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UNIVERSITY

A PLACE TO LEARN; A CHANCE TO GROW



A large, faint background image of a winged lion statue, likely the VIT logo, standing on a pedestal. The lion is holding a scale of justice in its right paw and a gavel in its left. The text is overlaid on this image.

welcome to

CSE 4001 - Internet and Web Programming

Unit 1

Introduction to Web System

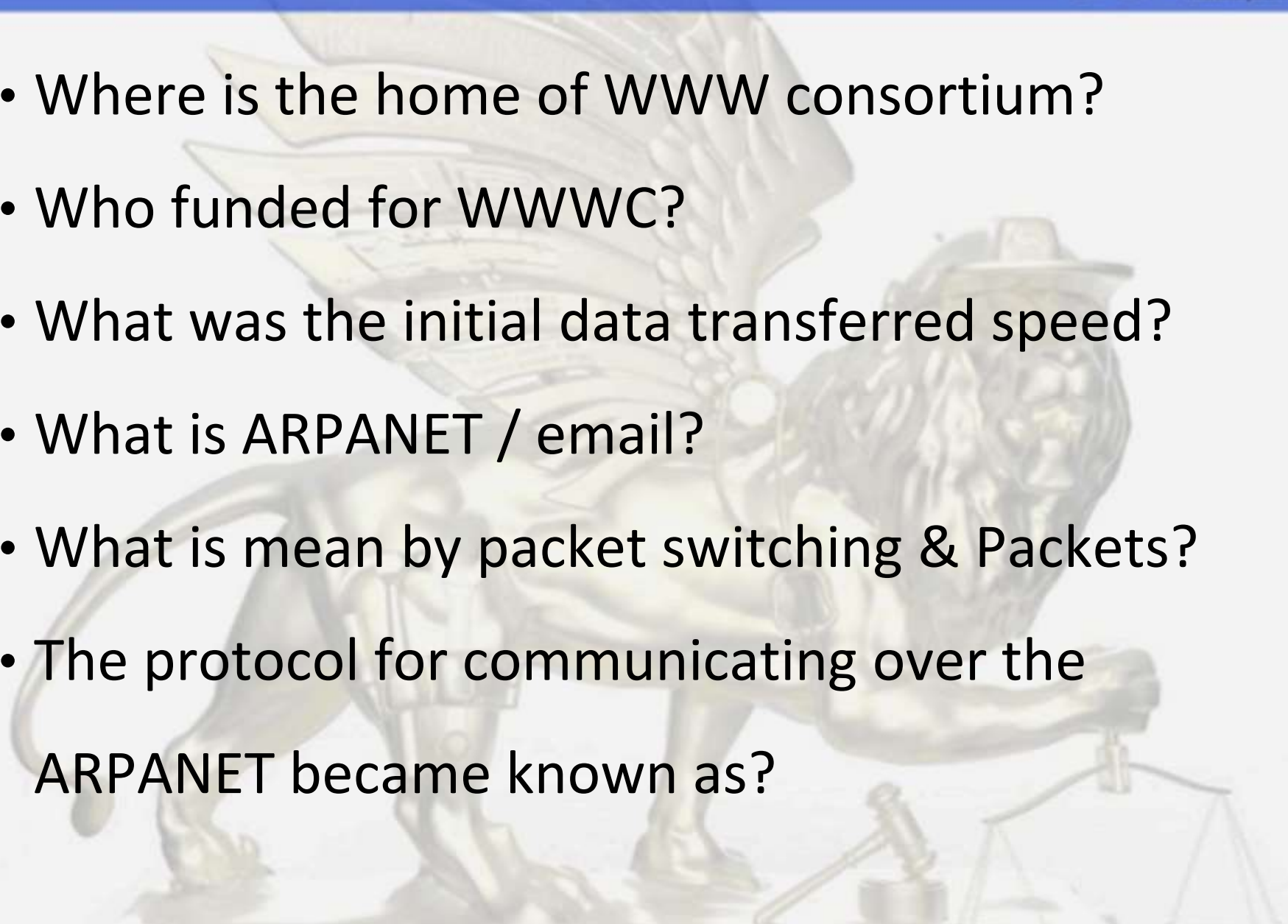
Internet Overview- WWW - Web Protocols
Web Browsers and Web Servers - Web
System Architecture – URL - Domain Name
– Client and Server-side Scripting.

Text Books:

- 1. Thomas Powell, HTML and CSS, Complete Reference, Fifth Edition, Mc Graw Hill, 2010
- 2. Thomas Powell, Fritz Schneider , JavaScript The complete reference, Mc Graw Hill, 2013
- 3. Tom Christiansen, Nathan Torkington, Perl Cookbook, O'Reilly, 2012
- 4. David Powers, PHP Solutions, Dynamic web page design made easy, Apress, 2010
- 5. Joe Fawcett, Danny Ayers, Liam R. E. Quin, Beginning XML, 5th Edition, Wrox, 2012

Reference Books:

- 1. Paul Dietel, Harvey Dietel and Abbey Dietel, Internet and World Wide Web How to program, 5th International Edition, Pearson, 2012

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- Where is the home of WWW consortium?
 - Who funded for WWWC?
 - What was the initial data transferred speed?
 - What is ARPANET / email?
 - What is mean by packet switching & Packets?
 - The protocol for communicating over the ARPANET became known as?

