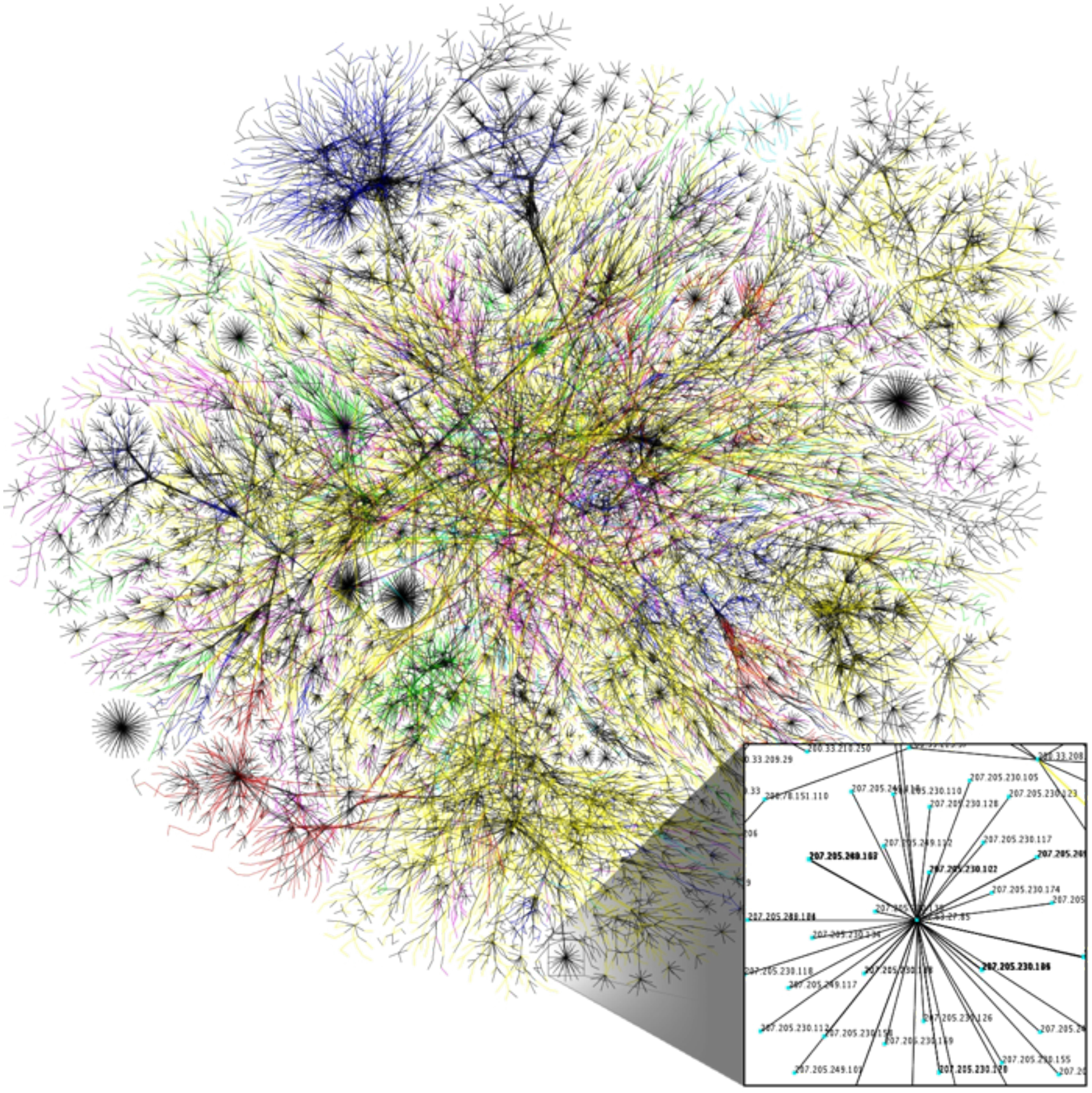
