

Using IP anycast for HA webapps

R.P. (Adi) Aditya

rpaditya@umich.edu

Senior Network Architect

How?

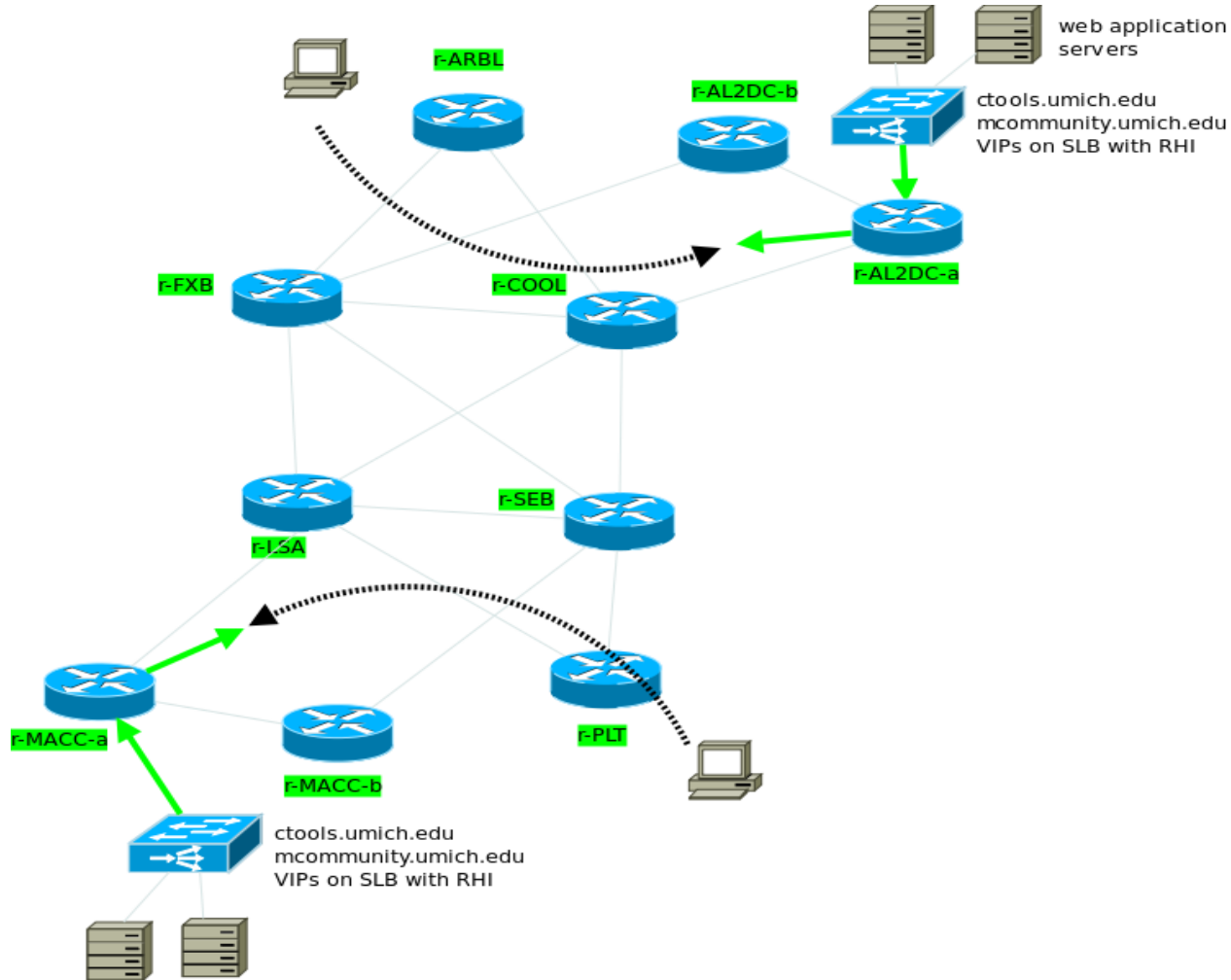
- Use routing protocol to advertise same IP address in multiple locations simultaneously.

