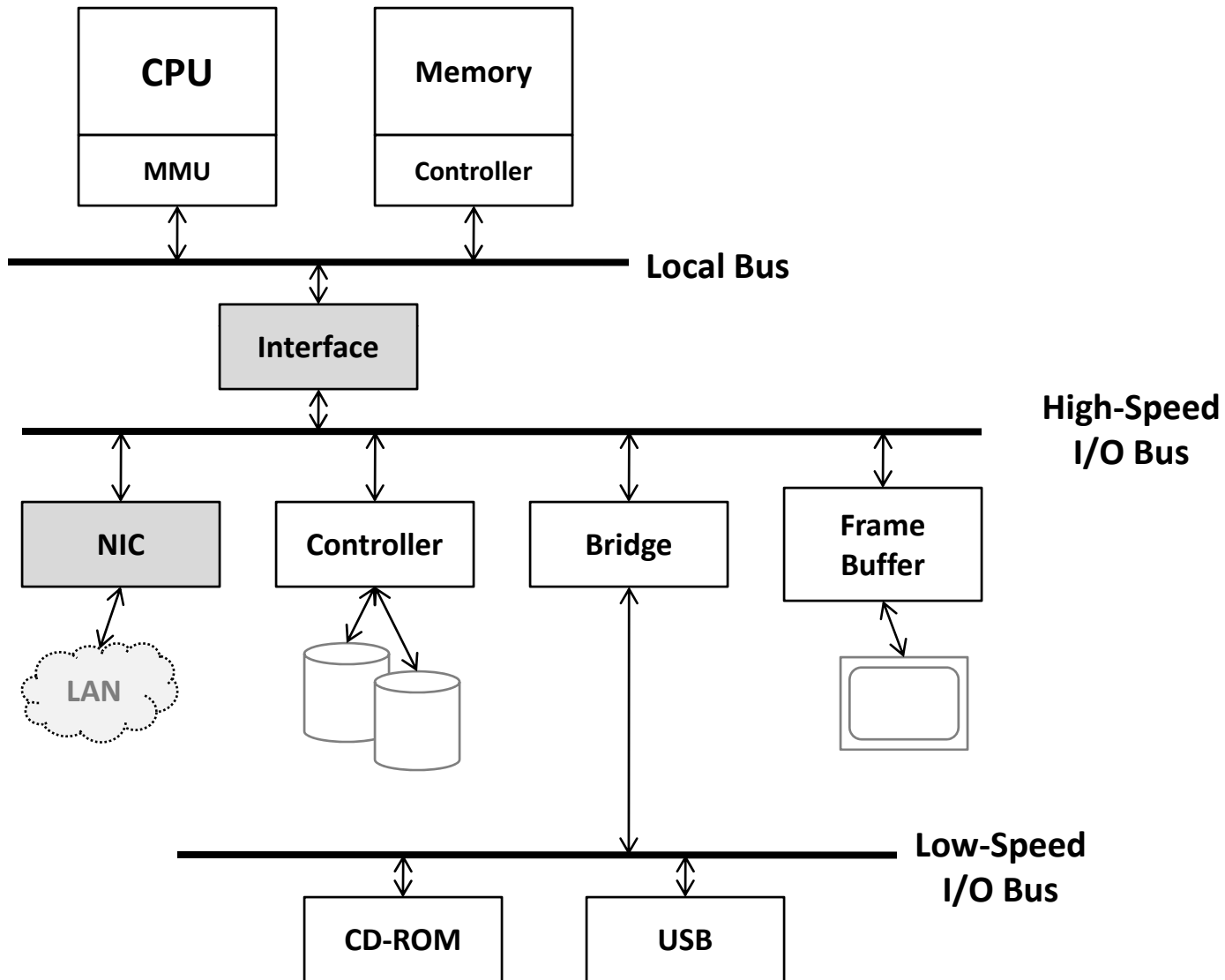


E6998 - Virtual Machines
Lecture 5
Network Virtualization

Scott Devine
VMware, Inc.

