Northumbria University
NEWCASTLE

KF5004

——

Network Design

——

The Implementation of a DNS infrastructure (BIND9) and Web Server Farm facilities (Apache, PHP, NFS, and MySQL)

——

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September 2023

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Important:

For your build please adjust all addresses to be from your provided range of addresses. if working on your own network, ensure you use addresses and mask that are appropriate.

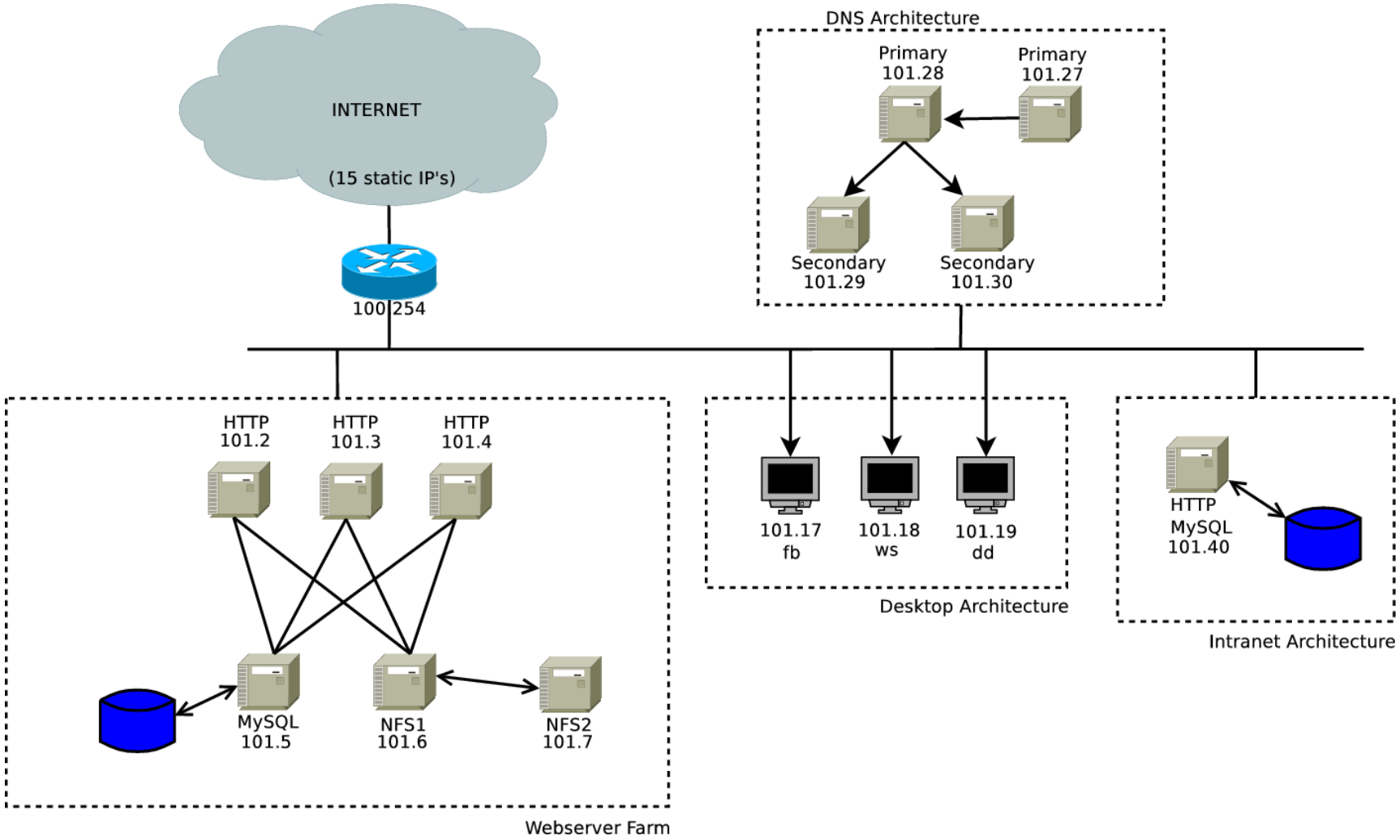

Figure 1: Schematic

1 Primary Server 1

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
      ens33:
        addresses: [192.168.101.28/16]
        gateway4: 192.168.100.254
        nameservers:
          search: [tech.co.uk, unn.co.uk]
          addresses: [8.8.8.8, 8.8.4.4]
```

/etc/bind/named.conf.local