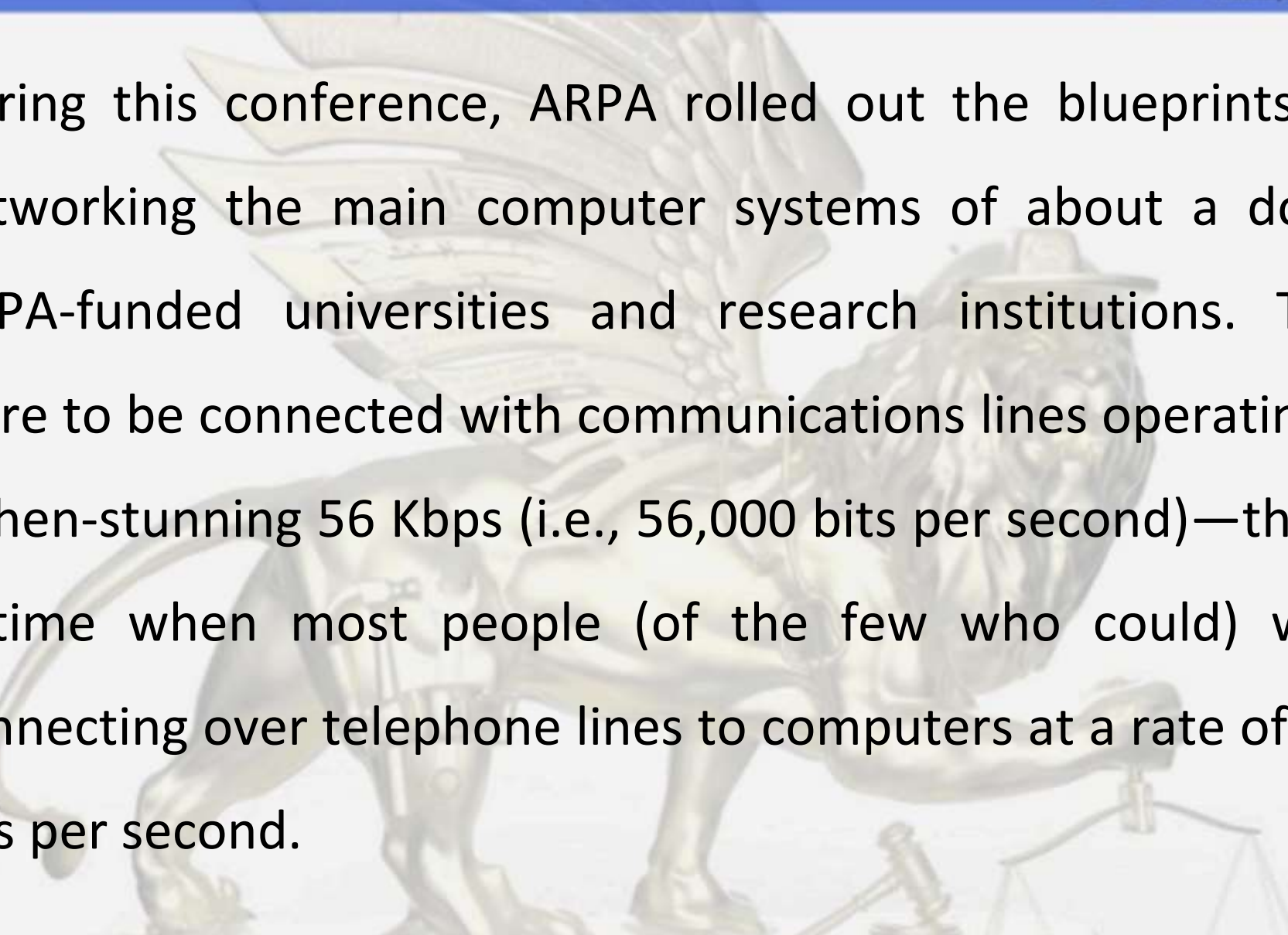
- What is mean by Internet Protocol? TCP/IP
- Why bandwidth is important?



Internet Overview

- In the late 1960s, one of the authors (HMD) was a graduate student at MIT. His research at MIT's Project MAC (now the Laboratory for Computer Science—the home of the World Wide Web Consortium) was funded by ARPA—the Advanced Research Projects Agency of the Department of Defense.

- ARPA sponsored a conference at which several dozen ARPA-funded graduate students were brought together at the University of Illinois at Urbana-Champaign to meet and share ideas.



During this conference, ARPA rolled out the blueprints for networking the main computer systems of about a dozen ARPA-funded universities and research institutions. They were to be connected with communications lines operating at a then-stunning 56 Kbps (i.e., 56,000 bits per second)—this at a time when most people (of the few who could) were connecting over telephone lines to computers at a rate of 110 bits per second.

- There was great excitement at the conference. Researchers at Harvard talked about communicating with the Univac 1108 “supercomputer” at the University of Utah to handle calculations related to their computer graphics research. Many other intriguing possibilities were raised.
- Academic research about to take a giant leap forward. Shortly after this conference, ARPA proceeded to implement the **ARPANET**, which eventually evolved into today’s **Internet**.

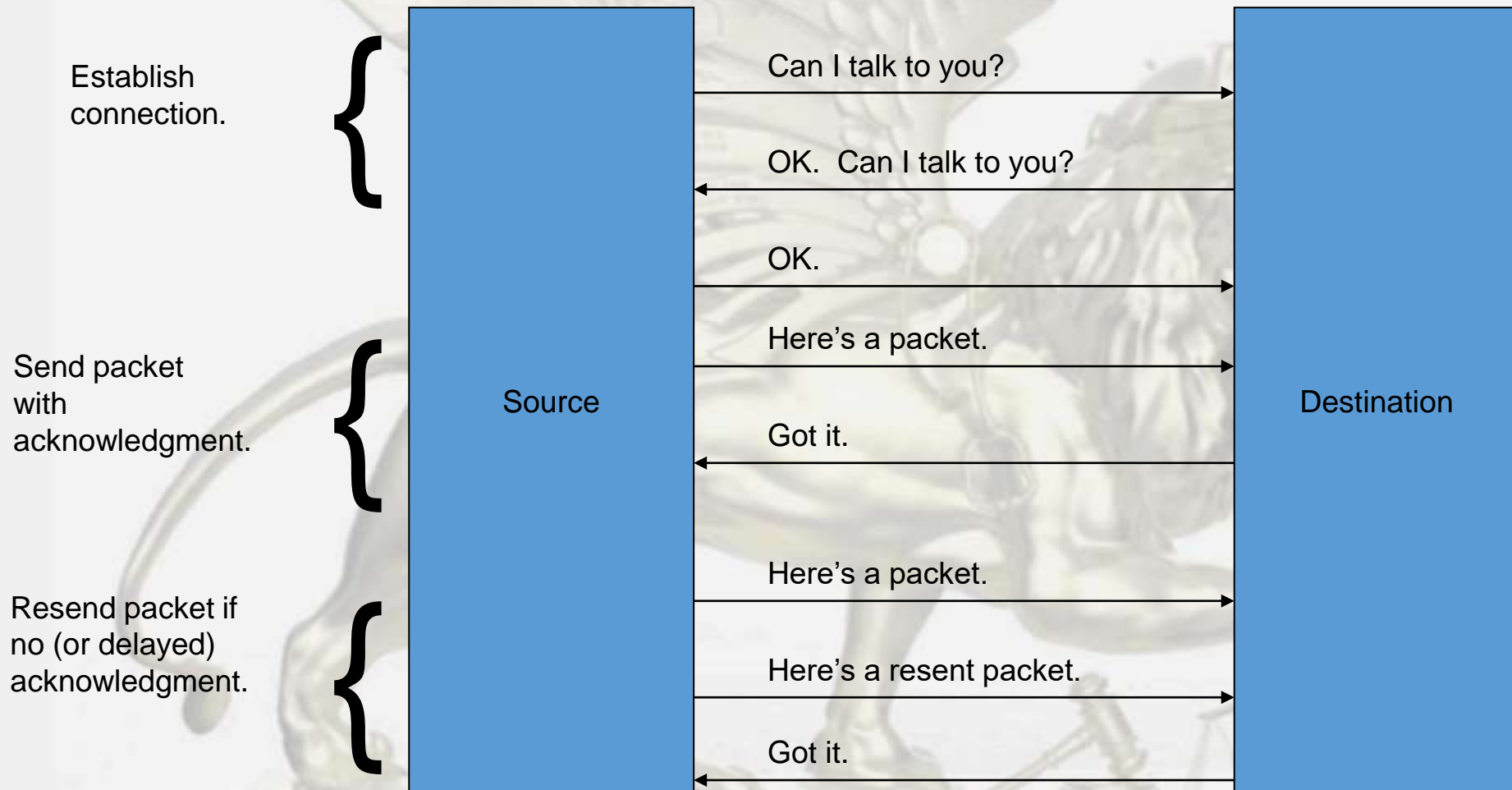
- Things worked out differently from what was originally planned. Rather than enabling researchers to share each other's computers, it rapidly became clear that enabling researchers to communicate quickly and easily via what became known as electronic mail (e-mail, for short) was the key early benefit of the ARPANET. This is true even today on the Internet, as e-mail facilitates communications of all kinds among a billion people worldwide.

