Introduction to Cloud Computing

I am here to help

buzzetti@us.ibm.com

Historic Waves of Economic and Social Transformation

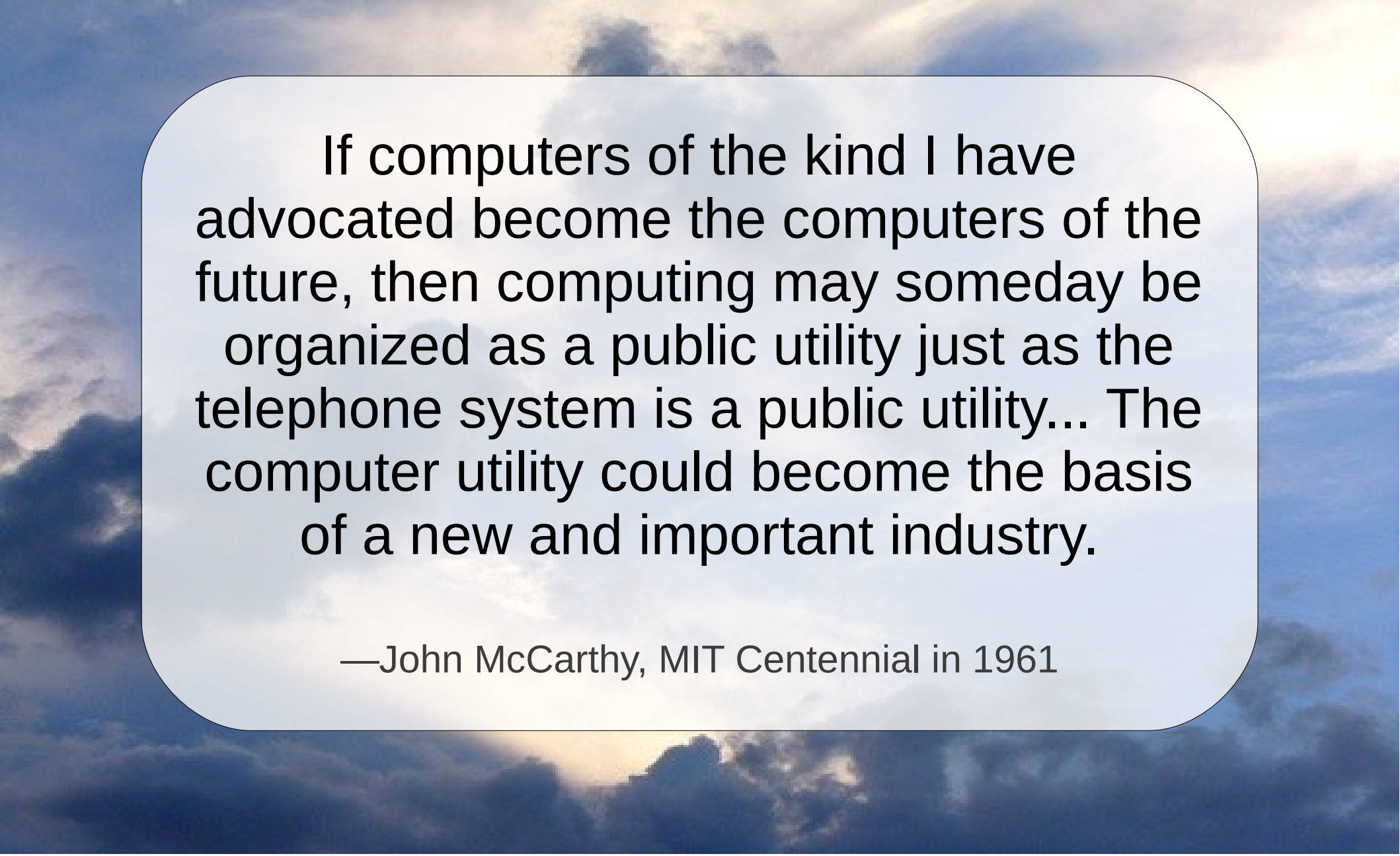
Industrial Revolution

Age of Steam and Railways

Age of Steel and Electricity

Age of Automobiles and Oil

Age of Communication & Information

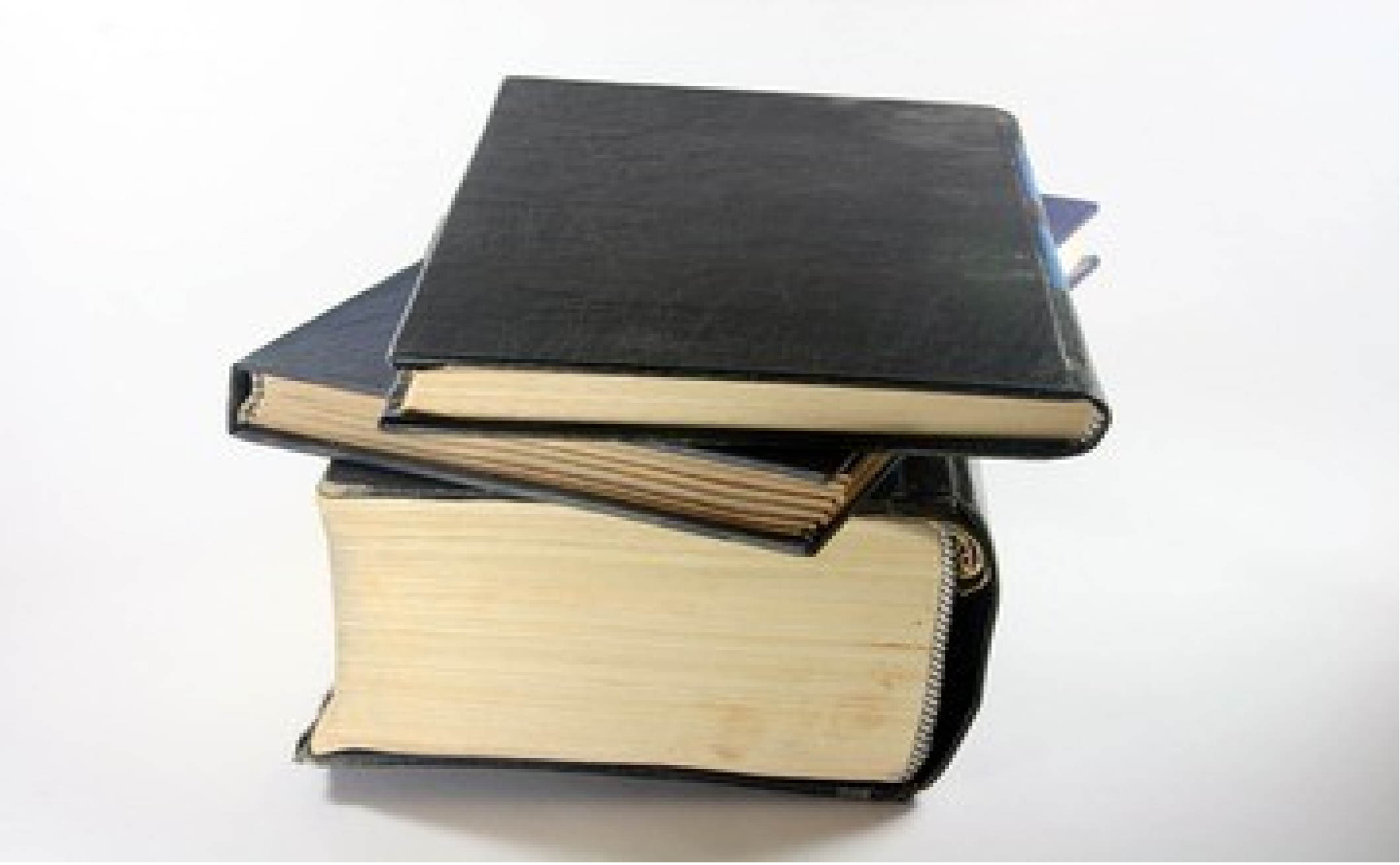

If computers of the kind I have advocated become the computers of the future, then computing may someday be organized as a public utility just as the telephone system is a public utility... The computer utility could become the basis of a new and important industry.
—John McCarthy, MIT Centennial in 1961

