

Tugas 4 – Teknik Sinkronisasi

Verifikasi Koneksi Jaringan

- Ping Ubuntu Server 1 ke Ubuntu Server 2

Command -> ping 192.168.100.2

```
ubuntu_server1@ubuntuserver1:~$ ping 192.168.100.2
PING 192.168.100.2 (192.168.100.2) 56(84) bytes of data.
64 bytes from 192.168.100.2: icmp_seq=1 ttl=64 time=0.433 ms
64 bytes from 192.168.100.2: icmp_seq=2 ttl=64 time=0.273 ms
64 bytes from 192.168.100.2: icmp_seq=3 ttl=64 time=0.361 ms
64 bytes from 192.168.100.2: icmp_seq=4 ttl=64 time=0.585 ms
64 bytes from 192.168.100.2: icmp_seq=5 ttl=64 time=0.329 ms
64 bytes from 192.168.100.2: icmp_seq=6 ttl=64 time=0.323 ms
64 bytes from 192.168.100.2: icmp_seq=7 ttl=64 time=0.349 ms
64 bytes from 192.168.100.2: icmp_seq=8 ttl=64 time=0.332 ms
64 bytes from 192.168.100.2: icmp_seq=9 ttl=64 time=0.555 ms
64 bytes from 192.168.100.2: icmp_seq=10 ttl=64 time=0.457 ms
64 bytes from 192.168.100.2: icmp_seq=11 ttl=64 time=0.502 ms
^C
--- 192.168.100.2 ping statistics ---
11 packets transmitted, 11 received, 0% packet loss, time 10228ms
rtt min/avg/max/mdev = 0.273/0.409/0.585/0.099 ms
ubuntu_server1@ubuntuserver1:~$
```

- Ping Ubuntu Server 2 ke Ubuntu Server 1

Command -> ping 192.168.100.1

```
ubuntu_server1@ubuntuserver2:~$ ping 192.168.100.1
PING 192.168.100.1 (192.168.100.1) 56(84) bytes of data.
64 bytes from 192.168.100.1: icmp_seq=1 ttl=64 time=0.392 ms
64 bytes from 192.168.100.1: icmp_seq=2 ttl=64 time=0.486 ms
64 bytes from 192.168.100.1: icmp_seq=3 ttl=64 time=0.359 ms
64 bytes from 192.168.100.1: icmp_seq=4 ttl=64 time=0.545 ms
64 bytes from 192.168.100.1: icmp_seq=5 ttl=64 time=0.470 ms
64 bytes from 192.168.100.1: icmp_seq=6 ttl=64 time=0.375 ms
64 bytes from 192.168.100.1: icmp_seq=7 ttl=64 time=0.431 ms
64 bytes from 192.168.100.1: icmp_seq=8 ttl=64 time=0.440 ms
64 bytes from 192.168.100.1: icmp_seq=9 ttl=64 time=0.458 ms
64 bytes from 192.168.100.1: icmp_seq=10 ttl=64 time=0.639 ms
64 bytes from 192.168.100.1: icmp_seq=11 ttl=64 time=0.262 ms
^C
--- 192.168.100.1 ping statistics ---
11 packets transmitted, 11 received, 0% packet loss, time 10239ms
rtt min/avg/max/mdev = 0.262/0.441/0.639/0.094 ms
ubuntu_server1@ubuntuserver2:~$
```

Konfigurasi Flat Naming

Command -> sudo nano /etc/host

Lalu ketikkan:

192.168.100.1 ubuntu_server1

192.168.100.2 ubuntu_server2

- Ubuntu Server 1

```
GNU nano 6.2 /etc/hosts *
127.0.0.1 localhost
127.0.1.1 ubuntu_server1

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
192.168.100.1 ubuntu_server1
192.168.100.2 ubuntu_server2

^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit      ^R Read File  ^N Replace    ^U Paste      ^J Justify    ^_ Go To Line  M-E Redo
```

- Ubuntu Server 2

```
GNU nano 6.2 /etc/hosts *
127.0.0.1 localhost
127.0.1.1 ubuntu_server2

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
192.168.100.1 ubuntu_server1
192.168.100.2 ubuntu_server2

^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit      ^R Read File  ^N Replace    ^U Paste      ^J Justify    ^_ Go To Line  M-E Redo
```

