



# Commercial Software Licensing

CHAPTER 12:

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## Cloud-SaaS Deployment Models

Prepared by DoD ESI | January 2013

## Chapter Overview

- Most software licenses today are either perpetual or subscription.
- Perpetual licenses involve software possession by the customer who dictates where deployment takes place:
  - *In the customer's IT environment.*
  - *In a third-party hosting company environment selected by and paid for by the customer.*
- Subscription licenses seldom involve physical possession of software by the customer. Software is typically deployed outside the customer's IT environment:
  - *In the Publisher or Reseller IT environment.*
  - *Or in a third-party environment selected and paid for by the Publisher or Reseller.*

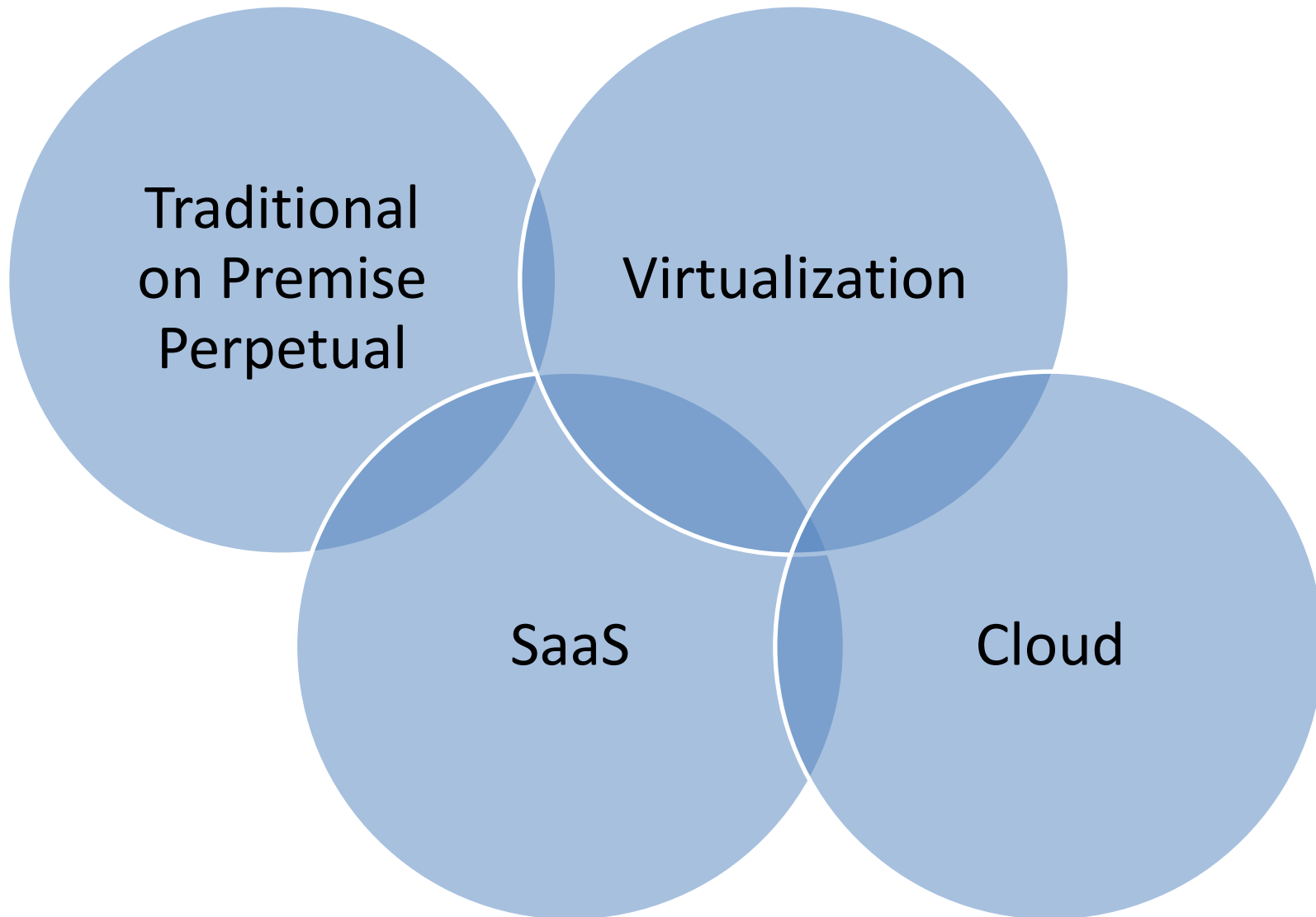


## Chapter Overview (cont.)

- The evolutions of cloud computing and virtualization have led to more sophisticated hosting models.
- Cloud computing provides three levels of third-party service offerings:
  - *IT infrastructure.*
  - *Computing platform.*
  - *Software.*
- Differentiation among the three levels of cloud hosting services concerns the level of control passed to the Contractor.



