

Routing: problems and requirements

RiNG workshop
Madrid, 13 december 2007
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Do we have a problem?

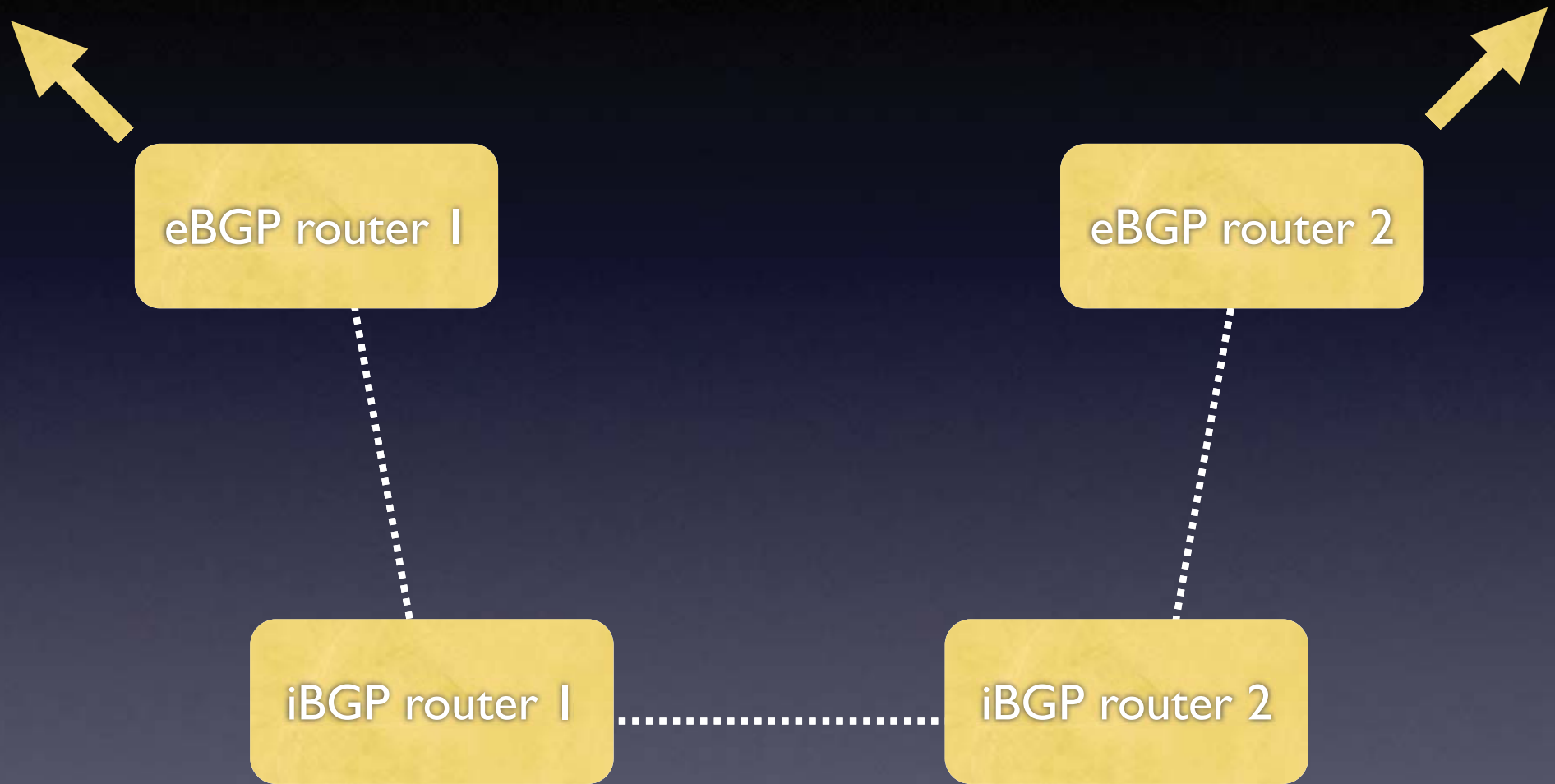
- Most of the time it seems to work!
 - Randy Bush et al. "happy packets" study
- Convergence isn't great
 - (so don't expose failures to eBGP?)
- The internet has to be all things to all people: VoIP, video

