a last mile in Singapore via Meg@POP or MetroE circuits.

VMware® vCloud™ Datacenter Service

Built on proven VMware solutions including VMware vSphere, VMware vCloud Director, and VMware vShield products, VMware® vCloud™ Datacenter Service deliver ready-to-use cloud infrastructure. Business and IT users can now easily self provision IT resources in minutes rather than days or weeks.

To meet security and compliance requirements, vCloud Datacenter Service includes ISO27001 compliance, virtualisation- and application-aware firewall capabilities, Layer 2 isolation, role-based access control, and Active Directory integration.

VMware® vCloud™ Connector

VMware vCloud Connector allows customers to use their current VMware management tools to view, manage, and deploy VMs in private and public clouds.

► Key Benefits

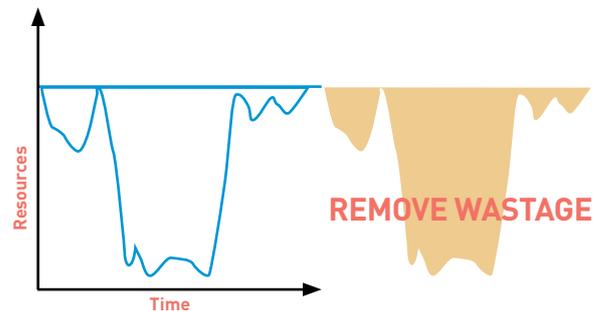


Improve Cash Flow

While building private clouds or upgrading their infrastructure, enterprises must study their cost projections carefully. This is because the initial outlay for new IT infrastructure might make up a relatively small portion of the total costs. Other long-term costs include support, licensing, training, power, and cooling costs. As an alternative, PowerON Compute enables

customers to pay for on-demand IT services and avoid having depreciating infrastructure. Cash management is significantly improved by:

- Eradicating upfront capital investment such as the procurement of hardware, software and build-up of data centres. Instead, customers can consume IT resources via an on-demand utility model.
- Avoiding wastage associated with under-utilised fixed infrastructure. PowerON Compute allows enterprises to easily provision their IT capacity according to cyclical business demands.



Enhanced Security

Compared to commodity public cloud offerings, PowerON Compute provides multiple layers of security for enhanced data protection.

- Data is housed securely at KCTC-2 – SingTel's latest green data centre built to TIA 9421 Tier-IV specifications² – for the most stringent industry standards for data centre reliability.
- To meet security and compliance requirements, PowerON Compute includes ISO 27001 compliance for better information security management.
- Access controls, firewalls, compliance logging, and reports on user activities provide better control of the audit processes.
- Organisation-specific and vApp-focused firewalls deliver more granular control of security gateways. Each organisation is also equipped with their own layer 2 network, enabling access and authentication according to LDAP/AD directory. This means enterprises can manage their own user base and provide role-based access according to their own policies.

² TIA 942 is a standard developed by the Telecommunication Industry Association (TIA) to define guidelines for planning and building data centres.



Accelerate Time-to-Value

i. Leverage PowerON Compute cloud service for more dynamic IT

Faced with an information overload, enterprises who want to build their own cloud platform are overwhelmed by the evaluation process. Some simpler services are best supported by a private cloud; other services are so complex that the time and capital required makes it more appealing to build it over a secure public cloud. Enterprises must make sure all separate components integrate well and ensure the cloud is a scalable and future proof.

SingTel PowerON Compute helps enterprises simplify and accelerate the delivery of application services by leveraging the pre-configured and pre-tested cloud infrastructure. Rather than spending time managing the infrastructure, IT staff can now focus on delivering virtualized applications to end users.

	SingTel PowerON Compute	Build your own
Research and evaluation time	Hours or days	Weeks or months
Configuration and testing	Pre-configured and pre-tested	Days or weeks
Provisioning and deployment	Hours or days	Days or weeks
Time to value	Hours or days	Weeks or months

The time and cost savings of upgrading an IT platform using SingTel PowerON Compute include:

ii. Application Portability

Traditional public cloud offerings require significant resource and time investments to reconfigure applications over the new IT platform. In contrast, VMware virtual machine (VM) or virtual applications (vApp) can be delivered seamlessly over the PowerON

Compute platform. This is because compatibility with existing enterprise VMware components is a key design feature for PowerON Compute.



