Cloud computing has completely changed the economic landscape and removed barriers for anybody wishing to bring a service to market. It is now possible to “rent” vast amounts of computer capacity on demand and only pay for what is used – at greatly reduced cost and lead time compared with traditional IT deployments.

Cloud services are incredibly popular, but many enterprises, operators, and service providers lack the resources required to offer them to their own organizations or external customers. An alternative is to outsource computing equipment from a cloud service provider that offers computing, storage, networking, virtualization, and management capabilities using a provision model called Infrastructure as a Service (IaaS).

An important decision is whether to create a public or private cloud. Services offerings for consumers, such as Managed Enterprise IT or Managed Billing Services, are simpler to deploy on public clouds because they are easily accessed by a wide population. In addition, public clouds can offer “pay as you go” plans, which make costs more predictable and capacity more elastic. However, public clouds, because of their inherent openness, bring increased security risks that need to be appropriately addressed.

On the other hand, private clouds are ideal for services that require isolation from the general public, such as OSS/BSS, inventory, and wallet payment regulated by PCI DSS. In addition to simplifying security policy control, private clouds use on-premise equipment that could be easier to configure for integration with existing IT infrastructure. Still, private clouds will not provide the same infrastructure elasticity and minimal capital spending of public clouds.

In “have it your way” fashion, Ericsson Managed Cloud Enablement Services is an IaaS solution that can be provided either from Ericsson data centers or customer premises and implemented as both private and public clouds. The hardware infrastructure for these services is based on the latest Intel® Xeon® processors E5 v2 family and was developed with input from Intel’s cloud solutions architects.
Cloud Computing Delivery Models

Ericsson offerings support three of the most common cloud computing service models shown in Figure 1:

- **Infrastructure as a Service (IaaS)** is the delivery of computing infrastructure. In the case of Ericsson Managed Cloud Enablement Services, this includes servers, storage, networking, and virtualization software.

- **Platform as a Service (PaaS)** adds operating systems, middleware, and runtime to an IaaS platform, providing everything a developer needs to build an application.

- **Software as a Service (SaaS)** provides applications and data on top of PaaS services, supporting the delivery of software designed to meet specific business requirements.

Ericsson Managed Cloud Enablement Services is a full, end-to-end managed IaaS cloud environment with service availability, reliability, and performance guaranteed through service level agreements (SLAs) and key performance indicators (KPIs). The services can be used by enterprises, operators, and service providers to either increase capacity to an already-served region, or establish capacity and services in a new region.

When Ericsson hosts the cloud infrastructure, it is a multi-tenant environment that delivers economies of scale as well as other cost benefits derived from delivering correctly-sized capacity to both small and large operators.

Cloud-Based Services Examples

Ericsson Managed Cloud Enablement Services provides for the fast launch of new services on top of a virtualization layer. This may be a combination of customer-managed and Ericsson-managed services, as shown in Figure 2. The standardization and modularization of this solution enables the deployment of new services in a day or two compared to the weeks or months typical of more traditional infrastructure.

For example, customers can manage their own deployment of Microsoft® SharePoint® server or Virtualization Desktop Infrastructure (VDI) employees serviced by a private cloud. Other options are to deploy services from the Ericsson Managed Application Services portfolio, which includes Managed Billing Services, Cloud Push to Talk Service, Managed Enterprise Cloud (Enterprise IT as a Service), and Managed Mobile Virtual Network Enablers (MVNE) Service.

Ericsson Managed Cloud Enablement Services incorporates an OpenStack® environment and set of tools to assist developers who are creating new services on top of this platform. OpenStack is an operating system for building public and private clouds that is supported by many established vendors and minimizes infrastructure software development cost because it is open source.

---

**Figure 1: Common Cloud Computing Delivery Models**

**Figure 2: Examples of Cloud-based Services**
Solution Architecture

Ericsson’s Managed Cloud Enablement Services was architected to offer customers a high level of convenience by enabling the easy and rapid provisioning of pay-per-use computing resources and services, which scale automatically to instantly meet changing demands.

