Competitive Landscape: Indian Utility Hosting and Cloud IaaS Providers

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We discuss various Indian utility hosting and cloud infrastructure as a service providers, the services they provide, the SLAs they commit to, their product and service offerings, and their future direction.

Key Findings

- Most IaaS and utility hosting providers in India have evolved from data co-location services, managed services and hosting, and are forging their identity as true IaaS providers. The distinctions among data center outsourcing, hosting and cloud IaaS continue to blur, as do the boundaries between customer needs, delivery models, providers and markets. The markets are distinct, but their services exist on a spectrum.

- Continuing with earlier data co-location services, many IaaS and utility hosting providers have options for dedicated equipment, especially for customers seeking dedicated and secure environments.

- Compared with all IaaS and utility hosting providers, Netmagic Solutions, Tata Communications, CtrlS Datacenters and Wipro provide a robust set of functionalities.

- Vendors like Tulip and Reliance are currently considered utility hosting providers. Some large, non-Indian multinational companies may lease space from players like Tulip and Reliance, and use it to provide offerings in India.

Recommendations

- Prices and offerings are likely to decline, with many more players expected to enter this market, especially in utility hosting. Providers should consider the value differentiators in their offerings as part of their strategy to sustain current pricing, or increase it.

- Providers (utility hosting and cloud IaaS) must invest in developing or buying integration tools that allow them to integrate management tools to manage client infrastructures — monitoring and capacity management are basic management needs, and present challenges to scale. A good example is Rackspace recently having reduced its prices by 33% in international markets. Indian service providers will soon do the same there.
- Wipro, Bharti Airtel and Reliance need to build in online provisioning capabilities, and to have dynamic billing features to qualify as cloud IaaS.
- Small or midsize businesses (SMBs) are the most likely to adopt public IaaS/utility hosting. Providers should consider preconfigured solutions for the SMB segment.
- In the long term, SLA adherence and service provider quality and support will determine total service costs, and the level of agility and elasticity end users can plan for in their infrastructures. Providers should ensure that they strictly follow the agreed-on SLAs.

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Analysis

Cloud infrastructure as a service (IaaS) in India is nascent, but evolving fast. Some established and large cloud IaaS players, such as Tata Communications, NTT Communications (with investments in Dimension Data and Netmagic Solutions) and CtrlS Datacenters, are evolving as major vendors,
with serious competition from utility hosting providers like Wipro, Reliance and Tulip. We provide guidance for the tough task of choosing from these vendors and services.

Cloud IaaS is the computing in cloud computing, providing computing, security, storage and network resources in an elastic, pay-as-you-go manner. Cloud IaaS often is self-service, and the customer service portal is a key piece of its functionality (see "How to Build an Enterprise Cloud Service Architecture"). Customer support, managed services and professional services are still important to many customers, and cloud IaaS providers differentiate themselves based on the quality of their service and support. Buyers must pay close attention to these aspects, as they are among the most significant contributors to solution costs and agility. IaaS comprises four key services: computing, security, storage and network. Most IaaS and utility hosting service providers provide disaster recovery (DR) and backup as services that can be used as add-ons to or extensions of storage services. But many customers want to use only backup as a service, or DR as a service. Thus, some service providers (especially for utility hosting) have tried to strategically position themselves only in the backup or DR-as-a-service space. Some customers have only DR or backup-as-a-service requirements, so many players, such as CtrlS Datacenters, position themselves as DR or backup service providers. Typically, such service providers can't be defined as IaaS service providers based only on these features.

Most cloud IaaS and utility hosting service providers provide these features, with some vendors specializing in certain capabilities (see "A Market Map and Compass to Drive Your Enterprise Data Center Managed Service Business"). At a broad level, there are two kinds of service providers:

- **Cloud IaaS**: Netmagic Solutions, Tata Communications and CtrlS Datacenters are in this category, with clearly defined offerings in computing, network and storage. They have good user self-service tools, with billings based on actual usage.

- **Utility**: These providers have graduated from data co-location managed services to providing most cloud IaaS services, except key elements such as user self-service and automatic usage-based billing. These vendors have moved into this space by buying data centers, or by building their own, as have Wipro, Tulip and Reliance.

For more information, see "Competitive Landscape: New Entrants to the Cloud IaaS Market Face Tough Competitive Challenges." In the context of this research, cloud IaaS specifically refers to:

- **Public cloud IaaS or cloud IaaS**: This is a standardized, highly automated and massively multitenant offering where computing resources, complemented by storage and networking capabilities, are owned and hosted by a service provider, and are offered to the customer on demand. The customer can self-provision this infrastructure using a Web-based graphical user interface (GUI) that serves as an IT operations management (ITOM) console for the overall environment; API access to the infrastructure may be offered optionally as well. Managed services are optional.

- **Utility hosting**: These providers have many of the same features as public cloud IaaS providers, but still lack some key elements. They might be multitenant to some extent, with identical offerings for many customers, but customization can be provided at an extra cost. There is no self-provisioning feature for the customer, and billing is monthly, based on predefined criteria that are not necessarily usage based. Management of the infrastructure can
be by the service provider or the user. Virtual private cloud environments are common in such scenarios.

- **"Cookie-cutter" hosted private cloud IaaS:** This is exactly like public cloud IaaS, but instead of being massively multitenant, it is single tenant. This offering is identical for each customer, except for different capacity pool sizes, and the provider manages all the private clouds in a unified way.

We believe that, in the long term, public cloud IaaS, utility hosting and cookie-cutter hosted private cloud IaaS will be fully convergent. The difference among these offerings is their shared tenancy, and the extent to which users can provision and provide capacity for themselves, along with billing methodology, whether based on real-time usage, or on hard-capacity allocations. It’s possible to offer a unified capacity pool of resources, and to allow an individual resource to be dynamically provisioned as a single tenant or as multitenant. Some providers already do this, and we believe this model is the future of the market, as it offers the greatest economies of scale.

### Competitive Situation and Trends

Cloud IaaS in India has been a slow and evolving market, with service providers and consumers taking one small step at a time and testing different offerings, watching how the market and competition react, then moving with suitable offerings for the expected market needs. Thus, utility hosting is logically more prevalent and accepted than cloud IaaS. We outline the key competitive forces, drivers and inhibitors influencing this market.

