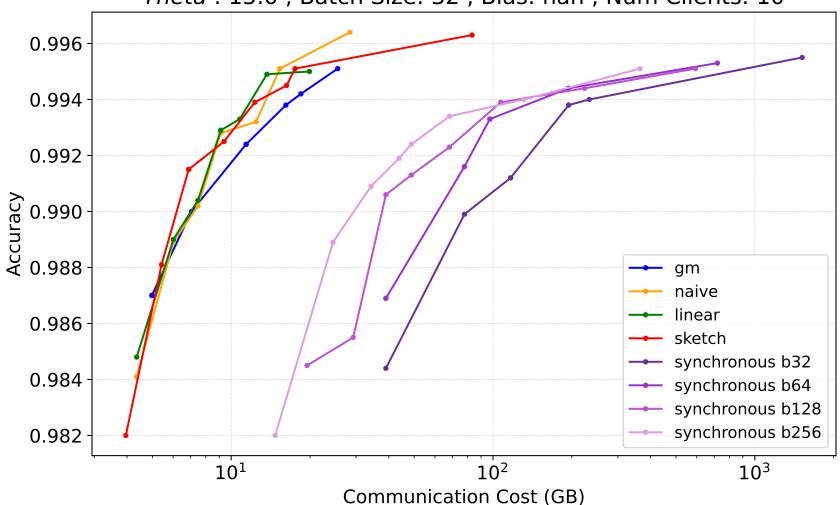
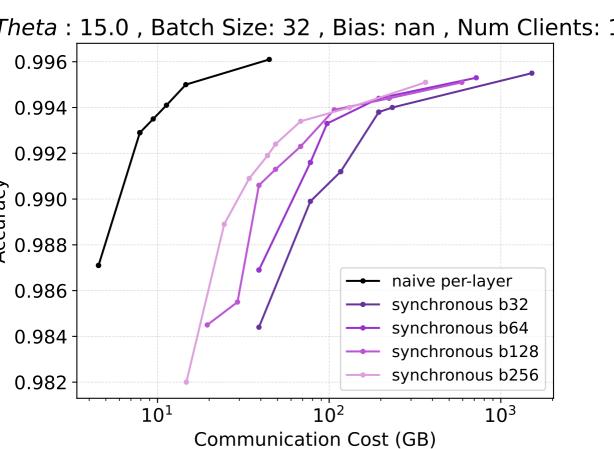
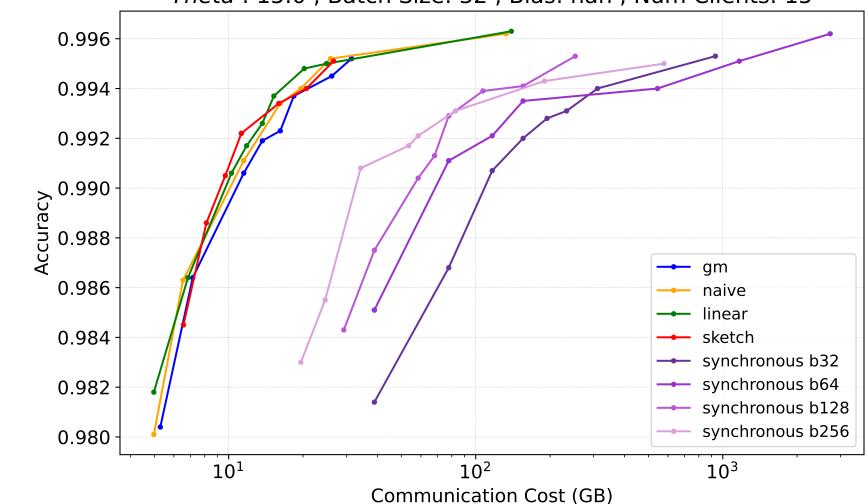


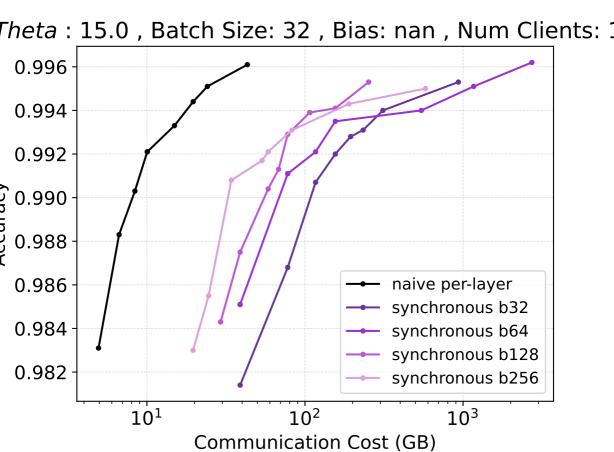
Theta: 15.0, Batch Size: 32, Bias: nan, Num Clients: 10



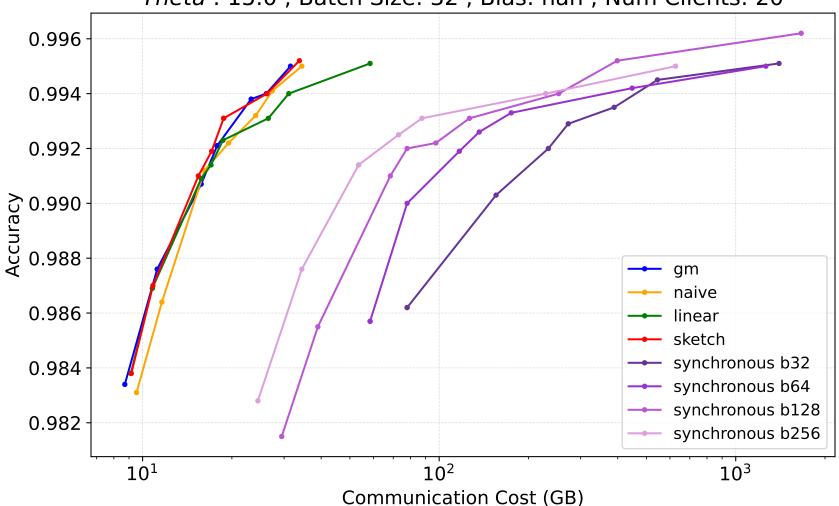


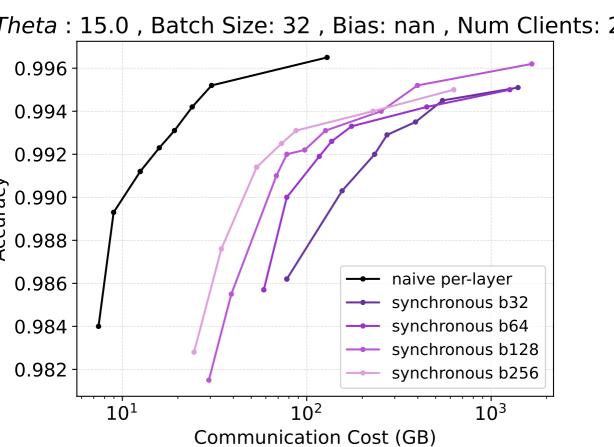
Theta: 15.0, Batch Size: 32, Bias: nan, Num Clients: 15



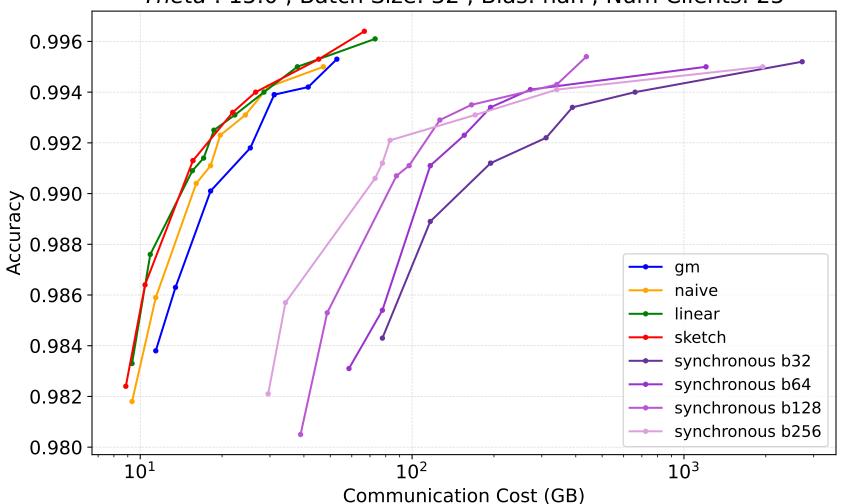


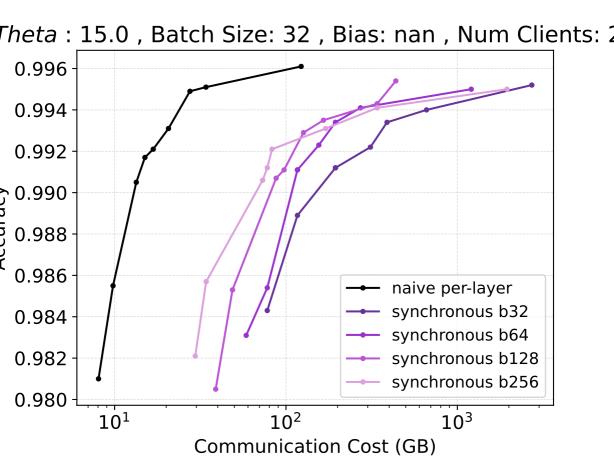
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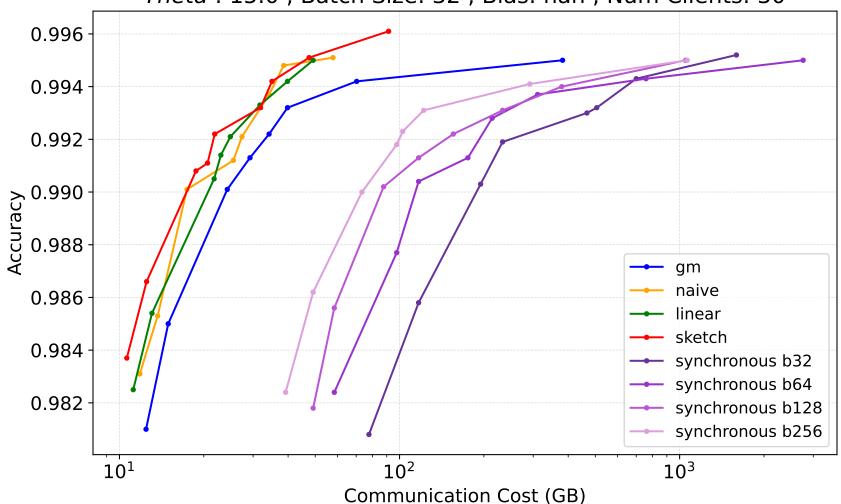


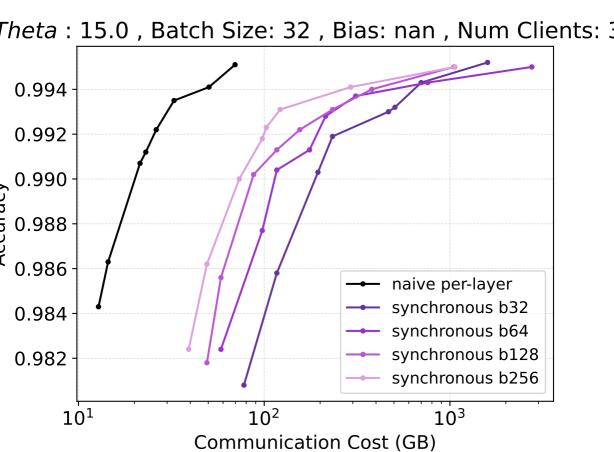
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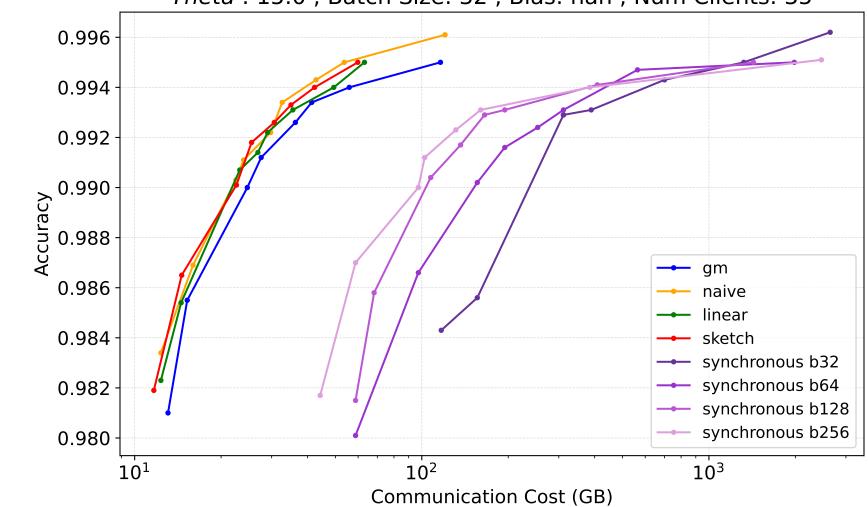


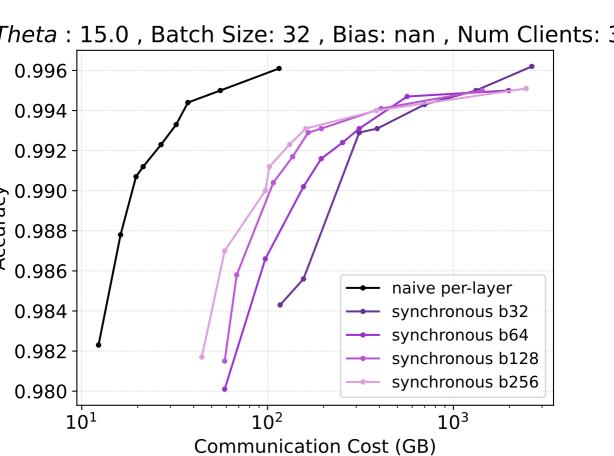
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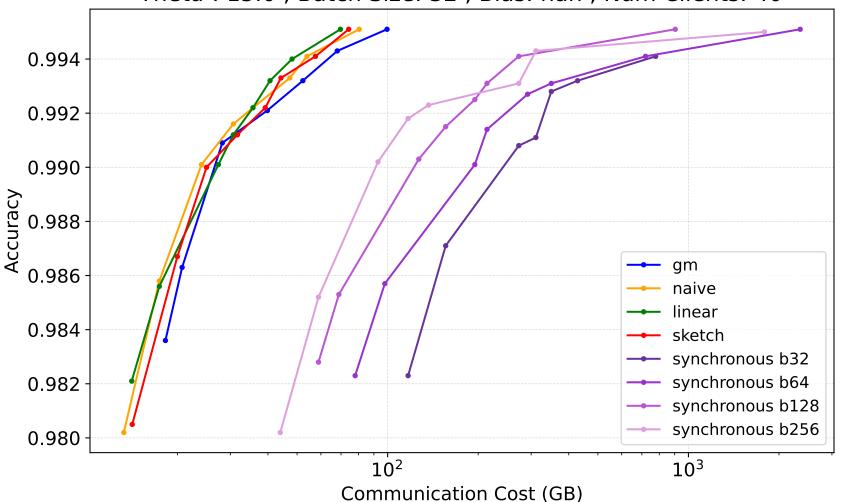


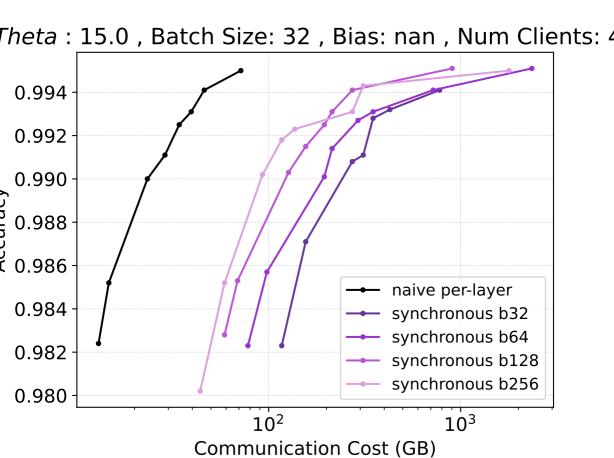
Theta: 15.0, Batch Size: 32, Bias: nan, Num Clients: 35



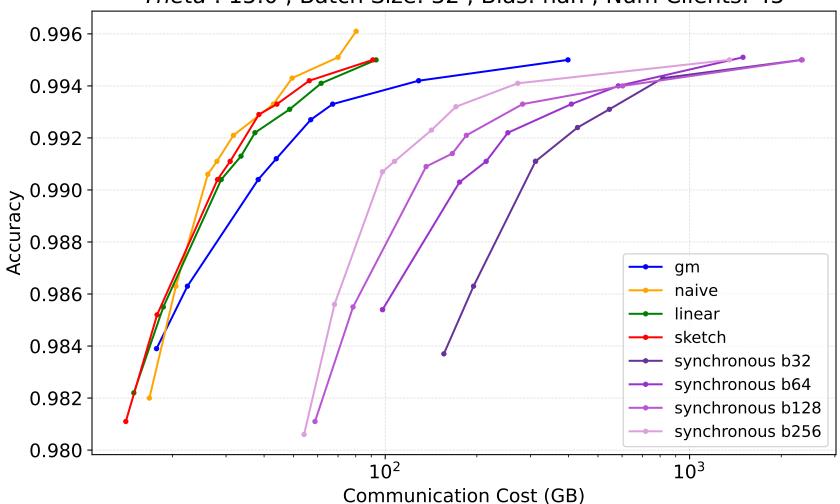


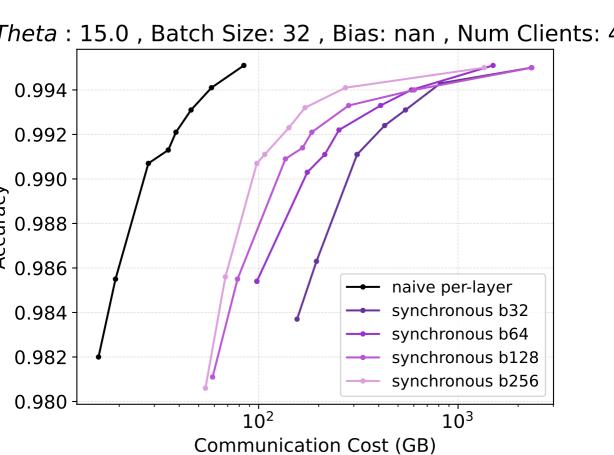
Theta: 15.0, Batch Size: 32, Bias: nan, Num Clients: 40



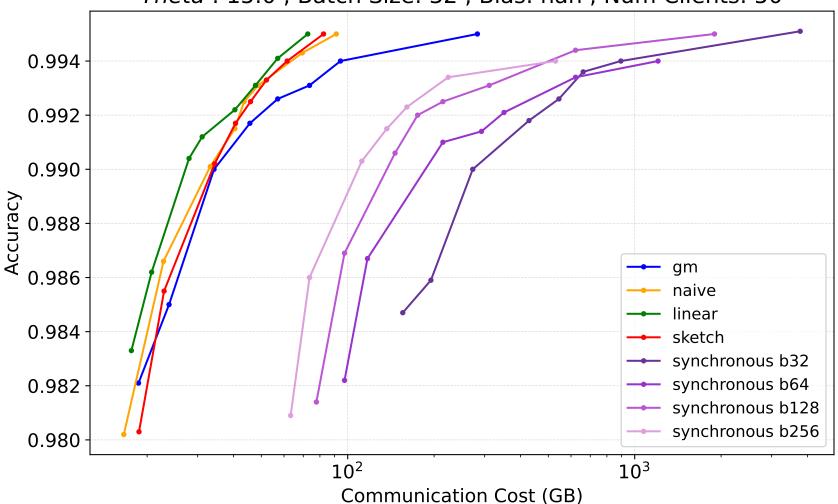


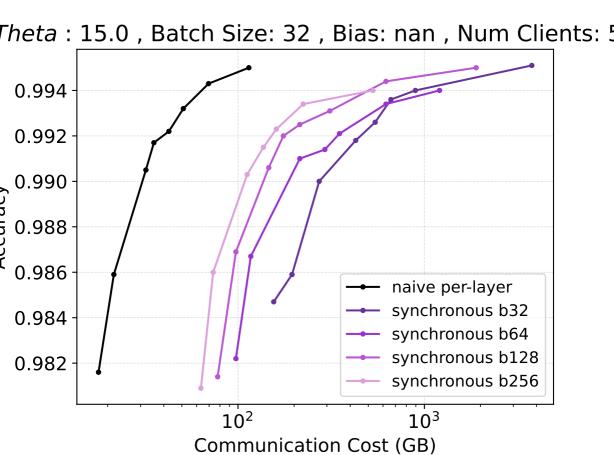
Theta: 15.0, Batch Size: 32, Bias: nan, Num Clients: 45



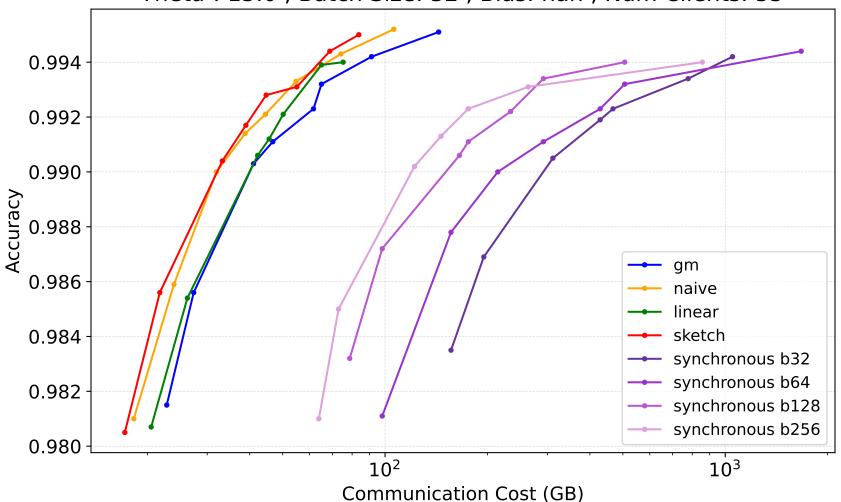


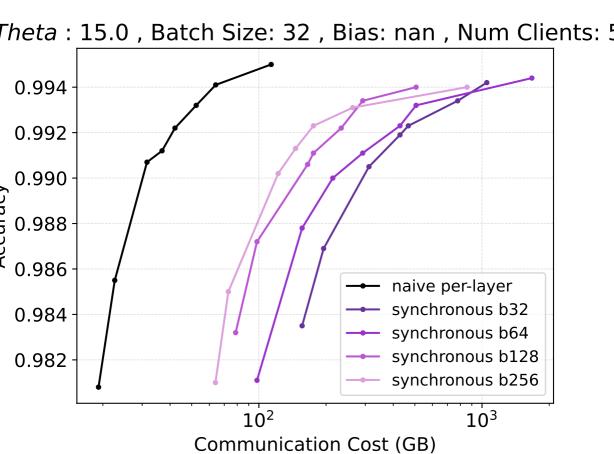
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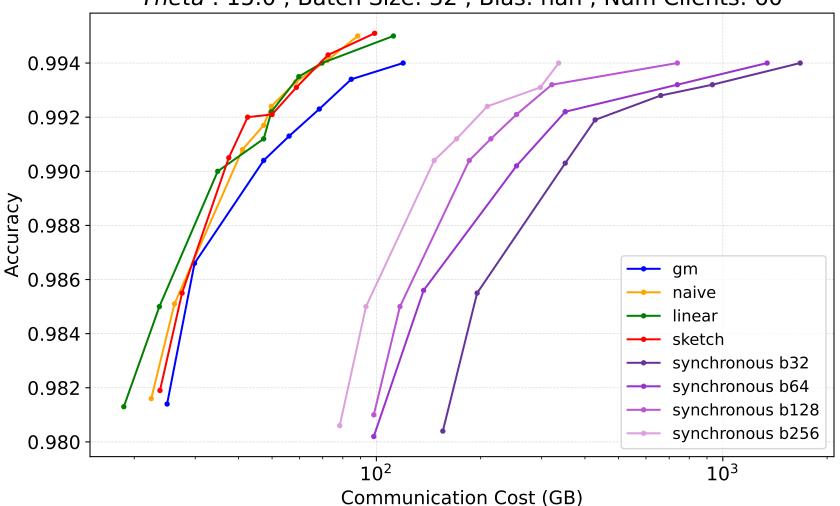


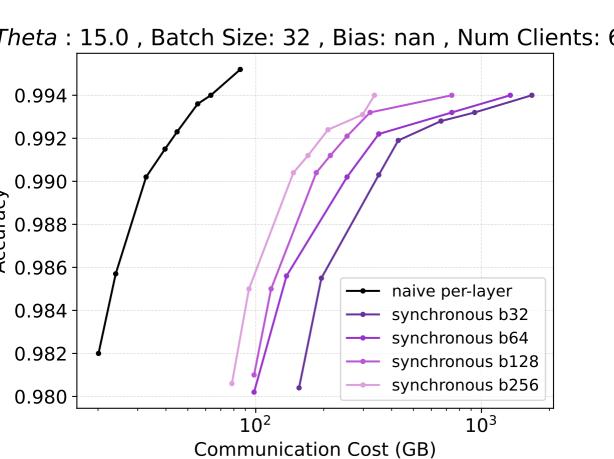
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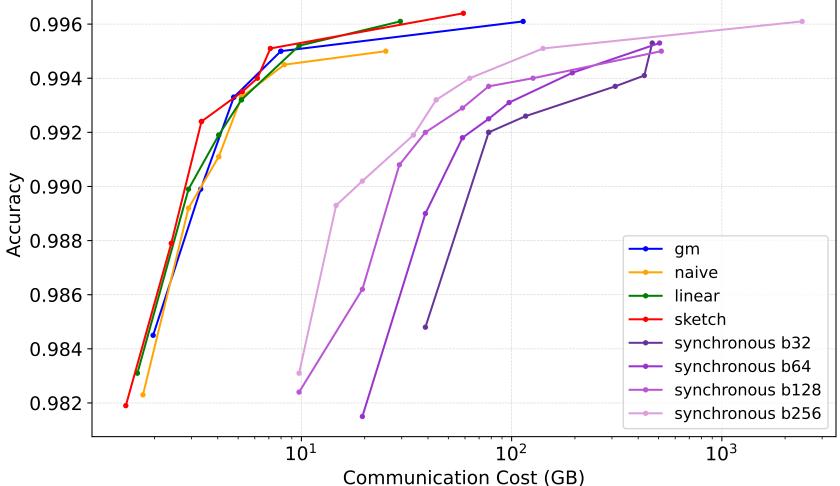


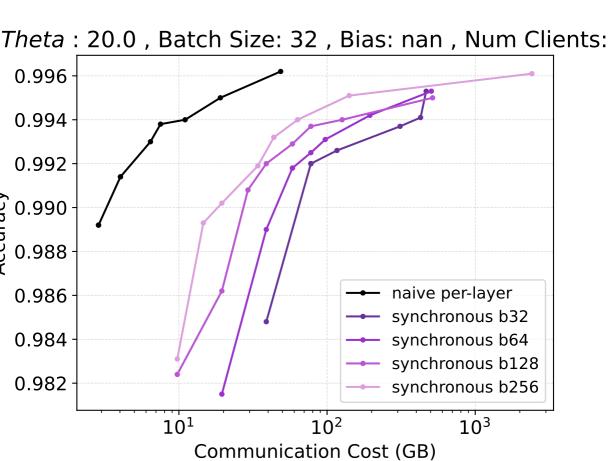
Theta: 15.0, Batch Size: 32, Bias: nan, Num Clients: 60



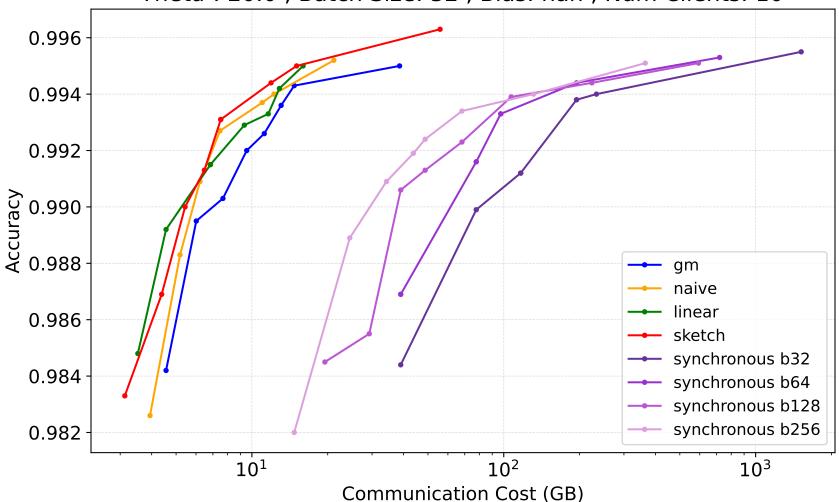


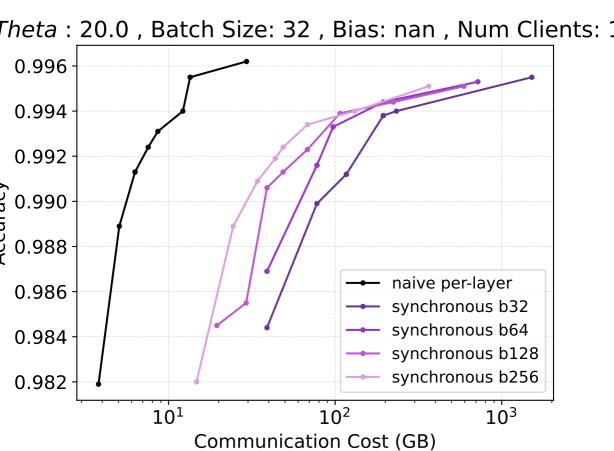
Theta: 20.0, Batch Size: 32, Bias: nan, Num Clients: 5 gm naive linear sketch → synchronous b32



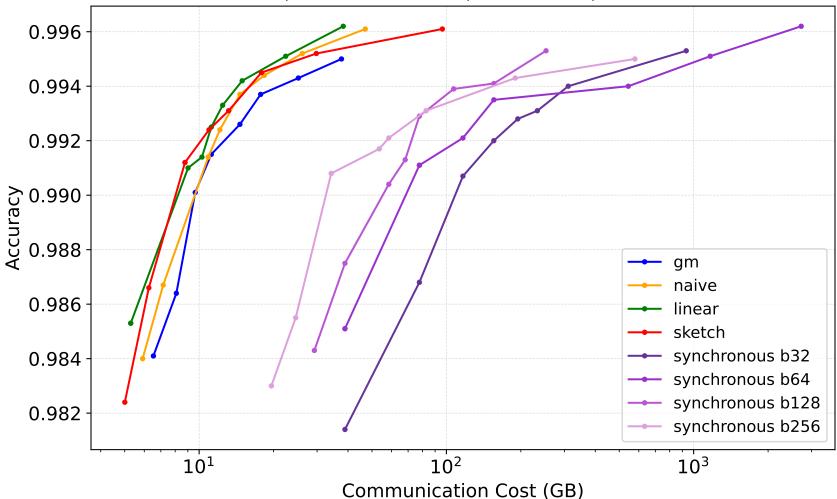


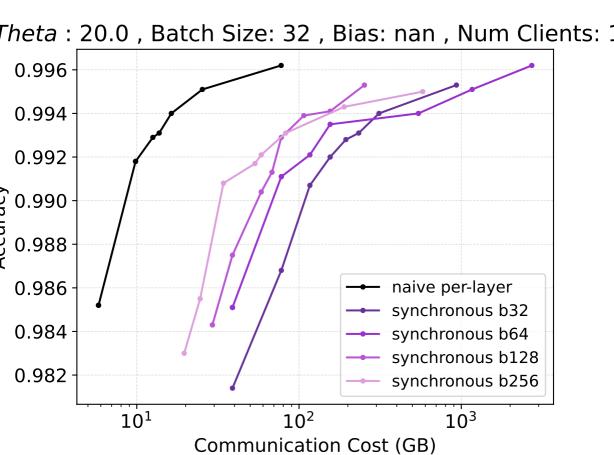
Theta: 20.0, Batch Size: 32, Bias: nan, Num Clients: 10

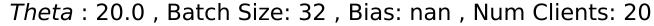


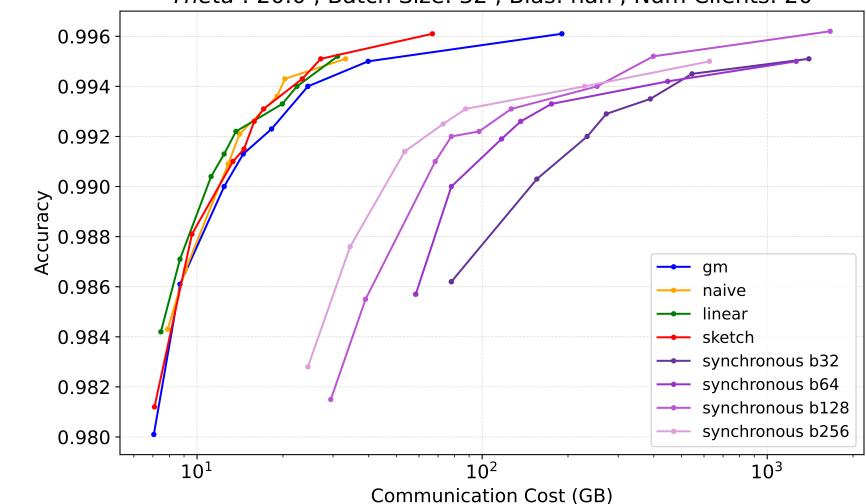


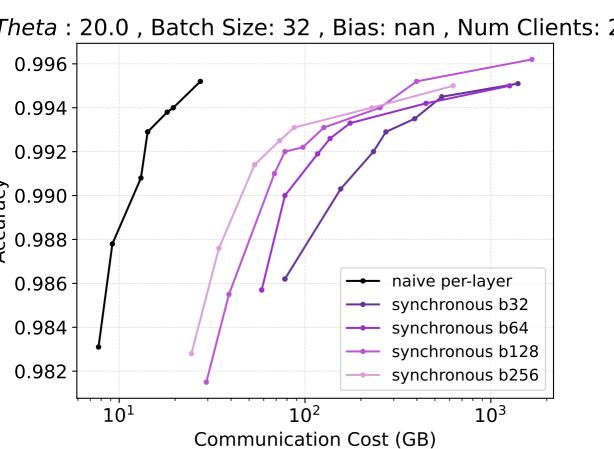
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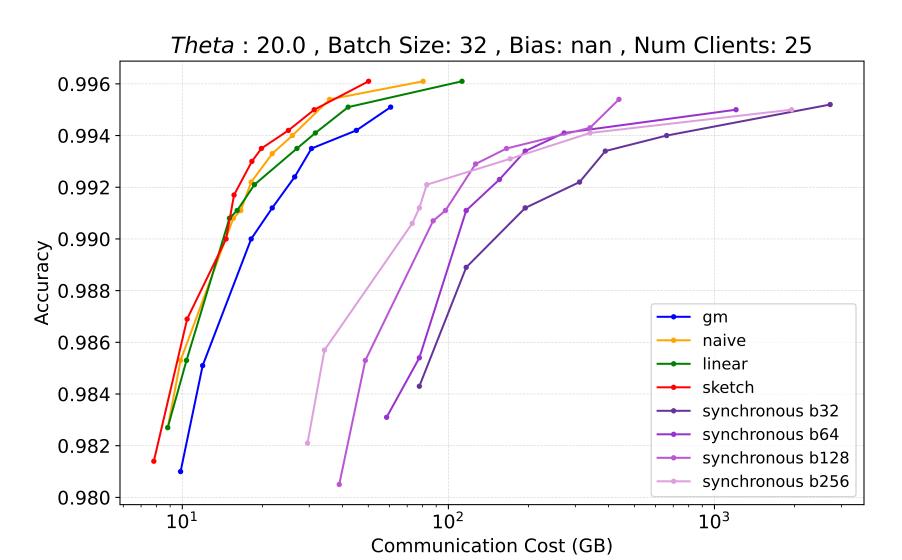


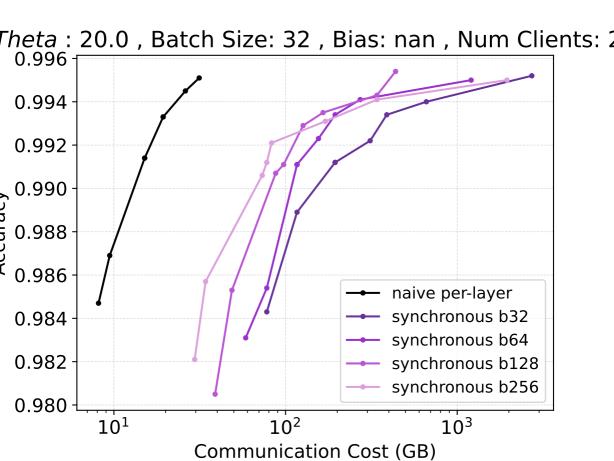


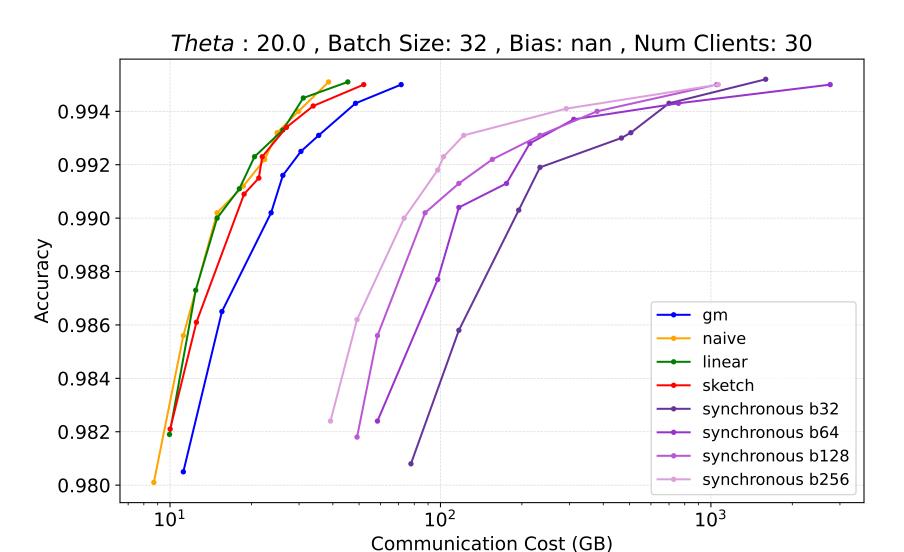


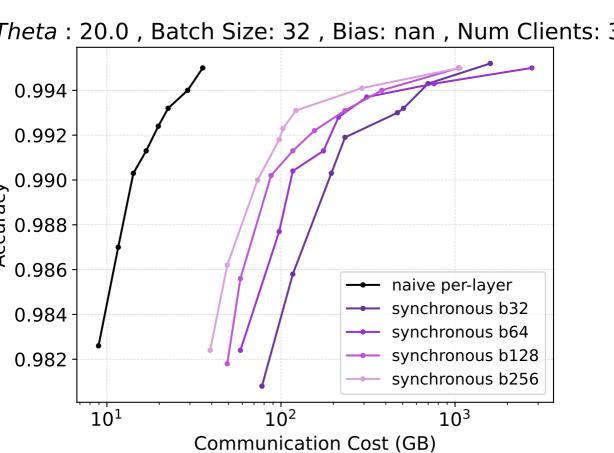




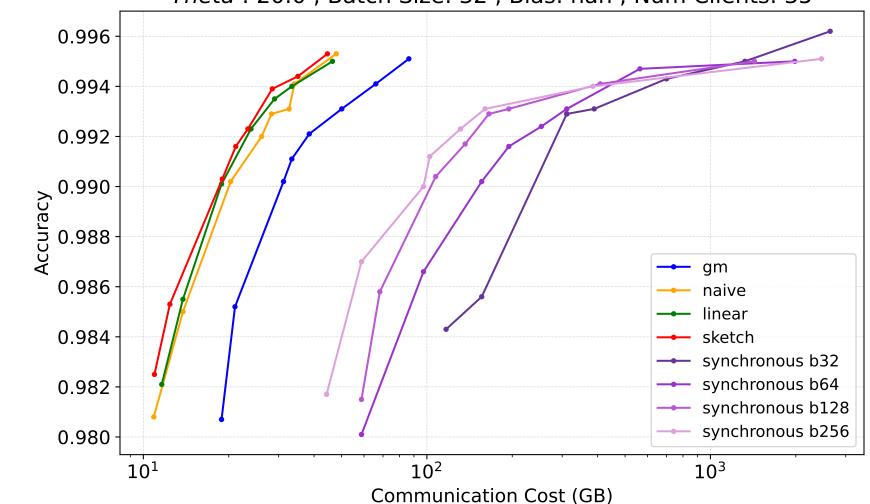


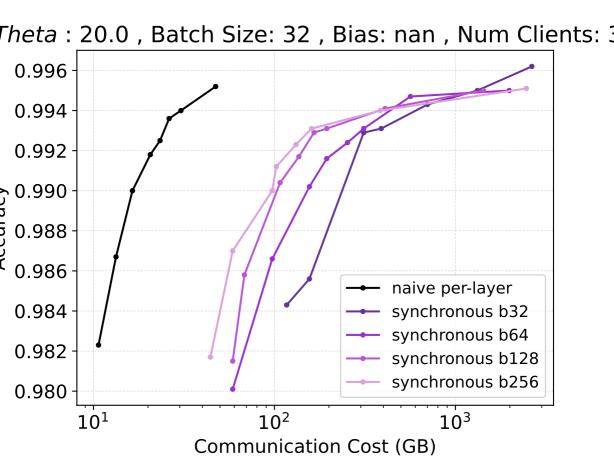




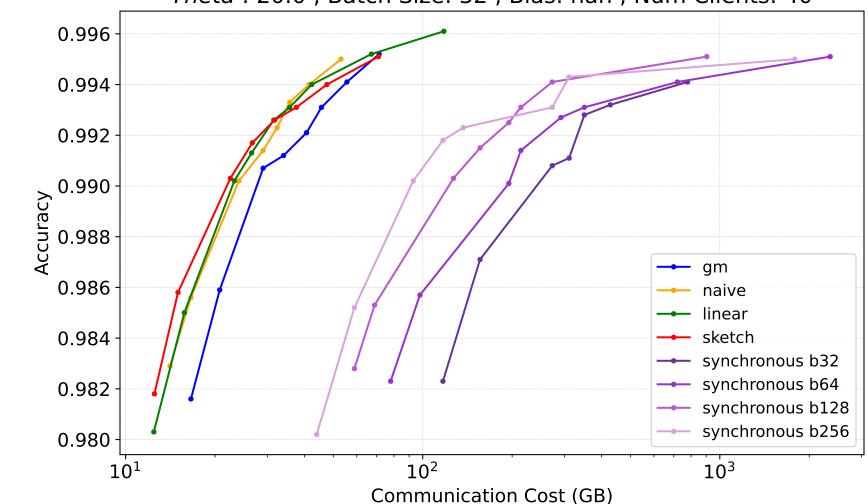


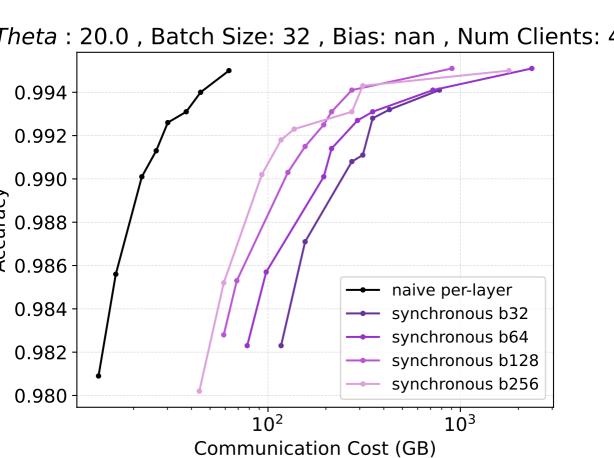
Theta: 20.0, Batch Size: 32, Bias: nan, Num Clients: 35



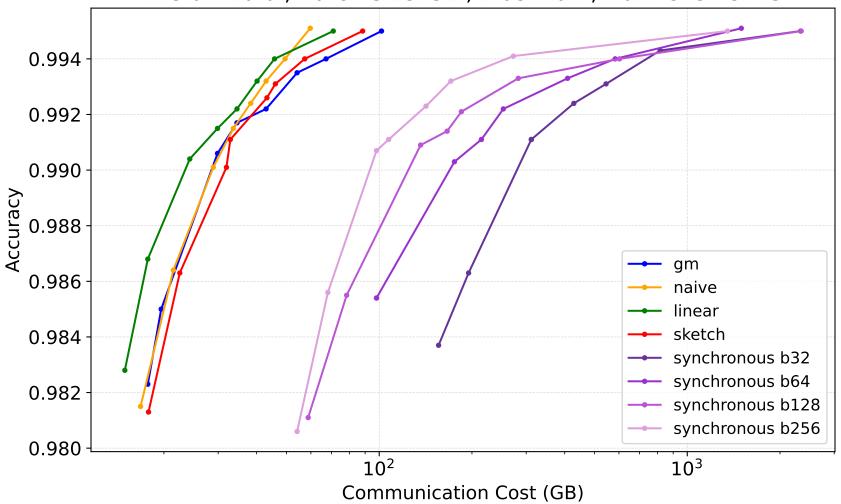


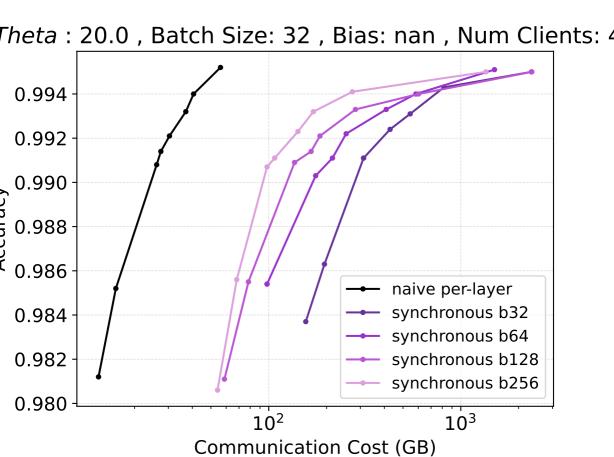
Theta: 20.0, Batch Size: 32, Bias: nan, Num Clients: 40



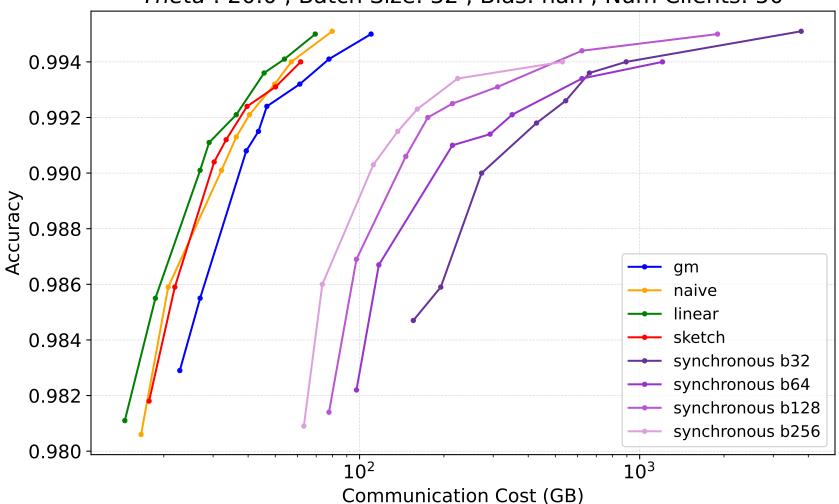


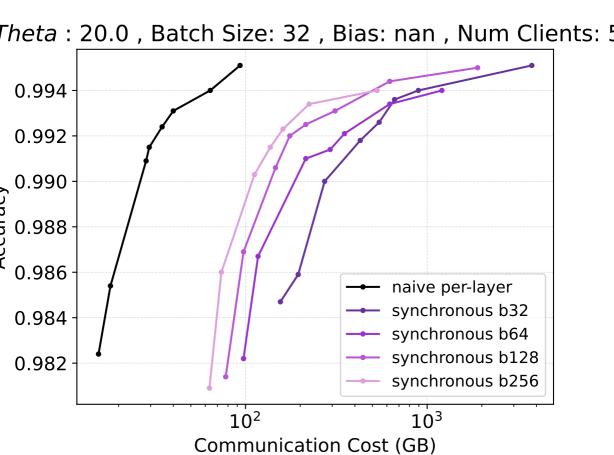
Theta: 20.0, Batch Size: 32, Bias: nan, Num Clients: 45

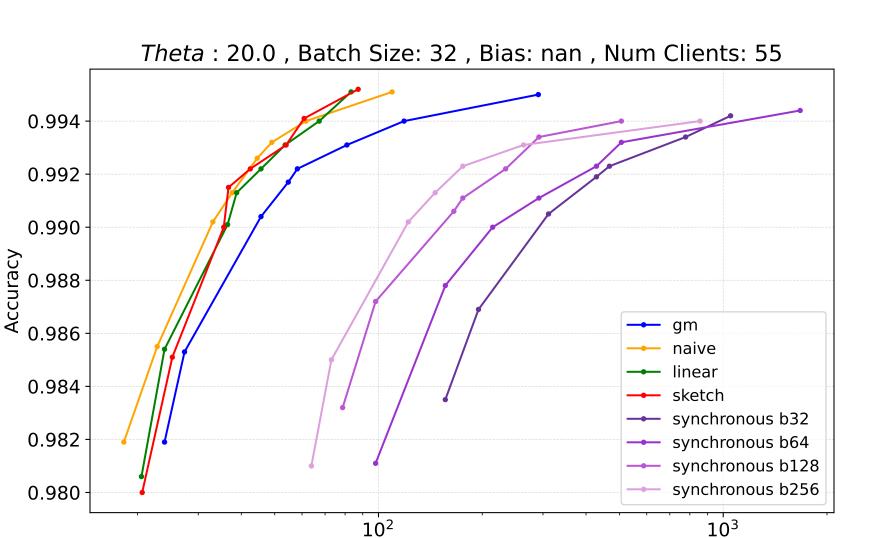




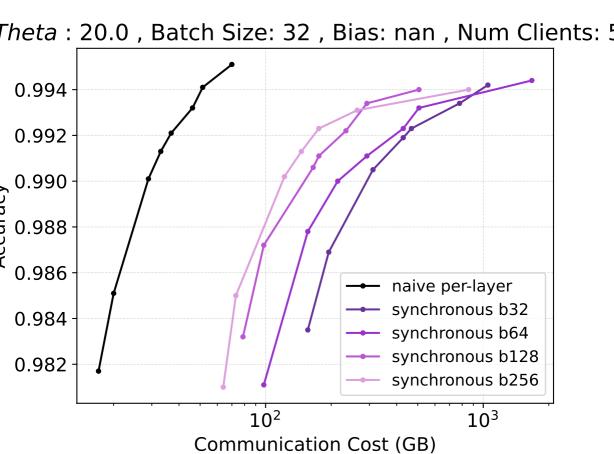
Theta: 20.0, Batch Size: 32, Bias: nan, Num Clients: 50



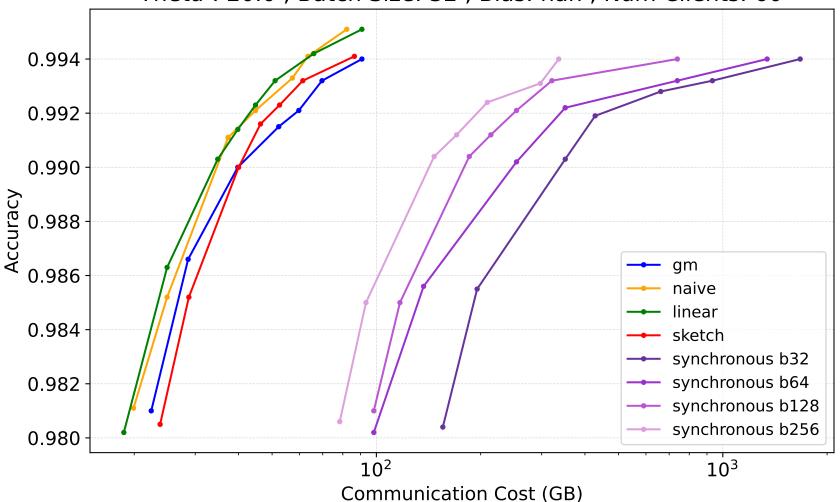


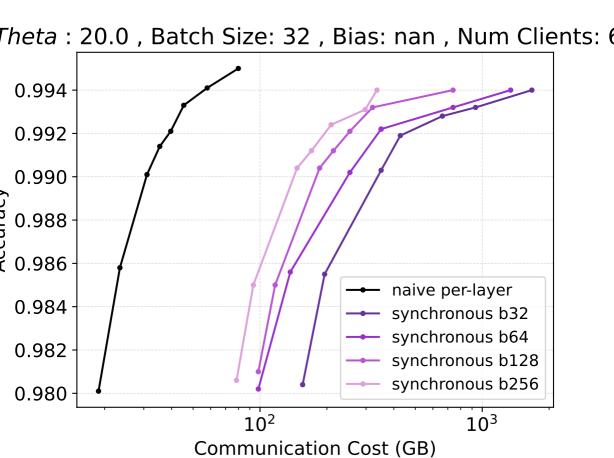


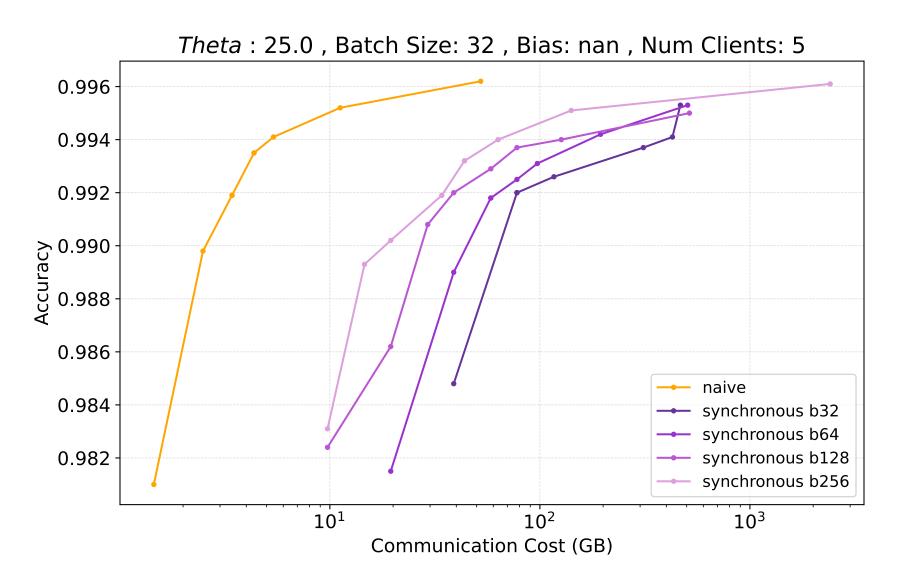
Communication Cost (GB)