Cloud

Economics

Risk Management

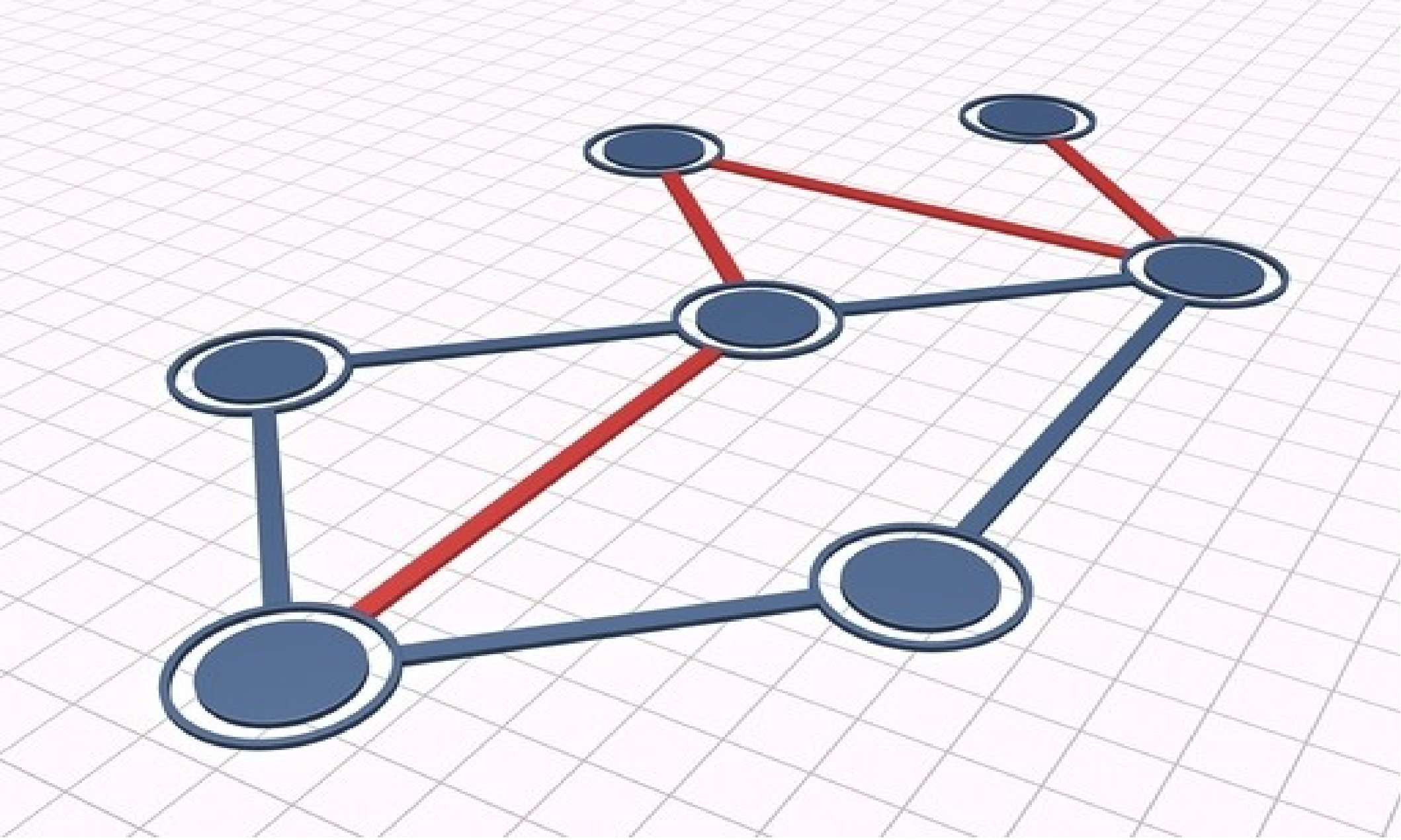
Time to Market



Information Society

Ubiquitous Society

NIST



Characteristics

Self Service

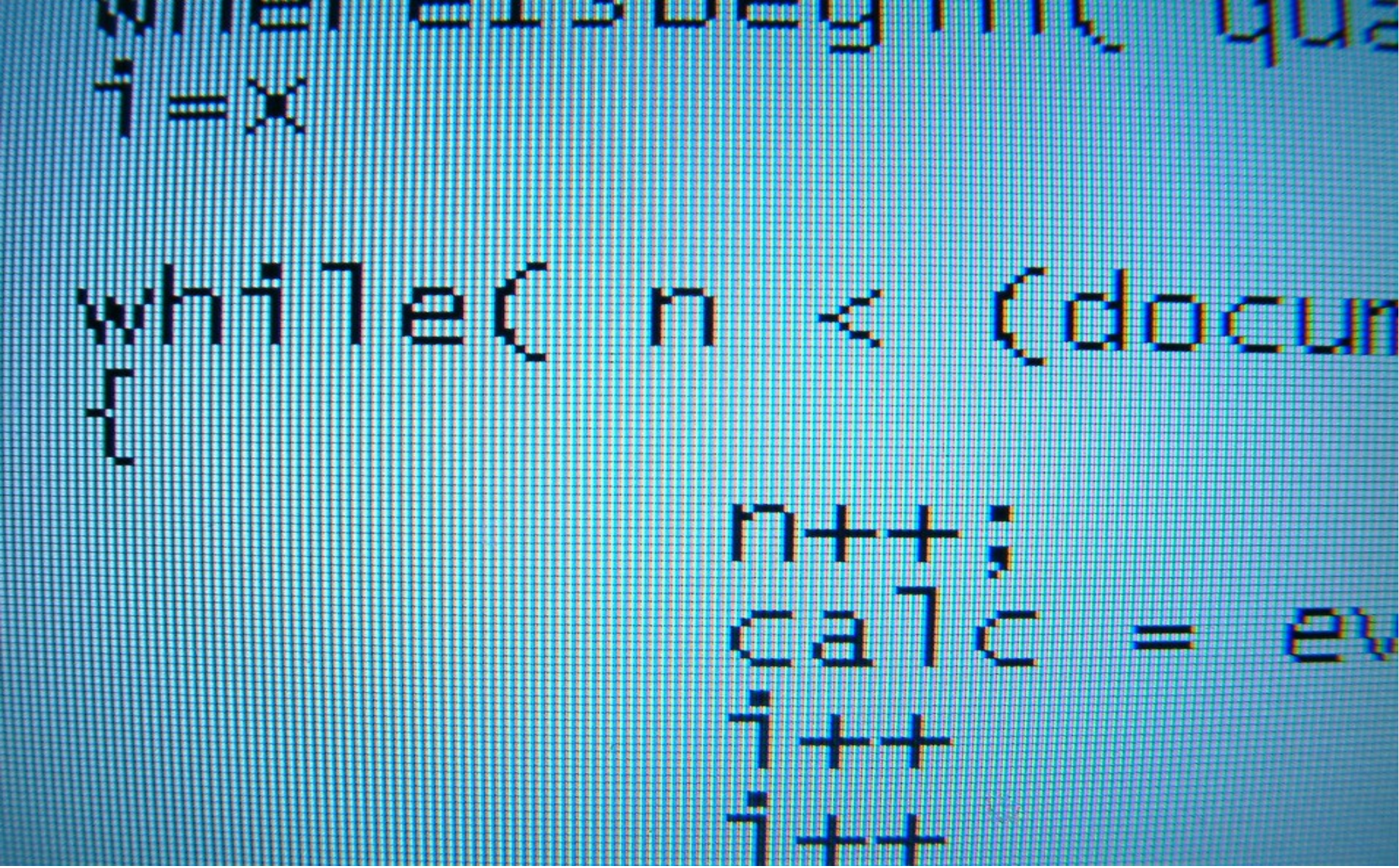
Broad Network Access

Resource Pooling

Rapid Elasticity

Measured Service

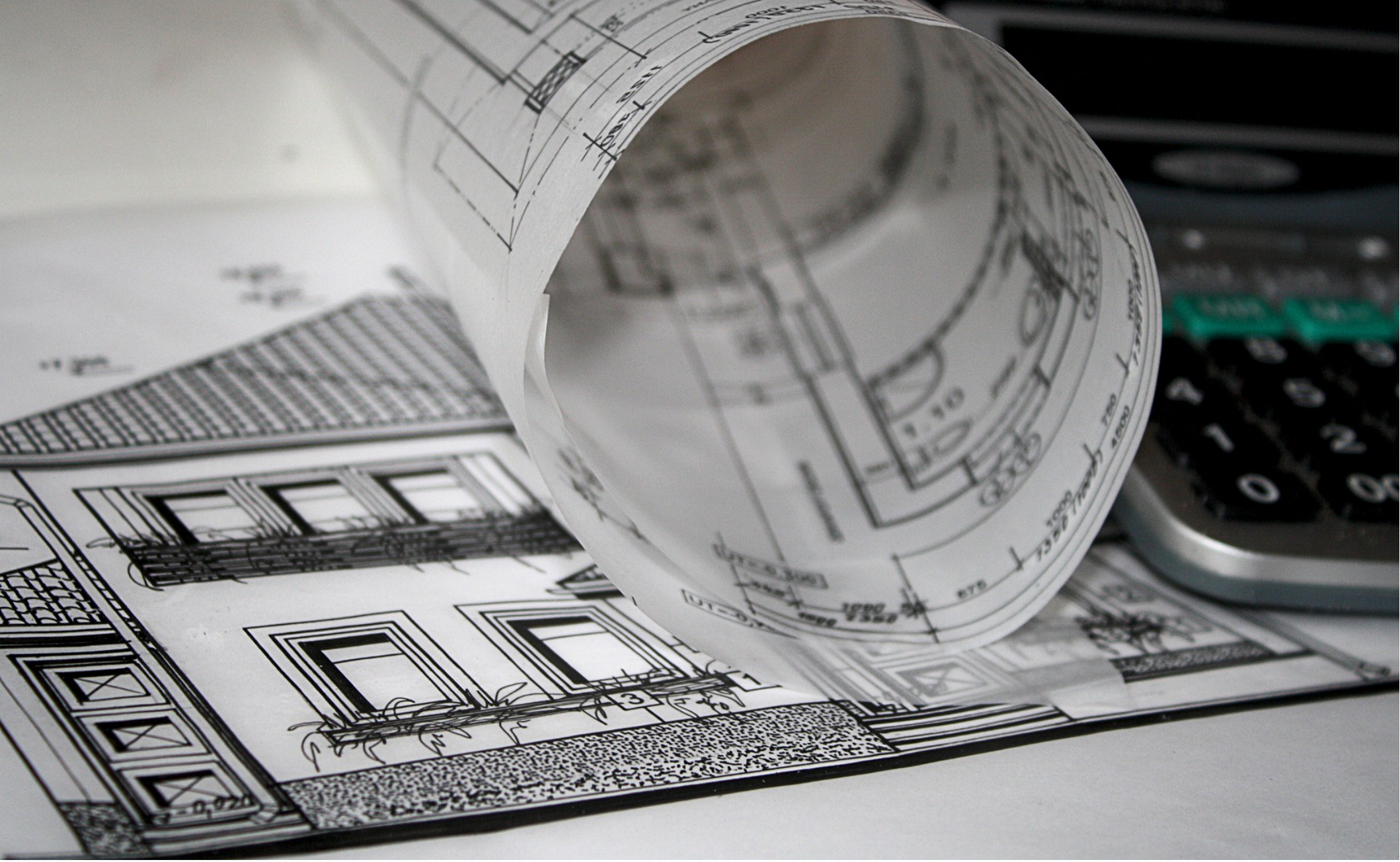
