

# Uni Software Defined Infrastructure Notes

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# Introduction

Contributing

## Contributing

These study materials are heavily based on [professor Goik's "Software Defined Infrastructure" lecture at HdM Stuttgart](#).

**Found an error or have a suggestion?** Please open an issue on GitHub ([github.com/pojointfx/uni-sdi-notes](https://github.com/pojointfx/uni-sdi-notes)):



Figure 1: QR code to source repository

If you like the study materials, a GitHub star is always appreciated :)

License

# License



Figure 2: AGPL-3.0 license badge

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User



# User

```
ssh root@138.68.70.72  
adduser pojntfx  
usermod -aG sudo pojntfx  
su pojntfx
```

SSH

# SSH

```
sudo apt update
sudo apt install -y openssh-server
sudo systemctl enable --now ssh
mkdir -p ~/.ssh
chmod 700 ~/.ssh
curl 'https://github.com/poijntfx.keys' | tee -a ~/.ssh/authorized_keys
chmod 600 ~/.ssh/authorized_keys
exit
```

UFW

# UFW

```
ssh pojntfx@138.68.70.72
sudo apt update
sudo apt install -y ufw
sudo systemctl enable --now ufw
sudo ufw default deny incoming
sudo ufw default allow outgoing
sudo ufw allow OpenSSH
sudo ufw enable
```

APT

# APT

```
sudo apt update
sudo apt install -y unattended-upgrades

sudo vi /etc/apt/apt.conf.d/50unattended-upgrades # Now re
Unattended-Upgrade::Origins-Pattern {
    "origin=*";
}
Unattended-Upgrade::Automatic-Reboot "true";
Unattended-Upgrade::Automatic-Reboot-Time "02:00";

sudo dpkg-reconfigure unattended-upgrades # Answer with yes
sudo systemctl enable --now unattended-upgrades
sudo unattended-upgrades --debug # Test the configuration;
sudo reboot # If required
```

Cockpit



# Cockpit

```
echo 'deb http://deb.debian.org/debian bullseye-backports n
sudo apt update
sudo apt install -t bullseye-backports -y cockpit
```

Caddy

## Caddy

```
curl -L 'https://dl.cloudsmith.io/public/caddy/stable/gpg.l
curl -L 'https://dl.cloudsmith.io/public/caddy/stable/debia
sudo apt update
sudo apt install -y caddy
sudo tee /etc/caddy/Caddyfile <<EOT
{
    email felix@pojtinger.com
}

cockpit.felixs-sdi1.alphahorizon.io {
    reverse_proxy https://localhost:9090 {
        transport http {
            tls_insecure_skip_verify
        }
    }
}
EOT
sudo systemctl enable --now caddy
```

DNS

Manager

## Manager

```
sudo apt update
sudo apt install -y bind9 bind9utils
sudo systemctl enable --now named
```

```
sudo vi /etc/bind/named.conf.options # Now add the following
version "not currently available";
recursion yes;
querylog yes;
allow-transfer { none; };
allow-query { any; };
```

```
sudo tee -a /etc/bind/named.conf.local <<EOT
zone "example.pojtinger" {
    type master;
    file "/etc/bind/db.example.pojtinger";
    allow-query { any; };
    allow-transfer { 159.223.25.154; 2a03:b0c0:3:d0::10
};
```

Worker

## Worker

```
sudo apt update
sudo apt install -y bind9 bind9utils
sudo systemctl enable --now named
```

```
sudo vi /etc/bind/named.conf.options # Now add the following
version "not currently available";
recursion yes;
querylog yes;
allow-transfer { none; };
allow-query { any; };
```

```
sudo tee -a /etc/bind/named.conf.local <<EOT
zone "example.pojtinger" {
    type slave;
    file "db.example.pojtinger";
    allow-query { any; };
    masters { 138.68.70.72; 2a03:b0c0:3:d0::e34:5001; }
};
```



## Exercises

## Exercises

**Use the dig command to query A/CNAME/MX/NS records from various machines/domains of your choice. Then execute reverse lookups as well.**

```
# Get A/AAA records from manager server
```

```
$ dig +noall +answer @138.68.70.72 example.pojtinger A
```

```
example.pojtinger.      3600    IN      A        138.68.70.72
```

```
$ dig +noall +answer @138.68.70.72 example.pojtinger AAAA
```

```
example.pojtinger.      3600    IN      AAAA     2a03:b0c0:3
```

```
# Get A/AAAA records from worker server
```

```
$ dig +noall +answer @159.223.25.154 example.pojtinger A
```

```
example.pojtinger.      3600    IN      A        138.68.70.72
```

```
$ dig +noall +answer @159.223.25.154 example.pojtinger AAAA
```

```
example.pojtinger.      3600    IN      AAAA     2a03:b0c0:3
```

```
# Get NS record
```

```
$ dig +noall +answer @159.223.25.154 example.pojtinger NS
```

```
example.pojtinger      3600    IN      NS       ns1.example.pojtinger.
```