

Top-shelf Networks  
Network Design Proposal for  
NY Jewelry

# DESIGN GUIDELINE

# Design outline

- ① Problem Statement
- ① Existing Network Analysis
- ① Changes and Upgrades to the Existing Network
- ① Timeline
- ① Budget
- ① Conclusion

# Problem Statement

- ⦿ NY Jewelry has experienced rapid growth both in New York and New Jersey and the network has not scaled to support their new footprint.
- ⦿ NY Jewelry is using inefficient weekly conference calls to share business data which is inefficient
- ⦿ They are also unable to effectively deploy an eCommerce solution because the stores are not individually networked.

# Existing Network Topology

- ⦿ the network at the first NY Jewelry store has a single connection to the local ISP and a switch sits behind the perimeter router, connecting the inside network and two web servers as well as a simple website for promotion. The other stores did not rely on Internet to conduct business and have no web presence.

# Recommended Changes

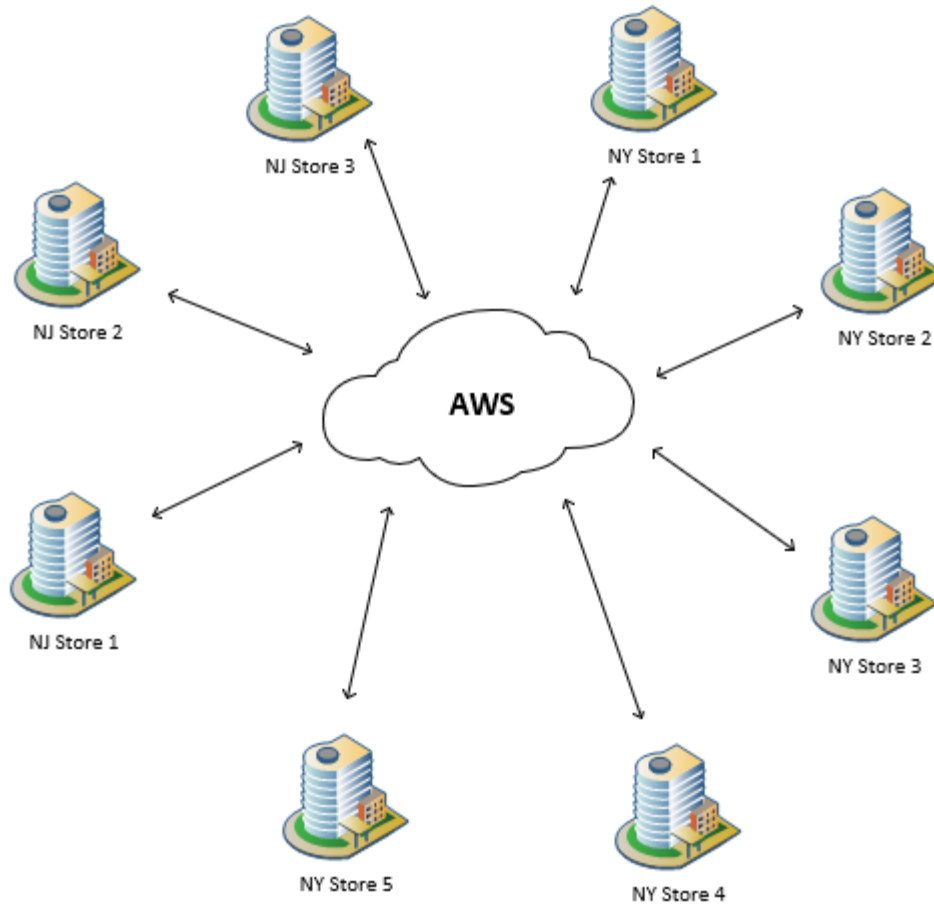
- ⦿ Top-Shelf Networks recommends building out an entirely new network considering non-existent networking at most current locations.
- ⦿ The servers will be moved to Amazon Web Services (AWS) to expedite deployment, provide centralized access for stores and eCommerce customers, increase security over an on-premise location, and offload some PCI DSS liability to Amazon.

