

# Join Ubuntu Workstation to a Windows Domain

By [wolffhaven](#) | [June 7, 2016](#) | [Active Directory](#), [Linux](#), [Ubuntu 16.04](#)

Here is my guide on how to Join Ubuntu Workstation to a Windows Domain using SSSD and Realmd. There are a few different methods out there on how to do this but from what I've tested and researched, using SSSD and Realmd is the most up to date and easiest way to achieve the desired result at the time of writing this. I've included links to all of the relevant documentation that I used in researching putting together this guide.

I just want to say off the bat, that I'm no Linux expert. I've only recently started to dabble with Linux. I wanted to see if this could be done so I tried it out in my test lab. I created this guide for myself so that I could use it again later when I no doubt forget how I originally done it in the first place. I couldn't really find an up to date step by step guide to join Ubuntu Workstation to a Windows Domain that was easy to follow for beginners so I'm putting this up on my site in the hope that it may help someone else. If you see any glaringly obvious mistakes or if there is a better way of doing something let me know in the comments. This isn't really Ubuntu specific as a lot of the steps from this guide have been adapted from the [Redhat](#) and [Fedora](#) documentation. If you are here following this guide, I'd say try it out in a test environment first to make sure it does everything that you need.

So in my test lab I went through and tested few different methods on how to go about joining a Ubuntu 16.04 computer to a Windows Domain. The different methods I tried were: –

- Winbind
- SSSD
- RealmD & SSSD

As I said earlier, I found that for a new linux user, the RealmD & SSSD method to Join Ubuntu Workstation to a Windows Domain, was the easiest and most effective. Your mileage may vary. I'll split this guide up in to separate sections.

- [1. Configuring the hosts file.](#)
- [2. Setting up the resolv.conf file.](#)
- [3. Setting up NTP.](#)
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## 1. Configuring the hosts file

To update the hosts file edit the `/etc/hosts` file. On my workstation, by default the fully qualified domain name wasn't in the hosts file so I had to add it. Note: Coming from

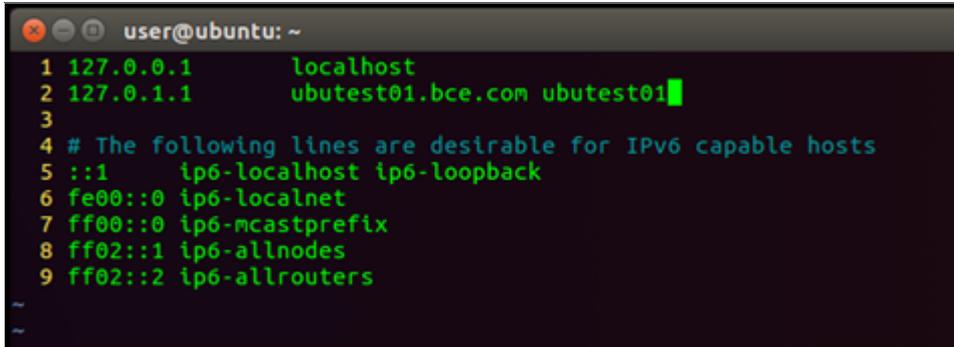
Windows I'd never seen a 127.0.1.1 address used as a loopback address. [Seems legit though.](#)

In this example the hostname of the workstation I want to join to the domain is ubutest01.

```
1 sudo vi /etc/hosts
```

Set the 127.0.1.1 address to your new hostname in the following format.

```
127.0.1.1 ubutest01.bce.com ubutest01
```



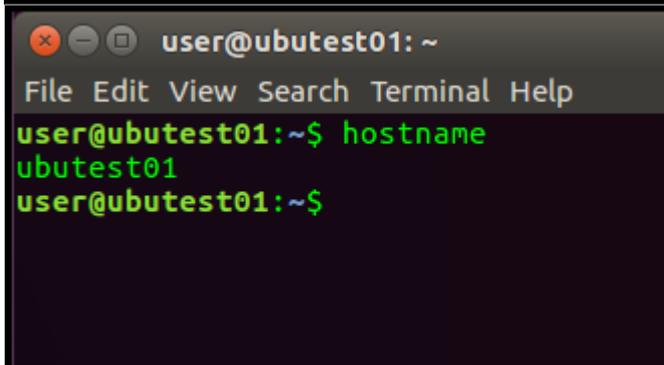
```
user@ubuntu: ~  
1 127.0.0.1    localhost  
2 127.0.1.1    ubutest01.bce.com ubutest01  
3  
4 # The following lines are desirable for IPv6 capable hosts  
5 ::1         ip6-localhost ip6-loopback  
6 fe00::0     ip6-localnet  
7 ff00::0     ip6-mcastprefix  
8 ff02::1     ip6-allnodes  
9 ff02::2     ip6-allrouters  
~  
~
```