# Chapter Objective – Define & Clarify...



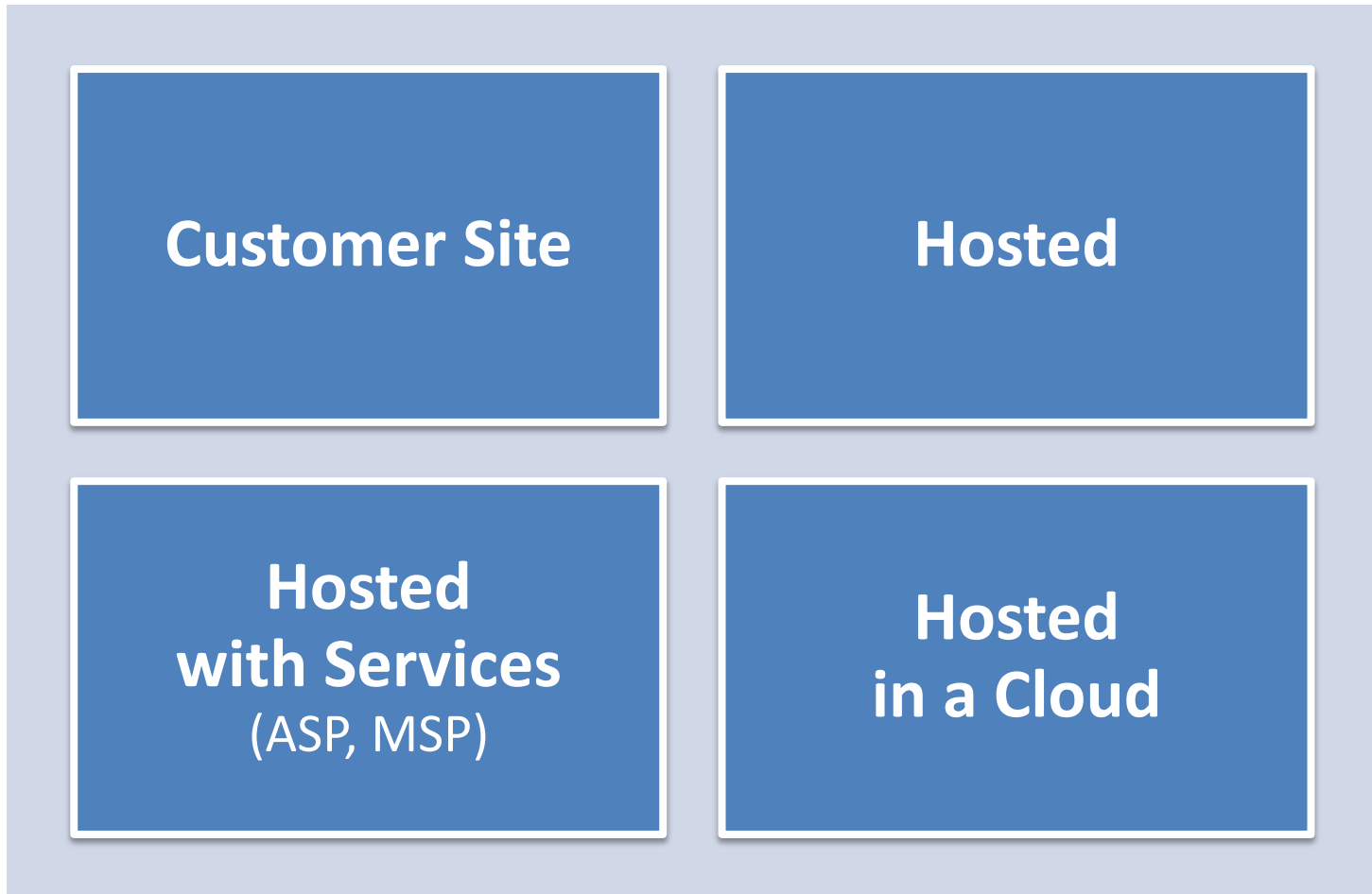
## Perpetual/ On Premises

- No specific time limit.
- Customer takes possession of software.
- Customer responsible for IT environment.
- Customer responsible for software maintenance.

## Subscription/ Off Premises

- Term is limited.
- Customer does not take possession.
- Contractor provides IT environment.
- Contractor provides all system maintenance.





ASP=Application Service Provider, MSP=Managed Service Provider



## Customer Site

- Deployment of software at a customer site involves all aspects of the IT environment:
  - Properly sized hardware.
  - Sufficient network bandwidth.
  - Firewall and other security measures.
  - Appropriately trained staff to manage the operation of the software and every element of the IT environment.

## Hosted

- Hosted deployment, without other services, typically involves deploying software in an IT environment managed by a third party.
- Limited hosting is restricted to the hardware, security, connectivity, and networking aspects of the IT environment.



## Hosted with Services

- Takes the pure hosting model to the next level by adding key services.
- Different types of providers deliver added services for implementation, support, upgrades, fixes, etc.:
  - Application Service Provider (*ASP*).
  - Managed Service Provider (*MSP*).

## Hosted in a Cloud

- The “cloud” concept is a hosting environment built around virtual servers, for optimization of hardware and other infrastructure resources.