```
//
// Do any local configuration here //
// Consider adding the 1918 zones here, if they are not used in your
// organization
// include "/etc/bind/zones.rfc1918";

zone "unn.co.uk" {
    type master;
    file "/etc/bind/db.unn.co.uk";
    allow-transfer {192.168.101.29; 192.168.101.30;};
    allow-query {192.168.101.29; 192.168.101.30;};
};

zone "tech.co.uk" {
    type master;
    file "/etc/bind/db.tech.co.uk";
    allow-transfer {192.168.101.29; 192.168.101.30;};
    allow-query {192.168.101.29; 192.168.101.30;};
};

zone "staff.unn.co.uk" {
    type slave;
    masters {192.168.101.27};
    allow-transfer {192.168.101.29; 192.168.101.30;};
    allow-query {192.168.101.29; 192.168.101.30;};
};

zone "168.192.in-addr.arpa" {
    type master;
    file "/etc/bind/db.168.192.in-addr.arpa";
    allow-transfer {192.168.101.29; 192.168.101.30;};
    allow-query {192.168.101.29; 192.168.101.30;};
};
```

/etc/bind/named.conf.options

```
options {
    directory "/var/cache/bind";

    // If there is a firewall between you and nameservers you want
    // to talk to, you may need to fix the firewall to allow multiple
    // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

    // If your ISP provided one or more IP addresses for stable
    // nameservers, you probably want to use them as forwarders.
    // Uncomment the following block, and insert the addresses replacing
    // the all-0's placeholder.

    // forwarders {
    //         8.8.8.8;
    // };

    // ========================================================================
    // If BIND logs error messages about the root key being expired,
    // you will need to update your keys.  See https://www.isc.org/bind-keys
    // ========================================================================
    dnssec-validation auto;
    auth-nxdomain no;    # conform to RFC1035
};
```

/etc/bind/db.unn.co.uk

```
$TTL    43200
$ORIGIN unn.co.uk.
@  1d  IN  SOA ns1.unn.co.uk. hostmaster.unn.co.uk. (
               2017090807 ; sn
               172800     ; ref
               900        ; ret
               1209600    ; exp
               3600       ; nx
          )
@                          IN       NS                  ns1.unn.co.uk.
                           IN       NS                  ns2.unn.co.uk.
                           IN       MX      10          mail.microsoft.com.
               ns1         IN       A                   192.168.101.29
               ns2         IN       A                   192.168.101.30
               ns3         IN       A                   192.168.101.28
               web         IN       A                   192.168.101.40
               www         IN       A                   192.168.101.2
                           IN       A                   192.168.101.3
                           IN       A                   192.168.101.4
               ftp         IN       CNAME               web
               intranet    IN       CNAME               web
               mysql       IN       A                   192.168.101.5
               nfs1        IN       A                   192.168.101.6
               nfs2        IN       A                   192.168.101.7
```

/etc/bind/db.tech.co.uk

```
$TTL    0
$ORIGIN tech.co.uk.
@  1d  IN  SOA ns1.unn.co.uk. hostmaster.unn.co.uk. (
                    2017092307 ; sn
                    1800       ; ref
                    900        ; ret
                    604800     ; exp
                    14400      ; nx
               )
@                IN        NS              ns1.unn.co.uk.
                 IN        NS              ns2.unn.co.uk.
A12345678        IN        A               192.168.101.40
web              IN        CNAME           A12345678
A12345679        IN        A               192.168.101.2
www1             IN        CNAME           A12345679
A12345680        IN        A               192.168.101.3
www2             IN        CNAME           A12345680
A12345681        IN        A               192.168.101.4
www3             IN        CNAME           A12345681
www              IN        A               192.168.101.2
                 IN        A               192.168.101.3
                 IN        A               192.168.101.4
A12345682        IN        A               192.168.101.5
mysql            IN        CNAME           A12345682
A12345683        IN        A               192.168.101.6
nfs1             IN        CNAME           A12345683
A12345684        IN        A               192.168.101.7
nfs2             IN        CNAME           A12345684
A12345685        IN        A               192.168.101.17
A12345686        IN        A               192.168.101.18
A12345687        IN        A               192.168.101.19
A12345688        IN        A               192.168.101.20
A12345689        IN        A               192.168.101.21
A12345690        IN        A               192.168.101.22
A12345691        IN        A               192.168.101.23
A12345692        IN        A               192.168.101.24
A12345693        IN        A               192.168.101.25
A12345694        IN        A               192.168.101.26
A12345695        IN        A               192.168.101.27
A12345696        IN        A               192.168.101.28
A12345697        IN        A               192.168.101.29
A12345698        IN        A               192.168.101.30
```

/etc/bind/db.168.192.in-addr.arpa

