리눅스 프로젝트 보고서

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목차

1 차 과제

1. 가상머신 4 개 설치

www, db01, storage, ns01

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2. 네트워크 연결

	www	db01	storage	ns01
NAT Network	10.0.2.11/24	-	-	10.0.2.31/24
Net1 Host-only Network	192.168.56.11/24	192.168.56.21/24	192.168.56.41/24	192.168.56.31/24
Net2 Host-only Network	192.168.60.11/24	192.168.60.21/24	192.168.60.41/24	

ex) www 의 NAT_Network

nmcli connection add con-name NAT_Network type ethernet ifname enp0s3

nmcli connection modify NAT_Network ipv4.addresses 192.168.56.11/24

nmcli connection modify NAT_Network ipv4.method manual

nmcli connection up NAT_Network

Net1 Host-only Network, Net2 Host-only Network 마찬가지로 연결.

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3. www 에 웹서버 설치

```
# yum install httpd
# systemctl start httpd.service
# systemctl enable httpd.service
# firewall-cmd --add-service=http
# firewall-cmd --add-service=http -permanent
```

3-2. php 설치

```
# yum install php php-mysqlnd
```

3-3. WordPress 다운로드 및 설치

```
# cd var/www/html
# vim index.html
# wget https://wordpress.org/latest.zip
```

3-4. db01 에 mariadb 설치

```
# yum install mariadb-server maraidb
# systemctl start mariadb.service
# systemctl enable mariadb.service
# firewall-cmd --add-service=mysql
```

```
# firewall-cmd --add-service=mysql -permanent
# mysql_secure_installation
```

3-5. mariadb 유저 생성.

```
# mysql -h localhost -u root
# Create DATABASE projectdb;
# Create user 'user01'@'%' identified by 'test1234';
# grant all privileges on projectdb.* to 'user01'@'%';
# FLUSH PRIVILEGES;
```

3-6. www 에서 WordPress 다운로드 및 설치

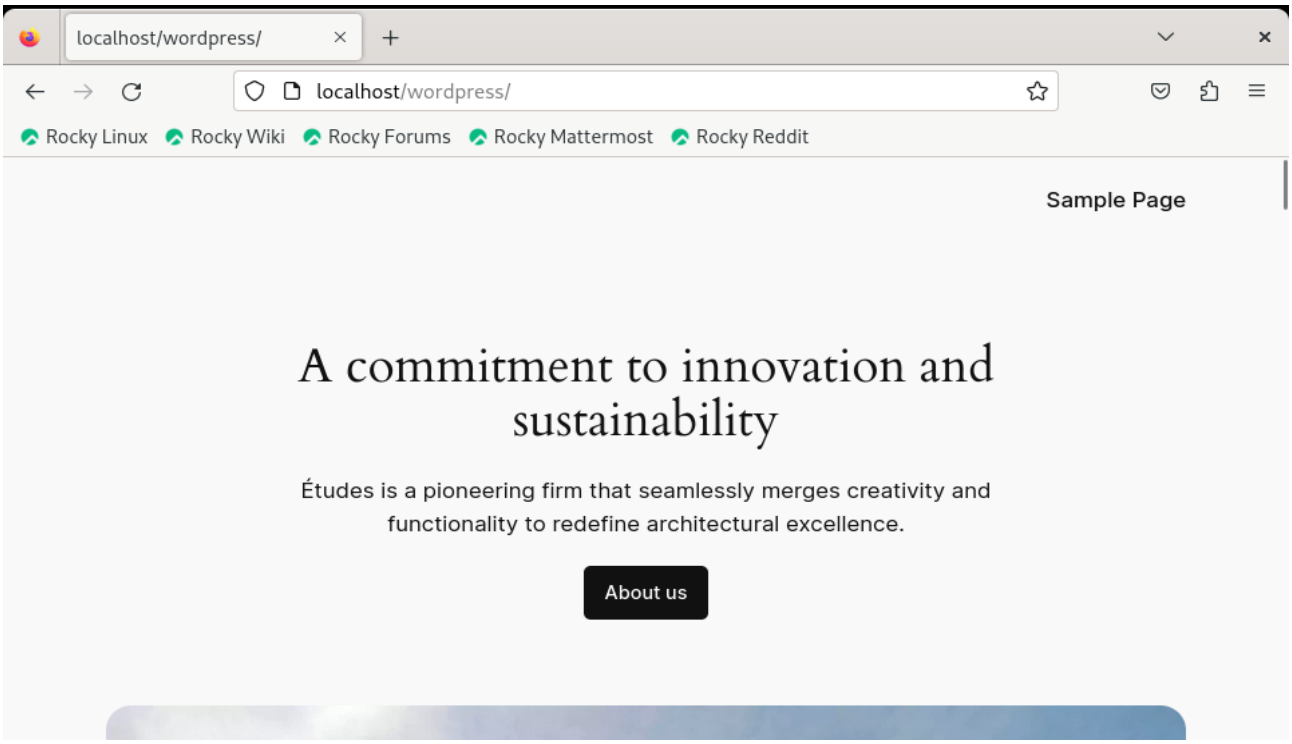
```
# cd var/www/html
# vim index.html
# wget https://wordpress.org/latest.zip
# unzip latest.zip
# cd wordpress
# ls -l
```

```
# vim wp-config.php
```

```
 * @package WordPress
 */

// ** Database settings - You can get this info from your web host ** //
/** The name of the database for WordPress */
define( 'DB_NAME', 'projectdb' );

/** Database username */
define( 'DB_USER', 'user01' );

/** Database password */
define( 'DB_PASSWORD', 'test1234' );

/** Database hostname */
define( 'DB_HOST', '192.168.56.21' );

/** Database charset to use in creating database tables. */
define( 'DB_CHARSET', 'utf8' );

/** The database collate type. Don't change this if in doubt. */
define( 'DB_COLLATE', '' );

/**#@+
                                                    23,27         23%
```

```
# systemctl restart httpd.service
```

