1 Operational Essential

==

Creating a Linux File System

****

Abc

==================

Abc

==================

Abc

==================

Abc

==================

Abc

==

123

****

Abc

==================

Abc

==================

Abc

==================

Abc

==================

Abc

==================

2 User and Group Management

==
====

Introduction to Linux User and Group Management
****
****

Linux user and group management
====================

Lab
`````
Understanding the command genet


## Listing users and service
====================

[root@server1 ~]# cat /etc/passwd
root:x:0:0:root:/root:/bin/bash

ntp:x:38:38::/etc/ntp:/sbin/nologin
chrony:x:997:995::/var/lib/chrony:/sbin/nologin
tcpdump:x:72:72::/:/sbin/nologin
mivaan:x:1000:1000:mivaan:/home/mivaan:/bin/bash
gluster:x:996:994:GlusterFS daemons:/run/gluster:/sbin/nologin
rpcuser:x:29:29:RPC Service User:/var/lib/nfs:/sbin/nologin
nfsnobody:x:65534:65534:Anonymous NFS User:/var/lib/nfs:/sbin/nologin
tss:x:59:59:Account used by the trousers package to sandbox the tcsd
daemon:/dev/null:/sbin/nologin
hacluster:x:189:189:cluster user:/home/hacluster:/sbin/nologin
unbound:x:995:991:Unbound DNS resolver:/etc/unbound:/sbin/nologin
apache:x:48:48:Apache:/usr/share/httpd:/sbin/nologin
sanjeev:x:1001:1001::/home/sanjeev:/bin/bash
maximus:x:1002:1002::/home/maximus:/bin/bash


[root@server1 ~]# getent  passwd
root:x:0:0:root:/root:/bin/bash


[root@server1 ~]# grep passwd /etc/nsswitch.conf
      // password database
**#passwd**:   db files nisplus nis
**passwd**:    files sss


[root@server1 ~]# getent  group

```
root:x:0:

[root@server1 ~]# getent networks
default          0.0.0.0
loopback          127.0.0.0
link-local        169.254.0.0


[root@server1 ~]# getent services
```

==============================================================
=====

# Managing Login Scripts

**************************************************************
********


## Login Scripts

====================


### Objectives
` ` ` ` ` ` ` ` `

Manage system-wide environment profiles
Manage templets user environment


### LAB
` ` ` `

Login shells and non-login shells
System login shells
Using login scripts and /etc/skel

Login shell
```````````

/etc/profile   ~/.bash_profile

~/.bashrc   /etc/bashrc

Non - Login shell
`````````````````

~/.bashrc                    /etc/bashrc




**Investigating the execution order**
==================

[student@server1 ~]$ pwd
/home/student


[student@server1 ~]$ su -l
Password:
Last login: Sun Aug  9 10:48:33 +0545 2020 from 192.168.1.68 on pts/0
[root@server1 ~]#


[root@server1 ~]# pwd
/root

```
[root@server1 ~]# echo $USER
root

[root@server1 ~]# id
uid=0(root) gid=0(root) groups=0(root)
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023


[root@server1 ~]# exit
logout


[student@server1 ~]$ su
                                                    // root on student dir
Password:
[root@server1 student]# pwd
/home/student
[root@server1 student]#

[root@server1 student]# echo $USER
student


[root@server1 ~]# vim .bashrc
            echo "from bash"


[root@server1 ~]# vim /etc/bash_profile
echo "profile"


[root@server1 ~]# su
from bash


[root@server1 ~]# su - root
Last login: Sun Aug  9 17:06:02 +0545 2020 on pts/0
from bash
```

Note
```````

Delete both edit from .bashrc and bash_profile tooo

## System login scripts
====================

[root@server1 ~]# ls /etc/profile*
/etc/profile

**/etc/profile.d:**
256term.csh              colorgrep.csh  csh.local  less.sh   vim.csh
256term.sh               colorgrep.sh   lang.csh   mc.csh    vim.sh
abrt-console-notification.sh colorls.csh   lang.sh    mc.sh     which2.csh
bash_completion.sh       colorls.sh     less.csh   sh.local  which2.sh

[root@server1 ~]# ls /etc/bash*
/etc/bash_profile  /etc/bashrc

**/etc/bash_completion.d:**
gluster  iprutils  redefine_filedir  scl.bash  yum-utils.bash

Lets check this example

```
[root@server1 ~]# echo $PS1
[\u@\h \W]\$
```

```
[root@server1 ~]# cd /tmp/
[root@server1 tmp]# ls
```

```
[root@server1 tmp]# cd /var/tmp/
[root@server1 tmp]# ls
```

```
[root@server1 ~]# vim /etc/bashrc
  [ "$PS1" = "\\s-\\v\\\$ " ] && PS1="[\u@\h \W]\\$ "
```
Change as

```
  [ "$PS1" = "\\s-\\v\\\$ " ] && PS1="[\u@\h \w]\\$ "
```

```
[root@server1 ~]# cd /var/tmp/
[root@server1 /var/tmp]#
```

**Home directory templets**
====================

```
[root@server1 ~]# cd /etc/skel/
[root@server1 /etc/skel]#




[root@server1 /etc/skel]# ls -la
total 24
drwxr-xr-x.  2 root root   62 Apr 11  2018 .
drwxr-xr-x. 99 root root 8192 Aug  9 17:15 ..
-rw-r--r--.  1 root root   18 Apr 11  2018 .bash_logout
-rw-r--r--.  1 root root  193 Apr 11  2018 .bash_profile
-rw-r--r--.  1 root root  231 Apr 11  2018 .bashrc




[root@server1 /etc/skel]# ls -a
.  ..  .bash_logout  .bash_profile  .bashrc

[root@server1 /etc/skel]# ls -A
.bash_logout  .bash_profile  .bashrc




[root@server1 /etc/skel]# cat .bash_logout
# ~/.bash_logout


[root@server1 /etc/skel]# cat .bash_profile

[root@server1 /etc/skel]# cat .bashrc




[root@server1 /etc/skel]# echo $PATH
/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin:/root/bin




[root@server1 /etc/skel]# cat .bashrc
if [ -f /etc/bashrc ]; then
     . /etc/bashrc
fi

To
```

```
# Source global definitions
if [ -f /etc/bashrc ]; then
        source /etc/bashrc
fi
```

```
[root@server1 /etc/skel]# cat .bash_profile
if [ -f ~/.bashrc ]; then
        . ~/.bashrc
fi
```

To

```
if [ -f ~/.bashrc ]; then
        source ~/.bashrc
fi
```

===============================================================
=====
# Creating and Managing Local Users
***********************************************************
********

## Introducing accounts and the id command
==============================

Objectives
```````````
Create, delete, and modify local user accounts

LAB
````
Linux user identification
Create local users

Manage user passwords
Working with user defaults
Modify and delete user accounts

User identification
``````````````````

```
[student@server1 ~]$ id                                    //login from
normal user:student
uid=1003(student) gid=1003(student) groups=1003(student)
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023


[student@server1 ~]$ id root
uid=0(root) gid=0(root) groups=0(root)
```

1 st user and group starts from 1000

```
[student@server1 ~]$ id –g                      //primary group id
1003


[student@server1 ~]$ id –G                      // secondary group id
1003


[student@server1 ~]$ id –Gn
student
```

Creating User Command

===================

User account may be local or domain based accounts.

Local account
`````````````

[root@server1 ~]# useradd -m user1

[root@server1 ~]# tail -n 1 /etc/passwd
user1:x:1004:1004::/home/user1:/bin/bash

[root@server1 ~]# ls /home/
maximus mivaan sanjeev student **user1**

[root@server1 ~]# ls -a /home/user1/
. .. .bash_logout .bash_profile .bashrc

[root@server1 ~]# useradd -N user2 -g users -G adm
[root@server1 ~]# !t
tail -n 1 /etc/passwd
user2:x:1005:100::/home/user2:/bin/bash

[root@server1 ~]# ls /home/
maximus mivaan sanjeev student user1 **user2**

[root@server1 ~]# useradd user3 -G adm -s /bin/sh
[root@server1 ~]# !t
tail -n 1 /etc/passwd
user3:x:1006:1006::/home/user3:/bin/sh

```
[root@server1 ~]# ls -l /sbin/adduser
lrwxrwxrwx. 1 root root 7 Aug  6 17:16 /sbin/adduser -> useradd
```