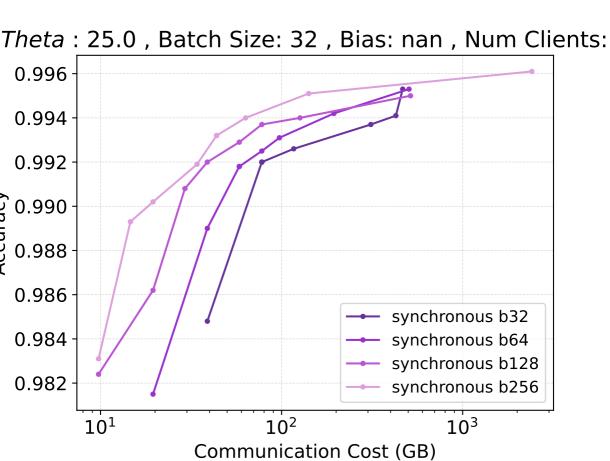


Theta: 20.0, Batch Size: 32, Bias: nan, Num Clients: 60

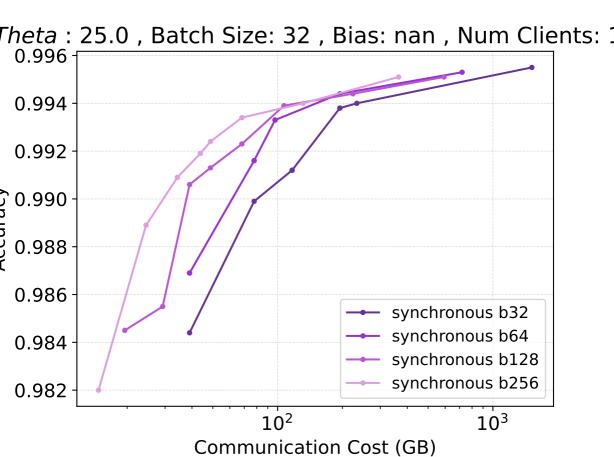


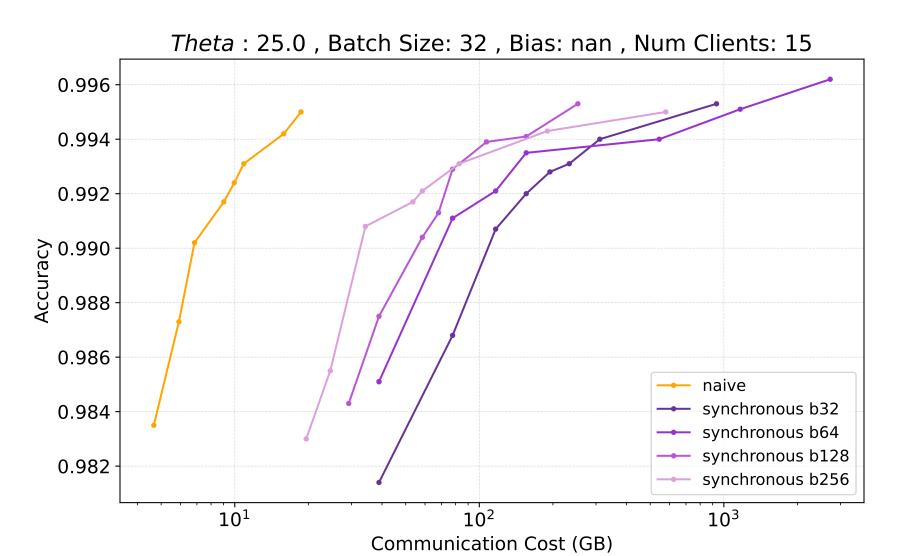


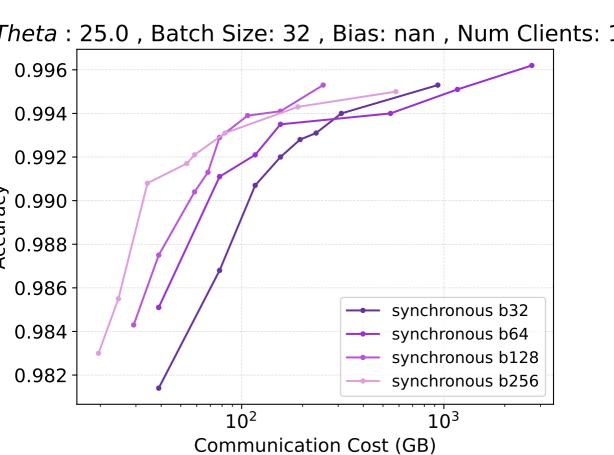




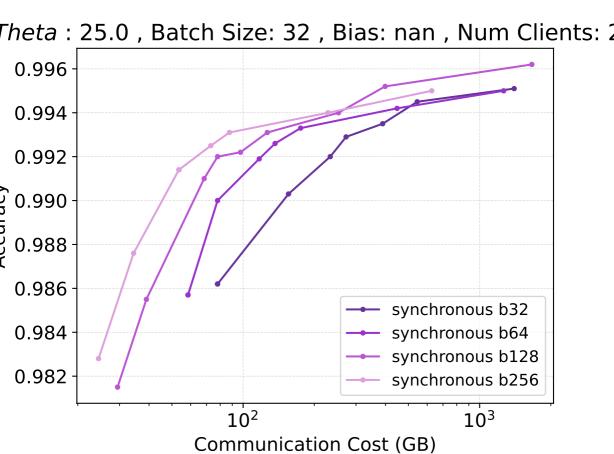


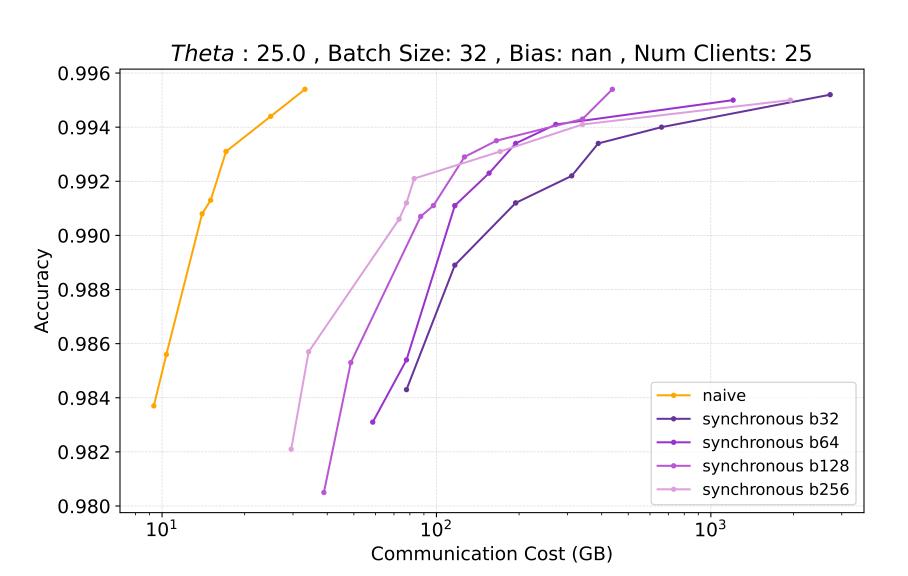


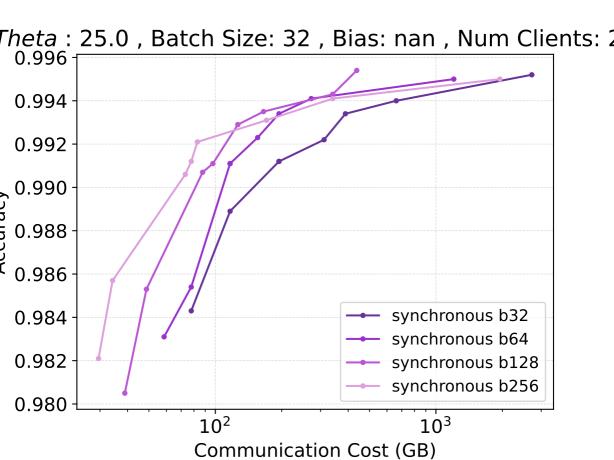


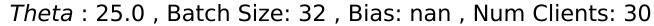


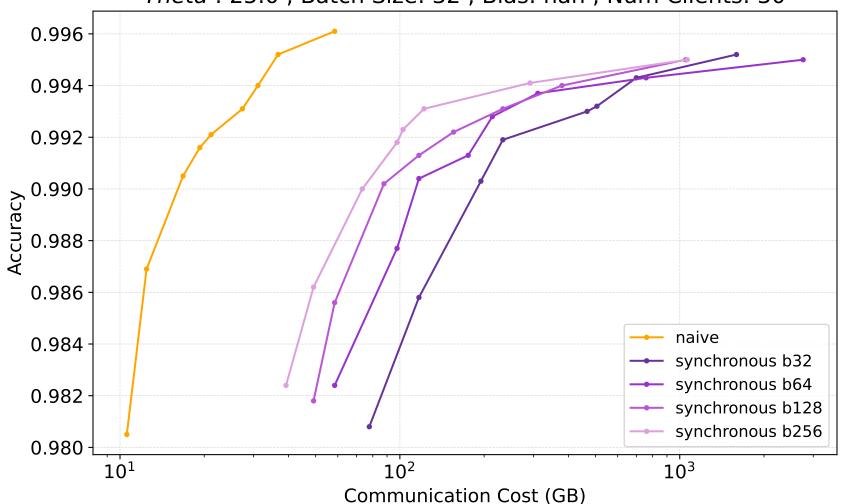


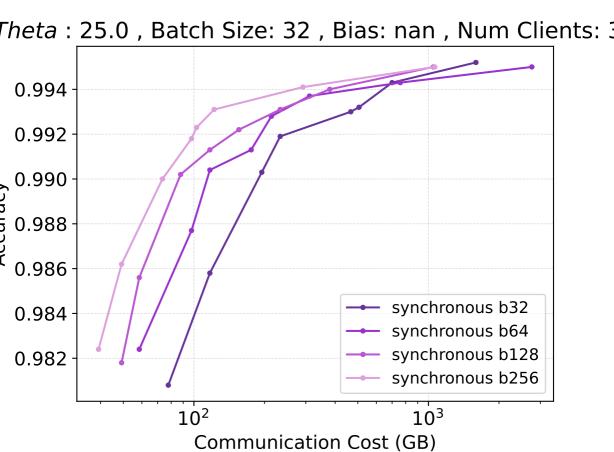




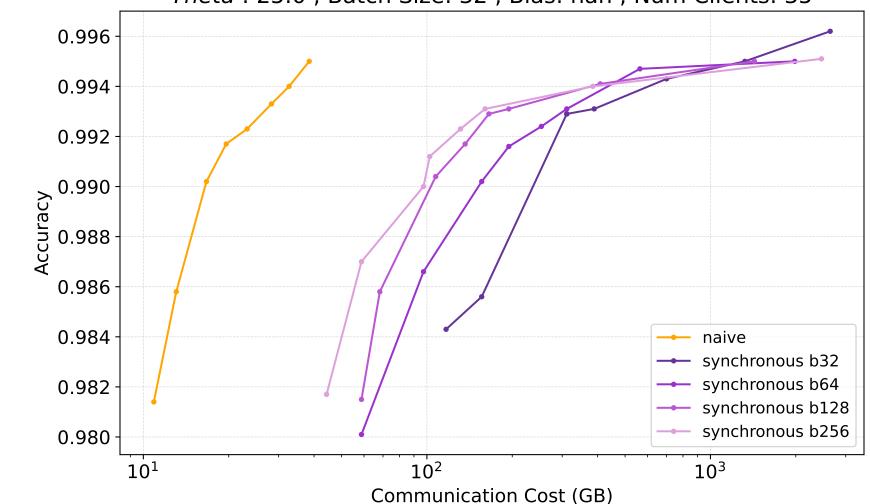


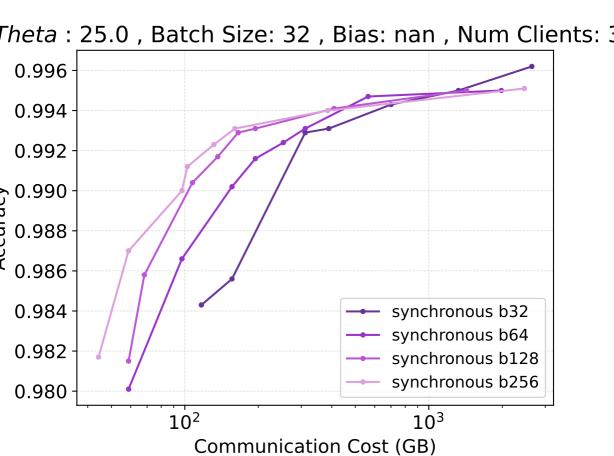




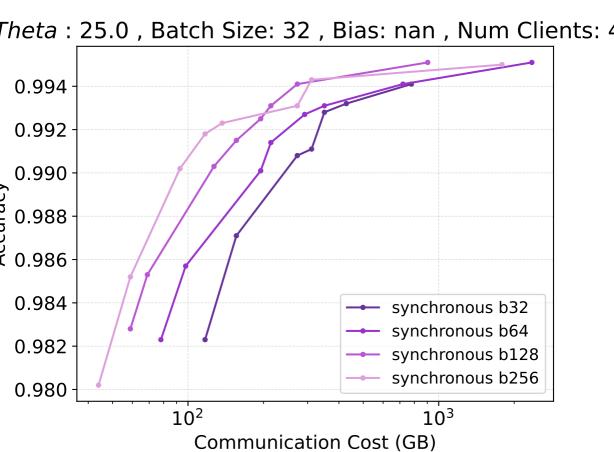


Theta: 25.0, Batch Size: 32, Bias: nan, Num Clients: 35

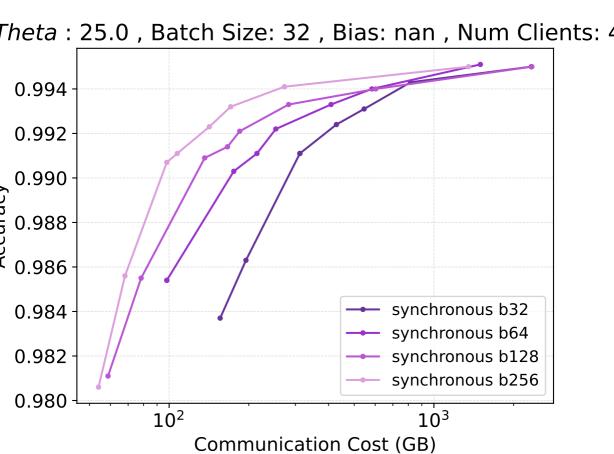


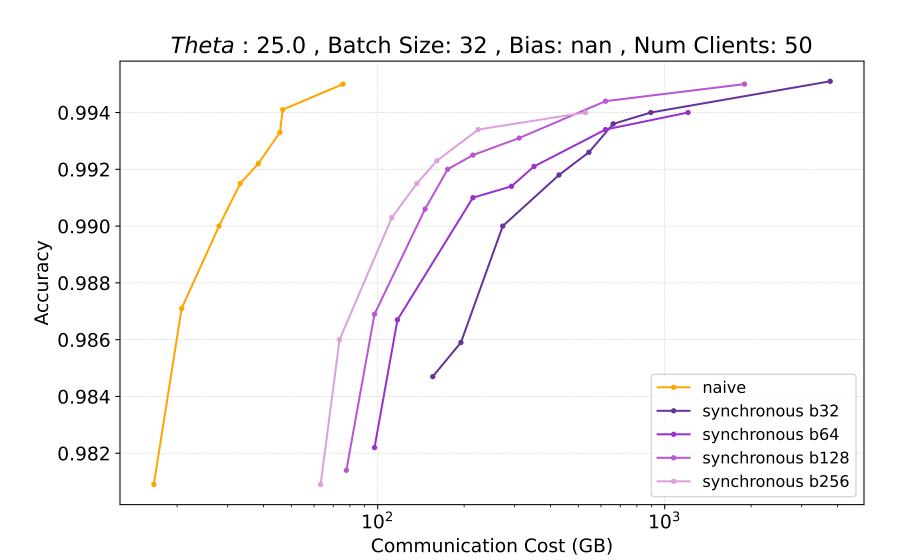


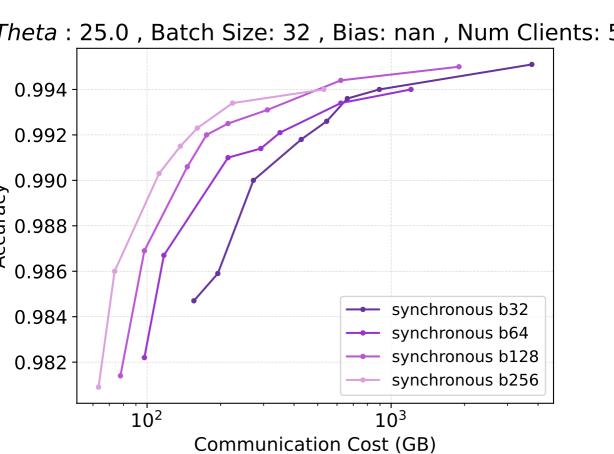


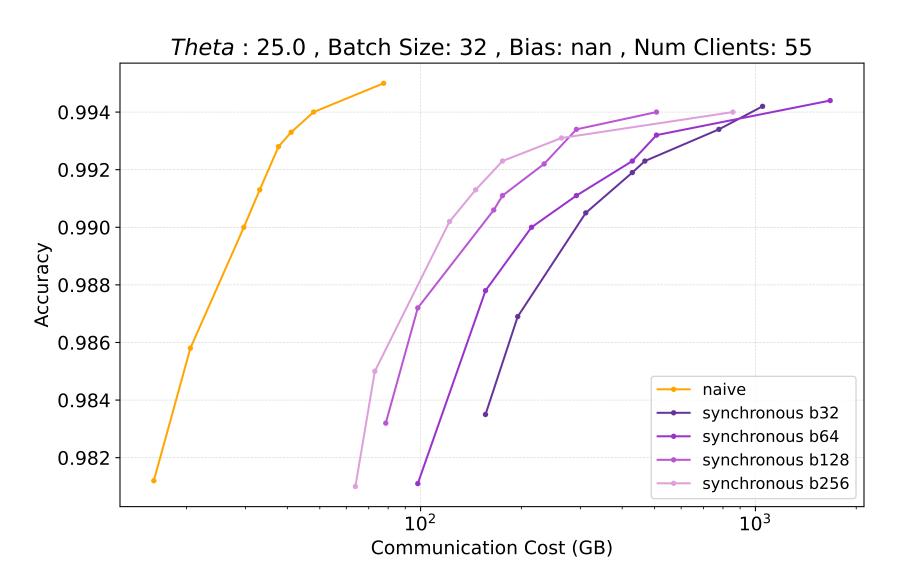


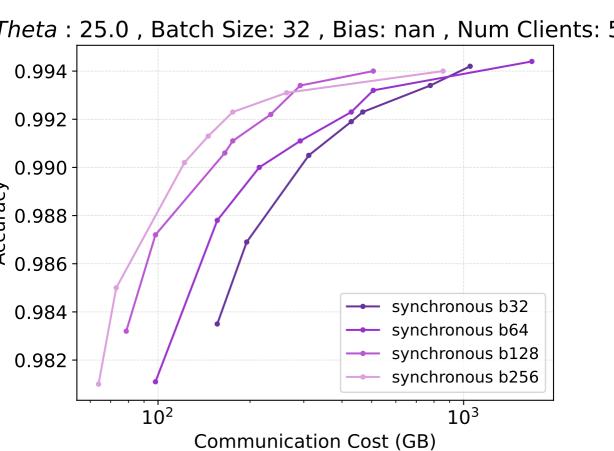


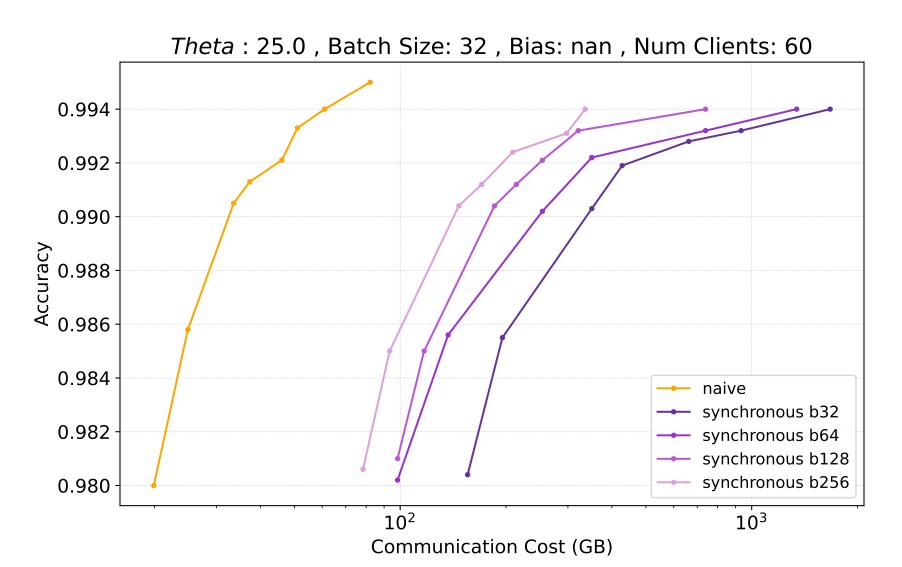


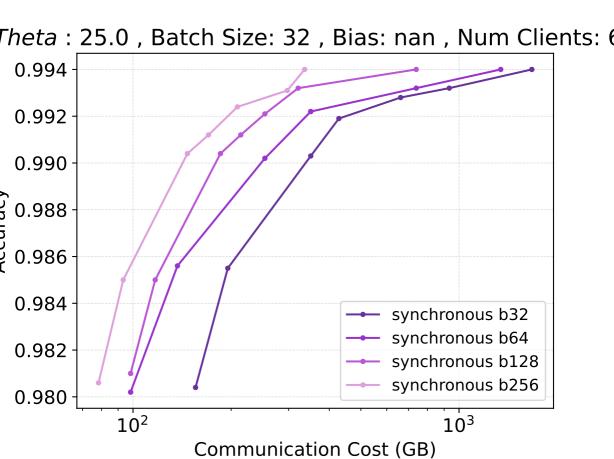


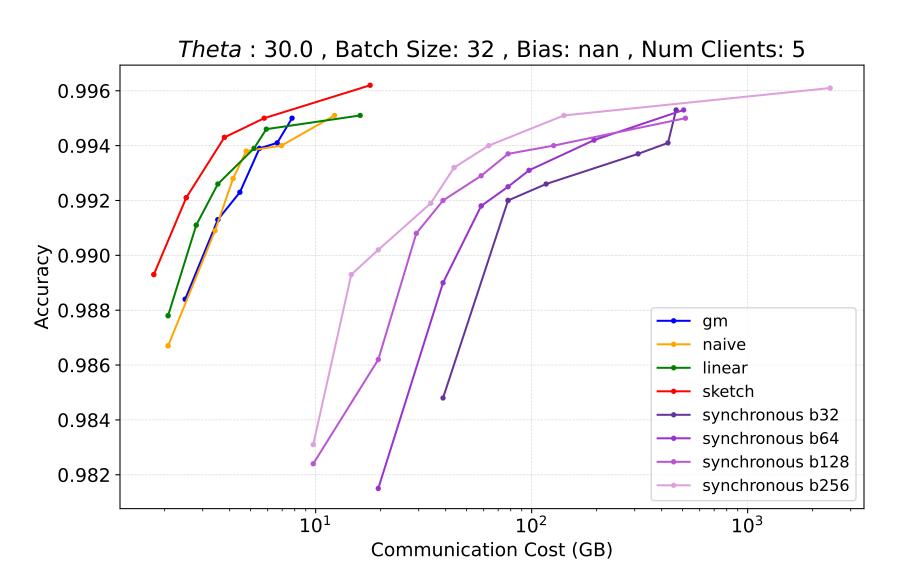


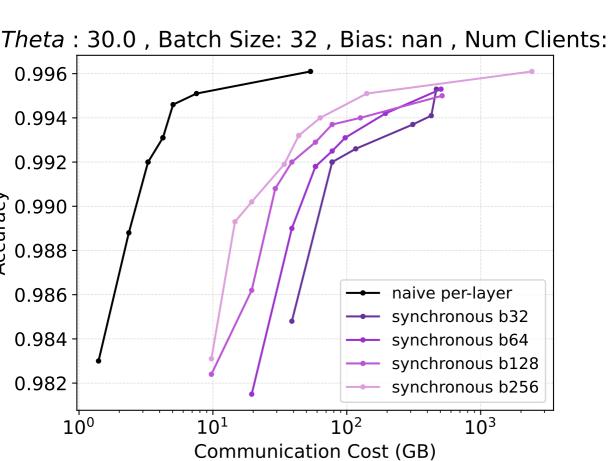


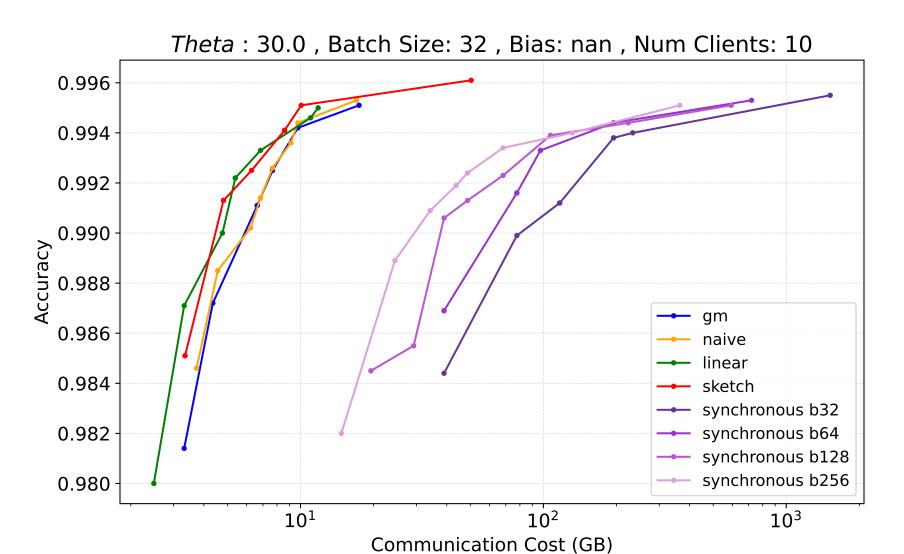


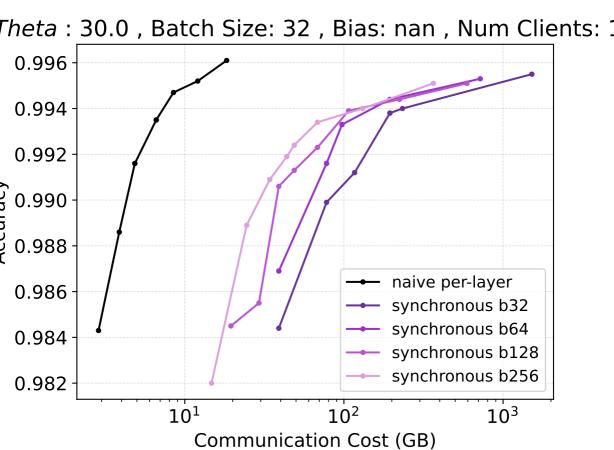




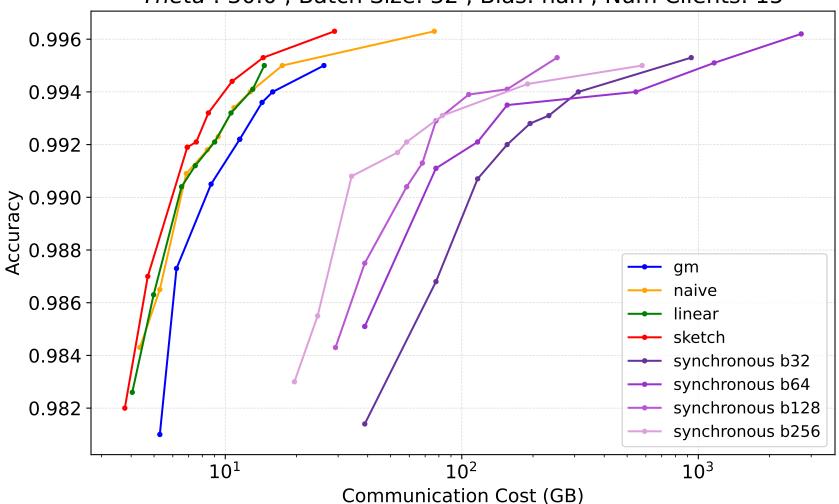


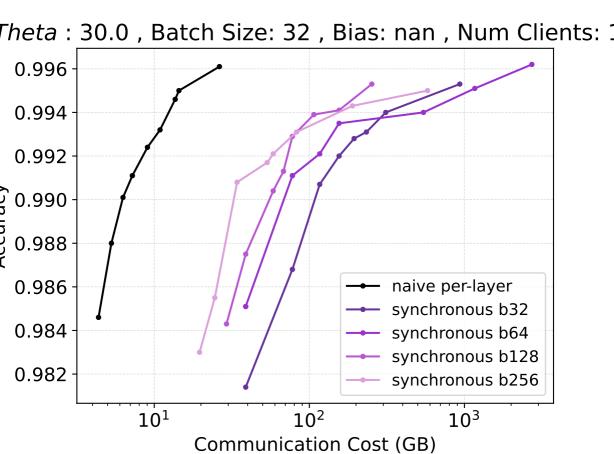


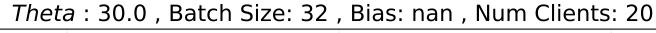


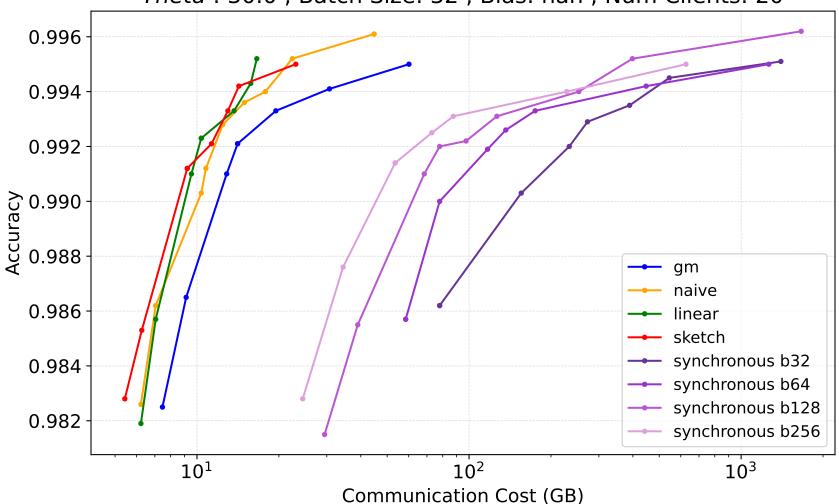


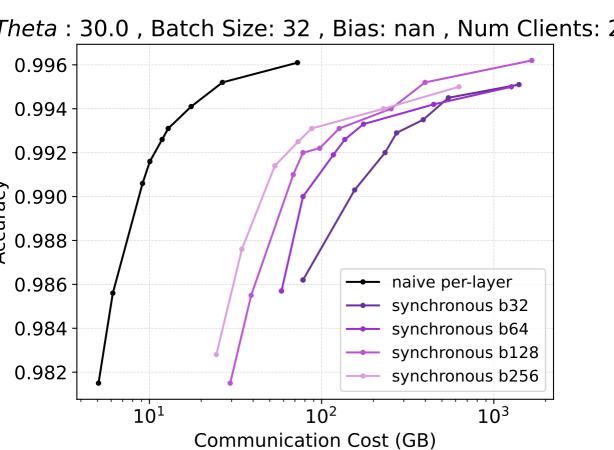
Theta: 30.0, Batch Size: 32, Bias: nan, Num Clients: 15

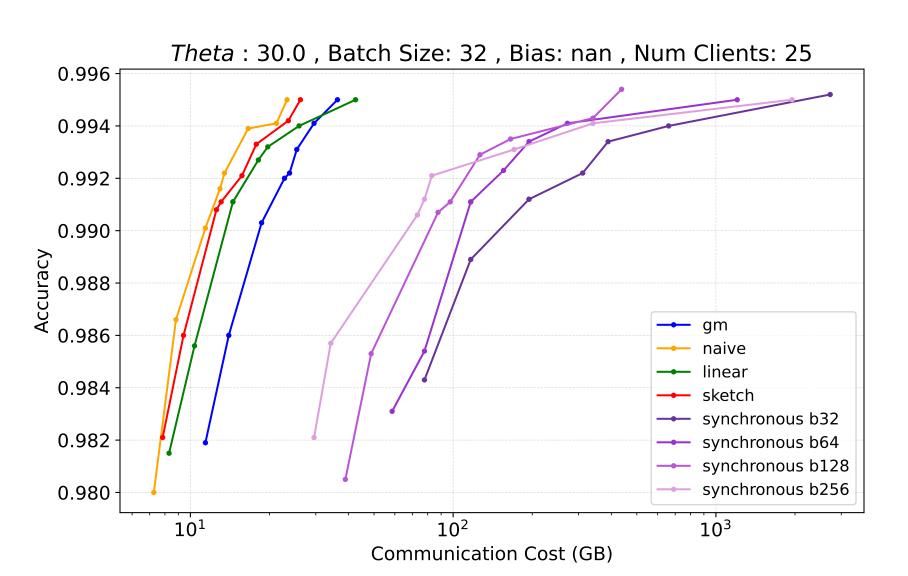


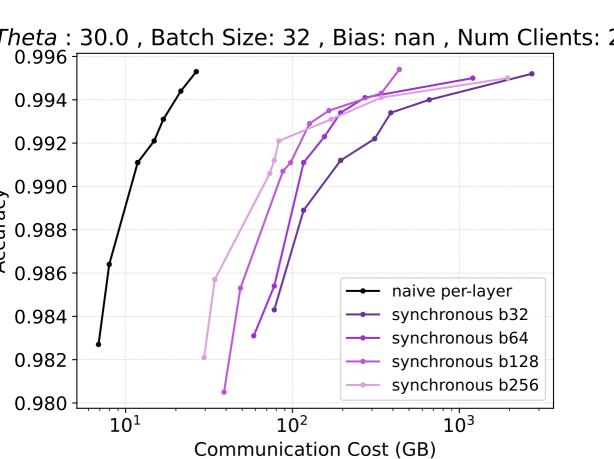


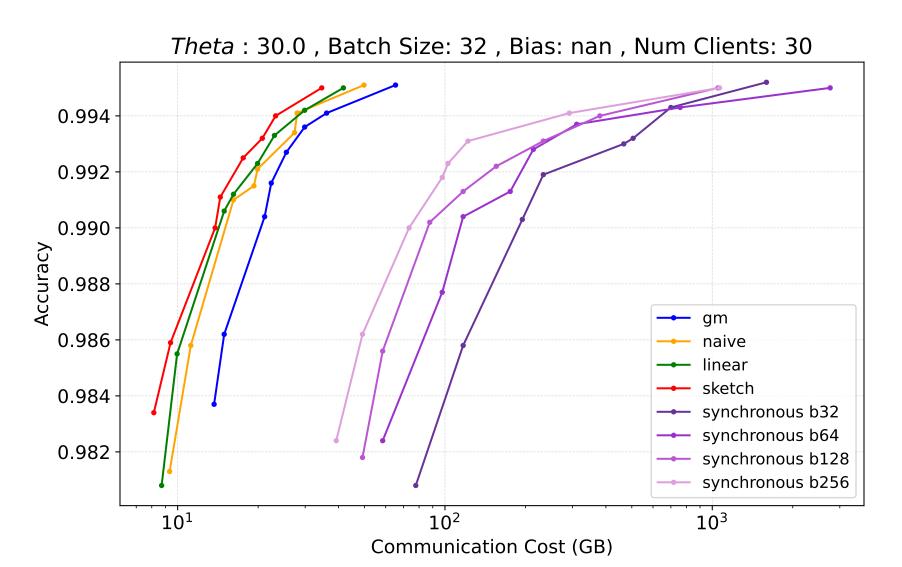


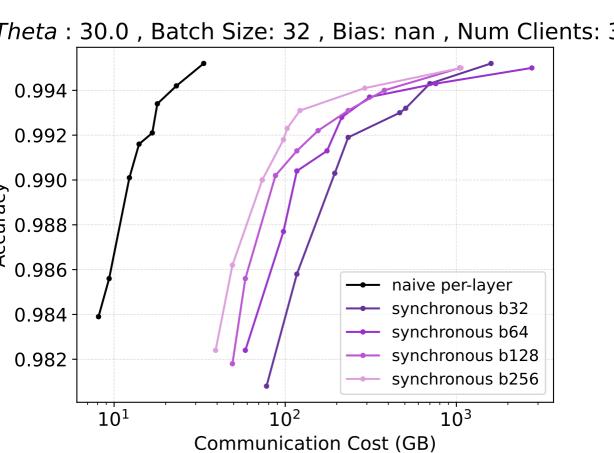


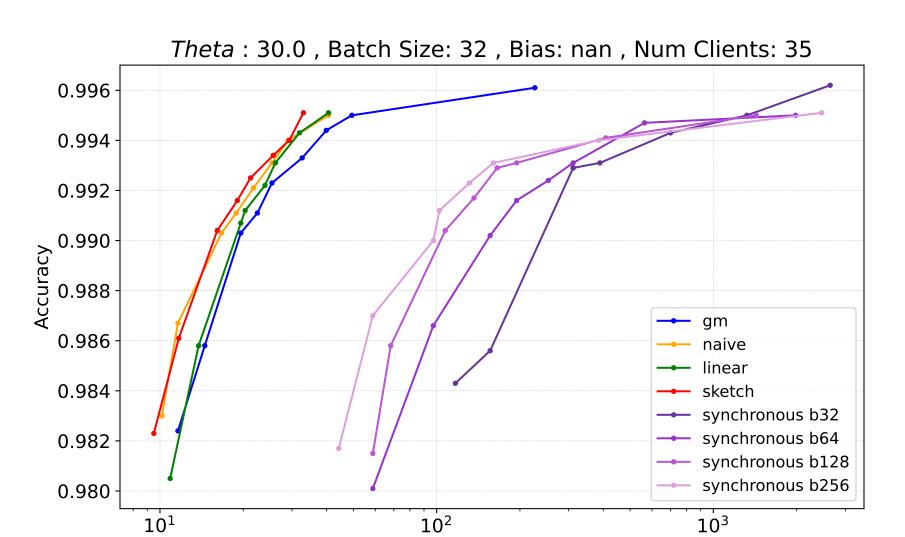




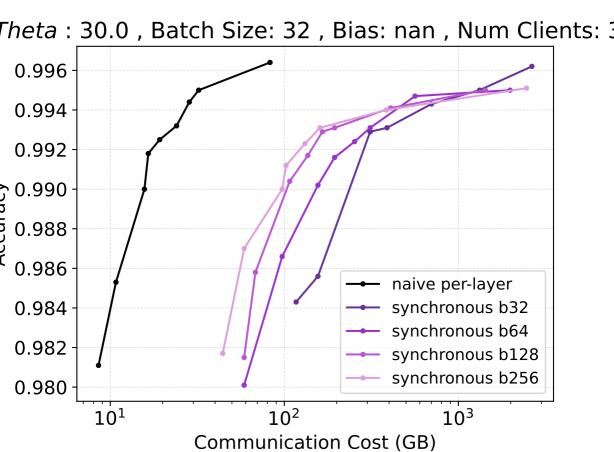




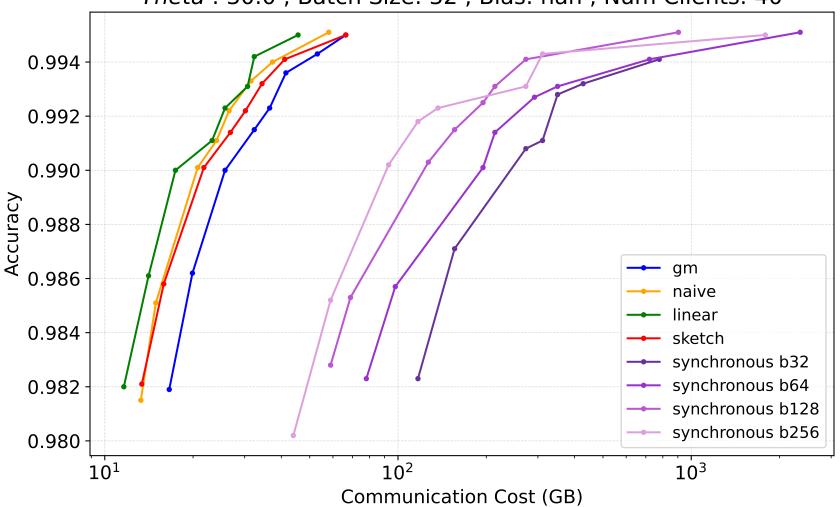


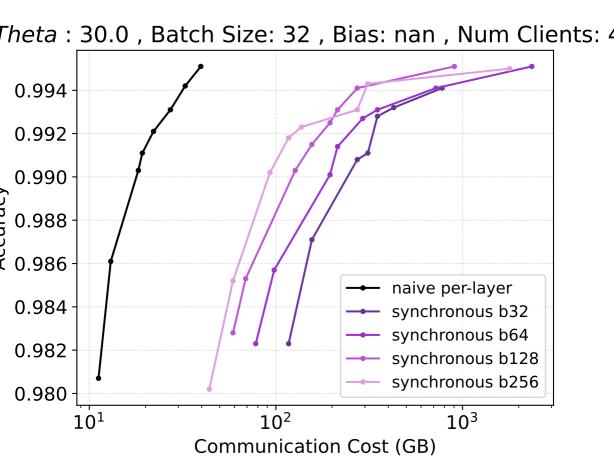


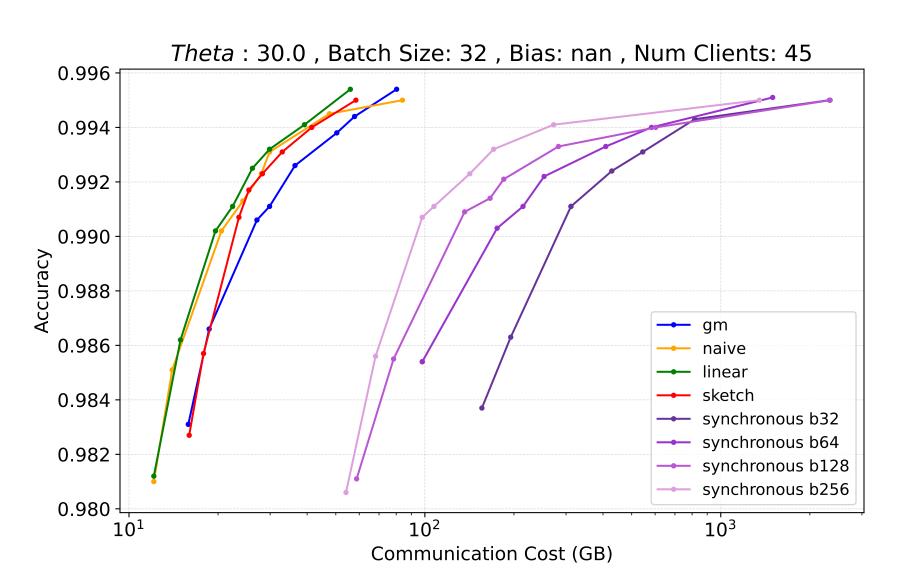
Communication Cost (GB)

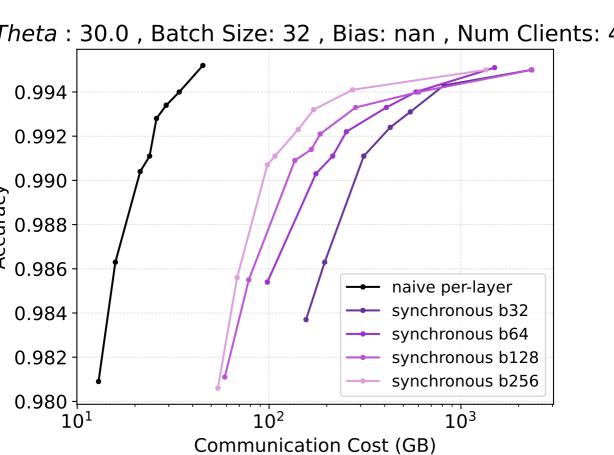


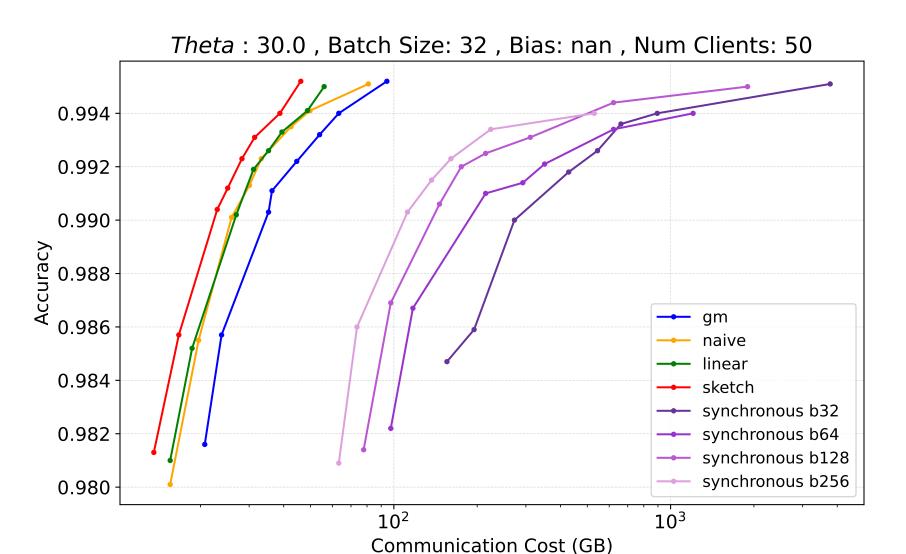
Theta: 30.0, Batch Size: 32, Bias: nan, Num Clients: 40

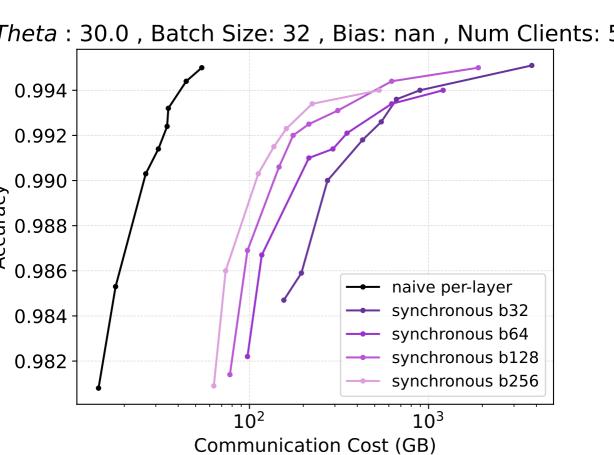




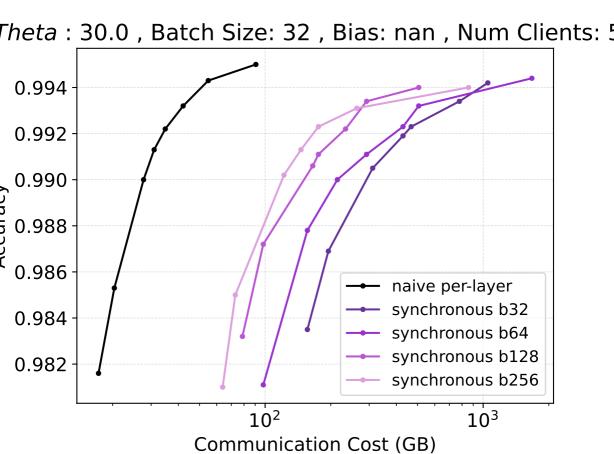




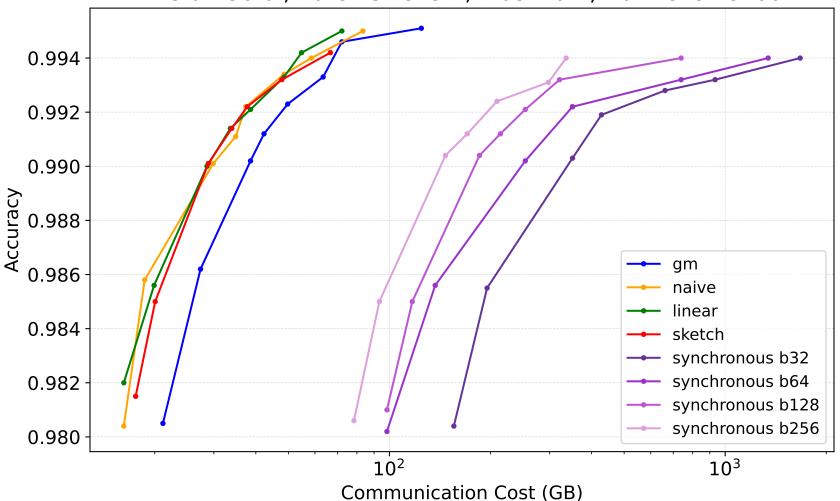


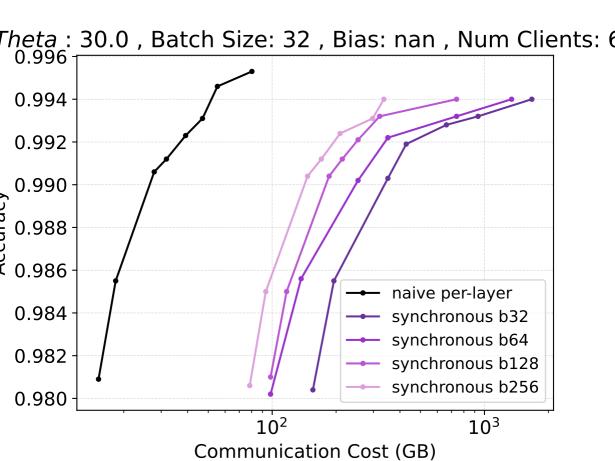




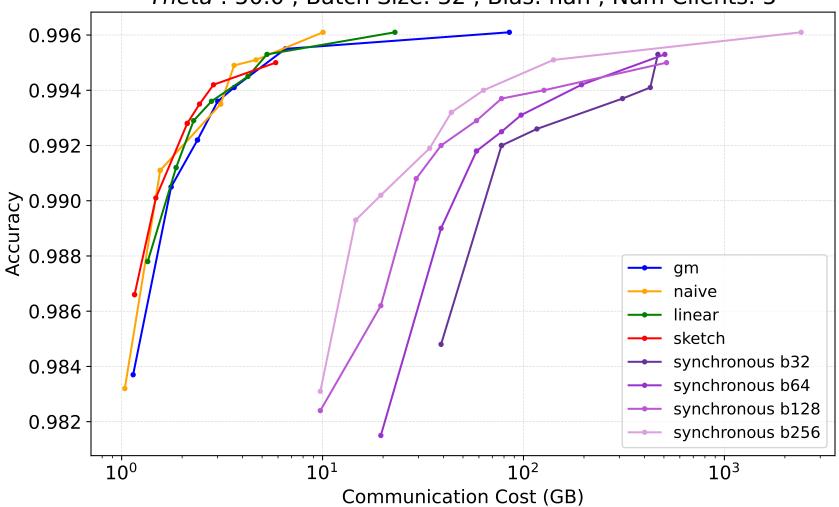


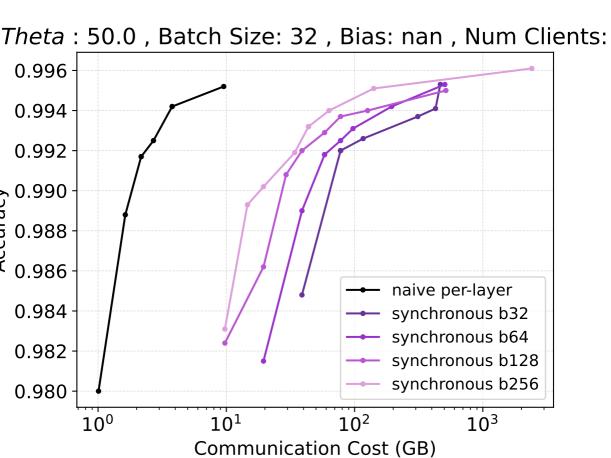
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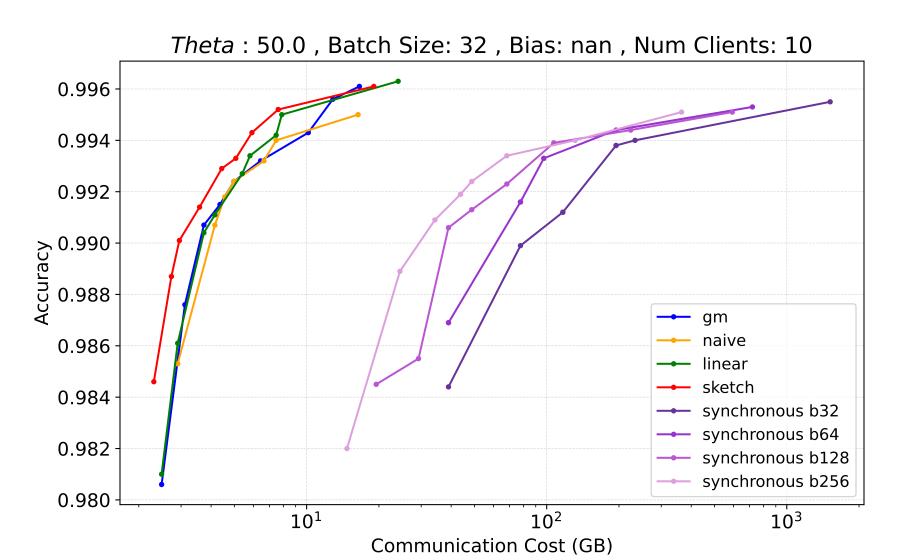


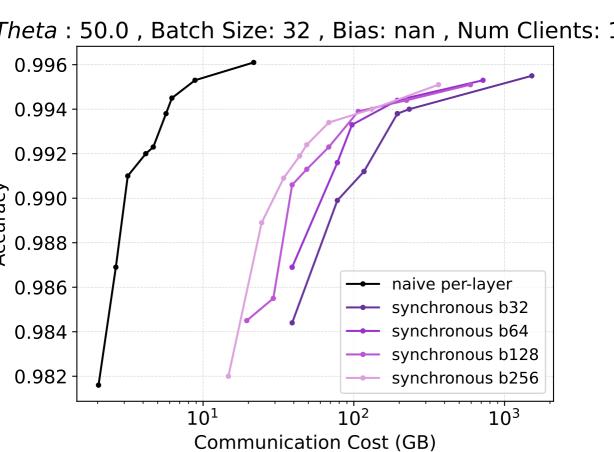


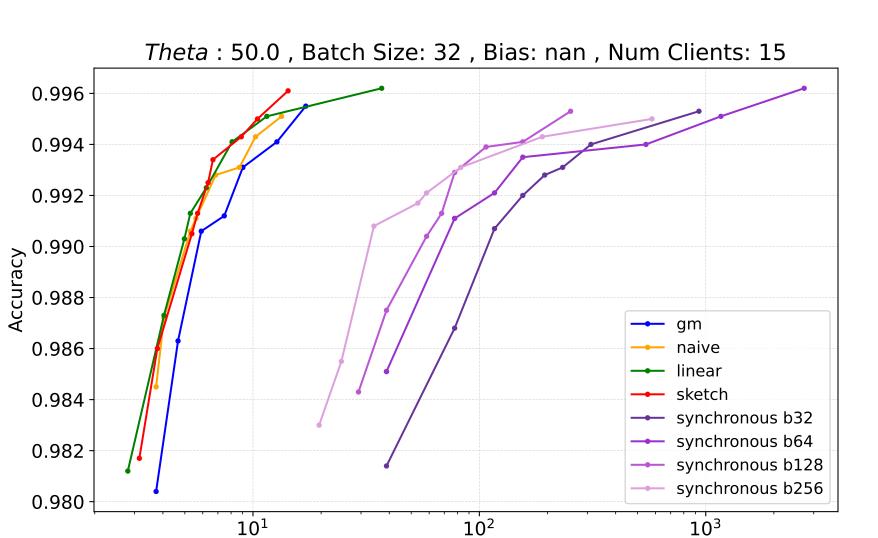
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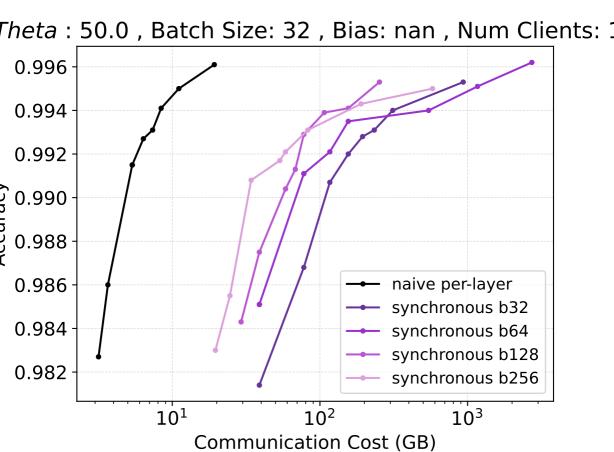


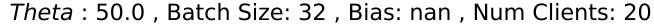


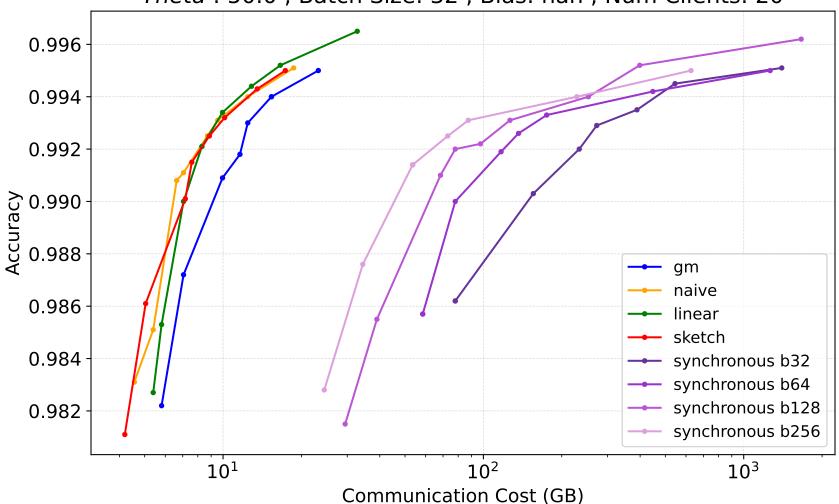


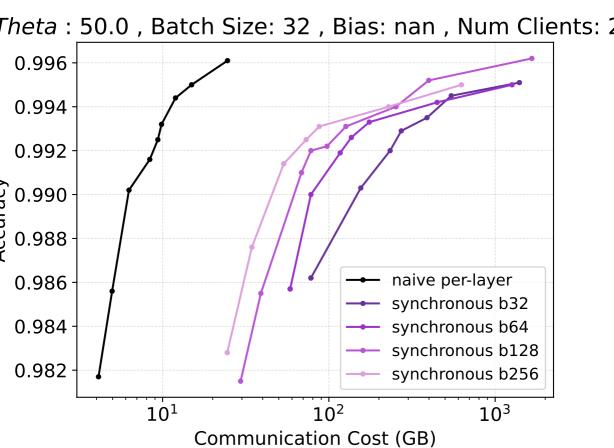


Communication Cost (GB)

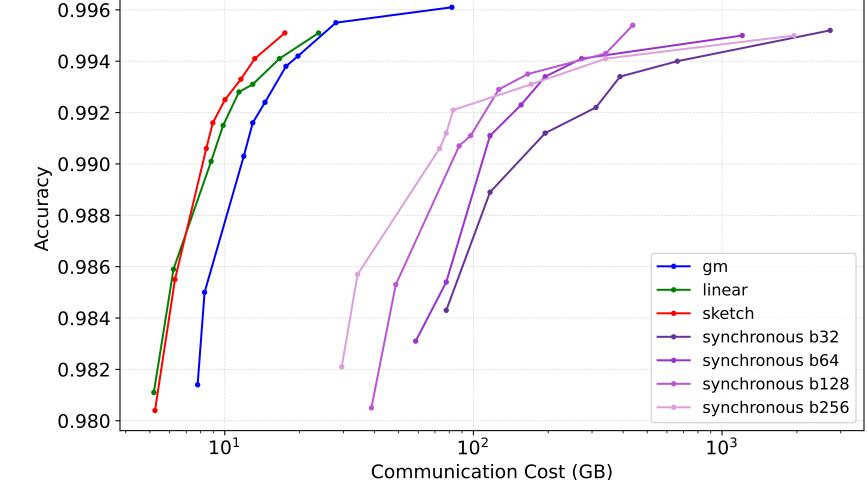


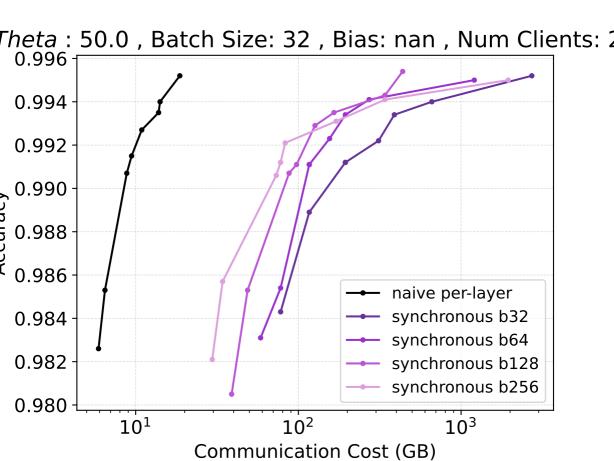


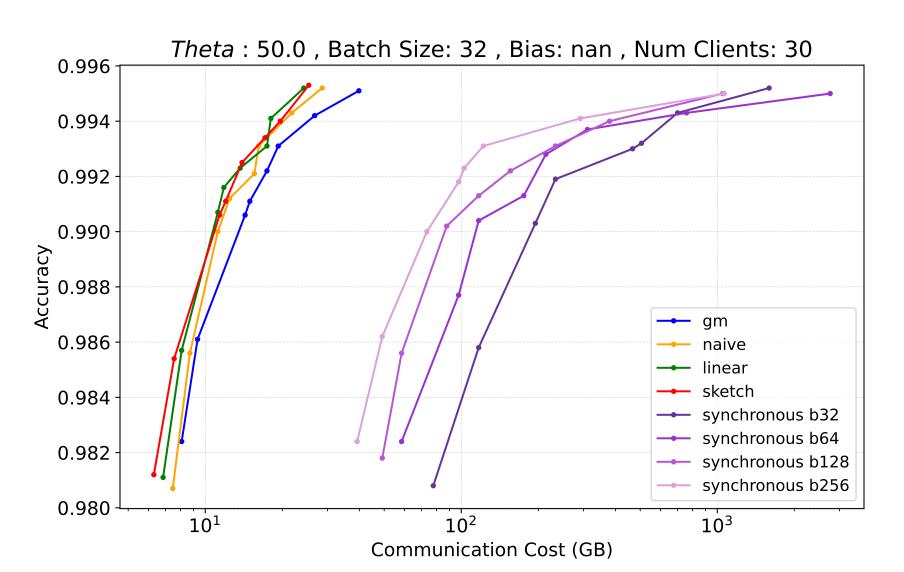


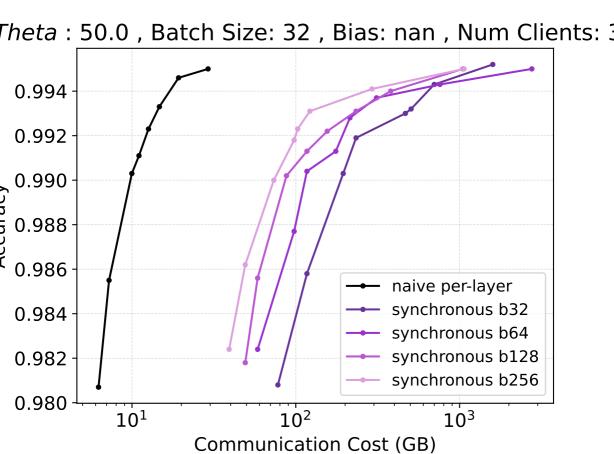


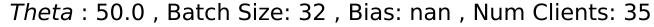


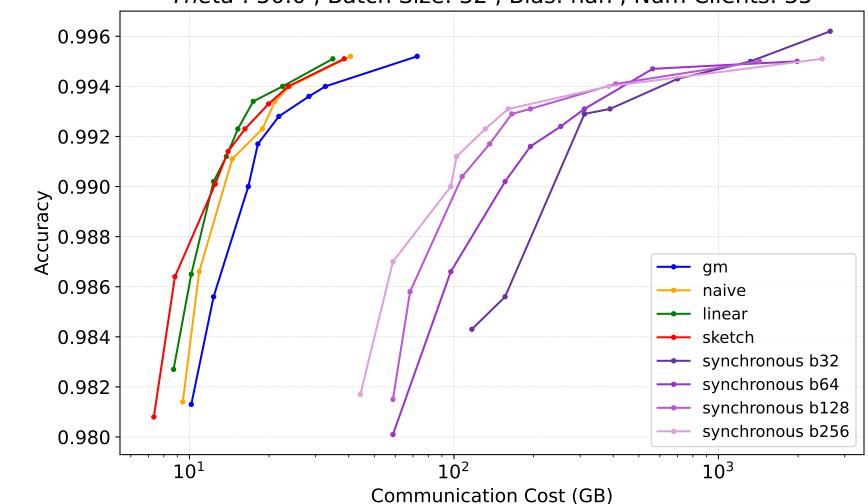


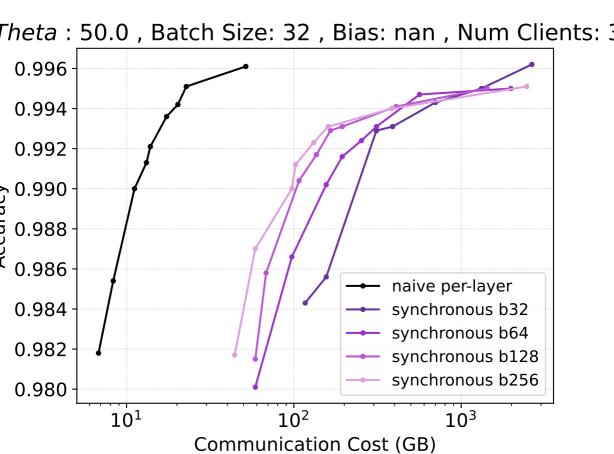




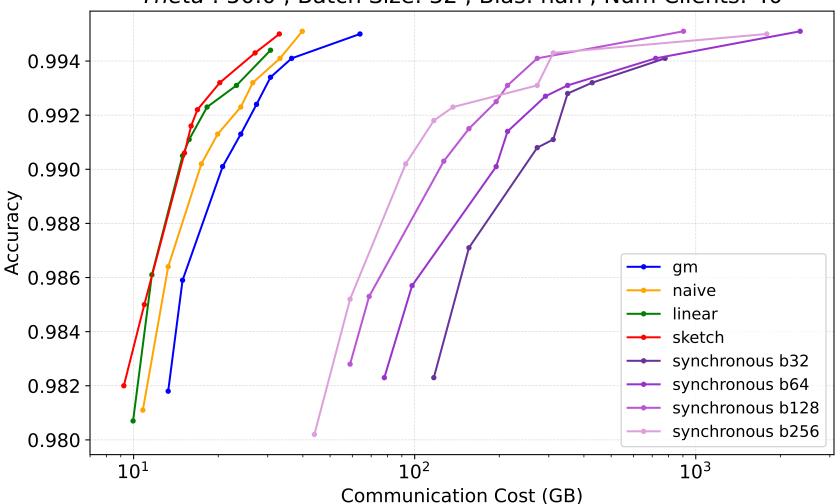


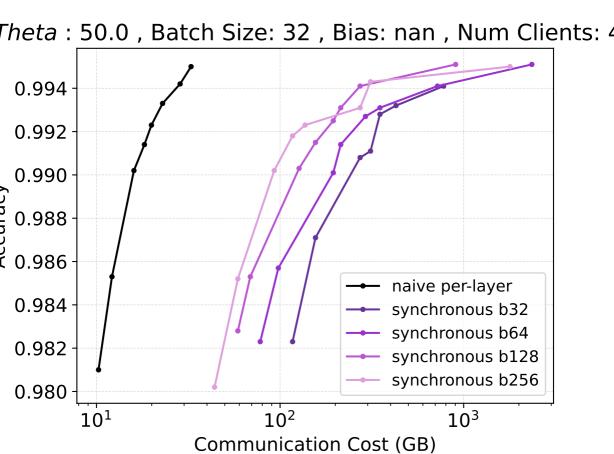


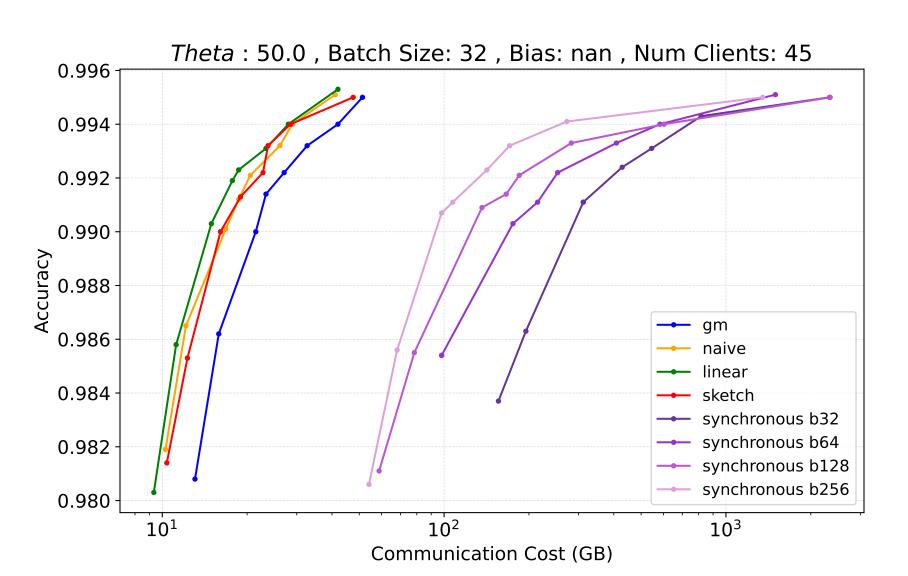


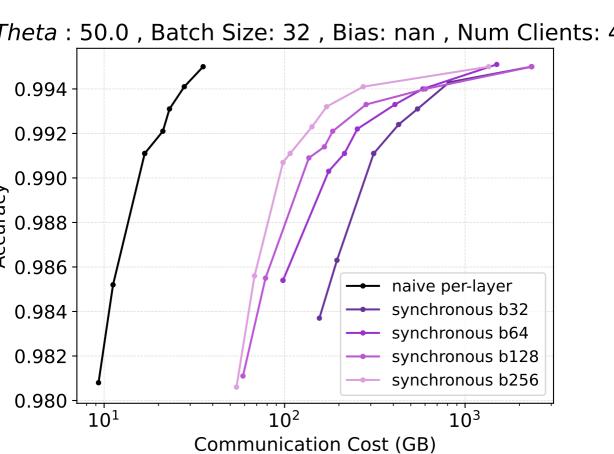


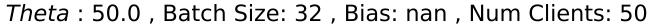
Theta: 50.0, Batch Size: 32, Bias: nan, Num Clients: 40

