Introduction to SoftLayer Cloud Services
SoftLayer provides world-wide services with a standardized modular infrastructure; triple network architecture and powerful automation.

**Flexible, Automated Infrastructure**

**Data Center & Pods**
- Standardized, modular hardware configurations
- Globally consistent service portfolio

**Triple Network**
- Public network for cloud services
- VPN for secure management
- Private network for communications and shared services

**IMS (Automation Software)**
- Bare metal provisioning
- Integrated BSS/OSS
- Comprehensive network management

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**World-Wide Services**

- **13 Data Centers**
  - with 100K Servers and 22M Domains in the US, Amsterdam and Singapore
- **19 Network Points of Presence**
  - in 5 countries to facilitate response times
- **2013 Projected Revenue: $397M**
  - Employees: 690
  - 21,000 customers

* Sold in US English, US $ Pricing
SoftLayer supports and extends IBM’s cloud strategy.

*Workload optimized, deployment choices, integrated services management*

- **Bare-Metal Servers, Virtualized Public Cloud Instances, Private Cloud Deployments**
  - Provides the *best fit optimized for a range of cloud workloads*

- **Integrated Platform Across Multiple Architectures**
  - Highly flexible with *support for public, private and hybrid deployments*

- **Common Management System with APIs**
  - Customer control and increased visibility with a *unified management system*

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**Proprietary Infrastructure Management System** facilitates automation & orchestration

**Private network** allows seamless communication across distributed environments

- **x86 Pod Infrastructure**
- **x86 Pod Infrastructure**
- **x86 Pod Infrastructure**
Standardized, modular infrastructure

One platform, myriad solutions to serve a broad range of customer requirements for performance, isolation

- Highly flexible architecture
- One platform for public cloud servers, private clouds, bare metal servers
- Complete integration
- Unified systems management & API
- Technology-neutral platform
- Support for broad range of operating systems, virtualization platforms
- Build hybrid, distributed, high-performance architectures and manage from a single pane of glass
- Pay by the hour or the month for a truly variable IT operations model
Triple-network architecture

- High-performance public network with transit from multiple tier-1 carriers
- Secure OOB management via VPN
- Private network for intra-application and inter-facility communications, access to shared services
- Native IPv6 support
- Virtual racks for integrated management
- Complete suite of network services
A better platform

*Unified architecture with common management and programming interfaces*

- Common command and control interface across a unified architecture
- Combine bare-metal servers, public cloud instances and private cloud deployments into distributed hybrid architectures and manage from a single control pane and API
- All deployed on-demand and provisioned in real-time
- Ideally suited to big data deployments, high I/O and latency-sensitive apps

**Unique Triple Network Architecture** allows seamless communication across distributed environments

**Infrastructure Management System** provides orchestration and automation
Service portfolio
Complete control

- Mobile and Web-based management portals
- Purchase, provision, deploy & manage infrastructure
- Access to services, tools, automation & tutorials
- Secure access via VPN to management network
- Two-factor authentication to Web portal
SoftLayer’s solutions and services satisfy some needs of our large enterprise clients for unmanaged infrastructure capability