Managing User Passwords
====================

```
[root@server1 ~]# passwd user1
Changing password for user user1.
New password:
BAD PASSWORD: The password is shorter than 7 characters
Retype new password:
passwd: all authentication tokens updated successfully
```

```
[root@server1 ~]# grep user1 /etc/shadow
```
**user1:6XA/
pQtyv$rZPpvkJKidkyDwFPu3j1TPqFh9XoOjXUwI9rLUhhI1wJSQTHt6tDe27
Z0AhGo6xZ39jNwRAH4nXAefvtSucN6/**:18483:0:99999:7:::
                    // by default sha512 also

```
[root@server1 ~]# grep user. /etc/shadow
```
rpc**user:**!!:18480::::::
user1:6XA/
pQtyv$rZPpvkJKidkyDwFPu3j1TPqFh9XoOjXUwI9rLUhhI1wJSQTHt6tDe27Z0Ah
Go6xZ39jNwRAH4nXAefvtSucN6/:18483:0:99999:7:::   /password set
user2:!!:18483:0:99999:7:::   // no
password set, password change after this days 18483

user3:!!:18483:0:99999:7:::   // no password set

```
[root@server1 ~]# echo 'user2:Password1' | chpasswd
                          // sending Password1 for user2 using chpasswd
```

```
[root@server1 ~]# grep user2 /etc/shadow
```
user2:6a4yjy/aOVUs/$Sz7i7tvIUbaab.Mfn2S28QVdk5PzcSEFUMN/
vEQpW0k9ph/jA4n1/o63E/
TUBgmx7qQsbE3GyfeCpPNdI0.mf1:18483:0:99999:7:::

```
[root@server1 ~]# echo Password1 | passwd user3 --stdin
Changing password for user user3.
passwd: all authentication tokens updated successfully.
```

```
[root@server1 ~]# grep user3 /etc/shadow
```
user3:6m8FkujI1$QflFXNbaFOqvYTSLHjnfqdqdYoFaf85.pHBWwt1.Qi82kVxP
HAKflY1dq5SyZue36mwGcy.BTc3lcIqALS29S/:18483:0:99999:7:::

```
[root@server1 ~]# grep user. /etc/shadow
```
rpc**user:**!!:18480::::::
user1:6XA/
pQtyv$rZPpvkJKidkyDwFPu3j1TPqFh9XoOjXUwI9rLUhhI1wJSQTHt6tDe27Z0Ah
Go6xZ39jNwRAH4nXAefvtSucN6/:18483:0:99999:7:::
user2:6a4yjy/aOVUs/$Sz7i7tvIUbaab.Mfn2S28QVdk5PzcSEFUMN/
vEQpW0k9ph/jA4n1/o63E/
TUBgmx7qQsbE3GyfeCpPNdI0.mf1:18483:0:99999:7:::
user3:6m8FkujI1$QflFXNbaFOqvYTSLHjnfqdqdYoFaf85.pHBWwt1.Qi82kVxP

HAKflY1dq5SyZue36mwGcy.BTc3lcIqALS29S/:18483:0:99999:7:::

Password age data
====================

[root@server1 ~]# chage -l student
Last password change   : Aug 09, 2020
Password expires   : never
Password inactive   : never
Account expires   : never
Minimum number of days between password change   : 0
Maximum number of days between password change   : **99999**
Number of days of warning before password expires   : 7

[root@server1 ~]# chage -l user1
Last password change   : Aug 09, 2020
Password expires   : never
Password inactive   : never
Account expires   : never
Minimum number of days between password change   : 0
Maximum number of days between password change   : 99999
Number of days of warning before password expires   : 7

[root@server1 ~]# grep user1 /etc/passwd
user1:x:1004:1004::/home/**user1**:/bin/bash   // second field X means ,
password in shadow data

```
[root@server1 ~]# pwunconv                                         //
convert password from shadow file
[root@server1 ~]# grep user1 /etc/passwd
user1:$6$XA/
pQtyv$rZPpvkJKidkyDwFPu3j1TPqFh9XoOjXUwI9rLUhhI1wJSQTHt6tDe27
Z0AhGo6xZ39jNwRAH4nXAefvtSucN6/:1004:1004::/home/user1:/bin/bash



[root@server1 ~]# pwconv
[root@server1 ~]# grep user1 /etc/passwd
user1:x:1004:1004::/home/user1:/bin/bash




[root@server1 ~]# chage -M 40 user1

[root@server1 ~]# chage -l user1
Last password change                      : Aug 09, 2020
Password expires                   : Sep 18, 2020
Password inactive               : never
Account expires                      : never
Minimum number of days between password change        : 0
Maximum number of days between password change        : 40
Number of days of warning before password expires   : 7



[root@server1 ~]# grep user1 /etc/shadow
user1:$6$XA/
pQtyv$rZPpvkJKidkyDwFPu3j1TPqFh9XoOjXUwI9rLUhhI1wJSQTHt6tDe27Z0Ah
Go6xZ39jNwRAH4nXAefvtSucN6/:18483:0:40:7:::




[root@server1 ~]# passwd -l user1                                  //
locking user
Locking password for user user1.
passwd: Success
```

```
[root@server1 ~]# grep user1 /etc/shadow
user1:!!$6$XA/
pQtyv$rZPpvkJKidkyDwFPu3j1TPqFh9XoOjXUwI9rLUhhI1wJSQTHt6tDe27Z0Ah
Go6xZ39jNwRAH4nXAefvtSucN6/:18483:0:40:7:::
```

```
[root@server1 ~]# passwd -u user1
Unlocking password for user user1.
passwd: Success
```

```
user1:$6$XA/
pQtyv$rZPpvkJKidkyDwFPu3j1TPqFh9XoOjXUwI9rLUhhI1wJSQTHt6tDe27Z0Ah
Go6xZ39jNwRAH4nXAefvtSucN6/:18483:0:40:7:::                // no !! Sign
```

Account Defaults
===================

```
[user1@server1 ~]$ less /etc/login.defs
```

```
[root@server1 ~]# useradd -D
GROUP=100
HOME=/home
INACTIVE=-1
EXPIRE=
SHELL=/bin/bash
SKEL=/etc/skel
CREATE_MAIL_SPOOL=yes
```

```
[root@server1 ~]# useradd -Ds /bin/sh
```

```
[root@server1 ~]# useradd -D
GROUP=100
HOME=/home
INACTIVE=-1
EXPIRE=
SHELL=/bin/sh
SKEL=/etc/skel
CREATE_MAIL_SPOOL=yes
```

```
[root@server1 ~]# cat /etc/default/useradd
# useradd defaults file
GROUP=100
HOME=/home
INACTIVE=-1
EXPIRE=
SHELL=/bin/sh
SKEL=/etc/skel
CREATE_MAIL_SPOOL=yes
```

```
[root@server1 ~]# vim /etc/default/useradd
```

SHELL=/bin/sh

Change to

SHELL=/bin/bash

Modify and delete accounts
=====================

[root@server1 ~]# su - student   //manage sudores file

[student@server1 ~]$ sudo usermod -c "user one" user1

[student@server1 ~]$ grep user1 /etc/passwd
user1:x:1004:1004:**user one**:/home/**user1**:/bin/bash

[student@server1 ~]$ chsh -l
/bin/sh
/bin/bash
/sbin/nologin
/usr/bin/sh
/usr/bin/bash
/usr/sbin/nologin
/bin/tcsh
/bin/csh

[student@server1 ~]$ sudo chsh -s /bin/sh user2
Changing shell for user2.
Shell changed.

[student@server1 ~]$ grep user2 /etc/passwd
user2:x:1005:100::/home/**user2**:**/bin/sh**

[student@server1 ~]$ sudo usermod -s **/bin/bash** user2

[student@server1 ~]$ grep user2 /etc/passwd
user2:x:1005:100::/home/**user2**:**/bin/bash**

```
[student@server1 ~]$ ls /home/
maximus  mivaan  sanjeev  student  user1  user2  user3


[student@server1 ~]$ sudo userdel -r user2
     //-r deletes home dir as well as corncobs and mails of user acc

[student@server1 ~]$ ls /home/
maximus  mivaan  sanjeev  student  user1  user3




[student@server1 ~]$ sudo userdel user3
[student@server1 ~]$ ls /home/
maximus  mivaan  sanjeev  student  user1  user3


[student@server1 ~]$ sudo find /home/ -uid 1003 -delete
[student@server1 ~]$ ls /home/
```

==
=====
Managing Local Groups
****
****

Creating local Groups
===================

Objectives
``````````

Create, delete  and modify local groups and group membership
Configure set-GID directories for collaboration

LAB
`````

Create local group
Modify group membership
Set GID permission on directory
Group password

Creating groups
`````````

```
[student@server1 ~]$ grep student /etc/group
student:x:1005:


[student@server1 ~]$ id
uid=1005(student) gid=1005(student) groups=1005(student)
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023




[student@server1 ~]$ sudo newgrp user1

[student@server1 ~]$ id
uid=1005(student) gid=1005(student) groups=1005(student)
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023




[student@server1 ~]$ sudo newgrp user1
[
root@server1 /home/student]# pwd
/home/student

[root@server1 /home/student]# touch file1

[root@server1 /home/student]# ls -l file1
```

```
-rw-r--r--. 1 root user1 0 Aug  9 18:45 file1

[root@server1 /home/student]#

[root@server1 /home/student]# exit
exit

[student@server1 ~]$ touch file2

[student@server1 ~]$ ls -l file
file1  file2

[student@server1 ~]$ ls -l file*
-rw-r--r--. 1 root    user1   0 Aug  9 18:45 file1
-rw-rw-r--. 1 student student 0 Aug  9 18:45 file2




[student@server1 ~]$ sudo groupadd sales

[student@server1 ~]$ grep sales /etc/group
sales:x:1006:



