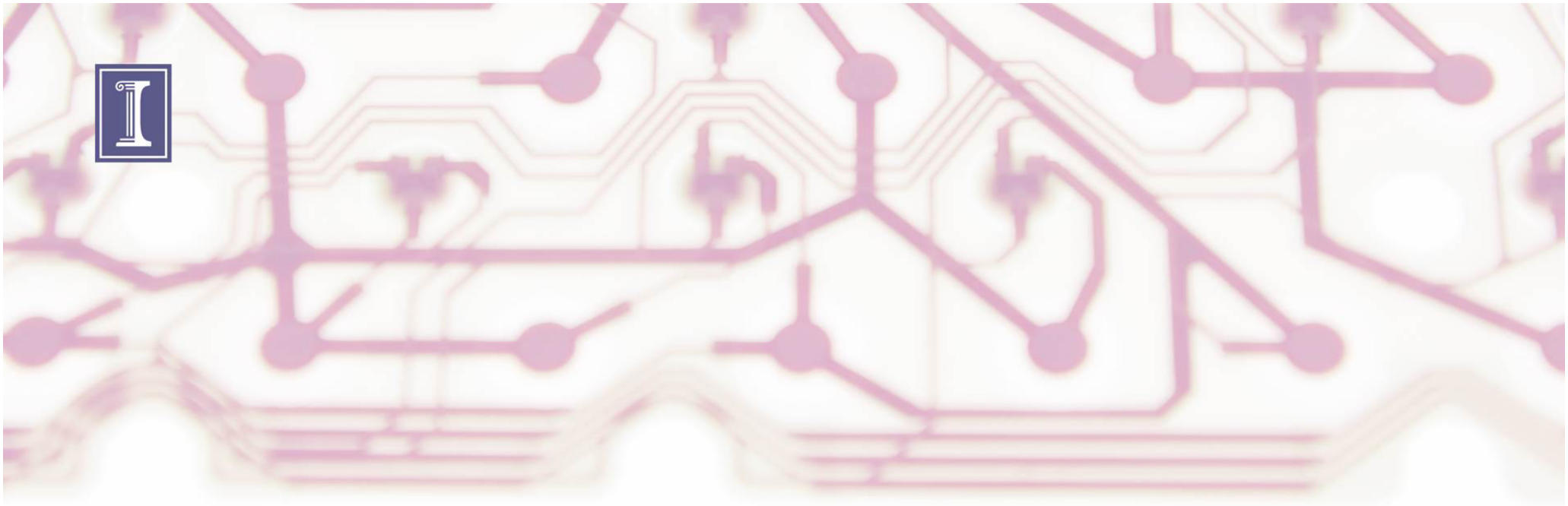

CLOUD COMPUTING APPLICATIONS

Infrastructure as a Service

Reza Farivar

Infrastructure as a Service

- The most fundamental of Cloud Computing Models
- Allows the user to “rent” computing resources
- The product is a “virtual” computer, that you can access remotely and do whatever you want
  - From the choice of the I/O specs for attached “hard drives” to the Operating System, middleware and applications
  - Network Connection
  - You are now responsible for managing everything running on the machine, including security of your server
- These resources are usually virtualized

Virtualized Resources

- Different customers have different needs
  - Ephemeral needs
- The Cloud Provider cannot operate a pool of many different sized computers
- Solution: Cloud provider operates a fleet of similar, powerful, hardware
- Carve out chunks of resources through virtualization
  - CPU
  - Memory
  - Storage
  - Network
  - Accelerators

Virtualized Resources

- Different customers have different needs
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- Solution: Cloud provider operates a fleet of similar, powerful, hardware
- Carve out chunks of resources through virtualization: VM Instance
  - CPU
  - Memory
  - Storage
  - Network
  - Accelerators
- Metal as a Service (MaaS)

