dns

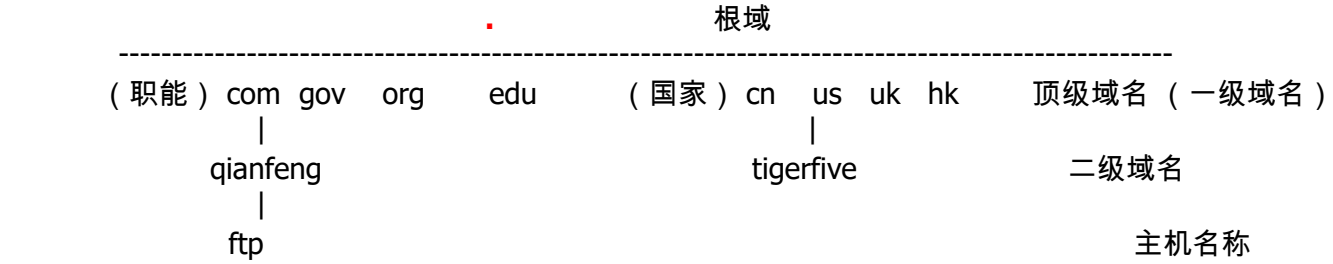
dns基础

域名解析
DNS(domain name system)
解析方式
1.本地解析
/etc/hosts
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
::1 localhost localhost.localdomain localhost6 localhost6.localdomain6

2.使用DNS服务器 domain name server/service/system
了解：解析方式先后顺序 nsswitch.conf

客户端设置(指定)DNS:
#vim /etc/resolv.conf

域名空间



ftp:qianfeng.com
ftp是主机名称
qianfeng.com 域名

FQDN
Fully Qualified Domain Name 完全合格域名,比如:www.baidu.com.

查询方式
1.递归查询 直接把结果给客户端
2.迭代查询 如果知道结果，把结果告诉客户端，如果不知道结果会把查询转发到下一台DNS服务器

缓存dns服务器

域名服务器的权威性:
权威名称服务器
有区域配置文件
非权威名称服务器
cache only

dns解析过程
www.hotyq.com
client拿到域名之后，首先访问/etc/hosts 文件

/etc/resolv.conf 里边记录dns 202.106.0.20
根
com
hotyq

DNS服务器知识点:
SOA 记录:起始授权记录
NS 记录:指定管理某一个域的服务器是谁子域授权
A 记录:正向解析 把域名解析成ip
PTR 记录:反向解析 (自己作实验) 为保证mail服务器的安全性
MX 记录:指定邮件服务器 会添加A记录
CNAME:别名
泛域名解析

负载均衡

主从
主DNS master
有自己的区域配置文件
从DNS slave
没有自己的区域配置文件,他的区域配置文件是从主DNS缓存过来的
只缓存
也是一台dns,没有自己的区域配置文件
转发
有自己的区域配置文件,如果收到自己解析不了的请求会转发到其他DNS
子域授权(了解)
View 视图(了解)

根DNS服务器

全球**13** 台**DNS** 根服务器分布 :
美国VeriSign 公司 2 台
网络管理组织IANA(Internet Assigned Number Authority) 1 台
欧洲网络管理组织RIPE-NCC(Resource IP Europeens Network Coordination Centre)1 台
美国PSINet 公司 1 台
美国ISI(Information Sciences Institute) 1 台
美国ISC(Internet Software Consortium) 1 台
美国马里兰大学(University of Maryland) 1 台
美国太空总署(NASA) 1 台
美国国防部 1 台
美国陆军研究所 1 台
挪威NORDUnet 1 台
日本WIDE(Widely Integrated Distributed Environments)研究计划 1 台

配置dns服务器

环境：
主DNS服务器:
主机名称:wing.qianfeng.com
ip地址:192.168.245.130

从DNS服务器/转发器/cache only:
主机名称:master.sina.com
ip地址:192.168.245.130
安装软件: (bind包漏洞较多，去官网下载最新的)DNS漏洞较多，
bind 主包
bind-utils 客户端测试工具（host 、dig 、nslookup ）
bind-chroot chroot环境 禁锢dns服务器的工作目录
caching-nameserver(rhel5提供模板文本，缓存服务) rhel6不需要

启动服务:
systemctl start named-chroot //wing提示:注意不要在工作目录下,否则后果很严重
systemctl start named-chroot-setup
systemctl start named