# IP addressing scheme

- ⦿ AWS DMZ Subnet 1 10.20.0.0/24
- ⦿ AWS Internal Subnet 2 10.10.0.0/24
- ⦿ Local Store LAN 192.168.x.0/25 VLAN 10
- ⦿ Local Store WLAN 192.168.x.128/25 VLAN 20
- ⦿ Local Store Security LAN 172.16.x.0/24 VLAN 500

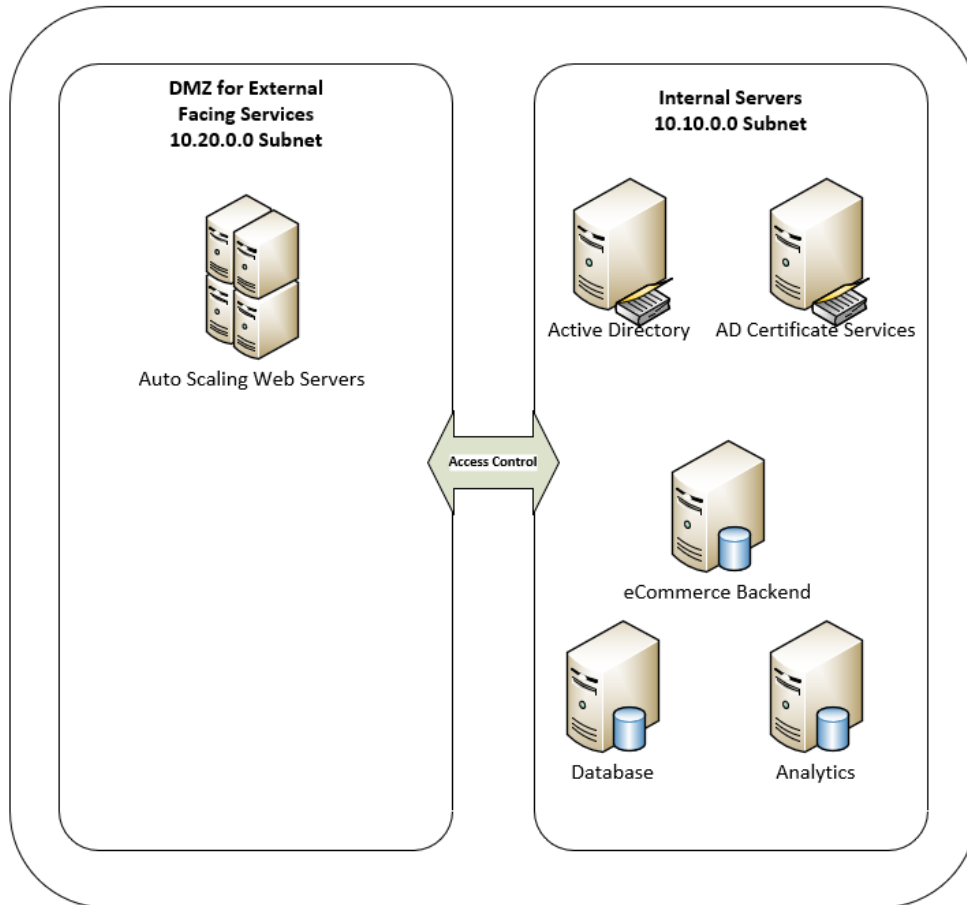
# New Topology

Hub and Spoke WAN Topology



# New Topology - AWS

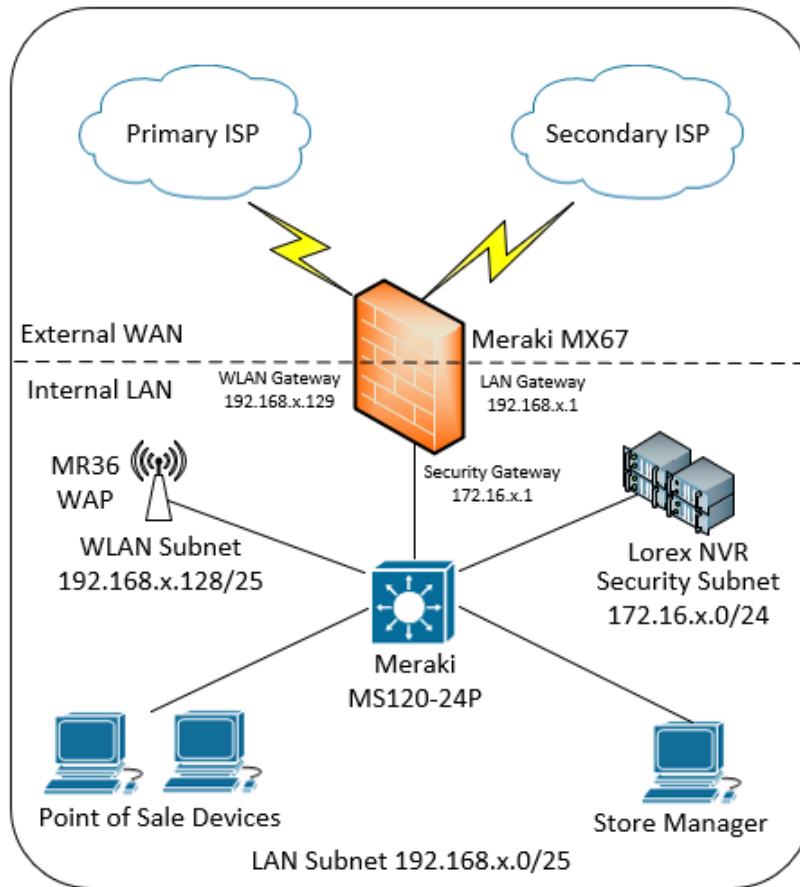
AWS Virtual Private Cloud





# New Topology

## Store Topology



# Protocol Design

- ⦿ AWS maintains PCI compliance for their infrastructure. NY Jewelry is responsible for securing the assets placed in the cloud.
- ⦿ Site-to-site VPN connections between the stores and AWS are encrypted using government-validated AES-256 encryption.
- ⦿ The MX67 firewall combined with the Advanced Security license offers web content and web search filtering to protect against malicious websites and enforce acceptable staff use of the internet, along with SourceFire Snort-based intrusion prevent to defend against malicious programs and hackers accessing the networking, along with Cisco Advanced Malware Protection.

# Security and regulatory design

- ④ The first requirement of PCI DSS is to install and maintain a firewall configuration to protect data. Both the local firewalls at each store and the security ACLs in AWS are suitable for restricting the flow of undesired traffic across the network. Automatic firmware updates performed on Meraki hardware also assist with compliance towards infrastructure maintenance.
- ④ The fourth requirement of PCI DSS is to encrypt transmission of cardholder data across open, public networks. The use of AES encryption with either point-to-point VPN connections or Wi-Fi 6 clients achieves compliance with this requirement.
- ④ The fifth requirement is that systems are protected against malware infection. The network client systems should have anti-virus software installed when possible.

# Security and regulatory design

- ⦿ The sixth requirement is that a threat identification system be implemented to detect potential security vulnerabilities on the network. This will be accomplished using the Nessus software discussed in the vulnerability management section.
- ⦿ The ninth requirement is restricting physical access to cardholder data in places where it is stored, processed, or transmitted. The installation of a video surveillance system at each store helps achieve compliance with this requirement. AWS facilities are also secured in compliance with industry guidelines, so server infrastructure is also compliant in this regard.
- ⦿ The eleventh requirement specifies that wireless scanning should be used to detect unauthorized wireless access points on the network. The WIPS technology contained in the MR36 wireless access point detect and quarantine rogue access points on the network.

# WAN design

- ① The servers will be moved to Amazon Web Services (AWS) to expedite deployment, provide centralized access for stores and eCommerce customers, increase security over an on-premise location, and offload some PCI DSS liability to Amazon.

