Mata Kuliah
"Cloud Computing/ Komputasi diAwan"

Slide : 3
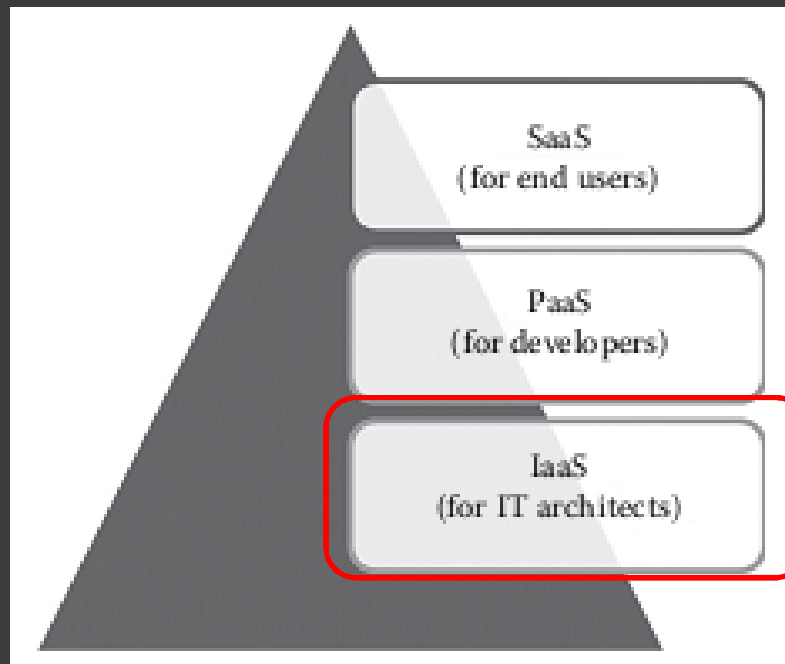
Presented by : Bambang S, S.Kom, MM, M.Kom

Cloud Service Model

◉ The National Institute of Standards and Technology (NIST) defines three basic service models, namely, IaaS, PaaS, and SaaS, as shown in Figure 5.1


SaaS
(for end users)

PaaS
(for developers)

IaaS
(for IT architects)

1. IaaS : The ability given to the infrastructure architects to deploy or run any software on the computing resources provided by the service provider. the underlying infrastructures such as computer, network, and storage are managed by the service provider. The end users are responsible for managing applications that are running on top of the service provider cloud infrastructure. The end users can access the services from their devices through web command line interface (CLI) or application programming interfaces (APIs) provided by the service providers.

Some of the popular IaaS provid -ers include Amazon Web Services (AWS), Google Compute Engine, OpenStack, and Eucalyptus.

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SaaS (for end users)

PaaS (for developers)

IaaS (for IT architects)
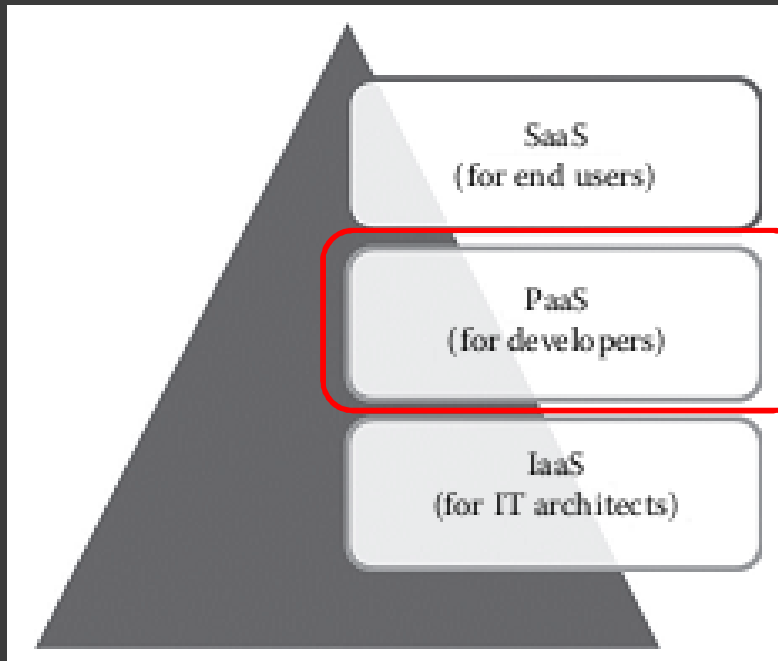
2. PaaS: The ability given to developers to develop and deploy an application on the development platform provided by the service provider. the developers are responsible for managing the deployed application and configuring the development environment. The developers can access the develop -ment platform over the Internet through web CLI, web user interface (UI), and integrated development environments (IDEs).
Some of the popular PaaS providers include Google App Engine, Force.com, Red Hat OpenShift, Heroku, and Engine Yard.