Reboot the system for the changes to take effect.

```
1 sudo reboot
```

To test if the name has been changed:

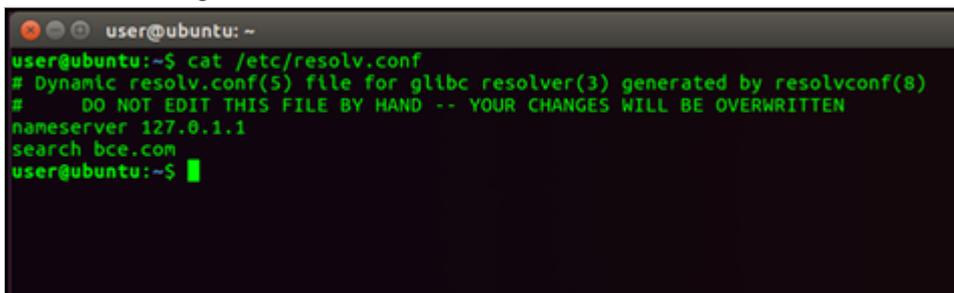
```
1 hostname
```



```
user@ubutest01: ~  
File Edit View Search Terminal Help  
user@ubutest01:~$ hostname  
ubutest01  
user@ubutest01:~$
```

## 2. Setting up the resolv.conf file

Make sure you're Ubuntu computer can talk to your DNS Servers. By default, the resolv.conf will be set like the following:



```
user@ubuntu: ~  
user@ubuntu:~$ cat /etc/resolv.conf  
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)  
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN  
nameserver 127.0.1.1  
search bce.com  
user@ubuntu:~$
```

To change it to have the actual DNS servers that you are using do the following:

```
1 sudo vi /etc/NetworkManager/NetworkManager.conf
```

Comment out the dns=dnsmaq line.

```
#dns=dnsmaq
```



```
user@ubuntu: ~  
user@ubuntu:~$ sudo apt -y install ntp  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  libopts25  
Suggested packages:  
  ntp-doc  
The following NEW packages will be installed:  
  libopts25 ntp  
0 upgraded, 2 newly installed, 0 to remove and 2 not upgraded.  
Need to get 576 kB of archives.  
After this operation, 1,786 kB of additional disk space will be used.  
Get:1 http://ubuntu.mirror.serversaustralia.com.au/ubuntu xenial/main amd64 libo  
pts25 amd64 1:5.18.7-3 [57.8 kB]  
Get:2 http://ubuntu.mirror.serversaustralia.com.au/ubuntu xenial/main amd64 ntp  
amd64 1:4.2.8p4+dfsg-3ubuntu5 [518 kB]  
Fetched 576 kB in 2s (282 kB/s)  
Selecting previously unselected package libopts25:amd64.  
(Reading database ... 204528 files and directories currently installed.)  
Preparing to unpack .../libopts25_1%3a5.18.7-3_amd64.deb ...  
Unpacking libopts25:amd64 (1:5.18.7-3) ...
```

Edit the vi ntp.conf file.

```
1 sudo vi /etc/ntp.conf
```

Comment out the ubuntu servers and put your own dc's in there. For example: –

```
server dc.bce.com iburst prefer
```

```
user@ubuntu: ~  
1 # /etc/ntp.conf, configuration for ntpd; see ntp.conf(5) for help  
2  
3 driftfile /var/lib/ntp/ntp.drift  
4  
5 # Enable this if you want statistics to be logged.  
6 #statsdir /var/log/ntpstats/  
7  
8 statistics loopstats peerstats clockstats  
9 filegen loopstats file loopstats type day enable  
10 filegen peerstats file peerstats type day enable  
11 filegen clockstats file clockstats type day enable  
12  
13 # Specify one or more NTP servers.  
14  
15 # Use servers from the NTP Pool Project. Approved by Ubuntu Technical Board  
16 # on 2011-02-08 (LP: #104525). See http://www.pool.ntp.org/join.html for  
17 # more information.  
18 server dc.bce.com iburst prefer  
19 server dc2.bce.com iburst prefer  
20 #pool 0.ubuntu.pool.ntp.org iburst  
21 #pool 1.ubuntu.pool.ntp.org iburst  
22 #pool 2.ubuntu.pool.ntp.org iburst  
23 #pool 3.ubuntu.pool.ntp.org iburst  
24  
25 # Use Ubuntu's ntp server as a fallback.
```

