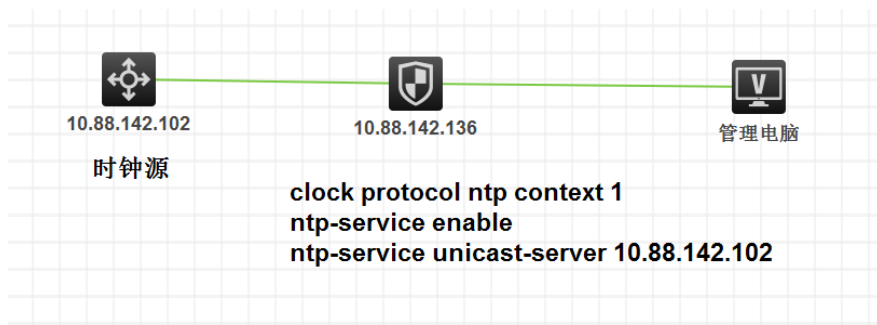


组网及说明

以实验室设备测试，逻辑组网如下：



问题描述

- 1、NTP时钟同步的时间是时钟源的当前时间，还是UTC零时区时间？
- 2、网络设备上抓包，报文中是否带有时间戳，或者报文中的时间该有谁来决定？
- 3、时钟源，与client上dis clock时间一致，如果在client上抓包发现时间总是差8小时的倍数可能是什么原因，该如何排查、怎样规范配置避免？

过程分析

Q: NTP时钟同步的时间是时钟源的当前时间，还是UTC零时区时间？
 A: NTP同步时钟源的UTC 0时区时间，即使时钟源为东八区时间12:00，client仍然会同步0时区时间4:00。

Q: 网络设备上抓包，报文中是否带有时间戳，或者报文中的时间该有谁来决定？
 A: 常规报文在网络设备上转发不带时间戳，在一台设备上抓包，报文的时间就是该设备上的时间，非常规报文有些是日志类型报文会带有时间戳。

解决方法

测试结果：

- (1) NTP同步时钟源的UTC 0时区时间
时钟源UTC时间为12.14 18:37，东八区Beijing时间为12.15 02:37

```
<H7B7-R1-S5130-PWR>dis clock
02:37:47.152 Beijing Fri 12/15/2000
Time Zone : Beijing add 08:00:00
```

client同步的时间为12.17 18:27

```
[H7B7-R1-F1060-IRF]dis ntp sessions
*****
source          reference      stra reach poll now offset  delay disper
*****
[25]LOCAL(0)    127.127.1.0   7 255 64 28 0.0000 0.0000 0.9155
[12345]10.88.142.102 127.127.1.0 2 255 64 66 -0.013 1.2817 4.4555
Notes: 1 source(master), 2 source(peer), 3 selected, 4 candidate, 5 configured.
Total sessions: 2
[H7B7-R1-F1060-IRF]dis ntp st
[H7B7-R1-F1060-IRF]dis ntp status
Clock status: synchronized
Clock stratum: 3
System peer: 10.88.142.102
Local mode: client
Reference clock ID: 10.88.142.102
Leap indicator: 00
Clock jitter: 0.000916 s
Stability: 0.000 pps
Clock precision: 2^-18
Root delay: 1.29700 ms
Root dispersion: 15.60974 ms
Reference time: bde391e0.4e4f57a8 Thu, Dec 14 2000 18:37:20.305
[H7B7-R1-F1060-IRF]dis clock
18:37:50 UTC Thu 12/14/2000
```

client

- (2) 时钟源，与client上dis clock时间一致，但是在client上抓包发现时间差8现象；

```
[H7B7-R1-S5130-PWR]dis clock ntp server
18:54:36.760 UTC Thu 12/14/2000
```

```
<H7B7-R1-F1060-IRF>dis clock ntp client
18:54:38 UTC Thu 12/14/2000
```

抓包发现报文显示的时间为12.15 02:57比设备实际时间多8个小时（差几分钟为操作时间差），此处逻辑为：报文实际时间就是12.14 18:54，只不过抓包软件会根据电脑当前时区与报文中带的0时区作比较，如果不一致会自动补上差值，这就下边截图报文中arrive time时间为中国区时间12.15 02:57的原因。