Some requirements

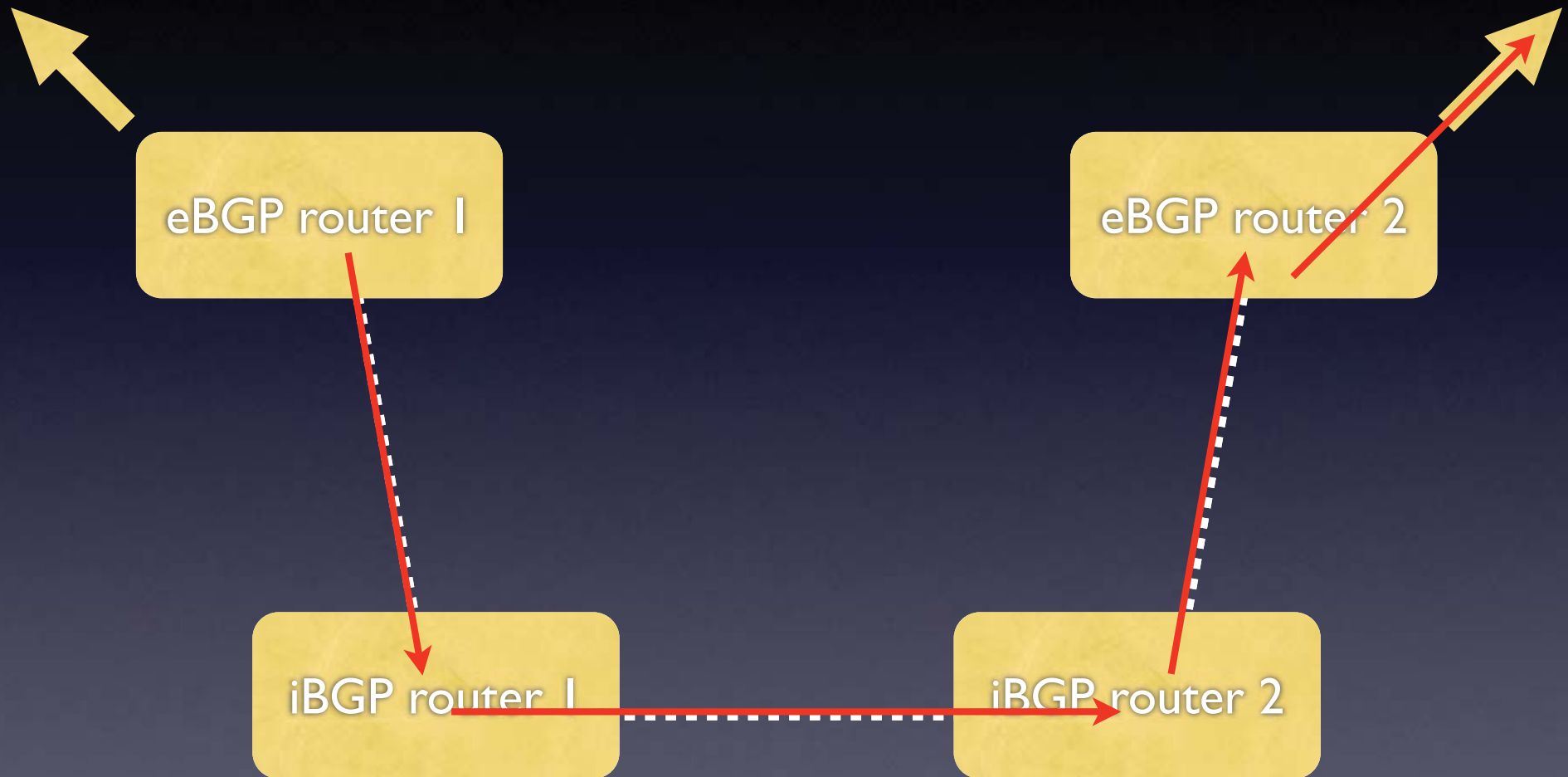
- No policy restrictions
- No topology restrictions
- Cheap/scalable

