

Introduction to Web Development

Chapter 1

Chapter 1

1 A Complicated Ecosystem

2 Definitions and History

3 The Client-Server Model

4 Where is the Internet?

5 Working in Web Development

6 Summary

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A Complicated Ecosystem



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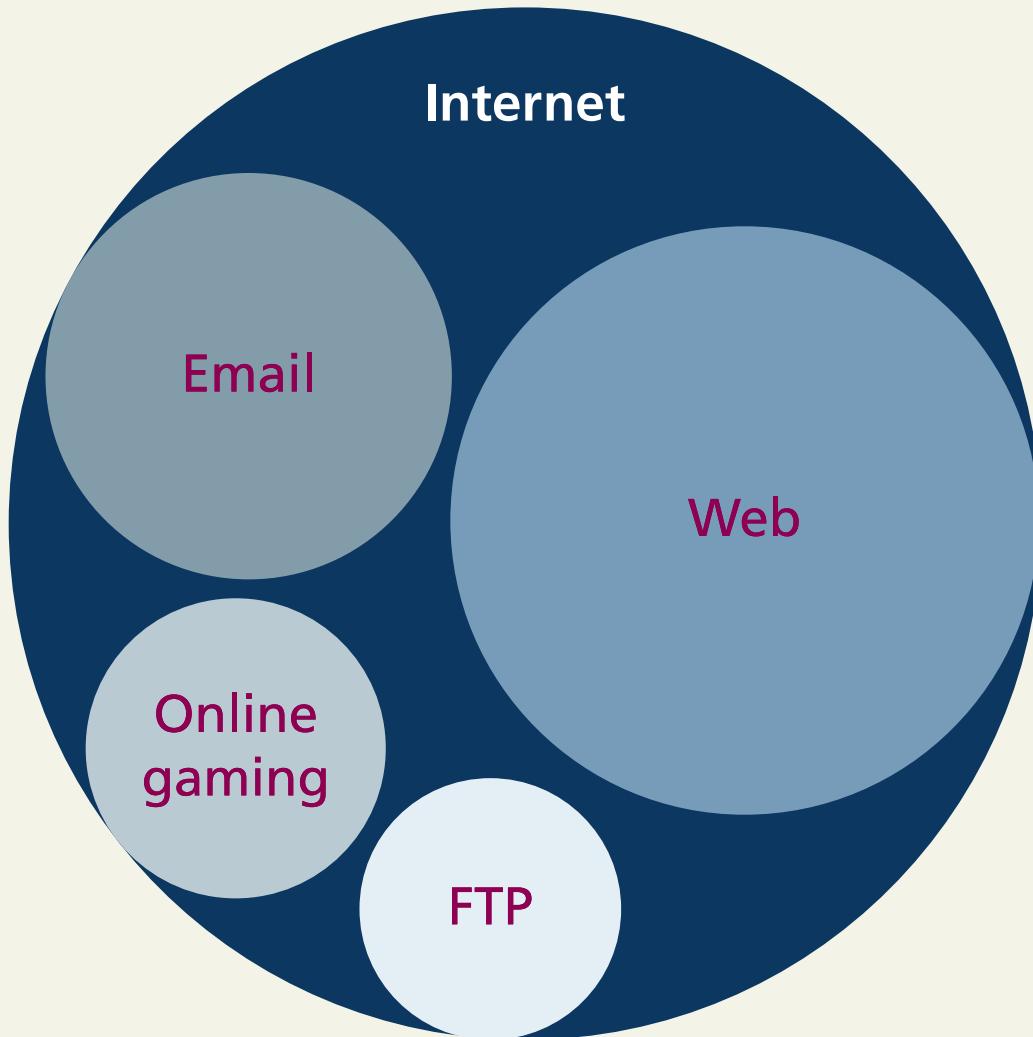
Definitions and History

A Short History of the Internet

- Telephone Network
- Packet Networks
 - ARPANET (1969)
 - X.25 (1974)
 - USENET (1979)
 - TCP/IP (1983) ← INTERNET

Definitions and History

The Internet and WWW are different (but related) things



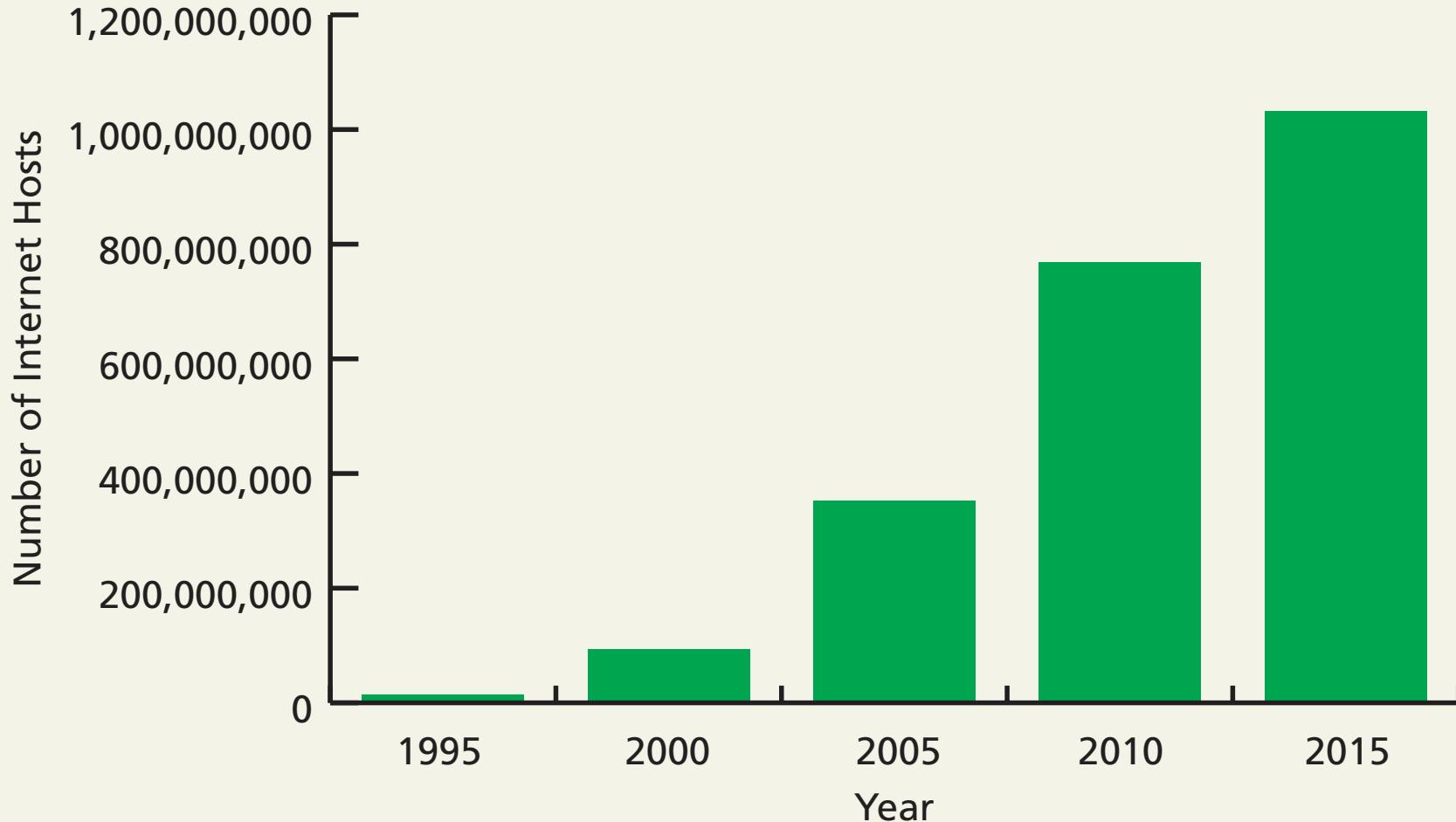
Definitions and History

The Birth of the Web (1990)

1. URLs
2. HTTP
3. SERVERS
4. BROWSERS
5. HTML

Definitions and History

The Growth of the Internet



Definitions and History

Web Applications in Comparison to Desktop Applications

Advantages:

- Accessible from any Internet-enabled computer.
- Usable with different operating systems and browser applications.
- Easier to roll out program updates
- Fewer security concerns about local
- Storage.

