UNIT 5-PLATFORMS FOR IOT DEVELOPMENT

DEVICES CREATION AND DATA TRANSMISSION;

- DATA TRANSMISSION IS SENDING AND RECEIVING DIGITAL OR ANALOG DATA BETWEEN DEVICES. THIS CAN BE ACHIEVED THROUGH DIFFERENT MEDIUMS, SUCH AS CABLES, OPTICAL FIBERS, OR WIRELESS SIGNALS. IN OUR DAILY LIVES, DATA TRANSMISSION IS ESSENTIAL, WHETHER SENDING AND RECEIVING EMAILS, ANSWERING PHONE CALLS, OR WATCHING OUR FAVORITE TV SHOWS. WHILE IN BUSINESS, VIDEO CONFERENCING, SENDING INQUIRIES TO E-COMMERCE SITES, AND STREAMING SERVICES ENABLE GLOBAL ENGAGEMENT FROM ONE DEVICE TO ANOTHER.

- HOWEVER, SLOW LOADING TIMES ON WEBSITES OR APPLICATIONS MAY OCCUR DUE TO DATA TRANSMISSION ISSUES SUCH AS BANDWIDTH, LATENCY, HARDWARE COMPATIBILITY, AND SO MUCH MORE. THESE COMMON FACTORS CAN SIGNIFICANTLY IMPACT BOTH BUSINESS OPERATIONS AND USER EXPERIENCE. THIS IS WHERE THE CONTENT DELIVERY NETWORKS (CDNS) PLAY SUCH A VITAL ROLE IN DATA TRANSMISSION.

- WITH THIS GUIDE, WE WILL WALK YOU THROUGH EVERY ASPECT OF THE TOPIC, EXPLORING THE INTRICACIES OF DATA TRANSMISSION AND HOW CONTENT DELIVERY NETWORKS (CDNS) TACKLE THESE ISSUES. ADDITIONALLY, YOU WILL GAIN INSIGHT INTO HOW DATA TRANSMISSION WORKS, THE IMPORTANCE OF HIGH-SPEED DATA TRANSFER, AND HOW YOU CAN UTILIZE CDN ON YOUR WEBSITE.

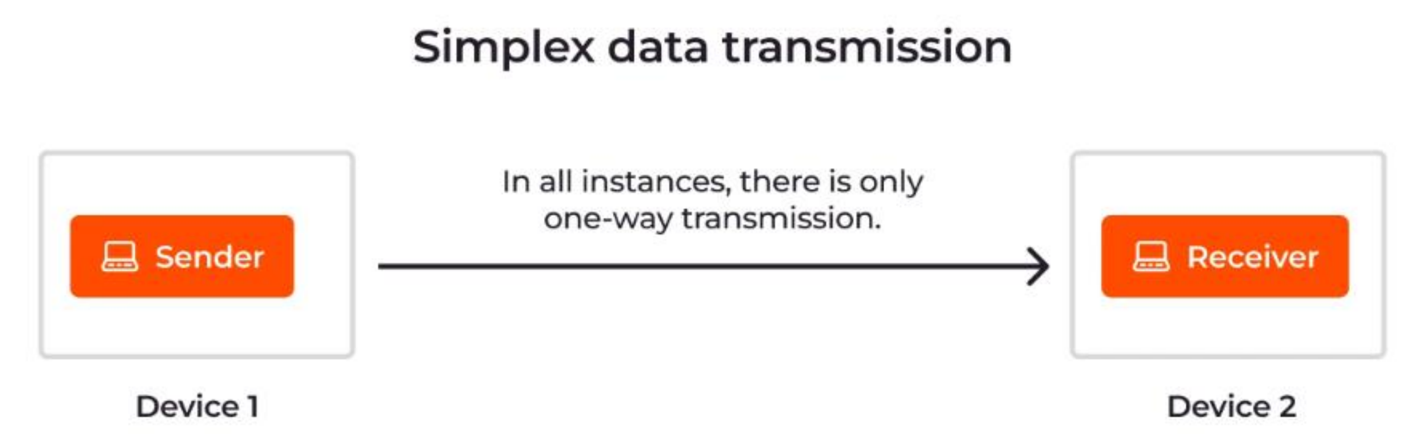
DATA TRANSMISSION WORK

- DATA TRANSMISSION INVOLVES AT LEAST TWO OR MORE DIGITAL DEVICES COMMUNICATING OVER A NETWORK, AND REQUIRES A FEW KEY COMPONENTS:
- **SENDER.** THE DEVICE THAT STARTS THE TRANSMISSION OF DATA.
- **RECEIVER.** THE DEVICE THAT RECEIVES THE DATA SENT BY THE SENDER.
- **MESSAGE OR DATA.** THIS IS THE INFORMATION TRANSMITTED FROM ONE DEVICE TO ANOTHER, INCLUDING TEXT, IMAGES, AUDIO, VIDEO, OR ANY OTHER FORM OF CONTENT.
- **MEDIUM.** THE PHYSICAL PATH OR CHANNEL THROUGH WHICH DATA IS TRANSMITTED, SUCH AS AN OPTICAL CABLE OR WIRELESS TRANSMISSION.
- **PROTOCOL.** A SET OF RULES GOVERNING THE FORMAT, TIMING, AND SEQUENCING OF DATA TRANSMISSION.

