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|  | Network Infrastructure Report |
|  |  |
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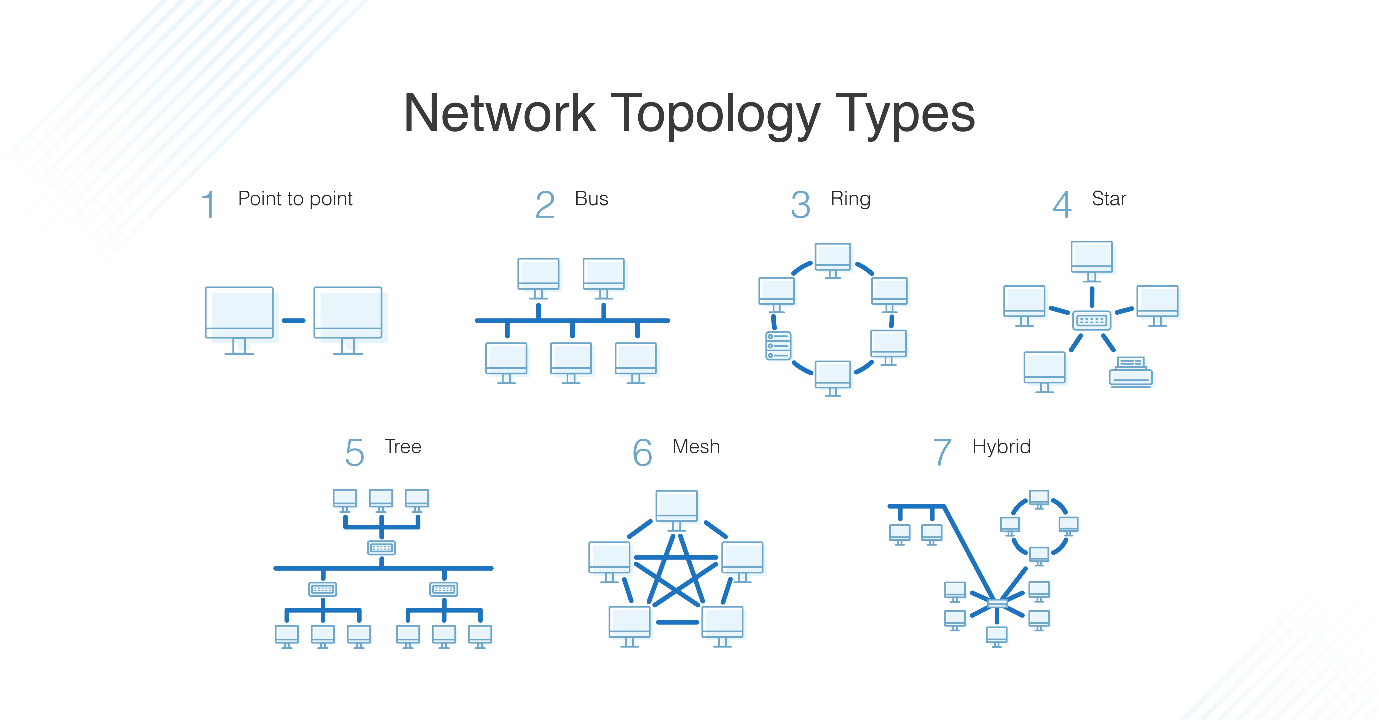
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# Problem Context

The Engineering and Computer Science department are getting an extension to their building and have given detailed floor plans as found in the appendix. Both departments need access to their own independent network for their students however, both departments have shared spaces which need access to both sections of the network. A Theoretical network must be developed and plotted to suit the buildings requirements whilst also making adjustments for the requirements of both departments. This will be achieved by recommending a network topology that suits the building, these topologies state how the network connected devices function in the network these topologies include Bus, Star, Ring, Mesh, Tree and Hybrid as seen in Figure 1.

*Figure 1: Network Topologies*

Each topology has its own advantages and disadvantages however, whatever topology implemented has to have redundancy to allow for a device to fail and the network to remain online and must cater for speed requirements of multiple computers accessing the network at once. The chosen topology must allow for wireless networks for student that bring their own devices (BYOD) or students that are not present at a computer but wish to access the network via mobile phone. Extra care will be taken to ensure the server room on the second floor has fast connections and that nothing will disrupt its connection and ensure a quality service.