Definitions and History

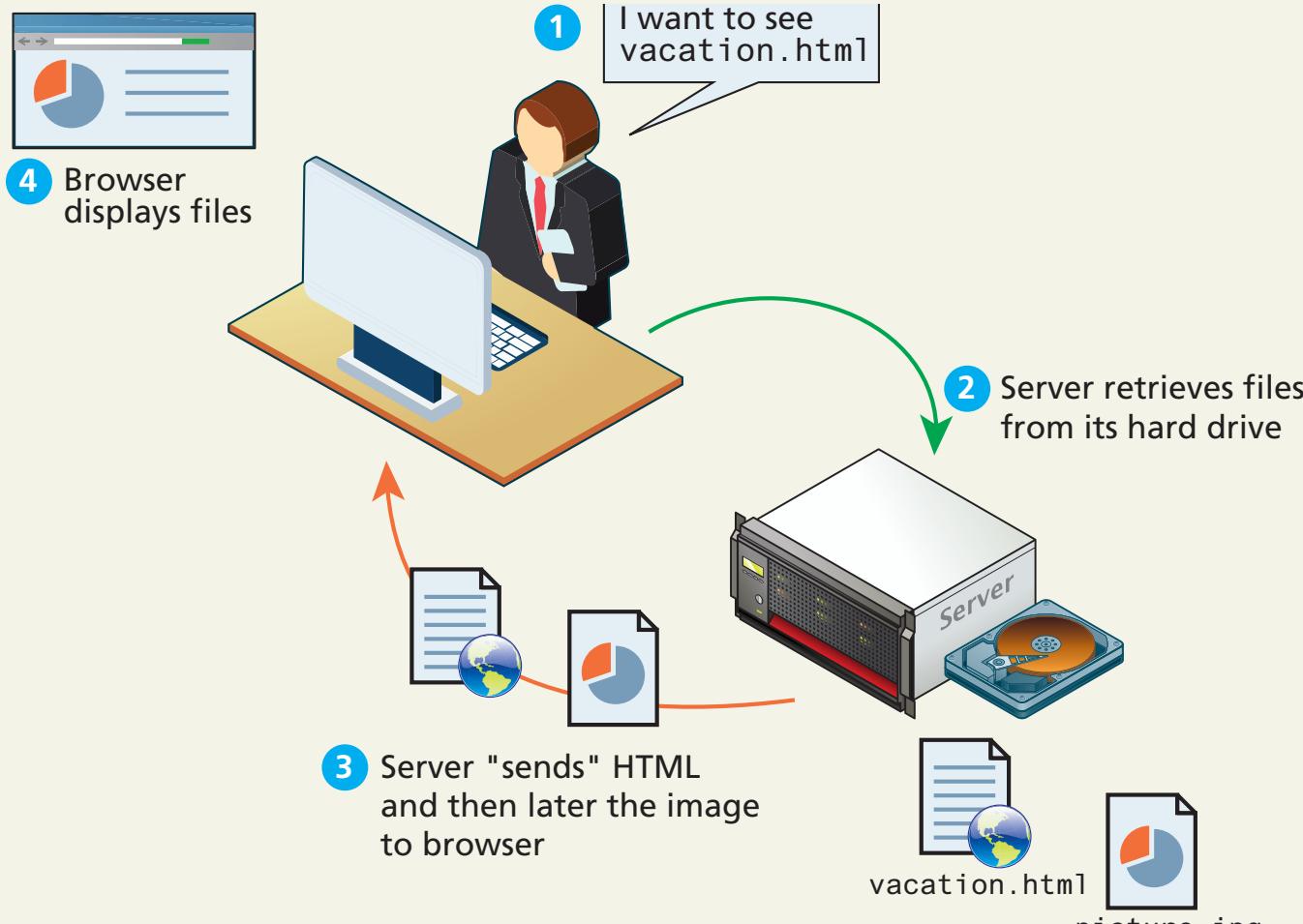
Web Applications in Comparison to Desktop Applications

Disadvantages:

- Requirement to have an active Internet connection
- Security concerns about sensitive private data being transmitted over the Internet.
- Concerns over the storage, licensing, and use of uploaded data.
- Problems with certain websites not having an identical appearance across all browsers.
- Restrictions on access to operating system resources
- Clients or their IT staff may have additional plugins added to their browsers

