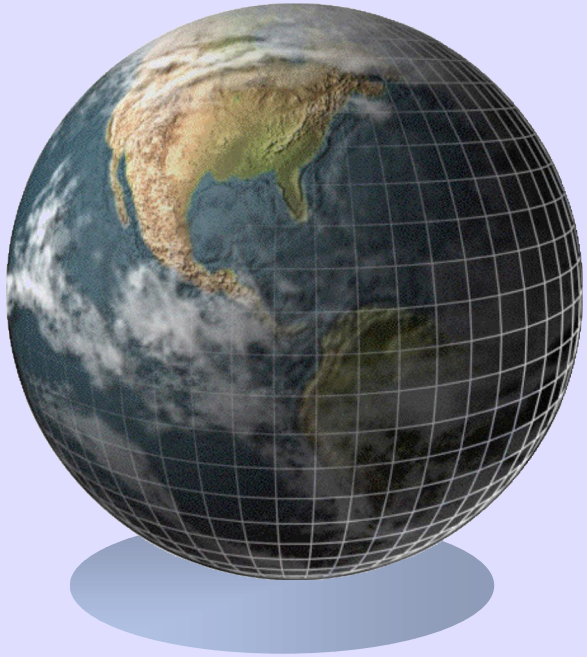
Root Name Service Stability



Lars-Johan Liman, M.Sc.
Senior Systems Specialist
Autonomica AB
(i.root-servers.net)

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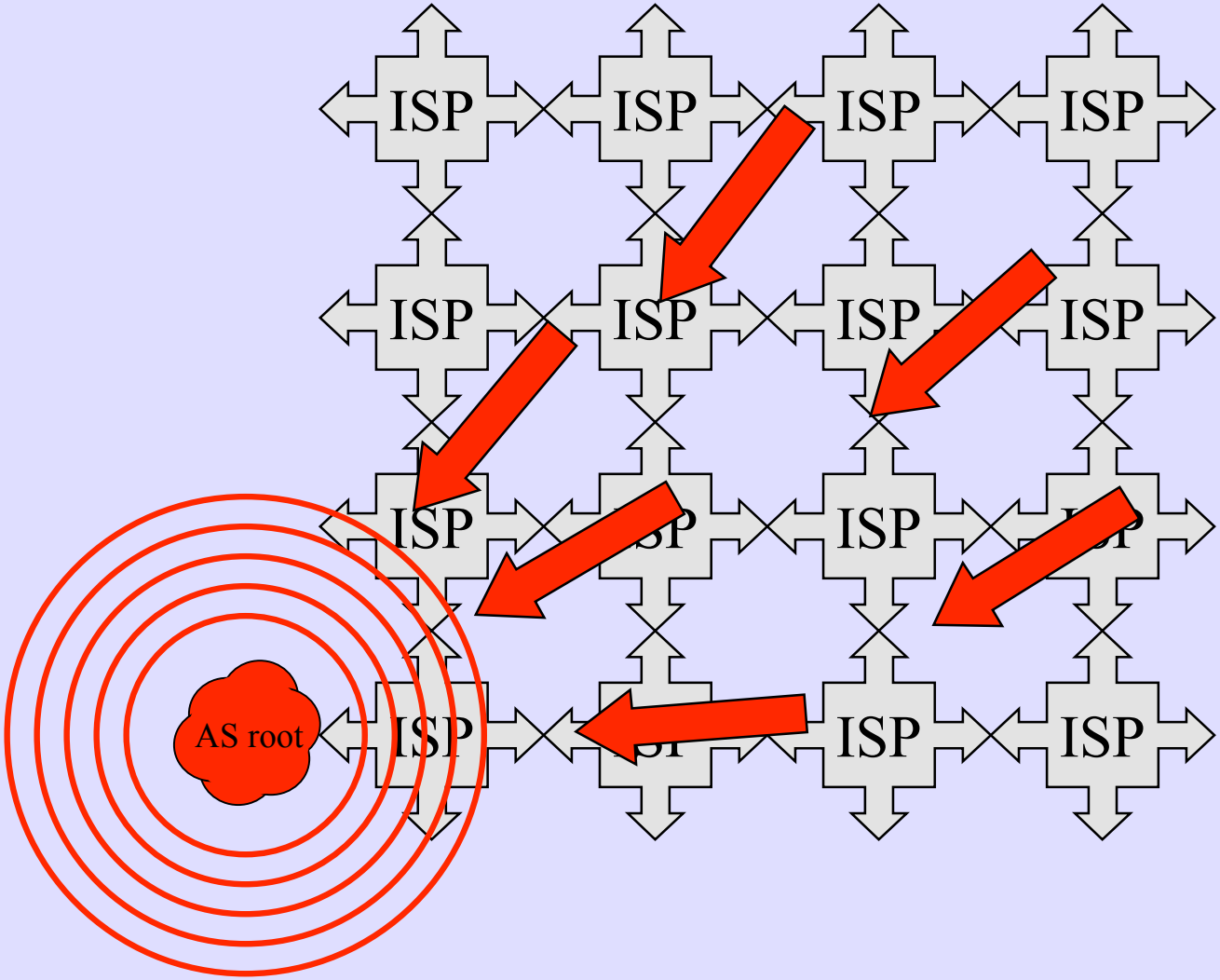
Disclaimer

