

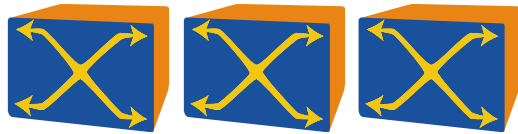
6WINDGate HA



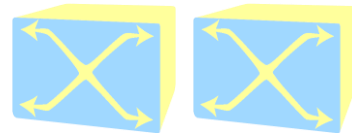
#SPEEDMATTERS For Serious Networks

HA for Networking Systems: Two Ways To Address This Question

- Redundancy in the equipment architecture



N active elements

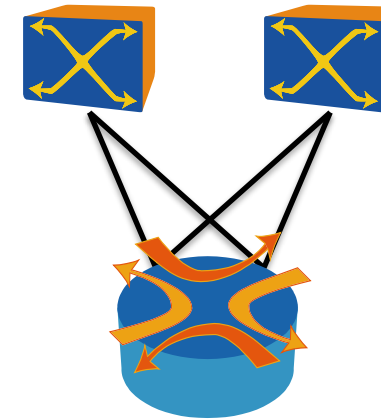


M inactive elements

- **Once a planned or unplanned outage has been detected on an active element**

- The whole configuration has to be restored in a inactive element
- Complete information has to be learned by the inactive element from the system to provide the service again
- Minimize switch-over delay to avoid service interruption

- Use Traffic Engineering to enhance system availability

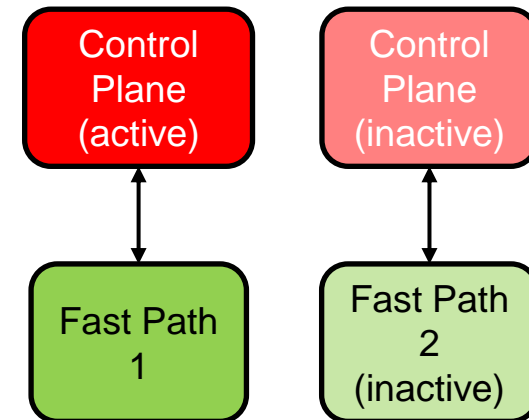


- **Deploy standard protocols on at least 2 interfaces**

- Routing with ECMP
- Link Aggregation (Ethergroups)
- VRRP

6WINDGate High Availability

- **1+1 Architecture to minimize service interruption**
- **System architecture relies on redundant hardware platforms, each running an instance of 6WINDGate**
- **Control Plane protocols must maintain a consistent view of the system for both instances in case an active Control Plane fails**



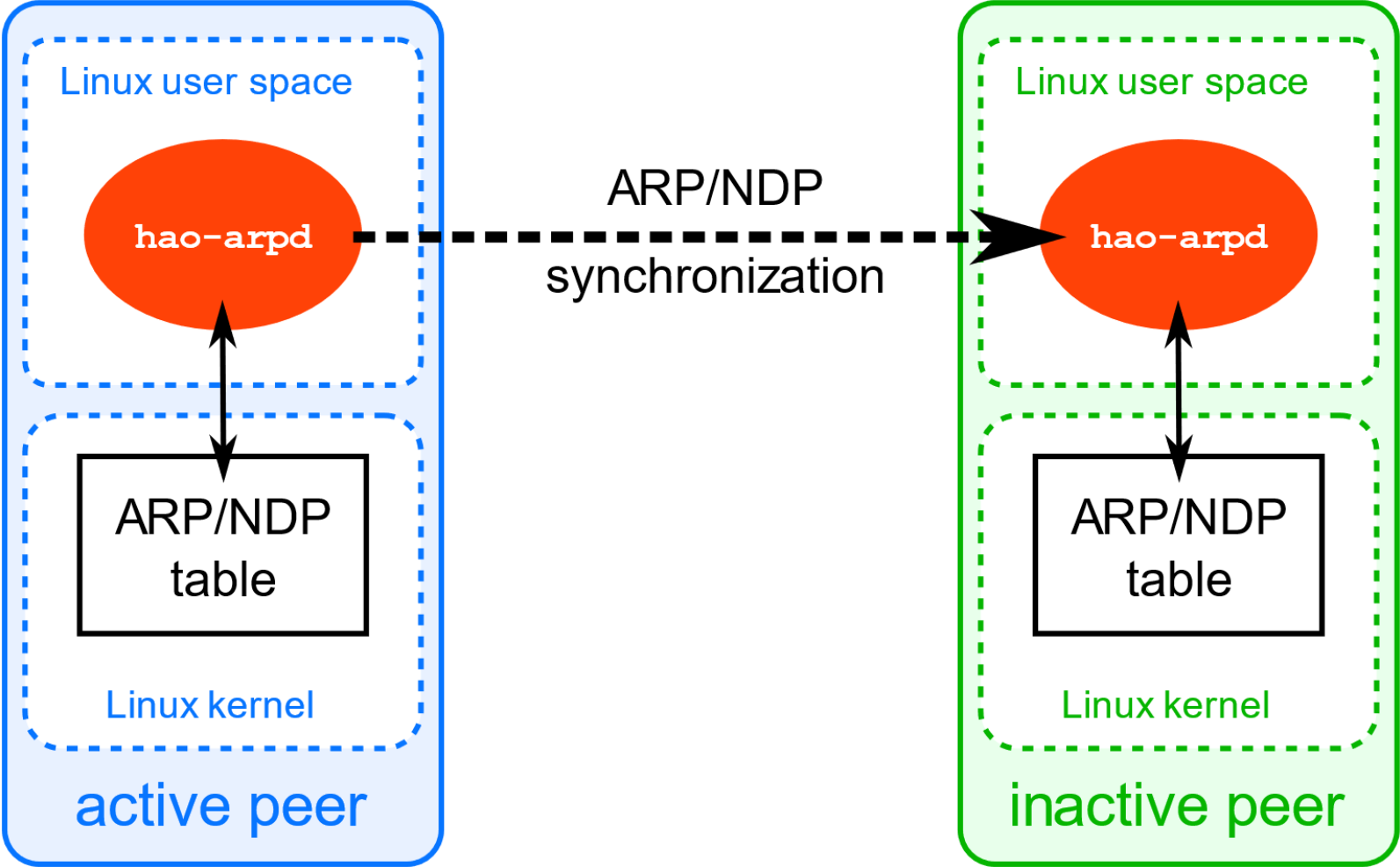
What Does 6WINDGate High Availability Provide?

