



Session 5: The Cloud

Mastering the Internet
Duke OLLI Spring 2024

David Shamlin

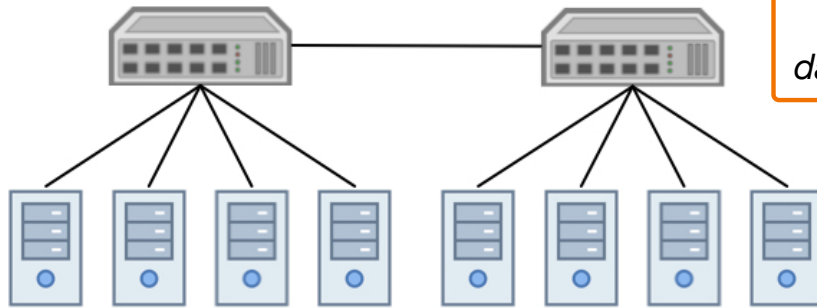
Review



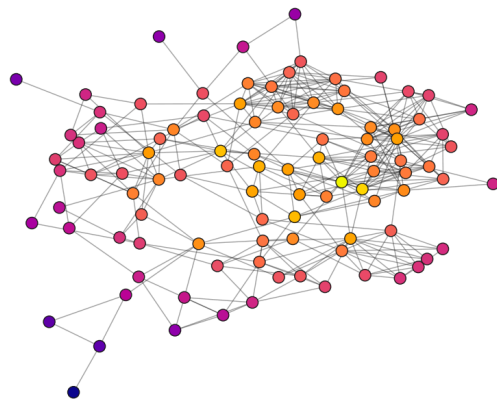
app = code + data

Review

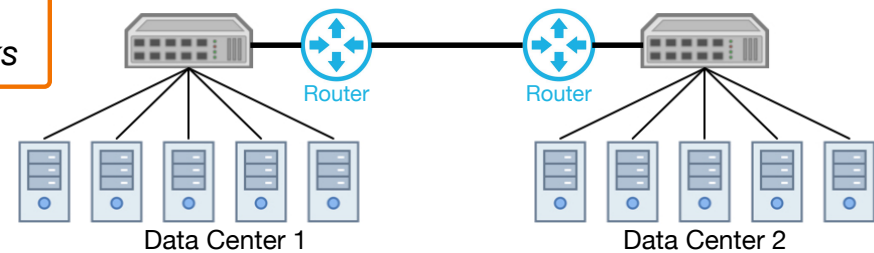
A computer network is a set of computers connected together via switches to share information (data) and collaborate.



Networks reside in data centers



The Internet is a network of computer networks



Networks in different data centers can be connected together via routers.

What am I paying what I buy a digital device?


The main “decision points” you face when purchasing a device that affect price:

1. Screen (size & type)
2. CPU
3. RAM
4. Storage (size & type)

Examples

- [Apple Macbook Pro](#)
- [Chromebooks](#) (on Amazon)

What is the Cloud and why would I use it?

- **What:** using computer resources (CPU/RAM and/or Storage) owned and managed by a company like Apple, Google, or Microsoft
 - It's like *leasing* a house/car instead of *purchasing*
 - Note: **cloud storage** is often used by consumers's independent of **cloud computing**
- **Why**
 - Keep data **synchronized** across multiple personal device
 - Backups
 - Share data (e.g., pictures) with friends/family *without making copies* of the data
 - Credit/edit your documents from *any browser on any computer*
 - Allow others to *collaboratively* edit your documents
 - Reduced cost 

Example

- MacBook Air: \$1,100
- HP Chromebook + 200GB cloud storage Storage
 - Two years: \$322
 - Five years: \$430

Definition of Cloud Computing

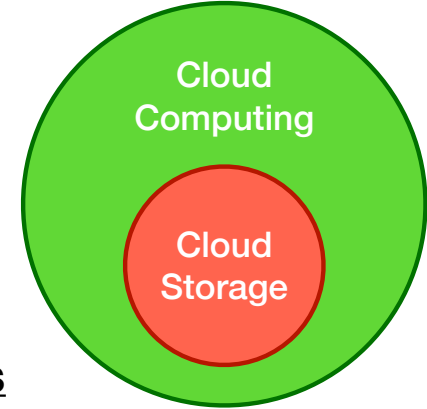
from [Wikipedia](#)

The *on-demand availability* of computer system resources, especially data storage (cloud storage) and computing power, *without direct active management by the user*. Large clouds often have functions *distributed over multiple locations, each of which is a data center*. Cloud computing relies on *sharing of resources* to achieve coherence and typically uses a *pay-as-you-go model*, which can help in reducing capital expenses but may also lead to unexpected operating expenses for users.

