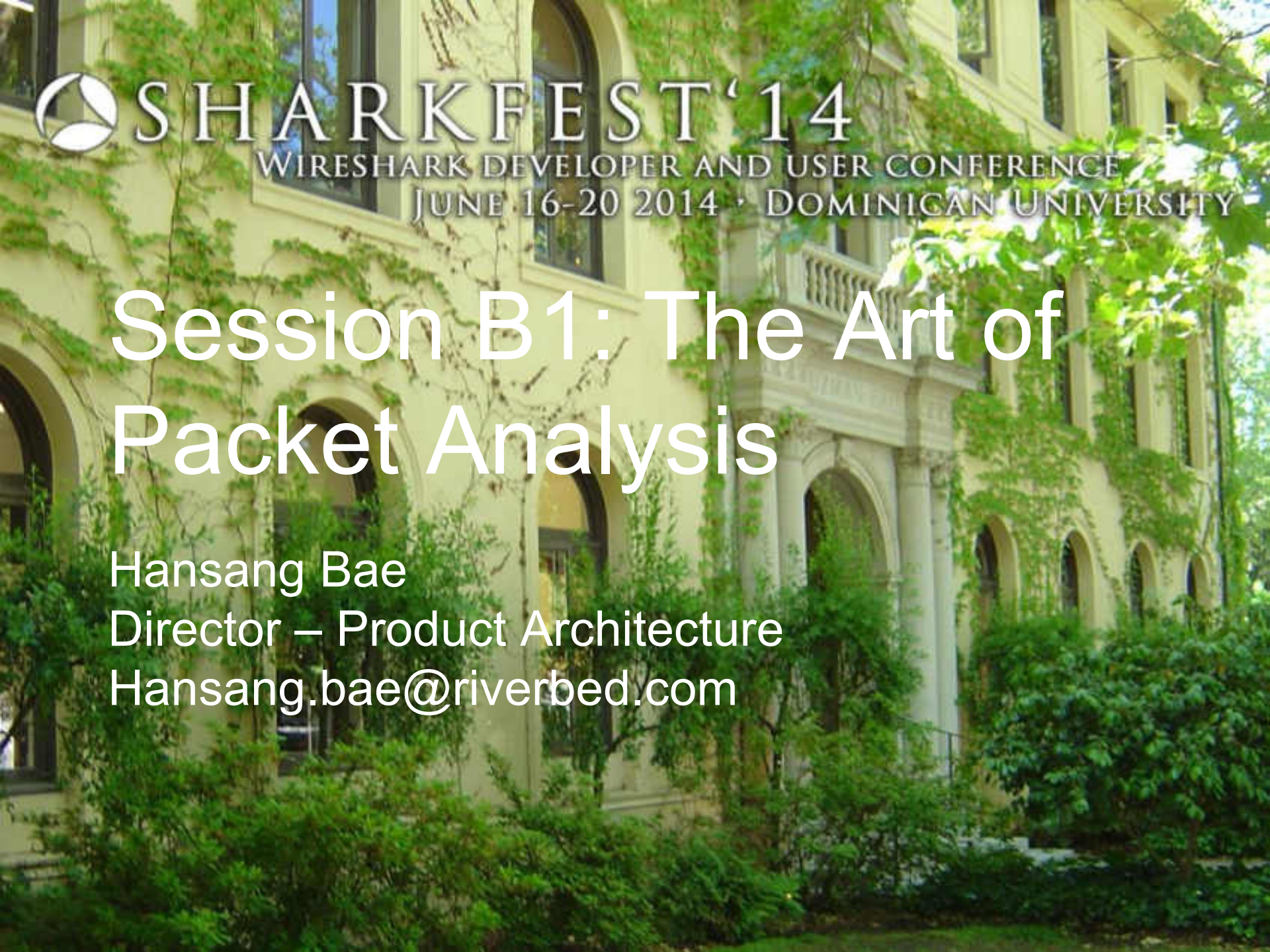


Session B1: The Art of Packet Analysis

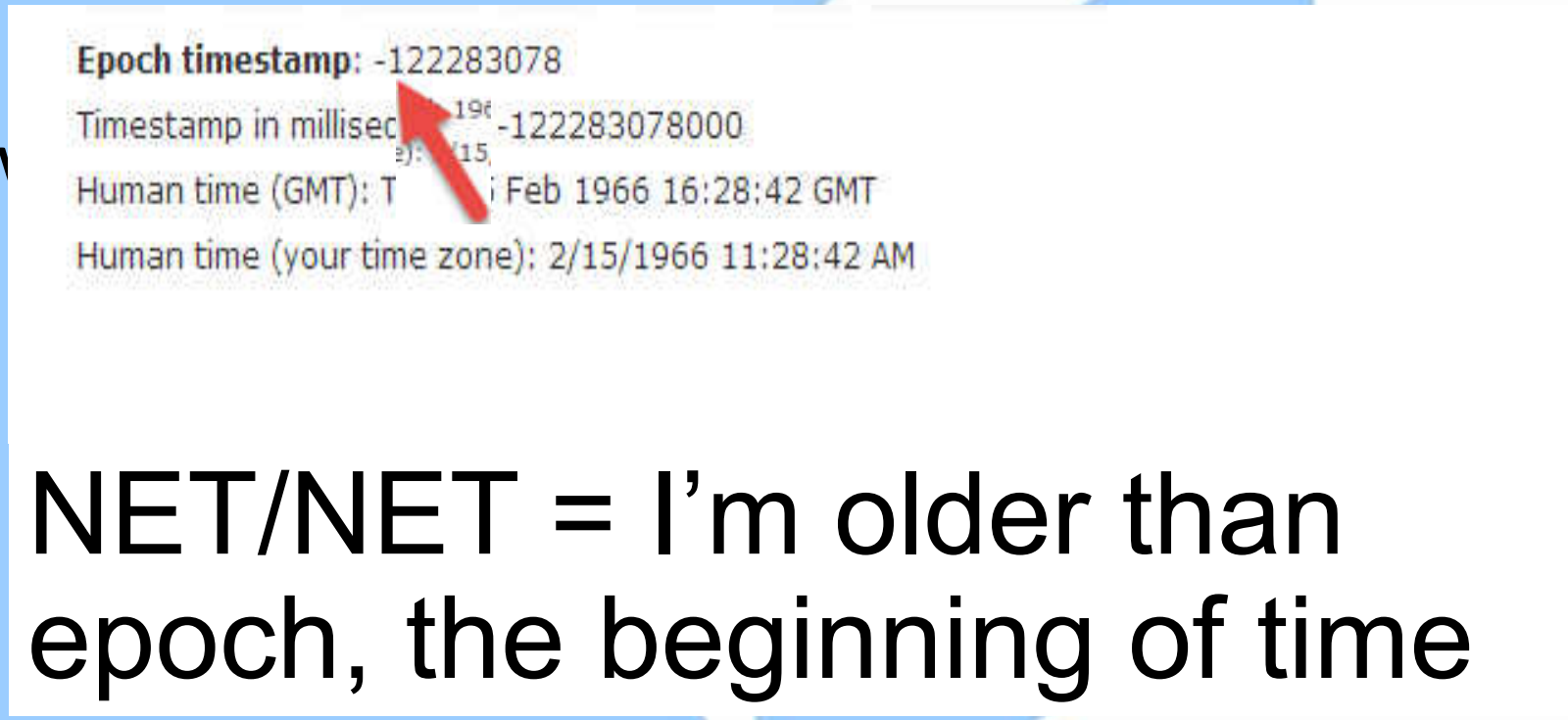
Hansang Bae
Director – Product Architecture
Hansang.bae@riverbed.com

Information

YouTube Channel with older sessions etc.