工作目录:（chroot的作用）
/var/named/chroot/etc 存放主配置文件（指定区域配置文件的作用）
/var/named/chroot/var/named 区域配置文件 （用来做解析）

主配置文件:
```
[root@wing etc]# cat named.conf
options {
        directory "/var/named";
};
zone "qianfeng.com." IN {
        type master;
        file "qianfeng.com.zone";
};
zone "245.168.192.in-addr.arpa" IN {                    //红色部分不能随便写,必须一样
        type master;
        file "192.168.245.arpa";
};
```

区域配置文件
正向区域配置文件:
```
[root@wing named]# cat qianfeng.com.zone
$TTL 86400                                              ;缓存时间
@ IN SOA wing.qianfeng.com. root.qianfeng.com (
                                                        100000000
                                                        3H
                                                        15M
                                                        1W
                                                        1D)                                     ;起
始授权记录
                                        IN NS wing.qianfeng.com.        ;NS记录
wing                                IN A  192.168.245.130

www.qianfeng.com.               IN A 192.168.245.222            ;正向解析

ftp.qianfeng.com.           IN CNAME www.qianfeng.com.      ;别名
wenku.qianfeng.com.     IN CNAME www.qianfeng.com.
video.qianfeng.com.     IN CNAME www.qianfeng.com.
```

```
www.qianfeng.com.        IN A  172.16.70.80                    ;多域名指定同一IP
ftp.qianfeng.com.         IN A  172.16.70.80
wenku.qianfeng.com.      IN A  172.16.70.80

www.qianfeng.com.         IN A  172.16.70.80                     ;负载均衡
www.qianfeng.com.         IN A  172.16.70.81
www.qianfeng.com.         IN A  172.16.70.82

*                          IN  A   www.up.com.                    ;泛域名解析

mail1.qianfeng.com.       IN A  172.16.70.80
mail2.qianfeng.com.       IN A  172.16.70.81
qianfeng.com.              IN  MX  10  mail1.qianfeng.com.       ;邮件交换记录
qianfeng.com.              IN  MX  11  mail2.qianfeng.com.
```

反向区域配置文件:

```
[root@wing named]# cat 192.168.245.arpa
$TTL 86400
@ IN SOA wing.qianfeng.com. root.qianfeng.com (
                                100000000
                                3H
                                15M
                                1W
                                1D)
                               IN NS wing.qianfeng.com.
130                 IN PTR wing.qianfeng.com.
```

(主机位)

解析测试:

A记录测试:

```
[root@wing named]# host -t a www.qianfeng.com
www.qianfeng.com has address 192.168.245.222
```

PTR记录测试:

```
[root@wing named]# host -t ptr 192.168.245.130
130.245.168.192.in-addr.arpa domain name pointer wing.qianfeng.com.
```

别名测试:

```
[root@wing named]# host -t a ftp.qianfeng.com
ftp.qianfeng.com is an alias for www.qianfeng.com.
www.qianfeng.com has address 192.168.245.222
```

负载均衡测试:

```
[root@wing named]# host -t a www.qianfeng.com
www.qianfeng.com has address 192.168.245.224
www.qianfeng.com has address 192.168.245.222
www.qianfeng.com has address 192.168.245.223
```

泛域名解析测试:

```
[root@wing named]# host -t a ww.qianfeng.com
ww.qianfeng.com has address 192.168.245.222
```

MX记录测试:

```
# host -t mx qianfeng.com
qianfeng.com mail is handled by 11 mail2.qianfeng.com.
qianfeng.com mail is handled by 10 mail1.qianfeng.com.
```

配置文件详解

主配置文件:

```
[root@tigerfive etc]# cat named.conf
options {
        directory "/var/named";
};
zone "tigerfive.cn." IN {
        type master;
        file "qianfeng.com.zone";        //区域配置文件的名称
};
zone "245.168.192.in-addr.arpa" IN {
        type master;
        file "192.168.245.arpa";
};
```