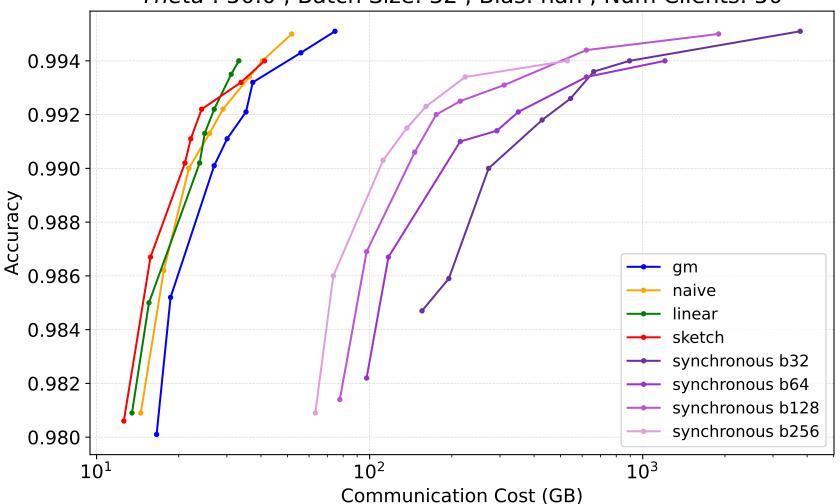


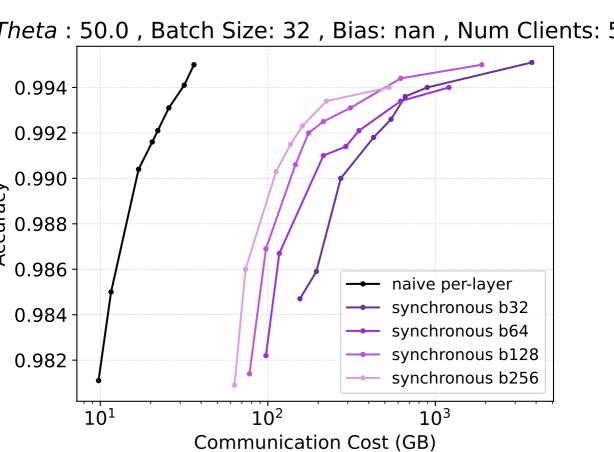


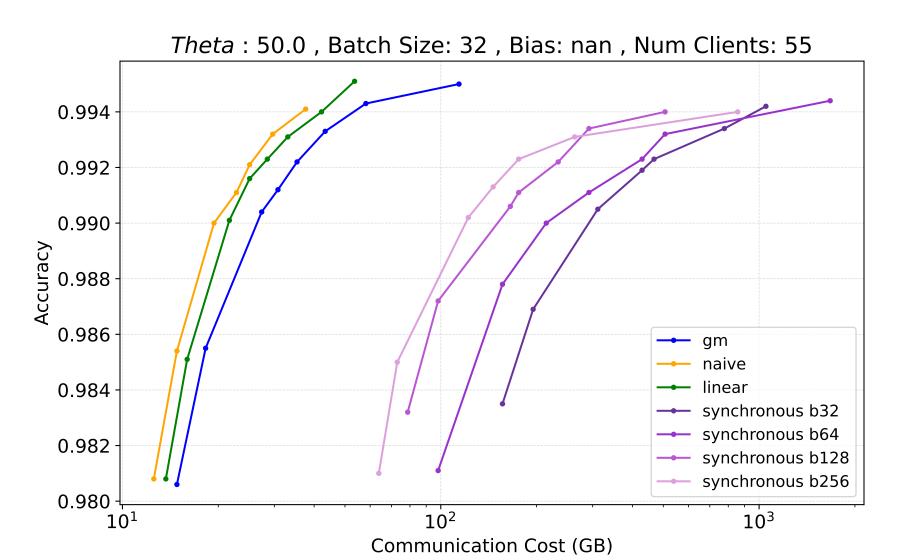


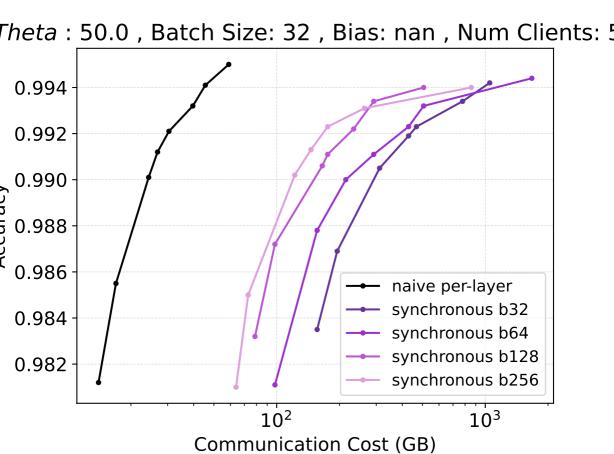




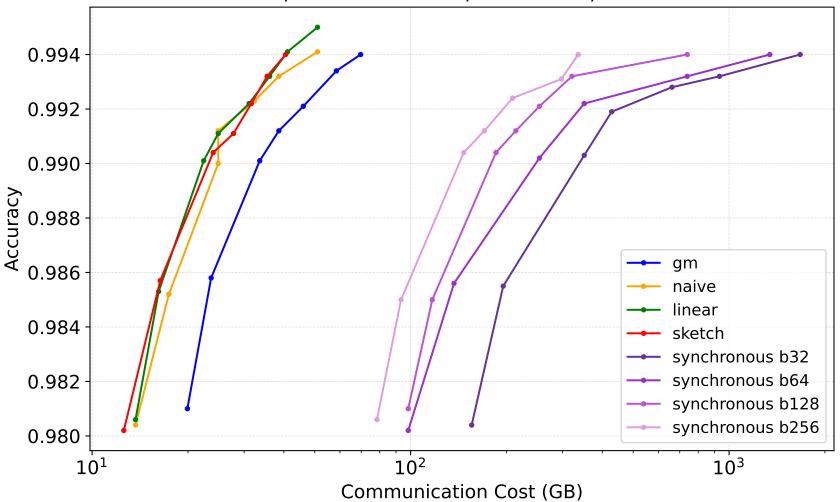


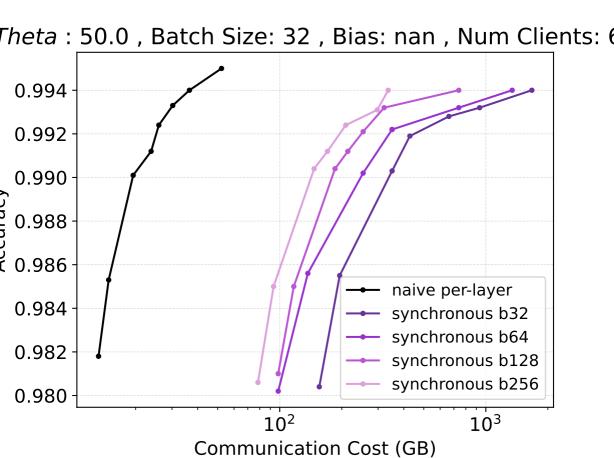


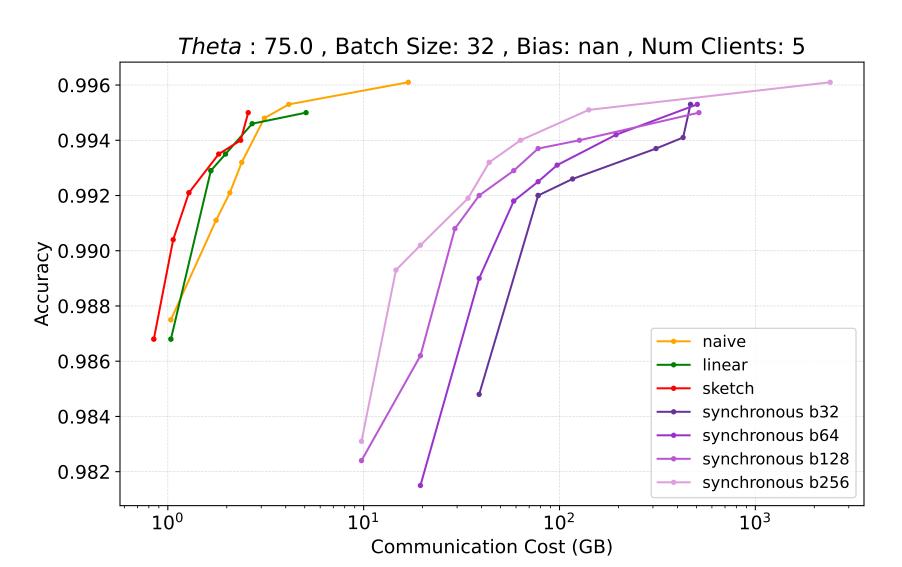


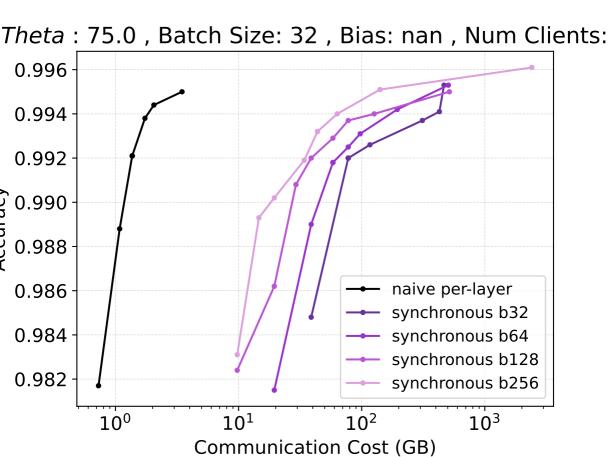






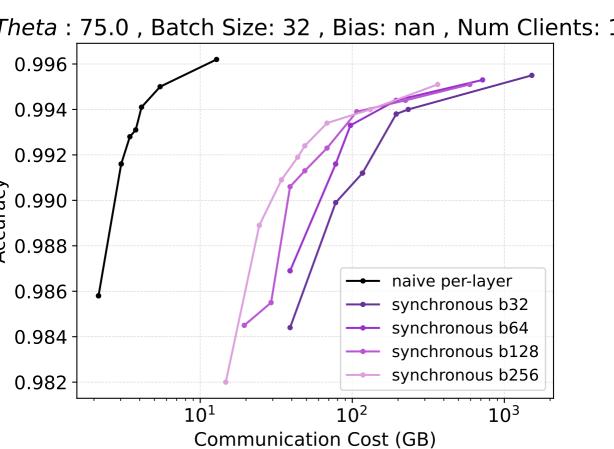


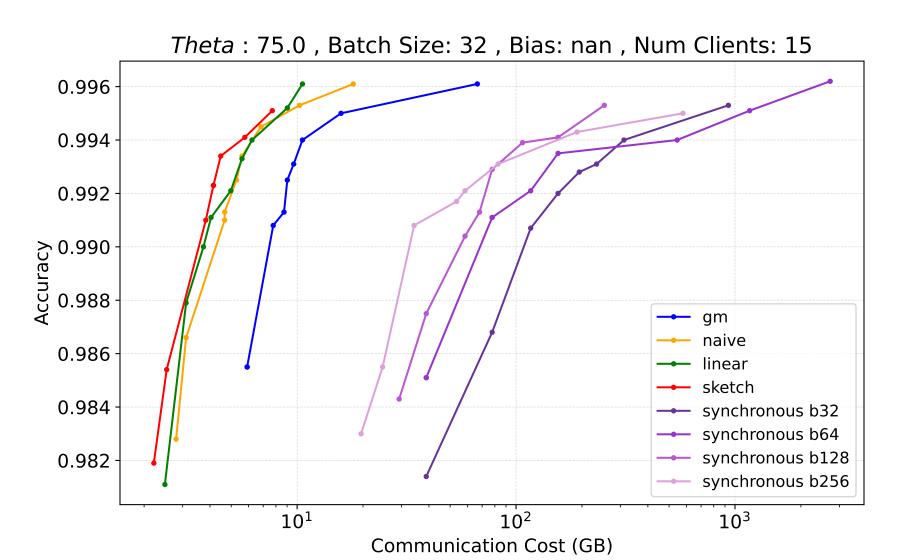


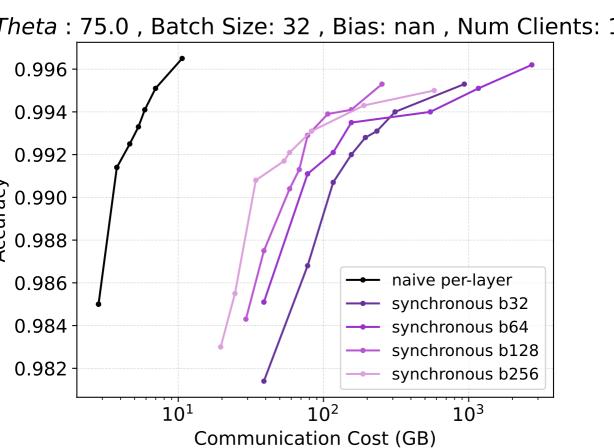


Theta: 75.0, Batch Size: 32, Bias: nan, Num Clients: 10 0.996 0.9940.992 Accuracy .0 °.0 0.986 naive linear sketch 0.984 → synchronous b32 → synchronous b64 0.982 synchronous b128 synchronous b256 0.980 10<sup>2</sup>  $10^{1}$  $10^3$ 

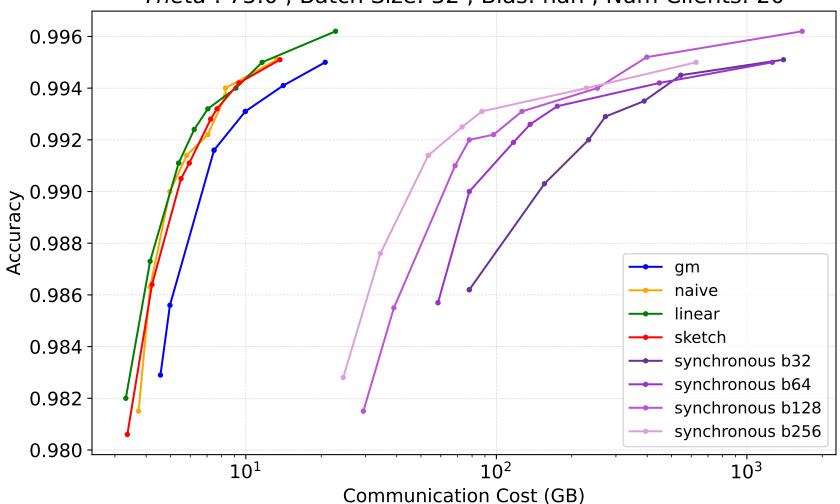
Communication Cost (GB)

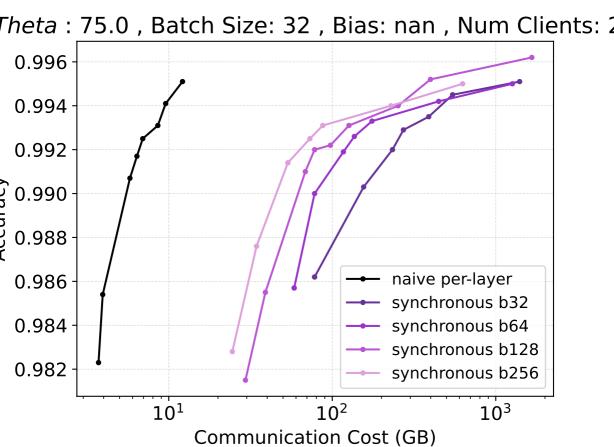


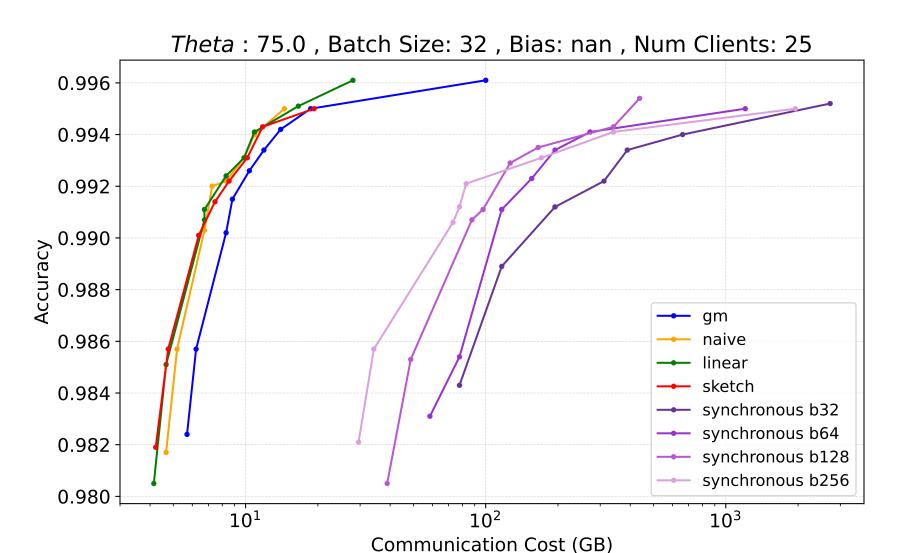


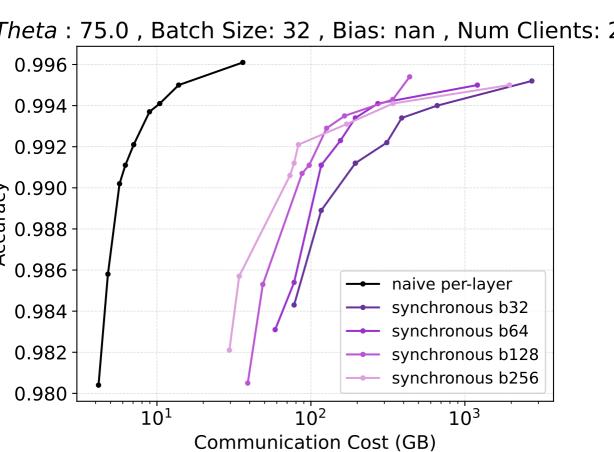


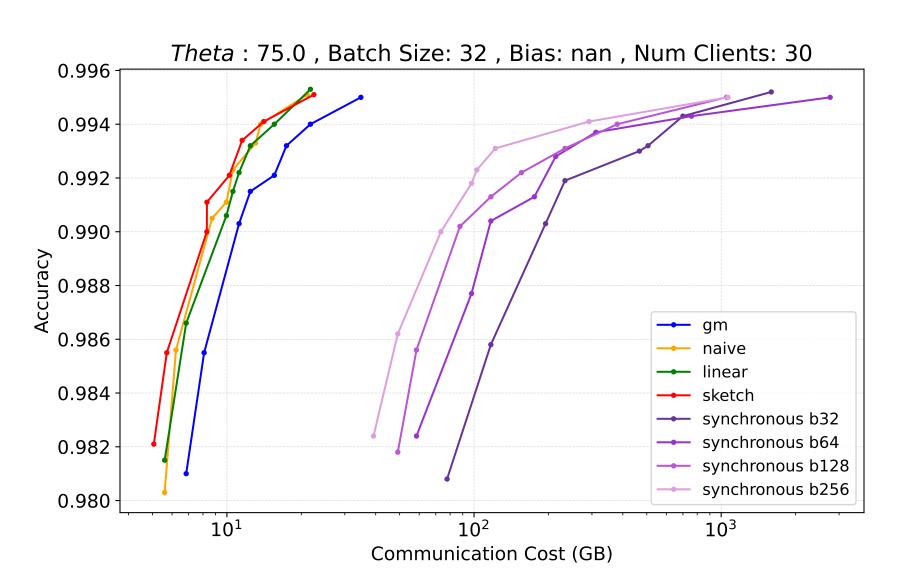


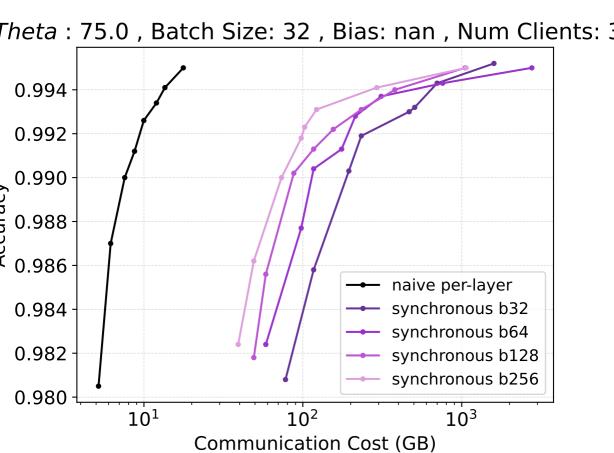




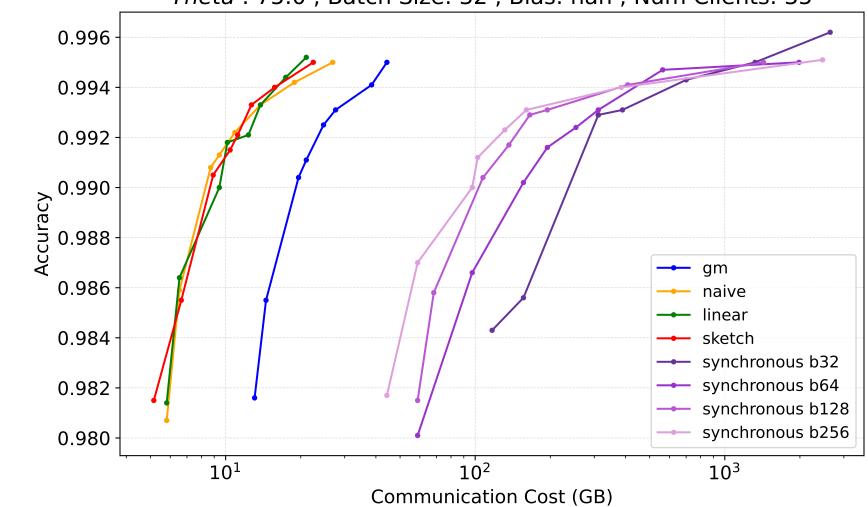


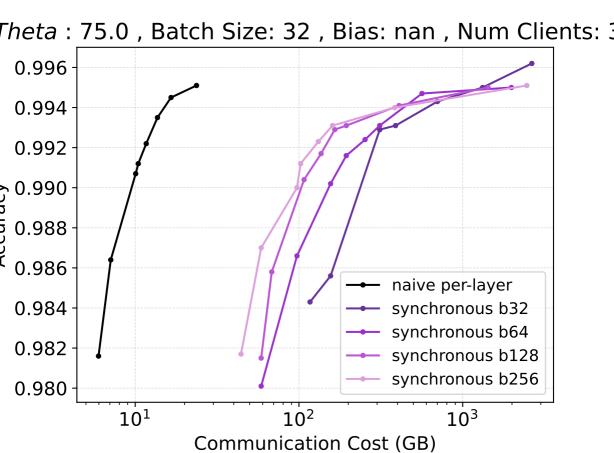




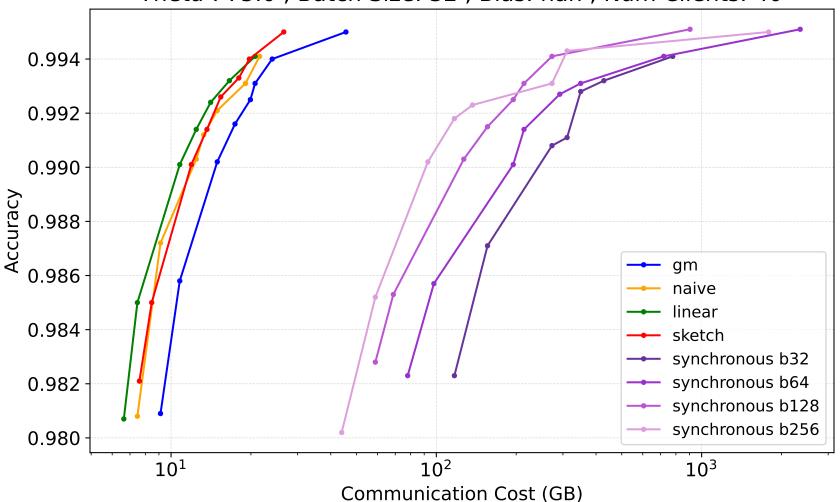


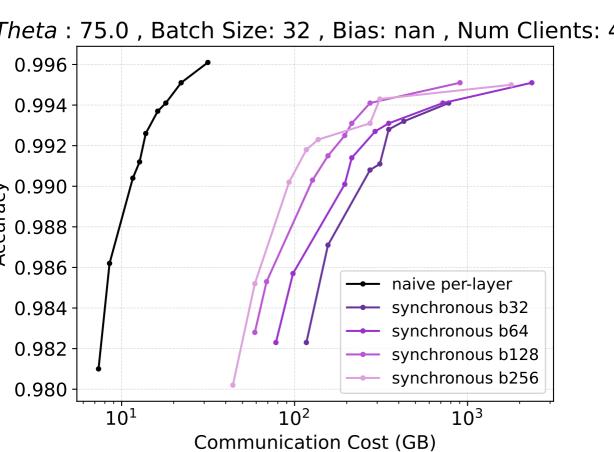
Theta: 75.0, Batch Size: 32, Bias: nan, Num Clients: 35

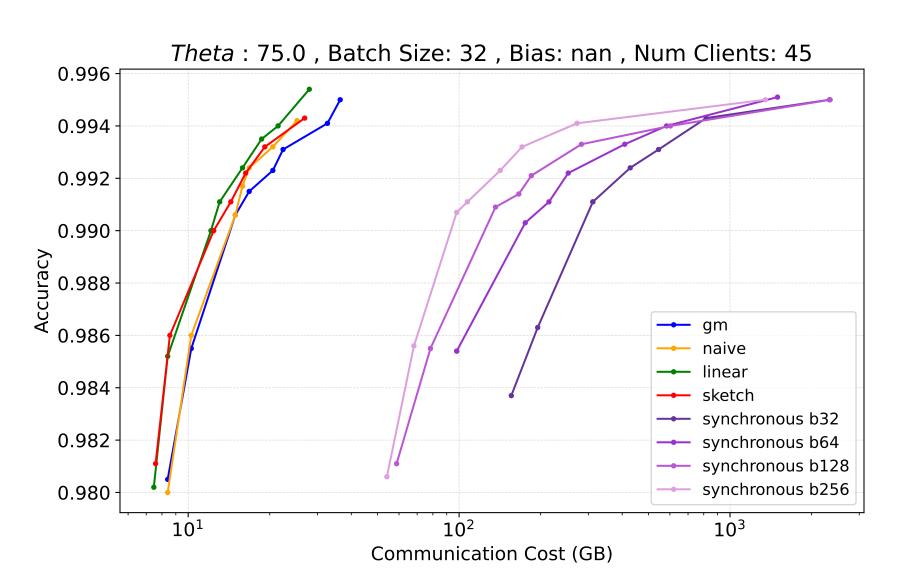


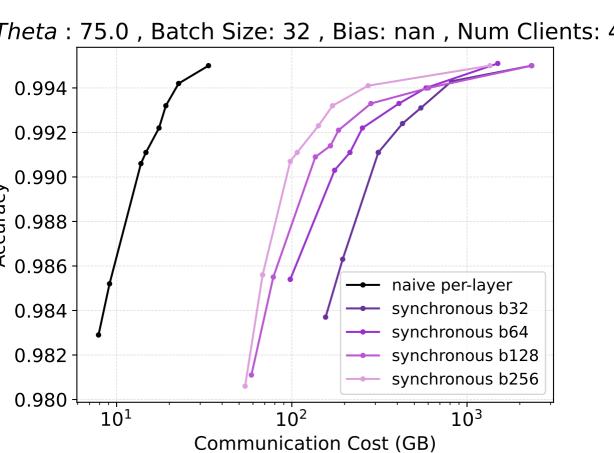


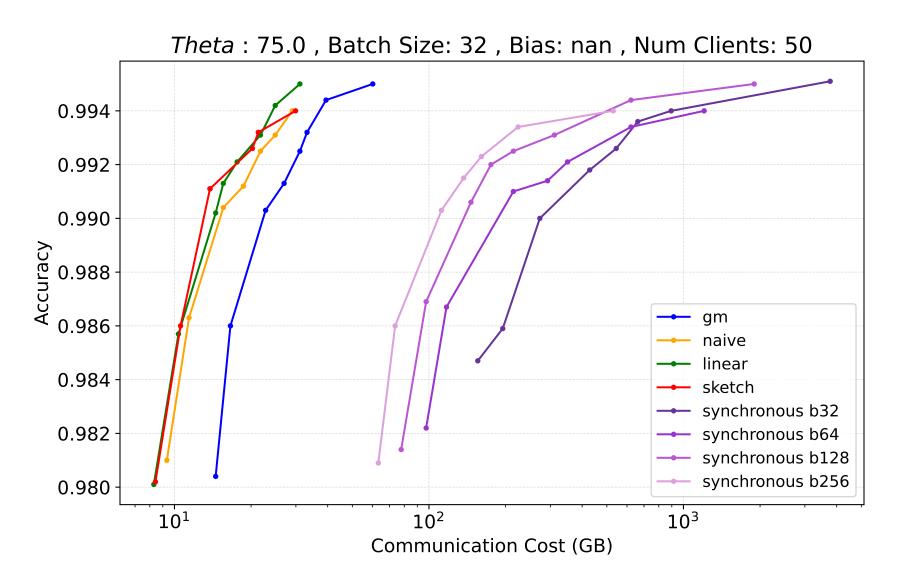
Theta: 75.0, Batch Size: 32, Bias: nan, Num Clients: 40

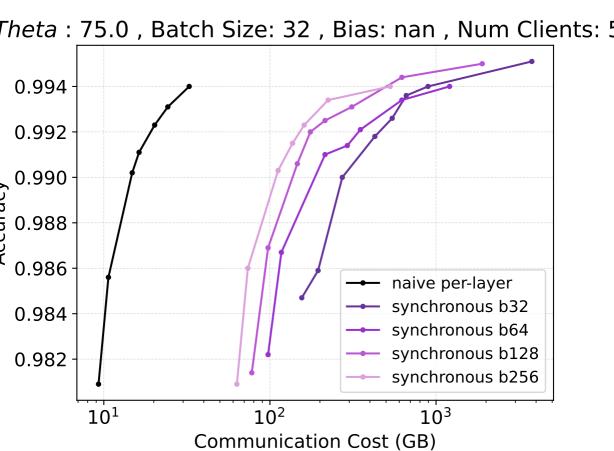




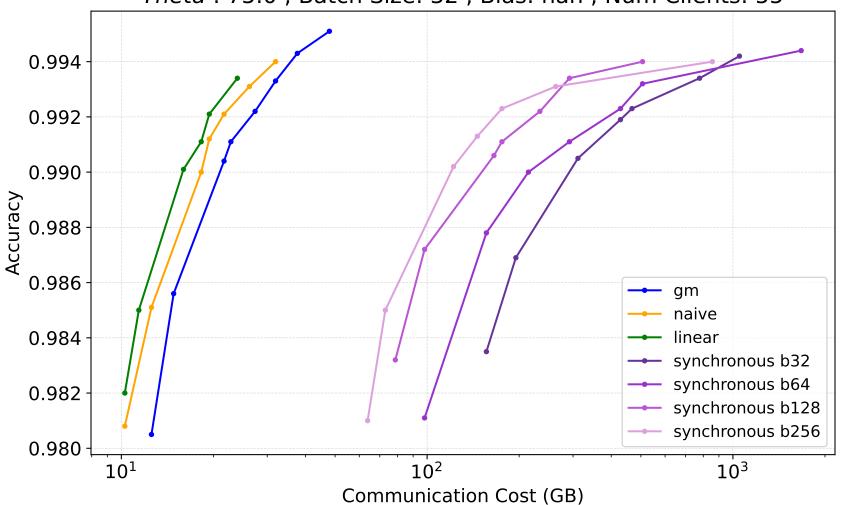


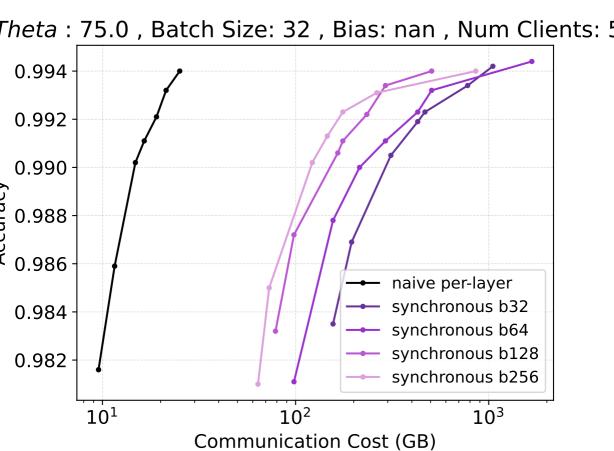




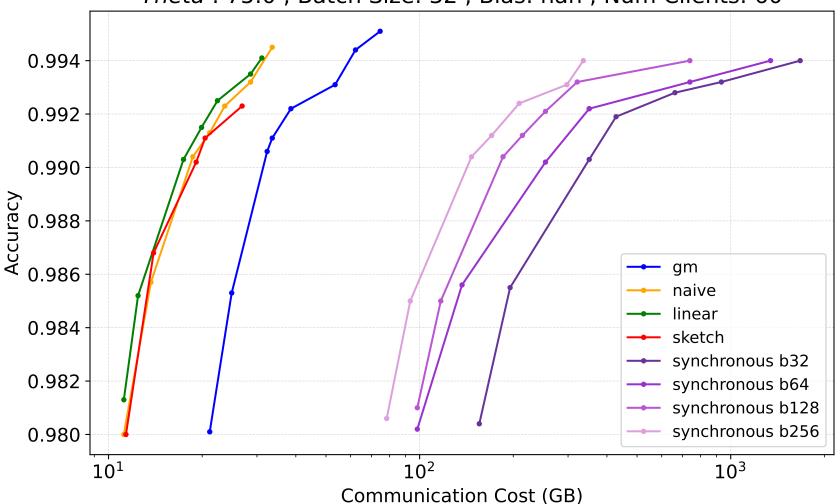


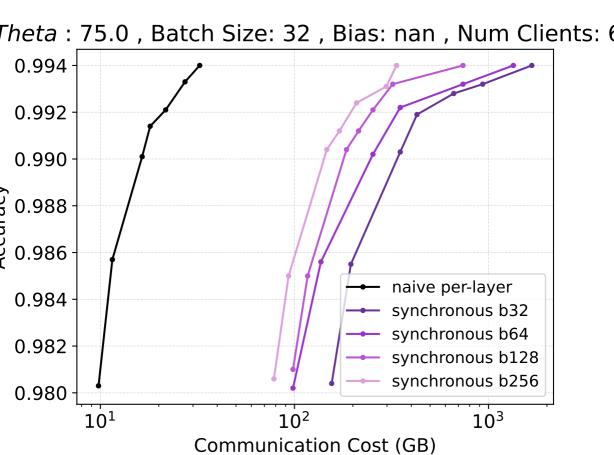
Theta: 75.0, Batch Size: 32, Bias: nan, Num Clients: 55



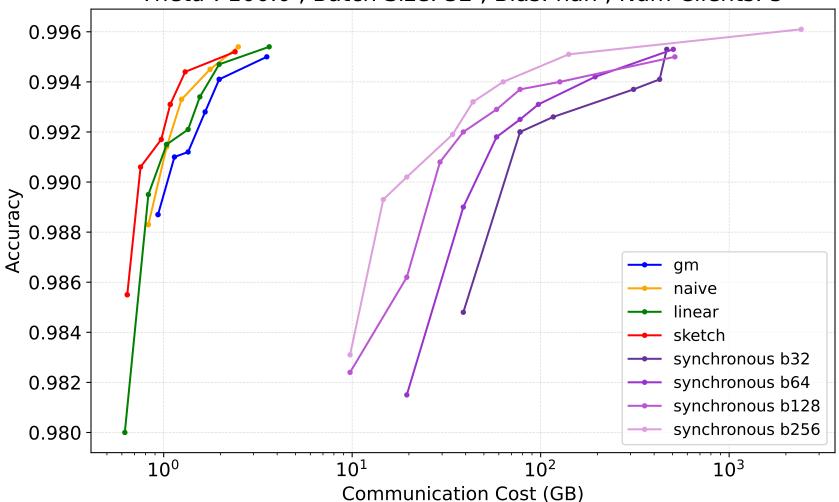


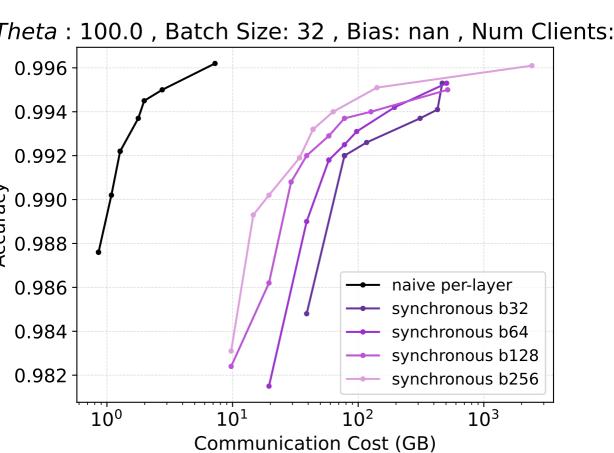
Theta: 75.0, Batch Size: 32, Bias: nan, Num Clients: 60

