Setting up a wireless network in a small scale organization

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# Introduction

A wireless network is a computer network that uses wireless data connections between network nodes. Wireless networking allows homes and business installations to avoid the costly process of introducing cables into a building, or as a connection between various equipment locations.

# Our company

Our company is a small software development startup that takes on projects that require the need for sufficient hardware resources to manage the data that we handle and process.

# Hardware requirements

Laptops:

* Processor: Aim for at least an Intel Core i5 or AMD Ryzen 5 processor for smooth performance with most development tools.
* RAM: 8GB of RAM is the minimum, but 16GB is preferable for multitasking and handling larger projects.
* Storage: A solid-state drive (SSD) is essential for fast boot times and application loading. Aim for at least 256GB, with 512GB or more recommended for storing code repositories and project files.
* Operating System: Windows or macOS are both viable options, depending on developer preference and compatibility with specific tools. Linux can also be an option for advanced users.
* Display: Consider a screen with good resolution (e.g., Full HD or higher) for comfortable coding and document viewing.

Other Peripherals:

* Keyboard: Invest in a high-quality, ergonomic keyboard that reduces typing fatigue and improves comfort.
* Mouse: A comfortable and accurate mouse is essential for navigating code and user interfaces.
* Monitor(s): Dual monitors significantly improve efficiency, allowing simultaneous code editing, documentation viewing, and reference materials.
* External hard drive: Back up your data regularly to an external hard drive for added security and peace of mind.

# IT infrastructure

IT Infrastructure:

This refers to the hardware, software, and network resources that support the company's operations. The specific requirements will depend on the startup's business model and development needs. Here are some key considerations:

* Development Tools: Choose appropriate code editors, compilers, frameworks, and test automation tools based on your programming language and project type.
* Version Control System (VCS): Implement a VCS like Git or Mercurial to manage code versions, track changes, and facilitate collaboration.
* Continuous Integration/Continuous Delivery (CI/CD): Automate build, test, and deployment processes for faster and more reliable software releases.
* Project Management Tools: Utilize tools like Jira, Trello, or Asana to manage tasks, track progress, and collaborate effectively.
* Communication & Collaboration: Secure platforms like Slack, Zoom, or Microsoft Teams enable team communication, meetings, and file sharing.
* Hosting & Servers: Choose suitable hosting solutions for your application. Cloud platforms offer scalability and flexibility.
* Security & Data Protection: Implement robust security measures like firewalls, access control, and data encryption to protect sensitive information.

# Hardware needed to set up a wireless network

* Router
* Networking cable
* Modem
* Switch
* Bridge
* Gateway
* NIC
* Repeater

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# Setting up a wireless network

* Step 1: Decide where to place the router

The best place for a wireless business router is in an open area of the workplace, as you'll benefit from even coverage. However, sometimes it's not easy to find a space out in the open because you must connect the router to a broadband gateway from your ISP (Internet service provider), which is usually attached to a cable near an outside wall.

* Step 2: Connect to the Internet

To solve the "long-distance" problem when connecting a router, you can use a CAT5e or CAT6 cable to connect the router to the ISP gateway's Ethernet port. Another option is to run Ethernet cables through the walls of your office to the chosen central location for the router.

* Step 3: Configure the wireless router gateway

If you have a gateway with an integrated router, you'll have to configure the gateway to disable the router and pass the WAN IP address—the unique Internet protocol address that the Internet provider assigns to your account—and all network traﬃc through to your new router.

* Step 4: Connect gateway to router

First, turn off the gateway. If there is already an Ethernet cable plugged into the gateway's local-area network (LAN) port, unplug the cable and plug it into your router's WAN port. Turn the gateway back on and wait a few minutes for it to boot up. Plug in the router's power supply and turn it on, again waiting a few minutes.

* Step 5: Use app or web dashboard

The easiest way to continue with router setup is to use a mobile app if the router maker provided one. If there is no app, or you'd rather use the router's web-based dashboard, connect the router to a computer via an Ethernet cable.

You might find the router's IP address printed on the back of device itself; if not, type 192.168.1.1, a common router address, into the browser search bar.

* Step 6: Create a username and password

To configure the router, you'll need to log in, using its default admin name and password. You can usually find this information printed on the router itself, or in an accompanying user manual.

Next, enter the required credentials. Once you're in, you should immediately create a new username and password. The defaults are usually something like "admin" and "password1234," which are obviously not secure—so make sure to change them at the first opportunity.

* Step 7: Update the router's firmware

Some routers may download new firmware automatically, but many do not. You may need to check for updates through the app or the browser interface. Update it as soon as possible, since the new firmware might fix bugs or offer new security protections.

* Step 8: Create a Wi-Fi password

Just as most routers come with preassigned admin usernames and passwords, most also come with preset Wi-Fi usernames and passwords. You’ll likely be prompted to change the Wi-Fi username and password, but even if you don't see such a prompt, plan to do so quickly.

* Step 9: Use auto-configuration tools where possible

If your router is equipped with auto-install features, rely on them to help complete setup. For example, you should be able to use auto-configuration to manage IP addresses with the Dynamic Host Configuration Protocol (DHCP), which automatically assigns IP addresses to devices. You can always change these addresses later.

* Step 10: Set up security

Many router manufactures provide security functionality to safeguard network and user privacy. You can login into the web dashboard and enabling added security features such as firewall, web filtering, and access controls to protect yourself from malicious traffic. You can also set up virtual private networks (VPNs) for privacy.

## MAC filtering

To set up MAC filtering on a router, the administrator must configure a list of devices that are allowed to join. The physical address of each approved device must be found and then those addresses need to be entered into the router, and the MAC address filtering option turned on.

Most routers display the MAC address of connected devices from the admin console. If not, use the operating system to do it. Once you have the list of MAC addresses, go into the router settings and put them in their proper places. (Lifewire, 2021)

# Conclusion

In conclusion, wireless networks have become the backbone of modern connectivity, transforming the way we communicate, work, and live. From the early stages of wireless technology to the current era of high-speed and ubiquitous networks, the evolution has been remarkable. Wireless networks have transcended geographical boundaries, empowered mobile devices, and laid the groundwork for the Internet of Things (IoT).