Service Models



SaaS

PaaS

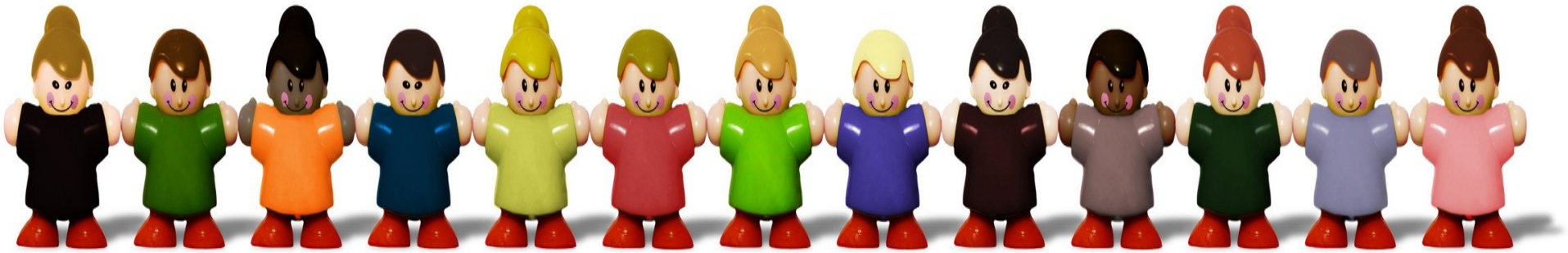
IaaS



Deployment Models

Private Cloud

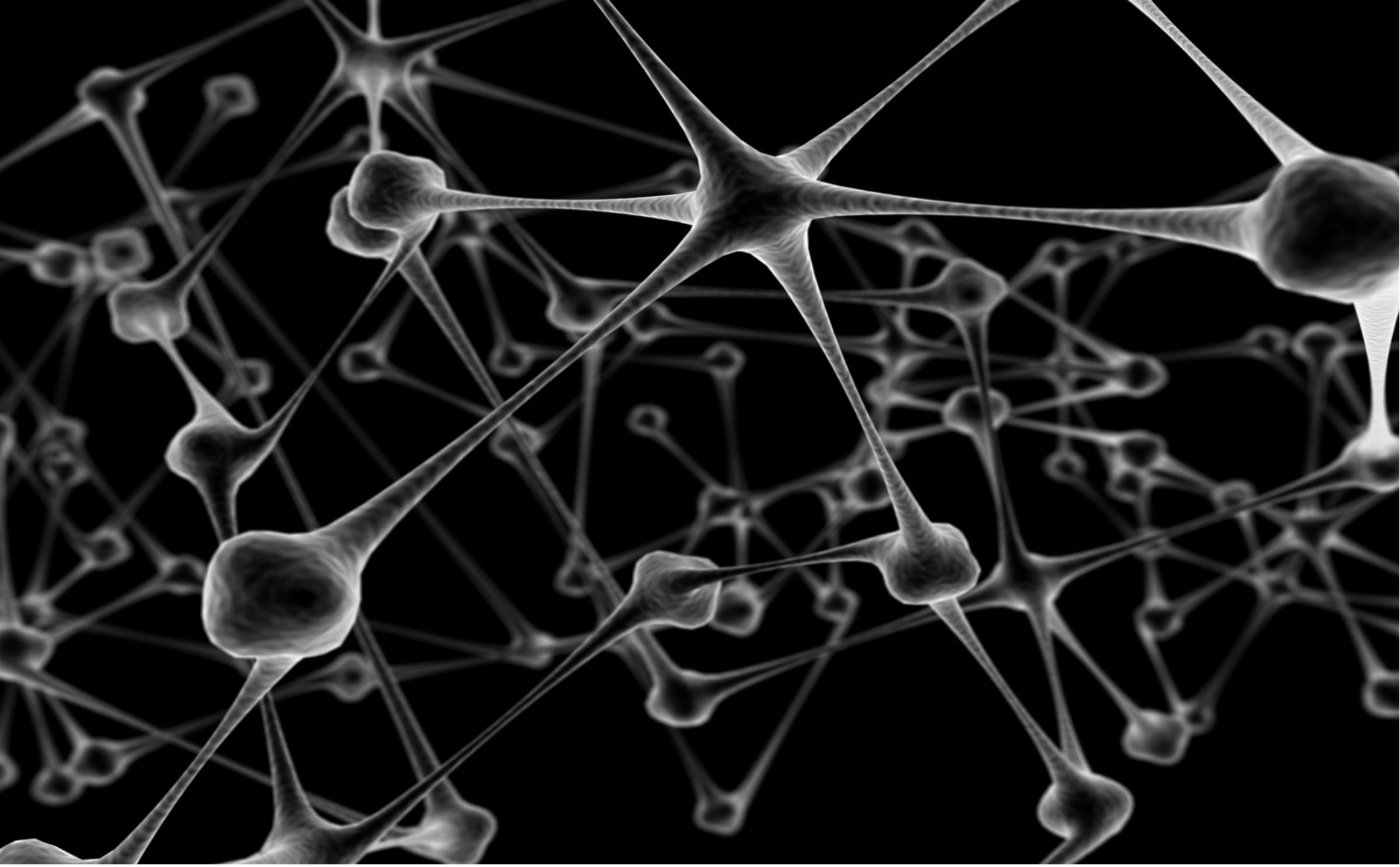
Public Cloud



Community Cloud

Hybrid Cloud

Building Blocks



Virtualization

Service Management

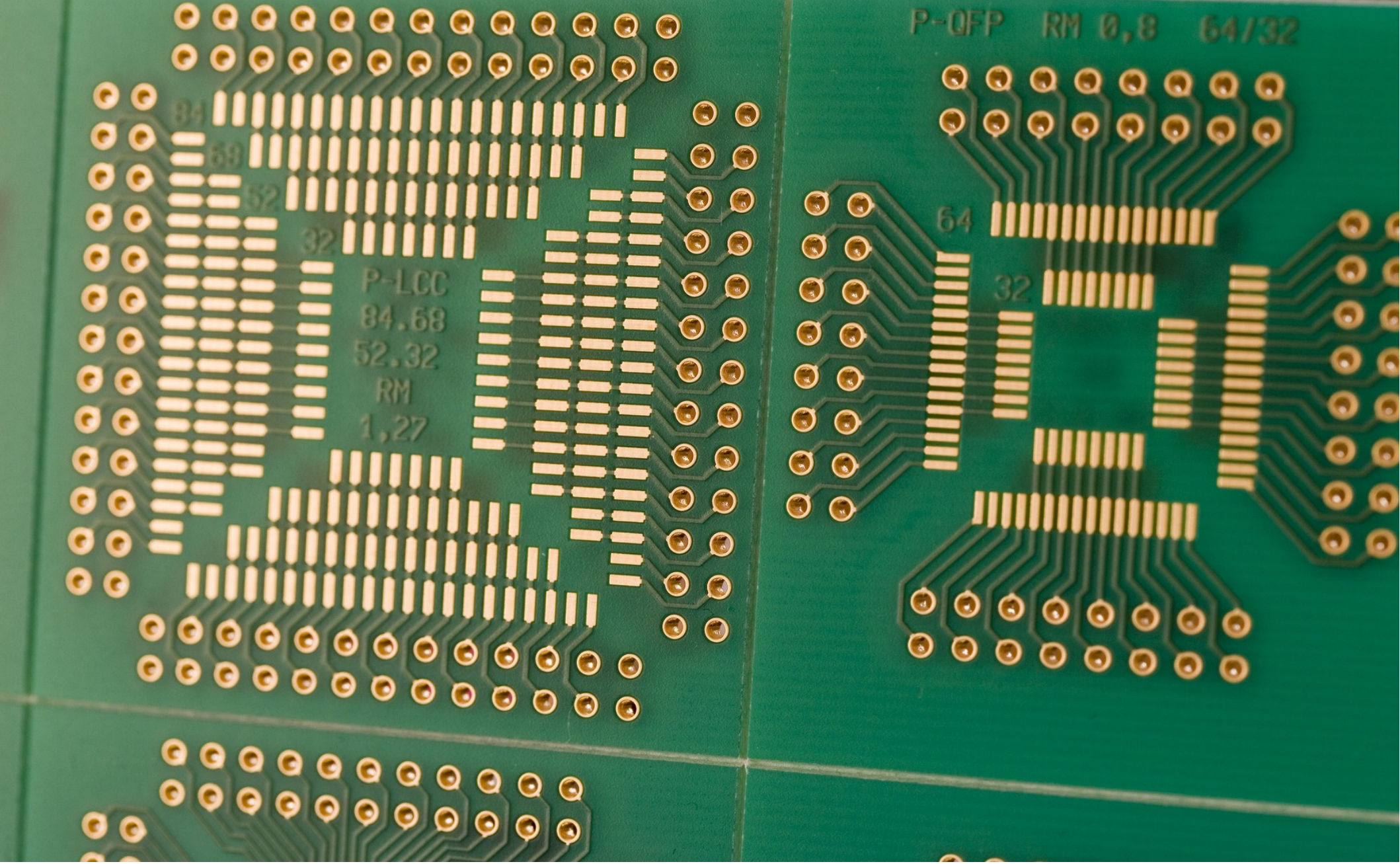
Web 2.0

How is it different ?

