Telecom Cloud Services

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Cloud computing is on-demand access to virtualized IT resources that are housed outside of customer own data center, shared by others, simple to use, paid for via subscription, and accessed over the Web. Cloud computing describes a new supplement, consumption, and delivery model for IT services based on Internet protocols, and it typically involves provisioning of dynamically scalable and often virtualized resources.

### Customer benefits
- Reduce Costs
- Improve service levels
- Free up company capital
- Future proof IT investment
- Quickly access new technologies
- Keep control of IT and focus on growth

### Provider benefits
- Increase ARPU and reduce churn with cloud services
- The value proposition
- Data center efficiency
- Service provider differentiation
- New revenue stream - Managed or hosted services revenue
Cloud Computing technologies

**Classic model**
- Application
- Data
- Runtime
- Middleware
- OIS
- Virtualization
- Servers
- Storage
- Network

**IaaS** (Infrastructure as a Service)
- Application
- Data
- Runtime
- Middleware
- OIS
- Virtualization
- Servers
- Storage
- Network

**PaaS** (Infrastructure as a Service)
- Application
- Data
- Runtime
- Middleware
- OIS
- Virtualization
- Servers
- Storage
- Network

**SaaS** (Software as a Service)
- Application
- Data
- Runtime
- Middleware
- OIS
- Virtualization
- Servers
- Storage
- Network

Operated by the end user
Operated by the provider
Cloud Computing technologies description

**IaaS**
- Infrastructure-as-a-Service (IaaS) is the delivery of computer infrastructure (typically a platform virtualization environment) as a service.
- Rather than purchasing data center space, servers, software, network equipment, etc., IaaS customers essentially rent those resources as a fully outsourced service. Usually, the service is billed on a monthly basis, just like a utility company bills customers.
- The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly select networking components (e.g., firewalls, load balancers).

**PaaS**
- PaaS model makes all of the facilities required to support the complete lifecycle of building and delivering web applications and services entirely available from the Internet, all with no software downloads or installation for developers, IT managers, or end users.
- One of the main differences between PaaS and IaaS is the level of control and administration available. With PaaS services, once the application is deployed to the cloud, no access to server software or the underlying operating system is available for administration.

**SaaS**
- Software-as-a-Service is a software distribution model in which applications are hosted by a vendor or service provider and made available to customers over a network, typically the Internet.
- SaaS is most often implemented to provide business software functionality to enterprise customers at a low cost while allowing those customers to obtain the same benefits of commercially licensed, internally operated software without the associated complexity of installation, management, support, licensing, and high initial cost.
Cloud Computing special cases

- Providers of this type of cloud-based solution (known as CaaS vendors) are responsible for the management of hardware and software required for delivering Voice over IP (VoIP) services, Instant Messaging (IM), and video conferencing capabilities to their customers.
- A CaaS model allows a CaaS provider’s business customers to selectively deploy communications features and services throughout their company on a pay-as-you-go basis for service(s) used.
- From the handset found on each employee’s desk to the PC-based software client on employee laptops, to the VoIP private backbone, and all modes in between, every component in a CaaS solution is managed 24/7 by the CaaS vendor.

**CaaS** (communication)

**MaaS** (monitoring)

- Monitoring-as-a-Service (MaaS) is the outsourced provisioning of security, primarily on business platforms that leverage the Internet to conduct business.
- MaaS security monitoring services offer real-time, 24/7 monitoring and nearly immediate incident response across a security infrastructure—they help to protect critical information assets of their customers.
# Cloud Computing deployment models

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<tr>
<th>Deployment Model</th>
<th>Description</th>
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<tr>
<td><strong>Private Cloud</strong></td>
<td>These private clouds can be built and operated as just what their name implies: a fully functional cloud that is owned, operated, and presumably restricted to a particular organization. In fact, there are an increasing number of software and service offerings designed to facilitate just this—essentially “private clouds in a box.” A special case is the virtual private cloud, which is any private cloud that is provisioned and operated by an outsourcing/hosting provider. For some these offer the best of both worlds—the control, security, and privacy of a private cloud with the ease of deployment and operations typical in public clouds.</td>
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<td><strong>Public Cloud</strong></td>
<td>Public cloud or external cloud describes cloud computing in the traditional mainstream sense, whereby resources are dynamically provisioned on a fine-grained, self-service basis over the Internet, via web applications/web services, from an off-site third-party provider who bills on a fine-grained utility computing basis. An interesting recent development is the emergence of a specialized form of public cloud known as a vertical cloud, sometimes known as a community cloud. These are public clouds organized around a group of competing/cooperating businesses in a particular vertical market, such as financial services.</td>
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<td><strong>Hybrid Cloud</strong></td>
<td>There is a class of modern platforms emerging that enable an organization to effectively create their own cloud out of a combination of particular private, public, and vertical clouds, yet manage this hybrid cloud as one, from one place, at the same time. This approach enables an organization to use the best tool for each job, while containing the increase in complexity. For these reasons it is likely that most enterprises will take, by design or by circumstance, a hybrid cloud approach.</td>
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![Cloud Computing Types](image-url)
**Expectations**

**The Cloud Gains**

We live in a dynamic world which demands dynamic solutions. The cloud solutions deliver the so needed elasticity and the concept of dynamic computing. Better utilisation and optimisation brings cost reductions. The green IT effect and faster time to market should not be undermined as well.