# LAN design

- ⦿ Top-Shelf Networks proposes that NY Jewelry install 2 separate internet connections from different ISPs for reliability.
- ⦿ The proposal includes the installation of MX67 firewall with MS120-24P switch at each location.

# Data center design

- For a centralized data center, Amazon Web Services (AWS) Elastic Compute Cloud (EC2) will be used to host all six backend servers.
- To secure data connections between each store and the central AWS Virtual Private Cloud, VPN technology will be used to create an encrypted data tunnel.
- Each store will have a Firewall device at the Internet edge. The firewall will serve as an endpoint for the site-to-site VPN tunnels. Both ISP connections will connect to the firewall and the VPN traffic can be routed over either ISP.

# Budget Summary

Part	Line Cost	Quantity per Store	Cost per Store	Total for 8 Stores	Monthly
<b>Network</b>					
MX67 + 3 yrs Advanced Security	\$ 1,450.00	1	\$ 1,450.00	\$ 11,600.00	
MS120-24P Network Switch	\$ 1,800.00	1	\$ 1,800.00	\$ 14,400.00	
MR36 Wireless AP	\$ 575.00	1	\$ 272.00	\$ 2,176.00	
Precision 3930 Rack Workstation Up to Intel Xeon E-2246G (6 Core, 12MB Cache, 3.6Ghz, 4.8Ghz Turbo w/UHD Graphics 630)Up to Windows 10 Pro for Workstations (4 Cores Plus) Up to 32GB 4x8GB DDR4 2666MHz UDIMM ECC Memory	\$ 1,700.00	1	\$ 1,700.00	\$ 13,600.00	
<b>Surveillance System</b>					
Lorex Dome Camera x 4 - LNE9292B	\$ 300.00	4	\$ 1,200.00	\$ 9,600.00	
Lorex Regular Camera x 4 - LNB9292B	\$ 300.00	4	\$ 1,200.00	\$ 9,600.00	
Lorex 16-Channel NVR – N881A63B-W	\$ 1,200.00	1	\$ 1,200.00	\$ 9,600.00	
<b>POS System - hardware only</b>					
POS Nation all-in-one touch terminal - 15" Touchscreen · Celeron Quad Core 2.4GHz · 4GB RAM · Solid-state Drive · Windows 10 Pro.	\$ 2,000.00	2	\$ 4,000.00	\$ 32,000.00	
POS Nation thermal receipt printer					
Barcode scanner POS Nation thermal receipt printer					
16" point of sale cash drawer					
<b>Installation and configuration</b>					
1 Network Engineer @ 100/hr	20			\$ 2,000.00	
Network Designer @ 100/hr	100			\$ 10,000.00	
3 Technicians @ \$45/hr	72		\$ 3,240.00	\$ 25,920.00	
<b>Miscellaneous Equipment</b>					
Cat5e/6	45 per 1000ft.	3	\$ 135.00	\$ 1,080.00	
Rack cabinet	\$ 700.00	1	\$ 700.00	\$ 5,600.00	
<b>AWS Cost</b>					
6 servers @ .18/hr 788/month average					\$ 788.00
2 CPU / 10GB RAM					
Microsoft Licensing					
<b>PROJECT TOTAL</b>			\$ 8,075.00	\$ 147,176.00	
<b>MONTHLY AVERAGE TOTAL</b>					\$ 788.00