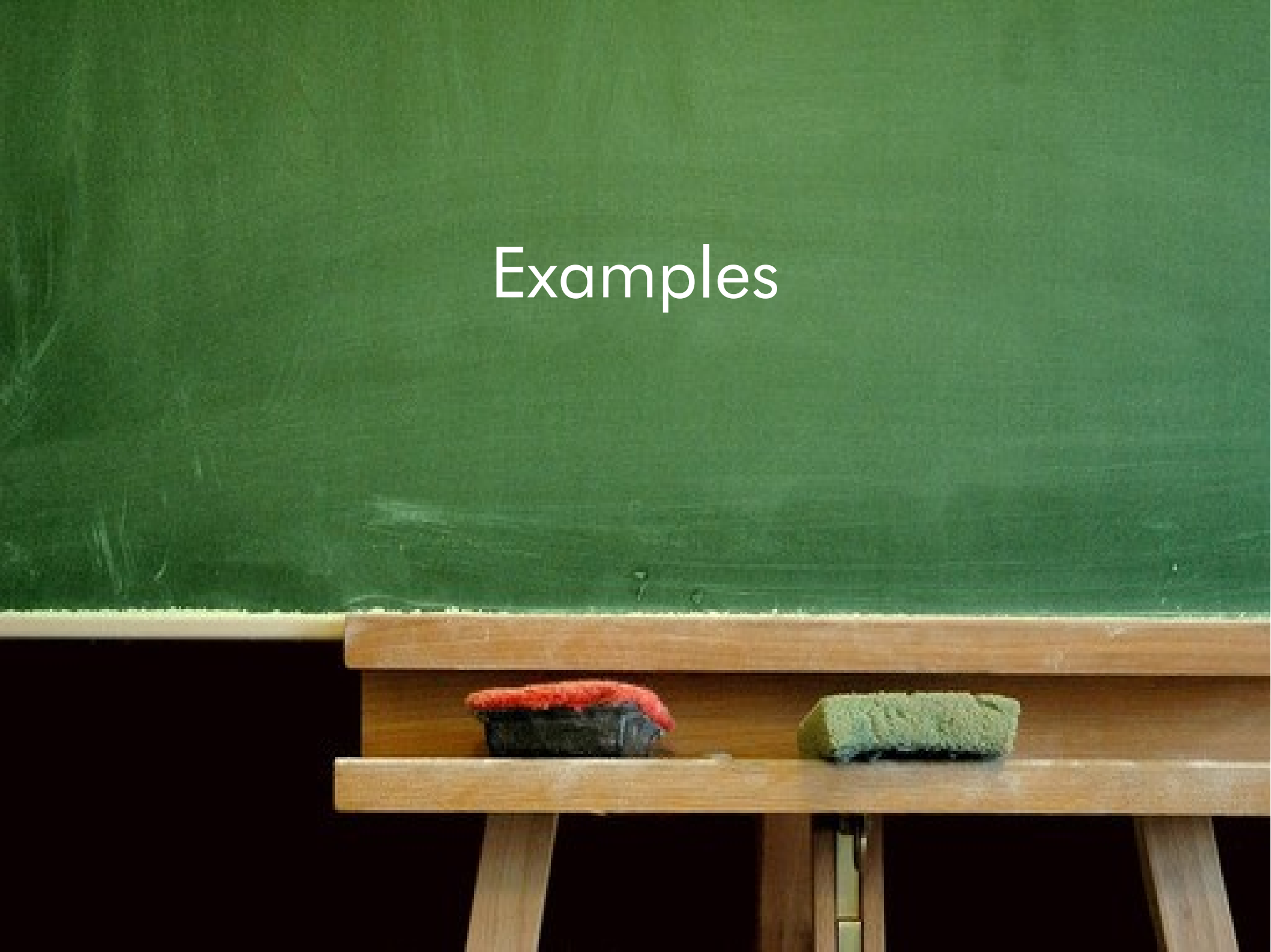
Delivery Model

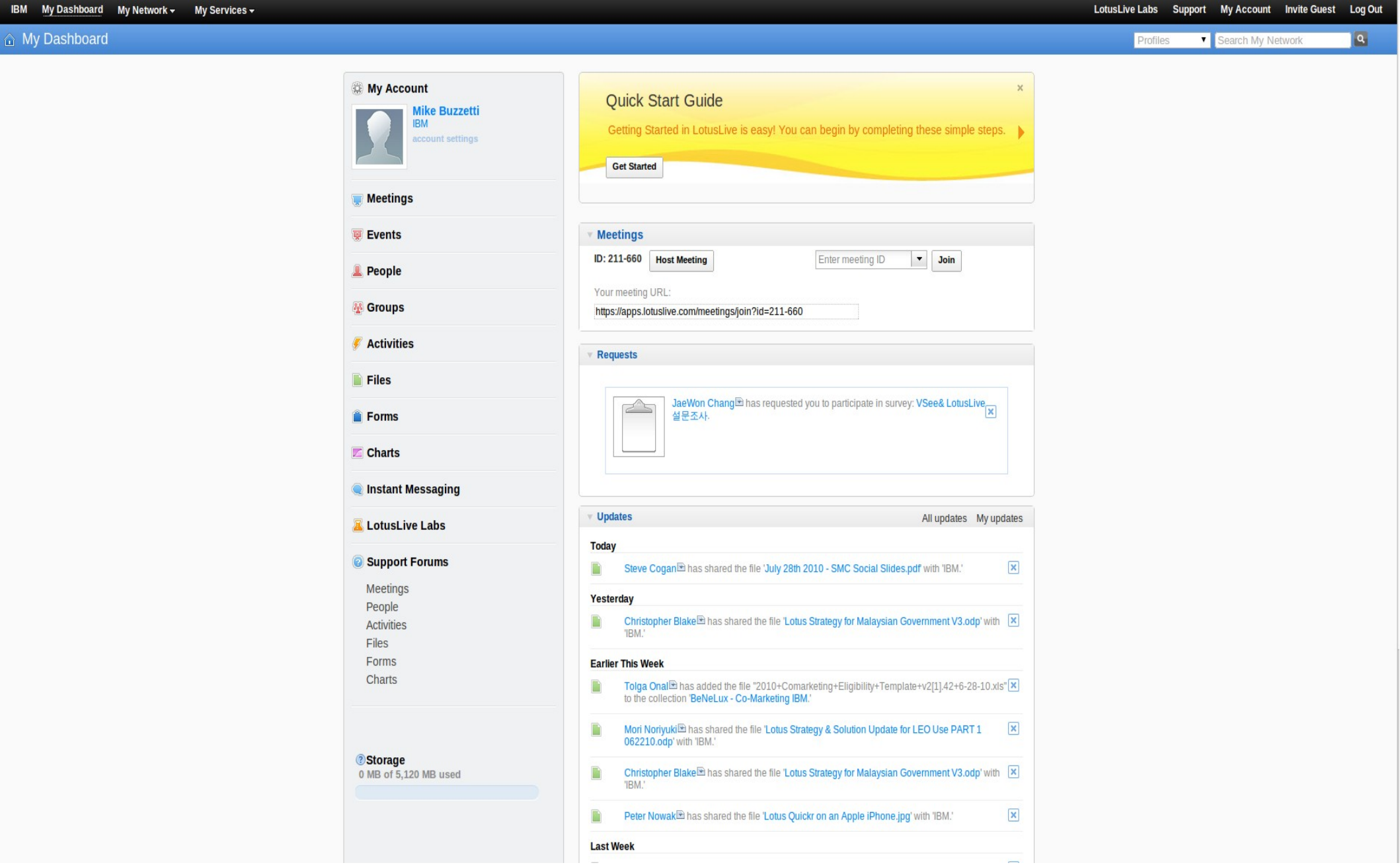
Interface Model

Business Model

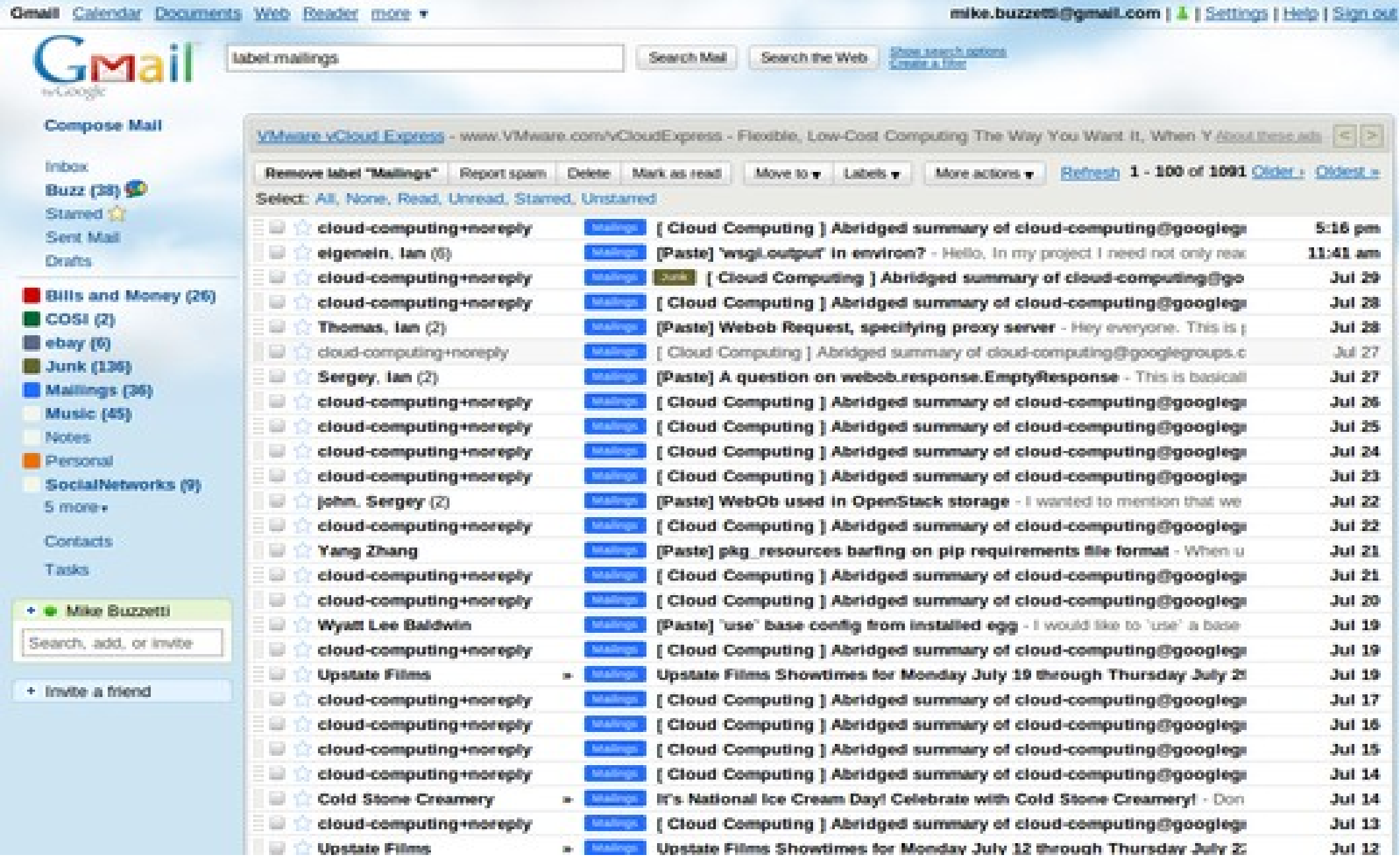


Technical Model


Examples


IBM
My Dashboard
My Network
My Services
LotusLive Labs
Support
My Account
Invite Guest
Log Out
My Dashboard
Profiles
Search My Network
My Account
Mike Buzzetti
IBM
account settings
Meetings
Events
People
Groups
Activities
Files
Forms
Charts
Instant Messaging
LotusLive Labs
Support Forums
Meetings
People
Activities
Files
Forms
Charts
Storage
0 MB of 5,120 MB used
Quick Start Guide
Getting Started in LotusLive is easy! You can begin by completing these simple steps.
Get Started
Meetings
ID: 211-660
Host Meeting
Enter meeting ID
Join
Your meeting URL:
https://apps.lotuslive.com/meetings/join?id=211-660
Requests
JaeWon Chang has requested you to participate in survey: VSee& LotusLive 설문조사.
Updates
All updates
My updates
Today
Steve Cogan has shared the file 'July 28th 2010 - SMC Social Slides.pdf' with 'IBM.'
Yesterday
Christopher Blake has shared the file 'Lotus Strategy for Malaysian Government V3.odp' with 'IBM.'
Earlier This Week
Tolga Onal has added the file "2010+Comarketing+Eligibility+Template+v2[1].42+6-28-10.xls" to the collection 'BeNeLux - Co-Marketing IBM.'
Mori Noriyuki has shared the file 'Lotus Strategy & Solution Update for LEO Use PART 1 062210.odp' with 'IBM.'
Christopher Blake has shared the file 'Lotus Strategy for Malaysian Government V3.odp' with 'IBM.'
Peter Nowak has shared the file 'Lotus Quickr on an Apple iPhone.jpg' with 'IBM.'
Last Week