#### Few Cloud IaaS Providers Exist in India

Few players qualify as cloud IaaS, per Gartner’s definition, wherein real-time elasticity, agility, pay as you go and self-service are key. Most so-called cloud IaaS service providers in India (except Netmagic, Tata and CtrlS) are utility hosting providers with no self-service portal, and with customers billed monthly or quarterly based on their monthly or quarterly usage, which is mostly configured once or twice a month, meaning that the providers offer no real-time elasticity and agility. However, most service providers, such as Wipro, Bharti Airtel and Sify, could graduate from utility hosting to become cloud IaaS by providing a real-time, elastic infrastructure, along with billing and customer self-service portals. Sify recently launched its user provisioning tool, and Dimension Data has acquired a user provisioning capability by acquiring OpSource in 2011.

### Market Players

#### Providers May Use Cloud IaaS Only in the Context of Managed Hosting

Many service providers with a background in Web hosting see a move into the cloud as largely defensive. Today, most revenue in the cloud IaaS market comes from customers who would have used co-location, dedicated hosting or managed hosting (either on dedicated servers or on utility hosting platforms) if cloud IaaS had not been available. Thus, few players in India have become full cloud IaaS providers, but have moved a step closer, which is utility hosting. For many service providers, cloud IaaS primarily exists for utility hosting, mixing dedicated servers and on-demand
virtual machines (VMs) for dynamic scalability. Some providers already have a utility hosting platform — a multitenant, virtualized, scalable and on-demand platform, but without self-service. Many continue to be more comfortable using this platform for hybrid hosting, as a cloud IaaS offering that does not allow customers to use self-service constitutes a less-controlled environment. For more details, see "Competitive Landscape: New Entrants to the Cloud IaaS Market Face Tough Competitive Challenges."

Some Providers Have Created a Distinct Brand Value

Tata Communications has always had an advantage in brand recognition, as it acquired Videsh Sanchar Nigam (VSNL). Netmagic has built a separate brand for itself by having some good business cases to showcase. Tata Communications, with its InstaCompute cloud solution, and Netmagic Solutions, with its SimpliCloud public cloud computing offering, provide user-driven, real-time infrastructure provisioning that help create a distinct value proposition. Companies like CtrlS have created a unique space as DR service providers with exclusive DR offerings.

The Future of Competition

There are currently three IaaS service providers in India, but the numbers will increase. Many utility hosting providers are expected to become cloud IaaS providers, and competition in this space is likely to intensify in the near future with many providers joining the fray. Wipro, Bharti Airtel and Sify have the potential to provide serious competition for current leaders such as CtrlS Datacenters, Netmagic Solutions and Tata Communications. As a result, the leaders are likely to offer new features and better support to augment their position.

Many hardware vendors like SIS could go into utility hosting, then cloud IaaS. Such vendors are waiting for the market to mature before making a major move. The ROI for newer vendors will be hard to achieve, and in the next two to three years there is a strong possibility of consolidation and mergers. The demand for public data center space, hosting services and IaaS services seems much lower than the supply in the same period. Since this is a capital-intensive industry, many vendors have invested large amounts of money. But since the industry initially had few customers, and since many vendors seemed to offer similar solutions, profit margins are under pressure. Vendors seek to gain economies of scale and deploy cost management, monitoring and processes that include better management of applications, hardware, and power and cooling systems. This will lead some cookie-cutter/utility hosting vendors to consider buyout offers from large, external vendors, such as Amazon, Rackspace, Google and HP. Netmagic Solutions and Dimension Data are expected to consolidate and reduce the redundancy in their offerings.

Building an Offering Can Be Unexpectedly Difficult and Expensive

Providers frequently underestimate how hard it is to build even a basic cloud IaaS offering. Although a number of vendors promise turnkey cloud offerings targeted at service providers — notably VMware, CloudStack and OpenStack (an open-source project) — such cloud stacks generally include only baseline functionality. Vendors considering entering this market frequently underestimate the integration effort necessary to adopt tools, and the development they must do to supply functionality that can’t be bought off the shelf. Automating the provisioning of VMs and
storage with cloud stack or homegrown tools is usually straightforward (see "Competitive Landscape: New Entrants to the Cloud IaaS Market Face Tough Competitive Challenges").

**Chargeback and Effective Capacity Management Still Face Challenges**

Performing hardware provisioning of switches (for customer virtual LANs), firewalls, application delivery controllers (often thought of simply as load balancers) and other network equipment often requires significant additional development work and investment in management tools. Providers also need to develop or buy and integrate tools that allow them to manage their infrastructures — monitoring and capacity management are only basic management needs, and present significant challenges when they scale. Successfully creating these offerings requires system engineering capabilities and software development skills. Many vendors entering this market do not have significant competency in software development or outside internal enterprise applications, and consequently are unprepared to do this work. The difficulty of just delivering a bare-bones service leads to a market filled with undifferentiated offerings that have only minimal capabilities, and this situation is worsening as more new entrants launch their offerings.

The challenges of building an excellent service that will scale and can support future customer needs, coupled with the rapid evolution of relevant technology, have led many providers with a longer history in the market to migrate from their original platforms to a wholly new implementation using the hard-won lessons of their initial attempts. Such efforts can rapidly change a provider’s competitive positioning.

**SLAs in the Cloud**

SLAs and metrics are critical areas that substantially differentiate the quality of service provider offerings. Other factors are interoperability of IaaS stacks, expertise in core areas such as DR and backup, and providing on-the-fly computing (see "Cloud IaaS: Service-Level Agreements"). Gartner evaluates SLAs based on four parameters: calculation method, actual SLA received by the customer, the provider’s track record and penalties for SLA violations. The irony in India is that most SLA-related vendor promises are similar, with no clear differentiation. The penalties, also similar, in credit points. "Evaluation Criteria for Public Cloud IaaS Providers" provides details on the nuances of SLAs, and how to differentiate among the different services. For details on calculation methods, outage length and penalties, see "Cloud IaaS: Service-Level Agreements."