Restart the ntp service.

```
1 sudo systemctl restart ntp.service
```

Then to check if it's working try running:

```
1 ntpq -p
```

```
user@ubuntu:~$ sudo systemctl restart ntp.service  
user@ubuntu:~$ ntpq -p  
      remote           refid      st t when poll reach  delay  offset  jitter  
-----  
DC.bce.com           192.189.54.17  3 u   1  64   1   1.293 -25.661  2.057  
*dc2.bce.com         192.168.1.4   4 u   1  64   1   0.269   3.352  2.761  
user@ubuntu:~$
```

During this process I found this little tip. This is a handy tool to make sure your syncing correctly:

```
1 sudo apt -y install ntpstat
```

Then run:

## 1 ntpstat

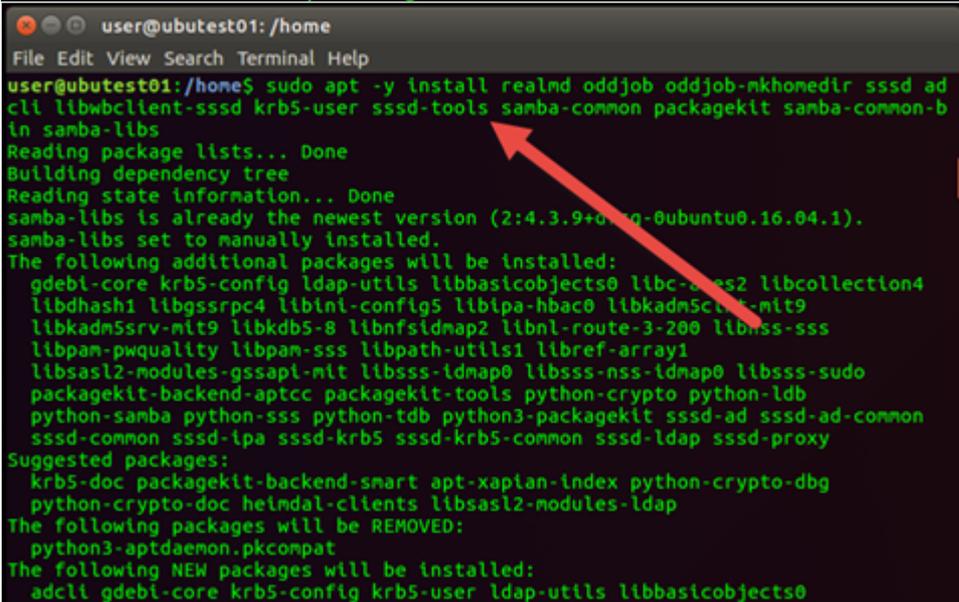
Should be syncing like a boss.

```
user@ubuntu:~$ ntpstat
synchronised to NTP server (192.168.1.4) at stratum 4
time correct to within 270 ms
polling server every 64 s
user@ubuntu:~$ █
```