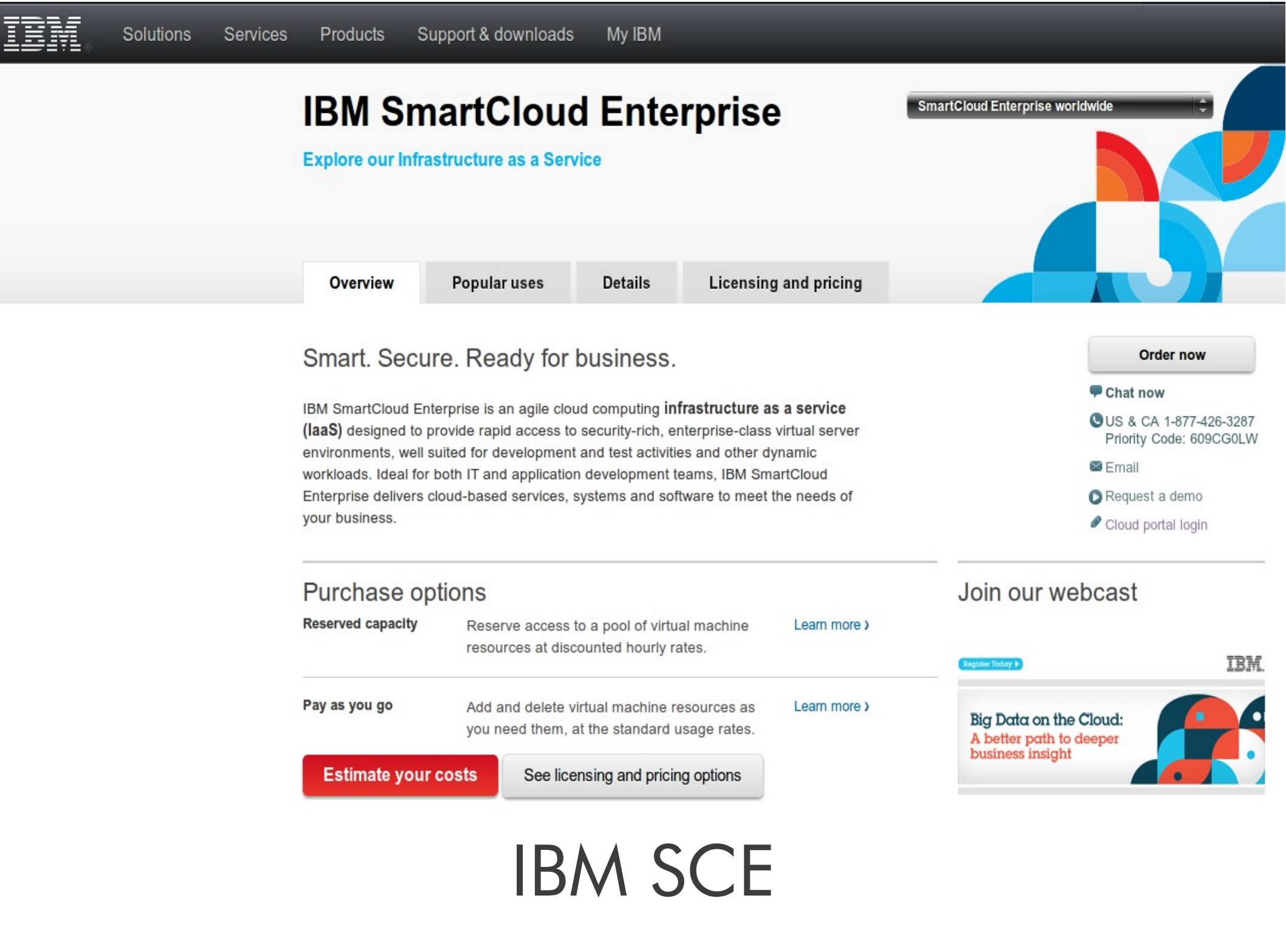
Lotus Live


Gmail Calendar Documents Web Reader more
mike.buzzetti@gmail.com | Settings | Help | Sign out
Gmail
label:mailings
Search Mail
Search the Web
Compose Mail
Inbox
Buzz (38)
Starred
Sent Mail
Drafts
Bills and Money (26)
COSI (2)
ebay (6)
Junk (136)
Mailings (36)
Music (45)
Notes
Personal
SocialNetworks (9)
5 more
Contacts
Tasks
Mike Buzzetti
Search, add, or invite
Invite a friend
Remove label "Mailings"
Report spam
Delete
Mark as read
Move to
Labels
More actions
Refresh
1 - 100 of 1091
Older ›
Oldest »
Select: All, None, Read, Unread, Starred, Unstarred
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr 5:16 pm
elgenein, Ian (6) [Paste] 'wsgi.output' in environ? - Hello, In my project I need not only rea 11:41 am
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@go Jul 29
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 28
Thomas, Ian (2) [Paste] Webob Request, specifying proxy server - Hey everyone. This is Jul 28
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegroups.c Jul 27
Sergey, Ian (2) [Paste] A question on webob.response.EmptyResponse - This is basicall Jul 27
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 26
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 25
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 24
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 23
john, Sergey (2) [Paste] WebOb used in OpenStack storage - I wanted to mention that we Jul 22
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 22
Yang Zhang [Paste] pkg_resources barfing on pip requirements file format - When u Jul 21
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 21
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 20
Wyatt Lee Baldwin [Paste] "use" base config from installed egg - I would like to "use" a base Jul 19
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 19
Upstate Films Upstate Films Showtimes for Monday July 19 through Thursday July 2 Jul 19
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 17
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 16
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 15
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 14
Cold Stone Creamery It's National Ice Cream Day! Celebrate with Cold Stone Creamery! - Don Jul 14
cloud-computing+noreply [Cloud Computing] Abridged summary of cloud-computing@googlegr Jul 13
Upstate Films Upstate Films Showtimes for Monday July 12 through Thursday July 2 Jul 12

Gmail

facebook
Search
Home
Profile
Account
Systemz Mainframe Guess I'll never be on "Does it blend?" on Thursday
Wall
Info
Photos
Boxes
Events
Write something...
Attach:
Share
Filters
Systemz Mainframe RT @ragtag: IBM zEnterprise launch event on YouTube: http://wp.me/p1fDS-9e
11 hours ago via Twitter · Comment · Like · @IBM_System_z on Twitter
3 people like this.
Write a comment...
Systemz Mainframe what does the new z196 give clients? Up to 90% improvement in performance with CICS and DB2 10 #systemz
11 hours ago via Twitter · Comment · Like · @IBM_System_z on Twitter
Systemz Mainframe are you ready for today? I know I am..
11 hours ago via Twitter · Comment · Like · @IBM_System_z on Twitter
Daniela Graeser Nasci pronta!
7 hours ago · Like
Write a comment...
View Photos of Systemz (4)
View Videos of Systemz (1)
Send Systemz a Message
Poke Systemz
I do it 99.9999
Information
Current City:
Poughkeepsie, NY
Create an Ad
AT&T Motorola BACKFLIP
Get the all-new Motorola BACKFLIP Android phone exclusively from AT&T and sync to your favorite social networking site.
Like
Operator of the Year
LEROS
point to point
Global Ground Transportation Driving People Who Drive Business.
(800) 825-3767

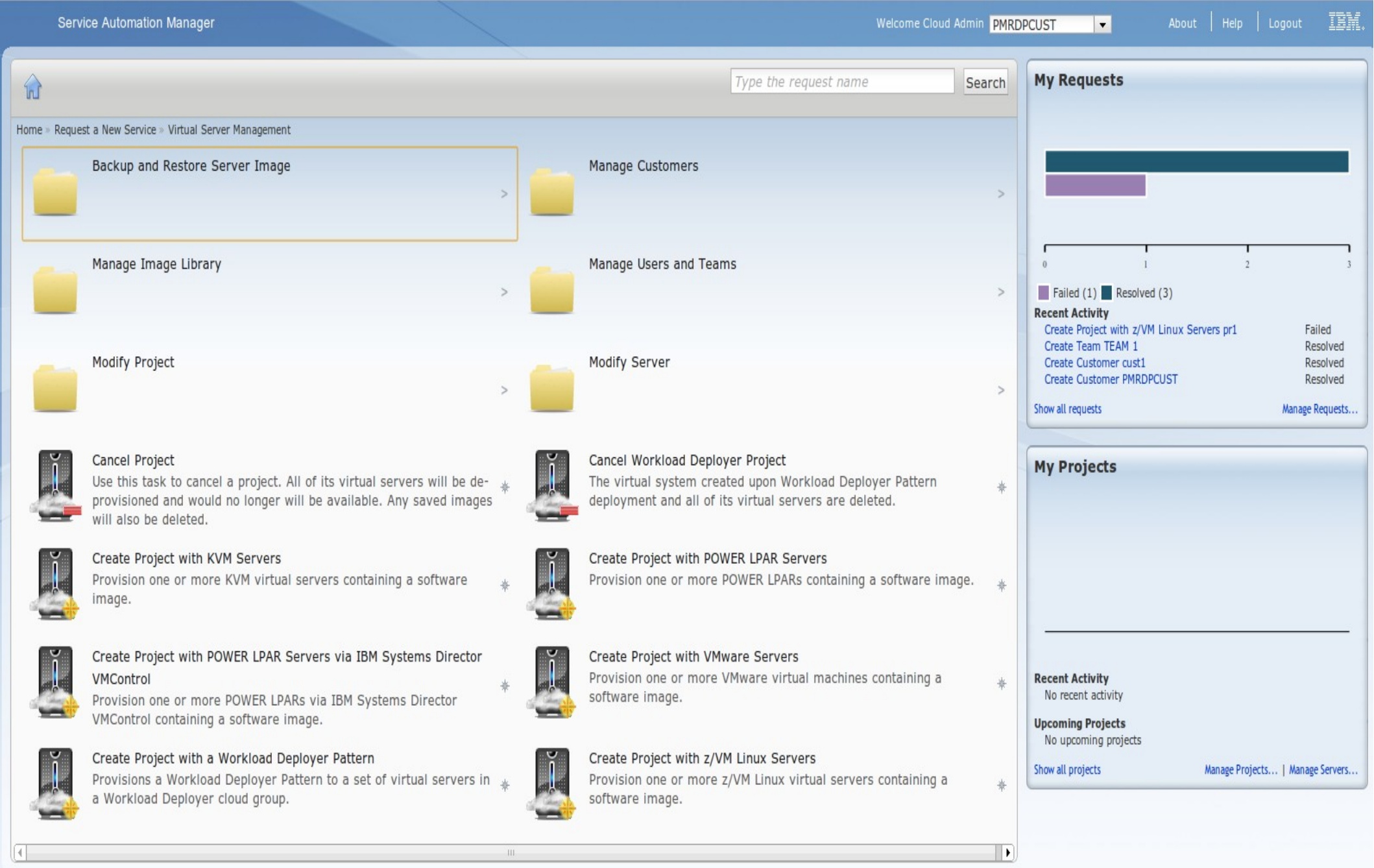
Facebook


Solutions
Services
Products
Support & downloads
My IBM
IBM SmartCloud Enterprise
Explore our Infrastructure as a Service
SmartCloud Enterprise worldwide
Overview
Popular uses
Details
Licensing and pricing
Smart. Secure. Ready for business.
IBM SmartCloud Enterprise is an agile cloud computing infrastructure as a service (IaaS) designed to provide rapid access to security-rich, enterprise-class virtual server environments, well suited for development and test activities and other dynamic workloads. Ideal for both IT and application development teams, IBM SmartCloud Enterprise delivers cloud-based services, systems and software to meet the needs of your business.
Order now
Chat now
US & CA 1-877-426-3287
Priority Code: 609CG0LW
Email
Request a demo
Cloud portal login
Purchase options
Reserved capacity
Reserve access to a pool of virtual machine resources at discounted hourly rates.
Learn more
Pay as you go
Add and delete virtual machine resources as you need them, at the standard usage rates.
Learn more
Estimate your costs
See licensing and pricing options
Join our webcast
Register Today
IBM
Big Data on the Cloud:
A better path to deeper business insight

IBM SCE

amazon web services
Sign in to the AWS Management Console
Create an AWS Account
English
AWS
Products
Developers
Community
Support
Account
Products & Services
Amazon Elastic Compute Cloud (Amazon EC2)
Amazon EC2 Details
EC2 Overview
EC2 FAQs
EC2 Pricing
Amazon EC2 SLA
EC2 Instance Types
EC2 Instance Purchasing Options
Reserved Instances
Spot Instances
Windows Instances
Amazon EC2 Features
Elastic Block Store
Amazon CloudWatch
Auto Scaling
Elastic Load Balancing
Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computing easier for developers.
Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction. It provides you with complete control of your computing resources and lets you run on Amazon's proven computing environment. Amazon EC2 reduces the time required to obtain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change. Amazon EC2 changes the economics of computing by allowing you to pay only for capacity that you actually use. Amazon EC2 provides developers the tools to build failure resilient applications and isolate themselves from common failure scenarios.
Sign Up For Amazon EC2
This page contains the following categories of information. Click to jump down:
Amazon EC2 Functionality
Service Highlights
Features
Instance Types
Operating Systems and Software
Pricing
Resources
Detailed Description
Intended Usage and Restrictions