www.youtube.com/hansangb

ww

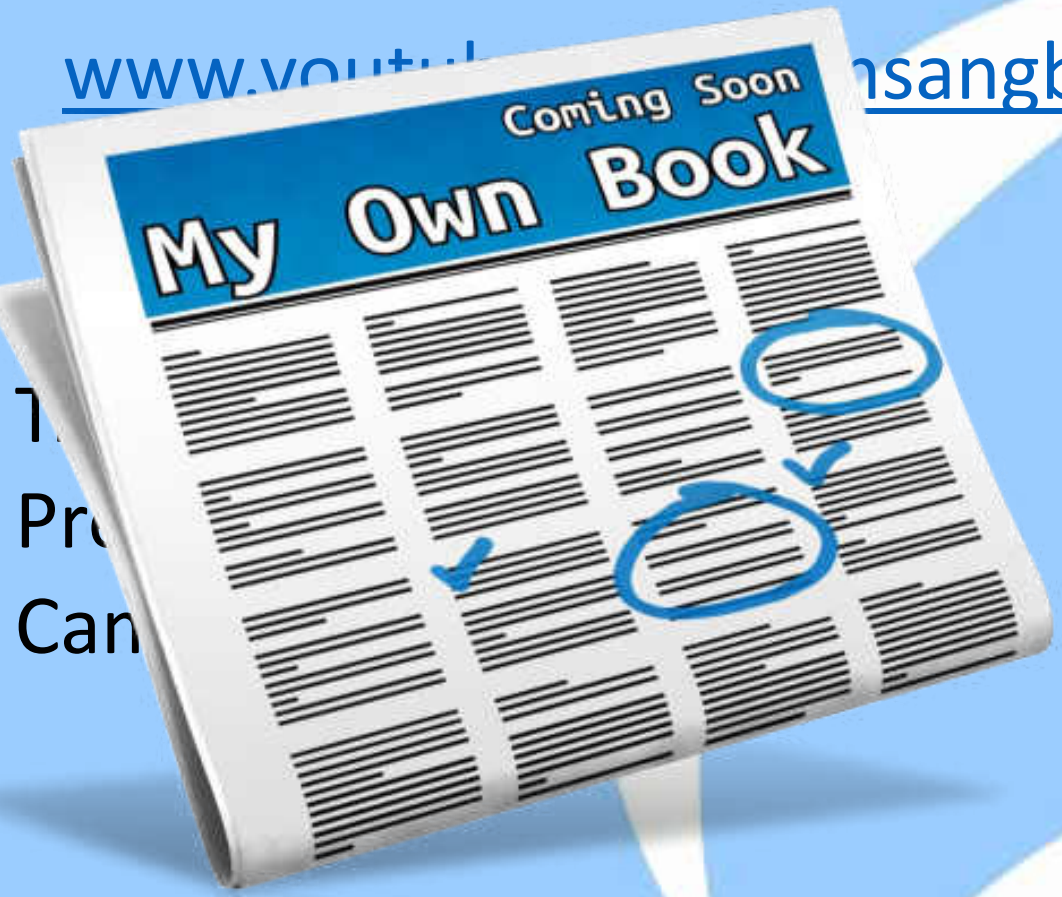


NET/NET = I'm older than epoch, the beginning of time

Q4 2014 Information (pester me - *PLEASE*)

YouTube Channel with older sessions etc.

www.youtu[illegible]nsangb



ww

- T
- Pr
- Can

TCP – What does it mean?

- Reliable – but why?
- Connection oriented – very polite protocol
- Flow Control – built-in traffic report
- Stream oriented – I don’t need no stinkin’ packets!
- Sequence numbers – fundamental building block

Troubleshooting TCP Nagle/Delayed Ack

- TCP is great for a lot of things, but real-time transactions that require small packets is not one of them.
- Nagle's motivation was to maximize the ratio of packets to data/content.
- Delayed-Ack can help in avoiding some "silly window" scenarios.
- Nagle has its place and need. Delayed-Ack has its place and need.
- However, Nagle + Delayed-ack = Bad news (sometimes). If you are a financial organization, be on the lookout!

