



# Computer Network

WEEK I

INTRODUCTION



Why ?



- A computer network is an interconnected collection of autonomous computers
- For computers to communicate with each other, they must “speak the same language”
- To reduce the complexity of these “languages”, they are broken into a series of **layers**
- Each layer provides a particular service to its higher layers and shields the higher layers from the details of how these services are implemented
- The number of layers, their functionality, the service they provide and the name of each layer differ from network to network



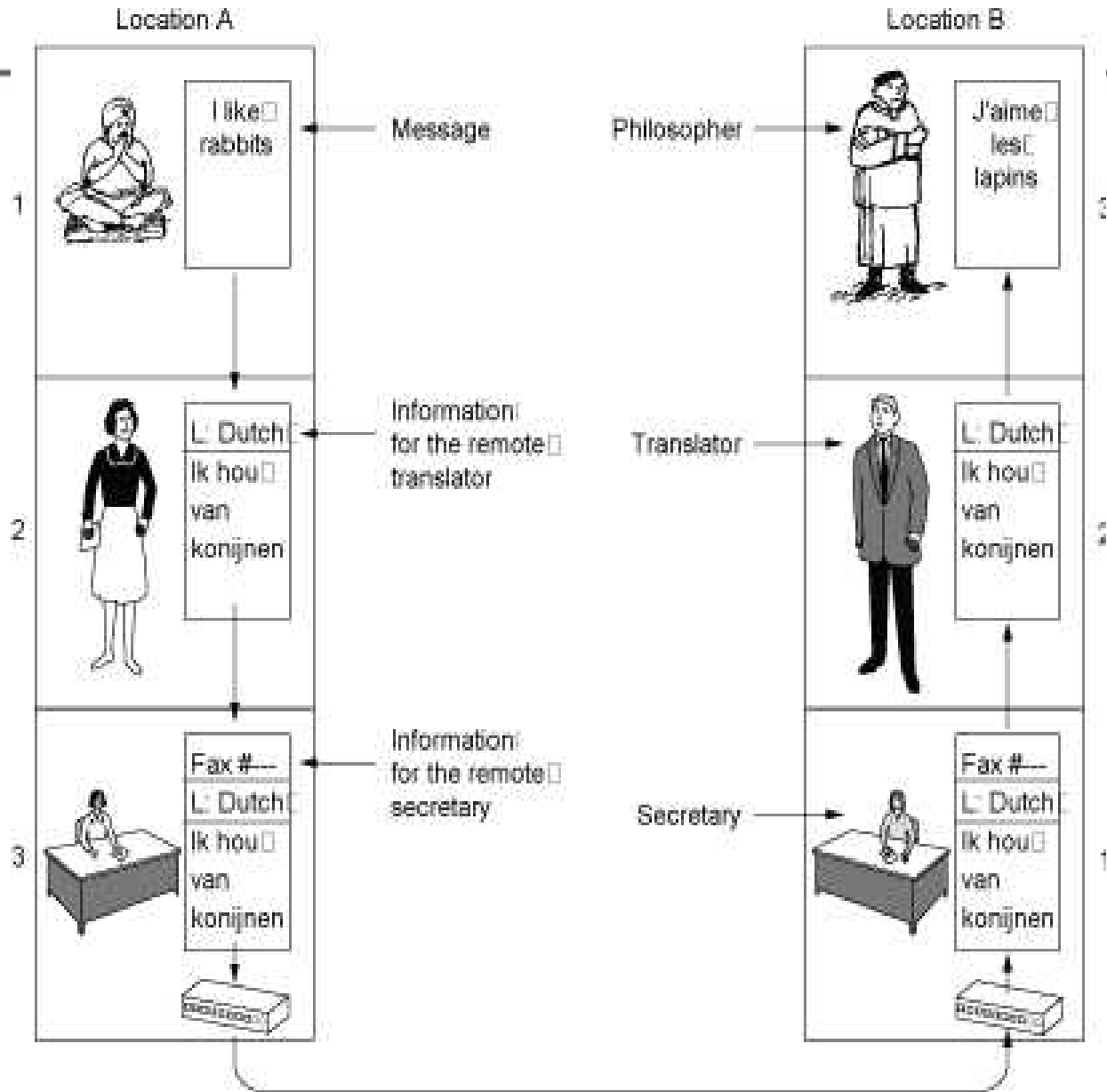
- Each layer is designed as if it communicates directly with the same layer on a different computer (**called peer processes**)
- The rules of how two peer layers talk to each other is called a **protocol**.
- Different peer layers will use different protocols
- Data is passed from one layer to the layer below until it reaches the bottom layer where the physical communication takes place.
- After receiving data from the network, the data passes up the corresponding layers of the computer



---

## • Analogy - 2 Philosophers example

- One English speaking philosopher wishes to send a message to a colleague in France (Peers in layer 3)
- Since they have no common language, they both hire a translator. The translators (Peers in layer 2) decide which language they will translate to.
- The translators send their message to their secretary (Peers in Layer 1) who may decide to send the message by fax, or email or telephone (Layer 1 protocol)
- Note that logically each layer communicates with its peer. In practice, each layer communicates with the layers below them





- Message is passed from layer 3 down through layers 2 and 1 before transmission
- At the opposite side, the message travels up through layer 1 and 2 before arriving at layer 3
- Layer 3 does not care how the message is transformed or how it is transmitted by the lower layers
- Layer 2 is only concerned with transforming the message (i.e. translation) and does not concern itself with how the message is transmitted
- Layer 1 is only concerned with transmitting the message and does not concern itself with the contents of the message



# Protocol Standard

|   | OSI Layers   | TCP/IP Layers          |   |
|---|--------------|------------------------|---|
| 7 | Application  | Application            | TCP/IP's application layer corresponds to OSI's application, presentation, and session layers |
| 6 | Presentation |                        |   |
| 5 | Session      |                        |   |
| 4 | Transport    | Host-to-Host Transport | TCP/IP's host-to-host transport layer corresponds to OSI's transport layer                    |
| 3 | Network      | Internet               | TCP/IP's Internet layer corresponds to OSI's network layer                                    |
| 2 | Data Link    | Network Interface      | TCP/IP's network interface layer corresponds to OSI's data link and physical layers           |
| 1 | Physical     |                        |   |



# Materi

- Week 1 : Introduction
- Week 2 : Physical Layer
- Week 3 : Cabelling
- Week 4 : Network Hardware
- Week 5 : Network Software
- Week 6 : Application Layer
- Week 7 : Review and Presentation

## **UTS**

- Week 8 – 9: Data link Layer
- Week 10 – 11: Network and Transport Layer
- Week 12 : Internetworking
- Week 13 : Network and System Management
- Week 14 : Security and Backup System

## **UAS**



# Penilaian

|                      |     |
|----------------------|-----|
| UTS : Tugas Mingguan | 40% |
| Ujian                | 60% |
| UAS : Tugas Mingguan | 40% |
| Ujian                | 60% |