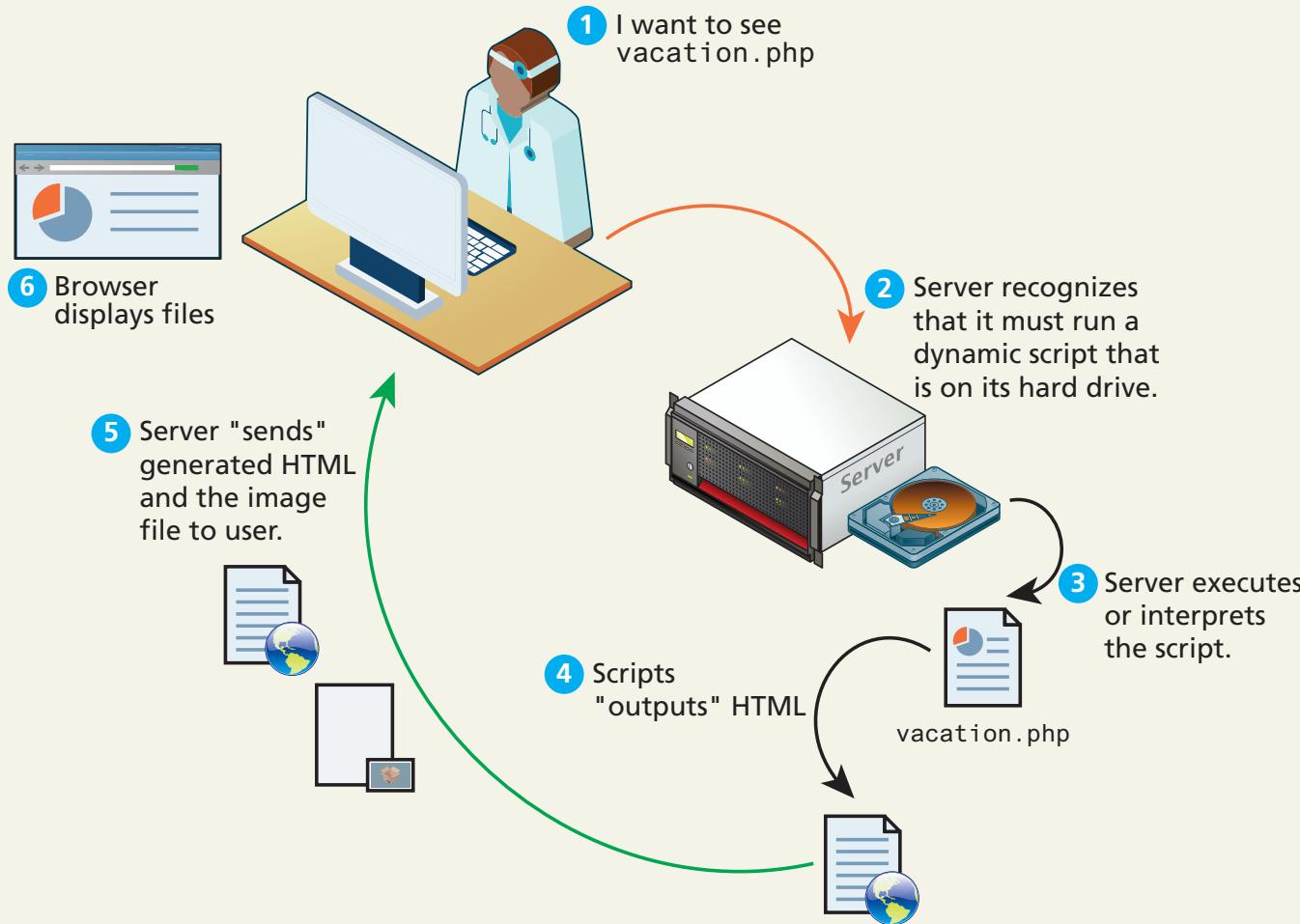
Definitions and History

Static Websites versus Dynamic Websites



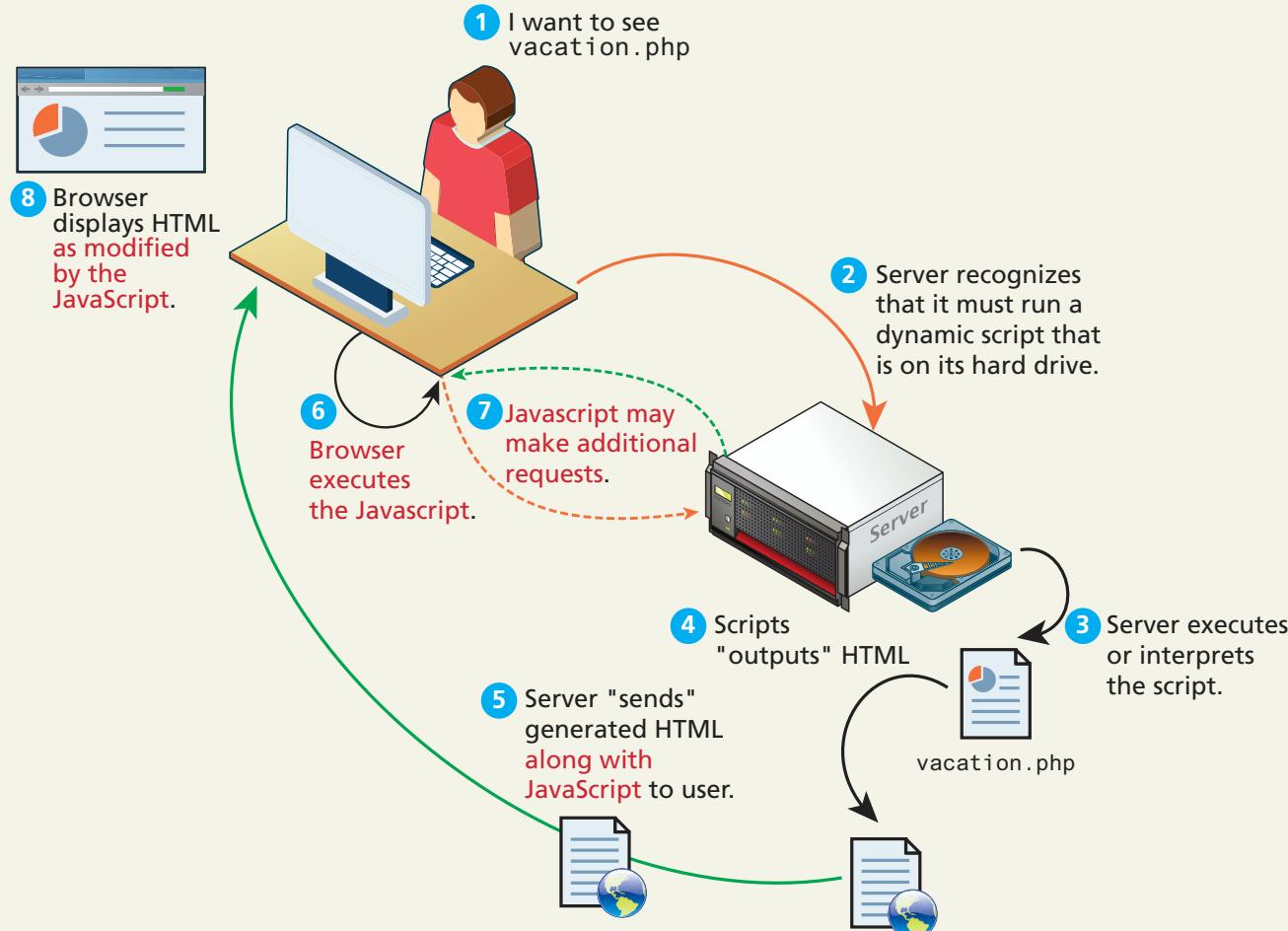
Definitions and History

Static Websites versus Dynamic Websites



Definitions and History

Static Websites versus Dynamic Websites



Definitions and History

Web 2.0 and Beyond

- Web 2.0 Dynamic
- Web 3.0 Semantic
- Web Science
- ...

