

## Layered Tech Cloud Data Center Service Guide

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### Cloud Data Center Service Description

The Layered Tech Cloud Data Center (CDC) service platform offers a secure self-service cloud computing, storage, and networking environment for customers to deploy and run a variety of workloads. Suitable for development, web hosting, SaaS application and critical e-business applications, the CDC provides complete, multi-tier network and security with a 100% compliance guarantee and 99.95% availability SLA.

Cloud Data Centers offer self-service and on-demand provisioning and management for entire virtual data center environments, including private network, compute, storage, logging, and monitoring and compliance. With a variety of standard and custom templates to choose from, Layered Tech Cloud Data Centers give businesses the flexibility they need to safely and quickly expand and contract their entire data center environment to meet evolving needs.

### E-business-class security and compliance

- Fully managed enterprise security with multi-layered defense, including firewalls and optional managed web application protection
- Tiered networking model for secure isolation of application tiers
- Real-time vulnerability and intrusion detection monitoring and reporting
- HIPAA and PCI compliance-ready configurations
- SSL VPN access for secure account and Cloud Server management

### Layered Tech Cloud Director Portal

- Delivers secure cloud computing services, management tools and logs
- Accessible 24/7 to customers with established accounts and environments.

Allows users too quickly and easily:

- Establish secure cloud services and assign service levels to the environment
- Rapidly provision entire cloud data center environments
- Ensure that standardized methods and procedures are put in place to handle change
- Lifecycle manage all aspects of virtual data centers
- Review system, management and security logs
- Interact securely with Layered Tech staff email and web-based ticket system
- Administer your organization granting various levels of user access to facilitate collaboration in a secure and controlled environment
- View billing and usage data.

### **Robust platform for critical applications**

- Built using best-of-breed technologies to offer extreme scalability, efficiency, and security
- Cloud load balancers enable rapidly scale-up or scale-out with available resources
- Advanced virtualization and workload management and automation with built-in service quality assurance engine based on service level
- High performance and persistent SAN storage
- Daily backup service option