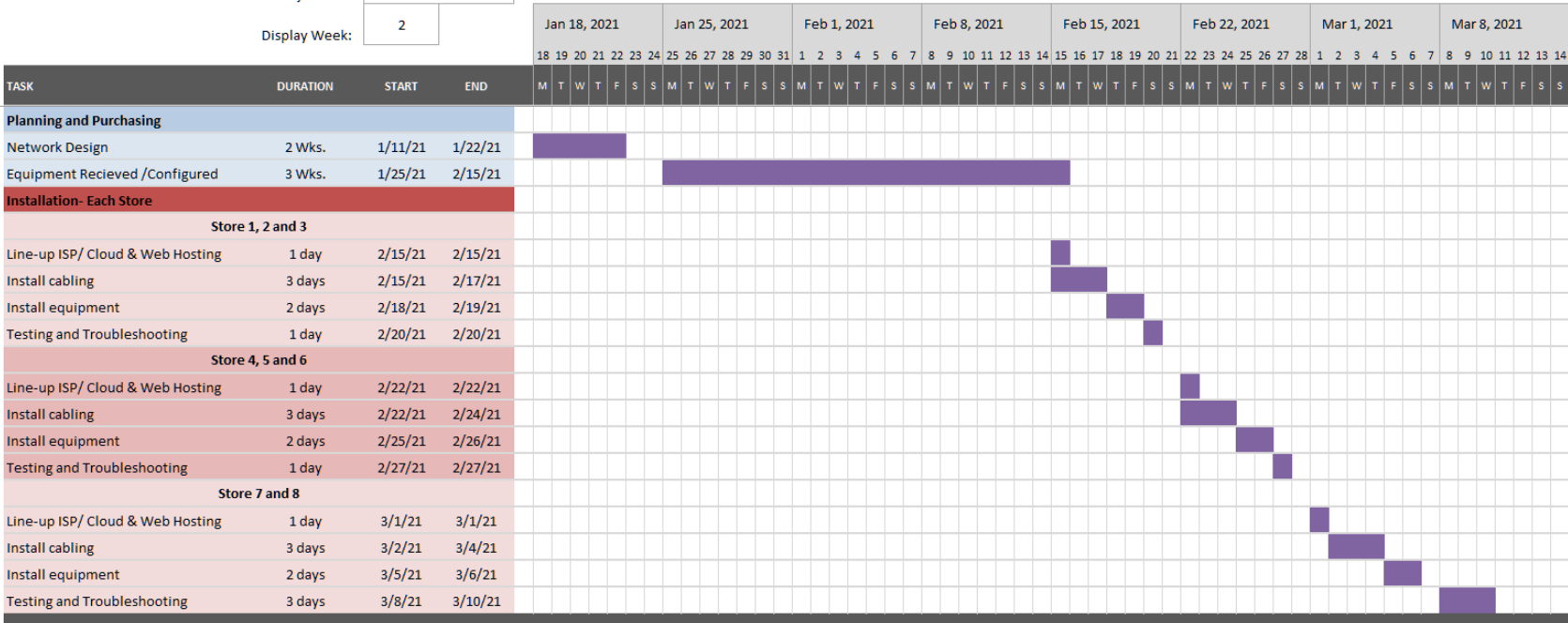
# Timeline

## NY Jewelry

### Top-Shelf Networks

Project Start:	Mon, 1/11/2021
Project End:	Wed, 3/10/2021
Display Week:	2

- Project timeline projects crews working 3 sites simultaneously. **Times are per store.**
- Extra testing time allowed at the end of the project to ensure all sites are interconnected.
- Duration reflects 1 day off per week.



# Precision 3930 Rack Workstation

- The short-depth and narrow design creates a smaller footprint ideal for space-limited workspaces. Extended operating temperatures, optional dust filters, legacy PCI slots and a remote power switch enable seamless integration into a data center and complex OEM medical imaging and industrial automation solutions.



# MR36 Wireless AP

- ⦿ Performance-critical wireless LANs
- ⦿ High-density environments



# MS120-24P Network Switch

- ⦿ Reliable platform with 24/7 Meraki Support
- ⦿ Low noise, fanless model available
- ⦿ Voice and video QoS
- ⦿ Non-blocking switch fabric



# MX67 + 3 yrs. Advanced Security



- ⦿ Managed centrally over the web
- ⦿ Classifies applications, users and devices
- ⦿ Zero-touch, self-provisioning deployments

# Conclusion

- ◎ NY Jewelry is a thriving jewelry business in New York and New Jersey seeking a robust and secure network overhaul to meet needs for greater information sharing and online retail sales to bolster their competitive edge in the marketplace. Top-Shelf Networks is excited to propose this solution to meet not only NY Jewelry's current needs, but scalable to future needs as well.