

## CS 656 Assignment 2

Yilun Bai

Emulator: ubuntu1804-002; Receiver: ubuntu1804-004; Sender ubuntu1804-008

Timeout: 100ms

Units: all transmission time units are in milliseconds (ms)

Small: small.txt

Set	Max Delay	Packet Discard Probability	Transmission time 1	Transmission time 2	Transmission time 3	Average
Baseline	0 (1)	0	122	104	100	108.67
No Delay 1	0 (1)	0.1	731	838	934	834.33
No Delay 2	0 (1)	0.2	1807	1415	1846	1689.33
No Delay 3	0 (1)	0.3	3340	3334	2666	3113.33
No Delay 4	0 (1)	0.4	5339	3220	4891	4483.33
No Delay 5	0 (1)	0.5	6805	7518	7209	7177.33
No Discard 1	10	0	226	226	224	225.33
No Discard 2	20	0	365	366	365	365.33
No Discard 3	30	0	507	510	505	507.33
No Discard 4	40	0	644	658	648	650
No Discard 5	50	0	837	862	867	855.33
Both 1	20	0.1	1639	1319	1386	1448
Both 2	20	0.2	2425	1768	2336	2176.33
Both 3	20	0.3	4096	4172	3328	3865.33
Both 4	40	0.1	1571	1762	1862	1731.67
Both 5	40	0.2	3109	2175	2869	2717.67
Both 6	40	0.3	4971	5092	3989	4684

Medium: medium.txt

Set	Max Delay	Packet Discard Probability	Transmission time 1	Transmission time 2	Transmission time 3	Average
Baseline	0 (1)	0	395	411	402	402.67
No Delay 1	0 (1)	0.1	5650	5144	5571	5455
No Delay 2	0 (1)	0.2	10708	10633	11716	11019
No Delay 3	0 (1)	0.3	21996	16926	18879	19267
No Delay 4	0 (1)	0.4	27527	26830	27512	27289.67
No Delay 5	0 (1)	0.5	43440	42125	43406	42990.33
No Discard 1	10	0	1184	1139	1273	1198.67
No Discard 2	20	0	2056	1998	2011	2021.67
No Discard 3	30	0	3214	2904	2864	2994
No Discard 4	40	0	3893	3811	3790	3831.33
No Discard 5	50	0	5139	5168	5174	5160.33
Both 1	20	0.1	8205	7688	8066	7986.33
Both 2	20	0.2	14114	14194	15527	14611.67
Both 3	20	0.3	27628	21654	24036	24439.33
Both 4	40	0.1	11450	9666	10065	10393.67
Both 5	40	0.2	17868	18021	19639	18509.33
Both 6	40	0.3	33166	26167	29254	29529

## CS 656 Assignment 2

Yilun Bai

Large: largeASCII.txt

Set	Max Delay	Packet Discard Probability	Transmission time 1	Transmission time 2	Transmission time 3	Average
Baseline	0 (1)	0	968	997	947	970.67
No Delay 1	0 (1)	0.1	13363	13025	13844	13410.67
No Delay 2	0 (1)	0.2	28965	24949	28998	27637.33
No Delay 3	0 (1)	0.3	49621	47065	46062	47582.67
No Delay 4	0 (1)	0.4	69464	75372	78403	74413
No Delay 5	0 (1)	0.5	110892	112096	112179	111722.3
No Discard 1	10	0	2942	2883	2970	2931.67
No Discard 2	20	0	5428	5123	5171	5240.67
No Discard 3	30	0	8069	8395	7305	7923
No Discard 4	40	0	9743	10122	9842	9902.33
No Discard 5	50	0	13013	13110	12946	13023
Both 1	20	0.1	20148	19726	20660	20178
Both 2	20	0.2	38096	33347	37792	36411.67
Both 3	20	0.3	62115	59463	58518	60032
Both 4	40	0.1	26809	25790	26763	26454
Both 5	40	0.2	47964	41598	47280	45614
Both 6	40	0.3	74977	71630	71261	72622.67

Combined Average Transmission Time:

