Characteristics of Cloud Computing

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Characteristics of Cloud Computing as per NIST

National Institute of Standards and Technology (NIST) is an agency under the scope of US Department of Commerce. NIST is responsible for defining standards in Science and Technology.

The Computer Security Division of NIST has provided a formal Definition and Characteristics of Cloud computing.

NIST five essential characteristics of Cloud Computing:

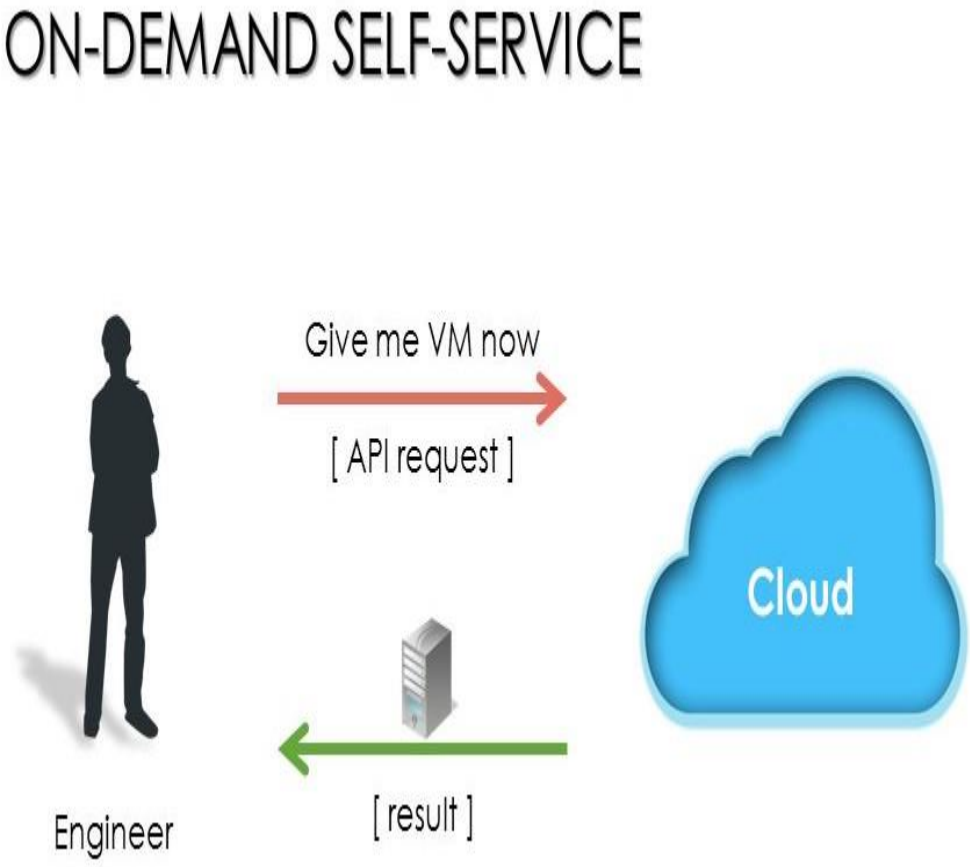
1. On demand self-service
2. Broad network access
3. Resource pooling
4. Rapid Elasticity
5. Measured service

On Demand Self service

One of the most notable characteristics of cloud computing is on-demand self-service. This means that cloud computing networks can provide computing capabilities. This includes server time, network storage, virtual machine, and database. Any website can rely on the characteristics of cloud computing. If it would need extra computing services, on-demand services will run the business.

Computer services such as Email, Application Network, or Server service can be provided without requiring interaction with each service provider.