```
$TTL 604800
$ORIGIN 168.192.in-addr.arpa.
@  1d        IN SOA        ns1.unn.co.uk. hostmaster.unn.co.uk. (
                            2015092303 ; sn
                            604800     ; ref
                            86400      ; ret
                            2419200    ; exp
                            604800     ; nx
                    )
                        NS      ns1.unn.co.uk.
                        NS      ns2.unn.co.uk.
2.101                   PTR     www.tech.co.uk.
3.101                   PTR     www.tech.co.uk.
4.101                   PTR     www.tech.co.uk.
5.101                   PTR     mysql.unn.co.uk.
```

2 Primary Server 2

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
        ens33:
            addresses: [192.168.101.27/16]
            gateway4: 192.168.100.254
            nameservers:
                search: [tech.co.uk, unn.co.uk]
                addresses: [192.168.100.1,8.8.4.4]
```

/etc/bind/named.conf.local

```
//
// Do any local configuration here //
// Consider adding the 1918 zones here, if they are not used in your
// organization
// include "/etc/bind/zones.rfc1918";

zone "staff.unn.co.uk" {
        type master;
        file "/etc/bind/db.staff.unn.co.uk";
        allow-transfer {192.168.101.28;};
        allow-query{192.168.101.28;};
        notify no;
};
```

/etc/bind/named.conf.options

```
options {
    directory "/var/cache/bind";

    // If there is a firewall between you and nameservers you want
    // to talk to, you may need to fix the firewall to allow multiple
    // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

    // If your ISP provided one or more IP addresses for stable
    // nameservers, you probably want to use them as forwarders.
    // Uncomment the following block, and insert the addresses replacing
    // the all-0's placeholder.

    // forwarders {
    //         8.8.8.8;
    // };

    // ========================================================================
    // If BIND logs error messages about the root key being expired,
    // you will need to update your keys.  See https://www.isc.org/bind-keys
    // ========================================================================
    dnssec-validation auto;
    auth-nxdomain no;    # conform to RFC1035
};
```

/etc/bind/db.staff.unn.co.uk

```
$TTL    43200
$ORIGIN staff.unn.co.uk.
@  1d  IN  SOA ns1.unn.co.uk. hostmaster.unn.co.uk. (
                        2017090801  ; sn
                        172800      ; ref
                        900         ; ret
                        1209600     ; exp
                        3600        ; nx
                )
@                   IN          NS              ns1.unn.co.uk.
                    IN          NS              ns2.unn.co.uk.
ns4                 IN          A               192.168.101.27
web                 IN          A               192.168.101.40
fb                  IN          A               192.168.101.17
ws                  IN          A               192.168.101.18
dd                  IN          A               192.168.101.19
ne                  IN          A               192.168.101.20
ly                  IN          A               192.168.101.21
```

3 Secondary Server 1

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
        ens33:
            addresses: [192.168.101.29/16]
            gateway4: 192.168.100.254
            nameservers:
                search: [tech.co.uk, unn.co.uk]
                addresses: [8.8.8.8, 8.8.4.4]
```

/etc/bind/named.conf.options

```
options {
    directory "/var/cache/bind";

    // If there is a firewall between you and nameservers you want
    // to talk to, you may need to fix the firewall to allow multiple
    // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

    // If your ISP provided one or more IP addresses for stable
    // nameservers, you probably want to use them as forwarders.
    // Uncomment the following block, and insert the addresses replacing
    // the all-0's placeholder.

    forwarders {
            192.168.101.254;
            8.8.8.8;
    };

