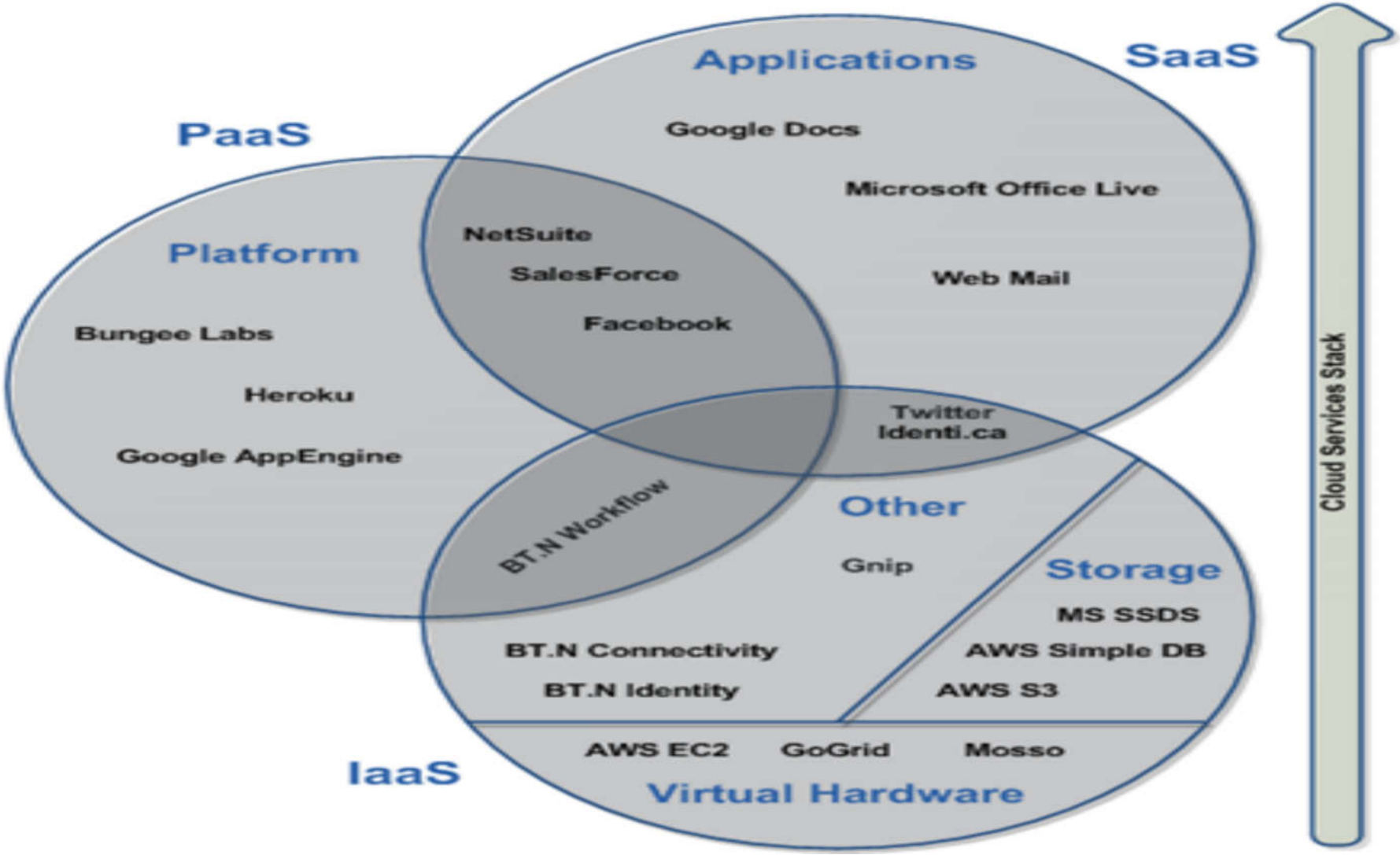
Cloud Computing service models



Source: ciscoschools

Platform as a Service

- From IaaS
- What is PaaS
- PaaS properties and characteristics
- Cloud Platforms

What is IaaS contribution?