- One of the primary goals for ARPANET was to allow multiple users to send and receive information simultaneously over the same communications paths (e.g., phone lines). The network operated with a technique called packet switching, in which digital data was sent in small bundles called packets. The packets contained address, error-control and sequencing information.

- The address information allowed packets to be routed to their destinations. The sequencing information helped in reassembling the packets— which, because of complex routing mechanisms, could actually arrive out of order— into their original order for presentation to the recipient. Packets from different senders were intermixed on the same lines. This packet-switching technique greatly reduced transmission costs, as compared with the cost of dedicated communications lines.

- The network was designed to operate without centralized control. If a portion of the network failed, the remaining working portions would still route packets from senders to receivers over alternative paths for reliability.
- The protocol for communicating over the ARPANET became known as **TCP—the Transmission Control Protocol**. TCP ensured that messages were properly **routed from** sender to receiver and that they arrived intact.

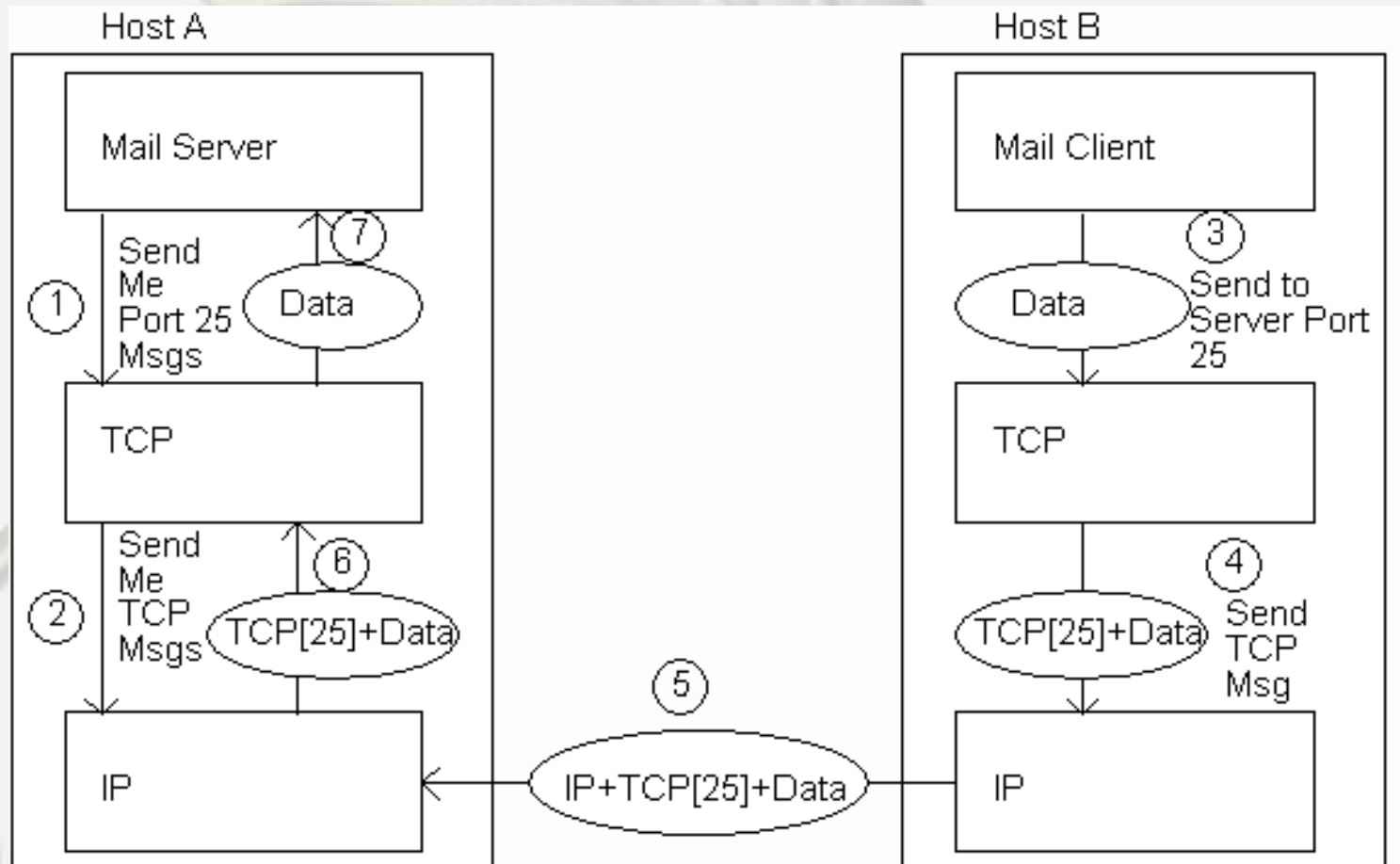
TCP



TCP

- TCP also adds concept of a **port**
 - TCP header contains port number representing an application program on the destination computer
 - Some port numbers have standard meanings
 - Example: port 25 is normally used for email transmitted using the Simple Mail Transfer Protocol (SMTP)
 - Other port numbers are available first-come-first served to any application

TCP



As the Internet evolved, organizations worldwide were implementing their own networks for both intraorganization (i.e., within the organization) and interorganization (i.e., between organizations) communications. A wide variety of networking hardware and software appeared.