## 4. Installing the required packages.

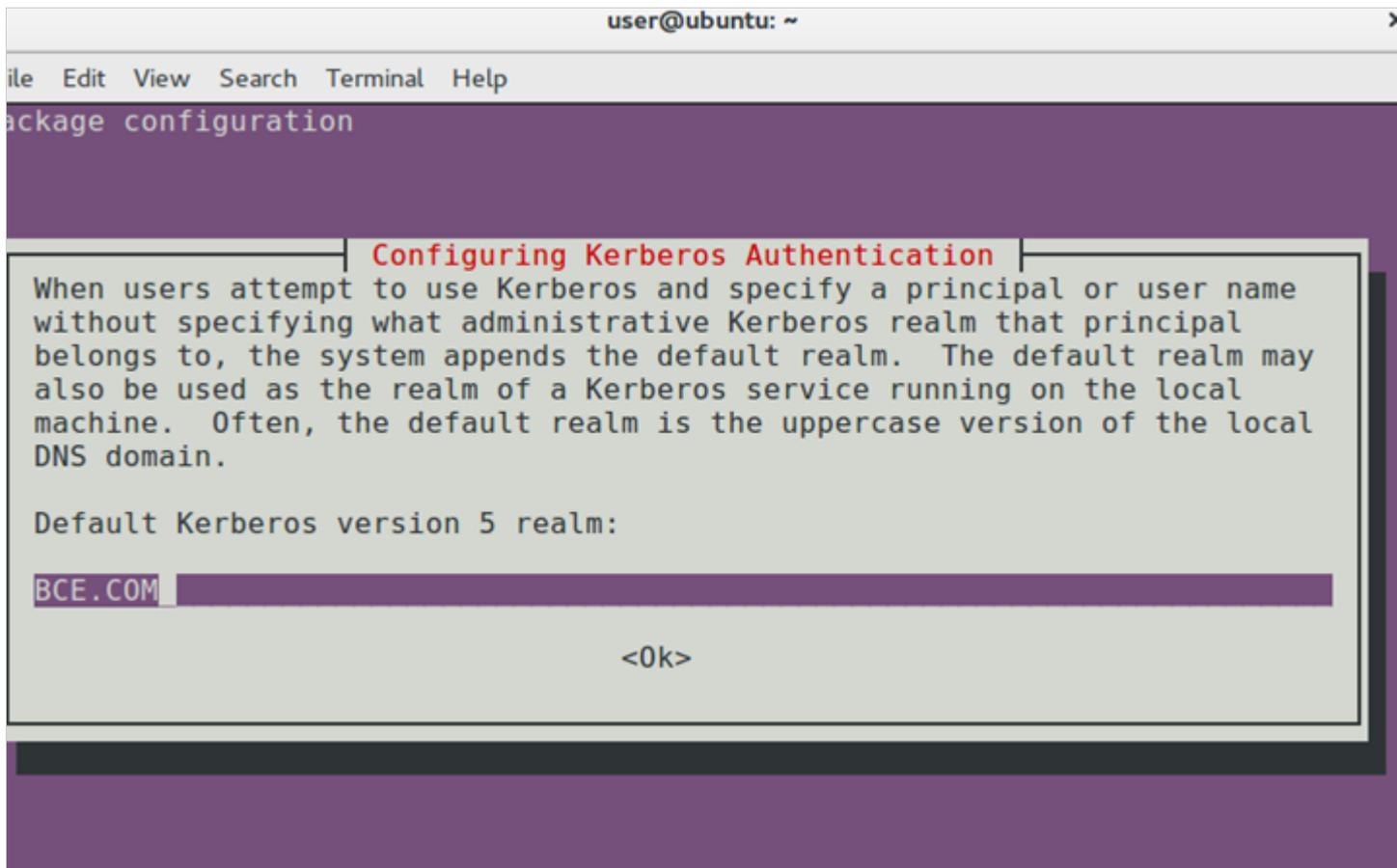
Install the necessary packages:

```
1 sudo apt -y install realmd sssd adcli libwbclient-sssd krb5-user sssd-tools
samba-common packagekit samba-common-bin samba-libs
```



```
user@ubutest01: /home
File Edit View Search Terminal Help
user@ubutest01:/home$ sudo apt -y install realmd oddjob oddjob-mkhomedir sssd ad
cli libwbclient-sssd krb5-user sssd-tools samba-common packagekit samba-common-b
in samba-libs
Reading package lists... Done
Building dependency tree
Reading state information... Done
samba-libs is already the newest version (2:4.3.9+dfsg-0ubuntu0.16.04.1).
samba-libs set to manually installed.
The following additional packages will be installed:
  gdebi-core krb5-config ldap-utils libbasicobjects0 libc-ares2 libcollection4
  libdhash1 libgssrpc4 libini-config5 libipa-hbac0 libkadm5srv-mit9
  libkadm5srv-mit9 libkdb5-8 libnfsidmap2 libnl-route-3-200 libnss-sss
  libpam-pwquality libpam-sss libpath-utils1 libref-array1
  libsasl2-modules-gssapi-mit libsss-idmap0 libsss-nss-idmap0 libsss-sudo
  packagekit-backend-aptcc packagekit-tools python-crypto python-ldb
  python-samba python-sss python-tdb python3-packagekit sssd-ad sssd-ad-common
  sssd-common sssd-ipa sssd-krb5 sssd-krb5-common sssd-ldap sssd-proxy
Suggested packages:
  krb5-doc packagekit-backend-smart apt-xapian-index python-crypto-dbg
  python-crypto-doc heimdal-clients libsasl2-modules-ldap
The following packages will be REMOVED:
  python3-aptdaemon.pkcompat
The following NEW packages will be installed:
  adcli gdebi-core krb5-config krb5-user ldap-utils libbasicobjects0
```

If you are presented with the following screen, put the domain name in CAPITALS.