Why IP Anycast routing for HA services?

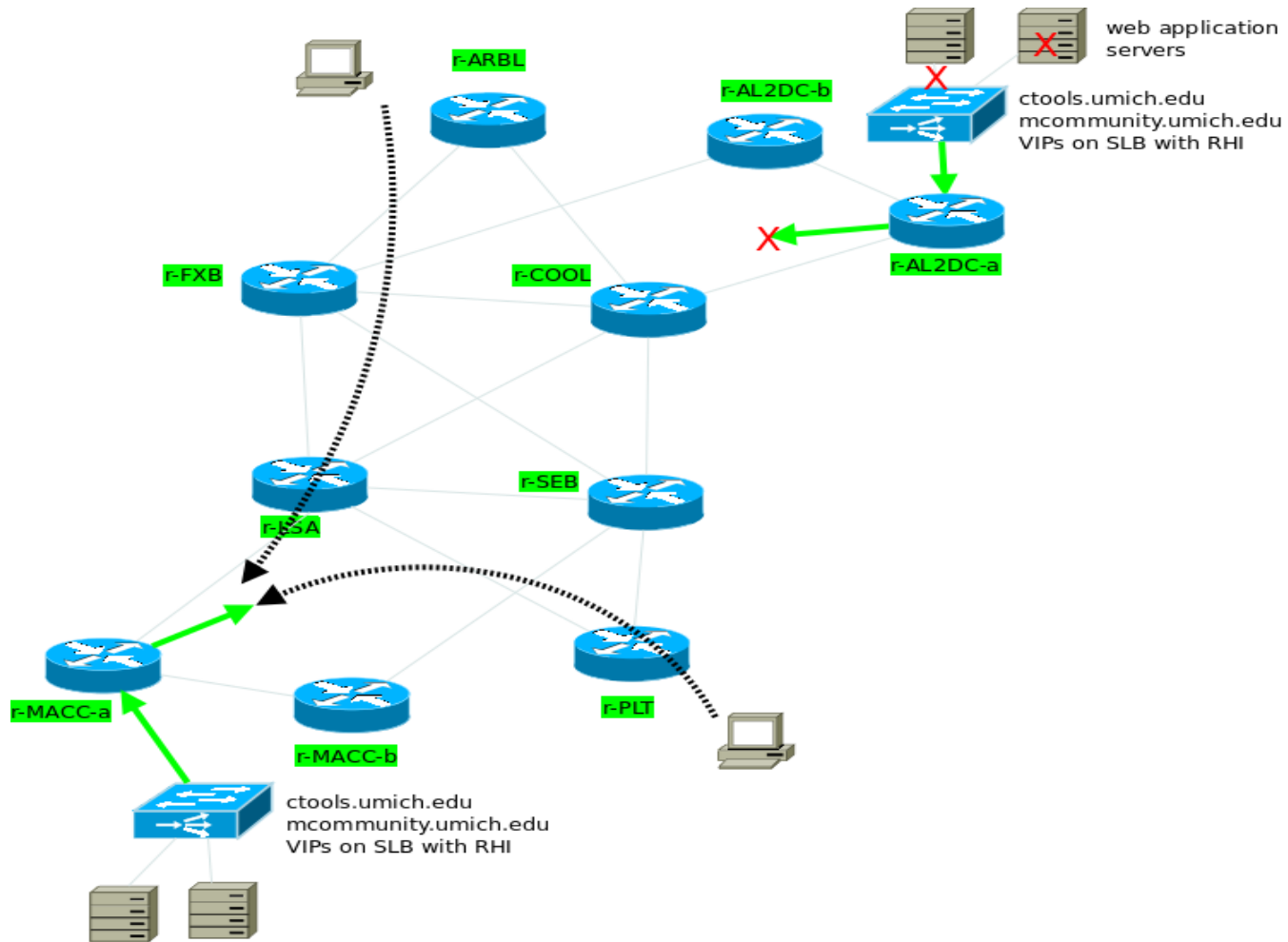
- Provides "shortest"-path routing (lowers latency)
- "transparent" failover in case of instance failure
- network partition resilience (if app is also partition tolerant)
- load-distribution

if done right!