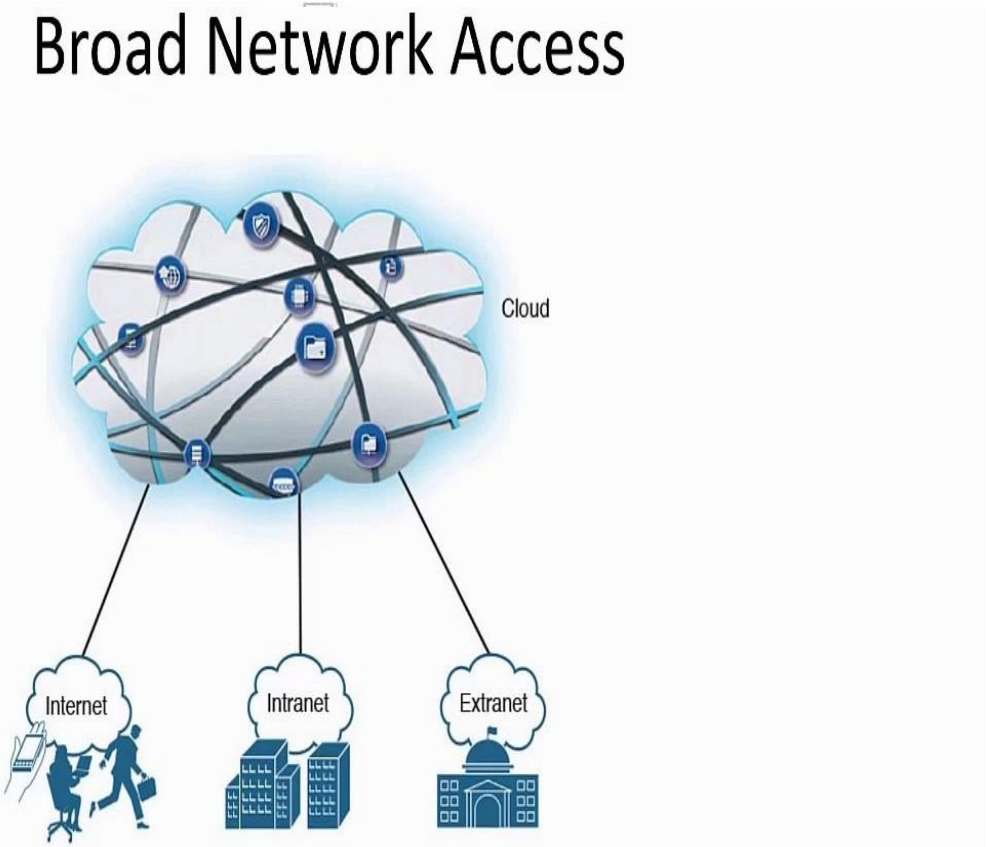
Self-service means that the consumer performs all the actions needed to acquire the service himself, instead of going through an IT department. For example – The consumer's request is then automatically processed by the cloud infrastructure, without human intervention on the provider's side.



Broad Network Access

Cloud computing resources are available over the network and can be accessed by diverse customer platforms. It other words, cloud services are available over a network—ideally high broadband communication link—such as the internet, or in the case of a private clouds it could be a local area network (LAN).

Network bandwidth and latency are very important aspects of cloud computing and broad network access, because they relate to the quality of service (QoS) on the network. This is particularly important for serving time sensitive manufacturing applications.