区域配置文件

正向区域配置文件:

```
vim /var/named/chroot/var/named/   tigerfive.cn.zone
$TTL 86400                                                    ;缓存时间（86400秒即一天，ping的时候的TTL是指多少跳，最多64 ）
@ IN SOA tiger-vm1.tigerfive.cn. root.tigerfive.cn (
            100000000          序列号主从DNS用到的，每次更新一次主配置文件序列号，从服务器检查自己的序列号，如果序列号不同，就更新配置文件
            3H                 多久进行一次主从序列号检查,默认三个小时
                               15M                ；retry  ，如果没有更新成功，就15分钟尝试更新一次
                               1W                 ；week如果没有更新成功就还能为客户端提供一周的服务
                               1D)                ；缓存一天                    ;起始授权记录
            IN NS  tiger-vm1.tigerfive.cn.      ;NS记录    指定管理的某个域是谁，或者授权。 必须有这条记录。(不能定格写，因为前面顺延一个主机名)
tiger-vm1     IN A   10.18.44.109                ; A 记录    正向解析 主机名的地方(tiger-vm1.tigerfive.cn. 之所以不写是因为顺延上边的@)
tiger-vm2     IN A   10.18.44.128
tiger-vm3     IN A   10.18.44.202
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
ftp.qianfeng.com.          IN CNAME www.qianfeng.com.      ;别名
wenku.qianfeng.com.      IN CNAME www.qianfeng.com.
video.qianfeng.com.       IN CNAME www.qianfeng.com.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
www.qianfeng.com.        IN A  172.16.70.80                ;多域名指定同一IP
ftp.qianfeng.com.          IN A  172.16.70.80
wenku.qianfeng.com.      IN A  172.16.70.80
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
ftp.qianfeng.com.       IN A  172.16.70.80                ;负载均衡
ftp.qianfeng.com.       IN A  172.16.70.81
ftp.qianfeng.com.       IN A  172.16.70.82
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*                          IN  A   www.up.com.              ;泛域名解析
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
mail1.qianfeng.com.       IN A  172.16.70.80
mail2.qianfeng.com.       IN A  172.16.70.81
qianfeng.com.              IN  MX  10  mail1.qianfeng.com.       ;邮件交换记录
qianfeng.com.              IN  MX  11  mail2.qianfeng.com.
```

~~~~~~
反向区域配置文件:
[root@wing named]# cat 192.168.245.arpa
$TTL 86400
@ IN SOA wing.qianfeng.com. root.qianfeng.com (
                                        100000000
                                        3H
                                        15M
                                        1W
                                        1D)
                                       IN NS wing.qianfeng.com.
130   IN PTR wing.qianfeng.com.
~~~~~~
只缓存 cache only   没有自己的区域配置文件
vim /var/named/chroot/etc/named.conf

options {
    recursion yes;
    forward only;
    forwarders {10.18.44.109};   //从那缓存
};
~~~~~~
vim /var/named/chroot/etc/named.conf
转发器   ：有请求先转发给别人,没有在查找自己,有自己的区域配置文件
options {
    recursion yes;
    forward first;
    forwarders {10.18.44.109};   //转发到那去
};
~~~~~~
vim /var/named/chroot/var/named/*.zone
~~~~~~

主从DNS

主：负责更新区域配置文件
从：下载更新以后区域配置文件，他本身没有区域配置文件

注意：两台机器时间同步
iptables selinux 关闭

        主   从
10.18.44.109   10.18.44.128

配置：
    主：
        options {
            directory "/var/named";
         };

        zone "tigerfive.cn." IN {
        type master;
        file "tigerfive.cn.zone";
        notify yes;   //允许通知
        allow-query { 10.18.44.128; };   //只允许44.128这台客户端访问dns
        ~~allow-transfer { 172.16.70.68; };~~
        };

        区域配置文件需要添加一条从服务器的NS记录和A记录
        $TTl 86400
~~~~~~

```
@ IN SOA tigerfive.cn.  root.tigerfive.cn(
                        2017122200
                        3H
                        15M
                        1W
                         1D)
                            IN  NS  dns.tigerfive.cn.
dns.tigerfive.cn.  IN  A    10.18.44.128
```

从:两种写法

第一种写法:

```
options {
    directory "/var/named";
};
zone "tigerfive.cn." IN {
type slave;
file "dns.tigerfive.cn.zone";
masters { 10.18.44.109; };
};
```

第2种写法:(没测试)

```
zone "tigerfive.cn." IN {
type slave;
file "dnss/dns.tigerfive.cn.zone";
masters { 172.16.70.88; };
};
```

!!!!给/var/named/chroot/var/ w权限 -R还要第归

==========

序列号

master slave

zone100000 zone100000

当slave发现自己的序列号和master不同就会更新自己的配置文件，默认三个小时对比一次

==========

dns服务器的高级特性

转发器和**cache only**

环境:

