

Cloud Computing Primer for the PHP Developer

Art Jasso

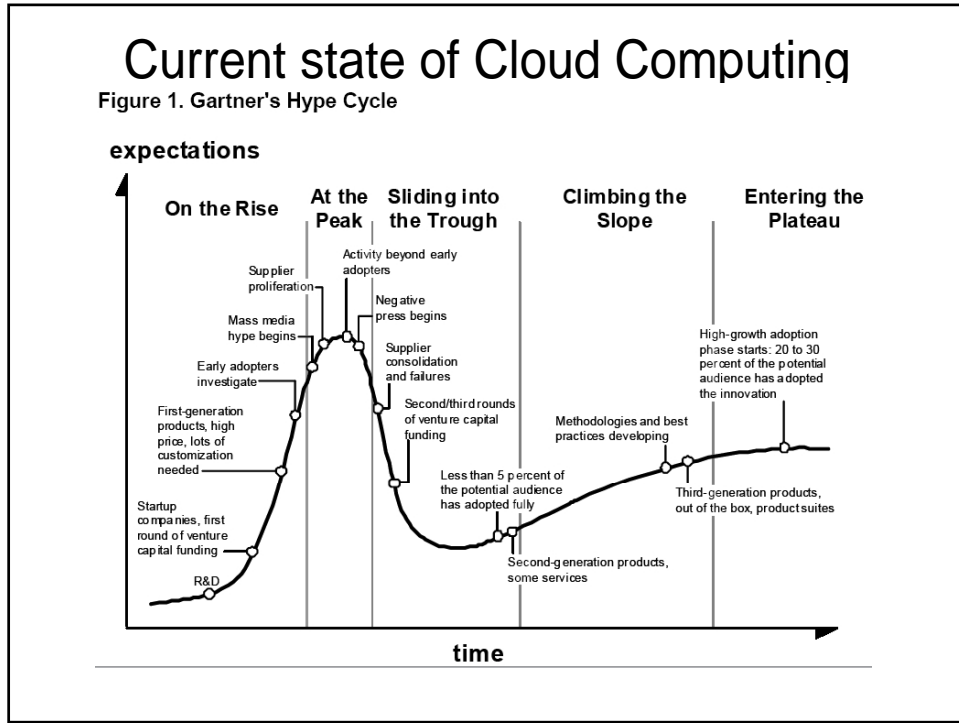
10/11/11

Cloud Computing Primer for the PHP Developer

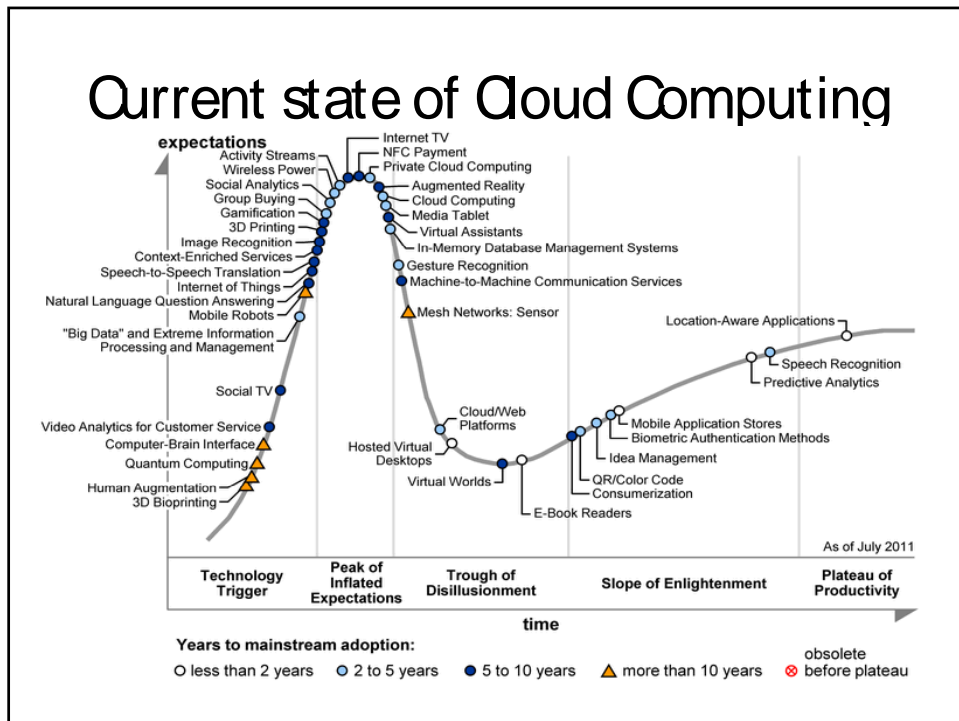
- Current state of Cloud Computing
- What is Cloud Computing?
- Cloud Basics
- Code Examples

Current state of Cloud Computing

Figure 1. Gartner's Hype Cycle



Current state of Cloud Computing



What is Cloud Computing?