[student@server1 ~]$ sudo grep sales /etc/gshadow
sales:!::                                      //invalid group
password
```

## Manage Group Membership
```
====================
```
```
[student@server1 ~]$ id -Gn
student



[student@server1 ~]$ id -gn
student
```

```
[student@server1 ~]$ sudo usermod -G sales,sanjeev student
```

**Making the use of SGID Permission**
===================

**Group Password**
===================

**Abc**
===================

============================================================
=====
# Using PAM to Control User Access
************************************************************
********

**Abc**
===================

**Abc**
===================

**Abc**
===================

**Abc**
===================

**Abc**
===================

**Abc**
===================

**Abc**
===================

**Abc**
===================

============================================================
=====
# Implementing Open LDAP Directories
************************************************************
********

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

==================

=============================================================
=====

# Implementing Open LDAP Authentication

*****************************************************************
********

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

==================


========================================================
=====
# Implementing Kerberos Authentication
**********************************************************
********


**Abc**
==================




**Abc**
==================


**Abc**
==================


**Abc**
==================


**Abc**
==================

# 6 Service Management

==============================================
====
## Linux service Mangement
*********************************************************
********

### Introduction
====================

No of machines needed
`````````````````````

Make a new clean machines

Server 1 - Centos cli

Server 2 - Centos cli

Blank Machine - Clean Install

Objectives
````````````
Study for

DNS        DHCP        PXE        FTP
HTTP       PHP         MariaDB
Email
Printing
Selinux services

LAB
````
Using system and systemctl to manage services

**Using system to manage services**
====================

[root@server1 ~]# yum install net-tools bash-completion vim-enhanced

```
[root@server1 ~]# ps -f 1                                            //
checking full process of system, no initd
UID      PID PPID C STIME TTY    STAT  TIME CMD
root      1   0  0 12:40 ?      Ss   0:02 /usr/lib/systemd/systemd
```

```
[root@server1 ~]# systemctl status sshd                             // process
initiated by systemd
```

```
[root@server1 ~]# systemctl status sshd
```

```
[root@server1 ~]# systemctl  stop sshd
```

```
[root@server1 ~]# systemctl disable shd
```
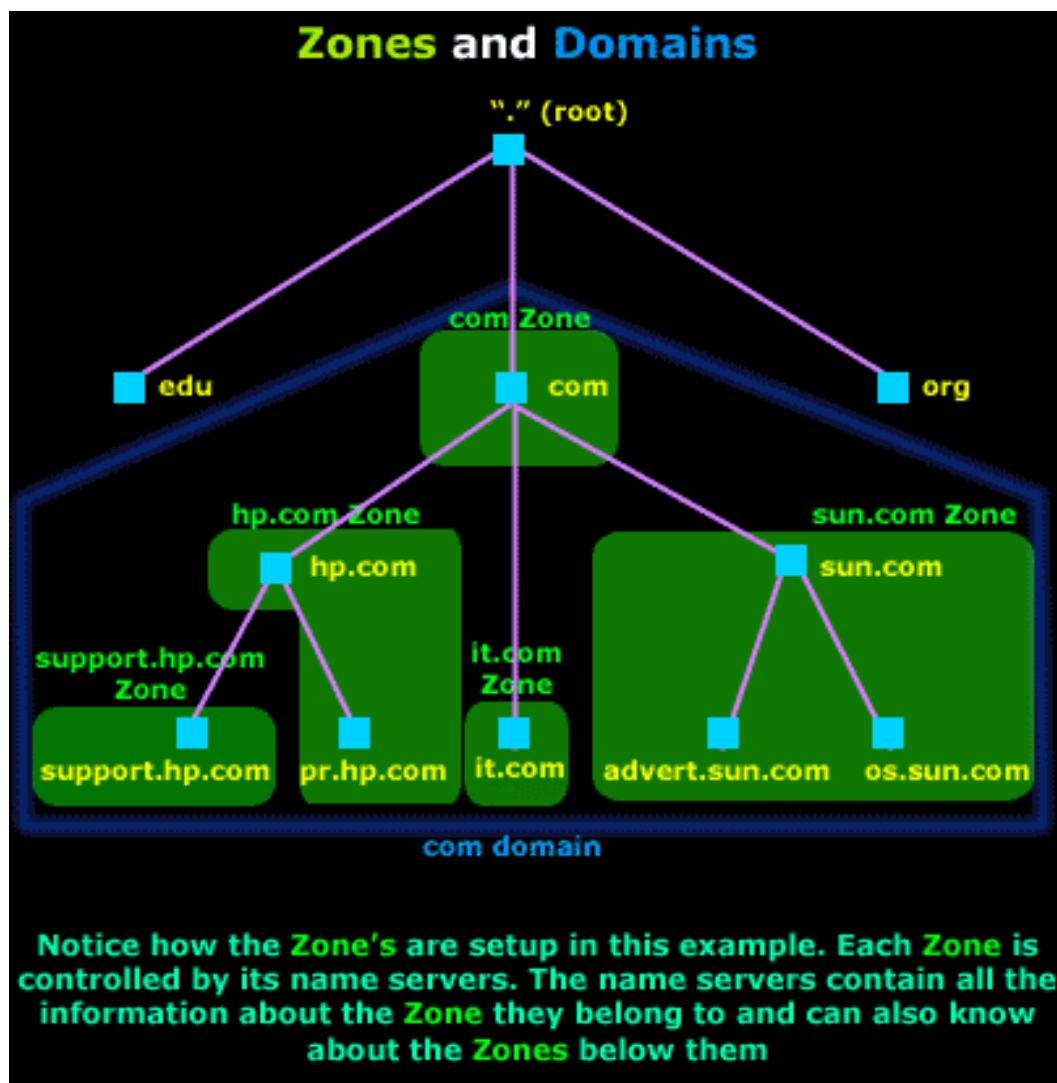
```
[root@server1 ~]# systemctl mask sshd
```

```
[root@server1 ~]# systemctl unmask sshd
```

==================================================================
=====
## Configure BIND DNS Service

**************************************************************
********

The Domain Name System (DNS) is the phonebook of the Internet.
Humans access information online through domain names, like nytimes.com or espn.com.
Web browsers interact through Internet Protocol (IP) addresses.
DNS translates domain names to IP addresses so browsers can load Internet resources.

https://www.cloudflare.com/learning/dns/what-is-dns/

**DNS Intoroduction**
=====================

 BIND
``````

Berkely Internet Domain .
The mostly widely implementedd Domain Name System (DNS) service.


Objectives
``````````

Configure a basic DNS server
Maintain a dns zone
Configure a caching-only name server
Configure a caching-only name server to forward DNS queries.



LAB
````

Install and test BIND
DNS Forwarding
Identify DNS files and locations
Configure forward lookup zones
Using DNS API's



**Configure a caching only server**
====================

Installing the bind packages
``````````````````

[root@server1 ~]# yum install bind bind-utils

Services
``````````

```
[root@server1 ~]# systemctl enable named
Created symlink from /etc/systemd/system/multi-user.target.wants/
named.service to /usr/lib/systemd/system/named.service.


[root@server1 ~]# systemctl start named

[root@server1 ~]# systemctl status named
● named.service - Berkeley Internet Name Domain (DNS)
   Loaded: loaded (/usr/lib/systemd/system/named.service; enabled; vendor
preset: disabled)
   Active: active (running)
```

## Firewall design . Port 53
``````````````````````

```
[root@server1 ~]# netstat  -ltn
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp     0     0 0.0.0.0:111        0.0.0.0:*          LISTEN
tcp     0     0 127.0.0.1:53         0.0.0.0:*          LISTEN
                  // Listening DNS request , lookup
tcp     0     0 0.0.0.0:22         0.0.0.0:*          LISTEN
tcp     0     0 127.0.0.1:953         0.0.0.0:*          LISTEN
                  // 953 is for controlling DNS


[root@server1 ~]# firewall-cmd --permanent --add-service=dns
success
[root@server1 ~]# firewall-cmd --reload
success
[root@server1 ~]# firewall-cmd --list-services
dhcpv6-client dns ssh
```

Controll dns lookup. From local machine 127.0.0.1
``````````````````````````````````````````````

Held on cache mode , can be fushed

```
`````````````````````````````

[root@server1 ~]# dig www.pluralsight.com @127.0.0.1

; <<>> DiG 9.11.4-P2-RedHat-9.11.4-16.P2.el7_8.6 <<>> www.pluralsight.com
@127.0.0.1
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 14303
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 7

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.pluralsight.com.            IN    A

;; ANSWER SECTION:
www.pluralsight.com.  60   IN    CNAME
www.pluralsight.com.cdn.cloudflare.net.
www.pluralsight.com.cdn.cloudflare.net. 300 IN A 104.19.161.127
www.pluralsight.com.cdn.cloudflare.net. 300 IN A 104.19.162.127

;; AUTHORITY SECTION:
cloudflare.net.         172798   IN    NS   ns4.cloudflare.net.
cloudflare.net.         172798   IN    NS   ns5.cloudflare.net.
cloudflare.net.         172798   IN    NS   ns3.cloudflare.net.
cloudflare.net.         172798   IN    NS   ns2.cloudflare.net.
cloudflare.net.         172798   IN    NS   ns1.cloudflare.net.

;; ADDITIONAL SECTION:
ns1.cloudflare.net.  172798   IN    A     173.245.59.31
ns2.cloudflare.net.  172798   IN    A     198.41.222.131
ns3.cloudflare.net.  172798   IN    A     198.41.222.31
ns1.cloudflare.net.  172798   IN    AAAA     2400:cb00:2049:1::adf5:3b1f
ns2.cloudflare.net.  172798   IN    AAAA     2400:cb00:2049:1::c629:de83
ns3.cloudflare.net.  172799   IN    AAAA     2400:cb00:2049:1::c629:de1f

;; Query time: 60 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Fri Aug 14 13:36:13 +0545 2020
;; MSG SIZE  rcvd: 354
```