**Competitive Profiles**

Table 1 provides a snapshot of IaaS revenue by vertical industry.
Table 1. IaaS Revenue by Vertical Industry

<table>
<thead>
<tr>
<th>Category</th>
<th>CtrlS Datacenters</th>
<th>Dimension Data</th>
<th>Netmagic Solutions</th>
<th>Reliance</th>
<th>Sify</th>
<th>Tata Communications</th>
<th>Wipro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking and Securities</td>
<td>16%</td>
<td>83%</td>
<td>18%</td>
<td>10%</td>
<td>16%</td>
<td>NA</td>
<td>16%</td>
</tr>
<tr>
<td>Communication, Media and Services</td>
<td>6%</td>
<td>-</td>
<td>20%</td>
<td>25%</td>
<td>19%</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Education</td>
<td>4.6%</td>
<td>-</td>
<td>3%</td>
<td>3%</td>
<td>NA</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>14%</td>
<td>11%</td>
<td>1%</td>
<td>10%</td>
<td>10%</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Healthcare Providers</td>
<td>2%</td>
<td>-</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>NA</td>
<td>5%</td>
</tr>
<tr>
<td>Insurance</td>
<td>4%</td>
<td>-</td>
<td>5%</td>
<td>20%</td>
<td>-</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Manufacturing and Natural Resources</td>
<td>20%</td>
<td>-</td>
<td>9%</td>
<td>15%</td>
<td>9%</td>
<td>NA</td>
<td>62%</td>
</tr>
<tr>
<td>Retail</td>
<td>0.5%</td>
<td>-</td>
<td>18%</td>
<td>5%</td>
<td>7%</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Transportation</td>
<td>6.1%</td>
<td>-</td>
<td>5%</td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Utilities</td>
<td>-</td>
<td>6%</td>
<td>3%</td>
<td>10%</td>
<td>-</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>0.55%</td>
<td>-</td>
<td>8%</td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Travel</td>
<td>3%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>IT and IT-Enabled Services (ITES)</td>
<td>17%</td>
<td>-</td>
<td>5%</td>
<td>-</td>
<td>28%</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Media</td>
<td>6.25%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6%</td>
<td>NA</td>
<td>9%</td>
</tr>
</tbody>
</table>

NA = data not available, and dashes mean that the vendor does not have an offering in this vertical industry

Source: Gartner (August 2012)
Table 2 provides a snapshot of the vendor services provided.
Table 2. Services Provided

<table>
<thead>
<tr>
<th>Service</th>
<th>CtrlS Datacenters</th>
<th>Dimension Data</th>
<th>Netmagic Solutions</th>
<th>Reliance</th>
<th>Sify</th>
<th>Tata Communications</th>
<th>Wipro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computing</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Backup</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>DR</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>NA</td>
<td>A</td>
</tr>
<tr>
<td>Storage</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Network</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>NA</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Security</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>NA</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Videoconferencing</td>
<td>NA</td>
<td>A</td>
<td>NA</td>
<td>NA</td>
<td>A</td>
<td>A</td>
<td>NA</td>
</tr>
<tr>
<td>User Self-Service Portal</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>NA</td>
<td>NA</td>
<td>A</td>
<td>NA</td>
</tr>
</tbody>
</table>

A = available and NA = not available

Source: Gartner (August 2012)
CtrlS Datacenters

CtrlS Datacenters is a Tier 4 data center promoted by the $20 billion, New York Stock Exchange-listed Och-Ziff Capital and Pioneer Group. Companies use CtrlS Cloud to operate cloud computing platforms, deliver infrastructure-on-demand services to customers, provide automatic scaling for applications and explore the cloud computing benefits in the enterprise. CtrlS Data Assurance allows companies to do online data backup. It provides an on-demand backup solution to protect data from contingencies such as file corruption, accidental deletion and hardware failure. CtrlS caters to enterprise and SMB markets, with enterprises as 67% of its clientele.

Market Overview and Revenue

CtrlS has four major offerings: Cloud Virtual Private Server (VPS), Real Cloud, Enterprise MyCloud, and Private Cloud. Real Cloud is targeted for independent software vendors (ISVs), application developers, resellers and white label resellers. Enterprise MyCloud is targeted to large enterprises and IT companies. CtrlS DR positions its on-demand concept for organizations that do not want to incur an initial capital expenditure (capex) for setting up a DR facility. CtrlS DR on Demand has these steps:

- Create the DR architecture per the business requirements.
- Do the initial setup.
- Set up the replication recovery point objective (RPO) — the maximum allowable time frame in which data might be lost.
- Take ownership of DR marshalling for the recovery time objective (RTO) — the time frame within which services should be restored to the desired levels.
- Restore the primary site when it's available.

CtrlS in India is spread across vertical markets such as banking, communication media and services, government, insurance, manufacturing and transportation.

General Product/Service Marketing Strategy

CtrlS has positioned itself as an on-demand infrastructure provider. It has two categories of offerings:

- A dedicated private infrastructure, such as Dedicated Servers, CtrlS DR on Demand and Private Clouds
- A shared infrastructure, such as the VPS and Real Cloud

How This Provider Competes

CtrlS advocates the need for the customer to scale up resources on demand on layers, including security, computing, software and storage. The products that address these are Dedicated Servers,
CtrlS DR on Demand and Private Clouds. CtrlS also has products for the shared infrastructure, such as VPS and Real Cloud.

**Observations and Recommendations:** CtrlS is relatively new, but has developed into a key player in this market. It has developed a good user provisioning tool that allows users to buy capacity on the fly with a credit card, and to provision the desired environment for a specific time period, whether hours or days or months. Various payment options besides credit cards are available, including demand drafts and checks. CtrlS positions itself as a Tier 4 data center with DR as a service, which is a good strategy to gain customer mind share. But it also needs to market its entire portfolio as vigorously as its DR offerings, since customers are not aware of all the offerings. CtrlS has moved from being a utility hosting provider to a cloud IaaS provider, offering serious competition to Tata Communications and Netmagic Solutions.