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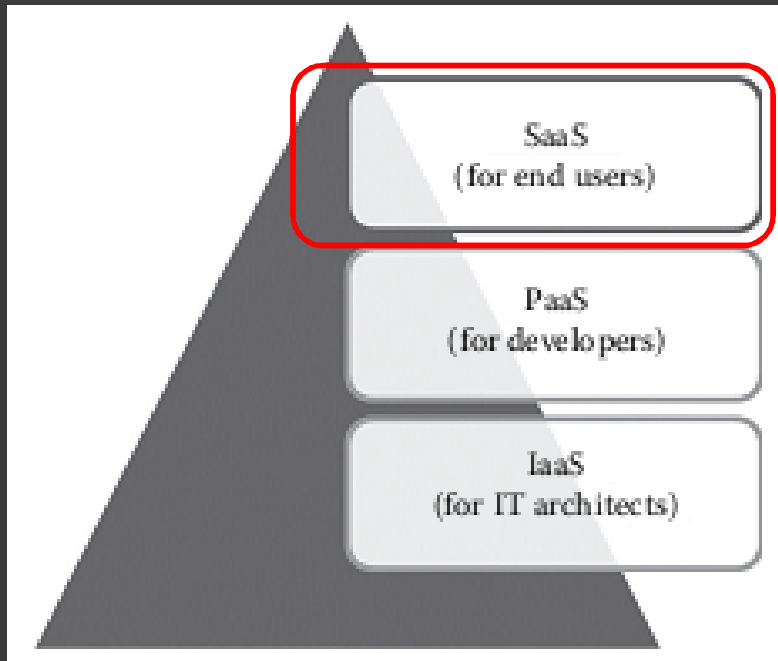

2. SaaS: The ability given to the end users to access an application over the Internet that is hosted and managed by the service provider. the end users are exempted from managing or controlling an application, the development platform, and the underlying infrastructure. The end users can access the services from any thin clients or web browsers. Some of the popular SaaS providers include Saleforce.com, Google Apps, and Microsoft office 365.

Cloud Service Model

The different service models of cloud computing can be deployed and delivered through any one of the cloud deployment models.

IaaS   PaaS   SaaS

FIGURE 5.2

User and service provider responsibilities of cloud service models: (a) IaaS, (b) PaaS, and (c) SaaS.