Dedicated Host SKUs (VM series and Host Type)	Available vCPUs	Available RAM	CPU
Dasv4_Type1	96	768 GiB	2.35 GHz AMD EPYC™ 7452
Ddsv4_Type1	80	504 GiB	Intel® Xeon® Platinum 8272CL (Cascade Lake)
Dsv4_Type1	80	504 GiB	Intel® Xeon® Platinum 8272CL (Cascade Lake)
Dsv3_Type1	64	256 GiB	2.3 GHz Intel® Xeon® E5-2673 v4 (Broadwell)
Dsv3_Type2	76	504 GiB	Intel® Xeon® Platinum 8171M (Skylake)
Esv3_Type2	76	504 GiB	Intel® Xeon® Platinum 8171M (Skylake)
Esv3_Type3	80	504 GiB	Intel® Xeon® Platinum 8272CL (Cascade Lake)
Fsv2_Type2	72	144 GiB	Intel® Xeon® Platinum 8168 (Skylake)
Fsv2_Type3	86	504 GiB	Intel® Xeon® Platinum 8272CL (Cascade Lake)
Lsv2_Type1	80	640 GiB	2.55 GHz AMD EPYC™ 7551
Ms_Type1	128	2,048 GiB	Intel® Xeon® Platinum 8280 (Cascade Lake)
Msm_Type1	128	3,892 GiB	Intel® Xeon® Platinum 8280 (Cascade Lake)
Msmv2_Type1	416	11,400 GiB	Intel® Xeon® Platinum 8180M (Skylake)

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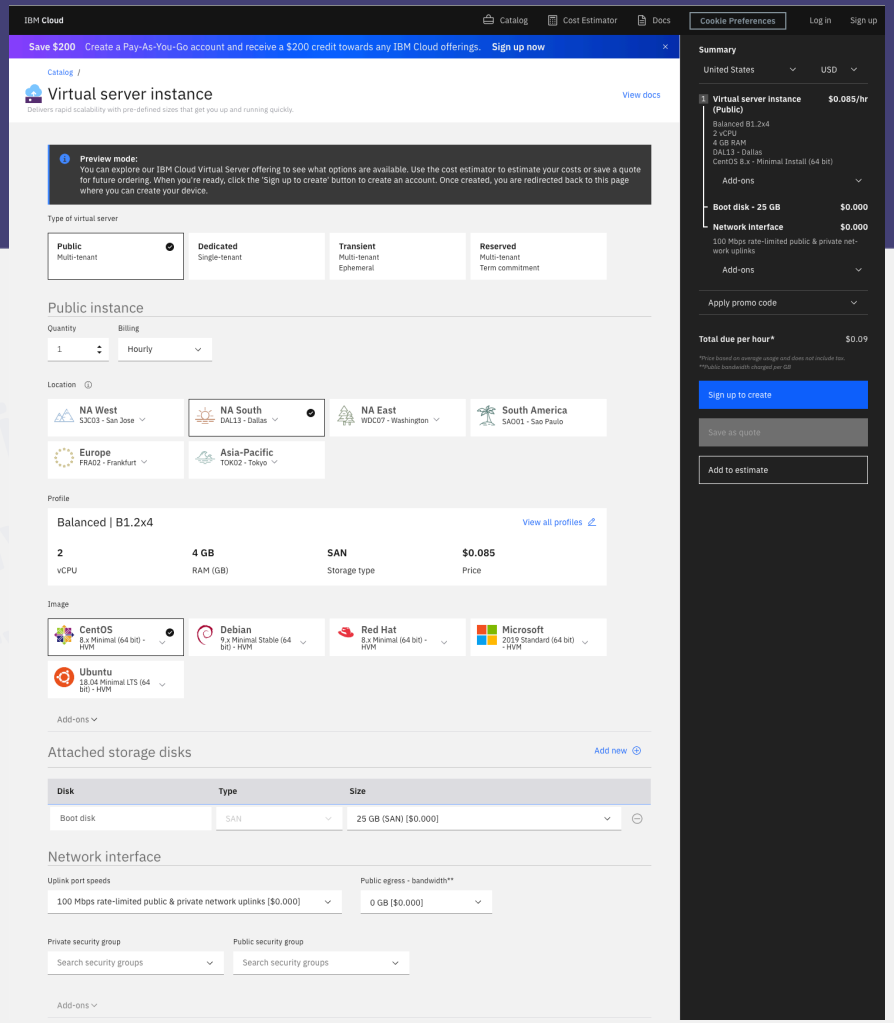
Advantages of IaaS vs. On-Prem

