Virginia Information Technologies Agency

Enterprise Architecture Technical Brief

Server / Device Naming

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Contents

For any comments, questions, and/or concerns with this technical brief, please contact VITA EA: ea@vita.virginia.gov

Naming Convention Recommendation

VITA recommends the following for a naming convention:

Character length = 15 maximum

Character capitalization = Lower case

[AAA] [A] [A] [AA] [A] [A] [AAA] [AAA]	Character field sets.
[156] [P] [V] [VC] [W] [Z] [APP] [026]	Sample one format.
156pvvcwzapp026.vita.virginia.gov	**Actual sample name.**
[260] [U] [P] [OT] [L] [Z] [ORC] [007]	Sample two format.
260upotlzorc007.vita.virginia.gov	**Actual sample name.**

Please review VITA's Server Device Naming Convention document for an explanation of what each character means within the sample names provided.

For comments, questions, or concerns, please contact us at: EA@vita.virginia.gov

Background Information

The following information obtained from various relevant documents is provided with the understanding there are many more documents affirming the same logic, but were not included to provide a concise, readable, and relevant technical brief.

In the vast majority of research, large organizations require more than simply a theme name (gemstones, Crayola colors, matrix characters, fishes, Starbucks drinks, planets, etc.) and/or a one-up number (jennifer8675309, pluto256, or enchantedforest), because they tend to run out of applicable purposed theme names, and more importantly, the name requires some table lookup or server login to ascertain the nature of that server.

Large organizations (such as VITA with its 63 agencies) require a more relevant server name convention to quickly identify a specific server role for ordinary or emergency system administration tasks (type-bldg-geo-nmbr – exchwc4rich3, addcpresnorf2, or apachefinvabch5).

Naming Convention Considerations for Cloud Resources. [1]

- Taking the time to consider the naming of our cloud servers and cloud resources is critical to managing our infrastructure as it allows us to identify that resource based on various useful attributes.
  - Environment (prod, dev, test etc.).
  - Function / Role.
  - Location.
  - Owner, etc.
- Considering how easy it is to create cloud servers, we also need to be able to delete servers that are no longer in use.
  - Assigning multiple attributes to our servers allows us to do this much more easily than if they were simply named server1, server2, etc.

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[1] Naming Convention Considerations for Cloud Resources. CakeSolutions Blog. Retrieved from https://www.cakesolutions.net/teamblogs/whats-in-a-server-name in February 2018.

Lifewire Naming Rules for Computers on Windows Networks. [2]

- Each computer name should be no longer than 15 characters.
- Avoid using lowercase letters in a computer name whenever possible.
    - On Windows Vista, the case of letters (upper or lower) is ignored.
    - Older versions of Microsoft Windows, however, treat computer names as case sensitive.
    - Entering computer names in all uppercase is recommended to avoid possible name conflicts that could prevent Windows computers from identifying each other.

GitHub's Proper Server Naming Schema Samples. [3]

- Specify Environment
    - dev – Development
    - stg – Staging
    - prd – Production
- Specify Purpose and Serial Number
    - app – Application Server (non-web)
    - ftp – SFTP server
    - dns – Name Server
    - cfg – Configuration Management (puppet/ansible/etc.)
    - mon – Monitoring Server (nagios, sensu, etc.)
- Example
    - eb01.prd.nyc.example.com
    - mon01.tst.nyc.example.com

Kpytko Active Directory Objects Naming Convention. [4]

- It is really good to have a common template for computers/servers as it would simply allow identifying them without logging onto them.

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[2] Naming Rules for Computers on Windows Networks. Lifewire article on January 26, 2018. Retrieved from the internet on February 22, 2018.

[3]A Proper Server Naming Schema by GitHubGist in 2016. Retrieved from https://gist.github.com/xluffy/4024f046cb83383744fa1793cc85f432 in October 2017.

