

What is a “Personal Area Network” (PAN)?

Here are some notes on the meaning of Personal Area Network (PAN), a growing segment of the wireless communications market

New terminology appears regularly in the high-tech arena, and wireless communications is no exception. One of the recent additions is PAN,

or *Personal Area Network*. This note attempts to explain this term with the hope that it will see consistent and meaningful usage in business and technical dialogue.

Networks Can be Defined by Distance

The most commonly-used terms for data communication networks are WAN (Wide Area Network) and LAN (Local Area Network), with WLAN (Wireless Local Area Network) being a specific subset of LAN. Distance is the main difference—LAN is generally considered to be a distinct group, such as the offices of a small company, or a single building in a large company. WAN refers to a larger area of service, such as a corporate campus or a set of office buildings scattered around a community. In the wireless realm, WAN may mean a citywide or regional wireless network, usually in the context of a point-to-multipoint system, or perhaps a mesh or ad hoc network that extends the reach of 802.11 WLAN to a larger area.

At present, PAN refers exclusively to wireless communications, both radio and optical, so it is best compared and contrasted to WLAN. WLAN has a range from zero to hundreds of feet in normal use, although longer range can be obtained when necessary. In terms of distance, PAN is usually considered to have a range in the tens of feet, with some references citing 10 meters (~33 feet) as the typical range for their specific PAN hardware. In general, WLAN can be defined as covering

an entire house or a set of offices, but not necessarily the entire building. PAN is then a room-size network covering an individual's work area or a work group.

Definition by Bandwidth

Although there are exceptions, it is valid to divide WAN, LAN (and WLAN) and PAN by the data rate, or bandwidth. In general, a WAN is a maximum-rate system using Gigabit Ethernet or fiber optics for 1 to 40 Gbps transmission. LAN is then the common 10/100 Mbps Ethernet, and WLAN primarily the IEEE 802.11a/b/g system with 2 to 54 Mbps rates. Although PAN is less well-defined, it includes lower data systems like Bluetooth. However, the first consumer uses of Ultra Wideband (UWB) will have PAN-type range with very high data rates (e.g. sufficient for high-definition television).

Definition by Usage

First, WAN is a regional backbone, part of a high-use network. LAN and WLAN are mainly used for file-sharing and Internet access routing.

As noted above, PAN has two branches (perhaps they will eventually get separate names!). The lower data rate systems are for control and access to a larger system, typically the user's personal computer or cell phone. Uses include wireless audio, keyboards, mice and inter-system (PC-cell phone) data links. High data rate PAN will typically be used for household video and audio distribution, similar to using a LAN or WLAN for routing Internet connections.

Hopefully, when distance-based and bandwidth guidelines are combined with the intended use of each network, we can get a better sense of the distinctions between them.