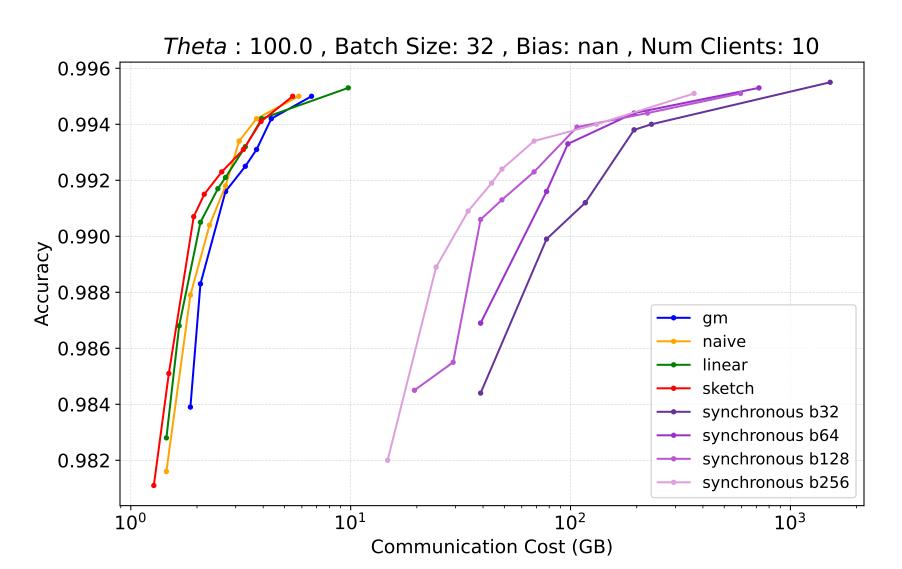


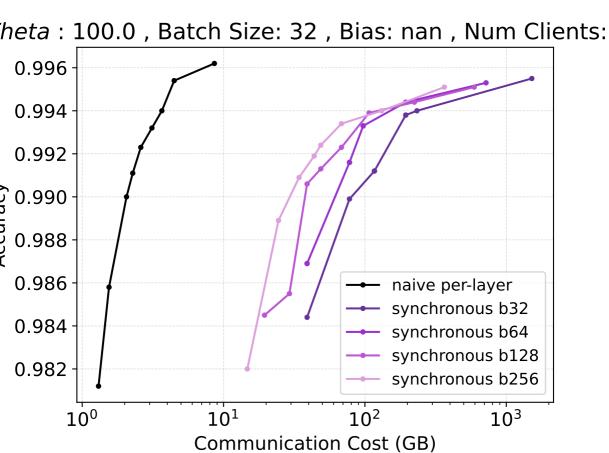


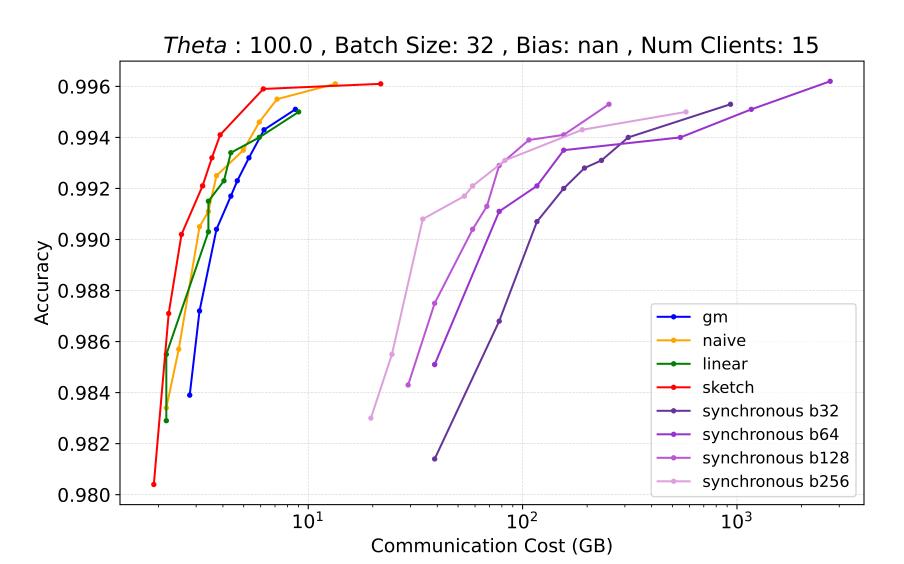


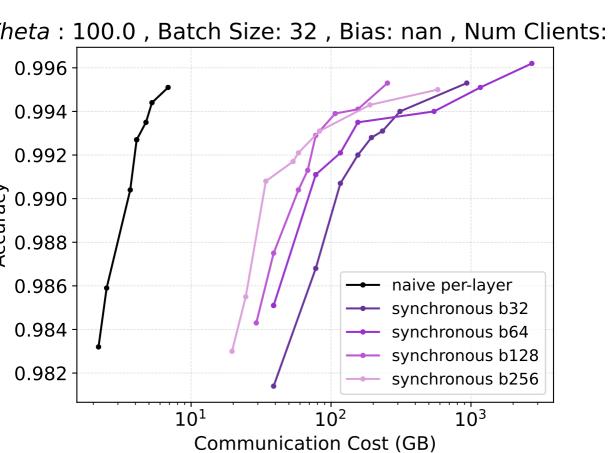


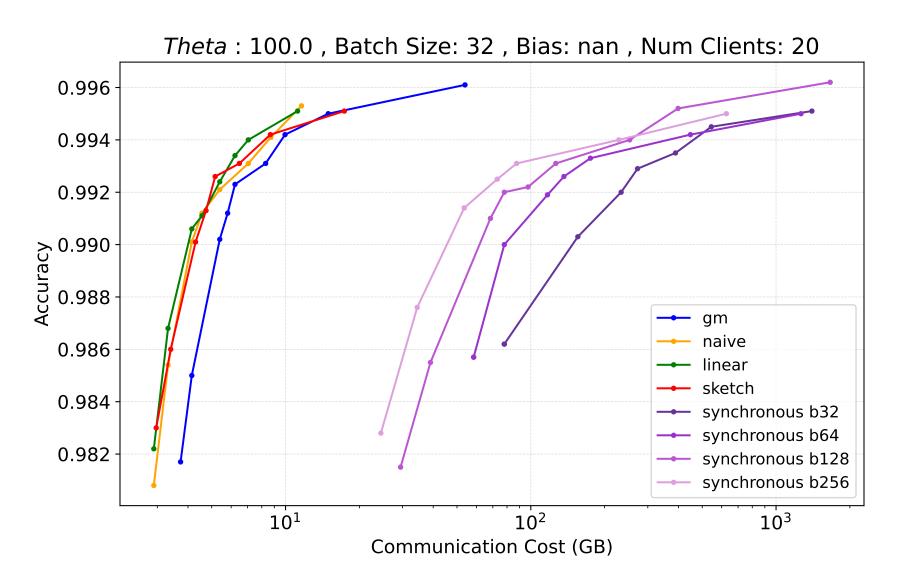


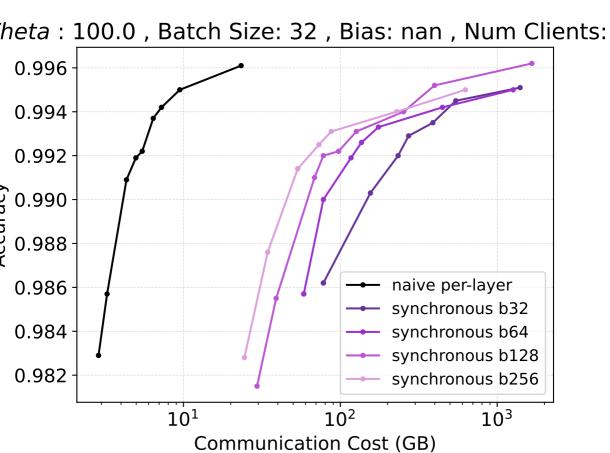


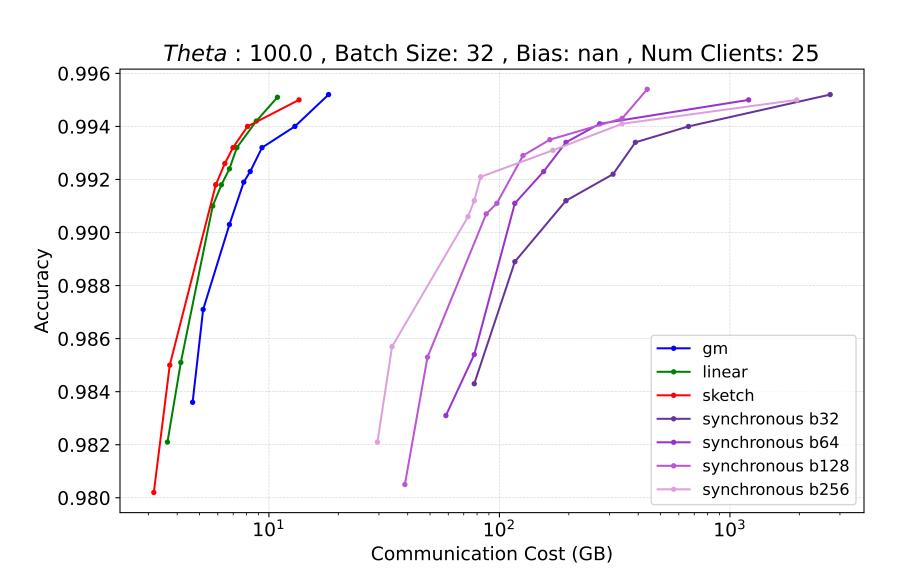


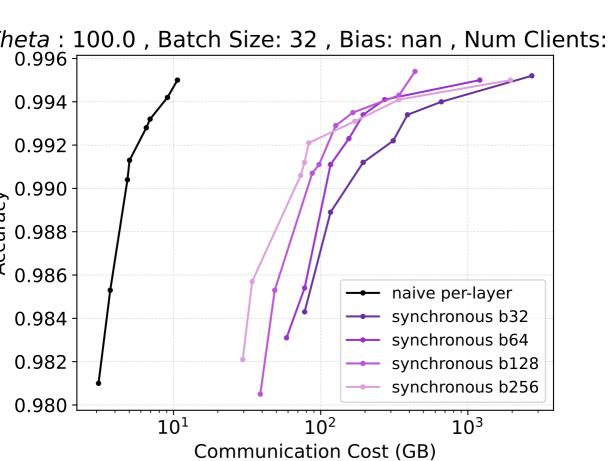


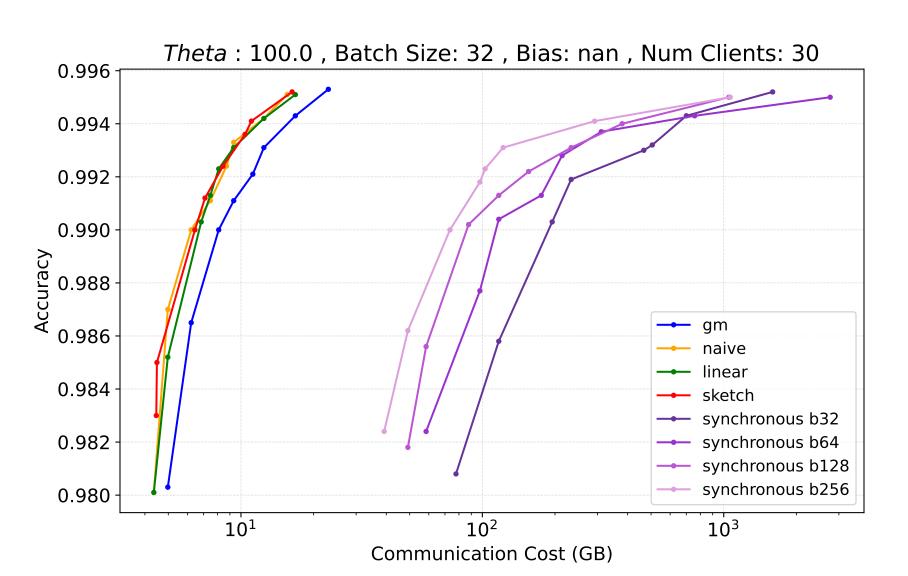


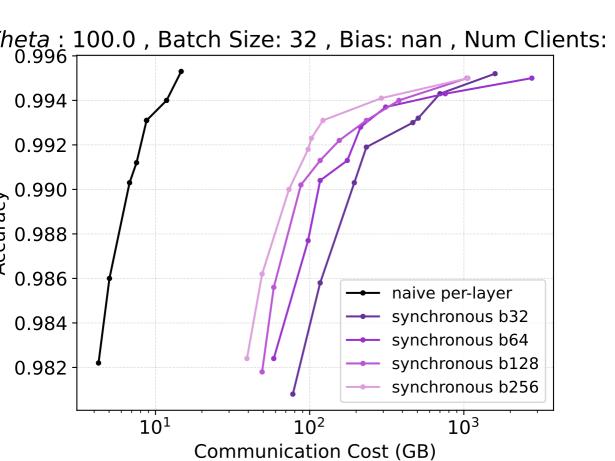


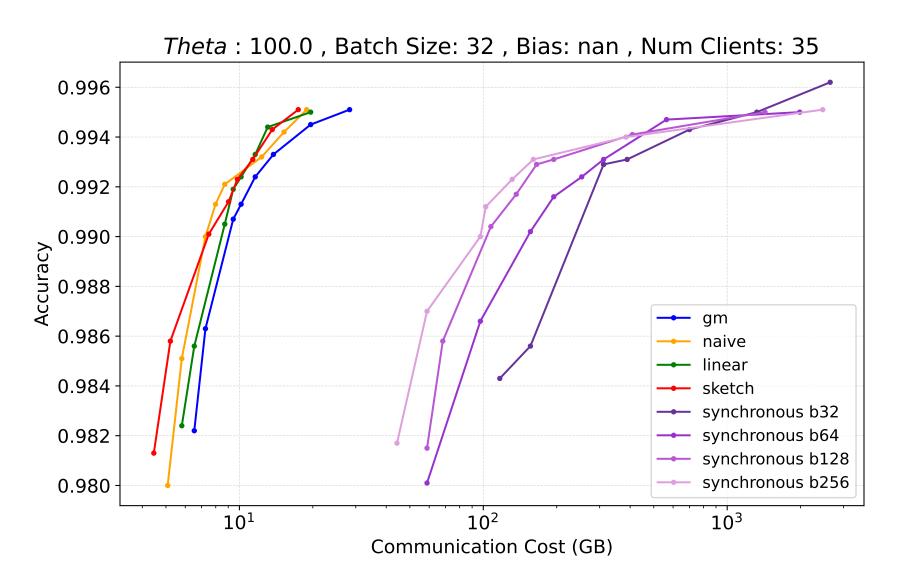


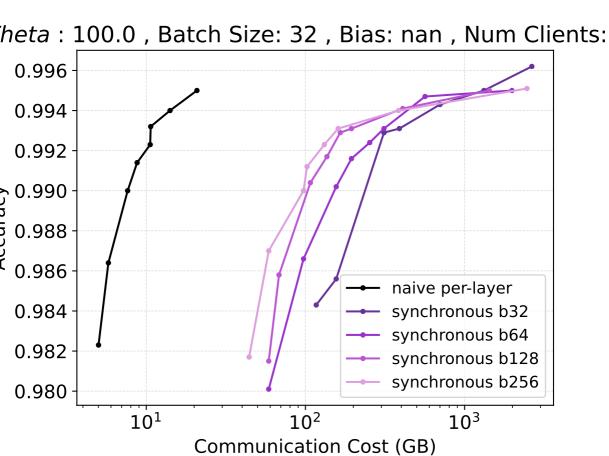


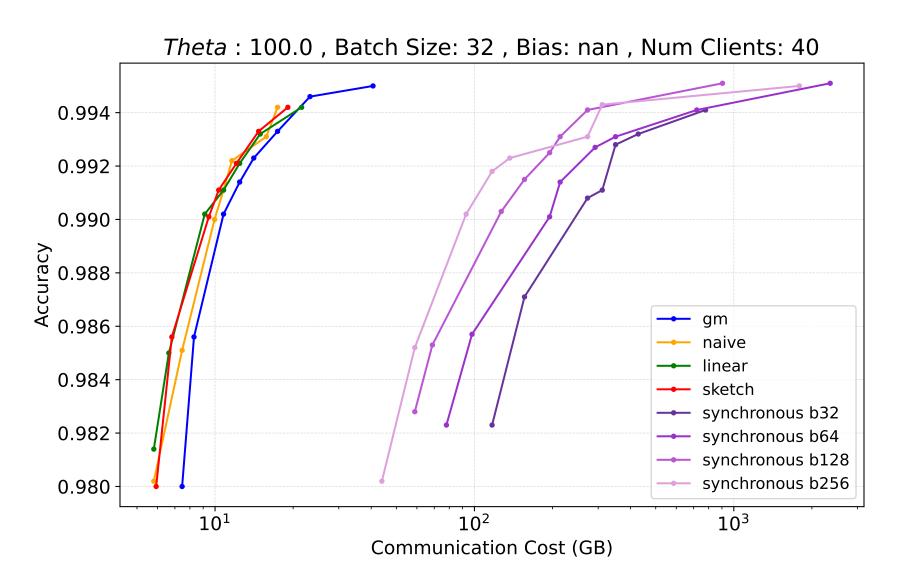


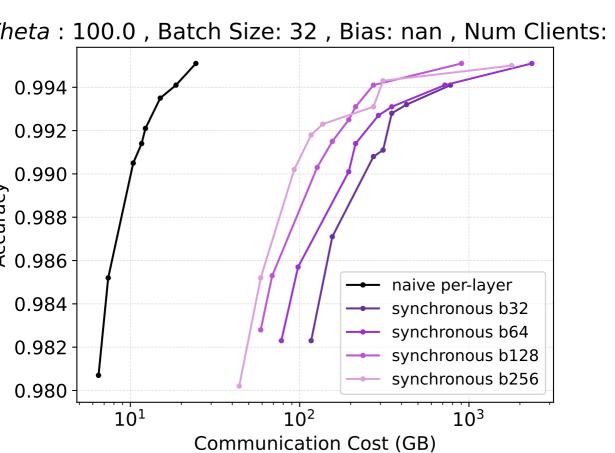


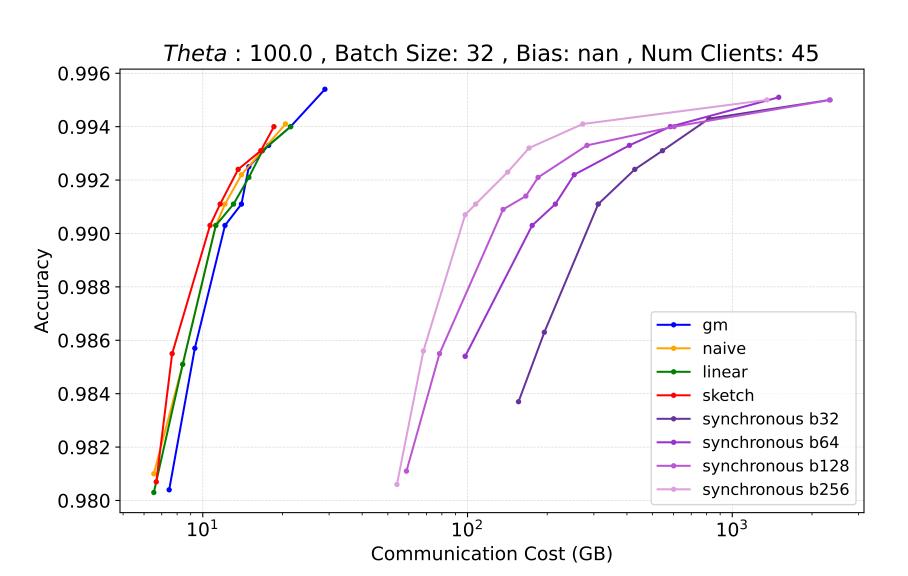


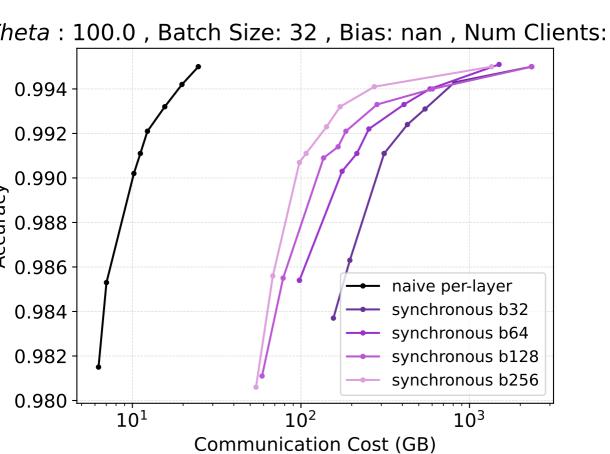


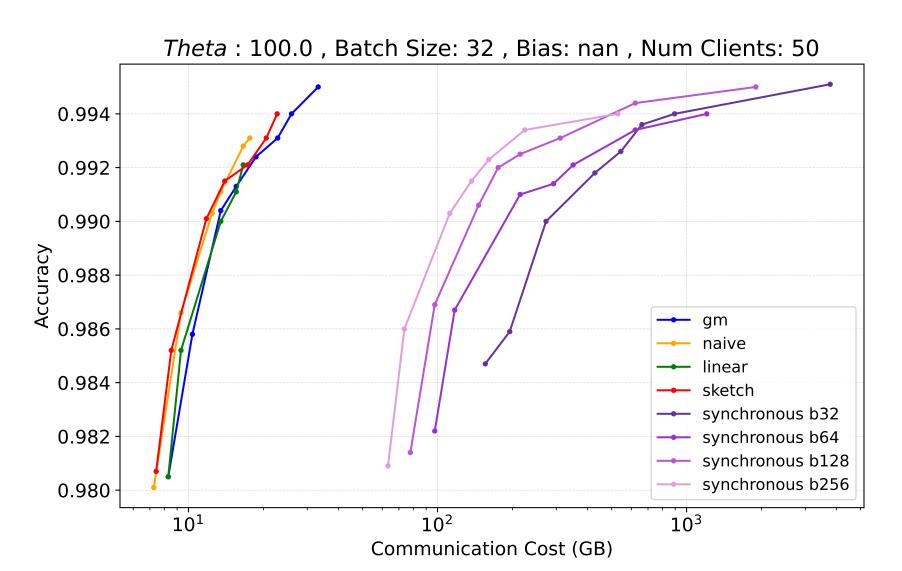


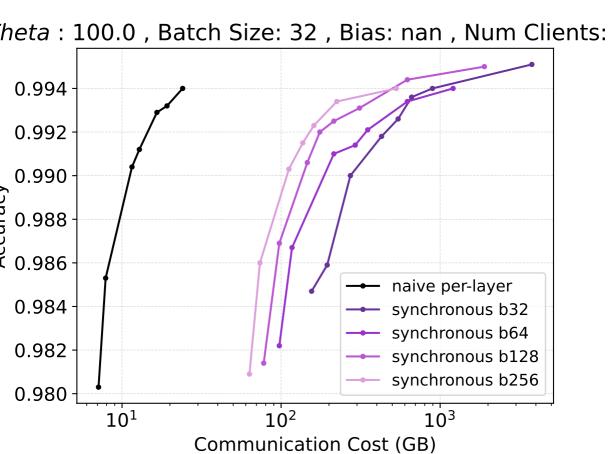




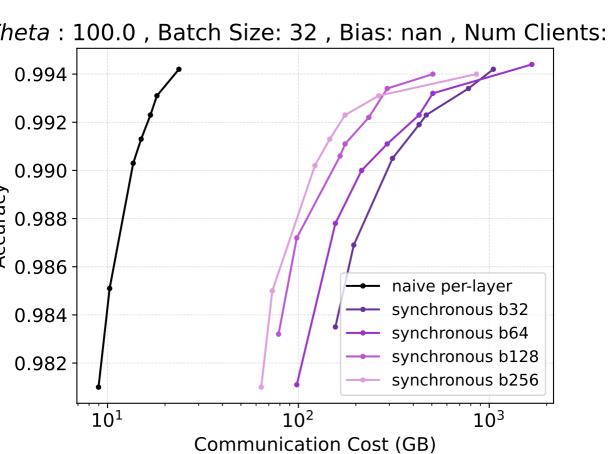


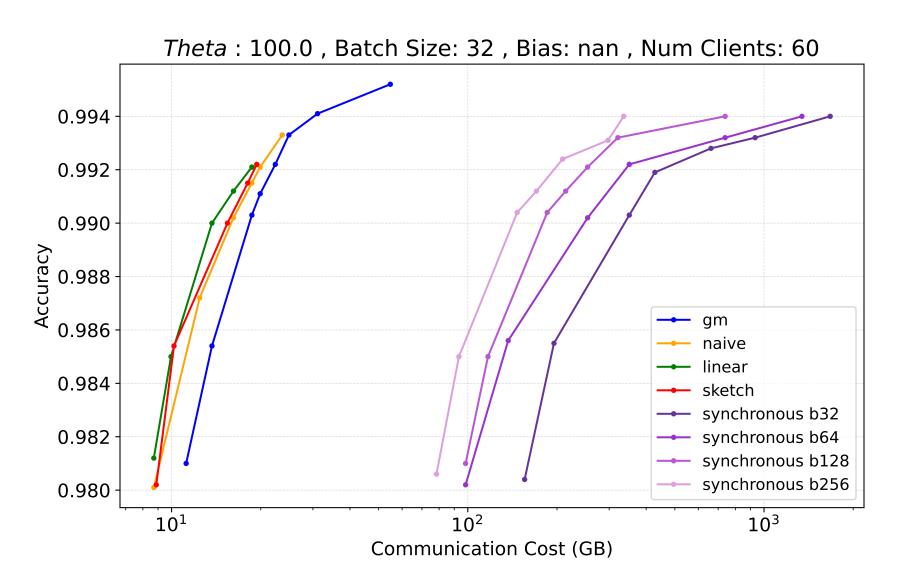


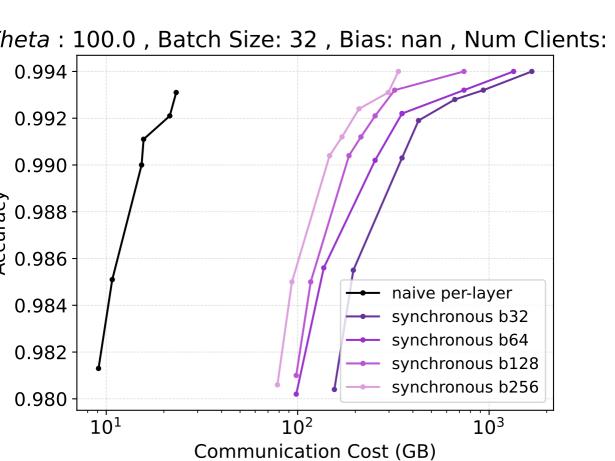


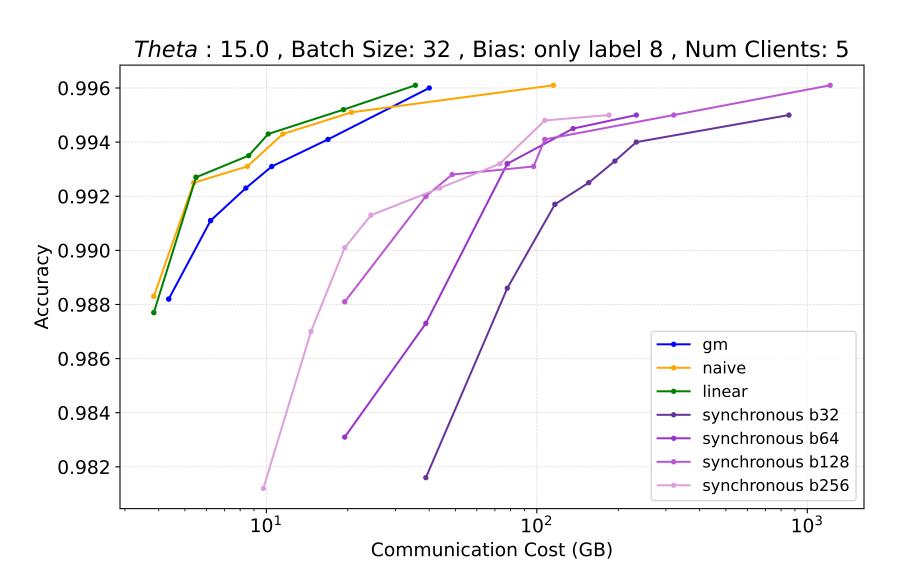


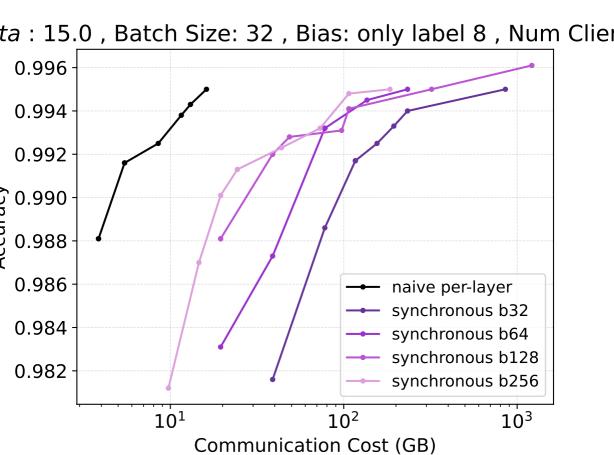


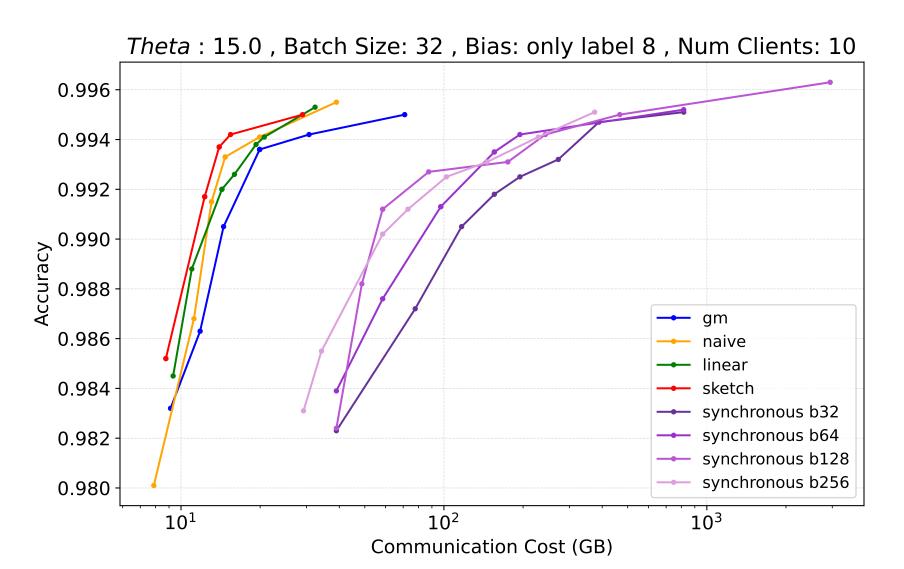


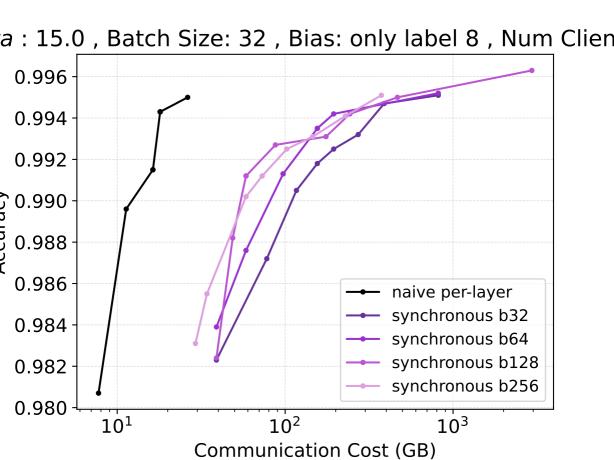


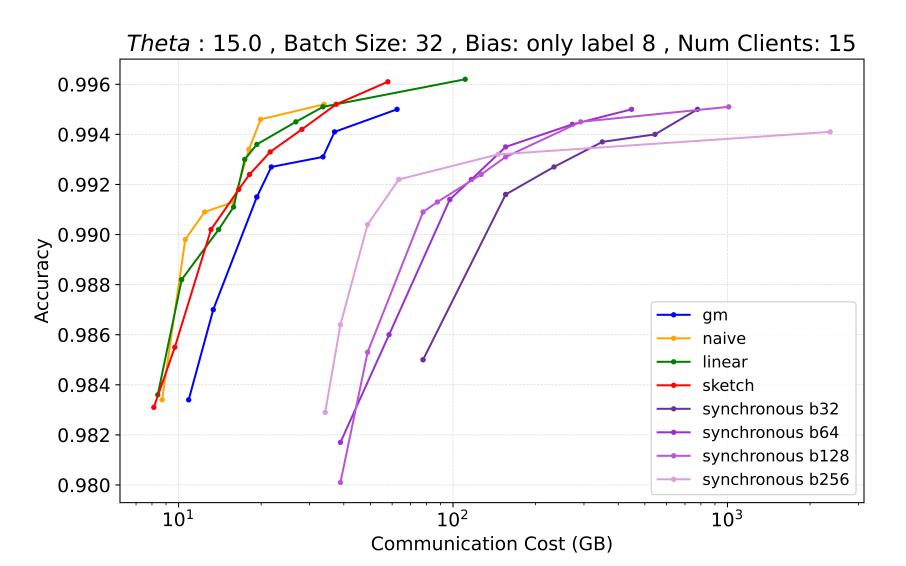


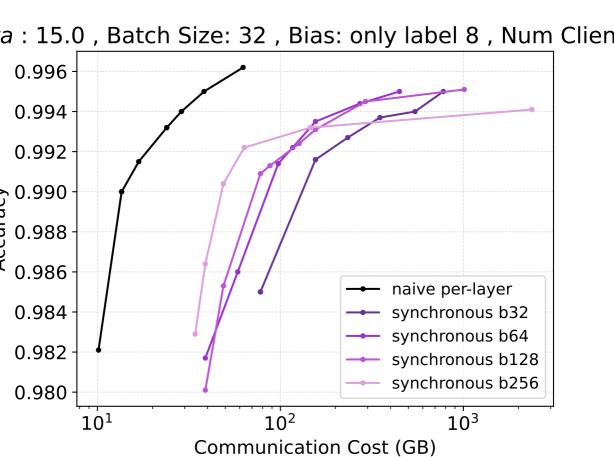


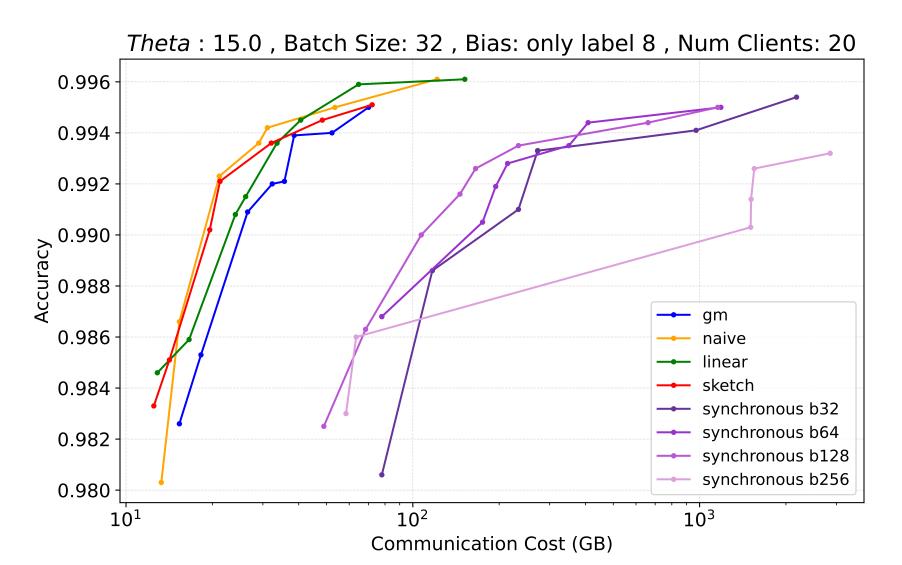


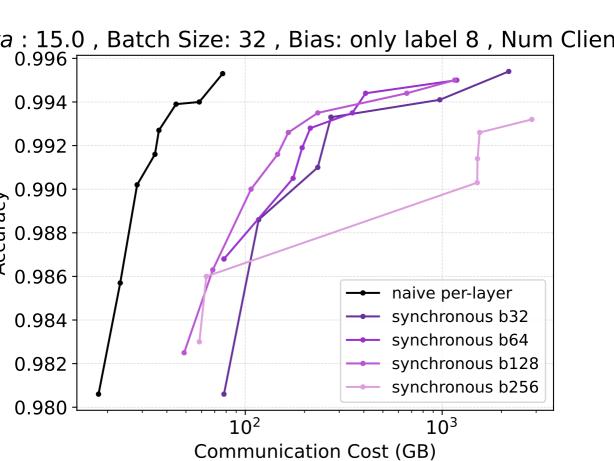


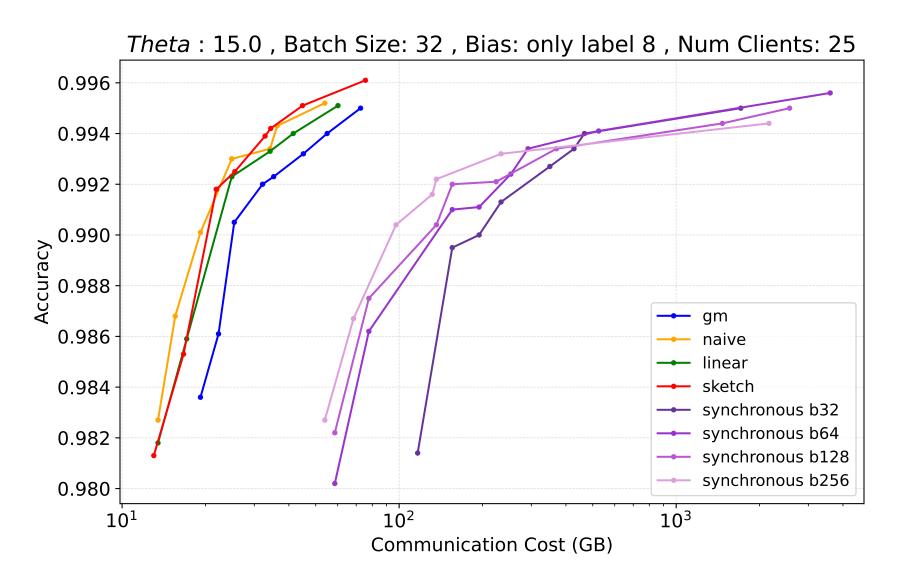


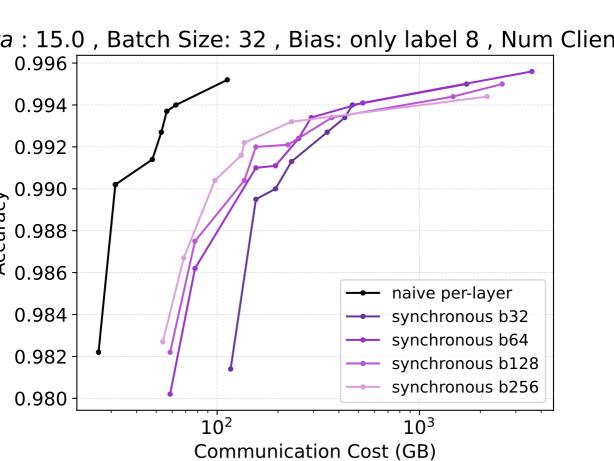


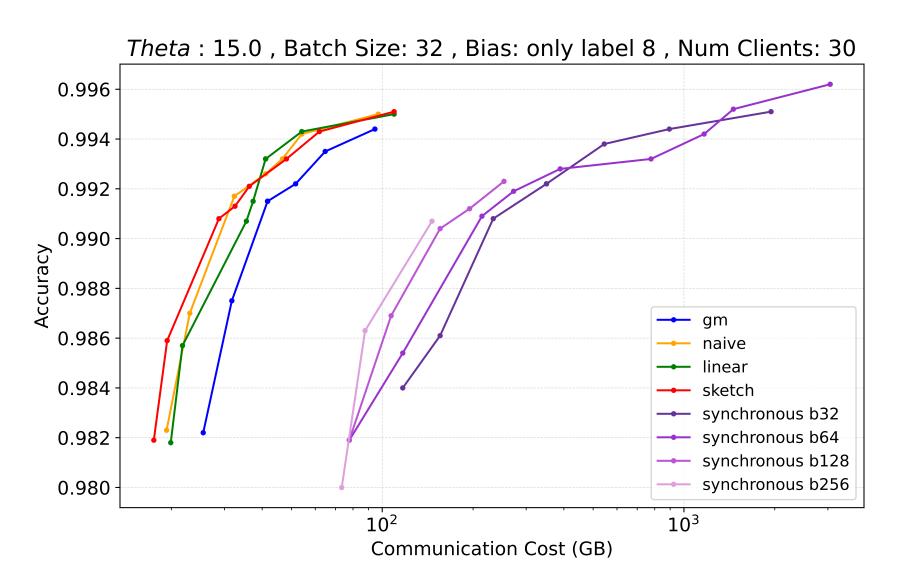


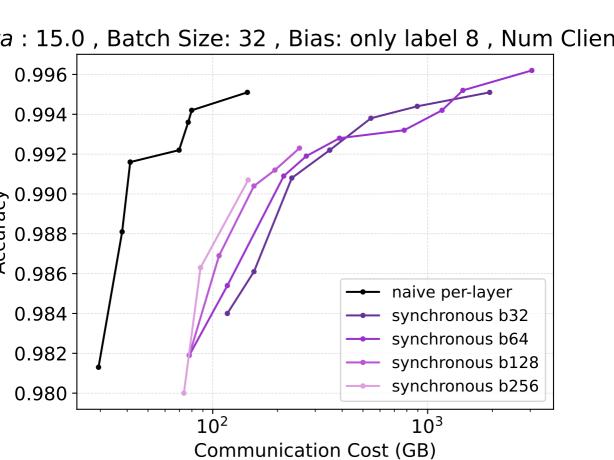


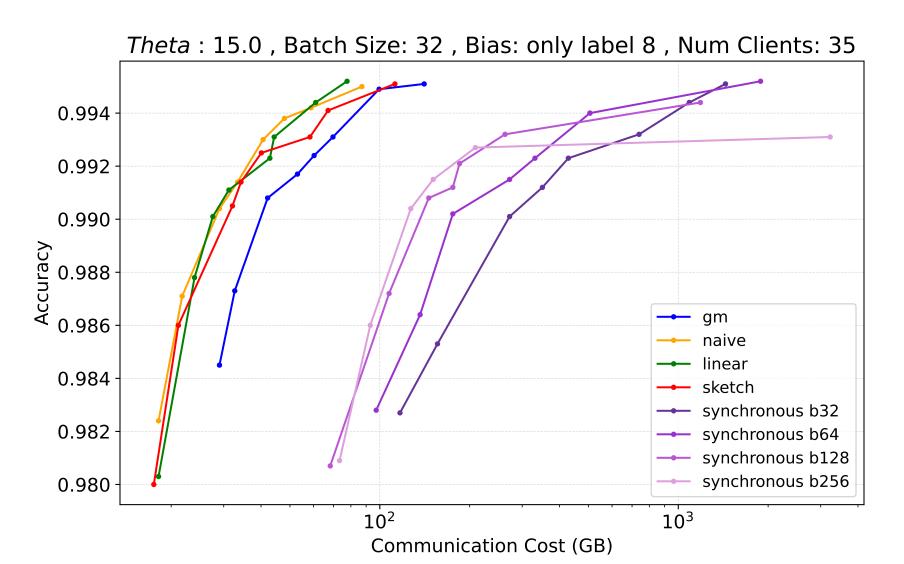


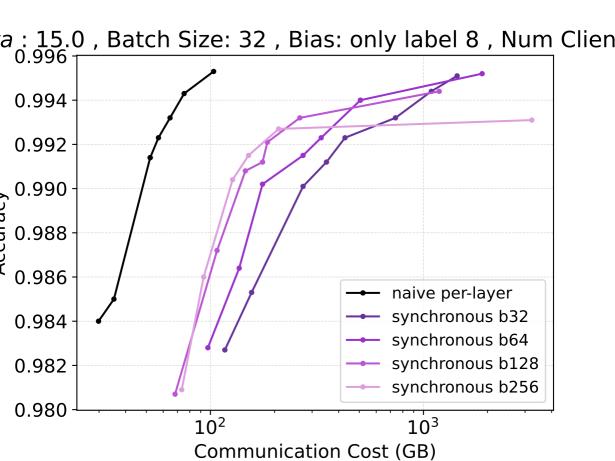




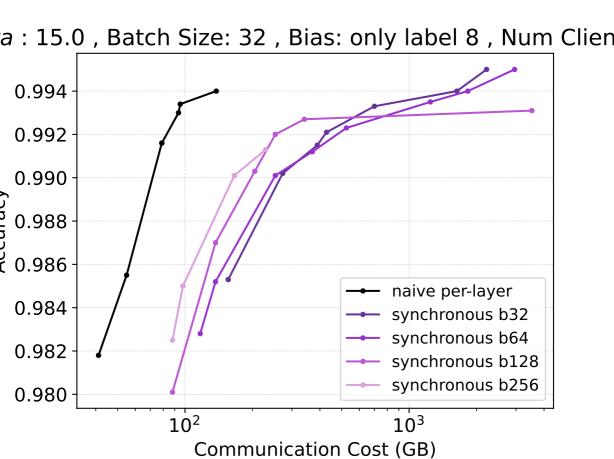






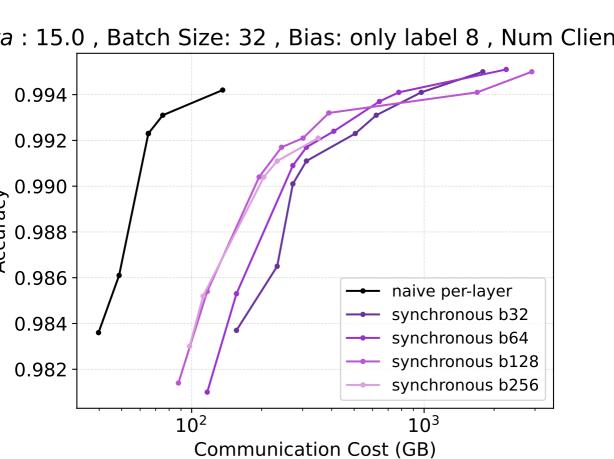


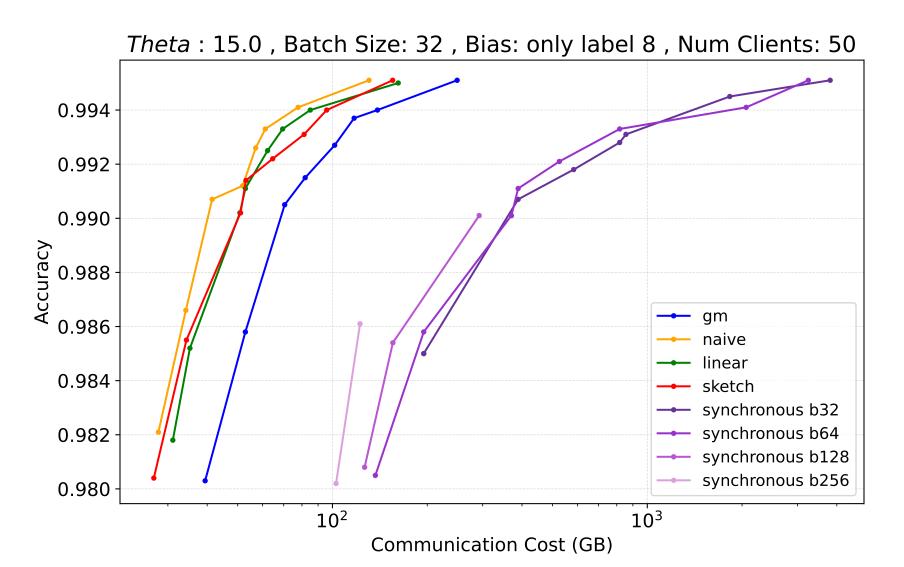


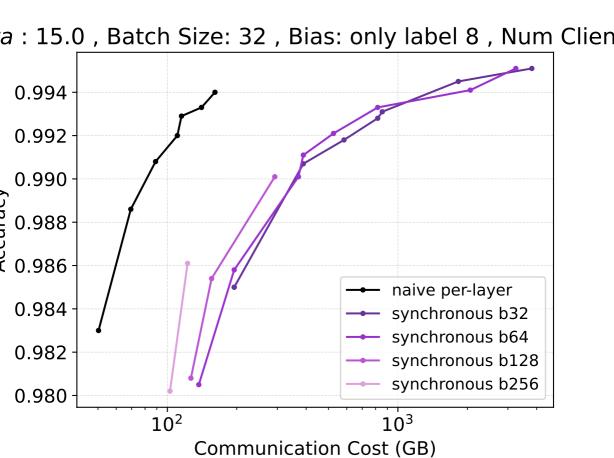


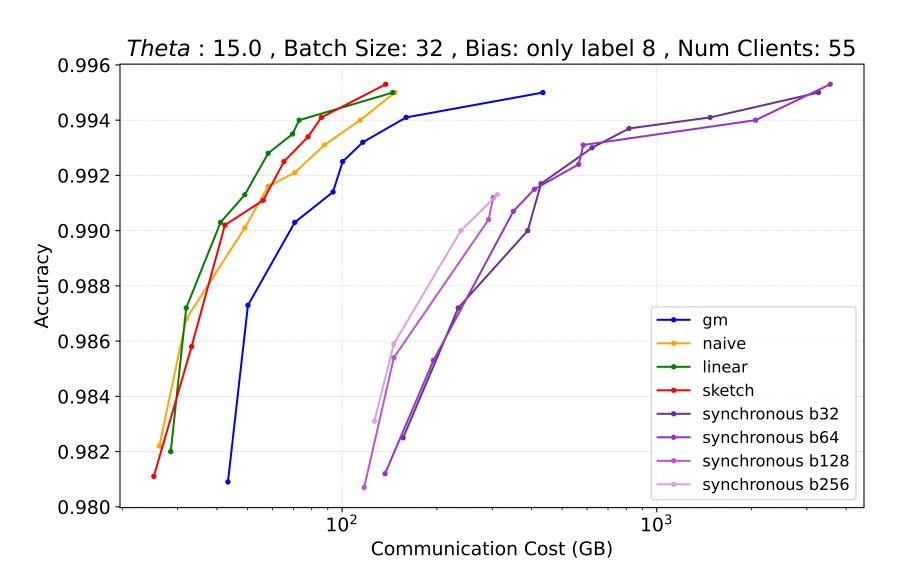
Theta: 15.0, Batch Size: 32, Bias: only label 8, Num Clients: 45 0.994 0.992 0.990 Accuracy 0.988gm 0.986 naive linear sketch 0.984 synchronous b32 → synchronous b64 0.982 synchronous b128 synchronous b256 10<sup>2</sup> 10<sup>3</sup>

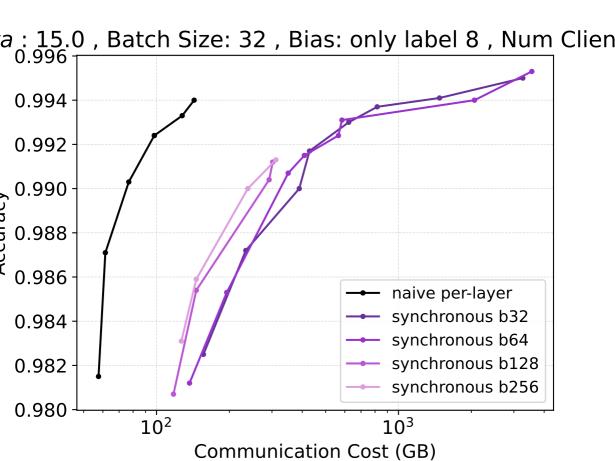
Communication Cost (GB)

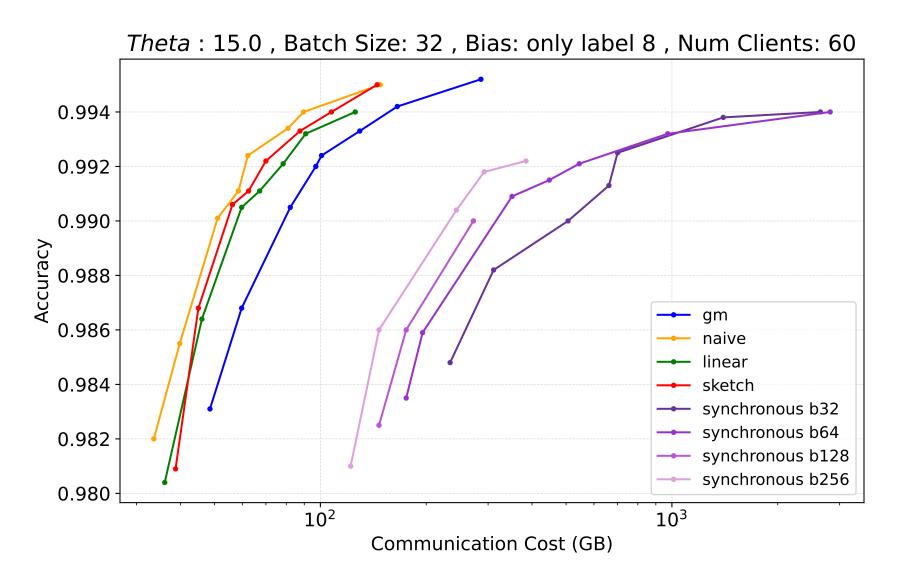


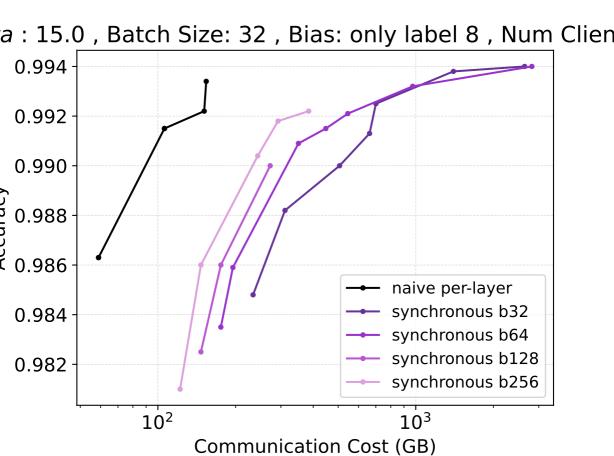


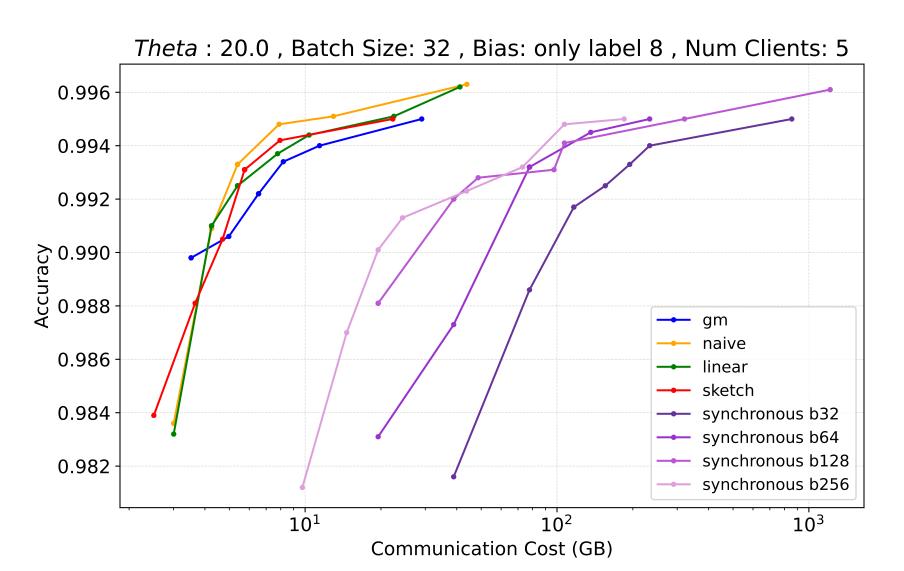


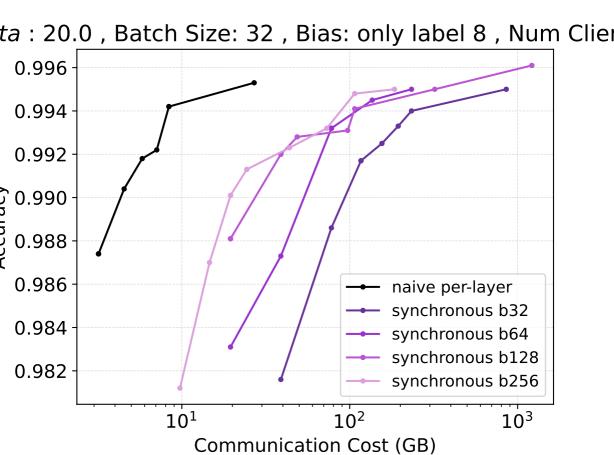


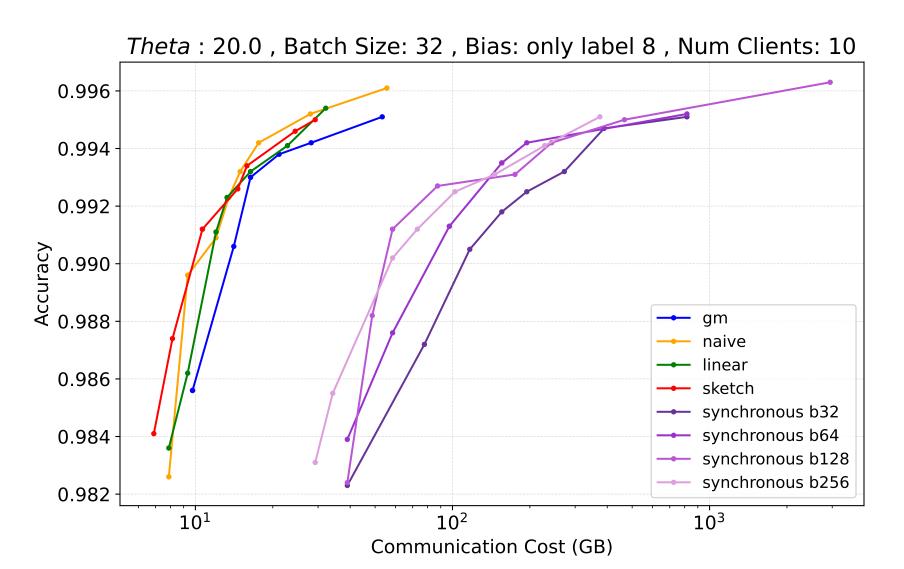


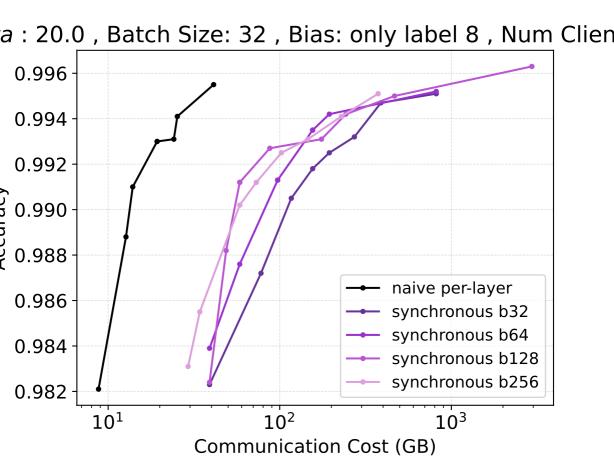


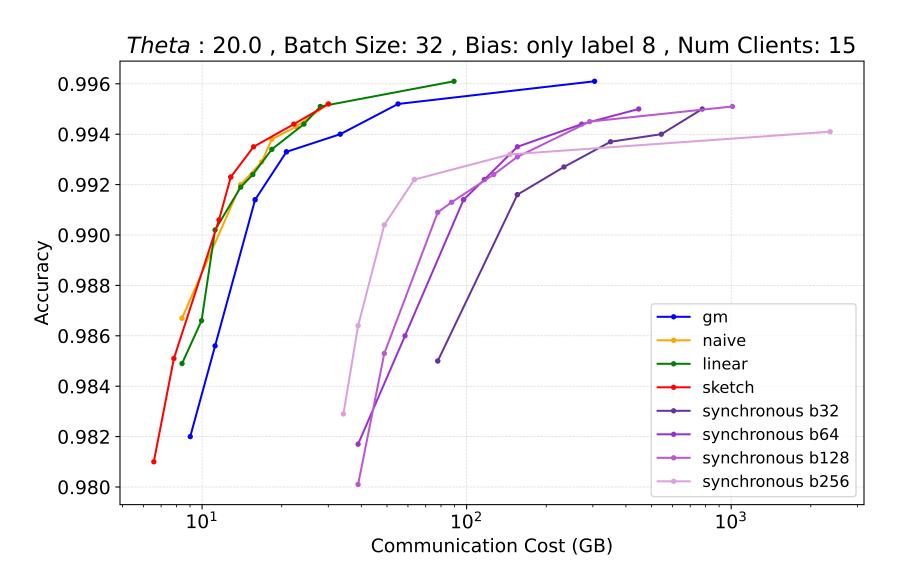


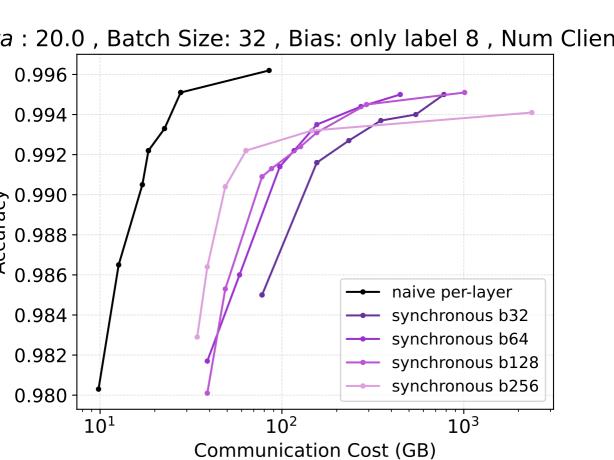


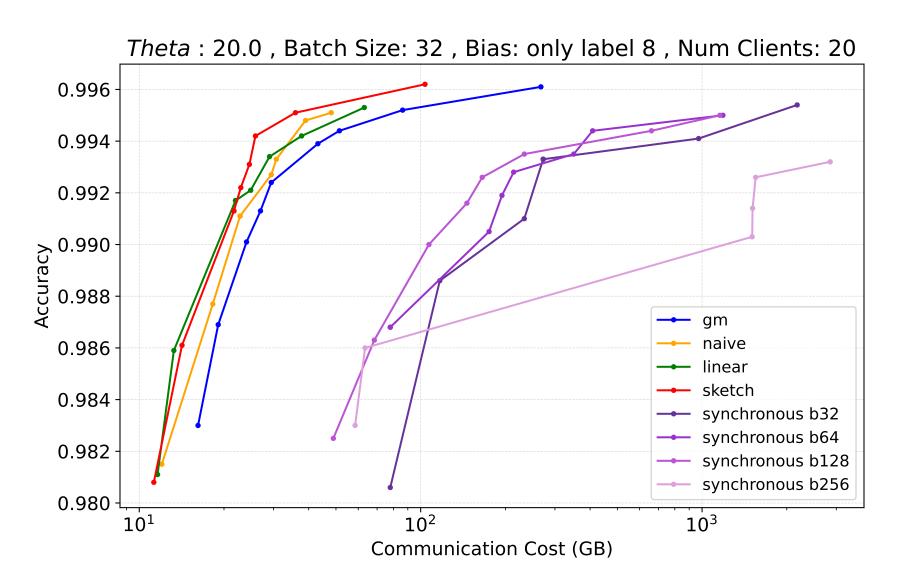


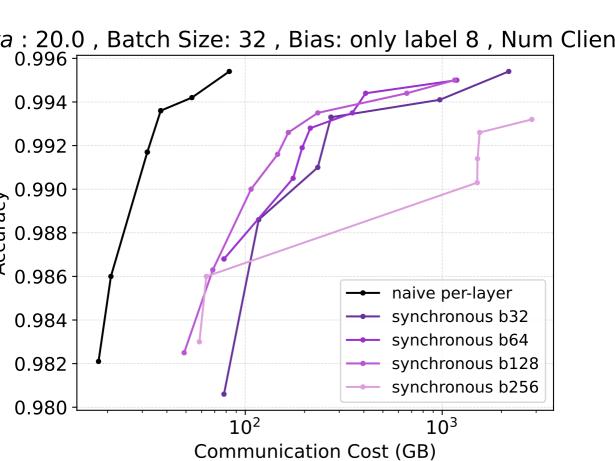


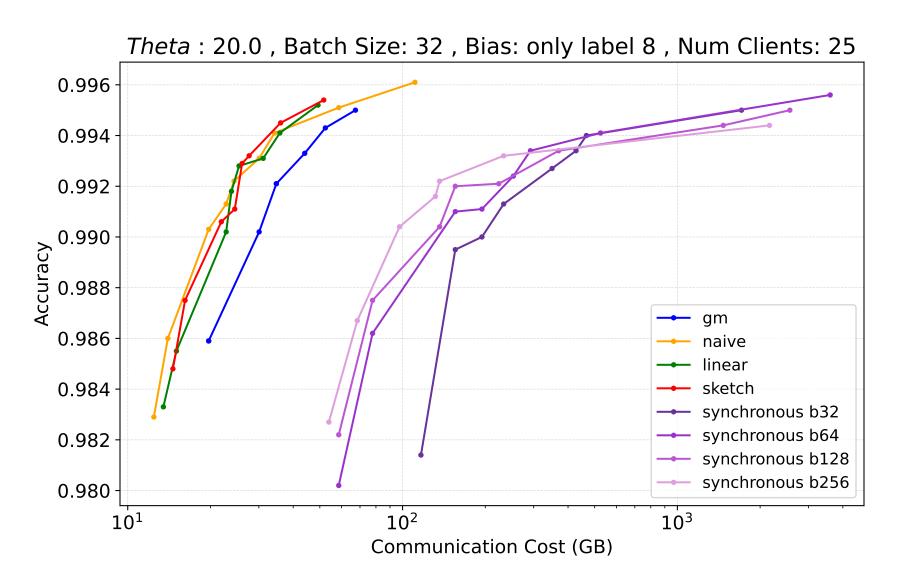


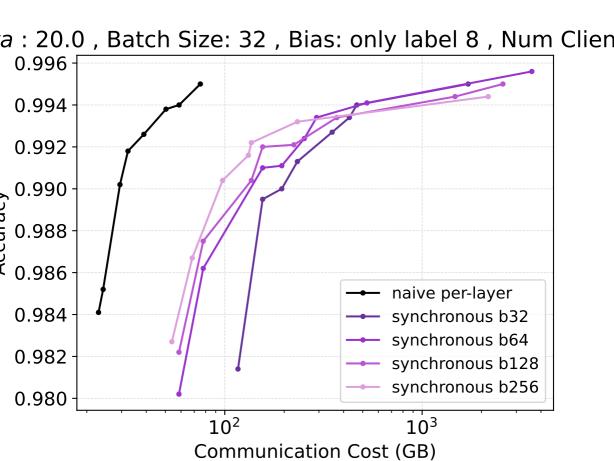


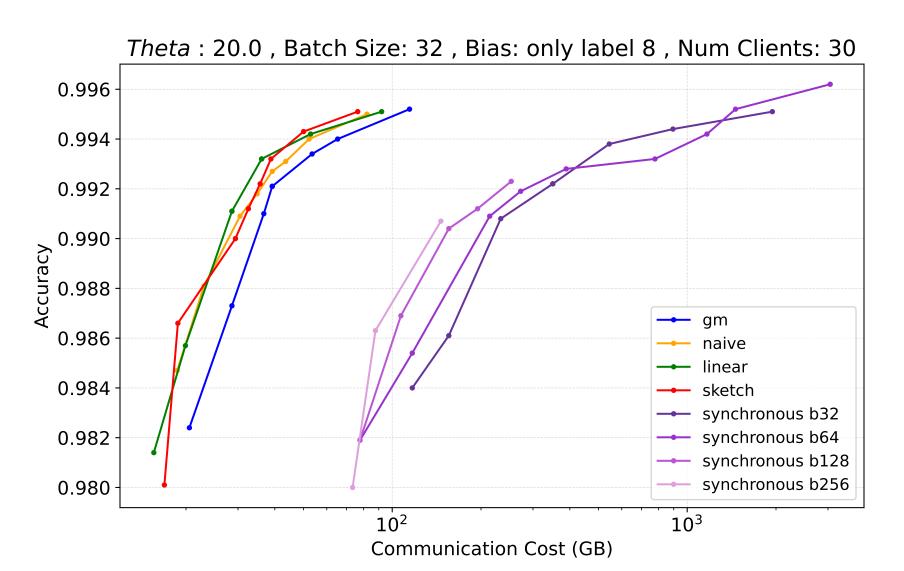


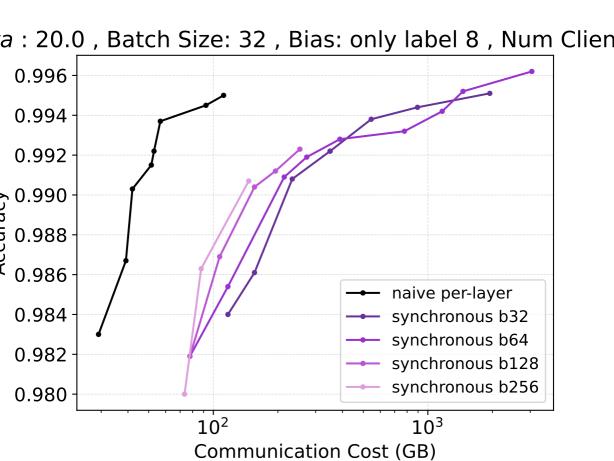


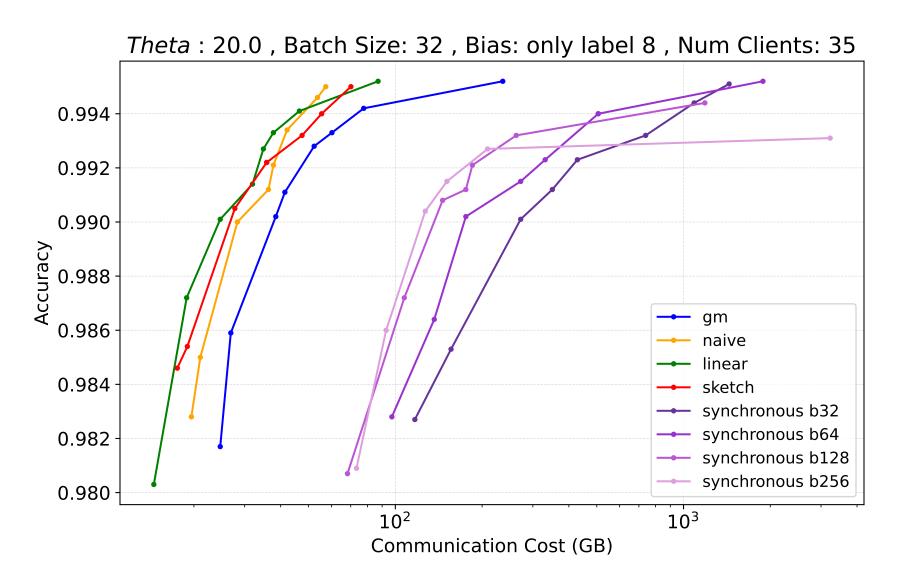


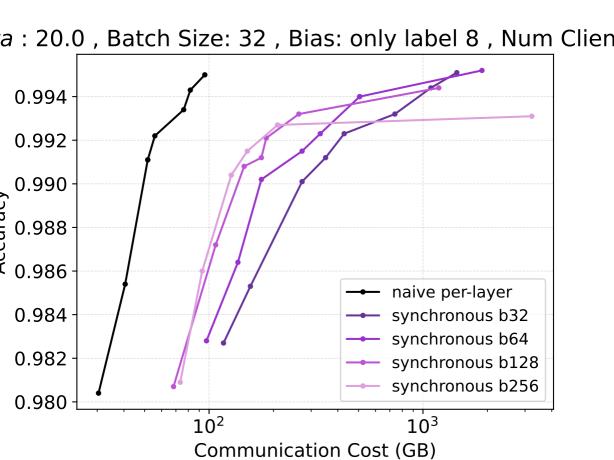


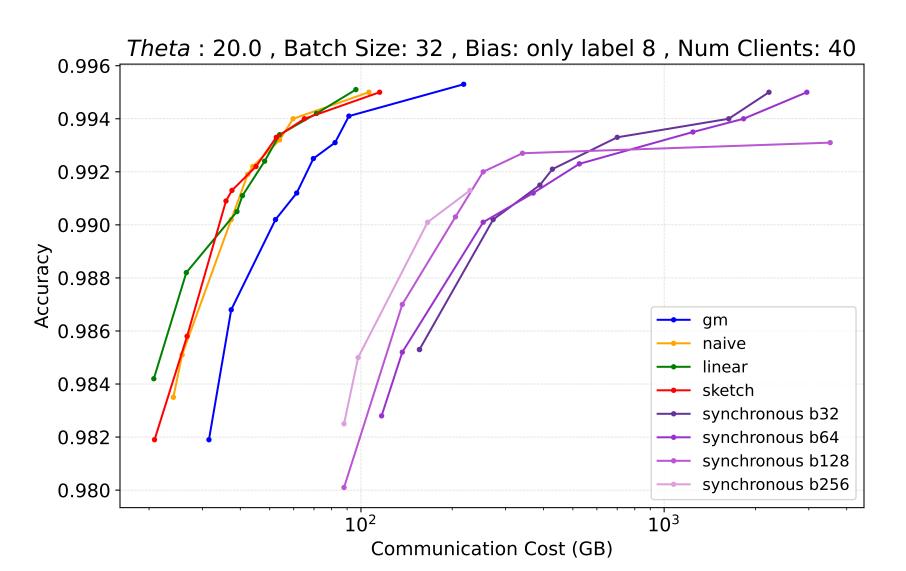


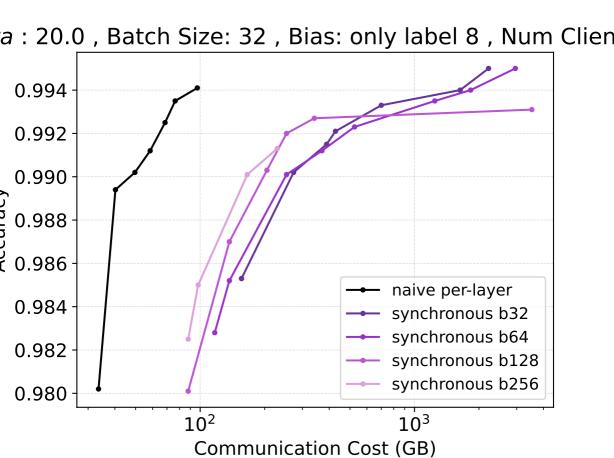




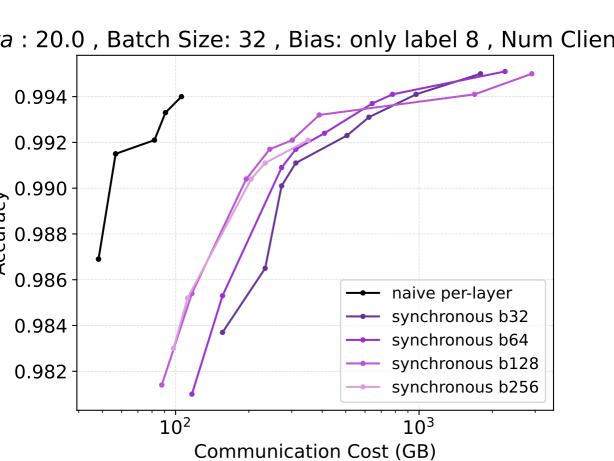


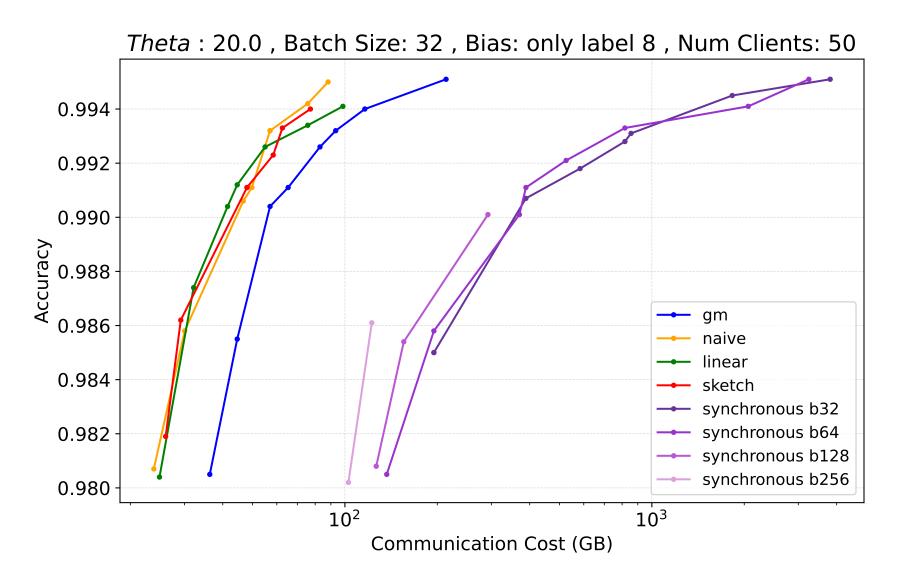


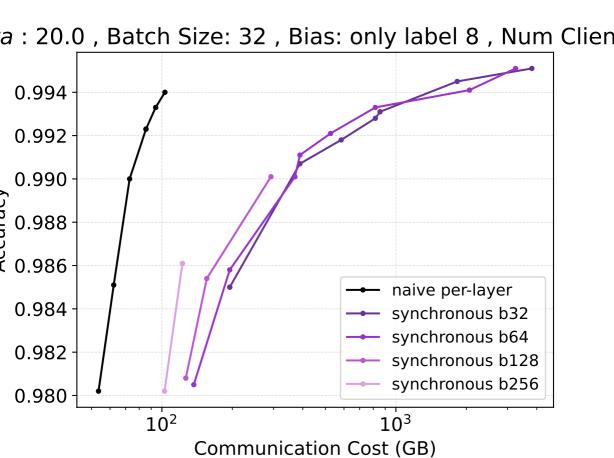


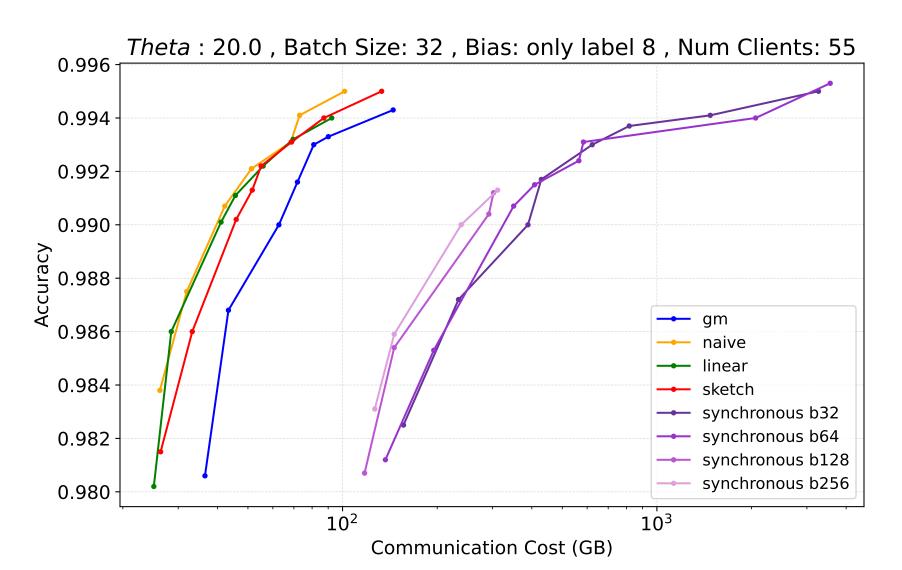


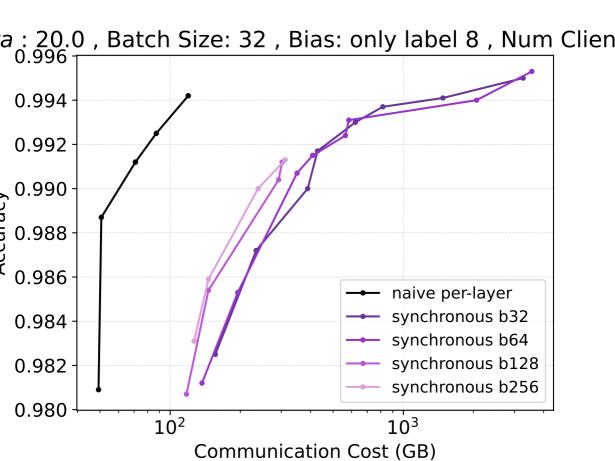
Theta: 20.0, Batch Size: 32, Bias: only label 8, Num Clients: 45 0.994 0.992 0.990 Accuracy 0.988gm 0.986 naive linear sketch 0.984 synchronous b32 → synchronous b64 0.982 synchronous b128 synchronous b256 10<sup>3</sup> 10<sup>2</sup> Communication Cost (GB)