3-7. 웹서버 설치 후 결과화면.

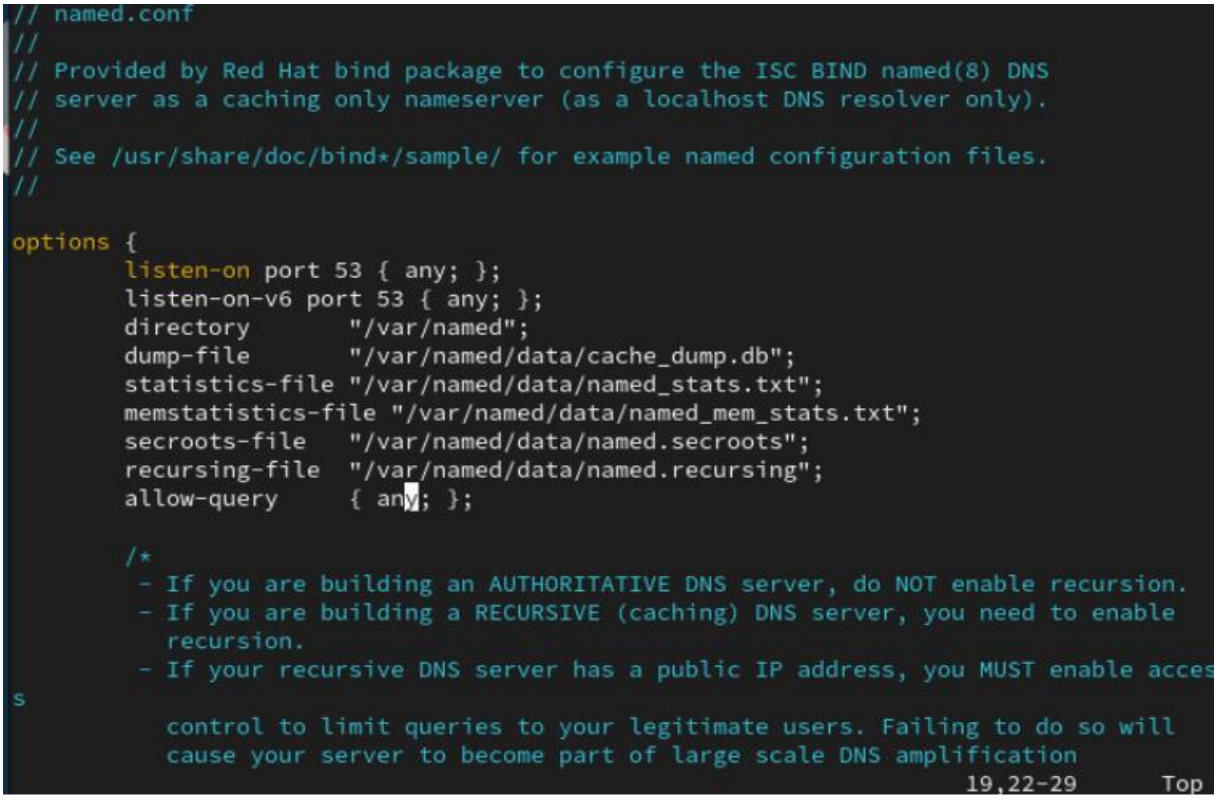


---

4. DNS 서비스 패키치 설치

```
# yum install bind
```

```
# vim /etc/named.conf
```



```
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//

options {
        listen-on port 53 { any; };
        listen-on-v6 port 53 { any; };
        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";
        secroots-file   "/var/named/data/named.secroots";
        recursing-file  "/var/named/data/named.recursing";
        allow-query     { any; };

        /*
         - If you are building an AUTHORITATIVE DNS server, do NOT enable recursion.
         - If you are building a RECURSIVE (caching) DNS server, you need to enable
           recursion.
         - If your recursive DNS server has a public IP address, you MUST enable acces
s
           control to limit queries to your legitimate users. Failing to do so will
           cause your server to become part of large scale DNS amplification
                                                                  19,22-29      Top
```

```
# systemctl start naemd.service
# systemctl enable naemd.service
# firewall-cmd --add-service=dns
# firewall-cmd --add-service=dns --permanent
```

```
#vim etc/named.rfc1912.zones
```

```
#Domain Zones
zone "example.com" IN{
        type master;
        file "example.com.zone";
        allow-update {none;};
};
"/etc/named.rfc1912.zones" 52L, 1133B
```