- Root server organizations operate indivitually.
- I can only speak authoritatively for i.root-servers.net operated by Autonomica AB based in Stockholm, Sweden.

Stability Factors

- Server and network operations.
  - Software and hardware diversity
  - Location and networking diversity
  - Diversity in operational models
  - Organizational diversity
  - Monitoring
  - Operational experience
- Data integrity.
  - Authenticated data transfers.
  - Monitoring



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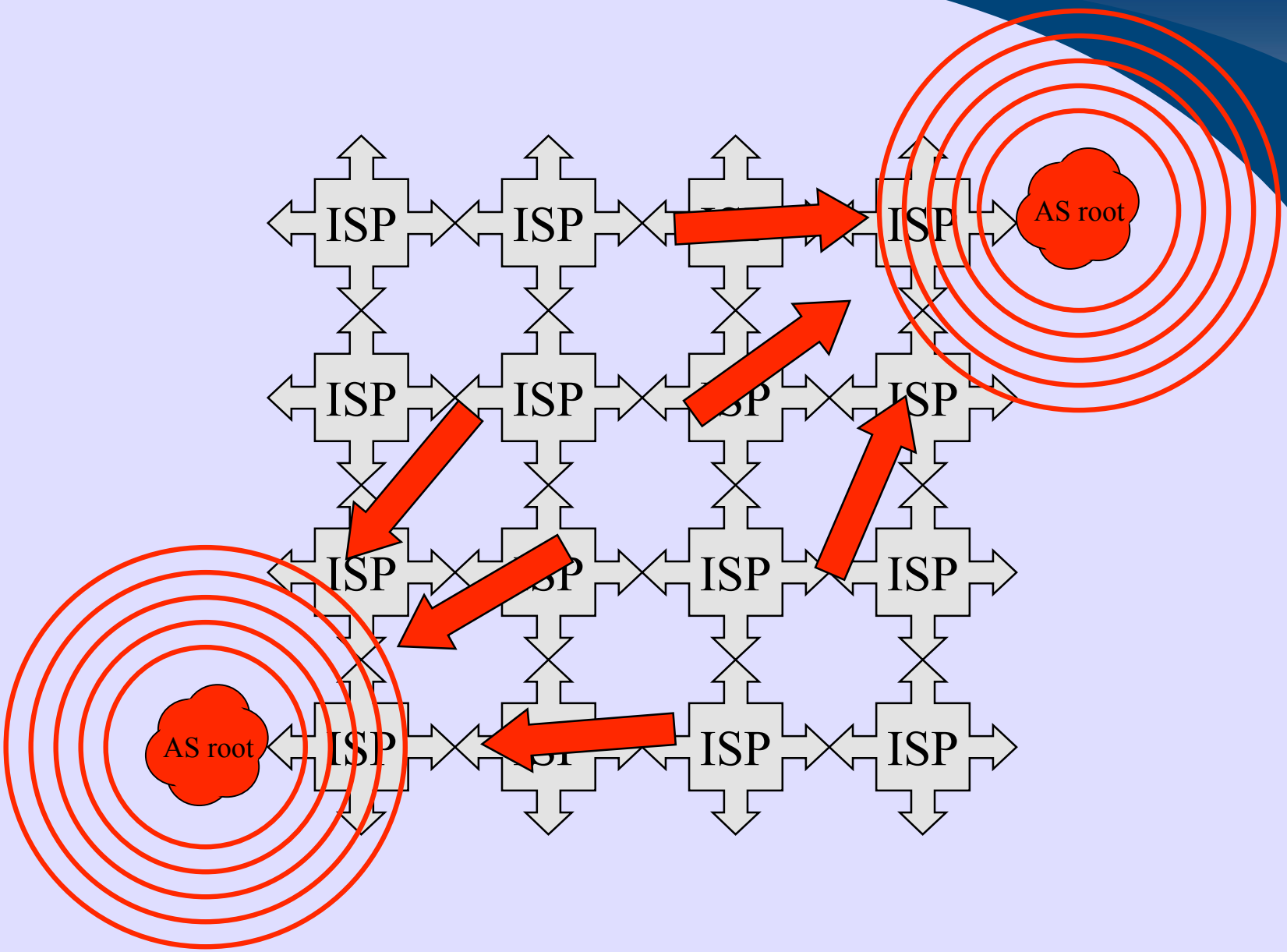
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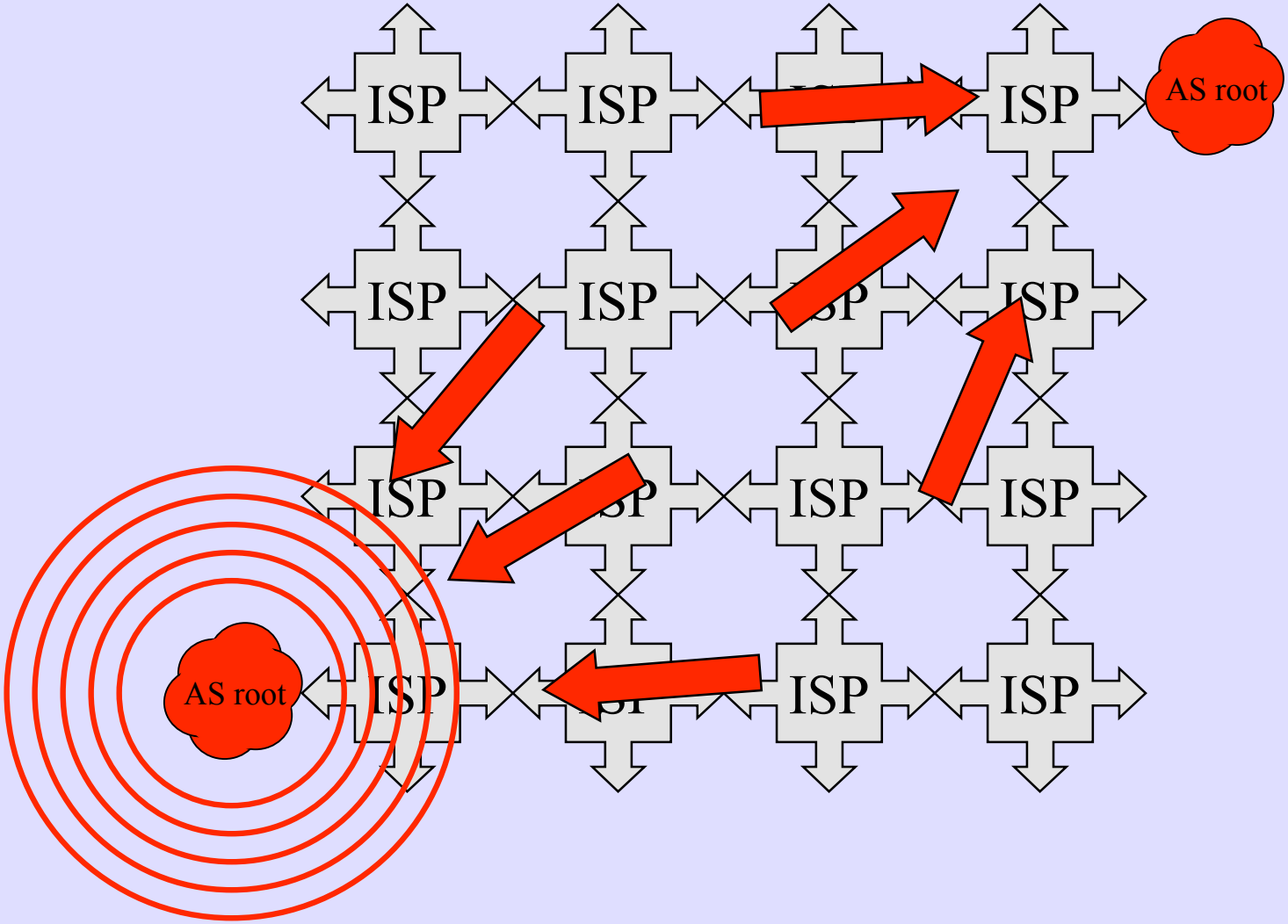