Computer System Organization



Device Virtualization

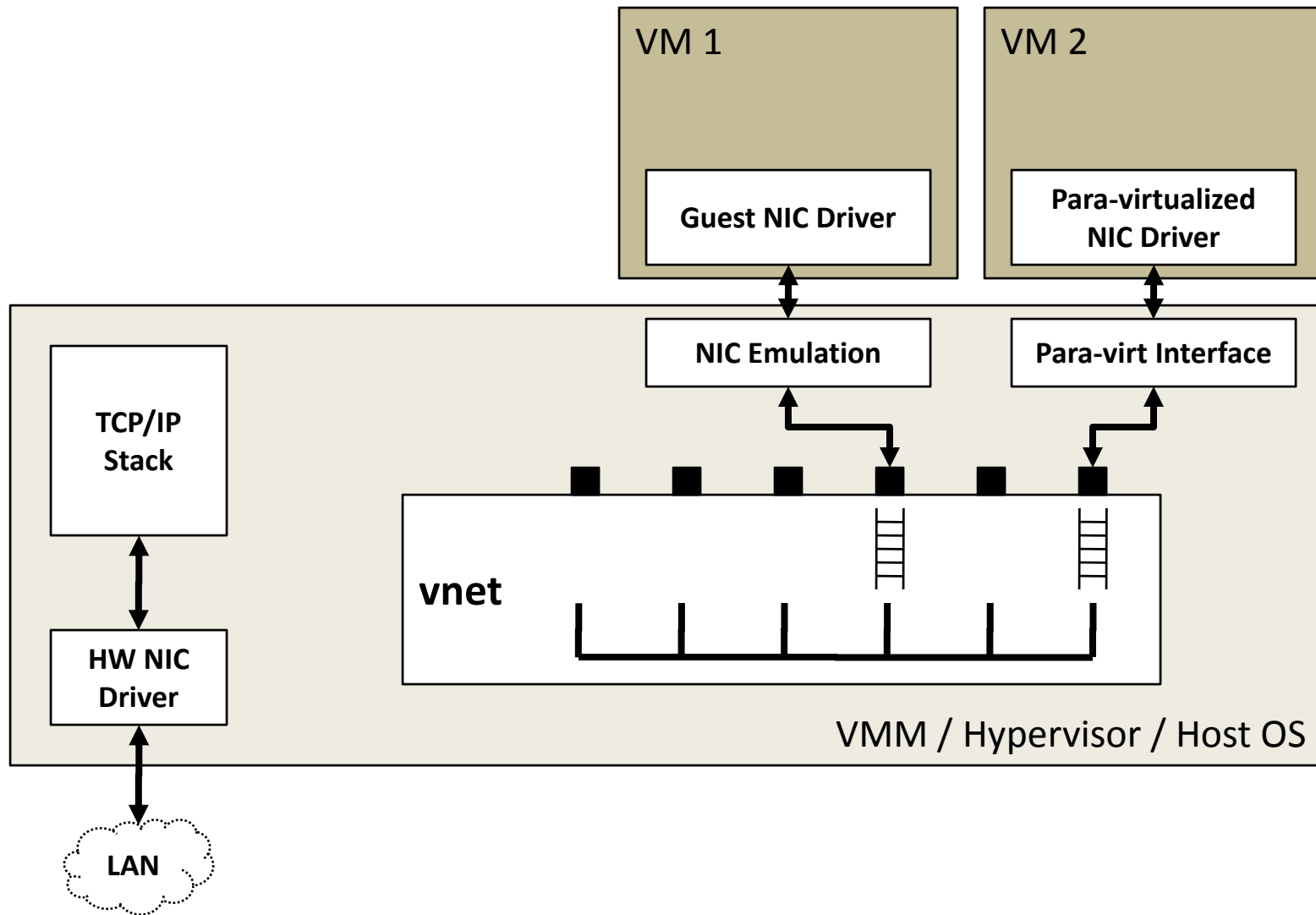
- **Goals**
 - Isolation
 - Multiplexing
 - Speed
 - Mobility
 - Interposition
- **Device Virtualization Strategies**
 - Direct Access
 - Emulation
 - Para-virtualization