- **Non-stop forwarding thanks to continuous synchronization of inactive system**
 - Inactive system can take over packet processing at any time to manage planned and unplanned outages
 - ARP, NAT/firewall, IPsec/IKE tables are continuously updated and ready-to-use
 - Minimal interruption of traffic during switch over
- **6WINDGate components monitoring**
 - Inner health check and Graceful Restart (GR) of 6WINDGate components
- **Traffic engineering through VRRP**
 - Including activity switch upon state change thanks to notification scripts
- **6WINDGate is NOT a HA Framework**
 - It provides the features to implement HA
 - The HA strategy (when to trigger switch over) depends on the use case and is left to the customer

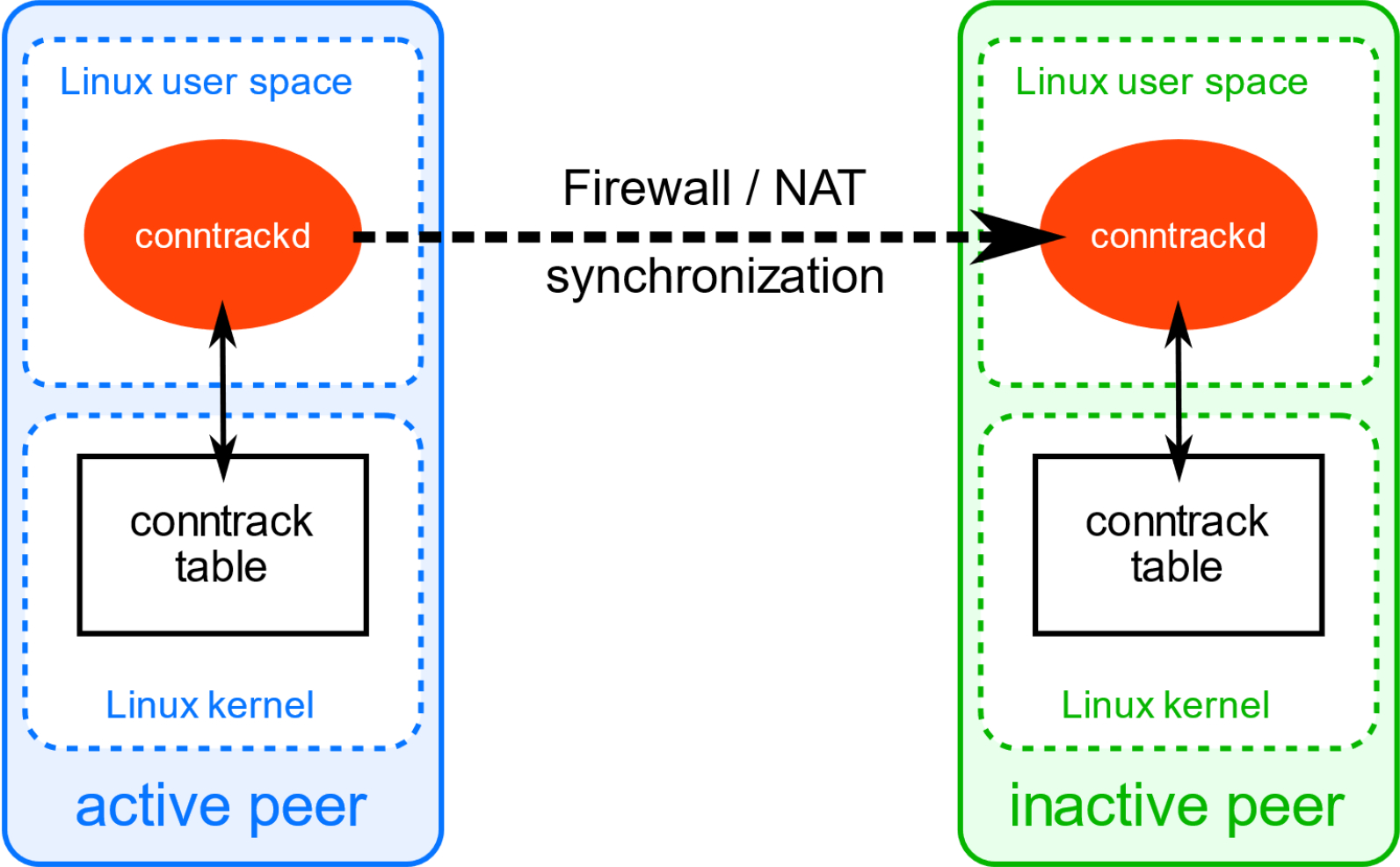
Control Plane Synchronization

- **Maintain coherent protocol information in several instances of 6WINDGate**
 - ARP/NDP tables, SA/SP tables for IPSec, Connection states of NAT and Firewall
- **Two types of states**
 - Object information: table element (SA, ...)
 - Updates are “rare”
 - Flow information: dynamic information related to an object (sequence number for a SA...)
 - Updates for every packet
- **Golden rule of 6WINDGate: only synchronization of Control Planes’ states is required; the CM/FPM will take care of the Fast Paths**