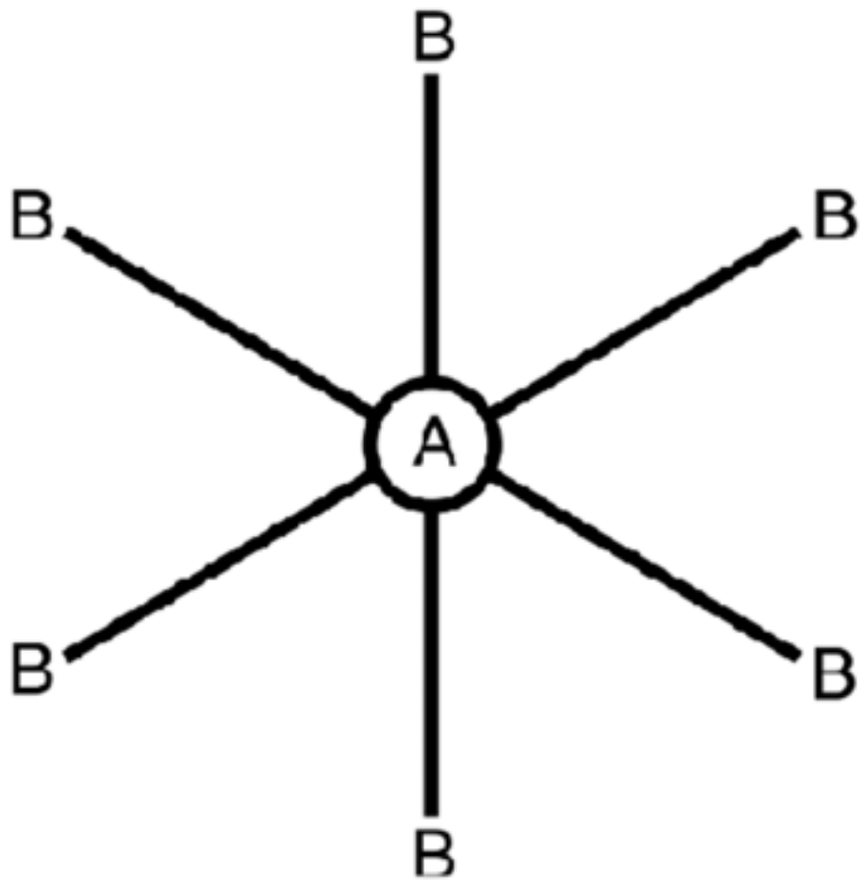
Internet