One challenge was to get these different networks to communicate. ARPA accomplished this with the development of **IP—the Internet Protocol, truly creating a “network of networks,” the current architecture of the Internet. The combined set of protocols is now commonly called TCP/IP.**

Internet Protocols

- **Communication protocol**: how computers talk
 - Cf. telephone “protocol”: how you answer and end call, what language you speak, etc.
- Internet protocols developed as part of ARPANET research
 - ARPANET began using TCP/IP in 1982
- Designed for use both within **local area networks** (LAN's) and between networks

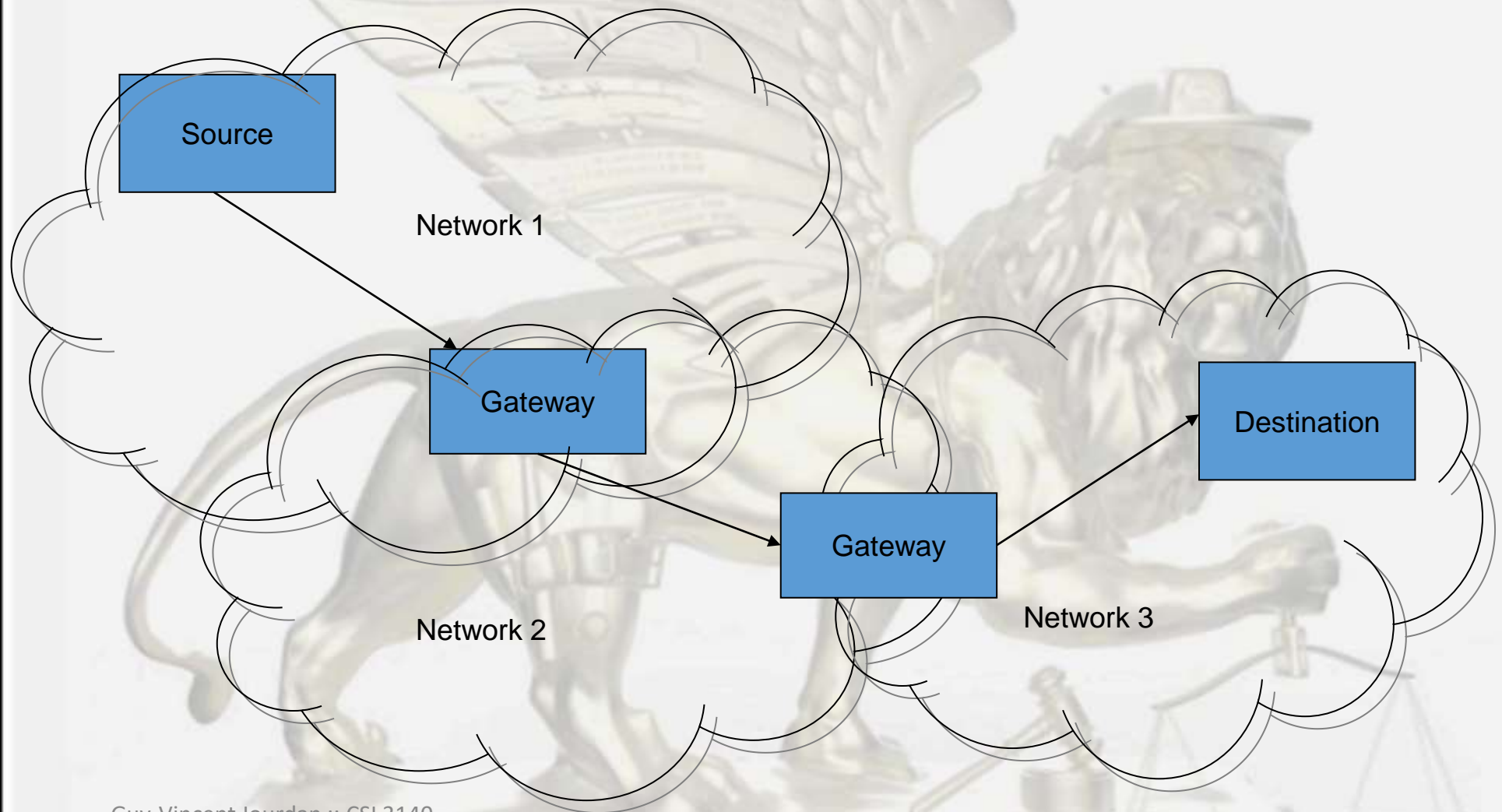
Internet Protocol (IP)

- IP is the fundamental protocol defining the Internet (as the name implies!)
- IP address:
 - 32-bit number (in IPv4)
 - Associated with at most one device at a time (although device may have more than one)
 - Written as four dot-separated bytes, e.g. 192.0.34.166

IP

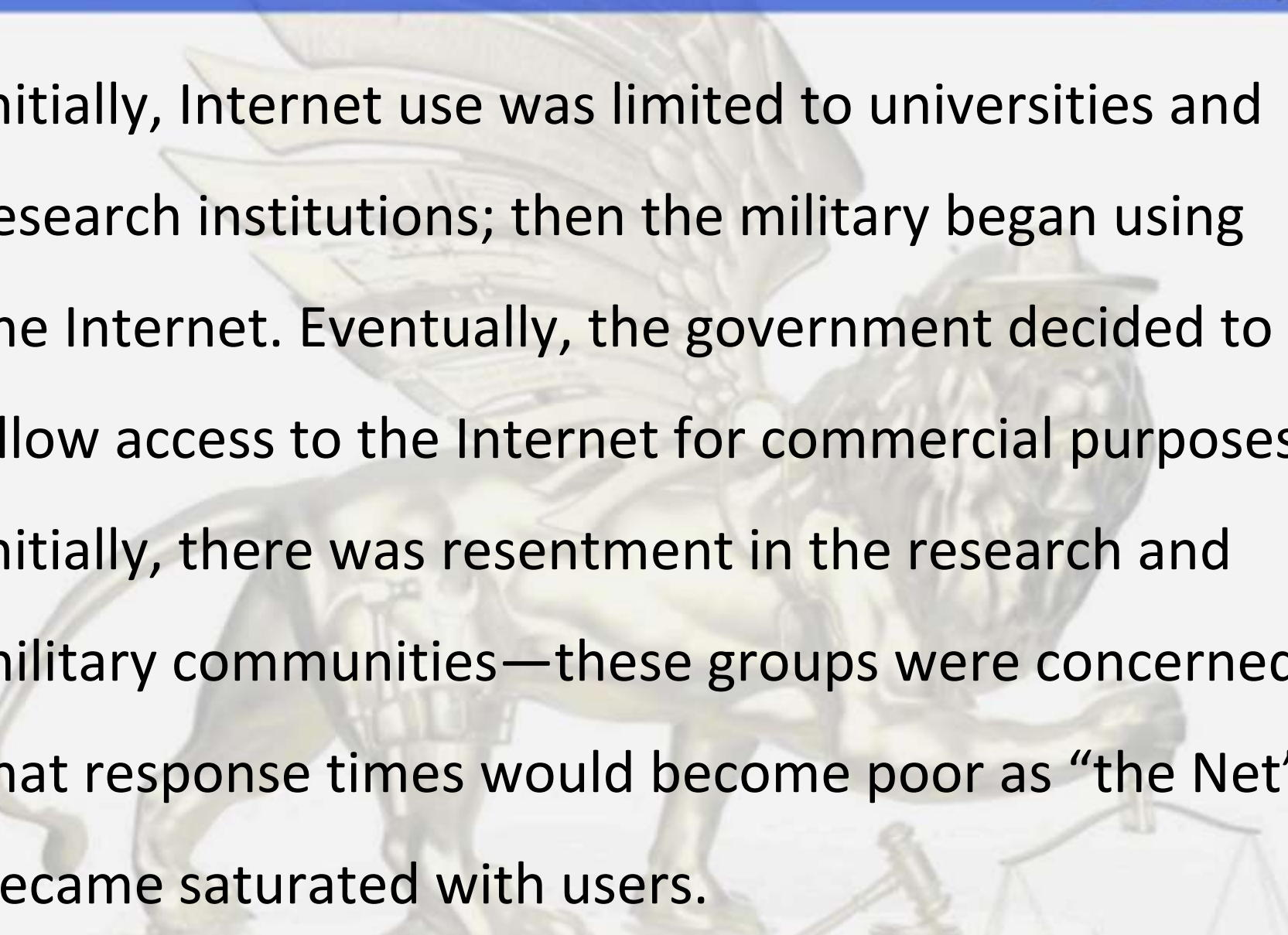
- IP function: transfer data from **source** device to **destination** device
- IP source software creates a **packet** representing the data
 - **Header**: source and destination IP addresses, length of data, etc.
 - **Data** itself
- If destination is on another LAN, packet is sent to a **gateway** that connects to more than one network