- The progression of cloud service options ranges from:
  - Infrastructure as a Service (*IaaS*),
  - to Platform as a Service (*PaaS*),
  - to Software as a Service (*SaaS*).





## Cloud Computing Analogy

- Cloud computing can be thought of as turning software from a product into a service—viewing it much like a utility, such as electricity or water.
- Moving from traditional in-house software deployment to Cloud-based software could be compared to switching from a privately owned and operated well system to a public water system with a tap in your house.

## Public , Private, Hybrid and Community Clouds

- Public clouds host many applications from many customers.
- Private clouds, usually hosted in a private environment, are created to run multiple applications for a dedicated customer.
- Hybrid clouds have both public and private cloud aspects.
- Community clouds are created to serve a group with common interests, concerns or requirements taking advantage of some of the cost savings available from public clouds along with some of the privacy aspects of private clouds.



# Changing Characteristics

**Mainframe**

**Client Server**

**Cloud**

**Need collaboration for service**

**Some network access**

**Multiple resources**

**Broader scalability**

**Optimization tools**

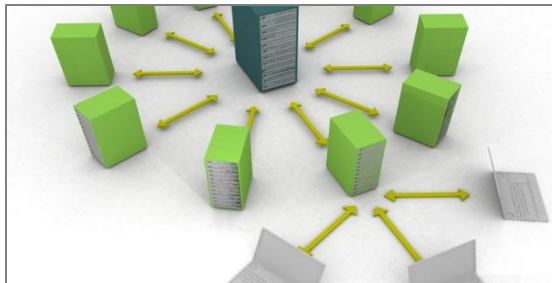
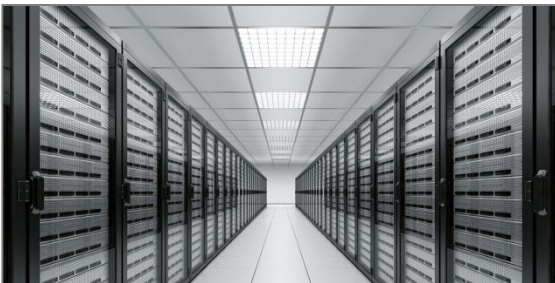
**On-demand self-service**