Definitions and History

Sociotechnological Integration—Web Science

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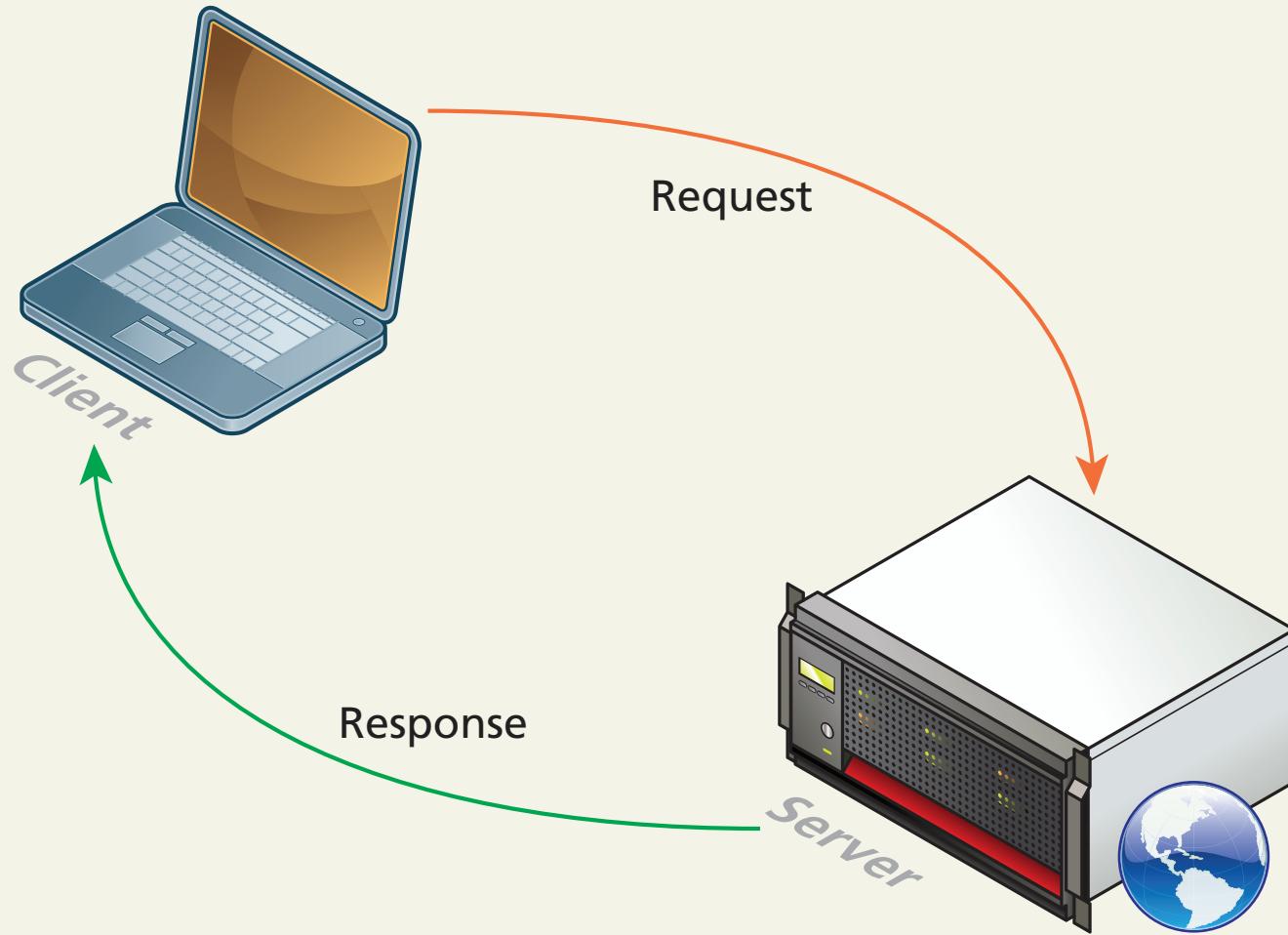
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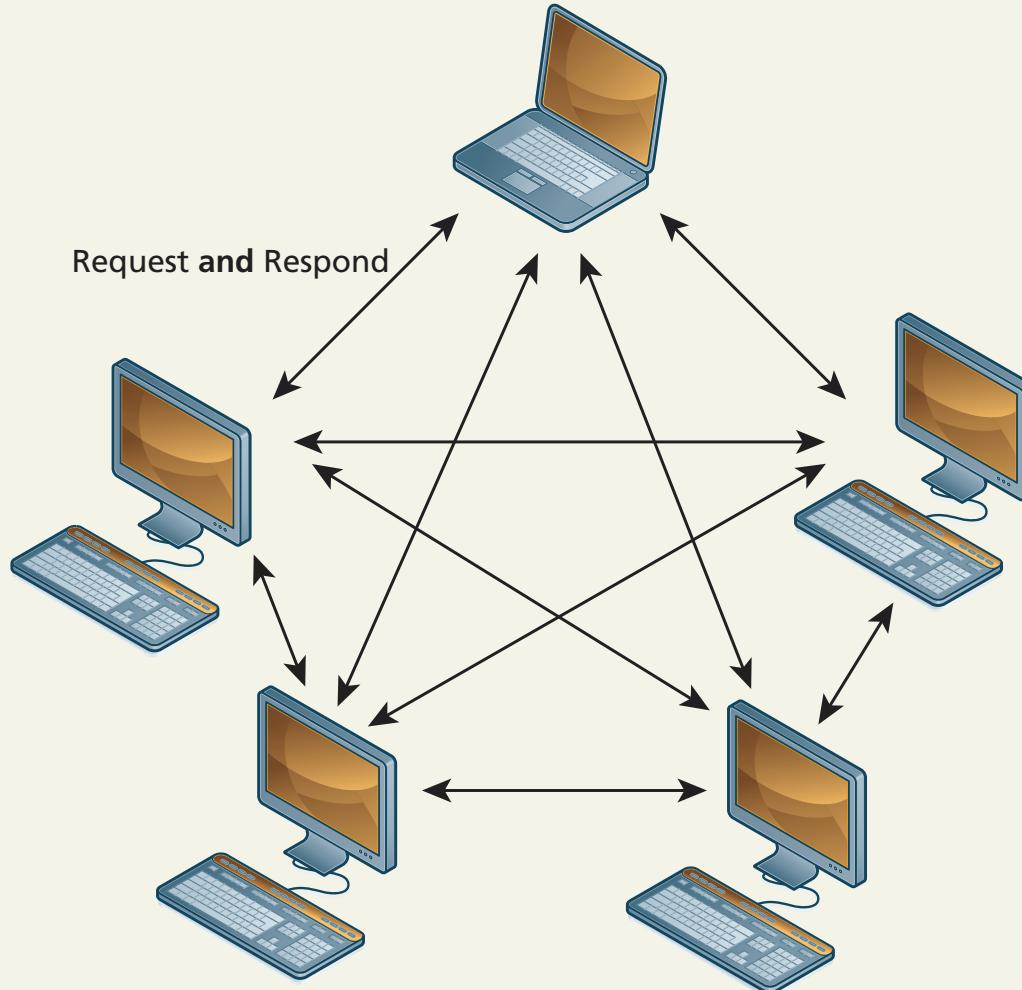
The Client-Server Model