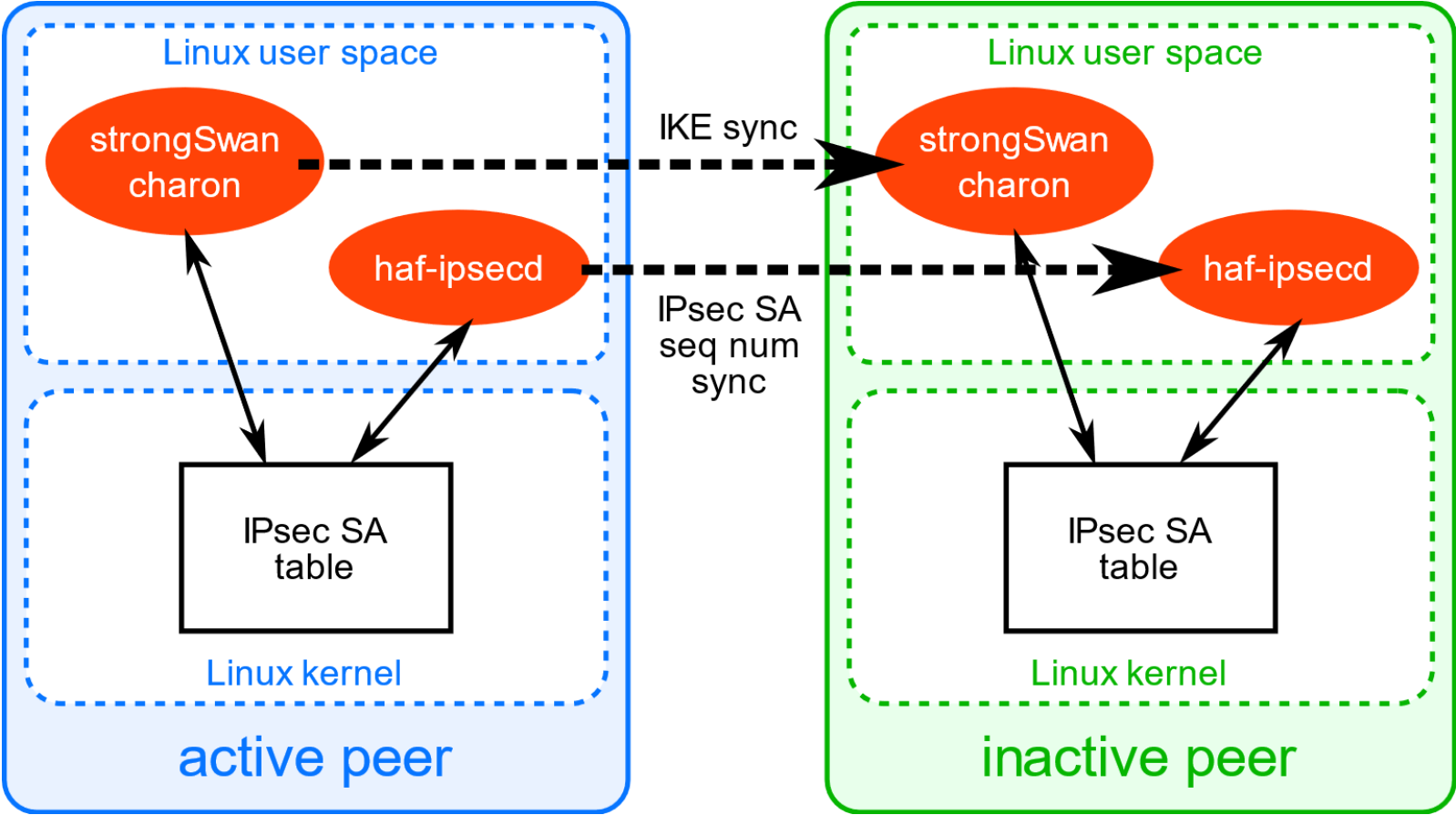
HA ARP / NDP Synchronization



HA Firewall / NAT Synchronization



HA IPsec / IKE Synchronization

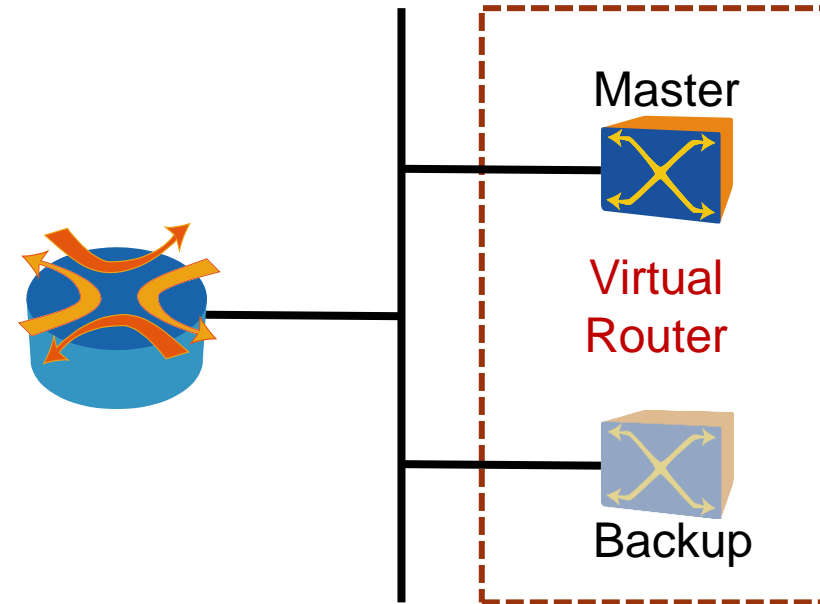


6WINDGate Components Monitoring

- **Daemon Monitoring System (DMS) provides proactive health check of 6WINDGate components and crash recovery**
- **Monitored daemons**
 - Cache Manager (cmgrd)
 - Fast Path (fp-rte)
 - Fast Path Manager (fpmnd)
 - Fast Path Statistics (fpsd)
 - Hitflags (hitflagsd)
- **Daemons are monitored by sending health check requests and automatically restarted if they don't respond or if the corresponding process crashes**
- **DMS can be configured to monitor custom daemons**
 - pid file or process name
 - Health check command, interval, timeout and retries
 - Valid exit codes/signals
 - Restart command with timeout

VRRP

- VRRP provides a way, for a set of routers, to control a virtual IPv4 address and MAC address, and to provide automatic failover.
- Master and Backup routers belong to the same VRRP group to form a Virtual Router.
- Master holds the Virtual IP and MAC addresses.
- Master regularly sends advertisements to Backup and in case of failure, Backup will become Master.
- Scripts can be called in case of role change, for example to trigger HA activity switch.





6WINDGate High Availability Modules