    // ========================================================================
    // If BIND logs error messages about the root key being expired,
    // you will need to update your keys.  See https://www.isc.org/bind-keys
    // ========================================================================
    dnssec-validation auto;
    auth-nxdomain no;    # conform to RFC1035
    };
```

/etc/bind/named.conf.local

```
//
// Do any local configuration here //
// Consider adding the 1918 zones here, if they are not used in your
// organization
// include "/etc/bind/zones.rfc1918";

zone "unn.co.uk" {
        type slave;
        file "db.unn.co.uk";
        masters {192.168.101.28;};
        allow-query {localnets;};
};

zone "tech.co.uk" {
        type slave;
        file "db.tech.co.uk";
        masters {192.168.101.28;};
        allow-query {localnets;};
};

zone "staff.unn.co.uk" {
        type slave;
        masters {192.168.101.28;};
        allow-query {localnets;};
};

zone "168.192.in-addr.arpa" {
        type slave;
        file "db.168.192.in-addr.arpa";
        masters {192.168.101.28;};
        allow-query {localnets;};
};
```

4 Secondary Server 2

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
        ens33:
            addresses: [192.168.101.30/16]
            gateway4: 192.168.100.254
            nameservers:
                search: [tech.co.uk, unn.co.uk]
                addresses: [192.168.100.254, 8.8.4.4]
```

/etc/bind/named.conf.options

```
options {
    directory "/var/cache/bind";

    // If there is a firewall between you and nameservers you want
    // to talk to, you may need to fix the firewall to allow multiple
    // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

    // If your ISP provided one or more IP addresses for stable
    // nameservers, you probably want to use them as forwarders.
    // Uncomment the following block, and insert the addresses replacing
    // the all-0's placeholder.

    forwarders {
        192.168.101.254;
        8.8.8.8;
    };

    // ========================================================================
    // If BIND logs error messages about the root key being expired,
    // you will need to update your keys.  See https://www.isc.org/bind-keys
    // ========================================================================
    dnssec-validation auto;
    auth-nxdomain no;    # conform to RFC1035
};
```

/etc/bind/named.conf.local

```
//
// Do any local configuration here //
// Consider adding the 1918 zones here, if they are not used in your
// organization
// include "/etc/bind/zones.rfc1918";

zone "unn.co.uk" {
    type slave;
    file "db.unn.co.uk";
    masters {192.168.101.28;};
    allow-query {localnets;};
};

zone "tech.co.uk" {
    type slave;
    file "db.tech.co.uk";
    masters {192.168.101.28;};
    allow-query {localnets;};
};

zone "staff.unn.co.uk" {
    type slave;
    masters {192.168.101.28;};
    allow-query {localnets;};
};

zone "168.192.in-addr.arpa" {
    type slave;
    file "db.168.192.in-addr.arpa";
    masters {192.168.101.28;};
    allow-query {localnets;};
};
```

5 Apache Server 1

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
        ens33:
            addresses: [192.168.101.2/16]
            gateway4: 192.168.100.254
            nameservers:
                search: [tech.co.uk, unn.co.uk]
                addresses: [192.168.101.29, 192.168.101.30]
```

/etc/fstab

```
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
 <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=fdae0e93-c8ec-44aa-a462-5b62af1c4277 /               ext4    errors=remount-ro 0       1
# swap was on /dev/sda5 during installation
UUID=3b24a428-f71a-4964-92d0-d812c0b6e107 none            swap    sw                0       0
/dev/fd0                        /media/floppy0        auto rw,user,noauto,exec,utf8  0       0
#MULTIPLE ENTRIES SELECT APPROPRIATELY
#nfs1.tech.co.uk:/var/content /var/www/html/wp-content nfs   rw,soft,timeo=101,intr
0 0
#:/var/content /var/www/html/wp-content
#nfs1.tech.co.uk:/var/content /var/www/html nfs   rw,soft,timeo=101,intr                        0 0
#nfs1.tech.co.uk /var/content /var/www/html/wp-content nfs   rw,soft,timeo=101,intr
0 0
#nfs1.tech.co.uk:/var/content 192.168.101.4:/var/www/html/wp-content nfs rw,soft,timeo=101,intr 0 0
```

6 Apache Server 2

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
        ens33:
            addresses: [192.168.101.3/16]
            gateway4: 192.168.100.254
            nameservers:
                search: [tech.co.uk, unn.co.uk]
                addresses: [192.168.101.29, 192.168.101.30]
```