角色:DNS转发(转发器) ,有自己的区域配置文件

IP地址:10.18.44.109(开转发)

主机名称:tiger-vm1.tigerfive.cn

区域解析:tigerfive.cn

角色:正常权威DNS服务器

IP地址:10.18.44.128

主机名称:tiger-vm2.tigerfive.cn

区域解析:tigerfive.cn

配置:只需要在需要开转发的DNS服务器10.18.44.109上修改主配置文件

```
# cat named.conf
options {
        directory "/var/named";
        recursion yes;
        forward first;
        forwarders { 10.18.44.128; };
};
zone "sina.com." IN {
        type master;
        file "sina.com.zone";
};
```

转发器:

在options内添加:

```
recursion yes;    //开递归，默认是开启状态
forward first;
forwarders { 172.16.70.88; };
```

cache only(只缓存DNS): 没有区域配置文件

在options内添加:

```
forward only;
forwarders { 172.16.70.88; };
```

==========

主从**DNS**

主：负责更新区域配置文件

从：下载更新以后区域配置文件，他本身没有区域配置文件

注意：两台机器时间同步

iptables selinux 关闭

主	从
172.16.70.88	172.16.70.68

配置：

主：

```
zone "up.com." IN {
type master;
file "up.com.zone";
notify yes;                                    //允许通知
allow-query { 172.16.70.68; };   //只允许70.68这台客户端访问dns
allow-transfer { 172.16.70.68; };
};
```

区域配置文件需要添加一条从服务器的NS记录和A记录

```
                IN  NS  dns.up.com.
dns.up.com.  IN  A    172.16.70.68
```

从:两种写法

第一种写法:

```
options {
};
zone "up.com." IN {
type slave;
file "slave.up.com.zone";
masters { 172.16.70.88; };
};
```

第2种写法:

```
zone "up.com." IN {
type slave;
file "slaves/slave.up.com.zone";
masters { 172.16.70.88; };
};
--------------------------------
```

给/var/named/chroot/var/ w权限 -R还要第归

主从加密(了解)

制作密钥：

```
#dnssec-keygen -a HMAC-MD5 -b 128 -n HOST wingkey
# cat Kwingkey.+157+62977.key
  wingkey. IN KEY 512 3 157 paluPukUec2uvZRpuGR+Dg==
```

注意：如果密钥中有"/"需要把"/"去掉

主：配置

```
key wingkey {                    //key的定义
algorithm  HMAC-MD5;
secret     paluPukUec2uvZRpuGR+Dg==;
};

zone "up.com." IN {
        type master;
        file "up.com.zone";
        allow-transfer { key wingkey; };     //key的使用
};
```

从： 配置

```
key wingkey {                    //key的定义
algorithm  HMAC-MD5;
secret     paluPukUec2uvZRpuGR+Dg==;
};
zone "up.com." IN {
        type slave;
        file "slaves/slave.up.com.zone";
        masters { 172.16.70.88 key wingkey; };     //key的使用
};
```

==========

视图（view） 智能DNS

拓扑结构：

```
172.16.70.70                  电信区域配置文件        172.16.70.89
client1                       dian.up.com.zone       www.up.com(dianxin)
                172.16.70.71
                   dns
                172.16.80.71
client2                       wang.up.com.zone       www.up.com(wangtong)
172.16.80.70                  电信区域配置文件        172.16.80.2
```

dns视图配置

主配置文件：

```
acl dianxin { 172.16.70.0/24;172.16.71.0/24; };
acl wangtong { 172.16.80.0/24;172.16.81.0/24; };

view dian {
```

```
        match-clients { dianxin; };
        zone "up.com." IN {
        type master;
        file "dian.up.com.zone";
        };
};
view wang {
        match-clients { wangtong; };
        zone "up.com." IN {
        type master;
        file "wang.up.com.zone";
        };
};
view qita {
        match-clients { any; };
        zone "up.com." IN {
        type master;
        file "wang.up.com.zone";
        };
};
```

区域配置文件：

```
==> /var/named/chroot/var/named/dian.up.com.zone <==
$TTL 86400
@ IN SOA dns.up.com. root.up.com ( 10000 3H 15M 1W 1D )
                        IN NS dns.up.com.
dns.up.com.     IN A  172.16.70.71
www.up.com.       IN A  172.16.70.89

==> /var/named/chroot/var/named/wang.up.com.zone <==
$TTL 86400
@ IN SOA dns.up.com. root.up.com ( 10000 3H 15M 1W 1D )
                        IN NS dns.up.com.
dns.up.com.     IN A  172.16.80.71
www.up.com.       IN A  172.16.80.90
```

