



**Figure 4.6** Example IP address assignment for routers and hosts attached to the three networks in the previous figure.

Host *Merlin* has connections to both the Ethernet and the Wi-Fi network, so it can reach destinations on either network directly. The distinction between a router (e.g., *Taliesyn*) and a multi-homed host (e.g., *Merlin*) arises from the configuration: a router is configured to forward packets between the two networks whereas a host can use either network, but does not forward packets.

As Figure 4.6 shows, an IP address must be assigned to each network connection. *Lancelot*, which connects only to the Ethernet, has been assigned 128.10.2.26 as its only IP address. *Merlin* has address 128.10.2.3 for its connection to the Ethernet and 128.210.0.3 for its connection to the Wi-Fi network; whoever made the address assignment chose the same value for the low-order byte of each address. The addresses assigned to router *Taliesyn* do not follow the convention. For example, *Taliesyn*'s addresses, 128.10.2.6 and 128.210.0.50, are two unrelated strings of digits. IP does not care whether any of the bytes in the dotted decimal form of a computer's addresses are the same or different. However, network technicians, managers, and administrators may need to use addresses for maintenance, testing, and debugging. Choosing to make all of a computer's addresses end with the same octet makes it easier for humans to remember or guess the address of a particular interface.