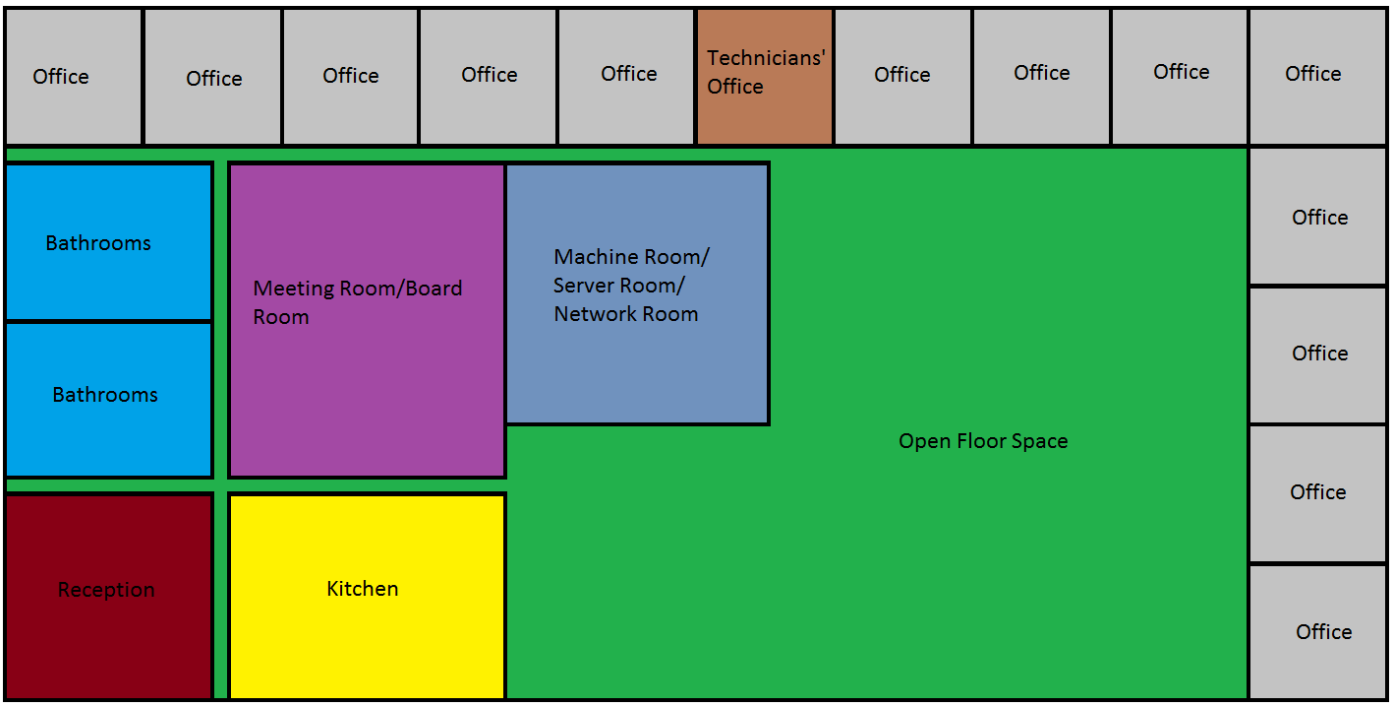
Packet Tracer: Building Layout and Network Requirements



Details

The building is a single-story detached property roughly 100 x 50 meters in size, with ample space in the ceiling, and a lot of natural light.

Each staff member should be able to connect 1 – 4 Wi-Fi devices to the network. These devices must be treated as **untrustworthy.** You may estimate the number of employees based on the other network requirements.

All networked devices should be able to access the Internet. The company has indicated that each device that connects using a wired access point should be capable of 50 Mb/s synchronously, and each device that connects via Wi-Fi should be capable of 10 Mb/s synchronously. **You may assume that the extant fibre ISP setup can handle the speeds required; your task is the design of the network inside the building.**

- **13 Offices:**
  - 2 – 4 people per office (using either desktops or laptops with Ethernet ports);
  - 4 Wired access points providing network access;
  - Wi-Fi available for 2 – 4 devices per person.
  - The office in the upper left corner is used as a storage space, and doesn't need network access.
- **Technicians' Office:**
  - 2 Technicians (using either desktops or laptops with Ethernet ports);
  - 2 Wired access points for office work;
  - 4 Wired access points for potential office equipment maintenance;
  - Direct wired access to machine room.
  - Wi-Fi available for up to 8 devices per technician.

- **Reception/Waiting area:**
    - 2 People (using either desktops or laptops with Ethernet ports);
    - 2 Wired access points – one per person;
    - Full Wi-Fi available for reception staff; 2 – 4 devices per person;
    - 1 Networked printer available;
    - Limited Wi-Fi for guests.
- **Kitchen:**
    - 4 Wired access points for IoT devices;
    - Wi-Fi for staff.
- **Meeting room/board room:**
    - 20 – 30 people;
    - Set up for teleconferencing;
    - 2 Wired access points for hardware used for teleconferencing;
    - Wi-Fi for staff.
- **Machine Room/Server Room**
    - No staff except technicians;
    - The room has independent ventilation and is sound proofed;
    - As per company policy, all servers, routers, and major switches must be located in the machine room. Only switches with fewer than 8 ports may be used outside the machine room. **The company already owns the servers that will live in this room. The servers are primarily used for centralised data and file storage, projects that require server infrastructure, supporting work-from-home, and intranet hosting. However, the servers are also capable of providing network services, such as DHCP, NAT, and DNS. (Note: you may select any server(s) in Packet Tracer that you consider appropriate, as they won't add to your budget. Just don't go overboard!)**
    - Servers are primarily accessed remotely from the technicians' office;
    - No wired access points apart from open ports on network hardware;
    - The ISP fibre line terminates here, so all Internet traffic moves through the machine room, but not necessarily through the servers;
    - No Wi-Fi needed.
- **Open Floor Space:**
    - Multi-functional office space that can be adapted to best suit current tasks and projects;
    - Space for 75 – 120 people;
    - Floor is raised to allow for cabling to be run under the desks to the machine room;
    - 100 Wired access points for Ethernet-capable devices;
    - Wi-Fi for staff;
    - 5 Networked printers available next to the machine room.