IP

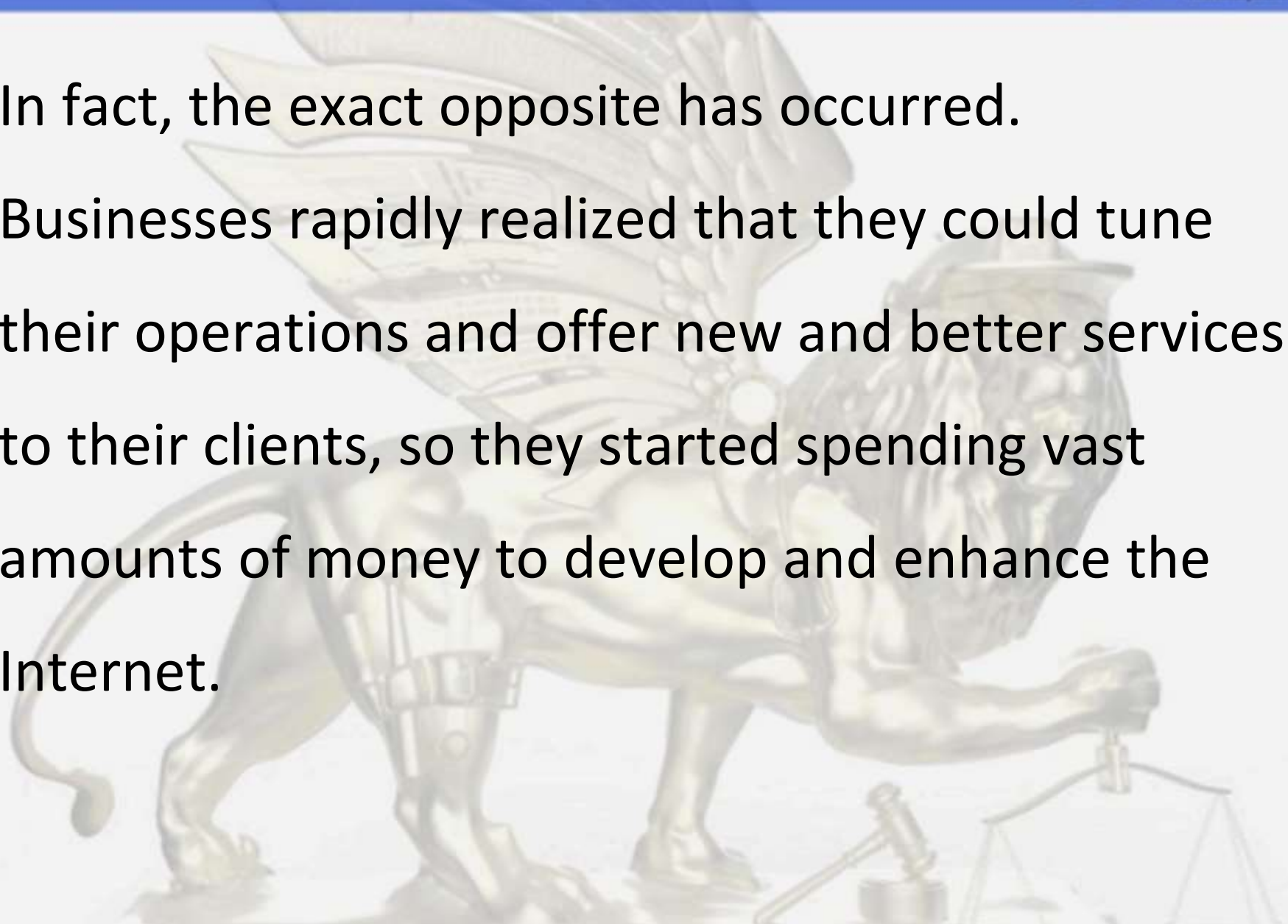


Transmission Control Protocol (TCP)