## 5. Configuring the Realmd.conf file

Make the following changes to the `realmd.conf` file before using [realmd to join the domain](#). This will make domain users have their home directory in the format `/home/user`. By default it will be `/home/domain/user`. You might want it like this, I do not. If you want to read more about these options [you can do that here](#).

Note: If you are going to have your domain users not use fully-qualified domain names, then you may run in to issues if you have a local linux user with the same account name as the active directory account name.

```
1 sudo vi /etc/realmd.conf
[active-directory]
os-name = Ubuntu Linux
os-version = 16.04
[service]
automatic-install = yes
[users]
default-home = /home/%u
default-shell = /bin/bash
[bce.com]
user-principal = yes
fully-qualified-names = no
```

```
user@ubutest01: /home
File Edit View Search Terminal Help
1 [active-directory]
2 os-name = Ubuntu Linux
3 os-version = 16.04
4
5 [service]
6 automatic-install = yes
7
8 [users]
9 default-home = /home/%U
10 default-shell = /bin/bash
11
12 [bce.com]
13 user-principal = yes
14 fully-qualified-names = no
~
~
~
~
~
~
8,7 All
```

## 6. Fix a bug with the Packagekit package.

There is a bug with the packagekit package in Ubuntu 16.04. You will need to do this as a workaround otherwise it will hang when you try to join the domain.

Note: I had to do this when I originally wrote this guide in May of 2016. This may have been fixed by the time you are reading this. I thought I'd put it in just in case.

```
1 sudo add-apt-repository ppa:xtrusia/packagekit-fix
2
3 sudo apt update
4
5 sudo apt upgrade packagekit
```

```
user@ubutest01: /home
File Edit View Search Terminal Help
python3-urllib3/xenial-updates,xenial-updates 1.13.1-2ubuntu0.16.04.1 all [upgradable from: 1.13.1-2]
user@ubutest01:/home$ sudo apt upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages will be upgraded:
  gir1.2-packagekitglib-1.0 openssh-client packagekit-tools python3-urllib3
4 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 736 kB of archives.
After this operation, 5,120 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ubuntu.mirror.serversaustralia.com.au/ubuntu xenial-updates/main amd64 openssh-client amd64 1:7.2p2-4ubuntu1 [586 kB]
Get:2 http://ppa.launchpad.net/xtrusia/packagekit-fix/ubuntu xenial/main amd64 gir1.2-packagekitglib-1.0 amd64 0.8.17-4ubuntu6-gcc5.4ubuntu1+testv20160425.2 [39.6 kB]
Get:3 http://ppa.launchpad.net/xtrusia/packagekit-fix/ubuntu xenial/main amd64 packagekit-tools amd64 0.8.17-4ubuntu6-gcc5.4ubuntu1+testv20160425.2 [53.5 kB]
Get:4 http://ubuntu.mirror.serversaustralia.com.au/ubuntu xenial-updates/main amd64 python3-urllib3 all 1.13.1-2ubuntu0.16.04.1 [57.3 kB]
Fetched 736 kB in 16s (43.7 kB/s)
(Reading database ... 207398 files and directories currently installed.)
```

## 7. Join Ubuntu Workstation to a Windows Domain.

Now, it's time to join the domain. Check that realm can discover the domain you will be joining.

```
1 realm discover
```

```
user@ubutest01: /home
File Edit View Search Terminal Help
user@ubutest01:/home$ realm discover
bce.com
  type: kerberos
  realm-name: BCE.COM
  domain-name: bce.com
  configured: no
  server-software: active-directory
  client-software: sssd
  required-package: sssd-tools
  required-package: sssd
  required-package: libnss-sss
  required-package: libpam-sss
  required-package: adcli
  required-package: samba-common-bin
user@ubutest01:/home$
```

Create the kerberos ticket that will be used the domain user that has privileges to join the domain.

```
1 kinit -V a_craig

user@ubutest01: /home
File Edit View Search Terminal Help
user@ubutest01:/home$ kinit -V a_craig
Using default cache: /tmp/krb5cc_1000
Using principal: a_craig@BCE.COM
Password for a_craig@BCE.COM:
Authenticated to Kerberos v5
user@ubutest01:/home$
```

