Why could you ping the 192.168.1.2 address from PC1 earlier before you had setup routes?

PC1 was able to ping the address 192.168.1.2 because the router was configured to send traffic destined for 192.168.1.2 via eth1. This does not mean we were able to ping PC2 however - only that router 1 knew where to direct traffic destined for that IP range.

If you wanted to expand this network to include 4 routers, what additional work would you have to do and why would static routes be a bad idea as this network gets larger? As an example of the network I'm talking about, look at this image:

The network admin would have to configure each of the routers to send packages destined for specific IP ranges, to the appropriate router, and PC's. As the network grows, the amount of router entries needed by the admin would grow very quickly, 2^n to be specific, where n is the number of routers required. Therefore, as networks grow larger and larger, static networks become more and more problematic, as the labor-hours required to configure each router to talk to new ones grows exponentially - this is still not factoring the likelihood of mistakes and debugging.

What considerations would you need if you wanted to have the same number of routers but you didn't want all of them connected to each other? As an example:

The routers would have to be organized by their IP and subnet mask range, so for router *OpenWrt21.02.1-4* to send a package to *OpenWrt21.02.1-2,* this would need to be sent 2 other routers, where each of those would need to know how to connect to the subsequent one. This method seems more complicated, however if static routes are required for whatever reason, reduces the labor needed to implement.