ACME Anvils and Supplies Incorporated
Network Plan – Final Project

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ACME Anvils and Supplies Incorporated
Network Plan – Final Project

Executive Summary

The purpose of this document is to provide Acme Anvils and Supplies Incorporated recommendations on how to build, configure and manage an information technology network and the associated user ID, groups, hardware, software, and firewall configurations to support its business operations. This IT network design physically covers Acme Anvils and Supplies' corporate offices in San Bernardino, CA, and its production and warehouse facility in Loma Linda, CA. It also provides specifications on setting up 32 users, user IDs, user groups, and associated levels of access, and this document provides firewall configurations.

This proposal makes the general assumption of creating a computer network with the highest quality information technology hardware with the intent of developing a network that will be robust, secure, and flexible to meet the needs of Acme Anvils and Supplies Incorporated over the next ten years. Within this in mind, there are many areas in this proposal that money can be saved as the owners discuss the return on making this investment. If need be, costs can be cut by lowering the quality of the workstations, switches, servers, and firewalls in that order. At this time, though, we recommend making the highest quality investment in Acme Anvils and Supplies Incorporated future as recommended in this proposal.

Network Diagrams

As detailed in the Network Maps below (large versions are located in Appendix 1), we have proposed three distinct firewalls at every major facility: San Bernardino HeadQuarters (HQ), Loma Linda Production Facility (PF), and Loma Linda Warehouse facility (WF). The firewalls at the two Loma Linda facilities are connected via a physical fiber line strung between the buildings (eventually a conduit should be laid between the facilities if the property is owned by the company). The firewalls between the HQ and PF are connected via a VPN connection over the Internet.

Each location has a PRI line that connects to a VoIP controller located in MDF. This line which can be provided by companies like Spectrum Enterprises or AT&T Business, can handle up to 23 simultaneous calls. The phone system is an IP address-based phone system that exclusively on VLAN-2, all other devices on the network not associated with phones run on VLAN-1. All IP phones are directly connected to a POE+ switch to provide power to the phone.

ACME Anvils and Supplies Incorporated
Corporate Headquarters, San Bernardino
Computer Network Diagram

HQ Offices - San Bernardino Network Map

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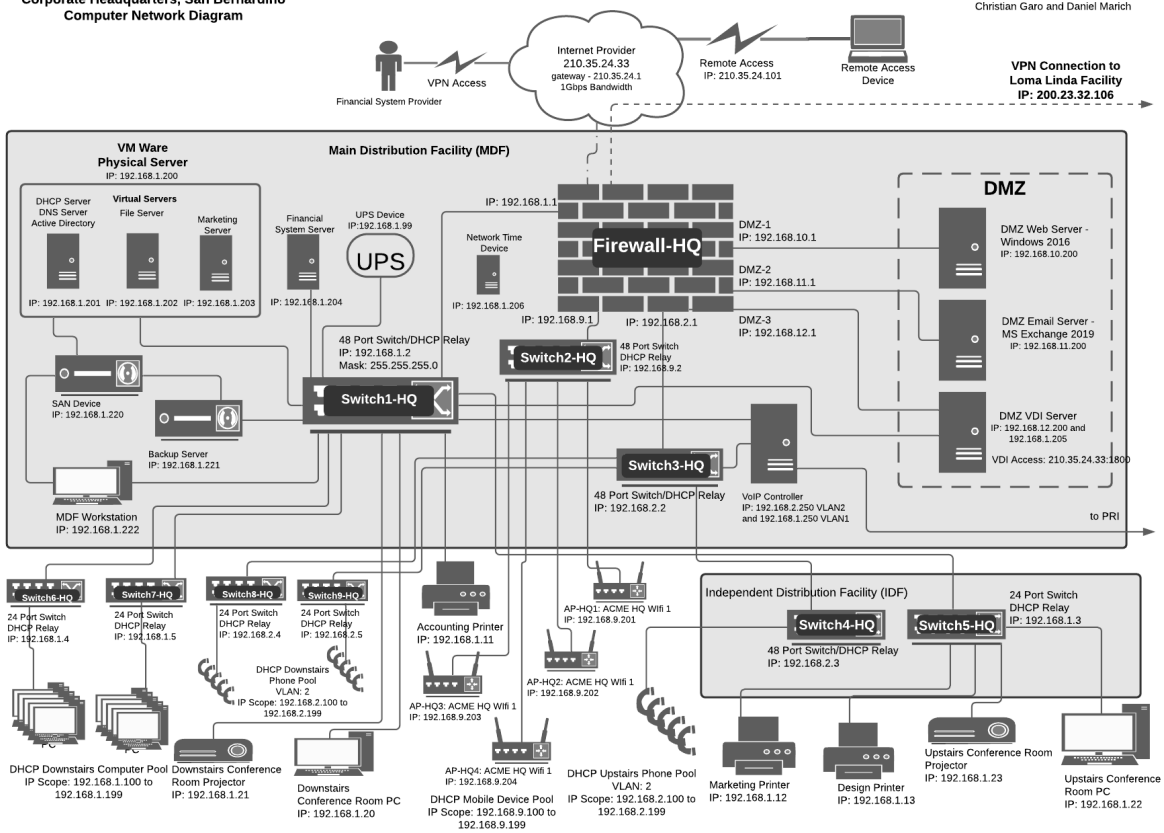
Created by
Christian Garo and Daniel Marich



