**Internet** A global system of interconnected computer networks linking billions of computing devices throughout the world; hosts: end systems running network applications, communication links: the media by which data travel (twisted pair copper wire/fiber optic cable); routers and switches: switching devices that end systems are connected to for forwarding data from one host to another; A network of networks, a communication infrastructure; **Network Protocol** defines format, order of messages sent and received between network entities & actions taken upon message transmission/receipt **Layer** a collection of conceptual similar functions that provide services to the layer above it and receives services from the layer below it; Application (supporting network applications), Transport (process-to-process data transfer), Network (data routing from source host to destination host), Link (data transfer between neighboring network devices), Physical (bit transfer on the transmission medium); At each layer, the data packet can be divided into header and data/payload; Encapsulation: the data packet from the upper layer is encapsulated in data part of a packet in this layer, and header is added over the data for control information; Decapsulation: remove header of this layer & extract data part for passing to the upper layer; **Components of the Internet** Network edge: servers & clients; Access networks: links connecting hosts to edge routers/switches; Residential access networks, Institutional access networks (school/company), Mobile access networks (Wi-Fi, 4G/5G);