**Difference Between IEEE and WFA (Wi-Fi Alliance)**

IEEE (Institute of Electrical and Electronics Engineers) and WFA (Wi-Fi Alliance) are two organizations involved in wireless networking but serve different purposes.

**1. IEEE (Institute of Electrical and Electronics Engineers)**

* **Function:** IEEE develops and maintains networking standards, including the **IEEE 802.11 family** (Wi-Fi standards).
* **Role:** Creates the **technical specifications** for wireless networking (e.g., 802.11a, 802.11b, 802.11ac, Wi-Fi 6).
* **Focus:** **Standardization** of technologies across multiple industries, including networking, power systems, and computing.
* **Example:** IEEE 802.11ax defines the technical requirements for **Wi-Fi 6**.

IEEE sets the **foundation** for how Wi-Fi works at the technical level.

**2. WFA (Wi-Fi Alliance)**

* **Function:** WFA **certifies** Wi-Fi devices to ensure they meet IEEE standards and work properly across brands.
* **Role:** Performs **compatibility and interoperability testing** before approving a product as "Wi-Fi Certified."
* **Focus:** Ensuring that different manufacturers’ devices work **seamlessly together**.
* **Example:** A router labeled **“Wi-Fi Certified 6”** has been tested by WFA to meet IEEE 802.11ax specifications.

WFA ensures **real-world performance and compatibility** of Wi-Fi products.

**Differences Between IEEE and WFA**

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| Feature | IEEE | WFA (Wi-Fi Alliance) |
| Role | Creates technical Wi-Fi standards | Certifies and tests Wi-Fi devices |
| Focus | Standardization of networking protocols | Compatibility & interoperability |
| Scope | Broad (includes Ethernet, Bluetooth, etc.) | Focused only on Wi-Fi technology |
| Output | Defines **802.11** wireless standards | Issues **Wi-Fi Certified** labels |
| Example | IEEE 802.11ac defines Wi-Fi 5 | WFA certifies a router as **Wi-Fi 5 Certified** |

**IEEE develops the core Wi-Fi standards** (e.g., 802.11ax for Wi-Fi 6).  
**WFA certifies and ensures devices comply with these standards** for proper performance and compatibility.