



***IP Tech Training***

# WHAT WE DO

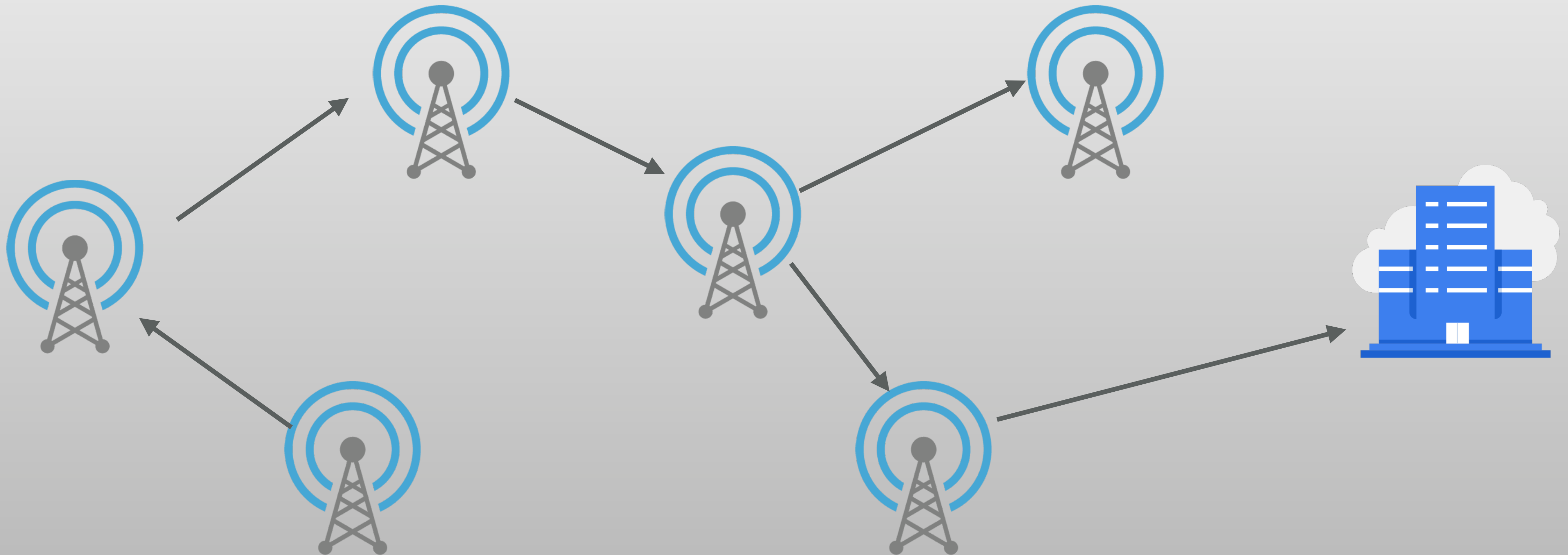
- Create and provide online trainings for the ISP industry
- Create and maintain bespoke online training portals for businesses and ISPs
- Maintain and support ISP networks around the world

# OUTLINE

- The evolution of a WISP
- OSPF vs BGP for internal routing
- PPPoE dial-ups to towers, or to core (Tunnels)?

