CLOUD COMPUTING APPLICATIONS

CLOUD COMPUTING INTRODUCTION

Roy Campbell & Reza Farivar

Tremendous Buzz

"Not only is it faster and more flexible, it is cheaper. […] the emergence of cloud models radically alters the cost-benefit decision"

(FT)

"Cloud computing achieves a quicker return on investment"

(Lindsay Armstrong of salesforce.com)

"In an economic downturn, the appeal of that cost advantage will be greatly magnified"

(IDC)

"Revolution, the biggest upheaval since the invention of the PC in the 1970s […] IT departments will have little left to do once the bulk of business computing shifts […] into the cloud"

(Nicholas Carr)

"No less influential than e-business"

(Gartner)

"The economics are compelling, with business applications made three to five times cheaper and consumer applications five to 10 times cheaper"

(Merrill Lynch)

"Domestic cloud computing estimated to grow at 53%"

(moneycontrol.com)

Perils of Corporate Computing

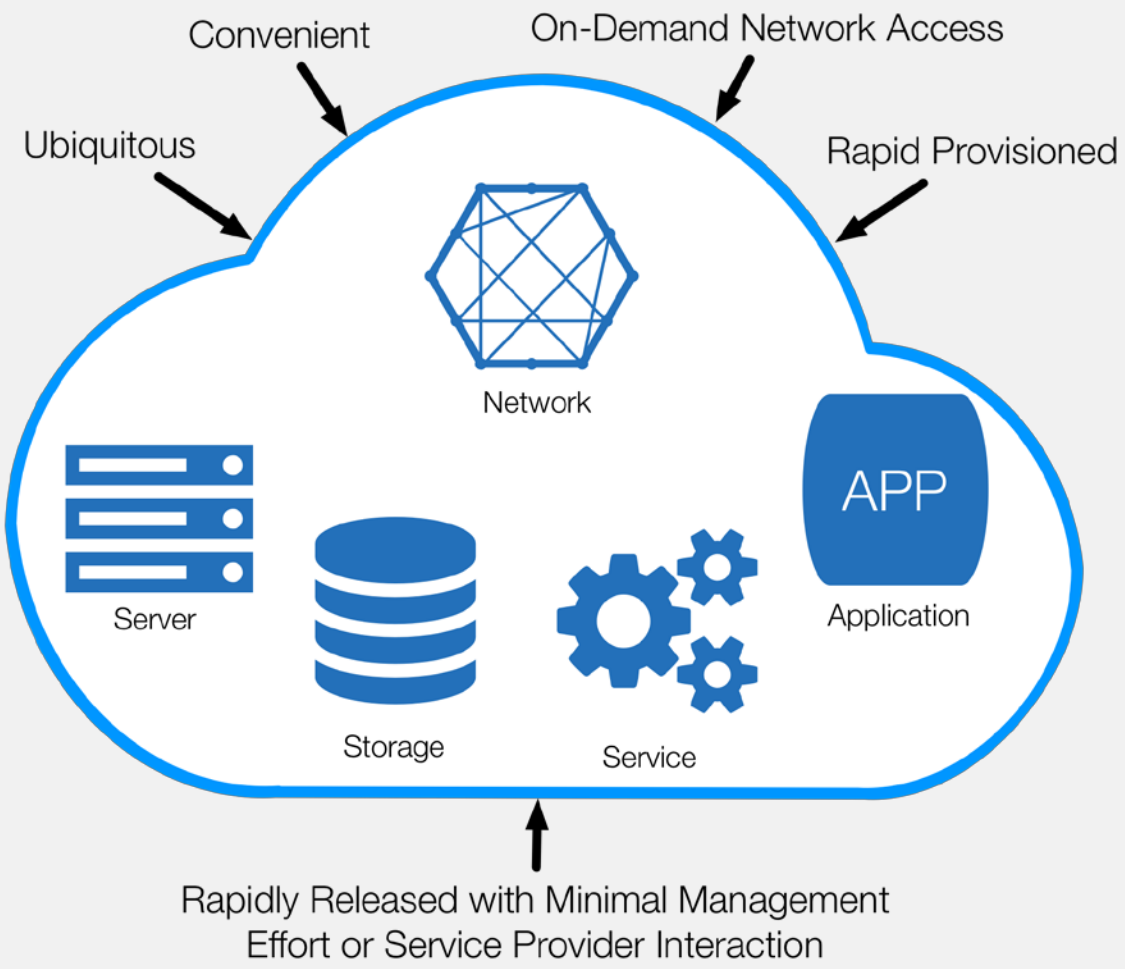
- Own information systems ☺
- However
  - Capital investment ☹
  - Heavy fixed costs ☹
  - Redundant expenditures ☹
  - High energy cost, low CPU utilization ☹
  - Dealing with unreliable hardware ☹
  - High levels of overcapacity (technology and labor) ☹
- NOT SUSTAINABLE