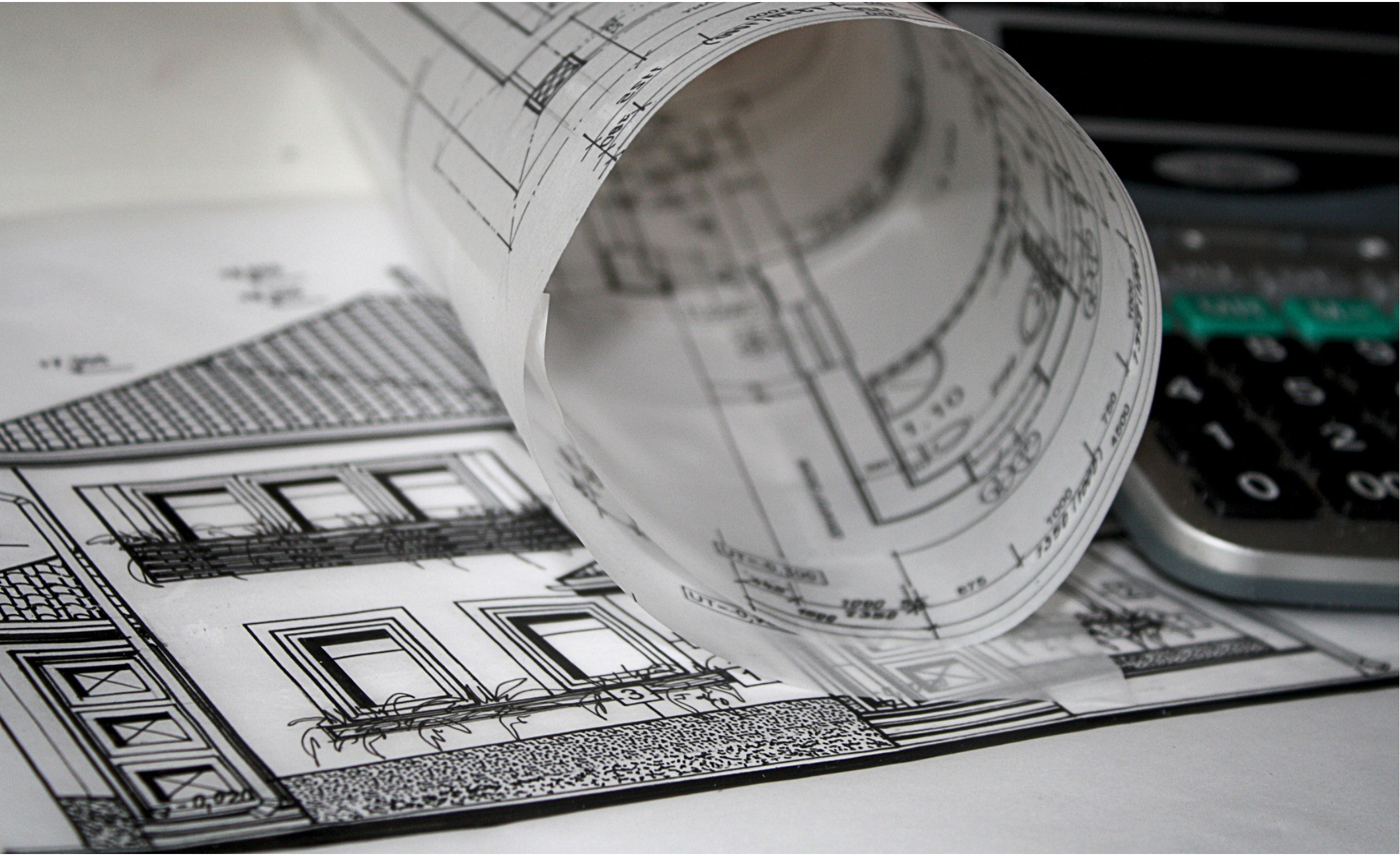
Amazon EC2


Service Automation Manager
Welcome Cloud Admin PMRDPCUST
About
Help
Logout
Type the request name
Search
Home » Request a New Service » Virtual Server Management
Backup and Restore Server Image
Manage Customers
Manage Image Library
Manage Users and Teams
Modify Project
Modify Server
Cancel Project
Use this task to cancel a project. All of its virtual servers will be de-provisioned and would no longer will be available. Any saved images will also be deleted.
Cancel Workload Deployer Project
The virtual system created upon Workload Deployer Pattern deployment and all of its virtual servers are deleted.
Create Project with KVM Servers
Provision one or more KVM virtual servers containing a software image.
Create Project with POWER LPAR Servers
Provision one or more POWER LPARs containing a software image.
Create Project with POWER LPAR Servers via IBM Systems Director VMControl
Provision one or more POWER LPARs via IBM Systems Director VMControl containing a software image.
Create Project with VMware Servers
Provision one or more VMware virtual machines containing a software image.
Create Project with a Workload Deployer Pattern
Provisions a Workload Deployer Pattern to a set of virtual servers in a Workload Deployer cloud group.
Create Project with z/VM Linux Servers
Provision one or more z/VM Linux virtual servers containing a software image.
My Requests
0
1
2
3
Failed (1)
Resolved (3)
Recent Activity
Create Project with z/VM Linux Servers pr1 Failed
Create Team TEAM 1 Resolved
Create Customer cust1 Resolved
Create Customer PMRDPCUST Resolved
Show all requests
Manage Requests...
My Projects
Recent Activity
No recent activity
Upcoming Projects
No upcoming projects
Show all projects
Manage Projects... | Manage Servers...

TSAM

Getting Started

Buy or build ?