**Pricing:** Pricing varies with the different offerings based on the duration of the requisition, the type of environment requested, the access level and type of security (hardware based or software enabled), and the level of complexity required. CtrlS Cloud VPS is an online tool wherein users can requisition the desired environment, and get specific pricing details. For example, a Basic VPS environment with a single-core processor and 512MB of RAM would cost $38 a month. Add-ons can be requisitioned on top of this offering. Similarly, users also can choose from different offerings in Real Cloud, and get the required pricing on the website. Customers can pay by credit card, demand draft and check.

**Certifications:** CtrlS is certified for International Organization for Standardization (ISO) 27001 security and ISO 20000-1 service delivery, as well as BSI BS25999 for business continuity. CtrlS also is a certified Tier 4 vendor under Telecommunications Industry Association (TIA) 942 for its Hyderabad and Navi Mumbai facilities.

**SLAs:** Since CtrlS has a Tier 4 data center, it ensures customers of 99.995% uptime availability of the infrastructure, including power and cooling. The hardware uptime SLA is four hours resolution from detection of the hardware problem by the service provider’s help desk or the customer. If CtrlS fails to provide the customer with the services required, a failure resulting from the complete unavailability of the service provider network is treated as a qualified network downtime event, for which the service provider issues the customer a service credit. If outages exceed total uptime hours, service credits are given as follows:

- More than or equal to 99.995% — no credits
- From 99.995% to less than 99.00% — two days’ equivalent service credit for the service period affected, calculated on a prorated basis
- From 99.00% to less than 98.00% — seven days’ equivalent service credit for the service period affected, calculated on a prorated basis
- From 98% — 15 days’ equivalent service credit for the service period affected, calculated on a prorated basis
- Calculation of actual uptime percentage — total uptime hours minus actual uptime times 100 equal total uptime hours
The SLAs are confusing. However, since CtrlS is a Tier 4 certified vendor, it is in a better position to provide 99.995% uptime. The real test of the SLAs comes when there is an outage, and customers report the actual recovery duration and service they received during and after it. Until then, we note these figures as reported.

Elements to Consider

Strengths

- CtrlS is the only service provider to position itself as a DR-as-a-service provider.
- It can provide services from cookie-cutter to utility hosting and cloud IaaS, so its range is vast.
- The management focus is strong, making the company reliable in the long term.

Cautions

- CtrlS must concentrate on brand building, and on communicating its core capabilities and facilities. Customers currently have varied perceptions about the company.
- At face value, the pricing appears confusing. However, the company’s website offers a clear and transparent pricing structure for all services requisitioned.

Dimension Data

Dimension Data (now part of NTT Group), operates over 60 offices across 13 Asia/Pacific countries. Dimension Data helps clients plan, build, support, manage, improve and innovate their information and communication technology (ICT) infrastructures. It combines expertise in networking, security, data center solutions, Microsoft solutions, and converged communication and contact center technologies with advanced skills in consulting, integration, training and managed services to design ICT solutions to accelerate the business goals of its clients.

Market Overview and Revenue

BSNL and Dimension Data have teamed up to launch dedicated Internet data centers across India to help enterprises leverage the power of cloud computing. Managed by Dimension Data, these facilities feature higher capacities for future expansions with optimal power, cooling and IT infrastructure performance. Dimension Data uses six data centers (Mumbai, Ahmedabad, Jaipur, Ghaziabad, Faridabad and Ludhiana) to provide its cloud offerings. The IaaS offering provides cloud-based computing and storage services. The computing services (processing and memory) are bundled together, and are offered across four key service packages:

- Express Package — one virtual CPU (vCPU)/core with 2GB RAM
- Standard Package — two vCPUs/cores with 4GB RAM
- Growth Package — four vCPUs/cores with 8GB RAM
Power Package — eight vCPUs/cores with 16GB RAM

Apart from IaaS (computing and storage), customers also have the option to purchase a shared firewall, shared load balancers on an operating expenditure (opex) model and related managed services to support IaaS subscriptions. Customers can also choose high availability (HA), backup and restore, and DR services for IaaS offerings by subscribing to the additional service. Ninety-four percent of Dimension Data’s IaaS revenue comes from the banking and government sectors.

General Product/Service Marketing Strategy

Dimension Data’s public computing-as-a-service offering includes:

- Cloud Servers: Built on VMware’s vSphere hypervisor.
- Cloud Files: An API-based storage solution that allows storage and retrieval of data from anywhere with Internet connectivity. The files are stored in an encrypted format, and are accessible via Secure Sockets Layer (SSL)-encrypted API calls.
- Cloud Software: Commercial software loaded onto a cloud server as an OS image that incurs additional charges when deployed as a server.

How This Provider Competes

The competitive positioning of Dimension Data hinges on these tactics:

- Segmentation: To understand and provide the right services in some large vertical industries, such as government, public sectors and related markets.
- Alignment and development of joint business plans: To differentiate its joint partnership/brand in a collaborative way to drive mutual success.
- Go to market using BSNL, Dimension Data and vendor pursuit teams: Combine operations support and service-level guarantees from Dimension Data to drive profitable business growth and client satisfaction.

Observations and Recommendations: Dimension Data is known in the market as a storage infrastructure provider with a strong presence in the government sector. This may be due to its relationship with BSNL. The Vblock stack used by Dimension Data for its offerings, along with a strong HA and DR offering, ideally positions it as a good storage and backup vendor. But this is not a cloud service in the true sense of the term, and is really an infrastructure offering. For Dimension Data to move to the next level of providing actual cloud services, it must team up with Netmagic, as both are part of NTT and have integrated synergies in their offerings.

Pricing: Pricing is based on capacity purchased, which is based on different packages. This way of selling capacity also makes the company an infrastructure player, not a true cloud vendor. For any prepackaged bundle, customers have the option to buy additional RAM in 2GB increments. For storage requirements, customers can purchase 50GB (as a minimum) to start with, and can increase in increments of 50GB. Additional discounted pricing is available for these packages:
- 100GB to 250GB
- 250GB to 500GB
- 500GB to 1,000GB
- 1,000GB and up

**Certifications:** Dimension Data has Statements on Standards for Attestation Engagements (SSAE) 16/International Standard on Assurance Engagements (ISAE) 3402 and ISO 27001 certifications.