## Configuring Forward and security
===================

```
[root@server1 ~]# netstat -ltn
tcp    0    0 127.0.0.1:53         0.0.0.0:*         LISTEN                //
listen on ipv4 and ipv6
tcp6   0    0 ::1:53              :::*              LISTEN                //
from local host
```

Change conf file
``````````````
```
[root@server1 ~]# vim /etc/named.conf
    listen-on port 53 { 127.0.0.1; };          to              listen-on port
53 { any; };
    listen-on-v6 port 53 { ::1; };             to              listen-on-v6
port 53 { none; };

    :wq
```

Check conf file ok or not
``````````````````````
```
[root@server1 ~]# named-checkconf -v                      // looks good
9.11.4-P2-RedHat-9.11.4-16.P2.el7_8.6
```

```
[root@server1 ~]# systemctl restart named
```

```
[root@server1 ~]# netstat -ltn                                       //
now looking only in ipv4
```

```
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address        Foreign Address       State
tcp     0     0 0.0.0.0:111          0.0.0.0:*           LISTEN
tcp     0     0 192.168.1.121:53     0.0.0.0:*           LISTEN
tcp     0     0 127.0.0.1:53         0.0.0.0:*           LISTEN
tcp     0     0 0.0.0.0:22           0.0.0.0:*           LISTEN
tcp     0     0 127.0.0.1:953        0.0.0.0:*           LISTEN
```

Allowing query to specified hosts of 192.168.1.0/24 and localhost
``````````````````````````

[root@server1 ~]# vim /etc/named.conf
          allow-query    { localhost; };          to          allow-query
{ localhost; 192.168.1.0/24; localnets; };


[root@server1 ~]# systemctl restart named

[root@server1 ~]# named-checkconf -v
9.11.4-P2-RedHat-9.11.4-16.P2.el7_8.6


[root@server1 ~]# dig www.onlinekhabar.com @127.0.0.1              // caching
only


For forwarding ,mode
``````````````````

[root@server1 ~]# vim /etc/named.conf
     forwarders { 8.8.8.8; 8.8.4.4; };
     forward only;


[root@server1 ~]# systemctl restart named
[root@server1 ~]# named-checkconf -v


[root@server1 ~]# dig www.pluralsight.com @127.0.0.1              // fast
response

; <<>> DiG 9.11.4-P2-RedHat-9.11.4-16.P2.el7_8.6 <<>> www.pluralsight.com

```
@127.0.0.1
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 19367
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.pluralsight.com.            IN    A

;; ANSWER SECTION:
www.pluralsight.com.     15    IN    CNAME
www.pluralsight.com.cdn.cloudflare.net.
www.pluralsight.com.cdn.cloudflare.net.    156 IN A 104.19.162.127
www.pluralsight.com.cdn.cloudflare.net.    156 IN A 104.19.161.127

;; Query time: 850 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Fri Aug 14 13:55:19 +0545 2020
;; MSG SIZE  rcvd: 132
```

```
[root@server1 ~]# dig www.ford.com @127.0.0.1                // fast
response

; <<>> DiG 9.11.4-P2-RedHat-9.11.4-16.P2.el7_8.6 <<>> www.ford.com
@127.0.0.1
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 5513
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.ford.com.              IN    A

;; ANSWER SECTION:
www.ford.com.            21415    IN    CNAME   www.ford.com.edgekey.net.
www.ford.com.edgekey.net. 193    IN    CNAME   e4213.dscx.akamaiedge.net.
e4213.dscx.akamaiedge.net. 19    IN    A    23.10.238.20
```

```
;; Query time: 728 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Fri Aug 14 13:56:05 +0545 2020
;; MSG SIZE  rcvd: 131
```

**Locating files and DNS Locations**
====================

```
[root@server1 ~]# vim /etc/named.conf
options {
     listen-on port 53 { any; };
     listen-on-v6 port 53 { none; };
     directory      "/var/named";
     dump-file       "/var/named/data/cache_dump.db";
     statistics-file "/var/named/data/named_stats.txt";
     memstatistics-file "/var/named/data/named_mem_stats.txt";
     recursing-file  "/var/named/data/named.recursing";
     secroots-file   "/var/named/data/named.secroots";
     allow-query     { localhost; 192.168.1.0/24; localnets; };

     forwarders { 8.8.8.8; 8.8.4.4; };
     forward only;


logging {
     channel default_debug {
          file "data/named.run";
           severity dynamic;

             print-severity yes;                              // add more
lines


     :wq
```

```
[root@server1 ~]# named-checkconf -v

[root@server1 ~]# systemctl stop named




Clearing all logs
`````````````
[root@server1 ~]# ls -lh /var/named/data/named.run
-rw-r--r--. 1 named named 17K Aug 14 14:01 /var/named/data/named.run




[root@server1 ~]# >/var/named/data/named.run                    // clearing
file

[root@server1 ~]# ls -lh /var/named/data/named.run
-rw-r--r--. 1 named named 0 Aug 14 14:03 /var/named/data/named.run




[root@server1 ~]# cat !$                                         // read ,
its empty
cat /var/named/data/named.run

[root@server1 ~]# systemctl start named




Now log logs like  and severity notice
``````````````

[root@server1 ~]# cat /var/named/data/named.run
info: managed-keys-zone: journal file is out of date: removing journal file
info: managed-keys-zone: loaded serial 6
info: zone 0.in-addr.arpa/IN: loaded serial 0
info: zone 1.0.0.127.in-addr.arpa/IN: loaded serial 0
info: zone 1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa/IN:
loaded serial 0
info: zone localhost.localdomain/IN: loaded serial 0
info: zone localhost/IN: loaded serial 0
notice: all zones loaded
```

notice: running

info: managed-keys-zone: Key 20326 for zone . acceptance timer complete:
**key now trusted**

Look zones
`````````

[root@server1 ~]# vim /etc/named.conf

**zone "." IN {**
    **type hint;**
    **file "named.ca";**

    :q

Zone file
```````

[root@server1 ~]# vim /etc/named.rfc1912.zones

zone "localhost.localdomain" IN {
    type master;
    **file "named.localhost";**                    **// local zone**
    allow-update { none; };

zone "1.0.0.127.in-addr.arpa" IN {
    type master;
    **file "named.loopback";**                    **//**
**reverse. Lookup zone**
    allow-update { none; };

    :q

```
[root@server1 ~]# ls /var/named/
data  dynamic  named.ca  named.empty  named.localhost  named.loopback
slaves


[root@server1 ~]# ll /var/named/
total 16
drwxrwx---. 2 named named   23 Aug 14 13:21 data
drwxrwx---. 2 named named   60 Aug 14 14:09 dynamic
-rw-r-----. 1 root  named 2253 Apr  5  2018 named.ca          // root zone
server
-rw-r-----. 1 root  named  152 Dec 15  2009 named.empty        // templets file
-rw-r-----. 1 root  named  152 Jun 21  2007 named.localhost        //
localhost name
-rw-r-----. 1 root  named  168 Dec 15  2009 named.loopback// reverse
lookup
drwxrwx---. 2 named named    6 Jun  1 21:11 slaves
```

**Entering a Zone in the Named.conf**
===================

Create DNS forward lookup zone
``````````

```
[root@server1 ~]# vim /etc/named.conf
```

Add before zone

```
        zone "example.vm." {
        type master;
        file    "db.example";
         allow-update {  none;};
        };
```


```
[root@server1 ~]# named-checkconf -v
```

Now need to create zones for domain of example.vm

**Creating a DNS Zone**
====================

[root@server1 ~]# cd /var/named/

[root@server1 named]# cp named.empty db.example                //template
copy

[root@server1 named]# ls -lh db.example
-rw-r-----. 1 root root 152 Aug 14 14:30 db.example

[root@server1 named]# chgrp named db.example

[root@server1 named]# ls -lh db.example
-rw-r-----. 1 root **named** 152 Aug 14 14:30 db.example

[root@server1 named]# vim db.example

```
$TTL 3H
@      IN SOA  @ rname.invalid. (
                     0     ; serial
                     1D    ; refresh
                     1H    ; retry
                     1W     ; expire
                     3H )   ; minimum
```