==========

授权

```
video.up.com.            IN  NS      dns.video.up.com.
dns.video.up.com.        IN  A       172.16.70.88
```

现在申请的是video域，需要在上级域up进行授权

根域：

```
zone "." IN {
   type hint;
   file "named.ca";
};
```

本地127解析

```
zone "localhost.localdomain" IN {
        type master;
        file "named.localhost";
        allow-update { none; };
};

zone "localhost" IN {
```

```
        type master;
        file "named.localhost";
        allow-update { none; };
};

zone "1.0.0.127.in-addr.arpa" IN {
        type master;
        file "named.loopback";
        allow-update { none; };
};

include "named.ca";
```

排错

c/s架构
client server
b/s架构
browser server

1.防火墙/selinux
  硬件防火墙/云安全
  端口转发 地址转发 统计服务流量

  安全和性能成反比

  100G网卡
  100000M
   (OPA)

2.配置
    权限
    配置文件
        空格
        . " ' `
        顶格
3.网络能否通

4.服务状态

5.看错误日志
    启动服务的时候
        #systemctl status 服务名称 -l
    看/var/log/messages和服务本身的独立日志

6.问问题
   干什么

7.配置

联通电信网段

联通
110.16.0.0/14 110.52.0.0/15 110.6.0.0/15 110.72.0.0/15 112.109.128.0/17 112.111.0.0/16 112.122.0.0/15
112.132.0.0/16 112.192.0.0/14 112.224.0.0/11 112.64.0.0/15 112.80.0.0/13 112.88.0.0/13 112.96.0.0/15
113.0.0.0/13 113.194.0.0/15 113.200.0.0/15 113.204.0.0/14 113.224.0.0/12 113.56.0.0/15 113.58.0.0/16
113.59.0.0/17 113.8.0.0/15 114.240.0.0/12 115.46.0.0/16 115.48.0.0/12 115.85.192.0/18 116.112.0.0/14
116.116.0.0/15 116.2.0.0/15 116.95.0.0/16 117.8.0.0/13 118.212.0.0/16 118.72.0.0/13 118.80.0.0/15
119.108.0.0/15 119.112.0.0/13 119.162.0.0/15 119.164.0.0/14 119.176.0.0/12 119.248.0.0/14 119.36.0.0/16
119.39.0.0/16 119.4.0.0/14