Now you can join the domain using realmd.

```
1 sudo realm --verbose join -U a_craig bce.com

user@ubutest01: /home
File Edit View Search Terminal Help

user@ubutest01:/home$ sudo realm --verbose join -U a_craig bce.com
* Resolving: _ldap._tcp.bce.com
* Performing LDAP DSE lookup on: 192.168.1.200
* Successfully discovered: bce.com
Password for a_craig:
* Unconditionally checking packages
* Resolving required packages
* LANG=C /usr/sbin/adcli join --verbose --domain bce.com --domain-realm BCE.COM
--domain-controller 192.168.1.200 --os-name Ubuntu Linux --os-version 16.04 --l
ogin-type user --login-user a_craig --stdin-password --user-principal
* Using domain name: bce.com
* Calculated computer account name from fqdn: UBUTEST01
* Using domain realm: bce.com
* Sending netlogon pings to domain controller: cldap://192.168.1.200
* Received NetLogon info from: dc2.bce.com
* Wrote out krb5.conf snippet to /var/cache/realmd/adcli-krb5-3F0g1E/krb5.d/adc
li-krb5-conf-W0vt8D
* Authenticated as user: a_craig@BCE.COM
* Looked up short domain name: bce
* Using fully qualified name: ubutest01
* Using domain name: bce.com
```

To do a quick test to see if it's worked:

```
1 id craig
```

```
user@ubutest01: /home
File Edit View Search Terminal Help
user@ubutest01:/home$ id craig
uid=1562601105(craig) gid=1562600513(domain users) groups=1562600513(domain user
s),1562601615(linuxadmins),1562602106(kodishares),1562601601(downloadredrection
),1562601616(adminshares)
user@ubutest01:/home$
```

This is all the Domain Groups that the domain user Craig belongs to. It's worked HUZDAH!



OK, now that's done. Lets tweak!

## 8. Configuring the SSSD.conf file.

I'd like to enable Dynamic DNS and some other features that I couldn't set via the realmd.conf file. We now have the opportunity to tweak these settings in the sssd.conf file. I've added the following:

```
1 sudo vi /etc/sss/sss.conf
auth_provider = ad
chpass_provider = ad
access_provider = ad
ldap_schema = ad
dyndns_update = true
dyndns_refresh_interval = 43200
dyndns_update_ptr = true
dyndns_ttl = 3600
```

```
user@ubutest01: /home
File Edit View Search Terminal Help
5 services = nss, pam
6
7 [domain/bce.com]
8 ad_domain = bce.com
9 krb5_realm = BCE.COM
10 realmd_tags = manages-system joined-with-adcli
11 cache_credentials = True
12 id_provider = ad
13 krb5_store_password_if_offline = True
14 default_shell = /bin/bash
15 ldap_id_mapping = True
16 use_fully_qualified_names = False
17 fallback_homedir = /home/%u
18 access_provider = ad
19
20 auth_provider = ad
21 chpass_provider = ad
22 access_provider = ad
23 ldap_schema = ad
24 dyndns_update = true
25 dyndns_refresh_interval = 43200
26 dyndns_update_ptr = true
27 dyndns_ttl = 3600
```

You can find a full list of options to tweak at the [sssd.conf man page](#).

## 9. Locking down which Domain Users can login.

Now, let's restrict which domain users can login.

```
1 sudo realm deny -R bce.com -a
```

I want users specified in a specific group to be able to login, as well as the domain admins.

```
1 sudo realm permit -R bce.com -g linuxadmins domain\ admins
```

```
user@ubutest01: /home
File Edit View Search Terminal Help
user@ubutest01:/home$ sudo realm deny -R bce.com -a
user@ubutest01:/home$ sudo realm permit -R bce.com -g linuxadmins domain\ admins
user@ubutest01:/home$
```

## 10. Granting Sudo Access.

Now lets grant some sudo access.

```
1 sudo visudo
```

```

user@ubutest01: /home
File Edit View Search Terminal Help
GNU nano 2.5.3 File: /etc/sudoers.tmp Modified

# Cmnd alias specification

# User privilege specification
root    ALL=(ALL:ALL) ALL

# Members of the admin group may gain root privileges
%admin  ALL=(ALL) ALL

# Allow members of group sudo to execute any command
%sudo  ALL=(ALL:ALL) ALL

# See sudoers(5) for more information on "#include" directives:

#includedir /etc/sudoers.d

%linuxadmins ALL=(ALL:ALL) ALL
%domain\ admins ALL=(ALL:ALL) ALL

Get Help  Write Out  Where Is  Cut Text  Justify  Cur Pos
Exit      Read File  Replace   Uncut Text To Spell  Go To Line