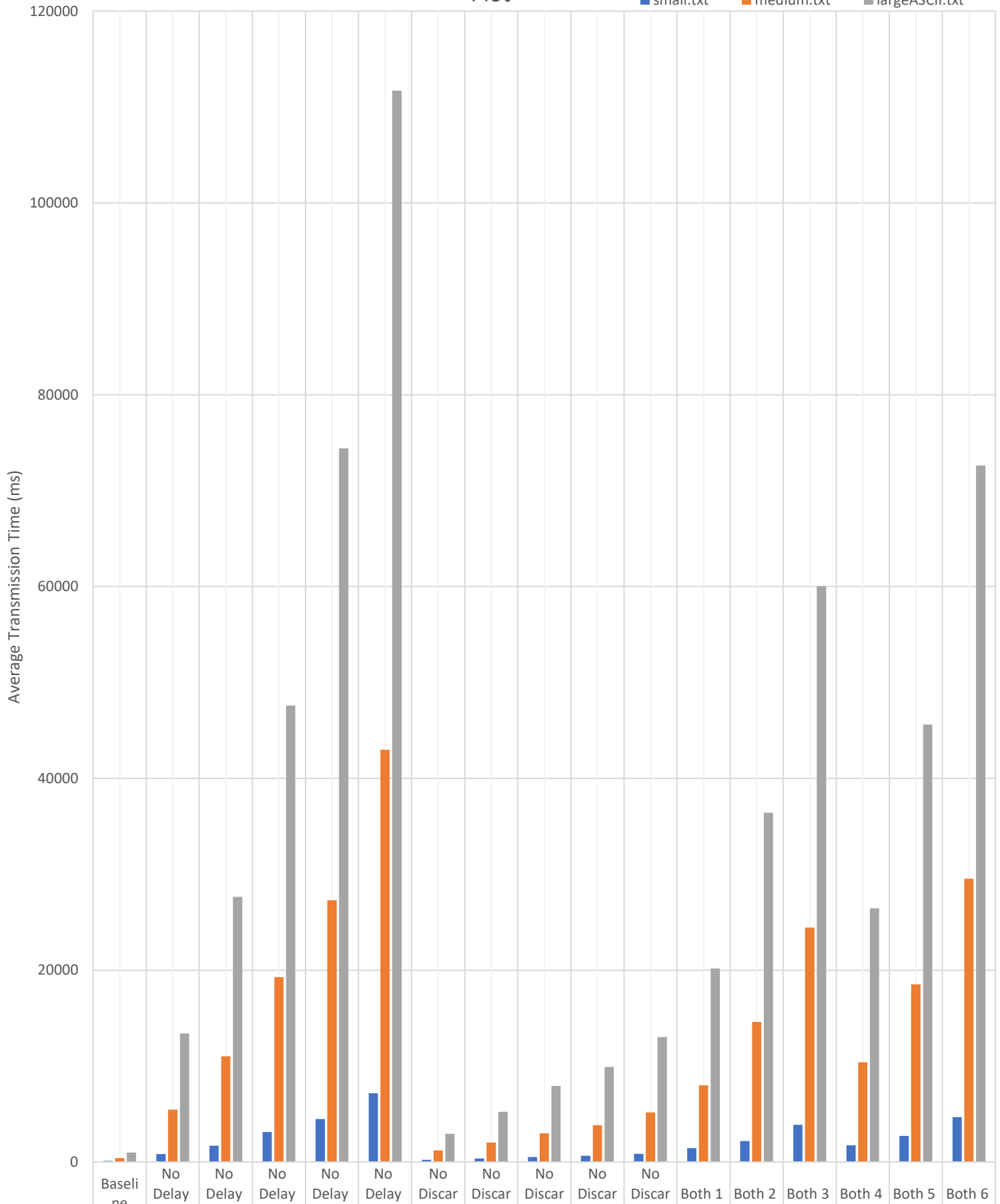
Set	Max Delay	Packet Discard Probability	small.txt (ms)	medium.txt (ms)	largeASCII.txt (ms)
Baseline	0 (1)	0	108.67	402.67	970.67
No Delay 1	0 (1)	0.1	834.33	5455	13410.67
No Delay 2	0 (1)	0.2	1689.33	11019	27637.33
No Delay 3	0 (1)	0.3	3113.33	19267	47582.67
No Delay 4	0 (1)	0.4	4483.33	27289.67	74413
No Delay 5	0 (1)	0.5	7177.33	42990.33	111722.3
No Discard 1	10	0	225.33	1198.67	2931.67
No Discard 2	20	0	365.33	2021.67	5240.67
No Discard 3	30	0	507.33	2994	7923
No Discard 4	40	0	650	3831.33	9902.33
No Discard 5	50	0	855.33	5160.33	13023
Both 1	20	0.1	1448	7986.33	20178
Both 2	20	0.2	2176.33	14611.67	36411.67
Both 3	20	0.3	3865.33	24439.33	60032
Both 4	40	0.1	1731.67	10393.67	26454
Both 5	40	0.2	2717.67	18509.33	45614
Both 6	40	0.3	4684	29529	72622.67

Findings:

1. Increase the packet delay would increase the transmission time (linearly). Increase the packet discard probability by 0.1 would double the transmission time (exponentially). If both are applied, the transmission time would increase largely.
2. Under similar delay and packet drop rate, the larger the file, the larger the transmission time. Smaller files transmit faster.