Troubleshooting TCP Nagle/Delayed Ack

Nagle rules:

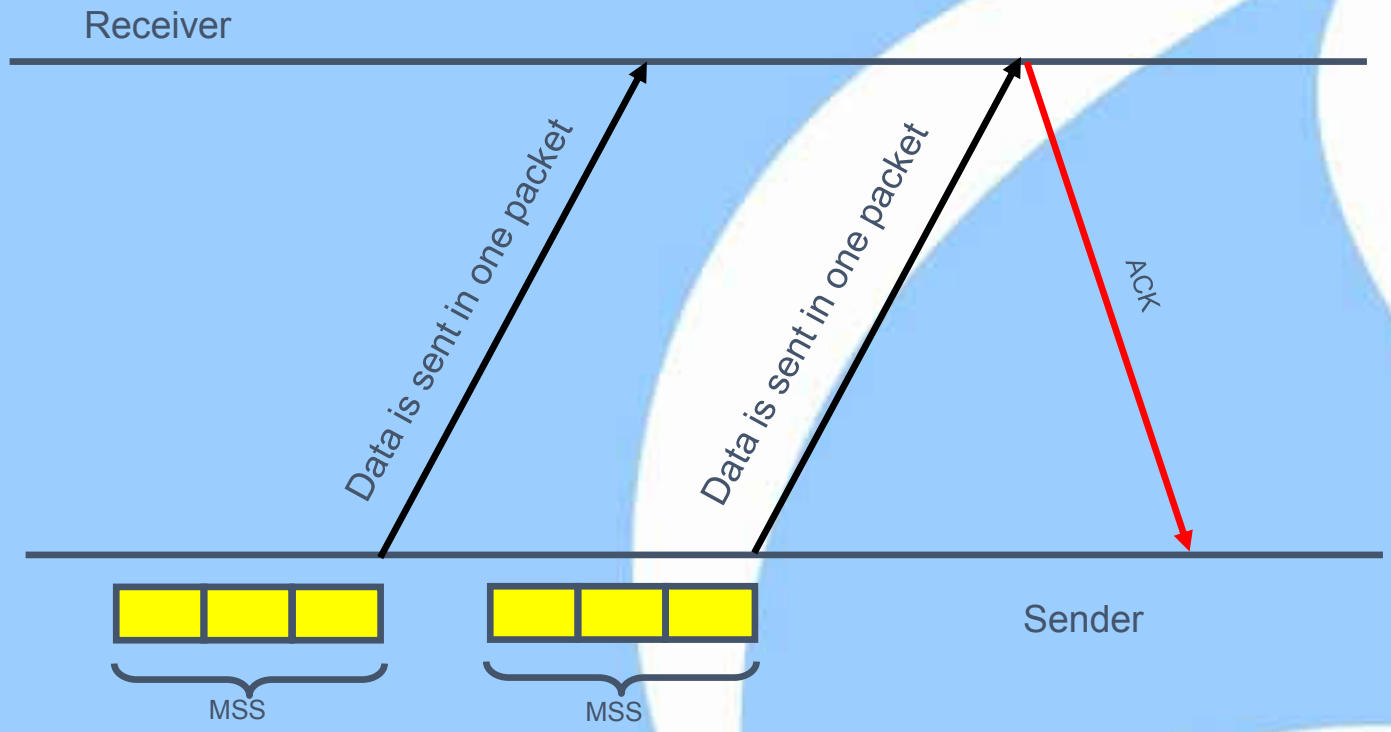
1. If there are unacknowledged in-flight data,new data is buffered
2. If the data to be sent is < MSS, it is buffered until MSS
3. RFC896 (Congestion control in IP/TCP internetworks)

When to send data:

1. Immediately if a full MSS size packet can be sent (at least MSS data is accumulated)
2. All previously sent data has been acknowledged AND PSH flag is set
3. PSH flag is set AND the override timeout (0.1 ... 1s) expired

