

Constant Hall

IT315: Intro Network and Security

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Specifications

Basic Layout:

- Building Length: 215 x 200 Feet
- Cable Maximum Length: Cat5e cables can span up to 330 feet (100 meters).
- Number of Floors: Two floors (ground and upstairs).
- Equipment Rooms: One on each floor to minimize the cable distance between network devices and endpoints.
- Telecommunication Rooms: Two upstairs and downstairs to further limit cable length and ensure compliance with cable length restrictions.

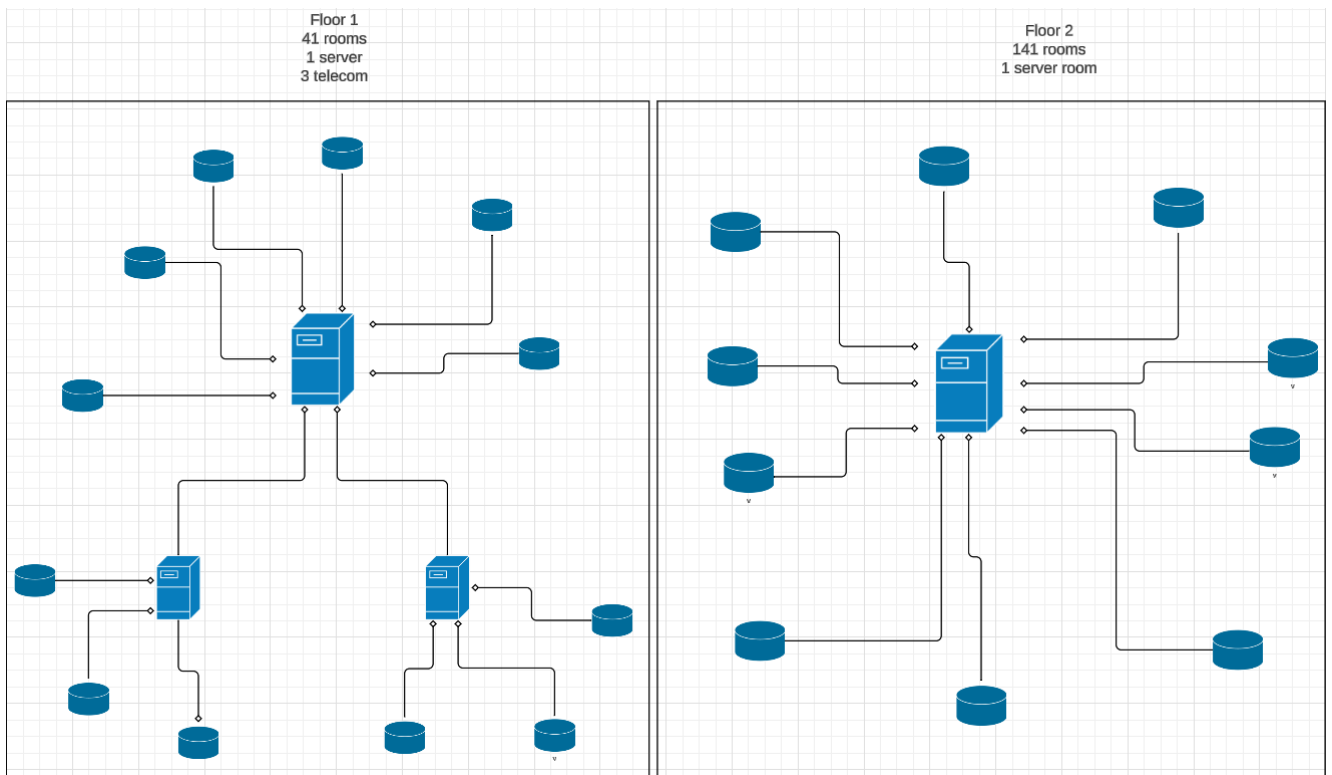
The cabling of Constant Hall is structured in a way that leverages equipment rooms on both floors and telecommunication rooms on the downstairs floor. This design ensures all cable runs are within the 330-foot limit of Cat5e cables, with strategic use of central locations to minimize cable lengths. The 10-foot vertical space provides an efficient pathway for cables between floors without compromising the total cable length needed.

On the upstairs floor, a single equipment room is centrally located to minimize the cable run distances to all network endpoints. This central position ensures that the farthest point on the floor is no more than approximately 76.2 meters (250 feet) from the equipment room, allowing plenty of cable length for routing through walls, ceilings, and around obstacles while staying within the 90-meter (295 foot) limit.

The downstairs floor, which is more expansive, employs a slightly different strategy to manage the longer distances. The main equipment room is not centrally located, two telecommunication rooms are installed to act as intermediate distribution points. These rooms help ensure that the cable lengths from the equipment room to any endpoint are kept well within the maximum allowable distance. The typical star topology is used and provided.

For determining the Cat5e cabling length, every 1 inch on the diagram represents 36 feet at 50% zoom. This allows for a total of 6 inches to represent the full combined distance of the building. After calculating the longest cable length (210 feet) and the shortest length (28.8 feet), the average cable length is 119.4 feet or 36.39 meters. With 2 cables needed for each room, totaling 374 cables, the total length for the cables comes to 44,655.6 feet or 13,611.03 meters. Additionally, when accounting for the 374 cables running from the upper to the lower-level equipment rooms (each spanning 90 feet), this adds another 33,660 feet or 10,257.17 meters. Therefore, the total cabling length required is approximately 78,315.6 feet or 23,868.2 meters.

Floor Plan / Cable layout / Star Topology



Budget

	Component	Number needed	Cost	Total cost
Cat5e Cable	VIVO Gray 1,000ft Bulk Cat5e	79 x 1000 ft	79x\$79.99	\$6,319.21
Data Outlet	RiteAV 2 Port Cat5e Wall Plate	182x2=364	364x\$18.33	\$6,672.12
Patch Panels	iwillink 10Gbps Patch Panel 48 Port	48 port x 12	12x\$59.99	\$719.88
Patch cables	InstallerParts (10 Pack Ethernet Cable CAT5E Cable UTP Booted 0.5 FT	58	58x\$10.79	\$625.82
Grand total				\$14,336.13

Each product was found on the amazon website and can be found using the Component name provided. Due to the extended size of each website, the full website would take up too much space.

More funding is recommended for incidentals.