/etc/fstab

```
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
 <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=fdae0e93-c8ec-44aa-a462-5b62af1c4245 /               ext4    errors=remount-ro 0       1
# swap was on /dev/sda5 during installation
UUID=3b24a428-f71a-4964-92d0-d812c0b6e109 none            swap    sw                0       0
/dev/fd0                        /media/floppy0        auto rw,user,noauto,exec,utf8  0       0
#MULTIPLE ENTRIES SELECT APPROPRIATELY
#nfs1.tech.co.uk:/var/content /var/www/html/wp-content nfs   rw,soft,timeo=101,intr
0 0
#:/var/content /var/www/html/wp-content
#nfs1.tech.co.uk:/var/content /var/www/html nfs   rw,soft,timeo=101,intr                        0 0
#nfs1.tech.co.uk /var/content /var/www/html/wp-content nfs   rw,soft,timeo=101,intr
0 0
#nfs1.tech.co.uk:/var/content 192.168.101.4:/var/www/html/wp-content nfs rw,soft,timeo=101,intr 0 0
```

7 Apache Server 3

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
        ens33:
            addresses: [192.168.101.4/16]
            gateway4: 192.168.100.254
            nameservers:
                search: [tech.co.uk, unn.co.uk]
                addresses: [192.168.101.29, 192.168.101.30]
```

/etc/fstab

```
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
 <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=fdae0e93-c8ec-44aa-a462-5b62af1c4259 /               ext4    errors=remount-ro 0       1
# swap was on /dev/sda5 during installation
UUID=3b24a428-f71a-4964-92d0-d812c0b6e110 none            swap    sw                0       0
/dev/fd0                        /media/floppy0        auto rw,user,noauto,exec,utf8  0       0
#MULTIPLE ENTRIES SELECT APPROPRIATELY
#nfs1.tech.co.uk:/var/content /var/www/html/wp-content nfs   rw,soft,timeo=101,intr
0 0
#:/var/content /var/www/html/wp-content
#nfs1.tech.co.uk:/var/content /var/www/html nfs   rw,soft,timeo=101,intr                        0 0
#nfs1.tech.co.uk /var/content /var/www/html/wp-content nfs   rw,soft,timeo=101,intr
0 0
#nfs1.tech.co.uk:/var/content 192.168.101.4:/var/www/html/wp-content nfs rw,soft,timeo=101,intr 0 0
```

8 MySQL Server

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
        ens33:
            addresses: [192.168.101.5/16]
            gateway4: 192.168.100.254
            nameservers:
                search: [tech.co.uk, unn.co.uk]
                addresses: [192.168.101.29, 192.168.101.30]
```

/etc/mysql/mysql.conf.d/mysqld.cnf - (1)

```
# The following values assume you have at least 32M ram

[mysqld_safe]
socket          = /var/run/mysqld/mysqld.sock
nice            = 0

[mysqld]
#
# * Basic Settings
#
user            = mysql
pid-file        = /var/run/mysqld/mysqld.pid
socket          = /var/run/mysqld/mysqld.sock
port            = 3306
basedir         = /usr
datadir         = /var/lib/mysql
tmpdir          = /tmp
lc-messages-dir = /usr/share/mysql
skip-external-locking
#
# Instead of skip-networking the default is now to listen only  on
# localhost which is more compatible and is not less secure.
#MULTIPLE ENTRIES SELECT APPROPRIATELY
#bind-address=::
#bind-address=0.0.0.0
#bind-address=127.0.0.1
#bind-address=www.unn.ac.uk
#bind-address=192.168.101.1
#bind-address=192.168.101.2 192.168.101.3 192.168.101.4
#
# * Fine Tuning
#
key_buffer_size         = 16M
max_allowed_packet      = 16M
thread_stack            = 192K
thread_cache_size       = 8
# This replaces the startup script and checks MyISAM tables if needed
# the first time they are touched
myisam-recover-options  = BACKUP
#max_connections        = 101
#table_cache            = 64
#thread_concurrency     = 10
#
# * Query Cache Configuration
#
# This replaces the startup script and checks MyISAM tables if needed
# the first time they are touched
myisam-recover-options  = BACKUP
#max_connections        = 101
#table_cache            = 64
#thread_concurrency     = 10
#
# * Query Cache Configuration
#
query_cache_limit       = 1M
query_cache_size        = 16M
#
# * Logging and Replication
#
# Both location gets rotated by the cronjob.
# Be aware that this log type is a performance killer.
# As of 5.1 you can enable the log at runtime!
#general_log_file        = /var/log/mysql/mysql.log
#general_log             = 1
#
```