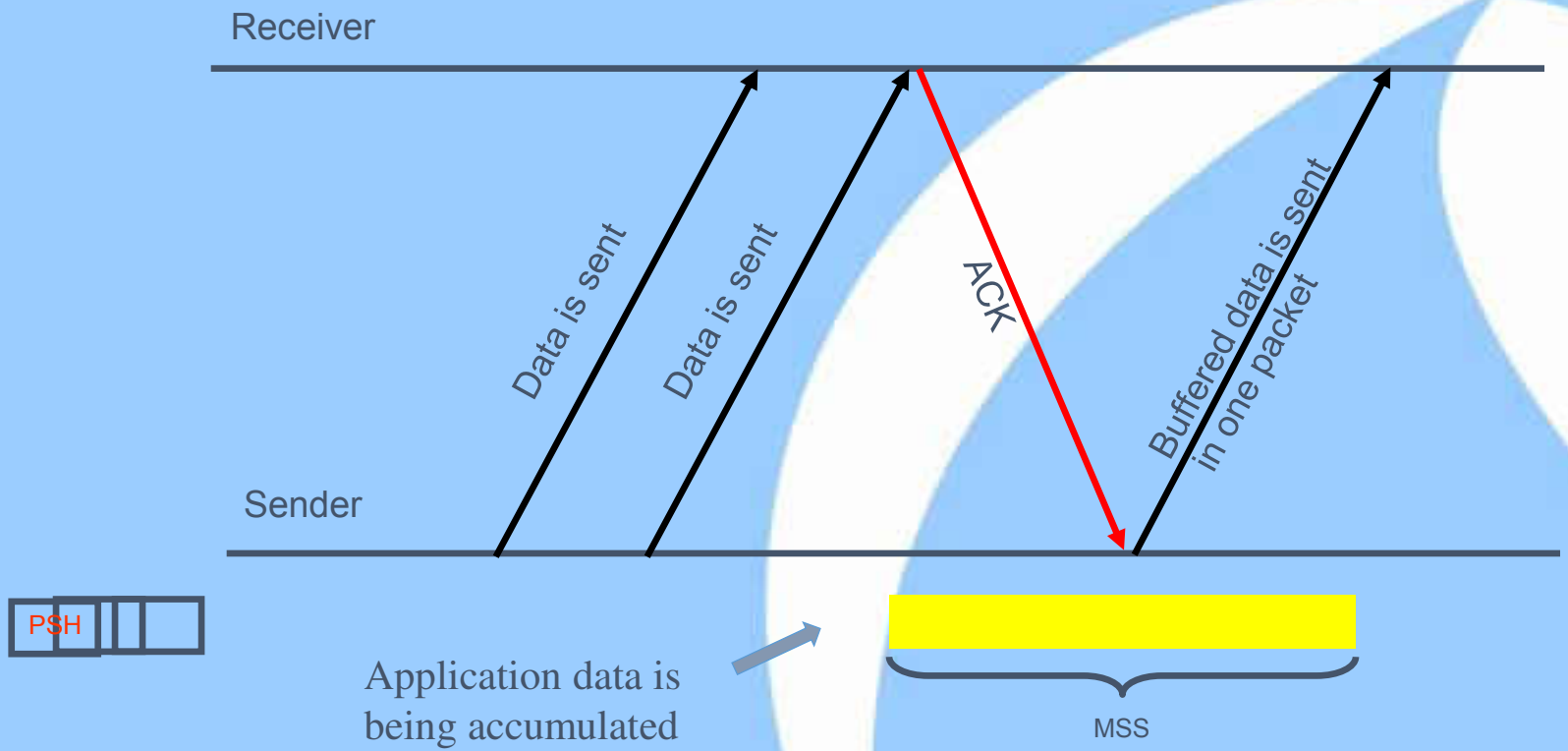
RFC1122 (Requirements for Internet Hosts – Communication Layers)

