

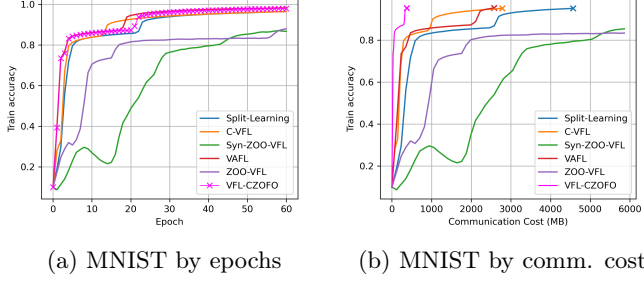
To All Reviewers: Experiments on More Clients

Figure 1: Experiment on 4 Clients

Table 1: Test Accuracy and Comm. Cost (4 Clients)

	Privacy	Test Accuracy	Cost (95%)	Cost (total)
Split learning	✗	97.67 ± 0.03	4570 MB	11718 MB
Compressed-VFL	✗	97.78 ± 0.12	2783 MB	7325 MB
VAFL	✗	97.60 ± 0.07	2703 MB	12288 MB
VAFL+DP	✓	96.72 ± 0.21	3179 MB	12288 MB
Syn-ZOO-VFL	✓	83.97 ± 0.51	-	11722 MB
ZOO-VFL	✓	87.42 ± 0.25	-	12291 MB
Ours	✓	96.60 ± 0.08	537 MB	1579 MB

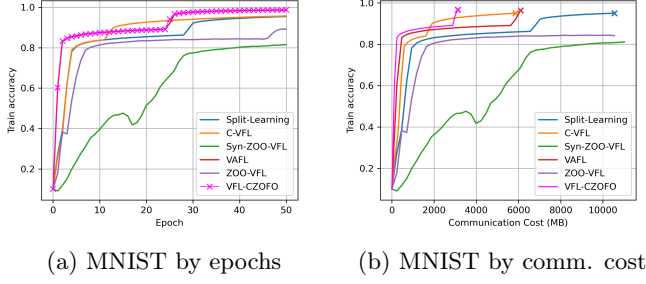


Figure 2: Experiment on 8 Clients

Table 2: Test Accuracy and Comm. Cost (8 Clients)

	Privacy	Test Accuracy	Cost (95%)	Cost (total)
Split learning	✗	97.46 ± 0.08	10547 MB	23438 MB
Compressed-VFL	✗	97.51 ± 0.09	5860 MB	14649 MB
VAFL	✗	97.41 ± 0.04	6390 MB	24579 MB
VAFL+DP	✓	96.62 ± 0.17	8132 MB	24579 MB
Syn-ZOO-VFL	✓	82.64 ± 0.57	-	23443 MB
ZOO-VFL	✓	89.49 ± 0.38	-	24093 MB
Ours	✓	96.81 ± 0.12	3272 MB	12590 MB

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Table 3: Privacy-utility Trade-off

	Trade-off type	Test Accuracy
VAFL	Test-accuracy-focused trade-off	97.36 ± 0.14
VFL-CZOFO	Test-accuracy-focused trade-off	97.35 ± 0.05
VAFL + DP ($\epsilon = 95$)	Balanced trade-off	95.94 ± 0.29
VFL-CZOFO ($\epsilon = 95$)	Balanced trade-off	96.32 ± 0.22

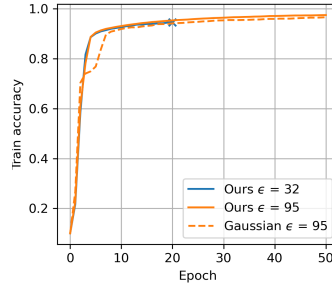


Figure 3: Achieving Smaller Privacy Budget

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Table 4: Computational Cost for Propagation (More Clients)

The number of Clients	Clients' Comp. Time per Epoch (s)	Server's Comp. Time per Epoch (s)
2	1.15	49.02
4	2.65	122.20
8	9.81	384.29

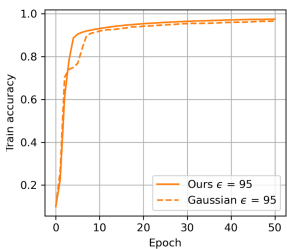
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Figure 4: The Convergence of the Central ZOE

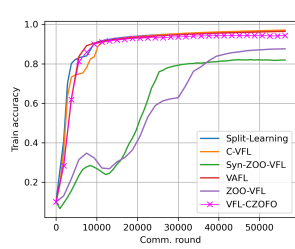
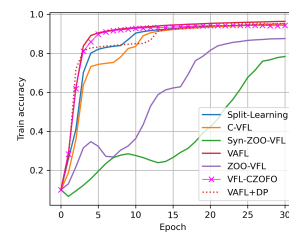
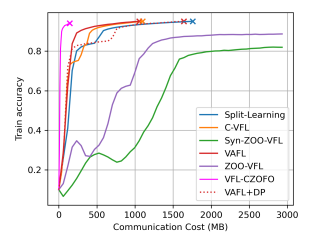


Figure 5: Mnist by Comm. Round

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(a) MNIST by epochs



(b) MNIST by comm. cost

Figure 6: Add VAFL-DP in Figure 3 of the Manuscript