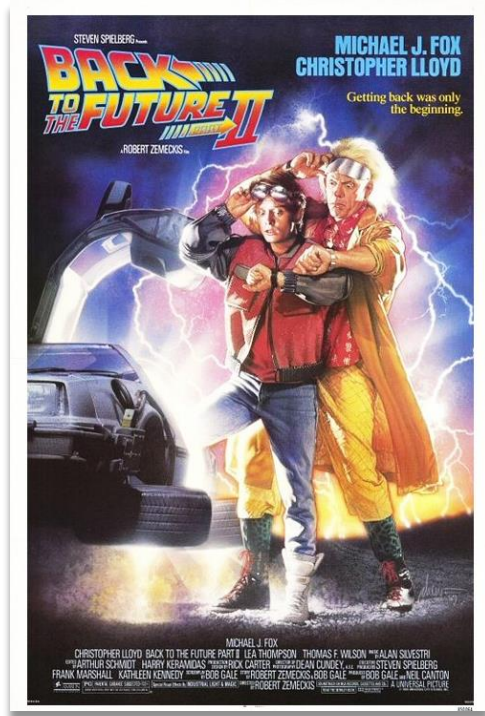


All about Time

OR HOW TO STOP FROM GOING BACK TO THE FUTURE...

About me

- ▶ A Linux user from ~2003
- ▶ Currently using Ubuntu.
- ▶ Previously used Redhat, Gentoo, Arch, Debian
- ▶ this presentation will be posted on
<http://denner.co>
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The future is now...

So lets talk about time!



“A man with a watch knows what time it is. A man with two watches is never sure.”

Segal's law

NTP

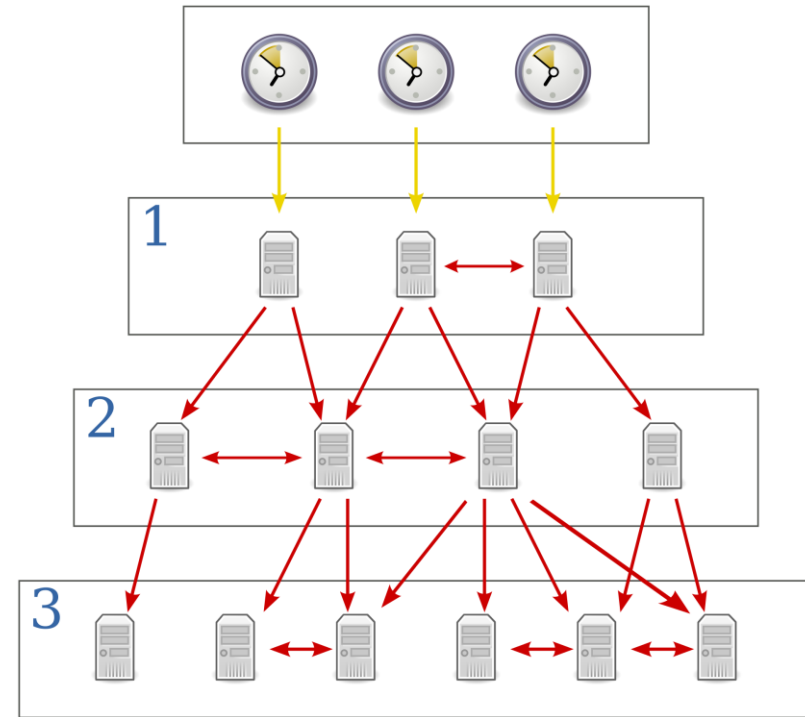
THE NETWORK TIME
PROTOCOL

Network Time Protocol

- ▶ Time in a networked environment is important
 - ▶ Built in clock will drift
 - ▶ Needed for comparing logs
 - ▶ Authentication (Kerberos)
- ▶ History
 - ▶ One of the oldest protocols... since 1985
 - ▶ Originally developed by David L Mills, he still oversees development
 - ▶ Reference implementation open source run by Harlan Stenn
- ▶ Usually good enough for ~10 ms or less (much less if local network)

But where does NTP get it's time from?

- ▶ Stratum 0
 - ▶ Atomic Clocks, GPS, Radio Clock, etc.
 - ▶ Reference clock, very accurate
- ▶ Stratum 1
 - ▶ Computer who's clock is synced to stratum 0 within a few micro seconds
- ▶ Stratum 2
 - ▶ Synchronized to stratum 1 and peered with other Stratum 2 servers
- ▶ Upper limit is Stratum 15, 16 means an unsynchronized device



Servers

- ▶ NIST
 - ▶ ***time.nist.gov***
 - ▶ Others listed at <http://tf.nist.gov/tf-cgi/servers.cgi>
- ▶ NTP pool (<http://www.pool.ntp.org>)
 - ▶ 0.us.pool.ntp.org 0,1,2,3
- ▶ OS provided servers
 - ▶ i.e. time.Ubuntu.com
- ▶ Other Local server
 - ▶ Ask your network admin

How? Edit your `/etc/ntp.conf`

- ▶ Add the server names you want:
 - ▶ `server 0.pool.ntp.org`
 - ▶ `server 1.pool.ntp.org`
 - ▶ `server 2.pool.ntp.org`
 - ▶ `server 3.pool.ntp.org`

```
adenner@li1117-82:~$ ntpq -p
      remote           refid      st t when poll reach   delay   offset  jitter
=====
+time-b.timefreq .ACTS.        1 u   367 1024   177   15.527  -0.128  13.471
-unassigned.v6.y .CDMA.        1 u    34 1024   377   36.457   7.433   1.090
*min-time-01.ine .GPS.         1 u   332 1024   377   27.235  -2.259   0.662
+gps.layer42.net .GPS.         1 u  1075 1024   377   43.092  -1.462   9.751
adenner@li1117-82:~$
```

More information

- ▶ <https://help.ubuntu.com/community/UbuntuTime>
- ▶ <https://www.freebsd.org/doc/handbook/network-ntp.html>
- ▶ <http://www.pool.ntp.org/en>
- ▶ https://en.wikipedia.org/wiki/Network_Time_Protocol
- ▶ http://www.informationweek.com/it-life/ntps-fate-hinges-on-father-time/d/d-id/1319432?cmp=em%2Dprog%2Dna%2Dna%2Dnewsltr%5F20150313%5Fcontrol&imm_mid=0ce65e