Cloud Computing Definitions

Part 1 of 8 – Application Hosting and Cloud Strategy

This is part 1 of an introductory series of documents intended to assist your organisation in defining your Application Hosting and Cloud Strategy. Your organisation may already have such a strategy, in which case these documents will hopefully confirm you are on the right track or they may identify challenges your organisation faces.

Cloud Computing Definitions

The National Institute of Standards and Technology (NIST) in the US has created definitions for a Cloud Computing model. The following definitions will be adopted for this document:

Cloud Service Models

- **Infrastructure as a Service (IaaS)**: The Cloud Service Provider (CSP) provides server, storage, networking and other fundamental computing resources. Combinations of physical servers, virtual servers and servers with pre-installed OSs are available. The consumer is responsible for installing the OS (where applicable), and has control over storage, database, middleware, and applications.
- **Platform as a Service (PaaS)**: The CSP provides an environment that allows the deployment and operation of consumer created or purchased applications. The consumer does not manage network, storage, servers, or operating systems, but does control the applications that run on it.
- **Software as a Service (SaaS)**: The software vendor provides an environment that allows the usage of the vendor's applications running on a cloud infrastructure. The consumer does not manage or control any of the underlying cloud infrastructure or the maintenance of the application. Limited configuration changes for the application may be available.

The diagram below illustrates what should be provided by the consumer and vendor in each of the cloud service models versus those provided by on-premises IT.
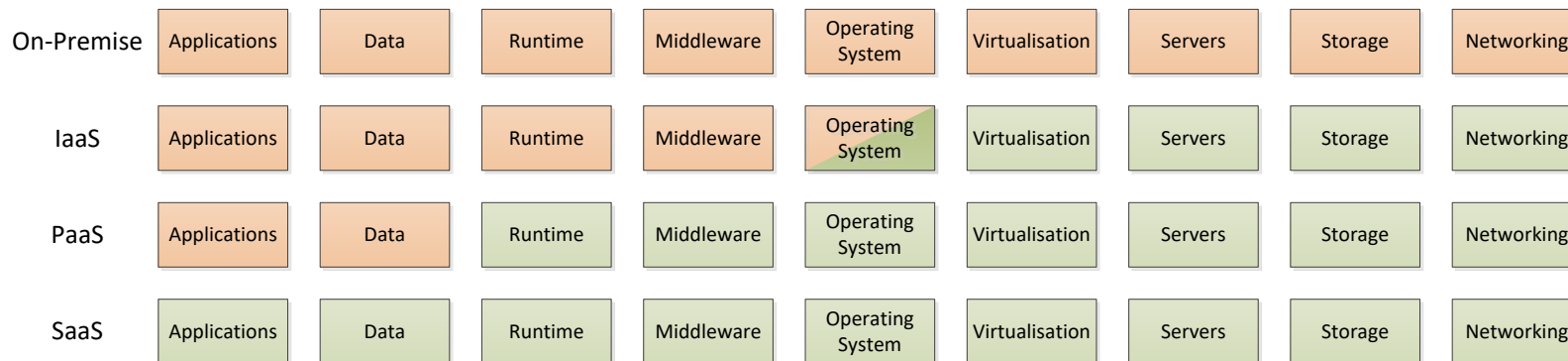
	Applications	Data	Runtime	Middleware	Operating System	Virtualisation	Servers	Storage	Networking
On-Premise	Applications	Data	Runtime	Middleware	Operating System	Virtualisation	Servers	Storage	Networking
IaaS	Applications	Data	Runtime	Middleware	Operating System	Virtualisation	Servers	Storage	Networking
PaaS	Applications	Data	Runtime	Middleware	Operating System	Virtualisation	Servers	Storage	Networking
SaaS	Applications	Data	Runtime	Middleware	Operating System	Virtualisation	Servers	Storage	Networking

Figure 1 - Cloud Service Models campared to On-Premise Model

Cloud Deployment Models

- **Private Cloud**: The cloud infrastructure is built and provisioned solely for the use of a single organisation. It can be owned and managed by the organisation that has use of it or by a third party, and can be hosted on the owner's or consumer's premises.
- **Public Cloud**: The cloud infrastructure is built and provisioned for the use of any organisation or individual that wants to use it and agrees to the terms & conditions of use. Any business or publicly funded organisation can own and manage a Public Cloud. The cloud infrastructure exists on the premises of the provider organisation.
- **Hybrid Cloud**: The cloud infrastructure comprises two or more of the Private, Community, and Public Cloud types. Custom or standardised technology allows data and applications to seamlessly run on a single cloud type or across cloud types, or move from one to the other.

Readiness for Cloud

Although there are more and more applications being used in the Cloud there are still many applications that do not lend themselves well for cloud deployment. Where cloud deployment is feasible there are two distinct types of solution:

- **Cloud-enabled**: The application was originally developed for deployment in a traditional data centre but it can be, or has been, modified to operate in the cloud.
- **Cloud-native (also referred to as cloud-centric or cloud-ready)**: The solution was specifically created in the cloud using cloud technologies and building on the cloud principles of elasticity, multi-tenancy and API based integration.

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