```

## 11. Configuring home directories.

Lets setup the home directory for domain users logging in.

```
1 sudo vi /etc/pam.d/common-session
```

Add to the bottom:

```
session required pam_mkhomedir.so
skel=/etc/skel/ umask=0022
```

```

user@ubutest01: /home
File Edit View Search Terminal Help
 8 #
 9 # As of pam 1.0.1-6, this file is managed by pam-auth-update by default.
10 # To take advantage of this, it is recommended that you configure any
11 # local modules either before or after the default block, and use
12 # pam-auth-update to manage selection of other modules. See
13 # pam-auth-update(8) for details.
14
15 # here are the per-package modules (the "Primary" block)
16 session [default=1] pam_permit.so
17 # here's the fallback if no module succeeds
18 session requisite pam_deny.so
19 # prime the stack with a positive return value if there isn't one already;
20 # this avoids us returning an error just because nothing sets a success code
21 # since the modules above will each just jump around
22 session required pam_permit.so
23 # The pam_umask module will set the umask according to the system default in
24 # /etc/login.defs and user settings, solving the problem of different
25 # umask settings with different shells, display managers, remote sessions et
26 # c.
26 # See "man pam_umask".
27 session optional pam_umask.so
28 # and here are more per-package modules (the "Additional" block)
29 session required pam_unix.so
30 session optional pam_sss.so
31 session optional pam_systemd.so
32 session required pam_mkhomedir.so skel=/etc/skel/ umask=0022
33 # end of pam-auth-update config
33,31 Bot

```

## 12. Configure Lightdm

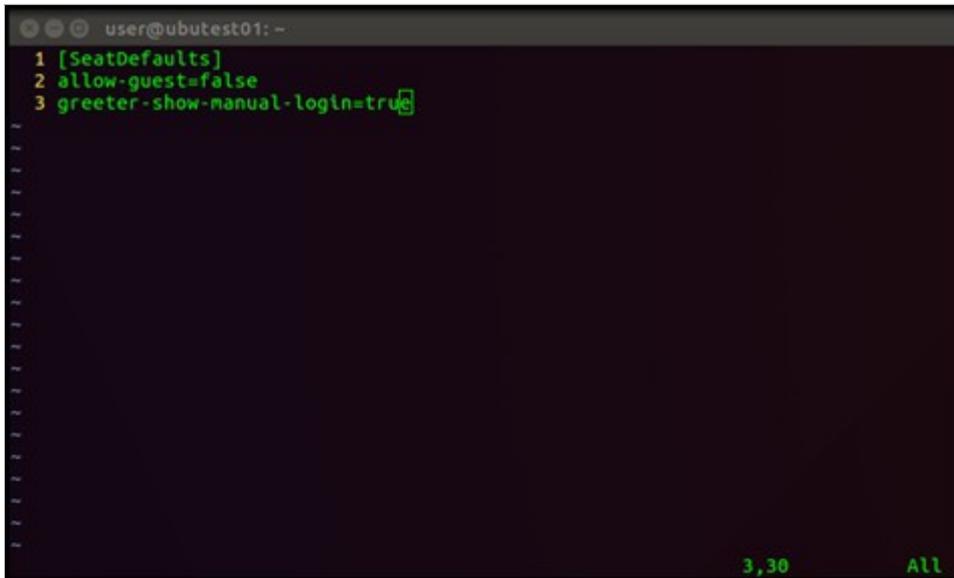
The last thing I want to do is edit the lightdm conf file so that I can log in with a domain user at the login prompt.

```
1 sudo vi /etc/lightdm/lightdm.conf
```

```
[SeatDefaults]
```

```
allow-guest=false
```

```
greeter-show-manual-login=true
```