vim /*var*/named/example.con.zone

```
; example.com zone file
$TTL 86400
@       IN      SOA     ns01.example.com. admin.example.com. (
                        2024051301 ; serial number
                        3600       ; refresh
                        1800       ; retry
                        604800     ; expire
                        86400 )    ; minimum TTL

; Name servers
@       IN      NS      ns01.example.com.

; Hosts
www     IN      A       192.168.56.11
db01    IN      A       192.168.56.21
storage IN      A       192.168.56.41
ns01    IN      A       192.168.56.31
~
~
~
~
~
~
"/var/named/example.com.zone" 17L, 549B                    17,37         All
```

systemctl restart named.service

chgrp named /*var*/named/example.com.zone

ls -l */var/named/example.com.zone -권한이 잘 바뀌었는지 확인.*

 # systemctl restart named.service

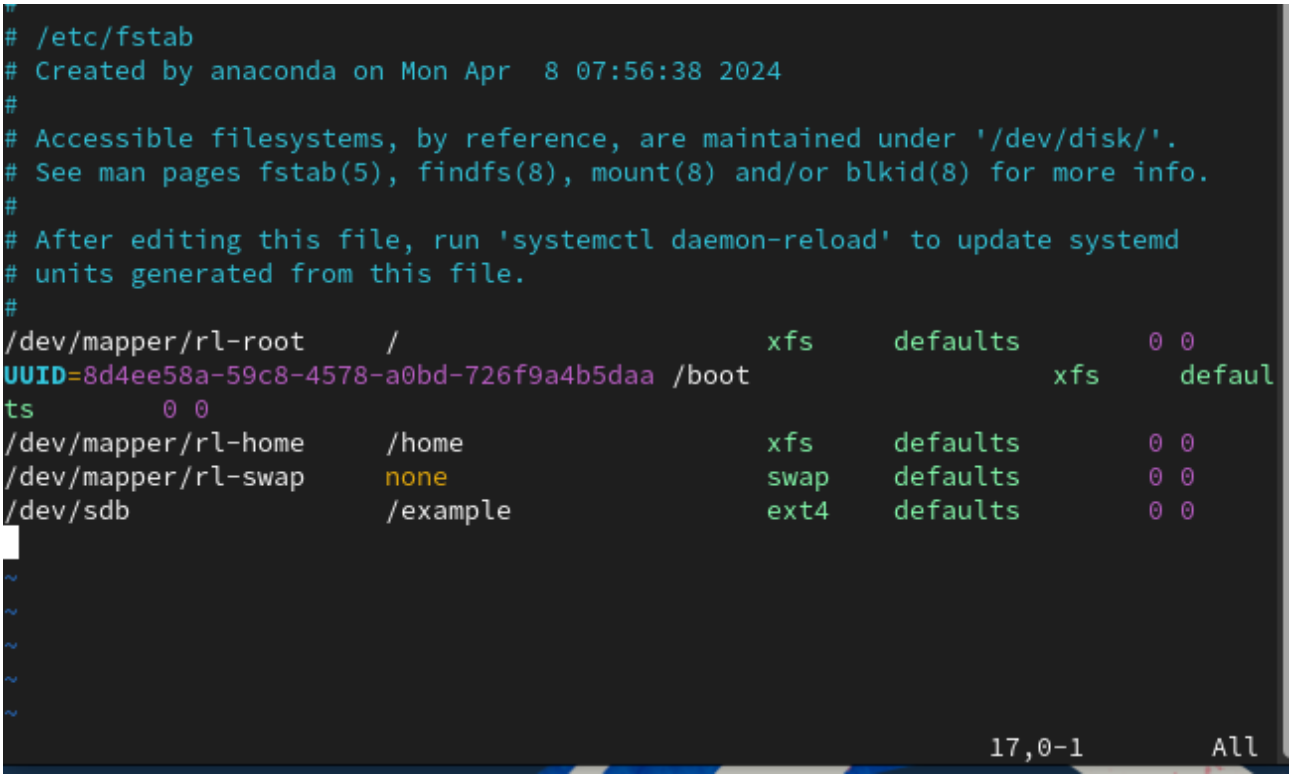
---

5. Storage 서버(NFS, iSCSI 서비스 제공)

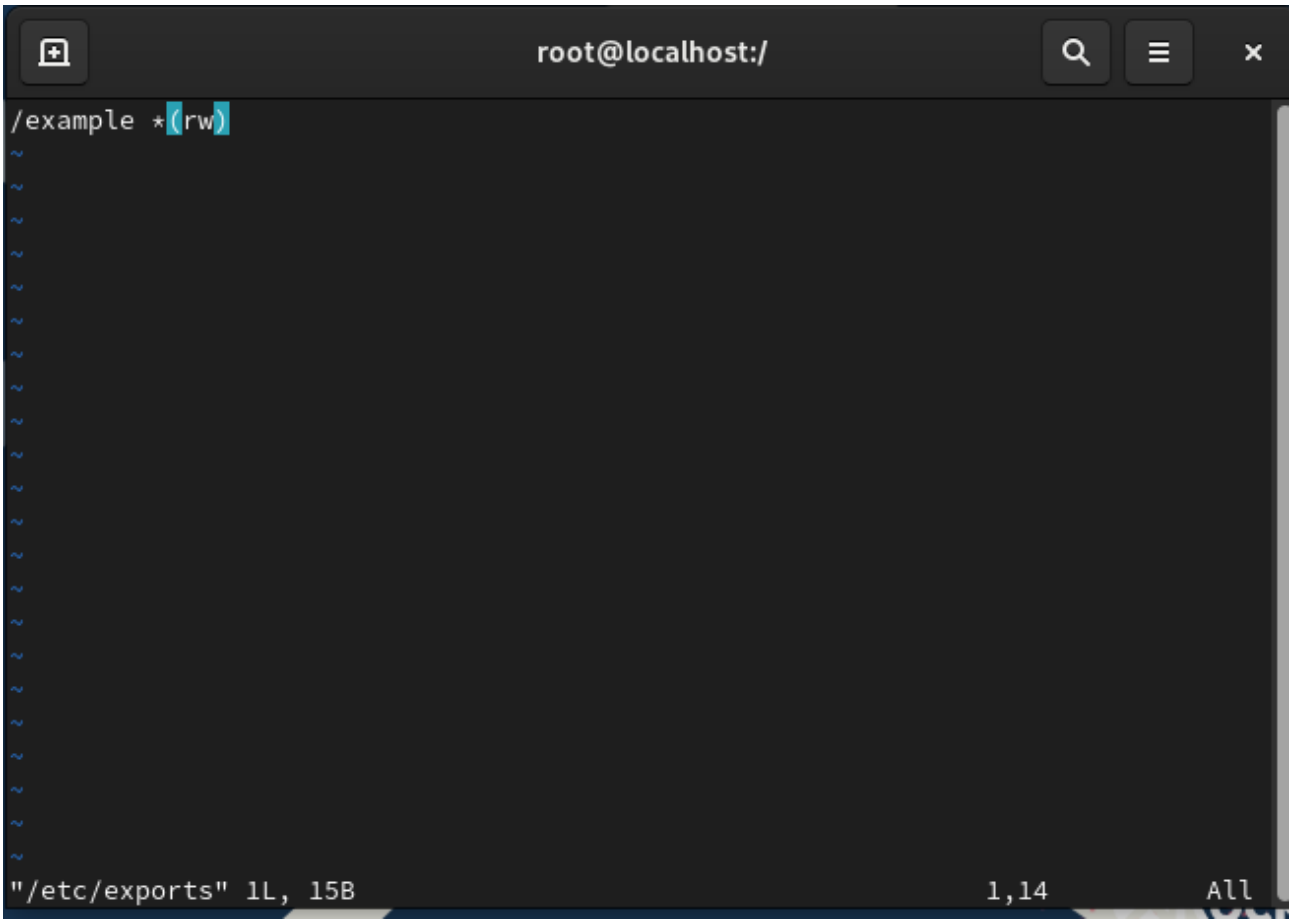
sdb 와 sdc 디스크 추가 후.

sdb 는 /example 로 mount. example 은 nfs 시스템.

vim /*etc*/fstab



vim /*etc*/exports : nfs 로 전송 할 파일과 경로 구성.



구성 후, 클라이언트 (www)에서

mkdir /example

mount -t nfs 192.168.56.41:/example /example