```
        NS    @
        A     127.0.0.1
        AAAA  ::1
```

//Change to

```
$TTL 3H
$ORIGIN example.vm.
example.vm.   IN SOA  server1.example.vm.   root.example.vm. (
                      1     ; serial
                      1D    ; refresh
                      1H    ; retry
                      1W    ; expire
                      3H )  ; minimum

example.vm.   NS    server1.example.vm.
server1       A     192.168.1.121

    :wq
```

[root@server1 named]# named-checkconf -v

[root@server1 named]# named-checkzone example.vm
db.example          // check file
zone example.vm/IN: loaded serial 1
OK

[root@server1 ~]# systemctl restart named

[root@server1 ~]# cat /var/named/data/named.run          //looks good

        info: zone example.vm/IN: loaded serial 1

Or

```
[root@server1 ~]# cat /var/named/data/named.run | grep example.vm
info: zone example.vm/IN: loaded serial 1
info: zone example.vm/IN: loaded serial 1
```

## Using a DNS tool and API
```
===================
```

DNS Query using Python API
```
`````````````````````
```

```
[root@server1 ~]# dig server1.example.vm @127.0.0.1

    ;; QUESTION SECTION:
;server1.example.vm.          IN     A

;; ANSWER SECTION:
server1.example.vm.    10800    IN    A    192.168.1.121

;; AUTHORITY SECTION:
example.vm.        10800    IN    NS   server1.example.vm.
```

```
[root@server1 ~]# dig -t NS example.vm @127.0.0.1
;; ANSWER SECTION:
example.vm.          10800     IN    NS   server1.example.vm.
```

```
[root@server1 ~]# which python
/usr/bin/python
```

```
[root@server1 ~]# python --version
Python 2.7.5
```

```
[root@server1 ~]# cp /usr/share/doc/python-dns ....../ examples/mx.py .


[root@server1 ~]# vim mx.py

#!/usr/bin/env python

import dns.resolver


answers = dns.resolver.query('nominum.com', 'MX')
for rdata in answers:
    print 'Host', rdata.exchange, 'has preference', rdata.preference
```

```
[root@server1 ~]# cat our.py
#!/usr/bin/env python

import dns.resolver

r=dns.resolver.Resolver()
r.nameservers = ['127.0.0.1']

answers = r.query('example.vm', 'NS')
for rdata in answers:
    print rdata
```

```
[root@server1 ~]# python our.py
```

```
=============================================================
=====
```

# Configuring FTP Service

```
***************************************************************
********
```

**Welcome to the world of FTP**
```
======================
```

Objectives
```
```````
```

Configure FTP server
Configure anonymous-only download on FTP server

LAB
```
`````
```

Configure DNS client on server2
Install vsftpd on server1
Configure vsftpd on server1

Create FTP YUM  repo on Server1
Use FTP repo on server2

Configure DNS client on server2
`````````````````````````````````

```
[root@server1 ~]# cat /etc/hosts
192.168.1.135   server1.example.com       server1          s1
192.168.1.65    server2.example.com       server2        s2
```

```
[root@server2 ~]# cat /etc/hosts
192.168.1.65    server2.example.com       server2          s2
192.168.1.135   server1.example.com       server1        s1
```

```
[root@server2 ~]# cat /etc/resolv.conf
# Generated by NetworkManager
search example.com
nameserver 192.168.1.254
```

```
[root@server2 ~]# ping server1
ping: server1: Name or service not known
```

```
[root@server2 ~]# vim /etc/sysconfig/network-scripts/ifcfg-enp0s17
PEERDNS=no
```

```
[root@server2 ~]# systemctl restart NewtwworkManager
```

```
[root@server2 ~]# cat /etc/resolv.conf
```

**Installing the vsftpd service**
======================

[root@server1 ~]# yum install vsftpd -y

[root@server1 ~]# systemctl enable vsftpd

[root@server1 ~]# systemctl start vsftpd


[root@server1 ~]# netstat -ltn
tcp6    0    0 :::**21**              :::*              LISTEN              //later on
ipv4


[root@server1 ~]# firewall-cmd --permanent --add-service=ftp
success
[root@server1 ~]# firewall-cmd --reload
success
[root@server1 ~]#


Go o browser and hit

ftp:// IP

Or

ftp://server1

**Configuring FTP to Allow only Anonymous Connections**
=============================================

[root@server1 ~]# cd /etc/vsftpd/

[root@server1 vsftpd]# ls
ftpusers  user_list  vsftpd.conf  vsftpd_conf_migrate.sh

[root@server1 ~]# vim vsftpd.conf

anonymous_enable=YES

**local_enable=NO**

**write_enable=NO**

local_umask=022

dirmessage_enable=YES

xferlog_enable=YES

connect_from_port_20=YES

xferlog_std_format=YES

**listen=YES**

**listen=NO**

pam_service_name=vsftpd
userlist_enable=YES
tcp_wrappers=YES

**anon_world_readable_only=YES**          **//manual line added**


    :wq



```
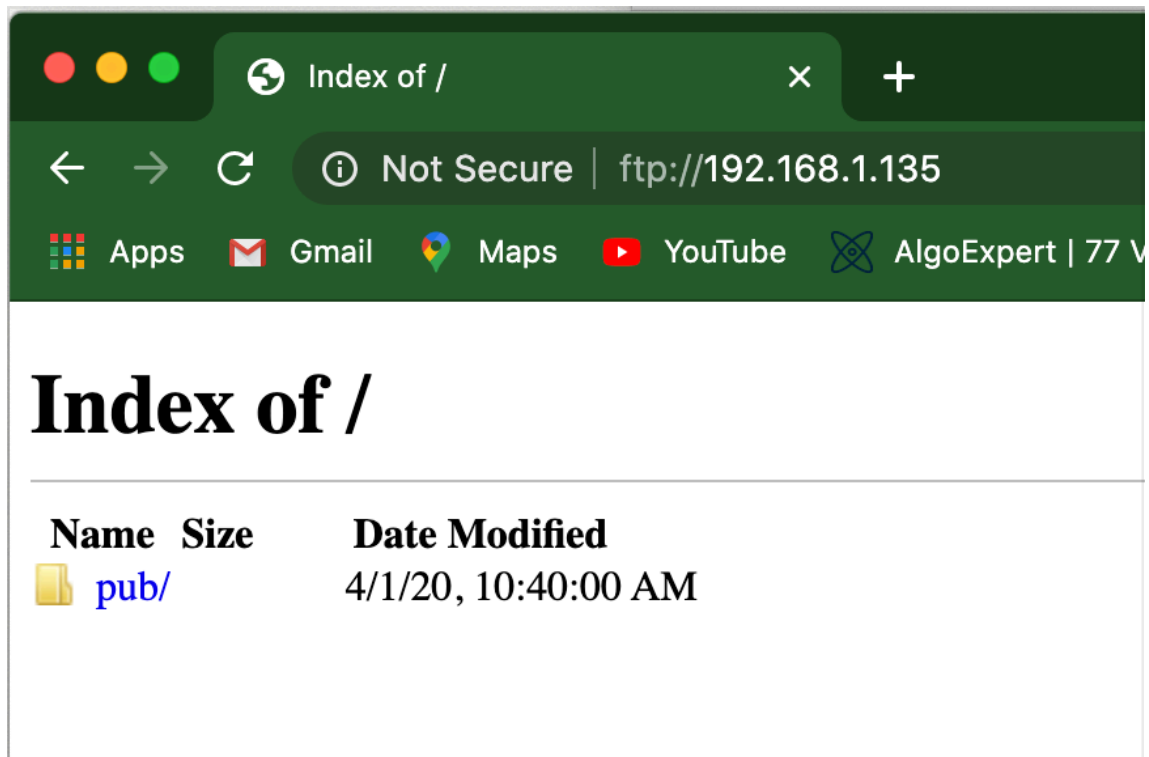[root@server1 ~]# systemctl restart vsftpd


[root@server1 ~]# netstat -ltn
tcp    0    0 0.0.0.0:21        0.0.0.0:*        LISTEN
    //only v4
```

**Creating an FTP YUM repository**

===========================


Creating a FTP repo
`````````````````````


ATTACH DVD , to MACHINE of SERVER1 as .ISO

[root@server1 ~]# mount /dev/sr0 /mnt/
mount: /dev/sr0 is write-protected, mounting read-only




[root@server1 ~]# lsblk

sr0            11:0    1  4.2G  0 rom  /mnt




[root@server1 ~]# df -h
Filesystem                Size  Used Avail Use% Mounted on
/dev/mapper/centos-root   17G  1.7G  **16G**  10% /