The chosen topology must allow for further expansion in the future as it is possible that this building may go through another expansion due to the demand in industry for STEM (Science, Technology, Engineering, Maths) employees. Once a topology is selected it will be theoretically deployed to find out how many resources are required to complete a full deployment to the building, from there it will be costed up (using industry prices on reputable sites) including all the wiring required and any additional network items. A copy of all the spaces in the building can be found in the appendix, however there are 59 Engineering spaces, 5 Siemens spaces including the server room, 48 Computer Science Spaces, 1 Pooled Computer Lab, 31 Maths and Physics Spaces and 9 College spaces.

Not all of these spaces require direct connection such as storage however the building should have wireless connectivity so should allow for connection in these rooms. Also of note are the devices scattered around the building that are not associated to any department but should be connected, these are devices like printers. Finally, there is a comms room at the back of the second floor which should be treated like the server room and given the best connection it can get.

|  |  |  |
| --- | --- | --- |
| Department | Room Type | Number of Spaces |
| Engineering | Professors Office | 23 |
| Engineering | Technicians Office | 1 |
| Engineering | Office | 11 |
| Engineering | Communications Laboratory | 1 |
| Engineering | Post Grad and RA | 1 |
| Engineering | HPL Hot Desks | 1 |
| Engineering | Project Lab | 6 |
| Engineering | Computer Lab | 2 |
| Engineering | Research Office | 1 |
| Engineering | Print Area | 1 |
| Engineering | Business Dev Mgr | 1 |
| Engineering | Head Of school | 1 |
| Engineering | Materials Lab | 1 |
| Engineering | ECR Office | 1 |
| Engineering | Computer Room | 1 |
| Engineering | Dr Fuels Lab | 1 |
| Engineering | Thermo fluids Lab | 1 |
| Engineering | General Store room | 3 (Including shared space) |
| Engineering | High Energy Elec Mec Storage Facility | 1 |
| Siemens | Lecturers Office | 1 |
| Siemens | Think Tank | 2 |
| Siemens | Head of Product Tng | 1 |
| Computer Science | Large Office w/meeting | 4 |
| Computer Science | Hourly Paid Lecturers | 1 |
| Computer Science | Single Office | 27 |
| Computer Science | Bookable Breakout Area | 1 |
| Computer Science | Research Student Workplaces(Joint with Maths and Physics) | 1 |
| Computer Science | PA to HOS | 1 |
| Computer Science | HOS | 1 |
| Siemens | Server Room | 1 |
| Computer Science | Technical support | 1 |
| Computer Science | Computer Lab | 4 |
| Computer Science | Storage | (shared storage) 1 |
| Computer Science | Research staff | 4 |
| Computer Science | Library/Quiet Room | 1 |
| Pooled Spaces | Pooled Computer Lab | 1 |
| Maths and Physics | Storage | 1 |
| Maths and Physics | Single Office | 25 |
| Maths and Physics | Head of School | 1 |
| Maths and Physics | PA to HOS | 1 |
| Maths and Physics | Research Student Workplaces (Joint with Computer Science) | 1 |
| Maths and Physics | Shared Workspaces | 2 |
| College | College Storage | 1 |
| College | College Office | 1 |
| College | Head Of college | 1 |
| College | Director of ops | 1 |
| Other | Linux Printer and Storage | 1 |
| Other | Copy Hub | 1 |
| Other | Printer | 1 |
| Other | Electrical Cupboard | 1 |
| Other | Comms Room | 1 |

*Table 1: Rooms by Department*

# Solution

## Chosen Network Topology

## Considered Network Topologies

## Materials

## Deployment

## Cost Breakdown

# Conclusion

Appendix

|  |  |  |
| --- | --- | --- |
| Department | Room Type | Number of Spaces |
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| Engineering | Office | 11 |
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| Engineering | Project Lab | 6 |
| Engineering | Computer Lab | 2 |
| Engineering | Research Office | 1 |
| Engineering | Print Area | 1 |
| Engineering | Business Dev Mgr | 1 |
| Engineering | Head Of school | 1 |
| Engineering | Materials Lab | 1 |
| Engineering | ECR Office | 1 |
| Engineering | Computer Room | 1 |
| Engineering | Dr Fuels Lab | 1 |
| Engineering | Thermo fluids Lab | 1 |
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| Computer Science | Research staff | 4 |
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| College | College Office | 1 |
| College | Head Of college | 1 |
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| Other | Copy Hub | 1 |
| Other | Printer | 1 |
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