5-2. */dev/*sdc 에 iSCI 스토리지 구성

5-3. Storage 에서

yum install iscsi-initiator-utils

vim */etc*/initiatorname.iscsi

systemctl start iscsi.service

systemctl enable iscsi.service

5-4. 클라이언트 (WWW)에서

- iSCSI 타겟 로그인

iscsiadm -m idscovery -t sendtargets -p 192.168.56.41:3260

```
# iscsiadm m node -T iqn.202405.com.example:servera -p
192.168.56.41:3260 -l
```

- iSCSI 마운트

```
# mkfs -t ext4 /dev/sdb

# mkdir /example2

# mount -t ext4 /dev/sdb /example2
```

#vim /etc/fstab

```
#
# /etc/fstab
# Created by anaconda on Mon Apr  8 07:56:38 2024
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
/dev/mapper/rl-root     /                       xfs     defaults        0 0
UUID=8d4ee58a-59c8-4578-a0bd-726f9a4b5daa /boot                   xfs     defa
ults        0 0
/dev/mapper/rl-home     /home                   xfs     defaults        0 0
/dev/mapper/rl-swap     none                    swap    defaults        0 0
192.168.56.31:/example  /example                nfs     rw              0 0
/dev/sdb                /example2               ext4    _netdev         0 0
~
~
"/etc/fstab" 17L, 739B                                    17,38-75      All
```

