

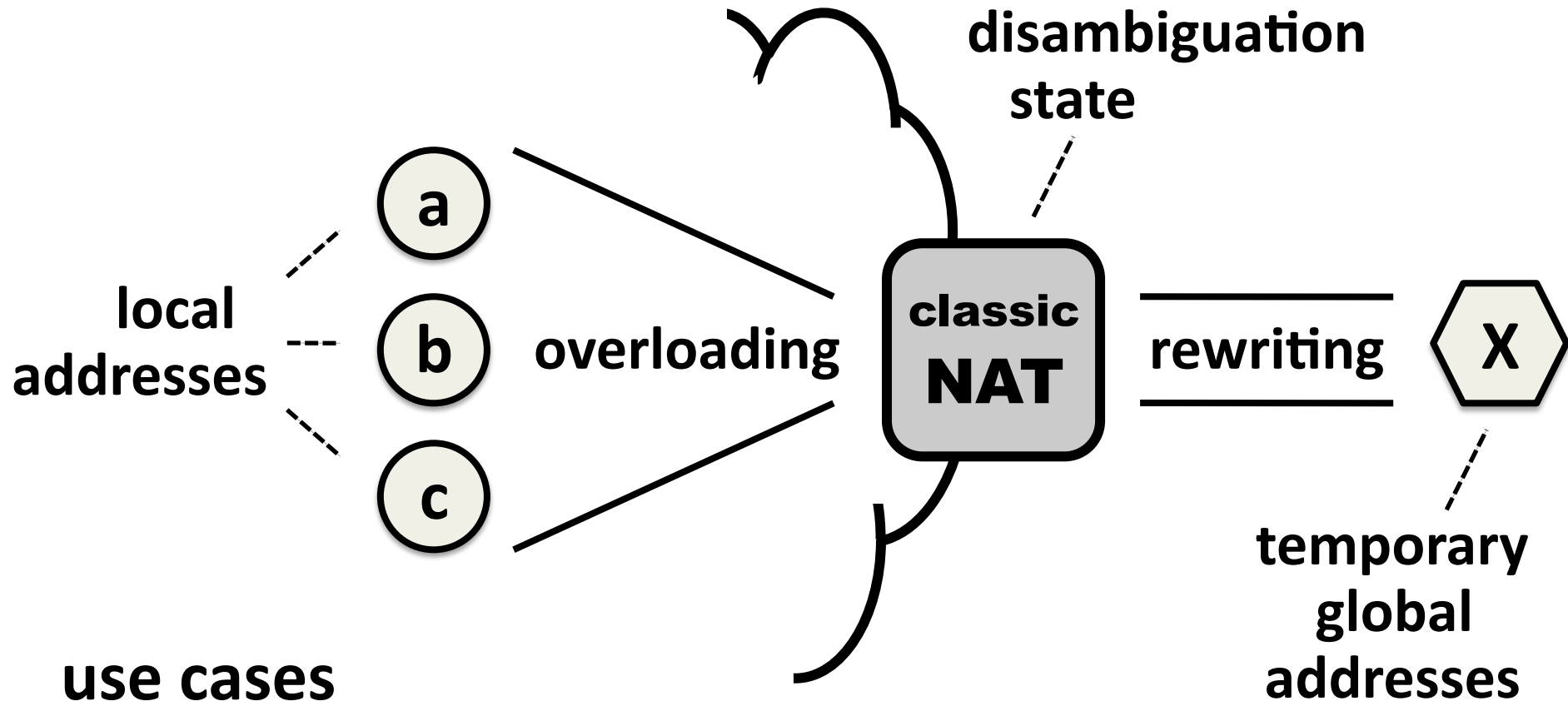
Qualifying the Harmfulness of Address Translation