Network Virtualization

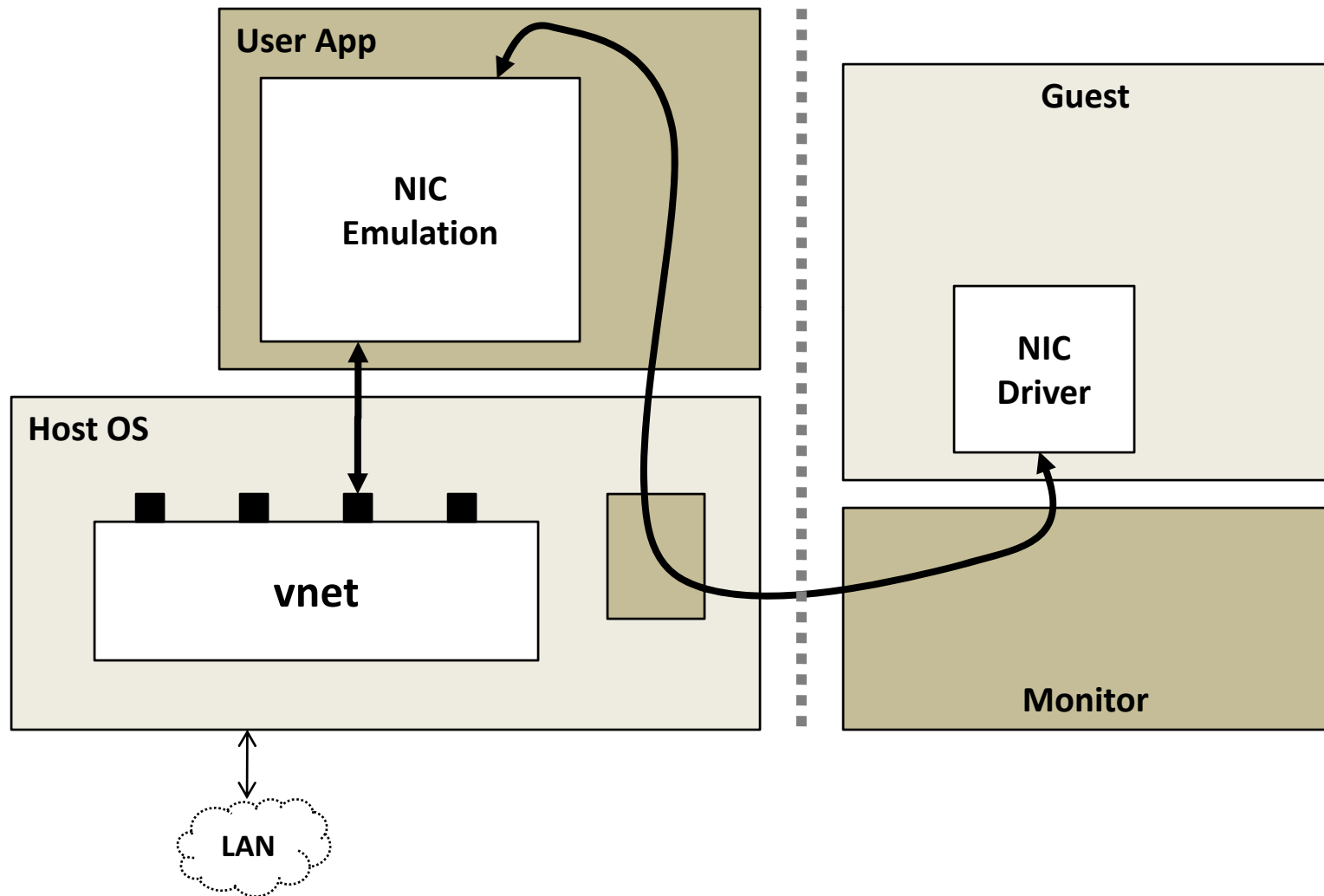
- **Considerations**

- What layer?
 - Ethernet
 - TCP/IP
- Which network are we attached to?
- What network identity?