/etc/mysql/mysql.conf.d/mysqld.cnf - (2)

```
#
# Error log - should be very few entries.
#
log_error = /var/log/mysql/error.log
#
# Here you can see queries with especially long duration
#log_slow_queries       = /var/log/mysql/mysql-slow.log
#long_query_time = 2
#log-queries-not-using-indexes
#
# The following can be used as easy to replay backup logs or for replication.
# note: if you are setting up a replication slave, see README.Debian about
#       other settings you may need to change.
#server-id              = 1
#log_bin                        = /var/log/mysql/mysql-bin.log
expire_logs_days        = 10
max_binlog_size   = 101M
#binlog_do_db           = include_database_name
#binlog_ignore_db       = include_database_name
#
# * InnoDB
#
# InnoDB is enabled by default with a 10MB datafile in /var/lib/mysql/.
# Read the manual for more InnoDB related options. There are many!
#
# * Security Features
#
# Read the manual, too, if you want chroot!
# chroot = /var/lib/mysql/
#
#
# InnoDB is enabled by default with a 10MB datafile in /var/lib/mysql/.
# Read the manual for more InnoDB related options. There are many!
#
# * Security Features
#
# Read the manual, too, if you want chroot!
# chroot = /var/lib/mysql/
#
# For generating SSL certificates I recommend the OpenSSL GUI "tinyca".
#
# ssl-ca=/etc/mysql/cacert.pem
# ssl-cert=/etc/mysql/server-cert.pem
# ssl-key=/etc/mysql/server-key.pem
```

9 Intranet Server

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
        ens33:
            addresses: [192.168.101.40/16]
            gateway4: 192.168.100.254
            nameservers:
                search: [tech.co.uk, unn.co.uk]
                addresses: [192.168.101.29, 192.168.101.30]
```

/etc/apache2/mods-available/php7.2.conf

```
<FilesMatch ".+\.ph(p[345]?|t|tml)$">
    SetHandler application/x-httpd-php
</FilesMatch>
<FilesMatch ".+\.phps$">
    SetHandler application/x-httpd-php-source
    # Deny access to raw php sources by default
    # To re-enable it's recommended to enable access to the files
    # only in specific virtual host or directory
    Order Deny,Allow
    Deny from all
</FilesMatch>
# Deny access to files without filename (e.g. '.php')
<FilesMatch "^\.ph(p[345]?|t|tml|ps)$">
    Order Deny,Allow
    Deny from all
</FilesMatch>

# Running PHP scripts in user directories is disabled by default
#
# To re-enable PHP in user directories comment the following lines
# (from <IfModule ...> to </IfModule>.) Do NOT set it to On as it
# prevents .htaccess files from disabling it.
<IfModule mod_userdir.c>
    <Directory /home/*/public_html>
        php_admin_flag engine Off
    </Directory>
    <Directory /home/ceo/public_html>
        php_admin_flag engine On
    </Directory>
</IfModule>
```

/etc/mysql/mysql.conf.d/mysqld.cnf - (1)