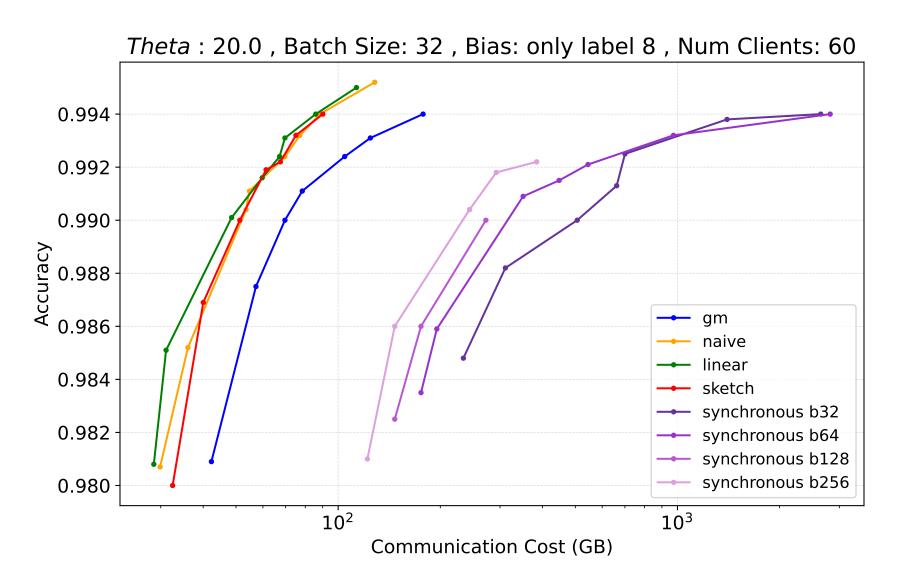


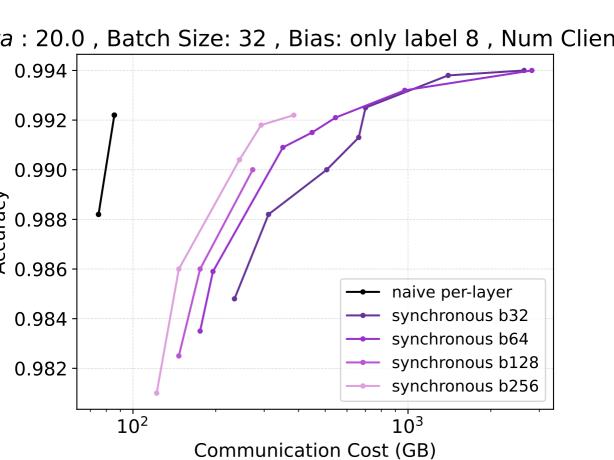


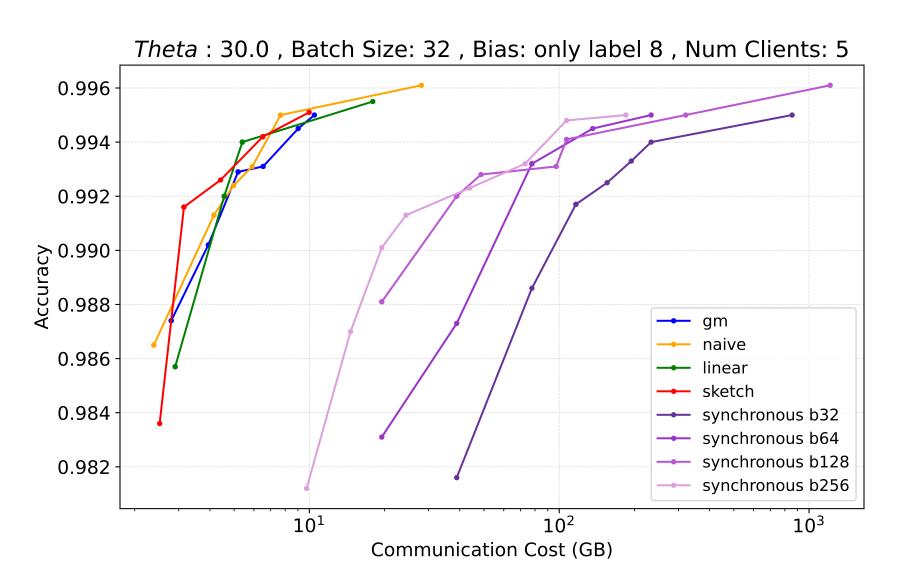


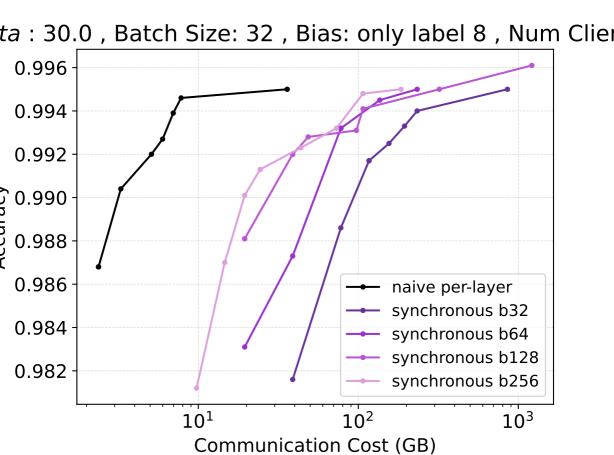


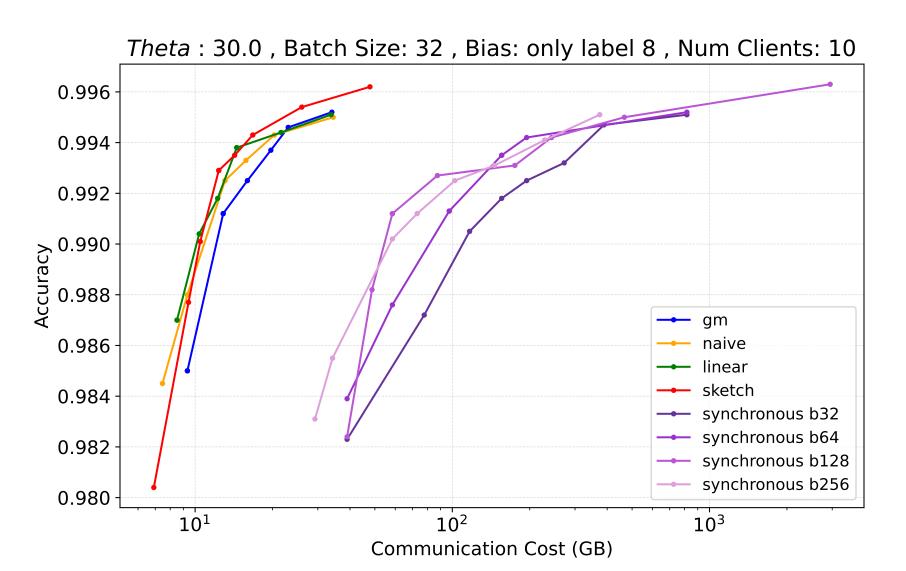


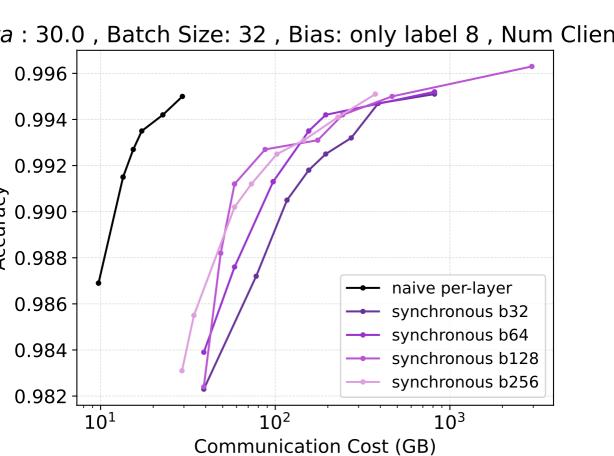


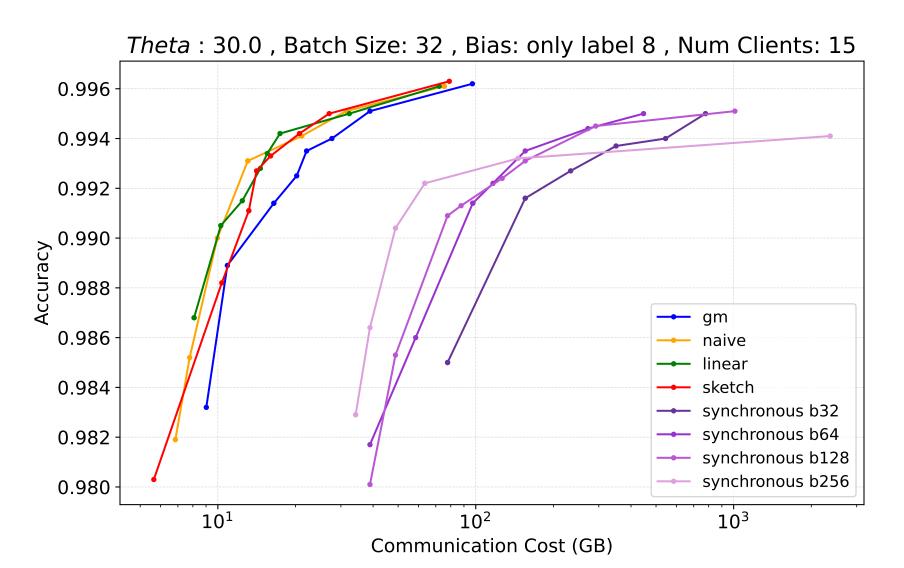


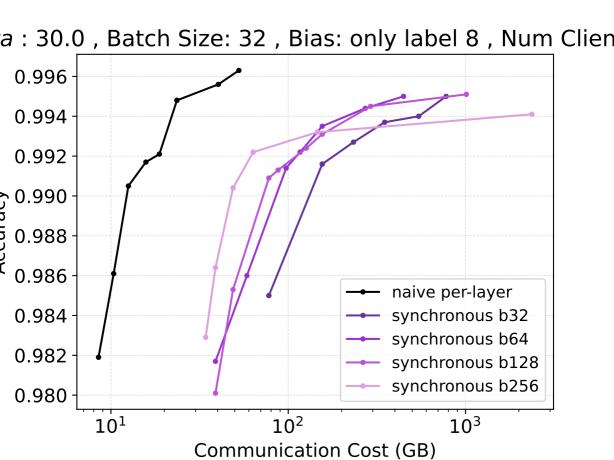


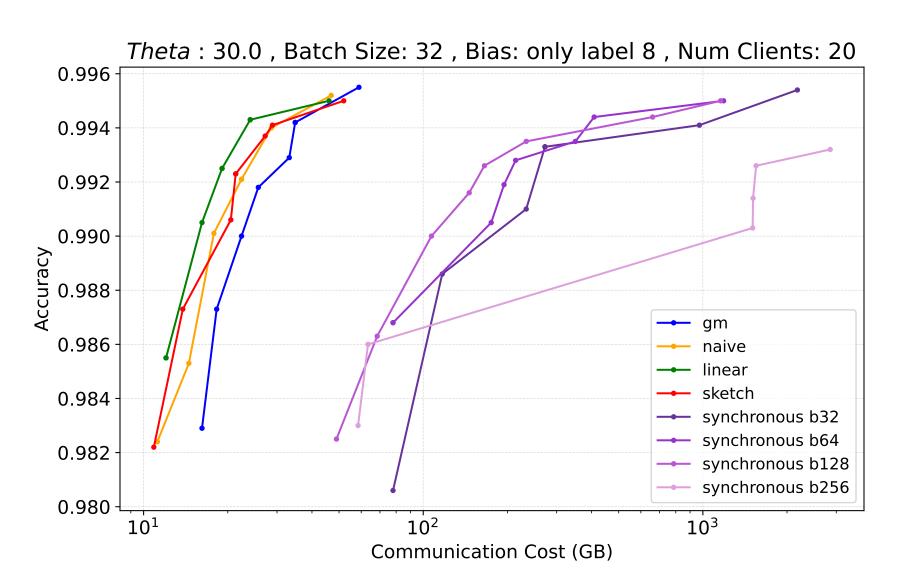


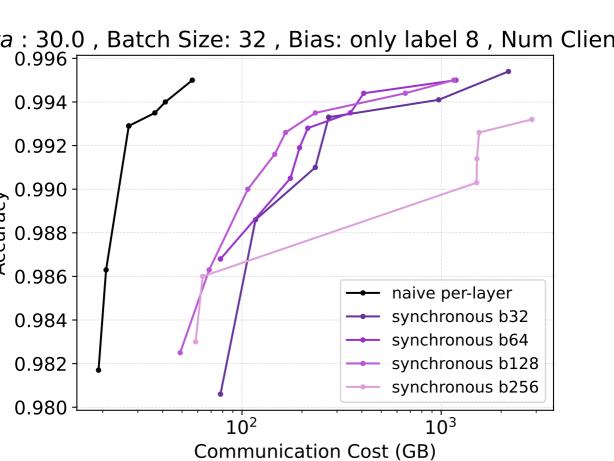


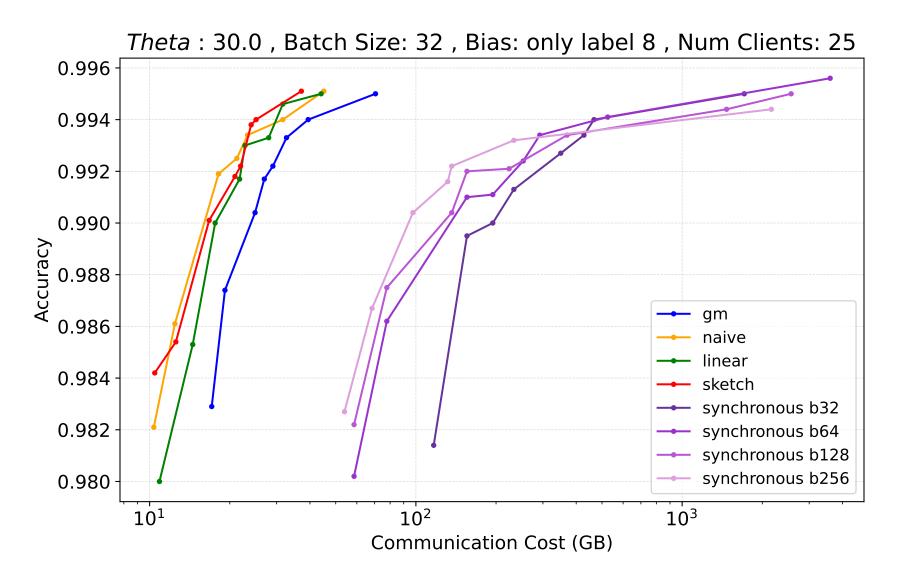


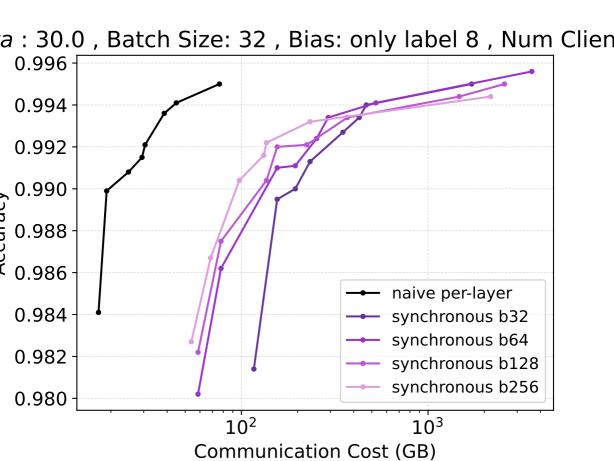


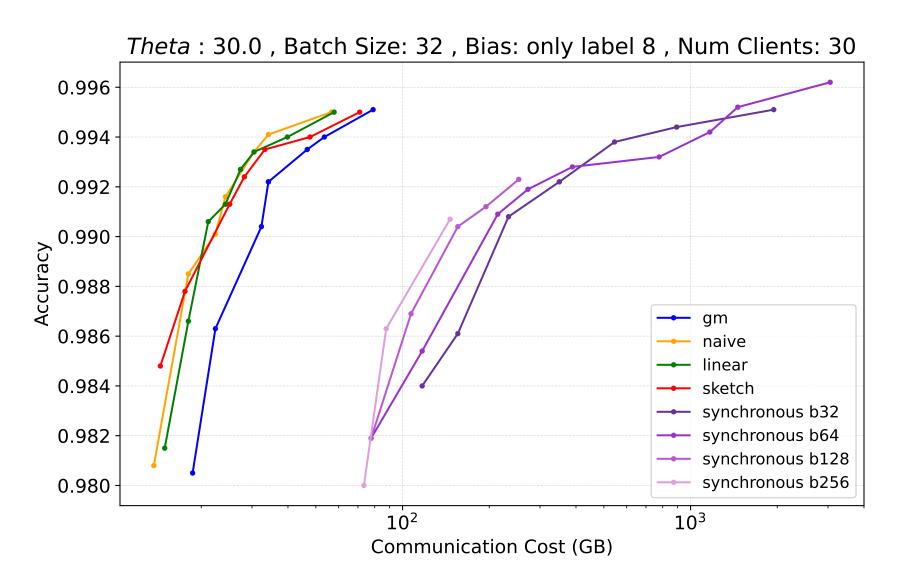


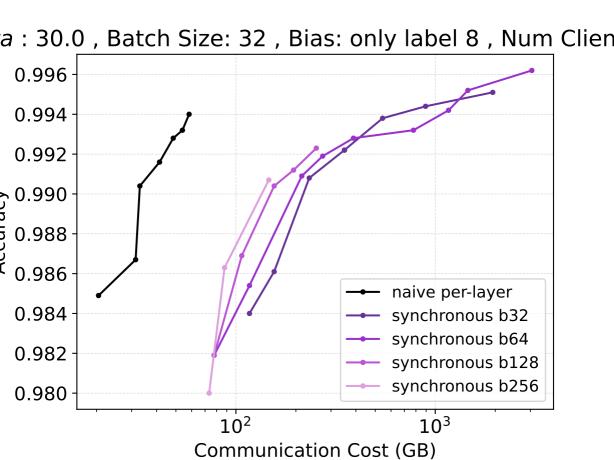


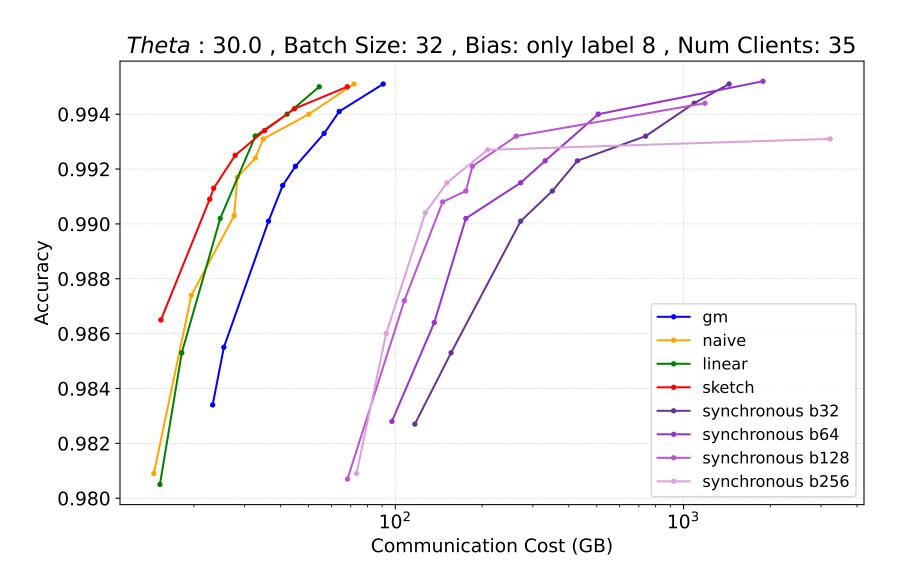


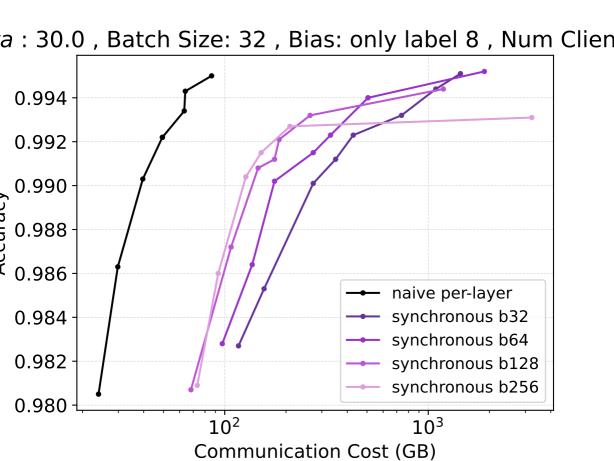


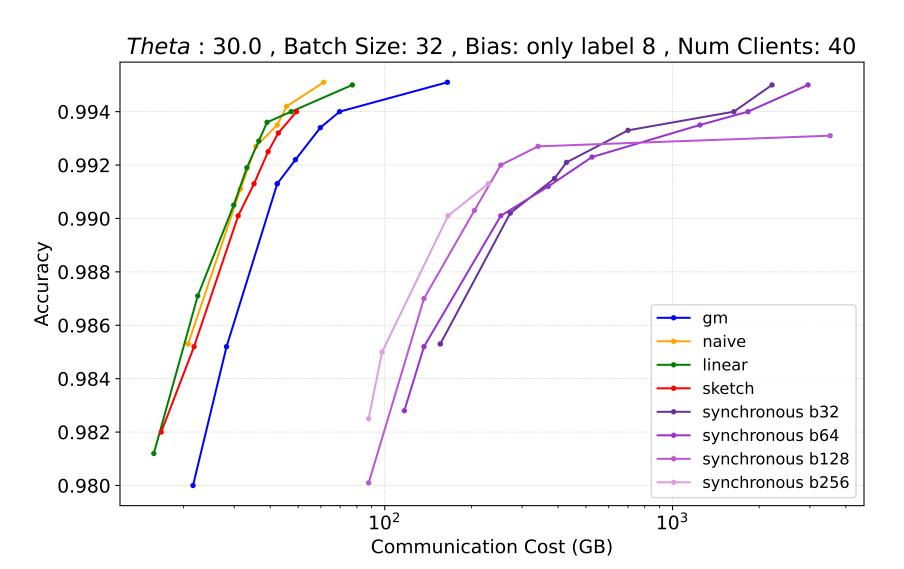


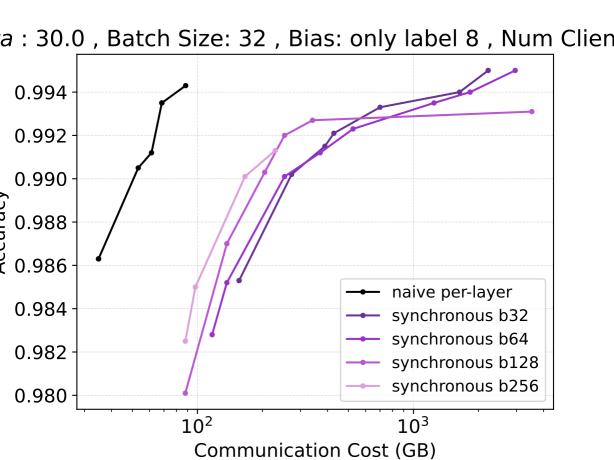


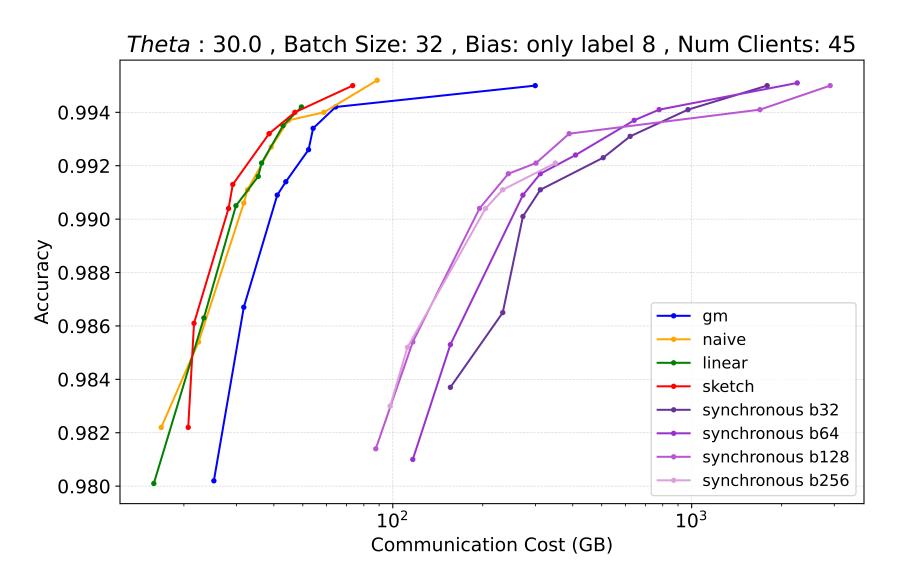


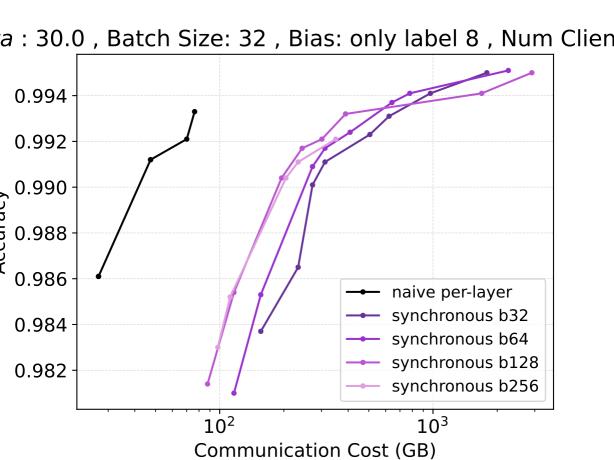


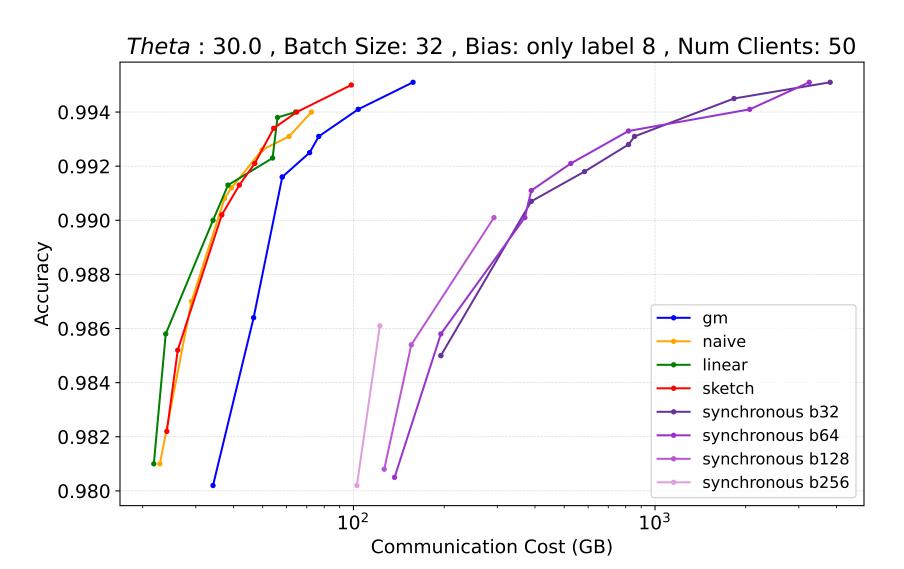


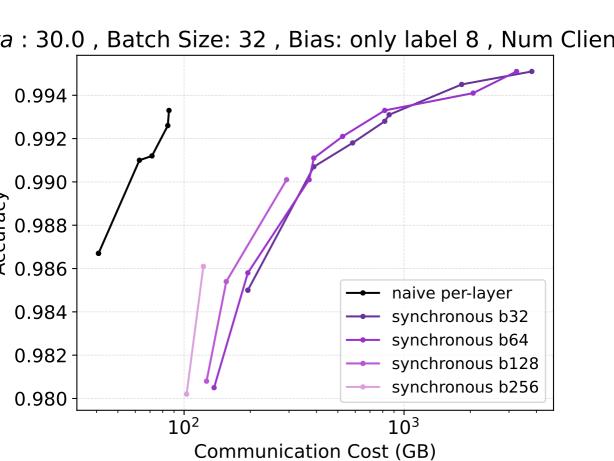


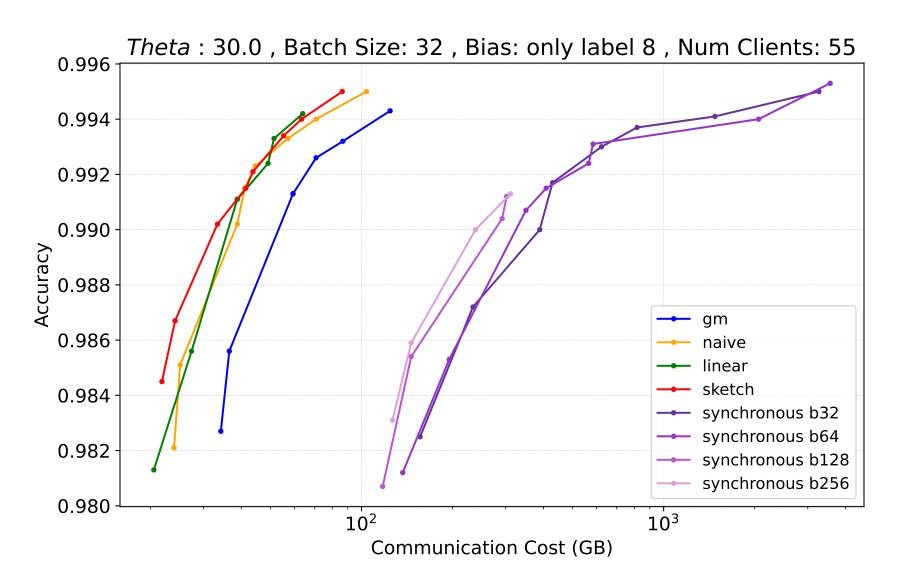


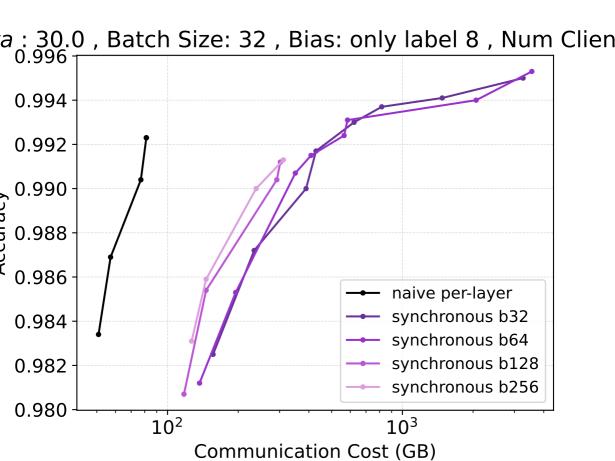


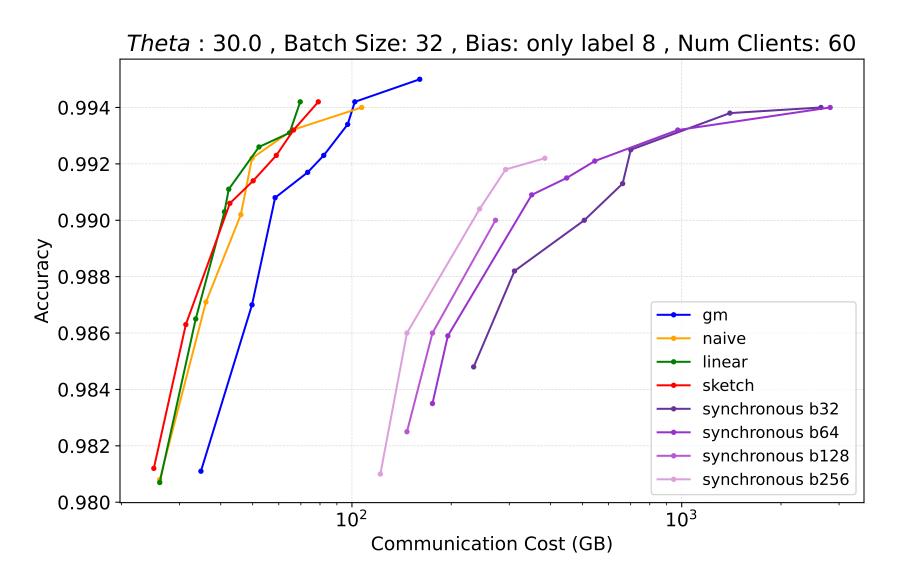


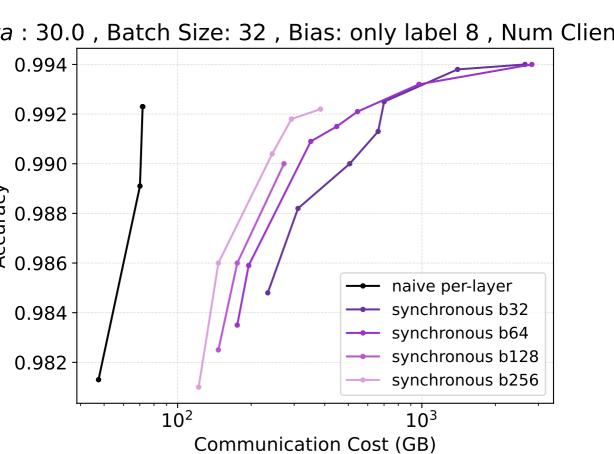




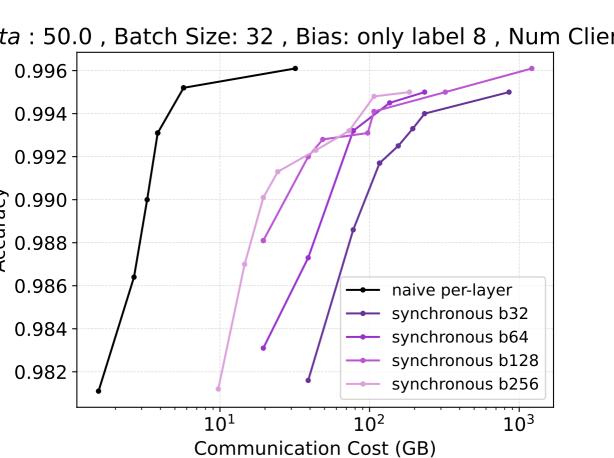


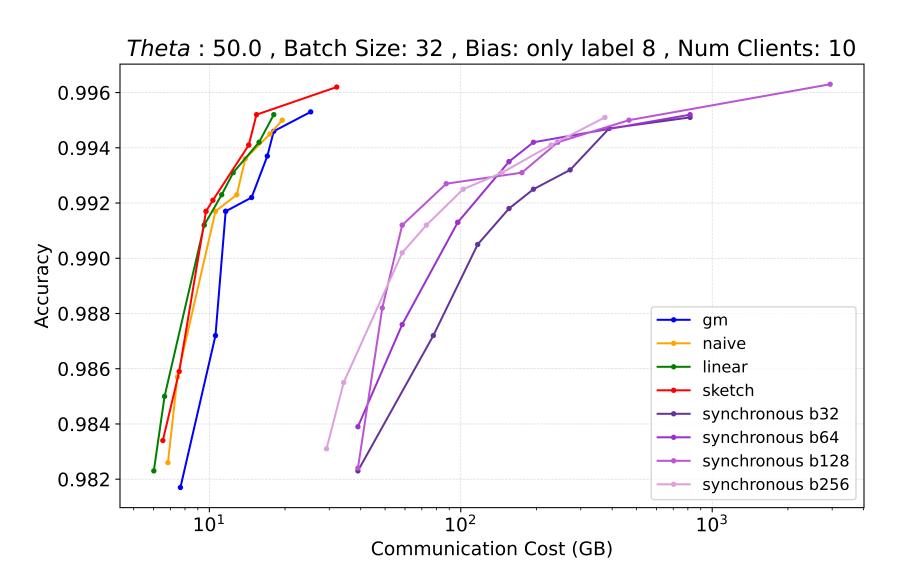


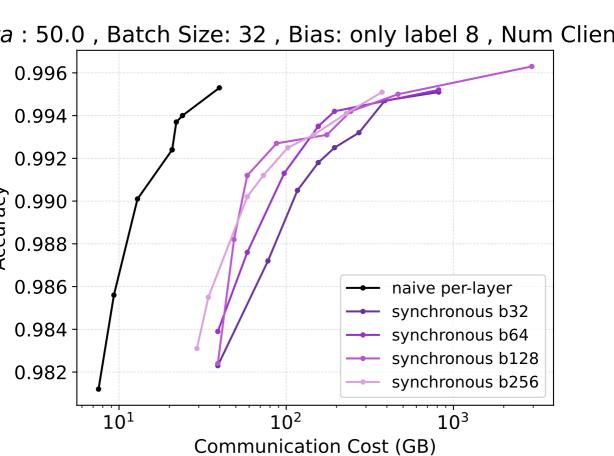


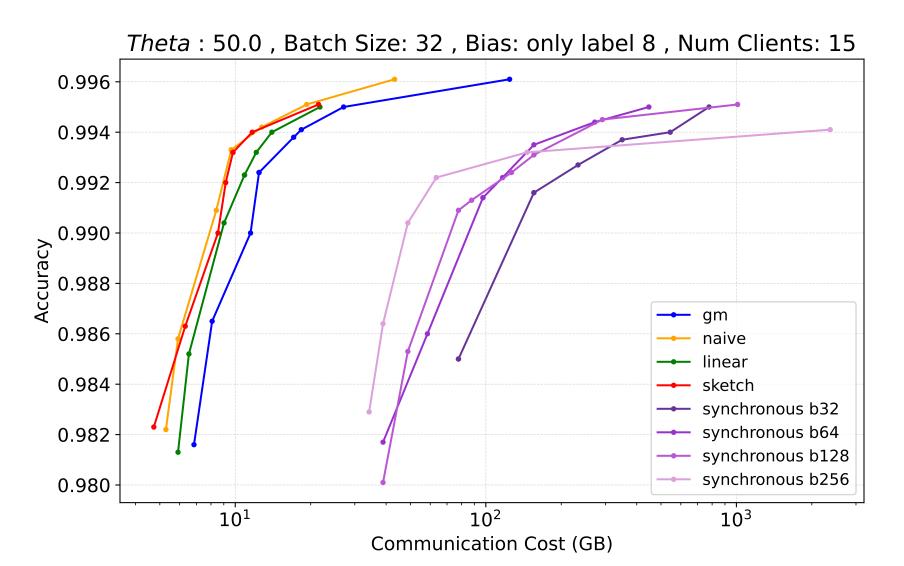


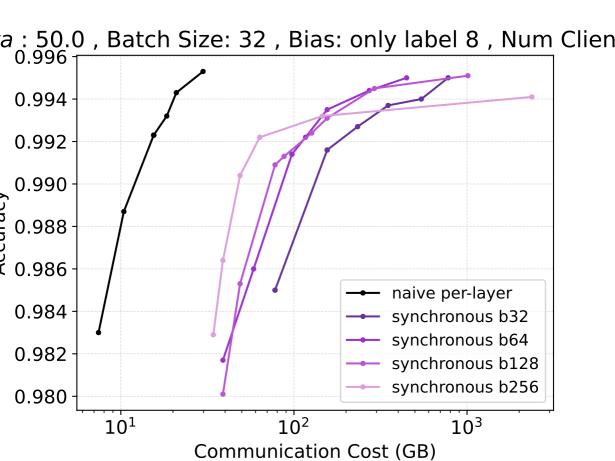


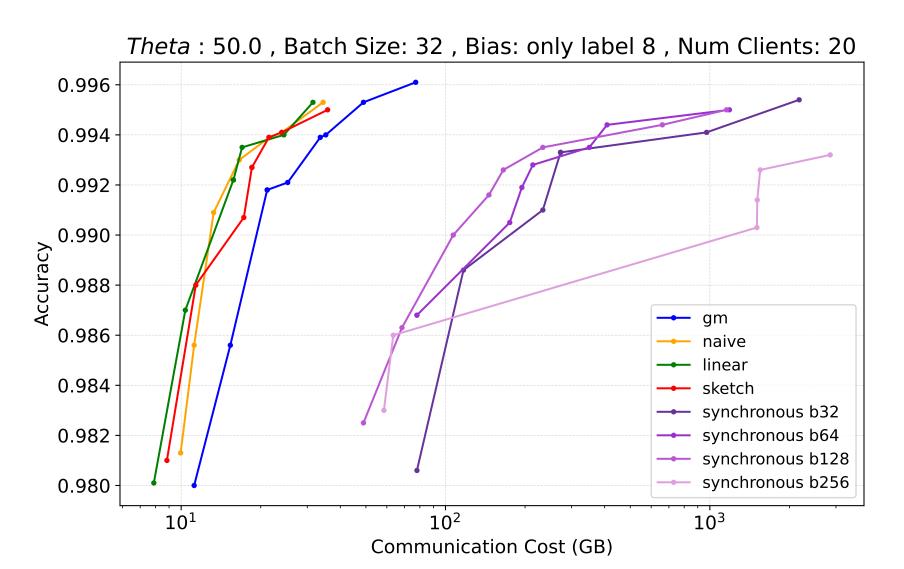


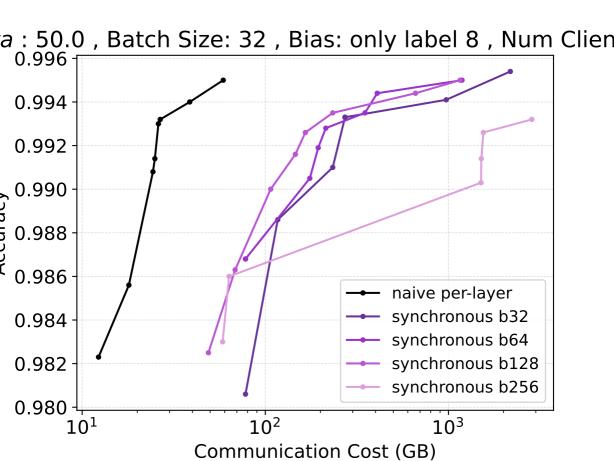


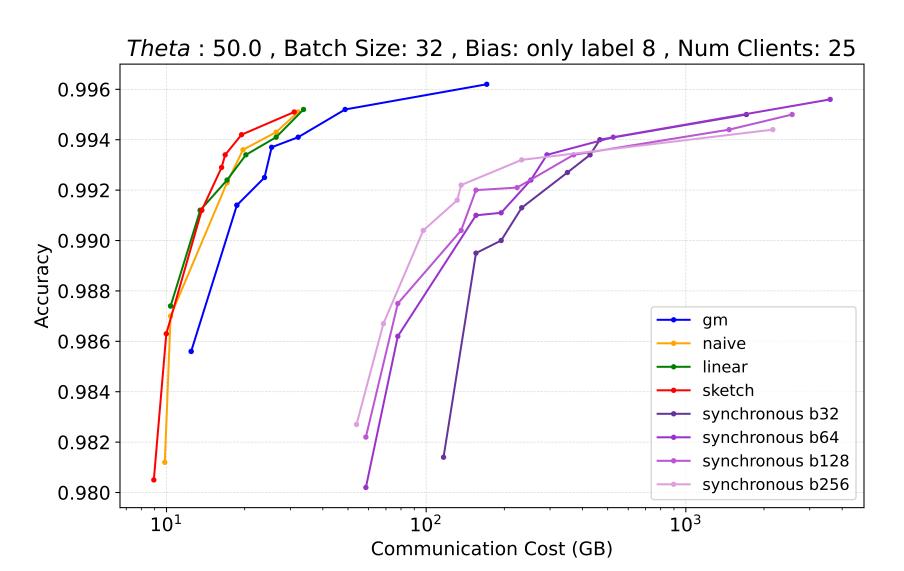


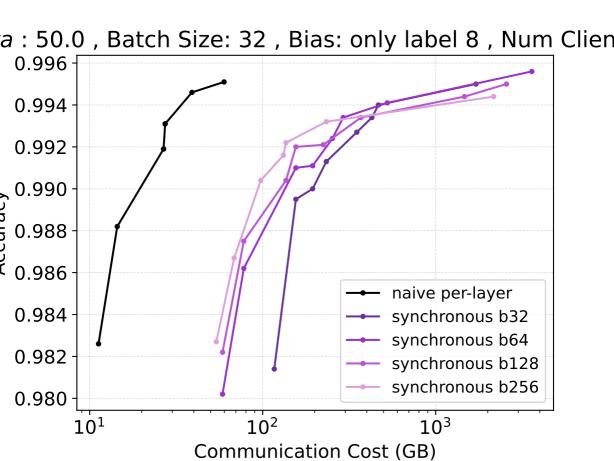


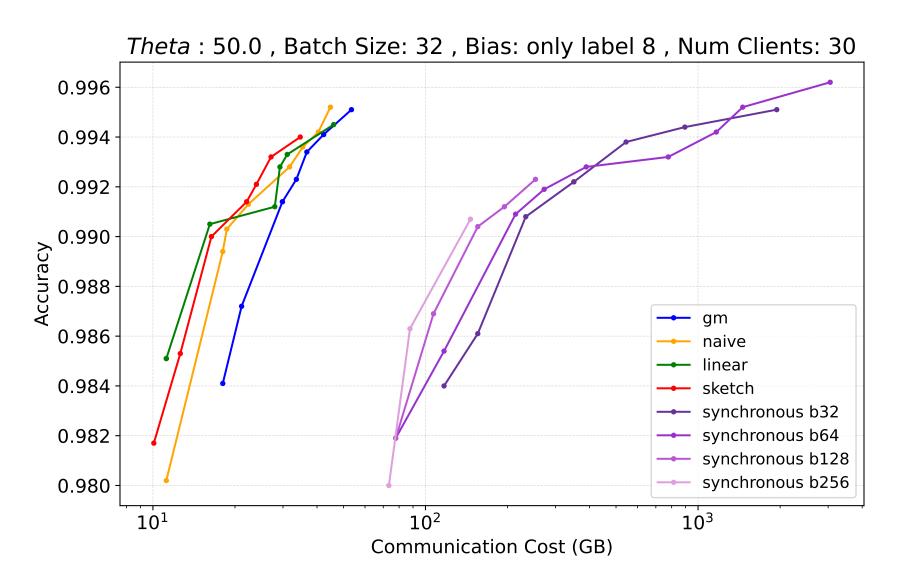


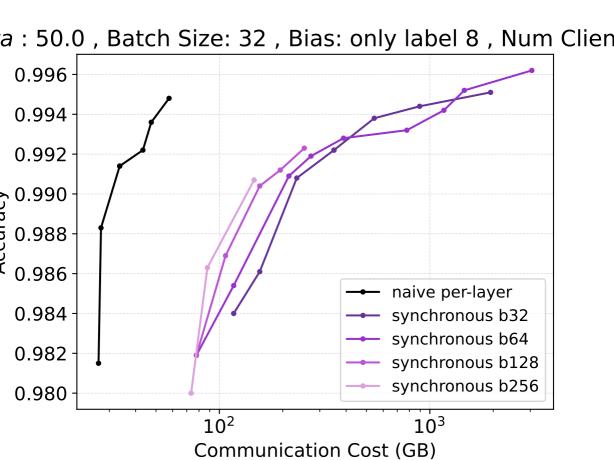


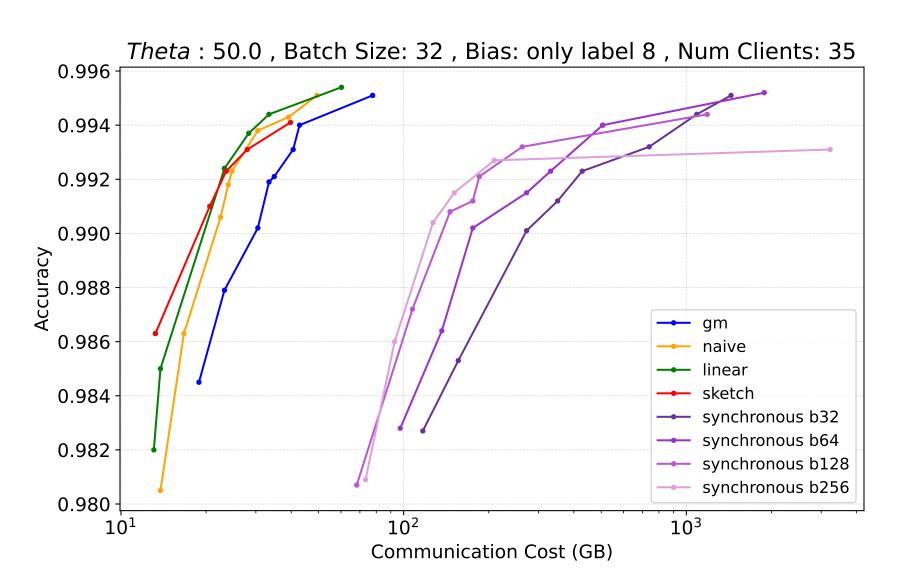


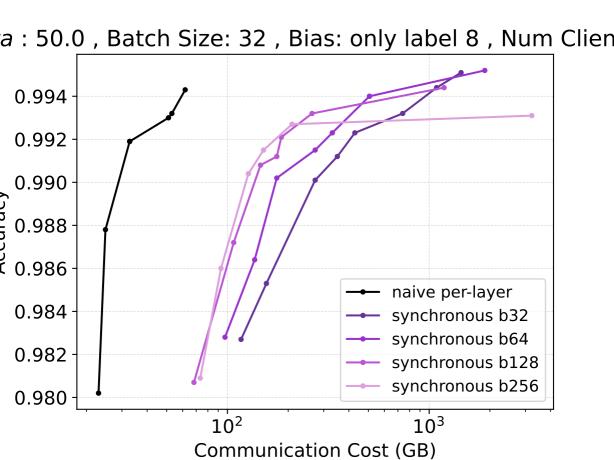


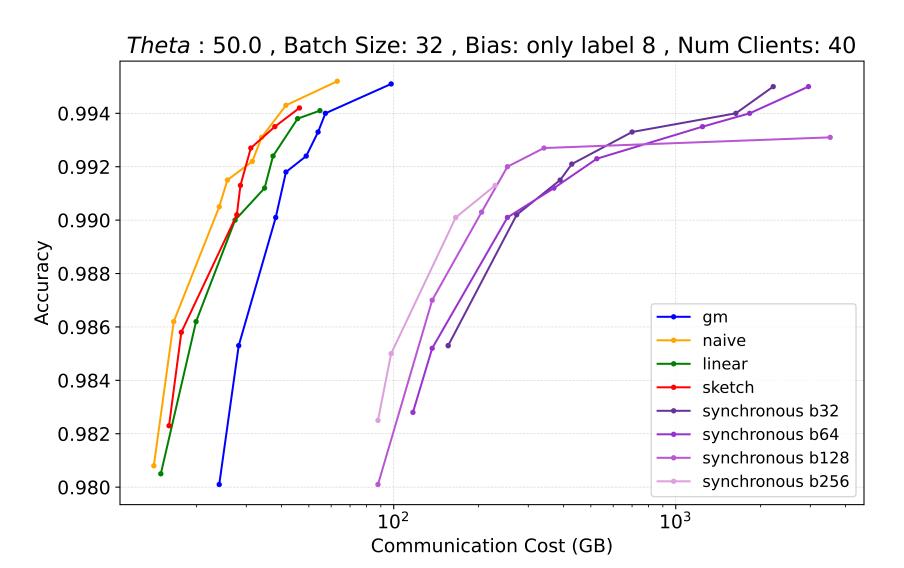


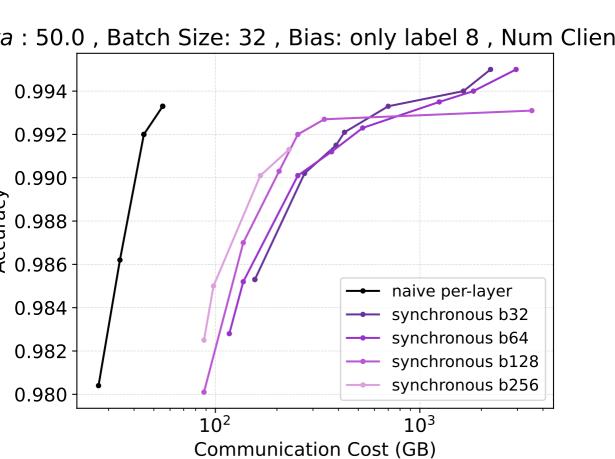






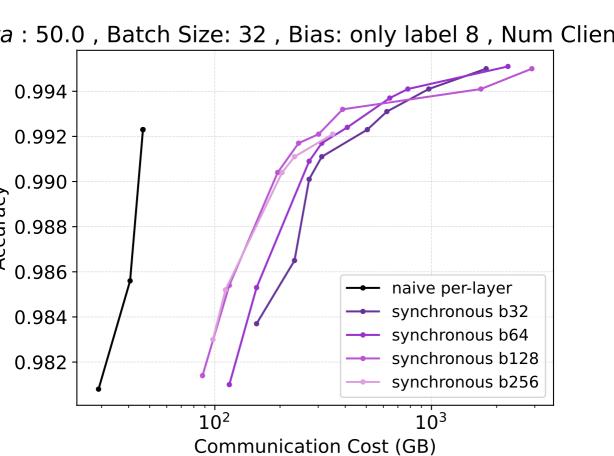


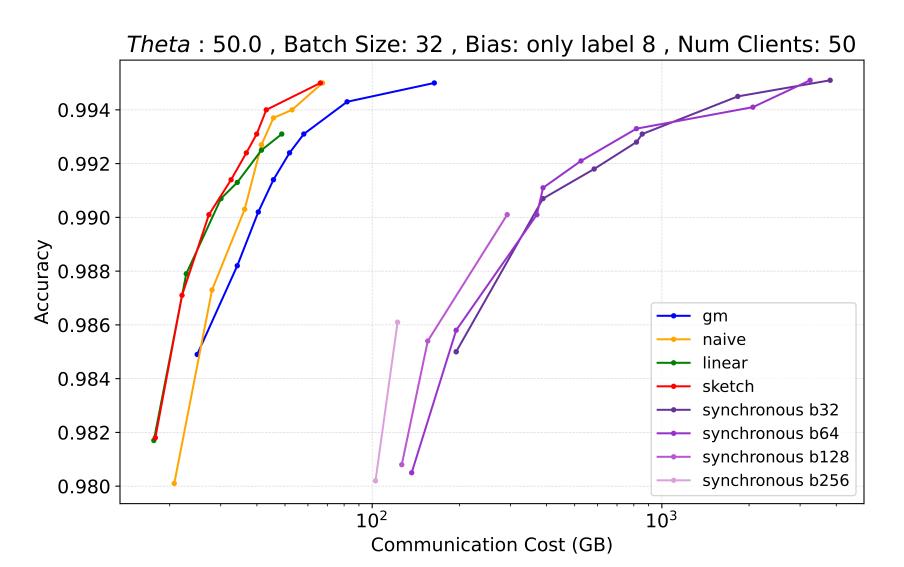


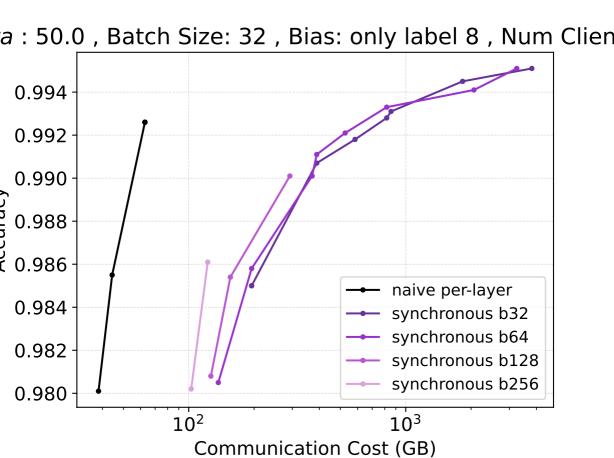


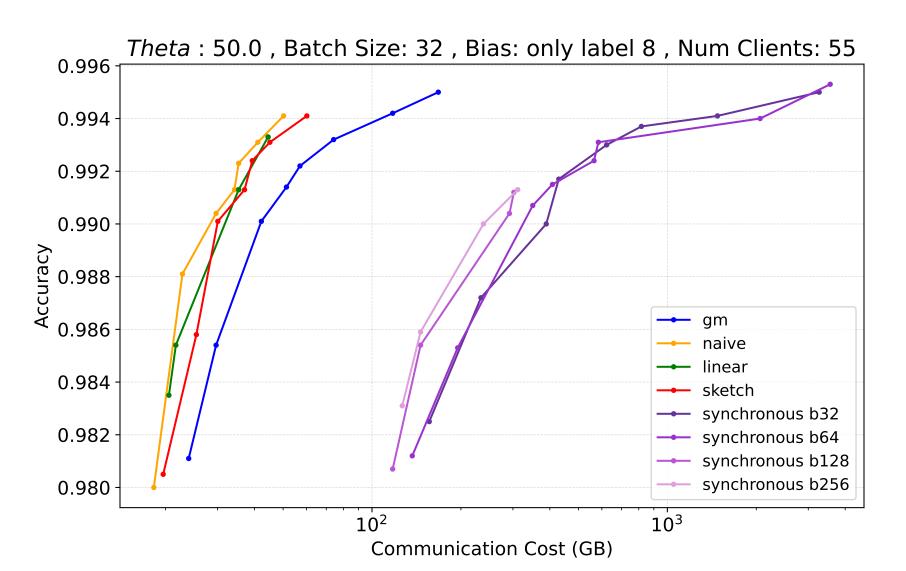
Theta: 50.0, Batch Size: 32, Bias: only label 8, Num Clients: 45 0.994 0.992 0.990 Accuracy 0.988 gm 0.986 naive linear 0.984sketch synchronous b32 synchronous b64 0.982 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup>

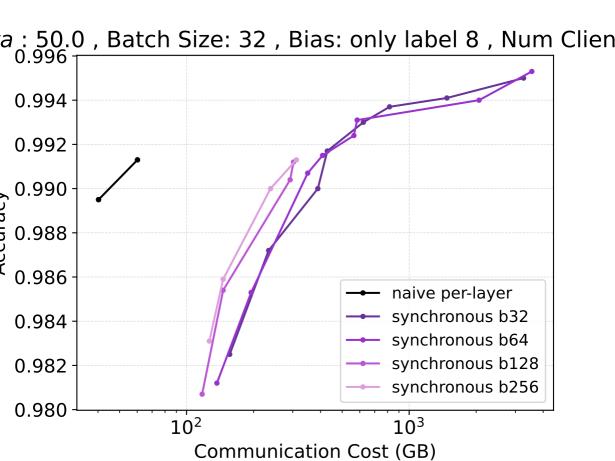
Communication Cost (GB)

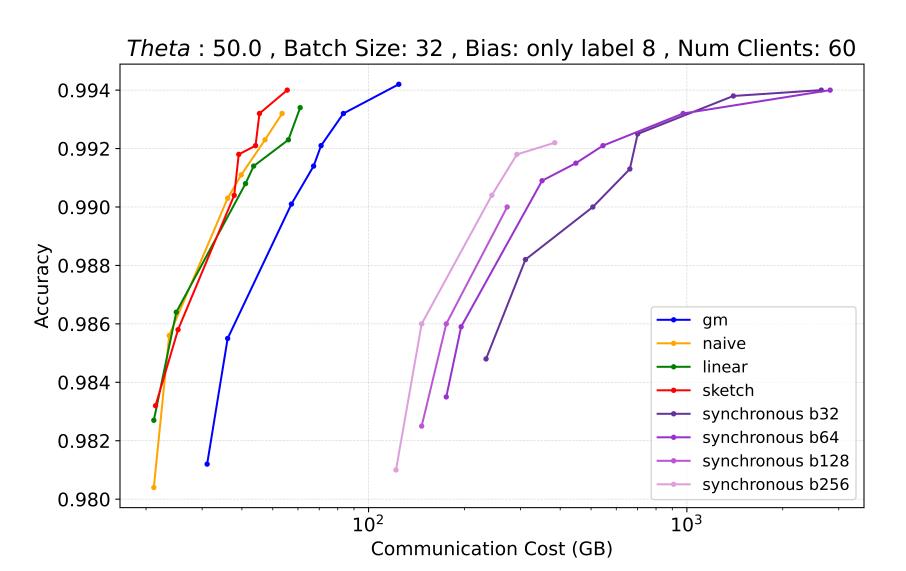


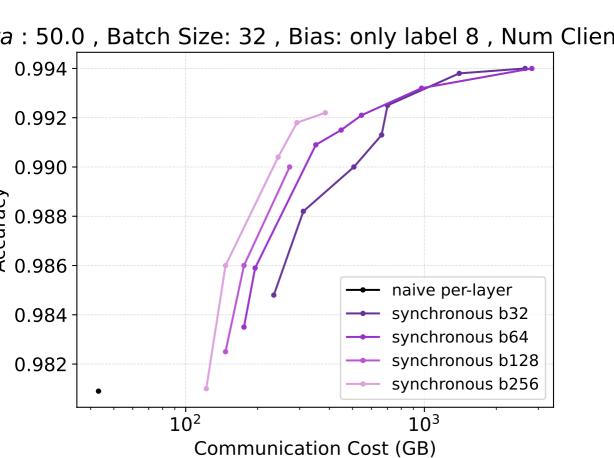


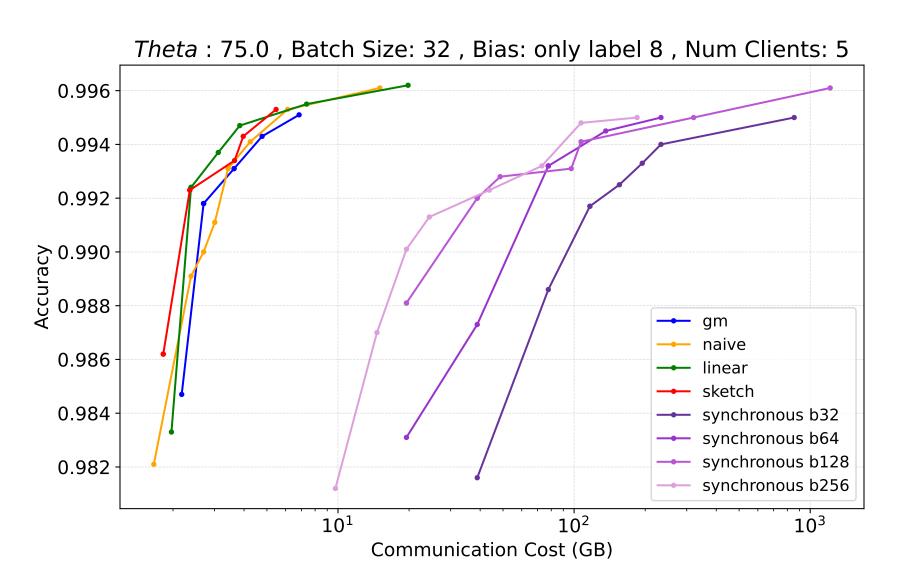


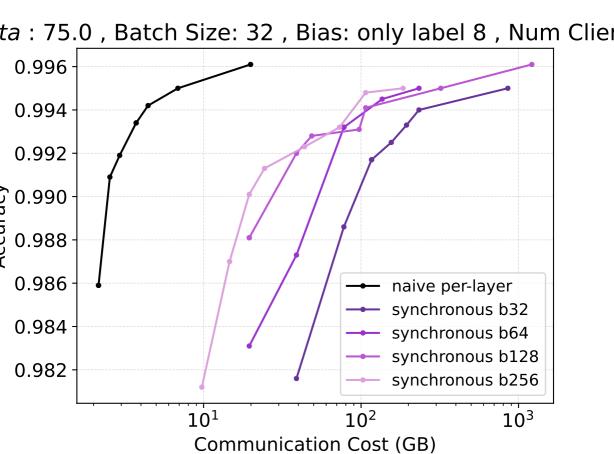


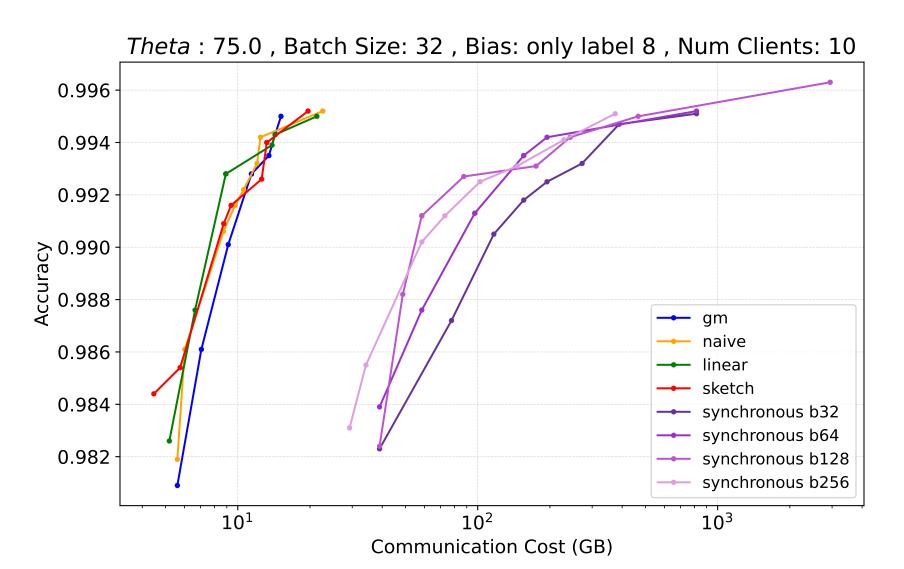


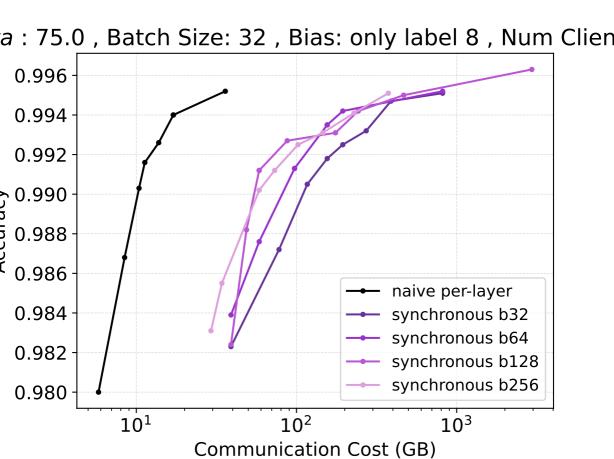


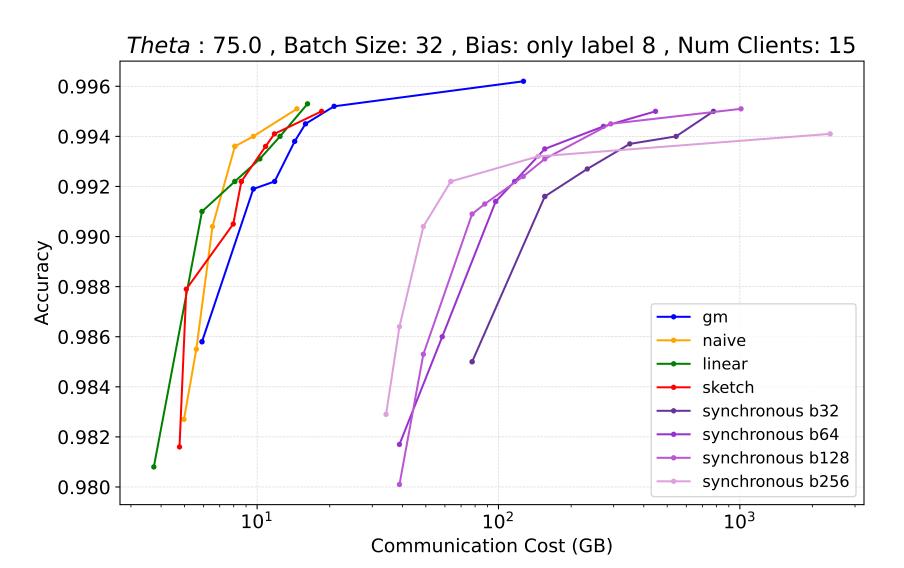


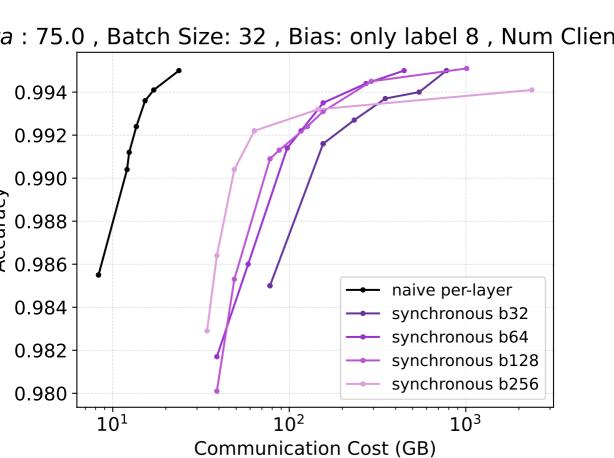


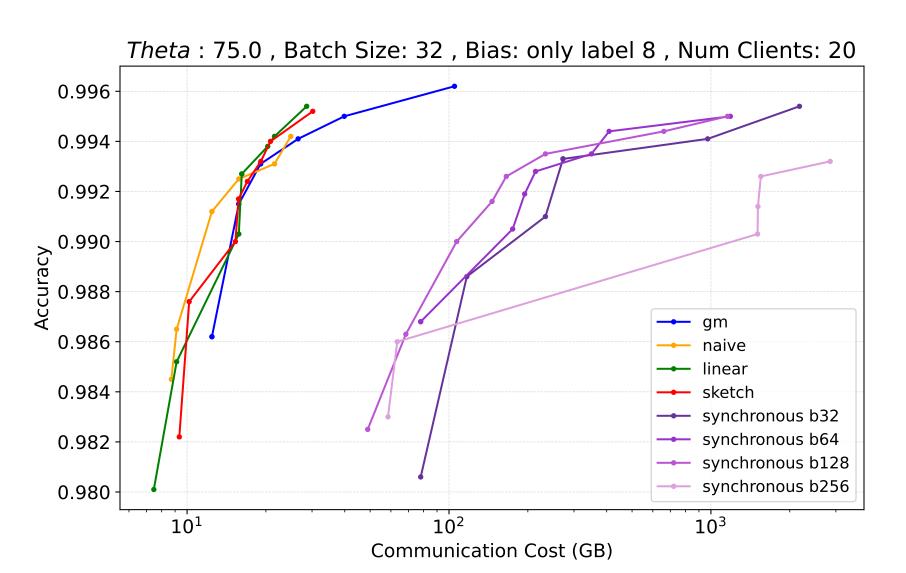


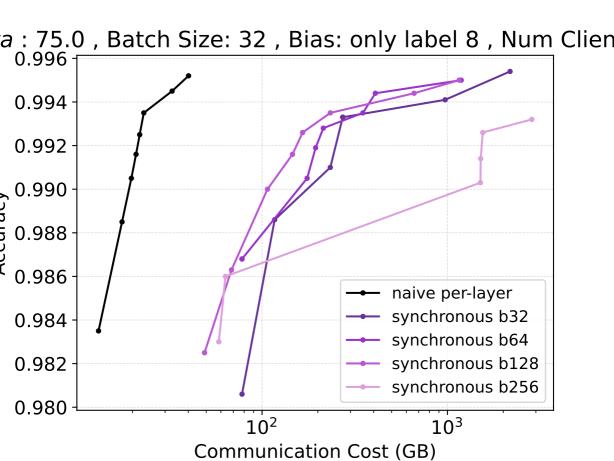


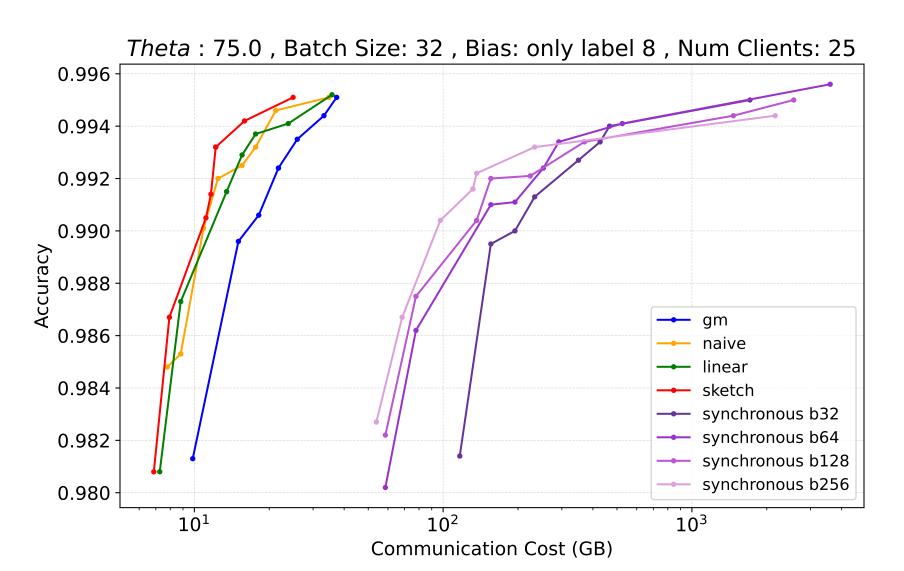


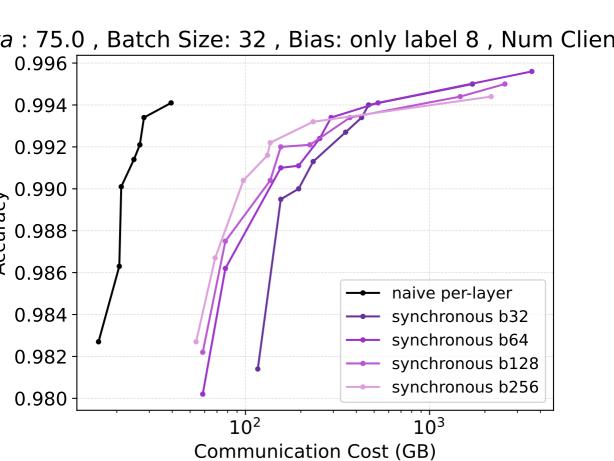




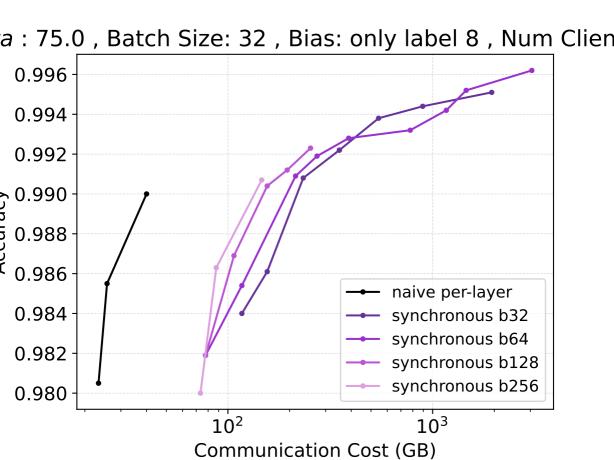


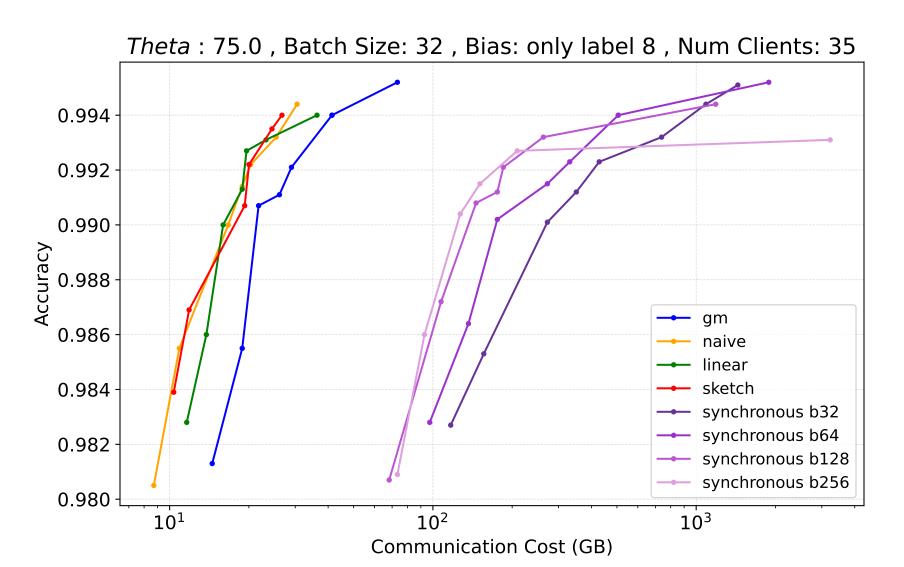


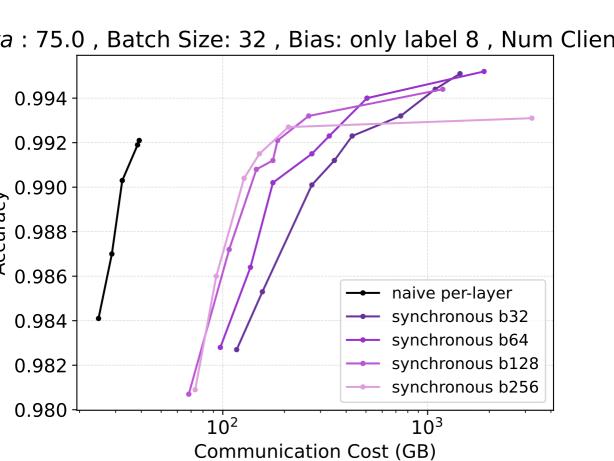


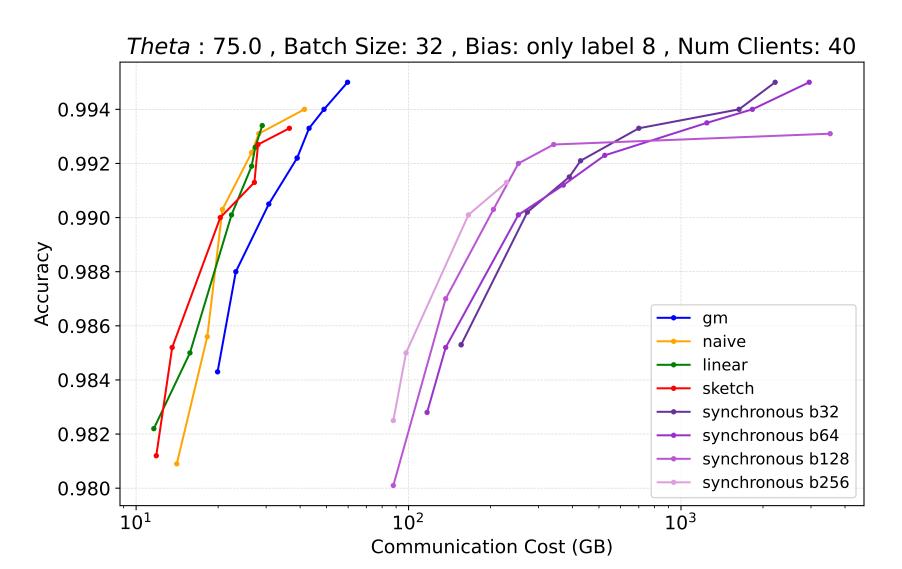


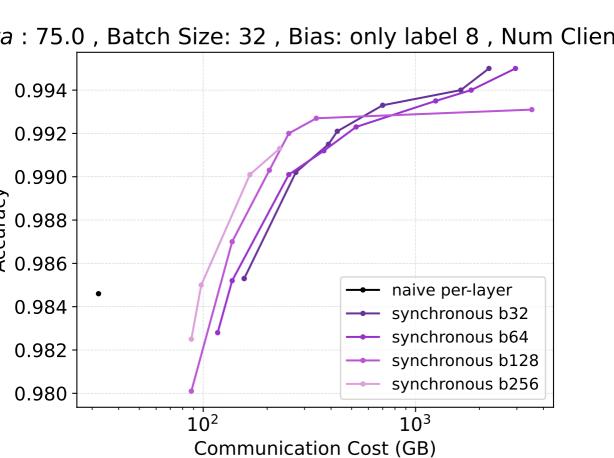




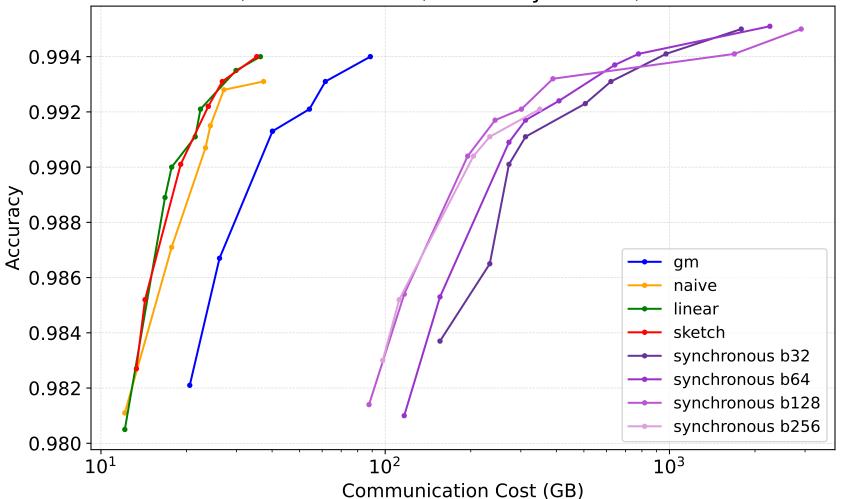


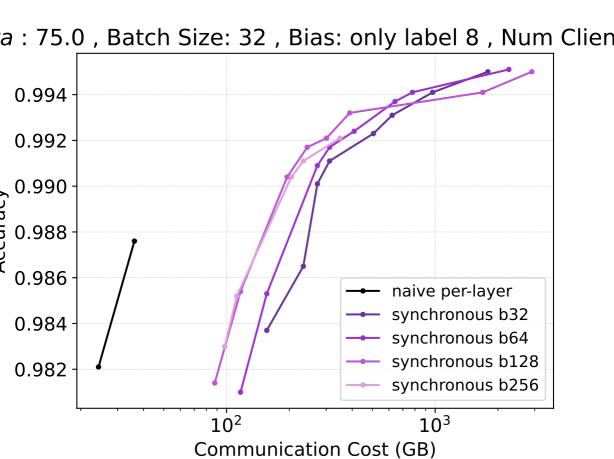


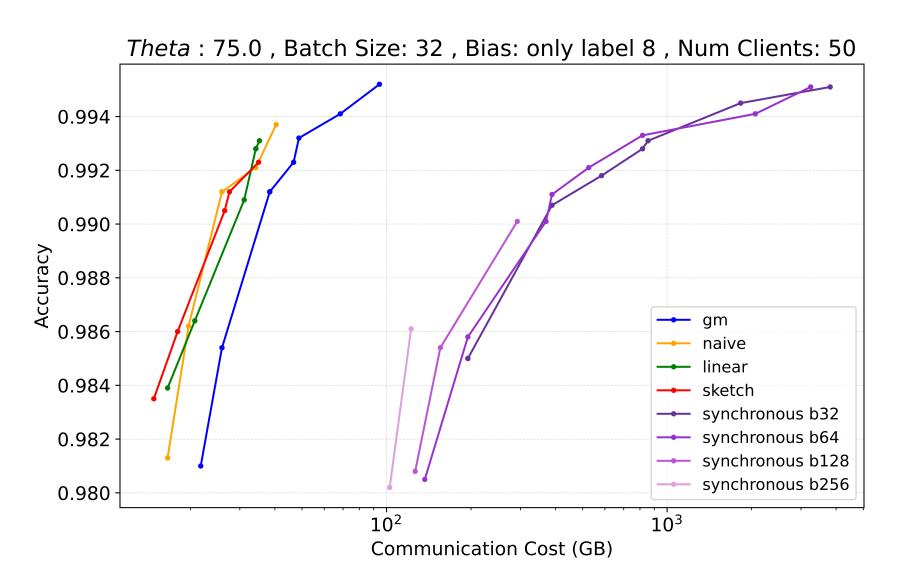


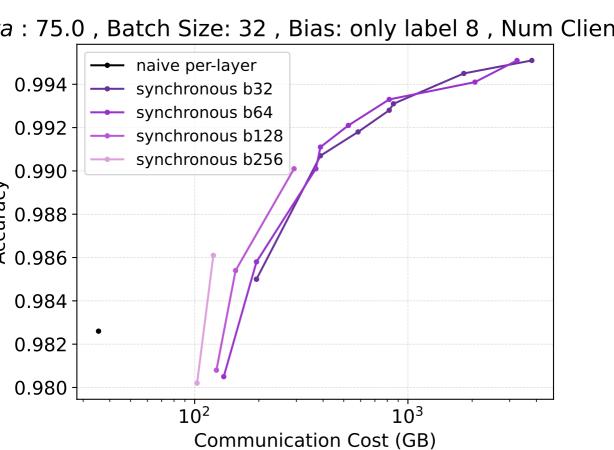


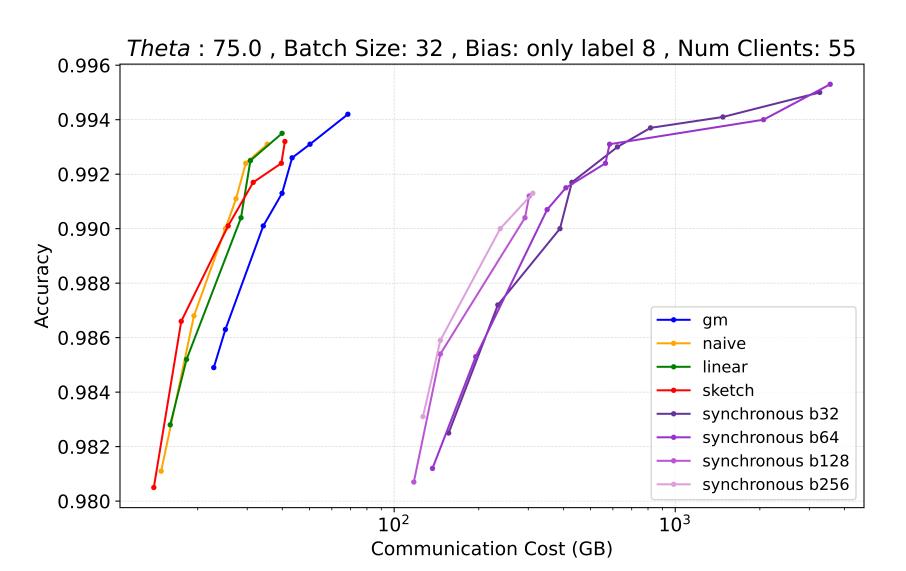
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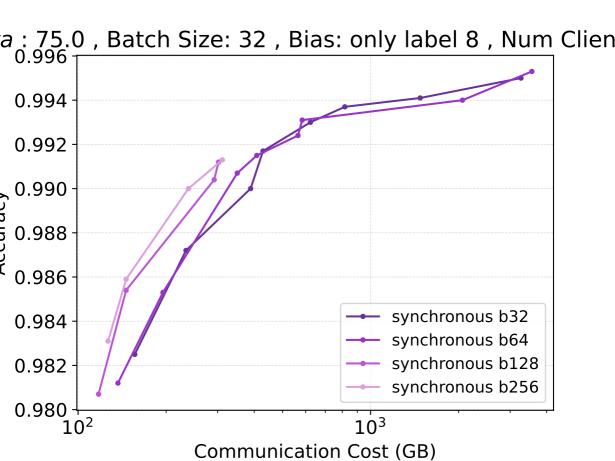