119.48.0.0/13 119.62.0.0/16 120.0.0.0/12 120.80.0.0/13 121.16.0.0/13 121.24.0.0/14 121.28.0.0/15
121.30.0.0/16 121.31.0.0/16 122.136.0.0/13 122.156.0.0/14 122.192.0.0/14 122.96.0.0/15 123.112.0.0/12
123.128.0.0/13 123.138.0.0/15 123.144.0.0/14 123.148.0.0/16 123.152.0.0/13 123.188.0.0/14 123.232.0.0/14
123.4.0.0/14 123.8.0.0/13 124.128.0.0/13 124.160.0.0/16 124.161.0.0/16 124.162.0.0/16 124.163.0.0/16
124.164.0.0/14 124.64.0.0/15 124.66.0.0/17 124.67.0.0/16 124.88.0.0/16 124.89.0.0/17 124.89.128.0/17
124.90.0.0/15 124.92.0.0/14 125.211.0.0/16 125.32.0.0/16 125.33.0.0/16 125.34.0.0/16 125.35.0.0/17
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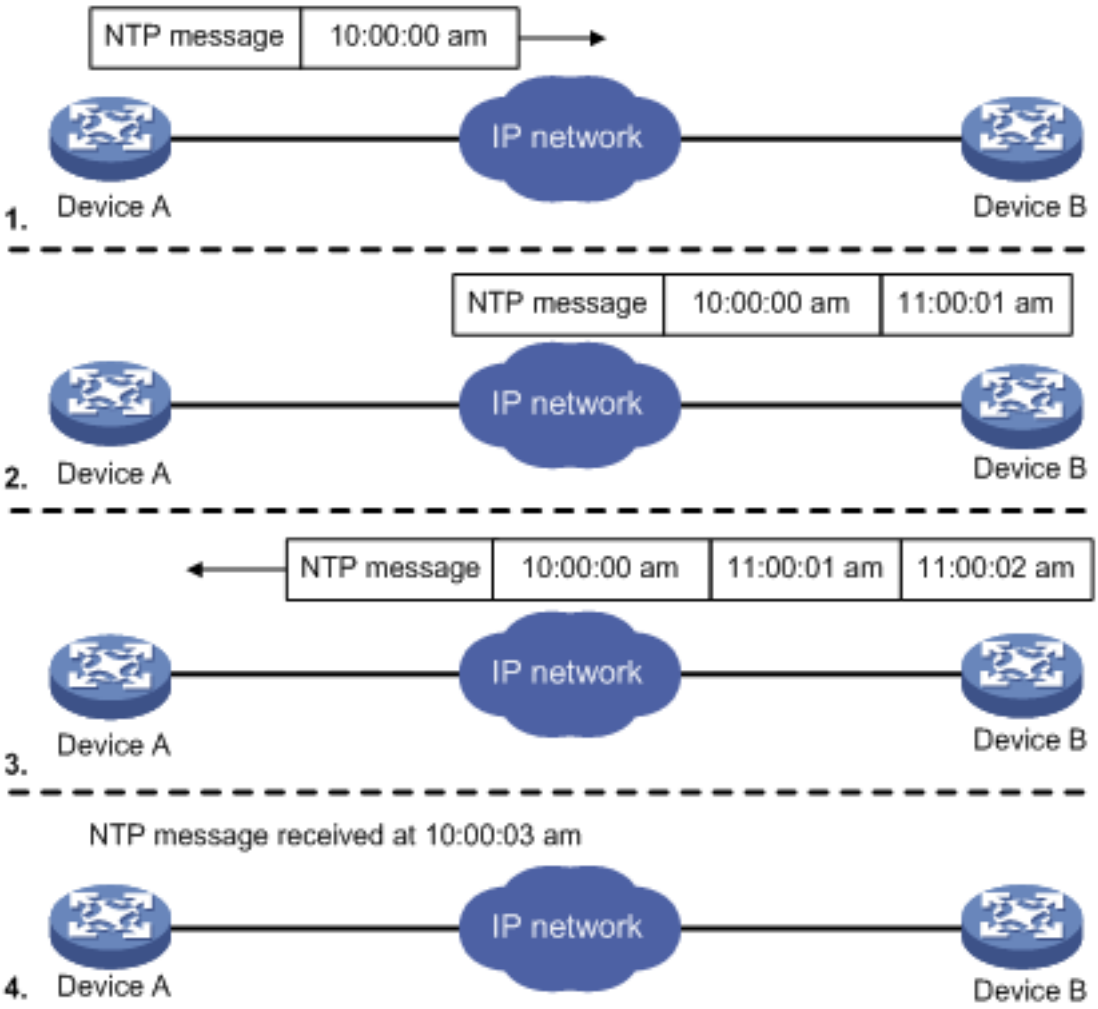
ntp(扩展)

NTP服务器
工作原理：



1、 Device A发送一个NTP报文给Device B，该报文带有它离开Device A时的时间戳，该时间戳为10:00:00am（T1）。
2、 当此NTP报文到达Device B时，Device B加上自己的时间戳，该时间戳为11:00:01am（T2）。
3、 当此NTP报文离开Device B时，Device B再加上自己的时间戳，该时间戳为11:00:02am（T3）。
4、 当Device A接收到该响应报文时，Device A的本地时间为10:00:03am（T4）。
5、 至此，Device A已经拥有足够的信息来计算两个重要的参数：
6、 NTP报文的往返时延Delay=（T4-T1）-（T3-T2）=2秒。
7、 Device A相对Device B的时间差offset=（（T2-T1）+（T3-T4））/2=1小时

安装软件：
[root@wing_ntp ~]# rpm -qa | grep ntp
ntp-4.2.2p1-9.el5_4.1

配置NTP服务器（假定本地服务器地址为：192.168.1.103）
NTP server的主配置文件:/etc/ntp.conf

ntp.conf文件部分选项说明
a. restrict管理权限控制
格式： restrict [需权限控制的IP] mask [netmask_IP] [parameter]
参数：
ignore 拒绝所有类型的 NTP 连线；
nomodiy 用户端不能更改 NTP 服务器的时间参数，这即表示用户端不能使用 ntpc 与 ntpq 这两个程序来修改服务器。 但用户端仍可透过这部主机来进行网路校时；
noquery 用户端不能夠使用 ntpq, ntpc 等指令来查询时间服务器，等于不提供 NTP 的网路校时；
notrap 不提供 trap 这个远端事件登录 (remote event logging) 的功能。
notrust 拒绝没有认证的用户端