Back to the Future

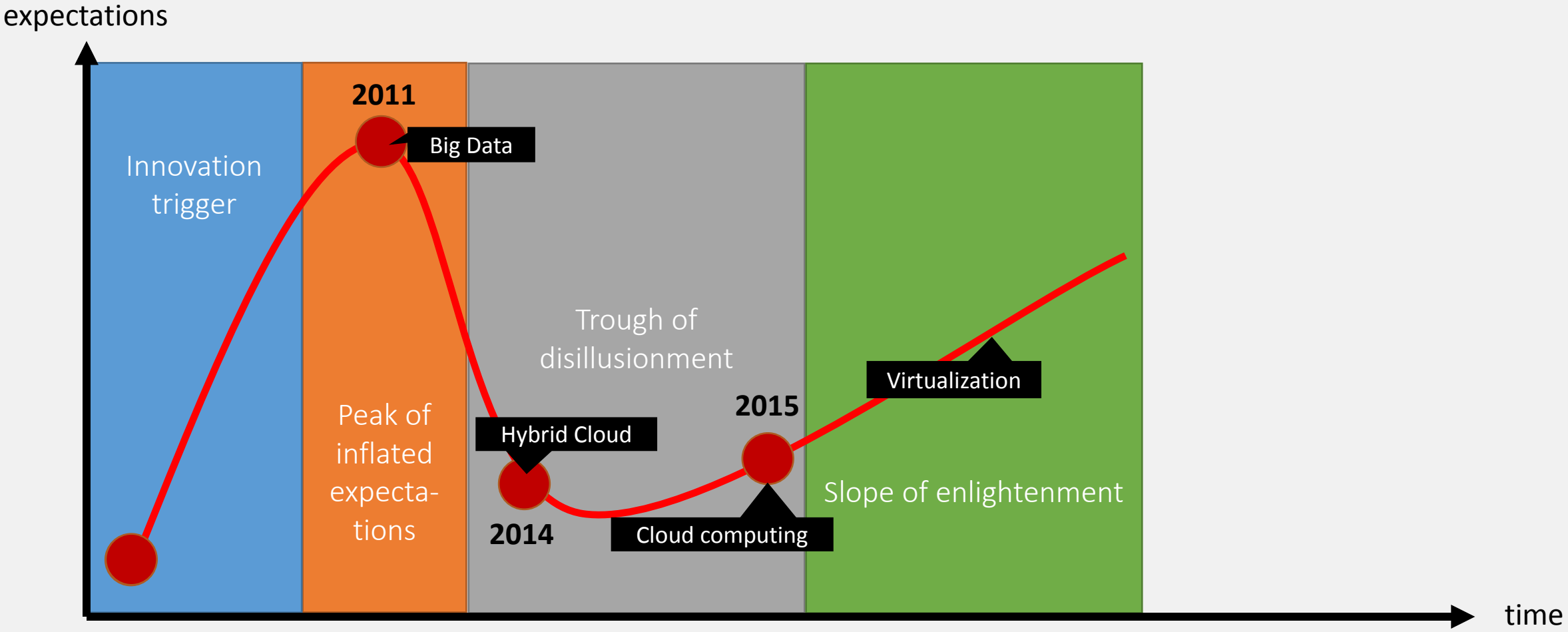
“Computing may someday be organized as a public utility, just as the telephone system is organized as a public utility”