Essential Characteristics

1. On-demand self-service
2. Broad network access
3. Resource pooling
4. Rapid elasticity
5. Measured service

Reference: [The NIST Definition of Cloud Computing](#)



Leading Cloud Providers

Cloud Provider	Consumer Cloud	Commercial Cloud
Amazon		Amazon Web Services (AWS)
Apple	iCloud	
Google	Google Workspace	Google Cloud Platform (GCP)
Microsoft	Microsoft 365	Azure

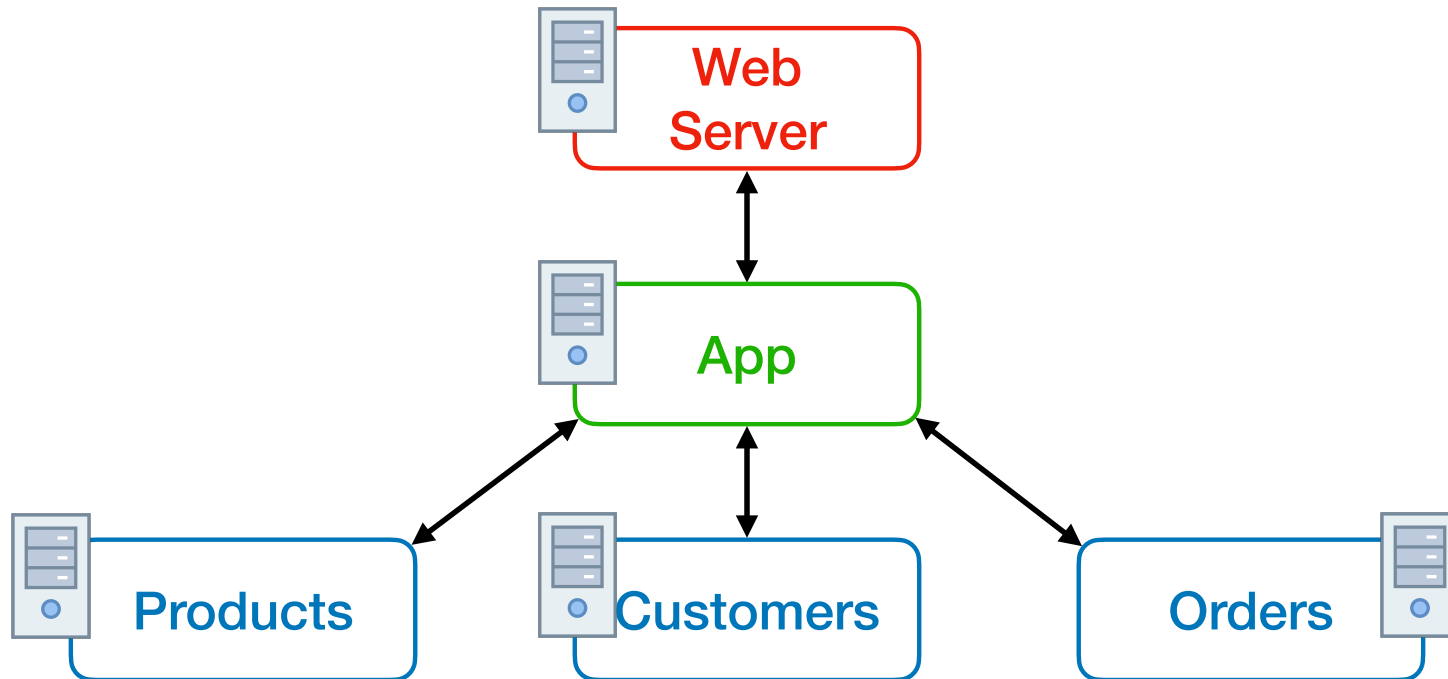
Advantages

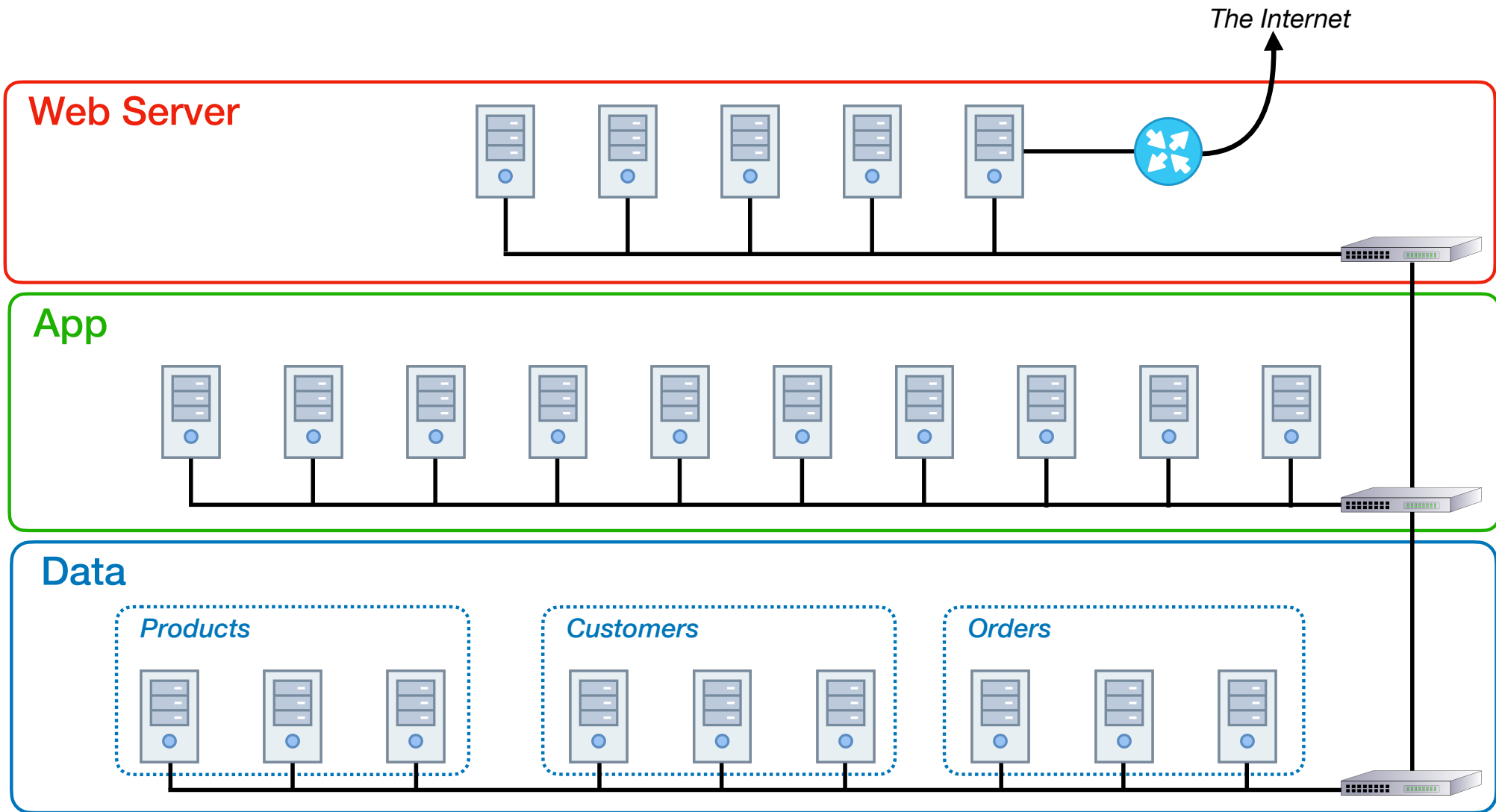
1. Democratized access via reduced hardware costs
2. Easier maintenance
3. Versatility
4. Reliability
5. Disaster recovery