[4] Active Directory Objects Naming Convention. Kpytko iSieks Blog of January 31, 2015. Retrieved from the internet on February 22, 2018.

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- You need to remember we are still limited to 15 characters in a computer name which is caused by NetBIOS.
  - Computer name CCLLLSVVFFFXXX**X** where:
    - CC – is for country code
    - LLL – is a location code
    - S – is for operating system type (Windows, Unix, Linux, Solaris, BSD)
    - VV – is operating system version (XP, 07, 08, 81, 10)
    - FFF – is machine function (WKS, NTB, TAB, MOB)
    - XXX**X** – next number for machine
  - Server name CCLLLSVV**R**FFFXXX where:
    - CC – is for country code
    - LLL – is a location code
    - S – is for operating system type (Windows, Unix, Linux, Solaris, BSD)
    - VV – is operating system version (03 – 2003, 08 – 2008, 12 – 2012)
    - **R – is for operating system release (1 – release 1, 2 – release 2)**
    - FFF – is machine function (DCR, DCW, FIL, PRT, APP, MGM)
    - XXX – next number for machine

Server Density Naming Conventions and Best Practices. [5]

- We didn't expect server naming conventions to be such a gripping topic, so we set out to understand why.
- There are two main reasons why server names strike a chord with people.
  - Naming Things is Hard
    According to Phil Karlton: There are only two hard problems in Computer Science:
    > Cache invalidation.
    > Naming things.
  - Servers are not what they used to be.
    According to Matt Simmons from Standalone Sysadmin:
   > A computer infrastructure largely exists in one of two worlds," he says.

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[5] Server Naming Conventions and Best Practices. David Mytton, CEO and Founder of Server Density article published October 29, 2015. Retrieved from https://blog.serverdensity.com/server-naming-conventions-and-best-practices/ in February 2018.

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> Either you have so few machines that you individually deal with them, and they're treated as pets, or you have so many that you can't individually deal with them, and you treat them like cattle.

- There is no such thing as a golden rule—much less a standard—on how to name servers.
- There's only so many heroes in A-Team and Arrested Development. Dog Breeds will only get you that far. There comes a point when naming servers has to be more about function than form.
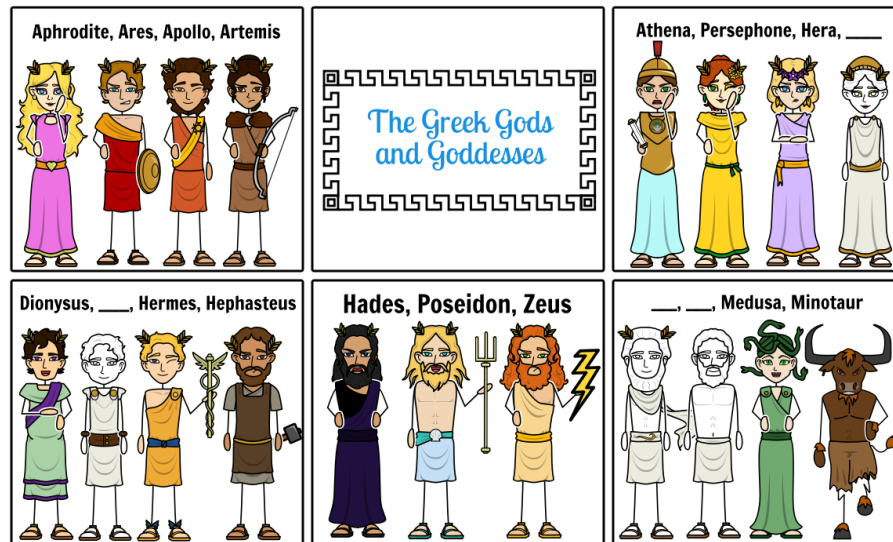