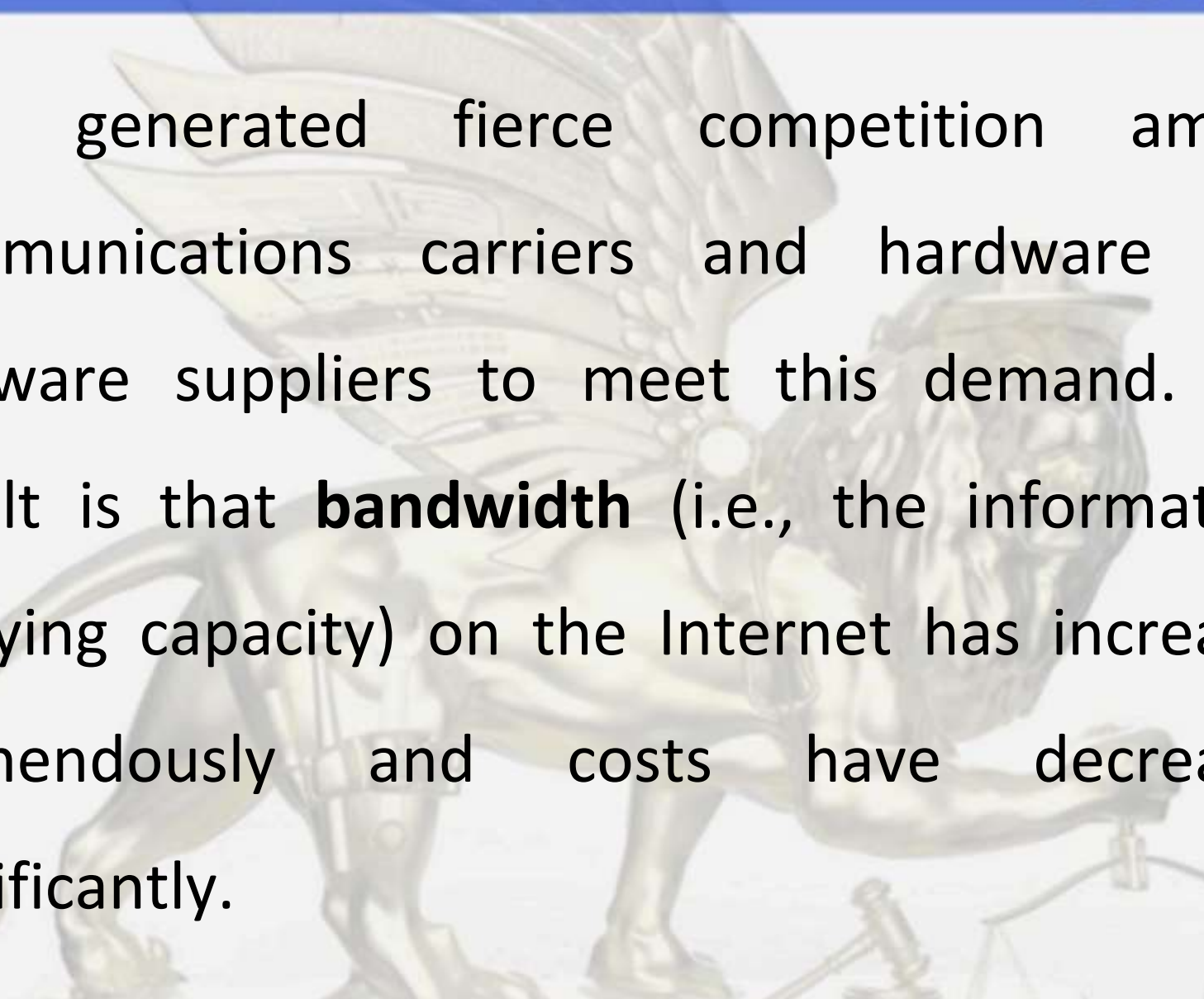
- Limitations of IP:
 - No guarantee of packet delivery (packets can be dropped)
 - Communication is one-way (source to destination)
- TCP adds concept of a **connection** on top of IP
 - Provides guarantee that packets delivered
 - Provide two-way (**full duplex**) communication



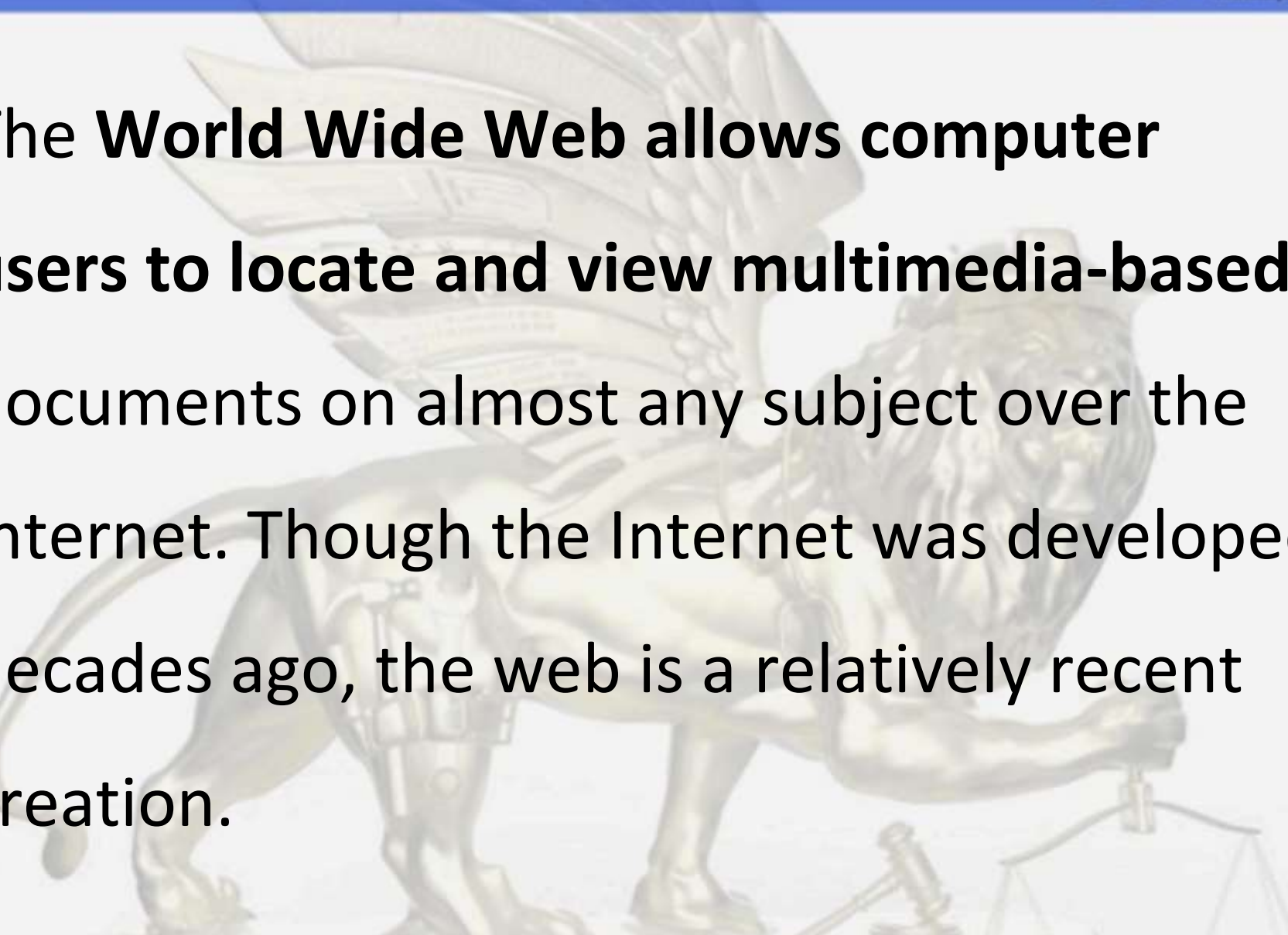
Initially, Internet use was limited to universities and research institutions; then the military began using the Internet. Eventually, the government decided to allow access to the Internet for commercial purposes. Initially, there was resentment in the research and military communities—these groups were concerned that response times would become poor as “the Net” became saturated with users.