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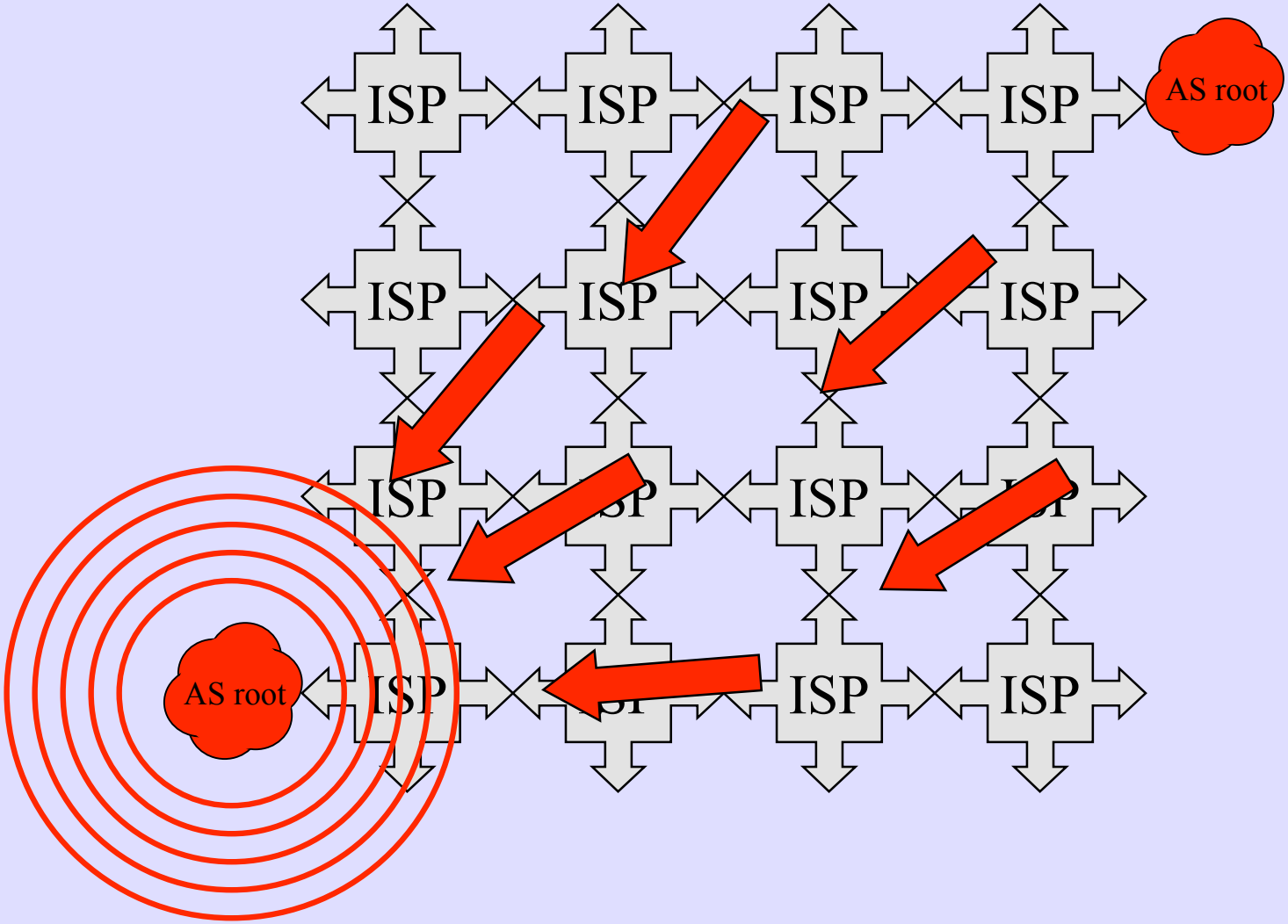
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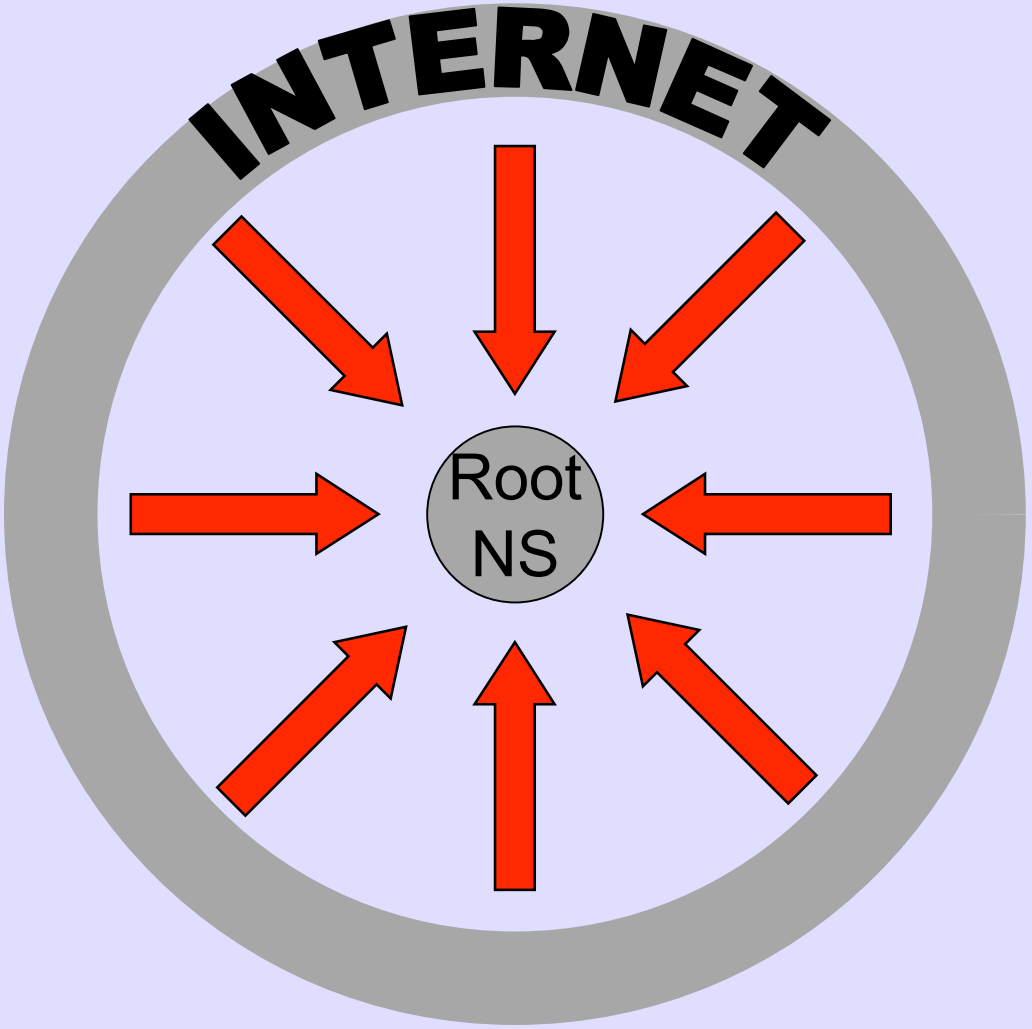
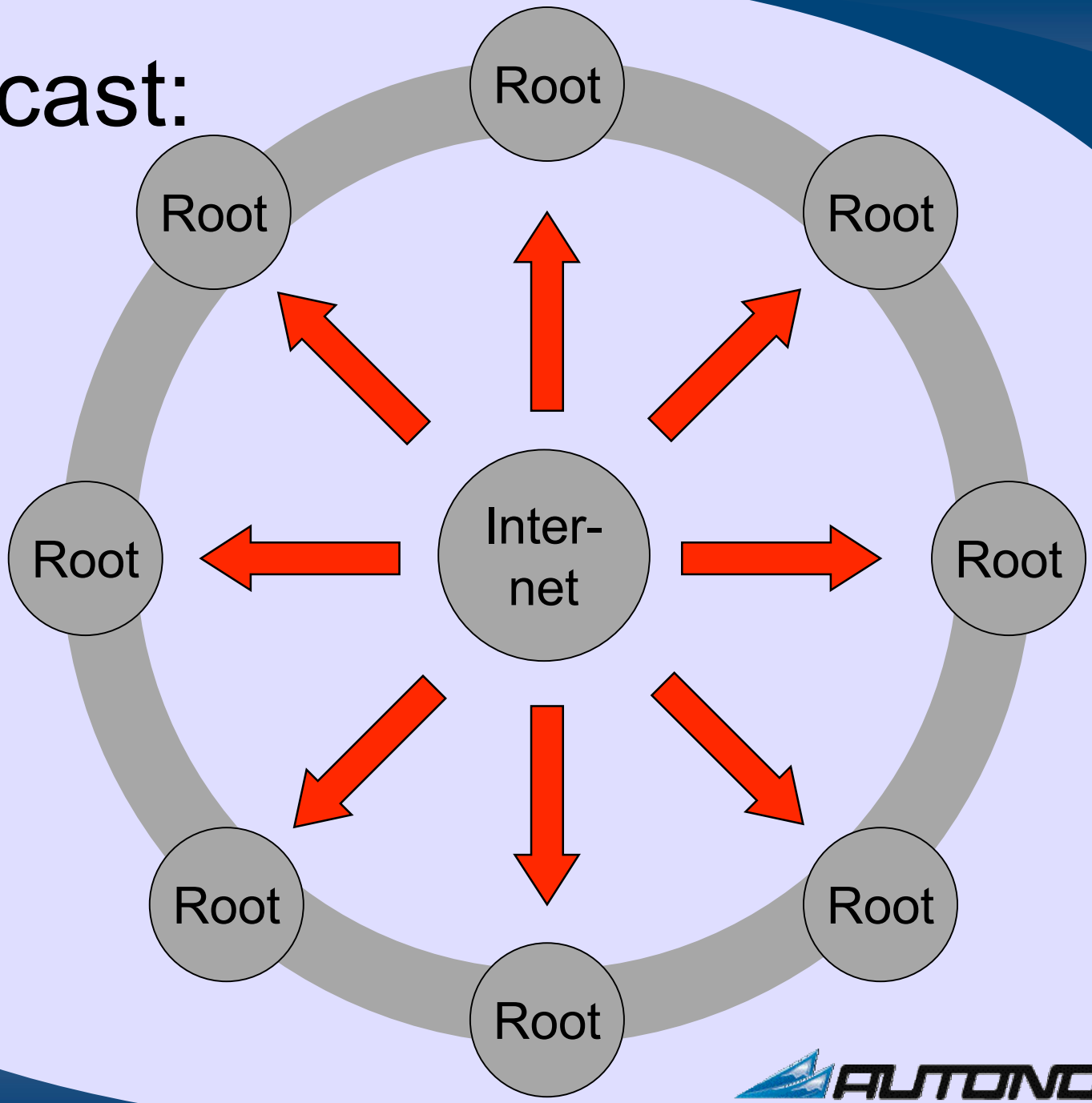
Unicast:



Anycast:



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Strategic Challenges

- Fundaments
  - Content governance. ⇐ ***STABILITY IS CRUCIAL!***
  - Technology.
    - Internet Standard compliance
  - Finance.
- Scaling
  - Growing in line with the demand ...
  - ... from end users.
  - ... from (top level) domain name holders.
  - ... from the root content authority.

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Some Direct Threats

- Distributed Denial of Service Attacks?
  - Anycast
- "Packet of Death"?
  - Software and platform diversity
  - *VERY* close relationship with software developers
- Social Engineering?
  - Organizational diversity
  - Very good collaboration btw. root ops

Some Direct Threats

- Bad data?
  - ***Need unquestionable authority for data!***
  - Strong editing procedures are essential
  - Signed data transfers
- False root servers?
  - TSIG doesn't scale
  - SIG(0) might work, but not widespread, cumbersome
  - Legal prosecution? Slow!
  - Waiting for DNSSEC (helps authenticating data, not servers, but mitigates problem)