Web Architecture

Winter 2020

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STRAVA

Last summer and fall I trained for the Chicago Marathon. Most of my training was done using a fitness tracking app called Strava.

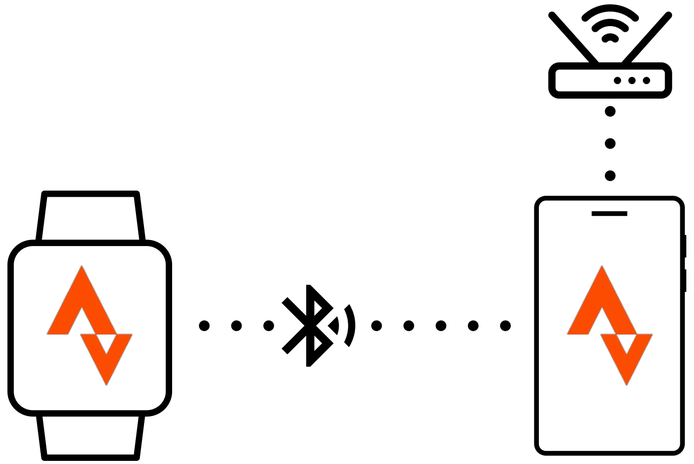
Strava works with GPS, in mobile phones or other GPS-enabled devices, to record activities that can be shared among user's followers or shared publicly. Each activity shows users' results, including route summary in map view form, elevation, pace, timing (total and moving time), and heart rate. Each activity post has "Kudos", enabling followers to like followed activity and leave comments.

In the following slides I will go through how this process is interpreted using the OSI model.

Layer 1
Physical Layer

The Apple Watch using the Strava App records the run. When the run is completed it synchs via a wireless protocol, Bluetooth, with the Strava App for iPhone. The iPhone needs to be connected to a Wireless LAN in order for this transmission of data to work.

The Physical Layer is responsible for the actual physical connection (transmission of bits) between devices.



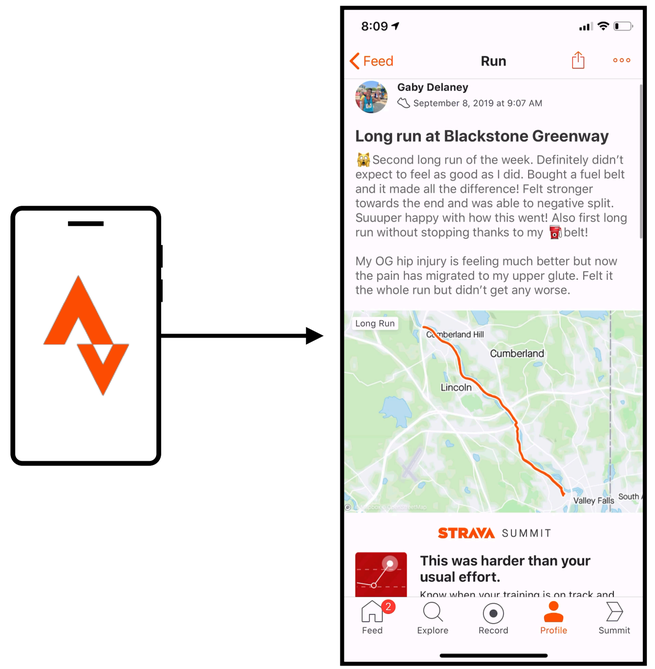
Layer 2
Data Link Layer

In the Data Link layer the data is transferred from my LAN to Strava's. Once the activity is synced, it will be uploaded into the Strava App. It will also display detailed analytics about the run and allow for the user's followers to "Like" or comment on the activity.

This is where the MAC and LLC Physical Addressing happens. This layer is divided into two sublayers

1. **Logical Link Control (LLC)**
2. **Media Access Control (MAC)**

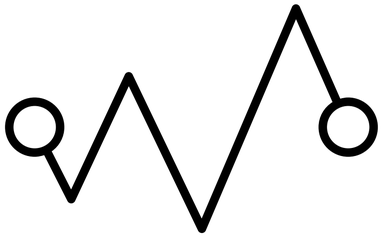
The main function of this layer is to make sure data transfer is free of issues or errors from one node to another.