2 차 과제

1. 웹서버

```
# cd /etc/httpd/conf.d
# vim 01-port-8080.conf
```

```
<VirtualHost 192.168.56.11:8080>
ServerAdmin webmaster@example.com
DocumentRoot "/src/www/web01"
ErrorLog "/var/log/httpd/web01-error_log"
CustomLog "/var/log/httpd/web01-access_log" common
</VirtualHost>

<Directory "/src/www/web01">
Options Indexes FollowSymLinks
AllowOverride None
Require all granted
</Directory>
```

```
# vim 02-port-8080.conf
```

```
<VirtualHost 192.168.60.11:8080>
ServerAdmin webmaster@example.com
DocumentRoot "/src/www/web02"
ErrorLog "/var/log/httpd/web02-error_log"
CustomLog "/var/log/httpd/web02-access_log" common
</VirtualHost>

<Directory "/src/www/web02">
Options Indexes FollowSymLinks
AllowOverride None
Require all granted
</Directory>
```

```
# 생성 확인
```

```
[root@localhost conf.d]# ls -l /etc/httpd/conf.d
total 32
-rw-r--r--. 1 root root   72 May 17 10:37 00-default.conf
-rw-r--r--. 1 root root  349 May 17 11:13 01-port-8080.conf
-rw-r--r--. 1 root root  349 May 17 11:14 02-port-8080.conf
-rw-r--r--. 1 root root 2916 Apr 22 10:04 autoindex.conf
-rw-r--r--. 1 root root 1577 Oct 20  2023 php.conf
-rw-r--r--. 1 root root  400 Apr 22 10:04 README
-rw-r--r--. 1 root root 1252 Apr 22 10:01 userdir.conf
-rw-r--r--. 1 root root  653 Apr 22 10:01 welcome.conf
```

/src/www 디렉터리 Storage 저장소의 nfs 로 마운트.

vim /etc/fstab

```
#
/dev/mapper/rl-root     /                       xfs     defaults        0 0
UUID=8d4ee58a-59c8-4578-a0bd-726f9a4b5daa /boot                   xfs     defaults
        0 0
/dev/mapper/rl-home     /home                   xfs     defaults        0 0
/dev/mapper/rl-swap     none                    swap    defaults        0 0
/dev/sdb                /example2               ext4    _netdev         0 0
192.168.56.41:/example /src/www                 nfs     rw              0 0
```

/src/www 밑에 web01 과 web02 생성.

```
[root@www www]# ls -l
total 24
drwx------. 2 root root 16384 May 14 11:22 lost+found
drwxr-xr-x. 2 root root  4096 May 16 10:29 web01
drwxr-xr-x. 2 root root  4096 May 16 10:25 web02
```

 # web01 과 web02 에 index.html 생성

```
<html>
        <p>"Welcome to Apache Webserver(web01)"</p>
        </html>
~
~
```

 # 생성확인

```
[root@localhost conf.d]# ls -lR /srv/www
/srv/www:
total 24
drwx------. 2 root   root   16384 May 14 10:55 lost+found
drwxr-xr-x. 2 nobody nobody  4096 May 17 11:19 web01
drwxr-xr-x. 2 nobody nobody  4096 May 17 11:19 web02
ls: cannot open directory '/srv/www/lost+found': Permission denied

/srv/www/web01:
total 4
-rw-r--r--. 1 nobody nobody 176 May 17 11:19 index.html

/srv/www/web02:
total 4
-rw-r--r--. 1 nobody nobody 176 May 17 11:19 index.html
```

