

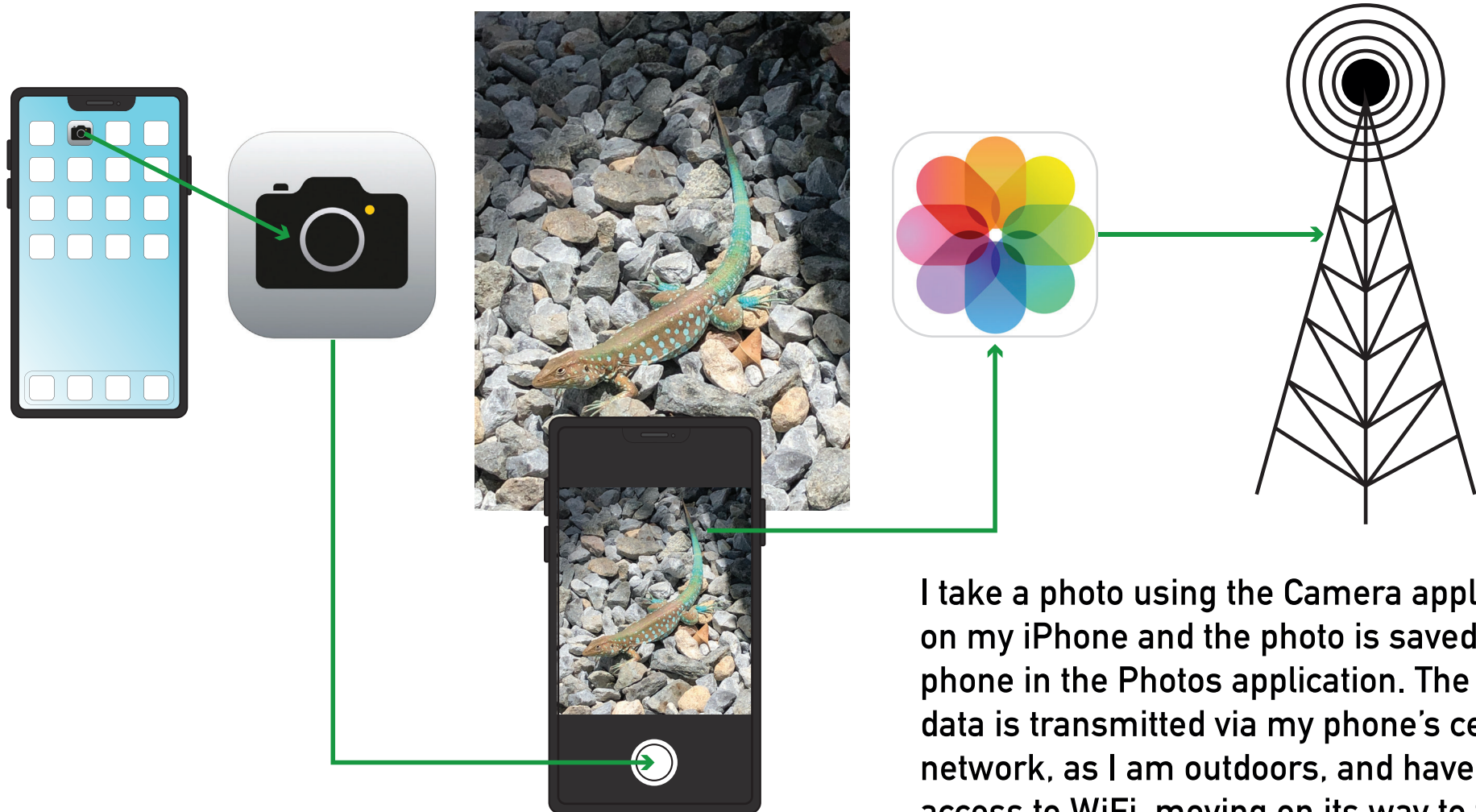
WEB ARCHITECTURE SPRING 2020
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OSI MODEL FOR PHOTOS

Photos is an application by Apple in which you can access photos you have taken with the Camera application on an iPhone or iPad. You can open Photos on those devices and view your photos, as well as on a computer after the photos have been uploaded to the Apple iCloud server and then downloaded after accessing them through the Photos application on your computer. My analysis here is of the OSI Model for taking a photo with an iPhone and how it reaches its final destination of the Photos application on my computer.



