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Why anycast?

- Better service to more users
- Help mitigate the load of DDoS attacks

# IPv4 and IPv6

- Most deployed anycast infrastructure is over IPv4
- Anycast distribution of services using IPv6 was prohibited by RFC 2373 (section 2.6)
  - prohibition lifted in RFC 3513 based on operational experience with IPv4 anycast
- Some IPv6 deployment (e.g. F-Root)

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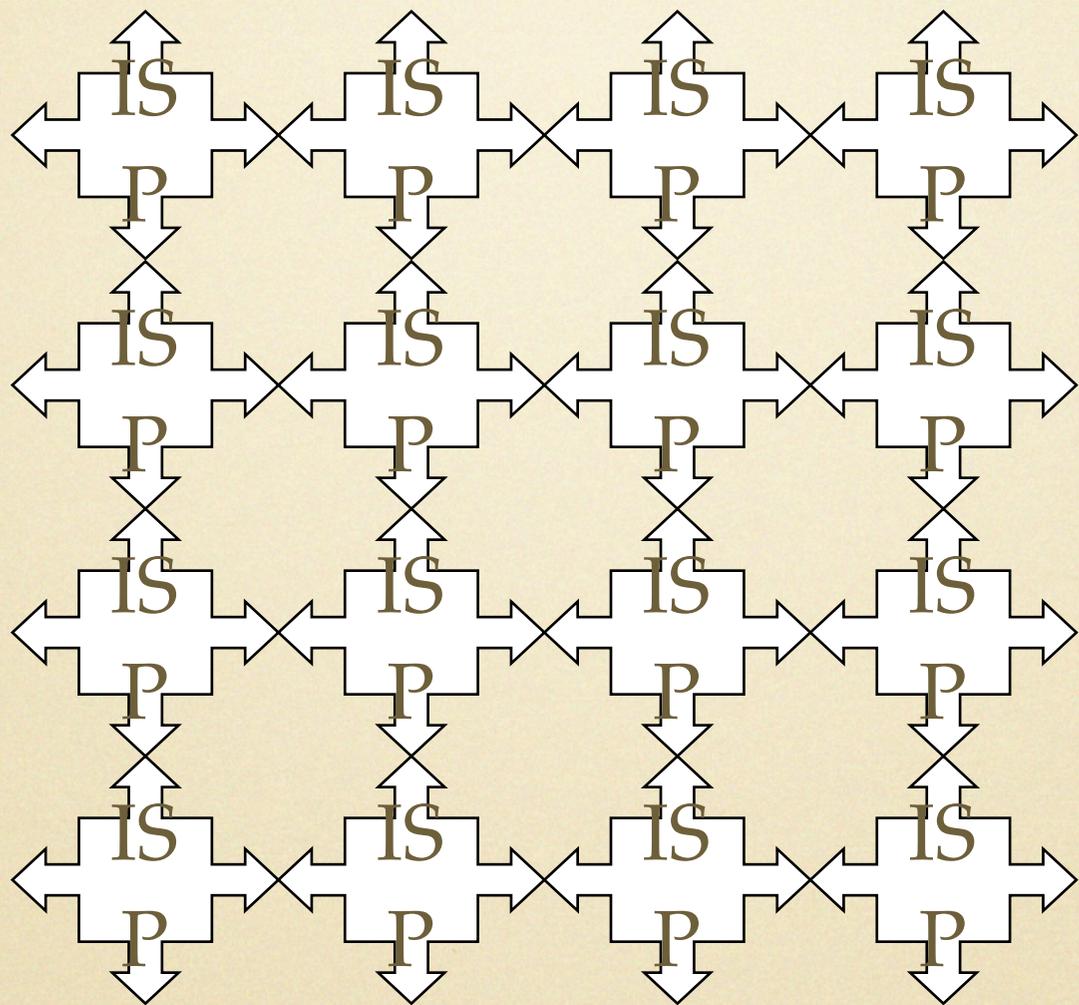
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- **THE SAME** data (usually)