The Request-Response Loop



The Client-Server Model

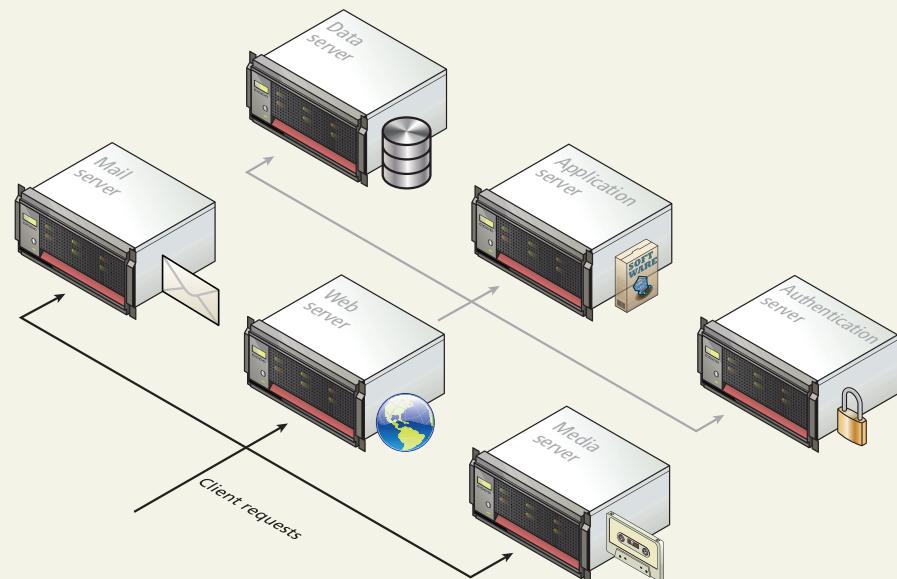
The Peer-to-Peer Alternative



The Client-Server Model

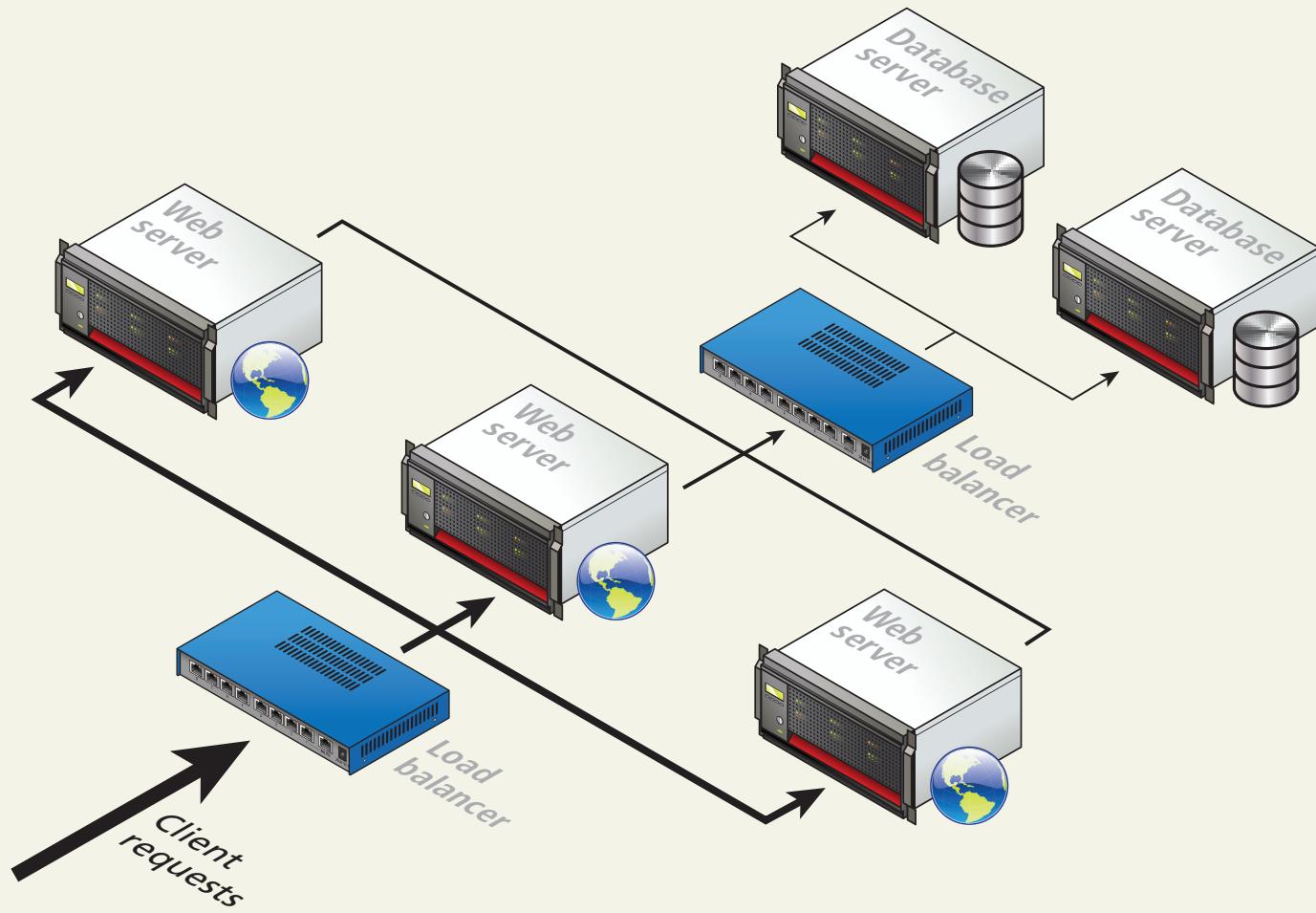
Server Types

- Web Servers
- Application Servers
- Database Servers
- Mail Servers
- Media Servers
- Authentication Servers
- ...