Create your own at Storyboard That

- Our current naming structure allows us to quickly identify key information about our servers and helps us filter by role, provider, or specific locations. Here is an example:
  - hcluster3-web1.sjc.sl.serverdensity.net
    - hcluster3: describes what the server is used for.
      - Other examples could be
        - mtx2 – our time series metrics storage cluster.
        - sdcom – servers which power our website.
    - web1: this is a web server (Apache or nginx) and is number 1 in the cluster.
    - sjc: this is the datacenter location code, San Jose in this case.
      - We also have locations like wdc (Washington DC) or tyo (Tokyo).
    - sl: this is the facility vendor name, Softlayer in this case.
      - We also have vendors like rax (Rackspace) and aws (Amazon Web Services).

- The advantage of this naming convention is that it scales as we grow. We can append and increment the numbers as needed.
- The transition to cloud computing has caused a dramatic increase of servers that sysadmins are tasked to administer (and provide names for).
- A good naming convention should make it easy to deploy, identify and filter through your server pool.
- For anything remotely scalable, and if identifying your servers is key, then consider something more practical and functional than pet names or planets and stars.
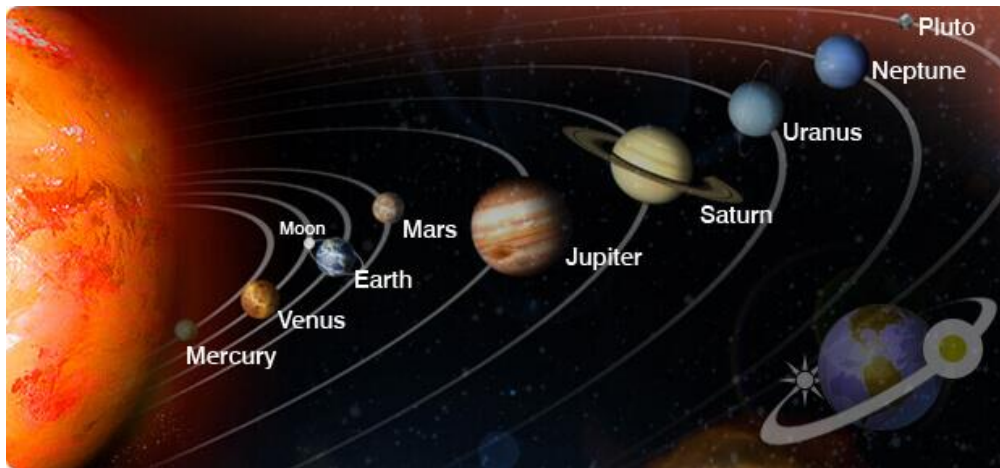
Stanford University Server Naming Standards – Infrastructure Architecture. [6]

- AS Server Naming Standards Naming Convention:
  [area] [application] [type] [group-number] [environment] [number]
  Examples:
    - asiaappg1dev1
    - psdbdev01
    - ofappprd01
- [area] denotes the practice or application area; sample values:
    - as Administrative Systems
    - asia AS Infrastructure & Architecture
    - dmr Data Management & Reporting
- [application] is optional and up to each practice area to determine; sample values:

[6]Server Naming Standards; Administrative Systems; Infrastructure, Architecture, and Operations. Stanford University. Retrieved from https://web.stanford.edu/dept/as/ops/standards-old.html in February 2018.