Virtual Networking with vnets



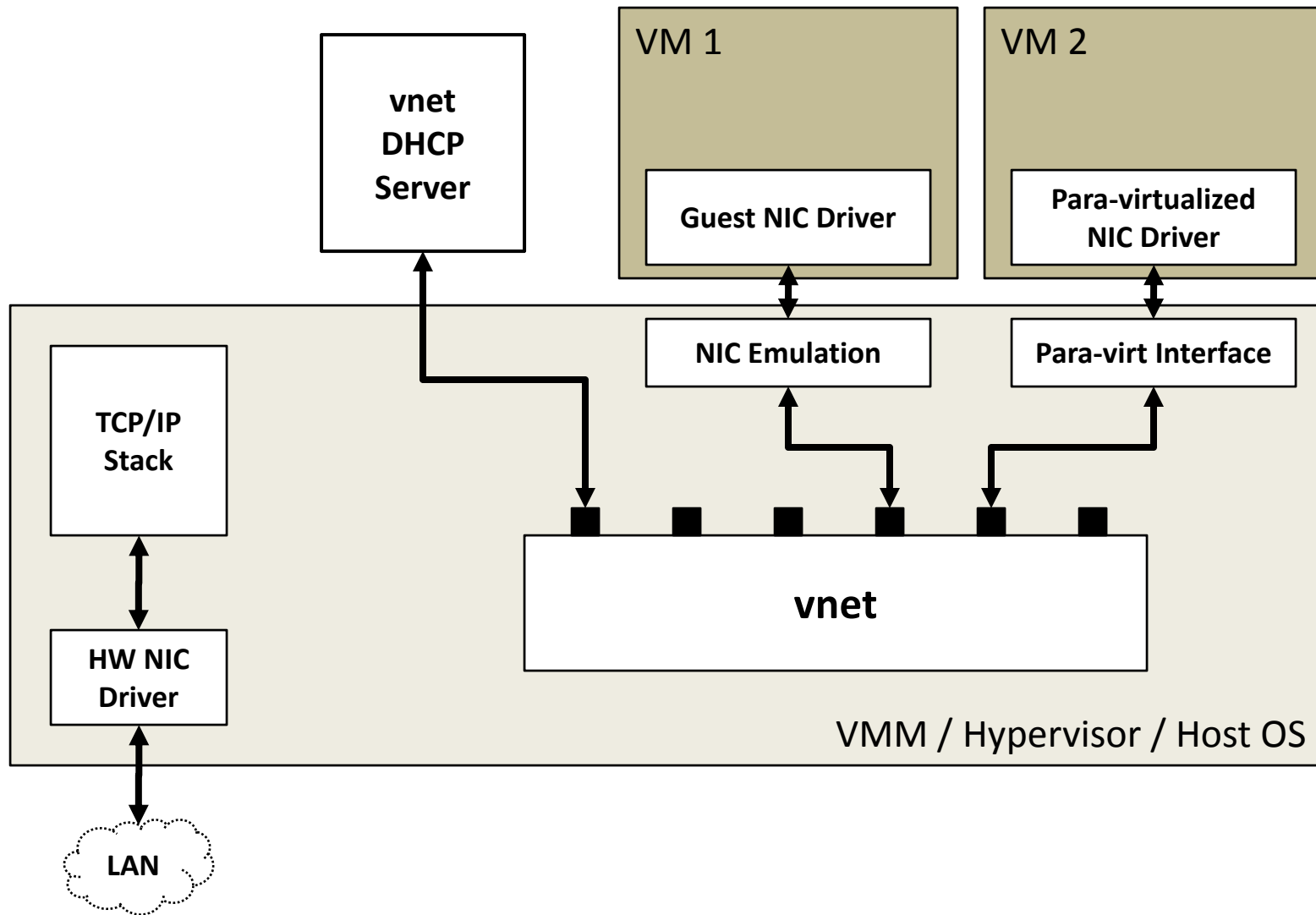
vnets in a Hosted Architecture



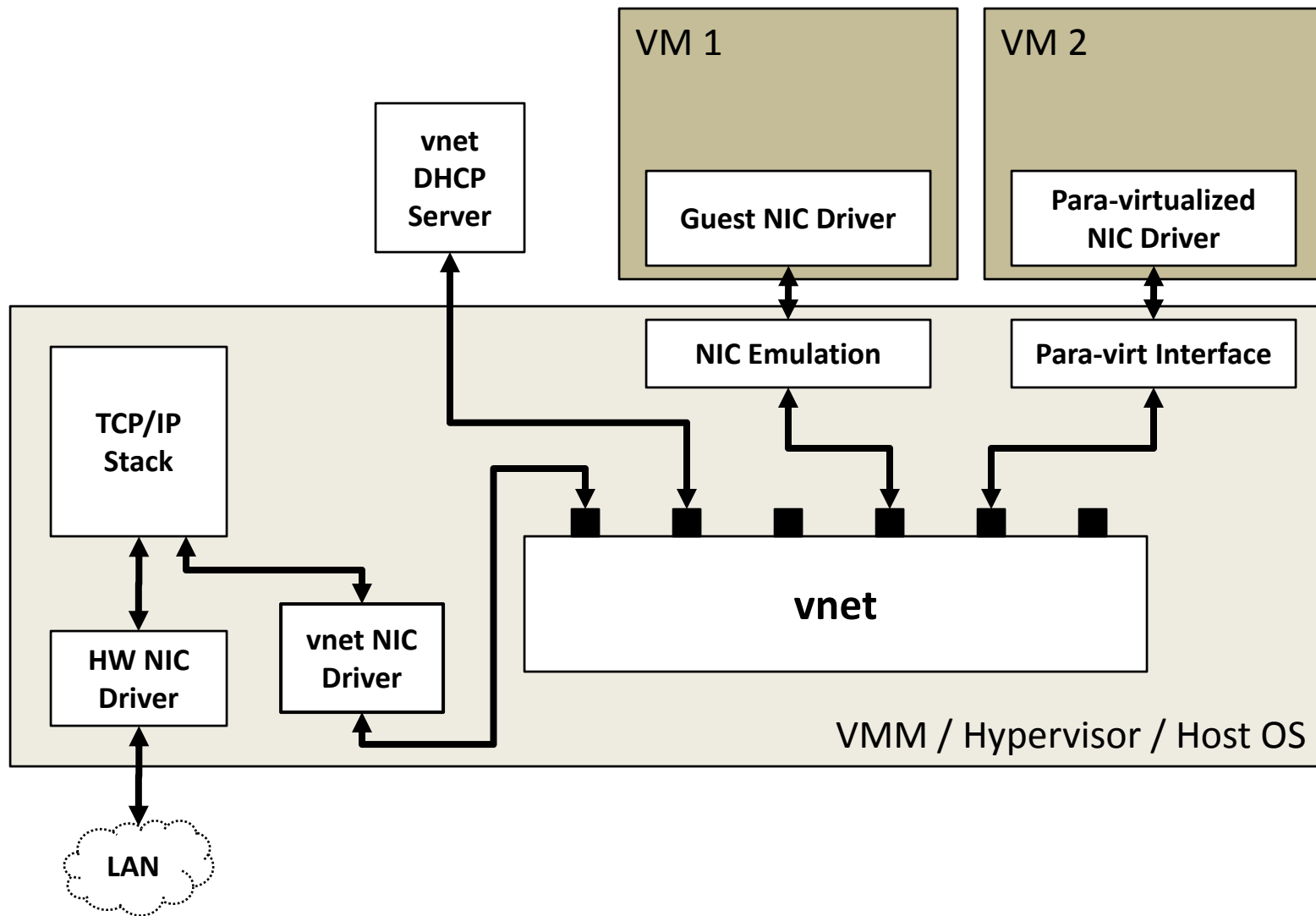
VMware's Hosted vnet API

```
char packet[1500];  
  
fd = open("/dev/vmnet1", O_RDWR);  
  
ioctl(fd, ...);  
  
read(fd, packet, 1500);  
  
write(fd, packet, 1500);  
  
close(fd);
```