<table>
<thead>
<tr>
<th>ISVs / Production ERP / Unmanaged Production</th>
<th>Hosted Enterprise Private Clouds</th>
<th>High Performance Computing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High I/O intensity, Predictable QOE</td>
<td>• High I/O intensity, Predictable QOE</td>
<td>• High I/O intensity, Predictable QOS</td>
</tr>
<tr>
<td>• Supports existing portfolio, license model, and provides platform for future services</td>
<td>• Excellent base to build out enterprise PC requirements (HA, data isolation, encryption, reporting, hybrid cloud, etc.)</td>
<td>• Dedicated high performance servers and GPUs with cloud flexibility</td>
</tr>
<tr>
<td>• ISV Application Production Infrastructure</td>
<td>• IBM SCO Openstack, Citrix Private Clouds and VMWare Private Clouds</td>
<td>• Load Balancing</td>
</tr>
<tr>
<td>• Global reach and load balancing</td>
<td></td>
<td>• GPU offering available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Big Data, Analytics, Database Services and Archive</th>
<th>Social Business</th>
<th>Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High I/O intensity, Predictable QOE</td>
<td>• High I/O intensity/Load balancing</td>
<td>• High I/O intensity, Predictable QOE</td>
</tr>
<tr>
<td>• Flexibility to add additional servers/cloud instances</td>
<td>• Integrated dedicated servers and cloud instances</td>
<td>• Scale cloud instances in minutes</td>
</tr>
<tr>
<td>• High availability / security</td>
<td>• Storage services for files and media</td>
<td>• High performing load balancers for variable demand</td>
</tr>
<tr>
<td>• Pre-configured Big Data solutions</td>
<td>• Reliable Collaboration software infrastructure platform</td>
<td>• Robust content delivery network</td>
</tr>
<tr>
<td>• Database management services</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dev Ops</th>
<th>Web Applications / E-Commerce</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High I/O intensity, Predictable QOE</td>
<td>• High I/O intensity, Predictable QOS</td>
</tr>
<tr>
<td>• Elasticity of offering</td>
<td>• Rapid expansion to meet market demand</td>
</tr>
<tr>
<td>• Promotion via cloud of application lifecycle</td>
<td>• Integrated dedicated servers and cloud instances</td>
</tr>
</tbody>
</table>
Cloud Computing Instance

<table>
<thead>
<tr>
<th>Item</th>
<th>Option</th>
<th>Hourly</th>
<th>Setup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Center</td>
<td>Amsterdam 1</td>
<td>€0.05</td>
<td>€0.00</td>
</tr>
<tr>
<td>Cores</td>
<td>1 x 2.0 GHz Core</td>
<td>€0.05</td>
<td>€0.00</td>
</tr>
<tr>
<td>Ram</td>
<td>2 GB</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Remote Management</td>
<td>Reboot / Remote Console</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Uplink Port Speeds</td>
<td>100 Mbps Public &amp; Private Networks</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Private Network Port</td>
<td>100 Mbps private uplink</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Public Network Port</td>
<td>100 Mbps public uplink</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Public Bandwidth</td>
<td>0 GB Bandwidth</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Primary IP Addresses</td>
<td>1 IP Address</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>First Disk</td>
<td>25 GB (LOCAL)</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Operating System</td>
<td>CentOS 6.0 - Minimal Install (32 bit)</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Host Ping</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Notification</td>
<td>Email and Ticket</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Advanced Monitoring</td>
<td>Monitoring Package - Basic</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Response</td>
<td>Automated Notification</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>VPN Management - Private Network</td>
<td>Unlimited SSL VPN Users &amp; 1 PPTP VPN User per account</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Vulnerability Assessments &amp; Management</td>
<td>Nessus Vulnerability Assessment &amp; Reporting</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Cloud Computing Instances Count</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hourly Rate: €0.10/hr
<table>
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<th>Hourly</th>
<th>Setup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Center</td>
<td>Amsterdam 1</td>
<td>€0.38</td>
<td>€0.00</td>
</tr>
<tr>
<td>Bare Metal Instance</td>
<td>2 x 2.0 GHz Core Bare Metal Instance - 2 GB Ram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ram</td>
<td>2 GB</td>
<td>€0.00</td>
<td>€0.00</td>
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<tr>
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<td>Public Bandwidth</td>
<td>0 GB Bandwidth</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Primary IP Addresses</td>
<td>1 IP Address</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>First Hard Drive</td>
<td>500GB SATA II</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Operating System</td>
<td>CentOS 6.0 - Minimal Install (32 bit)</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Monitoring</td>
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<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Server Quantity</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hourly Rate: €0.38/hr
SoftLayer Private Clouds

SoftLayer Private Clouds automatically provisions and configures your:

- **Management Server**
  - Standardized configuration

- **Host Servers**
  - Custom configure up to 10 Host Servers to be automatically registered with Management Server and assigned to first zone; add more zones and Host Servers after initial deployment

- **Object Storage**
  - Creates new Object Storage account as the central repository for templates, images, and other shared data

- **IP Addresses**
  - 16 Portable Public IP Addresses required and added to order; select more IP addresses in order summary

To order your Private Cloud, click "Build Now" and:

**Step 1:** Select a Host Server from the list of server options and click "Add". Your Private Cloud Management Server and IP Addresses will be automatically added to your order

