

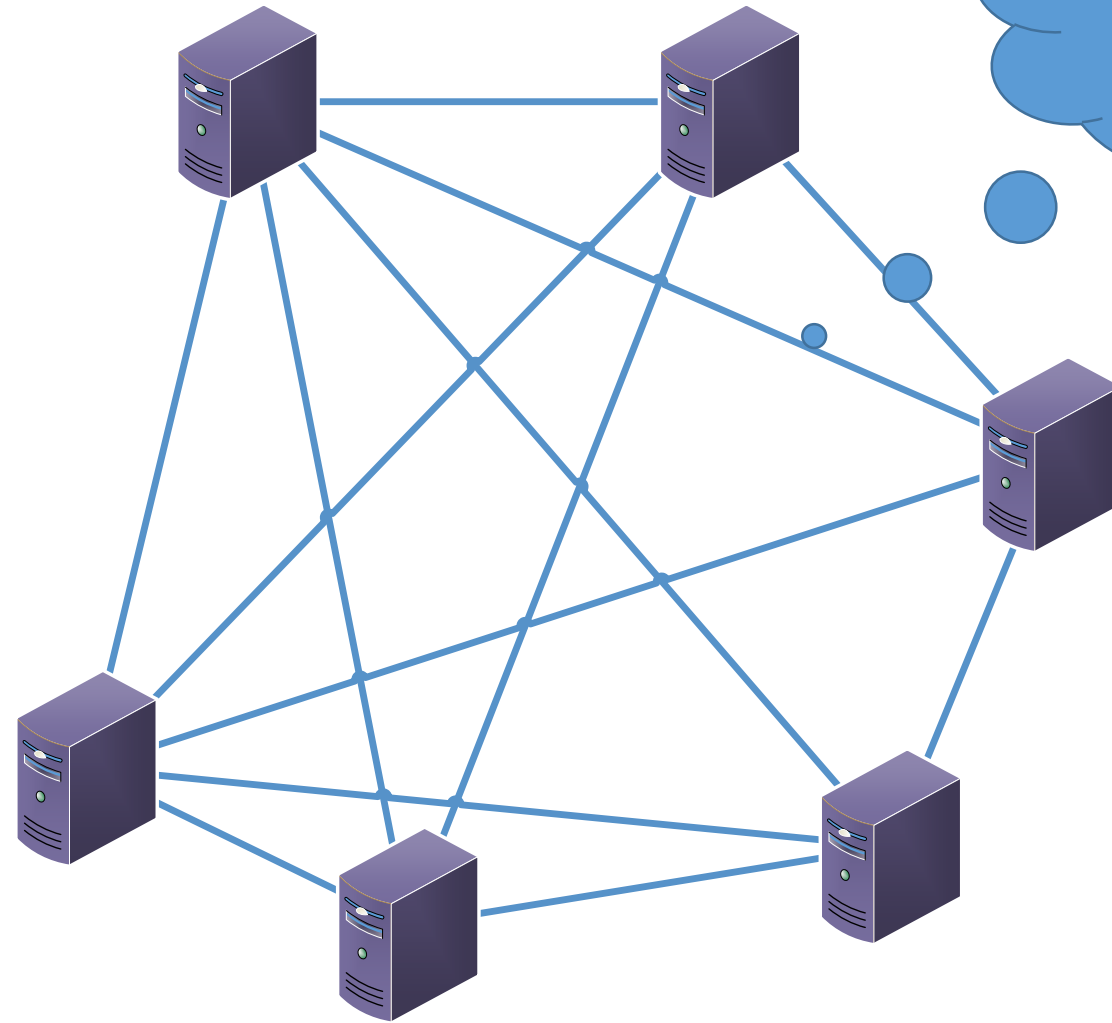
# Federation Implementations

# Federation Architectures

# Federation