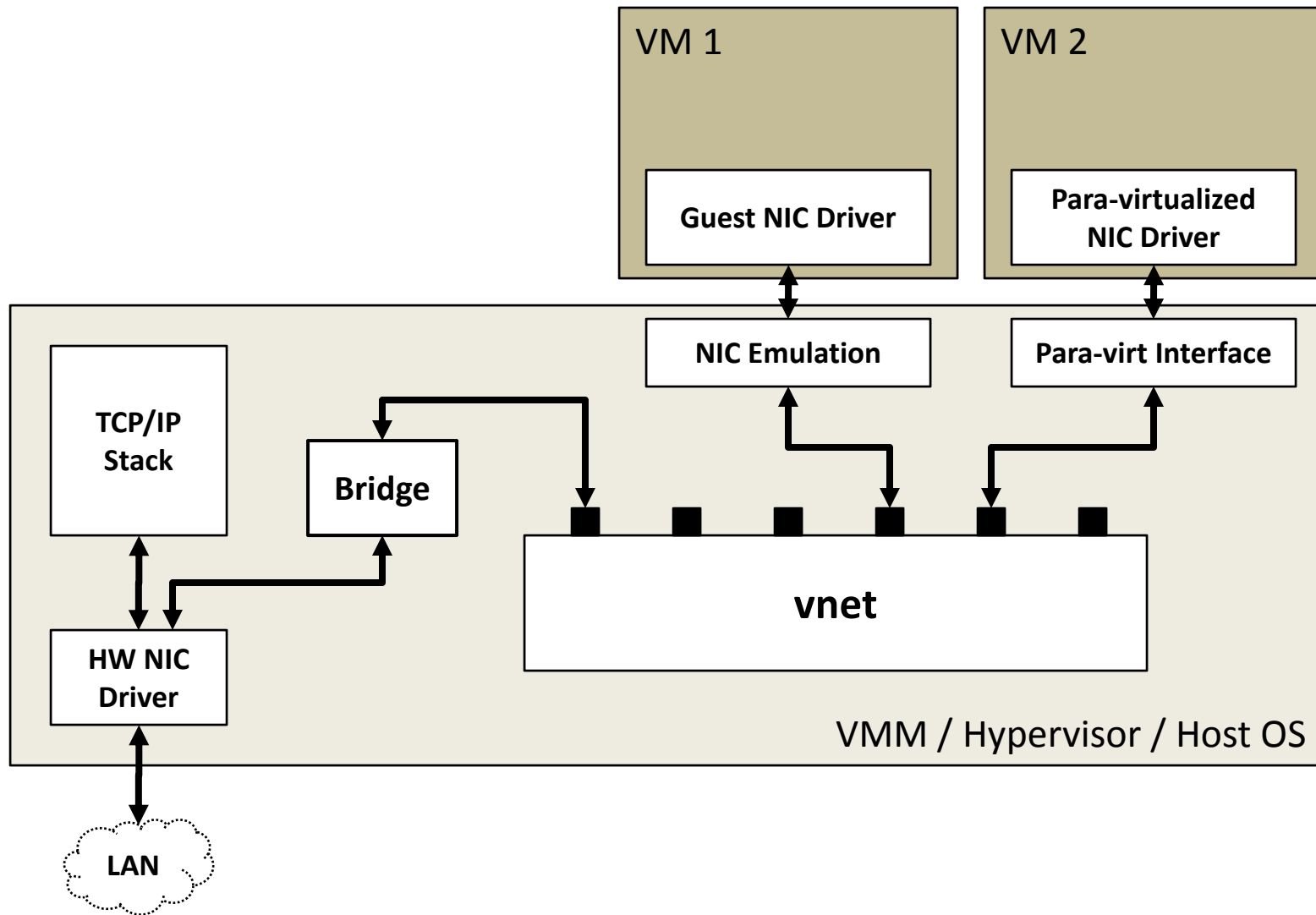
DHCP Service



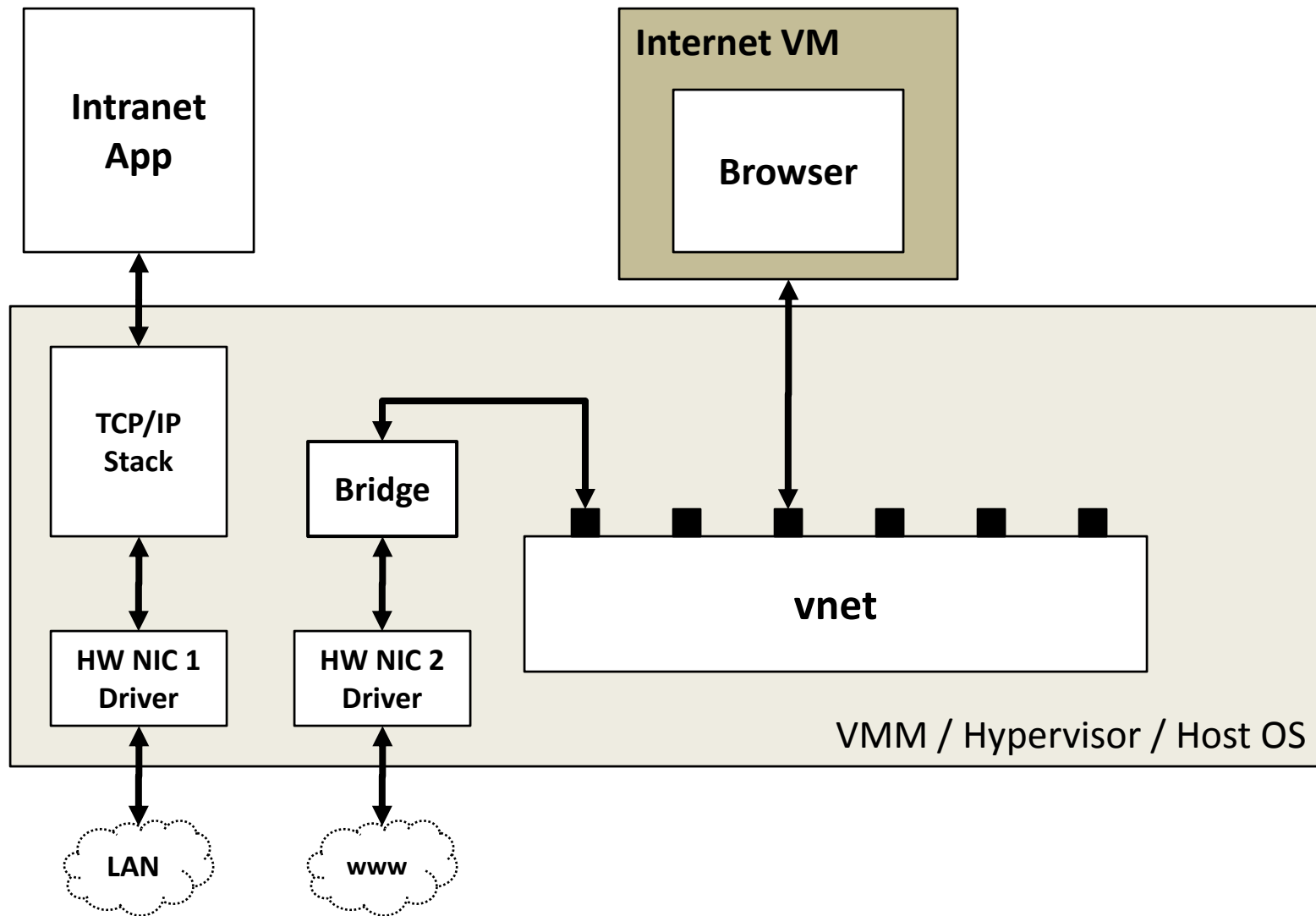