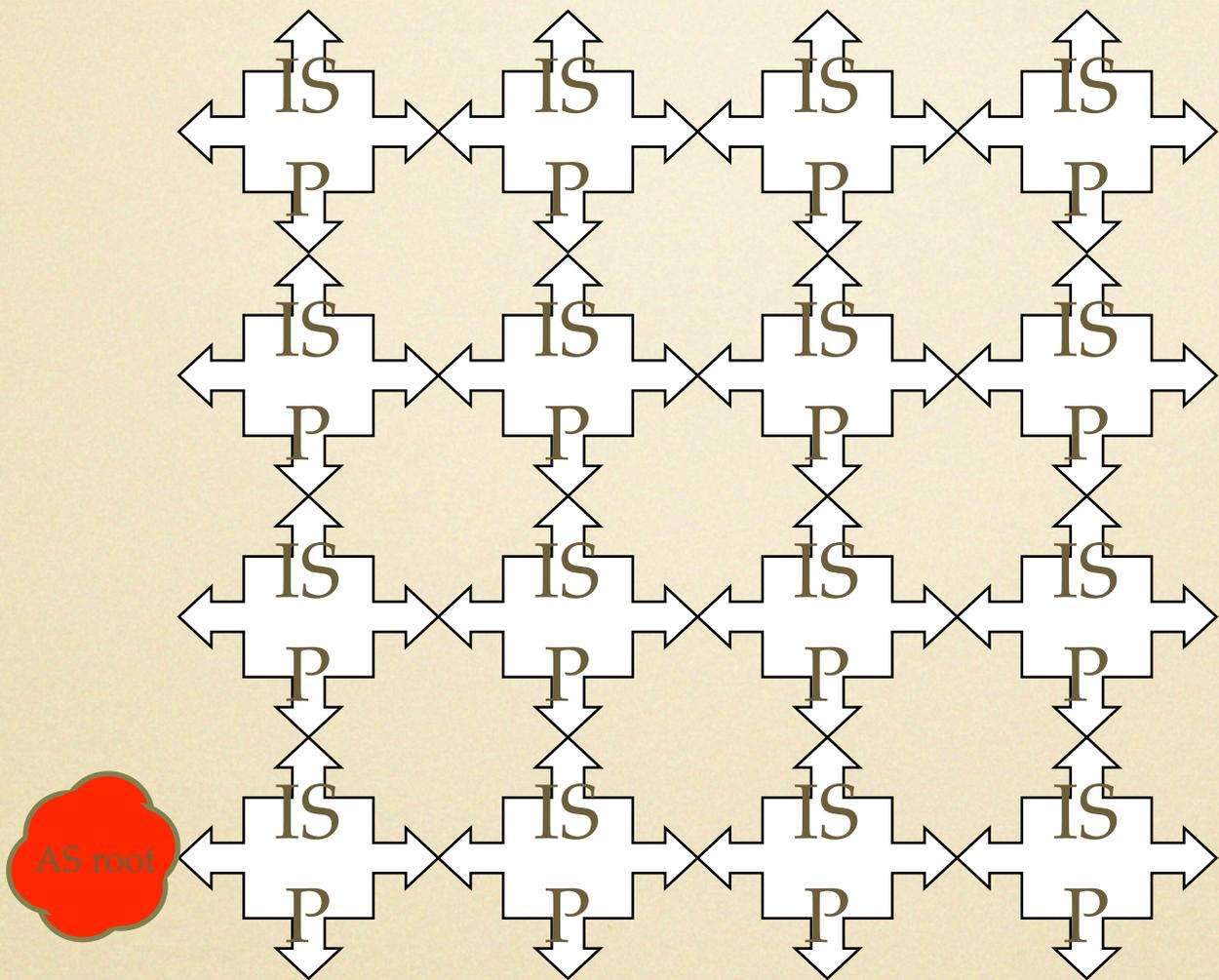
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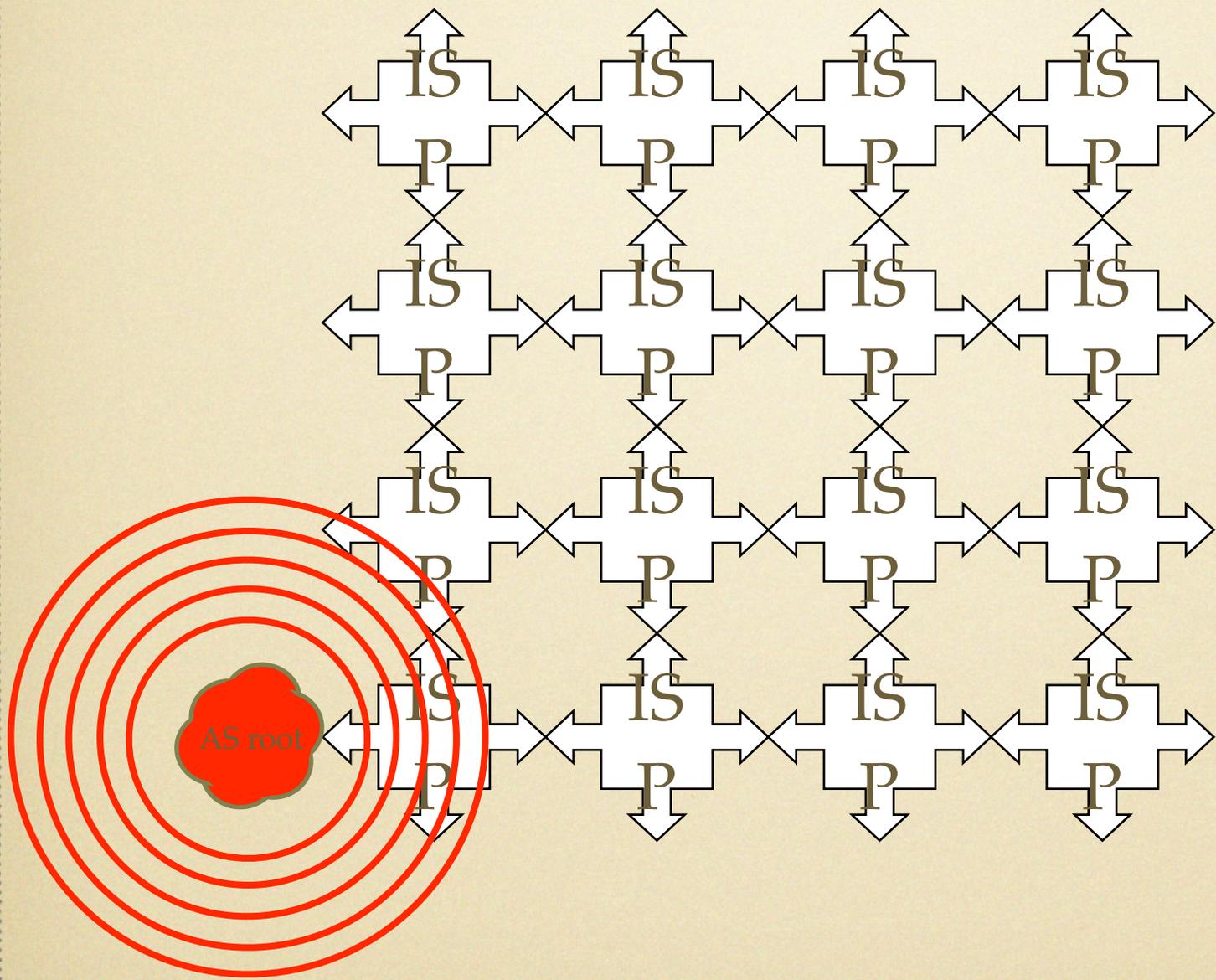