# THE EVOLUTION OF A WISP

- Bridged with DHCP

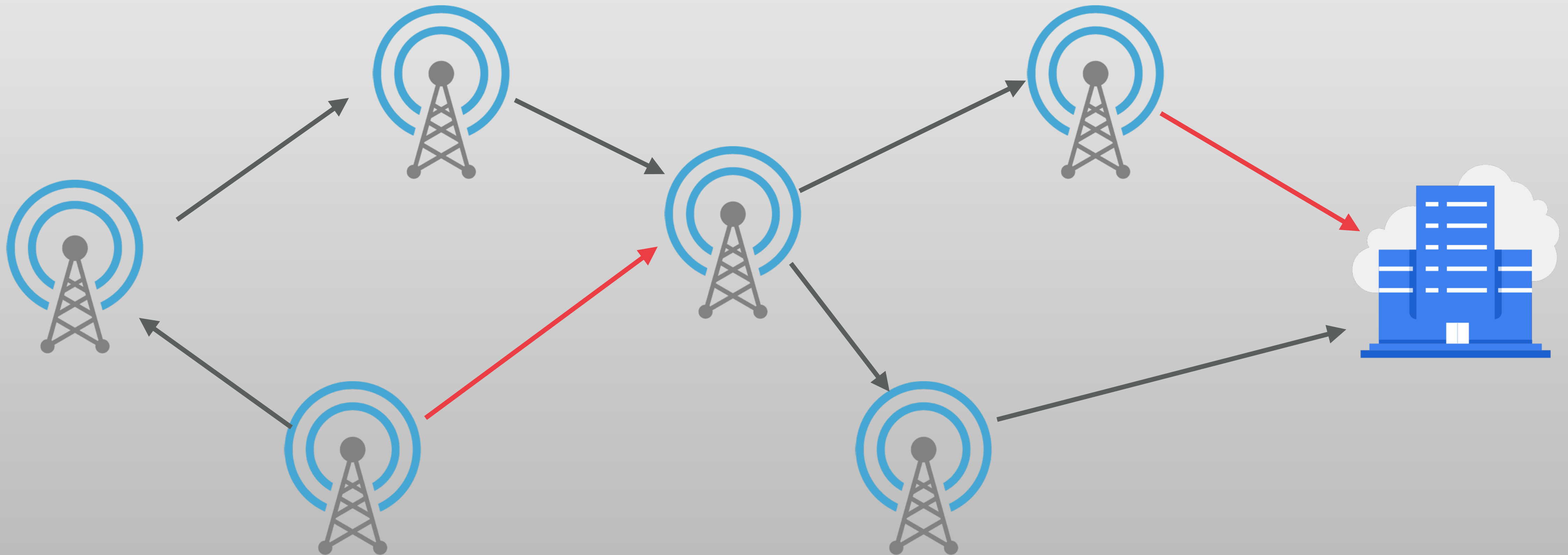


# THE EVOLUTION OF A WISP

- Bridged with DHCP
  - Benefits
    - Easy to setup
  - Problems
    - Unstable
    - Limited growth potential
    - Single broadcast domain
    - Susceptible to loops
    - Very difficultly to diagnose faults
    - No failover

