A diagram of computer network

Description automatically generatedBased on the configuration of your company we decided to use a 3 layer network configuration

Note: The access switches were numbered in physical ascending order, therefore A1 is on the first floor, whereas A16 is on the fifth floor.

Based on your employee count we calculated that your business would have the following bandwidth:

Employees to Enterprise Servers: 277 Mb/s

Employees to open internet: 25.2 Gb/s

As such, we made the decision to logically divide your network amongst 2 “trunks”. Each trunk has an approximate bandwidth uplink of 12.6 Gb/s.

On each floor, each independent department will be connected to an access switch. To ensure TIA/EIA compliance, departments which exist different floors will each receive their own access switch, to ensure only backbone cabling is traveling vertically.

Subnetting has been applied, and as such every Access switch will have its own independent subnet id, As well as a range of available hosts. Subnets have been set in order to maximize the number of available host nodes per subnet

The “left” trunk contains 7 access switches, which will all be connected to a single distribution switch (D1). The total uplink bandwidth from the distribution switch will be approximately 12621 Mb/s

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Figure : "Left" Trunk

The “right” trunk contains 9 access switches, all connected to a second distribution switch (D2). The approximate total bandwidth going from D2 up to the core layer will be 12579 Mb/s

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Figure : "Right" Trunk

Additionally, we have shown how configuration would work to implement Wi-Fi in the offices. All lightweight access on a single floor would be connected to an access switch located on each floor (W\_). These access switches would then all be connected to D2. Further study would be needed to determine the approximate bandwidth usage of the Wi-Fi implementation.

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Figure : Optional Wi-Fi Setup

A central core switch (C1) will be connected to both distribution switches, all the internally hosted enterprise servers, and a firewall (F1). Additionally, if you choose to implement Wi-Fi then all lightweight Access points will be centrally managed by a wireless LAN controller (WLC1)

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Figure : Core Layer Layout

Summary of Every Backbone Connection

Many of the backbone connections are wired only vertically, as such they have not been displayed on the physical layer, here is a summary of all networking devices and their respective backbone connections.

|  |  |  |  |
| --- | --- | --- | --- |
| Source Device | Source Location | Destination Device | Destination Location |
| A1 | TR1A | D2 | TR2B |
| A2 | TR1B | D2 | TR2B |
| A3 | TR1B | D1 | TR2A |
| A4 | TR2A | D1 | TR2A |
| A5 | TR2A | D2 | TR2B |
| A6 | TR2B | D2 | TR2B |
| A7 | TR3A | D2 | TR2B |
| A8 | TR3A | D1 | TR2A |
| A9 | TR3B | D1 | TR2A |
| A10 | TR3B | D1 | TR2A |
| A11 | TR4A | D1 | TR2A |
| A12 | TR4B | D1 | TR2A |
| A13 | TR4B | D2 | TR2B |
| A14 | TR5A | D2 | TR2B |
| A15 | TR5A | D2 | TR2B |
| A16 | TR5A | D2 | TR2B |
| F1 | EF | C1 | ER |
| D1 | TR2A | C1 | ER |
| D2 | TR2B | C1 | ER |
| BELOW ROWS ARE OPTIONAL | | | |
| W1 | TR5B | D2 | TR2B |
| W2 | TR5B | D2 | TR2B |
| W3 | TR5B | D2 | TR2B |
| W4 | TR5B | D2 | TR2B |
| W5 | TR5B | D2 | TR2B |
| WLC1 | ER | C1 | ER |