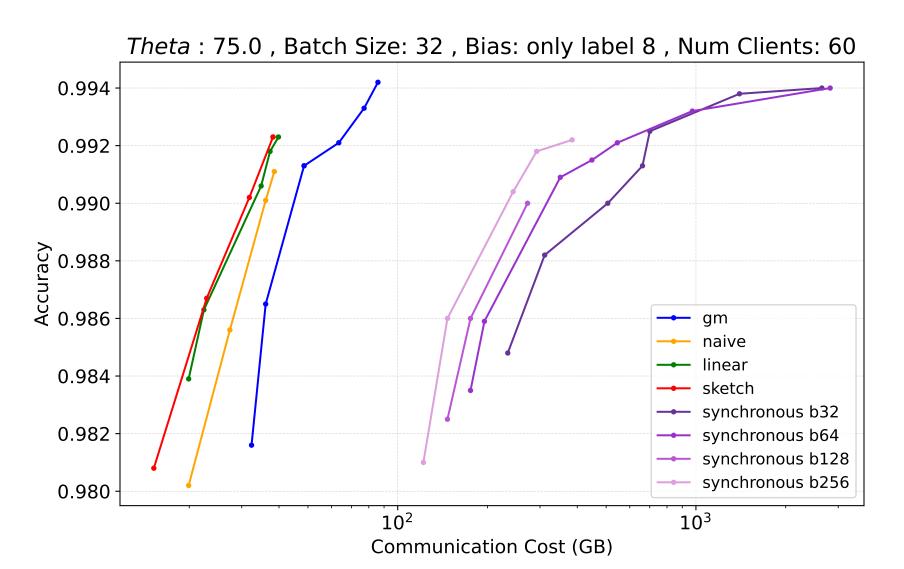


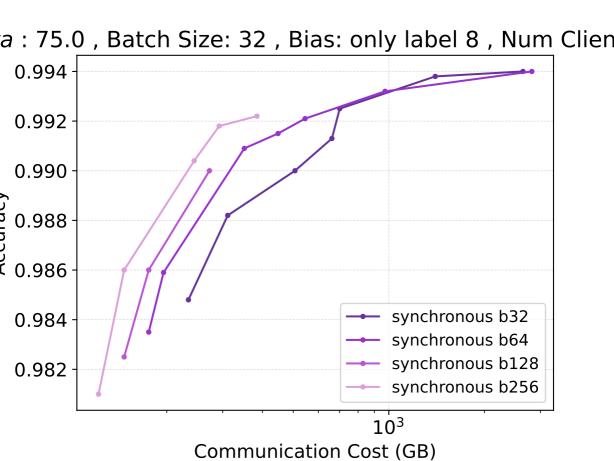




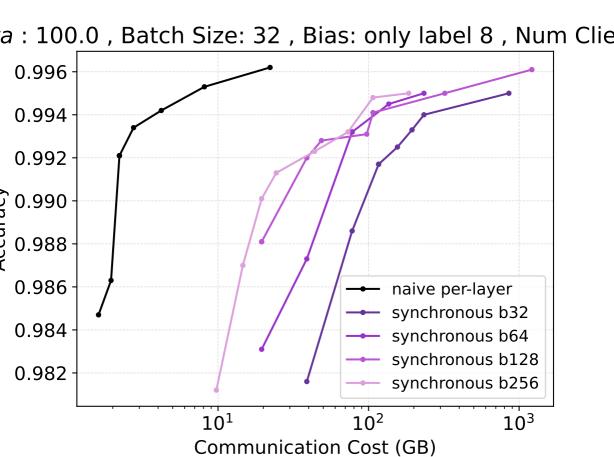




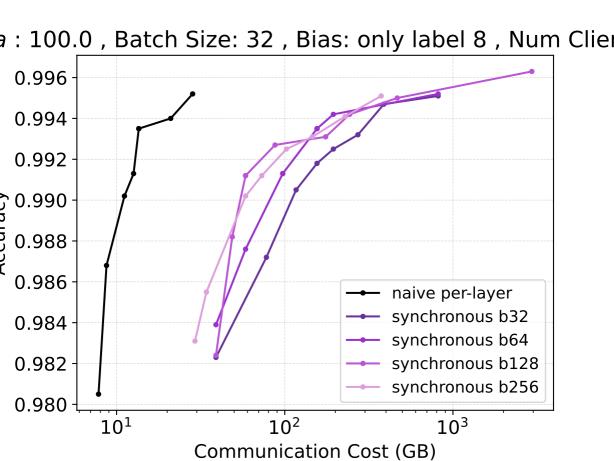


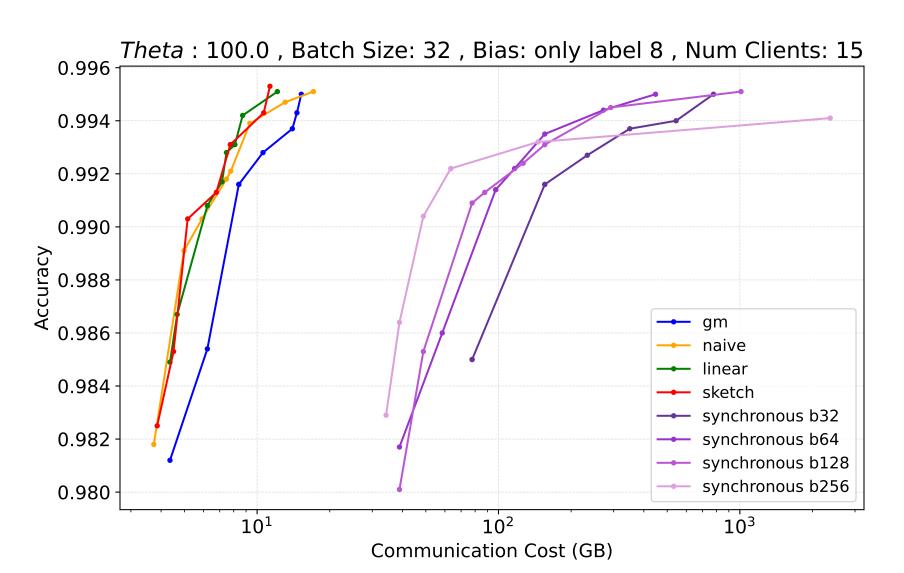


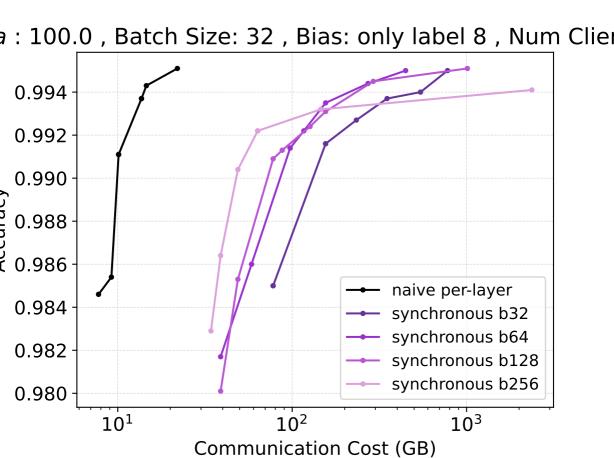
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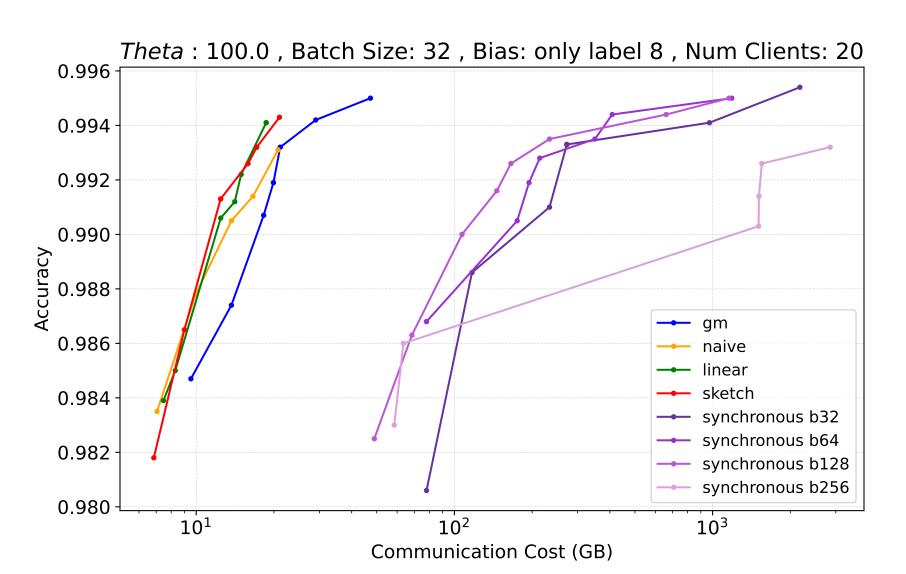


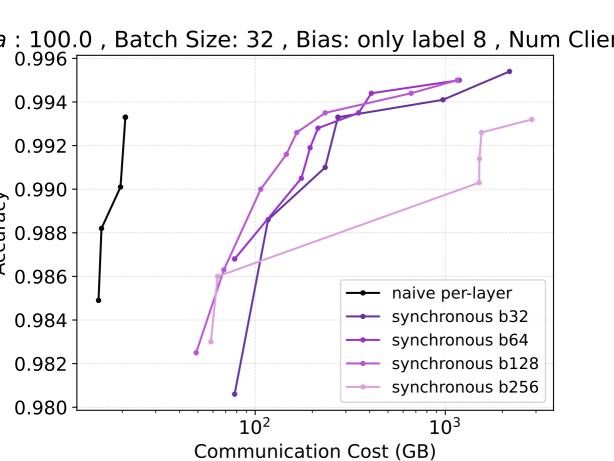


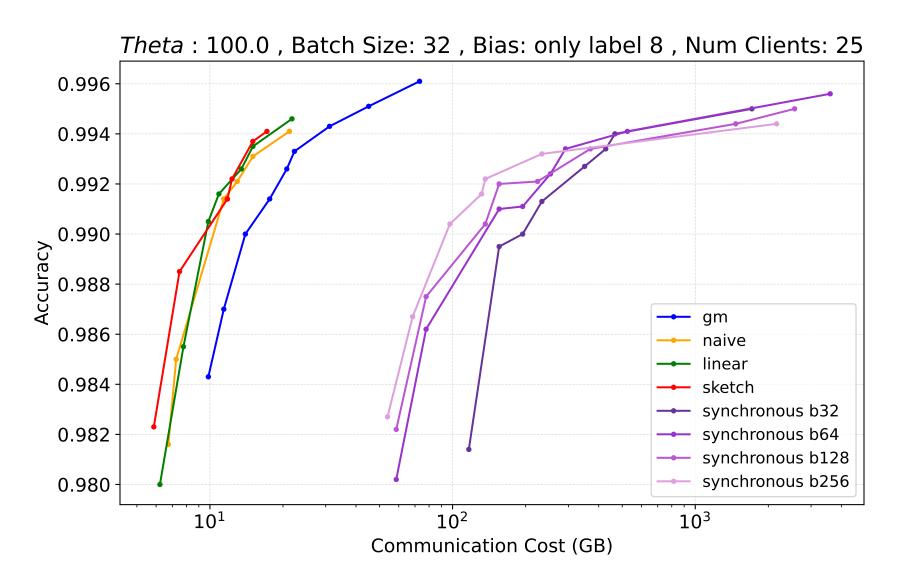


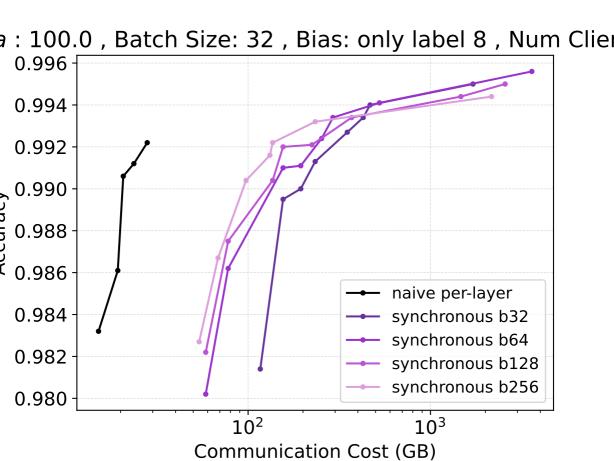


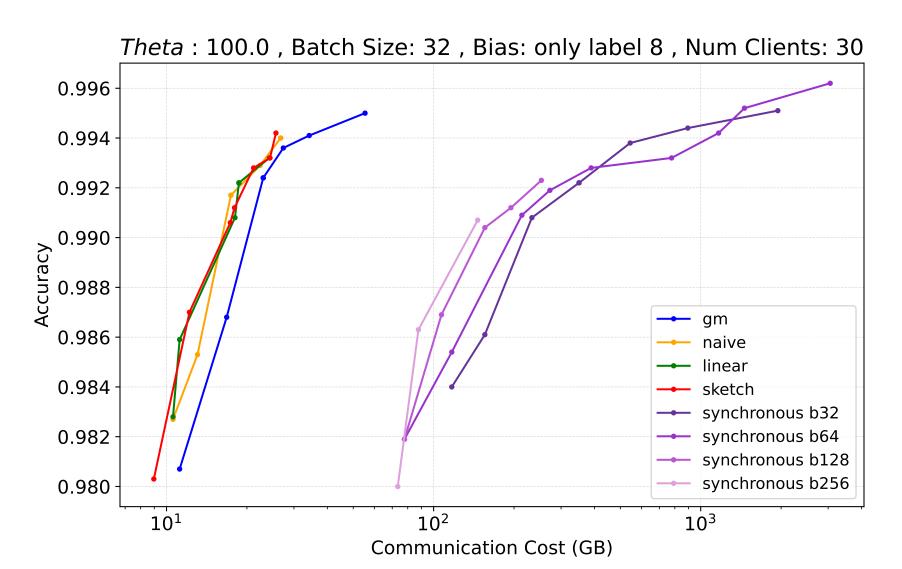


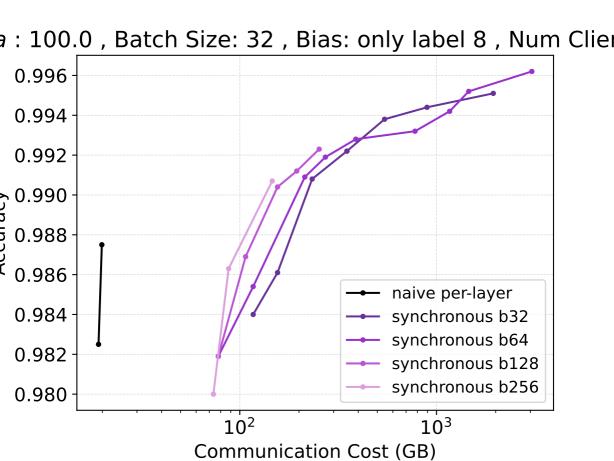


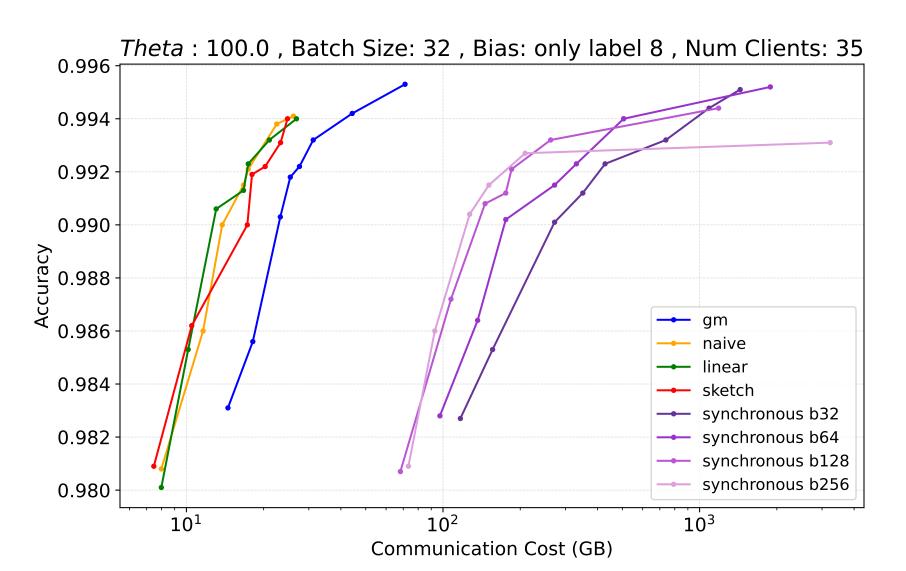


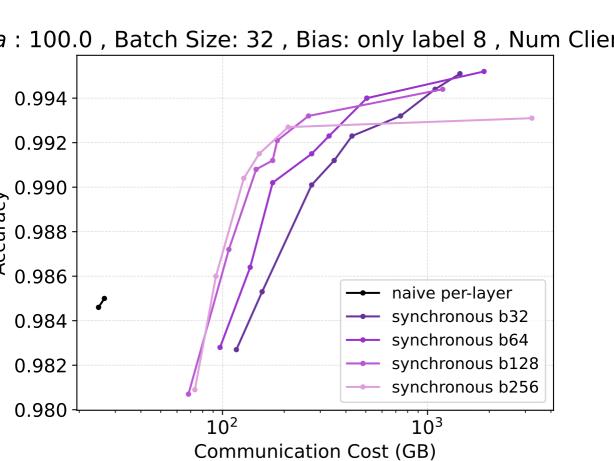






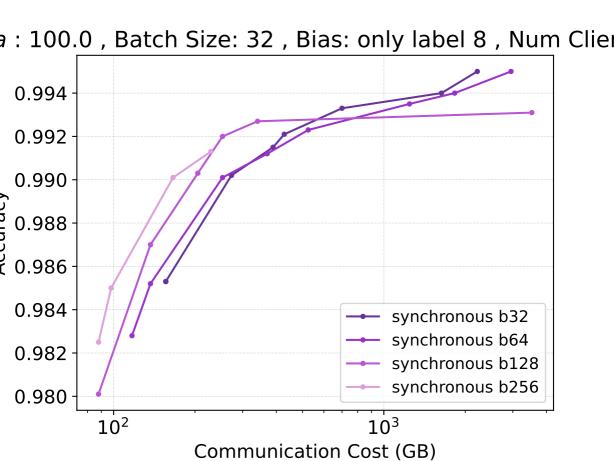






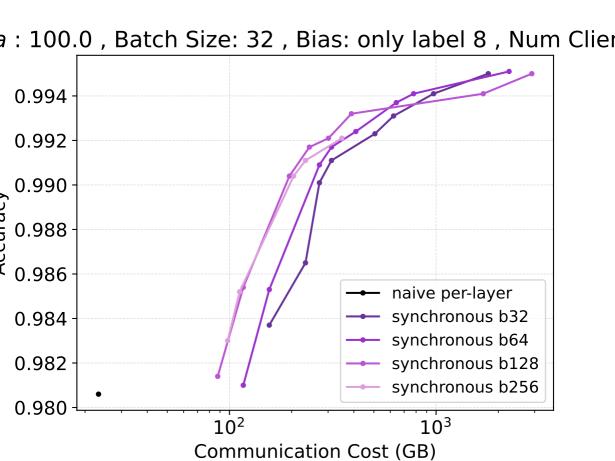
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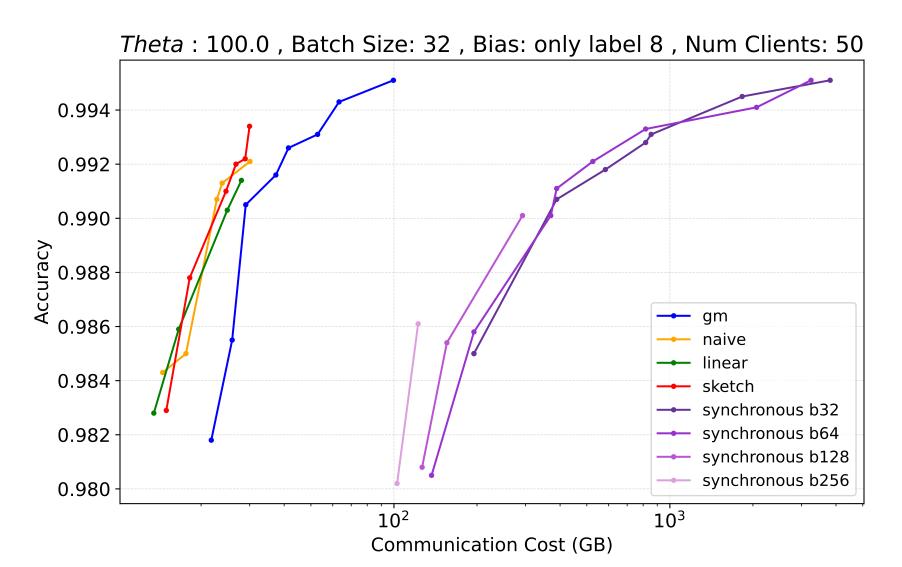
Communication Cost (GB)

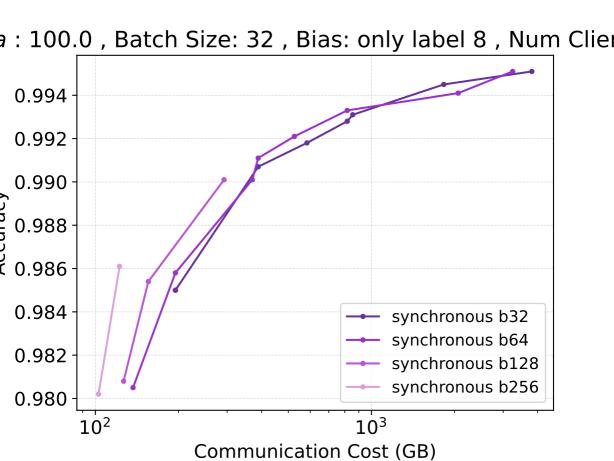


Theta: 100.0, Batch Size: 32, Bias: only label 8, Num Clients: 45 0.994 0.992 0.990 Accuracy 0.988gm 0.986 naive linear sketch 0.984 synchronous b32 synchronous b64 0.982 synchronous b128 synchronous b256 10<sup>1</sup> 10<sup>2</sup> 10<sup>3</sup>

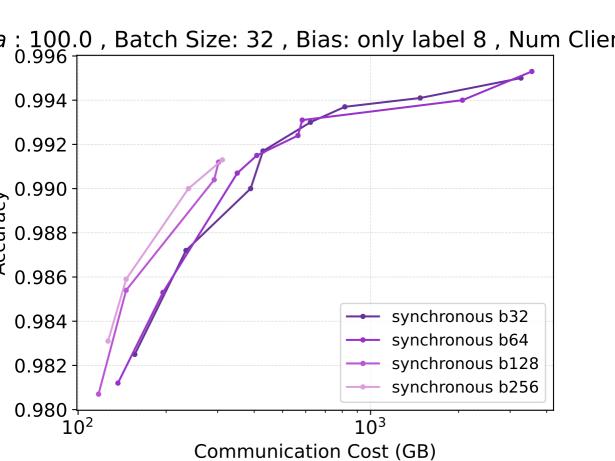
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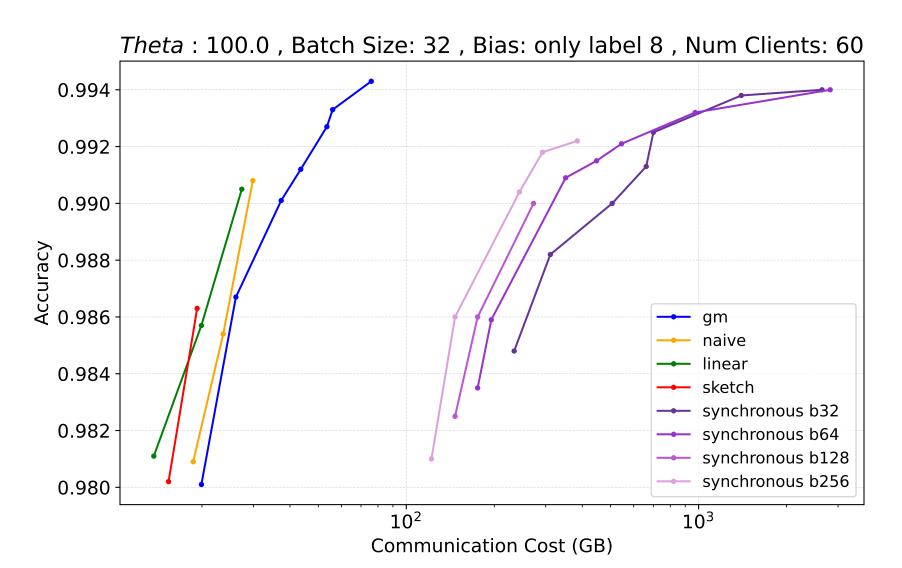


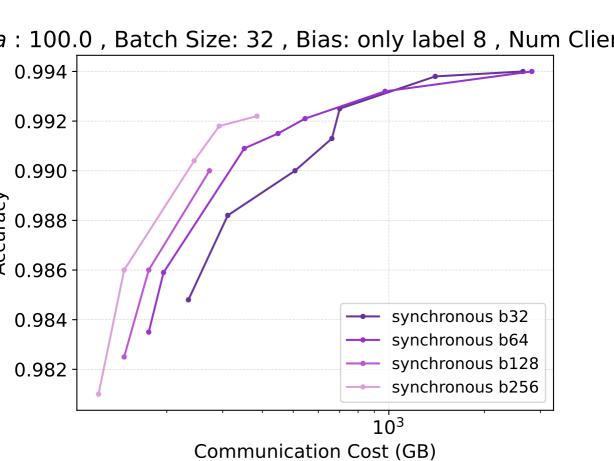


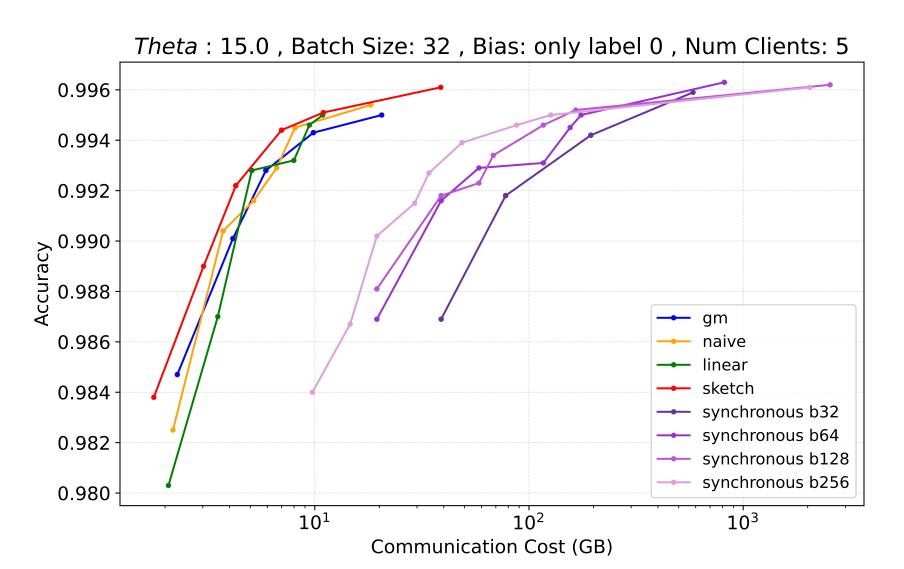


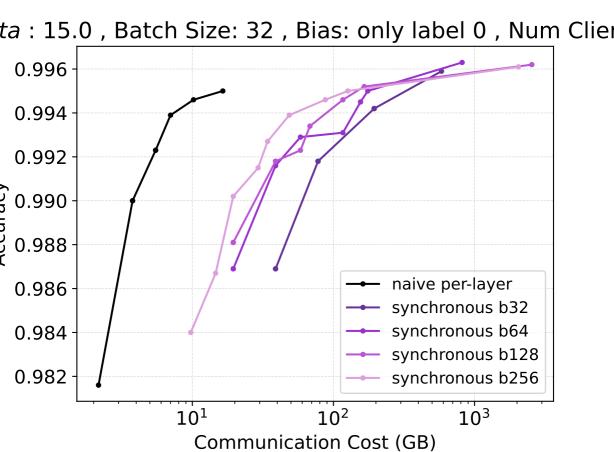


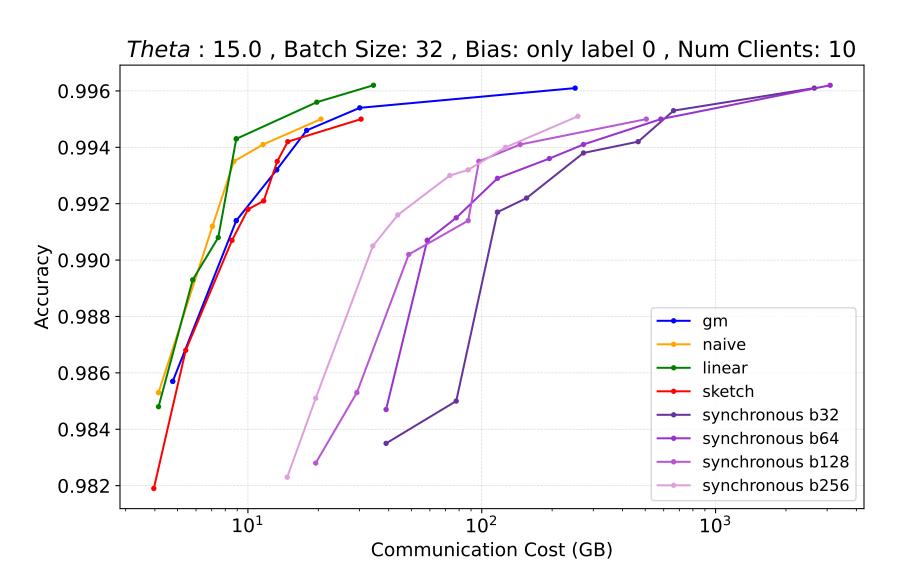


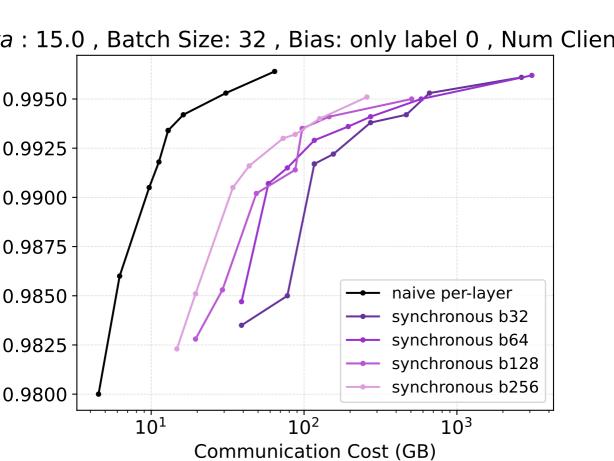


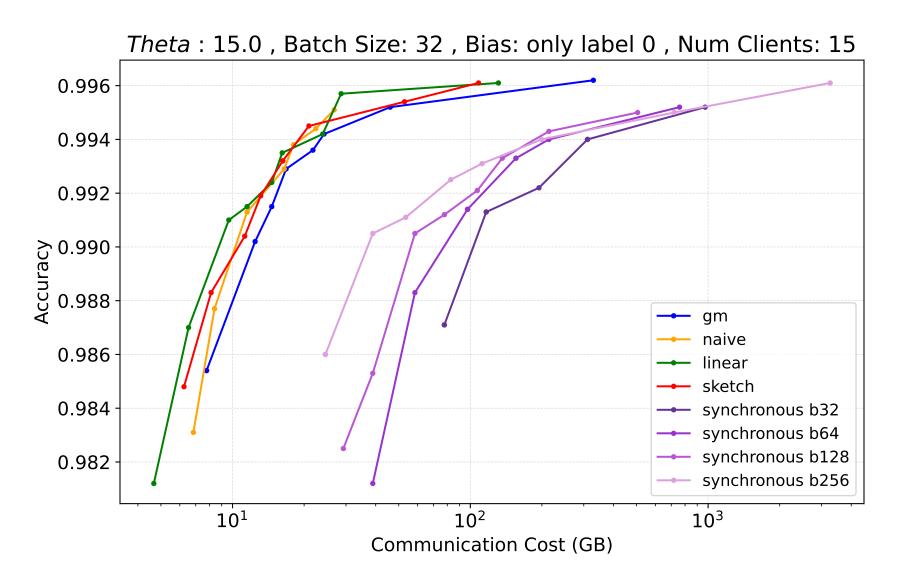


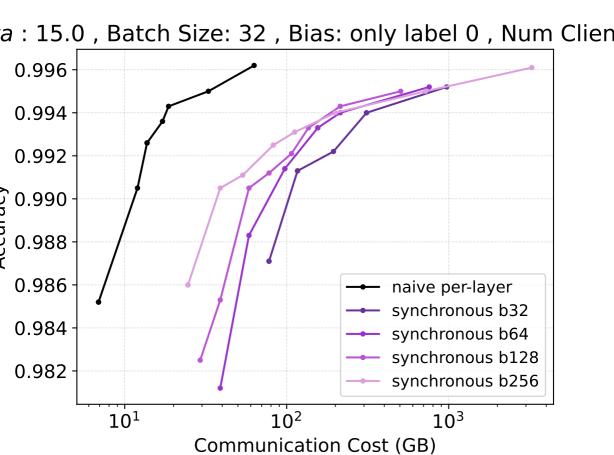


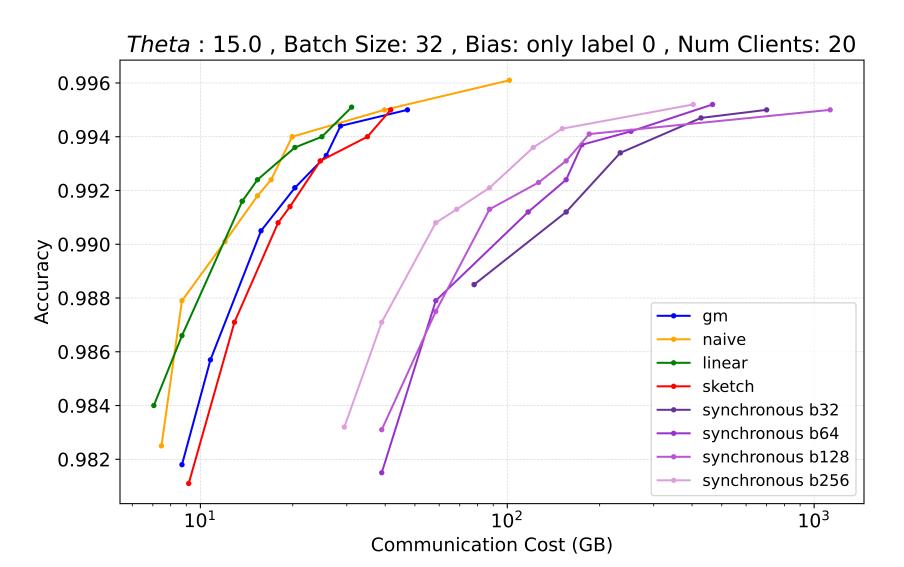


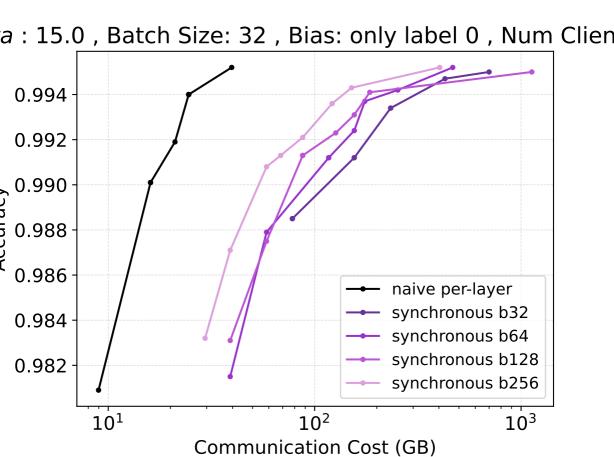


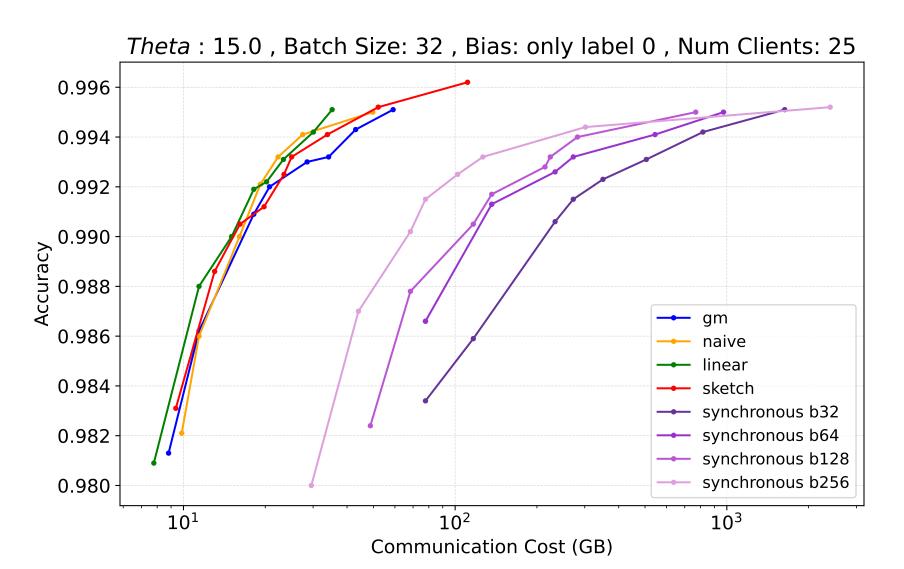


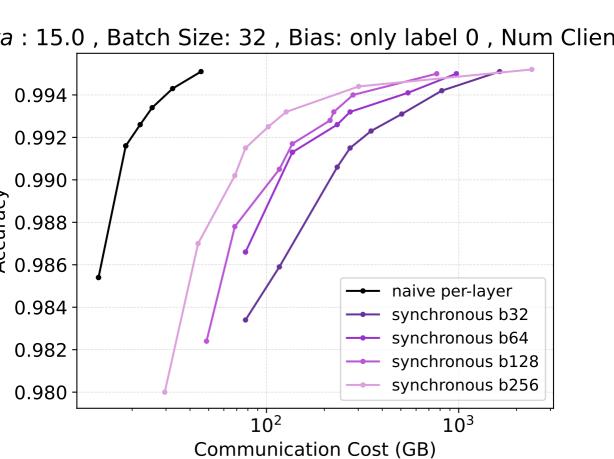


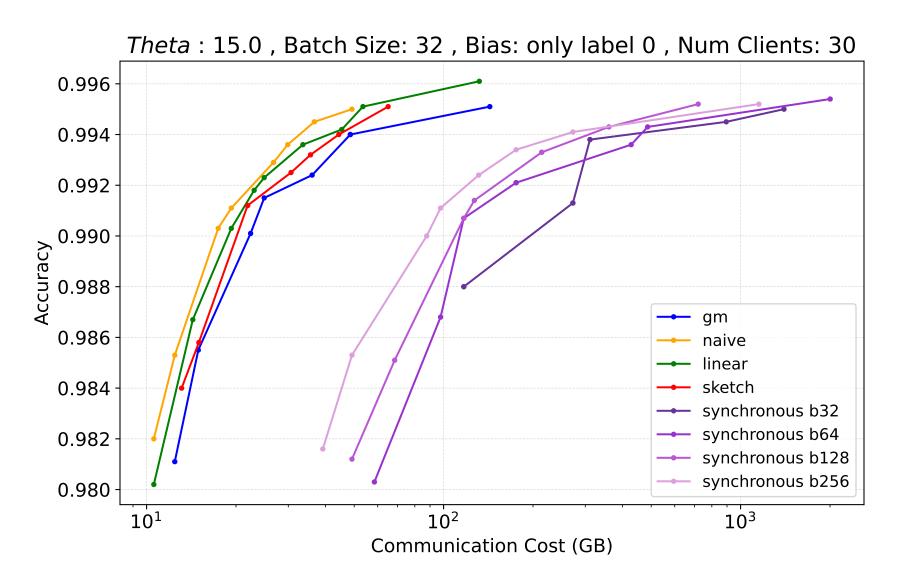


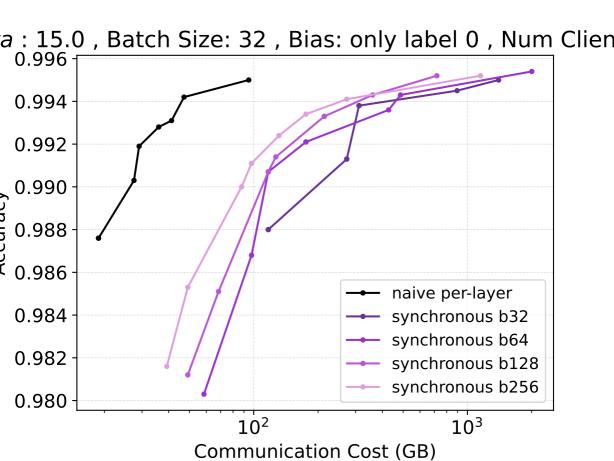




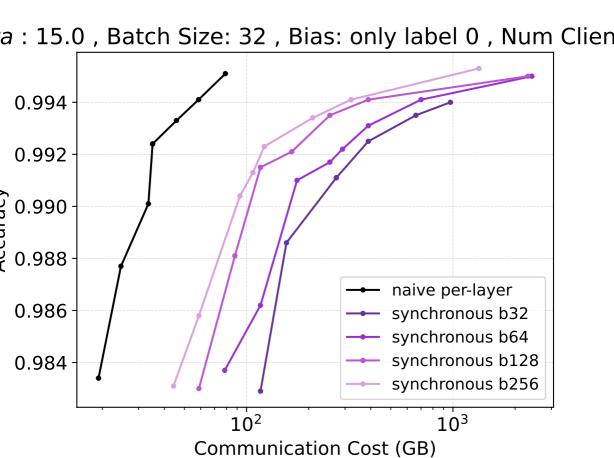




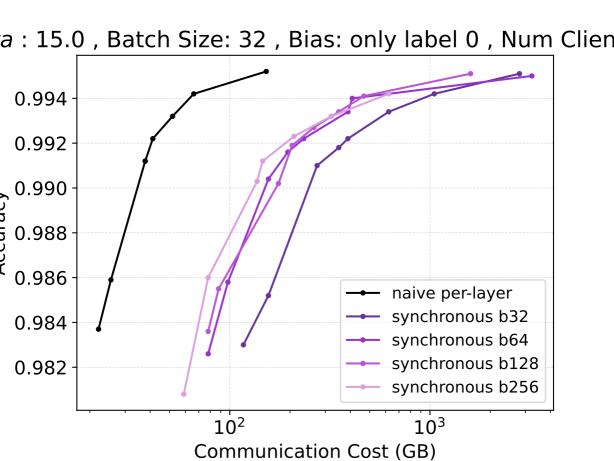


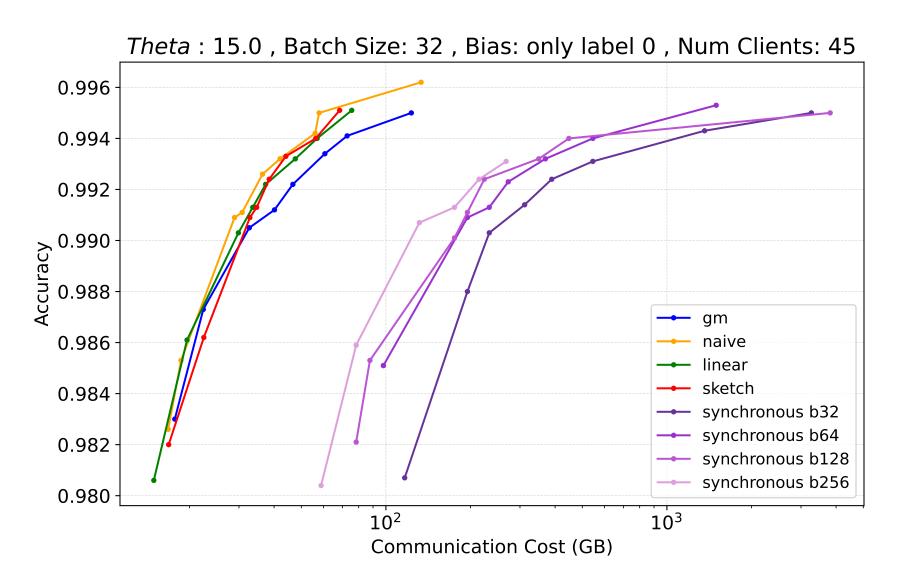


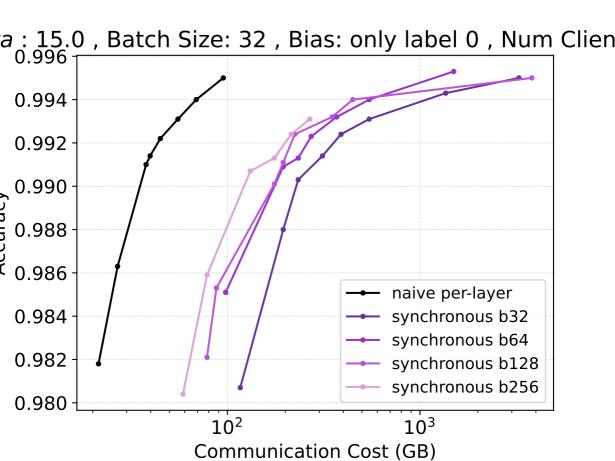
Theta: 15.0, Batch Size: 32, Bias: only label 0, Num Clients: 35 0.996 0.994 0.992 Accuracy 0.0 ر.0 gm 0.986 naive linear 0.984 sketch synchronous b32 synchronous b64 0.982 synchronous b128 synchronous b256 0.980  $10^{1}$ 10<sup>2</sup> 10<sup>3</sup> Communication Cost (GB)

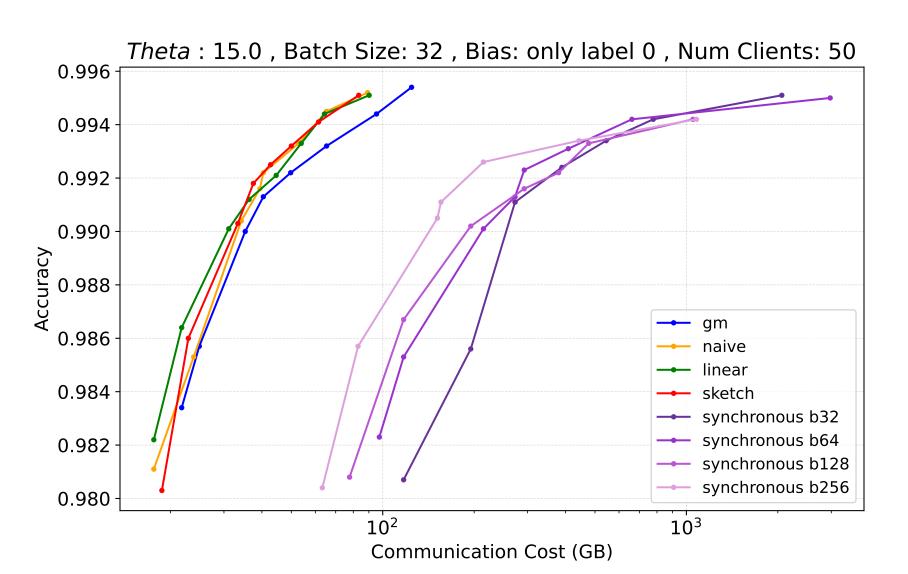


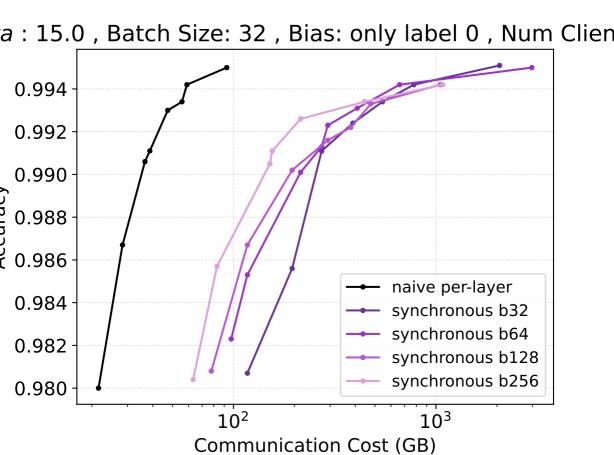
Theta: 15.0, Batch Size: 32, Bias: only label 0, Num Clients: 40 0.994 0.992 0.990 Accuracy 0.988 gm 0.986 naive linear 0.984 sketch → synchronous b32 0.982 → synchronous b64 → synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup> Communication Cost (GB)





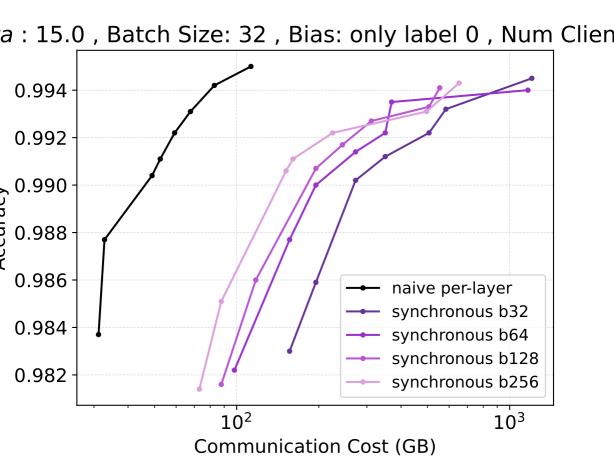


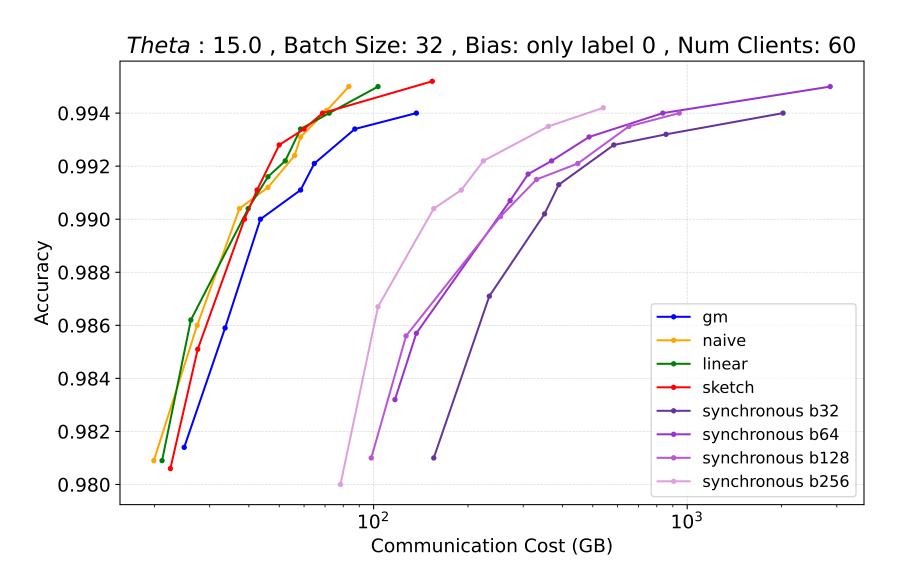


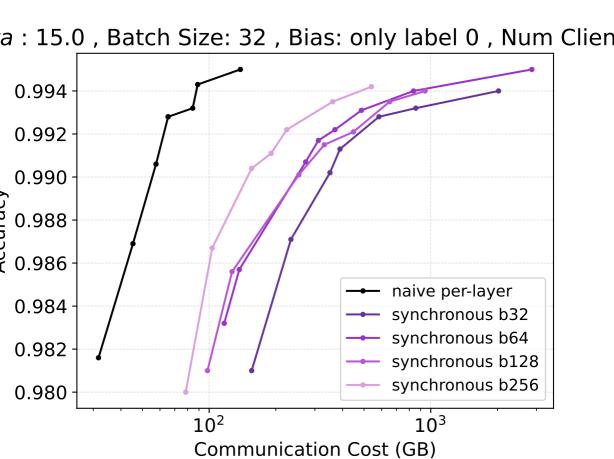


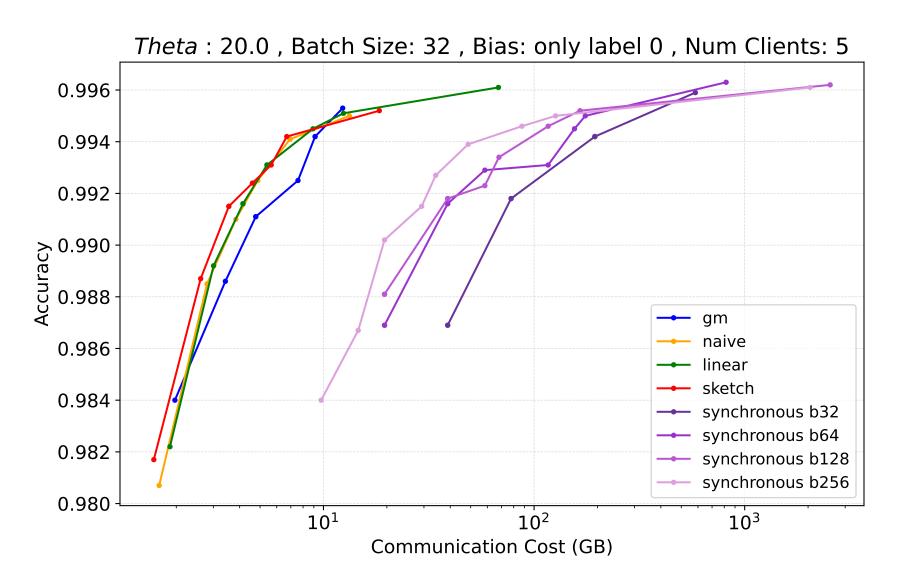
Theta: 15.0, Batch Size: 32, Bias: only label 0, Num Clients: 55 0.994 0.9920.990 Accuracy 0.988 gm 0.986 naive linear 0.984 sketch → synchronous b32 → synchronous b64 0.982 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup>

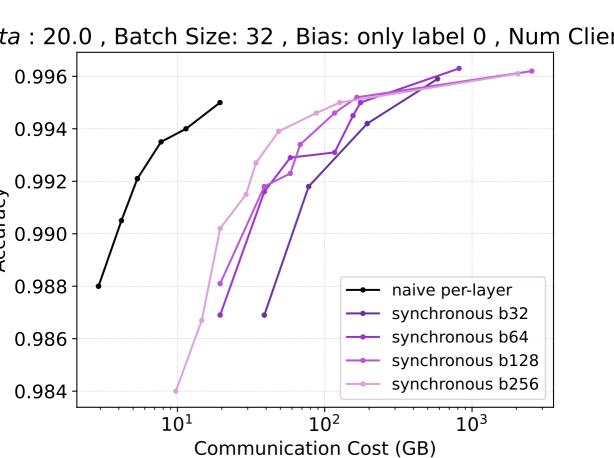
Communication Cost (GB)