# THE EVOLUTION OF A WISP

- Static Routing

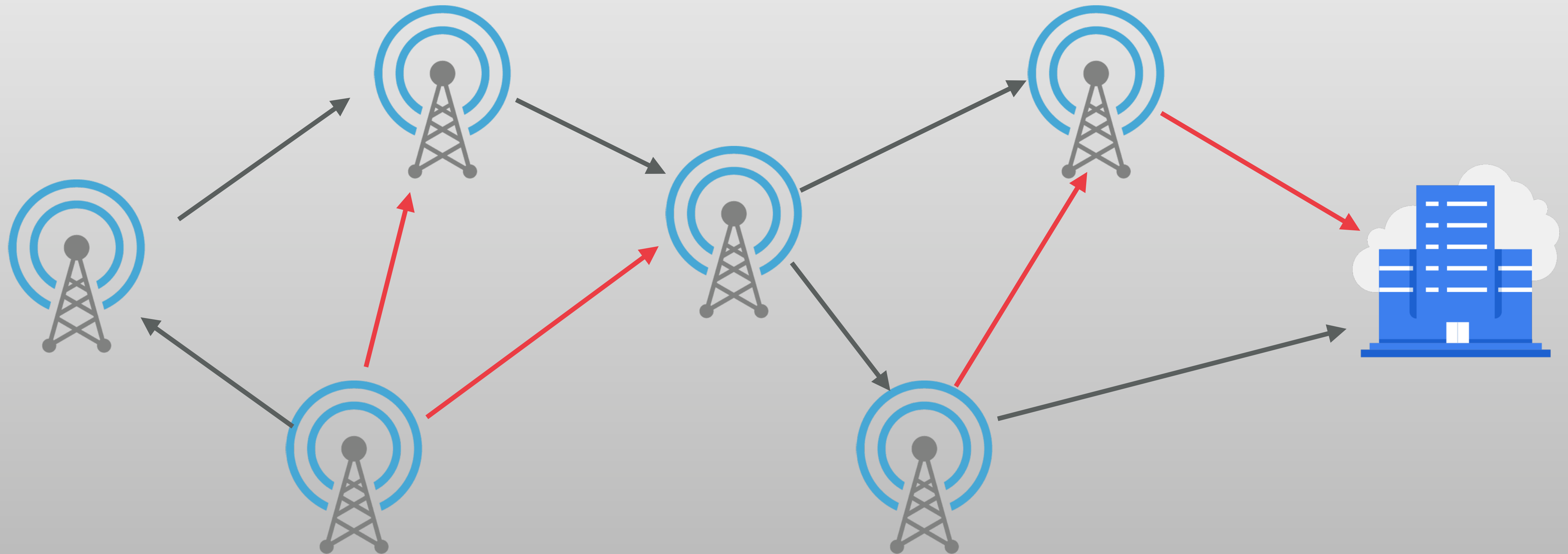


# THE EVOLUTION OF A WISP

- Static Routing
  - Benefits
    - Removes all of the downsides of a bridged system
    - Adds the potential for failover
  - Problems
    - Difficult to setup and maintain
    - Failover is usually a manual process (can be automated with scripts)
    - Difficult to scale

# THE EVOLUTION OF A WISP

- Automated Routing with OSPF or BGP





# THE EVOLUTION OF A WISP

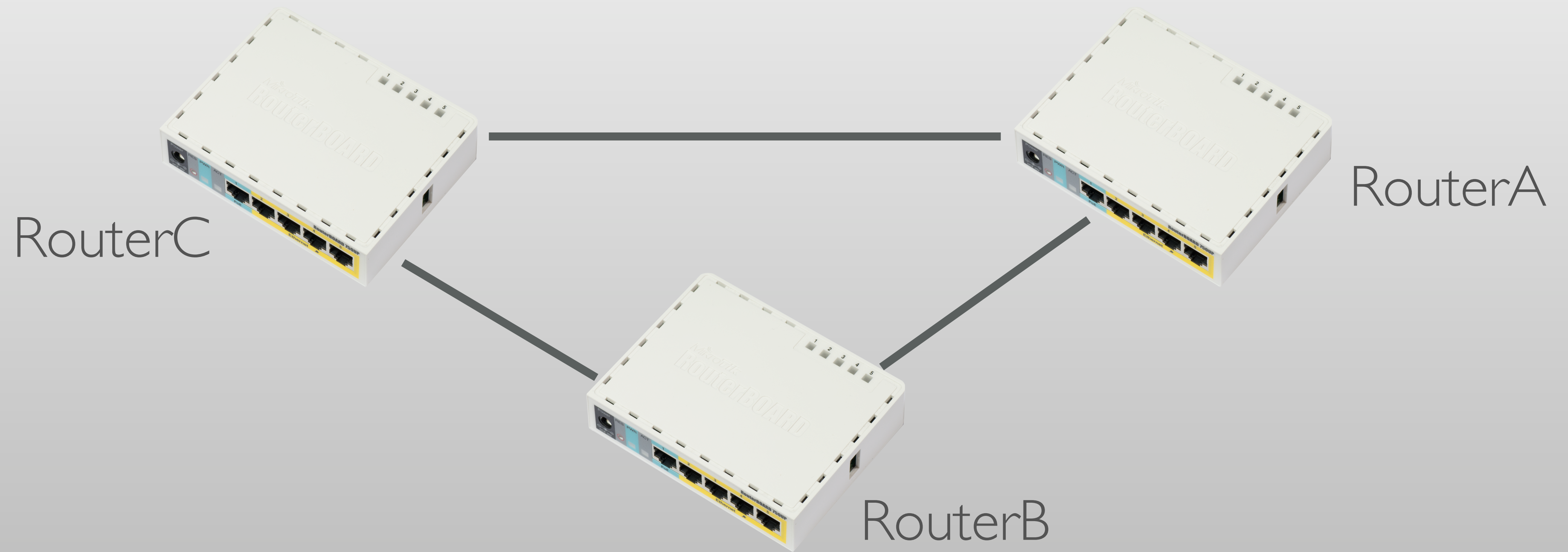
- Automated Routing with OSPF or BGP
  - Benefits
    - System builds itself based on parameters you set
    - Fully automated failover
    - Infinitely scalable
  - Problems
    - Notifications need to be in place for failovers
    - Good hardware needed on towers and core

