
Chapter 22:

TCP Persist Timer

Introduction

❑ Why we use persist timer:

- ❖ If an 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
 - The sender queries the receiver periodically to find out if the window has been increased. 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

An Example

Seq	Win	ACK	Seq	Win	ACK
1	65535	0	1	65535	0
2	65535	0	2	65535	0
3	65535	0	3	65535	0
4	65535	0	4	65535	0
5	65535	0	5	65535	0
6	65535	0	6	65535	0
7	65535	0	7	65535	0
8	65535	0	8	65535	0
9	65535	0	9	65535	0
10	65535	0	10	65535	0
11	65535	0	11	65535	0
12	65535	0	12	65535	0
13	65535	0	13	65535	0
14	65535	0	14	65535	0
15	65535	0	15	65535	0
16	65535	0	16	65535	0
17	65535	0	17	65535	0
18	65535	0	18	65535	0
19	65535	0	19	65535	0
20	65535	0	20	65535	0
21	65535	0	21	65535	0
22	65535	0	22	65535	0
23	65535	0	23	65535	0
24	65535	0	24	65535	0
25	65535	0	25	65535	0
26	65535	0	26	65535	0
27	65535	0	27	65535	0
28	65535	0	28	65535	0
29	65535	0	29	65535	0
30	65535	0	30	65535	0
31	65535	0	31	65535	0

Figure 23.1 Examples of packet-level probing in a networked system.

Silly Window Syndrome

- ❑ **About persist timer:**
 - ❖ It always bounded between 5 and 60 seconds
 - ❖ The persist state which is different from the retransmission timeout is that **TCP never gives up sending window probes.**
- ❑ **When it occurs small amounts of data are exchanged across the connection, instead of full-sized seqments.**
- ❑ **What is Silly Window Syndrome**
 - ❖ It can be caused by either end:
 - The receiver can advertise small windows
 - The sender can transmit small amounts of data.

Silly Window Syndrome (Cont.)

- ❑ **Correct avoidance is performed on both ends:**

- ❖ The receiver must not advertise small windows
- ❖ The sender is not transmitting unless one of conditions is true:
 - A full-sized segment can be sent
 - We can send at least one-half of the maximum sized window ever advertised
 - We can send everything we have if:
 - ✓ *We are not expecting an ACK (no outstanding data), or*
 - ✓ *The Nagle algorithm is disabled ($W = 1$)*

Silly Window Syndrome



Silly Window Syndrome

Index	Region/State (Mapas 20-21)	Actual Resource (%)		Projected Resource (%)	
		Actual	Projected	Actual	Projected
1	1	100	100	100	100
2	2	100	100	100	100
3	3	100	100	100	100
4	4	100	100	100	100
5	5	100	100	100	100
6	6	100	100	100	100
7	7	100	100	100	100
8	8	100	100	100	100
9	9	100	100	100	100
10	10	100	100	100	100
11	11	100	100	100	100
12	12	100	100	100	100
13	13	100	100	100	100
14	14	100	100	100	100
15	15	100	100	100	100
16	16	100	100	100	100
17	17	100	100	100	100
18	18	100	100	100	100
19	19	100	100	100	100
20	20	100	100	100	100
21	21	100	100	100	100
22	22	100	100	100	100
23	23	100	100	100	100
24	24	100	100	100	100
25	25	100	100	100	100
26	26	100	100	100	100
27	27	100	100	100	100
28	28	100	100	100	100
29	29	100	100	100	100
30	30	100	100	100	100
31	31	100	100	100	100
32	32	100	100	100	100
33	33	100	100	100	100
34	34	100	100	100	100
35	35	100	100	100	100
36	36	100	100	100	100
37	37	100	100	100	100
38	38	100	100	100	100
39	39	100	100	100	100
40	40	100	100	100	100
41	41	100	100	100	100
42	42	100	100	100	100
43	43	100	100	100	100
44	44	100	100	100	100
45	45	100	100	100	100
46	46	100	100	100	100
47	47	100	100	100	100
48	48	100	100	100	100
49	49	100	100	100	100
50	50	100	100	100	100
51	51	100	100	100	100
52	52	100	100	100	100
53	53	100	100	100	100
54	54	100	100	100	100
55	55	100	100	100	100
56	56	100	100	100	100
57	57	100	100	100	100
58	58	100	100	100	100
59	59	100	100	100	100
60	60	100	100	100	100
61	61	100	100	100	100
62	62	100	100	100	100
63	63	100	100	100	100
64	64	100	100	100	100
65	65	100	100	100	100
66	66	100	100	100	100
67	67	100	100	100	100
68	68	100	100	100	100
69	69	100	100	100	100
70	70	100	100	100	100
71	71	100	100	100	100
72	72	100	100	100	100
73	73	100	100	100	100
74	74	100	100	100	100
75	75	100	100	100	100
76	76	100	100	100	100
77	77	100	100	100	100
78	78	100	100	100	100
79	79	100	100	100	100
80	80	100	100	100	100
81	81	100	100	100	100
82	82	100	100	100	100
83	83	100	100	100	100
84	84	100	100	100	100
85	85	100	100	100	100
86	86	100	100	100	100
87	87	100	100	100	100
88	88	100	100	100	100
89	89	100	100	100	100
90	90	100	100	100	100
91	91	100	100	100	100
92	92	100	100	100	100
93	93	100	100	100	100
94	94	100	100	100	100
95	95	100	100	100	100
96	96	100	100	100	100
97	97	100	100	100	100
98	98	100	100	100	100
99	99	100	100	100	100
100	100	100	100	100	100

Figure 21.9 Dependence of actual bus resources on availability of the city's bus resources

Summary

- ❑ TCP's persist timer is set by one end of a connection when it has data to send, 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