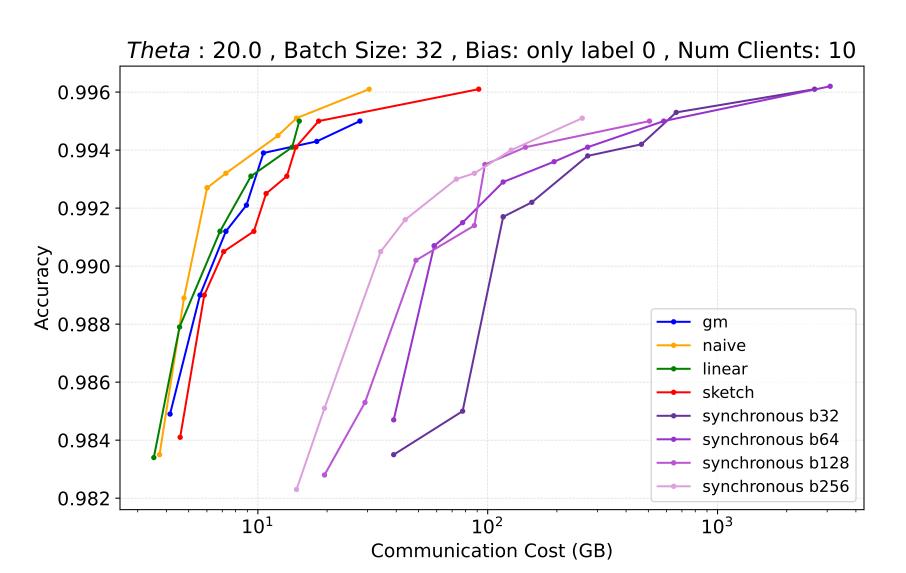


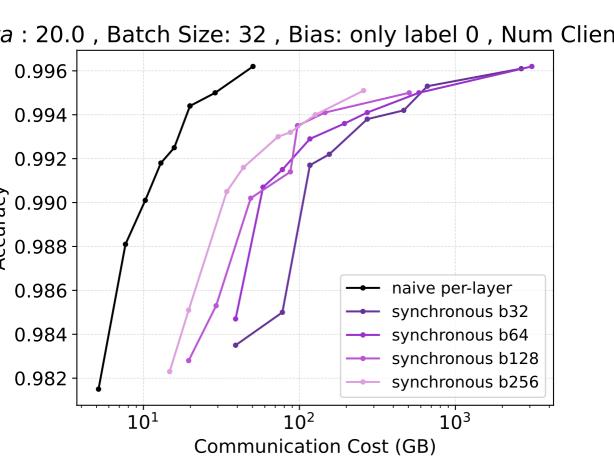


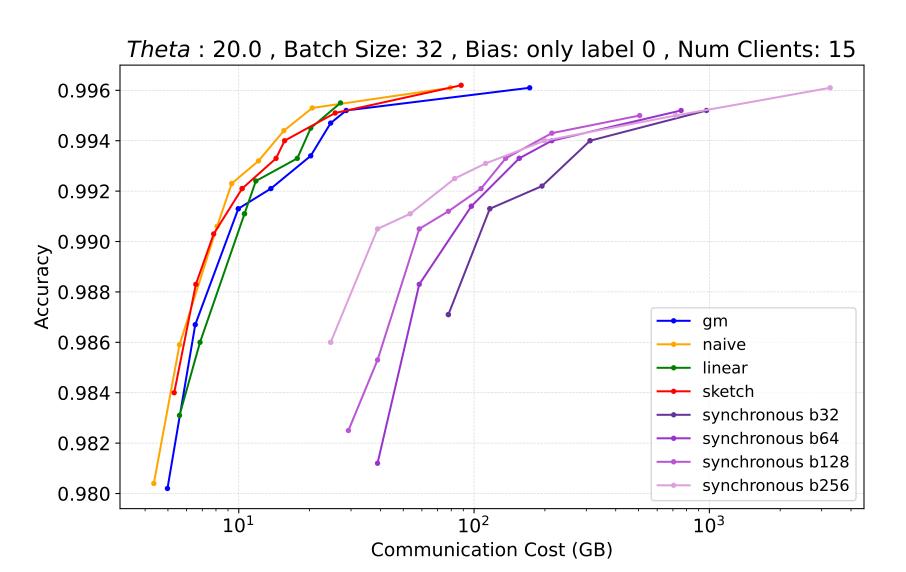


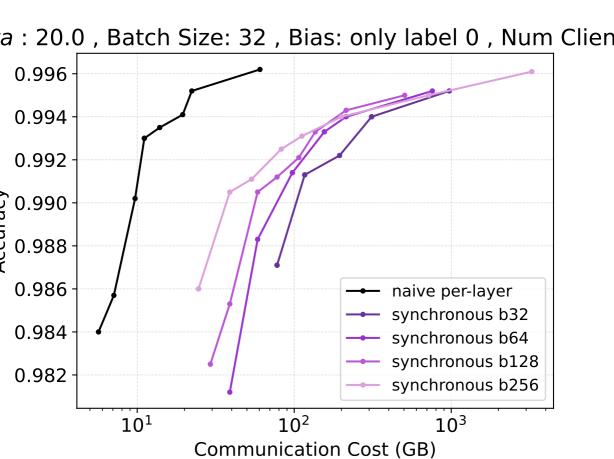


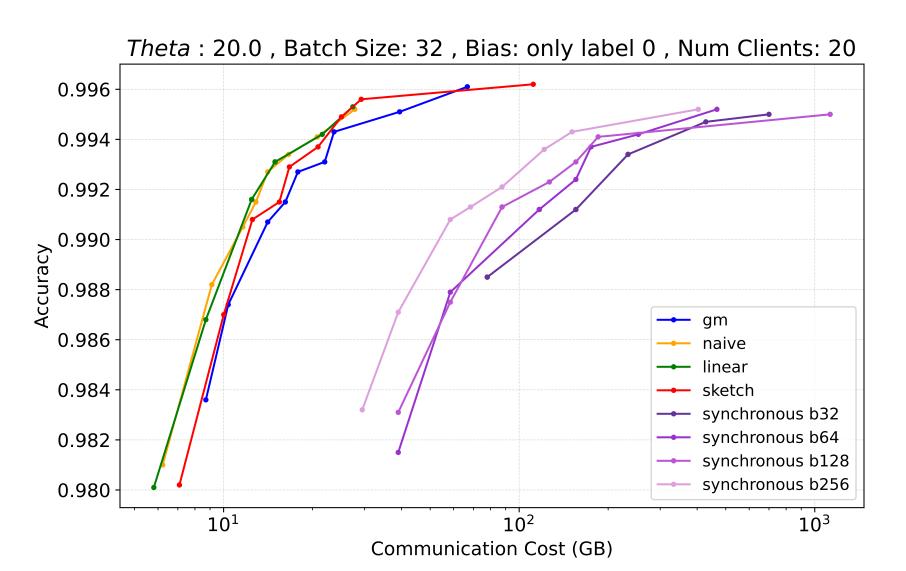


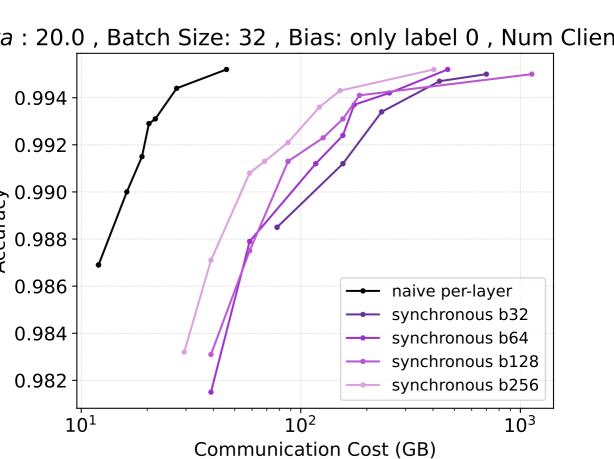


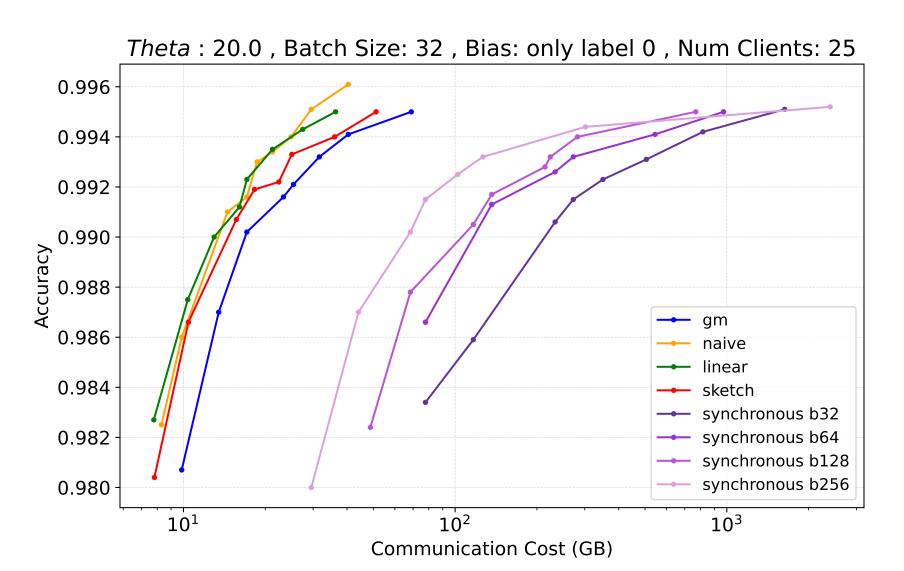


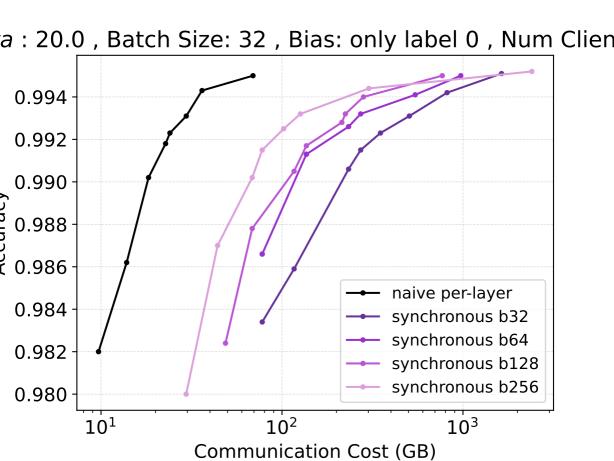


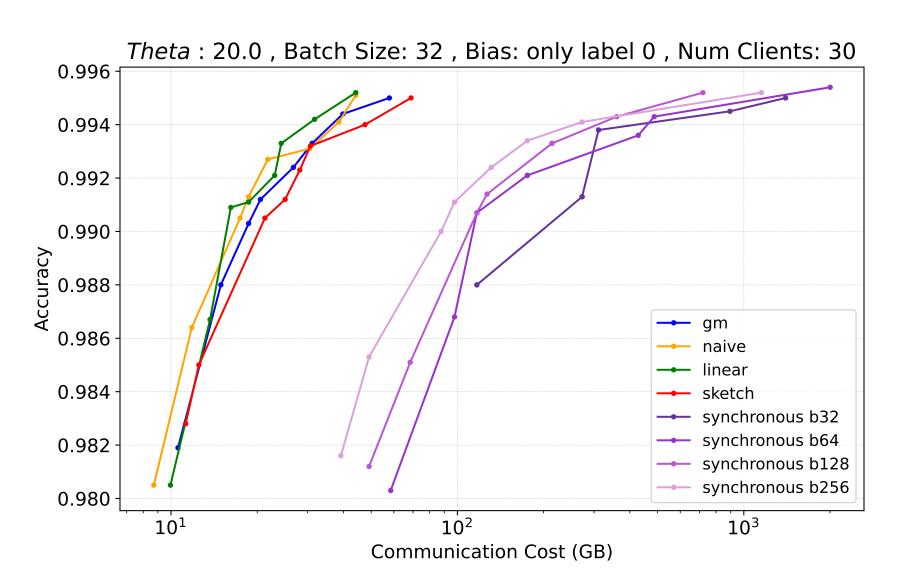


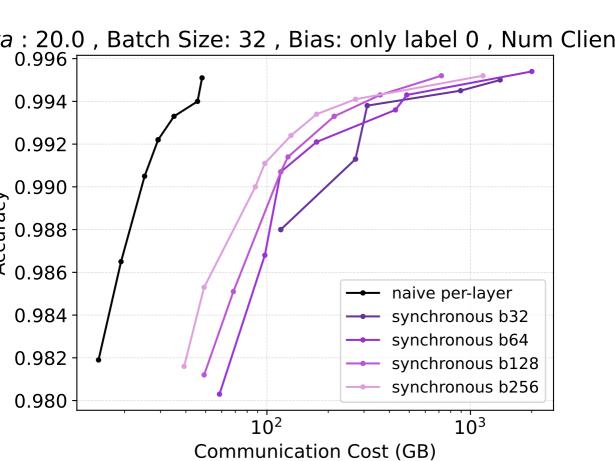




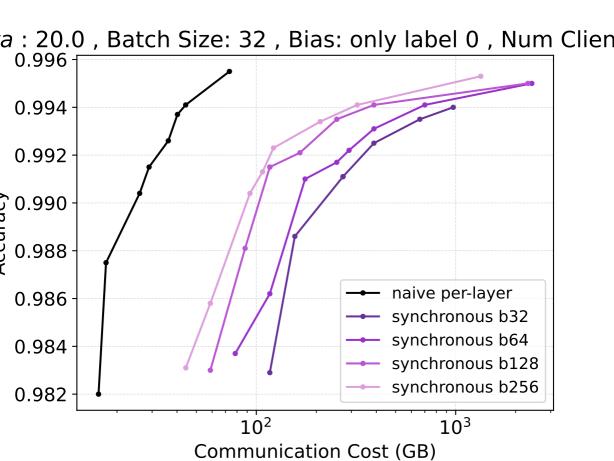


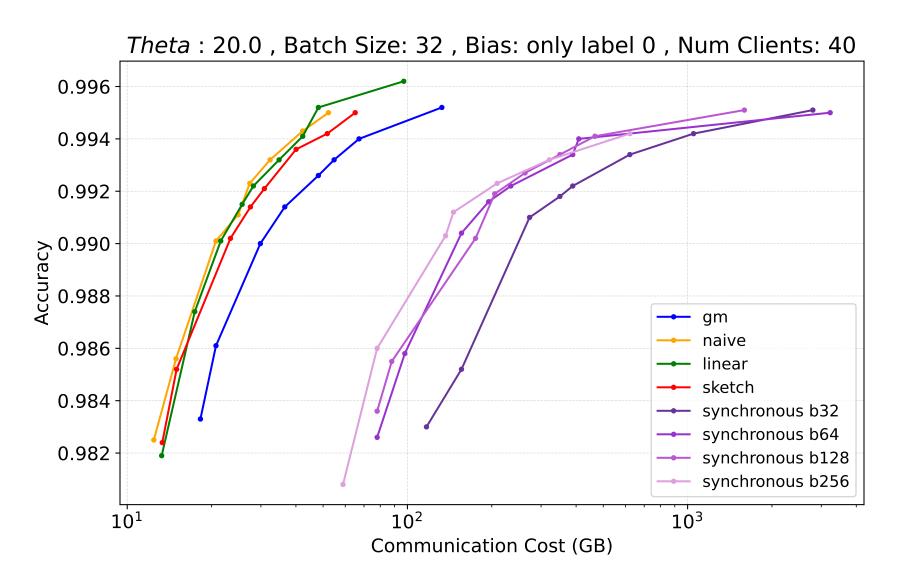


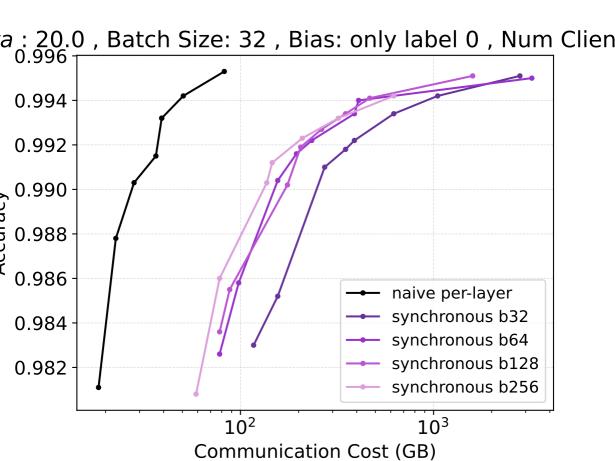


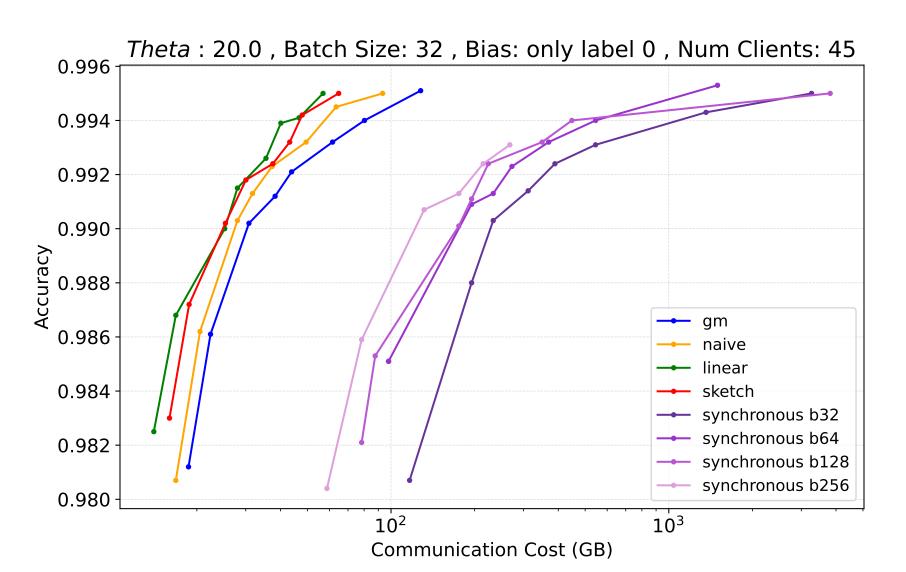


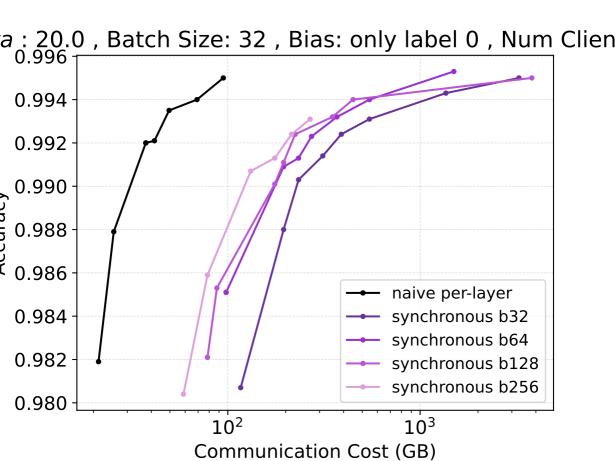


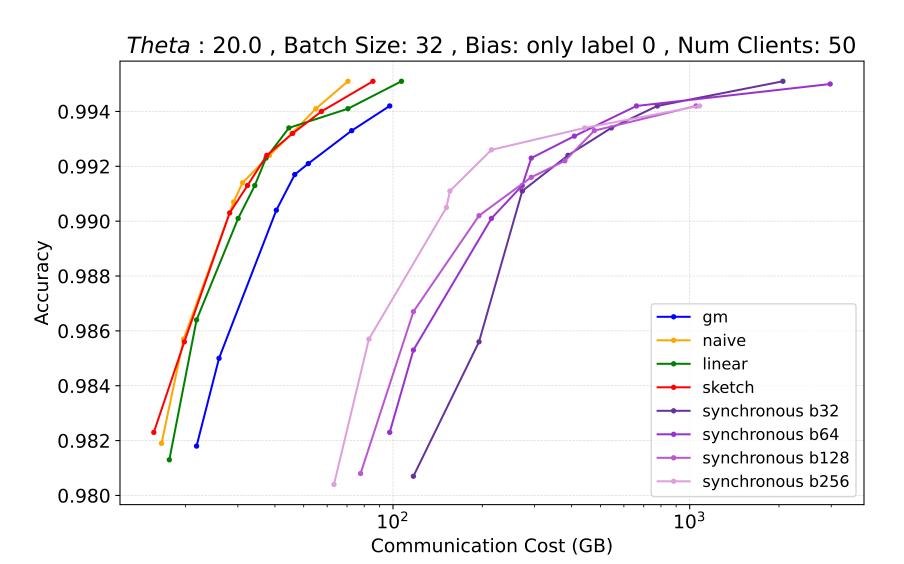


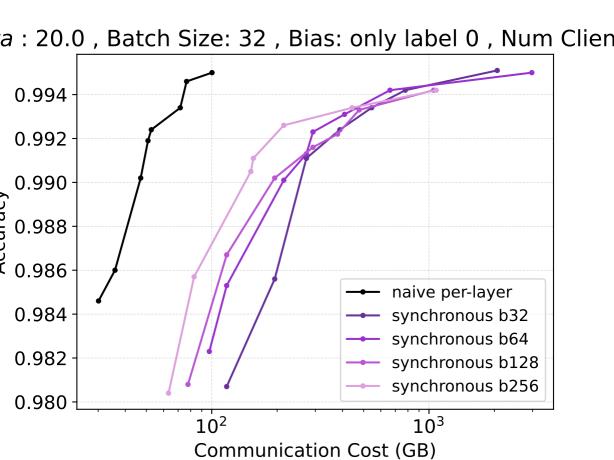


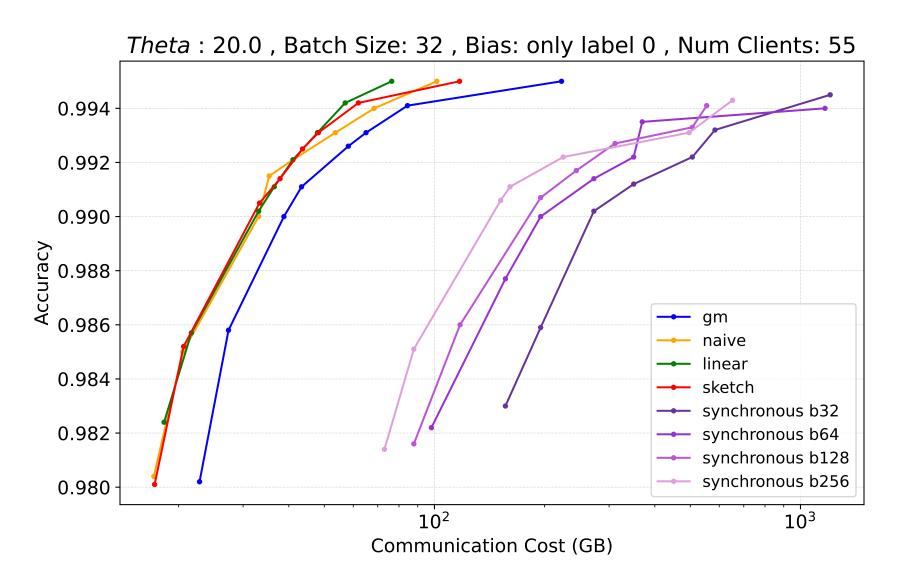


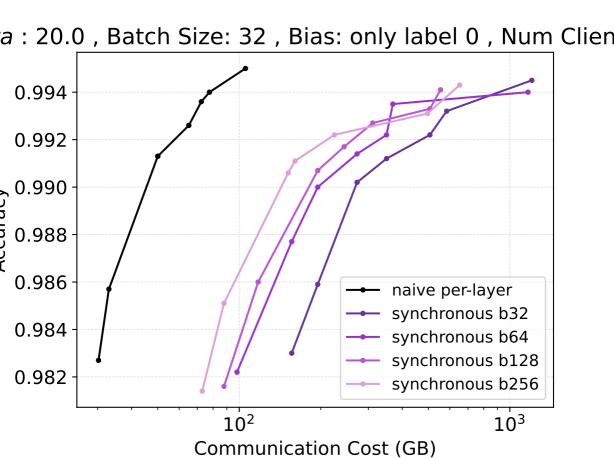


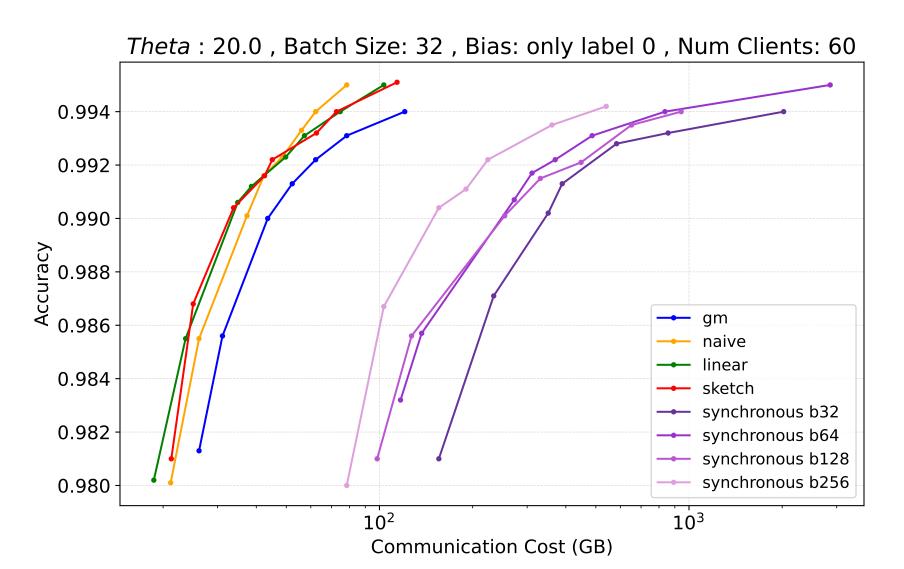


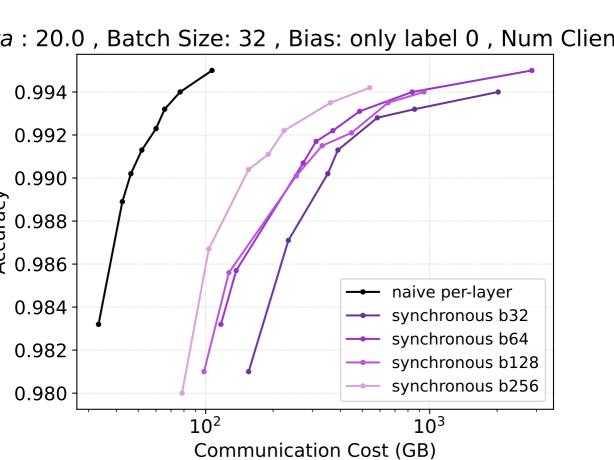


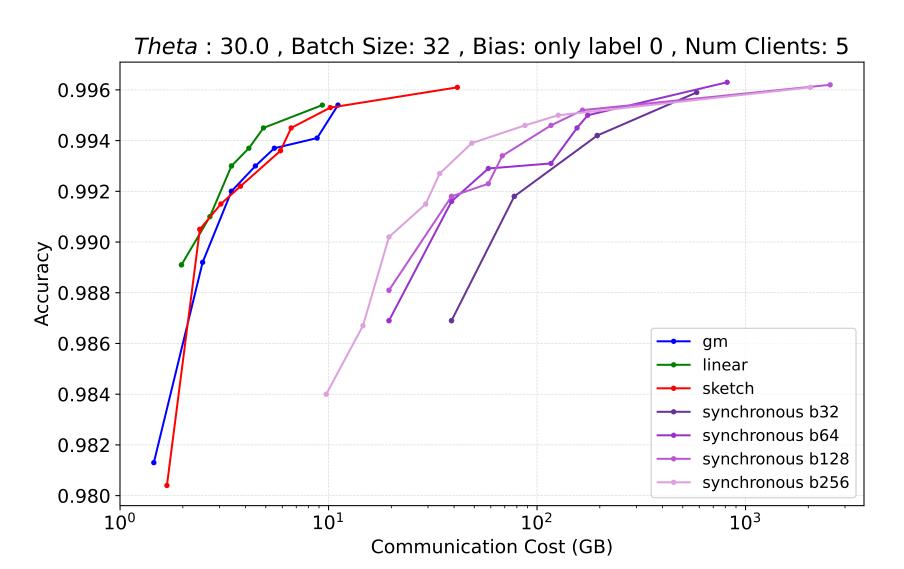


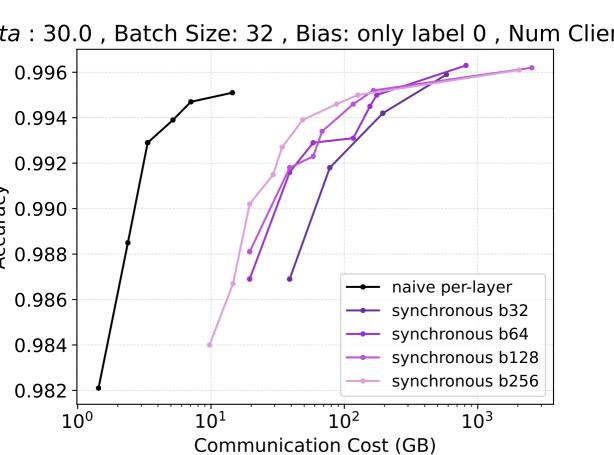


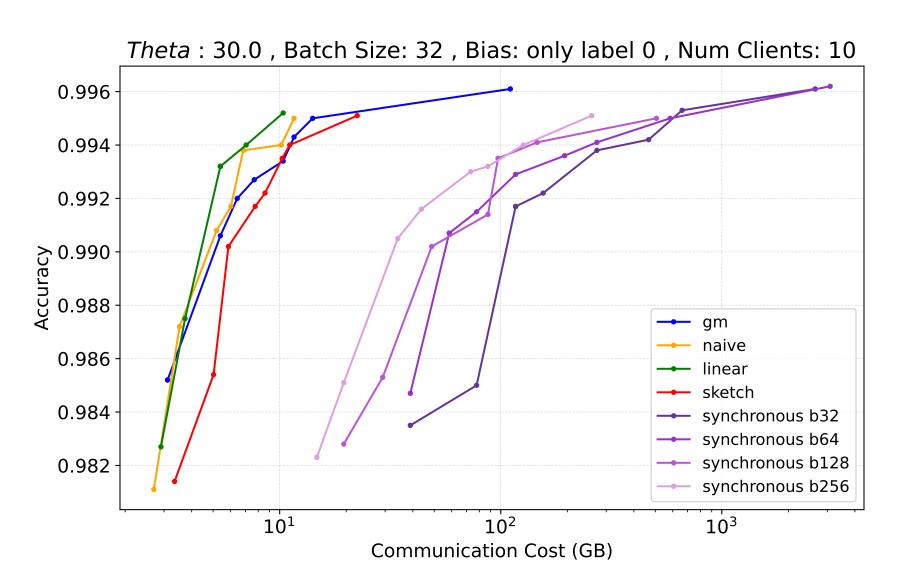


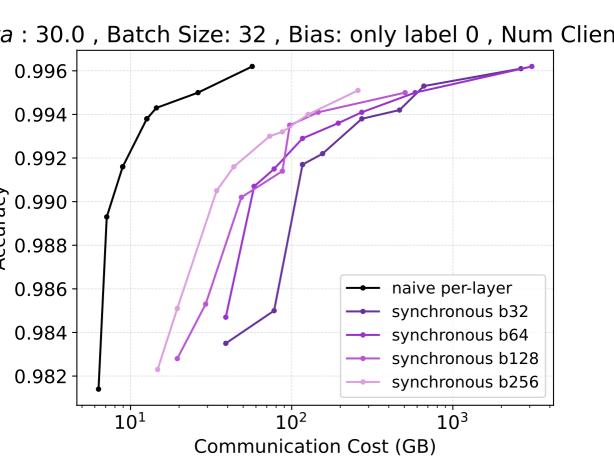


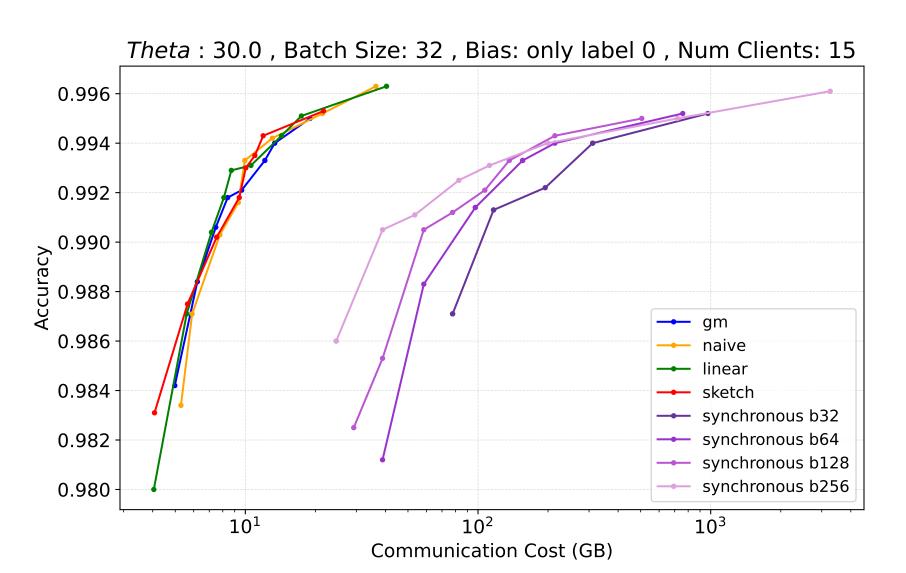


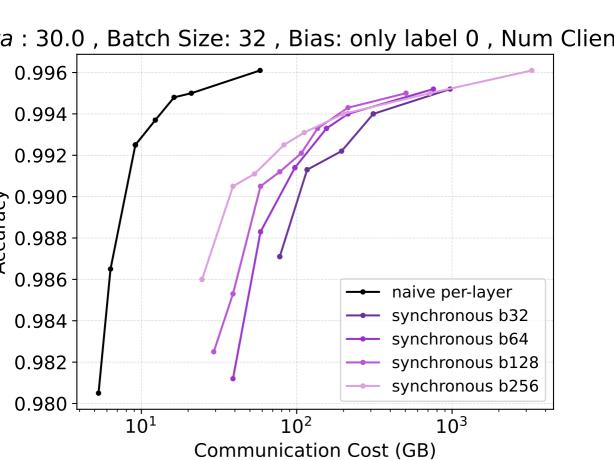


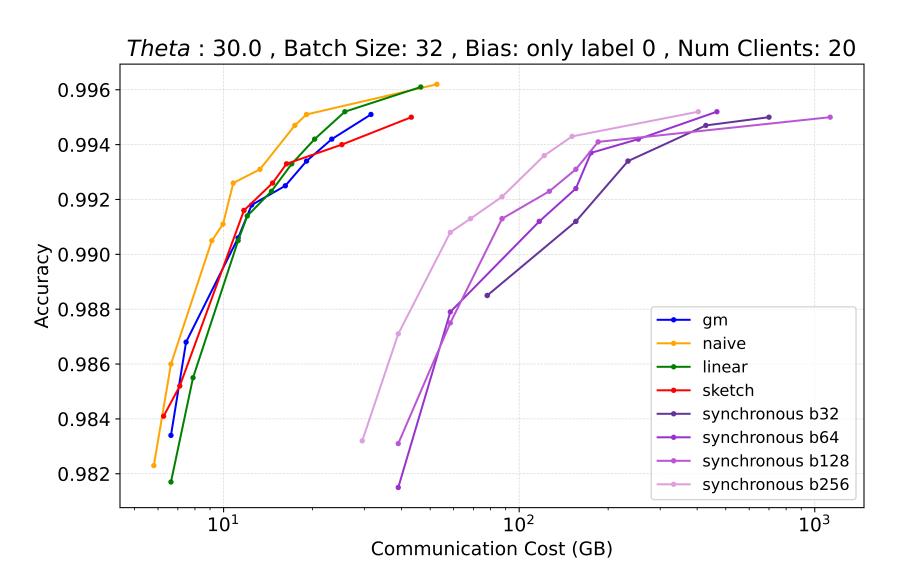


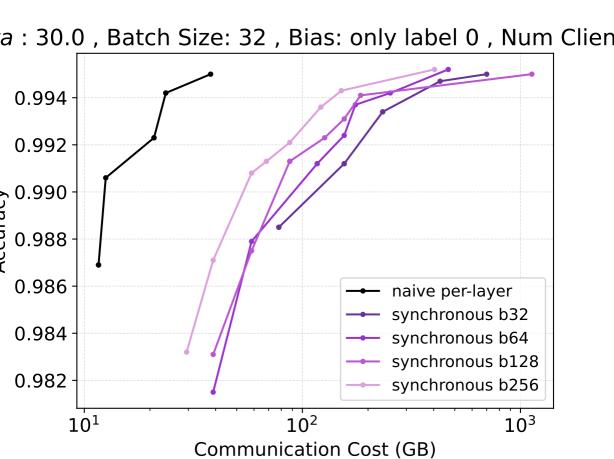


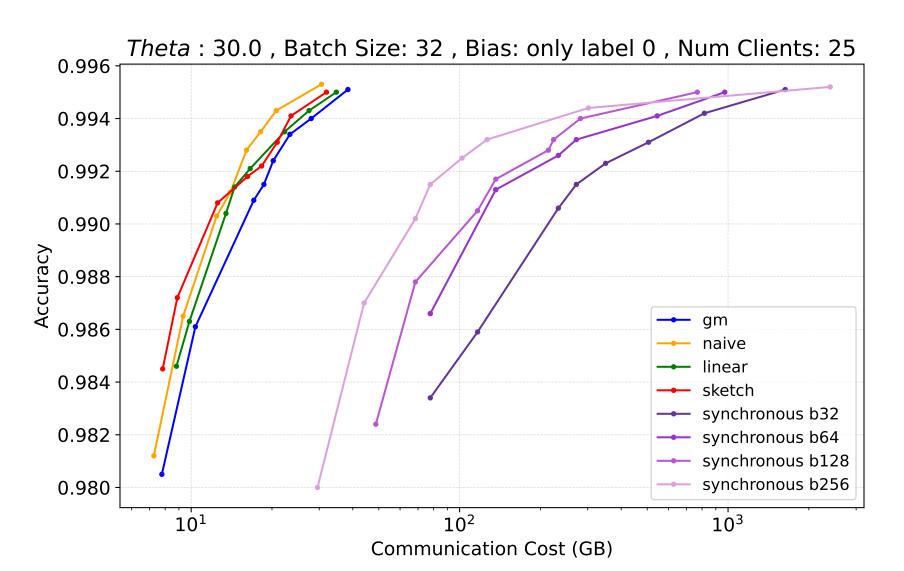


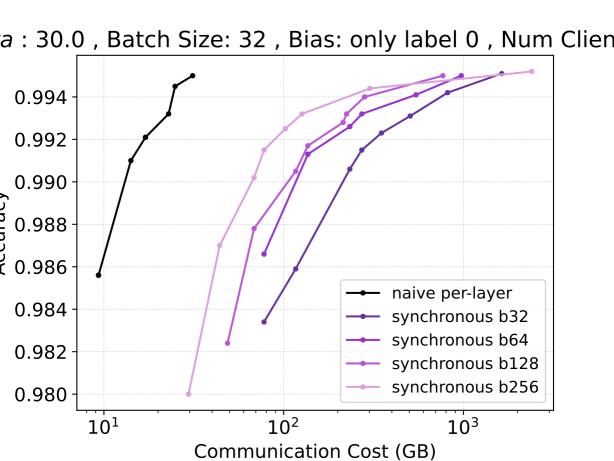


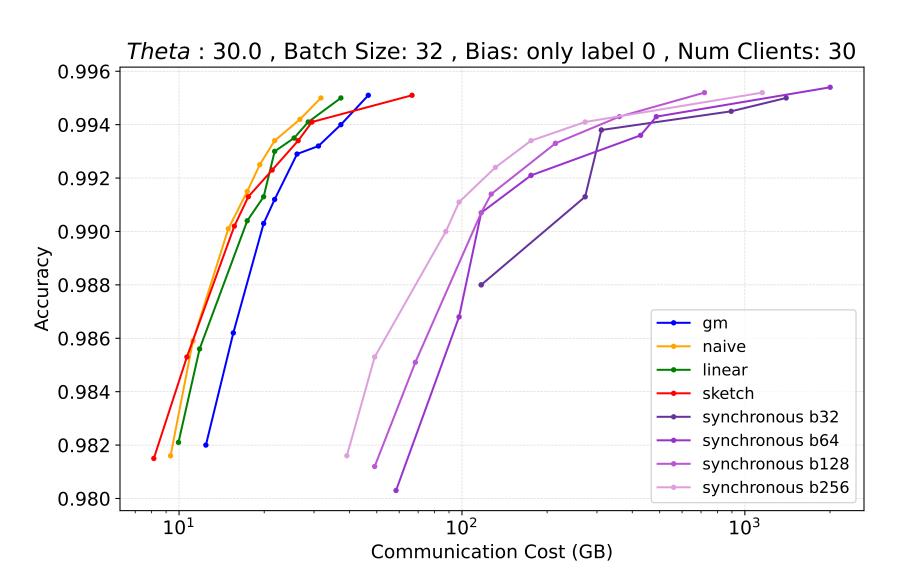


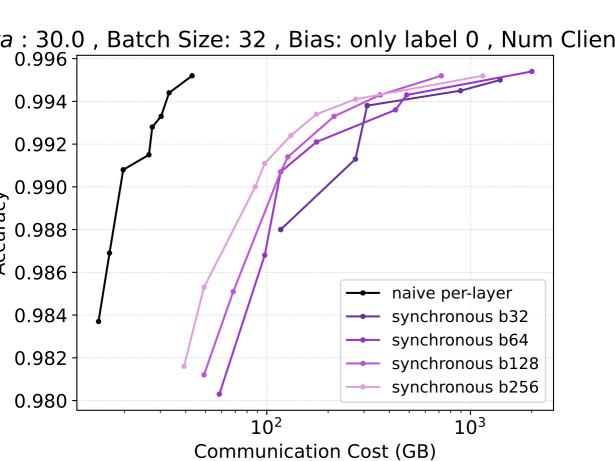


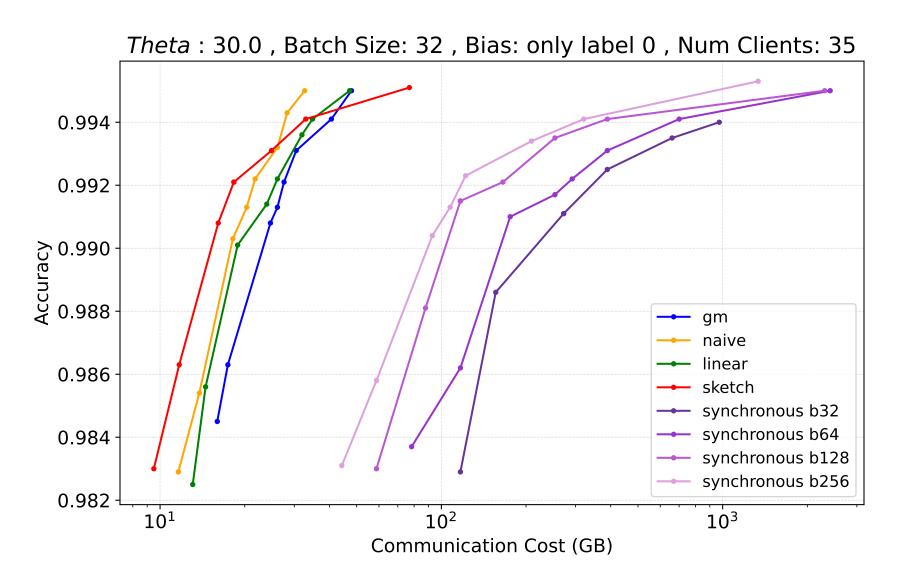


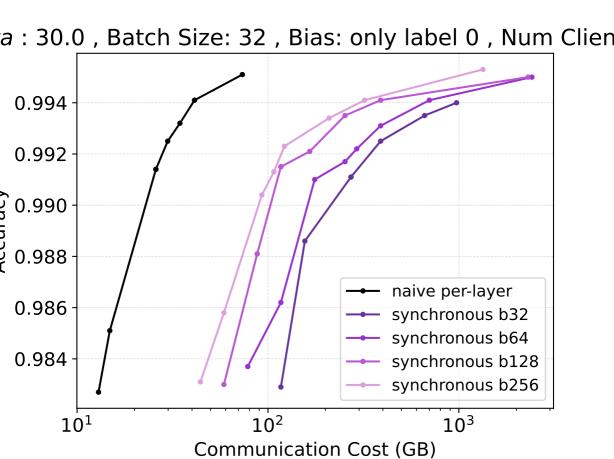


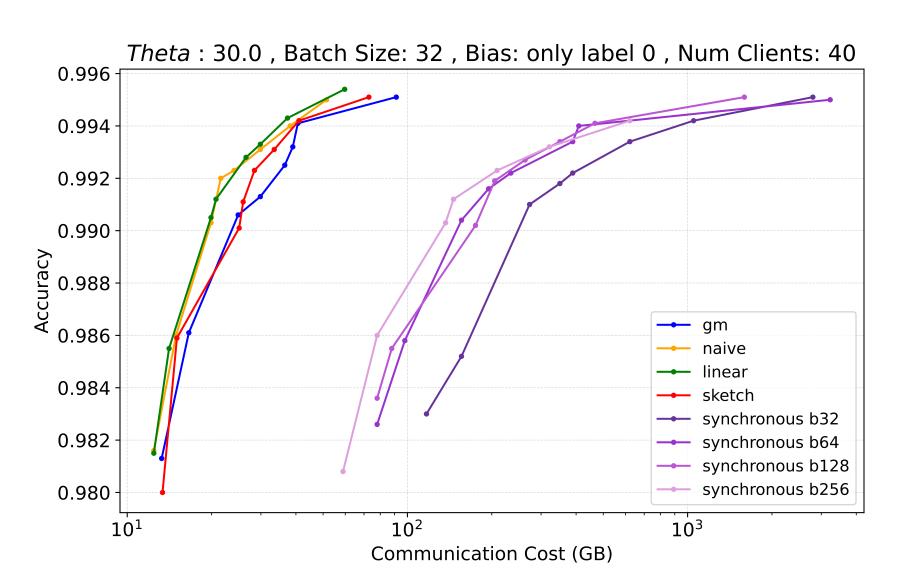


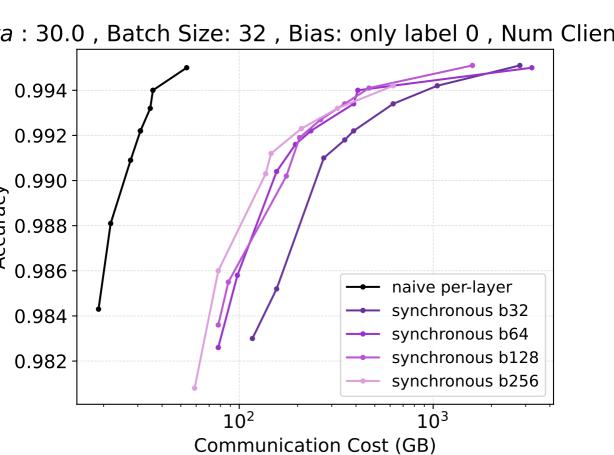


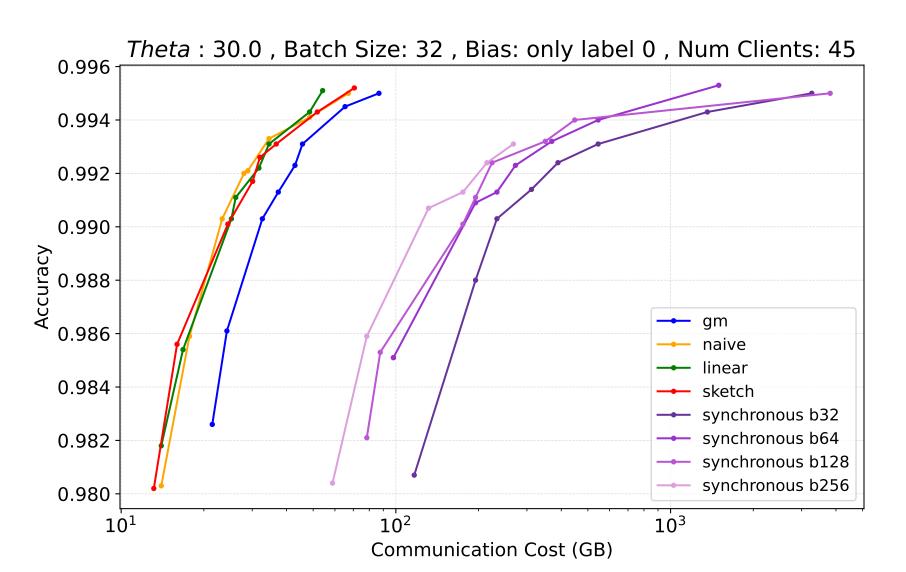


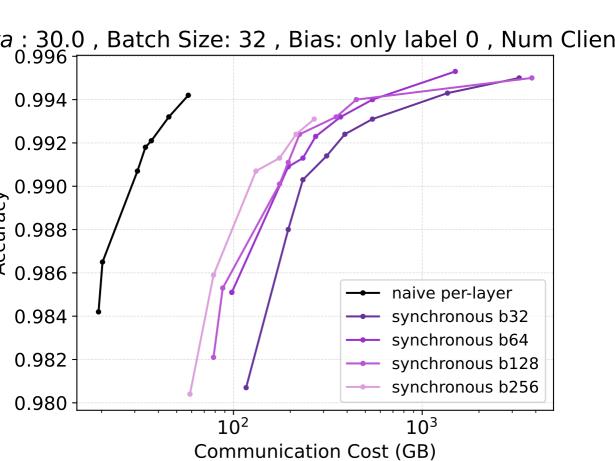


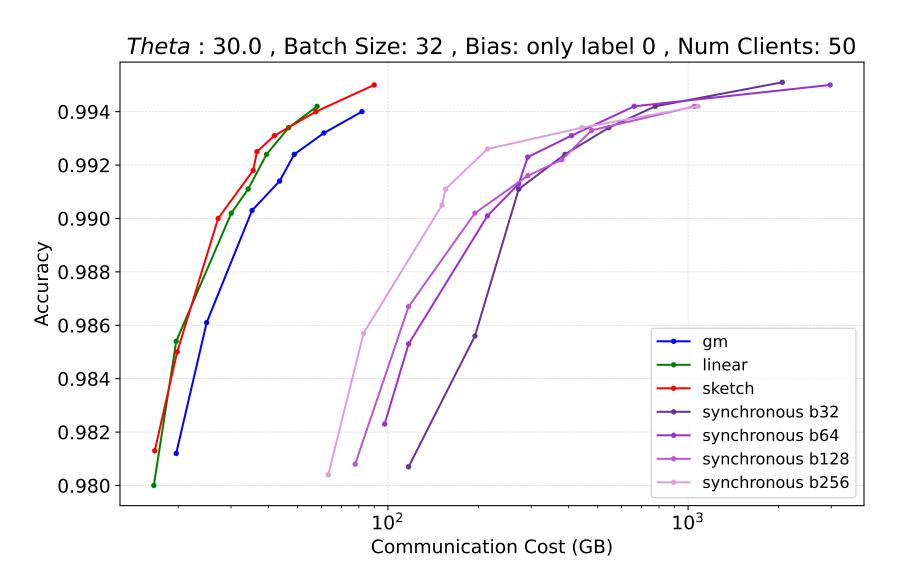


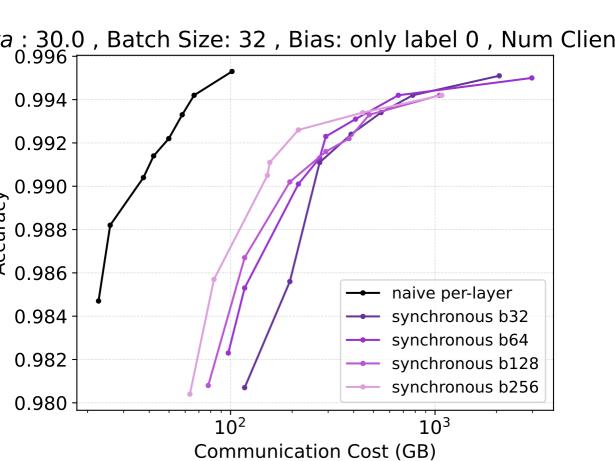


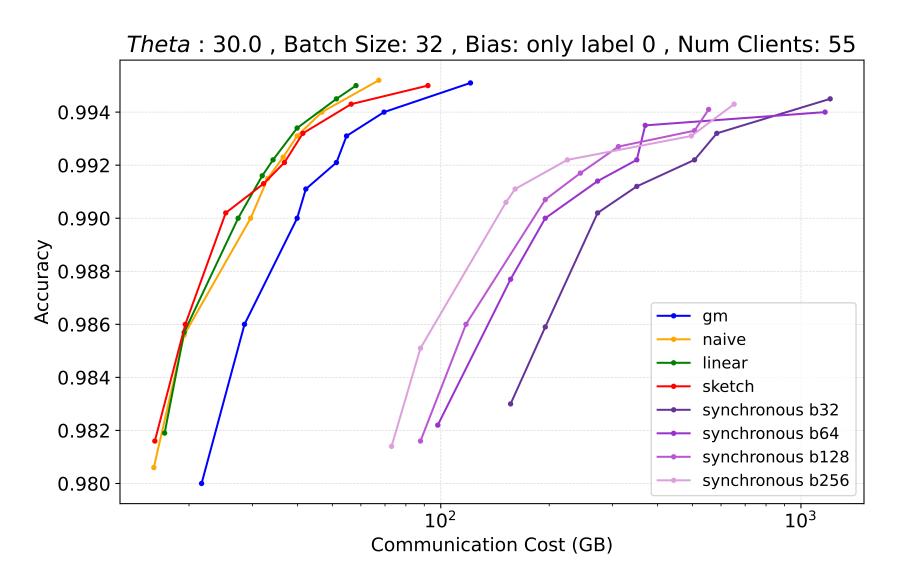


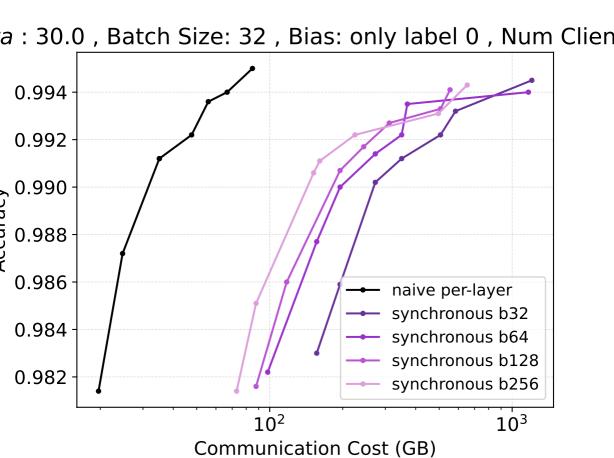


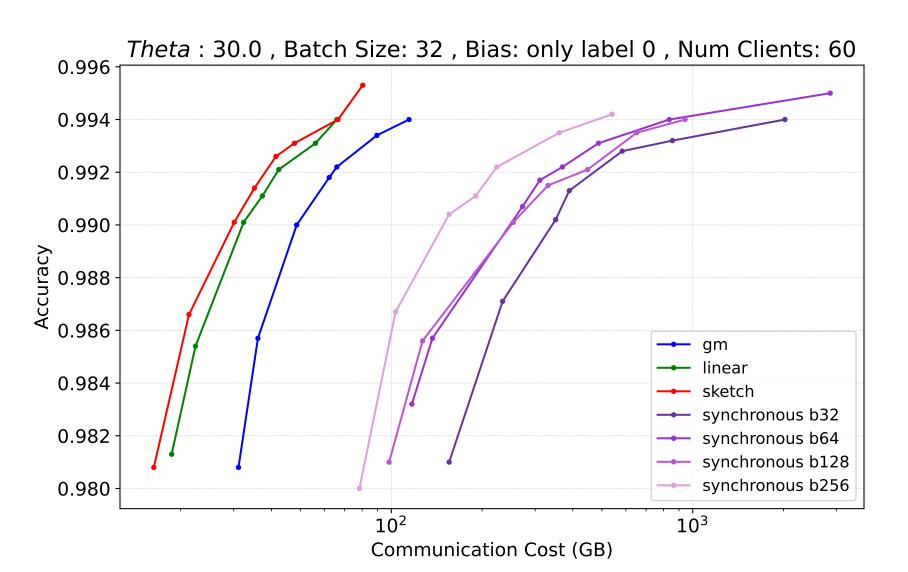


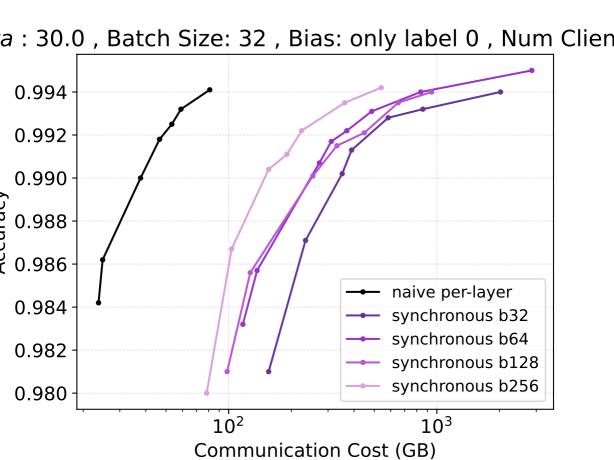


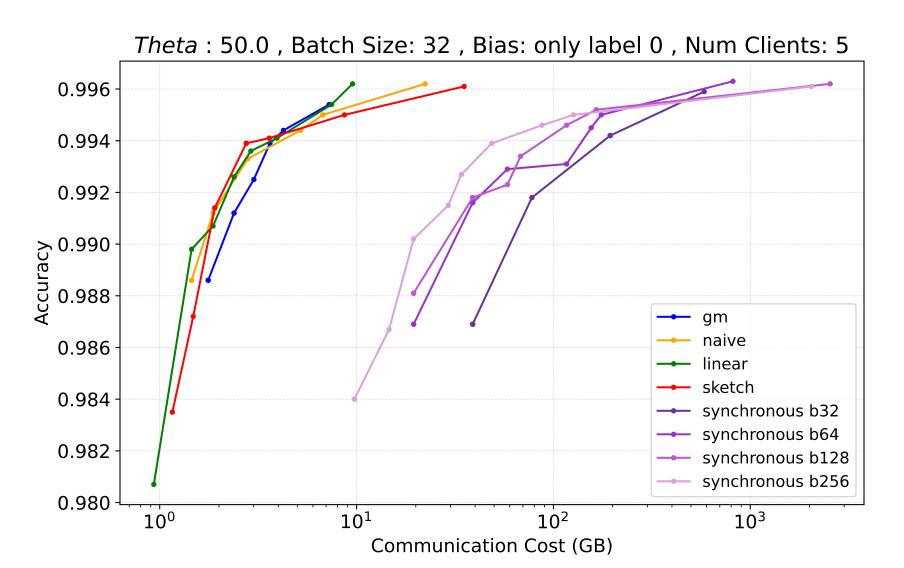


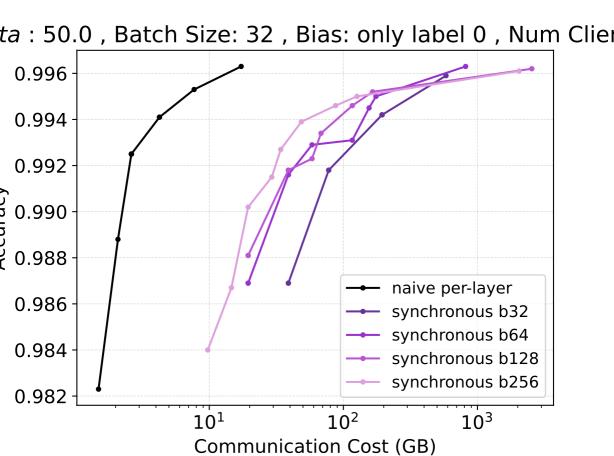


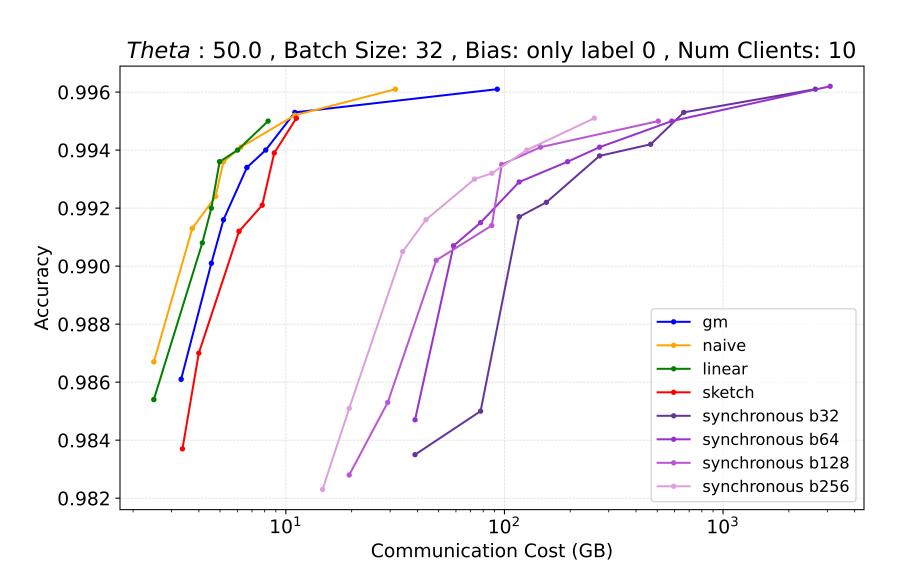


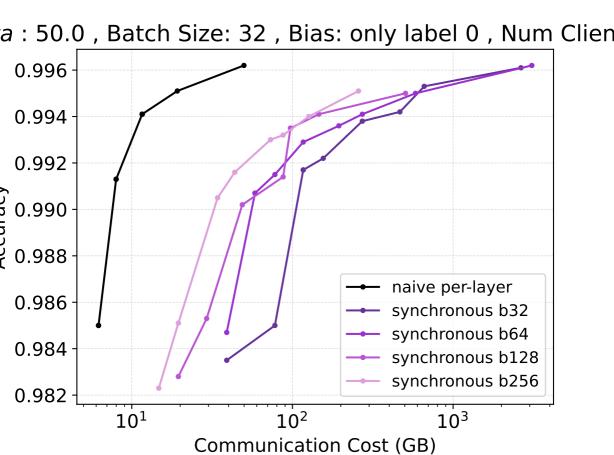


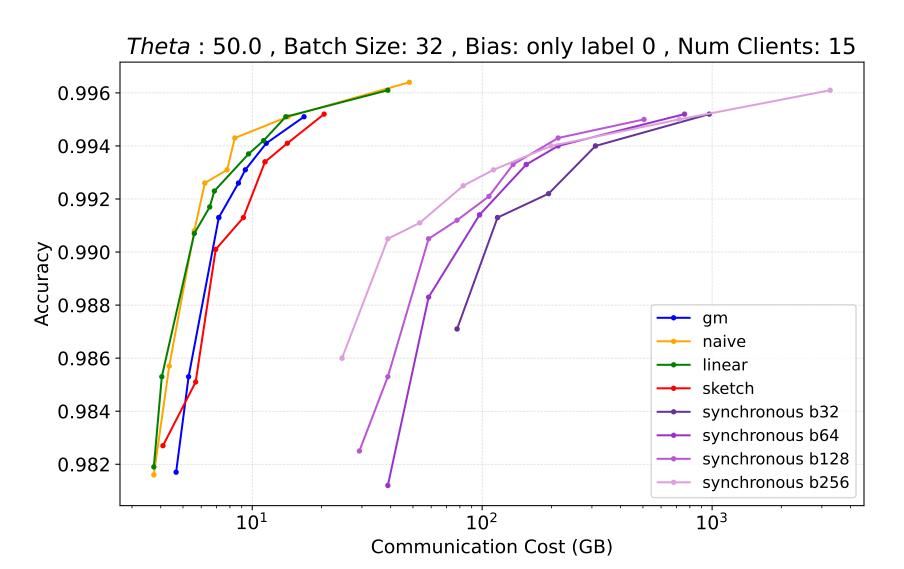


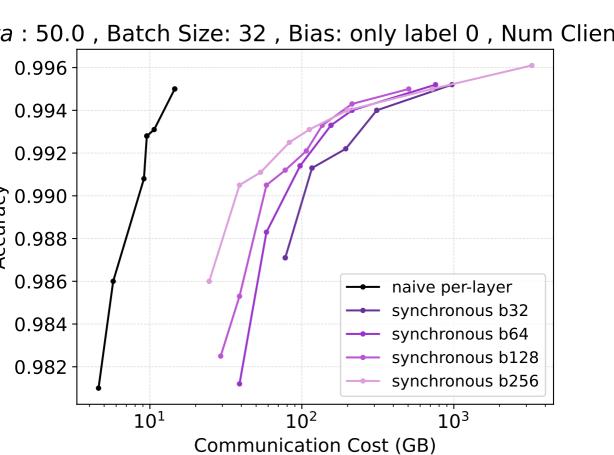


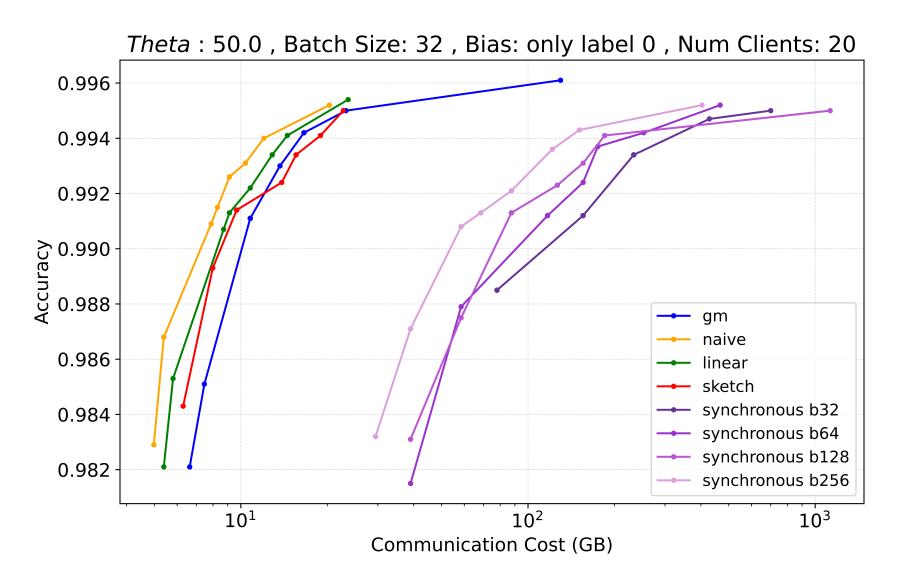


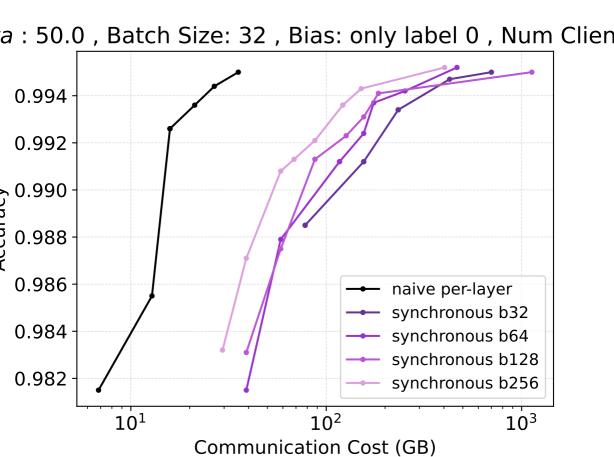


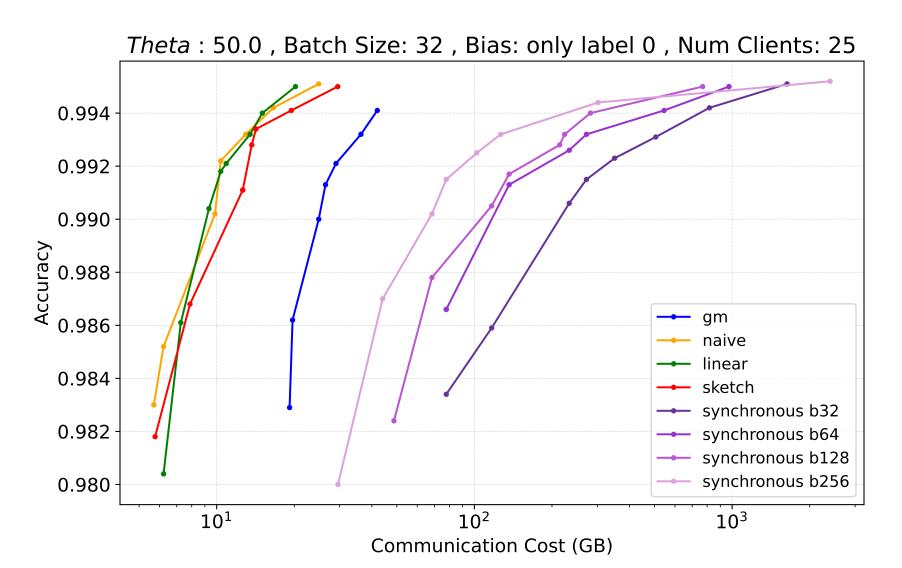


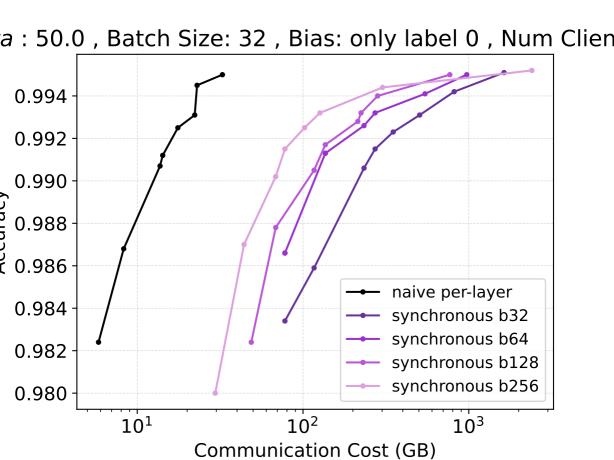


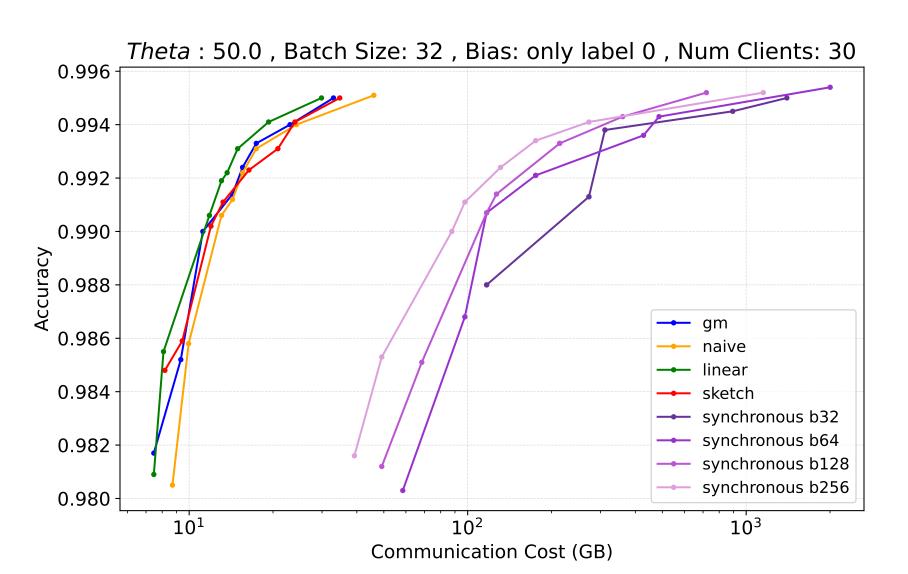


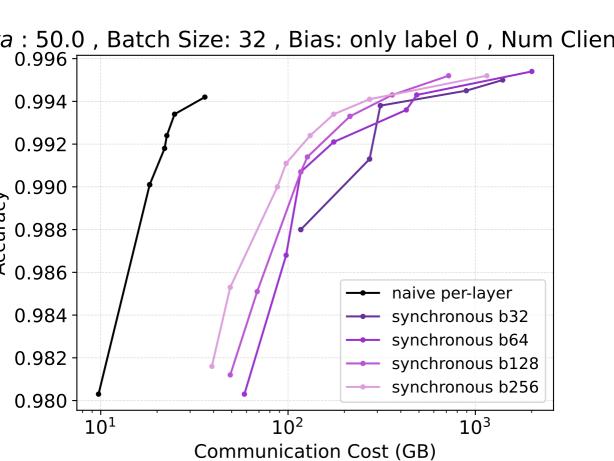


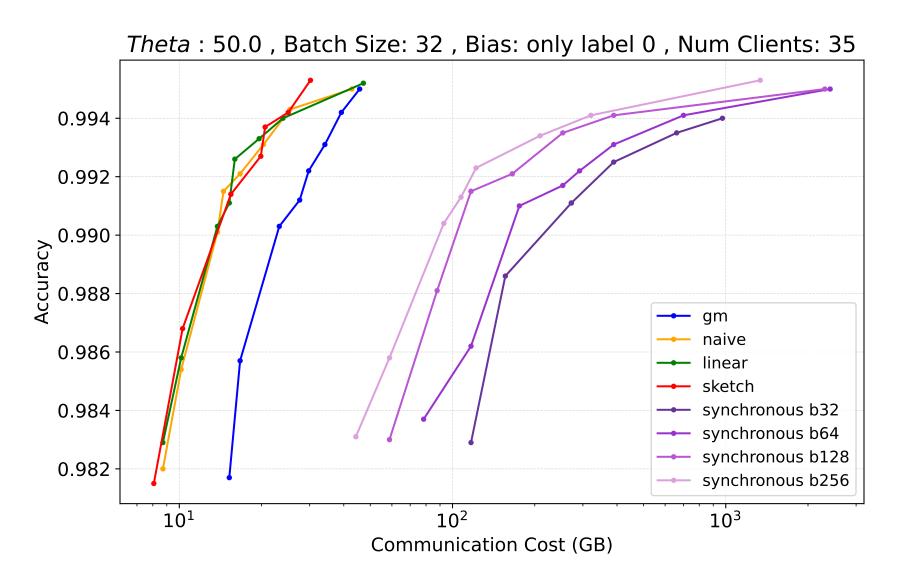


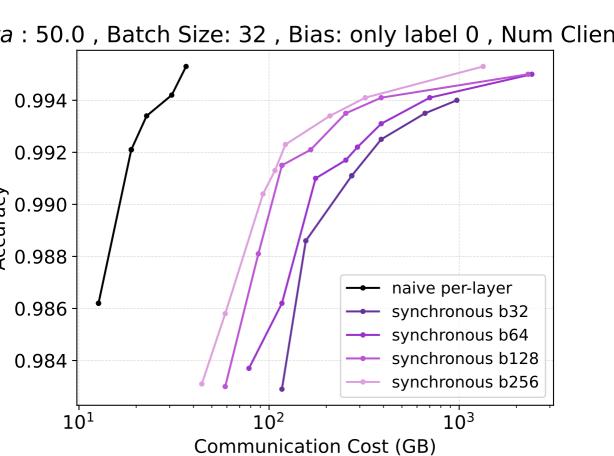