LAYER 1 PHYSICAL LAYER

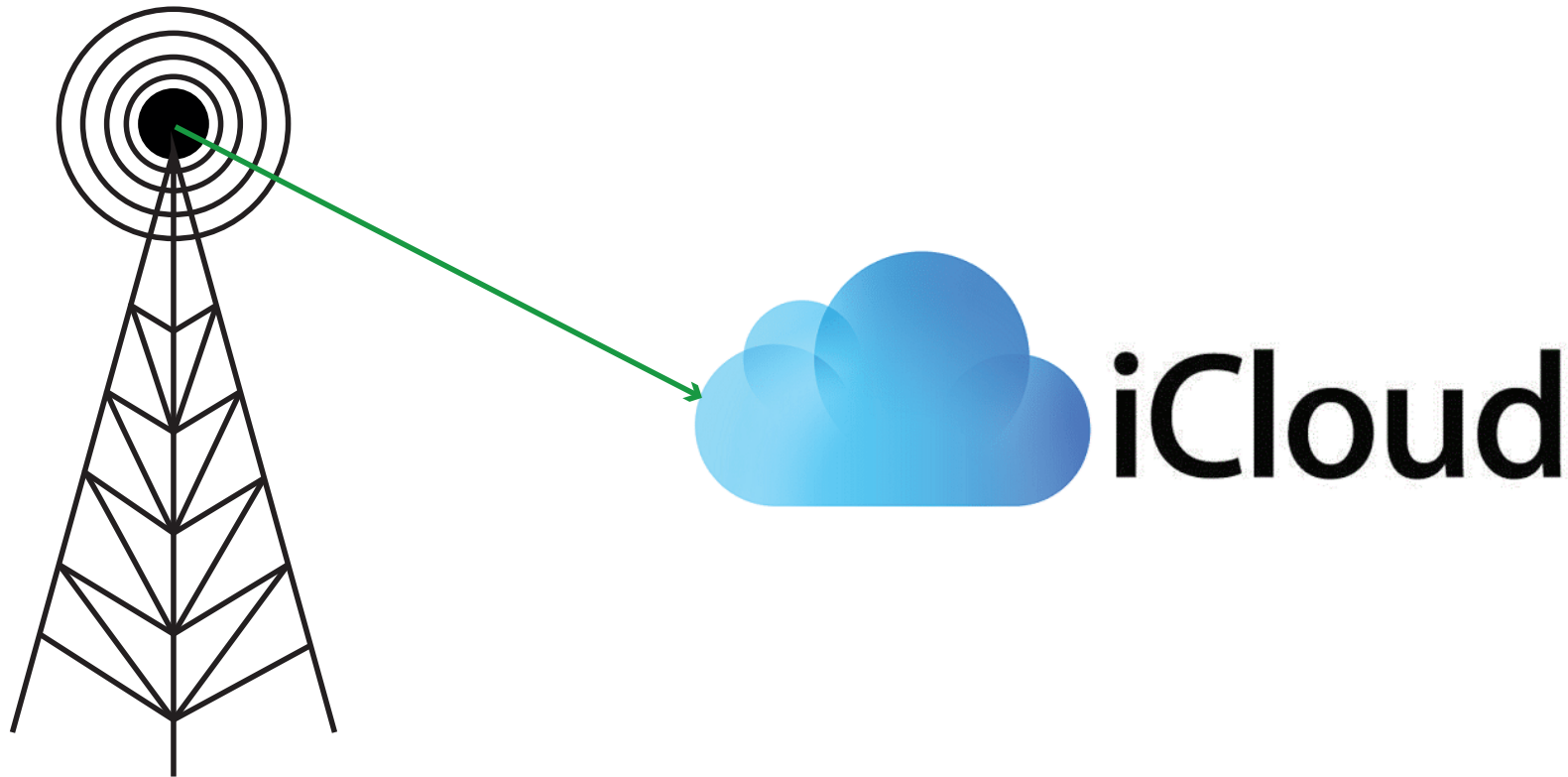
The Physical Layer is where the physical transmission of raw data occurs, converting bits to electrical, radio, or optical signals.



I take a photo using the Camera application on my iPhone and the photo is saved on my phone in the Photos application. The digital data is transmitted via my phone's cellular network, as I am outdoors, and have no access to WiFi, moving on its way to the Apple iCloud server.