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- o dss Decision Support Systems
- o infra Infrastructure
- o is Information Security
- [type] denotes the primary function of the server; sample values:
    - o app Application server
    - o db Database server
    - o web Web server
- [group-number] is optional and is used for clustered hosts; sample values are g1, g2, etc.
- [environment] denotes the primary environment the server hosts:
    - o dev Development
    - o prd Production
    - o uat User-acceptance Test
- [number] is a number that makes the server name unique.
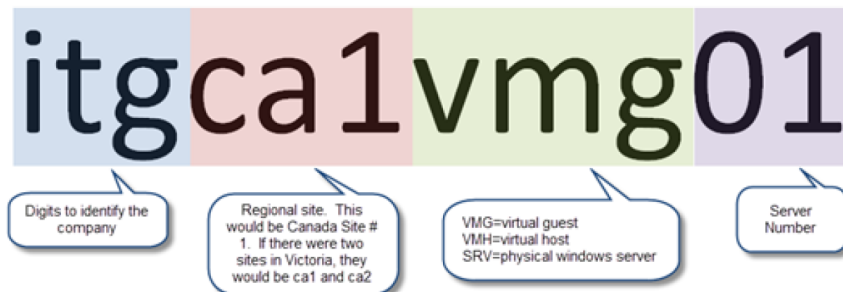
University of Wisconsin – Madison Computer Naming Convention. [7]

- The computer name should provide information as to who manages the computer and what its purpose is.
- Computer Object names will conform to the 15-character standard (<DEPT><FF>-<YYYYYY>), where:
    - o Every computer object name will begin with DEPT (Department Code).
    - o <FF> will use the Computer Object Primary Function Codes.
    - o <YYYYY> will be determined by local department policies.
- Location Field - Computer location field will be populated in the following format: <XXXX><YYYY><ZZZZ>

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[7]Campus Active Directory Naming Convention. University of Wisconsin-Madison CADS. Retrieved from https://kb.wisc.edu/cads/page.php?id=30600 in February 2018.

- o <XXXX> - The FP&M assigned facility number of the building the Computer resides in. (Facility Number list:
- o <YYYY> - Room number for the location of the computer. If there is not a number assigned to the room two zeros will be entered instead.
- o <ZZZZ> - Department Code (DEPT).
- Example:
  - o Name: DOITWS-SDH-01
  - o Description: WS-DB-FS
  - o Location: 0155-B263-DOIT

Senuna Server Naming Conventions and Why They're Important. [8]

- Server roles in the name of the host makes it a lot easier to see exactly what purpose that server has at a very quick glance.
  - o A very basic example would be:
    - ▪ SV-DC-01
    - ▪ SV-DC-02
    - ▪ SV-TS-01
    - ▪ SV-DB-01
    - ▪ SV-FL-01
    - ▪ SV-FL-02
    - ▪ SV-BK-01
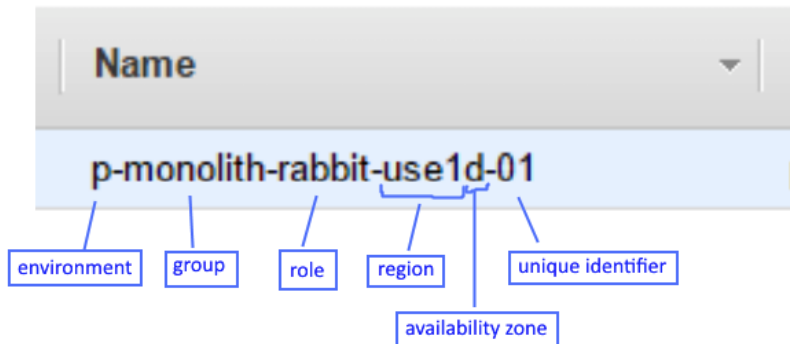
Microsoft Support Naming Conventions in Active Directory for Computers, Domains, Sites, and OUs. [9]

- Computer Names
  - o Maximum name length = 15 characters.
    - ▪ 16th character is reserved to identify the functionality that is installed on the registered network device.

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[8] Server Naming Conventions and Why They're Important. Senuna.com. Retrieved from https://www.senuna.com in February 2018.

[9] Naming Conventions in Active Directory for Computers, Domains, Sites, and OUs. Microsoft Support – July 25, 2017. Retrieved from Microsoft on February 22, 2018.