ACME Anvils and Supplies Incorporated
Corporate Headquarters, San Bernardino

Loma Linda - Production Facility Network Map

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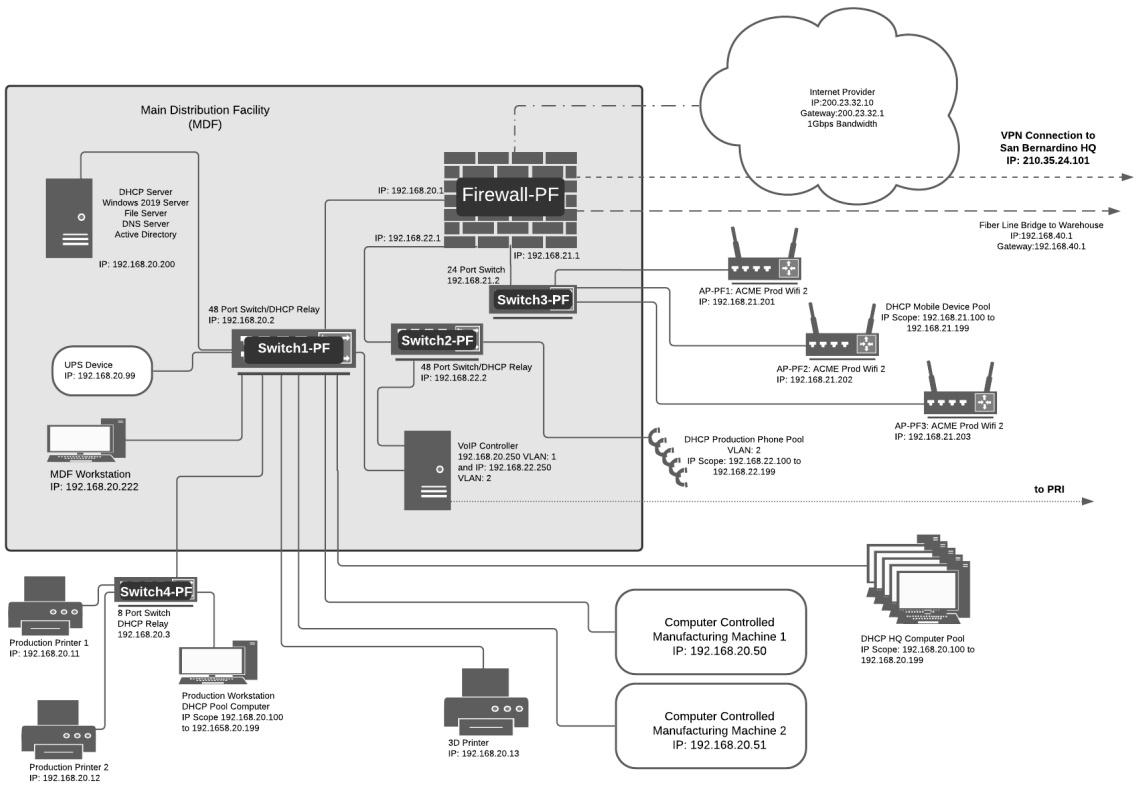
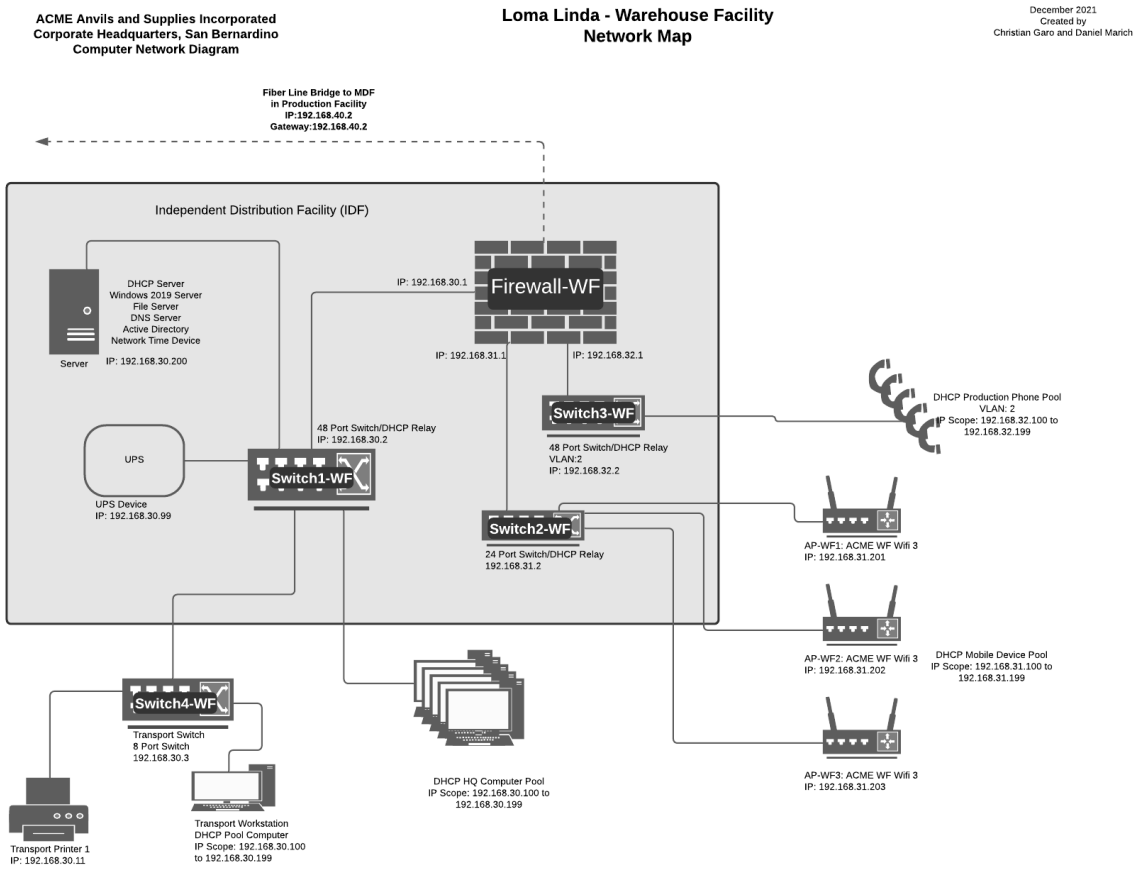




Infrastructure Information

Network

The proposed compute network consists of 32 workstations, up to 23 simultaneous active phone lines at each physical location, three Juniper SRX Series firewalls, 17 Cisco switches of different sizes, and HPE SAN device, eight HPE ProLiant DL160 Gen10 Servers, and an HPE ProLiant MicroServer Gen10 Plus running VMWare. The proposed network consists of nine subnets and three DMZs all running as Class C networks. For a complete list of all IP addresses and associated devices please see Appendix 1. All subnets meet at a firewall/router that dynamically routes traffic to the appropriate subnet unless denied by Active Directory security group policies. Please see Appendix 2 for a detailed hardware list. Unless stated otherwise the cabling for the network will be Cat6 and Cat6 POE+ for IP phones and access points.

Access Points are wired via POE+ Cat6 cables and are evenly place throughout their respective facilities. Please refer to Appendix 3 for detailed placement. There are three wall outlet access points in the Production facility and three wall outlet access points in the Warehouse facility at Loma Linda. The HQ in San Bernardino has four ceiling access points with two per floor. DHCP for Wireless and login procedures for the access points are handled by the primary Windows Server 2019 DHCP controller, and there are two levels of access: employee and guest.

DHCP Pool Assignments

All IP address assignments are static except for the listed DHCP Pools Assignments listed below. DHCP is handled by the Windows 2019 App Server at each location. Note that the DHCP Pool assignments for IP phones are on VLAN-2, all other DHCP Assignments are on VLAN-1.

DHCP Pool Assignments				
DHCP IP Scope	**Device Pool**	**Location**	**Hardware**	**VLAN**
192.168.1.100 to 199	HQ Workstations Pool	HQ	HP Workstation Z2 G5 SFF Desktop	
192.168.2.100 to 199	IP Phone Pool on VLAN2	HQ	Cisco SPA303-G1 3 Line IP Phone	VLAN-2
192.168.9.100 to 199	HQ Mobile Device Pool	HQ	Custom Devices	
192.168.20.100 to 199	PF Workstation Pool	PF	HP Workstation Z2 G5 SFF Desktop	
192.168.21.100 to 199	PF Mobile Device Pool	PF	Custom Devices	
192.168.22.100 to 199	PF IP Phone Pool	PF	Cisco SPA303-G1 3 Line IP Phone	VLAN-2
192.168.30.100 to 199	WF Workstation Pool	WF	HP Workstation Z2 G5 SFF Desktop	
192.168.31.100 to 199	WF Mobile Device Pool	WF	Custom Devices	
192.168.32.100 to 199	WF IP Phone Pool	WF	Cisco SPA303-G1 3 Line IP Phone	VLAN-2

Storage Area Network

The proposed storage area network solution is a self-contained system produced by Hewart Packard. The HPE StoreEasy 1660 has 32TB SAS Storage, and it will be connected directly to the VMware server, and the backup device.