LAYER 2 DATA LINK LAYER

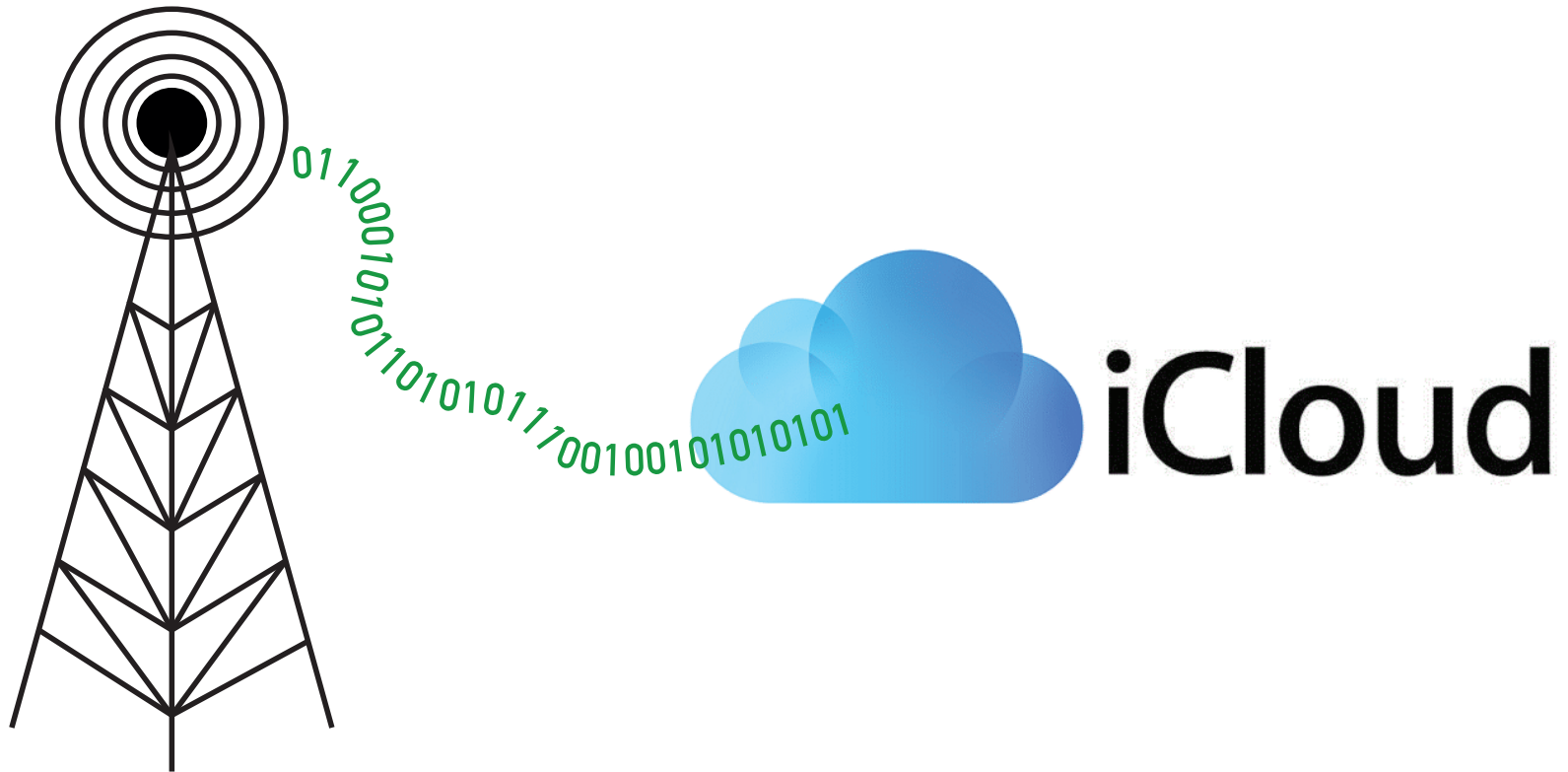
The Data Link Layer is where the physical addressing takes place. It ensures a transmission between nodes that is error free. It is broken down into two sublayers, MAC (Medium Access Control) and LLC (Logical Link Control).



A connection is made between nodes from my cellular network to iCloud.

LAYER 3 NETWORK LAYER

The Network Layer is where data is transmitted from one node to another, both being in different networks.