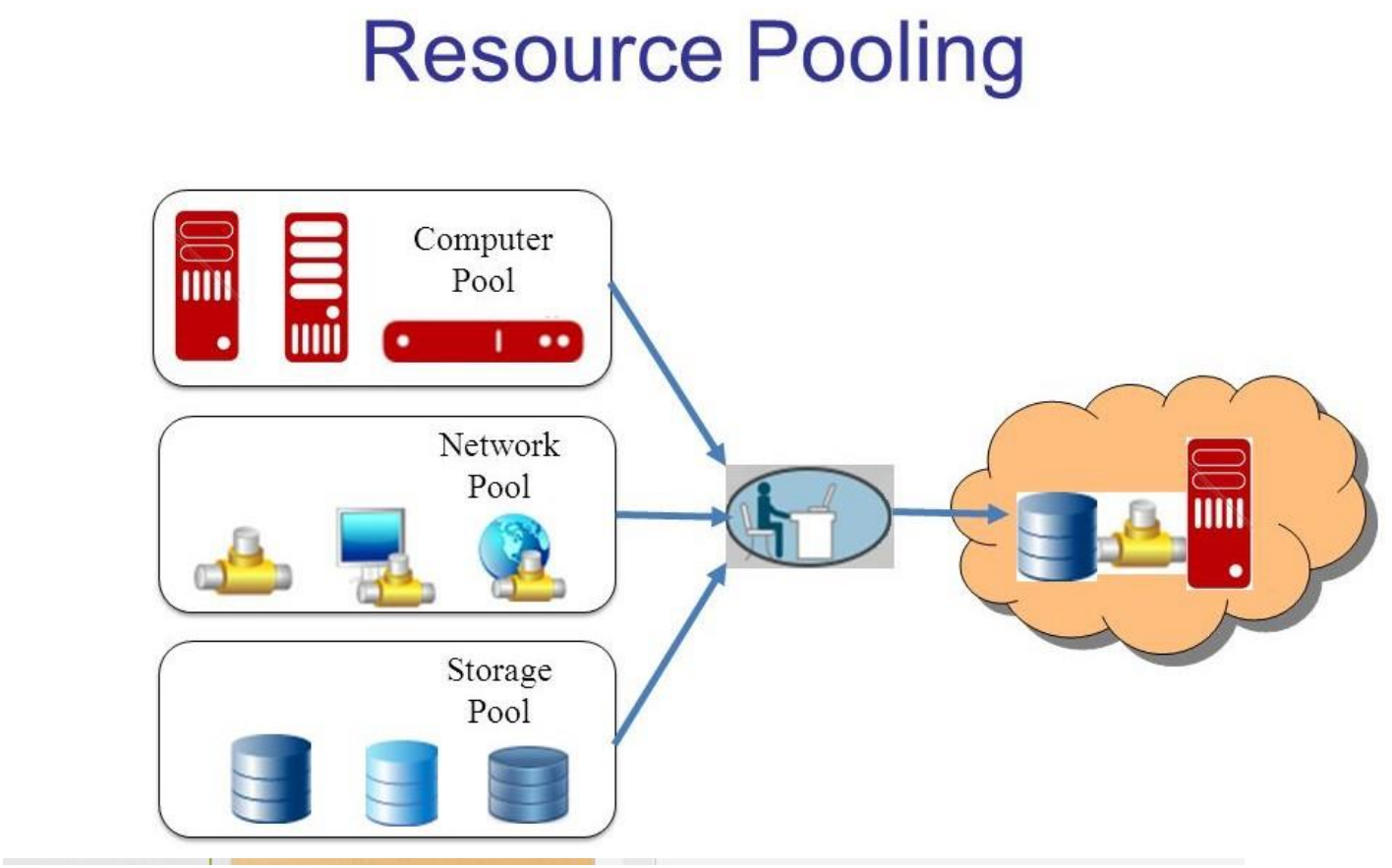


Resource pooling

Resource pooling means that multiple customers are serviced from the same physical resources. Providers' resource pool should be very large and flexible enough to service multiple client requirements and to provide for economy of scale. When it comes to resource pooling, resource allocation must not impact performances of critical manufacturing applications.

Cloud computing is a popular computing resource service because of its affordability. The cost of infrastructure that cloud computing shoulders is expensive. Thus, it can offer lower pricing compared to reliable traditional computing services. It benefits businesses by cutting cost. This cloud computing feature made the pricey cost of services affordable to many.

Example of resources include storage, processing, memory, and network bandwidth.