[root@server1 ~]# mkdir  /var/ftp/pub/centos72

[root@server1 ~]# cd /mnt/


[root@server1 mnt]# ls
CentOS_BuildTag  EULA  LiveOS   RPM-GPG-KEY-CentOS-7        TRANS.TBL
isolinux
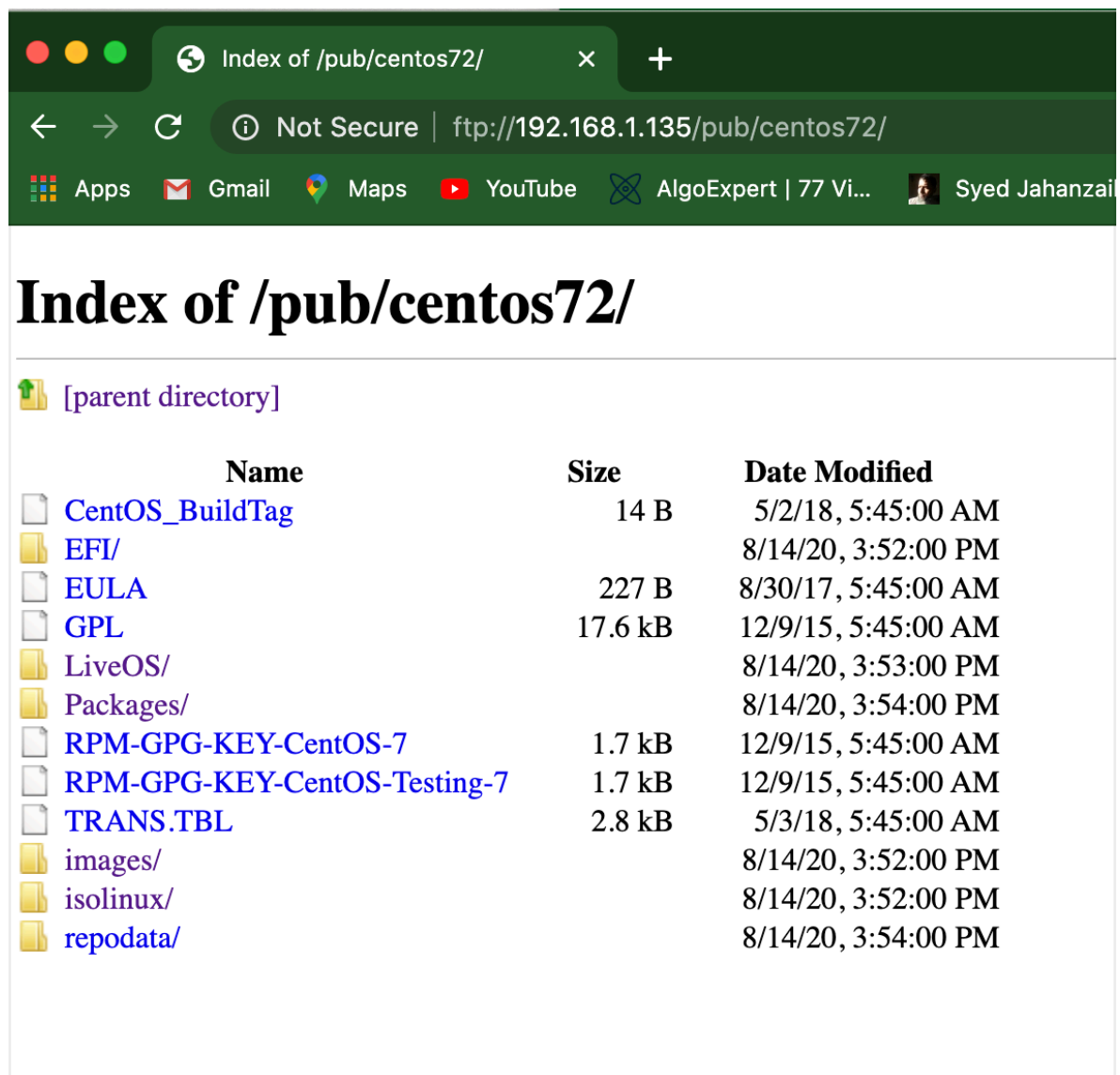EFI        GPL   Packages  RPM-GPG-KEY-CentOS-Testing-7  images
repodata




[root@server1 mnt]# find . | cpio -pmd /var/ftp/pub/centos72/        **//Use
sync, cpio or cp to copy commands**

```
[root@server1 ~]# df –h /mnt/
Filesystem     Size  Used Avail Use% Mounted on
/dev/sr0       4.2G  4.2G     0 100% /mnt


[root@server1 ~]# eject /mnt
Or
[root@server1 ~]# umount /mnt



[root@server1 ~]# df –h /dev/mapper/centos-root
Filesystem             Size  Used Avail Use% Mounted on
/dev/mapper/centos-root   17G  5.8G   12G  35% /


[root@server1 ~]# ls /var/ftp/pub/centos72/
CentOS_BuildTag  EULA  LiveOS   RPM-GPG-KEY-CentOS-7        TRANS.TBL
isolinux
EFI         GPL   Packages  RPM-GPG-KEY-CentOS-Testing-7  images
repodata
```

# Index of /pub/centos72/

🔼 [parent directory]

| Name | Size | Date Modified |
|---|---|---|
| CentOS_BuildTag | 14 B | 5/2/18, 5:45:00 AM |
| EFI/ | | 8/14/20, 3:52:00 PM |
| EULA | 227 B | 8/30/17, 5:45:00 AM |
| GPL | 17.6 kB | 12/9/15, 5:45:00 AM |
| LiveOS/ | | 8/14/20, 3:53:00 PM |
| Packages/ | | 8/14/20, 3:54:00 PM |
| RPM-GPG-KEY-CentOS-7 | 1.7 kB | 12/9/15, 5:45:00 AM |
| RPM-GPG-KEY-CentOS-Testing-7 | 1.7 kB | 12/9/15, 5:45:00 AM |
| TRANS.TBL | 2.8 kB | 5/3/18, 5:45:00 AM |
| images/ | | 8/14/20, 3:52:00 PM |
| isolinux/ | | 8/14/20, 3:52:00 PM |
| repodata/ | | 8/14/20, 3:54:00 PM |

Use FTP repo
` ` ` ` ` ` ` ` ` ` ` ` `

[root@server2 ~]# cd /etc/yum.repos.d/


[root@server2 yum.repos.d]# ls
CentOS-Base.repo        CentOS-Media.repo        CentOS-fasttrack.repo
epel.repo
CentOS-CR.repo          CentOS-Sources.repo      CentOS-x86_64-kernel.repo
CentOS-Debuginfo.repo   CentOS-Vault.repo        epel-testing.repo

```
[root@server2 yum.repos.d]# mkdir backup

[root@server2 yum.repos.d]# mv * backup/                              //old backup
file placing

[root@server2 yum.repos.d]# ls
      backup

[root@server2 yum.repos.d]# yum repolist


[root@server2 yum.repos.d]# vim ftp.repo                              // repo file
[ftp_c7]
name=FTP_centos_7.2
baseurl=ftp://server1.example.com/pub/centos72/       or  baseurl=ftp://
192.168.1.135/pub/centos72/
enabled=1
gpgcheck=




[root@server2 yum.repos.d]# yum clean all
Failed to set locale, defaulting to C
Loaded plugins: fastestmirror, langpacks
Cleaning repos: ftp_c7
Cleaning up list of fastest mirrors
Other repos take up 98 M of disk space (use --verbose for details)



[root@server2 ~]# yum repolist
Failed to set locale, defaulting to C
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
repo id                    repo name                          status
ftp_c7                     FTP_centos_7.2                      3971
repolist: 3971
```

Now check
```````````

[root@server2 ~]# yum install bash-completion

=================================================================
=====
## Configure DHCP
*****************************************************************
********

**The ISC DHCP Server**

```
====================
```

Objectives
`````````

Configure a DHCP Server

LABS
`````

Configure Static IP on server1
Disable DHCP in Virtual BOX
Install DHCP on Server1
Configure DHCP
Test DHCP Service

DHCP
``````

Dynamic  Host Configuration Protocol
Enables a server to automatically assign an IP address and other network
configuration to client device.

Used for TFTP server for PXE BOOT.

**Configure a static IP address**
```
===================
```

**Disable Virtualbox DHCP and Install DHCP Server**
```
===============================
```

[root@server1 ~]# ip a

```
    lo: <LOOPBACK,UP,LOWER_UP>
          inet 127.0.0.1/8
    enp0s8:                                          // internal network

    enp0s17                                          // bridge adapter
          192.168.1.135
```

[root@server1 ~]# yum install dhcp -y

**Configure an ISC DHCP Server**
====================

[root@server1 ~]# vim /etc/dhcp/dhcpd.conf

```
# DHCP Server Configuration file.
#   see /usr/share/doc/dhcp*/dhcpd.conf.example
#   see dhcpd.conf(5) man page


option domain-name-servers 8.8.4.4;
option domain-search "example.com";

default-lease-time 86400;
max-lease-time 86400;
ddns-update-style none;
authoritative;
log-facility local4;


subnet 172.17.50.0 netmask 255.255.255.0 {
    range              172.17.50.100 172.17.50.190;
```

```
}
```

```
                :wq
```

```
[root@server1 ~]# dhcpd -t -cf /etc/dhcp/
dhcpd.conf                          // test conf file
Internet Systems Consortium DHCP Server 4.2.5
Copyright 2004-2013 Internet Systems Consortium.
All rights reserved.
For info, please visit https://www.isc.org/software/dhcp/
Not searching LDAP since ldap-server, ldap-port and ldap-base-dn were not
specified in the config file
```