**Broad network access**

**Resource pooling**

**Rapid elasticity**

**Automatic optimization**



# Cloud Deployment Models

Type >	Public	Community	Private	Hybrid
Where?	Off premise at provider	On or off premise	On or off premise	On or off premise
Who?	General public	Multiple, related organizations	Limited to a single organization	Determined by each cloud
What?	Users' concerns and purposes vary	Users share the same concerns	Used by various business units	Users' concerns and purposes vary



# What is SaaS? – A Timeline Approach to Understanding SaaS

## Licensing

Use of Perpetual license model

Use of Term license model

Use of Subscription-based model

## Technology

**1950s/60s**

Partitioning of mainframes (Precursor to virtualization)

**1980s/90s**

Client server architecture made virtualization irrelevant

**1989**

World Wide Web Developed

**Late 1990s**

Re-emergence of high infrastructure costs makes virtualization relevant again

Technology advancement in managing OS commands enables X86 architecture virtualization

## Hosting

**1960s**

Centralized hosting begins as mainframe providers offer time-sharing and service bureaus

**1990s**

Hosting companies offer full scope data center and software services—ASPs/MSPs

**Late 1990s**

Hosting companies add virtualization and internet connectivity

## Fee Based Applications Software Deployment

**1990s**

Migrations from Mainframe Computing to Client-Server Architectures (Enterprise Applications Suites)

**~ 2003**

SaaS Application Suites (e.g. NetSuite, Inc.)

**2010**

Research indicates 54% of public-sector respondents are investigating or interested in SaaS solutions.

**1998**

First "Multi-Tenant" SaaS Application

**2008**

Major IT companies invest in cloud computing research/infrastructure. (Google, IBM, Intel, etc.)

**~ 2011**

Federal government announces "Cloud First" policy to evaluate safe, secure cloud computing options.

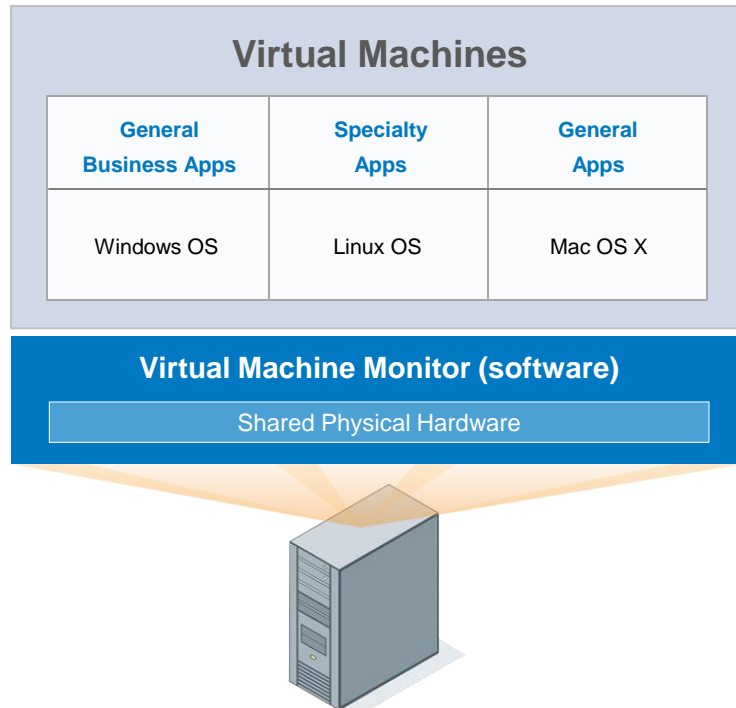


Top federal government cloud strategists meet at GovCloud2011 to share best practices.