No.	Time	Source	Destination	Protocol	L1 Info
1	2000-12-15 02:57:54.548794	10.88.142.136	10.88.26.111	TLSv1.2	Application
2	2000-12-15 02:57:54.635028	Hangzhou_1d:52:b8	Broadcast	ARP	who has 10.88.142.136
3	2000-12-15 02:57:54.635280	Hangzhou_1d:52:b8	Broadcast	ARP	who has 10.88.142.136
4	2000-12-15 02:57:54.635323	Hangzhou_1d:52:b8	Broadcast	ARP	who has 10.88.142.136
5	2000-12-15 02:57:54.635354	Hangzhou_1d:52:b8	Broadcast	ARP	who has 10.88.142.136
6	2000-12-15 02:57:54.635385	Hangzhou_1d:52:b8	Broadcast	ARP	who has 10.88.142.136
7	2000-12-15 02:57:54.635417	Hangzhou_1d:52:b8	Broadcast	ARP	who has 10.88.142.136
8	2000-12-15 02:57:54.635451	Hangzhou_1d:52:b8	Broadcast	ARP	who has 10.88.142.136
9	2000-12-15 02:57:54.635483	Hangzhou_1d:52:b8	Broadcast	ARP	who has 10.88.142.136
10	2000-12-15 02:57:54.685804	10.88.26.111	10.88.142.136	TCP	50193->443 [ESTABLISHED]
11	2000-12-15 02:57:54.690482	fe80::cc7d:18c7:e537:6c70	ff02::1:2	DHCPv6	Solicit XID: 0x00000000
12	2000-12-15 02:57:54.745956	10.88.26.111	10.88.142.136	TCP	50187->443 [ESTABLISHED]
13	2000-12-15 02:57:54.746050	10.88.142.136	10.88.26.111	TLSv1.2	Application
14	2000-12-15 02:57:54.753324	10.88.26.111	10.88.142.136	TLSv1.2	Application
15	2000-12-15 02:57:54.753373	10.88.142.136	10.88.26.111	TCP	443->50187 [ESTABLISHED]
16	2000-12-15 02:57:54.754587	10.88.26.111	10.88.142.136	TCP	[TCP segment of a flow ...]
17	2000-12-15 02:57:54.754614	10.88.26.111	10.88.142.136	TLSv1.2	Application
18	2000-12-15 02:57:54.754643	10.88.142.136	10.88.26.111	TCP	443->50193 [ESTABLISHED]
19	2000-12-15 02:57:54.760482	10.88.142.136	10.88.26.111	TLSv1.2	Application
20	2000-12-15 02:57:54.762235	Hangzhou_6b:da:f0		Spanning-tree (ffor-)	STP

Frame 1: 379 bytes on wire (3032 bits), 379 bytes captured (3032 bits) on interface
Encapsulation type: Ethernet (1)
Arrival Time: Dec 15, 2000 02:57:54.548794000 [乱码为：中国区时间，后续抓包截图此处均为东八区中国区时间]
[Time shift for this packet: 0.000000000 seconds]
Epoch Time: 976820274.548794000 seconds
[Time delta from previous captured frame: 0.000000000 seconds]
[Time delta from previous displayed frame: 0.000000000 seconds]
[Time since reference or first frame: 0.000000000 seconds]
Frame Number: 1
Frame Length: 379 bytes (3032 bits)

(3) 如何规范性配置，避免第二点现象；

国内设备所有同步时间的设备（包括时钟源及ntp client），在开局情况下，建议都改为东八区时间，这样及保证时钟源及Ntp client时间一致，而且抓包的显示时间也是设备当前时间；

```
<HZB7-R1-S5130-PWR>dis clock
19:06:16.718 UTC Thu 12/14/2000
<HZB7-R1-S5130-PWR>
<HZB7-R1-S5130-PWR> ntp server
<HZB7-R1-S5130-PWR>
<HZB7-R1-S5130-PWR>sy
<HZB7-R1-S5130-PWR>system-view
System View: return to User View with Ctrl+Z.
[HZB7-R1-S5130-PWR]clock time
[HZB7-R1-S5130-PWR]clock timezone Beijing add 8
[HZB7-R1-S5130-PWR]dis clock
03:06:32.889 Beijing Fri 12/15/2000
Time Zone : Beijing add 08:00:00
```