Troubleshooting TCP Nagle/Delayed Ack

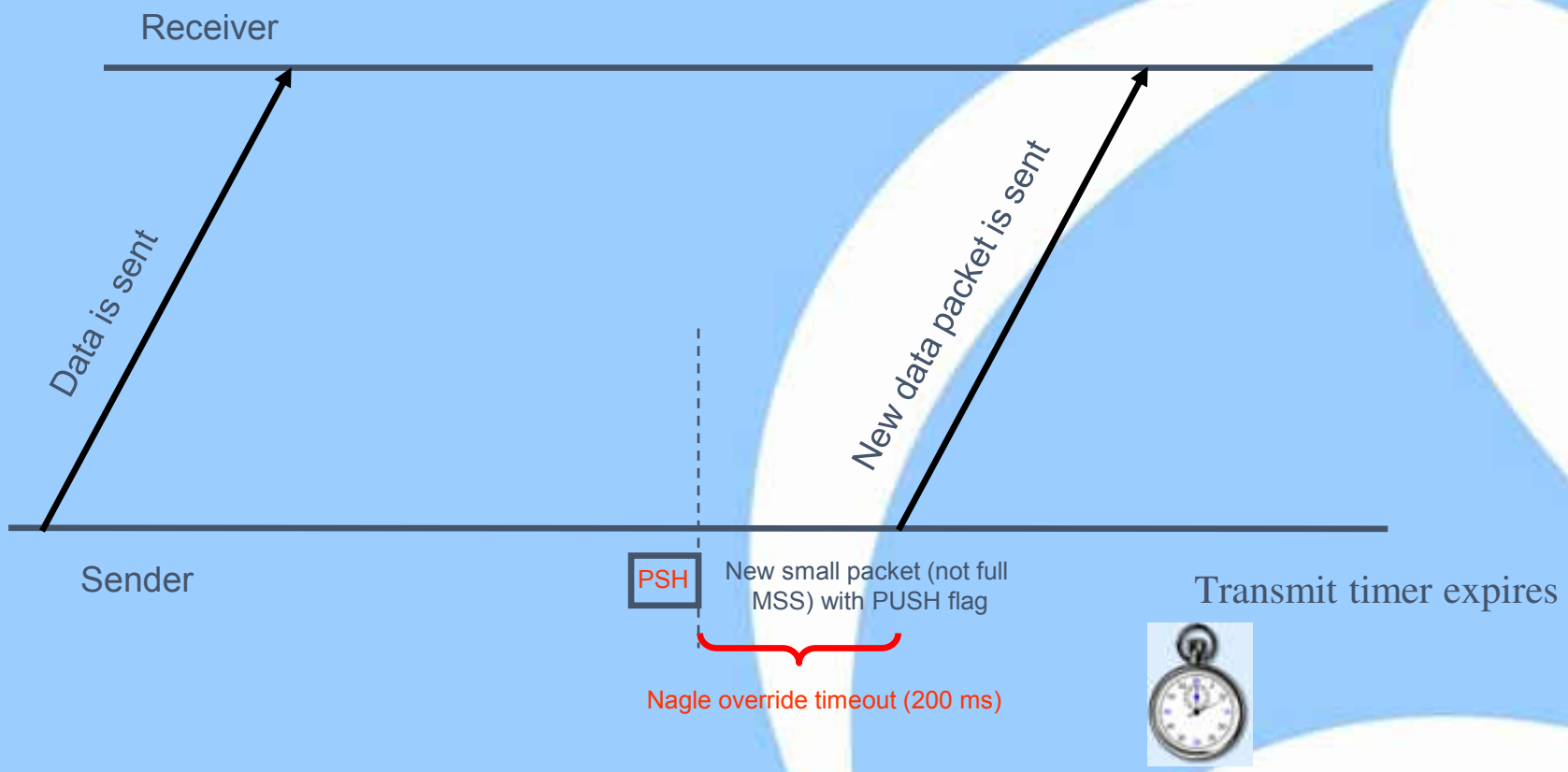


Application data is accumulated until MSS

Troubleshooting TCP Nagle/Delayed Ack



Troubleshooting TCP Nagle/Delayed Ack



Troubleshooting TCP Nagle/Delayed Ack

- TCP is great for a lot of things, but real-time transactions that require small packets is not one of them.

Troubleshooting TCP Nagle/Delayed Ack