- IaaS provides **virtual machines** and **resources** such that vendors can **segment** resources for each user
- IaaS providers can also make **user need not purchase the hardware**
- IaaS can make better use of resources(**utilization)**

IaaS is not Enough

- IaaS provides many **virtual** or **physical** machines, but it cannot alter the **quantity automatically**
- User may require
  - Require **automatic decision-making** of dispatching of jobs to available resources (servers etc)
  - Need a **running environment** or development and testing platform, to design their application or services

IaaS is **Good** but **Not Good enough**

- Consumers require more and more
  - Large-scale resource **abstraction** and **management**
  - Requirement of **large-scale resources** **on demand**
  - Running and hosting environment
  - **Automatic** and **autonomous mechanism**
  - Distribution and management of jobs
  - **Access control** and **authentication**

PaaS: The solution

What does PaaS offer?

- Facilities for **application design**
- **Application development**
- Application testing, **deployment**
- Application services such as team collaboration (list) web service integration and marshaling , database integration, security, scalability, storage , persistence , state management, application versioning application instrumentation and developer community facilitation
- All these services may be provisioned as an integrated solution over the web

PaaS

- PaaS is a computing platform that **abstracts** the
  - infrastructure,
  - OS, and
  - middle-ware

  - to drive **developer productivity**

What is PaaS?

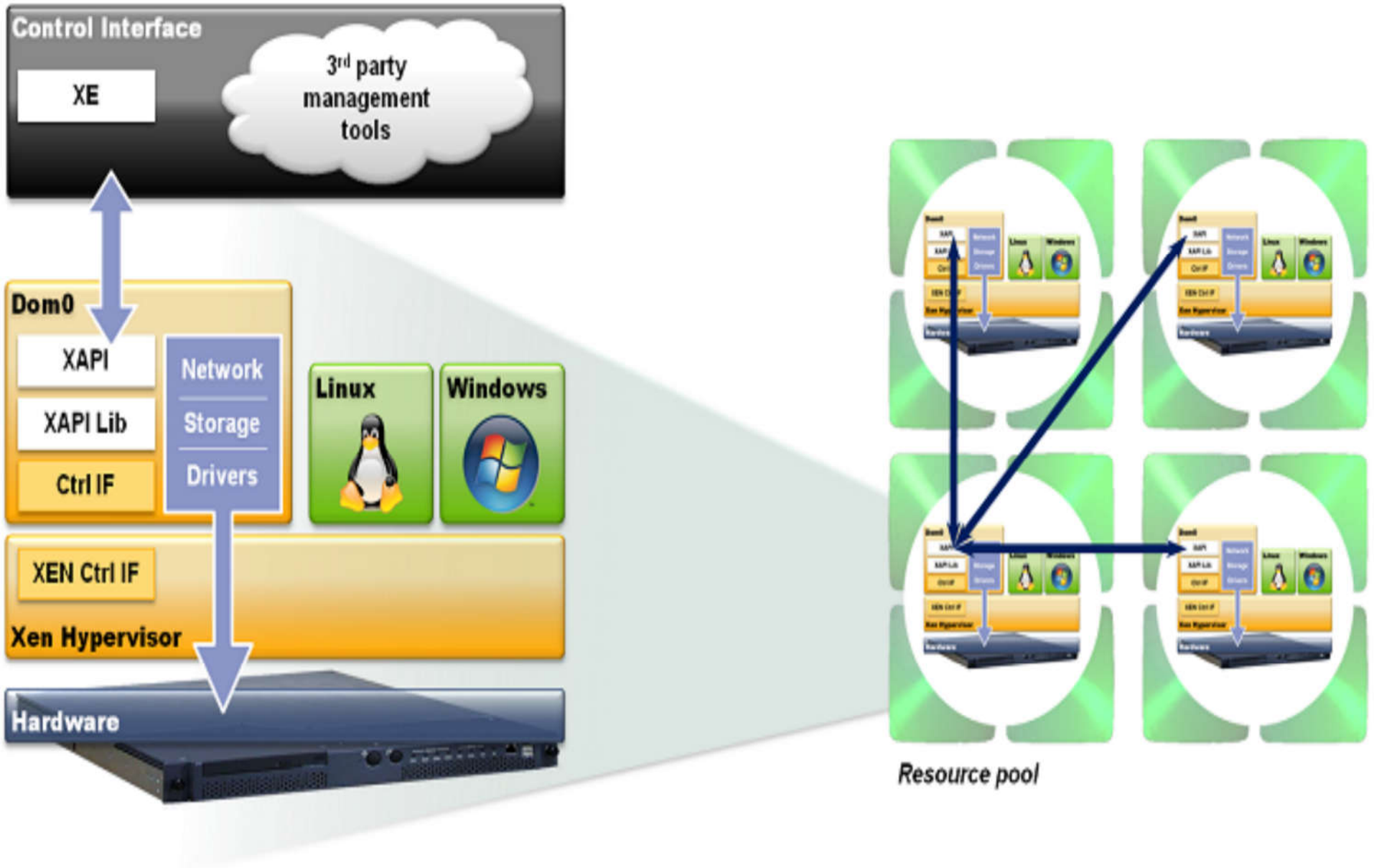
- Platform as a service (PaaS) is the
  - delivery of a **computing platform** and
  - **solution stack** as a service
- Google App Engine (GAE)
- Microsoft Azure