Disadvantages

1. Internet dependent
2. Vendor lock-in
3. Loss of control over data
4. Less control over maintenance
5. More appealing hacking target

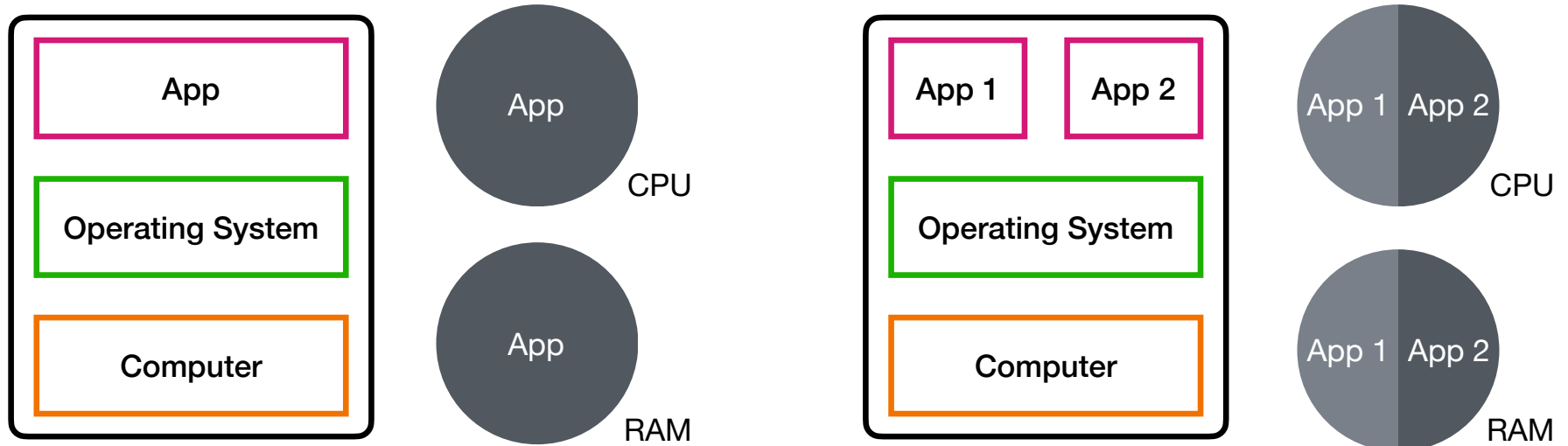
Example: Retail Site



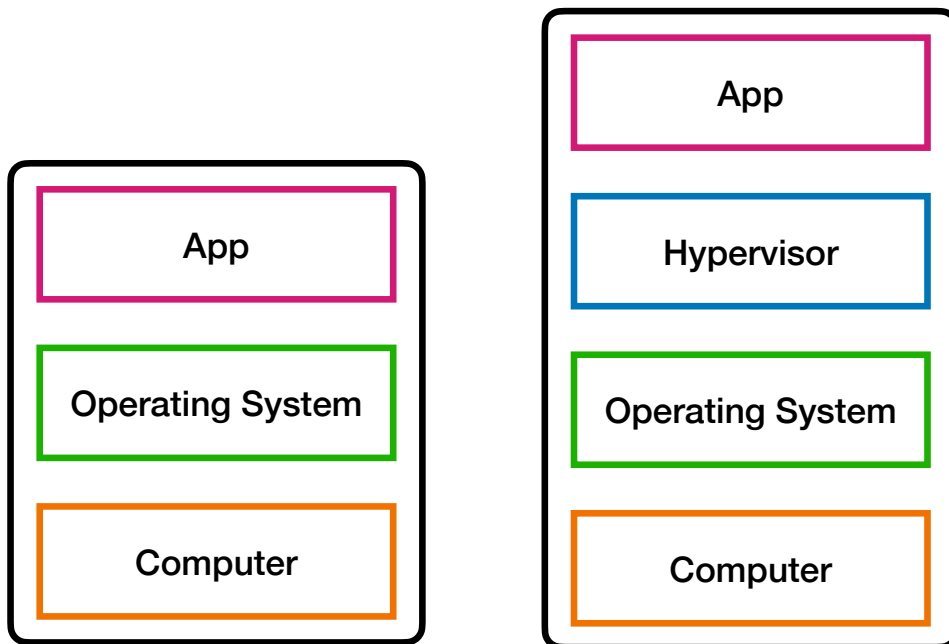


Multi-Tasking

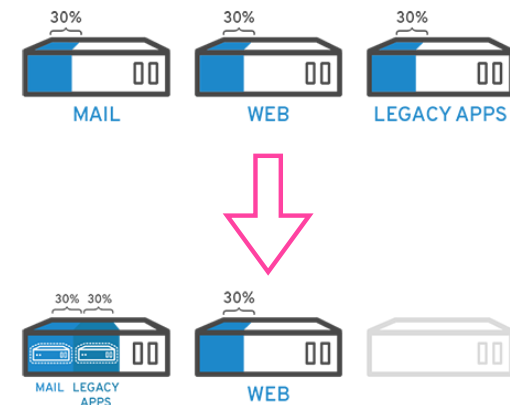
One computer running **multiple** applications **concurrently**