Architectures

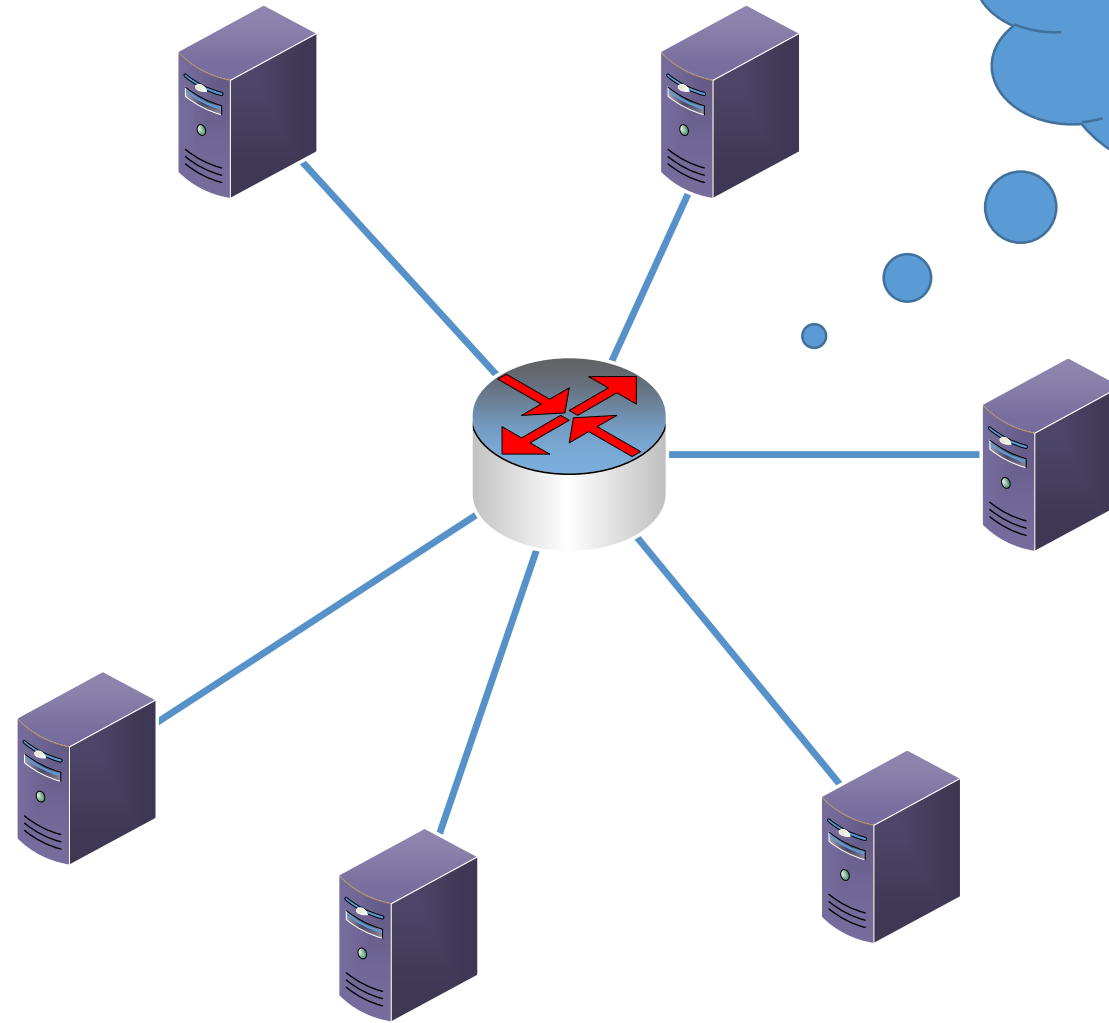
- Full Mesh
- Hub and Spoke
  - Central Login
- Hybrid

