Welcome to

Network Management

Communication and Network Security 2019

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Slides are available as PDF, kramse@Github

7-Network-Management.tex in the repo security-courses

NTP Network Time Protocol

NTP opsætning

foregår typisk i `/etc/ntp.conf` eller `/etc/ntpd.conf`

det vigtigste er navnet på den server man vil bruge som tidskilde

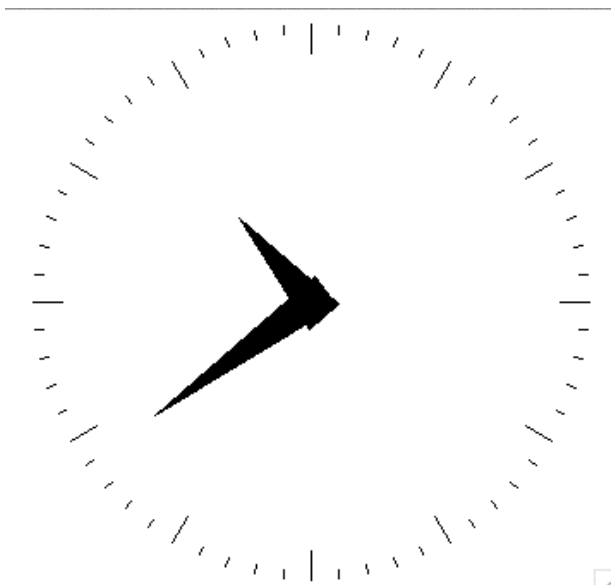
Brug enten en NTP server hos din udbyder eller en fra `http://www.pool.ntp.org/`

Eksempelvis:

```
server ntp.cybercity.dk

server 0.dk.pool.ntp.org
server 0.europe.pool.ntp.org
server 3.europe.pool.ntp.org
```

What time is it?



Hvad er klokken?

Hvad betydning har det for sikkerheden?

Brug NTP Network Time Protocol på produktionssystemer

What time is it? - spørg ICMP

ICMP timestamp option - request/reply

hvad er klokken på en server

Slayer icmpush - er installeret på server

viser tidstempel

```
#  icmpush -v -tstamp 10.0.0.12
ICMP Timestamp Request packet sent to 10.0.0.12 (10.0.0.12)

Receiving ICMP replies ...
fischer          -> 21:27:17
icmpush: Program finished OK
```

Stop - NTP Konfigurationseksempler

Vi har en masse udstyr, de meste kan NTP, men hvordan

Vi gennemgår, eller I undersøger selv:

- Airport
- Switche (managed)
- Mac OS X

BIND DNS server

Berkeley Internet Name Daemon server

Mange bruger BIND fra Internet Systems Consortium - altså Open Source

konfigureres gennem `named.conf`

det anbefales at bruge BIND version 9

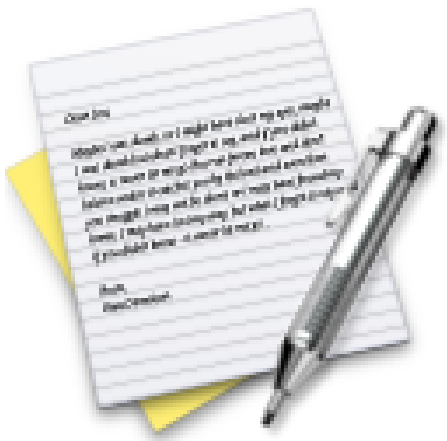
- *DNS and BIND*, Paul Albitz & Cricket Liu, O'Reilly, 4th edition Maj 2001
- *DNS and BIND cookbook*, Cricket Liu, O'Reilly, 4th edition Oktober 2002

Kilde: `http://www.isc.org`

BIND konfiguration - et udgangspunkt

```
acl internals { 127.0.0.1; ::1; 10.0.0.0/24; };
options {
        // the random device depends on the OS !
        random-device "/dev/random"; directory "/namedb";
        port 53; version "Dont know"; allow-query { any; };
};
view "internal" {
   match-clients { internals; };
   recursion yes;
   zone "." {
       type hint;   file "root.cache"; };
   // localhost forward lookup
   zone "localhost." {
        type master; file "internal/db.localhost";   };
   // localhost reverse lookup from IPv4 address
   zone "0.0.127.in-addr.arpa" {
        type master; file "internal/db.127.0.0"; notify no;   };
...
}
```

Exercise

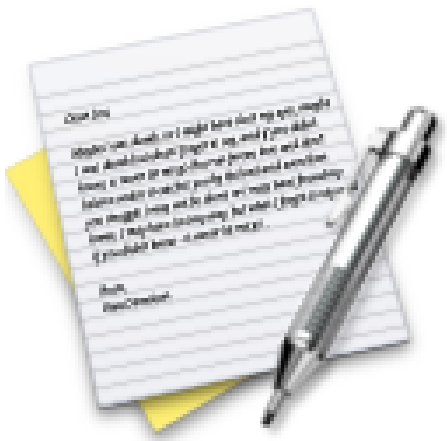


Now lets do the exercise

??

which is number **??** in the exercise PDF.