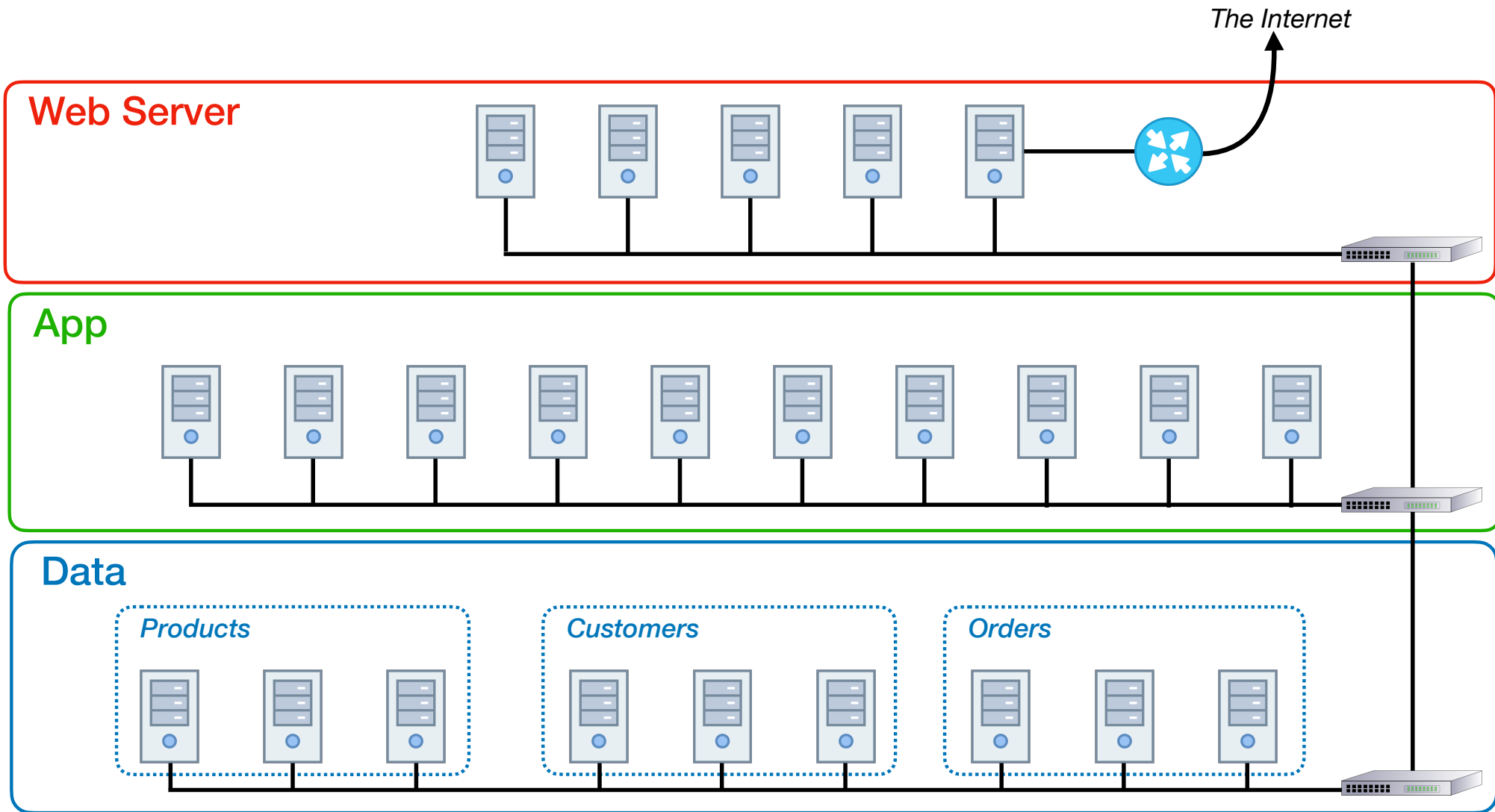
Virtualization

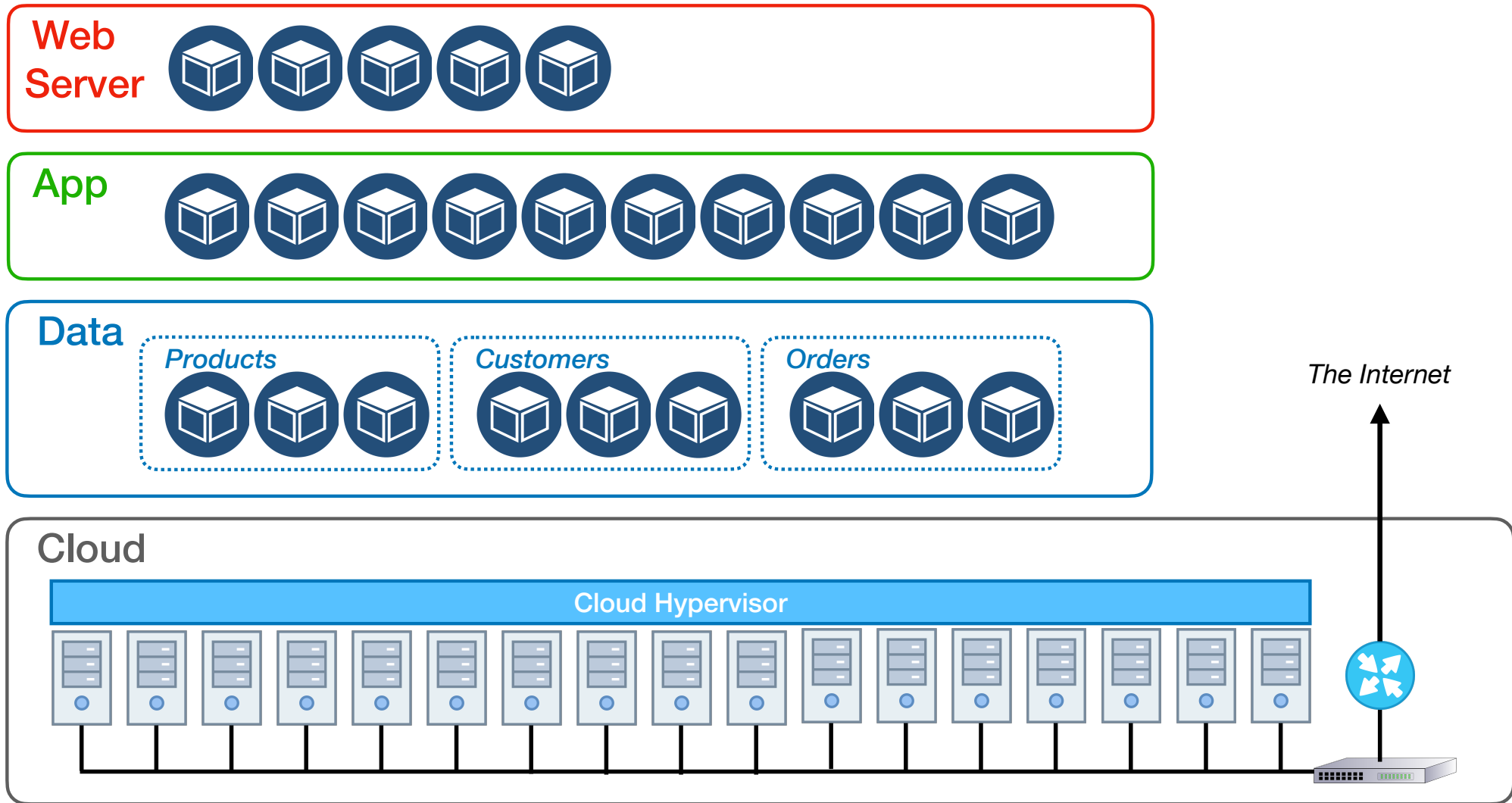


Virtualization create multiple virtual computers (a.k.a. **virtual machines** or **VMs**) on a single physical machine. These virtual machines can access all the parts of the physical machine, including the computer's CPU, memory and storage.



Each virtual machine runs on its own operating system and functions like a completely separate machine—even though it's sharing the resources of one physical computer. This is the key feature of virtualization: a single physical machine running multiple tasks simultaneously on different virtual machines, instead of several computers each running a single task.





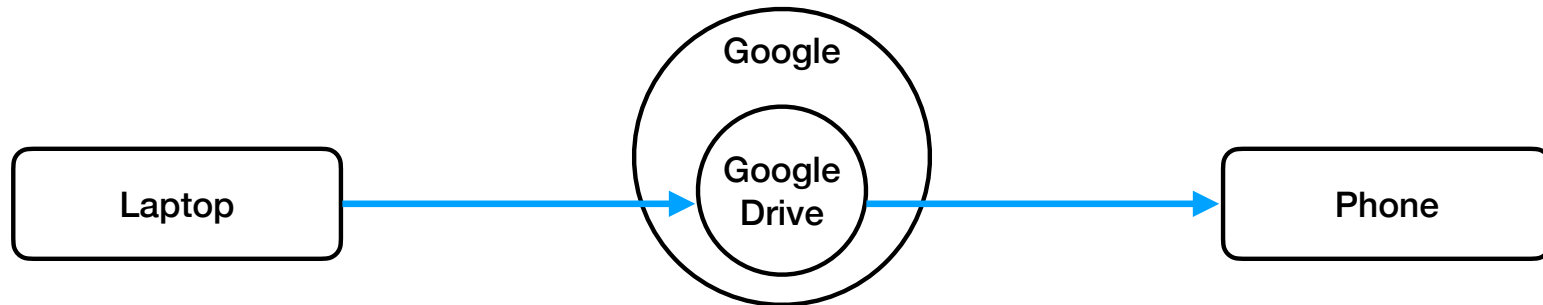
Definition of Cloud Storage