```
# The following values assume you have at least 32M ram

[mysqld_safe]
socket          = /var/run/mysqld/mysqld.sock
nice            = 0

[mysqld]
#
# * Basic Settings
#
user            = mysql
pid-file        = /var/run/mysqld/mysqld.pid
socket          = /var/run/mysqld/mysqld.sock
port            = 3306
basedir         = /usr
datadir         = /var/lib/mysql
tmpdir          = /tmp
lc-messages-dir = /usr/share/mysql
skip-external-locking
#
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
#MULTIPLE ENTRIES SELECT APPROPRIATELY
#bind-address=::
#bind-address=0.0.0.0
#bind-address=127.0.0.1
#bind-address=www.unn.co.uk
#bind-address=192.168.101.1
#bind-address=192.168.101.2 192.168.101.3 192.168.101.4
#
# * Fine Tuning
#
key_buffer_size         = 16M
max_allowed_packet      = 16M
thread_stack            = 192K
thread_cache_size       = 8
# This replaces the startup script and checks MyISAM tables if needed
# the first time they are touched
myisam-recover-options  = BACKUP
#max_connections        = 101
#table_cache            = 64
#thread_concurrency     = 10
#
# * Query Cache Configuration
#
# This replaces the startup script and checks MyISAM tables if needed
# the first time they are touched
myisam-recover-options  = BACKUP
#max_connections        = 101
#table_cache            = 64
#thread_concurrency     = 10
#
# * Query Cache Configuration
#
query_cache_limit       = 1M
query_cache_size        = 16M
```

/etc/mysql/mysql.conf.d/mysqld.cnf - (2)

```
#
# * Logging and Replication
#
# Both location gets rotated by the cronjob.
# Be aware that this log type is a performance killer.
# As of 5.1 you can enable the log at runtime!       #
general_log_file         = /var/log/mysql/mysql.log
#general_log             = 1
query_cache_size        = 16M
#
# Error log - should be very few entries.
#
log_error = /var/log/mysql/error.log
#
# Here you can see queries with especially long duration
#log_slow_queries       = /var/log/mysql/mysql-slow.log
#long_query_time = 2
#log-queries-not-using-indexes
#
# Error log - should be very few entries.
#
log_error = /var/log/mysql/error.log
#
# Here you can see queries with especially long duration
#log_slow_queries       = /var/log/mysql/mysql-slow.log
#long_query_time = 2
#log-queries-not-using-indexes
#
# The following can be used as easy to replay backup logs or for replication.
# note: if you are setting up a replication slave, see README.Debian about
#       other settings you may need to change.
#server-id              = 1
#log_bin                        = /var/log/mysql/mysql-bin.log
expire_logs_days        = 10
max_binlog_size   = 101M
#binlog_do_db           =  include_database_name
#binlog_ignore_db       =  include_database_name
#
# * InnoDB
#
# InnoDB is enabled by default with a 10MB datafile in /var/lib/mysql/.
# Read the manual for more InnoDB related options. There are many!
#
# * Security Features
#
# Read the manual, too, if you want chroot!
# chroot = /var/lib/mysql/
#
#
# InnoDB is enabled by default with a 10MB datafile in /var/lib/mysql/.
# Read the manual for more InnoDB related options. There are many!
#
# * Security Features
#
# Read the manual, too, if you want chroot!
# chroot = /var/lib/mysql/
#
# For generating SSL certificates I recommend the OpenSSL GUI "tinyca".
#
# ssl-ca=/etc/mysql/cacert.pem
# ssl-cert=/etc/mysql/server-cert.pem
# ssl-key=/etc/mysql/server-key.pem
```

10 NFS Server 1

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
      ens33:
        addresses: [192.168.101.6/16]
        gateway4: 192.168.100.254
        nameservers:
          search: [tech.co.uk, unn.co.uk]
          addresses: [192.168.101.29, 192.168.101.30]
```

/etc/exports (nfs-kernel-server installed)

```
# /etc/exports: the access control list for filesystems which may be exported
#               to NFS clients.  See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes       hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_subtree_check)
#
# Example for NFSv4:
# /srv/nfs4        gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes  gss/krb5i(rw,sync,no_subtree_check)
#
#MULTIPLE ENTRIES SELECT APPROPRIATELY
#/var/content *(rw,sync,no_subtree_check)
#/var/content www?(rw,sync,no_subtree_check)         #/
var/content www.unn.co.uk(rw,sync,no_subtree_check) #/
var/content www.tech.co.uk(rw,sync,no_subtree_check) #/
var/content 192.168.101.2(rw,sync,no_subtree_check)
```

11 NFS Server 2

/etc/netplan/10-cloud-init.yaml

```
# NETWORK CONFIG
network:
    version: 2
    ethernets:
      ens33:
        addresses: [192.168.101.7/16]
        gateway4: 192.168.100.254
        nameservers:
          search: [tech.co.uk, unn.co.uk]
          addresses: [192.168.101.29, 192.168.101.30]
```

END