

# Malware Removal and System Recovery on Windows PCs

(Written by: Dan Desaulniers 2025)

Malware infections remain one of the most common cybersecurity issues faced by home users and small organizations. These infections can range from adware and spyware to more harmful threats such as trojans and ransomware. Effective malware removal requires a structured approach to ensure that systems are cleaned thoroughly, data is protected, and future risks are minimized.

This paper outlines a practical, real-world process for identifying, removing, and recovering from malware infections on Windows-based personal computers, based on hands-on IT support experience.

## Common Signs of Malware Infection

Typical indicators that a PC may be infected with malware include:

- Slow system performance or frequent crashes
- Unexpected pop-ups or browser redirects
- Unauthorized software installations
- Suspicious network activity
- Locked or inaccessible files
- Changes to system settings without user action

Recognizing these symptoms early helps prevent further system damage or data loss.

## Initial Assessment and Safety Measures

Before beginning malware removal, several precautionary steps should be taken:

### 1. Disconnect the PC from the Internet

This prevents malware from communicating with external servers and other computer devices. This helps stop it from spreading further.

### 2. Backup Important Files (if safe to do so)

Critical documents and photos should be copied to an external drive or cloud service, ensuring infected executables are not transferred.

### 3. Identify the Nature of the Infection

Determine whether the infection is mild (adware, unwanted programs) or severe (system compromise, encryption, or rootkits).

## **Malware Scanning and Removal Process**

### **Step 1: Boot into Safe Mode (if necessary)**

Safe Mode loads Windows with minimal services, reducing malware activity and allowing security tools to function more effectively.

### **Step 2: Run Antivirus and Anti-Malware Tools**

Commonly used tools include:

- Built-in Windows Defender
- Third-party anti-malware utilities

Multiple scans may be required to fully identify threats.

### **Step 3: Remove Detected Threats**

All identified malware should be quarantined or deleted according to the security software's recommendations.

### **Step 4: Check for Suspicious Programs**

Review installed programs and remove any unfamiliar or unnecessary software that may have been bundled with malware.

### **Step 5: Clean Browser Extensions and Settings**

Malware often modifies browser settings or installs harmful extensions. These should be removed and browser defaults restored.

## **System Recovery and Hardening**

Once malware is removed, additional steps help secure the system:

- Install all operating system updates
- Update antivirus software
- Enable firewall protection
- Remove outdated or vulnerable software
- Implement strong passwords and account security

In severe cases, a full operating system reinstall may be recommended to guarantee system integrity.

## **Data Protection and Backup Implementation**

After system recovery:

- Set up automated local backups (external drives)
- Configure cloud backups (such as OneDrive or Google Drive)
- Verify restore procedures regularly

Backups ensure data can be recovered in case of future incidents.

## **User Education and Prevention Strategies**

Preventing future infections is just as important as removal. Key education points include:

- Avoiding suspicious email links and attachments
- Downloading software only from trusted sources
- Keeping systems updated
- Using strong, unique passwords
- Enabling multi-factor authentication where available

Teaching users these practices significantly reduces repeat infections.

Malware removal on Windows PCs requires a methodical approach combining threat identification, removal tools, system recovery, and user education. Effective remediation not only restores system functionality but also improves long-term security awareness.

By pairing technical solutions with preventative practices and backup strategies, individuals and organizations can significantly reduce the risk and impact of future cyber incidents.