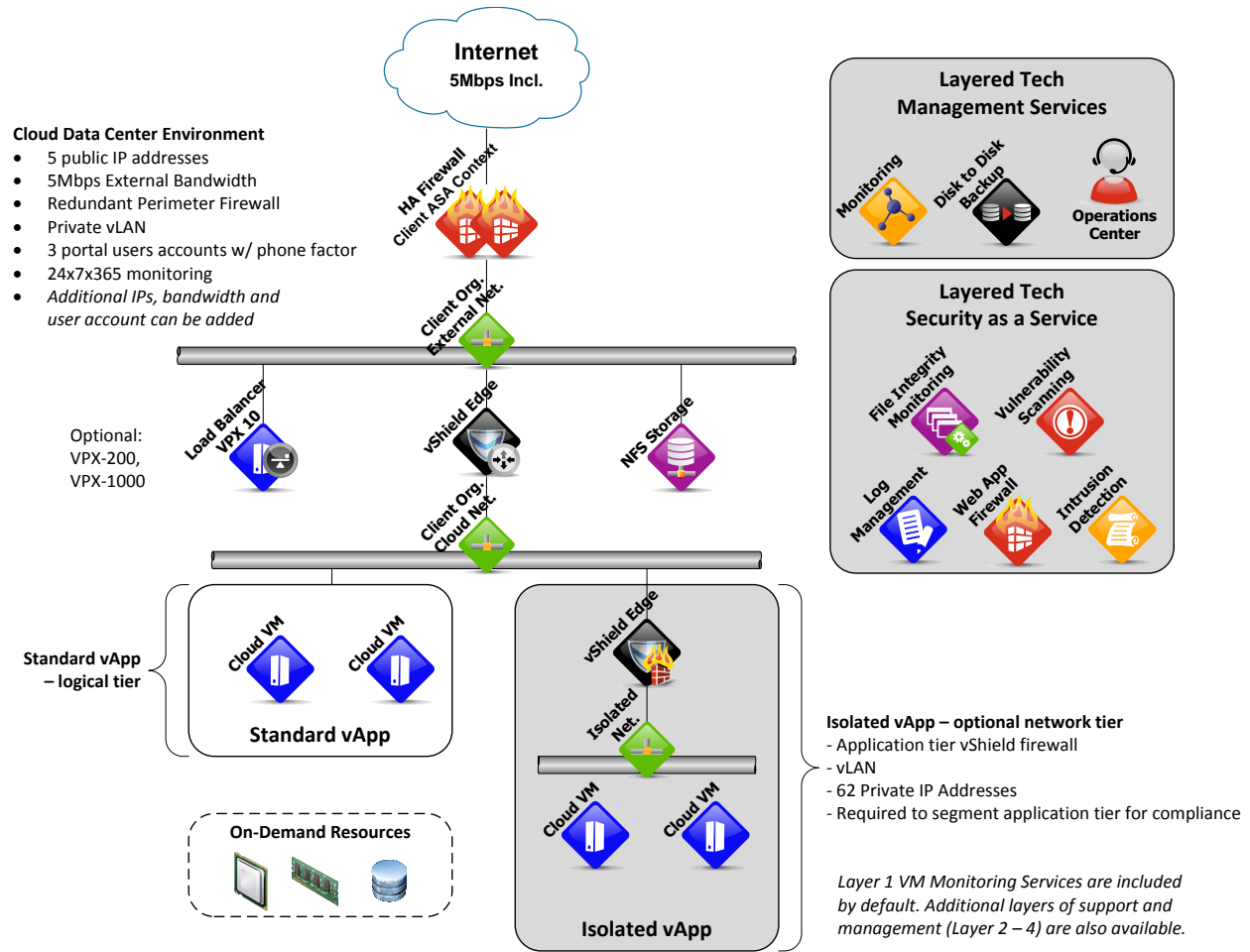
### **Managed support**

- Client environment and virtual resources support by Layered Tech monitoring, support, proactive infrastructure management to complete compliance management options
- 24x7x365 fully managed server and software support via portal based ticket system and phone support (as defined in by support level)
- Virtual server and infrastructure monitoring with proactive response
- Availability SLA – 100% network/power and 99.95% cloud data center uptime
- Optional compliance management and 100% guarantee

### **Details of Service Options**

The Layered Tech Cloud Data Center (CDC) service is built upon a scalable network architecture that allows client to build applications in both flat network environments or in multitier isolated network segments. It starts with a virtual private Cloud Data Center environment and allows you to group up to 254 VMs into vApps. This allows you to manage network rule sets for multiple VMs as a group and provides the ability logically organize and isolate your environment. vApp come in two types, standard and isolated.

The diagram below illustrates the client Cloud Data Center environment and optional services.



### Cloud Data Center Customer Environment

The cloud data center environment provides the core network environment to accommodate the addition of 100s of vApp segments and 1000s of virtual machines. Each client starts with a Cloud Data Center environment which can be purchased on a month to month basis. This environment consists of the following:

- 5Mbps bandwidth
- 5 public IP address (1 assigned to be external interface, 1 reserved for SSL VPN, 3 address assignable by customer)
- Redundant perimeter firewalls
- 256 private IP addresses
- 3 role-based Cloud user accounts with multi-factor (phone-factor) authentication. Additional accounts can be added.

Any IP addresses and space provided to client by Layered Tech is solely for Customer’s use with the provided Service, and are non-portable and non-transferable. Upon any termination of Service, client’s

access to such IP addresses and space will cease.

### **Isolated vApp**

The Isolated vApp provides secure application tier within the customer cloud data center environment in which customers can provision VMs. Customer may have multiple isolate vApps to group VM together such as database tier, application server tier or a web server tier. Isolated vApp is a security best practice and required for multitier compliant applications. The Isolated vApp can be provisioned on-demand and does incur a monthly fee. The Isolated vApp consists of the following:

- vLAN segment
- vShield Edge firewall
- 62 private IP addresses

### **Standard vApp**

The Standard vApp provides a logical application tier within the customer cloud data center environment in which customers can provision VMs. Customer may have multiple vApps to group VM together to segment application or to segment application tiers. The Standard vApp can be provisioned on-demand and does not incur a monthly fee. The Standard vApp consists of the following:

- 62 private IP addresses

### **Cloud Load Balancer**

The cloud load balancer enables elastically scalable environments for improved performance, ensuring application availability and to help meet cyclical demands. This enterprise class load balancer that can be self-provisioned and easily managed via our integrated Cloud Director portal. The Cloud Load Balancer consists of the following:

- Support for 10Mbps traffic load. Upgradable to 200Mbs or 1000Mbps.
- Supports multiple protocols and algorithms
- SSL offload, acceleration and termination
- L4 load balancing and DoS defenses
- L7 content filtering
- HTTP & URL rewrite
- TCP buffering and multiplexing
- VPN Access
- Supported via Layered Tech expert support team

Layered Tech Cloud Load Balancer is based upon Citrix NetScaler technology. By default, the standard edition of Netscaler VPX is provisioned. If client would like to upgrade to the Premier edition of NetScaler VPX application controller this can be ordered via the service desk. Advanced functionality not provided via the Layered Tech Cloud Director portal can be configured and managed via the Layered

Tech managed services team.