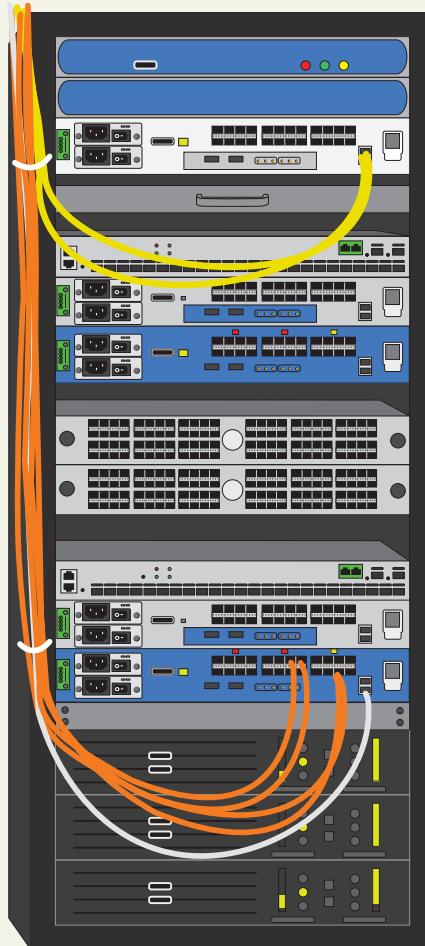
The Client-Server Model

Real-World Server Installations – Server Farm



The Client-Server Model

Real-World Server Installations – Server Rack



Fiber channel switches

Rack management server

Test server

Keyboard tray and flip-up monitor

Patch panel

Production web server

Production data server

RAID HD arrays

Patch panel

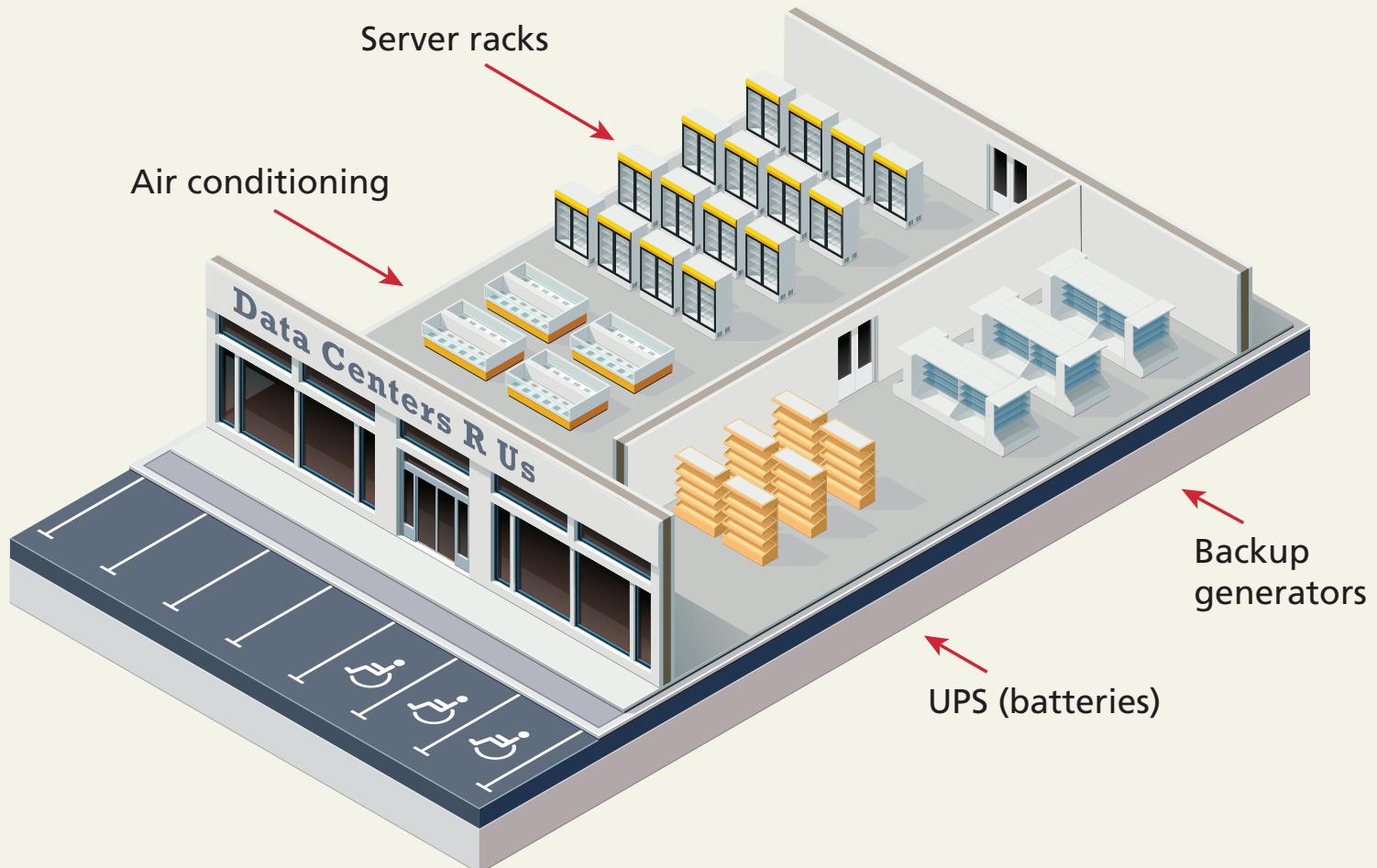
Production web server

Production data server

Batteries and UPS

The Client-Server Model

Real-World Server Installations – Data Center



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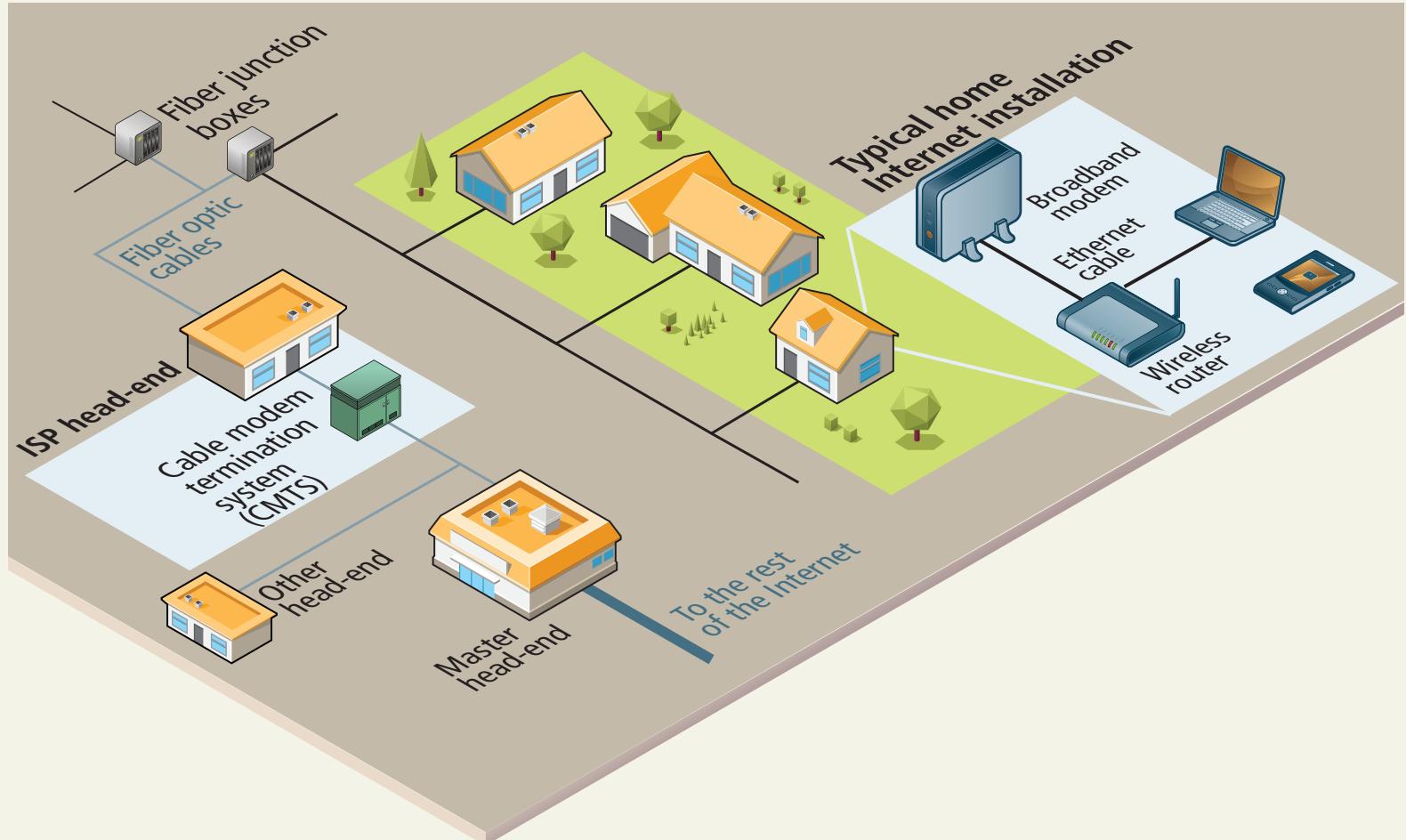
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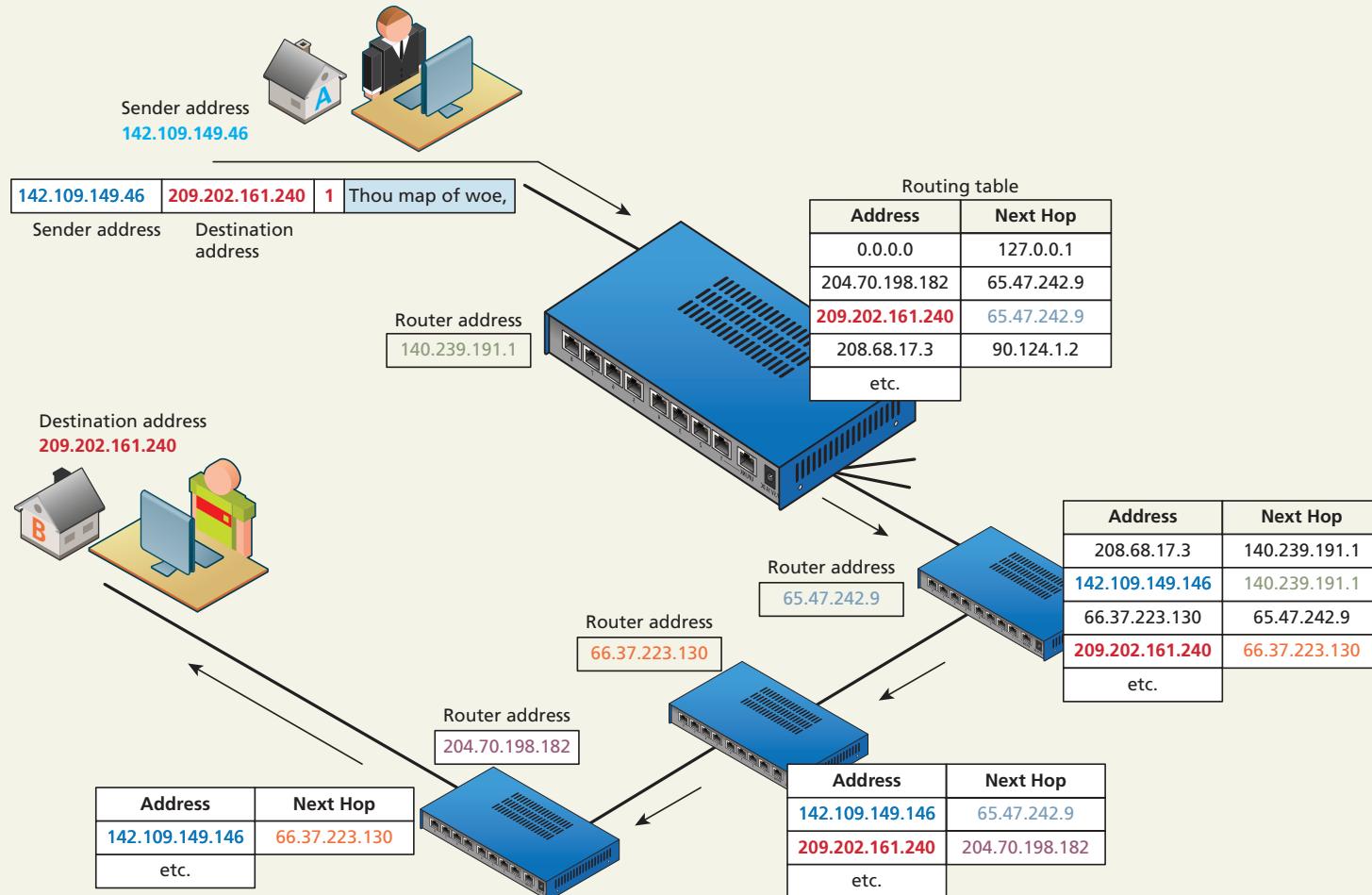
Where Is the Internet?