In fact, the exact opposite has occurred. Businesses rapidly realized that they could tune their operations and offer new and better services to their clients, so they started spending vast amounts of money to develop and enhance the Internet.



This generated fierce competition among communications carriers and hardware and software suppliers to meet this demand. The result is that **bandwidth** (i.e., the information-carrying capacity) on the Internet has increased tremendously and costs have decreased significantly.



The World Wide Web allows computer users to locate and view multimedia-based documents on almost any subject over the Internet. Though the Internet was developed decades ago, the web is a relatively recent creation.

- In 1989, **Tim Berners-Lee of CERN** (the European Organization for Nuclear Research) began to develop a technology For sharing information via hyperlinked text documents. Berners-Lee called his invention the **HyperText Markup Language (HTML)**. He also wrote communication protocols to **form** the backbone of his new information system, which he called theWorldWideWeb. In particular, he wrote the **Hypertext Transfer Protocol (HTTP)**—a **communications protocol** used to send information over the web.



Tim Berners-Lee, the father of the World Wide Web

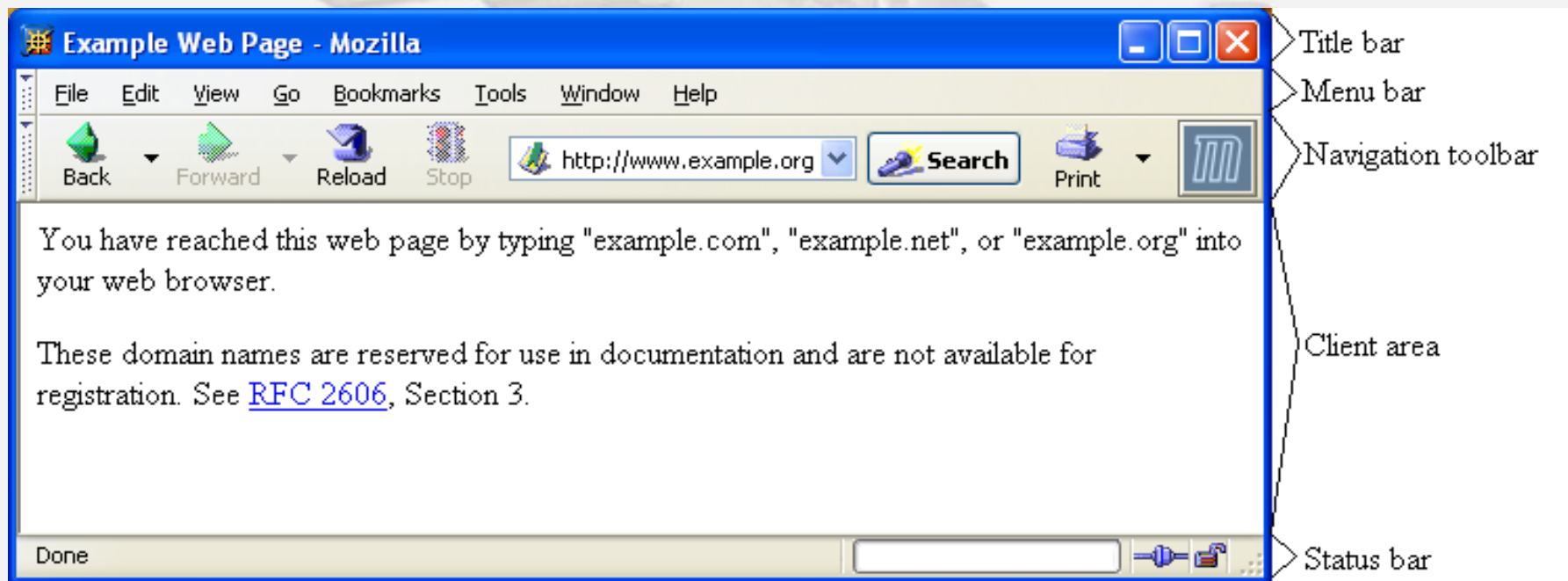
Web Browsers

- First graphical browser running on general-purpose platforms: Mosaic (1993)



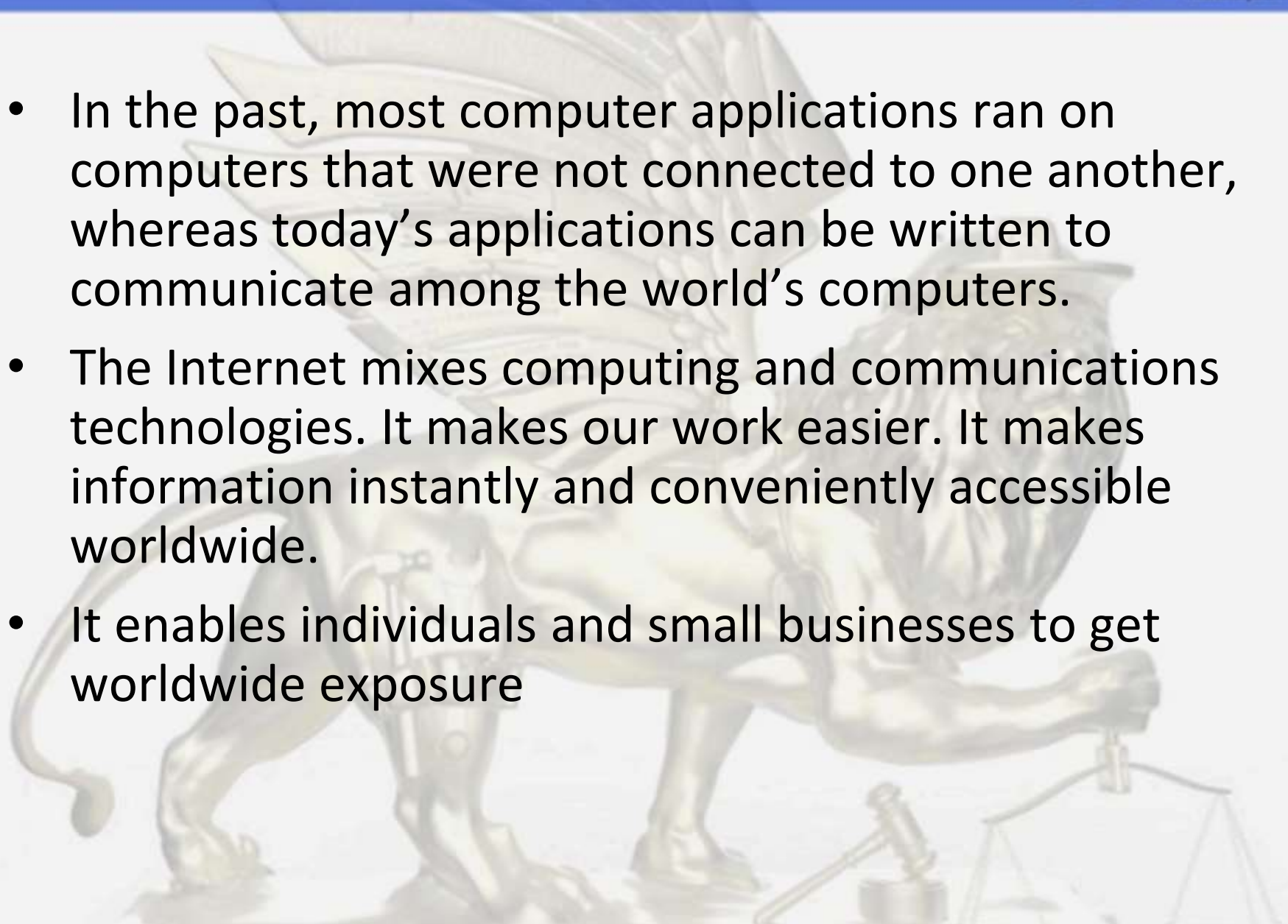
- Web use exploded with the availability in 1993 of the Mosaic browser, which featured a user-friendly graphical interface. Marc Andreessen, whose team at NCSA developed Mosaic, went on to found Netscape, the company that many people credit with initiating the explosive Internet economy of the late 1990s.