Verifikasi Flat Naming

- Ubuntu Server 1

Command -> ping ubuntu_server 2

```
ubuntu_server1@ubuntuserver1:~$ ping ubuntu_server2
PING ubuntu_server2 (192.168.100.2) 56(84) bytes of data.
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=1 ttl=64 time=0.370 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=2 ttl=64 time=0.298 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=3 ttl=64 time=2.61 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=4 ttl=64 time=0.429 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=5 ttl=64 time=0.492 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=6 ttl=64 time=0.264 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=7 ttl=64 time=0.382 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=8 ttl=64 time=0.552 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=9 ttl=64 time=0.404 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=10 ttl=64 time=0.272 ms
64 bytes from ubuntu_server2 (192.168.100.2): icmp_seq=11 ttl=64 time=2.17 ms
^C
--- ubuntu_server2 ping statistics ---
11 packets transmitted, 11 received, 0% packet loss, time 10196ms
rtt min/avg/max/mdev = 0.264/0.749/2.608/0.783 ms
ubuntu_server1@ubuntuserver1:~$ _
```

- Ubuntu Server 2

Command -> ping ubuntu_server 1

```
Ubuntu_server1@ubuntuserver2:~$ ping ubuntu_server1
PING ubuntu_server1 (192.168.100.1) 56(84) bytes of data.
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=1 ttl=64 time=0.389 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=2 ttl=64 time=0.565 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=3 ttl=64 time=0.364 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=4 ttl=64 time=0.464 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=5 ttl=64 time=0.563 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=6 ttl=64 time=0.511 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=7 ttl=64 time=0.724 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=8 ttl=64 time=0.352 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=9 ttl=64 time=0.358 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=10 ttl=64 time=0.536 ms
64 bytes from ubuntu_server1 (192.168.100.1): icmp_seq=11 ttl=64 time=0.513 ms
^C
--- ubuntu_server1 ping statistics ---
11 packets transmitted, 11 received, 0% packet loss, time 10199ms
rtt min/avg/max/mdev = 0.352/0.485/0.724/0.109 ms
ubuntu_server1@ubuntuserver2:~$ _
```

Install NTP

Command -> sudo apt install ntp

- Ubuntu Server 1

```
(Reading database ... 74116 files and directories currently installed.)
Preparing to unpack .../libevent-pthreads-2.1-7_2.1.12-stable-1build3_amd64.deb ...
Unpacking libevent-pthreads-2.1-7:amd64 (2.1.12-stable-1build3) ...
Selecting previously unselected package libopts25:amd64.
Preparing to unpack .../libopts25_1%3a5.18.16-4_amd64.deb ...
Unpacking libopts25:amd64 (1:5.18.16-4) ...
Selecting previously unselected package ntp.
Preparing to unpack .../ntp_1%3a4.2.8p15+dfsg-1ubuntu2_amd64.deb ...
Unpacking ntp (1:4.2.8p15+dfsg-1ubuntu2) ...
Selecting previously unselected package sntp.
Preparing to unpack .../sntp_1%3a4.2.8p15+dfsg-1ubuntu2_amd64.deb ...
Unpacking sntp (1:4.2.8p15+dfsg-1ubuntu2) ...
Setting up libopts25:amd64 (1:5.18.16-4) ...
Setting up ntp (1:4.2.8p15+dfsg-1ubuntu2) ...
Created symlink /etc/systemd/system/network-pre.target.wants/ntp-systemd-netif.path → /lib/systemd/s
ystem/ntp-systemd-netif.path.
Created symlink /etc/systemd/system/multi-user.target.wants/ntp.service → /lib/systemd/system/ntp.se
rvice.
ntp-systemd-netif.service is a disabled or a static unit, not starting it.
Setting up libevent-pthreads-2.1-7:amd64 (2.1.12-stable-1build3) ...
Setting up sntp (1:4.2.8p15+dfsg-1ubuntu2) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for dbus (1.12.20-2ubuntu4.1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.4) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu_server1@ubuntuserver1:~$ _
```

