

TCP/IP 通訊協定及應用

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<http://wmlab.csie.ncu.edu.tw/course/tcp>

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Chapter 22: TCP Persist Timer

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Introduction

- ◆ Why we use persist timer:

- If a acknowledgment is lost, we could end up with both sides waiting for the other
 - ♦ To prevent deadlock from occurring the sender uses a persist timer
 - ♦ These segments from the sender are called window probes

- ◆ An Example:

- We'll invoke the server as
 - ♦ `svr4 % sock -i -s -P100000 5555`
- The server sleep for 100,000 seconds(27.8 hours) before reading from the network
- The client on host bsd1 and performs 1024-byte writes to port 5555 on the server

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An Example

```

1 0.0 bmd1.1027, avr4.5555, P1102510241 ack 1 win 4096
2 0.191941 (0.1920) bmd1.5555, bmd1.1027, ack 1025 win 4096
3 0.003954 (0.0039) bmd1.5555, bmd1.1027, ack 1 win 4096
4 0.203040 (0.0034) bmd1.5555, avr4.5555, 2048/3073 win 4096
5 0.207056 (0.0072) bmd1.5555, bmd1.1027, ack 3073 win 4096
6 0.000000 (0.0000) bmd1.5555, bmd1.1027, ack 1025 win 4096
7 0.216113 (0.0034) bmd1.5555, avr4.5555, P4097310241 ack 1 win 4096
8 0.219399 (0.0039) bmd1.5555, avr4.5555, P102510241 ack 1 win 4096
9 0.000000 (0.0000) bmd1.5555, bmd1.1027, ack 3121 win 4096
10 0.230312 (0.0093) bmd1.5555, P161457491904 ack 1 win 4096
11 0.230312 (0.0093) bmd1.5555, P161457491904 ack 1 win 4096
12 0.240961 (0.0039) bmd1.5555, P1613979210241 ack 1 win 4096
13 0.402143 (0.1612) avr4.5555, bmd1.1027, ack 9217 win 0
14 5.351581 (4.8494) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
15 0.000000 (0.0000) bmd1.5555, avr4.5555, 1025/1026 win 4096
16 10.351714 (4.9961) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
17 10.356760 (0.0040) avr4.5555, bmd1.1027, ack 9217 win 0
18 16.381881 (5.9962) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
19 16.350849 (0.0040) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
20 28.356774 (13.9964) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
21 28.356774 (0.0040) avr4.5555, bmd1.1027, ack 9217 win 0
22 52.352074 (23.9974) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
23 52.356839 (0.0040) avr4.5555, bmd1.1027, ack 9217 win 0
24 100.354224 (49.9974) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
25 100.354224 (0.0040) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
26 140.359914 (99.9977) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
27 140.359915 (0.0039) avr4.5555, bmd1.1027, ack 9217 win 0
28 220.357579 (99.9977) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
29 220.341684 (0.0041) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
30 220.341684 (99.9977) bmd1.1027, avr4.5555, 9217/9218 (1) ack 1 win 4096
31 280.363313 (0.0041) avr4.5555, bmd1.1027, ack 9217 win 0

```

Figure 22.1 Example of persist timer probing a zero-sized window

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An Example

- ◆ About persist timer:

- It always bounded between 5 and 60 seconds
- The persist state is different from the retransmission timeout is that TCP never gives up sending window probes

- ◆ What is Silly Window Syndrome

- It can be caused by the receiver can advertise small windows and the sender can transmit small amounts of data

- ◆ Correct avoidance of the silly window syndrome

- 1.The receiver must not advertise small windows
- 2.Sender is not transmitting unless one of conditions is true:
 - ♦ a.a full-sized segment can be sent
 - ♦ b.we can send at least one-half of the maximum sized window ever advertised
 - ♦ c.we can send everything we have and either we are not expecting an ACK

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Silly Window Syndrome



Figure 22.2 Time line showing mounting evidence of alky windows syndrome.

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Silly Window Syndrome

[illegible]

Figure 22.3 Sequence of events for recurrent prevalence of the silly syndrome syndrome

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Summary

- ◆ TCP's persist timer is set by one end of a connection but has been stopped because the other end has advertised a zero-sized window
- ◆ TCP's avoidance of the silly window syndrome is to prevent TCP from advertising small windows or from sending small segments

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