For example in Serbia*, the IT market is evaluated approximately 950 Mio. USD, and from this amount only 110 Mio USD stays to the domestic companies. With usage of cloud technologies, expectations are that amount could be almost doubled to 210 Mio USD. This is savings are mainly based on IaaS scenario.


**Target groups for Cloud Computing Services**

- Business users, especially SMEs
- Public enterprises and governmental institutions
- ISVs and training centres
- Events and conferences
- Schools and Universities
- Residential users
Examples of Public Sector Clouds


In October 2009, following approval from the CIO Council, a team led by the Cabinet Office set out to define how the public sector could utilise the Cloud Computing approach to ICT delivery and explore what benefits and challenges this approach would create. This became known as Phase 2 of the G-Cloud Programme.

Phase 2 (October 2009 to April 2010) was led by the Cabinet Office and included representatives from over 10 Government departments who headed up work packages involving some 100 volunteers from a broad spectrum of ICT suppliers.


The Federal Government’s current Information Technology (IT) environment is characterized by low asset utilization, a fragmented demand for resources, duplicative systems, environments which are difficult to manage, and long procurement lead times. These inefficiencies negatively impact the Federal Government’s ability to serve the American public.

Cloud computing has the potential to play a major part in addressing these inefficiencies and improving government service delivery. The cloud computing model can significantly help agencies grappling with the need to provide highly reliable, innovative services quickly despite resource constraints.
UK G-Cloud

The overriding goals for Data Centre Consolidation, the G-Cloud and the Applications Store for Government

- Reduce ICT costs (contributing to the Operation Efficiency Programme (OEP) savings target for ICT);
- Provide open competition and create a vibrant marketplace enabling the best product at the best price;
- Create flexibility by reducing supplier lock-in to ensure users can readily switch between suppliers for ICT services;
- Reduce time from idea to service; and
- Reduce the carbon footprint of Public Sector ICT services;

G-Cloud specific goals

- Drive efficiency and value through standardisation, sharing and re-use of services
- Develop a trusted brand and standards for the promotion of secure Cloud Computing for the Public Sector;
- Assure the provision of secure and reliable cloud infrastructure for the delivery of cross Public Sector services and;
- Provide a route for rapid access to a portfolio of standardised and re-usable G-Cloud Services.
<table>
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<th>Current Environment</th>
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<td>• Improved asset utilization (server utilization &gt; 60-70%)</td>
<td>• Low asset utilization (server utilization &lt; 30% typical)</td>
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<td>• Aggregated demand and accelerated system consolidation (e.g., Federal Data Center Consolidation Initiative)</td>
<td>• Fragmented demand and duplicative systems</td>
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<td>• Improved productivity in application development, application management, network, and end-user</td>
<td>• Difficult-to-manage systems</td>
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<td>• Purchase “as-a-service” from trusted cloud providers</td>
<td>• Years required to build data centers for new services</td>
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<td>• Near-instantaneous increases and reductions in capacity</td>
<td>• Months required to increase capacity of existing services</td>
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<td>• More responsive to urgent agency needs</td>
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<td>• Shift focus from asset ownership to service management</td>
<td>• Burdened by asset management</td>
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<td>• Tap into private sector innovation</td>
<td>• De-coupled from private sector innovation engines</td>
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<td>• Encourages entrepreneurial culture</td>
<td>• Risk-adverse culture</td>
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<td>• Better linked to emerging technologies (e.g., devices)</td>
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And Makedonski Telekom Group?

Advantages

- The most sophisticated, fastest and most reliable network in Macedonia
- The biggest data centers and disaster recovery center in Macedonia
- The largest server farm in Macedonia
- The highest virtualization ratio on various platforms (not just x86/x86-64)
- Largest Enterprise storage system in Macedonia
- Data is kept exclusively in the country
- Highest Data & Operation Security Standards.
- The only full end to end PKI system in Macedonia

Votes

ISO 9001:2009 Certified
ISO 27001:2005 Certified
ISO 2000:1:2005 Certified
ISO 14001:2004 Certified

Experience

Makedonski Telekom Group has internal knowledgeable team for operating and developing complex cloud services for the most demanding customers. Makedonski Telekom Group is offering an unique blend of advantages compared with any other cloud provider.

All of this qualifies Makedonski Telekom Group as an ideal partner and cloud services provider.