**SLAs:** Dimension Data guarantees 99.982% uptime.

**Elements to Consider**

**Strengths**

- The company has a strong partnership with BSNL, which will help it focus on government and public-sector organizations.
- NTT support and future alliances with strong sister companies like Netmagic Solutions give Data Dimension a solid road map and direction.
- A sustained brand-building exercise has paid off with good brand awareness among IT organizations.

**Cautions**

- More clarity is required on pricing.
- There is no user-based online provisioning, management and on-the-fly infrastructure requisition, acquisition, and start and stop features, making the company a hybrid cookie-cutter cloud and IaaS provider.
- It will be important to see whether Dimension Data and Netmagic work together, or whether they will they cannibalize each other’s offerings. The companies should develop a common portfolio, and should seek opportunities to work together.

**Netmagic Solutions**

Netmagic Solutions has more than 1,200 customers and a presence in most vertical industries, mostly in banking, financial security and insurance (BFSI), communication, media and retail. With over 550 employees and revenue growth of almost 50%, the company has a strong presence in the Indian market. However, Netmagic does not offer desktop management services, and concentrates on the data center. It not only has a strong presence in the IaaS market, but also hosts some well-known Indian online stores like Flipkart.com, and Hungama.com. Until a few years ago, Netmagic was not well-known in the Indian market, as it did not focus as much on marketing and advertising.
However, over the past couple of years, it has concentrated on marketing, which has led to greater recognition by Indian customers.

Market Overview and Revenue

Netmagic Solutions (now part of NTT Group) operates seven data centers across India (in Mumbai, Chennai, Noida and Bangalore). It provides services such as co-location, managed hosting, application hosting, DR and the cloud to more than 1,200 customers.

General Product/Service Marketing Strategy

Netmagic’s cloud services offer customers an enterprise-grade cloud infrastructure. They can choose from Netmagic’s SimpliCloud public cloud platform, which offers real-time IaaS services in a pay-per-use model, a private cloud or a hybrid cloud model, depending on business and/or technical requirements.

SimpliCloud is based on a technology combination comprising VMware ESX, Cisco Unified Computing Systems (UCS) blades, and EMC and NetApp storage. Customers have access to self-provisioning and management tools that allow them to create, modify and delete instances within minutes. Customers also can choose to pay by the hour or the month, and can select from a wide spectrum of managed services. SimpliCloud is available on a fixed-price and an elastic-price basis. The fixed plan is ideal for steady or constant consumption rates and monthly billing. Customers can choose from two availability zones/grids — Noida and Chennai.

How This Provider Competes

Netmagic, like its competitors, has developed a methodology that helps organizations move data from traditional data centers to a virtual private cloud, or a hybrid cloud wherein some infrastructure is consumed from the Netmagic public cloud. Netmagic doesn’t usually use the services of a third-party cloud services provider to analyze and help move infrastructure onto the cloud, but does the analysis and movement on its own. It also has services to manage and maintain other applications (if required) so that it can provide value-added services on top of IaaS. This makes life easier for end customers, as they don’t see Netmagic just as an IaaS or a data co-location partner, but as a service provider offering varied services, including hosting, managed services, application and infrastructure management and monitoring, network services and cloud-based services.

Observations and Recommendations: For customers that want to start with a private cloud environment hosted outside their premises and substantial control over that environment, Netmagic is a good option. If a customer plans to have a hybrid cloud offering in the long term, Netmagic is a good choice that enables the customer to start with a private cloud hosted at Netmagic, then consumer services from the SimpliCloud offering, which is a public cloud.

Pricing: A typical large pack per the fixed plan would cost almost $190 a month. This pack includes four vCPUs, 4GB of RAM, 40GB of storage space and 40GB of bandwidth. The OS has options of Windows 2003 Standard or Enterprise, Red Hat Enterprise Linux (RHEL), Ubuntu, SUSE and Debian. Similarly, a small pack would cost approximately $70 a month. This includes one vCPU (a maximum of two vCPUs), 1GB of RAM, 40GB of storage and 40GB of bandwidth.
The fixed and elastic plans are customizable, which means more CPU, RAM, disk and bandwidth can be added to an existing instance at any time. SimpliCloud Elastic is an ideal solution for situations with a lot of fluctuation expected, even in one day. Users pay on an hourly basis, along with a fixed fee for persistent storage. A typical large pack in the Elastic solution costs about $0.30 per hour, and includes four vCPUs, 4GB of RAM and 40GB of storage.

**Certifications:** Netmagic data centers are ISO 27001, ISO 9001:2008 and ISO 20000 certified.

**SLAs:** Netmagic warrants 99.99% uptime on customer cloud server instances over a calendar month of usage. Server instance availability is 100 times the total minutes per month of unscheduled downtime minutes, divided by the total minutes of use per month. If Netmagic fails to maintain availability in any calendar month of the service term due to any act or omission on the part of Netmagic, the customer is entitled to receive a credit against the monthly recurring charge as set in the online order and reflected in the invoice for the service. A service credit will only be given with respect to the impacted cloud server instance, and only if the monthly recurring charge has been paid for that month. Service credits are noncumulative, and cannot be carried or accumulated on a month-by-month basis. Table 3 shows the service credits.

<table>
<thead>
<tr>
<th>Power Supply/Network Availability</th>
<th>Service Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>99.99% to 99.95%</td>
<td>No credit</td>
</tr>
<tr>
<td>99.94% to 99.90%</td>
<td>2% of monthly recurring charge</td>
</tr>
<tr>
<td>99.89% to 99.80%</td>
<td>5% of monthly recurring charge</td>
</tr>
<tr>
<td>99.79% to 99.70%</td>
<td>10% of monthly recurring charge</td>
</tr>
</tbody>
</table>

*Source: Gartner (August 2012)*

**Elements to Consider**

**Strengths**

- Netmagic is a well-known brand in data center co-location, managed hosting and cloud IaaS.
- The company has some well-known customers and case studies, making it a promising partner.
- Management is focused on building a strong cloud IaaS offering in India, and is putting a lot of effort into building brand awareness and creating visibility.