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- o Minimum name length = 1 character.
- Best Practices for DNS computers:
    - o Identify the owner of the computer in the computer name.
    - o Choose a name that describes the purpose of the computer.
    - o Use a unique name for every computer in your organization including those in different DNS domains.
    - o In DNS computer names, use only the characters listed in RFC 1123, which includes A-Z, a-z, 0-9, and the hyphen (-).
    - o Do not use extended ASCII or UTF-8 characters, unless, <u>all</u> the DNS servers in your environment support them.

- A real nightmare is trying to the work out the server roles when every host is named after Snow White and the Seven Dwarfs.
    - o Take a look at an infrastructure named after Snow White and the Seven Dwarfs, which tells me and everyone else… nothing:
        - ▪ Bashful
        - ▪ Doc
        - ▪ Dopey
        - ▪ Grumpy
        - ▪ Happy
        - ▪ Sleepy
        - ▪ Sneezy

Eric Singer Naming Convention: Server Names. [10]
- 15 characters is a length limitation I would always suggest maintaining.
    - o Obviously with a 15-character limit, there are going to be a lot of abbreviations – be consistent.
- When you're at the 10s of thousands size, you need a whole new way of dealing with server names.
- Sometimes you will have a DC3 and a DC4 when there are no DC1 and DC2 anymore – learn to let it go.

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[10] Naming Convention: Server Names by Eric Singer in January 2017. Retrieved from http://www.ericcsinger.com/naming-conventions-server-names/ in October 2017.

- Load balancers can help with renaming / moving things.   They help because of their ability to create a "virtual IP" and redirect that traffic to any real IP as needed.   In the case of DNS, it would enable you to move your DNS functionality to a new server without having to change the IP you have configured across all your systems.
- I like to use something short (as in 3 letters or less) to tell me something about the application or purpose of the server.
    - SQL for a SQL Database Server.
    - RMQ for a Rabbit MQ server.
    - EXM for an Exchange Mailbox server.
- I use a few letters to denote the environment of the server:
    - P = Production.
    - S = Stage.
    - U = UAT.
    - D = Dev.
    - T = Test.
    - X = Sandbox.
- Application group number that really ties everything together.   I use a simple "01", "02", etc.

Reddit – How do you decide on your server naming convention? [11]

- PRD-NYC-SQL01. i4sander Post.
    - 3 Letter Importance (LAB / DEV / TST / PRD)
    - 3 Letter Location (We use UN Code, but could be airport codes, etc.)
    - 3 Letter Type of Server (WEB, SQL, etc.)
    - 2 Digit Unique Index Number I find the dashes make it easy to read, and scope at the front makes all the same level of importance stuff sort together. Might be over kill if you have only one site, or if you only have production (no dev / test networks to support).

- I took over an account once where all of the servers where named after Sesame Street characters. It was cute, but completely useless. It took a month to figure out

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[11]How do you decide on your server naming convention? Reddit SysAdmin Blog – 2017. Retrieved from the internet on February 22, 2018.

that Big Bird was the DC and Elmo was the SQL server. –WhiskeyRider69 IT Manager Post

- We omit dashes for the most part - easier to type. Ours our typically OOOLLRRRNN.
    - Organization Location Role Number (Sequential).
    - Each site is an Organization as it operates within itself (retail) with some resources shared.
    - We add DR, N1, etc., for backup/clustering/etc..
    - We don't do any development, so our environments are only Prod and Lab.
        - I typically use 90-99 for lab environment or add -lab at the end of hostname. –macboost84 Post
- @#*& all these people who name &$#% after stars in the universe, dead rock stars, and random other &$#%.
    - In my company's case... geo-location:region:virtual/hw:function-[0-9].