Backup Solution

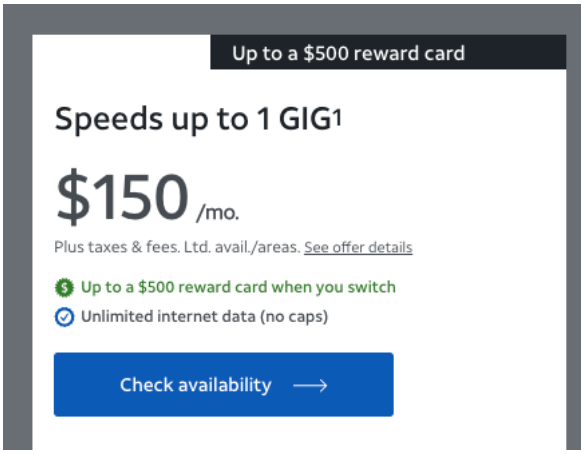
This proposal recommends scheduling full backups once a week with incremental backups scheduled every night. The backup device would be a HPE StoreOnce 3620 - Storage enclosure - 6 bays - HDD 4 TB x 6 - rack-mountable - 2U

Workstations

All workstations are standardized to one model, HP Workstation Z2 G5 SFF Desktop - Intel Core i5-10500 3.10GHz, vPro, 8GB DDR4, 256GB SSD, and run Windows 10 along with a copy of MS Office 365. They come with a 27" Full HD 1920 x 1080 60 Hz HDMI, USB Built-in Speakers Monitor. Please refer to Appendix 3 for approximate workstation placement.

Internet Speeds

The speeds we plan on receiving from our provider are 1 Gbps. This plan will be offered by AT&T Business Fiber.



Firewall Configurations Rules

The Firewall will be configured to Class C networks, with a default mask of 255.255.255.0. Configuration of Firewall Policies can be created by the network administrator. The network administrator will create policies to aid in the control of traffic of anyone within the organization to access network resources and decrease the possibility of malicious acts and breaches. We must start with the most important rules at the top of the rule base. It should mimic the following:

1. Least Privilege
   Implementing least privilege allows the network administrator to have control of the organization's traffic. It is best practice to only approve traffic in-line with the organization and deny the rest.
2. Define Rule Base
   The following policies will be followed:
   a. Deny all use of USB drivers are prohibited for all departments
   b. Remote access will only be granted for:
      i. Marketing to Marketing Server
      ii. Management to all Servers
   c. Grant everyone has access to the Intranet (besides Interns)
   d. Grant everyone has access to the Internet (including Interns and Visitors)
   e. Deny all from accessing all social networking sites: e.g., Facebook, Twitter, MySpace, TikTok, Pinterest
   f. Everyone is blocked from accessing gambling and inappropriate sites: e.g. NSFW domains, fanduel
3. Network Shares
   Management users have access to all servers from San Bernardino and Loma Linda servers. Marketing users have access to marketing servers only. Everyone has access to Intranet, other than interns and guests accounts. Everyone has access to the Internet.

POLICY NAME	SOURCE IP	SERVICE	ACTION	LOG
INTERENT	EVERYONE	DNS, HTTPS	ACCEPT	YES
ADMIN	ADMIN PC	ALL	ACCEPT	YES
MANAGMENT	MANAGEMENT	ALL	ACCEPT	YES
MARKETING	MARKETING	MAREKTING SERVERS	ACCPET	YES
SOCIAL MEDIA	EVERYONE	FACEBOOK, INSTAGRAM	DENY	YES
INAPPROPRIATE SITES	EVERYONE	NSFW	DENY	YES
GAMBLING	EVERYONE	FANDUEL, GAMBLING	DENY	YES
FILE ACCESS	INTERNS,GUEST	FILES	DENY	YES
FILE ACCESS	SB, LL	FILES	ACCEPT	YES
REMOTE ACCESS	MARKETING, MA	REMOTE ACCESS	ACCEPT	YES
REMOTE ACCESS	HVAC PROVIDER	REMOTE ACCESS	ACCEPT	YES
VPN	MANAGMENT	VPN	ACCEPT	YES
WEBSENSE	EVERYONE	SSL	ACCEPT	YES
WEBMAIL	EVERYONE	MAIL	ACCEPT	YES

SAN BERNARDINO FIREWALL TO DMZ WEB SERVER IN					
SOURCE IP	SOURCE PORT	DESTINATION IP	PROTOCOL	ACTION	TRUST/UNTRUST/DMZ
ANY	22	192.168.10.200	SSH	ACCEPT	DMZ TO TRUST
ANY	80	192.168.10.200	HTTP	DENY	DMZ TO TRUST
SERVERS	22	192.168.10.200	SSH	ACCEPT	DMZ TO TRUST
ANY	ANY	ANY	ANY	DENY	DMZ TO TRUST

SAN BERNARDINO FIREWALL TO DMZ MAIL SERVER IN					
SOURCE IP	SOURCE PORT	DESTINATION IP	PROTOCOL	ACTION	TRUST/UNTRUST/DMZ
192.168.11.200	110	192.168.1.1	MAIL	ACCEPT	DMZ TO TRUST
ANY	ANY	ANY	ANY	DENY	DMZ TO TRUST

SAN BERNARDINO FIREWALL TO DMZ VDI SERVER IN					
SOURCE IP	SOURCE PORT	DESTINATION IP	PROTOCOL	ACTION	TRUST/UNTRUST/DMZ
192.168.1.205	80	192.168.1.1	VDI	ACCEPT	DMZ TO TRUST
ANY	ANY	ANY	ANY	DENY	DMZ TO TRUST

SAN BERNARDINO FIREWALL TO INTERNET OUT					
SOURCE IP	SOURCE PORT	DESTINATION IP	PROTOCOL	ACTION	TRUST/UNTRUST/DMZ
ANY	80	210.35.24.33	HTTP	ACCEPT	TRUST TO UNTRUST
ANY	443	210.35.24.33	HTTPS	ACCEPT	TRUST TO UNTRUST
ANY	ANY	ANY	ANY	DENY	TRUST TO UNTRUST

LOMA LINDA FIREWALL OUT					
SOURCE IP	SOURCE PORT	DESTINATION IP	PROTOCOL	ACTION	TRUST/UNTRUST/DMZ
ANY	80	200.23.32.10	HTTP	ACCEPT	TRUST TO UNTRUST
ANY	443	200.23.32.10	HTTPS	ACCEPT	TRUST TO UNTRUST
ANY	ANY	ANY	ANY	DENY	TRUST TO UNTRUST

Use Logging
Log all firewall policies. Logging allows a trail of all network activity to be generated and followed. This is useful in diagnosing and troubleshooting.

Use Network Time Protocol (NTP)
NTP synchronizes the clocks of all devices within the organization that is on the Internet. By synchronizing the clocks, logs will be more useful to diagnose and troubleshoot more efficiently. If the clocks are not synchronized, it is more difficult to understand what and when a problem occurred and for scheduled procedures to be executed. We propose purchasing TimeMachines' NTP Network Time Server with GPS, TM1000A.

Audit Software and Firmware
Auditing software and firmware regularly will ensure the programs are operational and configured to organization standards. Implementing a weekly check of software and firmware will help identify holes within the security and changes that need to be made.

Remote Access
Remote Access will be granted to groups with Top Secret or Secret security clearance. Must be renewed bi-yearly. The in-house VDI server will be accessible for remote users.
Individuals can be added to the Remote Access list with approval from their direct supervisor. In order for an individual without a Top Secret or Secret clearance, we require the reason for the need for Remote Desktop, a valid CyberSecurity training certificate that has been completed within one year of the request, and a signature from a supervisor holding a Top Secret or Secret security clearance. The administrator will review the Allow log every two weeks to ensure Roles, Clearances, and Permissions have been changed or expired.