# ROUTING CHOICE - OSPF OR BGP?

OSPF	BGP
Fairly easy to implement	More challenging to implement
Routing table takes some time to build	Routing table is built almost instantly
Failover is sometimes slow due to Routing table build time	Failover time can be fully customised
Routing path control is a bit challenging	Routing filters makes routing path control easy

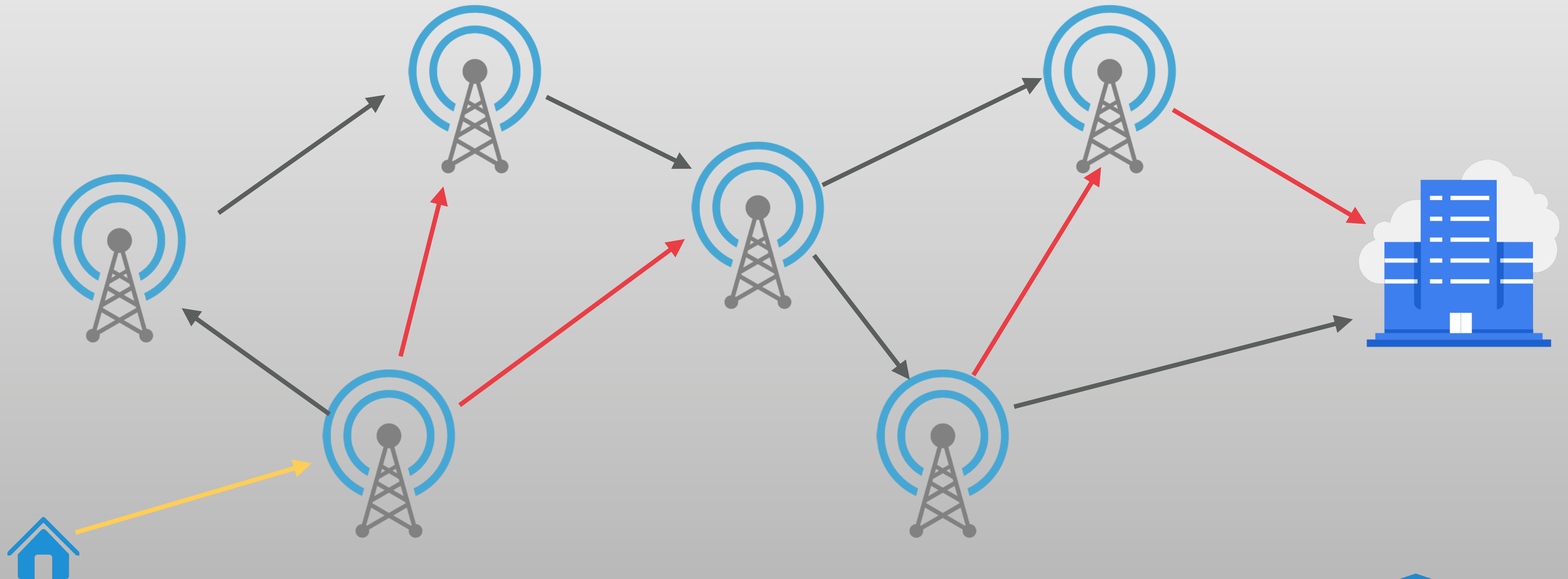
# ROUTING CHOICE - OSPF OR BGP?

