THE INTERNET

Cold War Communications

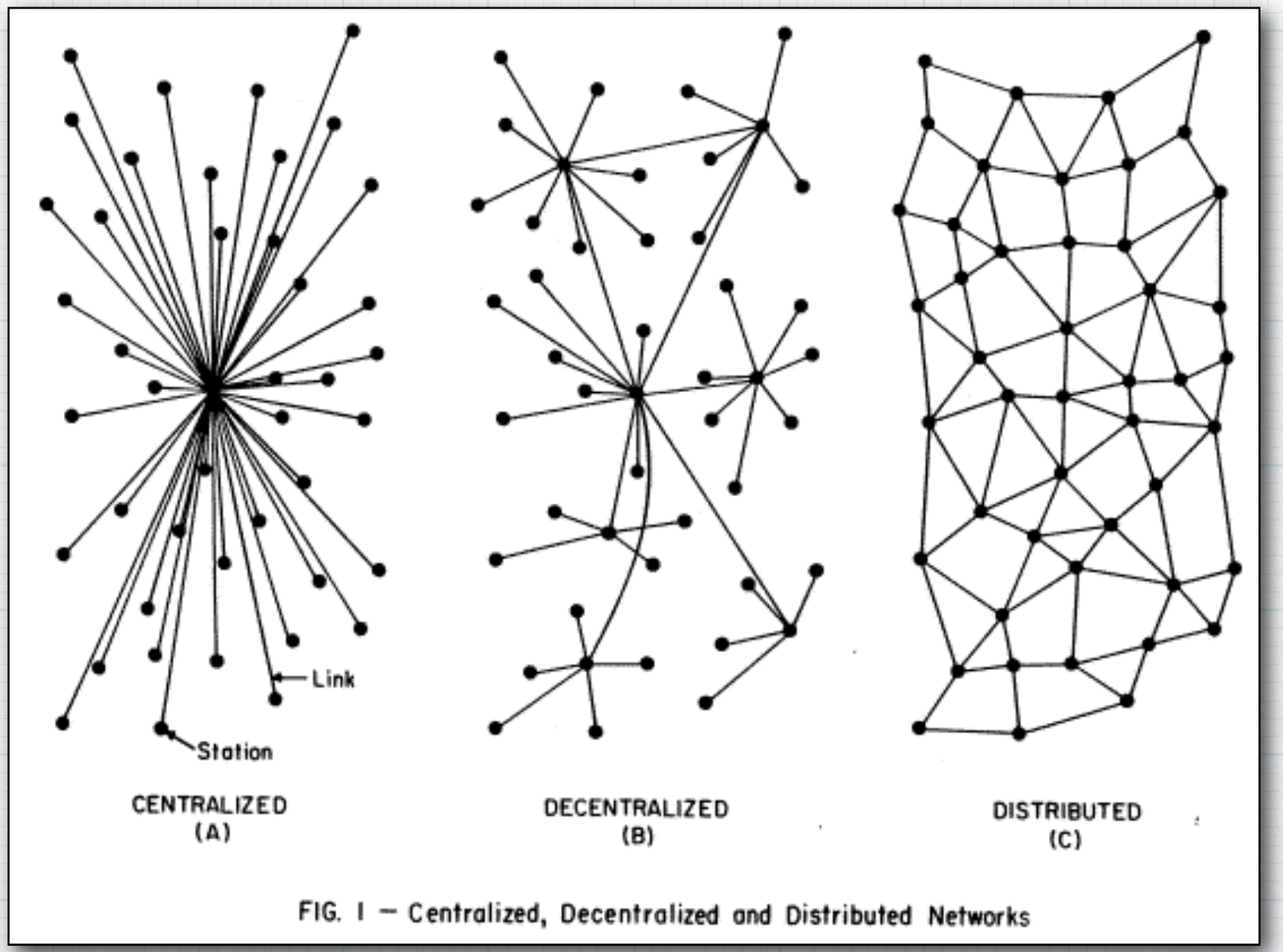