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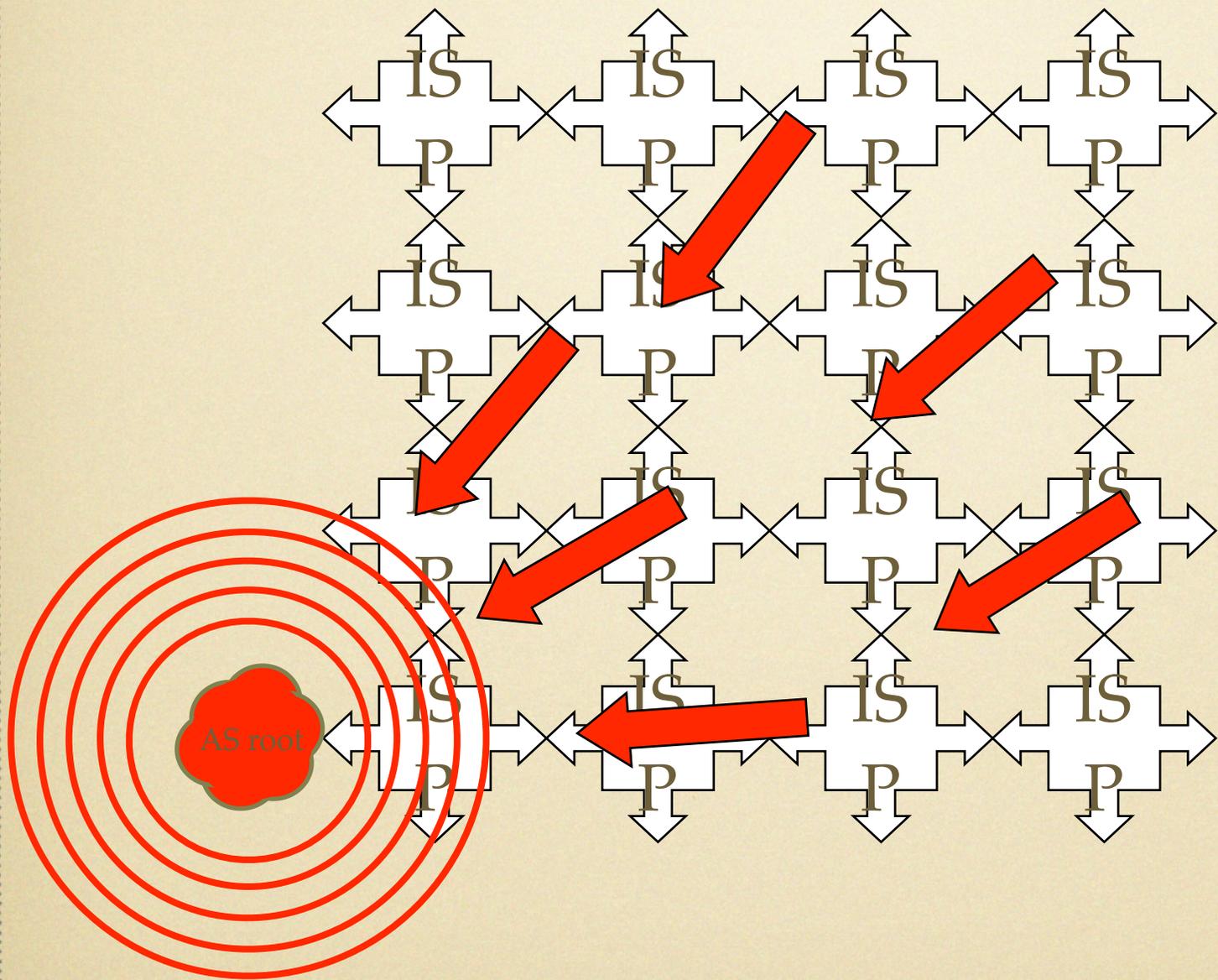
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