**Step 2:** Choose your first Host Server’s location and customize its configuration
  - All Host Servers in initial order will be assigned to default Host Server Zone

**Step 3:** Choose your Host Server’s additional services

**Step 4:** Review your SoftLayer Private Clouds order and then:
  - Customize your Cloud Management and Host Servers hostnames and domains (required)
  - Click “Add Server” to configure additional Host Servers (optional)
  - Repeat steps 1 through 3 as needed

When finished, choose “Place an order” or “Place a quote”, and click “Finalize Your Order”

After your Private Cloud is deployed, go to Hardware—Private Clouds in the Customer Portal to log into the cloud management system, add and configure additional Host Server zones and Host Servers, and manage your Private Cloud.
Private Cloud Instance

SoftLayer Private Clouds

Step 1

Add a Host Server to your private cloud from the list below — click "ADD" to enter the customization process.

<table>
<thead>
<tr>
<th>Server</th>
<th>Configuration</th>
<th>Monthly*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CloudPlatform Host Server (1U / 2Proc)</td>
<td>Dual Processor Quad Core Xeon 5504 - 2.00GHz (Nehalem) - 2 x 4MB cache</td>
<td>Starting at €440.21</td>
</tr>
<tr>
<td>CloudPlatform Host Server (2U / 2Proc)</td>
<td>Dual Processor Quad Core Xeon 5504 - 2.00GHz (Nehalem) - 2 x 4MB cache</td>
<td>Starting at €516.24</td>
</tr>
<tr>
<td>CloudPlatform Host Server (2U / 4Proc)</td>
<td>Quad Processor Hex Core Nehalem EX 7540 - 2.00GHz - 4 x 18MB cache</td>
<td>Starting at €1,230.93</td>
</tr>
</tbody>
</table>

Note, the following are required for each SoftLayer Private Cloud and will be included with your order at checkout. Additional IP Addresses can be added in final order summary.

<table>
<thead>
<tr>
<th>Server</th>
<th>Configuration</th>
<th>Monthly*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CloudPlatform Management Server</td>
<td>Single Processor Quad Core Xeon 5620 - 2.40GHz (Westmere) - 1 x 12MB cache w/HT</td>
<td>Starting at €485.83</td>
</tr>
</tbody>
</table>

* Server prices include required software licenses and networking services costs, which will be shown in your order summary.
SoftLayer Private Clouds
Step 4

Review your Private Clouds order and then:
- Customize your Cloud Management and Host Servers hostnames and domains (required)
- Click “Add Server” button on right to configure additional Host Servers (optional)
When finished, choose “Place an order” or “Place a quote”, and click “Finalize Your Order” at bottom of page.

CloudPlatform Host Server (1U / 2Proc)
Domain: Edit domain information for this server
Monthly Total: €440.21
Quantity: 1

CloudPlatform Management Server
Domain: Edit domain information for this server
Monthly Total: €485.83
Quantity: 1

Additional Products
Object Storage - Pay as you go
Monthly Total: €0.00
Quantity: 1

Additional Products
16 Portable Public IP Addresses
Monthly Total: €24.33
Quantity: 1

Final Order Totals
Total: €950.38
Setup Total: €0.00
Taxes: €0.00
Final Monthly Total: €950.38
Prorated Total: €950.38
Prorated Initial Charge: EUR950.38