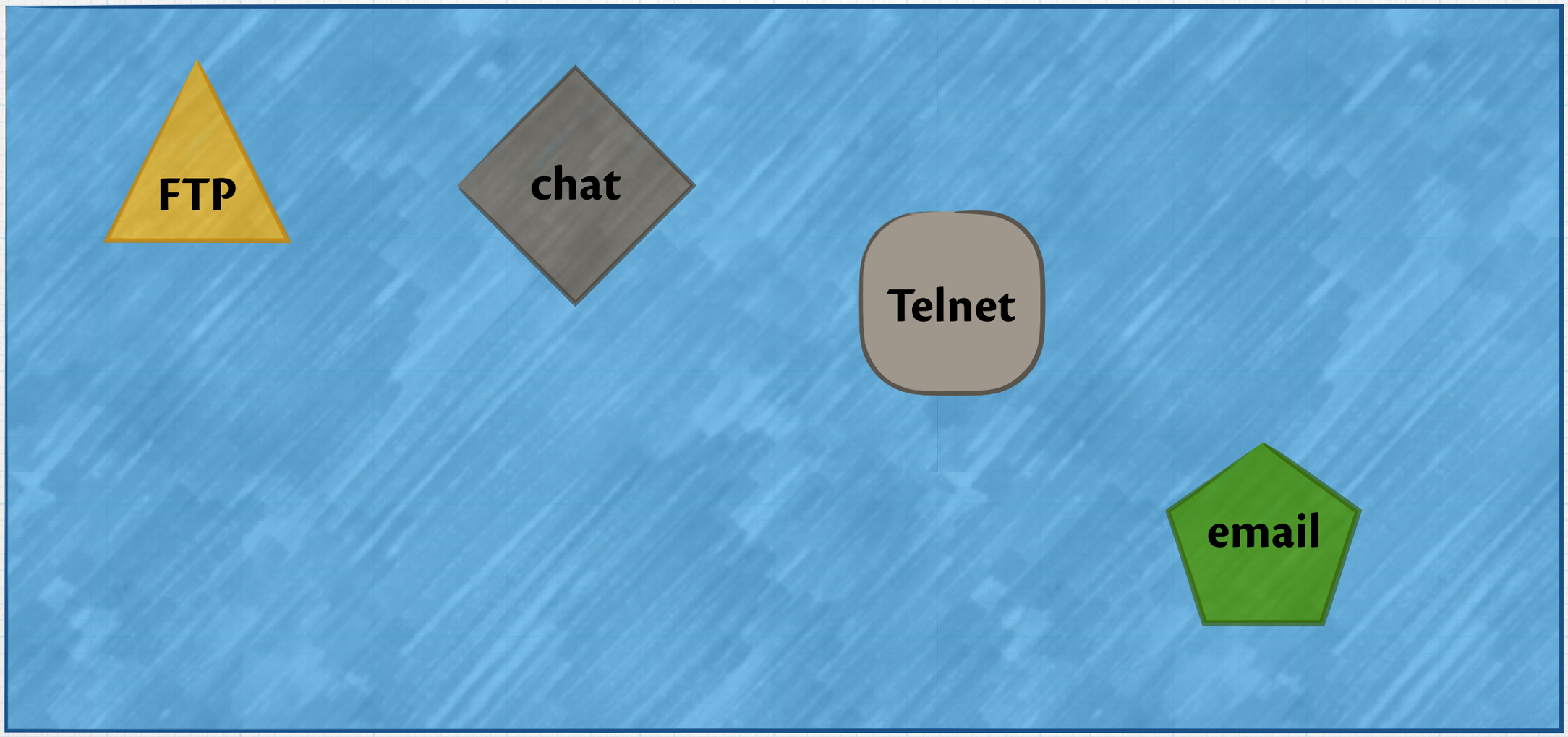


