

PART 1:

Plan and budget:

-estimated cable run

300 feet per floor

-total cable length

2,000 feet of cabling = \$479.98

-materials needed

- Cabling

1,000 feet of Cat6 cabling = \$239.99

- RJ45 outlets

RJ45 outlets = 50 cost = \$339.5

- Patch panels

48 port patch panels cost = \$73.90

-cost estimation

Estimated cost is \$893.38

-floor plan image/diagram

PART 2:

Plan and budget: for where and what equipment is needed to support an ethernet network in all rooms:

-equipment room

- Main backbone switch layer 3 = \$4,619.00
- 48 port Patch panels = \$73.90
- Cable management = \$239.20 *on going sale*

-Telecom closet

- Managed access switches = \$3,202.29
- 48 port Patch panels = \$73.90
- Cable management = \$24.69

-end point connectivity

- RJ45 outlets for all rooms = \$339.5

- Patch cables 300 feet = \$233.99

- Equipment per room

- 2 ethernet ports/RJ45 ports per classroom = 62 ports = \$6,200
- 2 ethernet ports/RJ45 ports per office = 2 ports = \$200

-cost estimation

- \$15,206.47

PART 3:

Plan and budget: for securing network traffic within the highschool and to the internet:

-requirements

- Support for 500 simultaneous connections
- VLAN/subnets to separate between students and staff
- Central firewall/router to manage internet access
- Ability to block or allow incoming or outgoing traffic based on source/destination IP
- Source-based firewall rules
- Managed switches

-network design overview

- VLAN 10 for staff and admin use // subnet = 192.168.10.0/24
- VLAN 1 for student use // subnet = 192.168.1.0/24
- VLAN 2 for school internet of things (printers/servers) // subnet = 192.168.2.0/24
- VLAN 99 for management of internet of things devices // subnet = 192.168.99.0/24

-firewall

- Fortinet FortiGate 500e = \$5,765.76
- Fortinet 10 x GE RJ45 ports = \$565.75
- Supports 100 to 1,000 users

-Managed switches

- Netgear 8-port Multi-Gigabit Switch (to support VLAN and trunking) = \$200

-cost estimation

- \$6,531.51

-Links to prices for all equipment

-RJ45 outlet

- https://www.amazon.com/Sancable-Ethernet-Plate-Keystone-Female/dp/B07LH1QD4B/ref=sr_1_3?dib=eyJ2ljojMSJ9.EfTjlsysBpSI3EcGM5FpJF-cR9IP0QaZ30Uexd8cSasd8lsA-jo1d-ZOQw7z95D0OxgdEoed8vGUnYQRb348VjksD3DctIjn-1ly-gdPKo-0cfMgbtmwKYJ8VBshUxY_GbqJ6vd4SmMdThjJT-4TL9sEVJCzjVxZs-We1RWrALd9gFeTMiUktl4Hy6_8q6rKEO06n-bDT8amSrKDeCYZM2U9ymIVf5qW-DwEXhy7b8.s4Q02N72WchYP1rRntP2IkV8L-D9tG3UjTxFrtzxNQw&dib_tag=se&keywords=rj45+wall+outlet&qid=1745690846&sr=8-3

-cat6 cabling

- <https://www.homedepot.com/p/Revo-300-ft-High-Grade-Bare-Copper-23AW-G-CAT6-Cable-with-Snagless-Cable-Boot-R300CAT6/310016106>

OR

- <https://tscables.com/products/cat6-plenum-rated-cable-shielded-f-utp-1000-ft-blue>

-48 port cat6 patch panel

- https://www.amazon.com/Keystone-Support-Rapink-Pass-Thru-Removable/dp/B09M6MSQ34/ref=sr_1_3?dib=eyJ2ljojMSJ9.VAaLbf9t1g2m6-gEeUurYyNvUqbn50bDI-wQ_hPzgx8p8wh4DWzCdOtVE6aJz8xtPEG_xKHhnYHMxhyFt7msebrhzPCHBJmDhuO-8Os8tYcTc_iyeGHwdoTHSbm3mNhGWFVwoVI-oQdCoOo0PbHgY1SqUEclT2zyiaNBHAJeCNDZ05giqNEtUG0225IzY4qPIWY-969nZprCQwyRiVJ0fPCYO325GuW8mj0ilxFDiLQ.5u7maJab92ys0FoLD6cibHA36l1KX3vSuraHbKTWObY&dib_tag=se&keywords=48%2Bport%2Bpatch%2Bpanel&qid=1745691724&sr=8-3&th=1