# Full Mesh Federations



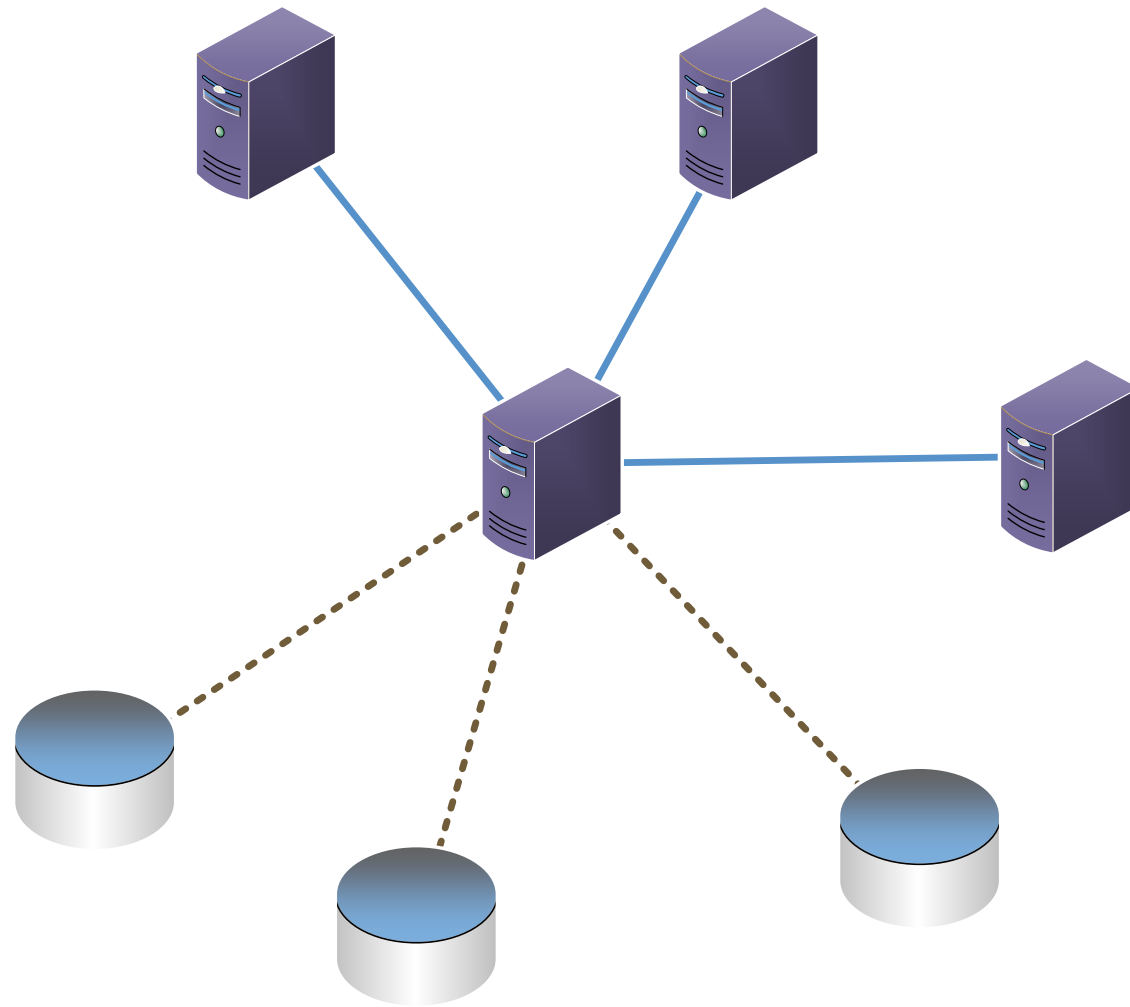
eduGAIN uses a  
full mesh  
architecture