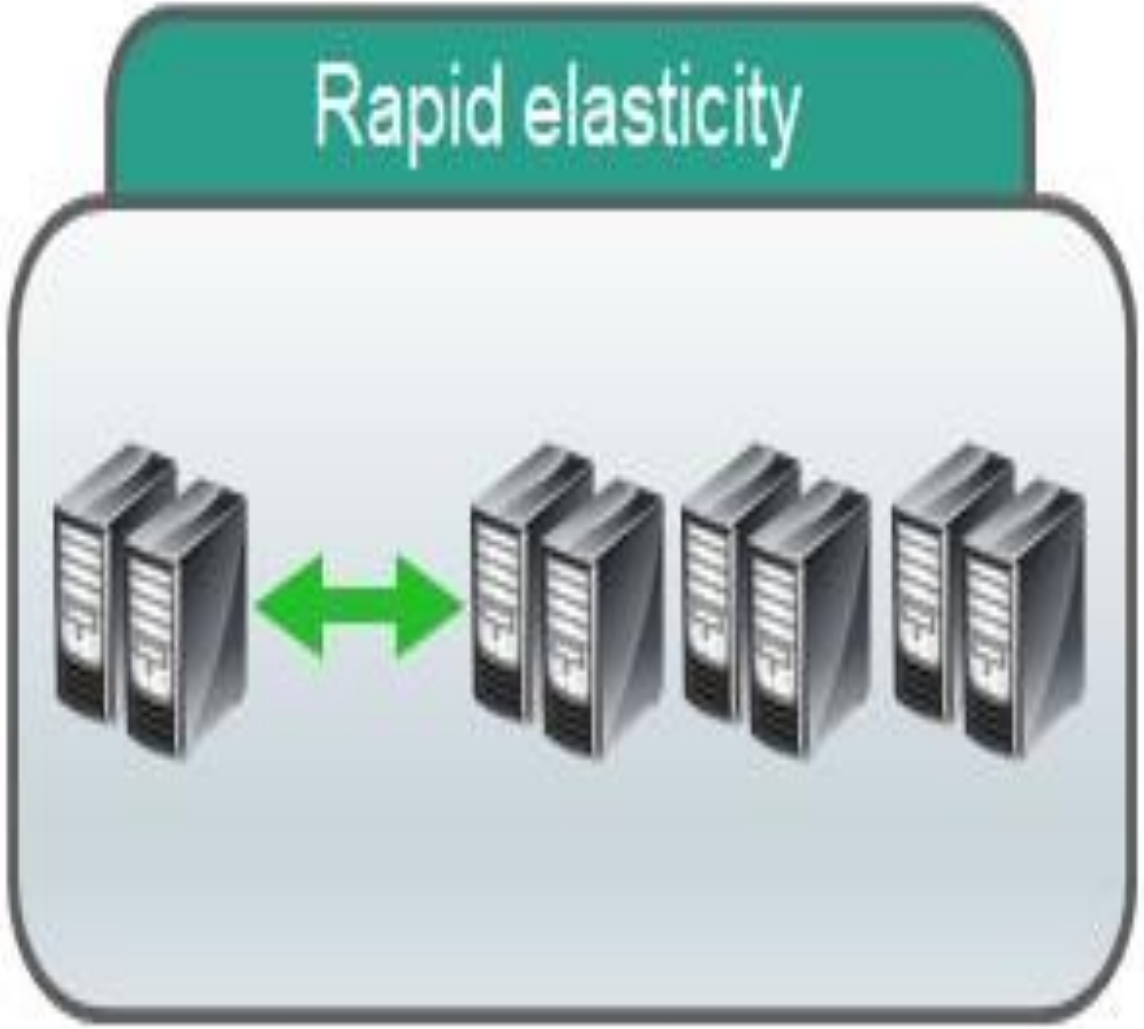


Rapid elasticity

One of the great things about cloud computing is the ability to quickly provision resources in the cloud as manufacturing organizations need them. And then to remove them when they don't need them. Cloud computing resources can scale up or down rapidly and, in some cases, automatically, in response to business demands. It is a key feature of cloud computing. The usage, capacity, and therefore cost, can be scaled up or down with no additional contract or penalties.

Elasticity is a landmark of cloud computing and it implies that manufacturing organizations can rapidly provision and de-provision any of the cloud computing resources. Rapid provisioning and de-provisioning might apply to storage or virtual machines or customer applications.

Just-in-time (JIT) service is the notion of requiring cloud elasticity either to provision more resources in the cloud or less.



Measured service

Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth and active user accounts). Resource usage can be monitored, controlled and reported, providing transparency for the provider and consumer.

Cloud computing resources usage is metered and manufacturing organizations pay accordingly for what they have used. Resource utilization can be optimized by leveraging charge-per-use capabilities. This means that cloud resource usage—whether virtual server instances that are running or storage in the cloud—gets monitored, measured and reported by the cloud service provider. The cost model is based on "pay for what you use"—the payment is variable based on the actual consumption by the manufacturing organization.