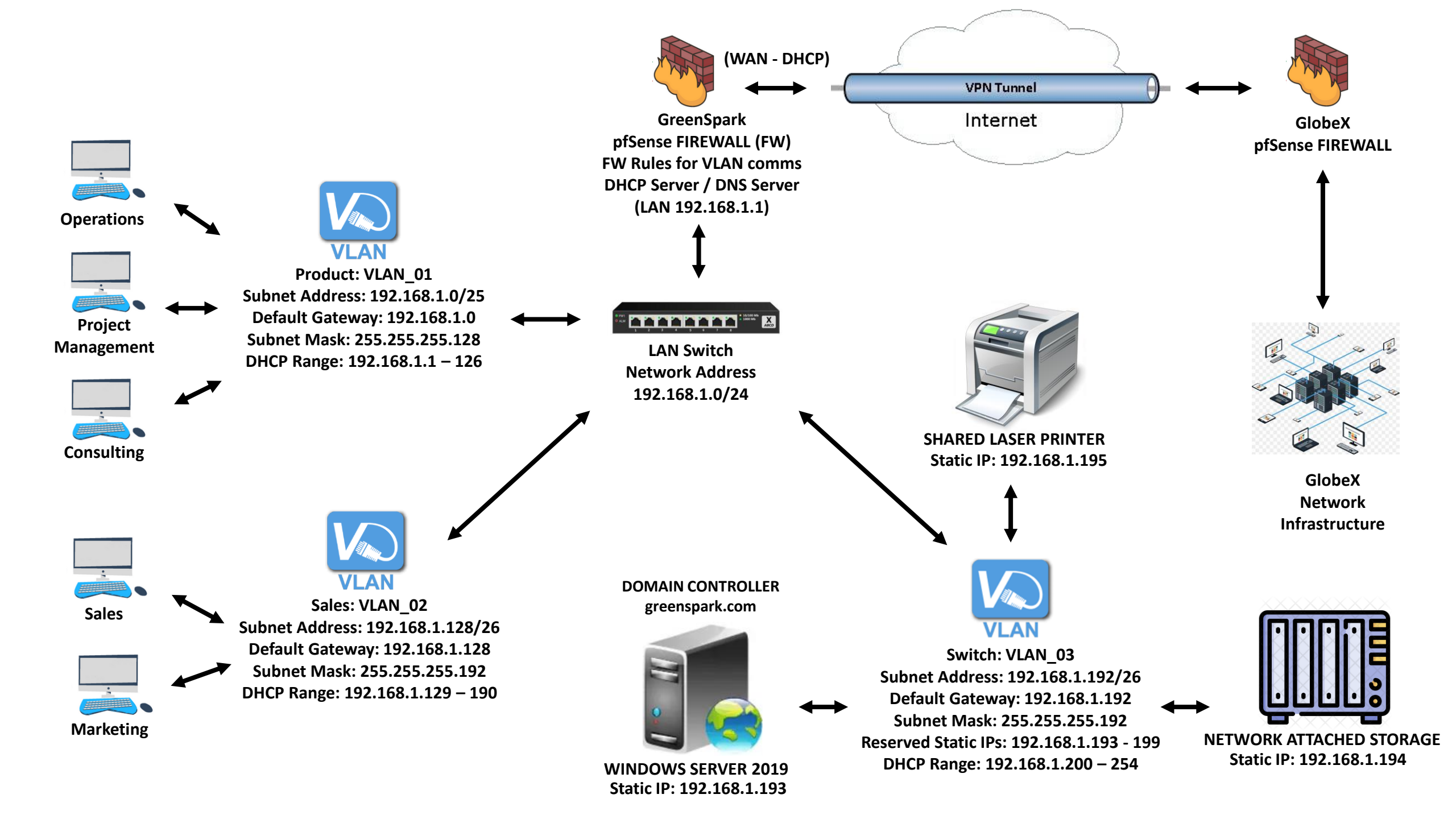
(WAN - DHCP)
VPN Tunnel
Internet
GreenSpark
pfSense FIREWALL (FW)
FW Rules for VLAN comms
DHCP Server / DNS Server
(LAN 192.168.1.1)
GlobeX
pfSense FIREWALL
Operations
Project Management
Consulting
VLAN
Product: VLAN_01
Subnet Address: 192.168.1.0/25
Default Gateway: 192.168.1.0
Subnet Mask: 255.255.255.128
DHCP Range: 192.168.1.1 – 126
LAN Switch
Network Address
192.168.1.0/24
SHARED LASER PRINTER
Static IP: 192.168.1.195
GlobeX
Network
Infrastructure
Sales
Marketing
VLAN
Sales: VLAN_02
Subnet Address: 192.168.1.128/26
Default Gateway: 192.168.1.128
Subnet Mask: 255.255.255.192
DHCP Range: 192.168.1.129 – 190
DOMAIN CONTROLLER
greenspark.com
WINDOWS SERVER 2019
Static IP: 192.168.1.193
VLAN
Switch: VLAN_03
Subnet Address: 192.168.1.192/26
Default Gateway: 192.168.1.192
Subnet Mask: 255.255.255.192
Reserved Static IPs: 192.168.1.193 - 199
DHCP Range: 192.168.1.200 – 254
NETWORK ATTACHED STORAGE
Static IP: 192.168.1.194

Device or Subnet	IP Address / CIDR / MAC	Subnet Mask	Default Gateway	DHCP Range
pfSense Firewall	**LAN:** 192.168.1.1 **WAN:** DHCP	255.255.255.0	WAN - DHCP	N/A
LAN Switch	**MAC:** 23:6A:B7:4C:3A:1B	N/A	N/A	N/A
VLAN_01	192.168.1.0/25	255.255.255.128	192.168.1.0	192.168.1.1 - 192.168.1.126
VLAN_02	192.168.1.128/26	255.255.255.192	192.168.1.128	192.168.1.129 - 192.168.1.190
VLAN_03	192.168.1.192/26	255.255.255.192	192.168.1.192	192.168.1.193 - 192.168.1.254
Domain Controller Windows Server 2019	**STATIC:** 192.168.1.193	255.255.255.192	192.168.1.192	N/A
Network Attached Storage	**STATIC:** 192.168.1.194	255.255.255.192	192.168.1.192	N/A
Laser Printer	**STATIC:** 192.168.1.195	255.255.255.192	192.168.1.192	N/A

- **We created a VLAN trunking topology:**
  - pfSense firewall acts as a router between all VLANs
    - Connected to LAN switch by single physical interface (trunk) that carries traffic for all VLANs
  - LAN switch forwards traffic for each VLAN to the appropriate ports

- **Why VLAN trunking**:
  - Network Segmentation – logical network segments allow for easier scalability
  - Cost – requires less physical hardware
  - Configuration – can reconfigure logical network segments without having to physically reconfigure network
  - Traffic Control – can provide additional bandwidth for critical traffic (presentations)

- **VLAN selection:**
  - Chose to create three VLANs and assigned 1st (largest) to support the most hosts
    - VLAN1 – 126 hosts (Operations, Project Management, Consulting)
    - VLAN2 – 62 hosts (Sales, Marketing)
    - VLAN3 – 62 hosts (Switch – Static IPs)
  - Reserved the range 192.168.1.193 – 199 for future shared resources

- **Firewall rules for VLAN to VLAN communications:**
  - Configured multiple Firewall > Rules in pfSense to allow communications between VLANs
  - Enabled VLANs on our switch and assigned switch ports to VLAN interfaces on pfSense