## Commercial Software Industry



# What is Virtualization? The Basics



- **Virtualization** is a key element of cloud computing, although it can also be implemented in other IT environments. It provides added efficiencies and flexibility to manage complex IT environments.
- **The virtualization process** allocates the resources of a single physical device—server, storage device, or network resource—into multiple “virtual” imitations of the hardware environment, with each functioning independently.
- **In server virtualization**, a layer of software called a virtual machine monitor or hypervisor is installed between the “host” server’s physical central processing unit (CPU) and the “guest” virtual machines, to manage communication between those layers.
- **This enables a user to transcend limitations** of the “one machine, one server” model, to satisfy diverse needs efficiently with a single hardware unit.

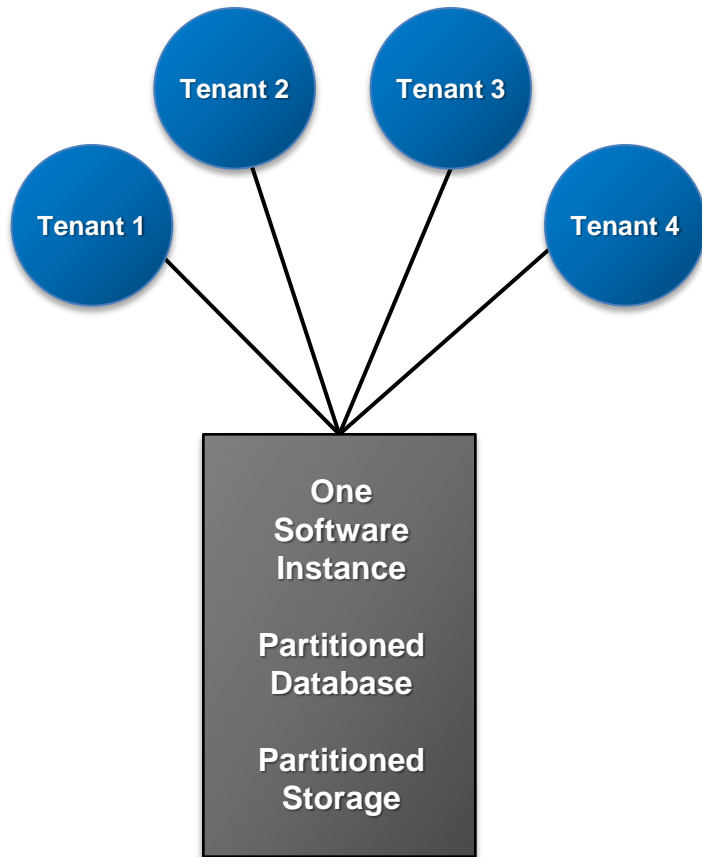
# Cloud – SaaS Comparison

Cloud	SaaS
<p>A set of technologies for hosting and accessing software.</p>	<p>A business model for licensing and accessing software.</p>
<p>The hosting technologies include all infrastructure components including servers, networks, data storage, operating systems, virtualization, etc. Access is usually via the internet. A cloud offering may or may not include application software as part of the package.</p>	<p>The license grant is a “right to use for a term” with no physical possession of the software by the customer. Payment is usually subscription based with monthly, quarterly or annual payments.</p>
<p>It is possible to deploy a perpetual license in a cloud. That combination would not be a SaaS offering. When a cloud is combined with a subscription software license, that combination is a SaaS offering.</p>	<p>When application software is offered in a SaaS model, all infrastructure components are included. Access is usually via the internet. This combination can be thought of as deploying an application in the cloud. It is possible to grant point to point access in a SaaS model, technically taking the deployment out of the cloud.</p>
<p>The hosting technologies can be on or off premise.</p>	<p>Since the subscription model does not include physical possession of the licensed application, SaaS licenses are by definition deployed off premise.</p>
<p>The hosting technologies can be deployed in a public, private, hybrid or community cloud. Public clouds by definition are off premise. The other three types can be either on or off premise.</p>	<p>Publishers offering SaaS licenses might own the cloud technologies or they might use third parties for some or all of these technologies.</p>
<p>For off premise clouds, the access or connectivity technology is the internet. Remote users in a private cloud might also use the internet to connect.</p>	<p>Publishers might offer multi-tenant or single tenant SaaS licenses. Some implications of multi-tenancy include Publisher directed timing of upgrades and limited customization.</p>

