

Extended household analogy

Kids writing letters to their friends

- Layers
- Data units
- Layer encapsulation
- Addressing in layers
- Protocols
- Responsibilities of layers
- Intermediate devices

Application layer

- Ahmet writes a **letter** to another kid, Mehmet (**Data unit**)



Ahmet

Dear Santay,
we had to leave our house. Dad was mad. We had to
do all the chores. Dad got everything he wanted. →
Mom said it was time to leave and she would
take us to a safer place where we don't have to
be scared.
I'm still nervous. I don't want to talk to the other
kids. Are you going to come this Christmas? We don't have
any of our stuff here. Can you bring some chapter books,
a dictionary, and a compass and a watch? I also want a
very very Very good dad. Can you do that too?
Love,
Blake.



Mehmet

Application layer

- Puts his letter into **envelope** ([encapsulation](#))



- Writes «To **Mehmet**, from your friend **Ahmet**» on top of the envelope ([address](#))
- Delivers the envelope to his parent

Application layer

- Starts with a greeting, uses kind expressions, ends with «kestane kebab acele cevap» ([protocol](#))
- Mentions recent advances in his life, his school etc.. ([layer responsibilities](#))
- Directly targets his friend (no [intermediate device](#))

Transport layer

In fact there are many kids, communicating with many kids in the other house

Parent puts all envelopes in a **package letterbox** (**data unit, encapsulation**)



Transport layer

- Parent writes the home postal address (sender) and destination postal address (receiver) on top of the package letterbox: Postal address and kids' names together determine the complete communication instance between each kid pair ([address](#))
- Parent keeps track of answer. If no answer arrives within 1 month, sends the letter package again, keeping their photocopies ([protocol](#))
- When an answer arrives, parent distributes the letters to the corresponding kids ([layer responsibilities](#))
- There are no intermediate parents in-between who perform similar tasks, other than the parents at the destination (no [intermediate devices](#))

Network layer

- Postal service collects the package from the postbox, puts it in a **carton box** (**data unit, encapsulation**) which is targeted to the same **district/city** with other letter packages (**address**)



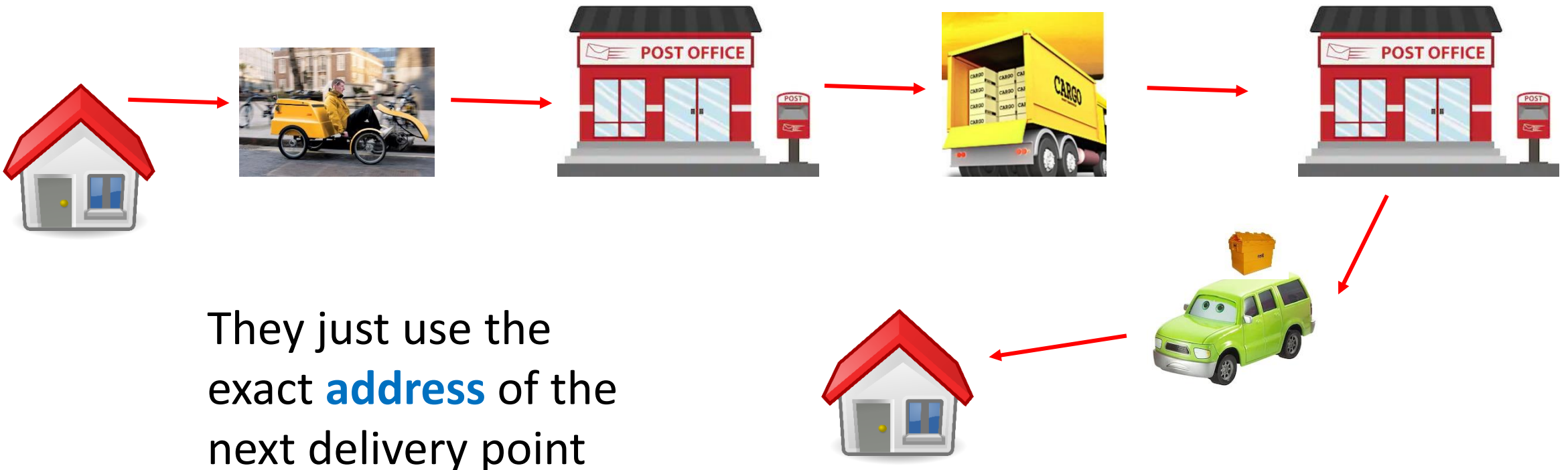
- Box may need to pass through other post offices in between (**Intermediate devices**)

Network layer

- Postal service has the responsibility to deliver the package to the destination. Sometimes packets may get lost, incorrectly delivered or broken though ([layer responsibilities](#))
- Determines the best path for the delivery. Forwards to the next post office in between ([protocol](#))

Data link layer

- Courier services carry the boxes in various **vehicles** (data unit, encapsulation) from home to post office, post office to post office, post office to home; using several kinds of transportation



Data link layer

- There may be different post offices, postal collection centers, kinds of transportation, houses etc... (**intermediate devices**)
- **Responsible** for building to building delivery of boxes
- If there are other courier vehicles on the same road, determines who will use the road first (**protocol**)
- In case of an accident, sends another vehicle to continue the delivery

Physical layer

- Carries the boxes between vehicles, buildings etc... using **hands, handcarts, trolleys, parachutes** etc... (**data unit, encapsulation**)



Address: Location of the vehicle, location of storage area in the post office, location of postbox etc... (**intermediate devices**)

Physical layer

- **Responsible** for carefully carrying the boxes from a point to another point
- Should obey work safety regulations (**protocol**)

Image resources

- <http://pluspng.com/carrying-box-png-9357.html>
- <https://www.vectorstock.com/royalty-free-vector/cartoon-delivery-man-carrying-cardboard-box-vector-19507912>
- <https://www.vectorstock.com/royalty-free-vector/red-street-postbox-vector-8655530>
- <https://www.bitmezat.com/urun/928602/hammal>
- <https://urun.n11.com/karakter-oyuncak/cars-3-buyuk-boy-karakter-araclar-charlie-cargo-dxv90-flf91-P385408494>
- <https://groups.google.com/forum/#!topic/advocates-for-urban-agriculture/biE47bGpyRM>
- <http://cargotruckinsurance.com/>
- <https://ya-webdesign.com/image/home-transparent-file/1411570.html>
- <https://www.shutterstock.com/tr/search/post%20office%20background>
- <https://www.packaging2buy.co.uk/single-wall-boxes-155x130x95mm.html>
- <https://www.clipart.email/clipart/father-with-kids-clipart-68112.html>
- <https://clipartstation.com/parent-and-child-clipart/>
- <http://clipart-library.com/boy-clipart.html>
- <https://clipartstation.com/kid-clipart-png/>

Further reading

- A similar analogy:
- <http://som.csudh.edu/fac/lpress/471/hout/netech/postofficelayers.htm>
- (using pen & paper, reading with light and glasses etc... may be more related to presentation layer)