Solution Stack

PaaS delivers more than the infrastructure- it delivers a solution stack

Solution stack in an integrated set of software that provides everything a developer needs to build an application- for both software development and **runtime**

Solution stack



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Google App Engine -

Google app engine

Integrated platform service

- Google Accounts for authentication
- Google Native file system called GFS
- BigTable platform - data management, a distributed storage system that manages very large-scale structured data

Infrastructure services

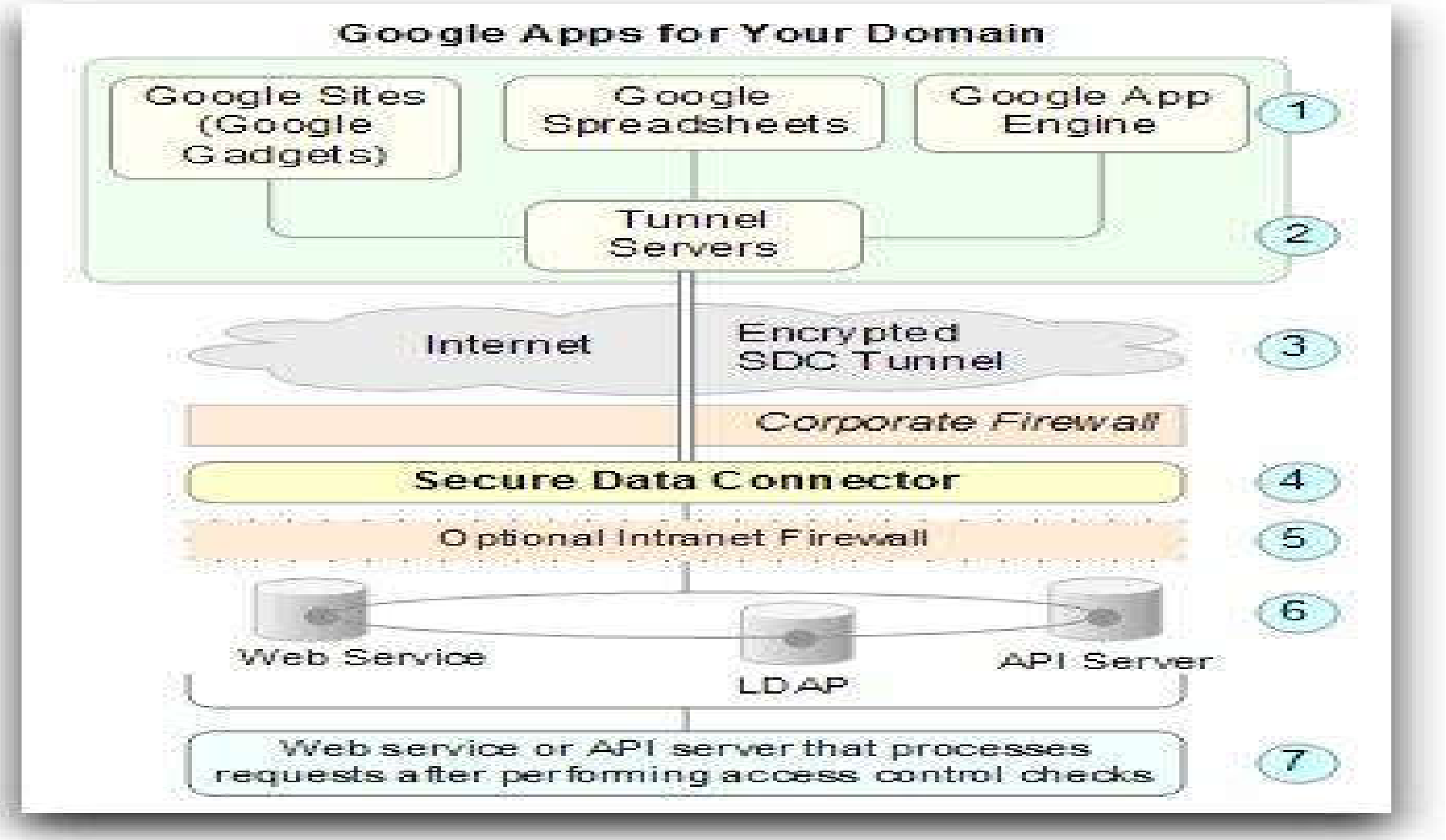
- Load balancing
- persistent storage with quota
- sorting and transactions
- programming interfaces
- scheduling tasks