DEMO



# PPPOE DIALUP - TOWER OR CORE?

- Dialup to Tower

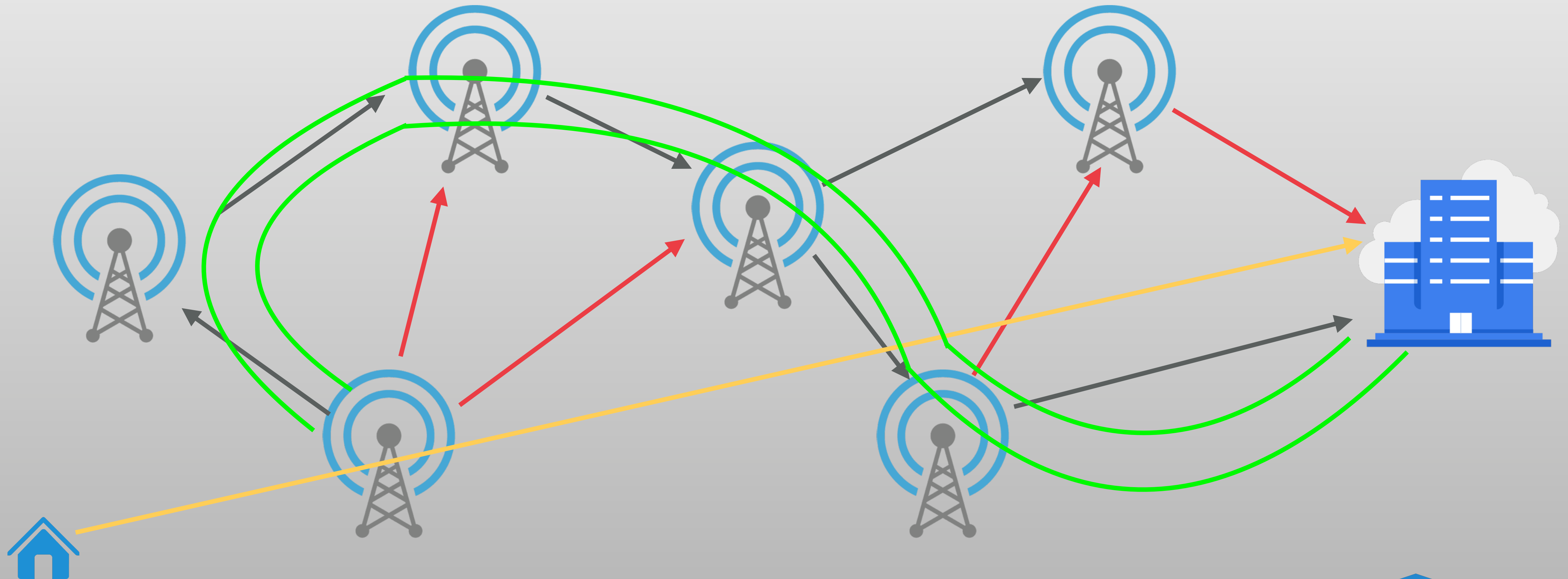


# PPPOE DIALUP - TOWER OR CORE?

- Dialup to Tower
  - Benefits
    - PPPoE Sessions stay active during a failover
    - MTU works very well as there are no tunnels
  - Problems
    - Client trace routes reveal your internal IP infrastructure
    - Good hardware needed on towers and core
    - Monitoring is difficult
    - Queues are managed by the tower (more resources)
    - Each tower router needs a separate firewall configuration

# PPPOE DIALUP - TOWER OR CORE?

- Dialup to Core (through tunnels)





# PPPOE DIALUP - TOWER OR CORE?

- Dialup to Core
  - Benefits
    - PPPoE Sessions stay active during a failover with appropriate BGP
    - Client trace routes show fewer hops
    - Easy monitoring of active clients and faults
    - Queues are handled by the core - Less expensive tower routers needed
    - Allows for a single central firewall on core for all clients
  - Problems
    - MTU needs to be considered with EoIP Tunnels

# PPPOE DIALUP - TOWER OR CORE?

## DEMO