注：那如果沒有在 parameter 的地方加上任何参数，表示『该 IP 或网段不受任何限制』意思
b． server设置上层NTP服务器
格式： server [IP or 主机名] [perfer]
参数：
perfer 表示"优先使用"的主机
c． fudge设置NTP服务器时间通告发送的stratum级别

注：Stratum：系统时钟的层数，取值范围为1～16，它定义了时钟的准确度。层数为1的时钟准确度最高，准确度从1到16依次递减，层数为16的时钟处于未同步状态，不能作为参考时钟。

举例：
#本地IP不受任何限制
restrict 127.0.0.1

#上层NTP服务器地址，优先使用61.129.42.44
server 61.129.42.44 prefer
server time.nist.gov

#內定的一个內部时间资料
server 127.127.1.0 # local clock
fudge 127.127.1.0 stratum 10

#时间差异分析的参数，记录上次的NTP server与上层NTP server联接所花费的时间
driftfile /var/lib/ntp/drift

#暂时不会使用的keys相关认证功能
keys /etc/ntp/keys

服务启动及查看方法：
启动NTP服务器:
#/etc/init.d/ntpd start
查看方法（主要是UDP数据包，且端口为123）：
#netstat –tlunp
或者
[root@wing_ntp ~]# lsof -i:123
COMMAND PID USER FD TYPE DEVICE SIZE NODE NAME
ntpd 10648 ntp 16u IPv4 40258 UDP *:ntp
ntpd 10648 ntp 17u IPv6 40259 UDP *:ntp
ntpd 10648 ntp 18u IPv6 40260 UDP localhost6.localdomain6:ntp
ntpd 10648 ntp 19u IPv6 40261 UDP [fe80::20c:29ff:feb2:f41c]:ntp
ntpd 10648 ntp 20u IPv4 40262 UDP localhost.localdomain:ntp
ntpd 10648 ntp 21u IPv4 40263 UDP wing_ntp.up.com:ntp

相关知识：

1、 系统时间：Linux 自己的系统时间。开机后，主动从BIOS中读取。
2、 BIOS时间：BIOS中记录的实际时间。
3、 Date和hwclock命令
a. Date命令：仅修正linux系统时间，不更新BIOS时间
命令格式：date MMDDhhmmYYYY
MM：月份 DD：日期 hh：小时 mm：分钟 YYYY：年
b. Hwlock命令：将当前Linux系统时间写入BIOS或读取BIOS时间
命令格式：hwclock [-rw]
-r：读出目前BIOS內的时间参数
-w：将当前Linux系统时间入BIOS中

4、客户端时间同步命令ntpdate

命令格式：ntpdate [-nv][NTP服务器IP/主机名]

注意事项：

a. 客户端执行并完成时间同步操作后，需执行hwclock命令写入BIOS

b. 在ntp server上重新启动ntp服务后，ntp server自身或者与其server的同步的需要一个时间段，这个过程可能是5分钟，在这个时间之内在客户端运行ntpdate命令时会产生no server suitable for synchronization found的错误

c. NTP服务器不可使用ntpdate命令。即：ntpdate与ntpd不能同时启用。

5、利用crontab来执行

```
#crontab -e
*/10 * * * * /usr/sbin/ntpdate 192.168.1.103 >> /root/ntpdate.log
```

6、几个可以使用（不保证，具体能用否还得看电信的心情）的NTP服务器：

- 133.100.11.8 prefer
- 210.72.145.44
- 203.117.180.36
- 131.107.1.10
- time.asia.apple.com
- 64.236.96.53
- 130.149.17.21
- 66.92.68.246
- 18.145.0.30
- clock.via.net
- 137.92.140.80
- 133.100.9.2
- 128.118.46.3
- ntp.nasa.gov
- 129.7.1.66ntp-sop.inria.frserver
- 210.72.145.44(中国国家授时中心服务器IP地址)
- ntp.sjtu.edu.cn (上海交通大学网络中心NTP服务器地址）
- 202.120.2.101 (上海交通大学网络中心NTP服务器地址）