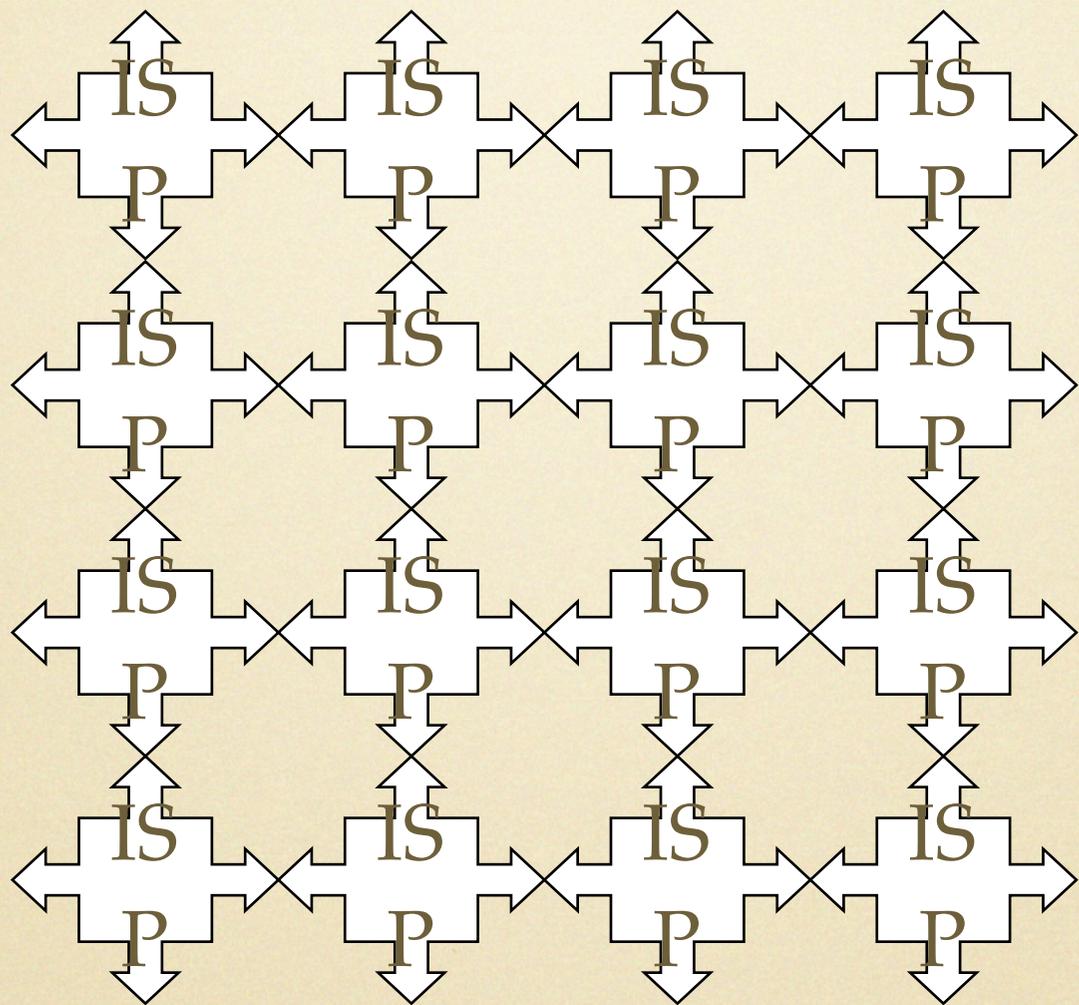
- Nodes located around a network
- **THE SAME** network information
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- **DIFFERENT** servers
- The routing system guides a request from a client towards an appropriate node