From the Computer to the Local Provider



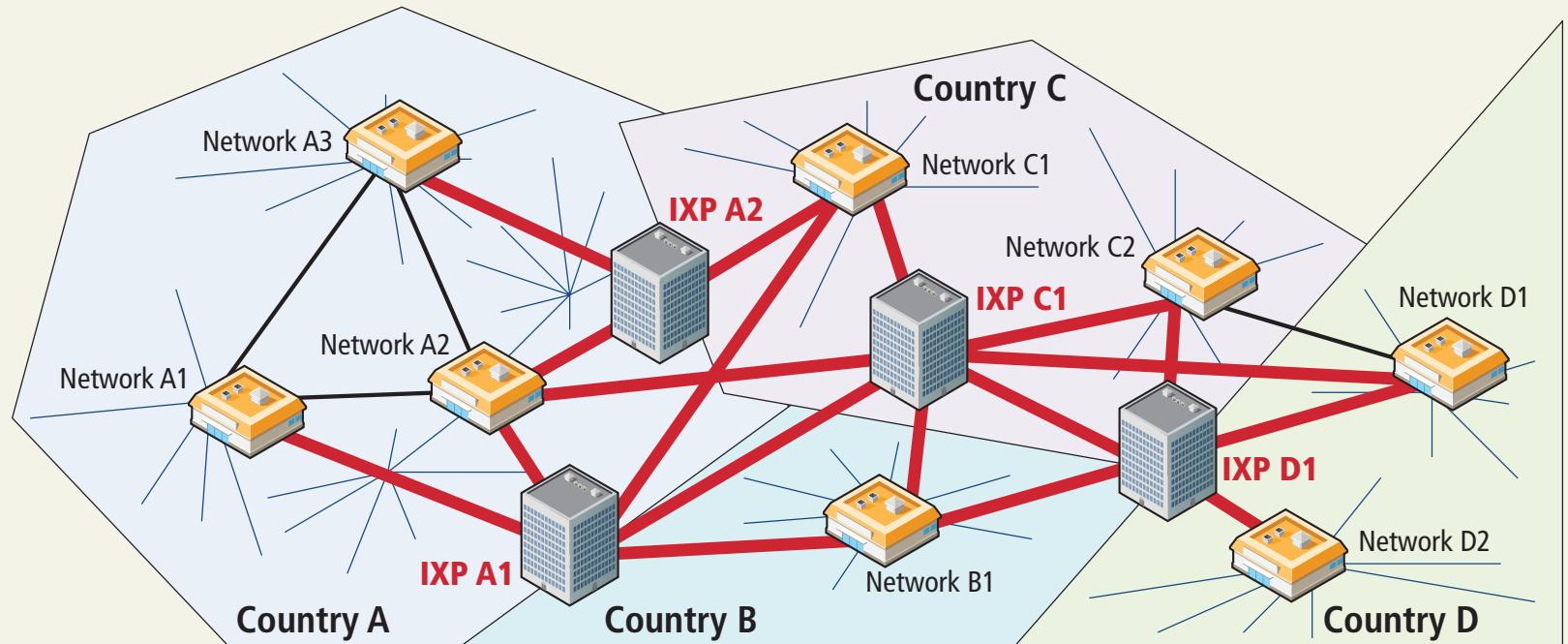
Where Is the Internet?

(Simplified) Routing Tables



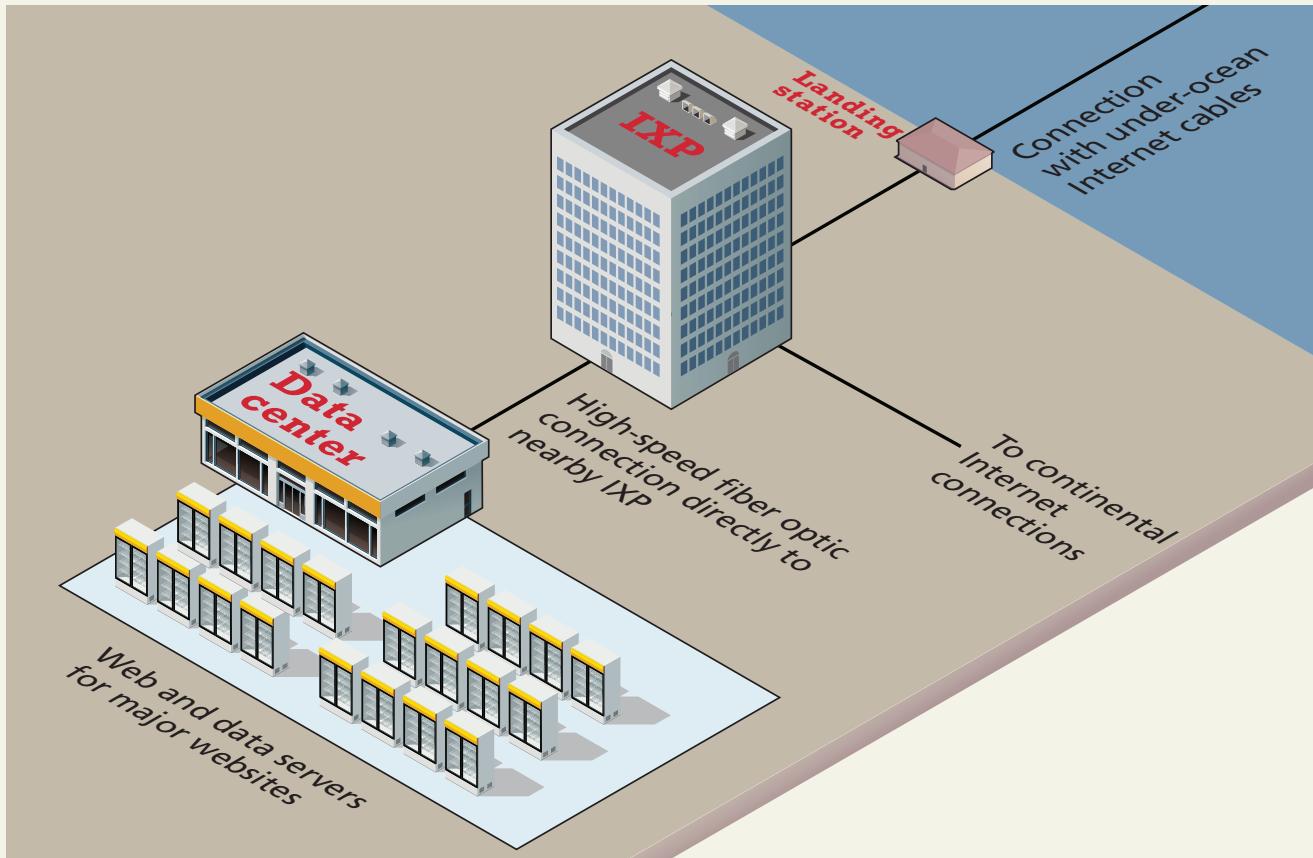
Where Is the Internet?