207.205.230.105
207.205.230.128
207.205.230.117
207.205.230.102
207.205.230.174
207.205.230.186
207.205.230.126
207.205.230.155

“While many have debated the origins of the Internet, it’s clear that in many ways it was built to withstand nuclear attack. The Net was designed as a solution to the vulnerability of the military’s centralized system of command and control during the late 1950’s and beyond. For, the argument goes, if there are no central command centers, then there can be no central targets and overall damage is reduced.”

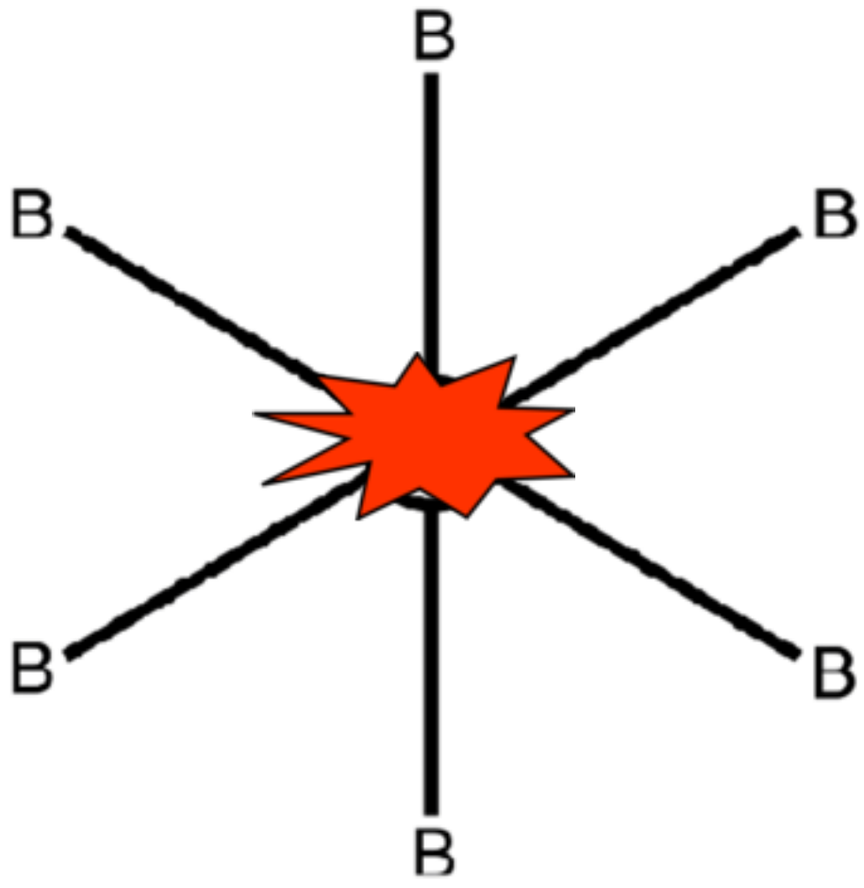
Alexander Galloway, *Protocol*

DARPA: Defense Advanced Research Projects Agency

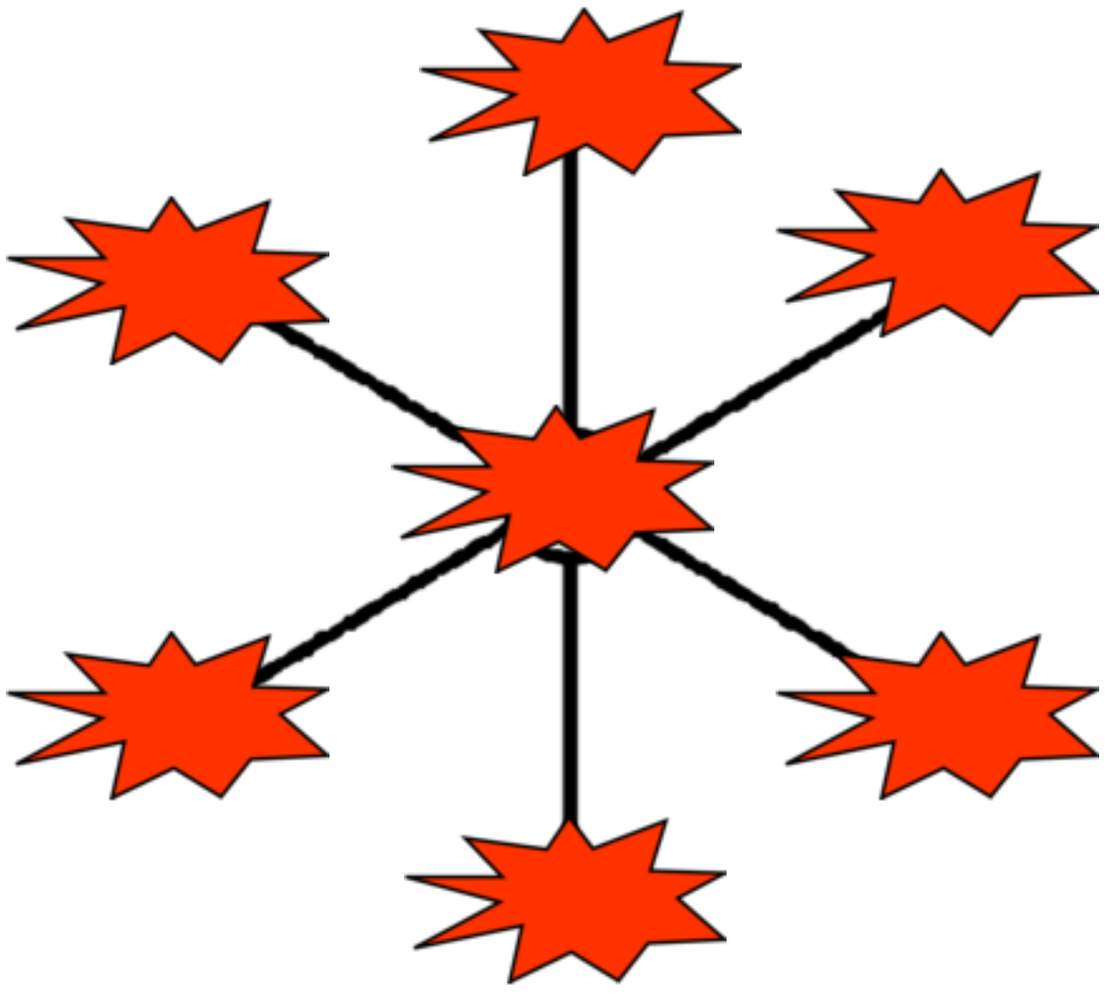


A = hub
B = node

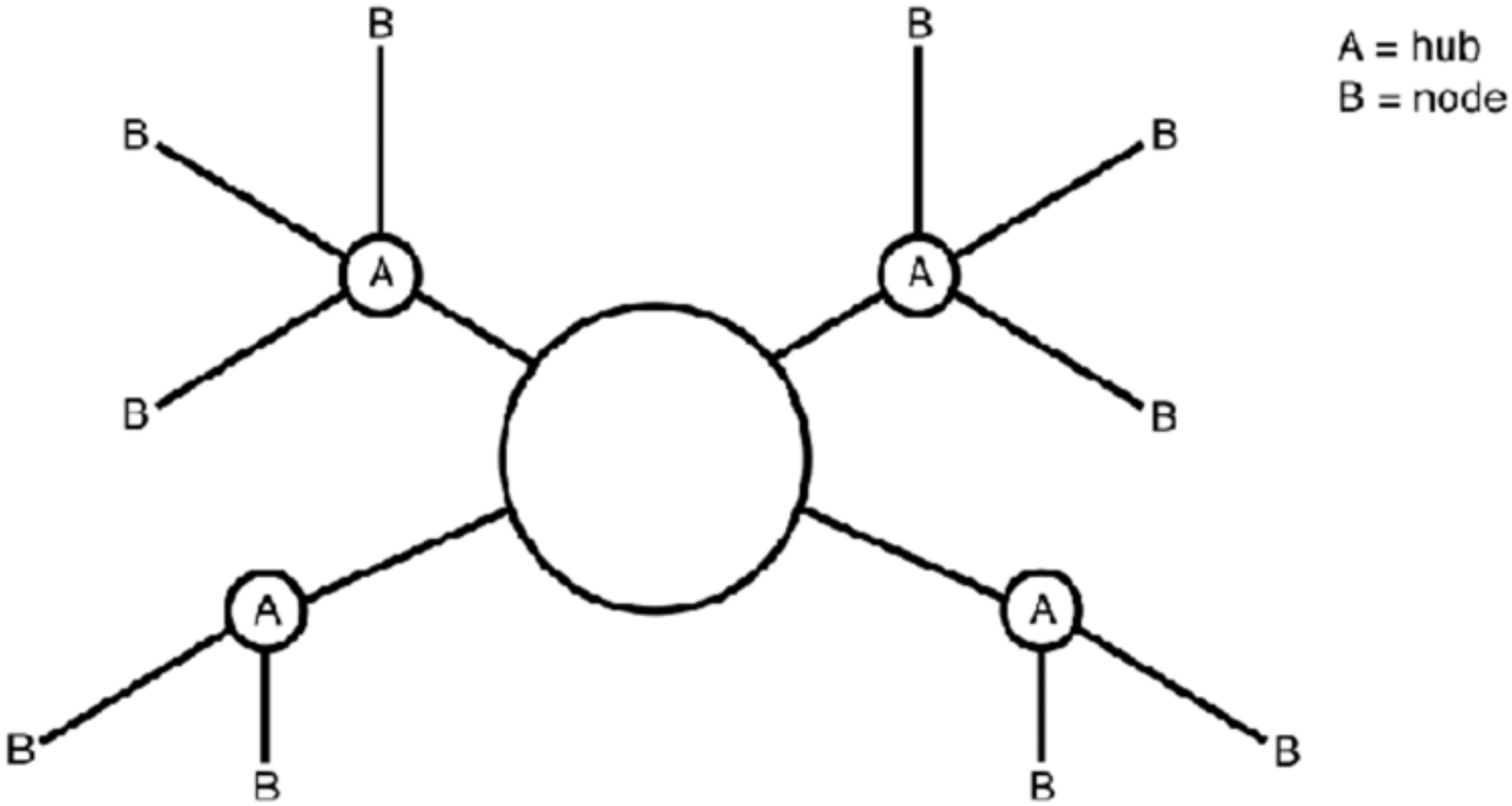
Centralized network



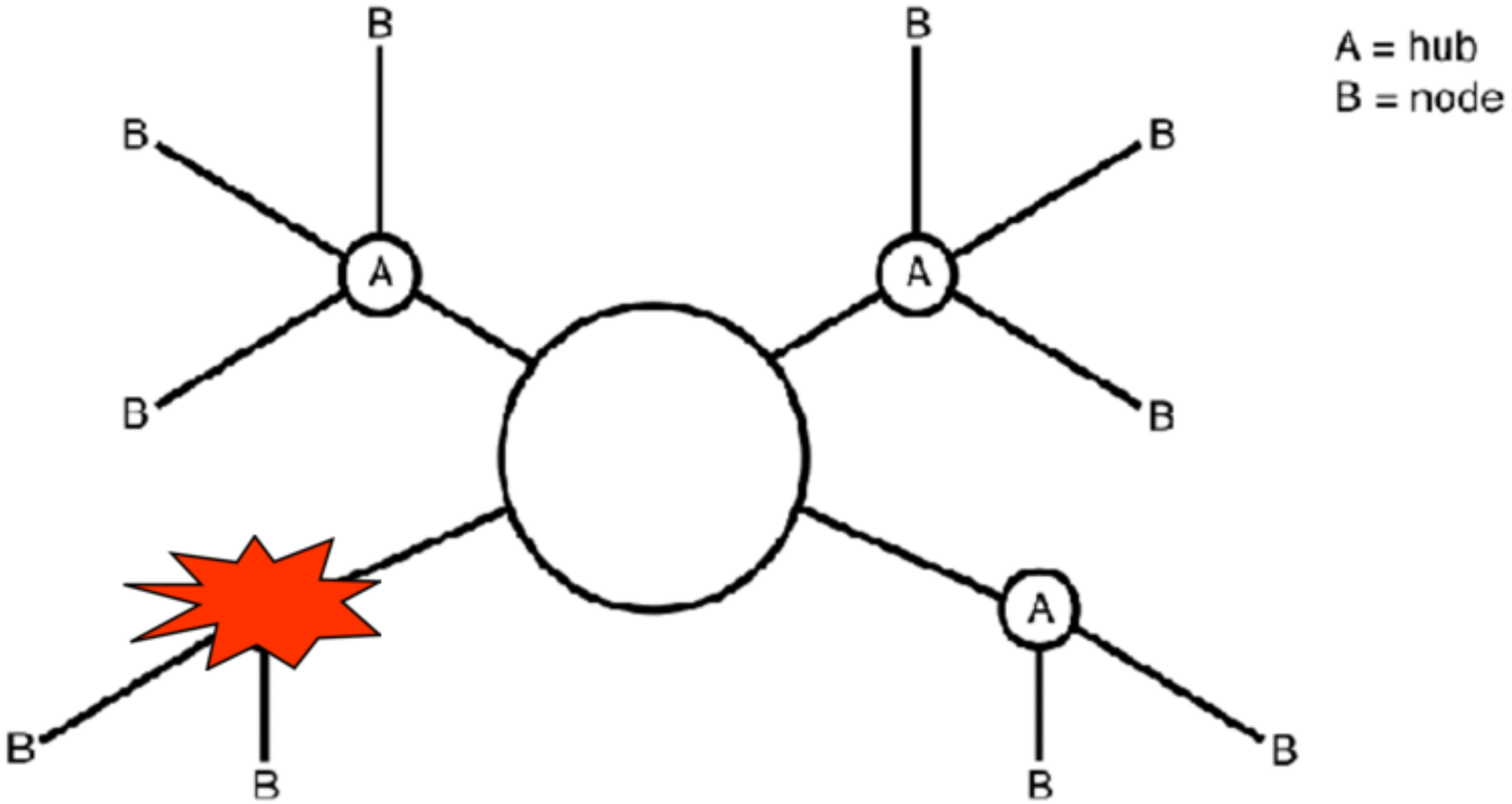
Centralized network



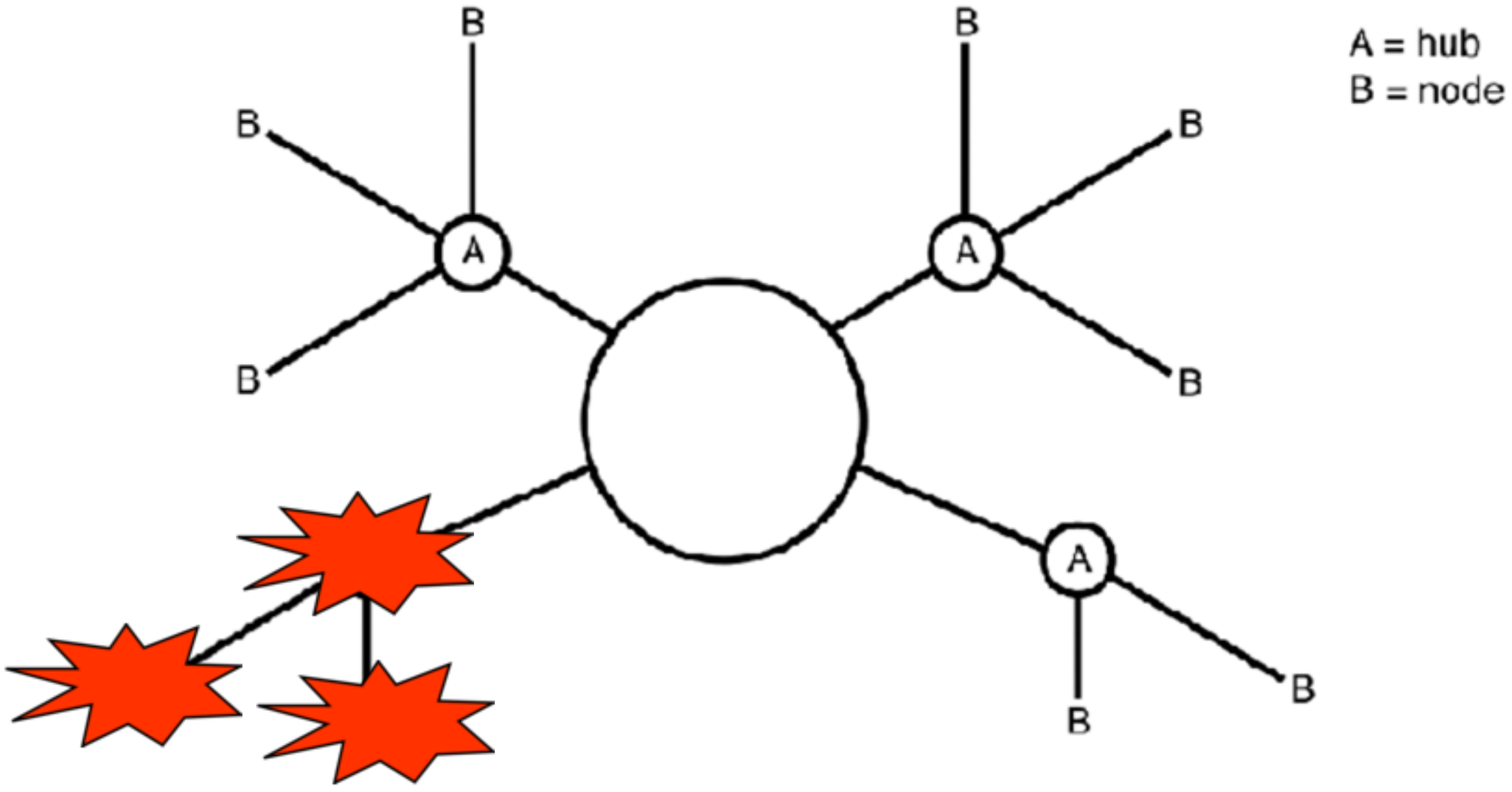
Centralized network



Decentralized network

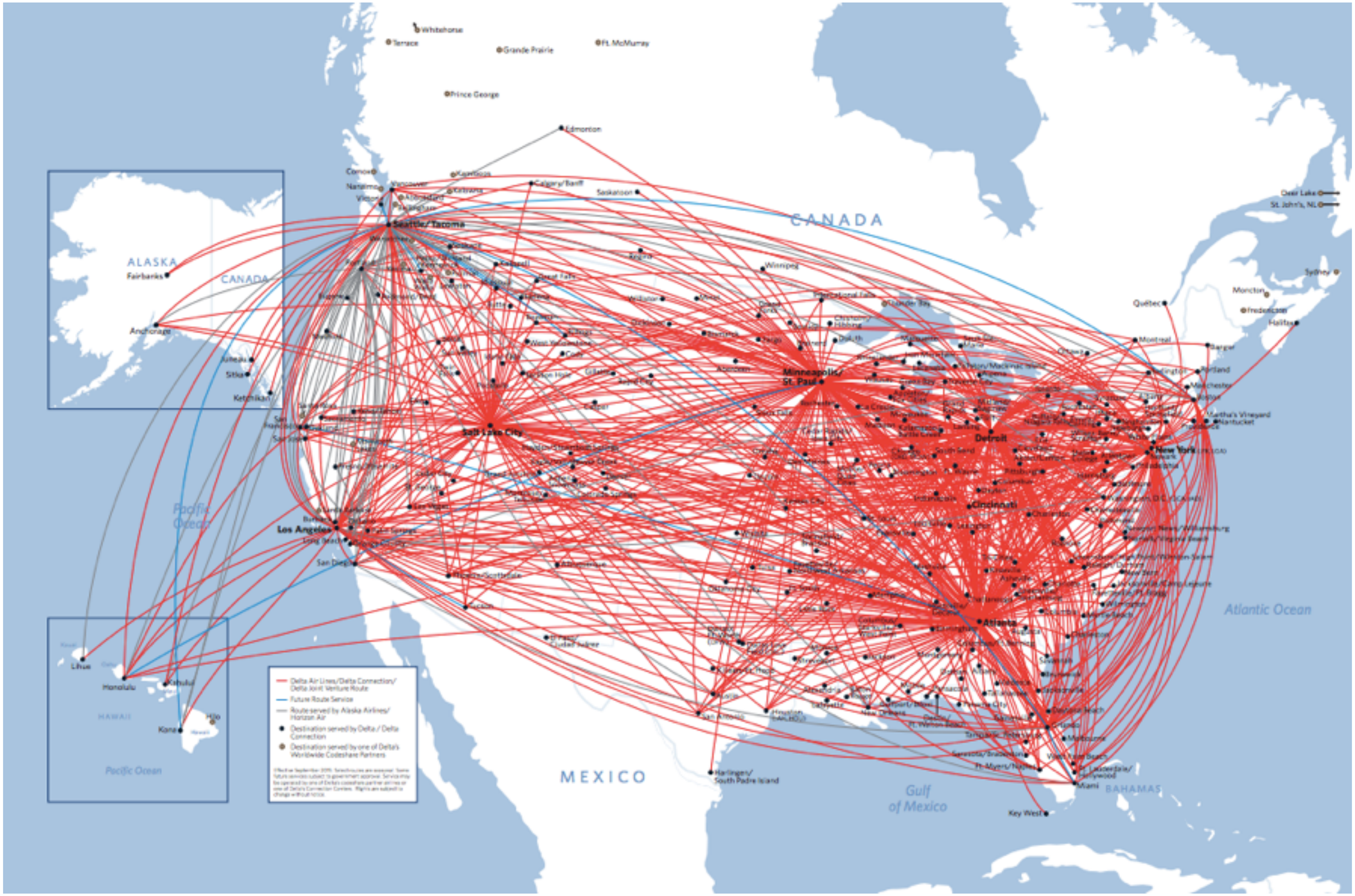


Decentralized network



Decentralized network

Seattle
Minneapolis/St. Paul
Milwaukee
Detroit
Boston
Hartford/Springfield