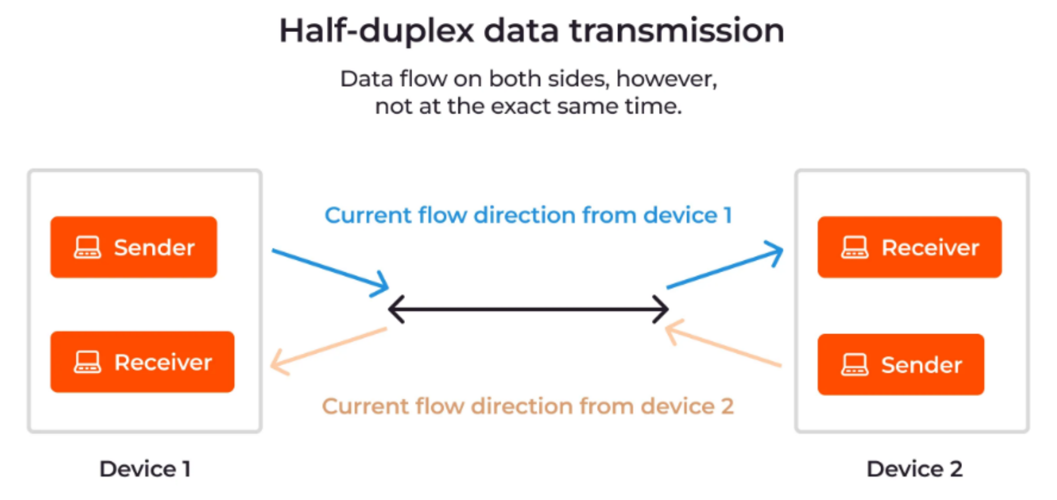
- **DIFFERENT FACTORS IN DATA TRANSMISSION BASED UPON?**

1. **THE DIRECTION OF INFORMATION.** THIS INDICATES HOW THE FLOW OF INFORMATION IS TRANSMITTED. THERE ARE THREE MAIN CATEGORIES—SIMPLEX, HALF-DUPLEX, AND FULL-DUPLEX—WHICH WE'LL EXPLORE FURTHER IN THE NEXT SECTION.
2. **THE LEVEL OF SYNCHRONIZATION.** THIS REFERS TO THE DEGREE OF SYNCING BETWEEN THE SENDER AND THE RECEIVER. DATA TRANSMISSION MODES CAN BE CATEGORIZED AS EITHER SYNCHRONOUS OR ASYNCHRONOUS.
3. **THE NUMBER OF BITS SENT.** THIS NUMBER PERTAINS TO THE BITS TRANSMITTED CONCURRENTLY THROUGHOUT THE NETWORK. THIS CATEGORIZATION INCLUDES TWO MAIN TYPES—SERIAL AND PARALLEL.

- **TYPES OF DATA TRANSMISSION**
- **SIMPLEX TRANSMISSION.** IT’S A MODE OF COMMUNICATION WHERE THE DATA CAN ONLY FLOW IN ONE DIRECTION, MEANING IT’S UNIDIRECTIONAL. IN THIS MODE, THE SENDER CAN SEND DATA, BUT THEY CAN’T RECEIVE IT. SIMILARLY, THE RECEIVER CAN ONLY RECEIVE DATA AND NOT SEND IT BACK. SO, IT’S A BIT LIKE A ONE-WAY STREET, WHERE DATA FLOW CAN ONLY GO IN ONE DIRECTION.



- **HALF-DUPLEX TRANSMISSION.** ANOTHER TYPE OF DATA TRANSMISSION MODE IS KNOWN AS HALF-DUPLEX, WHICH ALLOWS DATA TO FLOW IN BOTH DIRECTIONS, BUT ONLY ONE DIRECTION AT A TIME. UNLIKE SIMPLEX MODE, WHICH ONLY ALLOWS DATA TO BE TRANSMITTED IN ONE DIRECTION, HALF-DUPLEX ALLOWS EACH STATION TO TRANSMIT AND RECEIVE DATA. HOWEVER, EACH STATION CAN ONLY SEND OR RECEIVE DATA AT A GIVEN TIME, MEANING THAT WHEN ONE DEVICE SENDS DATA, THE OTHER CAN ONLY RECEIVE IT, AND VICE VERSA. IT'S SIMILAR TO A TWO-LANE HIGHWAY WHERE ONLY ONE DIRECTION OF TRAFFIC CAN GO AT ONCE.



- **FULL-DUPLEX TRANSMISSION.** IN FULL-DUPLEX DATA TRANSMISSION, INFORMATION CAN FLOW IN BOTH DIRECTIONS SIMULTANEOUSLY, ALLOWING FOR TWO-WAY COMMUNICATION. UNLIKE HALF-DUPLEX, WHICH ONLY ALLOWS ONE DIRECTION OF DATA FLOW AT A TIME, FULL-DUPLEX ENABLES BOTH STATIONS TO TRANSMIT AND RECEIVE DATA CONCURRENTLY, MAKING IT BIDIRECTIONAL.