**Testing DHCP and Dhclient**
==================

==============================================================
=====
# Installing PXE
*************************************************************
********

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
======================

==================================================================
=====

# Configuring Email

*****************************************************************
********

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
====================

=============================================================
=====
# Configuring Printing
*******************************************************
********

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**

====================

===============================================================
=====

# Configuring Apache web server

***********************************************************
********

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

=======================

==================================================================

# Installing and Testing PHP
**********************************************************************

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
======================

==================================================================

# Installing MariaDB
**********************************************************************

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

====================

================================================================
=====
# Configure SE Linux for Services
*************************************************************
********

**Abc**

==================

**Abc**

==================

**Abc**
==================

**Abc**
===================

**Abc**
=====================

# 5 Virtualization Management

===================================================

## Introduction to linux Virtualization Management

*************************************************************

**Corse Overview**
====================

Intro Virtual Machines
Migrating and running VM
Managing DOCKER
Create Virtualized VM

**Virtualization in Linux**
====================

Get professional Linux Certification like , LFCS or RHCSA

Clean build on Bare Metal

Lab Environment
```````````````

Physical Host — CentOS7.2 MATE Desktop


Migration Labs - Server1 centOS7.2 physician host , Genome Desktop and Server2 centOS7.2 physician host , Genome Desktop


Toolkits
````````

KVM and Libvirt
Install VMs
Libvirt and DNSMasq
Manage Networks
Manage VMs
Migrate VM's




## Hardware Support for KVM
==================


```
[root@server1 ~]# lscpu
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                1
On-line CPU(s) list:   0
Thread(s) per core:    1
Core(s) per socket:    1
Socket(s):             1
NUMA node(s):          1
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 142
Model name:            Intel(R) Core(TM) i5-8210Y CPU @ 1.60GHz
Stepping:              9
CPU MHz:               1608.000
BogoMIPS:              3216.00
Hypervisor vendor:     KVM
```

Virtualization type:   full
L1d cache:            32K
L1i cache:            32K
L2 cache:             256K
L3 cache:             4096K
NUMA node0 CPU(s):     0
Flags:               fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca
cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx rdtscp lm constant_tsc
rep_good nopl xtopology nonstop_tsc pni pclmulqdq monitor ssse3 cx16 pcid
sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdrand hypervisor lahf_lm
abm 3dnowprefetch fsgsbase avx2 invpcid rdseed clflushopt


[root@server1 ~]# cat /proc/cpuinfo


[root@server1 ~]# grep -E '(vmx|svm)' /proc/cpuinfo




================================================================
=====

# Installing XRDP

************************************************************
********

https://draculaservers.com/tutorials/install-xrdp-centos/


**Introduction to XRDP service**
====================


XRDP:
````````

GUI environment runs by X server.
Sync with Remote Desktop protocol
Allows windows client able to connect via GUI,
xrdp provides a fully functional RDP server compatible with a wide range of

RDP clients, including FreeRDP and Microsoft RDP client.


Demo
``````

Install XRDP
Remotely. Connect from windows
Load locale specific keymaps files



`````````````````````````````````

Xrdp client      ==>        mstsc.exe


Public IP address

Xrdp port 3389            ==>              127.0.01  ==>> VNC PORT 5901   ==>>
X Server
````````````````

**Installing XRDP on Machine**
====================

[root@server1 ~]# yum list epel-release

[root@server1 ~]# yum install epel-release


[root@server1 ~]# yum repolist

[root@server1 ~]# yum list xrdp

[root@server1 ~]# yum install xrdp -y

[root@server1 xrdp]# yum install tigervnc-server


[root@server1 ~]# yum install tigervnc

[root@server1 ~]# yum info xrdp


[root@server1 ~]# yum history  info
Failed to set locale, defaulting to C
Loaded plugins: fastestmirror, langpacks

**Transaction ID : 4**
Begin time    : Mon Jul 20 14:25:33 2020
Begin rpmdb   : 1364:77fdaf0b906998ba237cc8ae20236a553f561c1d
End time      :          14:25:35 2020 (2 seconds)
End rpmdb     : 1368:5540a54715ea0d877c6680652ba2838e15e92f49
User          : root <root>
Return-Code   : Success
Command Line  : install tigervnc
Transaction performed with:
    Installed    rpm-4.11.3-32.el7.x86_64              @anaconda
    Installed    yum-3.4.3-158.el7.centos.noarch         @anaconda
    Installed    yum-plugin-fastestmirror-1.1.31-45.el7.noarch @anaconda
Packages Altered:
    Dep-Install fltk-1.3.4-1.el7.x86_64            @base
    Dep-Install mesa-libGLU-9.0.0-4.el7.x86_64      @base
    Install    tigervnc-1.8.0-19.el7.x86_64        @base
    Dep-Install tigervnc-icons-1.8.0-19.el7.noarch @base


[root@server1 ~]# yum history undo 4
            // roll back last install package basis on transaction ID


[root@server1 ~]# cd /etc/xrdp/


**Configuring XRDP to Operate with SELinux and MATE desktop**
==============================================

[root@server1 ~]# getenforce
Enforcing
                        // enforcing mode


[root@server1 ~]# cd /usr/sbin/

[root@server1 sbin]# ls

[root@server1 sbin]# ls -Z xrdp*
-rwxr-xr-x. root root system_u:object_r:bin_t:s0      xrdp
-rwxr-xr-x. root root system_u:object_r:bin_t:s0      xrdp-chansrv
-rwxr-xr-x. root root system_u:object_r:bin_t:s0      xrdp-sesman


[root@server1 sbin]# chcon -t bin_t xrdp xrdp-sesman

```
[root@server1 sbin]# systemctl start xrdp
[root@server1 sbin]# systemctl enable xrdp


[root@gluster3 xrdp]# firewall-cmd --permanent --add-port=3389/tcp
success
[root@gluster3 xrdp]# firewall-cmd --reload
success



[root@server1 sbin]# netstat -ltn
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 0.0.0.0:3389           0.0.0.0:*              LISTEN
tcp      0      0 0.0.0.0:111            0.0.0.0:*          LISTEN
tcp      0      0 192.168.122.1:53       0.0.0.0:*          LISTEN




[root@server1 xrdp]# netstat -antup | grep xrd
tcp      0      0 0.0.0.0:3389          0.0.0.0:*          LISTEN    11490/xrdp
tcp      0      0 127.0.0.1:3350        0.0.0.0:*          LISTEN    11489/xrdp-
sesman



[root@server1 ~]# cd /etc/xrdp/

[root@server1 xrdp]# vim startwm.sh                        // sometimes no
files existed , not compulsory to be added
        (end on line add)

        fi
        #multi user MATE sesktop
        echo 'mate-session' > ~/.xsession
        chmod +x ~/.xsession


[root@server1 xrdp]# systemctl start xrdp

[root@server1 xrdp]# firewall-cmd --permanent --add-port=3389/tcp

[root@server1 xrdp]# firewall-cmd --reload
```

## CONNECTIG VIA WINDOWS CLIENT
``````````````````````````````

Run remote desktop connection via windows ==> need IP address and username and password

## If you are using server mode , need to install
`````````````````````````

**For mate**
```````````

```
yum install -y epel-release
yum groupinstall -y "MATE Desktop"
reboot
```

```
echo "mate-session" > ~/.Xclients
chmod a+x ~/.Xclients
```

**For gnome**
```````````

```
yum groupinstall "GNOME DESKTOP" -y
systemctl get-default
systemctl set-default graphical.target
systemctl isolate graphical.target
```

**Configure RDP Keymap**
===================
Try to use US key map

Check @ key

[root@server1 ~]# cd /etc/xrdp/


[root@server1 xrdp]# setxkbmap -layout gb

[root@server1 xrdp]# xrdp-genkeymap  km-0809.ini


[root@server1 ~]# bash

Now the key-mapping begins  Once disconnect , and connect back.. WALLA


===============================================================
=====
# Virtual Machine Networking
***********************************************************
********


**Virtual networks**
===================

**Libvirt**
```````````

Used by virtual box
Same as in KVM too


**Demo**
```````

Default Network
Using virsh to manage virtualization
Remove default virtual network
Creating virtual network
Using btctl to display bridge connections


**BIG QUESTION**
`````````````

Where did **vib0** come from?



**The default Network**
===================
[root@server1 ~]# ip a
1: lo:
2: enp0s3
3: virbr0
4: virbr0-nic:



server with GUI gives extra virtual package to add, like vibr0
```````````````

On **ip a**, it gives loopback and ethernet interface

But on adding libvirt , loopback creates
`````````````````````````````````````````



[root@server1 ~]# yum install libvirt


[root@server1 ~]# cd /etc/libvirt/

[root@server1 libvirt]# ls

```
[root@server1 libvirt]# cd qemu/networks/


[root@server1 networks]# ls
autostart  default.xml


[root@server1 networks]# systemctl start libvirtd.service

[root@server1 networks]# systemctl enable libvirtd.service

[root@server1 networks]# systemctl status libvirtd.service
● libvirtd.service - Virtualization daemon
  Loaded: loaded (/usr/lib/systemd/system/libvirtd.service; enabled; vendor
preset: enabled)
  Active: active (running)