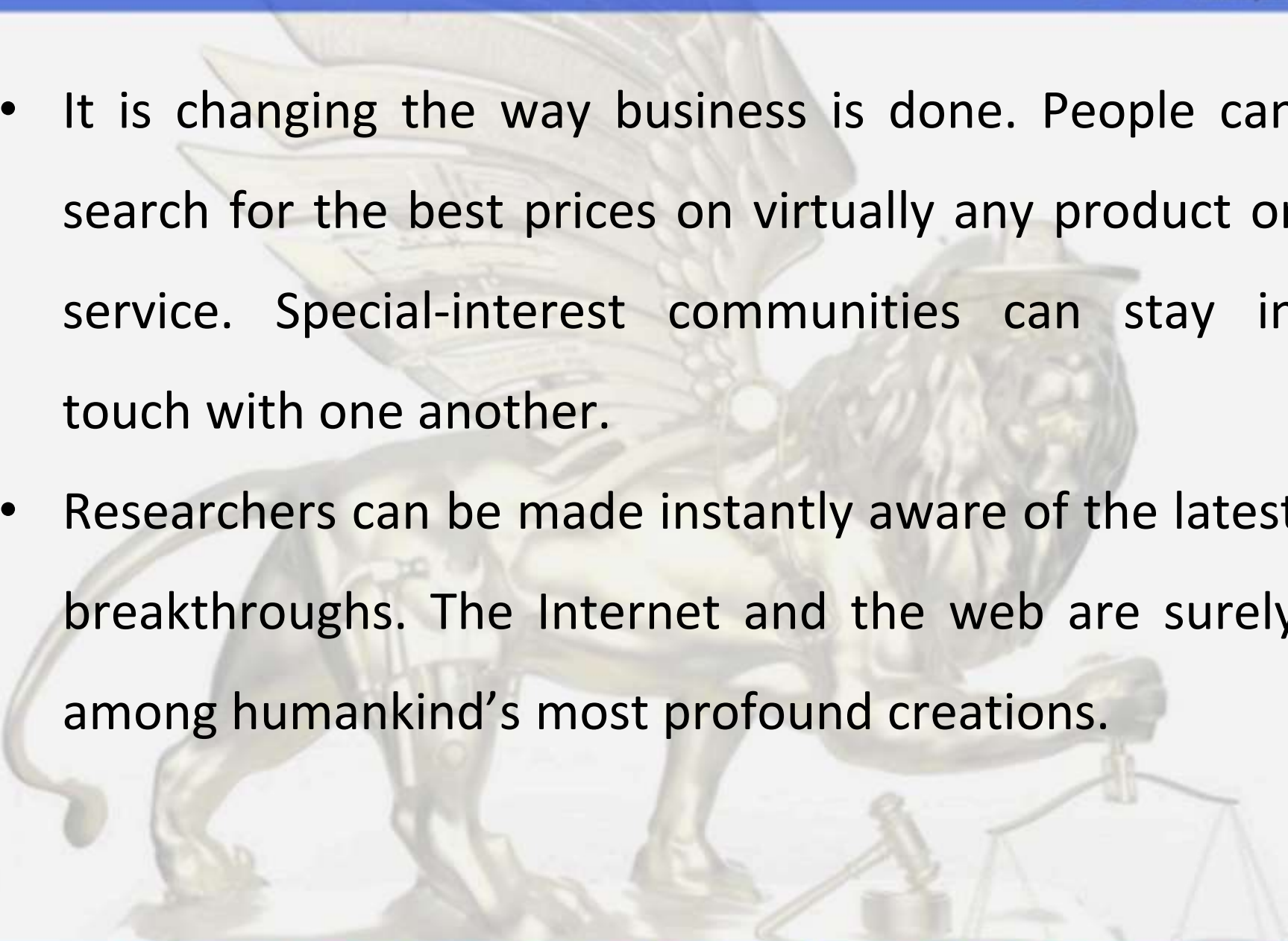
Web Browsers



Web Browsers

- Primary tasks:
 - Convert web addresses (URL's) to HTTP requests
 - Communicate with web servers via HTTP
 - **Render** (appropriately display) documents returned by a server

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- In the past, most computer applications ran on computers that were not connected to one another, whereas today's applications can be written to communicate among the world's computers.
 - The Internet mixes computing and communications technologies. It makes our work easier. It makes information instantly and conveniently accessible worldwide.
 - It enables individuals and small businesses to get worldwide exposure

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- It is changing the way business is done. People can search for the best prices on virtually any product or service. Special-interest communities can stay in touch with one another.
 - Researchers can be made instantly aware of the latest breakthroughs. The Internet and the web are surely among humankind's most profound creations.

Current News



5g internet



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About 20,00,00,000 results (0.47 seconds)

Airlines cancel some US flights over 5G concerns

 The Economic Times

[Air India to curtail or revise US flights due to 5G internet deployment -Deployment of 5G](#)

Air India said on Tuesday it will curtail or revise its flights to the US due to deployment of 5G internet there from January 19.

1 day ago



 HT Tech

[5G can KILL the Boeing 777? Faster internet for you THREATENS aviation, know how](#)

5G networks in the US have proven to be harmful for the Boeing 777 aircraft. Know how it hurts aviation already.

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