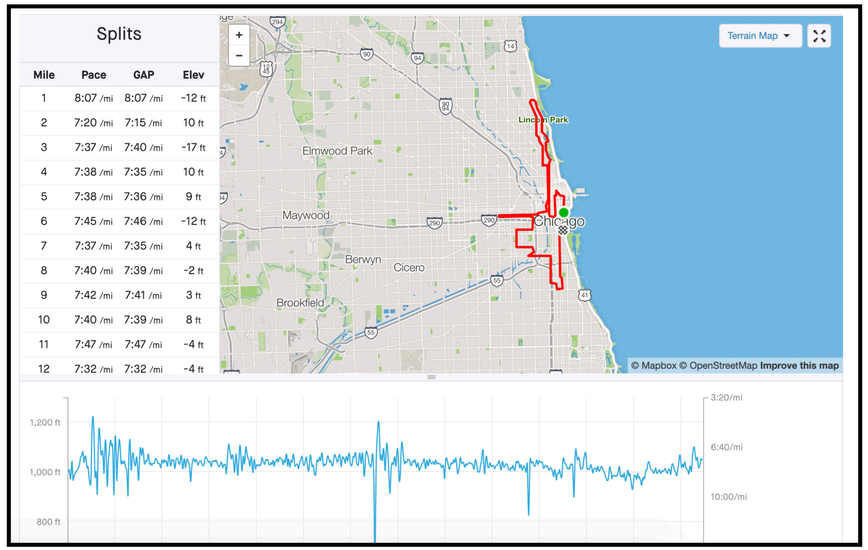


Layer 3
Network Layer

In the Network Layer, once the activity has been syced, the data package is then sent from my device's IP address to Strava via the fastest route. This layer comes into play when I want to pull up my analytics from my phone or computer for review. This same process takes place when other users want to pull up my activity to "like" or comment.

The Network layer transmits data from one host to the other located in different networks. It handles the data after the data arrives.

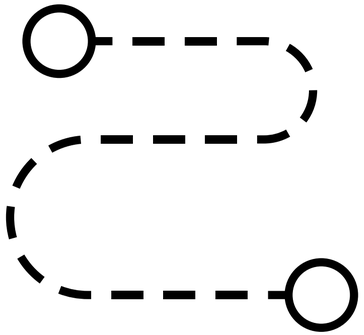




Layer 4
Transport Layer

This is where the data is actually sent. The Transport layer will take data and divide it into segments. Then when it’s received it is then reassembled and rebuilt for the lower layers. The transport layer will properly order all data.

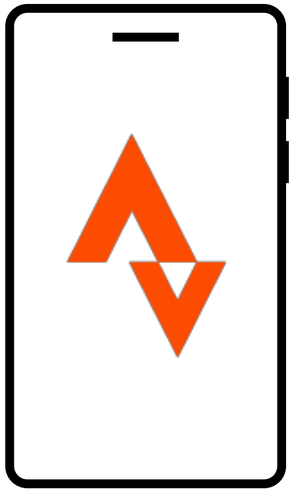
The Transport layer is responsible for transmission of data across network connections.



Layer 5
Session Layer

In the Strava App, the Session layer would keep my existing session running, whether it was browsing previous activities or while recording an activity.

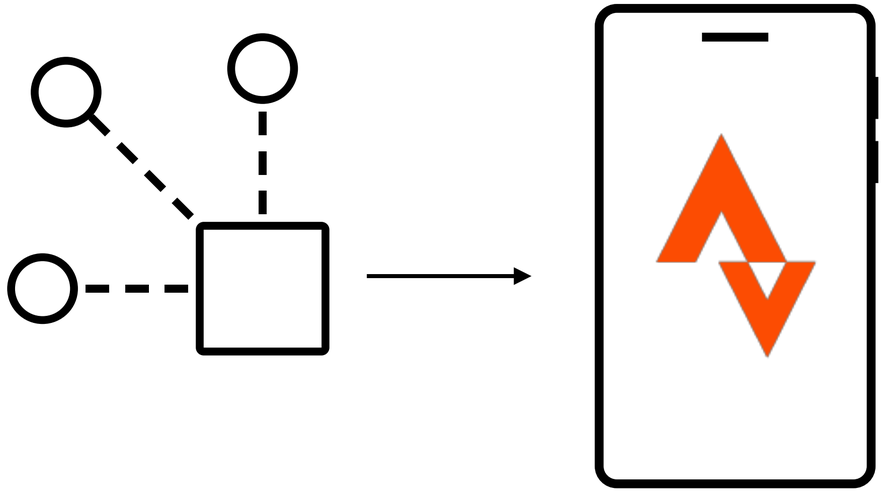
The Session layer is in charge of establishing and terminating connection between devices



Layer 5
Presentation Layer

The information received from the previous layers is decrypted and gets ready to be viewed in the Application Layer

The Presentation Layer is where the data is formatted so that the receiving device will understand (decripting), encripts data if needed.



Layer 6
Application Layer

In this layer is where we finally see the activity profile including the run's analytics.

In the Applicationlayer the data is produced and transferred to the network. This layer also displays the received information to the user.