        –st3venb Management and Senior Systems Engineer Post
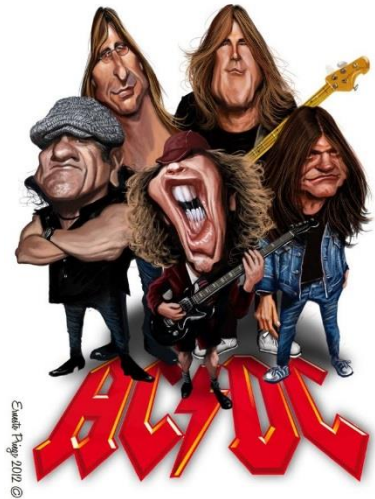
- In my experience, the more creative a naming convention the fewer times the engineer has had to dig out of an emergency on a network. At 3am, when the world is burning down, having to figure out if "tatooine" is the DNS or the DHCP server is a problem you DON'T want or need. So just name them after functions / locations / intervals. – MSPinParadise Post
- Servers are not people or pets. They are disposable and should be as uniform as possible. Name them something clear based on function, location, etc. or you will hate yourself (or your replacement will hate you) when the company grows. – ScrambyEggs79 Post
- The naming scheme should let everyone know what's going on, and where something is. There shouldn't be a lookup table when you get a "down" monitoring alert. –Bibbleiw Security Admin Post
- At my current job, they're named after local towns, and it's really, really annoying. I had to create a spreadsheet to figure everything out. I'm 2+ months in and still have to reference it.
    - My old job was much better. IT servers were location/city code - server function - unique code. So, the Exchange server in NYC would be NY-EXCH-01. If it was a VM, it would be NY-VM-EXCH-01. Virtual servers were
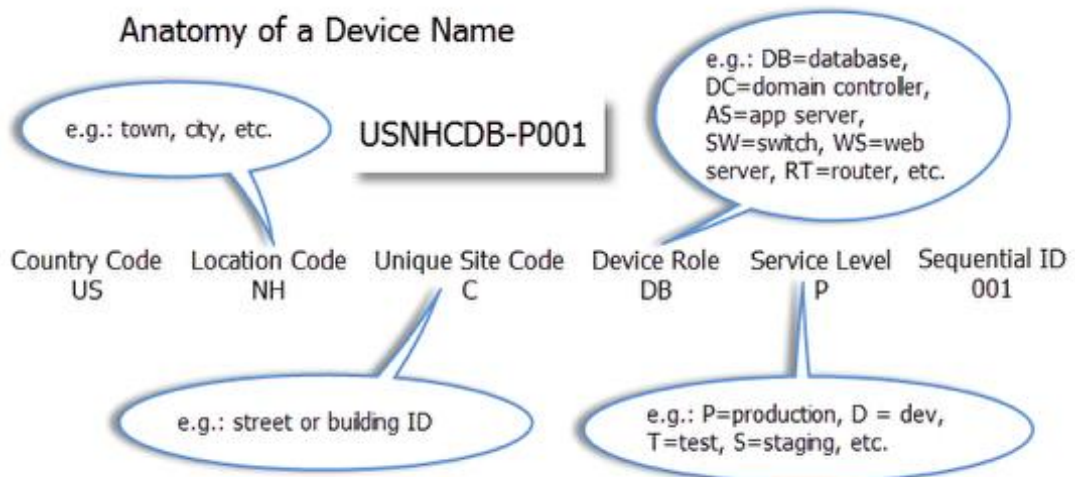
location/city code - xhost physical location. So, NY-xhost406 for the virtual server in the NY datacenter in u6 in cabinet 4. –NirvanaFan01234 Post

- LP-SCCM-SP01:
    - o L = Las Vegas Data Center (Use the first letter of the DC the server is in.
        - ▪ We only have 2 data centers, so one letter is sufficient for us).
    - o P = Physical Server (or V for Virtual)
    - o SCCM = The service hosted on the server, SCCM in this case
    - o S = Standalone (or C for Cluster)
    - o P = Production (or T for Test, or D for Dev)
    - o 01 = Index number
        - ▪ This scheme has worked well for us to quickly know whether a server is a VM or physical and where it resides.
    - o We've tried a few naming schemes in the past, but this one has been very popular since we began using it. –rx8saxman Post
    - o

Anatomy of a Device Name

USNHCDB-P001

e.g.: town, city, etc.

e.g.: DB=database, DC=domain controller, AS=app server, SW=switch, WS=web server, RT=router, etc.

| Country Code US | Location Code NH | Unique Site Code C | Device Role DB | Service Level P | Sequential ID 001 |

e.g.: street or building ID

e.g.: P=production, D = dev, T=test, S=staging, etc.