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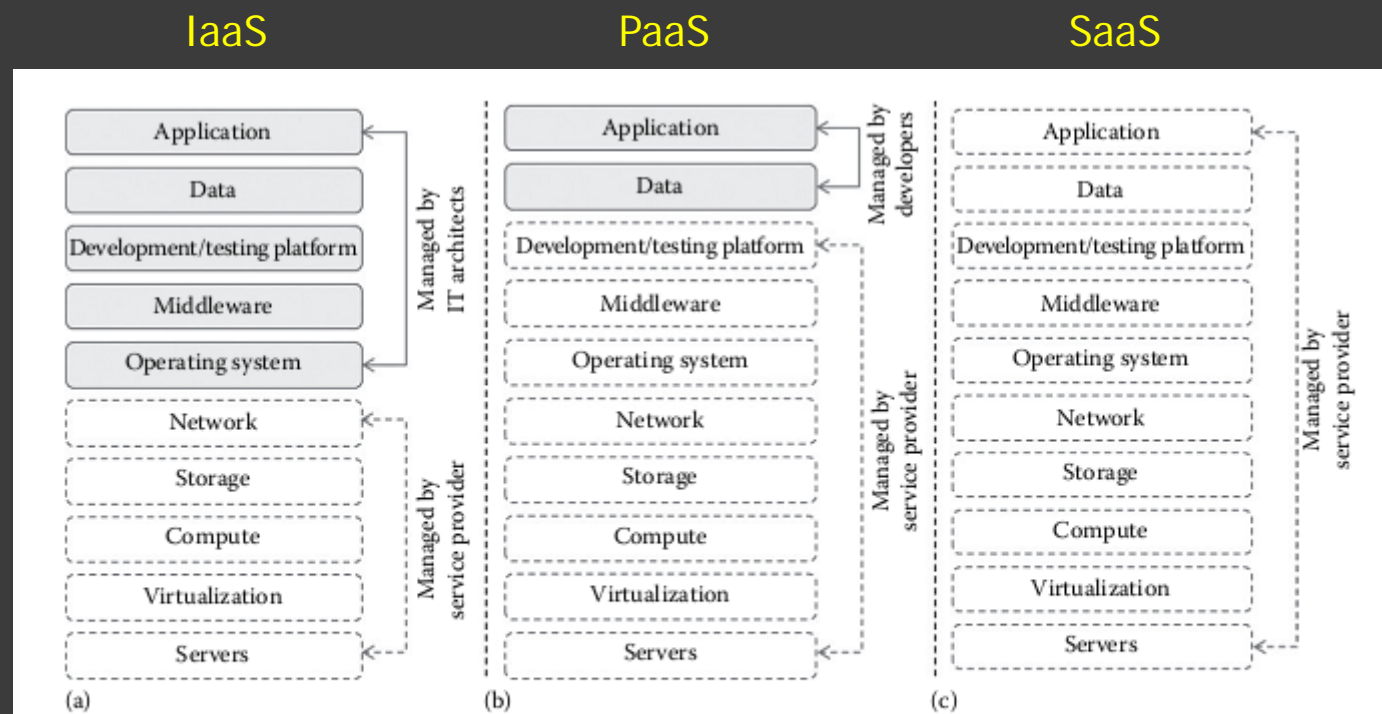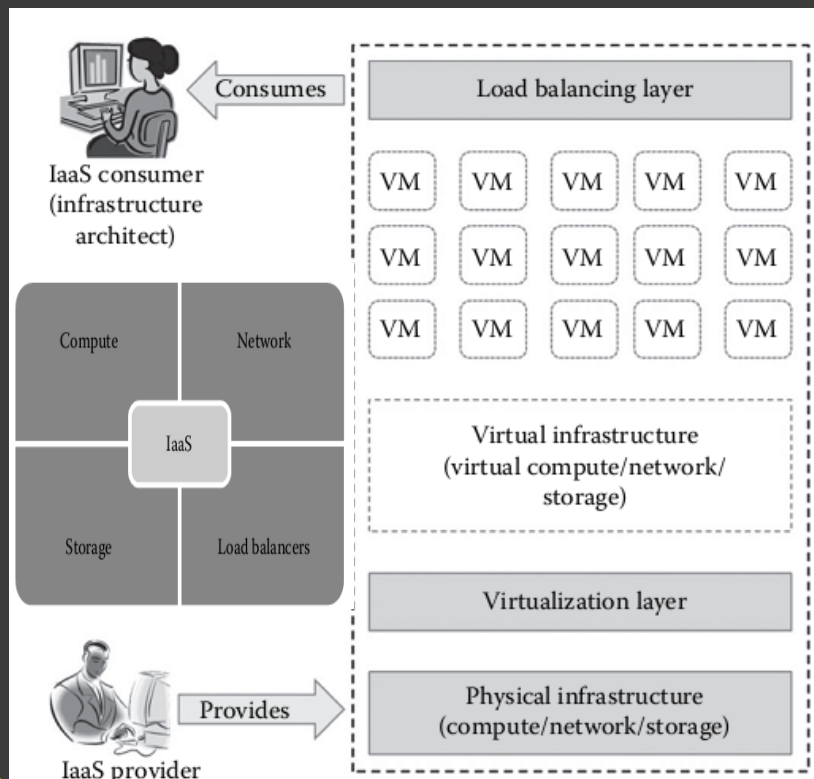
1. Infrastucture as a Service (IaaS)

- IaaS provides virtual computing, storage, and network resources by abstract-ing the physical resources.
- Technology virtualization is used to provide the virtual resources.
- All the virtual resources are given to the virtual machines (VMs) that are configured by the service provider.
- The end users or IT architects will use the infrastructure resources in the form of VMs
- The targeted audience of IaaS is the IT architect. The IT architect can design virtual infrastructure, network, load balancers, etc., based on their needs.