- Ubuntu Server 2

```
(Reading database ... 74116 files and directories currently installed.)
Preparing to unpack .../libevent-pthreads-2.1-7_2.1.12-stable-1build3_amd64.deb ...
Unpacking libevent-pthreads-2.1-7:amd64 (2.1.12-stable-1build3) ...
Selecting previously unselected package libopts25:amd64.
Preparing to unpack .../libopts25_1%3a5.18.16-4_amd64.deb ...
Unpacking libopts25:amd64 (1:5.18.16-4) ...
Selecting previously unselected package ntp.
Preparing to unpack .../ntp_1%3a4.2.8p15+dfsg-1ubuntu2_amd64.deb ...
Unpacking ntp (1:4.2.8p15+dfsg-1ubuntu2) ...
Selecting previously unselected package sntp.
Preparing to unpack .../sntp_1%3a4.2.8p15+dfsg-1ubuntu2_amd64.deb ...
Unpacking sntp (1:4.2.8p15+dfsg-1ubuntu2) ...
Setting up libopts25:amd64 (1:5.18.16-4) ...
Setting up ntp (1:4.2.8p15+dfsg-1ubuntu2) ...
Created symlink /etc/systemd/system/network-pre.target.wants/ntp-systemd-netif.path → /lib/systemd/s
ystem/ntp-systemd-netif.path.
Created symlink /etc/systemd/system/multi-user.target.wants/ntp.service → /lib/systemd/system/ntp.se
rvice.
ntp-systemd-netif.service is a disabled or a static unit, not starting it.
Setting up libevent-pthreads-2.1-7:amd64 (2.1.12-stable-1build3) ...
Setting up sntp (1:4.2.8p15+dfsg-1ubuntu2) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for dbus (1.12.20-2ubuntu4.1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.4) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu_server1@ubuntuserver2:~$ _
```

- Mengkonfigurasi Ubuntu Server 1 sebagai NTP Server

Command -> sudo nano /etc/ntp.conf

Menentukan pool server: ntp.dinus.ac.id

```
GNU nano 6.2 /etc/ntp.conf *
# Use servers from the NTP Pool Project. Approved by Ubuntu Technical Board
# on 2011-02-08 (LP: #104525). See http://www.pool.ntp.org/join.html for
# more information.
#pool 0.ubuntu.pool.ntp.org iburst
#pool 1.ubuntu.pool.ntp.org iburst
#pool 2.ubuntu.pool.ntp.org iburst
#pool 3.ubuntu.pool.ntp.org iburst
pool 127.0.0.1 iburst
pool ntp.dinus.ac.id iburst

# Use Ubuntu's ntp server as a fallback.
pool ntp.ubuntu.com

# Access control configuration; see /usr/share/doc/ntp-doc/html/acconf.html for
# details. The web page <http://support.ntp.org/bin/view/Support/AccessRestrictions>
# might also be helpful.
#
# Note that "restrict" applies to both servers and clients, so a configuration
# that might be intended to block requests from certain clients could also end
# up blocking replies from your own upstream servers.

# By default, exchange time with everybody, but don't allow configuration.
#restrict -4 default kod notrap nomodify nopeer noquery limited
#restrict -6 default kod notrap nomodify nopeer noquery limited

# Local users may interrogate the ntp server more closely.
restrict 127.0.0.1
restrict ::1

# Needed for adding pool entries
#restrict source notrap nomodify noquery

# Clients from this (example!) subnet have unlimited access, but only if
```

Buat restrict dengan mengizinkan IP: 192.168.100.0 dengan subnet mask: 255.255.255.0 dan diberikan rule: nomodify nopeer, noquery, notrust.

```
GNU nano 6.2 /etc/ntp.conf
# Access control configuration; see /usr/share/doc/ntp-doc/html/acconf.html for
# details. The web page <http://support.ntp.org/bin/view/Support/AccessRestrictions>
# might also be helpful.
#
# Note that "restrict" applies to both servers and clients, so a configuration
# that might be intended to block requests from certain clients could also end
# up blocking replies from your own upstream servers.

# By default, exchange time with everybody, but don't allow configuration.
#restrict -4 default kod notrap nomodify nopeer noquery limited
#restrict -6 default kod notrap nomodify nopeer noquery limited

# Local users may interrogate the ntp server more closely.
restrict 127.0.0.1
restrict ::1

# Needed for adding pool entries
#restrict source notrap nomodify noquery

# Clients from this (example!) subnet have unlimited access, but only if
# cryptographically authenticated.
#restrict 192.168.123.0 mask 255.255.255.0 notrust
restrict 192.168.100.0 mask 255.255.255.0 nomodify nopeer noquery notrust

# If you want to provide time to your local subnet, change the next line.
# (Again, the address is an example only.)
#broadcast 192.168.123.255

# If you want to listen to time broadcasts on your local subnet, de-comment the
# next lines. Please do this only if you trust everybody on the network!
#disable auth
#broadcastclient
```