SSL Solution
The built-in web filter Websense will run SSL to secure data transmission over the internet. It is the leading standard and verifies all certificates through a certificate authority. The Certificate will be pasted into our web server and modify the site to use HTTPS.

VPN
VPN access will be given to Users with a Top Secret or Secret security clearance, remote employees, and Financial System Advisors. This access is given to these users to access internal applications and data. In addition, due to the multiple locations that these authorized users can have a shared network between the different locations. The implementation of the VPN will aid in the security and potential snooping of sensitive data when an individual is using the public Internet.
For VPN access, it is possible for individuals to be added to the Remote Access list with approval from their direct supervisor. In order for an individual without a Top Secret or Secret

clearance, we require the reason for the need for Remote Desktop, a valid CyberSecurity training certificate that has been completed within one year of the request, and a signature from a supervisor holding a Top Secret or Secret security clearance.

Specialty Equipment
We recommend a network time device to handle the synchronization of all servers and associated network devices. We propose purchasing TimeMachines' NTP Network Time Server with GPS, TM1000A. In addition, the 3D printer would be considered a specialty equipment that should be selected by the owner to meet specific business requirements.

Wi-Fi Policies
There will be two Wi-Fi Networks, one for employees and one for guests at each facility.

- For San Bernardino HQ the SSIDs are AMCE-HQ Wi-Fi Emp and AMCE-HQ Wi-Fi Guest
- For Loma Linda Production facility the SSIDs are AMCD-PF Wi-Fi Emp and AMCE-PF Wi-Fi Guest
- For Loma Linda Warehouse facility the SSIS are AMCE-WF Wi-Fi Emp and AMCE-WF Wi-Fi Guest

For all uses of the Wi-Fi network will have to login via a Web page that loads upon connection. Employee passwords are the same as their network password, and a guest will have a temporary password generated for one day's use. Employees will be able to access the same network shares that they can via their desktop Windows login, and guest users will be able to only access the Internet through access can be given to other devices on a case-by-case basis.

Applications
The HPE Proliant Micoserve is running VMWare vSphere 7.0.2 and the three virtual servers it hosts are running Windows Server 2019. All other servers are running Windows Server 2019 except for the Web Server in DMZ 1 which is running Windows Server 2016. In addition, certain servers for specific groups run custom software. For example, the accounting department has a server that runs its financial software system on top of Windows 2019. Every Windows Server 2019 server that handles DHCP also handles access to MS Office 365.

San Bernardino HQ				
IP Address	**Type**	**Name**	**Location**	**Applications**
192.168.1.200	Blade Server	VMServer1-HQ	HQ-MDF	VMWare vSphere
192.168.1.201	Virtual Server	APP-Server-HQ	Blade Server	Windows 2019/DHCP Server/File Server/DNS Server/Active Directory
192.168.1.202	Virtual Server	File Server	Blade Server	Windows 2019
192.168.1.203	Virtual Server	Marketing Server	Blade Server	Windows 2019
192.168.1.204	Physical Server	Financial System Server	HQ-MDF	Windows 2019
192.168.1.205	Physical Server	DMZ VDI Server	HQ-MDF	Windows 2019
192.168.1.250	Physical Server	VOIP Controller	HQ-MDF	Windows 2019 - VoIP Controller Software
192.168.10.200	Physical Server	DMZ Web Server	HQ-MDF	Windows 2016
192.168.11.200	Physical Server	DMZ Email Server	HQ-MDF	Windows 2019 - MS Exchange 2019
192.168.12.200	Physical Server	DMZ VDI Server	HQ-MDF	Windows 2019 - VDI Application
Loma Linda Facilities				
192.168.20.200	Physical Server	App-Server-PF	PF_MDF	Windows 2019/DHCP Server/File Server/DNS Server/Active Directory
192.168.20.250	Physical Server	VoIP Controller	PF-MDF	Windows 2019 - VoIP Controller Software
192.168.30.200	Physical Server	App-Server-WF	WF-IDF	Windows 2019/DHCP Server/File Server/DNS Server/Active Directory

Users

Individual users

The creation of domain user accounts will be created for all registered employees of Acme. These individual users will use their User IDs to access any computer. According to the User IDs security clearance, individual accounts will be granted access to resources and servers.
All guest and intern users will be able to access the guest accounts on any computer. The only access a guest account is granted is the Internet.

Groups

Groups will be configured according to:

1. Location (e.g., San Bernardino HQ, Loma Linda)
2. Executive Team
3. Union
4. Supervisors
5. Departments (e.g., management, accounting, marketing, production, transport, and design)
6. Security Clearance (e.g., Top Secret, Secret, Unclassified, Classified, None).
7. Intern
8. Guest

User ID

User IDs will be configured by the first two initials of your first and last name, followed by their employee identification number. For example, President/Owner: Wyl E Coyote, employee identification number: 00001. Wyl E Coyote's user ID would be "wyco00001".
By following these rules, every employee will have an individualized user ID to themselves.

Security Groups

Within Active Directory, Security Groups will be defined. This is where permissions will be assigned to gain access to resources within the network. Individuals with Top Secret and Secret

Security Clearance will have Read, Write, Delete permissions. Individuals with Classified and Unclassified Clearances will have Read and Write permissions. Interns and Visitors will have non-permissions. For additional permissions, it is possible for individuals to be added to the Remote Access list with approval from their direct supervisor.
In order for an individual without a Top Secret or Secret clearance, we require the reason for the need for Remote Desktop, a valid CyberSecurity training certificate that has been completed within one year of the request, and a signature from a supervisor holding a Top Secret or Secret security clearance.

