**Why bother with the command 'encap dot1q'?**

The default switchport mode is 'dynamic auto'. In this default mode a Cisco switch enables DTP (dynamic trunking protocol). DTP packets will be sent out of the interface to negotiate the trunking mode AAAAAAND some of the trunking parameters, such as which encapsulation to use.

You can statically assign the switchport mode to 'trunk'. DTP will no longer negotiate whether it will trunk or not, BUT it will still try to negotiate some characteristics OF the trunk, such as the encapsulation.

***Therefore, the default encapsulation mode for trunking on Cisco switch ports is not 802.1q, but 'negotiated'.***

Even if both switches on the trunk only support DOT1Q, DTP messages will be used to negotiate to 802.1q.

To disable this behavior, you simply use 'sw trunk encap dot1q', and the negotiation is over. You can also disable DTP protocol altogether on the port using the 'switchport nonegotiate' command, in which case all parameters must be assigned statically.

Why would you ever want to do this? I always try to challenge myself to come up with use cases and have found it helps to understand the command/feature and why it exists.

CASE 1:

You need to trunk with a non-Cisco switch. DTP is proprietary to Cisco, so you cannot negotiate port parameters with it and the other switch could have issues with the DTP packets. To ensure proper configuration and compatibility, statically configure all the port parameters, including encapsulation. You should also use the 'switchport nonegotiate' command to turn off DTP.

CASE 2:

Say you have a requirement from a group of developers or testers, and the use of the port changes often. One day it will be connected to a single PC, another day a switch with multiple VLANs. Heaven forbid, some days they connect a really old Cisco switch that defaults to ISL (this has happened to me IRL). For this port you'll probably want to leave it at the default 'switchport mode dynamic auto', but you will want to set the default access vlan and statically configure 'sw trunk encap dot1q'.

CASE 3:

Customer has a mix of old and new Cisco switches. The default encap on the old switches is ISL. To ensure everything is standard just statically configure 'encap dot1q' so there are no unknowns.

CASE 4:

Finally, on the latest VIRL IOSvL2 image it will not allow you to use the 'switchport mode trunk' command unless you have already issued 'encap dot1q'. The console will throw an error and laugh at you.

// Note the output below 'n-802.1q'. The 'n' means negotiated via DTP. //

SW1-EAST#show interface trunk

Port Mode Encapsulation Status Native vlan

Gi0/14 auto **n**-802.1q trunking 1

Gi0/15 auto **n**-802.1q trunking 1