Clear Order and Start Over

* Totals will vary depending on current currency exchange rates. Currencies other than USD are only available on Visa and MasterCard.
<table>
<thead>
<tr>
<th>Partner Type</th>
<th>Definition</th>
</tr>
</thead>
</table>
| **Referral Partner** | Due to the services referral partners provide, they are in a position to refer new hosting customers to SL  
- In exchange for referring us new business, we provide referral partners with monthly commission payments and other benefits  
- Referred customers sign directly with SL  
- Examples include application developers, consultants, web designers, etc.  
- Referral partners are managed by channel sales team |
| **Strategic Partner** | Higher-revenue partnership opportunities where hosting is usually a component of the partner’s overall solution.  
- A strategic partner’s business model usually dictates that they will resell SL’s services  
- Examples are SI’s, MSP’s, SaaS providers, ad agencies, etc. Existing strategic partners are Citrix, Presidio, Sirius Computer Solutions, Cloudant, Rocket Science, SparkRed, Phone Valley (Digitas), etc.  
- Strategic partners are managed by the channel sales team |
<table>
<thead>
<tr>
<th>Partner Type</th>
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</tr>
</thead>
</table>
| Hosting Reseller | Hosting resellers buy hosting services from SL at a discount, mark them up, and resell them.  
|                | - Hosting is their primary source of revenue.  
|                | - May or may not leverage SL’s brand.  
|                | - Examples include Hostgator, SiteGround, Arvixe, etc.  
|                | - Hosting resellers are managed by global and key accounts teams.                                                                       |
| Distributor    | Large distributors partner with thousands of resellers and sell through them  
|                | - Most distributors are either planning to launch or have recently launched cloud business units  
|                | - SoftLayer sells to the distributor, the distributor sells to the reseller  
|                | - Examples include Ingram Micro, Synnex, etc.  
|                | - Distributors are managed by the channel sales team.                                                                                  |
Customer Technical Support:

Provide frontline support 24x7 to a diverse technical customer base through:
- Phone
- Chat
- Tickets

Team is composed of 45 agents with an industry tenure of 3.5 years.
- Experience in control panels and hosting technologies
  - cPanel, & Plesk
  - Linux, Windows, Virtualization Technologies

Support reactive monitoring
- Nimbus based
- Ping Monitoring
  - Services Monitoring (HTTP, FTP, SMTP, etc.)
  - System Level Report (Disk, CPU, Memory, etc.)

Advanced Customer Support – CSA

Provide Tier II support for customer base through:
- Escalated Phone, Chat, & Tickets
- Support Subject Matter Experts (SME) for new product releases
- Direct Support for VIP Customers
- 24x7 backup support for Managed Services

Team is composed of a large team of Systems Administrators
- Extensive experience in operating systems and systems administration
  - BSD, Linux, Windows, Virtualization (ESX/ESXi, Xen, Citrix Xenserver, HyperV, etc.)
  - Shell scripting and familiarity with various programming languages
  - Dedicated FW, LB, and VPN management
  - Webserver, and CDN management
  - Certifications held include RHCE, CCNA, LPIC 1&2, and MCSE

Manages Legacy AS Products
- Managed Backup / Security
- Legacy Dedicated Firewalls (2,500)
- Legacy Load Balancers (250)
**Managed Services**

**Monitoring**
- Services, CPU, Disk, Memory, URLs, Synthetic Transactions
- 90+ Software Plugins
  - Lotus Notes and IBM software
- Monthly Account Reports
  - Proactive capacity planning

**Data Protection**
- Managed disk-to-disk backups
  - Multiple physical locations
- Database backup
- Disaster Recovery

**Extended SLA**
- 15 minute automated service notification
- 1 hour HW replacement start

**Database Services**
- Microsoft SQL, MySQL, MongoDB, Riak
- Performance consultation, backups, and reporting

**Security**
- Monthly OS Patching
- Monthly vulnerability scan
- Antivirus, OS File Integrity
- IDS, IPS, HIPS, VPN, FW
- Server hardening

**24x7 Operations Team (13)**
- 9 Systems Administrators
- 4 DBAs
  - 2 Microsoft SQL
  - 2 MongoDB, Riak, MySQL
Nimsoft Monitoring provides detailed graphing and invaluable customizable alarms. Graphing provides a comprehensive visual depiction of your usage over time for analysis and review, to guide capacity and growth planning. And alarms will let you know when a service is outside an expected range, and can be tracked from the customer portal and also be configured to send email alerts.
www.softlayer.com/ibmpartners
should be used to sign up for the SoftLayer services

Key Items to Assess

• Type of operating environment (OS, hypervisor, network requirements, etc.)
• Amounts of infrastructure –
  • VMs, storage, Network, Security, Monitoring,
• Key additional services (e.g. database services, archiving, HA, email)

Discussing these with your client will help prepare them for signing up at www.softlayer.com/ibmpartners
## Enablement Resources for Business Partners

