# Lab – Preparing Your Network for Active Directory

**Overview**

In this lab, you will lay out the design for your domain, learn the importance of having a good naming convention, and build an IP addressing scheme for your network.

Regardless of how many devices you have present on your network, how you design the network will determine how well it performs, how long it will last, and how easy it will be to troubleshoot.

The first domain controller installed on the network is the forest root. As with most small to medium-sized networks, we will be using the single domain model.
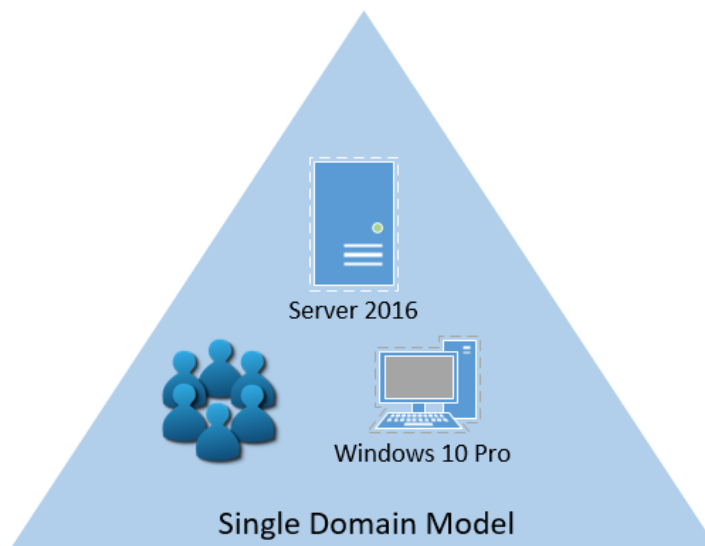


A single domain forest model reduces administrative complexity by providing the following advantages:

- Any domain controller can authenticate any user in the forest.
- All domain controllers can be global catalogs, so you do not need to plan for global catalog server placement.

We will be creating a Microsoft domain forest using a single domain controller, but before we get to that part, we first need to design a  naming convention and IP scheme for our network.

The one cardinal rule to designing a network is to keep it simple. Be sure to plan for growth to ensure your network will last somewhere between five and seven years.

**Choose the right domain name**

You should NOT name your domain based on something that will change or become outdated. Examples include naming your domain after a product line, operating system, or anything likely

to change over time. Stick with something will still make sense five or even seven years down the road.

Stick with short names of 15 characters or less; this will allow legacy devices to be able to find devices on the domain.

Every device on your domain will have two names: a fully qualified domain name (FQDN) and a NETBIOS name. Some older operating systems and software use NetBIOS names to locate each other on the network.

Think long-term as much as possible.

**Alternatives to using .Local**

There is a lot of debate on how to name an internal network properly. If you're creating a testing environment such as we are, then using .local is fine, but there is a [RFC 2606](#) listing approved top-level domains (TLDs) reserved just for testing purposes.

The widespread consensus is to avoid using .local for any production network, and for your testing lab environment, you can use one of the following reserved TLDs listed under RFC 2606.

.test
.example
.invalid
.localhost

As you can see from the names, these were created for testing and not for production, and that is a primary consideration when choosing whether to use one of these reserved top-level domain names. Again, these would not be used to name a production network.

You are strongly advised to reserve your domain name on the Internet for any production networks, even if you are not planning on using it soon. This will ensure there will be no conflicts later with another business on the Internet wanting to use the same domain name.

Once you have registered your new domain name with ICANN, you can add a prefix to create a subdomain not registered on the Internet.

You could use your registered external domain name internally, but this creates management issues and requires the use of two different DNS servers.

1. Internal DNS -- contains records for the internal servers mapped to internal addresses
2. External DNS -- mapped to public addresses (Split Horizon DNS)

Not recommended.

**The Solution: Using Subdomains**

Using your registered external domain name and prefixing it with a subdomain name is considered best practice by Microsoft and the industry.

A subdomain name can be based on location or function though there may be other criteria.

**Example**

I have registered and own the domain name of syberoffense.com. Internally, I would create a subdomain based on one of the two previously mentioned criteria.

If I use location, my internal network could be called, us.syberoffense.com

When using location for your subdomain name, you could use the subdomain name of **asia** to represent a global presence, **asia.syberoffense.com,** or prefix your external domain name using the name of a city or town the organization resides in, such as **tucson.syberoffense.com**.  If I based the name subdomain on function, my internal network could be called,
**lab.syberoffense.com**

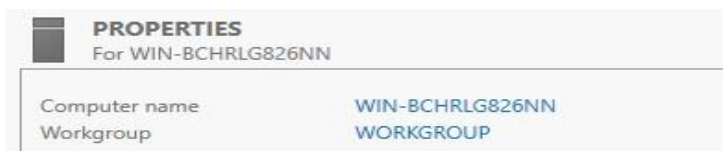Location and function are the two primary naming conventions we use.

Choose your forest domain name:_____

Choose a subdomain prefix_____

The last thing you want to have to do is rename an existing production domain so make sure you give this ample thought and do it right the first time.

The second part of any naming convention deals with how you will identify devices on your network. By default, Microsoft will give each host on the network a unique name, but this name is not conducive to good network management, nor does it ease having to find and troubleshoot problem devices.

Right now, my primary domain controller has a default name given to it during the install.



```
PROPERTIES
For WIN-BCHRLG826NN

Computer name        WIN-BCHRLG826NN
Workgroup            WORKGROUP
```

What you must remember is regardless of what I rename this machine, that name will be prefixed to the name of the domain. This ends up being the fully qualified domain name (FQDN) for the device. I identify domain controllers by prefixing them with the names DC1,

DC2, and so on. I know that when I see the name DC1, this is my forest root. DC2 would be the replica or backup DC for the forest root if I had one.

**Video Tutorial for This Lab Begins Here!**

**Designing an IP Addressing Scheme for Your Network**

We want to avoid two things when naming and designing an IP scheme for our network, we do not want to have to rename the domain, and secondly, we do not want to run out of IP addresses.

There are ways to prevent it. The first is to ensure you have management approval for your naming convention and your IP addressing scheme.

Having multiple eyes on the target is never a bad thing. You would do well to remember that if you touch it, you own it right.

**Example**

I have a small to medium-size network in this example, and I have identified all the devices that need IP addressing.

I have one firewall, one switch, two servers, and 25 workstations running Windows 10 professional.

I have planned and included ample room for growth into this IP scheme. If the network is designed to last between five and seven years, so should my IP addressing scheme.

Here's how I broke down and allocated my available IP addresses for this network:

**Network IP Addressing Scheme for us.syberoffense.com**

| Network IP Address | 192.168.145.0 |
|---|---|
| Subnet mask | 255.255.255.0 |
| Default Gateway | 192.168.145.1 |
| Networking Devices | .2 - .9 |
| Servers | .10 - 19 |
| Printers | .20 - .29 |
| Hosts | .30 - .199 |
| Unused | .200 - 254 |

Because I could, I gave myself plenty of room for growth in each of the areas where I reserved a block of IP addresses. You can reserve blocks of IP addresses the way it however you see fit.

**Summary**

In this lab, we looked at the importance of choosing a naming convention for our forest root. We also look at ways to prevent issues with our naming convention by first registering our domain name and then assigning a subdomain name as a prefix to our internal network.

Finally, we looked at how to go about designing an IP addressing scheme for our network. Any device that needs to be readily available on the network needs to be configured with a static IP address. These include firewalls, switches, servers, and printers.