Name	Department	Position	Security Group	Group	Employee Number	User ID	Internal Emails	External Email
Wyl E Coyote	President/Owner	President/Owner	Top Secret	Management	00001	Wyco00001	Wyco00001@acme.com	Wyco00001@aasinc.mail.com
Elmer Fudd	Accounting	Manager	Top Secret	Management	00002	Elfu00002	Elfu00002@acme.com	Elfu00002@aasinc.mail.com
Wilma Flintstone	Accounting	Supervisor	Secret	Union	00003	Wifl00003	Wifl00003@acme.com	Wifl00003@aasinc.mail.com
Allison Rexford	Accounting	Senior Acct	Secret	Union	00004	Alre00004	Alre00004@acme.com	Alre00004@aasinc.mail.com
Mister Slate	Accounting	Accountant	Secret	Union	00005	Misl00005	Misl00005@acme.com	Misl00005@aasinc.mail.com
Betty Rubble	Accounting	Accountant	Secret	Union	00006	Beru00006	Beru00006@acme.com	Beru00006@aasinc.mail.com
Bam Bam Rubble	Accounting	Technician	Classified	Union	00007	Baru00007	Baru00007@acme.com	Baru00007@aasinc.mail.com
Daisy Duck	Accounting	Technician	Classified	Union	00008	Dadu00008	Dadu00008@acme.com	Dadu00008@aasinc.mail.com
Daffy Duck	Marketing	Manager	Top Secret	Management	00009	Dadu00009	Dadu00009@acme.com	Dadu00009@aasinc.mail.com
Bugs Bunny	Marketing	Supervisor	Secret	Union	00010	Bubu00010	Bubu00010@acme.com	Bubu00010@aasinc.mail.com
Rex Allison	Marketing	Analyst	Classified	Union	00011	Real00011	Real00011@acme.com	Real00011@aasinc.mail.com
Fred Flintstone	Marketing	Sales	Unclassified	Union	00012	Frfl00012	Frfl00012@acme.com	Frfl00012@aasinc.mail.com
Roster Cogburn	Marketing	Sales	Unclassified	Union	00013	Roco00013	Roco00013@acme.com	Roco00013@aasinc.mail.com
Donald Duck	Marketing	Sales	Unclassified	Union	00014	Dodu00014	Dodu00014@acme.com	Dodu00014@aasinc.mail.com
Mickey Mouse	Marketing	Intern	None	None	00015	Mimo00015	Mimo00015@acme.com	Mimo00015@aasinc.mail.com
Wanda Andrews	Production	Manager	Top Secret	Management	00016	Waan00016	Waan00016@acme.com	Waan00016@aasinc.mail.com
Suely Smith	Production	Supervisor	Secret	Union	00017	Susm00017	Susm00017@acme.com	Susm00017@aasinc.mail.com
Eddie Griffith	Production	Lead	Secret	Union	00018	Edgr00018	Edgr00018@acme.com	Edgr00018@aasinc.mail.com
Jason Wright	Production	Technician	Classified	Union	00019	Jawr00019	Jawr00019@acme.com	Jawr00019@aasinc.mail.com
Jonny Quest	Production	Technician	Classified	Union	00020	Joqu00020	Joqu00020@acme.com	Joqu00020@aasinc.mail.com
Marilyn Jones	Production	Technician	Classified	Union	00021	Majo00021	Majo00021@acme.com	Majo00021@aasinc.mail.com
Scobby Do	Production	Intern	None	None	00022	Scdo00022	Scdo00022@acme.com	Scdo00022@aasinc.mail.com
Tommy Lasorda	Transport	Manager	Top Secret	Management	00023	Tola00023	Tola00023@acme.com	Tola00023@aasinc.mail.com
Steve Garvey	Transport	Supervisor	Secret	Union	00024	Stga00024	Stga00024@acme.com	Stga00024@aasinc.mail.com
Jesse Owens	Transport	Driver	Unclassified	Bowling League	00025	Jeow00025	Jeow00025@acme.com	Jeow00025@aasinc.mail.com
Ron Cey	Transport	Driver	Unclassified	Bowling League	00026	Roce00026	Roce00026@acme.com	Roce00026@aasinc.mail.com
Sandy Koufax	Transport	Driver	Unclassified	Bowling League	00027	Sako00027	Sako00027@acme.com	Sako00027@aasinc.mail.com
Duke Snider	Transport	Warehouse	Unclassified	Union	00028	Dusn00028	Dusn00028@acme.com	Dusn00028@aasinc.mail.com
Tom Brady	Design	Manager	Top Secret	Management	00029	Tobr00029	Tobr00029@acme.com	Tobr00029@aasinc.mail.com
Derrick Carr	Design	Analyst	Classified	Union	00030	Deca00030	Deca00030@acme.com	Deca00030@aasinc.mail.com
Jeff Goff	Design	Analyst	Classified	Union	00031	Jego00031	Jego00031@acme.com	Jego00031@aasinc.mail.com
Phillip Rivers	Design	Intern	None	None	00032	Phri00032	Phri00032@acme.com	Phri00032@aasinc.mail.com

Password Rules

A password must be a minimum of 12 characters long. The password must include at least one upper case letter, one lower case letter, two numbers, and two symbols. A password should never contain personal information, such as employee ID, date of birth, SSN number, name of spouse or children. A forced password reset will be enforced every 180 days.
By following these rules, we can reduce the chances of breaches in security, stolen data, and brute force hacking.

Distribution or Email Groups

Distribution groups will be defined according to the groups above: Location, Executive Team, Union, Supervisors, and Departments. By having an updated distribution list of employees to their respective roles, messages can be received by the right people in a timely manner.

Active Directory Information

Group Policy Objectives

GPO OBJECTIVES	
ACTION	**OPERATING SYSTEM AFFECTED**
PROHIBIT USB DRIVERS FOR ALL DEPARTMENTS	ALL WORKSTATIONS
PROHIBIT ACCESS TO CONTROL PANEL AND PC SETTINGS	ALL WORKSTATIONS
ENABLE ACCESS TO CONTROL PANEL AND PC SETTINGS	ADMINISTRATOR ACCOUNT
ENABLE GUEST ACCOUNT	ALL WORKSTATIONS
PROHIBIT USER INSTALLS	ALL WORKSTATIONS
ENABLE USER INSTALLS	ADMINSTRATOR ACCOUNT
ENABLE ACCESS TO ALL SERVERS	MANAGEMENET USERS
ENABLE ACCESS TO MARKETING SERVER	MARKETING USERS GROUPS

Summary

This document is a comprehensive recommendation to build, configure, and manage an information technology network and associated user ID, groups, hardware, software, and firewall configurations to support business operations for Acme Anvils and Supplies Incorporated. This proposal provides a high-end, high-quality network hardware solution to give Acme Anvils and Supplies a return on investment that will last the company well into the next decade. It also provides users, groups, firewall configurations, and wireless access policies that maximize security without inhibiting business operations. We are confident that if the recommendations in the document are followed, Acme Anvils and Supplies Incorporated will be well prepared to compete in the anvil manufacturing industry for years to come.