# Hub and Spoke Federations

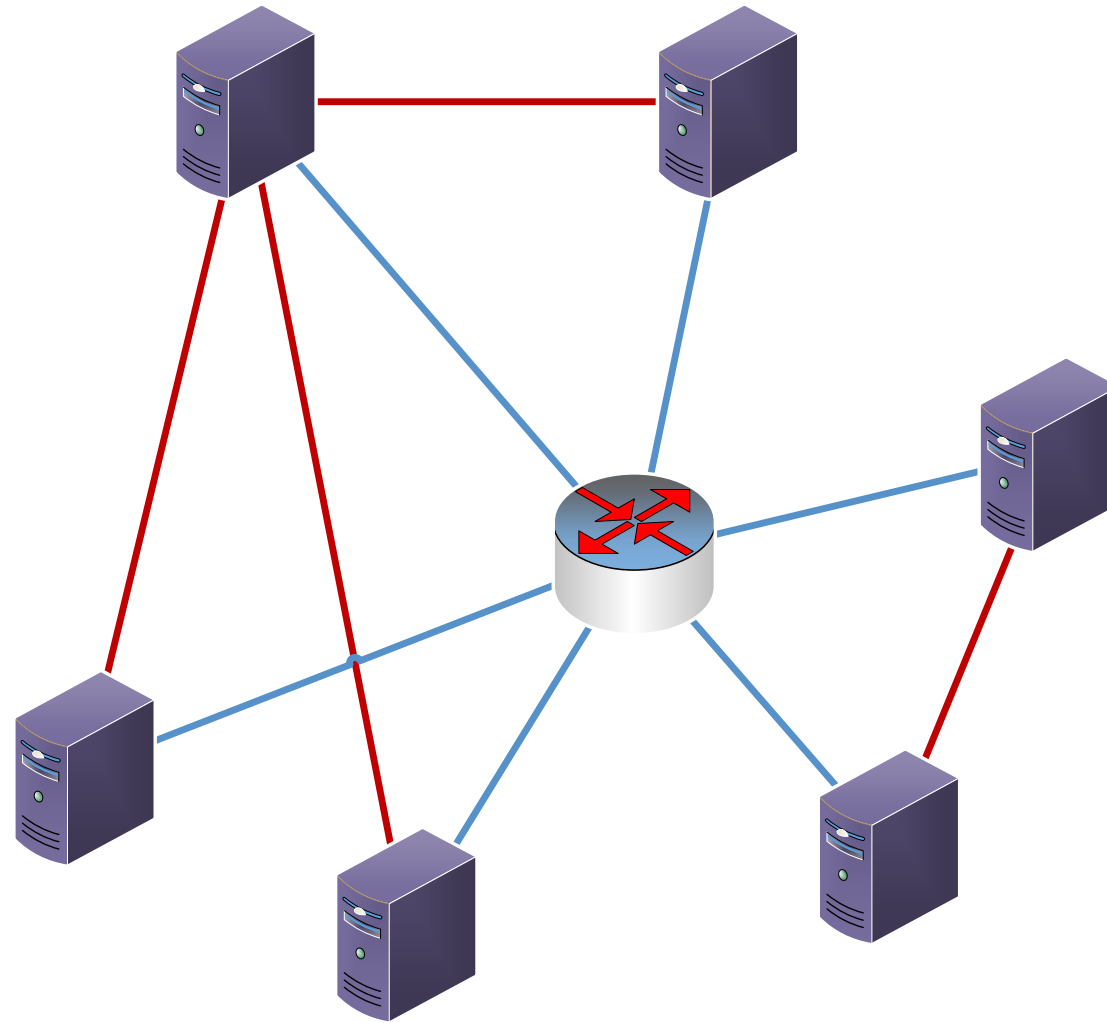


eduroam uses a  
hub and spoke  
architecture

# Central Login (a variant of Hub & Spoke)



# Hybrid Federations



# Full Mesh Pros & Cons

## Pros

- Simpler for the operator
- Better UX
- No single point of failure
- No single point to intercept attributes (good privacy)
- Individual providers have full control of their data

## Cons

- May be harder for new providers
- All providers must agree on a standard protocol (SAML2INT) – complicates interoperability with commercial software
- Harder to debug problems
- Larger metadata



# Hub and Spoke Pros & Cons

## Pros

- Makes on-boarding simpler for providers
- Hub can hide/resolve interoperability problems
- Hub can extend or transform attributes

## Cons

- Complicates discovery
- Hub can be a single point of failure
- More complex to operate, and requires more investment for the operator
- Individual providers lose some control
- Privacy

# Central Login Pros & Cons

## Pros

- Most of the pros of a hub & spoke, plus:
- Even lower barrier to entry

## Cons

- All the cons of a hub & spoke, plus:
- Loss of individual institutional identity
- Higher support costs