**Cautions**

- Some customers will opt to wait for effective resolutions to major issues before they will believe in the brand, and will thus wait to purchase.
- Various providers that lack a full cloud offering are virtualizing physical servers, and are selling end-product virtual servers as cloud offerings. These providers lack essential cloud features, such as self-provisioning, on-demand billing, hourly usage and the ability to stop, start, create and manage the cloud anywhere, anytime. While most customers appreciate the differences between cloud and utility hosting, Netmagic, although different from other vendors, must make an effort to educate certain customers about these differences so that they make the right decision.

- Customers with large requirements usually seek dedicated hosting contracts, because they can amortize dedicated hardware over a longer contract term. With this approach, it’s possible for physical dedicated servers to negate the price advantage of the cloud under certain circumstances.

Reliance

Reliance is a leading, integrated telecom company in India, with over 150 million customers. It provides a complete range of telecom services covering mobile and fixed-line telephony. It also includes broadband, national and international long-distance and data services, and a vast range of value-added services and applications. The company has nine data centers across India. They are located in Mumbai, Bangalore, Chennai and Hyderabad. All are Level 3 data centers.

Market Overview and Revenue

Reliance Internet Data Centers (IDC) offers standard and advanced managed hosting services. The services range from offering a bulk co-location space to fully managed hosting of servers on rent/lease models. A range of managed, value-added services is offered, such as firewalls, intrusion detection, backup, streaming, mailing, system administration, database administration, load balancing, storage services and DR/business continuity planning (BCP) solutions. Reliance IDC has over 100 IaaS clients spread across vertical industries, with 25% of its IaaS clients in communications, media and services.

General Product/Service Marketing Strategy

Reliance’s cloud computing services involve central computing and a data storage IT infrastructure at its data center, and are offered to end customers via the Internet on a dedicated/shared/virtual, pay-per-usage model.

Virtual Host is a dedicated offering from Reliance for clients that do not want a shared infrastructure. Virtual Host provides the features of a hosting environment, such as security, data transfers, data backup, enterprise storage and an OS with hardening bundled with a virtual server using server virtualization on a cloud computing platform.

How This Provider Competes

Reliance sells using a direct sales team in India, which has about 500 people. It also sells through channel partners, and currently has about 600. Reliance also jointly goes to market with partners like Microsoft.
Observations and Recommendations: Reliance is still considered a telecom vendor with some large data centers. It is perceived to provide space for hosting infrastructures and applications, and has great potential to become a cloud IaaS provider, though it is not there yet. Most of its standard packages, from which consumers can pick and choose, are set up like the data plans customers choose for telecom/mobile services. This is expected from a telecom vendor, but these services cannot be considered cloud services. They are catalog utility services that consumers can purchase, but they can’t dynamically create and provision solutions on a real-time basis.

Pricing: IaaS pricing is pay per use. There are different packages for different IaaS products, ranging from Basic, Value and Advanced to Enterprise. One major difference between Basic and Enterprise is the shared CPU, which is a single core for all offerings except Enterprise, which is a dual core. Another major difference is in server storage space. All offerings are based on Hyper-V, and come with Microsoft SQL Web and Workgroup packages. The Advanced and Enterprise packages also come with MS SQL Database 2005 Standard version. HA is a standard feature in all packages except Basic.

Certifications: Reliance is certified for ISO 20000 (IT service management [ITSM]) and ISO 27001.

SLAs: It is difficult to classify and quantify whether the SLAs are sufficient, as we have not seen a key differentiation between the services offered by Reliance and those of other vendors. Reliance has an SLA of 99.96% uptime. Availability of the infrastructure below this level is considered a failure. Such failures are compensated for as service credits.

Elements to Consider

Strengths

- Reliance has a well-known brand, so customers perceive it as trustworthy.

- It can be included in the list of vendors for those with plans to move to a one-stop shop for all telecom requirements, as it owns the entire end-to-end architecture, including access systems, the national fiber-optic backbone, international cable systems, Internet gateways and nearly 240,000 square feet of data center space.

- Reliance’s Storage on Demand service is well-accepted, as it offers unified storage (network-attached storage [NAS], a storage area network [SAN] and Internet Small Computer System Interface [iSCSI]) on a utility-based model (storage space when required) to enterprises hosting mission-critical applications/databases.

Cautions

- There are no user-based online provisioning, management or on-the-fly infrastructure requisition, acquisition, starting and stopping features, so this is a hybrid cookie-cutter cloud and IaaS provider.

- The relationship between the cloud IaaS offering and pricing is confusing.
Sify

Sify is one of the largest managed enterprise, network and IT service companies in India, offering end-to-end solutions with a good range of products delivered over a common telecom data network infrastructure reaching more than 710 cities and towns. With four Tier 3 data centers and a combined floor space of over 90,000 square feet across the country, Sify is one of India’s oldest network and connectivity service providers, and has been an early mover in the data center and IaaS space.

Market Overview and Revenue

Most of Sify’s customer base comes from the IT, ITES and BFSI service sectors. Computing, infrastructure management services and backup form a major portion of the company’s IaaS services. Sify has more than 180 IaaS-specific customers across the strategic and emerging enterprise that are managed by a dedicated team of professional service consultants.

General Product/Service Marketing Strategy

The Sify cloud IaaS comes in three variants — public (ExpressCloud), private (PrivateCloud), and a combination of public and private (HybridCloud). Sify IaaS has ready-to-use packages for simple one- and two-server Web application environments. The offering is available as a virtual private server, which is a ready-to-use, bundled IT infrastructure package for Internet-based application hosting on a secure multitenant, enterprise-grade environment backed by stringent service-level guarantees. The virtual private server comes bundled with Internet, security (firewall), network design, DNS and Internet Protocol (IP). Scale-up vCPU, RAM and bandwidth are available for customers.

As of now, Sify does not have a Web-based user provisioning of infrastructure, but the Sify Enterprise portal allows customers to manage and control their setup online.

How This Provider Competes

Sify is one of the leading Internet infrastructure providers in India, and has moved into the collocation and data center space. It has created a footprint in the cloud services space, and recently launched an online cloud services provisioning tool. The company has specific geographic and vertical teams that have helped develop a local presence in many large Indian markets. Sify has a strong presence in the banking and ITES industries, which it can leverage to provide cloud-based services.