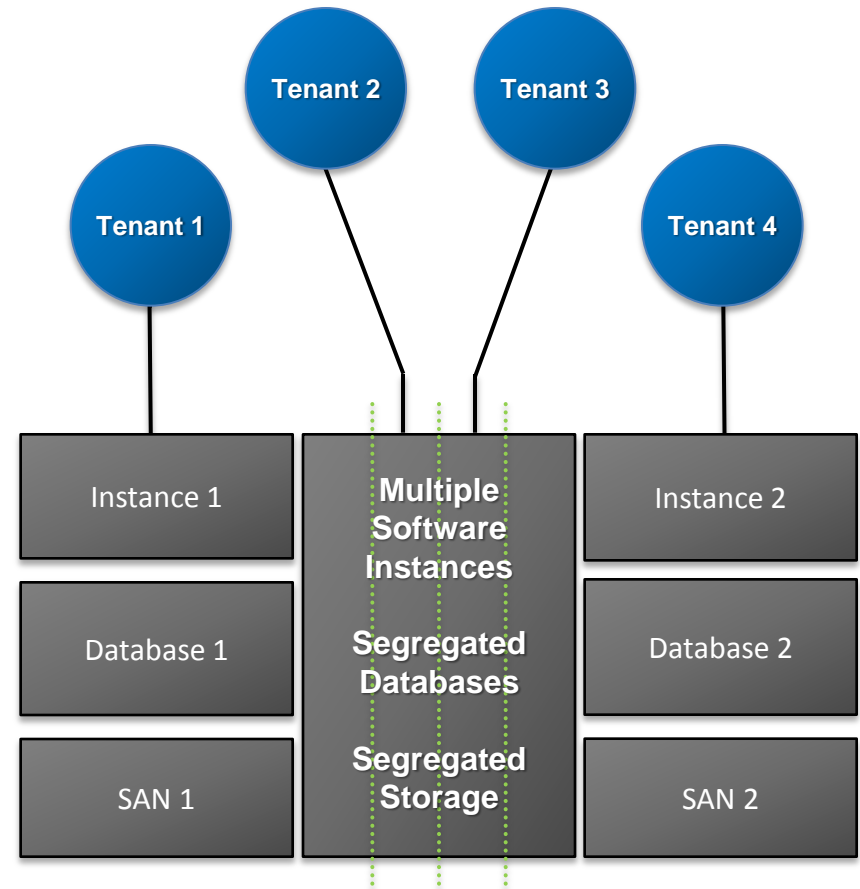




# SaaS Characteristics Multi- v. Single-Tenancy



**Multiple** tenants all share the same resources.



Each **Single** tenant accesses its own allocated portion of each resource.



- Multi-Tenancy
  - *Multiple tenants (organizations) share same infrastructure and same instance of software*
  - *Simplified approach saves costs, but restricts customization and can raise security issues.*
- Single-Tenancy
  - *Each tenant (organization) runs their own unique instance of the software, separate from other tenants.*
  - *Permits robust customization and assures database isolation for security, but at a higher cost.*