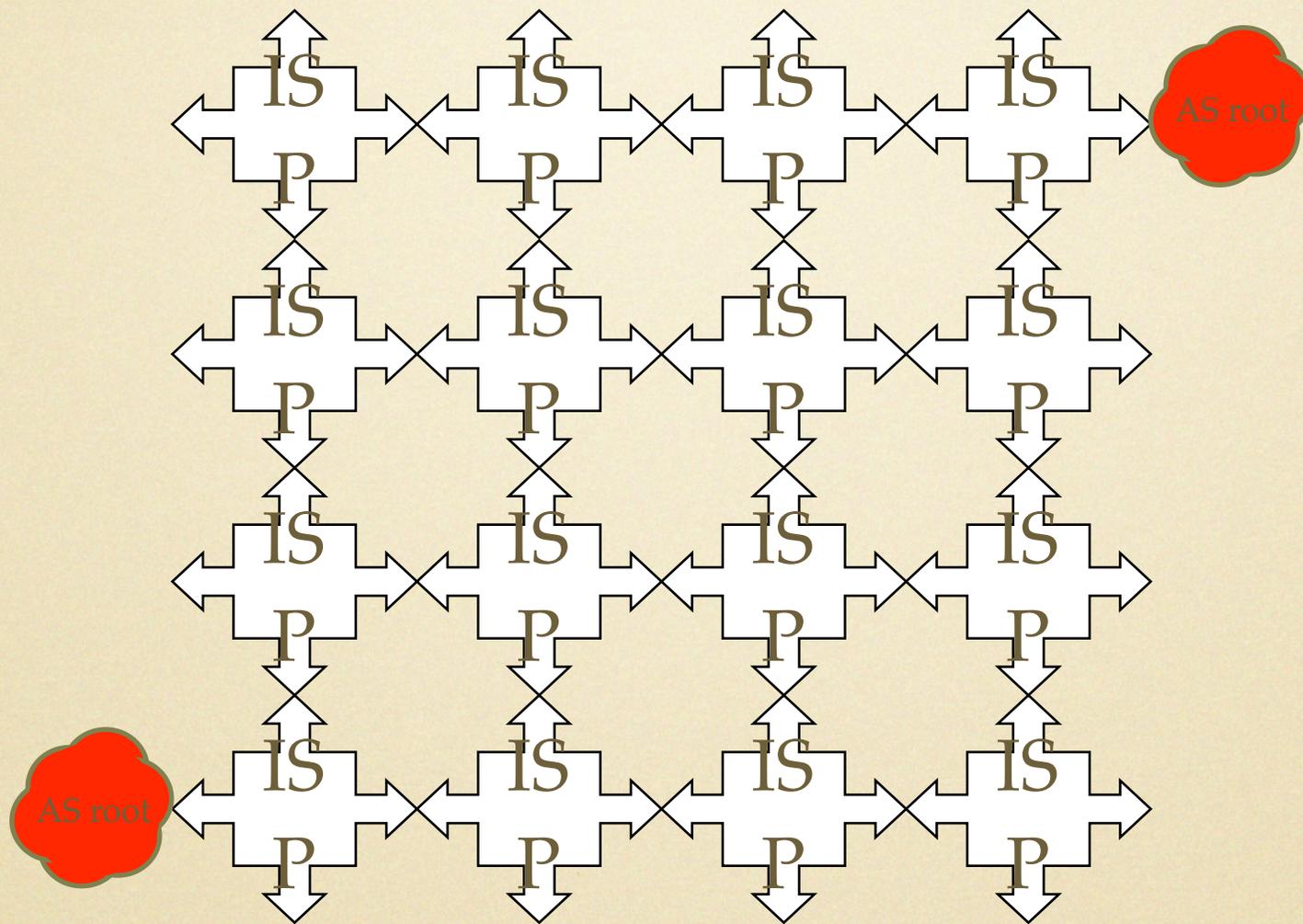


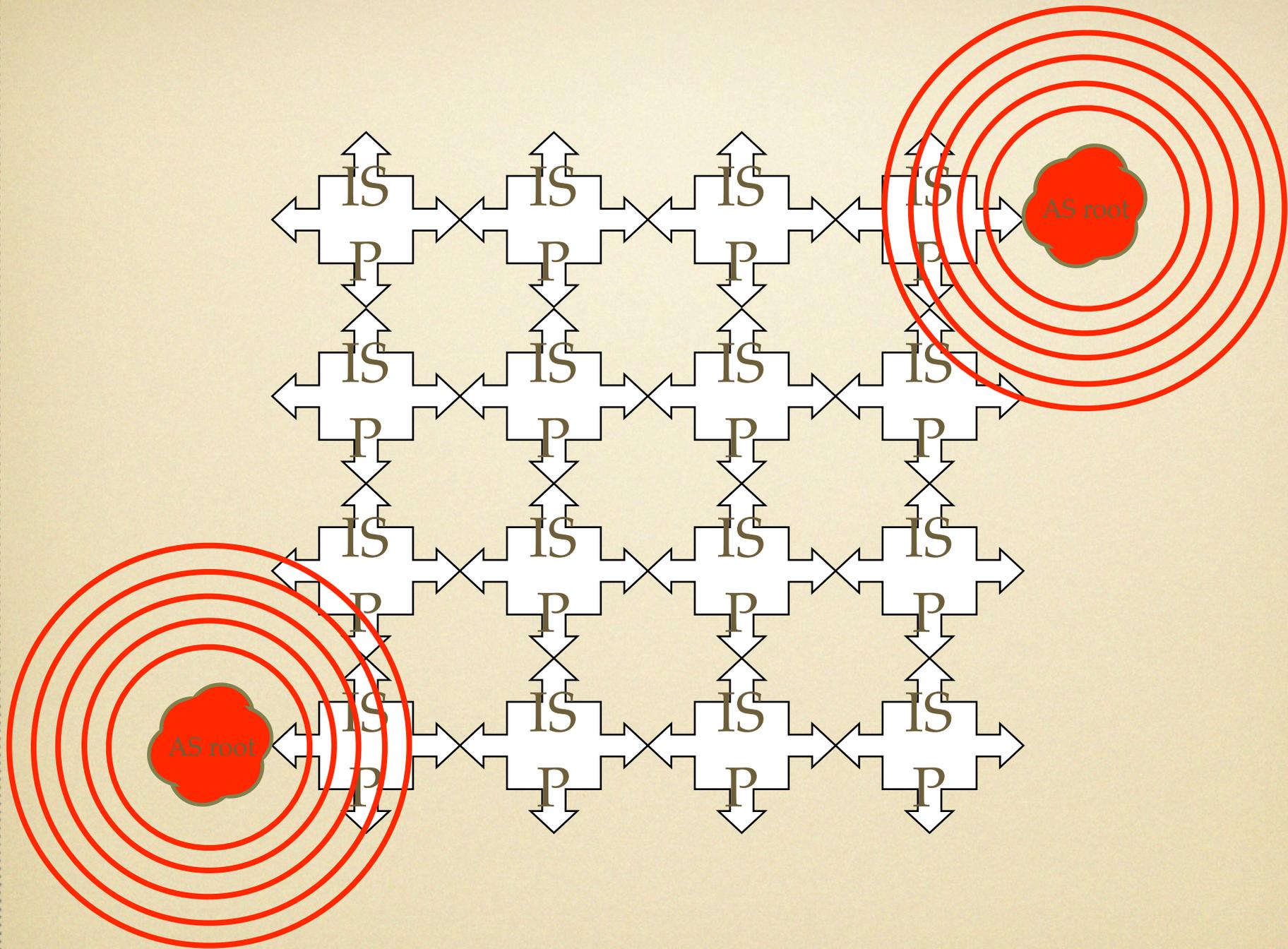


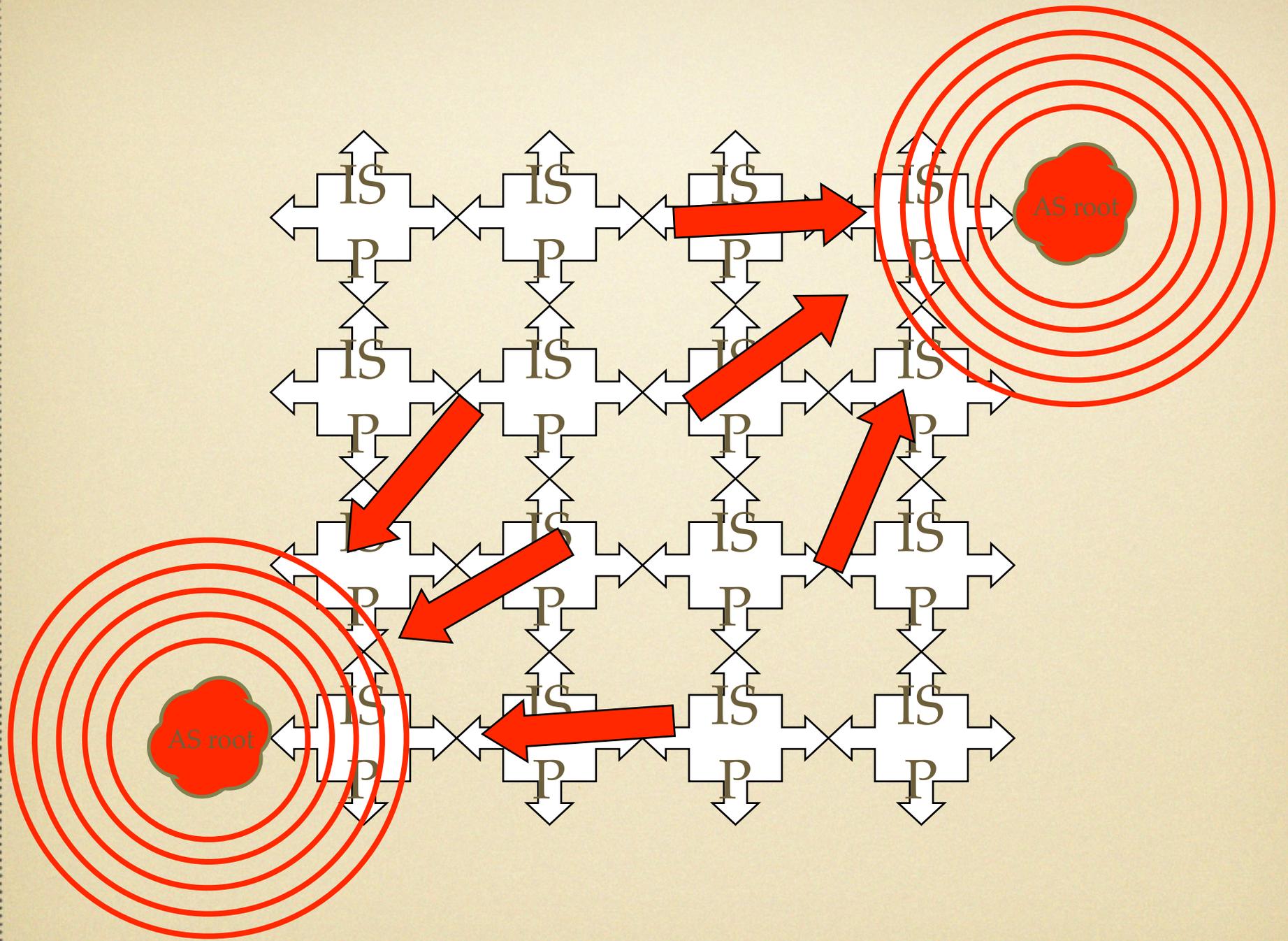












# How does Anycast Work?

- Anycast routes can be injected into the global routing system using BGP, or into an IGP
  - In the latter case for anycast inside an operator's network
- Suitability of protocols for anycast vary
  - e.g. protocols with a long transaction time (and those that require state to be retained between transactions) require a stable routing system

# Not Universally Applicable

- The suitability of anycast as a strategy for distributing a service depends on the characteristics of protocols and the network the service is distributed within