GAE - Solution stack

Development stack

- Python runtime
- java run time
- SDK
- web based administration console
- datastore

Google App stack



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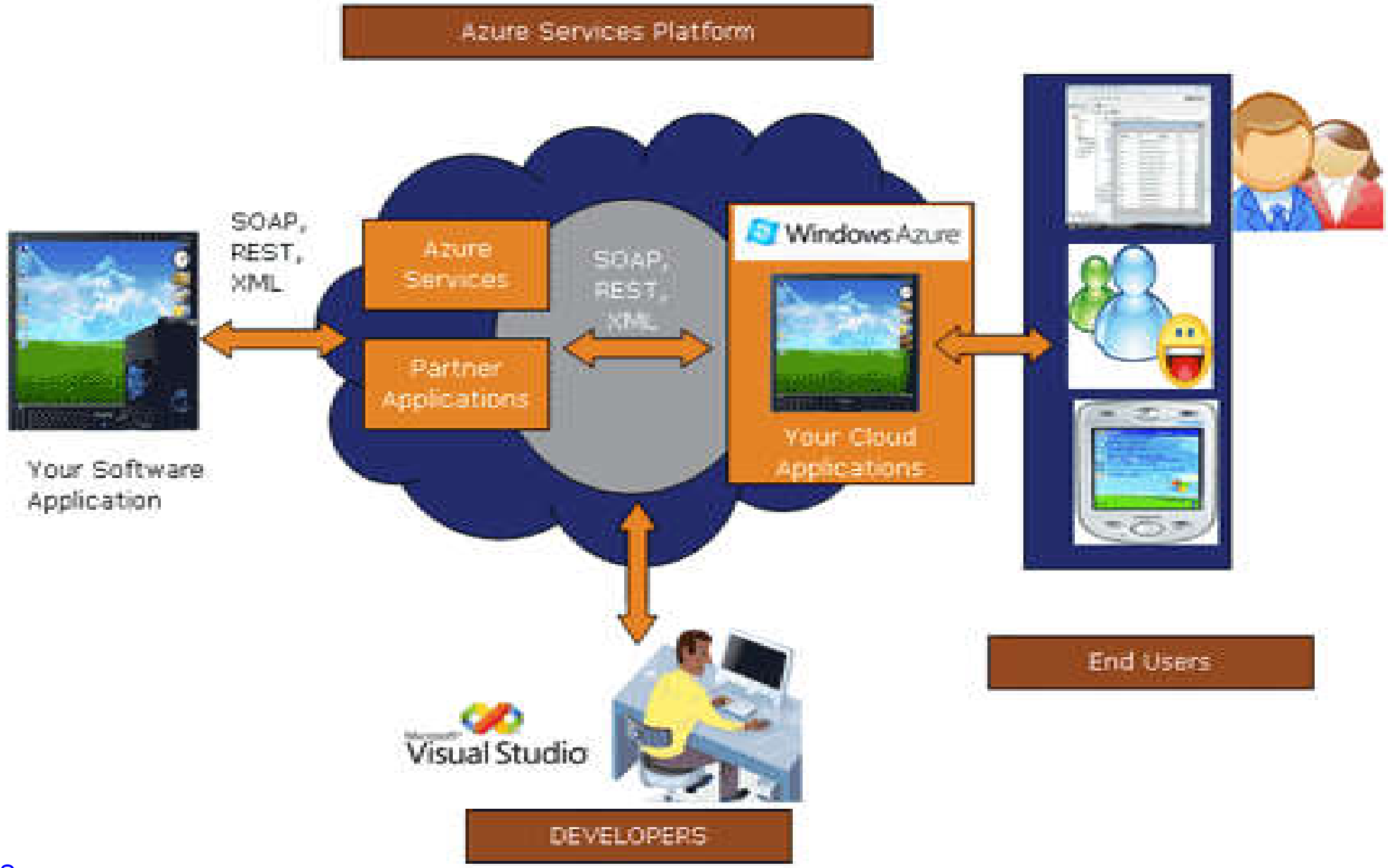
Microsoft Azure - Solution stack