[root@server1 ~]# ip a                        //virtual bridge created ,
virtual NIC
1: lo:
2: enp0s3
3: virbr0
4: virbr0-nic:


[root@server1 ~]# brctl show
bridge name    bridge id        STP enabled    interfaces
virbr0         8000.5254000207cf    yes        virbr0-nic


[root@server1 ~]# cd /etc/sysconfig/network-scripts/

[root@server1 network-scripts]# ls
```

**Making use of command virsh**
========================

```
[root@server1 ~]# cd /etc/libvirt/qemu/networks/


[root@server1 networks]# cat default.xml
```

```
<!--
WARNING: THIS IS AN AUTO-GENERATED FILE. CHANGES TO IT ARE LIKELY TO BE
OVERWRITTEN AND LOST. Changes to this xml configuration should be made using:
  virsh net-edit default
or other application using the libvirt API.
-->

<network>
  <name>default</name>
  <uuid>fb5d5101-1841-44bb-a165-343f98447262</uuid>
  <forward mode='nat'/>
  <bridge name='virbr0' stp='on' delay='0'/>
  <mac address='52:54:00:02:07:cf'/>
  <ip address='192.168.122.1' netmask='255.255.255.0'>
    <dhcp>
      <range start='192.168.122.2' end='192.168.122.254'/>
    </dhcp>
  </ip>
</network>
```

```
[root@server1 networks]# ip -4 a
3: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
       valid_lft forever preferred_lft forever
```

```
[root@server1 networks]# virsh list
```

```
[root@server1 networks]# virsh net-list
setlocale: No such file or directory
 Name          State     Autostart    Persistent
----------------------------------------------------------
 default       active    yes          yes
```

```
[root@server1 networks]# less default.xml
```

[root@server1 networks]# virsh
setlocale: No such file or directory
Welcome to virsh, the virtualization interactive terminal.

Type:  'help' for help with commands
     'quit' to quit

virsh #

         virsh # net-list
         Name            State     Autostart    Persistent
         ----------------------------------------------------------
          default          active    yes           yes



         virsh # net-destroy --network default
              virsh # net-destroy --network default
              Network default destroyed




[root@server1 ~]# ip a
1: lo:
2: enp0s3


[root@server1 networks]# virsh

     virsh # net-start default
     Network default started


[root@server1 ~]# ip a
1: lo:
2: enp0s3
3: virbr0
4: virbr0-nic:

[root@server1 ~]# virsh net-autostart default

**Removing the default network**
========================


[root@server1 ~]# systemctl status libvirtd
● libvirtd.service - Virtualization daemon
  Loaded: loaded (/usr/lib/systemd/system/libvirtd.service; enabled; vendor preset: enabled)
  Active: **active (running)**


[root@server1 ~]# virsh net-destroy default


[root@server1 ~]# cd /etc/libvirt/qemu/networks/

[root@server1 networks]# cp default.xml
~                                          //making backup in home dir


[root@server1 networks]# virsh net-undefine default

[root@server1 networks]# ls
autostart

[root@server1 networks]# systemctl stop libvirtd.service


[root@server1 networks]# systemctl disable libvirtd.service


` ` ` ` ` ` ` ` ` ` ` ` `

Starting now

[root@server1 networks]# virsh net-list
setlocale: No such file or directory
 Name            State     Autostart    Persistent
----------------------------------------------------------


[root@server1 ~]# ip a
1: lo:
2: enp0s3

## Creating the virtual network
======================

```
[root@server1 networks]# virsh net-list
setlocale: No such file or directory
 Name            State     Autostart   Persistent
----------------------------------------------------------


[root@server1 networks]# virsh net-list --inactive
setlocale: No such file or directory
 Name            State     Autostart   Persistent
----------------------------------------------------------


[root@server1 networks]# cp ~/default.xml .
[root@server1 networks]# ls
     autostart  default.xml
[root@server1 networks]# pwd
     /etc/libvirt/qemu/networks


[root@server1 networks]# virsh net-define default.xml
setlocale: No such file or directory
Network default defined from default.xml


[root@server1 networks]# virsh net-list --inactive
setlocale: No such file or directory
 Name            State     Autostart   Persistent
----------------------------------------------------------
 default         inactive  no          yes
```

```
[root@server1 networks]# virsh net-list
setlocale: No such file or directory
 Name            State     Autostart   Persistent
----------------------------------------------------------


[root@server1 ~]# ip a
1: lo:
2: enp0s3


[root@server1 networks]# brctl show
bridge name   bridge id        STP enabled   interfaces




[root@server1 networks]# virsh net-start default
setlocale: No such file or directory
Network default started




[root@server1 networks]# brctl show
bridge name   bridge id        STP enabled   interfaces
virbr0        8000.5254000207cf    yes          virbr0-nic
```

```
[root@server1 networks]# virsh net-list
setlocale: No such file or directory
 Name          State     Autostart   Persistent
----------------------------------------------------------
 default       active    no          yes


[root@server1 networks]# virsh net-autostart default


[root@server1 networks]# virsh net-list
setlocale: No such file or directory
 Name          State     Autostart   Persistent
----------------------------------------------------------
 default       active    yes         yes




[root@server1 networks]# virsh net-edit default

<network>
 <name>default</name>
 <uuid>fb5d5101-1841-44bb-a165-343f98447262</uuid>
 <forward mode='nat'/>
 <bridge name='virbr0' stp='on' delay='0'/>
 <mac address='52:54:00:02:07:cf'/>
 <ip address='192.168.56.1' netmask='255.255.255.0'>
  <dhcp>
   <range start='192.168.56.100' end='192.168.56.254'/>
  </dhcp>
 </ip>
</network>


[root@server1 networks]# ip a s vibr0                              //no ip
changed , interface refresh needed




[root@server1 networks]# virsh net-destroy default
setlocale: No such file or directory
```

Network default destroyed

[root@server1 networks]# virsh net-start default
setlocale: No such file or directory
Network default started

[root@server1 networks]#
[root@server1 networks]#
[root@server1 networks]# ip a s virbr0
11: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc
noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:02:07:cf brd ff:ff:ff:ff:ff:ff
    inet **192.168.56.1/24** brd 192.168.56.255 scope global virbr0
      valid_lft forever preferred_lft forever

` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `

Some more changes, custom define virtual bridge

[root@server1 networks]# cp default.xml hostonly.xml

[root@server1 networks]# vim hostonly.xml
```
<network>
  <name>host-only</name>
  <bridge name='virbr1' stp='on' delay='0'/>
  <mac address='52:54:00:02:ca:fe'/>
  <ip address='192.168.100.1' netmask='255.255.255.0'>
    <dhcp>
      <range start='192.168.100.101' end='192.168.100.200'/>
    </dhcp>
  </ip>
</network>
```

[root@server1 networks]# virsh net-define hostonly.xml
setlocale: No such file or directory
Network host-only defined from hostonly.xml

[root@server1 networks]# virsh net-start host-only

[root@server1 networks]# virsh net-autostart host-only

```
[root@server1 networks]# brctl show
bridge name    bridge id          STP enabled    interfaces
virbr0          8000.5254000207cf     yes           virbr0-nic
virbr1          8000.52540002cafe    yes           virbr1-nic
```

```
[root@server1 networks]# ip a s virbr1
13: virbr1: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc
noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:02:ca:fe brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.1/24 brd 192.168.100.255 scope global virbr1
       valid_lft forever preferred_lft forever
```

## Old school using brctl
====================

```
[root@server1 networks]# brctl addbr br0
```

```
[root@server1 networks]# brctl show br0
        bridge name    bridge id          STP enabled    interfaces
        br0          8000.000000000000    no
```

```
[root@server1 networks]# brctl show
        bridge name    bridge id              STP enabled        interfaces
        br0          8000.000000000000      no
        virbr0        8000.5254000207cf       yes               virbr0-nic
        virbr1        8000.52540002cafe      yes               virbr1-nic
```

```
[root@server1 networks]# brctl stp br0 on
```

```
[root@server1 networks]# brctl show
        bridge name    bridge id              STP enabled        interfaces
        br0          8000.000000000000      yes
```

```
[root@server1 networks]# brctl delbr br0
```

================================================================
=====
# Installing KVM
****************************************************************
********

**Abc**
===================

**Abc**
===================

**Abc**
===================

**Abc**
===================

```
================================================================
=====
```

# Installing XRDP

```
****************************************************************
********
```

**Abc**
```
==================
```

**Abc**
```
==================
```

**Abc**
```
==================
```

**Abc**
```
==================
```

```
================================================================
=====
```

# Installing XRDP

```
****************************************************************
********
```

**Abc**
```
==================
```

**Abc**

==================

**Abc**

==================

**Abc**

==================

==============================================================
=====

# Installing XRDP

**********************************************************
********

**Abc**

==================

**Abc**

==================

**Abc**

==================

**Abc**

==================

==============================================================
=====

# Installing XRDP

**********************************************************

**\*\*\*\*\*\*\*\***

**Abc**
==================

**Abc**
==================

**Abc**
==================

**Abc**
==================