

# Technical Guide: Network Device Configuration

## Documentation

The configuration of a network device relies on understanding IP addressing, subnet masks, and the gateway. In a simple environment, the device should be placed within the same subnet as the gateway to ensure direct communication. Using a static IP address is recommended to prevent variations or conflicts with the DHCP server. Initial access may require a direct RJ45 connection and temporary configuration of the workstation to reach the device's default IP via the administration interface or a manufacturer-provided application. Reset, backup, and restore functionalities help secure and efficiently manage the configuration. As each device is unique, it is imperative to consult the official documentation corresponding precisely to the model and its specifications, especially in VLAN or routed environments.

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## 1. Objective

This document aims to provide the necessary instructions for configuring network devices such as printers, Wi-Fi access points, IP cameras, and other connected equipment. It details best practices regarding IP addressing, access to the administration interface, and network parameter management.

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## 2. Prerequisites

Before performing any operations, verify the following:

- Workstation or server with administrator rights
  - RJ45 network cables or appropriate connection
  - Manufacturer documentation for the device (manual, exact model, generation, and options)
  - Access to the local network to collect IP information
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## 3. Fundamental Concepts

### 3.1 IP Addressing and Subnet

- The device must be configured within the **same IP subnet as the gateway** to ensure direct communication on the local network.
- Example of a typical configuration:
  - Gateway: 192 . 168 . 1 . 1
  - Device: 192 . 168 . 1 . 50
  - Subnet mask: 255 . 255 . 255 . 0

## 3.2 Advanced Case: VLAN and Routing

- In environments using VLANs or routing, the device may be on a different subnet.
  - This configuration requires the setup of specific routes and rules on the router or routing equipment.
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## 4. IP Address Assignment

### 4.1 Static IP

- It is recommended to assign a **static IP** to devices to ensure stable access.
- Verify that the chosen address:
  - Belongs to the correct subnet
  - Is not already in use on the network

### 4.2 DHCP Interaction

- The DHCP server automatically assigns IP addresses.
  - Best practices:
    - Choose an IP outside the DHCP range
    - Or configure a DHCP reservation based on the device's MAC address
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## 5. Local Network Verification

- Use a workstation connected to the local network to collect the following information:
  - Workstation IP address
  - Subnet mask
  - Default gateway

### Example (Windows):

```
Ipconfig
```

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## 6. Direct Connection and Initial Access

1. Connect the device directly to a workstation via RJ45.
  2. Temporarily configure the workstation IP to be within the same subnet as the device's default IP.
  3. Access the device's default IP using a web browser or a manufacturer-provided application.
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## 7. Administration Interface

- Most devices have a **web interface** accessible from a browser.
  - Primary functions include:
    - Network and Wi-Fi configuration
    - Security settings
    - Firmware updates
  - Some devices also provide a mobile application for simplified automatic configuration.
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## 8. Reset and Configuration Management

- The **RESET** function restores factory settings and recovers the default IP address.
  - Administration interfaces may allow **backup, export, and import** of configurations, useful for duplication or rapid restoration of settings.
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## 9. Documentation and Support

Before performing any operation, it is essential to consult:

- The official device manual
- The exact model reference, including generation, year, and options
- Manufacturer-provided guides or customer support documentation

⚠ Instructions may vary depending on the model, generation, or activated options. Prior verification is essential to avoid incorrect configuration.

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## 10. Best Practices

- Use fixed IP addresses for essential devices
  - Avoid conflicts with DHCP
  - Verify the subnet and gateway before any configuration
  - Document all changes for proper tracking and maintenance
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## Fiber Connection (up to 1 Gbit/s and above ⚡ )

Your connection can be ultra-fast. However, if you keep old switches 🕒 and Cat5 cables, you will not achieve maximum throughput 📉. Upgrade your microswitches and cables (Cat5e/Cat6) to fully exploit your fiber 💎.

### Cat5e capabilities:

- Theoretical speed: up to 1 Gbit/s over standard distances (~100 m) ✅
- Compatible with most current fiber subscriptions at 1 Gbit/s
- Stable for 4K streaming, remote work, and online gaming

### Limitations:

- For fiber subscriptions above 1 Gbit/s (2.5 Gbit/s or more), Cat5e may become the bottleneck
- For long or multi-floor installations, Cat6 is recommended to ensure maximum performance

### 10Gbit/s connections and cabling:

- Cat5e → max theoretical  $\approx$  1 Gbit/s ✅ (far below 10 Gbit/s)
- Cat6 → can reach 10 Gbit/s, but only for distances  $\leq$  55 m
- Cat6a / Cat7 → recommended for 10 Gbit/s over standard distances up to 100 m
- Switches and routers must also support 10 Gbit/s to fully leverage the connection