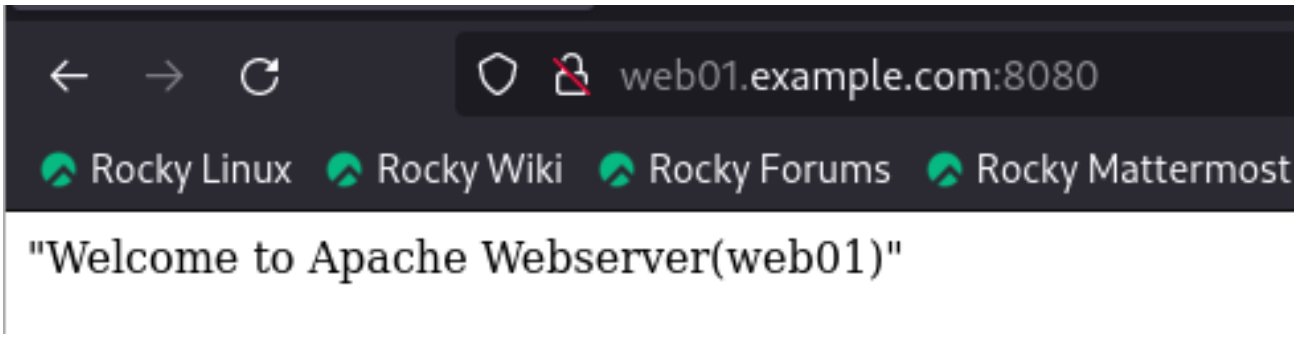
1-2. ns01 에서 web01 과 web02 호스트 추가

vim /*var*/named/example.com.zone

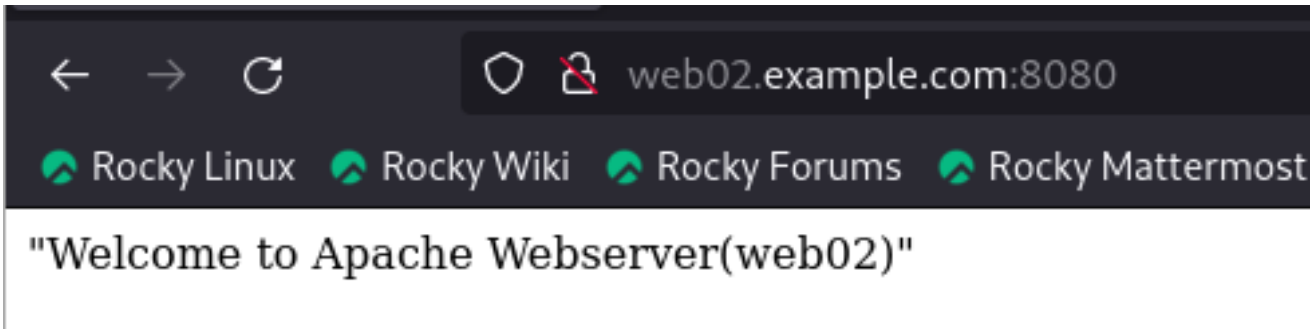
```
; example.com zone file
$TTL 86400
@       IN      SOA     ns01.example.com. admin.example.com. (
                        2024051301 ; serial number
                        3600       ; refresh
                        1800       ; retry
                        604800     ; expire
                        86400 )    ; minimum TTL

; Name servers
@       IN      NS      ns01.example.com.

; Hosts
www     IN      A       192.168.56.11
db01    IN      A       192.168.56.21
storage IN      A       192.168.56.41
ns01    IN      A       192.168.56.31
web01   IN      A       192.168.56.11
web02   IN      A       192.168.60.11
~
~
~
~
"/var/named/example.com.zone" 19L, 599B                       19,24-37      All
```

접속 확인.

* web01



*web02



2. DNS 서버 로드 밸런싱.

vim /var/named/example.com.zone

```
; example.com zone file
$TTL 86400
@       IN      SOA     ns01.example.com. admin.example.com. (
                        2024051301 ; serial number
                        3600       ; refresh
                        1800       ; retry
                        604800     ; expire
                        86400 )    ; minimum TTL

; Name servers
@       IN      NS      ns01.example.com.

; Hosts
www     IN      A       192.168.56.11
db01    IN      A       192.168.56.21
storage IN      A       192.168.56.41
ns01    IN      A       192.168.56.31
web01   IN      A       192.168.56.11
web02   IN      A       192.168.60.11

internal-portal 1     IN      A       192.168.56.11
internal-portal 2     IN      A       192.168.60.11
~
"/var/named/example.com.zone" 22L, 704B                    22,15         All
```

internal-portal 1 IN A 192.168.56.11

internal-portal 2 IN A 192.168.60.11 추가

---

3. DB 설정.

mkdir /datastore

vim /etc/fstab

```
#
# /etc/fstab
# Created by anaconda on Mon Apr  8 07:56:38 2024
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
/dev/mapper/rl-root     /                       xfs     defaults        0 0
UUID=8d4ee58a-59c8-4578-a0bd-726f9a4b5daa /boot                   xfs     defaults
      0 0
/dev/mapper/rl-home     /home                   xfs     defaults        0 0
/dev/mapper/rl-swap     none                    swap    defaults        0 0
/dev/sdb                /datastore              ext4    _netdev         0 0
~
~
~
~
~
~
                                                                16,38-74      All
```

/dev/sdb (iSCI) 영구마운트 이후.

 # cp -r /var/lib/mysql /datastore/

 # chown -R mysql:mysql /datastore/mysql/

 # 결과 확인

```
[root@localhost ~]# ls -l /datastore/
total 20
drwx------. 2 root  root  16384 May 17 11:55 lost+found
drwxr-xr-x. 5 mysql mysql  4096 May 17 12:11 mysql
[root@localhost ~]# ls -l /datastore/mysql/
total 122928
-rw-r-----. 1 mysql mysql     24576 May 17 12:11 aria_log.00000001
-rw-r-----. 1 mysql mysql        52 May 17 12:11 aria_log_control
-rw-rw----. 1 mysql mysql      2108 May 17 12:11 ib_buffer_pool
-rw-r-----. 1 mysql mysql  12582912 May 17 12:11 ibdata1
-rw-r-----. 1 mysql mysql 100663296 May 17 12:11 ib_logfile0
-rw-rw----. 1 mysql mysql  12582912 May 17 12:11 ibtmp1
-rw-r-----. 1 mysql mysql         0 May 17 12:05 multi-master.info
drwx------. 2 mysql mysql      4096 May 17 12:05 mysql
srwxrwxrwx. 1 mysql mysql         0 May 17 12:11 mysql.sock
-rw-r-----. 1 mysql mysql        16 May 17 12:05 mysql_upgrade_info
drwx------. 2 mysql mysql      4096 May 17 12:05 performance_schema
drwx------. 2 mysql mysql      4096 May 17 12:05 wordpress
[root@localhost ~]#
```