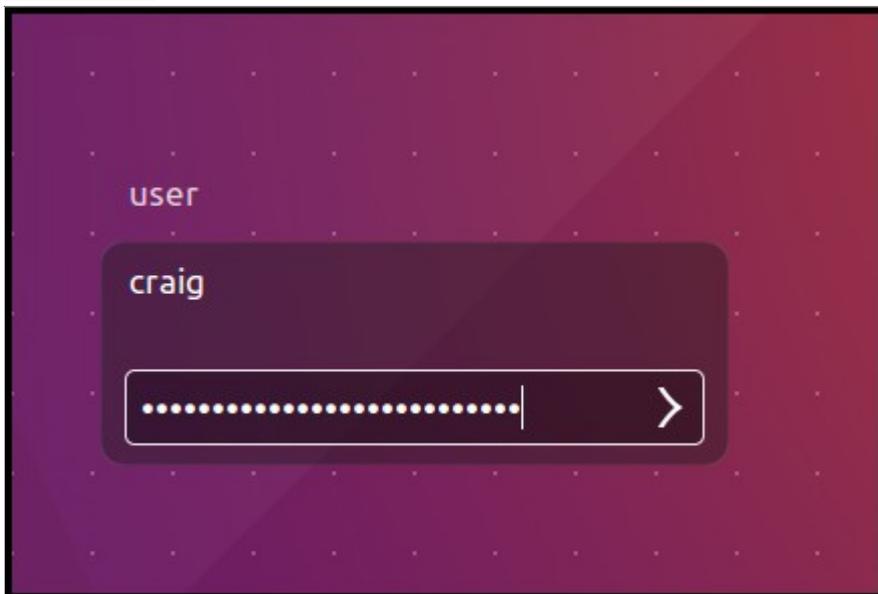


```
user@ubutest01: -  
1 [SeatDefaults]  
2 allow-guest=false  
3 greeter-show-manual-login=true
```

I think that's all the tweaking I'm going to do. I'm going to reboot and see if I can login.

```
1 sudo reboot
```

Once the login screen pops up you should be able to manually login. Click login.



I can log in. Huzzah!

## 13. Final Thoughts & Failures

This was a fun process and I learned a lot about Ubuntu and Linux in creating this guide. There were a few failures however so it wasn't all smooth sailing.

### Dynamic DNS

So after all that, I still had issues with Dynamic DNS. I researched this as much as I could but couldn't find a resolution. I manually added the A records on my DNS server but I'd really like to get Dynamic

DNS working. If anyone knows where I have gone wrong or can point out how to get this working please leave a comment.

## SAMBA File Sharing

I also had some issues after this with getting SAMBA/CIFS File sharing working with Windows Authentication. I would like to be able to share a folder in Ubuntu to Windows Users and have the Windows Users authenticate to the Ubuntu share with their Windows credentials. I've spent a fair bit of time trying to find a resolution to this and played a bit with ACLS in Ubuntu as well but couldn't get it working properly. I put this down to being fairly new to Linux and not fully understanding some of the intricacies with SAMBA and Linux authentication. If anyone can point me in the right direction for getting SAMBA File Sharing working please leave me a comment.

## 14. Links

Below are the links that I used when researching this guide.

SSSD-AD Man Page

<http://linux.die.net/man/5/sss-ad>

SSSD.Conf Man Page

<http://linux.die.net/man/5/sss.conf>

SSSD-KRB5 Man Page

<http://linux.die.net/man/5/sss-krb5>

SSSD-SIMPLE Man Page

<http://linux.die.net/man/5/sss-simple>

PAM\_SSS Module Man Page

[http://linux.die.net/man/8/pam\\_sss](http://linux.die.net/man/8/pam_sss)

SSSD – Fedora

<https://fedorahosted.org/sss/>

Redhat – Ways to Integrate Active Directory and Linux Environments

[https://access.redhat.com/documentation/en-US/Red\\_Hat\\_Enterprise\\_Linux/7/html/Windows\\_Integration\\_Guide/introduction.html](https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Windows_Integration_Guide/introduction.html)

Redhat – Using Realmd to Connect to an Active Directory Domain

[https://access.redhat.com/documentation/en-US/Red\\_Hat\\_Enterprise\\_Linux/7/html/Windows\\_Integration\\_Guide/ch-Configuring\\_Authentication.html](https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Windows_Integration_Guide/ch-Configuring_Authentication.html)

Realm Man Page

<http://manpages.ubuntu.com/manpages/trusty/man8/realm.8.html>

Realmd.conf Man Page

<http://manpages.ubuntu.com/manpages/trusty/man5/realmd.conf.5.html>

Correcting DNS issue by editing Resolv.Conf file

<http://askubuntu.com/questions/201603/should-i-edit-my-resolv-conf-file-to-fix-wrong-dns-problem>