CenturyLink Cloud Server Naming Convention. [12]

- All CenturyLink Cloud servers follow a standard naming convention that incorporates a number of pieces of information to make a unique key.
- When servers are moved between datacenters as a Service Task they are renamed to match the new geography.

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[12] Server Naming Convention by CenturyLink Cloud – June 30, 2015. Retrieved from https://www.ctl.io/knowledge-base/servers/server-naming-convention/ in October 2017.

- Once a server is deleted in the control portal, that server name cannot be reused. If a new server is deployed with the same name (and in the same account and datacenter), the control portal will increment to the next numeric code.
    o For example, UC1BTDISRVR02 is created and then deleted; the next server will become UC1BTDISRVR03.

GEO ACCT NAME INCR
Datacenter Account Alias Name Incrementor

Example

UC1 BTDI SRVR 02
Datacenter Account Alias Name Incrementor

Spiceworks Server Naming Convention Best Practices. [13]

Sample: PWAPPSRV003

    Physical or Virtual: P

        OS Brand: W

        Device Function: APPSRV

        Device Number: 003

    Physical or Virtual:

        P = Physical

        V = Virtual

    OS Brand:

        A = Cisco ASA

        D = Dell Storage Center

        E = Equalizer OS

        F = Embedded Firmware

        I = Cisco IOS

        L = Linux

        M = VMWare

        N = Brocade Network OS

        U = Dell FluidFS

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[13] Server Naming Conventions: What do you use? And 15 Character Hostname Limit Still Recommended. Spiceworks Best Practices. Retrieved from https://community.spiceworks.com/topic/1948453-server-naming-conventions-what-do-you-use in December 2017.

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V = VNXe
W = Windows
X = Force 10
Device Functions:
APPSRV = Application Server
BAKSRV = Backup Server
BLDENC = Blade Enclosure
DIRSRV = Directory Server
EMLSRV = Email Server
FIREWL = Firewall
FTPSRV = FTP Server
HYPVIS = Hypervisor
NASSRV = NAS File Server
PDU = Power Distribution Unit
RPS = Redundant Power Supply
SANSRV = SAN Appliance
SQLSRV = SQL Server
SW-BLD = Blade Enclosure Switch
SW-SAN = SAN specific switch
SW-SVR = General server/network switch
UPS = Uninterruptable Power Supply
WEBSRV = Web Server
Device Number:
The number of the device that matches the first four parts of the naming scheme.

- Using a 15 character or less name is important when you use a Windows cluster because the CNO breaks horribly if the name is not 15 characters or less. – Gary D. Williams Post
- I've seen longer than 15 character names break a managed AV (Anti-Virus) software that imported computers via Active Directory. There was a computer name 17 characters long. When the AV manager imported the computers, it lopped off the last 2 characters. That computer showed as "offline" in the console, since there was no computer by that name. As a result, that computer had to be installed independently and not managed through AD (Active Directory). –Sigkill Post
- I've never seen a good reason to exceed 15 characters in a host name. Even if you want to have a long name like OurCompanyIntranet.contoso.com, **it's usually a better idea to have OurCompanyIntranet be a CNAME that points to an A-record for IntranetSrv01 anyway.** –David6267 Post

- Last week I supported a customer who couldn't setup SharePoint 2013. It took me many days to discover the problem was related to a long hostname (17 characters)… After I changed it to a short one (less than 15 characters) it worked like a charm! – VINICIUS6376 Post