- **National Institute of Standards and Technology (NIST) Definition:**
- Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable IT resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.
- This cloud model promotes availability and is composed of five essential characteristics (On-demand self-service, Broad network access, Resource pooling, Rapid elasticity, Measured Service);
- three service models (Cloud Software as a Service (SaaS), Cloud Platform as a Service (PaaS), Cloud Infrastructure as a Service (IaaS)); and,
- four deployment models (Private cloud, Community cloud, Public cloud, Hybrid cloud). Key enabling technologies include: (1) fast wide-area networks, (2) powerful, inexpensive server computers, and (3) high-performance virtualization for commodity hardware.

What is Cloud Computing? Five Characteristics

- **On-demand, Self-service**
 - Using cloud services without talking to a salesperson.
- **Broad network access**
 - Accessible over Internet or internal network
- **Resource pooling**
 - Hardware and software resources are pooled.
 - Amazon S3 storage service and EC2 virtual hosting platform.
- **Rapid Elasticity**
 - Cloud services should help you scale up or down as needed.
 - Salesforce platform
- **Measured Service**
 - Pay on actual service versus flat fee. Pay per MB or # users.

What is Cloud Computing? Three Service Models

- 3 Aas – as a Service
- Infrastructure as a Service (IaaS)
 - Storage, memory, and machine instances are offered as a service.
 - Examples are Amazon Storage/ RackSpace Cloud Servers /Microsoft Azure Cloud
- Platform as a Service (PaaS)
 - The entire platform is offered as a service, instead of offering infrastructure components separately.
 - Google App Engine, RackSpace CloudSites
- Software as a Service (SaaS)
 - We don't care about hosting at all. We only care about the application and application components that work out of the box.
 - Google Apps, Salesforce.com

What is Cloud Computing? Four Deployment Model

- Private Clouds
 - Within organizations
- Public Clouds
 - Amazon S3 anyone who needs and pays for it
- Community Clouds
 - Between Private/ Public Google App Engine
 - Python and Java communities
- Hybrid Clouds

Cloud Basics

- What do I need to know for Cloud Computing Programming?
- Virtualization
- Clustering

Cloud Basics - What do I need to know for Cloud Computing Programming?

- PHP
- Object Oriented Development
 - Most web service PHP libraries use OO paradigm
 - Procedural vs. OO
 - `update_page()` function vs. `page -> update()`
- Network Programming
 - HTTP protocol vs. socket programming
 - PHP uses cURL (Client URL Library Functions) extension to connect to URL, retrieve content or post data.
- XML
 - PHP Cloud Computing Primer for the PHP Developer SimpleXML ~~functions commonly used for web services~~
 - PHP DOM extensions use for more complex XML.
- JSON
 - Data exchange format popular with AJAX requests.
 - JavaScript Object Notation
 - JSON extension is enabled by default in PHP.

Cloud Basics

- Virtualization
 - Server hardware is no longer in the next room.
 - Rent a VPS Virtual Private Server such as Slicehost.
- Clustering
 - If machines become virtual then it is easier to have many of them.
 - If you have many machines then you need a way to piece them together into an architecture.

Web Services - SOAP

- SOAP - Simple Object Access Protocol
 - SOAP Envelope = XML message with payload
 - WSDL – Web Service Description Language
 - UDDI – Repository that holds WSDL
 - UDDI (Universal Description, Discovery, and Integration) is an XML-based registry for businesses worldwide to list themselves on the Internet.
 - Use PHP built-in SOAP extension. (SoapClient)

Web Services - REST

- REST - REpresentational State Transfer
 - REST deals with resources, and resources can be anything.
 - REST resources are represented by a URL.
 - `http://mycloud.net/basket?item_id=3`
 - `http://mycloud.net/user/mary`
 -
- REST uses HTTP methods to manipulate this resource:
 - POST – Updates an Object
 - GET – Retrieves an Object
 - PUT – Creates an Object
 - DELETE – Removes an Object
- PHP has no special functions for REST because it uses HTTP. Therefore you will use cURL to pass REST requests.
- HTTP API

Web Services – HTTP API

- Pure REST API use the 4 HTTP methods and nothing more.
- Less RESTfull implementations accept arbitrary URLs that contain not only resource but an action as well.
 - `http://mycloud.net/basket/add_item?item_id=3`
 - `http://mycloud.net/user/mary?action=register`
- Most HTTP API use only GET and POST not PUT and DELETE
- 'HTTP API' is neither a formal name or protocol. It is any webservice that uses HTTP protocols but does not use the REST principles.

Code Examples

- cURL Webservice
- SOAP Webservice
- JSON /REST Webservice

References

- PHP Development in the Cloud by Ivo Jansch and Chin Vito
- Yahoo Web services
- Various examples on internet.