draft-vogt-address-translation-harmfulness

Christian Vogt

IPv6 Address Independence BOF @ IETF 74. March 26, 2009

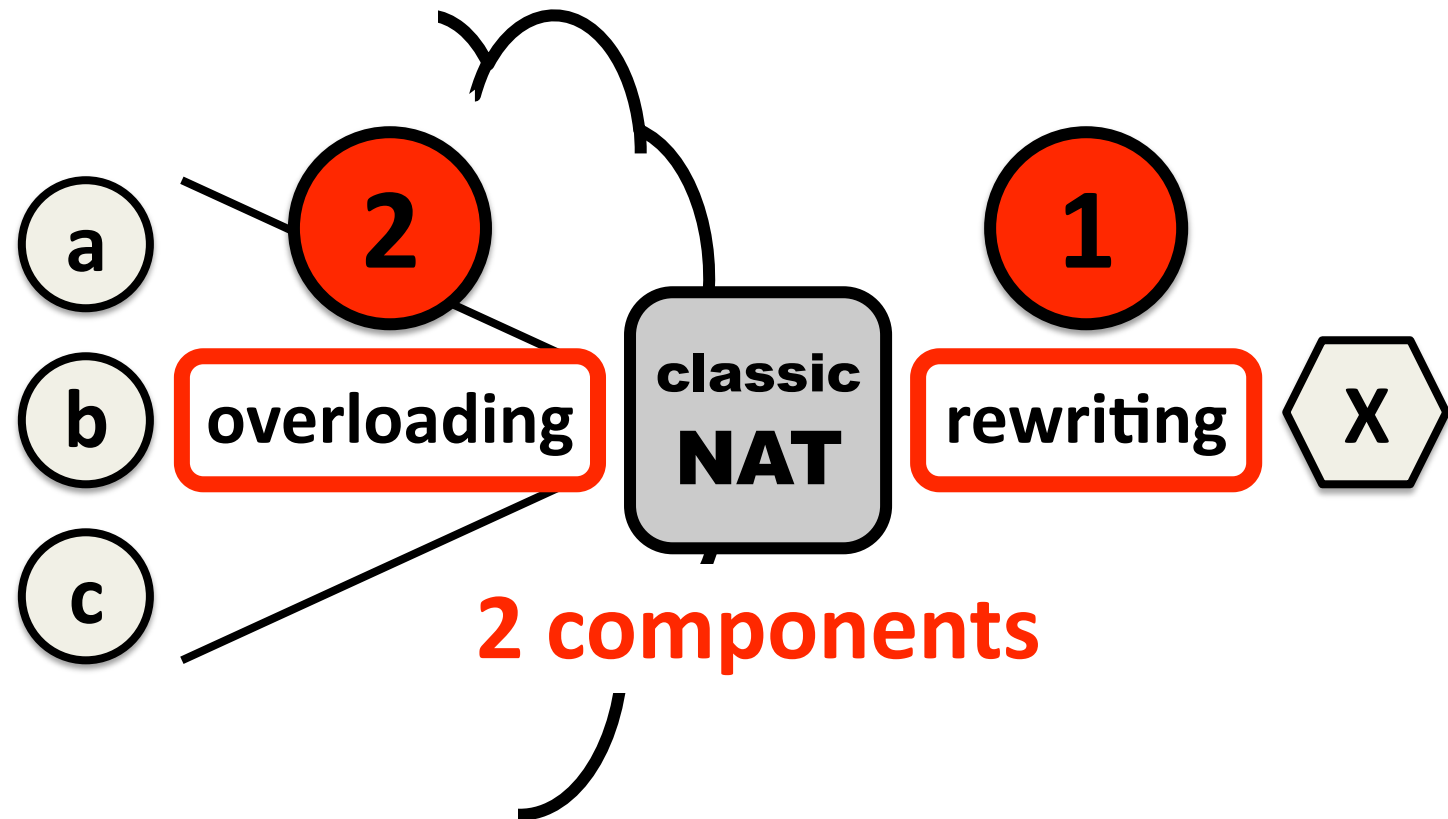
Classic Many-to-1 NAT



use cases

- address conservation
- topology concealment
- provider independence

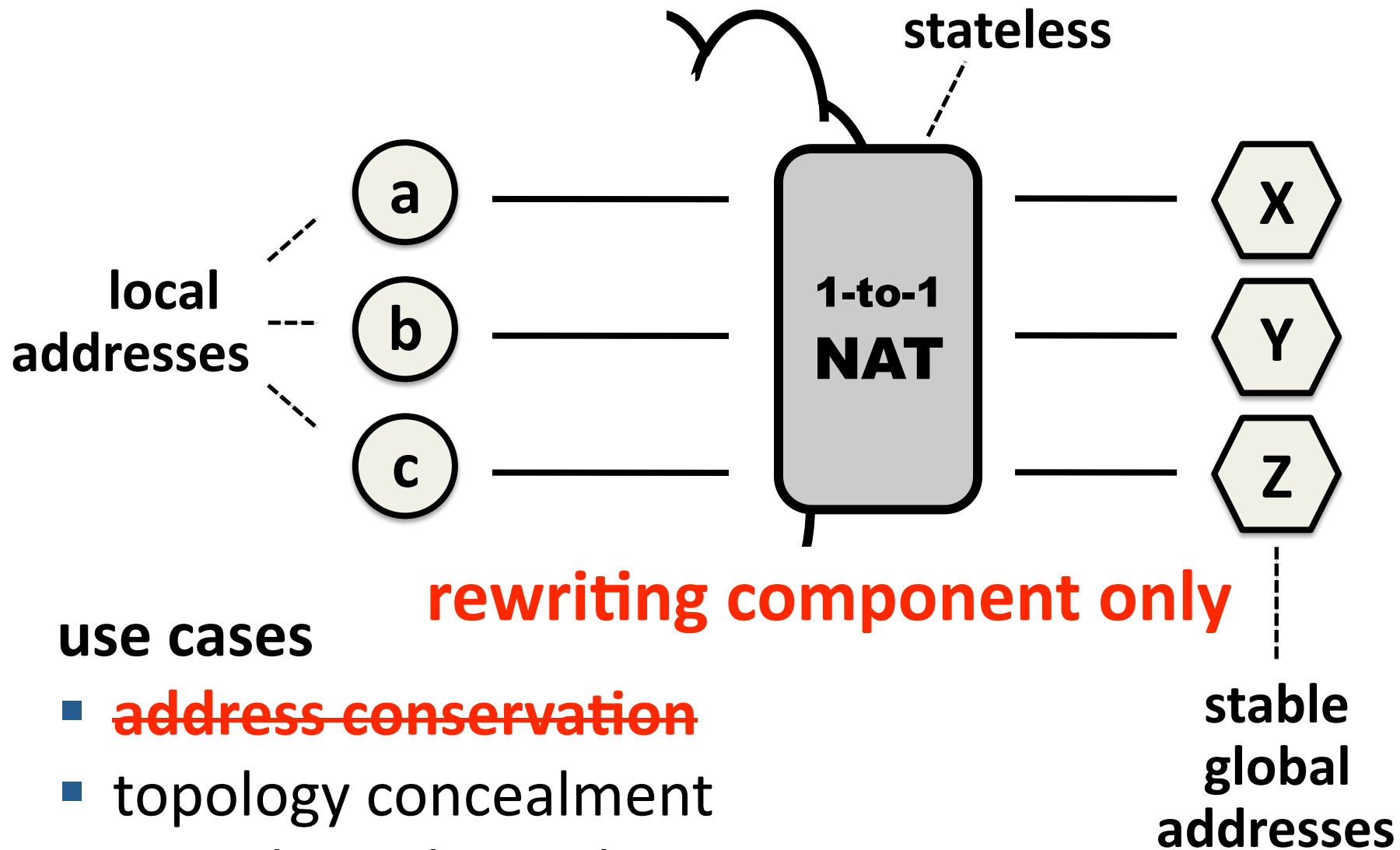
Classic Many-to-1 NAT



use cases

- address conservation ----- requires rewriting + overloading
- topology concealment ----- requires rewriting only
- provider independence ----- requires rewriting only

1-to-1 NAT without Address Overloading



Impacts

- limited host reachability
 - global addresses required in DNS and referrals
- reduced network robustness
 - NAT is single point of failure
 - disambiguation state may expire
- loss of generic forwarding support
 - modifiable port numbers required for state indexing
- harmfulness = cost to solve resulting problems
- difference between 1-to-1 and many-to-1 NAT?

Mitigating Limited Host Reachability

	(auto-) configuration of global addresses		coordination with NAT	
	in DNS	in hosts	by DNS	by hosts
1-to-1	static configuration (existing practice)	NAT traversal (existing practice)	not needed	not needed
many-to-1	dynamic address assignment	NAT traversal (existing practice)	dynamic address assignment	NAT traversal (existing practice)

- existing practice sufficient for 1-to-1 NAT
- many-to-1 NAT requires new methods
- both NAT types require host support

Mitigating Reduced Network Robustness and Loss of Generic Forwarding Support

	redundancy	keepalives	tunneling
1-to-1 NAT	for higher robustness (existing practice)	not needed	not needed
many-to-1 NAT	for higher robustness (existing practice)	for higher robustness	for generic forwarding

- simple redundancy for 1-to-1 NAT
- extra host support for many-to-1

Conclusions

- both NAT types problematic
- problems harder to mitigate in many-to-1 NAT
 - due to dynamicity of global addresses
 - due to statefulness of NAT
- host support required for either NAT type