Azure platform

- Windows Azure
- Microsoft .NET services
- Microsoft SQL services
- Live services

MS Azure stack



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PaaS Features

PaaS

- Deliver the computing platform as service
  - Developing application using programming languages and tools supported by the PaaS provider
  - Deploying consumer-created applications on to the cloud infrastructure
    - http://sdmcetcon1.appspot.com

Resource pool

- The capacities to abstract and control all the underlying resources
  - Resource pool dynamically provides an abstraction and consolidation of large-scale resources
  - Consumers can acquire and return resources from resource pool on demand pool on demand

Resource Pool

- PaaS providers define the smallest unit of resources
  - 1GHz CPU computation
  - 1 GB storage space
  - 1 MB memory capacity
- PaaS consumers can acquire units on their demand
- Consumer may not be aware of whether provided is dedicated or shared

Core Platform

- To provide a reliable environment for running applications and services
  - Core platform provides basic functionalities of a PaaS environment
  - Act as a bridge between **consumer** and **hardware**

Core platform

- Reduce the responsibility of the runtime environment
- Based on the core platform to develop their applications
- Do not need to care about how to built, configure, manage and maintain the **backend** enviroment

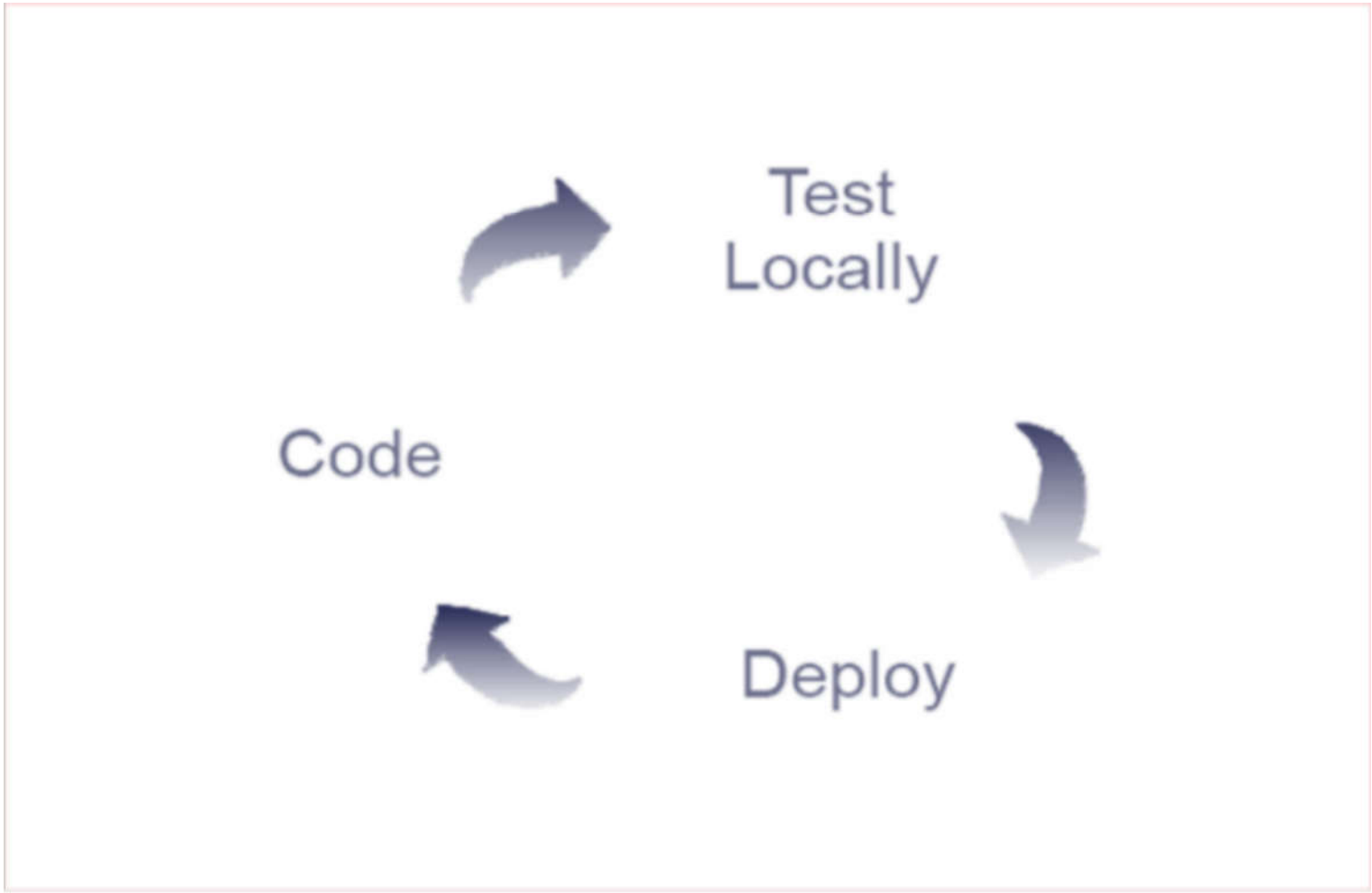
Enabling services

- To provide platform interfaces and services to drive the development productivity
  - Enabling services provide **programming IDE** and system control interfaces to access the PasS environment
  - Consumers can develop their applications through the **APIs and development tools**

Enabling services

- Provide a development and **testing platform** for running developed applications on the runtime environment
- Reduce the responsibility of managing the development environment
- Decrease the development period