Plot

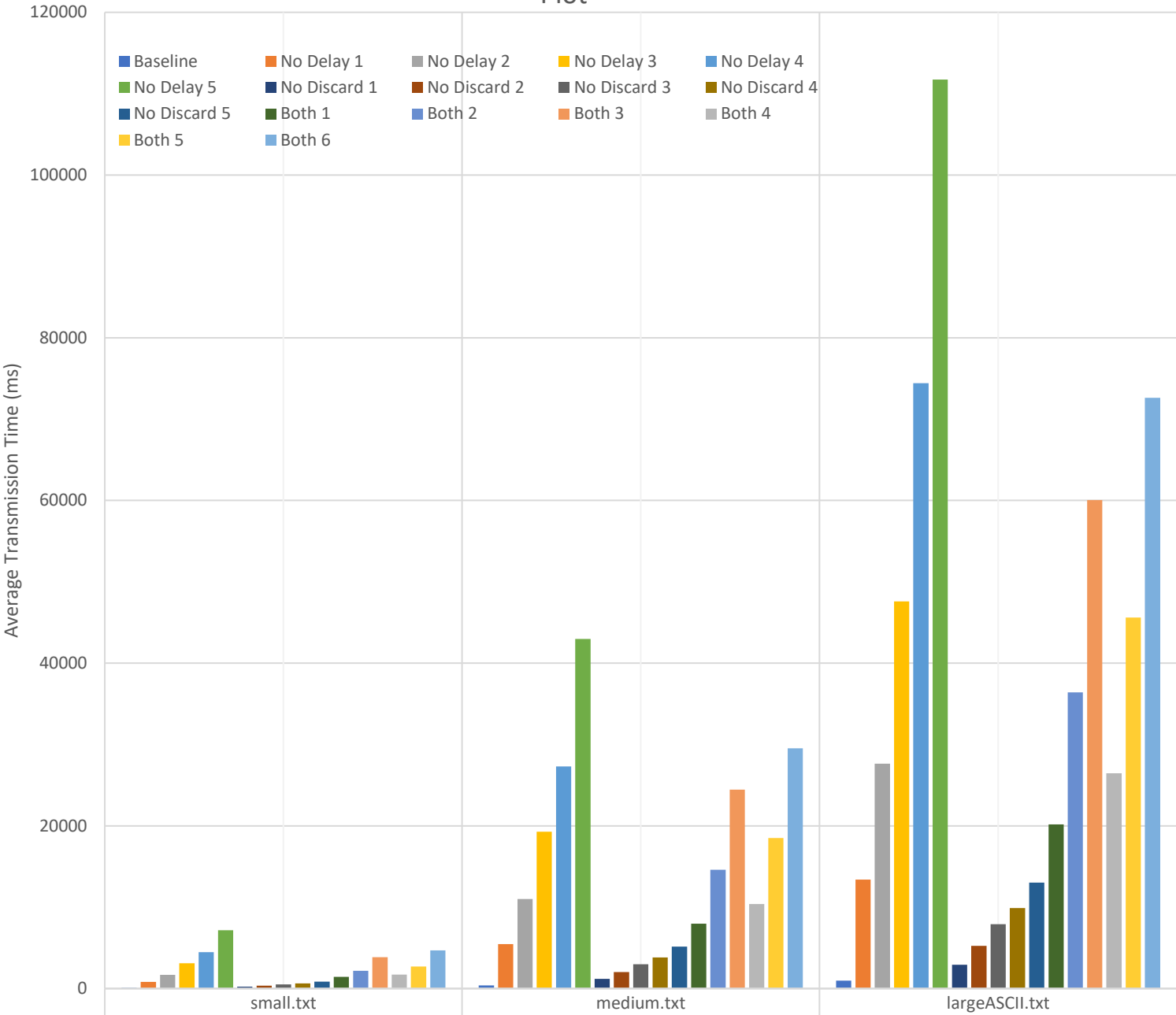
■ small.txt ■ medium.txt ■ largeASCII.txt



■ small.txt	108.67	834.33	1689.3	3113.3	4483.3	7177.3	225.33	365.33	507.33	650	855.33	1448	2176.3	3865.3	1731.7	2717.7	4684
■ medium.txt	402.67	5455	11019	19267	27290	42990	1198.7	2021.7	2994	3831.3	5160.3	7986.3	14612	24439	10394	18509	29529
■ largeASCII.txt	970.67	13411	27637	47583	74413	111722	2931.7	5240.7	7923	9902.3	13023	20178	36412	60032	26454	45614	72623

Set

Plot



Baseline	108.67	402.67	970.67
No Delay 1	834.33	5455	13410.67
No Delay 2	1689.33	11019	27637.33
No Delay 3	3113.33	19267	47582.67
No Delay 4	4483.33	27289.67	74413
No Delay 5	7177.33	42990.33	111722.3
No Discard 1	225.33	1198.67	2931.67
No Discard 2	365.33	2021.67	5240.67
No Discard 3	507.33	2994	7923
No Discard 4	650	3831.33	9902.33
No Discard 5	855.33	5160.33	13023
Both 1	1448	7986.33	20178
Both 2	2176.33	14611.67	36411.67
Both 3	3865.33	24439.33	60032
Both 4	1731.67	10393.67	26454
Both 5	2717.67	18509.33	45614
Both 6	4684	29529	72622.67

Set