### **Virtual Machines**

The Layered Tech Cloud Data Center enables provisioning and life-cycle management of virtual machines within our high performance infrastructure. Each virtual machine has dedicated resources to ensure it runs at optimal performance. Our built-in quality assurance engine powered by VMturbo ensures that each workload is placed and distributed in our vast cluster for optimal performance. This capability goes beyond the standard Distributed Resource Scheduler (DRS) to further ensure that peak workloads are distributed and managed to ensure all clients within CDC operate in optimal environment.

The Cloud Virtual Machines consists of the following:

- Support virtual machines from 1 to 16 vCPU and up to 96GB RAM
- Each vCPU runs at 2.3Ghz or better
- 40GB of high performance, persistence storage standard for base OS and Layered Tech tools unless otherwise noted in the template description
- Additional high performance SAN storage optional.
- Virtual Machine memory resources are reserved.
- Provisioned CPU resources are not oversubscribed. A rare and temporarily exceptions to this policy is possible in the event that Layered Tech experiences multiple server hardware failures.

Each virtual server is partitioned from other instances to segregate each Customer's data from those of other customers. This partitioning is designed to prevent cross communication from one Customer's virtual machine(s) to those of another Customer. Layered Tech segregates Customer environments stored on the CDC Storage environment by utilizing VMFS segmentation for individual customer virtual machine instances, allowing only the virtual machines to which the allocation is assigned to access that storage.

### **Instance Failover Service**

Should a hardware failover occur with a Layered Tech CDC resource group or cluster, client virtual machines will automatically be restarted and distributed across the other available ESXi nodes within the resource group and cluster. Layered Tech will replace or repair a failed server node and once restored and confirmed stable by layered Tech Operations, instances may be redistributed within the resource cluster. The instance redistribution is automated for optimal performance across all workloads.

### **Supported Compute Operating Systems**

Layered Tech CDC includes the automated installation of the Operating Systems listed below. Operating System images are maintained on a quarterly basis to include the latest tested and proven service packs, patches and hot fixes. Layered Tech work with clients to maintain the OS on provisioned virtual machines for customers that have purchased our managed support services. (See software and security patch management policy later in this document and detailed in our managed services description)

- Windows Server 2008 R2 64-bit
- RedHat Enterprise Linux 5.x (64-bit)
- RedHat Enterprise Linux 6.x (64-bit)
- CentOS 5.x (64-bit)
- CentOS 6.x (64 & 32-bit)

Operating Systems cannot be changed against a virtual server once provisioned. Clustered Operating Systems are not supported on CDC instances.

### **Supported Software**

Layered Tech can provide supported web server, app server and data bases software to be installed after service is initiated. Layered Tech managed service team can configure or install the following packages:

Microsoft IIS  
Apache Web Server  
Apache Tomcat  
JBoss  
MySQL (Standard, Enterprise)  
Microsoft SQL Server 2008 (Web, Standard, Enterprise)  
Microsoft SQL Server 2012  
PostgreSQL

\*Incremental licensing and application management fees may apply.

Customer may supply their own application software and respective licenses to complete the solution to meet their business needs. Layered Tech does not provide any monitoring or management of customer provided software or services with the service.

### **Data Storage and Retention**

The standard virtual machine configuration includes 40GB of storage unless noted in the template description. Additional data storage is available and can be self-provisioned from the Cloud Director portal. Provisioned data is segmented via VMFS and assigned to an individual VM. Data stores can be retained independent of the associated virtual machine via the private template library enabling clients to be able to bring up and down virtual machines without having to build and reload data stores. In addition, data stores can be retained and reassigned via Layered Tech Cloud administrators as a managed service.

### **Security Services**

The security services include configuration features as well as optional add on services listed below. The security services enablement and configuration is managed by the Customer or can be managed by Layered Tech with option managed services.

**Configuration Features:**

- Configurable perimeter firewall
- Configurable app tier firewall (include with isolated vApp)
- Configurable tier-to-tier isolation
- Unlimited firewall rulesets
- Firewall logging with optional Layer 3 or Layer 4 support (see managed services section)
- Default rule set enabled across all tiers. TCP Ports include 80, 443, 3389 & 22.
- Stateful Packet Inspection at perimeter and vApp FW
- Deny rule between tiers enabled by default.
- ICMP (ping) communication is allowed by default between virtual servers.