Host-only Networking



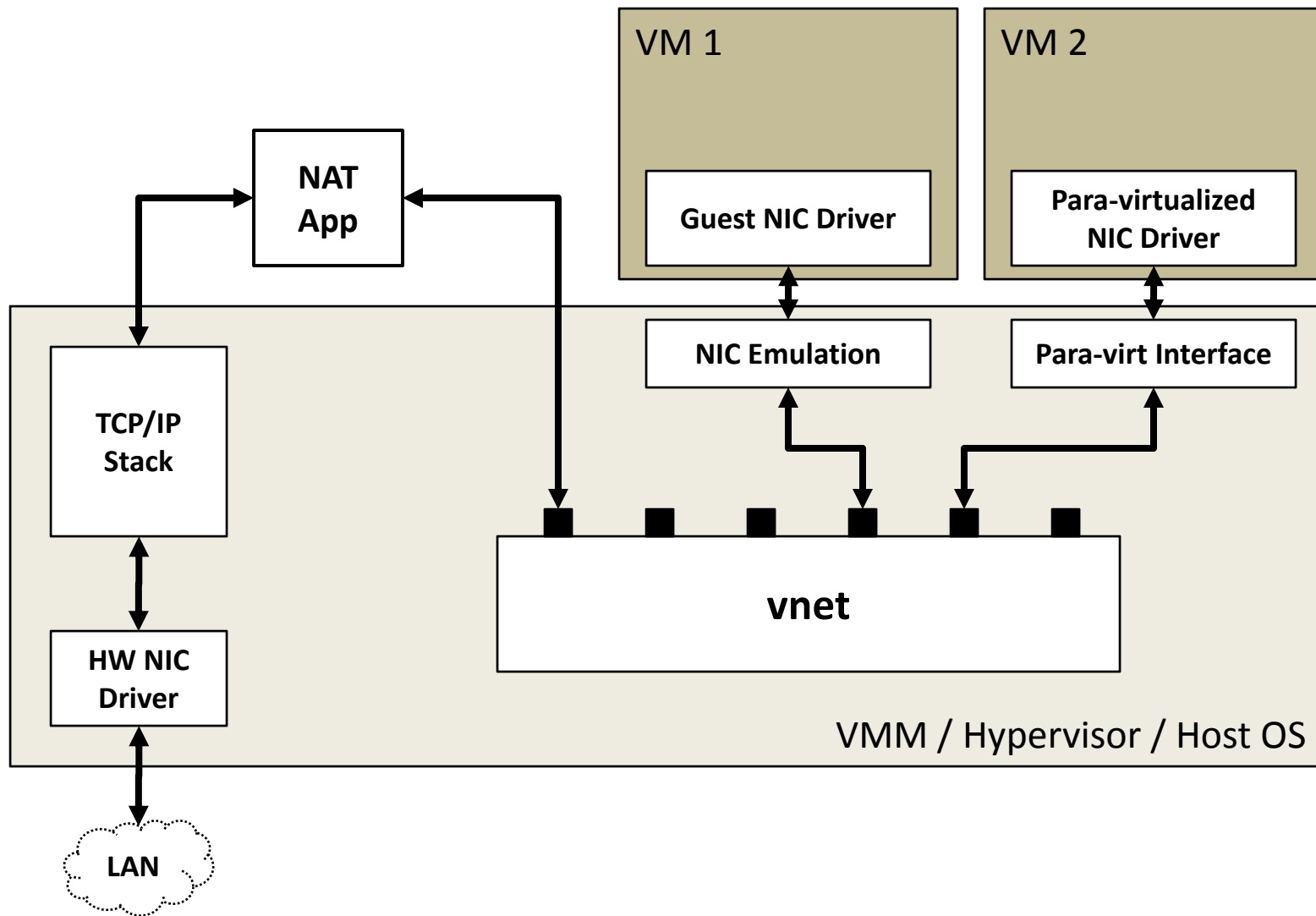
Bridged Networking