Command -> sudo ufw allow 123/udp

Command -> sudo systemctl restart ntp

- Mengkonfigurasi Ubuntu Server 2 sebagai NTP Client

Command -> sudo apt install ntpdate

Command -> sudo ntpdate

Command -> sudo nano /etc/ntp.conf

```
GNU nano 6.2 /etc/ntp.conf
# Specify one or more NTP servers.

# Use servers from the NTP Pool Project. Approved by Ubuntu Technical Board
# on 2011-02-08 (LP: #104525). See http://www.pool.ntp.org/join.html for
# more information.
#pool 0.ubuntu.pool.ntp.org iburst
#pool 1.ubuntu.pool.ntp.org iburst
#pool 2.ubuntu.pool.ntp.org iburst
#pool 3.ubuntu.pool.ntp.org iburst

# Use Ubuntu's ntp server as a fallback.
#pool ntp.ubuntu.com

# Access control configuration; see /usr/share/doc/ntp-doc/html/accpt.html for
# details. The web page <http://support.ntp.org/bin/view/Support/AccessRestrictions>
# might also be helpful.
#
# Note that "restrict" applies to both servers and clients, so a configuration
# that might be intended to block requests from certain clients could also end
# up blocking replies from your own upstream servers.

# By default, exchange time with everybody, but don't allow configuration.
restrict -4 default kod notrap nomodify nopeer noquery limited
restrict -6 default kod notrap nomodify nopeer noquery limited

# Local users may interrogate the ntp server more closely.
restrict 127.0.0.1
restrict ::1

# Needed for adding pool entries
restrict source notrap nomodify noquery

# Clients from this (example!) subnet have unlimited access, but only if
```

Mengkoneksikan ke Ubuntu Server 1 sebagai NTP Server

```
GNU nano 6.2 /etc/ntp.conf
# details. The web page <http://support.ntp.org/bin/view/Support/AccessRestrictions>
# might also be helpful.
#
# Note that "restrict" applies to both servers and clients, so a configuration
# that might be intended to block requests from certain clients could also end
# up blocking replies from your own upstream servers.

# By default, exchange time with everybody, but don't allow configuration.
restrict -4 default kod notrap nomodify nopeer noquery limited
restrict -6 default kod notrap nomodify nopeer noquery limited

# Local users may interrogate the ntp server more closely.
restrict 127.0.0.1
restrict ::1

# Needed for adding pool entries
restrict source notrap nomodify noquery

# Clients from this (example!) subnet have unlimited access, but only if
# cryptographically authenticated.
#restrict 192.168.123.0 mask 255.255.255.0 notrust

# If you want to provide time to your local subnet, change the next line.
# (Again, the address is an example only.)
#broadcast 192.168.123.255

# If you want to listen to time broadcasts on your local subnet, de-comment the
# next lines. Please do this only if you trust everybody on the network!
#disable auth
#broadcastclient
server 192.168.100.1 prefer iburst
```

Command -> sudo ufw allow 123/udp

Command -> sudo systemctl restart ntp

Verifikasi NTP

Command -> ntpq -p

- Ubuntu Server 1

```
ubuntu_server1@ubuntu1server1:~$ ntpq -p
      remote           refid      st t when poll reach   delay   offset  jitter
=====
127.0.0.1          .POOL.           16 p    -   64    0    0.000   +0.000   0.000
ntp.dinus.ac.id   .POOL.           16 p    -   64    0    0.000   +0.000   0.000
ntp.ubuntu.com    .POOL.           16 p    -   64    0    0.000   +0.000   0.000
+103.246.107.89   182.16.248.57    3 u   17   64   177    4.015  -14.644  13.360
-alphyn.canonica  132.163.96.1     2 u   27   64   177   251.216 +10.169  38.400
+185.125.190.56   194.121.207.249  2 u   25   64   177   213.038  -0.104  17.031
-185.125.190.57   201.68.88.106    2 u   25   64   177   216.912  +7.902   8.081
*185.125.190.58   86.23.195.30     2 u   23   64   177   232.330  -1.253  11.234
ubuntu_server1@ubuntu1server1:~$ _
```

- Ubuntu Server 2

```
ubuntu_server1@ubuntu2server2:~$ ntpq -p
      remote           refid      st t when poll reach   delay   offset  jitter
=====
ubuntu_server1   .INIT.           16 u    -  512    0    0.000   +0.000   0.000
ubuntu_server1@ubuntu2server2:~$
```