目前NTP client时间为12.15 03:07，但是实际上NTP从时钟源同步的时间仍然是时钟源0时区的时间，即12.14 18:57

```
<HZB7-R1-F1060-IRF>dis clock
19:06:44 UTC Thu 12/14/2000
<HZB7-R1-F1060-IRF>sy ntp client
<HZB7-R1-F1060-IRF>system-view
System View: return to User View with Ctrl+Z.
[HZB7-R1-F1060-IRF]clock timezone Beijing add 8
[HZB7-R1-F1060-IRF]dis clock
03:07:07 Beijing Fri 12/15/2000
Time Zone : Beijing add 08:00:00
```

抓包显示时间并未差8小时，符合预期

No.	Time	Source	Destination	Protocol	L1 Info
1	2000-12-15 03:20:10.881595	10.88.142.136	10.88.26.111	TLSv1.2	Application Data
2	2000-12-15 03:20:10.976354	Hangzhou_6b:da:c3	Broadcast	ARP	who has 192.168.3.1
3	2000-12-15 03:20:11.076607	10.88.26.111	10.88.142.136	TCP	51728->443 [ACK] Seq=100000000
4	2000-12-15 03:20:11.076715	10.88.142.136	10.88.26.111	TLSv1.2	Application Data
5	2000-12-15 03:20:11.084425	10.88.26.111	10.88.142.136	TLSv1.2	Application Data
6	2000-12-15 03:20:11.084475	10.88.142.136	10.88.26.111	TCP	443->51728 [ACK] Seq=100000000
7	2000-12-15 03:20:11.086483	10.88.26.111	10.88.142.136	TCP	[TCP segment of a flow ...]
8	2000-12-15 03:20:11.086518	10.88.26.111	10.88.142.136	TLSv1.2	Application Data
9	2000-12-15 03:20:11.086552	10.88.142.136	10.88.26.111	TCP	443->51724 [ACK] Seq=100000000
10	2000-12-15 03:20:11.096622	10.88.142.136	10.88.26.111	TLSv1.2	Application Data
11	2000-12-15 03:20:11.102003	10.88.142.136	10.88.26.111	TLSv1.2	Application Data
12	2000-12-15 03:20:11.129195	10.88.142.101	10.88.142.136	ICMP	Echo (ping) request id=0
13	2000-12-15 03:20:11.129247	10.88.142.136	10.88.142.101	ICMP	Echo (ping) reply id=0
14	2000-12-15 03:20:11.216373	Hangzhou_1d:60:db	Broadcast	ARP	who has 10.88.142.136
15	2000-12-15 03:20:11.218333	Hangzhou_1d:60:db	Broadcast	ARP	who has 10.88.142.136
16	2000-12-15 03:20:11.220273	Hangzhou_1d:60:db	Broadcast	ARP	who has 10.88.142.136
17	2000-12-15 03:20:11.297658	10.88.26.111	10.88.142.136	TCP	51724->443 [ACK] Seq=100000000
18	2000-12-15 03:20:11.297662	10.88.26.111	10.88.142.136	TCP	51728->443 [ACK] Seq=100000000
19	2000-12-15 03:20:11.297734	10.88.142.136	10.88.26.111	TLSv1.2	Application Data
20	2000-12-15 03:20:11.297749	10.88.142.136	10.88.26.111	TLSv1.2	Application Data

Frame 1: 379 bytes on wire (3032 bits), 379 bytes captured (3032 bits) on interface
Encapsulation type: Ethernet (1)
Arrival Time: Dec 15, 2000 03:20:10.881595000
[Time shift for this packet: 0.000000000 seconds]
Epoch Time: 976821610.881595000 seconds