The guiding principles of the design were:

- **On-demand self-service** allows customers to automatically acquire and release IT resources and services without requiring any action from the service providers whenever the need for such resources increases or decreases.
- **Broad network access** makes resources and services available over the network and accessed by thin or thick client platforms.
- **Resource pooling** aggregates the available computing resources, and dynamically assigns and reassigns them based on demand.
- **Rapid elasticity** through the automated provisioning and releasing of resources and applications makes them appear to be unlimited and available in any quantity at any time.
- **Administrator user interface** shows the consumption of resources to help ensure their availability.

Figure 3 shows a simplified version of the solution architecture, including the following three functional layers:

- **Resource and Projection Layer** ensures resources easily scale up as needed, and provides high availability (99.9%) and disaster recovery.
- **Supply and Automation Layer** reduces the effort needed for IT configuration, helping to speed up the deployment of applications and services.
- **Delivery and Service Layer** provides a secure, low-cost connection between users and the system, and carries out the pay-as-you-go model.

In addition, this managed environment offers complete operation and maintenance of multi-vendor environments, and a full set of tools and processes to support operations (e.g., ticketing and monitoring), and to manage physical and virtual resource utilization.

The Ericsson solution runs on servers based on the Intel® Xeon® processors E5-2600 v2 product family. Manufactured on industry-leading 22nm process technology with 3D Tri-Gate transistors, these processors provide the performance and power efficiency required by cloud system and data centers. For its data centers supporting Ericsson’s Managed Cloud Enablement Services, Ericsson can choose commercial, Intel® Xeon® processor-based servers in either 10-core/single-socket or 20-core/dual-socket configurations.

### Virtualization Technology

Fundamental to cloud computing infrastructure is the virtualization of services, which enables higher utilization of resources, provides economies of scale, and lowers capital and operational expenses. At the same time, performance is critical, and that is why Intel is constantly enhancing Intel® Virtualization Technology (Intel® VT). Now able to reach near-native performance, server platforms with Intel VT perform various virtualization tasks in hardware, which reduces the overhead and footprint of virtualization software, thus boosting performance. In fact, Intel has taken a comprehensive platform approach to substantially increase virtualization performance by adding features and enhancements to its processors, chipsets, and network interface cards with the Intel® 82599 10 Gigabit Ethernet Controller.

![Figure 3: Simplified Solution Architecture](image-url)
Solution Benefits

The key benefits offered by Managed Cloud Enablement Services are:

- Reduced time-to-market is possible through pre-defined and packaged service elements and a wide range of support for different virtualization technologies.
- Capacity as a Service allows customers to implement services incrementally according to actual business, solution, and performance needs.
- Higher productivity and service quality is achieved through the automation and standardization of services.
- Economies of scale reduce costs via a multi-customer delivery model and the cloud paradigm.
- Improved predictability of services comes from the standardization of services and the use of industry-leading processes and tools.
- Support for future business models is easier with elastic capacity and modular service elements.
- Best service fit via modularity provides the flexibility to combine services to accurately match customer needs.

Doing More with Less

Space and power consumption represent the two biggest concerns for data centers – both private and those managed by public cloud providers. By combining Intel® Xeon® processor E5-2600 v2 product family-based servers with other energy-efficient data technologies, IT professionals can increase data center efficiency, cut power bills and energy consumption, and reduce space needs.

Compared to the previous generation, the new Intel Xeon processor E5-2600 v2 product family deliver:

- Up to 50 percent more performance\(^2\)
- Up to 45 percent greater Java® performance\(^3\)
- Up to 45 percent improvement in energy efficiency\(^4\)

Increasing Business Agility

Cost pressures and fast time-to-market requirements are driving enterprises, operators, and service providers to consider cloud computing for the delivery of services and applications. Ericsson Managed Cloud Enablement Services is a complete IaaS solution that runs on Intel-based servers and offers great flexibility by supporting private and public clouds, and Ericsson or customer hosting models. Customers can also choose to start off using Ericsson resources and then assume more responsibility for their cloud services as they grow and become comfortable with increasing their operational expenditure. This solution provides Ericsson’s customers with a world-class cloud solution, making their businesses more agile and efficient.

For more information about Ericsson Managed Cloud Enablement Services, visit [www.ericsson.com](http://www.ericsson.com).

For more information about Intel solutions for communications infrastructure, visit [www.intel.com/go/commssinfrastructure](http://www.intel.com/go/commssinfrastructure).

---

3. Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark™ and MobileMark™, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to [http://www.intel.com/performancedata](http://www.intel.com/performancedata).