Anycast auto-routes to "nearest" instance of app

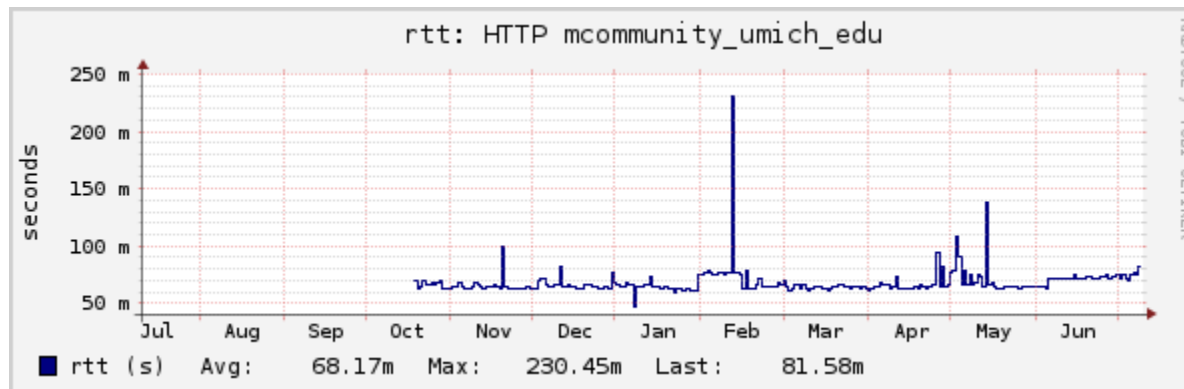


Anycast auto-reroutes on failure of an app instances

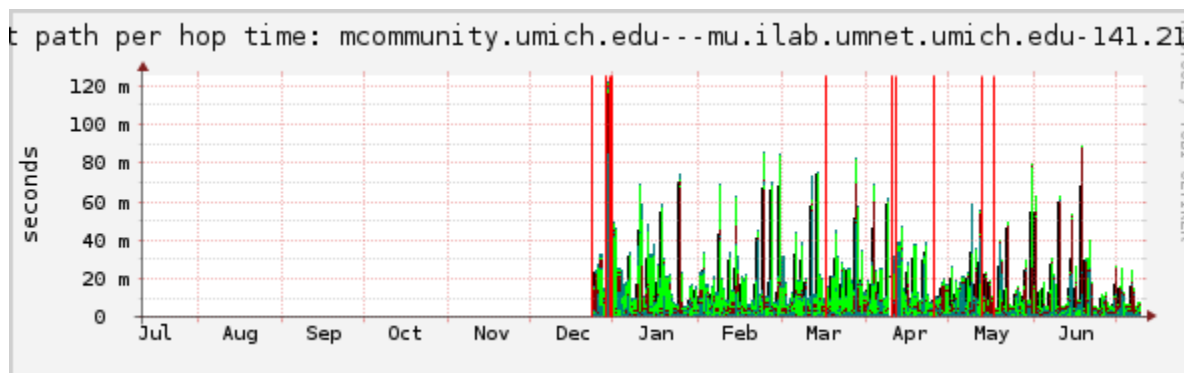


- network anycast routing is worth deploying if your network and routing are more stable than the server infrastructure and application
- typically used for short-lived, session-less services
- used to great effect for DNS recursive and auth service, both intra- and inter- domain
- used occasionally for inter-domain CDNs for HTTP, over TCP
- we use it intra-domain for HTTP/S web applications for all the advantages it provides

Our Enterprise web directory HTTP rtt on average



red vertical lines are route switches, almost all due to planned maintenance



Anycast Problems

- harder to debug if there are routing oscillations
- Coordinate multiple instances -- client might hit multiple versions
- generally more complexity, needs better operator training
- Need better tools to monitor, catch and fix problems

All said, based on our experience, worth doing!

- Rolled out IP anycast routing for our LMS just 2 weekends ago, so far, so good.