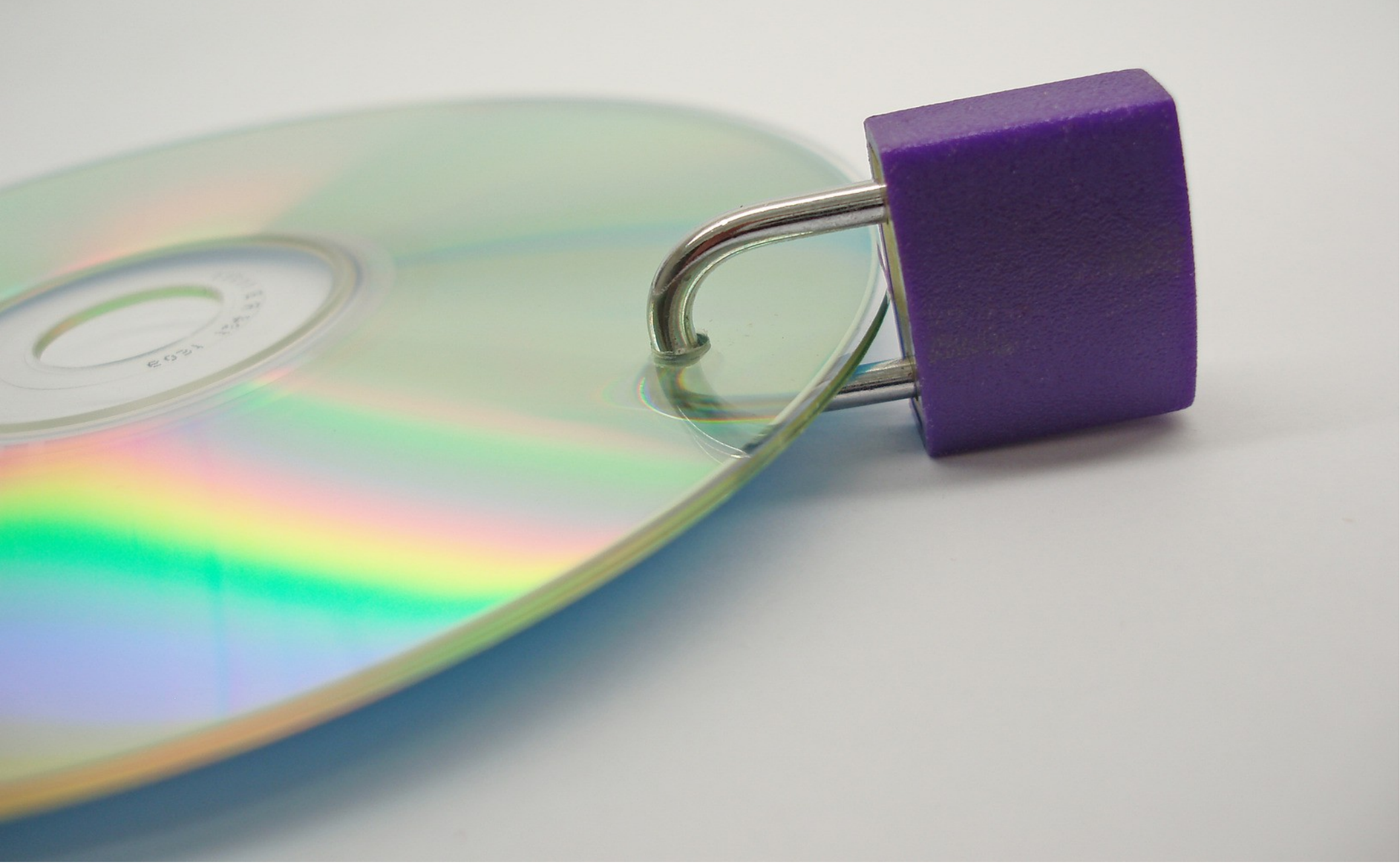
Business Plan

Know your costs

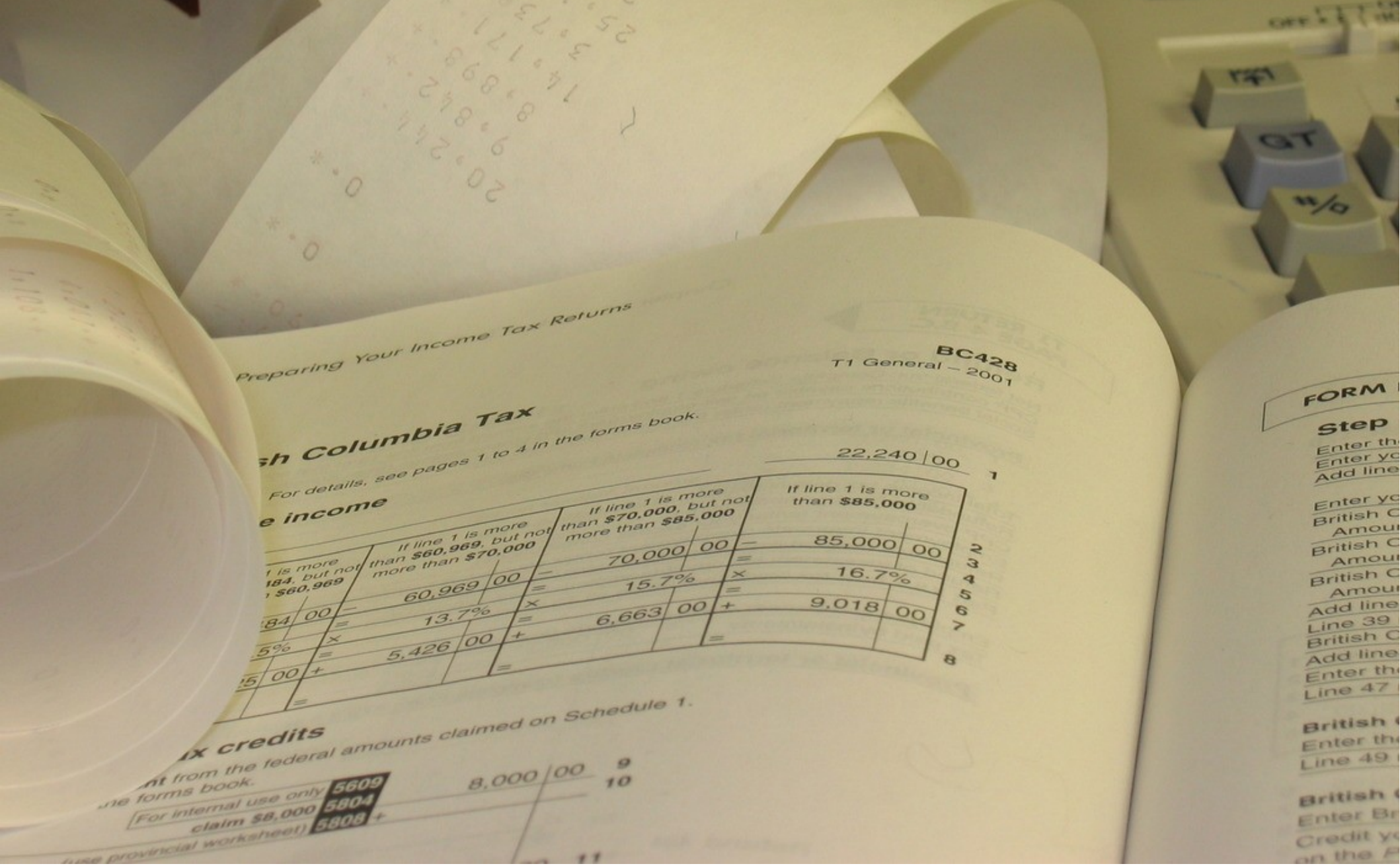
Define Service Catalog

Define your SLA

Barriers to Adoption



Security


Preparing Your Income Tax Returns
BC428
T1 General – 2001
sh Columbia Tax
For details, see pages 1 to 4 in the forms book.
e income
22,240 00
If line 1 is more than $85,000
85,000 00
16.7%
9,018 00
If line 1 is more than $70,000, but not more than $85,000
70,000 00
15.7%
6,663 00
If line 1 is more than $60,969, but not more than $70,000
60,969 00
13.7%
5,426 00
x credits
nt from the federal amounts claimed on Schedule 1.
ne forms book.
For internal use only
claim $8,000
use provincial worksheet)
5609
5804
5808
8,000 00
FORM
Step
Enter th
Enter yo
Add line
Enter yo
British C
Amou
British C
Amou
British C
Amou
Add line
Line 39
British C
Add line
Enter th
Line 47
British
Enter th
Line 49
British
Enter Br
Credit yo
on the

Compliance

Reliability

Budgeting

Customization

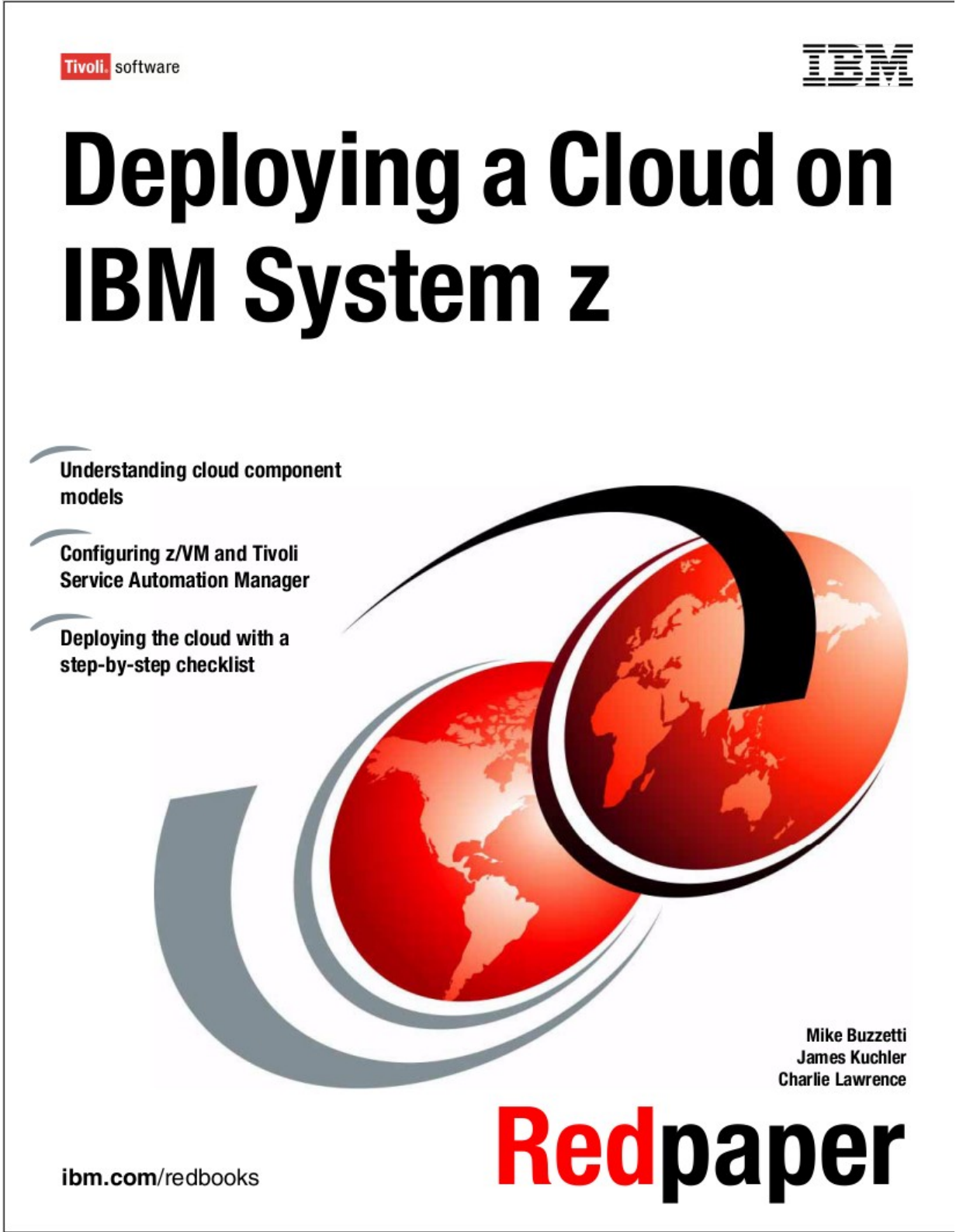
It's New

It's Magic

My two cents

Backup

- Describes how to build a cloud using TSAM and Linux on System z.
- Focuses on Infrastructure as a Service.
- Only uses things that ship with the products.
- We are working on the next version currently



Cloud Computing and SaaS

- SaaS is a software application delivery model where a software vendor develops a web-native software application and hosts and operates (either independently or through a third-party) the application for use by its customers over the Internet. Customers do not pay for owning the software itself but rather for using it.
- Software as a Service has been around for a while now and actually precedes the newer term Cloud Computing.
- Delivering software applications is just one capability of cloud computing. Not all SaaS offerings can be classified as cloud enabled. However, if an SaaS offering is written in such a way that it is "massively scalable," then that SaaS offering could be considered a form of cloud computing. (source: Gartner)
  - Many SaaS vendors are now re-positioning their offerings as 'Cloud' offerings in order to participate in the cloud hype...even if their offering is not "massively scalable“
- Cloud Computing is great for the SaaS model as it can further reduce the costs associated with producing and delivering a SaaS application.
- Examples
  - GMail
  - Salesforce.

Platform as a Service

- Definition: includes all the systems and environments comprising the end-to-end life cycle of developing, testing, deploying and hosting web applications delivered as a service over the Internet.

- Examples include:
  - Mosso, PHP, .NET, Java, Rails, Python, other?
  - Google App Engine, Python
  - SalesForce – Proprietary
  - Morph - Ruby on Rails
  - Heroku - Ruby on Rails
- Benefits: Quickly launch new applications for a relatively low cost. Other benefits include limited scalability and reduced cost of operations (e.g no system administrators needed).
- Disadvantages can include porting development time costs for existing applications as not all applications come straight over.
- Billing for these services varies. It can be by the hour, request, CPU cycle, or other creative ways. Some even help you do pass through billing for your customers; like Mosso. But, the defining factor in pricing of Application Platform Clouds is that they generally strive to be robust, simple, and easy to load your application into when you are ready.

Infrastructure as a Service

- Definition: IaaS is a pay-for-what-you-need-when-you-need-it information technology delivery and service model. It is a technology service delivered over the Internet that provisions the resources such as servers, connections, storage, and related tools necessary to build an application environment from scratch on-demand. A common characteristic is a high degree of flexibility in what resources are provisioned.
- Examples of IaaS providers:
  - Amazon Web Services - Extremely flexible Build your own w/ many add-ons
  - VMWare - Build your own
  - Elastra - Up an comer build and manage your own IaaS
  - Tera - Sexy GUI based IaaS/PaaS building tools
  - Xen - Build your own
  - XCalibre - Very interesting and can do Linux or Windows
  - Nirvanix - All about cloud storage, very interesting subset similar to Amazon S3
  - EngineYard - Rails only Build your own
  - Joyent - Build your own on Solaris w/ Java/PHP/Rails/Python
- Benefit: Rapid provisioning of computing resources All the details of provisioning, racking, stacking, cabling, and more are completely abstracted away from you.
- Disadvantage: Difficult to move from one cloud to another in some cases.
- Billing for these services is usually incremental by use and can get complex with tiered on-demand pricing that can be difficult to track in real time. Pricing is usually well defined but can be rather difficult to forecast in some cases. It can vary to the minute depending on levels of use, tiers of service, and other interesting combinations.

So What Is Different About Cloud Computing?

	Traditional Computing		Cloud Computing
Delivery Model	Buy assets and build delivery architecture	→	Buy external **service**
Interface Model	Internal network or intranet	→	Via the **Internet** using standard Internet IFaPs (IP, HTML, HTTP)
Business Model	Pay for fixed assets and administrative overhead	→	Pay directly based on **usage** or indirectly (e.g., subsidized by advertising)
Technical Model	Single tenant	→	Scalable, elastic, dynamic, **multi-tenant**

Source: Gartner

What Trends Are Driving The Cloud Computing?