Exercise



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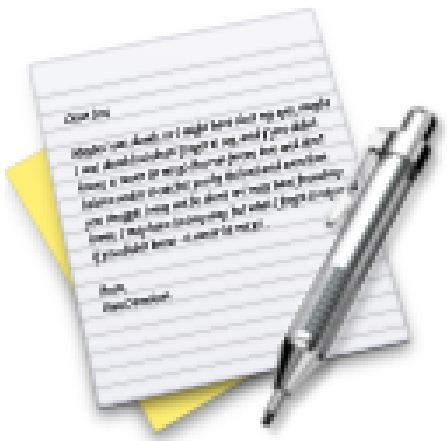

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Små DNS tools bind-version - Shell script

```
#! /bin/sh
# Try to get version info from BIND server
PROGRAM=`basename $0`
. `dirname $0`/functions.sh
if [ $# -ne 1 ]; then
   echo "get name server version, need a target! "
   echo "Usage: $0 target"
   echo "example $0 10.1.2.3"
   exit 0
fi
TARGET=$1
# using dig
start_time
dig @$1 version.bind chaos txt
echo Authors BIND er i versionerne 9.1 og 9.2 - måske ...
dig @$1 authors.bind chaos txt
stop_time
```

http://www.kramse.dk/files/tools/dns/bind-version

Små DNS tools dns-timecheck - Perl script

```
#!/usr/bin/perl
# modified from original by Henrik Kramshøj, hlk@kramse.dk
# 2004-08-19
#
# Original from: http://www.rfc.se/fpdns/timecheck.html
use Net::DNS;

my $resolver = Net::DNS::Resolver->new;
$resolver->nameservers($ARGV[0]);

my $query = Net::DNS::Packet->new;
$query->sign_tsig("n","test");

my $response = $resolver->send($query);
foreach my $rr ($response->additional)
  print "localtime vs nameserver $ARGV[0] time difference: ";
  print$rr->time_signed - time() if $rr->type eq "TSIG";
```

http://www.kramse.dk/files/tools/dns/dns-timecheck

DHCPD server

Dynamic Host Configuration Protocol Server

Mange bruger DHCPD fra Internet Systems Consortium
`http://www.isc.org` - altså Open Source

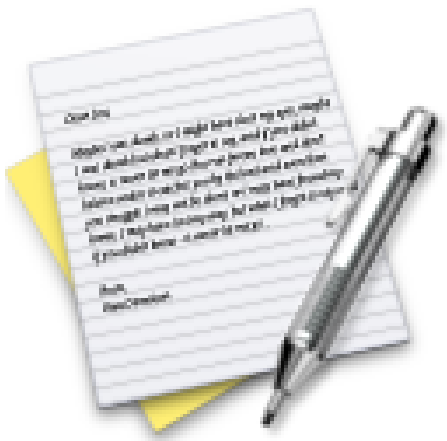
konfigureres gennem `dhcpd.conf` - næsten samme syntaks som BIND

DHCP er en efterfølger til BOOTP protokollen

```
ddns-update-style ad-hoc;

shared-network LOCAL-NET {
    option  domain-name "security6.net";
    option  domain-name-servers 212.242.40.3, 212.242.40.51;
    subnet 10.0.42.0 netmask 255.255.255.0 {
            option routers 10.0.42.1;
            range 10.0.42.32 10.0.42.127;
    }
}
```

Exercise



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Logfiler

Logfiler er en nødvendighed for at have et transaktionsspor

Logfiler giver mulighed for statistik

Logfiler er desuden nødvendige for at fejlfinde

Det kan være relevant at sammenholde logfiler fra:

- routere
- firewalls
- webservere
- intrusion detection systemer
- adgangskontrolsystemer
- ...

Husk - tiden er vigtig! Network Time Protocol (NTP) anbefales

Husk at logfilerne typisk kan slettes af en angriber - hvis denne får kontrol med systemet