 # vim /etc/my.cnf.d/mariadb-server.cnf

```
# See the examples of server my.cnf files in /usr/share/mysql/
#

# this is read by the standalone daemon and embedded servers
[server]

# this is only for the mysqld standalone daemon
# Settings user and group are ignored when systemd is used.
# If you need to run mysqld under a different user or group,
# customize your systemd unit file for mysqld/mariadb according to the
# instructions in http://fedoraproject.org/wiki/Systemd
[mysqld]
#datadir=/var/lib/mysql
#socket=/var/lib/mysql/mysql.sock
log-error=/var/log/mariadb/mariadb.log
pid-file=/run/mariadb/mariadb.pid
datadir=/datastore/mysql
socket=/datastore/mysql/mysql.sock


#
# * Galera-related settings
#
"/etc/my.cnf.d/mariadb-server.cnf" 57L, 1520B                 22,24         11%
```

 # vim /etc/my.cnf

```
#
# This group is read both both by the client and the server
# use it for options that affect everything
#
[client-server]

#
# include all files from the config directory
#
!includedir /etc/my.cnf.d
[client]
socket = /datastore/mysql/mysql.sock

[mysql]
socket = /datastore/mysql/mysql.sock
~
~
~
~
~
~
~
~
"/etc/my.cnf" 15L, 293B                                    15,36         All
```

 # 접속 확인.

```
[root@localhost mysql]# mysql -h localhost -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 4
Server version: 10.5.22-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

 # DATA 경로 확인.

```
MariaDB [(none)]> SELECT @@DATADIR
    -> ;
+---------------------+
| @@DATADIR           |
+---------------------+
| /datastore/mysql/ |
+---------------------+
1 row in set (0.000 sec)
```

4. 스토리지 NET2 로 변경

 # /iscsi/iqn.2024-05.com.example:servera/tpg1/portals delete 192.168.56.41 3260

 # /iscsi/iqn.2024=05.com.example:servera/tpgq/portals create 192.168.60.41 3260

```
/> ls
o- / ..................................................................................... [...]
  o- backstores ......................................................................... [...]
  | o- block ............................................................... [Storage Objects: 1]
  | | o- example ..................................... [/dev/sdc (10.0GiB) write-thru activated]
  | |   o- alua ................................................................ [ALUA Groups: 1]
  | |     o- default_tg_pt_gp ..................................... [ALUA state: Active/optimized]
  | o- fileio .............................................................. [Storage Objects: 0]
  | o- pscsi ............................................................... [Storage Objects: 0]
  | o- ramdisk ............................................................. [Storage Objects: 0]
  o- iscsi ....................................................................... [Targets: 1]
  | o- iqn.2024-05.com.example:servera ..................................................... [TPGs: 1]
  |   o- tpg1 ..................................................... [no-gen-acls, no-auth]
  |     o- acls ................................................................................ [ACLs: 1]
  |     | o- iqn.2024-05.com.example:example ..................................... [Mapped LUNs: 1]
  |     |   o- mapped_lun0 ........................................... [lun0 block/example (rw)]
  |     o- luns ................................................................................ [LUNs: 1]
  |     | o- lun0 ..................................... [block/example (/dev/sdc) (default_tg_pt_gp)]
  |     o- portals .............................................................................. [Portals: 1]
  |       o- 192.168.60.41:3260 ................................................................... [OK]
  o- loopback .................................................................... [Targets: 0]
/>
```

문제점.

문제 1.

DB 설정 중

 # vim etc/my.cnf.d/mariadb-server.cnf

이렇게 설정해야 내부 네트워크에서만 마리아 DB 를 사용할 수 있는데 이렇게 설정하면 wordpress 로 접속이 안됨.

문제 2.

작업 중 노트북의 전원이 꺼짐 >> 제부팅이 안됨.

하드디스크 용량 문제임을 확인하고 재부팅에 성공했지만, 가상머신 파일을 복구할 수 없었음.

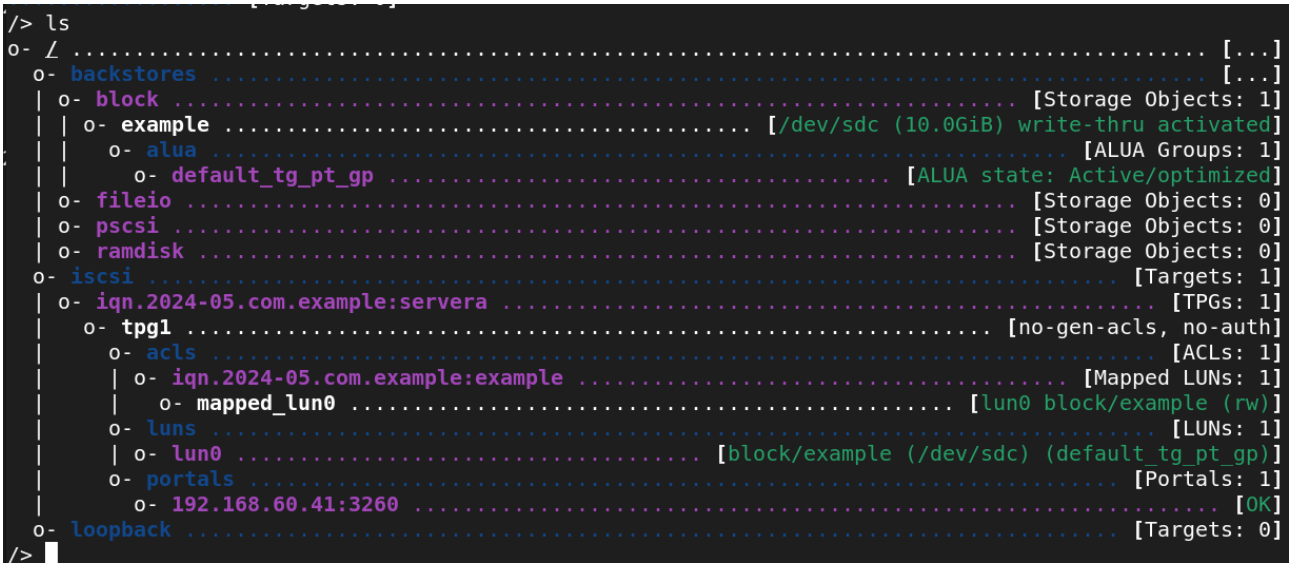
서비스 별 구성 파일

1. www