- Anycast is distinctly unsuitable for many combinations of (protocol, network, client distribution)

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- Automatic fail-over
- Localisation of attack traffic and flash crowds

# Implementation

- Service availability
- Covering prefix
- Measurement

# Considerations with anycast

- Equal-cost-paths
  - can be found in real networks (e.g. in an IGP, or on the Internet with PPLB)
  - with an IGP there are route selection strategies that can help (e.g. CEF)
  - on the Internet, if PPLB is done on two links to two different ASes and these ASes have selected different anycast nodes, then this spells trouble (but not just for anycast)

# Considerations with anycast

- Route-dampening
- RPF
  - anycast infrastructure looks like a big, multi-homed AS; RPF checks on links to multi-homed networks require care (or should be avoided)

# Service Area

- Services distributed on the Internet
- Taxonomy: local node, global node
- Limiting propagation of the service prefix is possible with coarse BGP attribute mangling (e.g. NO\_EXPORT)

# Active Draft

- draft-ietf-grow-anycast-04 aimed at BCP
  - recently emerged into the I-D index
  - -02 passed grow wglc
  - -03 incorporated small changes in response to AD review, and was IETF last-called
  - -03 completed SecDir and Gen-ART review

# Active Draft

- draft-ietf-grow-anycast-04 contains some small changes following SecDir review
- the authors will be asking the grow chair to run a fresh grow wglc to make sure we have consensus

Questions?