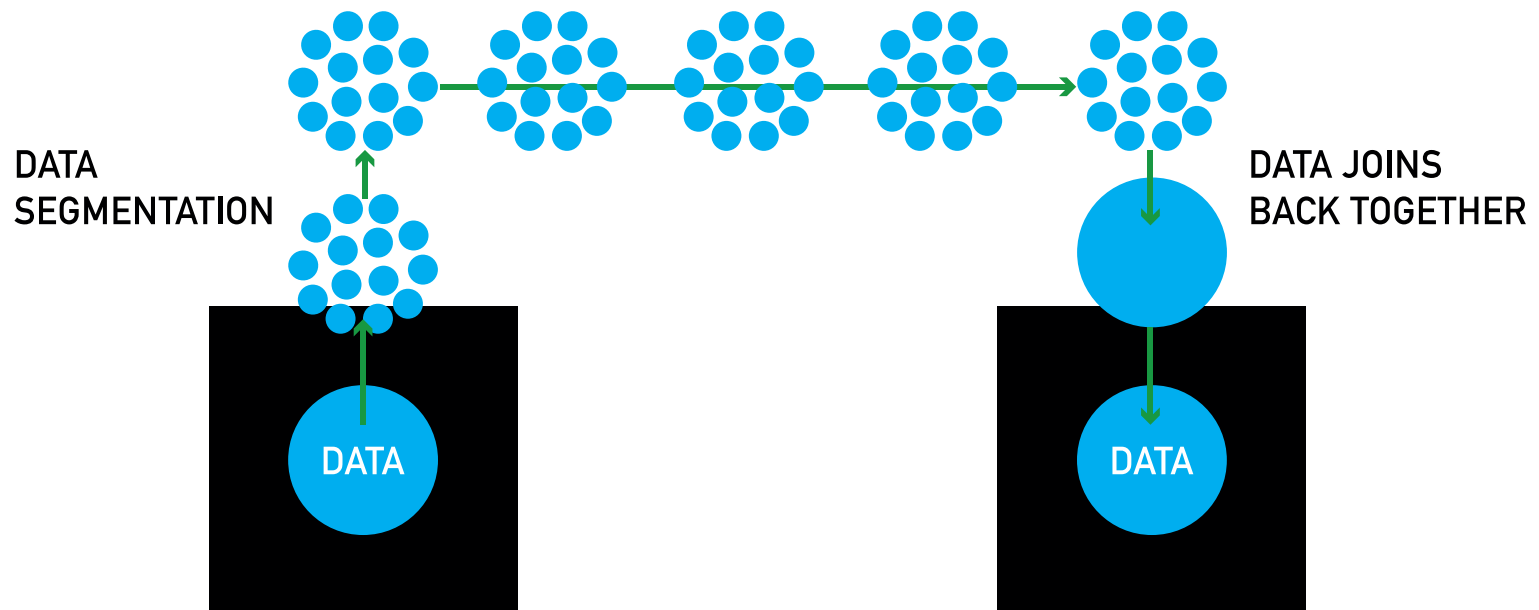
Once a connection is made between the address of my cellular network and iCloud, data packets are transferred, and the data for the photo that I took is uploaded into iCloud.

LAYER 4

TRANSPORT LAYER

The Transport Layer is where the data is actually transferred from source to host. This is done via TCP (Transmission Control Protocol) or UDP (User Datagram Protocol), TCP being the more reliable of the two.

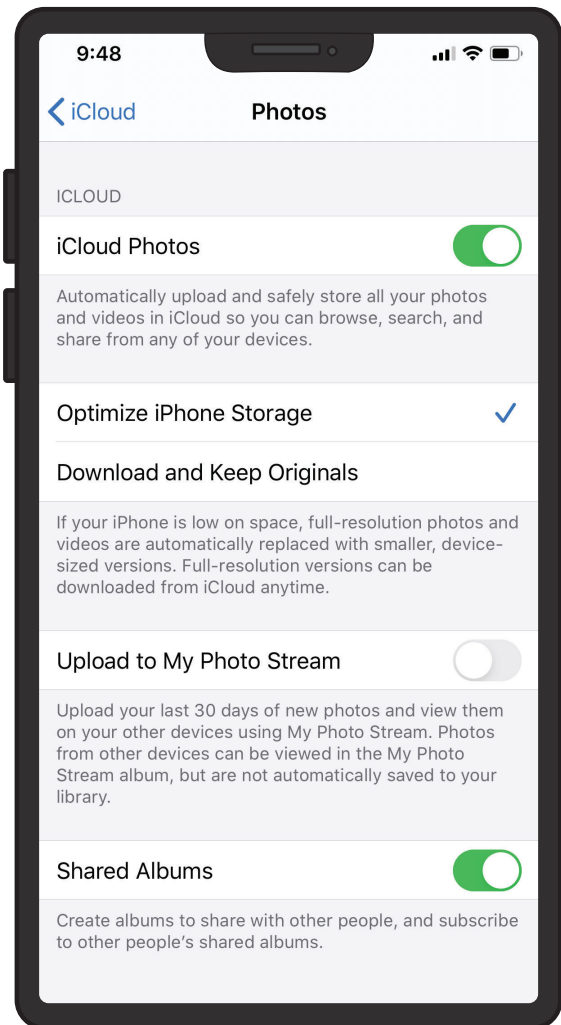
Information is moved from network to network. The sending computer uses segmentation to break up the bits of data into smaller segments, and then puts the pieces back together for the receiving end computer.