```
[root@localhost conf.d]# ls -lR /srv/www
/srv/www:
total 24
drwx------. 2 root   root   16384 May 14 10:55 lost+found
drwxr-xr-x. 2 nobody nobody  4096 May 17 11:19 web01
drwxr-xr-x. 2 nobody nobody  4096 May 17 11:19 web02
ls: cannot open directory '/srv/www/lost+found': Permission denied

/srv/www/web01:
total 4
-rw-r--r--. 1 nobody nobody 176 May 17 11:19 index.html

/srv/www/web02:
total 4
-rw-r--r--. 1 nobody nobody 176 May 17 11:19 index.html
```

```
[root@localhost conf.d]# ls -l /etc/httpd/conf.d
total 32
-rw-r--r--. 1 root root   72 May 17 10:37 00-default.conf
-rw-r--r--. 1 root root  349 May 17 11:13 01-port-8080.conf
-rw-r--r--. 1 root root  349 May 17 11:14 02-port-8080.conf
-rw-r--r--. 1 root root 2916 Apr 22 10:04 autoindex.conf
-rw-r--r--. 1 root root 1577 Oct 20  2023 php.conf
-rw-r--r--. 1 root root  400 Apr 22 10:04 README
-rw-r--r--. 1 root root 1252 Apr 22 10:01 userdir.conf
-rw-r--r--. 1 root root  653 Apr 22 10:01 welcome.conf
```

2. storage



3. ns01

```
[root@localhost ~]# ls -l /etc/named.rfc1912.zones
-rw-r-----. 1 root named 1134 May 13 18:59 /etc/named.rfc1912.zones
```

```
[root@localhost ~]# ls -l /var/named/example.com.zone
-rw-r-----. 1 root named 700 May 17 11:28 /var/named/example.com.zone
```

4. db

```
[root@localhost ~]# ls -l /datastore/
total 20
drwx------. 2 root  root  16384 May 17 11:55 lost+found
drwxr-xr-x. 5 mysql mysql  4096 May 17 12:11 mysql
[root@localhost ~]# ls -l /datastore/mysql/
total 122928
-rw-r-----. 1 mysql mysql     24576 May 17 12:11 aria_log.00000001
-rw-r-----. 1 mysql mysql        52 May 17 12:11 aria_log_control
-rw-rw----. 1 mysql mysql      2108 May 17 12:11 ib_buffer_pool
-rw-r-----. 1 mysql mysql  12582912 May 17 12:11 ibdata1
-rw-r-----. 1 mysql mysql 100663296 May 17 12:11 ib_logfile0
-rw-rw----. 1 mysql mysql  12582912 May 17 12:11 ibtmp1
-rw-r-----. 1 mysql mysql         0 May 17 12:05 multi-master.info
drwx------. 2 mysql mysql      4096 May 17 12:05 mysql
srwxrwxrwx. 1 mysql mysql         0 May 17 12:11 mysql.sock
-rw-r-----. 1 mysql mysql        16 May 17 12:05 mysql_upgrade_info
drwx------. 2 mysql mysql      4096 May 17 12:05 performance_schema
drwx------. 2 mysql mysql      4096 May 17 12:05 wordpress
[root@localhost ~]#
```