Predictable Performance and Control

Unlike most public cloud offerings which suffer a performance hit whenever there are more concurrent users; PowerON Compute delivers predictable performance through its “Committed” and “Dedicated” service schemes. This is possible with the allocation of compute resources at committed levels. Resource can also be allocated in minutes.

> Service Schemes

SingTel PowerON Compute offers flexible service levels through its three service schemes:

- Pay-as-you-go Service Scheme:** Allows users to rapidly scale up or down compute resources. It is suitable for rapid pilot projects or software testing that thrives with rigid compute resources.
- Committed Service Scheme:** Provides reserved compute resources as well as additional “burst rate” capacity above committed levels. This offers predictable performance by setting aside resources for increasing workload over a multi-tenant infrastructure.
- Dedicated Service Scheme:** Offers predictable performance by allocating dedicated resources. It is targeted for both high-performance and security-critical requirements.

Depending on specific IT requirements, enterprises can select any combination of service schemes to suit their needs.

Summary of the 3 Service Schemes

	Committed	Dedicated	Pay-as-you-go
Targeted Use Cases	<ul style="list-style-type: none"> Bursty workloads Cyclical usage 	<ul style="list-style-type: none"> Peak Constant workloads High performance requirement 	<ul style="list-style-type: none"> Test/ Development workload Pay for what you use
Chargeable Unit	Monthly subscription	Monthly subscription	Per core (CPU), Per GB (Memory), Per GB (Storage) per hour
Storage Type	Fiber Channel	FC/SSD	SATA
SLA	99.99%	99.99%	99.99%

PowerON Compute

PowerON Business Solutions On Demand The Intelligent Utility For Smart Businesses			
PowerON Connectivity	PowerON Infrastructure	PowerON Applications	PowerON Managed Services
<ul style="list-style-type: none"> • Electronic bandwidth on demand 	<ul style="list-style-type: none"> • PowerON Compute • PowerON ezCompute 	<ul style="list-style-type: none"> • OneOffice • Web Builder • eShop Builder • QuickBooks Online • Reputation Watch And more... 	<ul style="list-style-type: none"> • Unified communications on demand • Security on demand

› About SingTel

SingTel is Asia's leading communications company with a comprehensive portfolio of services that include data and voice services over fixed, wireless, and Internet platforms. Serving both the corporate and residential markets, SingTel is committed to bringing the best of global communications to its customers in Asia Pacific and beyond.

› About PowerON

PowerON is SingTel's end-to-end suite of cloud-based services covering PowerON Connectivity; PowerON Infrastructure; PowerON Applications and PowerON Managed Services. It provides businesses with an "Intelligent Utility", providing instant, low cost, scalable and secure IT resources on-demand. SingTel is your one-stop shop for all your business needs, now, and in the future. There is no smarter way to power up your business for growth.

➤ **Ethisphere 2011 World's Most Ethical Companies**

Telecom Services

➤ **Market Leadership for Carrier Ethernet APEJ**

IDC Top Line

➤ **Market Leadership for International IPVPN APEJ***

IDC Top Line

➤ **Business Superbrands**

Superbrands Singapore 2010

➤ **Best Business Ethernet Service**

2010 MEF Carrier Ethernet Service Provider of the Year for Asia Pacific

* IDC Topline Mar 2011 - Harnessing the Performance of IP VPNs to Gain an Edge in the New Asia-Centric Era Mar 2011

➤ **Managed Connectivity Services Provider of the Year**

ComputerWorld Singapore 2006 - 2010

➤ **ISO/ IEC Certification**

ConnectPlus IP VPN and Meg@POP IP VPN

➤ **Customer Care Awards and Telecommunication Services**

ComputerWorld Singapore 2009 & 2010

➤ **Data Communications Service Provider of the Year**

Frost & Sullivan – Asia Pacific ICT Award 2010

➤ **Market Leadership for International IPVPN APEJ****

IDC Topline

** IDC Topline Jun 2010 - Delivering the Business Benefits of Cloud with IPVPN Jun 2010

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