# The Recent Evolution of SaaS Deployment Models



## IaaS

Infrastructure  
as a Service

HOST



## PaaS

Platform  
as a Service

BUILD



## SaaS

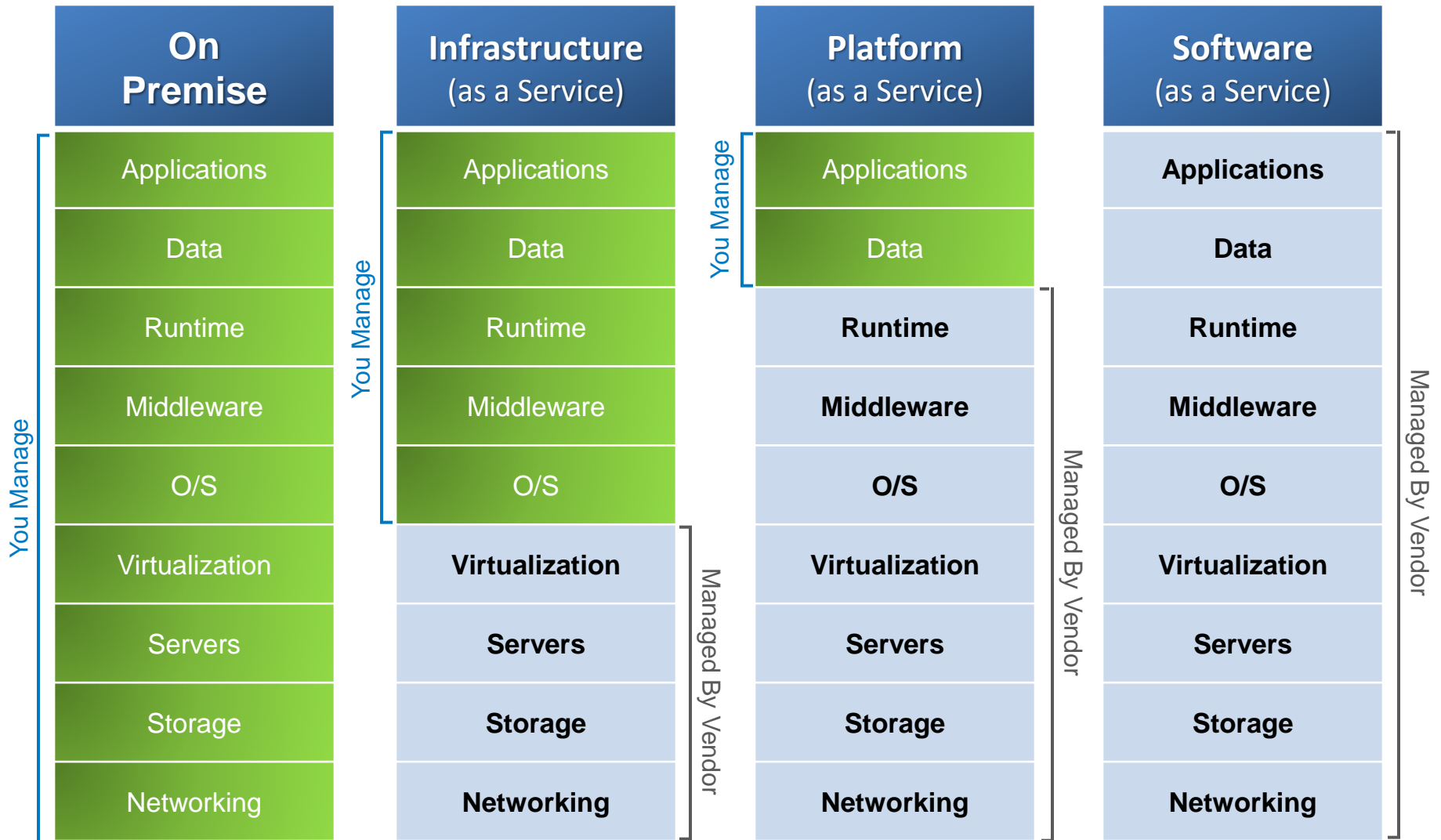
Software  
as a Service

CONSUME



# From On Premise to SaaS

## Who is in Control of the Stack?



## Are we Clear About SaaS and Cloud?



- True or False—cloud computing and SaaS are synonymous.
- True or False—a perpetual license can be deployed to the cloud.
- Cloud computing requires which of the following?
  - *Internet connections*
  - *Virtualization*
  - *SaaS licenses*
  - *Remote data storage*
  - *A special operating system*