New York (JFK, LGA)
Salt Lake City
Columbus
Pittsburgh
Baltimore
Washington DC (IAD)
Los Angeles
San Diego
Nashville
Memphis
Atlanta
Raleigh/Durham
Bermuda
Hermosillo
Ciudad Juarez
New Orleans
Orlando
Tampa
Fort Lauderdale
Marsh Harbour
North Eleuthera
Nassau
Los Cabos
Monterrey
Cancun
Cozumel
Puerto Vallarta
Guadalajara
Mexico City
Mérida
Belize City
Huatulco
San Pedro Sula
Tegucigalpa
San Salvador
Managua
Liberia
San José
Panama City
Cartagena
Medellin
Bogotá
Quito
Lima
Santiago
Buenos Aires
Montevideo
Porto Alegre
Florianópolis
Navegantes
Curitiba
São Paulo (GRU)
São Paulo (CGH)
Rio de Janeiro
Rio de Janeiro (SDU)
Vitória
Belo Horizonte
Uberlandia
Goiânia
Brasília
Cuiabá
Campo Grande
Londrina
Asunción
Iguazú Falls
Manaus
Belém
Teresina
Fortaleza
Natal
Recife
Maceió
Aracaju
Salvador
Aruba
Bonaire
Caracas
Grenada
Barbados
St. Lucia
St. Kitts
Antigua
St. Maarten
St. Thomas
St. Croix
Santo Domingo
Kingston
Montego Bay
Port-au-Prince
Santiago
Punta Cana
San Juan
Santo Domingo
Grand Cayman
Turks and Caicos
Exuma
Marsh Harbour
Freeport/Grand Bahama
Nassau
North Eleuthera
CARIBBEAN
Grand Cayman
Montego Bay
Kingston
Santiago
Port-au-Prince
Punta Cana
Santo Domingo
San Juan
St. Thomas
St. Maarten
St. Kitts
Antigua
St. Lucia
Barbados
Grenada
Aruba
Bonaire
Delta Air Lines/Delta Joint Venture Route
Future Route Service
Alaska Airlines/Horizon Air Route
Destination served by Delta/Delta Connection
Destination served by one of Delta's Worldwide Codeshare Partners
Effective September 2015. Select routes are seasonal. Some future services subject to government approval. Service may be operated by one of Delta's codeshare partner airlines or one of Delta's Connection Carriers. Flights are subject to change without notice.



Real example of decentralized network: air travel routes

The ARPANET (an internet precursor) over time

Protocol

way in which information is passed from one computer to another

Email
HTTP — hypertext transfer protocol
FTP — file transfer protocol
IP — internet protocol

Tools

Dreamweaver

(Imagination)

(Sketching tool)

InDesign
(Digital sketching tool)

Sublime Text
(Code editor)

Github
(Code repository)

Google Chrome
(Browser for testing)