Observations and Recommendations: Sify’s current offering is more like a hosted infrastructure, with some prepackaged offerings in the form of ExpressCloud and PrivateCloud. Although Sify calls these cloud offerings, it is a utility hosting provider. Real-time requisitioning of extra capacity and space is a challenge. Sify’s offerings can be used for virtual private infrastructure capabilities, or for basic public cloud offerings.

Pricing: Cloudinfinit Service is available from one vCPU/1GB of RAM on per hour, month and year (on a multiyear contract) basis. The infinitStorage Service is available on per-GB, per-month basis.
DR as a service is available in a per-protected-node and a per-usage mode. A persistent fee for storage and other components is charged on monthly basis. Desktop as a service is available per virtual desktop per month, which includes the infrastructure, licenses, support, management and network components.


**SLAs:** Sify provides differentiated (based on the services chosen) SLAs, from 99.95% to 99.99%, on a monthly basis. It notes in its SLA a minimum outage time of 4.32 minutes, and customers can obtain 24/7 support facilities, if required.

**Elements to Consider**

**Strengths**

- Sify is one of the oldest brands in India in the ICT space.
- Many customers across various vertical markets are potential targets for the company’s cloud IaaS offerings.
- Sify has a regional sales team that focuses on various regions, providing good coverage across the country.

**Cautions**

- There is too much focus on other businesses, such as connectivity, networking, application development and co-location.
- Sify must establish itself as a credible cloud IaaS provider, rather than a service provider that does a bit of everything.
- The company needs better internal process, service and support capabilities to provide less expensive and better market offerings.

**Tata Communications**

Tata Communications has headquarters in Mumbai, and data centers in Hyderabad, India, and Singapore. It was formed when the Tata Group acquired VSNL from the Indian government. Tata Communications has the unique distinction of having its own submarine cable, a Tier 1 IP network, connectivity to more than 200 countries across 400 points of presence (POPs), and nearly 1 million square feet of data center and co-location space worldwide.

**Market Overview and Revenue**

Tata Communications has reported (see Tata Communications Q2 Consolidated EBITDA up 60%) consolidated financial results according to Indian generally accepted accounting principles (GAAP).
Gross revenue was at $738 million for the quarter ending on 30 September 2011, compared with $637 million for the corresponding quarter in the prior year. Operating profit grew 60%, to $105 million, for the quarter ending on 30 September 2011, compared with $64 million in the corresponding quarter of the prior year. The company has around 7,770 employees.

Tata’s IaaS cloud offering is InstaCompute, and its software as a service (SaaS) offerings are InstaOffice and InstaContactCenter. InstaCompute is a self-service, on-demand and portal-based offering that can be used to requisition test and development environments, and to host Web services and single applications.

**General Product/Service Marketing Strategy**

Tata Communications offers free trials for customers that want to try the solution before buying it. Customers get 30 days or approximately $40 (whichever comes first) to try the service. This gives the provider an edge, since people can experience the service before committing to purchase it.

InstaCompute provides an HTTP query-based API that allows its administrator and users to access the various features supported by the management server. It provides network management tools via the online management portal to help customers configure remote access to their VMs. Internet access to InstaCompute is via any standard ISP. For even more secure connectivity, Tata Communications’ Multiprotocol Label Switching (MPLS) customers can bypass the Internet. InstaCompute uses the Citrix XenServer hypervisor. Also, InstaCompute service administrators can control and secure customer data via user accounts, passwords and the virtual host ID. The InstaCompute portal is protected with dual-layer Cisco Adaptive Security Appliances (ASA) firewalls configured in an active/active pair in the infrastructure, and operated in routed mode. Through the included firewall configuration tools, InstaCompute users can add rules to allow specific traffic to their VMs and acquired public IP addresses. All traffic is blocked by default, which means users must configure traffic to meet their individual security needs. InstaCompute is provided from Tata Communications’ Tier 3 data centers, built to security standards (ISO 20000, ISO 27001 and TIA 942), including multilevel physical security that ensures access to the infrastructure environment and the sensitive data residing within. It is restricted to authorized people only, and is safe from damage and natural disaster.

**How This Provider Competes**

The InstaCompute IaaS service offers a public cloud solution that provides virtual servers in a multitenant environment. Access is via the Internet or private network (available to MPLS customers). Bridging of InstaCompute with a customer’s MPLS service is offered free of charge.

**Observations and Recommendations:** Tata Communications is a true IaaS provider from which customers can order, provision and manage their resources online. Prices are listed publicly for easy comparison.

**Pricing:** Pricing is based on usage, charged hourly and prorated, with no commitment. Prices are competitive, ranging from $0.055 to $2.49 per hour, depending on the amount of computing resources required, and include free use of firewalls, load balancers, public IP addresses and inbound data transfers. Tata provides a service availability guarantee of 99.95%, calculated
monthly. Customers get 24/7 support via phone or email at no additional cost. Large customers are provided with an account manager.

Tata Communications charges a rate of $0.15 per GB of storage per month. Computing instances are billed at a per-hour range, from $0.555 for one core, 1GB of RAM and 20 GB of storage, to $2.49 per hour for eight cores, 40GB of RAM and 20 GB of storage.

**Certifications:** Certifications are as follows:

- Hyderabad data center: SAS 70 Type II, ISO 27001, s 9000, ISO 14000, ISO 20000, SAS 70 Type II, ISO 20000 and ISO 27001. It also meets TIA 942.

**SLAs:** Per the service agreement publicized by Tata Communications, service is provided with a target availability of 99.95% per month, which means that if the service is not available for more than 22 minutes a month, the customer is entitled to a service unavailability credit, but is restricted to the affected service only. The service unavailability credit is a percentage of the monthly recurring charge for the affected service, capped at 20% of the monthly recurring charge, as shown in Table 4.