- "pick any two"
 - (as in: good, fast, cheap)
- Incrementally upgradable, of course

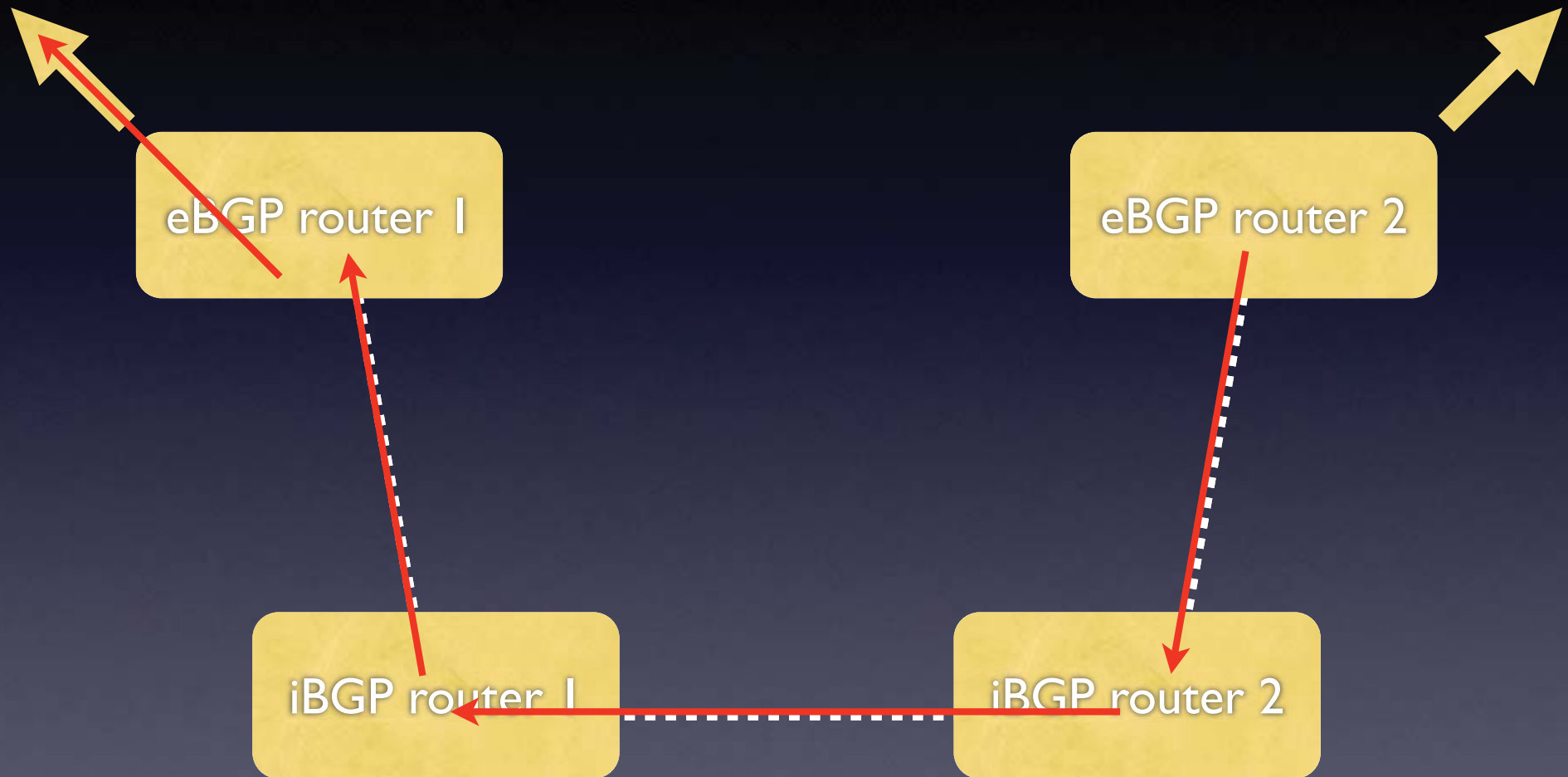
Harmful policies



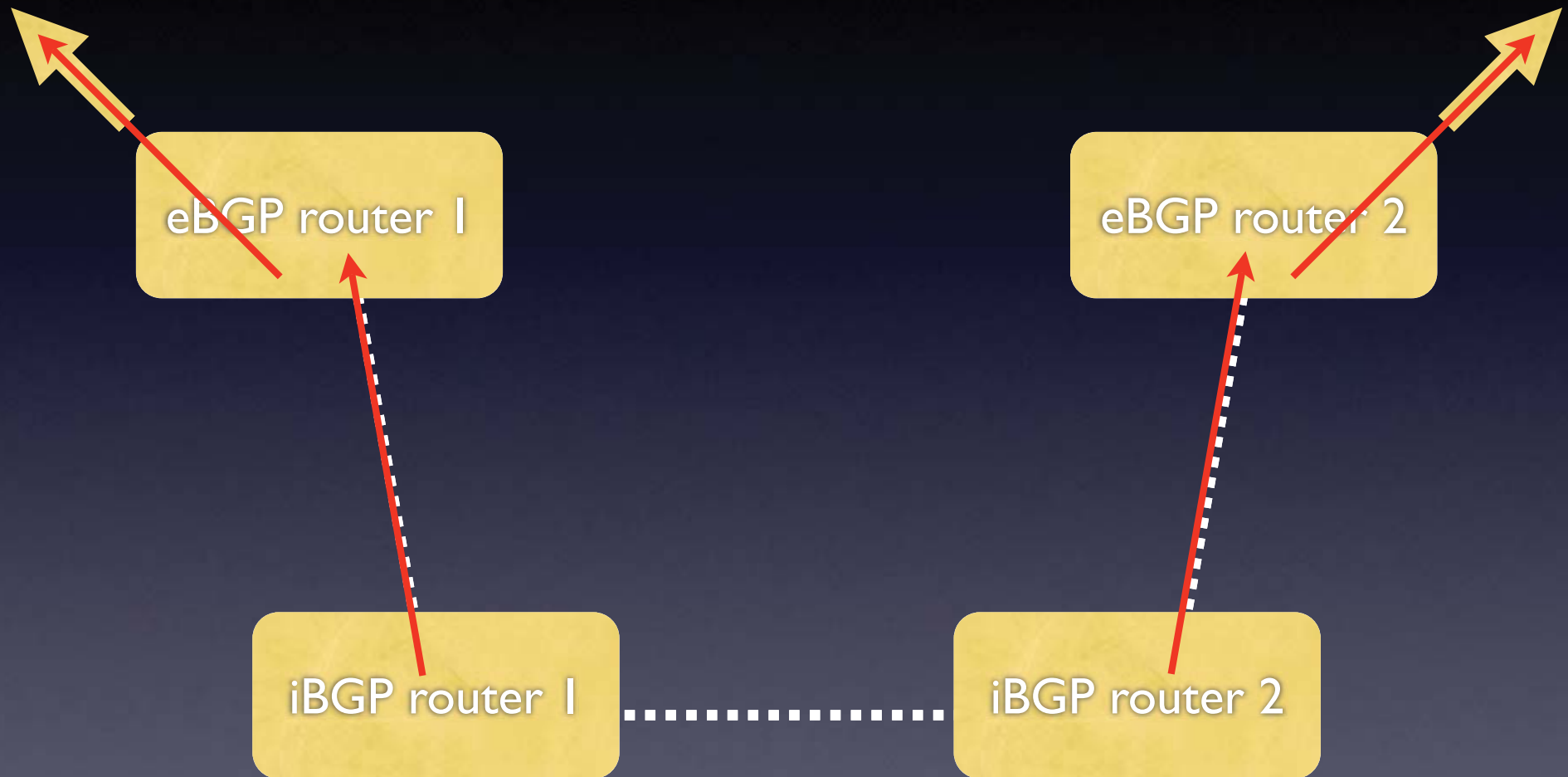
Harmful policies



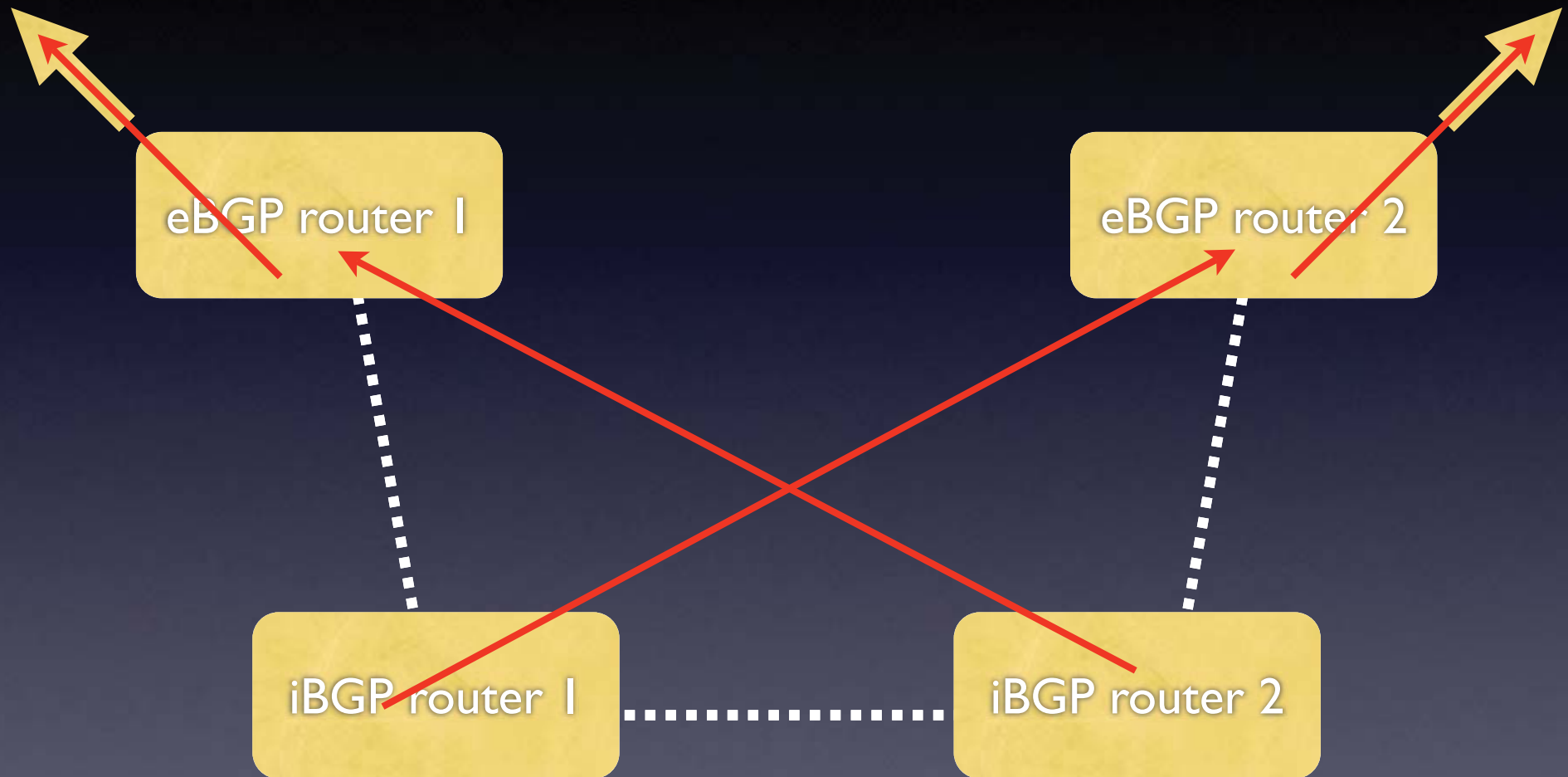