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1. Infrastucture as a Service (IaaS)

TABLE 5.1

Summary of Popular IaaS Providers

Provider	License	Deployment Model	Host OS	Guest OS	Supported Hypervisor(s)
Amazon Web Services	Proprietary	Public	Not available	Red Hat Linux, Windows Server, SuSE Linux, Ubuntu, Fedora, Debian, CentOS, Gentoo Linux, Oracle Linux, and FreeBSD	Xen
Google Compute Engine	Proprietary	Public	Not available	Debian 7 Wheezy, CentOS 6, Red Hat Enterprise Linux, SUSE, Windows Server, CoreOS, FreeBSD, and SELinux	KVM
Microsoft Windows Azure	Proprietary	Public	Not available	Windows Server, CentOS, FreeBSD, openSUSE Linux, and Oracle Enterprise Linux	Windows Azure hypervisor
Eucalyptus	GPLv3	Private and hybrid	Linux	Linux and Windows	Xen, KVM, VMware
Apache CloudStack	Apache 2	Private	Linux	Windows, Linux, and various versions of BSD	KVM, vSphere, XenServer/XCP
OpenNebula	Apache 2	Private, public, and hybrid	CentOS, Debian, and openSUSE	Microsoft Windows and Linux	Xen, KVM, VMware
OpenStack	Apache 2	Private and public	CentOS, Debian, Fedora, RHEL, openSUSE, and Ubuntu	CentOS, Ubuntu, Microsoft Windows, and FreeBSD	libvirt, Hyper-V, VMware, XenServer 6.2, baremetal, docker, Xen, LXC via libvirt

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2. Platform as a Service (PaaS)
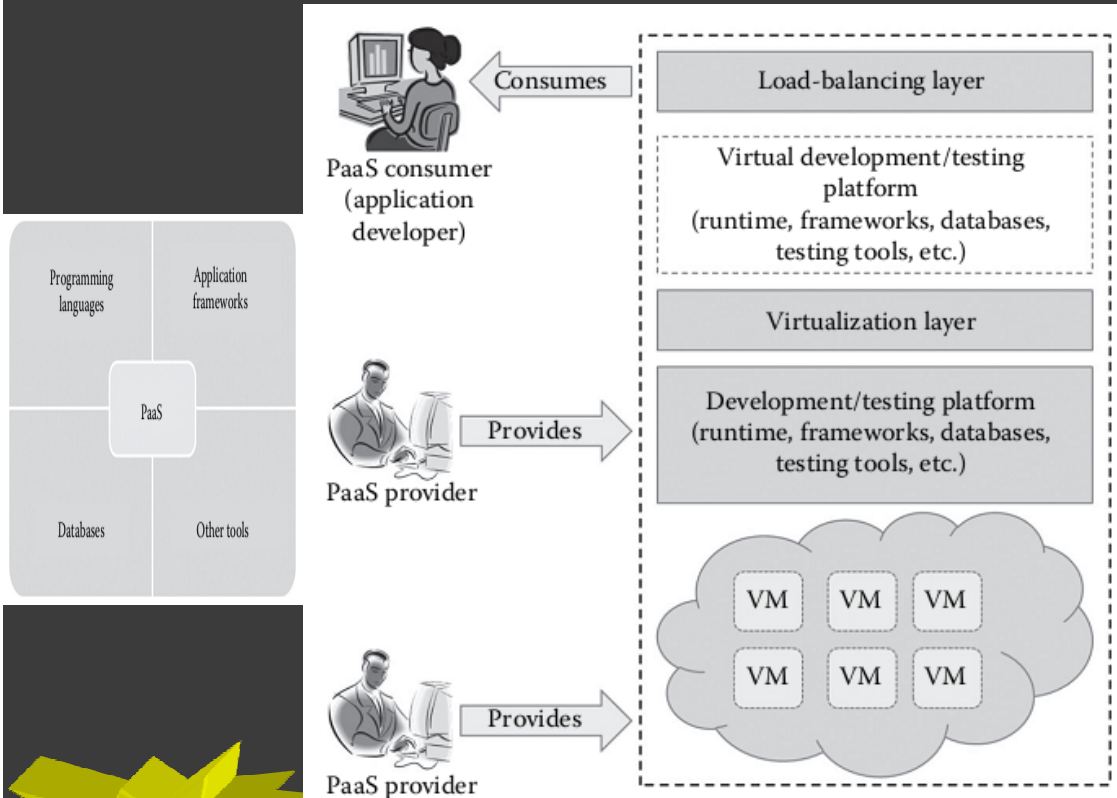
- PaaS consumers or developers can consume language runtimes, application frameworks, databases, message queues, testing tools, and deployment tools as a ser-vice over the Internet.
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- PaaS providers may provide programming languages, application frameworks, databases, and testing tools
- Some of the PaaS pro-viders also provide build tools, deployment tools, and software load bal-ancers as a service