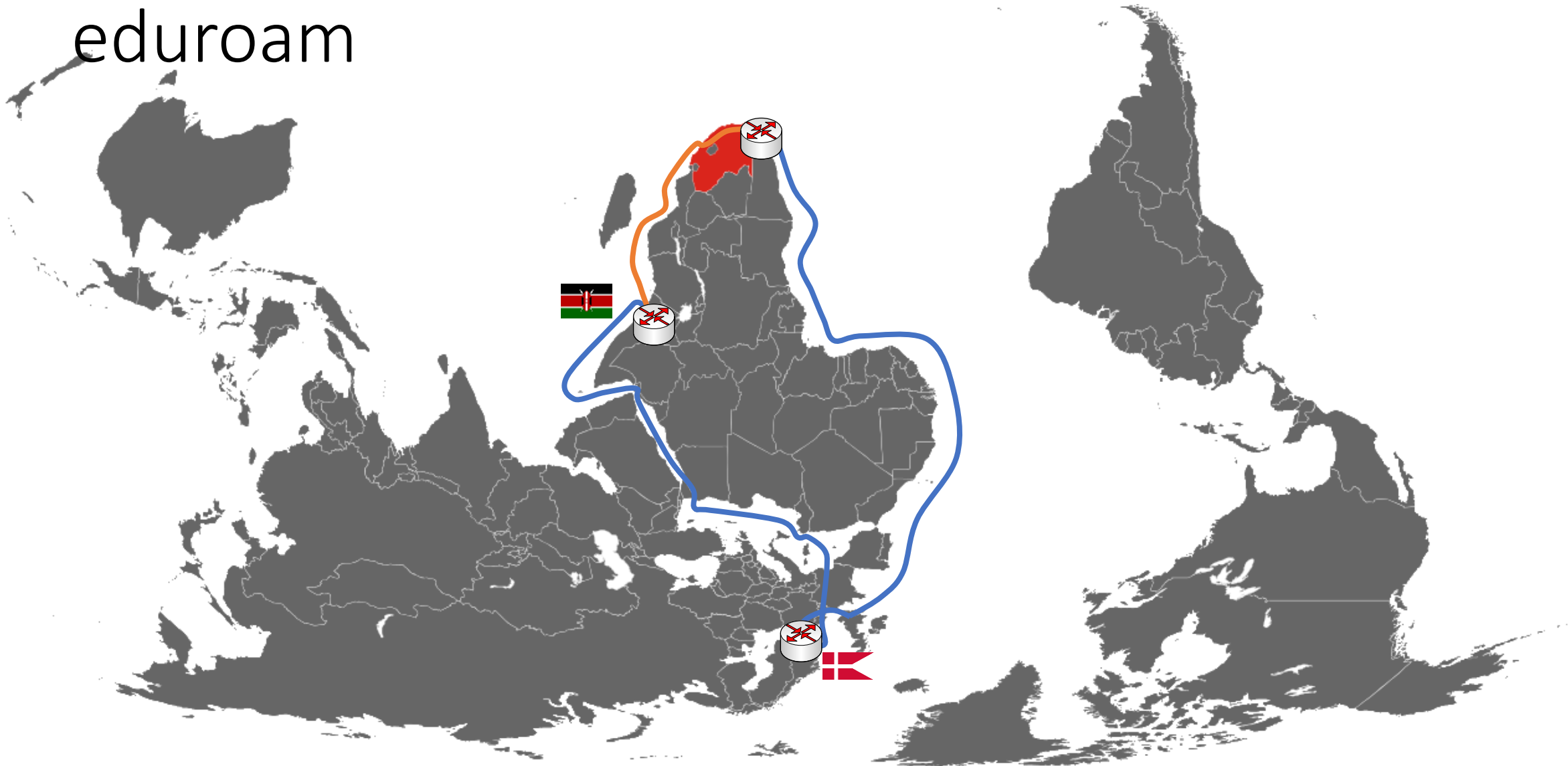
Which architecture is right for  
you?

# Case Study: eduroam

# eduroam: Why hub & spoke?

- Allows the use of off-the-shelf RADIUS servers
  - Reuses existing skill sets in network admin
  - RADIUS inherently supports proxying
  - Really hard to do discovery
- 
- But the architecture is inefficient and has single points of failure...