<table>
<thead>
<tr>
<th>Category</th>
<th>Web Links</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Partner Inquiries</strong></td>
<td><strong>Contact your Channel Rep for questions</strong></td>
<td>Overview of Softlayer</td>
</tr>
<tr>
<td><strong>IBM Business Partner Applications</strong></td>
<td><a href="http://softlayer.com/ibmpartners">softlayer.com/ibmpartners</a></td>
<td>IBM Business Partners Landing Page for inquiries</td>
</tr>
</tbody>
</table>
Apply for a relationship at
www.softlayer.com/ibmpartners

IBM Reference
Vincenzo Raeli IBM Italy Channel Cloud Managed Services email: vick_raeli@it.ibm.com

http://www.ibm.com/smartcloud
Twitter: #ibmcloud

Thank you
Approfondimenti tecnici
Bare Metal Servers

- Provision in 2-4 hours; choose from components such as memory, disk controllers, OS / storage options…
- Upgrade / replace components when needed
- Use FlexImages to clone systems
- Use passwords or SSH keys to access
- Remote console access, OS reloads…
- Full networking support – VLANs, external IPs, firewalls..
- Serves as a key building block
- Pricing monthly (dedicated, custom servers) or hourly
Virtual Servers
(the CCI offering)

A public cloud based on Citrix XenServer technology.

- Integrated with the Softlayer API
- Provisioning in minutes
- Local Storage via RAID 10
- Isolation on the per-core basis
- No CPU / RAM overvprovisioning
- Stop, power off, suspend / resume
Self-managed virtualized environments (Private Clouds):

The Private Clouds product provides customers the ability to order and deploy a complete private cloud (for deploying and managing virtual servers) with just one push of a button.

The system automatically:
- provisions your Host Servers and installs each host’s hypervisor.
- provisions your Management Server and installs its management system.
- registers your Host Servers with the Management Server.
- Provisions and integrates an Object Storage account tied to solution
- completes additional network and resource management tasks.
Self-managed virtualized environments (Private Clouds): Available Hypervisors

Citrix Xen
- Extensive API
- Limited Management tools, add’l 3rd Party Tools
- Features include XenMotion, HA, AWB,/HPM (based on license)
- SL licenses per server

Microsoft Hyper-V
- API Available (WMI)
- Limited management tools
- Features include Live migration, host clustering for free
- SL offers Hyper-V with Datacenter Edition
- No Per VM fee

VMware
- Extensive API (VIX API)
- Extensive management tools
- Features include vMotion, Storage Motion, DRS, PM (based on license)
- SL licenses per RAM reserved for VMs

Virtuozzo
- OS Virtualization, Para Virtualized
- Guest OS must be based on primary OS
- VM’s created at the OS Level
Storage Options

- A bare metal server with any software you like (e.g. NFS, GPFS...)

- Object Storage
  - Based on OpenStack Swift + indexing & CDN integration

- QuantaStor Storage OS
  - SAN (iSCSI) and NAS (NFS) access
  - Advanced and easy to use web administration
  - Thin provisioning of storage volumes
  - Asynchronous replication of storage volumes
  - Dynamic expansion of storage pools
  - Software and hardware integrated – QuantaStor manages the RAID controller

- iSCSI SAN
  - Remote mounted, reliable, enterprise grade, fast, 1 TB or less

- NAS / FTP
  - Remote mounted, cost effective, reliable, 2 TB or less
Load Balancing Options

- **Global Load Balancing**
  - Distribute traffic between data centers
  - Configured instantly
  - Round robin, weighted round robin, geography, failover

- **Local Load Balancing**
  - Distribute traffic within a data center pod
  - Configured instantly
  - + lowest latency, least connections, shortest response, persistence IP

- **Citrix NetScaler VPS**
  - Maximum flexibility
  - L7 traffic management, SSL offloading..
  - Content caching, compression, firewall..
SoftLayer API at a glance

SoftLayer [main] API
- Version 3.0 API provides 2,200 function calls to over 180 services
- Supports REST, SOAP & XML-RPC interfaces
- Clients implemented in C#, Perl, PHP, Python, Ruby, VB .Net, command line Python client
- Is a major direct source of revenue
- Accessible from mobile devices as well