LAYER 5

SESSION LAYER

Connections between the local and remote application are established, maintained, and disconnected in the Session Layer.

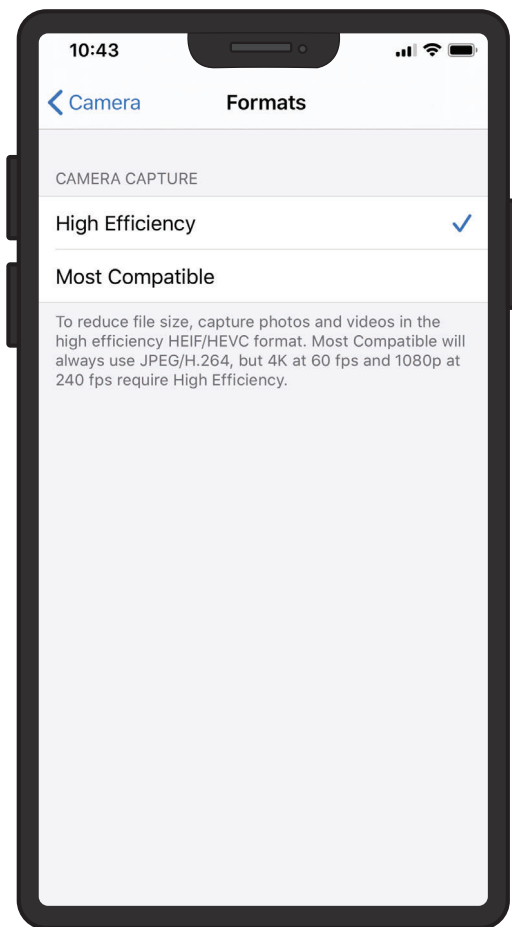


In the Photos application, the Session Layer keeps me connected to iCloud, whether I'm accessing my photos via my iPhone, iPad, or my computer. In iPhone settings, you can choose to turn iCloud Photos on, and this automatically logs you in and opens a session so it can upload your photos and videos to iCloud, where you can access and share them from any of your devices.

LAYER 6

PRESENTATION LAYER

The Presentation Layer is where the data is translated into a format that the end device can understand.



The original photo taken with my iPhone was saved in a format called HEIF (High Efficiency Image Format), which has the .HEIC file extension. It is a format which Apple is using to replace the JPEG standard. It basically produces images that have smaller file sizes and better image quality through an advanced image compression method. It is based on the High Efficiency Video Compression format (HEVC). In iPhone settings you can also choose to use standard JPEG format instead of HEIF. In the Presentation Layer the data packets from the previous layers get formatted back into either the HEIF or the JPEG format (depending on what you've chosen in your iPhone settings), readying a photo to be able to be read by the Photos application software on my computer in the Application Layer. For my purposes, I want the best image quality, so I have HEIF chosen in my iPhone settings. I am working on a MacBook computer, so this format is compatible as a standard coming from Apple. I read that some Windows PCs may have some compatibility issues reading the HEIF format. What I found interesting is that if you do have the settings in your iPhone set to HEIF, if you go to attach a photo from your iPhone to an email, the technology automatically reformats the HEIF file into JPEG format as it attaches to the email because JPEG is a standard format understood by all computers and devices!

LAYER 7

APPLICATION LAYER

The Application Layer is the layer in which the end user interacts directly with the software application. The data that was translated into a usable format by the Presentation Layer is received here.



I open the Photos application on my computer, find my photo, and can then download it from iCloud to my computer. I can keep it as its original .HEIC file format, or I can export it to a format of JPEG, TIFF, or PNG, and save the file to my hard drive.

