Network Routing: Mac + iPhone Hotspot + Pi

The Question

"If I connect Mac to iPhone hotspot, am I still on the same network as the Pi?"

The Answer

YES! You ARE on the same network as the Pi via Ethernet.

How It Works

Mac Has TWO Separate Network Connections:

1. **WiFi Interface (en0)**
• Connected to: iPhone hotspot
• Network: 172.20.10.0/24 (or similar, assigned by iPhone)
• Purpose: Internet access
• Default route: YES (for internet)

2. **Ethernet Interface (en1, en2, etc.)**
• Connected to: Pi via Ethernet cable
• Network: 192.168.10.0/24
• IP: 192.168.10.1 (Mac)
• Purpose: Local Pi access
• Default route: NO (doesn't interfere with internet)

macOS Routing Logic

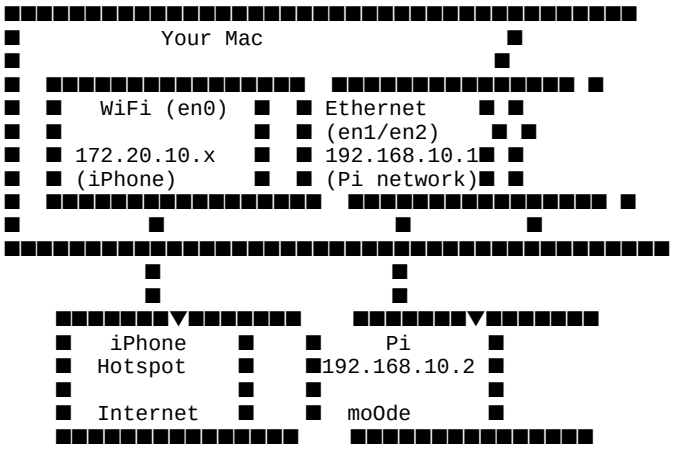
macOS routes traffic based on **destination IP address**:

```
When you try to access 192.168.10.2 (Pi):
  ↓
macOS checks routing table:
  "Is 192.168.10.2 in any local subnet?"
  ↓
YES! It's in 192.168.10.0/24
  ↓
macOS checks: "Which interface handles 192.168.10.0/24?"
  ↓
Ethernet interface (en1/en2) is configured for 192.168.10.0/24
  ↓
Traffic goes via ETHERNET ■
  ↓
You ARE on the same network as Pi!

When you try to access 8.8.8.8 (Internet):
  ↓
macOS checks routing table:
  "Is 8.8.8.8 in any local subnet?"
  ↓
NO! It's not in any local subnet
  ↓
macOS uses DEFAULT ROUTE
  ↓
Default route points to WiFi (en0)
  ↓
Traffic goes via WIFI ■
  ↓
```

```
Internet works!
```

Visual Representation



Verification Commands

Check Mac Routing Table:

```
netstat -rn | grep -E "default|192.168.10"
```

You'll see:

```
default            link#XX            UGSc           en0      (WiFi - internet)
192.168.10.0/24    link#XX           UCSc           en1     (Ethernet - Pi network)
192.168.10.1       XX:XX:XX:XX:XX:XX  UHLWI          en1      (Mac Ethernet IP)
192.168.10.2       XX:XX:XX:XX:XX:XX  UHLWI          en1      (Pi IP)
```

Test Pi Connectivity:

```
# This will use Ethernet interface
ping -c 2 192.168.10.2

# This will use WiFi interface
ping -c 2 8.8.8.8

# Check which interface is used
route get 192.168.10.2
route get 8.8.8.8
```

Test SSH:

```
# This will connect via Ethernet
ssh andre@192.168.10.2
```

Key Points

1. **You ARE on Pi's network** via Ethernet cable
2. **WiFi is separate** - only for internet
3. **macOS automatically routes** based on destination IP
4. **No configuration needed** - macOS handles it automatically
5. **Both work simultaneously** - no conflicts

Common Misconception

■ **Wrong**: "If Mac is on iPhone's network, it can't be on Pi's network"
■ **Correct**: "Mac can be on MULTIPLE networks simultaneously via different interfaces"

Summary

• ■ Mac IS on Pi's network (via Ethernet)
• ■ Mac HAS internet (via WiFi)
• ■ Both work at the same time
• ■ No special configuration needed
• ■ Standard macOS behavior

You can control the Pi normally via SSH/web interface even when connected to iPhone hotspot!