**Intrusion Detection**

Our Network Intrusion Detection Services utilize a custom-developed configuration of industry standard tools, such as Snort\*, to monitor your networks for known attack traffic. As alerts are generated they are delivered into the Layered Tech Service Desk which performs Tier 1 review using the best practices developed by our experienced, certified and dedicated Compliance and Security team. This service meets or exceeds all required security and standards compliance expected in systems handling sensitive data and gives you the assurance that we will manage and you can know when anomalous activity occurs.

*Key Features:*

- Internal network monitoring
- First response by 24/7 Service Desk
- Event history reporting available
- Custom monitoring available
- Customizable event delivery destinations
- Available for shared and dedicated networks
- Utilization of community attack signatures with regular updates
- Provided as a fully managed solution

**File Integrity Monitoring**

The LT File Integrity Monitoring service utilizes an enterprise class platform, based on Tripwire\*, that provides host-based monitoring for critical system file changes. As alerts are generated by the system they are delivered into the Layered Tech Service Desk which performs Tier 1 review using the best

practices developed by our experienced, certified and dedicated Compliance and Security team. This service meets or exceeds all required security and standards compliance expected in systems handling sensitive data and confirms changes that occur to critical files.

*Key Features:*

- First response by 24/7 Service Desk
- Enterprise platform utilizing common toolset
- Event history reporting available
- Common critical files monitored by default
- Custom monitoring available
- Customizable event delivery destinations
- Each participating system has a dedicated local host agent

### **Vulnerability Management**

The Vulnerability Scanning and Management service offered by Layered Tech provides routine and regular vulnerability assessments of your server environments. The network scanning platform is built on trusted, industry-standard tools such as Nessus, which generate vulnerability reports using up-to-date attack signatures and is fully integrated into the Layered Tech Cloud Director portal for clients who subscribe to this service.

*Key Features:*

- Industry standard platform
- Regular attack signature updates
- Portal-based log reporting
- Full service management from LT
- Regular scan scheduling
- Direct access to LT team for specific tuning needs

### **Web Application Firewall**

Layered Tech offers a host based Web Application Firewall service utilizing the Stingray\* Application Firewall. Each web node receives a local agent which communicates with LT's central management and control systems. This best in class platform allows web servers to be placed anywhere and maintain protected status without dependency on expensive networking designs calling for data duplication or inline appliances. The distributed setup is uniquely viable for cloud systems where virtual networks can complicate appliance-based installations.

*Key Features:*

- Full protection against dangerous web application weaknesses.
- Cloud friendly design which avoids appliance-based network bottlenecks



- Fully managed with hands-off updates and event management
- Deploy anywhere there is internet connectivity.
- Meets all security standard requirements for Web Application Protection

## **PCI & HIPAA Compliance**

The Cloud-Based Security Services offered by Layered Tech are the just part of our entire compliant and secure offerings. If your compliance and security needs include all of these services or even more, our Layer 4 Compliance Management Services offering includes all of these plus a full management suite that offers our full Compliance Guarantee!

*Features include:*

- Site monitoring and system monitoring services for one hosted site/IP address on your server
- 24/7 monitoring and “first responder” issue escalation
- Issue troubleshooting and remediation
- Customized escalation and remediation procedures
- Detail performance statistics via client portal
- Synthetic transactions available for deployment to interrogate system health
- File integrity monitoring and remediation services
- Intrusion detection
- Vulnerability scanning
- Change management
- Compliant OS patching and updates
- Audit support and guarantee

## **Anti-virus**

Layered Tech uses third-party anti-virus software and is deploy with each Windows Server instance. Anti-virus is optionally provided for Linux based systems. Layered Tech AV service provides regular signature file updates. Anti-virus technology provides reasonable protection against malware, including viruses, spyware and Trojans, but such technology cannot completely ensure the prevention of such malware. Should disruption or changes occur due to malware, Layered Tech will use commercially reasonable efforts for customers purchasing managed service (L2-L4) on the impacted virtual machine to remedy the situation as soon as possible after being notified of the problem, but Layered Tech will not be responsible for any damages due to worms, phishing attacks, rootkits, trojan horses or other such malware, including infection of end-user devices or lost or corrupted data/messages.

## **Cloud Data Center Portal**

The cloud data center service offers a client portal to enable self-service to create, modify, decommission and manage Cloud Data Center services. It provides data to review system health,

performance and to interact with our services and support team. Clients may define user privileges to view, configure, and/or purchase new CDC environments and the associated services. Clients are empowered and responsible for enabling multiple users within an organization with role-based access privileges and multi-factor authentication services.

The CDC Portal is accessible via web browser at <https://my.layeredtech.com/>. Tested and supported web browsers include Internet Explorer 9, Mozilla Firefox, and Google Chrome.