Appendix 1

ACME Anvils and Supplies - IP Address and Device List						
Subnet	**IP Address**	**Device**	**Label**	**Location**	**Hardware**	**Details**
192.168.1.0/24	192.168.1.1	Gateway	Firewall-HQ	HQ-MDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.1.2	Switch	Switch1-HQ	HQ-MDF	WS-C2960X-48TD-L Catalyst 2960-X Switch	
	192.168.1.3	Switch	Switch5-HQ	HQ-IDF	WS-C2960X-24TS-LL Catalyst 2960-X Switch	
	192.168.1.4	Switch	Switch6-HQ	Downstairs Compute Pool	WS-C2960X-24TS-LL Catalyst 2960-X Switch	
	192.168.1.5	Switch	Switch7-HQ	Downstairs Compute Pool	WS-C2960X-24TS-LL Catalyst 2960-X Switch	
	192.168.1.11	Printer	Accounting Printer	Downstairs	HP Laserjet Pro M404dn Monochrome Laser Printer	
	192.168.1.12	Printer	Marketing Printer	Upstairs	HP Color LaserJet Pro M255dw	
	192.168.1.13	Printer	Design Printer	Upstairs	HP Color LaserJet Pro M255dw	
	192.168.1.20	Workstation		Downstairs Conference Room	HP Workstation Z2 G5 SFF Desktop	
	192.168.1.21	Projector	Projector1-HQ	Downstairs Conference Room	Epson VS260 3-Chip 3LCD XGA Projector	
	192.168.1.22	Workstation		Upstairs Conference Room	HP Workstation Z2 G5 SFF Desktop	
	192.168.1.23	Projector	Projector2-HQ	Upstairs Conference Room	Epson VS260 3-Chip 3LCD XGA Projector	
	192.168.1.99	UPS Device	UPS-HQ	HQ-MDF	CyberPower PR1500LCD	
	192.168.1.100 to 199	DHCP	HQ Workstations Pool	HQ	HP Workstation Z2 G5 SFF Desktop	
	192.168.1.200	Blade Server	VMServer1-HQ	HQ-MDF	HPE ProLiant MicroServer Gen10 Plus E-2224	
	192.168.1.201	Virtual Server	DHCP/DNS/Domain/Active Directory	Blade Server	Virtual	
	192.168.1.202	Virtual Server	File Server	Blade Server	Virtual	
	192.168.1.203	Virtual Server	Marketing Server	Blade Server	Virtual	
	192.168.1.204	Physical Server	Financial System Server	HQ-MDF	HPE ProLiant DL160 Gen10 4208	
	192.168.1.205	Physical Server	DMZ VDI Server	HQ-MDF	HPE ProLiant DL160 Gen10 4208	NIC 1
	192.168.1.206	NTD	Network Time Device	HQ-MDF	TimeMachines, NTP Network Time Server with GPS, TM1000A	
	192.168.1.220	SAN Device	SAN-HQ	HQ-MDF	HPE StoreEasy 1660 32TB SAS Storage	
	192.168.1.221	Physical Server	Backup Storage Device	HQ-MDF	HPE StoreOnce 3620	
	192.168.1.222	Workstation	MDF Computer	HQ-MDF	HP Workstation Z2 G5 SFF Desktop	
	192.168.1.250	Server	VOIP Server on VLAN-1	HQ-MDF	HPE ProLiant DL160 Gen10 4208	VLAN-1 Nic1
192.168.2.0/24	192.168.2.1	Gateway	Firewall-HQ	HQ-MDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.2.2	Switch	Switch3-HQ	HQ-MDF	WS-C3850-48F-S Catalyst 3850 Switch	VLAN-2
	192.168.2.3	Switch	Switch4-HQ	HQ-IDF	WS-C3850-48F-S Catalyst 3850 Switch	VLAN-2
	192.168.2.4	Switch	Switch8-HQ	HQ	WS-C2960L-24PQ-LL - Cisco Catalyst 2960L Switch	VLAN-2
	192.168.2.5	Switch	Switch9-HQ	HQ	WS-C2960L-24PQ-LL - Cisco Catalyst 2960L Switch	VLAN-2
	192.168.2.100 to 199	DHCP	IP Phone Pool on VLAN2	HQ	Cisco SPA303-G1 3 Line IP Phone	VLAN-2
	192.168.2.250	Server	VOIP Server on VLAN2	HQ-MDF	HPE ProLiant DL160 Gen10 4208	VLAN-2 Nic-2
192.168.9.0/24	192.168.9.1	Gateway	Firewall-HQ	HQ-MDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.9.2	Switch	Switch2-HQ	HQ-MDF	WS-C2960L-24PQ-LL	DHCP Relay
	192.168.9.201	Access Point	AP-HQ1	HQ	NETGEAR Wireless Access Point (WAX610PA)	
	192.168.9.202	Access Point	AP-HQ2	HQ	NETGEAR Wireless Access Point (WAX610PA)	
	192.168.9.203	Access Point	AP-HQ3	HQ	NETGEAR Wireless Access Point (WAX610PA)	
	192.168.9.204	Access Point	AP-HQ4	HQ	NETGEAR Wireless Access Point (WAX610PA)	
	192.168.9.100 to 199	DHCP	HQ Mobile Device Pool	HQ	Custom Devices	
192.168.10.0/24	192.168.10.1	Gateway	Firewall-HQ	HQ-MDF	SRX345-SYS-JE - Juniper SRX Series	DMZ-1
	192.168.10.200	Physical Server	DMZ Web Server	HQ-MDF	HPE ProLiant DL160 Gen10 4208	DMZ-1
192.168.11.0/24	192.168.11.1	Gateway	Firewall-HQ	HQ-MDF	SRX345-SYS-JE - Juniper SRX Series	DMZ-2
	192.168.11.200	Physical Server	DMZ Email Server	HQ-MDF	HPE ProLiant DL160 Gen10 4208	DMZ-2
192.168.12.0/24	192.168.12.1	Gateway	Firewall-HQ	HQ-MDF	SRX345-SYS-JE - Juniper SRX Series	DMZ-3
	192.168.12.200	Physical Server	DMZ VDI Server	HQ-MDF	HPE ProLiant DL160 Gen10 4208	DMZ-3 / NIC-2

ACME Anvils and Supplies - IP Address and Device List (Cont.)

Subnet	IP Address	Device	Label	Location	Hardware	Details
192.168.20.0/24	192.168.20.1	Gateway	Firewall-PF	PF-MDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.20.2	Switch	Switch1-PF	PF-MDF	WS-C2960X-48TD-L Catalyst 2960-X Swi	DHCP Relay
	192.168.20.3	Switch	Switch4-PF	PF-Production	WS-C2960CX-8TC-L Cisco Compact Swit	DHCP Relay
	192.168.20.11	Printer	Production Printer 1	PF-Production	HP Laserjet Pro M404dn Monochrome	Laser Printer
	192.168.20.12	Printer	Production Printer 2	PF-Production	HP Laserjet Pro M404dn Monochrome	Laser Printer
	192.168.20.13	Printer	3D Printer	PF-CMC	Custom Business Equipment	
	192.168.20.50	Manufacturing Machine	CCM-1	PF-CMC	Custom Business Equipment	
	192.168.20.51	Manufacturing Machine	CCM-2	PF-CMC	Custom Business Equipment	
	192.168.20.99	UPS	UPS-PF	PF-MDF	CyberPower PR1500LCD	
	192.168.20.100 to 199	DHCP	PF Workstation Pool	PF	HP Workstation Z2 G5 SFF Desktop	
	192.168.20.200	Physical Server	App-Server-PF	PF_MDF	HPE ProLiant DL160 Gen10 4208	Windows 2019/DHCP Server/File Server/DNS Server/Active Directory
	192.168.20.222	Workstation	PF-MDF Workstation	PF_MDF	HP Workstation Z2 G5 SFF Desktop	
	192.168.20.250	Physical Server	VoIP Controller	PF-MDF	HPE ProLiant DL160 Gen10 4208	VLAN 1
192.168.21.0/24	192.168.21.1	Gateway	Firewall-PF	PF-MDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.21.2	Switch	Switch3-PF	PF-MDF	WS-C2960L-24PQ-LL - Cisco Catalyst 2960L Switch	
	192.168.21.201	Access Point	AP-PF1	PF	Cisco CATALYST 9105AX SERIES-WALLPLATE	
	192.168.21.202	Access Point	AP-PF2	PF	Cisco CATALYST 9105AX SERIES-WALLPLATE	
	192.168.21.203	Access Point	AP-PF3	PF	Cisco CATALYST 9105AX SERIES-WALLPLATE	
	192.168.21.100 to 199	DHCP	PF Mobile Device Pool	PF	Custom Devices	
192.168.22.0/24	192.168.22.1	Gateway	Firewall-PF	PF-MDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.22.2	Switch	Switch2-PF	PF-MDF	WS-C3850-48F-S Catalyst 3850 Switch	
	192.168.22.100 to 199	DHCP	PF IP Phone Pool	PF	Cisco SPA303-G1 3 Line IP Phone	VLAN2
	192.168.22.250	Physical Server	VoIP Controller	PF-MDF	HPE ProLiant DL160 Gen10 4208	VLAN 2
192.168.30.0/24	192.168.30.1	Gateway	Firewall-WF	WF-IDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.30.2	Switch	Switch1-WF	WF-IDF	WS-C2960X-48TD-L Catalyst 2960-X Switch	
	192.168.30.3	Switch	Switch4-WF	WF-Transport	WS-C2960CX-8TC-L Cisco Compact Switch	
	192.168.30.11	Printer	Transport Printer 1	WF-Transport	HP Laserjet Pro M404dn Monochrome	Laser Printer
	192.168.30.99	UPS	UPS-WF	WF-IDF	CyberPower PR1500LCD	
	192.168.30.100 to 199	DHCP	WF Workstation Pool	WF	HP Workstation Z2 G5 SFF Desktop	
	192.168.30.200	Physical Server	App-Server-WF	WF-IDF	HPE ProLiant DL160 Gen10 4208	Windows 2019/DHCP Server/File Server/DNS Server/Active Directory
192.168.31.0/24	192.168.31.1	Gateway	Firewall-WF	WF-IDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.31.2	Switch	Switch2-WF	WF-IDF	WS-C2960X-48TD-L Catalyst 2960-X Switch	
	192.168.31.100 to 199	DHCP	WF Mobile Device Pool	WF	Custom Devices	
	192.168.31.201	Access Point	AP-WF1	WF	Cisco CATALYST 9105AX SERIES-WALLPLATE	
	192.168.31.202	Access Point	AP-WF2	WF	Cisco CATALYST 9105AX SERIES-WALLPLATE	
	192.168.31.203	Access Point	AP-WF3	WF	Cisco CATALYST 9105AX SERIES-WALLPLATE	
192.168.32.0/24	192.168.32.1	Gateway	Firewall-WF	WF-IDF	SRX345-SYS-JE - Juniper SRX Series	
	192.168.32.2	Switch	Switch3-WF	WF-IDF	WS-C3850-48F-S Catalyst 3850 Switch	
	192.168.32.100 to 199	DHCP	WF IP Phone Pool	WF	Cisco SPA303-G1 3 Line IP Phone	VLAN2