WORKING OF GOOGLE APP ENGINE



Enabling services

- Enabling services are the main focus of consumers
- Consumers can make use of these sustaining services to develop their applications
  - Programming IDE
    - Integrate the full functionalities supported from the runtime environment
    - Provide some development tools, such as profiler, debugger and testing environment
  - System control interfaces
    - Make the decision according to some principles and requirements
    - Describe the flow of installations and configurations

PaaS: Properties and characteristics

- Guarantee some properties and characteristics
  - Scalability
  - Availability
  - Manageability
  - Performance
  - Accessibility

Summary

- **PaaS is magic box**
  - **Request anything on demand,** and return the rent of resources dynamically
  - Automatically build an initial environment and supports self-management with high-quality of service and performance
  - Provide an ability of fault tolerance and disaster recovery that makes services be more available and reliable
  - Supports the **security property** to limit malicious behavior in cloud environment
- **More important**
  - Do not care about how it works
  - Pay as u go

What is advantages of PaaS?

- Facilitate deployment of application **without** the cost and complexity of buying and managing the underlying hardware and software and provisioning hosting capabilities
- PaaS provides all the required to support the complete life cycle of building and delivering web applications and services entirely available from the internet

Cloud Platform

- Microsoft Azure
- Hadoop
- Google App Engine

SaaS Types

- Add-on development facilities
- Stand-alone development environments
- Application delivery-only environments
- Open platform as a service

PaaS : characteristics

- Web based user interface creation tools
- Multi-tenant architecture
- Integration with web service and databases
- Support for development team collaboration
- Utility-guide instrumentation