Cloud storage is a model of computer data storage in which data, said to be “[in] the cloud”, is stored remotely [...] and is accessible to users over [...] the Internet. The physical storage spans multiple servers (sometimes in multiple locations), and the physical environment is [...] owned and managed by a cloud computing provider. These cloud storage providers are responsible for keeping the data available and accessible, and the physical environment secured, protected, and running. People [...] lease storage capacity from the providers to store [...] data.

— [Wikipedia](#)

Syncing

- **Definition:** Sync is a shortcut for synchronization, which means data is consistent and accessible on two or more devices. When you synchronize files, such as images and videos, they become readily accessible on multiple devices.



Demos / Exercises

- Demo: Sync-ing photos and browser bookmarks
- Exercise: signing into & out of your Chrome Browser with your Google account
- Exercise: using Google Docs
 - Demo (Exercise ?): using Microsoft Word
- Exercise: collaborating with Google Sheets

Homework



Next Wednesday (June 5)
is our last session!

1. If you would like to revisit any of information covered in sessions 1-5 and/or have unanswered questions (ie, parking lot items) or new questions, please share them with David via an email to olli.shamlin@gmail.com by the end of day Friday.
2. For consideration (no promises!)

Would you be interested in workshops in the Fall?

- 2 hour weekly sessions
- 2-4 people per session
- Each sessions content to be determined by you