(John McCarthy, 1961)

Cloud Computing



Cloud Adoption: Gartner's Hype Cycle



Delivery Models

- Software as a Service (SaaS)
  - Use provider's applications over a network
  - SalesForce.com
- Platform as a Service (PaaS)
  - Deploy customer-created applications to a cloud
  - AppEng
- Infrastructure as a Service (IaaS)
  - Rent processing, storage, network
  - Capacity and other fundamental computing resources
  - EC2, S3

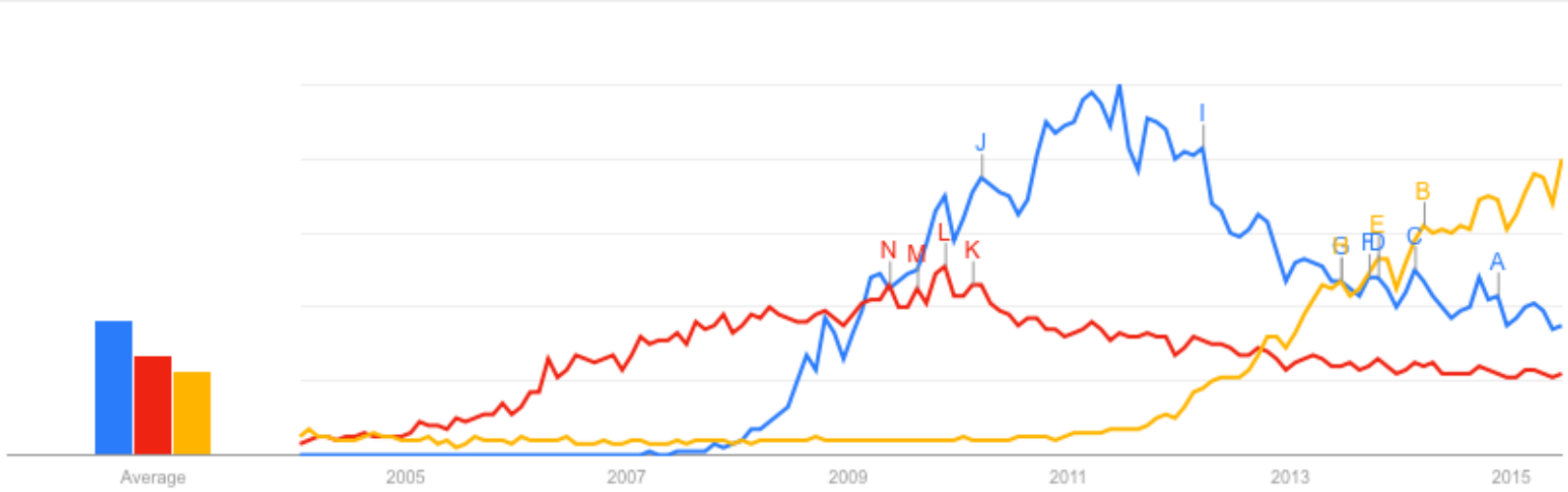
Synergy: Cloud Computing, Virtualization, and Big Data

Cloud Computing
Search term

Virtualization
Search term

Big Data
Search term

Interest over time



Google trends

Big Data Data Revolution and Clouds

- Data collection too large to transmit economically over Internet -- Petabyte data collections

- Computation is data intensive
  - Lots of disks, networks and CPUs
  - Overhead of maintaining cyber infrastructure is expensive
  - Users buy Big Data services from Clouds to share overhead

- Easy-to-write programs, fast turnaround
- MapReduce – Hadoop, PIG, HDFS, HBase