Portal capabilities include:

- Organization and network creation
- vApp creation and management
- VM creation and management
  - Monitoring
  - vCPU increase/decrease
  - Memory increase/decrease
  - Start/stop/suspend/clone
  - System logs
- Storage increase
- Manage server templates
- Network and IP management
- NAT rules/enablement
- Firewall management
- Load Balancer provisioning and management
- Security services provisioning and management (log)
- Billing management
- Create, track and manage service ticket
- Organization administration and account management

### **Layered Tech Application Programming Interface (API)**

The Service includes access to the API for use by the Clients. This provides Clients with the ability to provision control and manage their CDC environment through the API. Layered Tech API is SOAP based. At the time of this Service Guide public documentation is not currently available but will be available in the future. Clients requiring access to API prior to completion of the documentation are encouraged to make a request via the service desk or account team to be escalated to Product Management.

### **Managed Support Services**

Layered Tech offers a range of managed support/service options for client cloud data center environments and virtual machines. Managed support ranges for Layer 1 monitoring to Layer 2 active support to Layer 3 proactive management to Layer 4 compliance management. Layer 1 monitoring is

provided by default and Layer 2-4 are optional enhanced support and managed services.

A detail description of Layer 1-4 support and management is provided at <http://www.layeredtech.com/managed-services/>

### **Software and Security Patch management**

Layered Tech will maintain virtual machines templates and running virtual machines that have subscribed to our managed services (L2-L4) with all recommended and approved security patches, service packs and hot-fixes in order to maintain the overall integrity and performance of the virtual machine. Security threats are evaluated, verified and tested before a hot-fix or patch is recommended to Customers. Layered Tech will determine the appropriate security course of action in order to correct issues on its systems, usually with little or no service disruption. Sometimes a reboot is necessary when a patch is distributed and installed, which Layered Tech will conduct during maintenance hours or as otherwise coordinated with the Customer.

Third party software provided to Clients by Layered Tech in connection with Cloud Data Center Service, is distributed in alignment with and subject to third party software licensing terms and conditions. Layered Tech makes no representations or warranties whatsoever with regard to such third party software.

### **Service Packs, Patches and Hot-Fixes**

All service packs are evaluated and tested on the standard Layered Tech server configurations. Layered Tech will integrate the service pack into the Layered Tech hardened and standard operating system build after testing has demonstrated its stability and performance benefits. Layered Tech “build” is updated on a quarterly basis. Existing Virtual machines will be upgraded during maintenance windows that will be coordinated with the Client. Critical patches, demonstrating a significant security risk, may be applied outside of the quarterly update schedule is determined necessary to maintain a secure and stable environment.

### **Terms of Service**

The Layered Tech Cloud Data Center is governed under our standard terms of service. The up to date term of service can be found at <http://www.layeredtech.com/about/legal/terms-of-service/>

### **Service Level Agreement**

The Layered Tech Cloud Data Center service includes a 99.95% infrastructure uptime guarantee. The complete Layered Tech SLA can be found at <http://www.layeredtech.com/about/legal/service-level-agreement/>

## Definitions

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**API** is an Application Programming Interface implemented by a software program which enables it to interact with other software.

**High Availability (HA)** means that active physical or virtual hardware elements will fail over to standby physical or virtual hardware elements in the case of failure, with minimal system downtime.

**Layer 1** is Layered Tech base level monitoring and alerting service available for all virtual machines in CDC.

**Layer 2** is Layered Tech support service provides management tools, support and administration services for your virtual machines and associated network and storage resources. This is an upgraded support package providing you with access to our 24/7 service desk via our ticketing system.

**Layer 3** is Layered Tech full management service that goes well beyond standard support services. This proactive service provides full system management including customizable management, escalation and remediation processes and reviews. This provides you access to our 24/7 service desk and managed services to proactively help manage your cloud data center environment.

**Layer 4** is Layered Tech compliance management that includes a bundle of security tools and management processes and audit support such that a virtual machine in the CDC environment will meet and pass PCI or HIPAA regulatory compliance. Not only do you get access our service desk and managed services, our security and compliance team proactively monitors your environment and remediates potential security and compliance risks. This team also assists with compliance audits.

**Portal** refers to the Cloud Data Center, Cloud Director Client portal.

**Storage** means CDC Storage which is designed for high availability with dual paths and redundant hardware for automatic failover.

**vCPU** means the virtual compute processor allocated to a virtual machine. The size and speed of the vCPU is a minimum of 2.3GHz.

**Virtual Machine** or **Virtual Server** means a server provisioned within a Layered Tech Cloud Data Center (CDC) environment.

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