PhoenixNet

PhoenixNet General Network Overview

A review, breakdown, and general rundown of PhoenixNet's Physical and Logical Topology (EOL/Shutdown Final Release 5/1/2021)

General Network Topology:

Network flow is as depicted above, flowing in from an ONT device, through a (required) AT&T gateway to a virtualized router (pfSense). Then from the virtualized router into a UniFi 24 port switch to be passed onto clients.

Physical Host Topology:
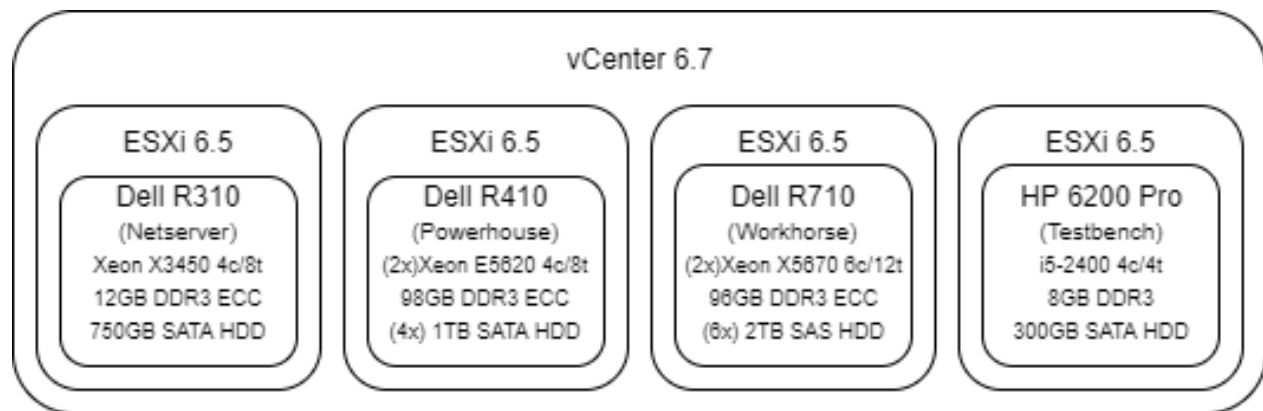
Physical network topology is as depicted above, consisting of 3 Dell Poweredge servers, and one test-bench standard desktop.

The "Netserver" handles running the following VM(s):

1. A pfSense VM for IP-routing, DDNS services, and acting as a firewall.
2. A PiHole VM for DNS-based advertisement blocking.
3. A Pritunl VM for remote access and site-to-site connectivity.

The "Powerhouse" handles running the following VM(s):

4. A Microsoft Windows Server 2019 deployment that services active directory, internal DNS, and group policy configuration management.
5. An onsite Bitwarden instance, handling password management and note saving.
6. A CheckMk server for SNMP monitoring of all onsite servers and services.
7. A FOG/PXE server for learning purposes.
8. A Guacamole server for remote access of VM(s) and Windows Desktop(s).
9. A Home Assistant server for automation of IoT devices.
10. A NGINX-Proxy-Manager server for the relay of HTTP/HTTPS traffic in and out of PhoenixNet.
11. A Portainer server for management of Docker-based deployments of services.
12. A "TICK" stack server for monitoring of internet speeds, as well as vCenter statistics.
13. A VMware vCenter Server Appliance for centralized VMware management.

May 1st, 2021

The "Workhorse" server handles running the following VM(s):

1. A Microsoft Windows Server 2019 deployment that mirrors the services deployed on the other Windows Server 2019 VM under Powerhouse and is considered a "failover" in the event of an outage, or update.
2. A dedicated VM workspace for my father.
3. A MultiCraft server for management of multiple Minecraft server(s).
4. A Paperless-NG server for the backup and digital-access of receipts and invoices.
5. A dedicated Ubuntu Server 20.04 VM for running my custom-built Discord bot.
6. A rental VM lent to an acquaintance for running a Minecraft server.
7. Another rental VM lent to another acquaintance for running a Terraria server.
8. A dedicated VM for running a tweaked and secured version of "ShareS" for on-site CDN hosting.
9. A TrueNAS server for SMB, NFS, Plex, Komga, and NextCloud.
10. A dedicated VDI-VM to be used as a remote workstation.
11. A VEEAM server for migration of VM(s) before the deployment of vCenter.
12. A dedicated Windows Server 2019 install for running windows-exclusive game-servers.

The "Testbench" server handled running the following VM(s):

1. An OctoPrint server for 3D-print queuing and management as well as time-lasping.
2. A dedicated serial-interface VM for remote serial access to lab equipment.

AD / GPO:

PhoenixNet operates under the domain "phoenix.lab" and uses Windows Server 2019 to manage it's active directory and domain name services internally.

All Windows 10 clients (Laptops, Desktops, and VDI, as well as several services internally) were connected in such fashion that allowed authorized users to use a single login to sign into any of said connected service(s).

vCenter and the SMB shares under TrueNAS took advantage of said connectivity to allow users to log in with their AD credentials.

DNS:

PhoenixNet leveraged it's domain "phoenix.lab" to allow easy access to most of it's services with simple sub-domains. This was accomplished via Windows Server 2019's DNS role.

Ubiquiti / UniFi:

PhoenixNet uses Ubiquti's UniFi products at the core of it's infrastructure. UniFi's 24-port switch was at the core of traffic-distribution and was combined with AC-AP(s) for wireless connectivity. UniFi's "Talk" platform was deployed via a UniFi Cloudkey Gen2+ to conduct SIP/PBX services using their devices such as the UniFi Talk Touch and UniFi Talk Flex.

Dell / DellEMC:

Dell's Poweredge R-series servers are the core of PhoenixNet's operations, running most, if not all of the VM(s) on-site.

iDRAC allows the remote-access of physical server's display and keyboard via a built-in microcomputer that runs a webserver.

VMware:

VMware utilizes the equipment that operates PhoenixNet to it's full-potential. Virtualization allows for PhoenixNet to consolidate its hardware down to 3 servers compared to operating an individual server for every-single software deployment.

PhoenixNet deployed a combination of ESXi for host-virtualization and vCenter for centralized management of said host(s).

RIPE NCC:

PhoenixNet participated in RIPE NCC's "Node Program" allowing other RIPE NCC users to perform network connectivity tests via an on-site hosted device.

Participation in this program is 100% voluntary, and was to be considered a donation of bandwidth to RIPE NCC for scientific purposes.

Network Shutoff / Cease of Operations:

Regarding a private matter that unfortunately leads to the cease of all operations, this document has been created to highlight the accomplishment(s) and project(s) that have been executed via PhoenixNet's creation over four years ago.

A backup has been created of all files existing on all equipment and has been setup for "cold-storage" in the event that a network migration cannot occur. This drive will safely be stored until needed or it is destroyed.

All equipment is being liquidated or stored until further required in response to recent events, as the next steps forward do not permit the continued operation of PhoenixNet's core services in their current state.

All storage, and essential services are being condensed to operate in small-scale via consumer hardware until further notice to preserve what is considered "critical" to PhoenixNet.

It has been a great 4 years building, maintaining, and learning from PhoenixNet, but as all things have wonderful beginnings, they must also have an equal end.

I hope to bring the skills I learned while operating PhoenixNet with me to my next potential employer, as the knowledge and challenges are very much so relevant to the current-day IT-world.

The old portfolio site is available via the following link if you would like to visit it for a historical view.

The official shutdown date for *everything* is May 1st, 2021.