<table>
<thead>
<tr>
<th>Duration of Service Unavailability (Minutes per Calendar Month)</th>
<th>Service Unavailability Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>From zero to 22 minutes of unavailability</td>
<td>No credit</td>
</tr>
<tr>
<td>Additional one hour of unavailability</td>
<td>5% of the monthly recurring charge</td>
</tr>
<tr>
<td>Additional two hours of unavailability</td>
<td>10% of monthly recurring charge</td>
</tr>
<tr>
<td>Additional three hours of unavailability</td>
<td>15% of monthly recurring charge</td>
</tr>
<tr>
<td>Additional four hours of unavailability</td>
<td>20% of monthly recurring charge</td>
</tr>
</tbody>
</table>

Source: Gartner (August 2012)

Tata Communications has more possibility than other vendors to adhere to SLAs, as in many cases it owns the submarine cable and has excellent connectivity.

**Elements to Consider**

**Strengths**

- Tata Communications has strong product and service offerings.
- It also has strong brand awareness and recognition.
- It can work with other Tata Group companies to provide full, end-to-end infrastructure solutions.
- It offers competitive pricing, enticing customers to try its cloud IaaS offerings.
- It offers a true pay-as-you-go model.

Cautions

- The perception that an outdated, single-stack technology (Xen) is being used can be a drawback if Tata wants to position itself as the future Amazon of India.
- There is a market perception that the company is large and difficult to work with.

Although Tata Communications provides private VM instances and dedicated managed hosting, it is perceived as best suited for the public cloud, not as a cookie-cutter.

**Wipro**

Aside from being one of the largest system integrators in India, Wipro also has IaaS offerings. With a total data center floor space of almost 38,500 square feet in India and 238,700 square feet across the globe, Wipro is among the eight largest IaaS providers in India. Its client base is widespread across different vertical industries, with manufacturing, natural resources and BFSI forming the majority of the base. Most of its IaaS services are in computing, archiving and backup, and storage. Wipro also provides core banking solutions and dealer management solutions in a pay-per-use model, and has partnered with SAP to provide SAP ERP in a cloud model (a subscriber-based host).

**Market Overview and Revenue**

Banking, insurance and manufacturing constitute 75% of Wipro’s IaaS business.

**General Product/Service Marketing Strategy**

Wipro markets its adaptable engagement model in its IaaS engagement approach. Its flexibility in engagement models gives clients the benefit of assessing their outsourcing maturity and working with the model that best fits the organization. Wipro uses HP OpenView and SiteScope, as well as Compuware Server Vantage, to manage its data center. For asset management, Wipro uses Wipro eAsset 3.0, and for patch management it uses Microsoft System Center Configuration Manager (SCCM). The help desk is Wipro eHelpline.

**How This Provider Competes**

Wipro has a dedicated, cloud go-to-market team across India covering all top tier cities. The team complements the account-specific, go-to-market teams that cover the market for IT business. The cloud sales team works directly in new opportunities and accounts, and supports account
managers in existing accounts and large enterprise accounts. Wipro's focus is balanced across the enterprise and SMB segments, represented by clusters across various industries. Apart from direct sales coverage, events, webinars and marketing programs are conducted in regions to facilitate interaction and generate pull with targeted customer segments.

**Observations and Recommendations:** Wipro has a strong infrastructure service offering, but this can't yet be termed a cloud service. Wipro is currently a utility hosting provider, but with strong potential to become a cloud IaaS provider. It's a good choice for organizations seeking to move some infrastructure from an in-house to an external data center, with all the safety and precautions of an internal data center. Thus, what's offered is more like a hosting or managed service. Wipro also can provide specific infrastructure services for a monthly fee, but customers must specify their requirements in terms of capacity, space and other details well in advance of what is provided. Consumers cannot instantly make a requisition (for example, via a self-service portal), and get more services required for a certain time period. Consumers also cannot dynamically move from a private to a public cloud environment. Billing is based on the needed capacity specified at the start of the time frame or in the contract. Billing also is not automated, and is based on specific customer requirements, which can't be changed dynamically.

Wipro can package all utility hosting with its cloud services provider and system integrator capacity to offer a full range of services, from deployment and management of the infrastructure, to the movement and management of applications and infrastructure in the cloud, and co-location services. This makes Wipro a strong player, despite it not yet being a cloud IaaS provider.

**Pricing:** Wipro charges users based on discrete computing, storage and service units used in any given time period. It also provides customers with customized offerings based on specific needs, which means pricing may vary depending on what's required. Wipro does not currently have an automated dynamic pricing model. All changes required by customers are manually configured, and pricing generally is based on use by the month. Provisioning, deprovisioning and billing are not yet automated.


**SLAs:** Wipro provides a 99.95% SLA. Any physical infrastructure failure resulting in customer application downtime is a failure. Wipro compensates these based on contracts signed with each customer. Thus, contract definitions and management are key when working with Wipro.
Elements to Consider

Strengths

- Wipro is a well-known and trusted corporate brand, so vendor reliability and recognition are not issues.
- Management’s focus on building the company’s reputation in the cloud IaaS space is evident.
- Wipro has a strong, long-term road map and strategy, especially in providing integrated end-to-end solutions.

Cautions

- The company is still perceived as a system integrator or cloud services provider and not as a major player in IaaS or utility hosting. Thus, it must create a distinct image as a cloud IaaS service provider.
- Wipro must build an effective pricing model directly mapped to vendors (such as EMC, NetApp, Cisco, Microsoft and Red Hat).

The company doesn’t provide single-cloud proprietary platforms, which are not good for security-cautious customers and government agencies that mandate such deployments.

References and Methodology

Cloud IaaS in India is nascent stage, but evolving fast. Use this guidance for the difficult task of choosing from among these vendors and services, based on Gartner’s definition, in which real-time elasticity, agility, pay as you go and self-service are important components.

Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"Top Six Adoption Trends for Cloud Compute IaaS in India"

"Market Insight: Structuring the Cloud Compute IaaS Market"

"Cloud IaaS: Service and Support Models"

"Refer Cloud Computing Tiered Architecture"

"Cloud IaaS: Service-Level Agreements"

"A Market Map And Compass To Drive Your Enterprise Data Center Managed Service Business"

"Evaluation Criteria for Public Cloud IaaS Providers"
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