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Cloud Service Model

The different service models of cloud computing can be deployed and delivered through any one of the cloud deployment models.

2. Platform as a Service (PaaS)

TABLE 5.2

Summary of Popular PaaS Providers

Provider	License	Deployment Model	Supported Languages	Supported Frameworks	Supported Databases	Client Tools
Cloud Foundry	Open source and proprietary	Public	Python, PHP, Java, Groovy, Scala, and Ruby	Spring, Grails, Play, Node.js, Lift, Rails, Sinatra, and Rack	MySQL, PostgreSQL, MongoDB, and Redis	cf. CLI, IDEs, and build tools
Google App Engine	Proprietary	Public	Python, Java, Groovy, JRuby, Scala, Clojure, Go, and PHP	Django, CherryPy, Pyramid, Flask, web2py, and webapp2.	Google Cloud SQL, Datastore, BigTable, and Blobstore	APIs
Heroku	Proprietary	Public	Ruby, Java, Scala, Clojure and Python, PHP, and Perl	Rails, Play, Django, and Node.js.	ClearDB, PostgreSQL, Cloudant, Membase, MongoDB, and Redis	CLI and RESTful API
Microsoft Windows Azure	Proprietary	Public	.Net, PHP, Python, Ruby, and Java	Django, Rails, Drupal, Joomla, WordPress, DotNetNuke, and Node.js.	SQL Azure, MySQL, MongoDB, and CouchDB	RESTful API and IDEs

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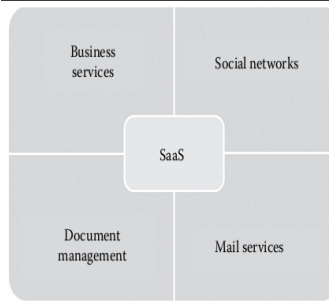
3. Software as a Service (SaaS)

TABLE 5.3

Summary of Popular SaaS Providers

Provider	Services Provided
Salseforce.com	On-demand CRM solutions
Google Apps	Gmail, Google Calendar, Talk, Docs, and Sites
Microsoft Office 356	Online office suite, software, plus services
NetSuite	ERP, accounting, order management, inventory, CRM, professional services automation (PSA), and e-commerce applications
Concur	Integrated travel and expense management solutions
GoToMeeting	Online meeting, desktop sharing, and video-conferencing software
Constant Contact	E-mail marketing, social-media marketing, online survey, event marketing, digital storefronts, and local deals tools
Workday, Inc.	Human capital management, payroll, and financial management
Oracle CRM	CRM applications
Intacct	Financial management and accounting software solutions

Business services

Social networks

SaaS

Document management

Mail services

• SaaS is delivered as an on-demand service over the Internet, there is no need to install the software to the end user's devices.
•SaaS services can be accessed or disconnected at any time based on the end user's needs.
•SaaS services can be accessed from
•any lightweight web browsers on any devices such as laptops, tablets, and
•smartphones.
•benefits of using thin clients for
•accessing the SaaS application are as follows: it is less vulnerable to attack,
•has a longer life cycle, consumes less power,

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**Terima Kasih,
Wassalam,
Thanks,
Matur Nuwun,
Tse-se,
Arigato**