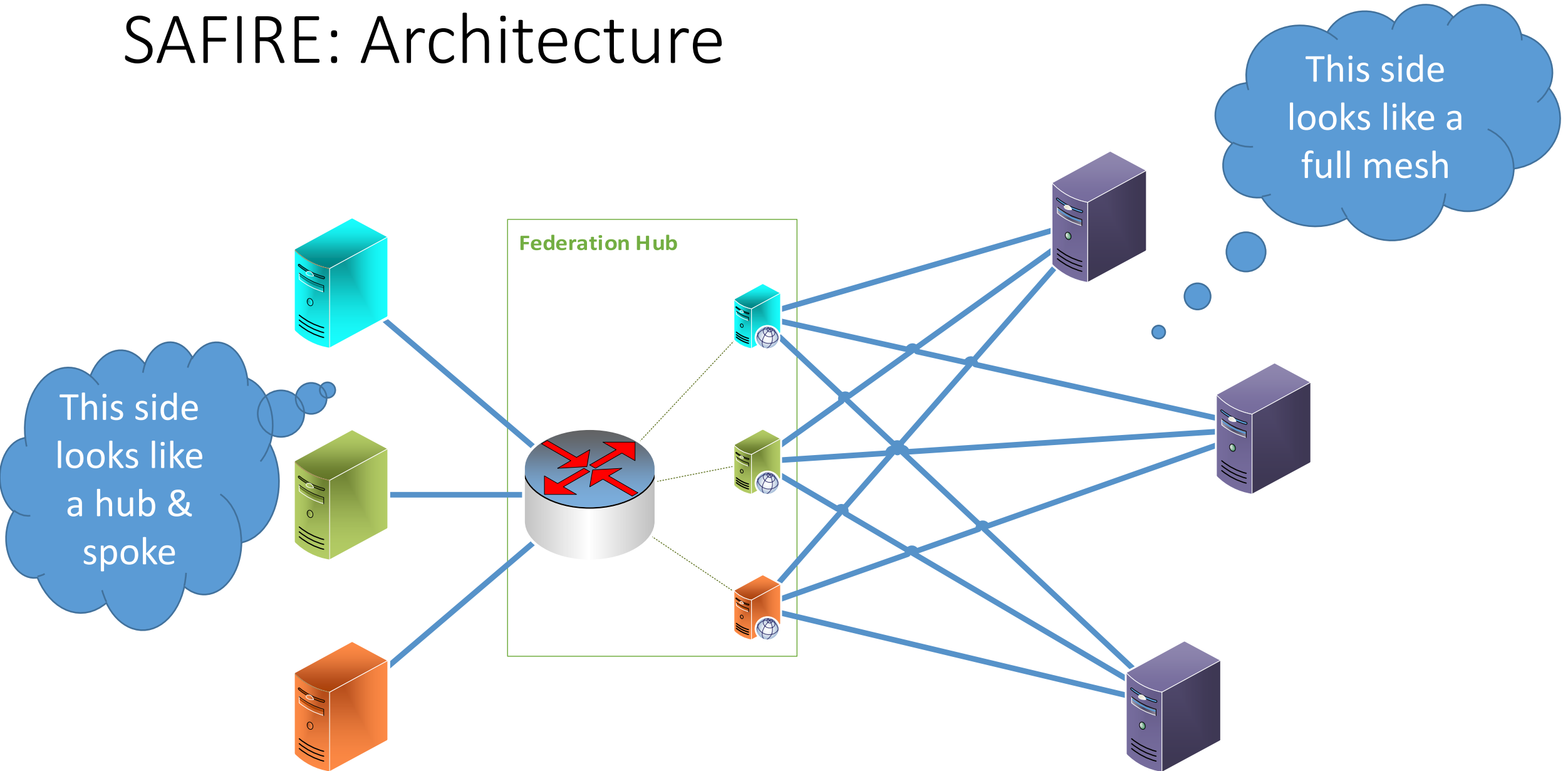
eduroam



# Case Study: SAFIRE

SAFIRE is a hub and spoke federation that looks like a hybrid/full mesh

# SAFIRE: Architecture





# SAFIRE: Why hub & spoke?

- Massively reduces the barrier to entry for new institutions
- Allows us to centralise scarce skills in the NREN
- Means we can take on providers full mesh federations can't even consider
  
- But, we look like a full mesh to fix the discovery problem...