FIG. 1 — Centralized, Decentralized and Distributed Networks

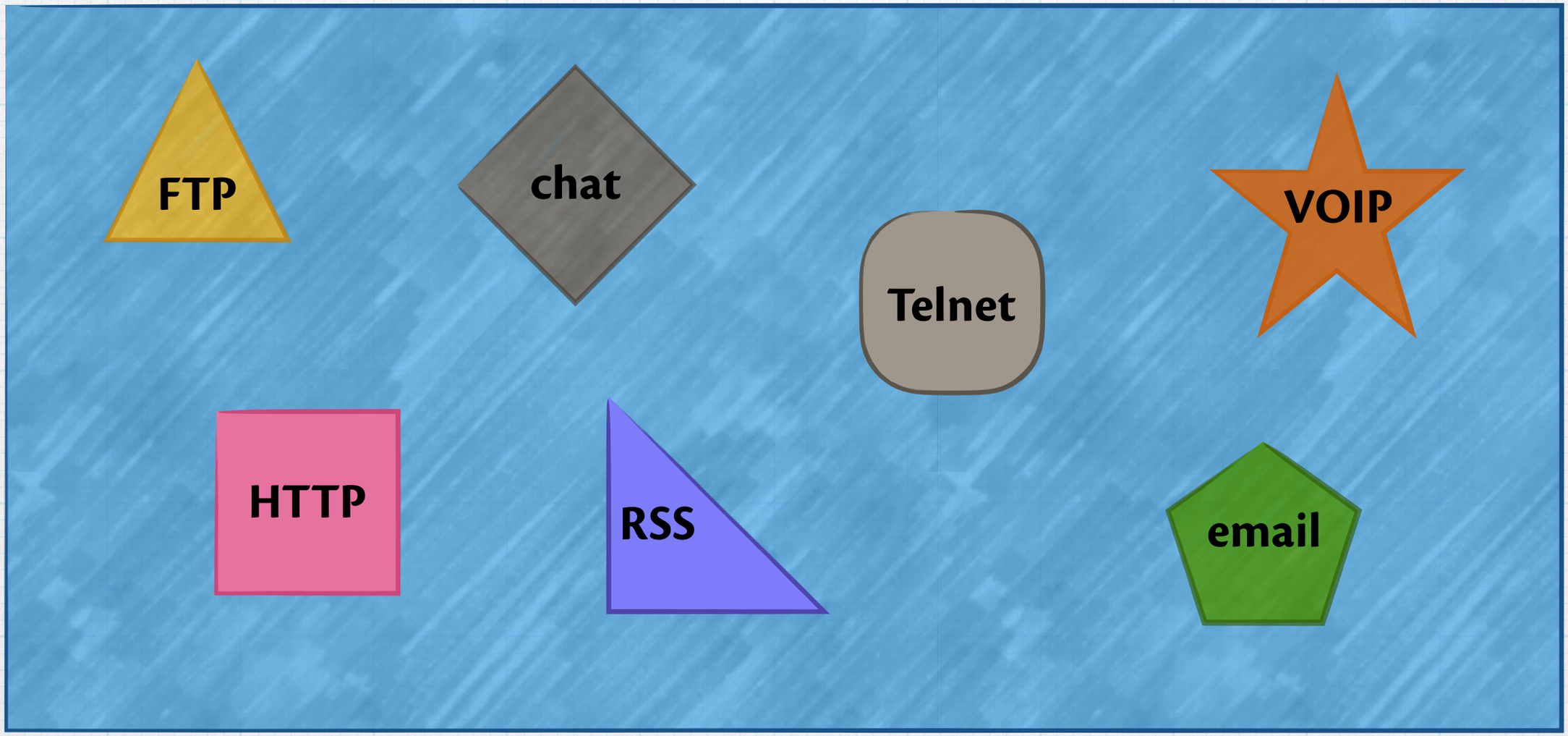
In the 1960s, during the Cold War with the Soviet Union, the U.S. began to fund a large communications network. This is a 1964 drawing by engineer Paul Baran demonstrating why he felt the new network should be *distributed*. A distributed network was safer, more robust.

ARPANET



The Advanced Research Projects Agency Network—called ARPAnet—launched in 1969 as an academic project funded by the U.S. Department of Defense. It had a minimal set of necessary *protocols* (languages that computers use to speak to one another) like Telnet for logging in to other computers remotely and File Transport Protocol for moving files. Email was added in 1971.

INTERNET



By 1980, as more regional networks merged into the network, it was renamed the Internet. Over time, more protocols have been added to create the Internet we know today, including the creation of the World Wide Web and its HyperText Transport Protocol in 1991. We will continue to add new protocols over time.

WEB DEVELOPMENT PROTOCOLS

The *server* is a computer that is connected to the Internet and is up and running 24/7. It waits for input requests and then sends out—or *serves*—requested files to the customers.

WEB DEVELOPMENT PROTOCOLS

FTP

TELNET / SSH

As the developer, our job is to create those files and upload them to the server. To upload/download files, we can use a File Transport Protocol *client* (or application) like Filezilla or Cyberduck.

We can also log on to the server with a Telnet client (or its newer, more secure cousin, a *secure shell* client: ssh) like PuTTY for Windows, or ssh, which is built-in to Mac OS. Servers typically run a version of Linux, which means that Telnet/ssh is how we can do Unix-like command line work.

WEB DEVELOPMENT PROTOCOLS

FTP

TELNET / SSH

HTTP

Customers visit our site using an HTTP client, which we typically call a *web browser*. They can see our files ("view source") but they cannot change our files.

The HTTPS protocol encrypts data ("s" means "secure"), which HTTP doesn't do.

World Wide Web Consortium

The World Wide Web Consortium (W3C) is the main international standards organization for the World Wide Web. It was founded in 1994 by Tim Berners-Lee in order to promote standards and to recommend new development ideas for the Web. The W3C is comprised of 443 members who develop and recommend standards for the WWW. It has no punitive power, so it is really an advisory board.

The W3C Schools website has outstanding tutorials on a huge number of web-related technologies, even things that the W3C has no control over (scripting languages, SQL databases, etc.). It should be your first stop for learning: https://www.w3schools.com/

The HTML and CSS validators are indispensable:

- Markup Validation (HTML, XML, etc.): https://validator.w3.org/
- CSS Validation: https://jigsaw.w3.org/css-validator/