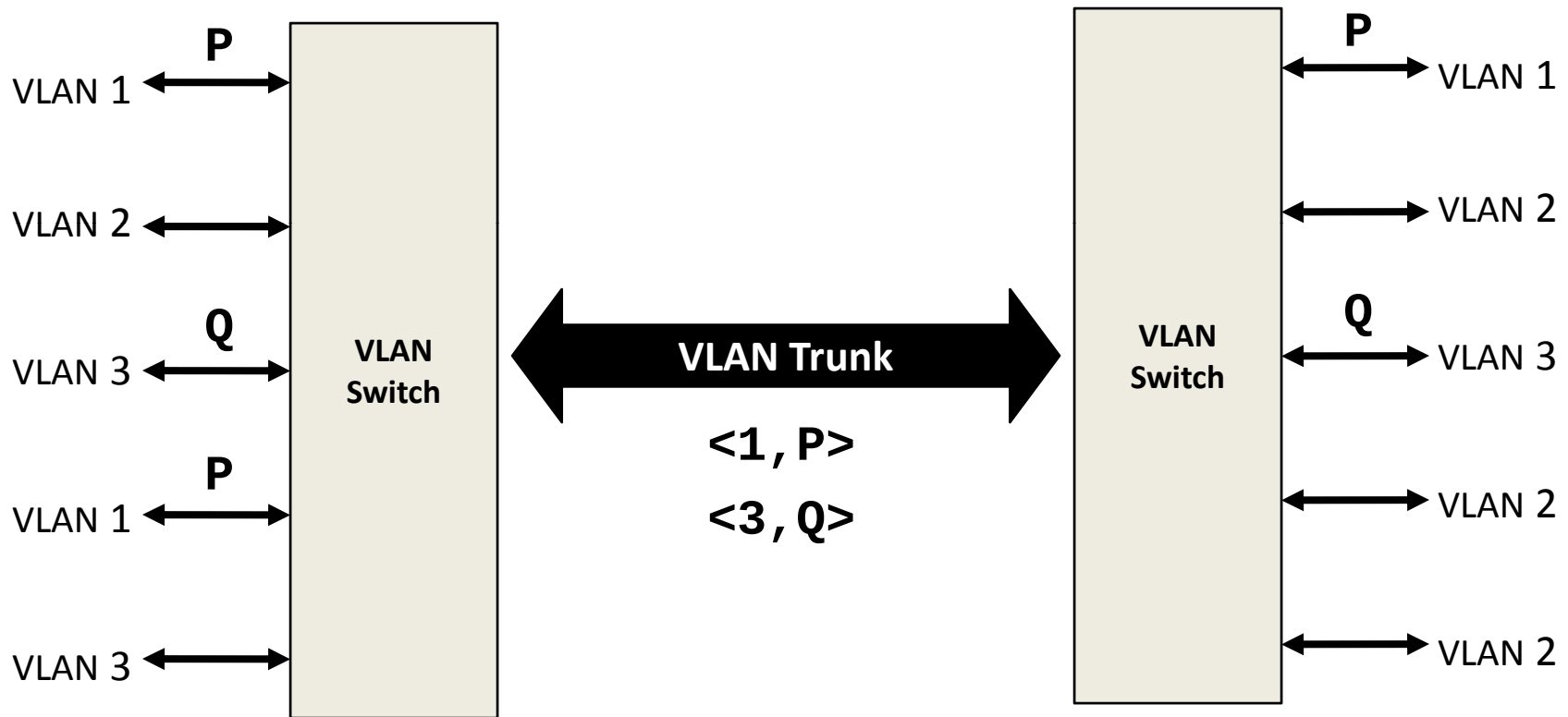
Secure Networking with 2 NICs



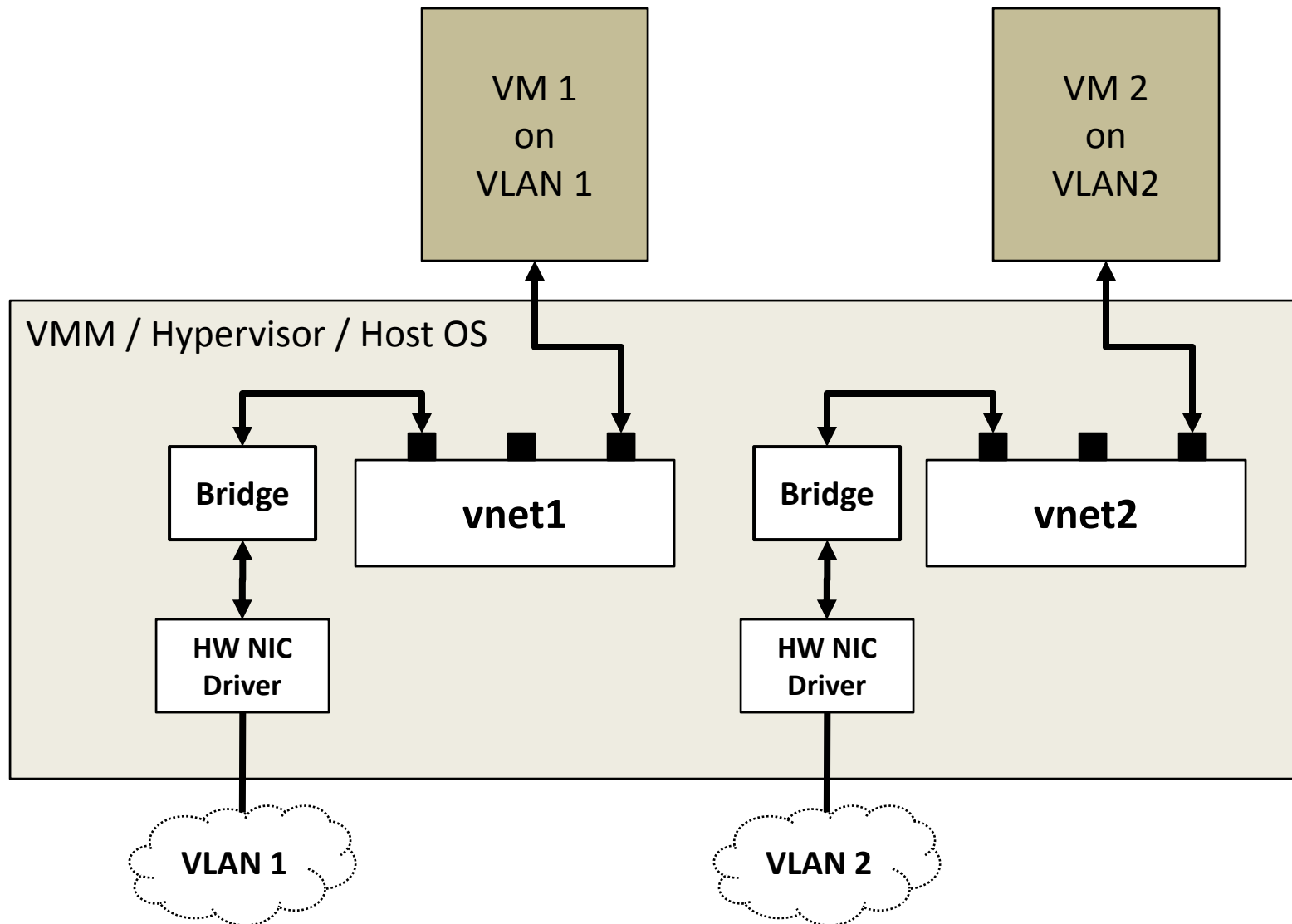
NAT Networking with vnets



VLAN Trunking



VLANs with vnets



VLAN Trunking with vnets