- No need to run a data center
  - No worries about space, power supplies, physical building security, network, failing components, …
- OpEx vs. CapEx
- Use different instances when needed
  - Rapid innovation
  - Quick response to shifting business conditions

IaaS Examples

- Microsoft Azure
- Amazon EC2 (Elastic Compute Cloud)
- Google Cloud Platform Compute Engine
- Oracle Cloud
- IBM Cloud
- Alibaba Cloud
- Rackspace
- Vultr
- …



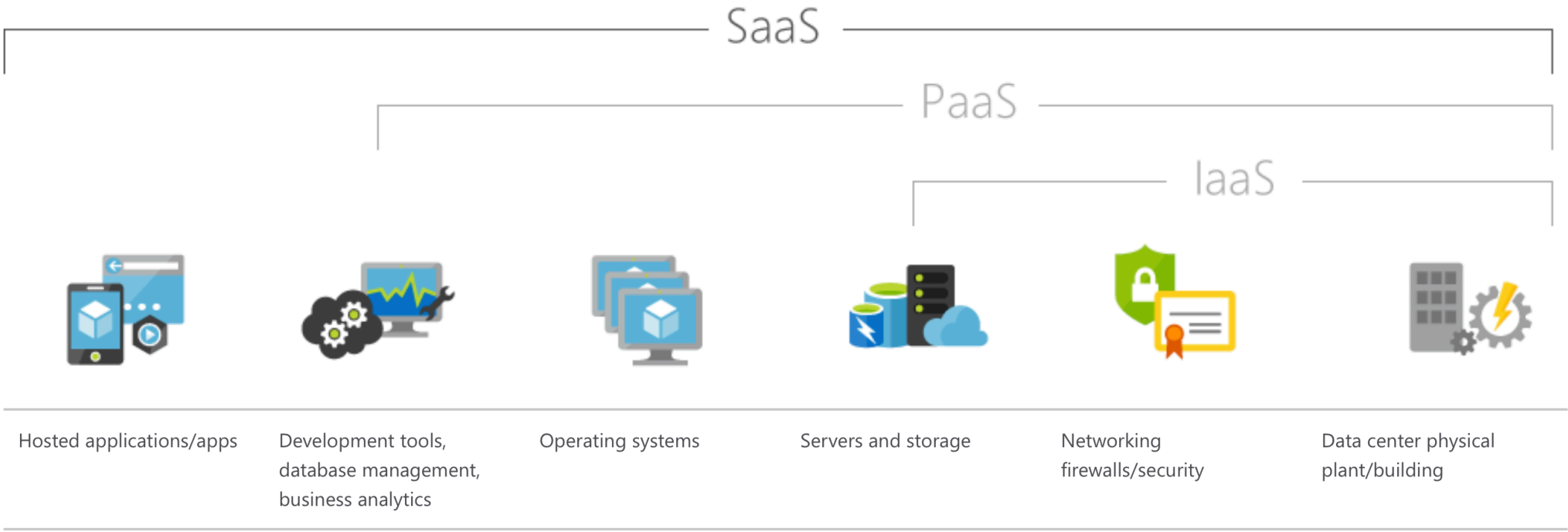
Instance Pricing

- On-Demand
- Reserved
- Spot Pricing

IaaS Sub-Category: Containers and Orchestration

- A subcategory of IaaS, or a place half-way between IaaS and PaaS (more towards the IaaS)
- You may think of a container as a light-weight Virtual Machine
  - Time to spin up a VM is tens of seconds to a few minutes
  - Time to start a container is fraction of a second to a few seconds
- Linux-Only

SaaS in Perspective



** Image courtesy of Microsoft Azure*