Appendix 2

ACME Anvils and Supplies - Company IT Hardware List

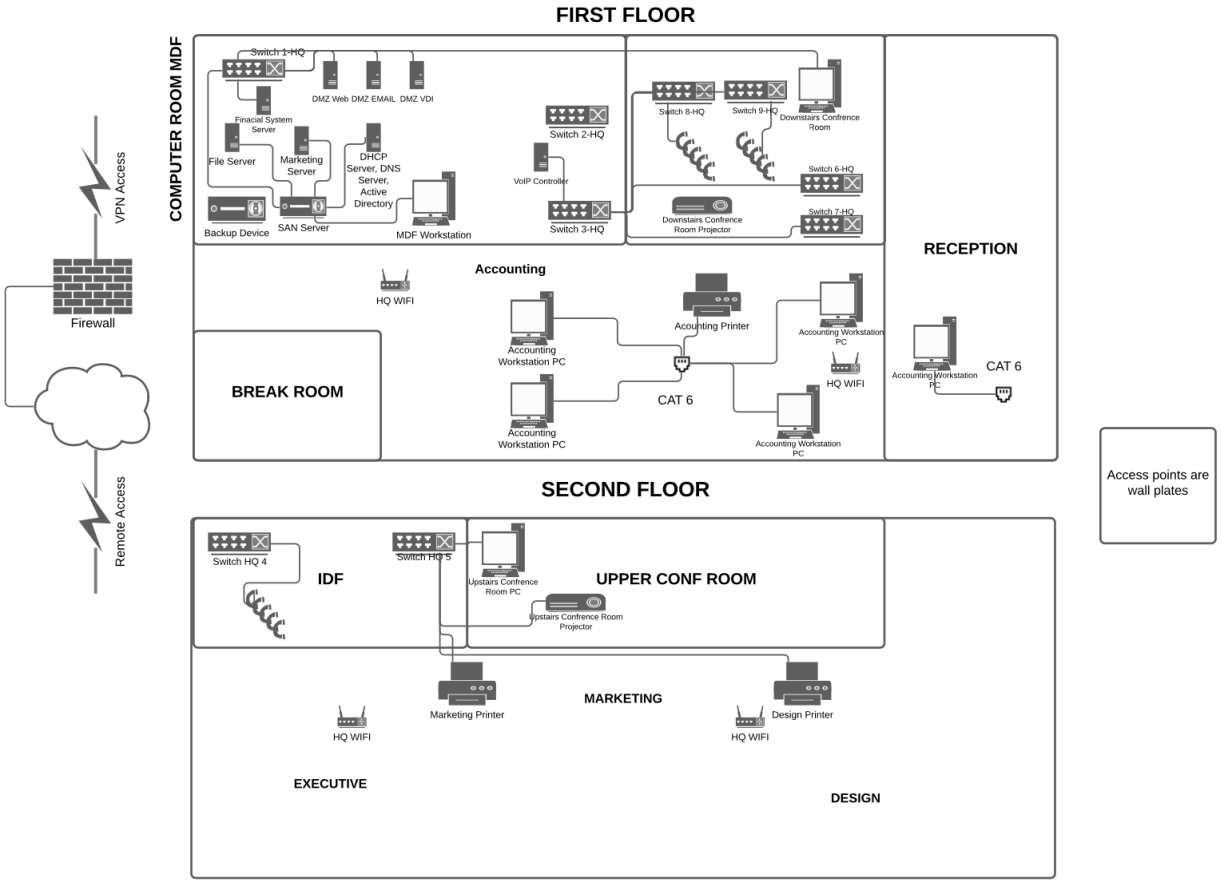
Device Name	Hardware	Software	Cost	Number of Units	Sub-Total	Grand Total
VMWare Server	HPE ProLiant MicroServer Gen10 Plus E-2224 S100i 4LFF-NHP 180W External PS Server, HPE 4TB SATA 6G (x 2),	VMware vSphere Essentials 1yr E-LTU, Microsoft Windows Server 2019 (16-Core) Standard Reseller Option Kit English SW	$3,516.96	1	$ 3,516.96	
Server	HPE ProLiant DL160 Gen10 4208 1P 16GB-R 8SFF 500W PS Server, HPE 1TB SATA 6G	Microsoft Windows Server 2019 (16-Core) Standard Reseller Option Kit English SW	$2,808.98	8	$ 22,471.84	
SAN	HPE StoreEasy 1660 32TB SAS Storage - Intel® Xeon-Bronze 3204 processor, 16GB of memory, 4 x 1GbE ports, redundant power and fans, a 2U rackmount form factor, and 8 x 4TB LFF (3.5"") drives standard.	Microsoft® Windows Storage Server 2016 Standard Edition with HPE StoreEasy Management Console pre-installed	10,629.99	1	$ 10,629.99	
Backup Storage Device	HPE StoreOnce 3620 - Storage enclosure - 6 bays - HDD 4 TB x 6 - rack-mountable - 2U	HPE StoreOnce Systems with HPE StoreOnce Catalyst	$20,837.99	1	$ 20,837.99	
Workstation	HP Workstation Z2 G5 SFF Desktop - Intel Core i5-10500 3.10GHz, vPro, 8GB DDR4, 256GB SSD, DVD-Writer, Quadro P400 (2GB), USB-C, Mini-DP, Gigabit Ethernet	Win 10 Pro	$1,129.99	32	$ 36,159.68	
Monitors	SAMSUNG LS27AM501NNXZA 27" Full HD 1920 x 1080 60 Hz HDMI, USB Built-in Speakers Monitor		$199.99	32	$ 6,399.68	
Phone Switches (48 Port - POE+)	WS-C3850-48F-S Catalyst 3850 Switch, Cisco Catalyst C3850-48F Switch Layer 3 - 48 * 10/100/1000 Ethernet POE+ ports - IP Base - managed- stackable		$4,126.00	4	$ 16,504.00	
Switches (48 port)	WS-C2960X-48TD-L Catalyst 2960-X Switch, Catalyst 2960-X 48 GigE, 2 x 10G SFP+, LAN Base		4,015.00	5	$ 20,075.00	
Switches (24port)	WS-C2960X-24TS-LL Catalyst 2960-X Switch, Catalyst 2960-X 24 GigE, 2 x 1G SFP, LAN Lite		1,113.00	2	$ 2,226.00	
Switches (24 Port - POE+)	WS-C2960L-24PQ-LL - Cisco Catalyst 2960L Switch, Catalyst 2960L 24 port GigE PoE+. 4x10G SFP+. Lan Lite		2,115.00	5	$ 10,575.00	
Switch (8 Port)	WS-C2960CX-8TC-L Cisco Compact Switch, Cisco Catalyst 2960-CX 8 - port compact Switch Layer 2 - 8 x 10/100/1000 Ethernet Ports, 2 SFP&2GE uplinks- LAN Base - Managed		642	2	$ 1,284.00	
Firewall	SRX345-SYS-JE - Juniper SRX Series Service Gateways, SRX345 Services Gateway includes hardware (16GE, 4x MPIM slots, 4G RAM, 8G Flash, power supply, cable and RMK)	Junos Software Enhanced (Firewall, NAT, IPSec, Routing, MPLS, Switching and Application Security).	2,399.00	3	$ 7,197.00	
Access Point (Wall Plate)	Cisco CATALYST 9105AX SERIES-WALLPLATE (C9105AXW-B), Model#: C9105AXW-B		314.99	6	1889.94	
Access Point (Ceiling)	NETGEAR Wireless Access Point (WAX610PA) - WiFi 6 Dual-Band AX1800 Speed | Up to 250 Devices | 1 x 2.5G Ethernet LAN Port | 802.11ax | Insight Remote Management | PoE+ or Included Power Adapter		199.99	4	799.96	
Network Time Device	TimeMachines, NTP Network Time Server with GPS, TM1000A, A GPS Antenna maintains current time broadcast by U.S. Satellites		329	1	329	
Server Racks	Server Rack - Locking Cabinet - Network Rack Cabinet Enclosure - 42U - Rack Mount - 32 Inch Deep - Server Cabinet - on Wheels - Shelf - Cooling Fan - Thermostat - Sysracks - SRF		799.99	2	1599.98	
Printer (Accounting, Transport, and Production)	HP Laserjet Pro M404dn Monochrome Laser Printer with Built-in Ethernet & Double-Sided Printing		309.99	3	929.97	
Color Printer (Marketing and Design)	HP Color LaserJet Pro M255dw Wireless Laser Printer, Remote Mobile Print, Duplex Printing		329	2	658	
Projector	Epson VS260 3-Chip 3LCD XGA Projector, 3,300 Lumens Color Brightness, 3,300 Lumens White Brightness, HDMI, Built-in Speaker, 15,000:1 Contrast Ratio		329.99	2	659.98	
UPS	CyberPower PR1500LCD Smart App Sinewave UPS System, 1500VA/1500W, 8 Outlets, AVR, Mini-Tower		514.95	3	1544.85	
IP Phone	Cisco SPA303-G1 3 Line IP Phone, Cisco Small Business Product 1-Year Limited Hardware Warranty		47.99	32	1535.68	
						$ 167,824.50