Harmful policies



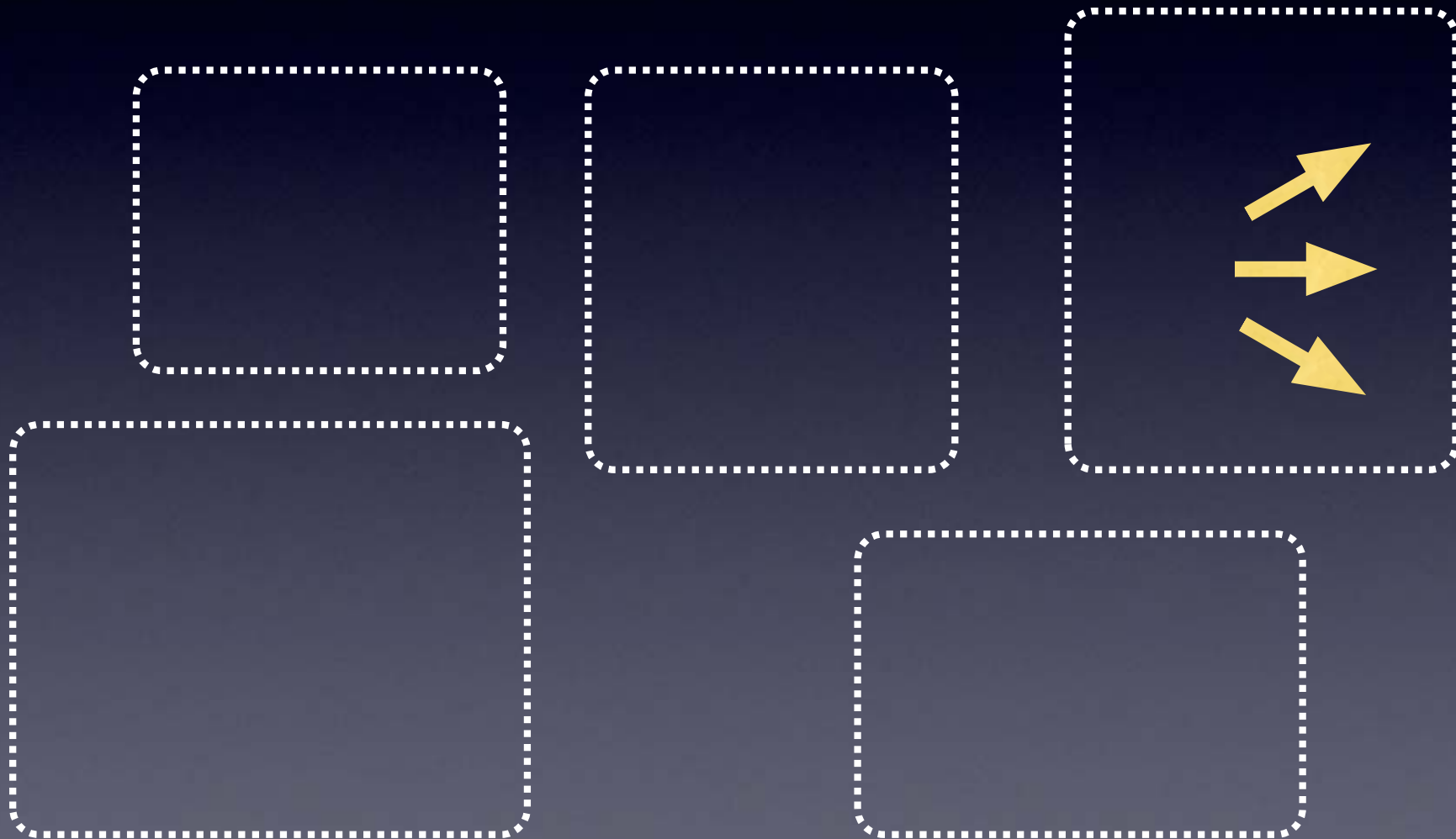
Harmful policies



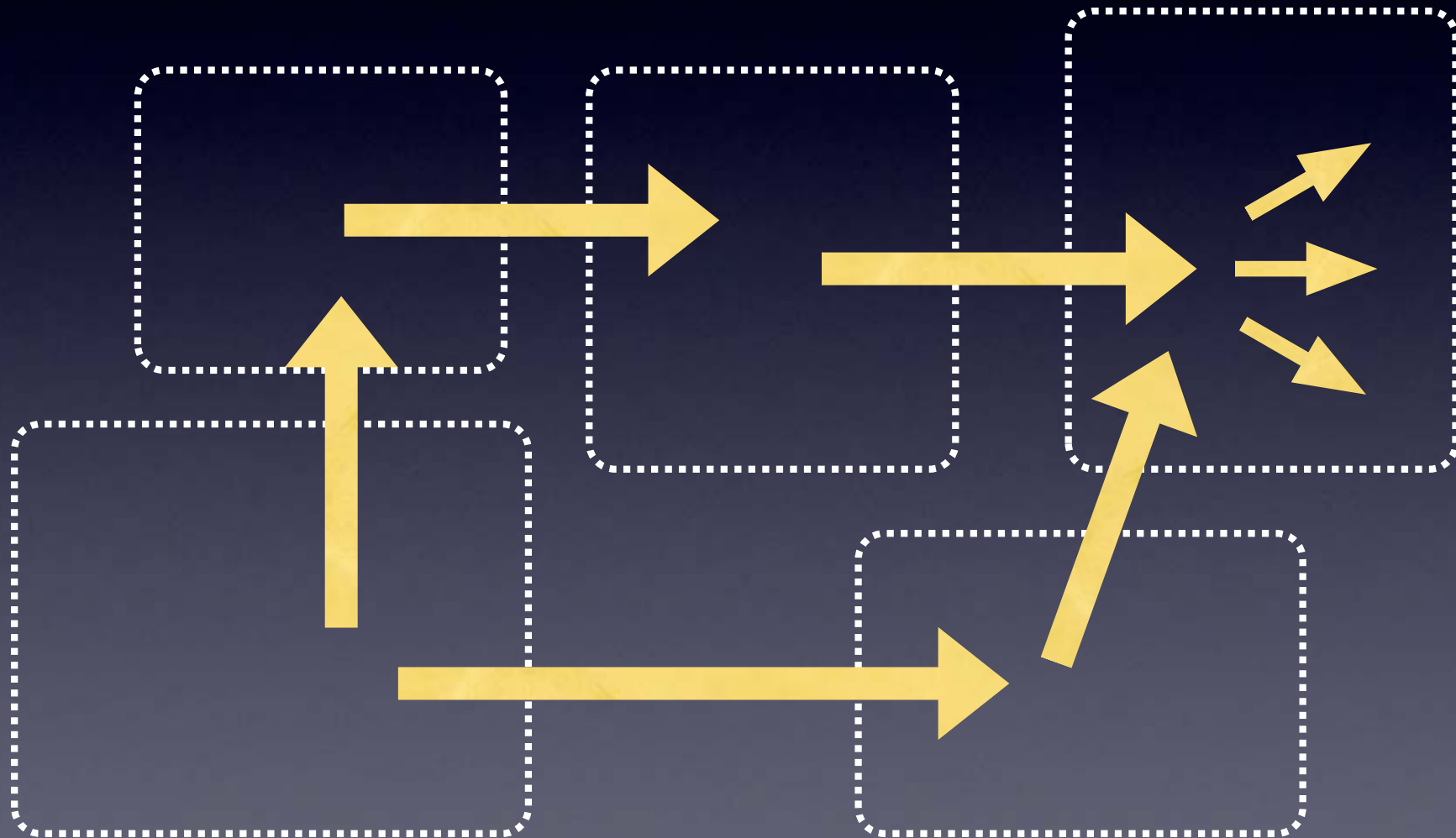
Harmful policies



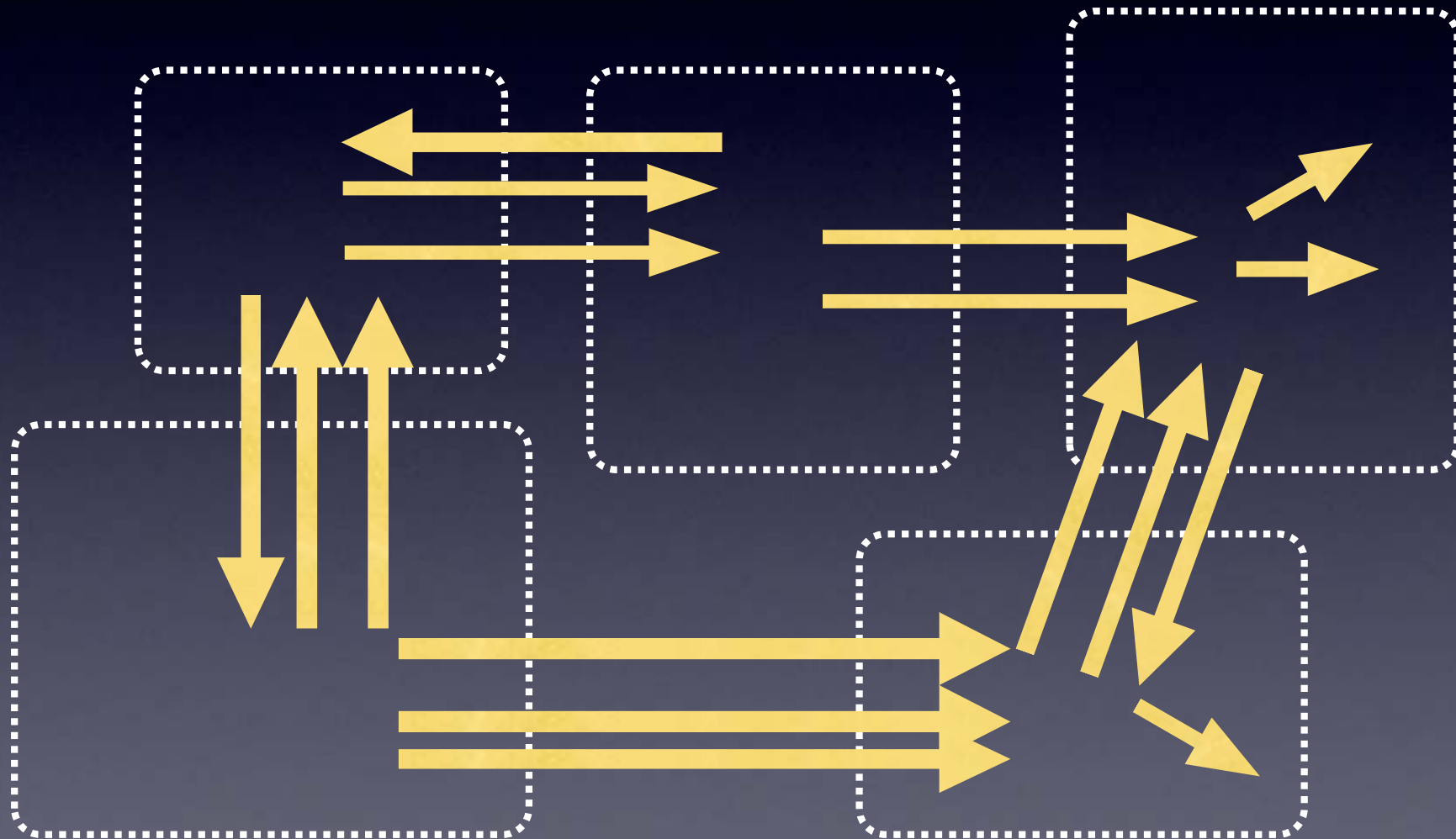
Topology, aggregation



Topology, aggregation



Topology, aggregation



Requirements—again

- (Large) end-users find renumbering unacceptable
 - they put IP addresses everywhere
- Multihoming
- Traffic engineering (and other policy)
- 50 ms convergence for VoIP
- Scalable and cheap
- Can only change tiny bits at a time: BGP, host stack, DNS, applications
- Mobility

What if?

- ...we could redesign completely?
- FQDN would be identifier
 - applications don't get to see addresses
- Look up locators in DNS
 - quick renumbering on topology change
- Use PKI for secure binding
- See which locator works
- Change in mid TCP session if needed

Conclusions

- Yes, there are problems
- Yes, it's useful to work on solutions
- But not if it causes significant inconvenience
- Not enough pain to make radical change possible in today's ossified network
 - but pain may increase in the future...
- Apparent way forward: add more rather than improve/replace what we have