From the Local Provider to the Ocean's Edge



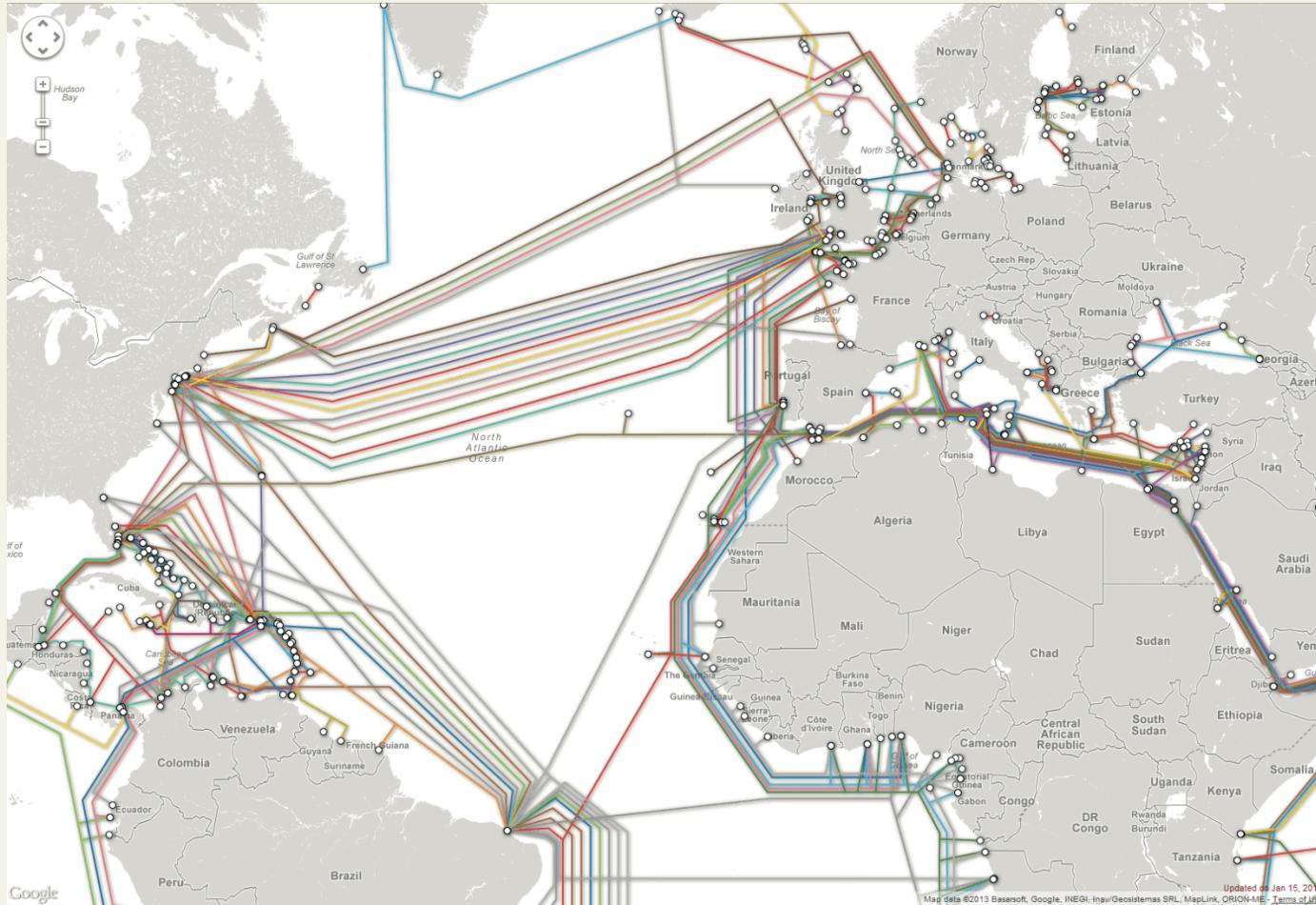
Where Is the Internet?

From the Local Provider to the Ocean's Edge –IXP and Data Centers



Where Is the Internet?

Across the Oceans



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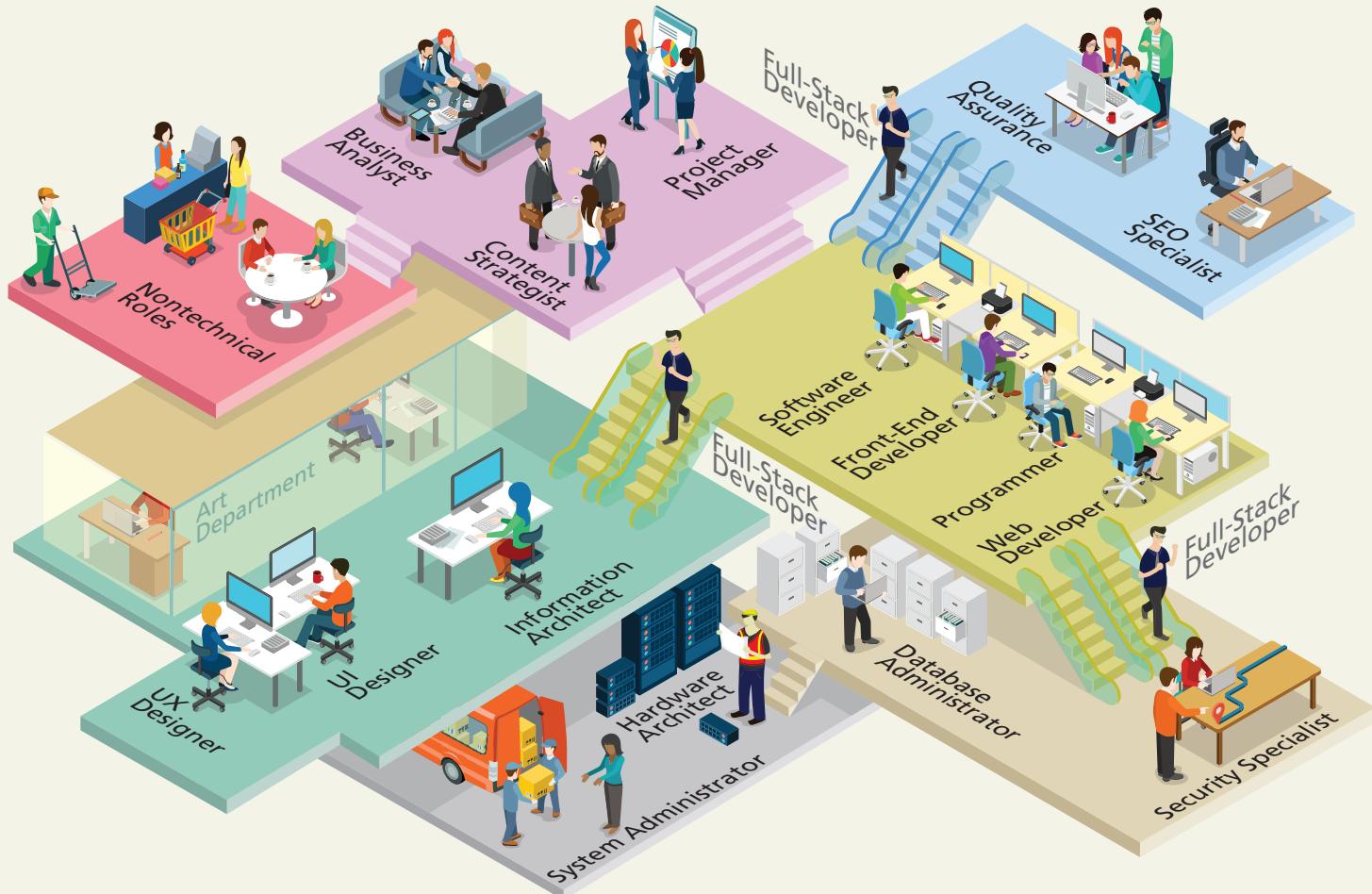
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Roles and Skills



Working in Web Development

Roles and Skills

- Hardware Architect/Network Architect/Systems Engineer
- System Administrator
- Database Administrator/Data Architect
- Security Specialist/Consultant/Expert
- Developer/Programmer
- Front-End Developer/UX Developer

Working in Web Development

Roles and Skills (II)

- Software Engineer
- UX Designer/UI Designer/Information Architect
- Tester/Quality Assurance
- SEO Specialist
- Content Strategists/Marketing Technologist
- Project Manager/Product Manager
- Business Analyst
- Nontechnical Roles

Working in Web Development

Types of Web Development Companies



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Key Terms

application server	(IX or IXP)	request-response loop
authentication server	Internet service provider (ISP)	response
bandwidth	load balancers	router
broadband modem	mail server	routing table
cable modem termination system	media server	semantic web
circuit switching	Mosaic	server
client	Netscape Navigator	server farm
client-server model	Network Access Points (NAP)	server racks
data center	next-hop routing	shared hosting
database server	packet	static website
DevOps	packet switching	user experience
dynamic website	peer	virtual server
failover redundancy	peer-to-peer	webmaster
fiber optic cable	model	Web 2.0
full-stack developer	request	World Wide Web Consortium (W3C)
HTTP	Request for Comments (RFC)	
intranet		
Internet exchange point		

Questions?