Appendix 3

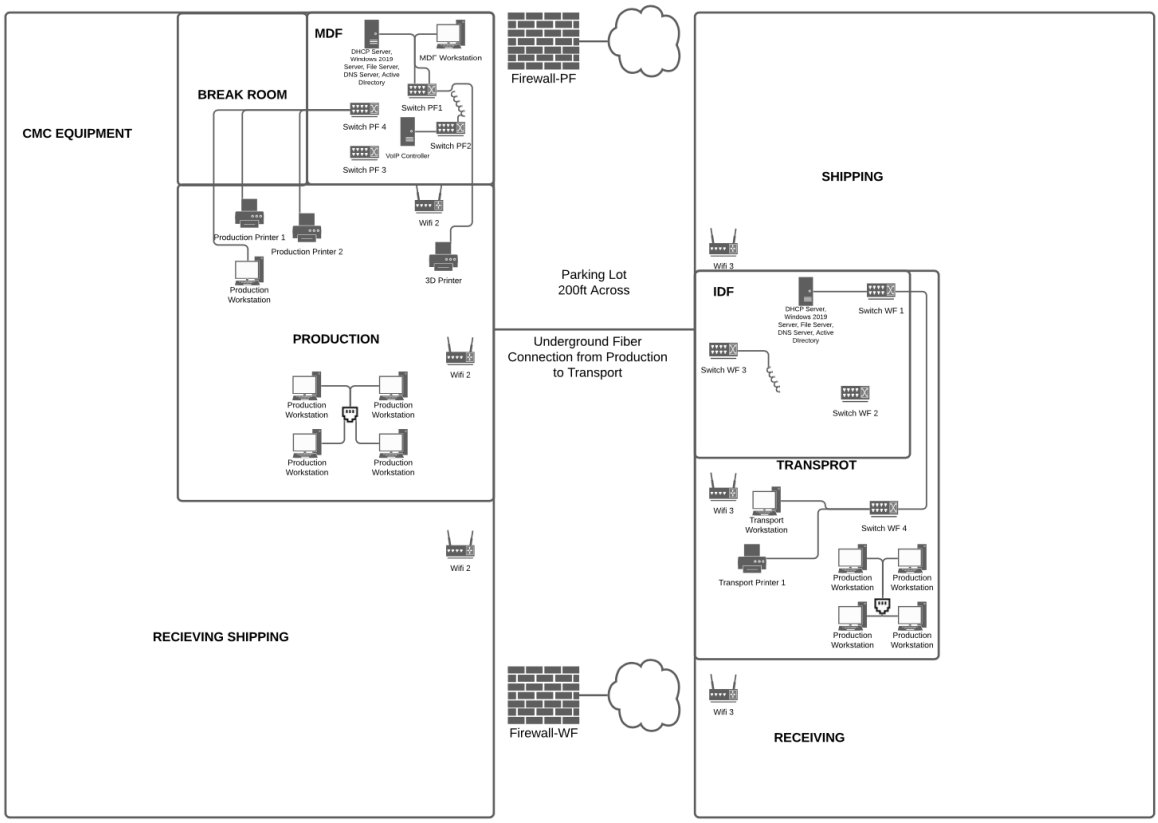
ACME Anvils and Supplies Incorporated
Corporate Headquarters, San Bernardino
Computer Network Diagram

HQ Offices - San Bernardino Network Map

December 2021
Created by
Christian Garo and Daniel Marich



ACME Anvils and Supplies Incorporated
Corporate Headquarters, San Bernardino
Computer Network Diagram

HQ Offices - Loma Linda Network Map

December 2021
Created by
Christian Garo and Daniel Marich