Here is your **comprehensive study-note breakdown** of the document **“40. Wireless Connections”**, formatted with bullet points and optimized for **CompTIA A+ 1102 Objective 1.7**. This breakdown preserves every critical detail while reinforcing exam-focused understanding of **Windows wireless networking**.

**✅ Structured Study Notes – Windows Wireless Connections**

**🧠 Concept Overview**

* Wireless networking in Windows is managed through:
  + **Wireless adapters**
  + **Device Manager**
  + **Network Settings**
* Knowing how to configure and troubleshoot wireless settings is critical for real-world support and the A+ exam.

**🔌 Wireless Adapter Configuration in Windows**

* **Verify adapter in Device Manager:**
  + Click **Start → Type “Device Manager” → Enter**
  + Go to **Network Adapters**
  + Example device: **802.11N USB Wireless LAN Card**
* **Confirm device is functioning:**
  + Double-click adapter → **Status** should say “working properly”
* **Advanced Tab Settings:**
  + **Radio on/off**: Controls wireless transmission
  + **Region selection**:
    - U.S.: Channels **1–11**
    - Europe: Channels **1–13**
    - Japan: Channels **1–14**
  + Region affects which channels can legally be used
* **Driver Tab**:
  + Shows version, status
  + Update/rollback options
* **Details Tab**:
  + Device metadata (e.g., MAC address, hardware ID)
* **Events Tab**:
  + Tracks when the device was installed, configured, and started
  + Example: Device installed on August 25, 2022
* **Power Management Tab**:
  + Options:
    - Allow Windows to **turn off device to save power**
    - Allow device to **wake computer** (usually not supported by wireless cards)

**📶 Connecting to a Wireless Network (Windows 10)**

1. Click **Network icon** (bottom right)
   * World icon with no symbol = **not connected**
2. View available networks
   * Network types supported: **802.11b, g, n**
   * Card cannot detect **a, ac, ax** networks if unsupported

Example:

* Two networks available:
  + **Dion Training**: For employee devices
  + **Dion Training IoT**: For IoT devices (lights, cameras, locks)
* Networks are **segmented** for security

**🔐 Steps to Connect**

* Click desired SSID → Choose **Connect automatically** (optional)
* Click **Connect**
* Enter **network password**
* Choose if PC should be **discoverable by other devices**:
  + Yes = **Private Network**
  + No = **Public Network**

Tip: On public Wi-Fi (hotel, coffee shop), select **No** to prevent unauthorized access.

**⚙️ Wireless Network Properties Overview**

Once connected, click **Properties** to see:

**🌐 Network Profile**

* **Private** (discoverable, used for home/office)
* **Public** (not discoverable, used for untrusted locations)

**📊 Metered Connection**

* Not covered in detail here (used with cellular plans or limited-bandwidth scenarios)

**🧾 IP & Connection Details**

* Connection via **DHCP**
* SSID: **Dion Training**
* Protocol: **Wi-Fi 4 (802.11n)**
* Security: **WPA2-Personal**, **Pre-shared Key**
* Frequency: **2.4 GHz** spectrum
* Channel: **Channel 1 (in U.S., channels 1–11 are available)**
* Speed:
  + Receive: **Up to 600 Mbps**
  + Send: **Up to 72 Mbps**
* Additional info:
  + **IPv6 and IPv4 addresses**
  + **Network adapter manufacturer**
  + **Driver version**
  + **Physical MAC address** (used for identification on LAN)

**🔁 Managing Known Networks in Windows**

* Navigate to **Wi-Fi settings → Manage Known Networks**

**🗑️ Why It Matters:**

* Windows **remembers every Wi-Fi** you’ve connected to.
* Automatically reconnects if it finds a previously used SSID.

⚠️ Risk: May auto-connect to **public or insecure** networks without prompting

**🧹 Best Practice:**

* **Forget** networks you no longer use:
  + Prevents auto-connection to old hotel or café Wi-Fi
  + Reduces security risk

How:

Click on a saved network → **Forget**

→ It will not auto-reconnect in the future.

**📌 Key Takeaways and Exam Tips**

| **Feature** | **Summary** |
| --- | --- |
| **Device Manager** | View and verify wireless adapter hardware status |
| **Advanced tab** | Modify radio settings and regional channel access |
| **Power tab** | Wireless adapters usually don’t support Wake-on-LAN |
| **Wi-Fi 4 (802.11n)** | Uses **2.4 GHz** (some versions support 5 GHz) |
| **Security Type** | WPA2-Personal with Pre-shared Key is common |
| **Public vs Private** | Select based on location and security posture |
| **Known Networks** | Prune unused networks to avoid unwanted connections |

**🎯 CompTIA A+ 1102 Relevance**

| **Objective** | **Description** |
| --- | --- |
| **1.7** | Configure Windows networking features |
| **4.3** | Troubleshoot wireless adapter and connectivity issues |

Expect exam questions like:

“A user can’t see a Wi-Fi 6 network. The adapter supports 802.11n. What’s the issue?”

✅ Answer: The adapter doesn’t support 802.11ax (Wi-Fi 6)