Infrastructure Technologies: Virtualization, Automation, SLAs

Application Technologies: Grid, MapReduce, Hadoop, SOA, Web 2.0

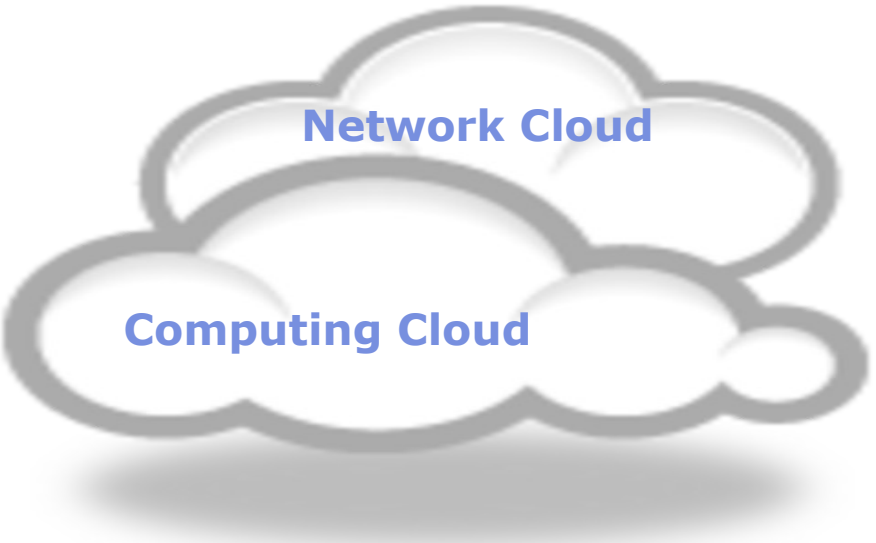
Data Intensive Applications: From massively parallel (e.g. Google) to large data files (e.g. You Tube)

Computing & Network Appliances: Special servers designed to handle specific tasks are blurring the lines between Network and Data Center

Open IT: Open Technologies, APIs, protocols, data formats, software platforms / data (e.g. Creative Commons, Open Data License)

Business Agility: Enter new markets, Deploy new application services. Stay ahead of compeition.

Broadband: Growth in Internet bandwidth enabling ubiquitous connectivity. Increased reliability and functionality embedded in the network.



Utility Computing: Get as much computing power as you need when you need it, pay for only what you use.

Industrialization of IT: Standardization, and commoditization (e.g email). Falling costs of storage.

Mobility: Explosion of form factors, cell phones/connected devices, Proliferation of sensors

New Business Models: Advertising, Services, Subscription

Web Applications and Platforms: Mashable applications and services built on Web Oriented Architecture (e.g. REST, RSS/ATOM)

Data Center Pressures: Growing costs of power and space, server sprawl

Source: Gartner, Thomas Weisel Partners, Merrill Lynch, IBM MI

Barriers To Adoptions

- **Security & Privacy** – Many companies and governments are uncomfortable with the idea of their information be located on systems that they do not control. Authentication and access right technologies will become increasingly important.
- **Compliance Issues** – Complying with Sarbanes-Oxley, HIPPA and other regulations may prohibit the use of clouds for some applications.
- **Reliability** – High availability will be a key concern. IT departments will worry about a loss of control should outages occur. Thus mission critical applications for large enterprises will probably not be run in the cloud.
- **Cloud Management** - Service Monitoring / Reporting / Management Technologies immature
- **Costs** – Economies of Scale only go so far, unless customer is willing to trade data or advertising views for services
- **Customization May Be Difficult** - Large Enterprises are used to fully customizable environments. Some clouds may not offer that capability.
- **It's Something New** – As with anything new, conservative oriented companies will hesitate to adopt clouds. Issues of security, trust, chargeback, & sharing will limit adoption by these types of companies
- **Organization / Culture** – Clouds have the potential to significantly reduce IT labor costs. IT organizations may be reluctant to encourage their companies to move to the new cloud computing model
- **Budgeting** – Clouds will have a significant impact in how companies budget for and spend money on Information Technology.

Source: Gartner, Forrester, CHQ MI

The Historical "Stack" Will Slowly Evolve To Compute Clouds.

From Historical Stacks to…

Services

Software

Hardware

"As a Service" Offerings handle client needs for specific on demand IT components.

Everything as a Service: Using SOA and SaaS businesses will have an opportunity create more dynamic services that enrich our everyday lives and improve how we do business.

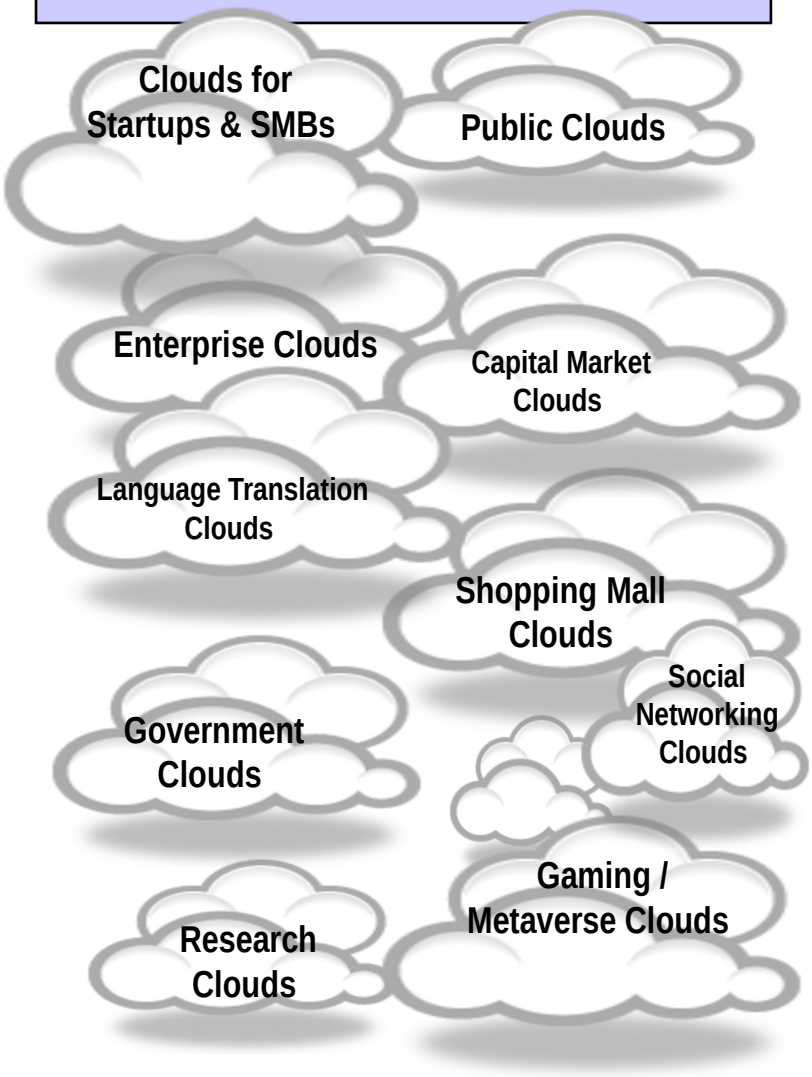
SaaS – Software as a Service: Delivery model where a software vendor develops a web-native software application and hosts and operates (either independently or through a third-party) the application for use by its customers over the Internet.

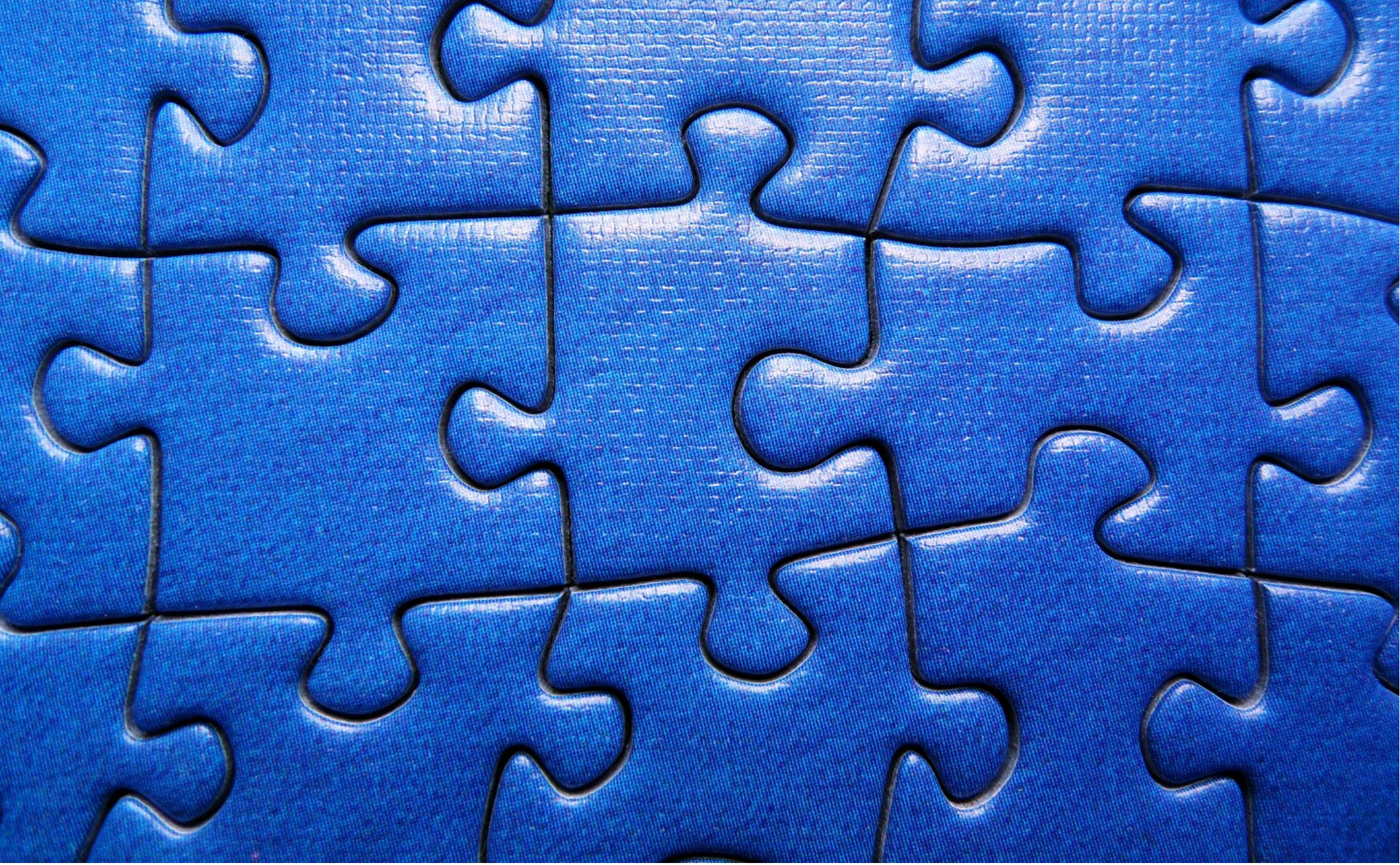
Platform As A Service On demand web-based operating systems and applications, such as SaaS, for 3rd party developers

Hardware as a Service: provides computing capacity and storage delivered online

Storage as A Service: combines a computing interface with online storage over the network as a service

Compute Clouds: provide a high performance infrastructure that delivers simplified services through innovative business models





What? Why? How?