# Example: Music

## Traditional: CD

**On premise**

**Need your own  
equipment to play music**

**Accessed only if in  
possession of CD and onsite**

**License to listen in  
perpetuity**

## Hosted: iTunes®

**Off premise**

**Use provider's portal  
to play music**

**Accessed from anywhere  
there is internet access**

**License to listen in  
perpetuity**

## SaaS: Pandora®

**Off premise**

**Use provider's portal  
to play music**

**Accessed from anywhere  
there is internet access**

**License to listen only while  
subscription is current**



- Aside from the OMB mandate, what are key business reasons for deploying to the cloud?
  - *Cost reduction*
  - *Speed & flexibility*
  - *Greater mobility*
  - *Easier collaboration*
  - *Heightened security*
- Each of these factors can be challenged, but the most interesting claim is that Cloud Computing saves money.
- What is it about SaaS licenses that leads to potential cost savings?



# Questions About Potential Cost Savings

- SaaS licenses generally provide all software and services needed to operate a business application, including:
  - *Application & Related Software Licenses*
  - *Maintenance (fixes, patches, upgrades) & Support*
  - *Infrastructure & Facilities*
- Since a SaaS subscription license price includes all those elements, how can you tell whether corresponding internal costs will go away?
- Will you end up paying twice for certain items (e.g. servers) if they do not leave your internal environment as a direct result of a SaaS license?
- How do you know a SaaS cost is lower than an internal cost for an item?
- Since you may license a variety of applications from a variety of SaaS vendors, do the economies of scale from each vendor outweigh the aggregate internal economies if you hosted all those apps on premise?



# Perpetual-SaaS Comparisons

Standard Product	Year 1	Year 2	Year 3	Year 4	Year 5	5 Year Total
Perpetual License	\$ 2,000,000					\$ 2,000,000
Maintenance & Support	\$ 400,000	\$ 400,000	\$ 400,000	\$ 400,000	\$ 400,000	\$ 2,000,000
Hosting Expenses Charged	\$ 120,000	\$ 120,000	\$ 120,000	\$ 120,000	\$ 120,000	\$ 600,000
<b>Total</b>	<b>\$ 2,520,000</b>	<b>\$ 520,000</b>	<b>\$ 520,000</b>	<b>\$ 520,000</b>	<b>\$ 520,000</b>	<b>\$ 4,600,000</b>
SaaS Product	Year 1	Year 2	Year 3	Year 4	Year 5	5 Year Total
Annual Subscription (3 year amortization)	\$ 1,533,333	\$ 1,533,333	\$ 1,533,333	\$ 1,533,333	\$ 1,533,333	\$ 7,666,667
Annual Subscription (5 year amortization)	\$ 920,000	\$ 920,000	\$ 920,000	\$ 920,000	\$ 920,000	\$ 4,600,000



- Flexibility

- *Switching from one SaaS vendor to another could be less costly than switching from one perpetual vendor to another for the same application.*
- *Would it be as easy to switch email providers as it would be to switch ERP SaaS vendors?*
- *What about customization?*
- *What about control over the timing of upgrades?*
- *Is virtualization limited to the cloud?*
- *How do you put a price on flexibility gained or lost?*





- Heightened Security
  - *Even if all infrastructure is outsourced, does it make sense to outsource data security?*
- Analytical Approaches
  - *A consistent approach to analyzing prices and internal costs is a mandatory prerequisite to gauging cost savings.*
  - *Should savings be measured on a deal basis or a collective basis?*



# Data Ownership & Data Security in SaaS Environments

- The government should always own its data at all times and all places.
- In a SaaS arrangement, it is likely the government's data will be stored outside the physical control of the government. This raises ownership and security concerns.
- The ESI BPA Master EULA includes language guaranteeing the government's ownership rights over its data, including the obligation of the service provider to provide the data to the government upon demand at no additional charge in a useable format (CSV or as otherwise requested by the government).



Compare and contrast perpetual software licenses vs. subscription licenses.

Describe and discuss software deployment options and the types of hosting services available.

Discuss cloud computing, what it is, how it works.

Discuss virtualization and its role in cloud computing.

Discuss the three levels of services currently used in hosting models, their similarities, their differences, and their impacts on licensing decisions.