-main backbone switch layer 3

- https://www.fs.com/products/69226.html?country=US¤cy=USD&languages=English&paid=google_shopping&gad_source=1&gbraid=0AAAAAoz-wfTv8siufZSnu3nXNx38Yx5vl&gclid=Cj0KCQjwiLLABhCEARIsAJYS6unx0ic4m2Drl3IAbb2U1oewgswBwSvssO5WVqEYaqHH5C5MgK9im_EaAvk_EALw_wcB

-cable management

- https://www.server-rack-online.com/esc-k12/?setCurrencyId=1&sku=ESC-K12&gad_source=1&gbraid=0AAAAApJADzJK2zF_y5AgBW97HrF6DLGst&gclid=Cj0KCQjwiLLABhCEARIsAJYS6um0SIFETgaeqoNhgxtg2l23Bx9aKR-tD4bgYR0NOcFtMrWj4v4OnckaAoPWEALw_wcB

-managed access switch

- <https://www.secureitstore.com/SG500X-48P.asp>

-patch cables

- https://www.newegg.com/turnstone-cables-1000-ft-network-ethernet-cables-blue/p/1YU-022J-00023?item=9SIAF94JTY0849&source=region&nm_mc=knc-googlemkp-pc&cm_mmc=knc-googlemkp-pc_-pla-bncables_-cables+-+network+ethernet+cables_-9SIAF94JTY0849&utm_source=google&utm_medium=paid+shopping&utm_campaign=knc-googlemkp-pc_-pla-bncables_-cables+-+network+ethernet+cables_-9SIAF94JTY0849&id0=Google&id1=22477759360&id2=177700073479&id3=&id4=&id5=pla-2023783538804&id6=&id7=9008554&id8=&id9=g&id10=c&id11=&id12=Cj0KCQjwiLLABhCEARIsAJYS6uk96ctfn7i09ESTTI33Eaa9pW7w2QujGFA1-xdFGKfyZNDpgNjaJkAaAh-eEALw_wcB&id13=&id14=Y&id15=&id16=747946990777&id17=&id18=&id19=&id20=&id21=pla&id22=119303782&id23=online&id24=9SIAF94JTY0849&id25=US&id26=2023783538804&id27=Y&id28=&id29=&id30=4309618514072422743&id31=en&id32=&id33=DA&id34=US&gad_source=1&gbraid=0AAAD-YhmO046VAwjTEvrF_1B_Rhn8oH&gclid=Cj0KCQjwiLLABhCEARIsAJYS6uk96ctfn7i09ESTTI33Eaa9pW7w2QujGFA1-xdFGKfyZNDpgNjaJkAaAh-eEALw_wcB

-Fortinet FortiGate 500e

- https://www.firewalls.com/fortigate-500e-1-year-unified-threat-protection-utp-ips-advanced-malware-protection-application-control-url-dns-video-filtering-antispam-service-and-forticare-premium.html?utm_campaign=Google+Shopping&utm_medium=cpc&utm_source=google&gad_source=1&gbraid=0AAAAAD_wkwk_VIDPUKSQNobv4X0MhY4AW&gclid=Cj0KCQjwiLLABhCEARIsAJYS6uIJMZSmpohPNQIrePxUTfbIO_zAas1CoszqQkkiEMggvDWBhZa7BEaAphVEALw_wcB

-Fortinet 10 x GE RJ45 ports

- <https://www.firewalls.com/fq-60f-lenc.html?srsIid=AfmBOoo3G2Nbhd133P8rEAae9mrwZrnHpT1g7PA02cdDjBdepUBJN7u3>

-Netgear 8-port Multi-Gigabit Switch

- <https://www.netgear.com/business/wired/switches/plus/ms308e/>