Object Store API:
- Based on OpenStack Swift
- REST-based
- Clients: Java, Ruby, PHP, Python
- Supports Containers and Objects
- Content Delivery Network integration
- Search integration

Message Queue API:
- REST-based
- 64k max
- Key/value pair message fields
- Clients: C#, Java, Ruby, PHP, Python
- Supports Topics, Topic Tags, Subscriptions
- Persistent via Cloudant data layer

Basic Concepts:
- Endpoint (public or private)
- Service (e.g. Account, Storage..)
- Method or Action (e.g. getUsers())
- Data Types (String, boolean, int and Complex)
- Properties (local, relational, count)
- Result limits (rows filtering)
- Object Masks (properties filtering)

To begin using the API:
- Enable the API use from Customer Portal
- Create unique secret API key
- Authentication based on user and API key
- Choose language client library
SoftLayer API: can I….?

Yes

- Use it to provision CCIs, bare metal instances, dedicated bare metal servers, storage, load balancers, manage DNS, network..
- Manage network devices through the entire connectivity chain, upstream or downstream
- Examine the capabilities, HW and component menus in any data center or pod
- Resize a Compute instance, upgrade or downgrade a dedicated server, replace a part, reload an OS, manage server lifecycle
- Obtain quotes for services or parts
- Manage my account, support tickets, events…
- Manage users in my account and their access to features, API calls (high granularity)
- Manage relationship with resellers, partners
- Manage shipments from / to the customer
- Manage the CDN, Object Store, Messaging Service, Transcoding Service..
- Have RightScale use the API to manage CloudLayer
- Re-skin my portal or implement a new one
- Purchase software licenses
Network Service Monitoring options

- Host Ping + IPMI Statistics (default)
- Email / Ticket notification (default)
- Automated Customer Notification (default)
- Host Ping + Services + IPMI Statistics ($5/server)
- Automated Reboot from Monitoring Failure ($5/server)
- 24 / 7 / 365 NOC Monitoring ($50/server)
Secure Multi-tenancy (SMS)

**Motivation:** A cloud consumer wants to deploy applications into an environment that meets the following criteria:
- Data isolation is managed relative to the environment
- The environment has the capability for controlled cross-tenant communications
- The environment may be defined with custom IP ranges.
- The environment can span multiple datacenters and have a single IP range span it.
- The environment can leverage cloud IaaS and PaaS services.

**Challenge:** If a cloud consumer wants to deploy a complex, highly available application from a template, into an isolated environment and leverage cloud services how can this be done?
- If the environment is not secure it will compromise the integrity of the application and the data
- If the environment can’t be standardized with custom IP addresses, then it will be difficult to replicate.
- If the environment can’t span datacenters, it is subject to single points of failure.
- If the environment can’t leverage cloud services, it won’t benefit from being in a cloud environment.

**Solution:**
- Define a SMS environment which is isolated through the use of custom configured gateways.
- Configure gateways in multiple datacenters to create L2 bridges.
- Allow access through the gateway to shared cloud services
- Deploy specialized IaaS and PaaS services within the SMS to support
  - Auto Scaling
  - Load Balancing
  - Storage Isolation
Auto-Scaling

• Motivation:
  • A cloud consumer wants to deploy a load balanced application and allow for dynamic, policy based elasticity of the deployed environment such that
  • New servers can be added to a load balancer
  • The environment should scale based on both schedule and performance policies.

• Challenge: How can a cloud service be defined that will allow for elasticity of load balanced environment, both within isolated SMS environments, as well as within regular environments
  • If the environment is not elastic the customer will be required to overprovision to meet peak demand or they will be under provisioned in times of excess demand
  • The consumer will lose business if not able to meet demand for their IT services.
  • If elasticity can not also be delivered to secure environment, the number of use cases for elasticity are limited.
  • If the solution is difficult to use, it will be rarely used.

• Solution:
  • Define an auto-scaling solution that will work in all cloud environments, including those in isolation.
  • Leverage Platform Cluster Manager Advanced Edition (PCMAE) to define and deploy applications which are capable of auto scaling.
  • Build an integrated solution with the IaaS cloud environment which simplifies the task of creating deployments capable of elasticity.
  • Integrate the solution with isolated SMS environments.