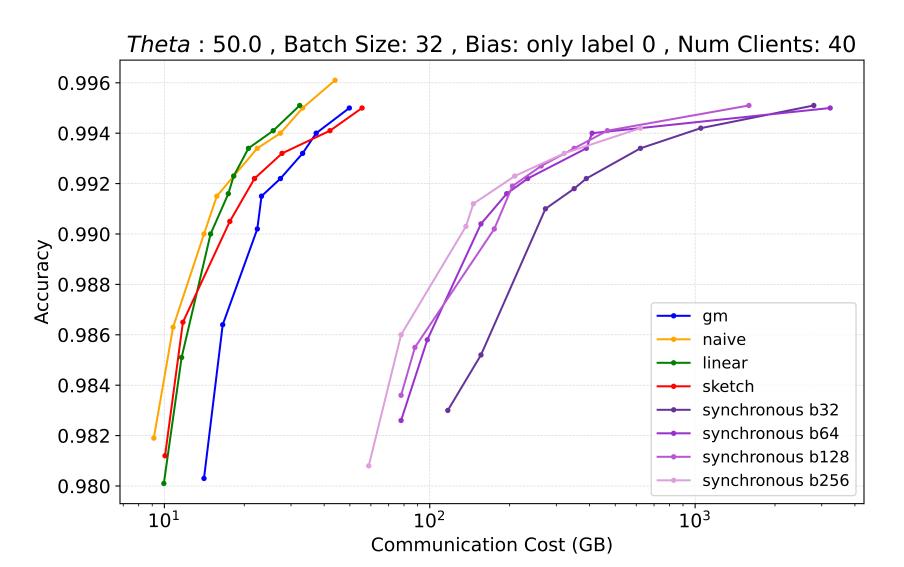


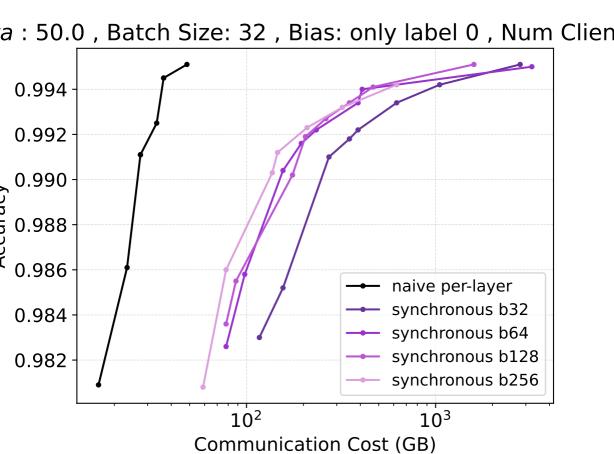


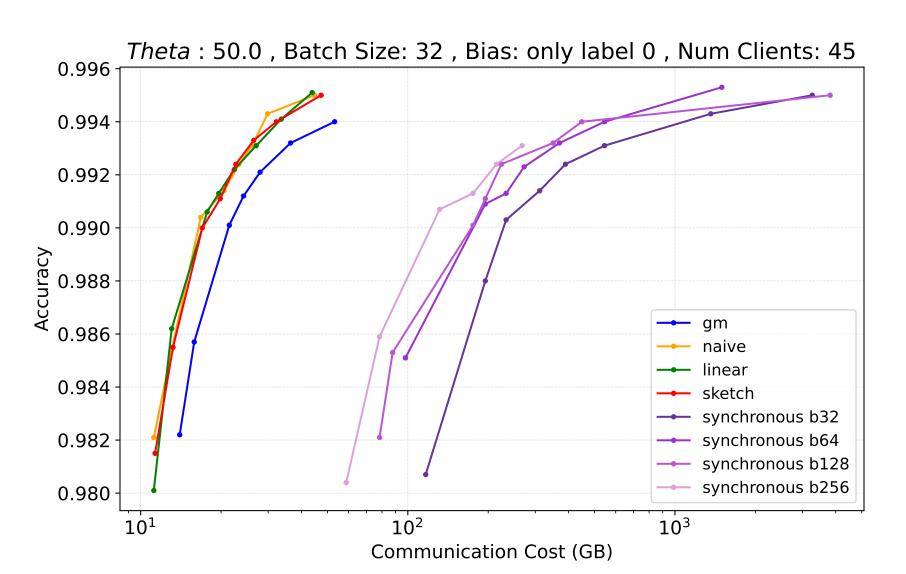


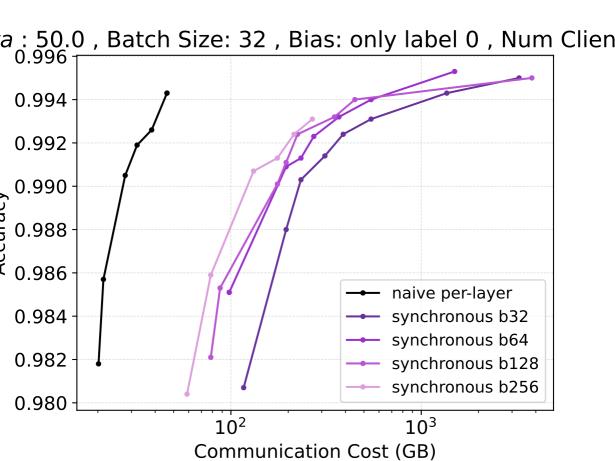












Theta: 50.0, Batch Size: 32, Bias: only label 0, Num Clients: 50 0.994 0.9920.990 0.988 gm 0.986 naive linear 0.984 sketch → synchronous b32 0.982 synchronous b64 synchronous b128 synchronous b256 0.980

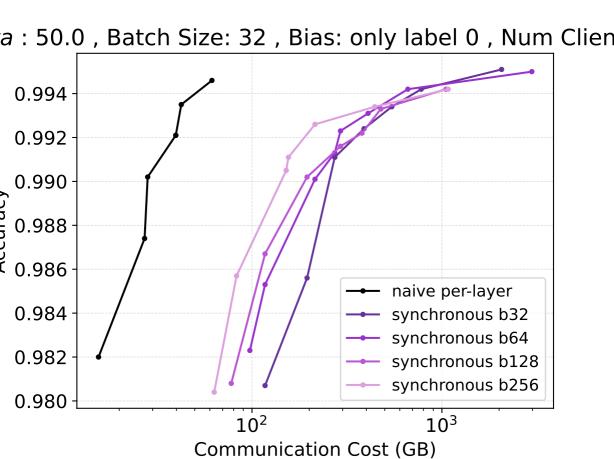
Communication Cost (GB)

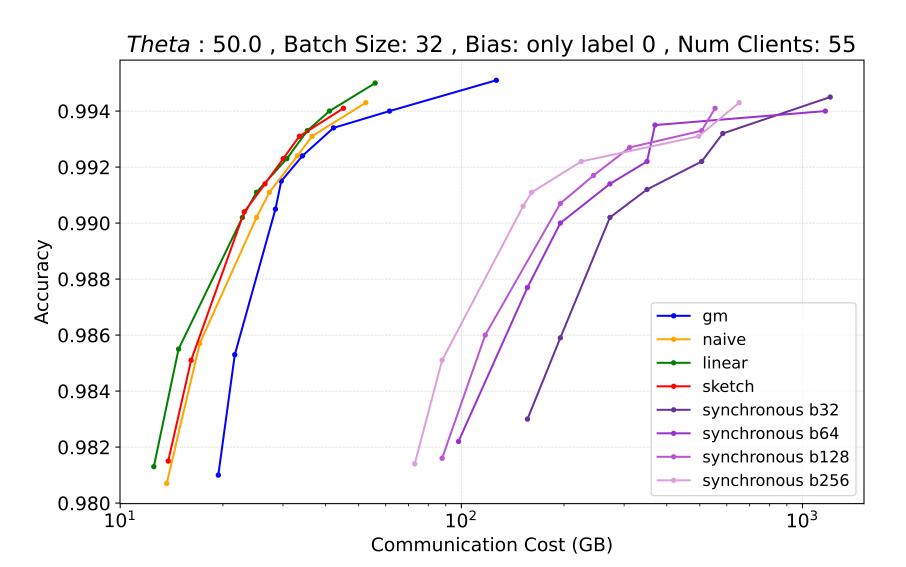
 $10^2$ 

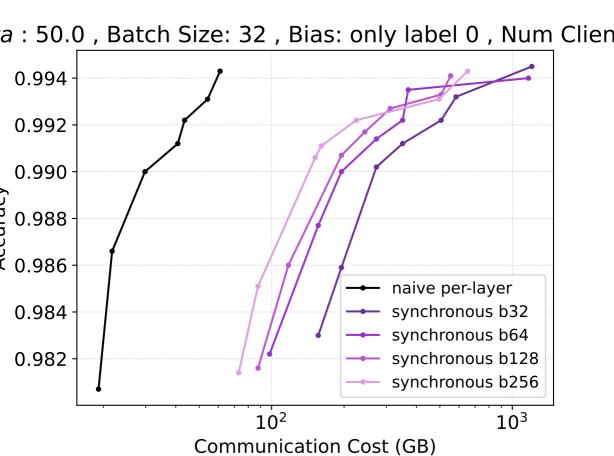
10<sup>3</sup>

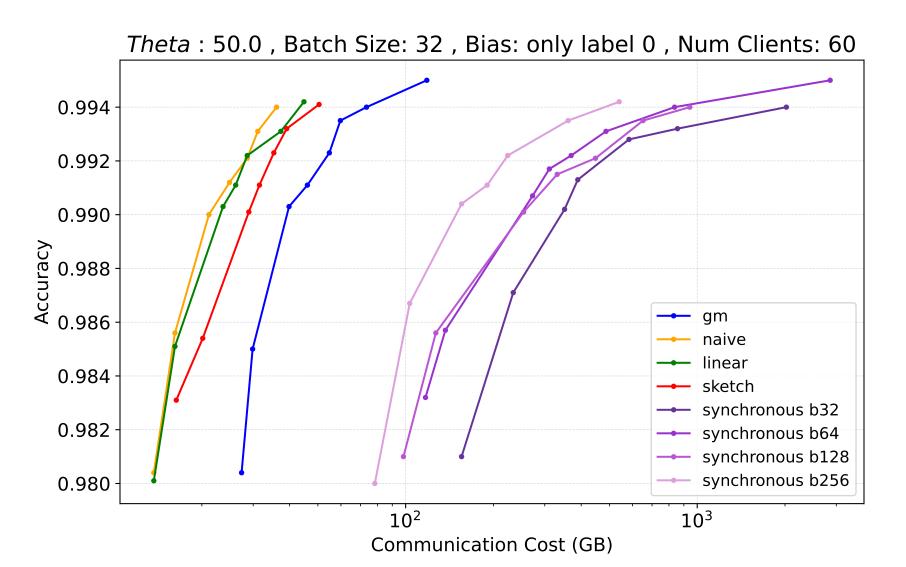
Accuracy

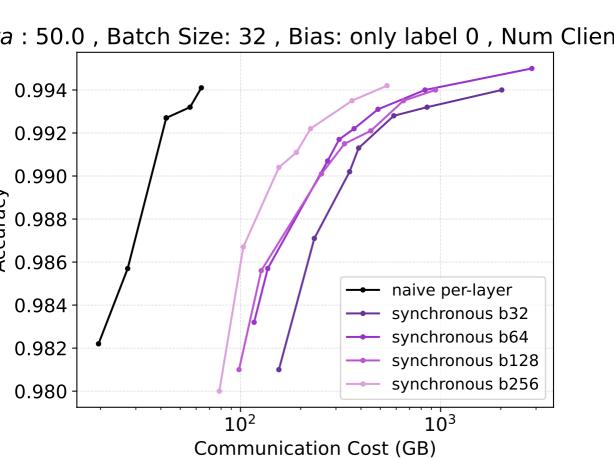
 $10^{1}$ 

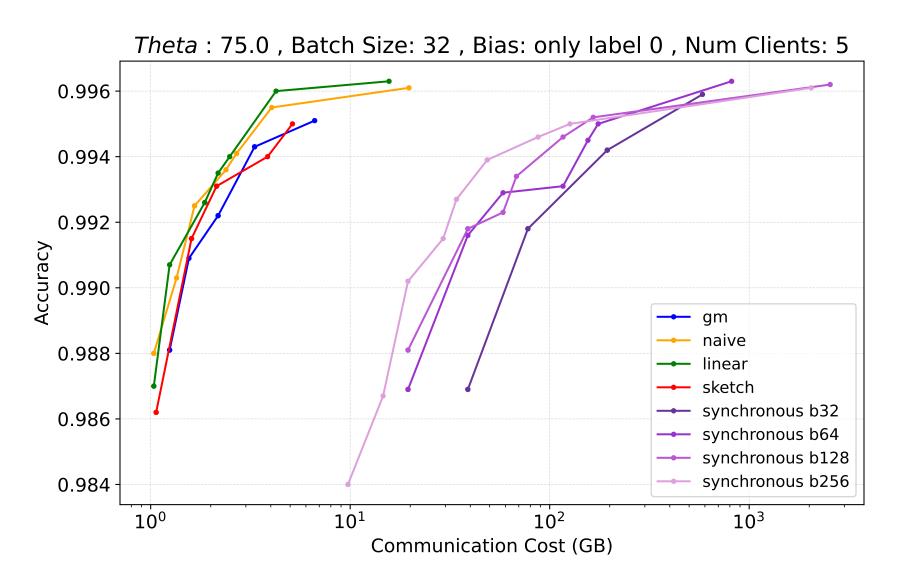


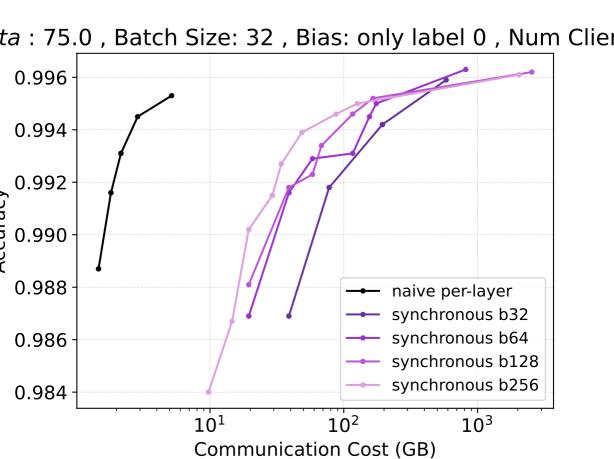


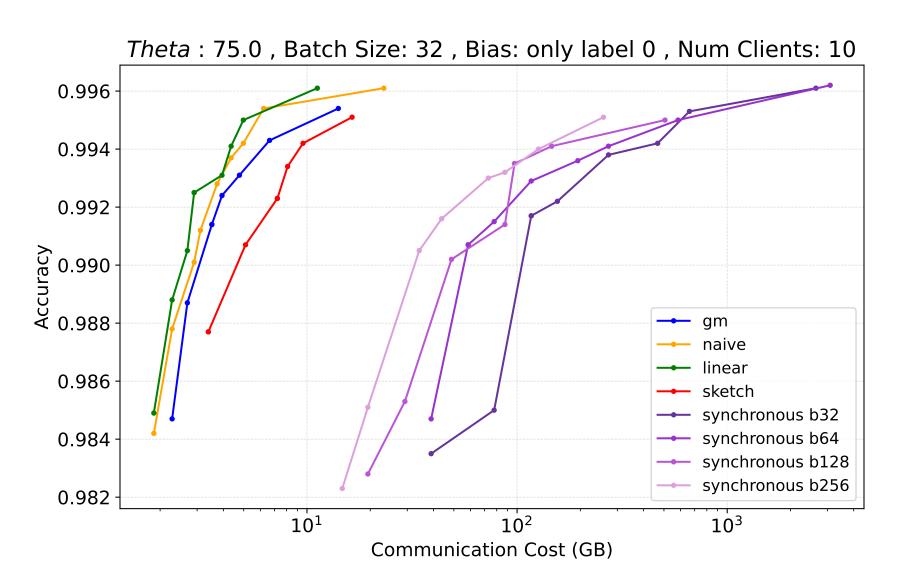


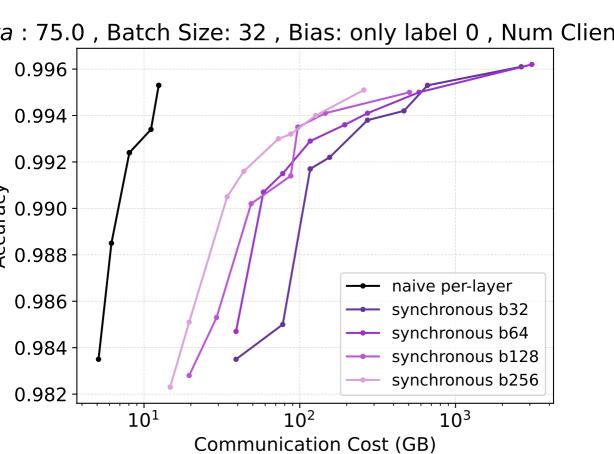


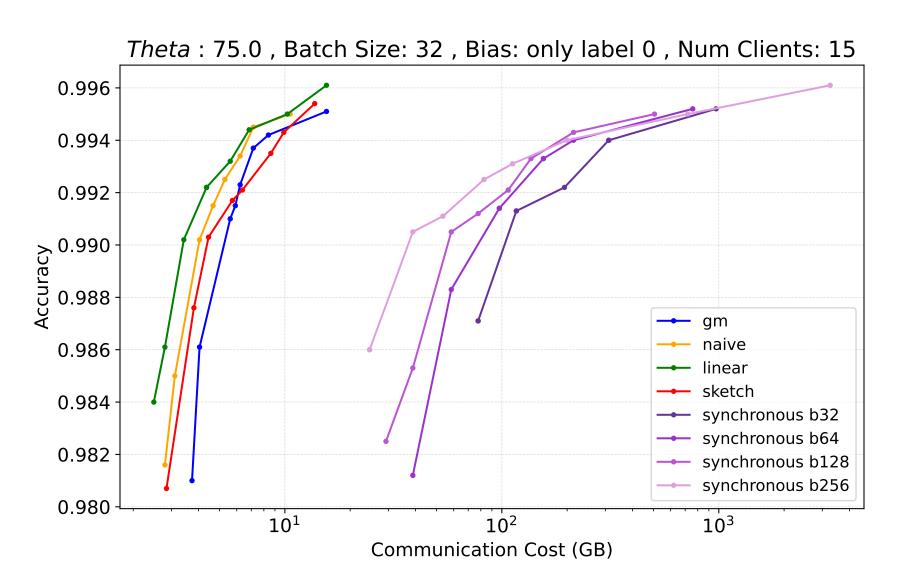


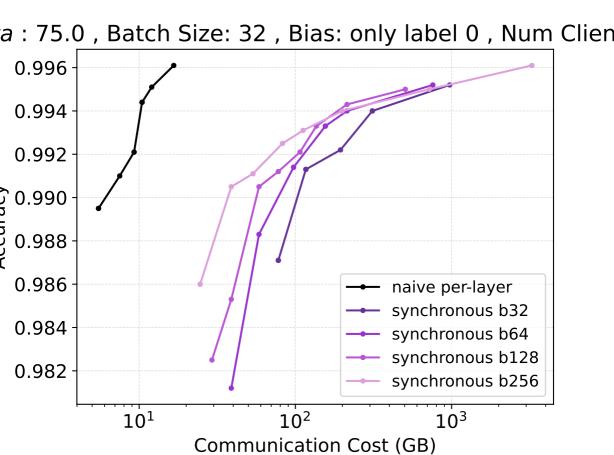


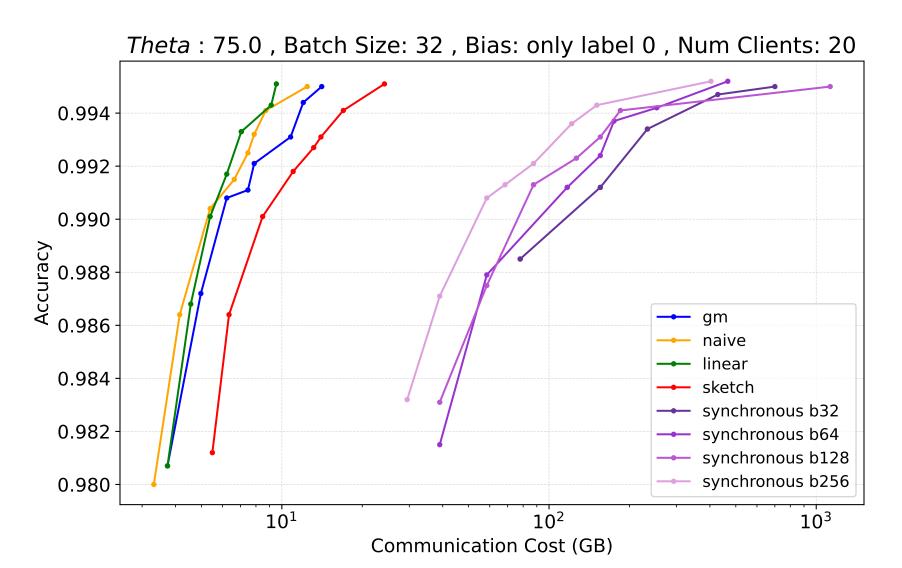


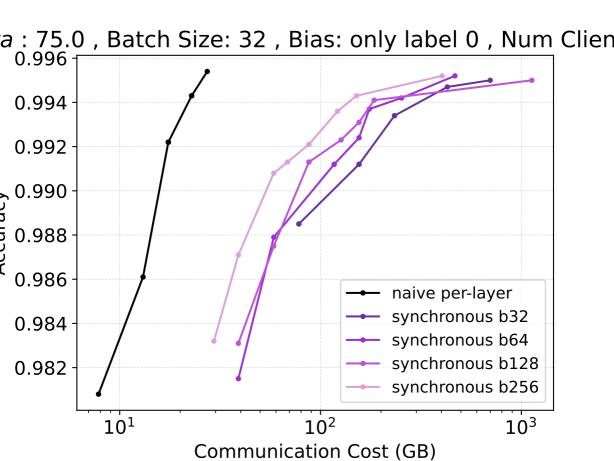


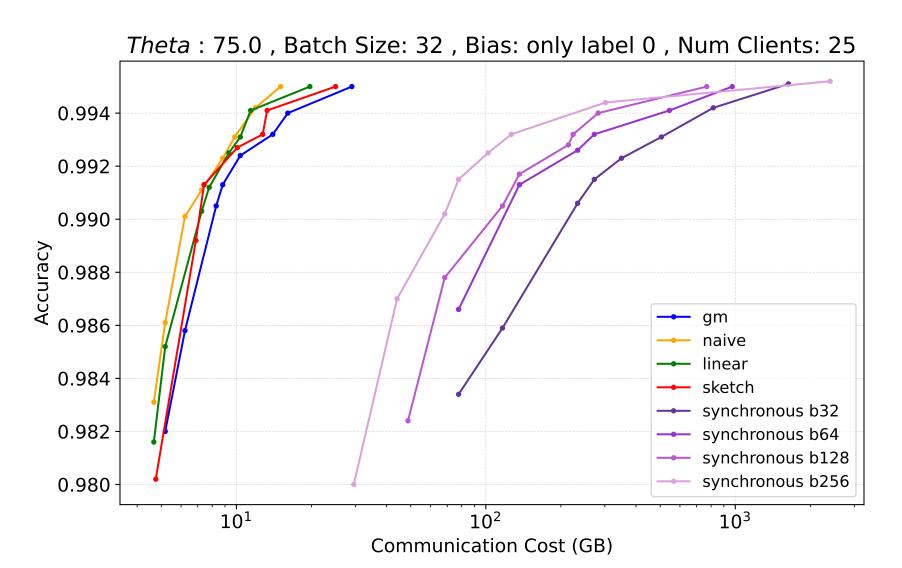


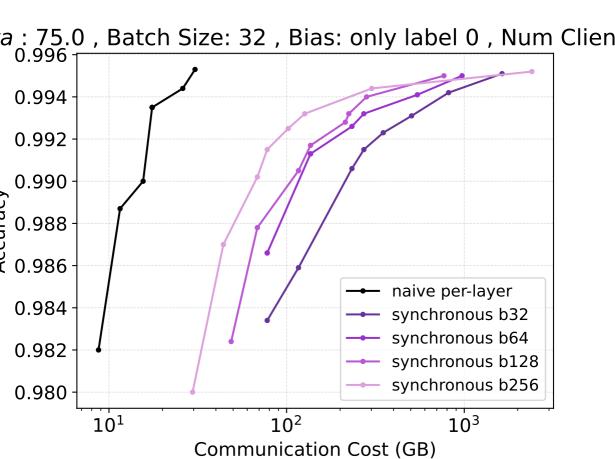


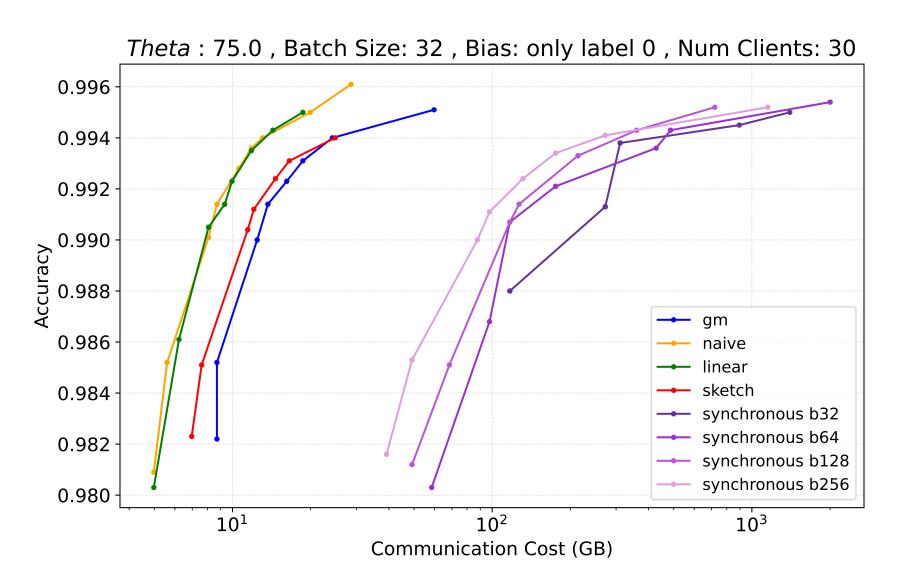


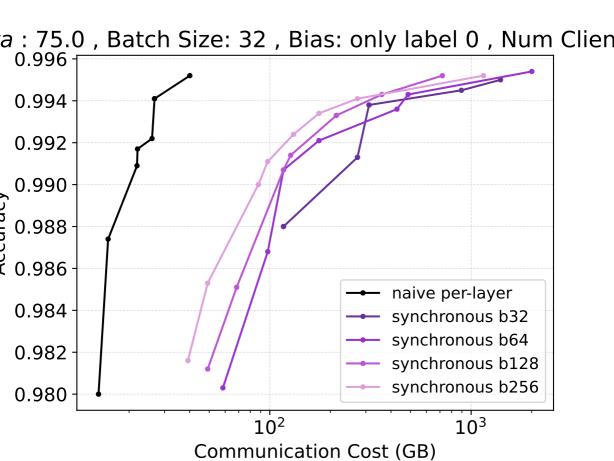


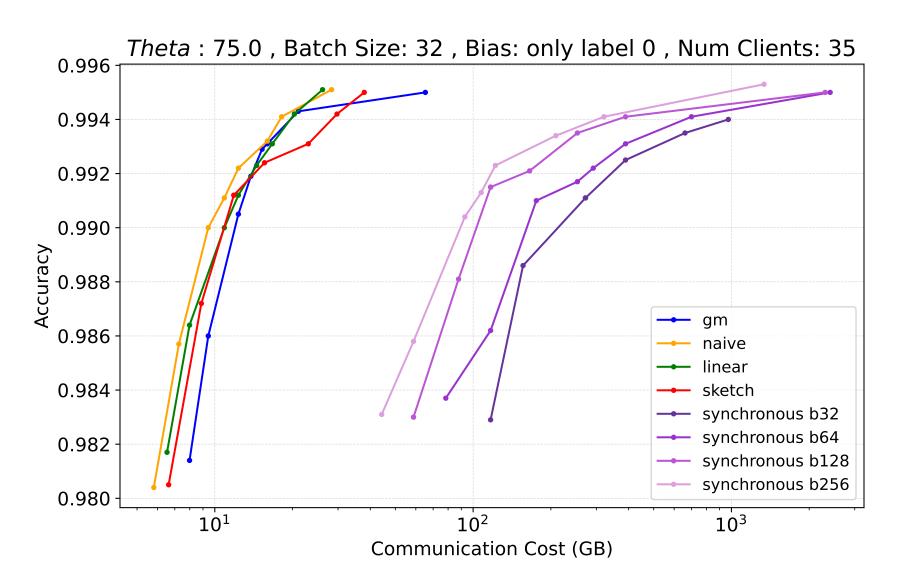


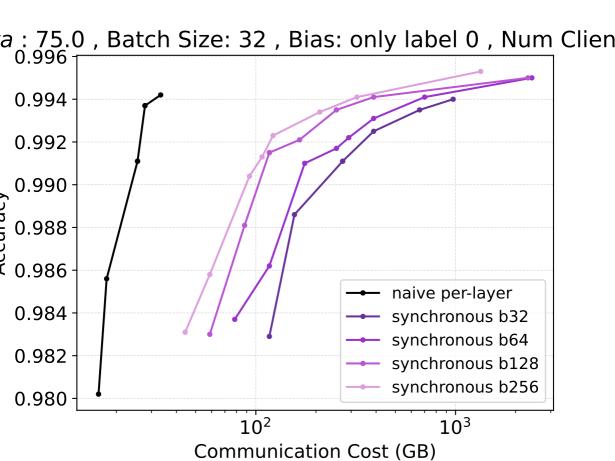


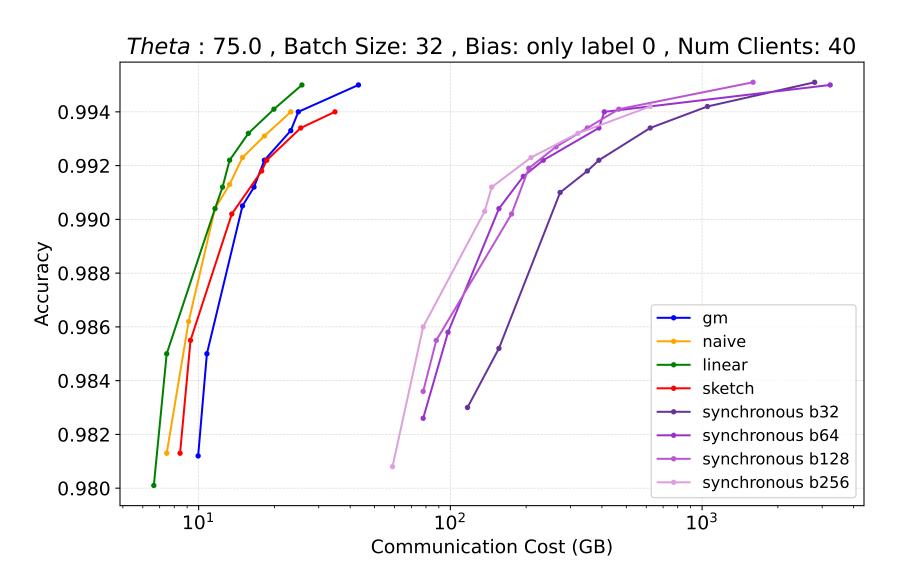


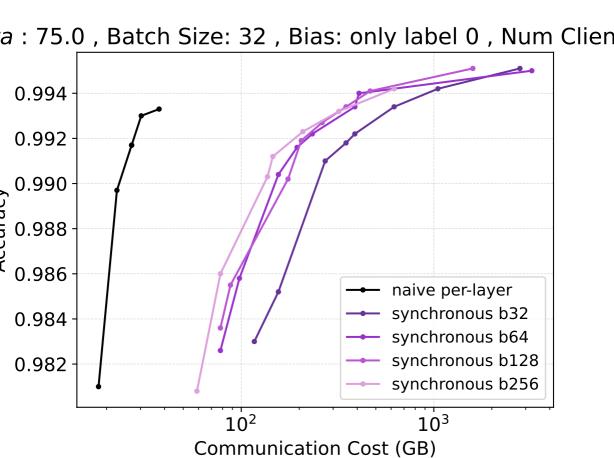


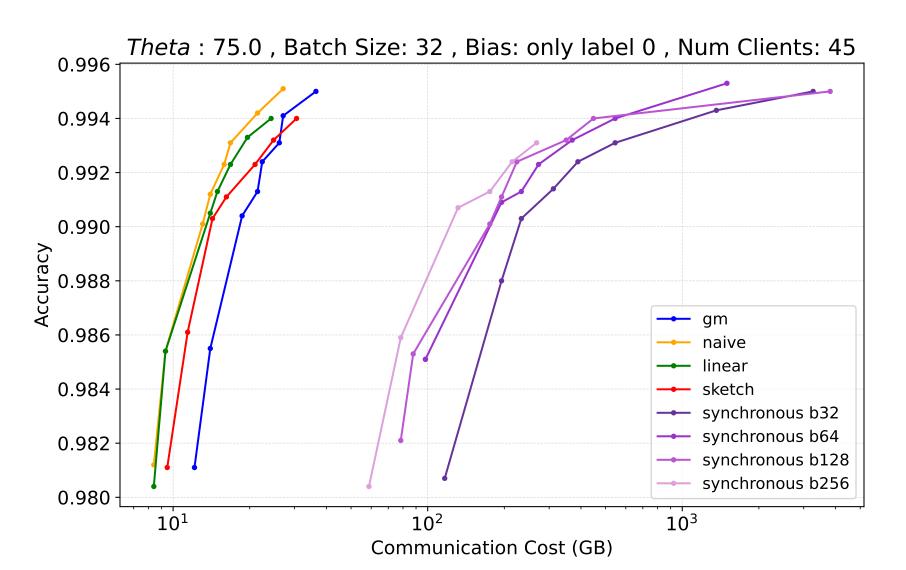


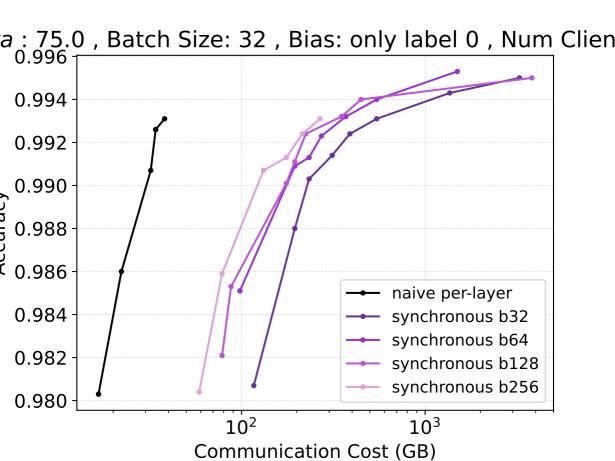


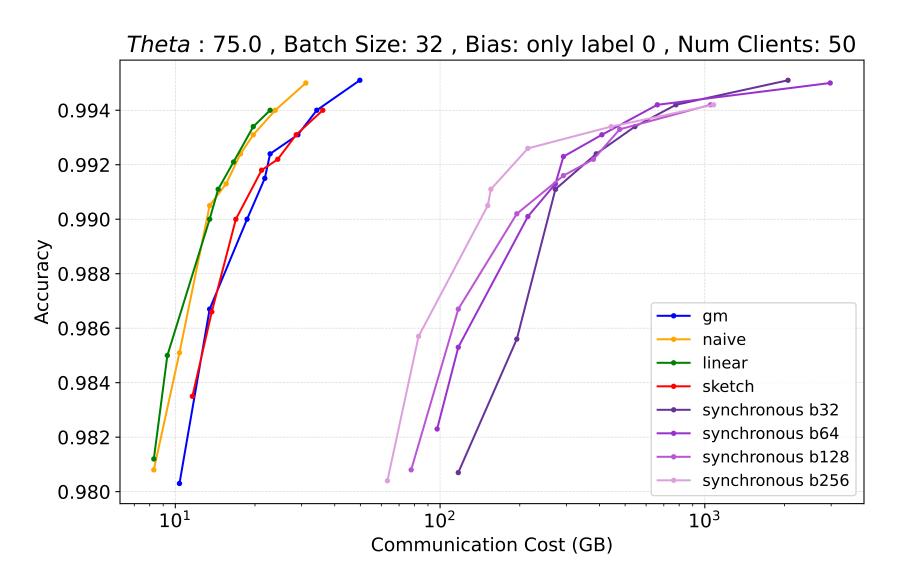


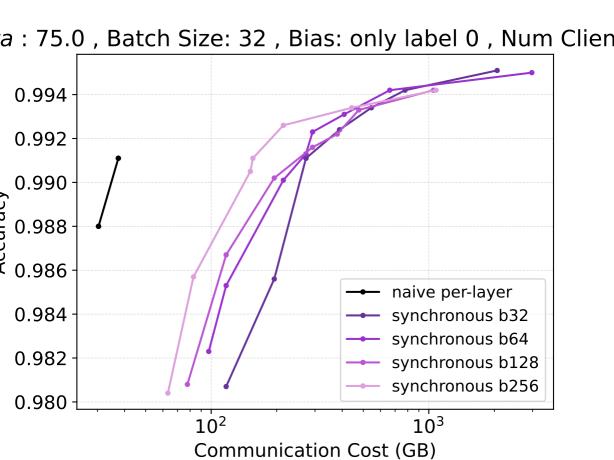


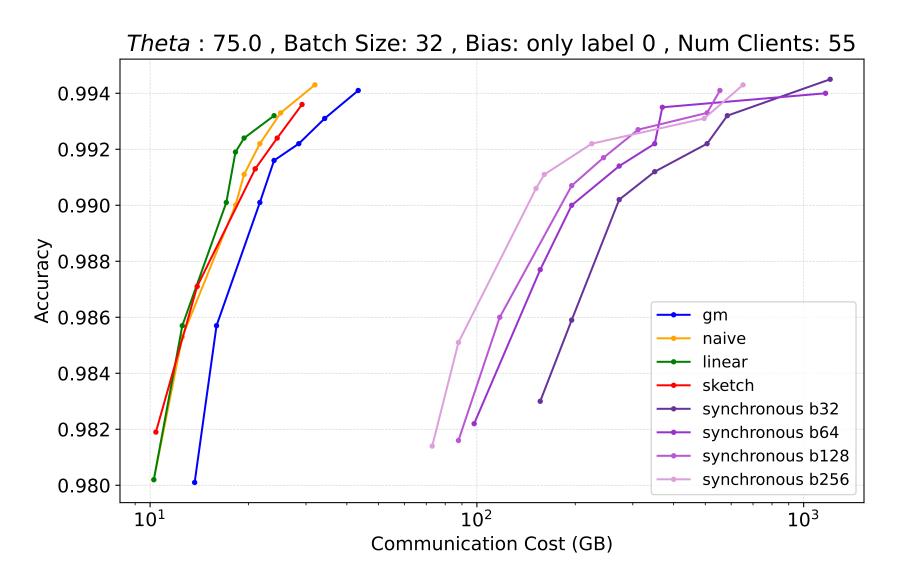


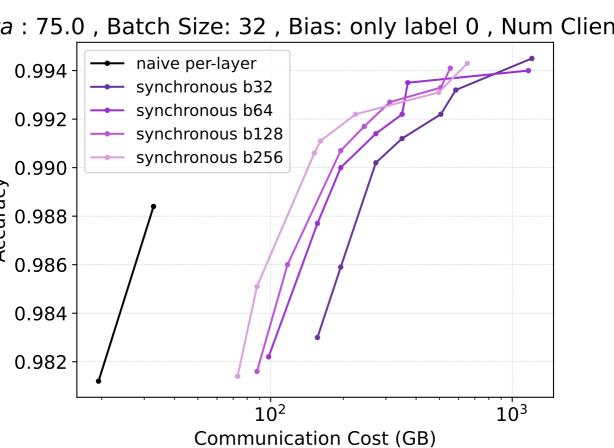


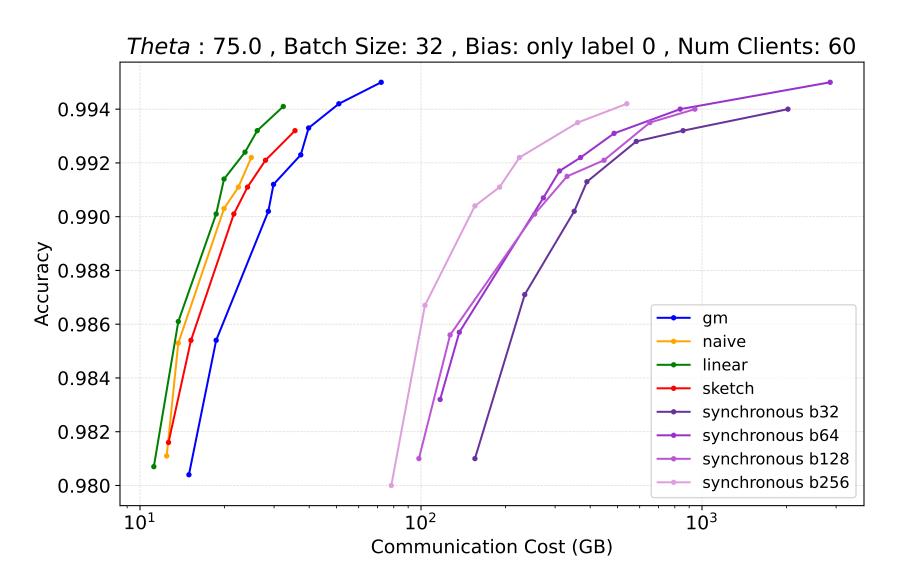


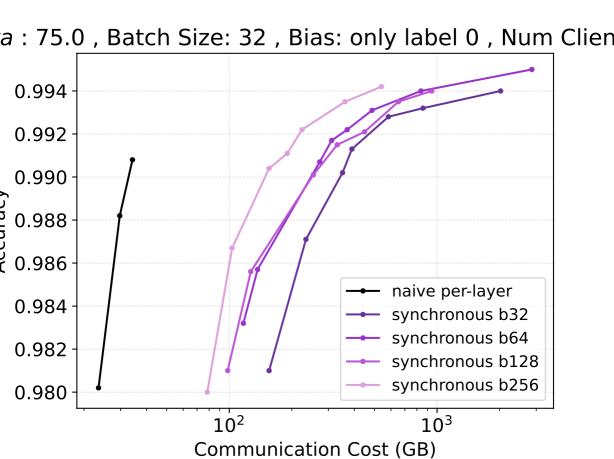


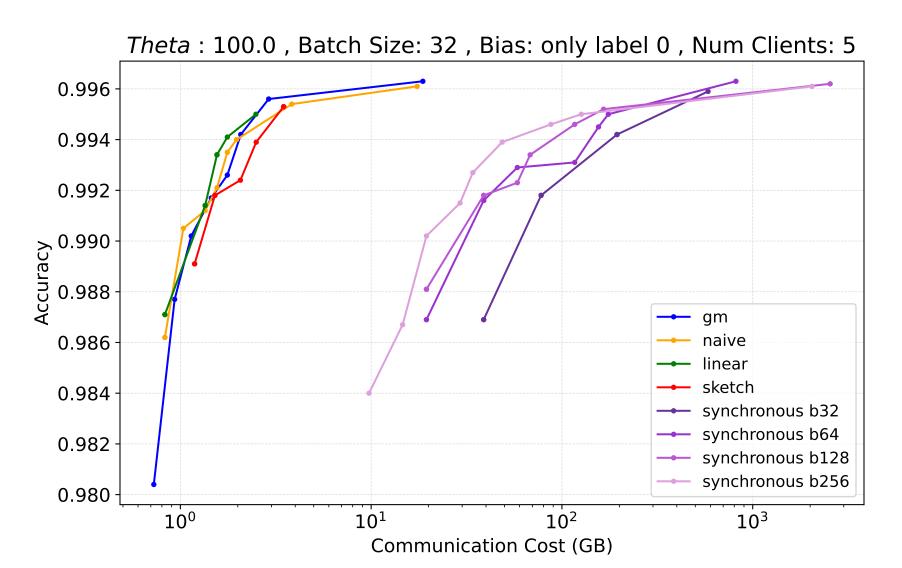


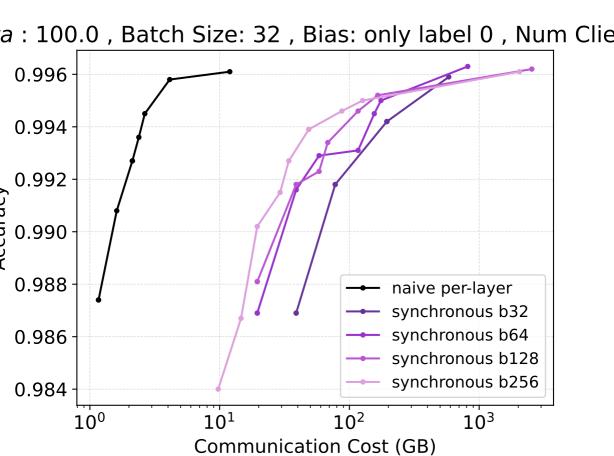


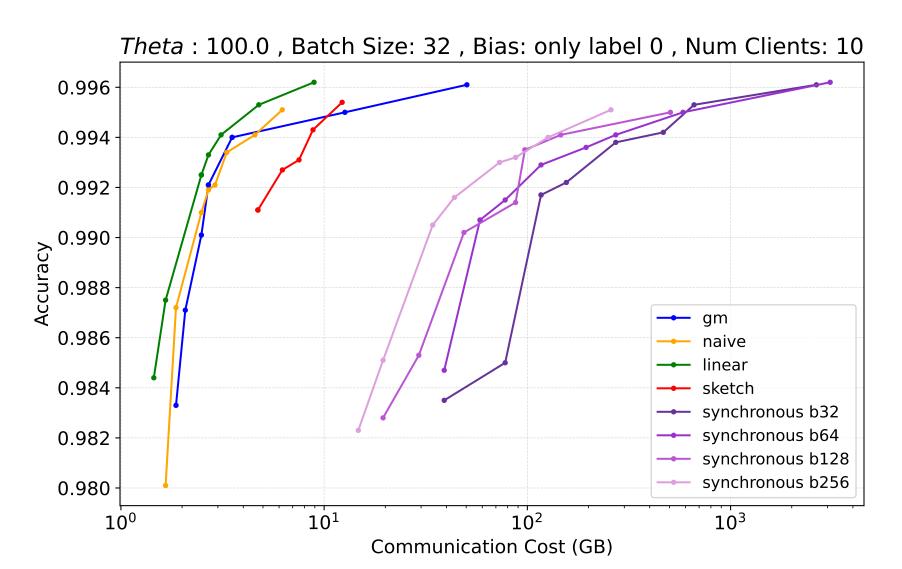


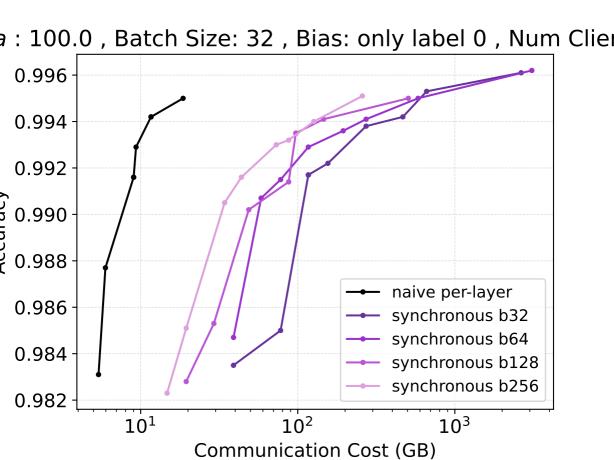


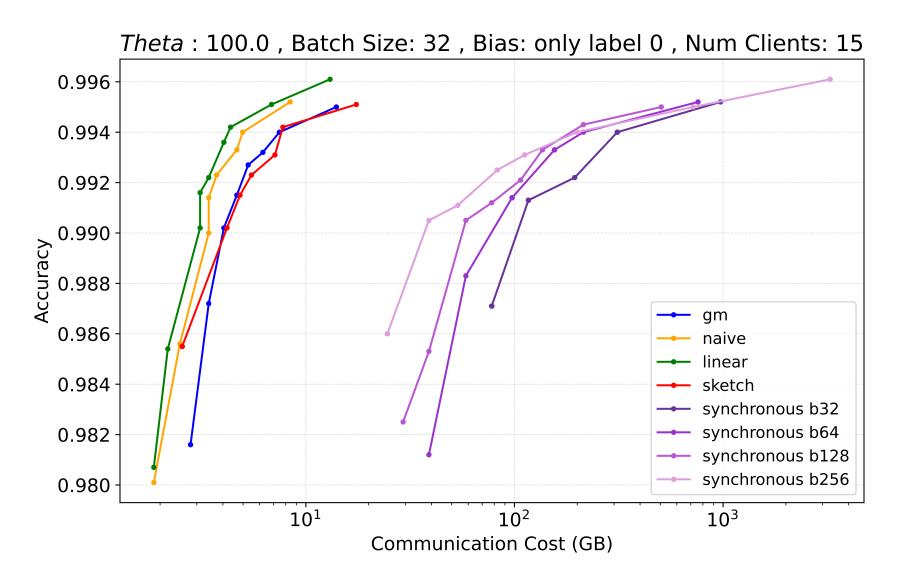


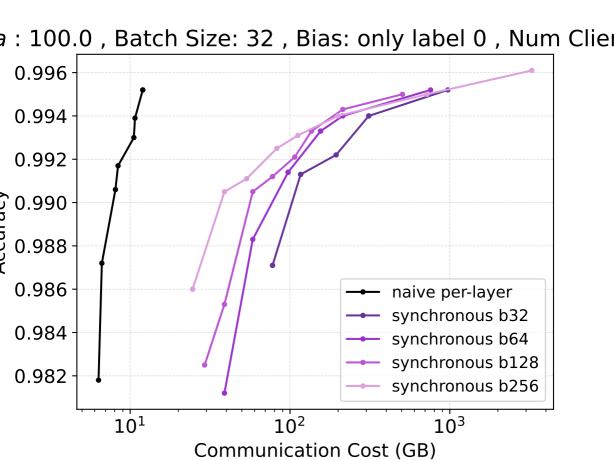




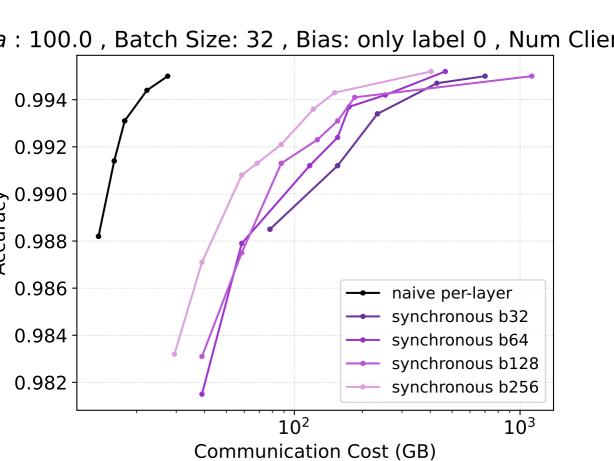


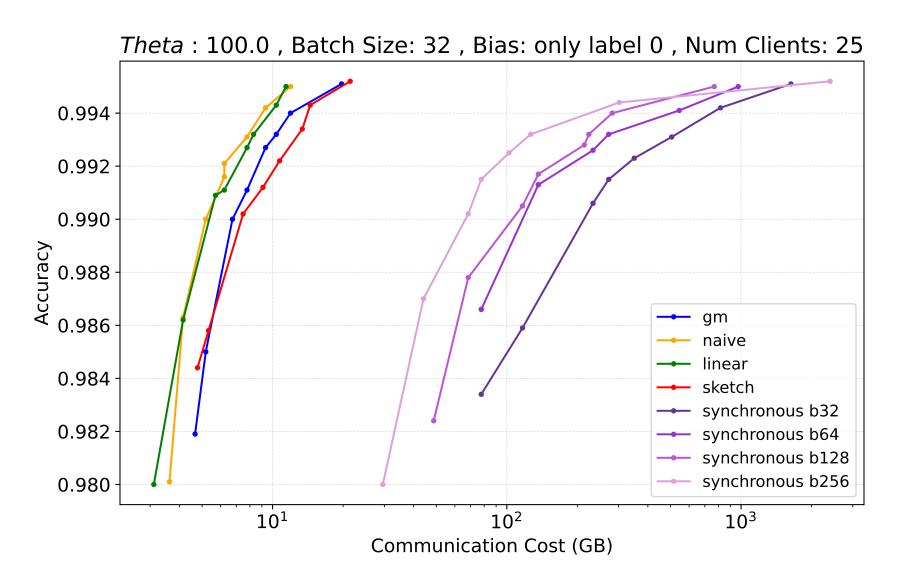


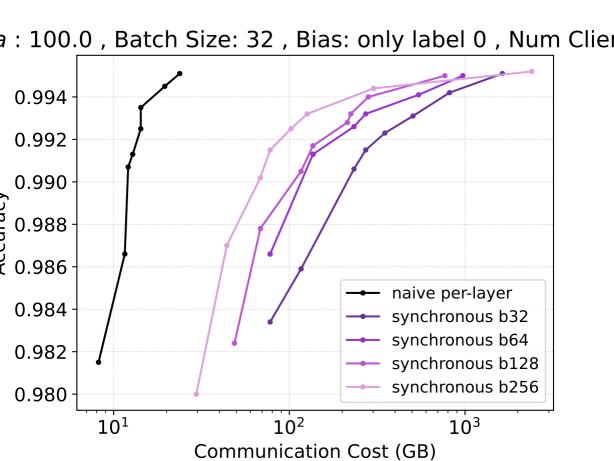


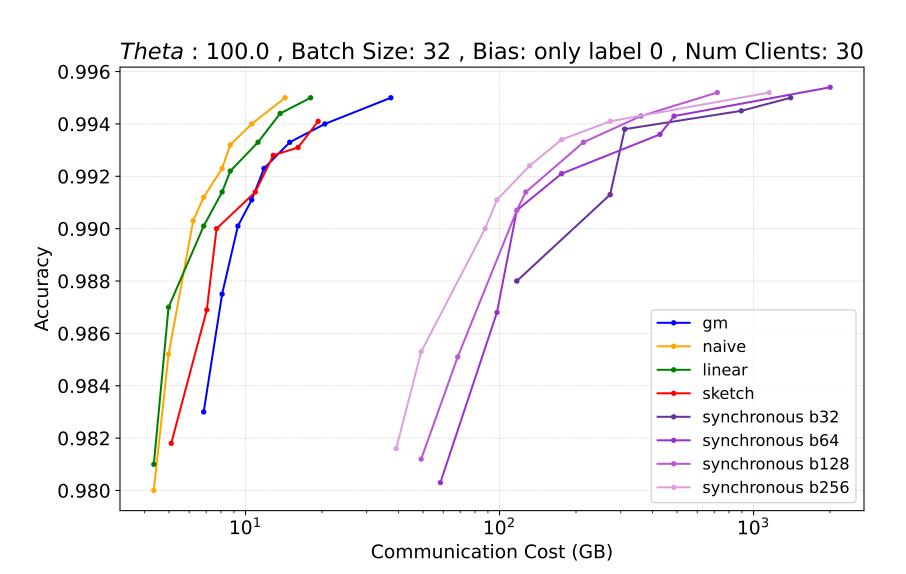


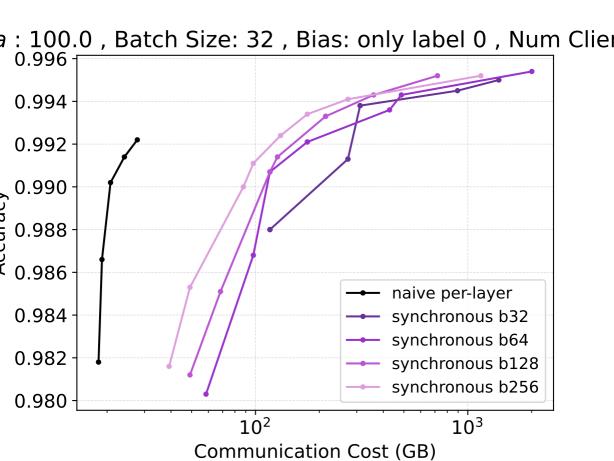
Theta: 100.0, Batch Size: 32, Bias: only label 0, Num Clients: 20 0.994 0.992 0.990 Accuracy 0.988 gm 0.986 naive linear sketch 0.984synchronous b32 → synchronous b64 0.982 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup> 10<sup>1</sup> Communication Cost (GB)

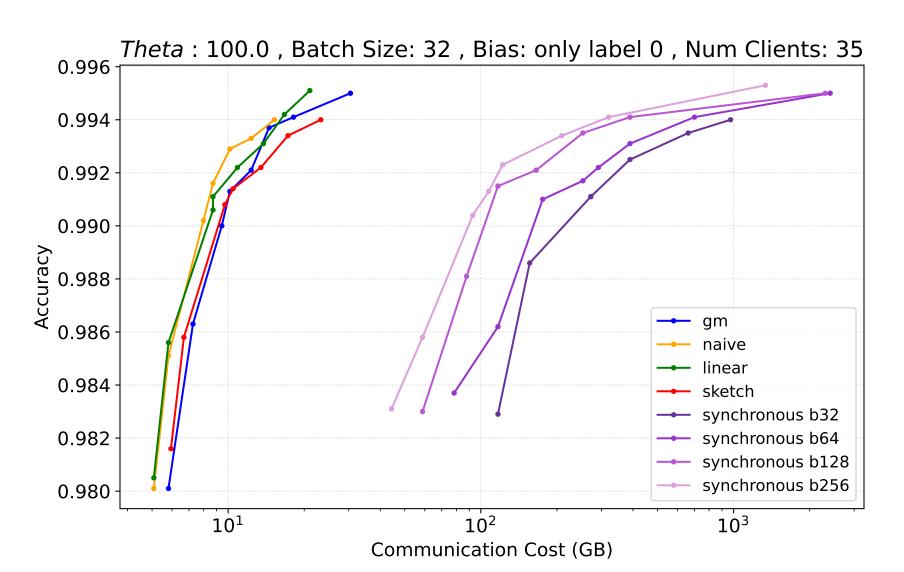


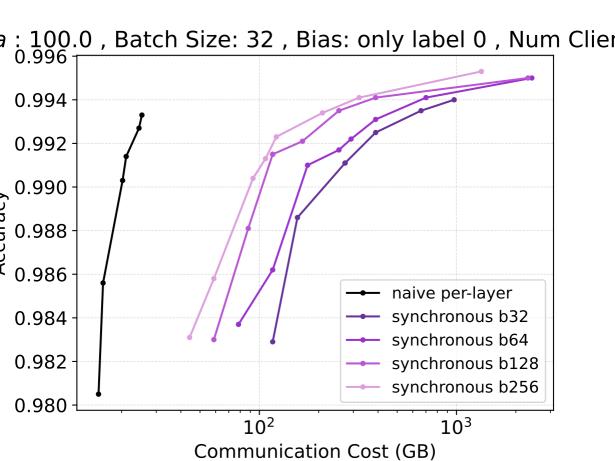


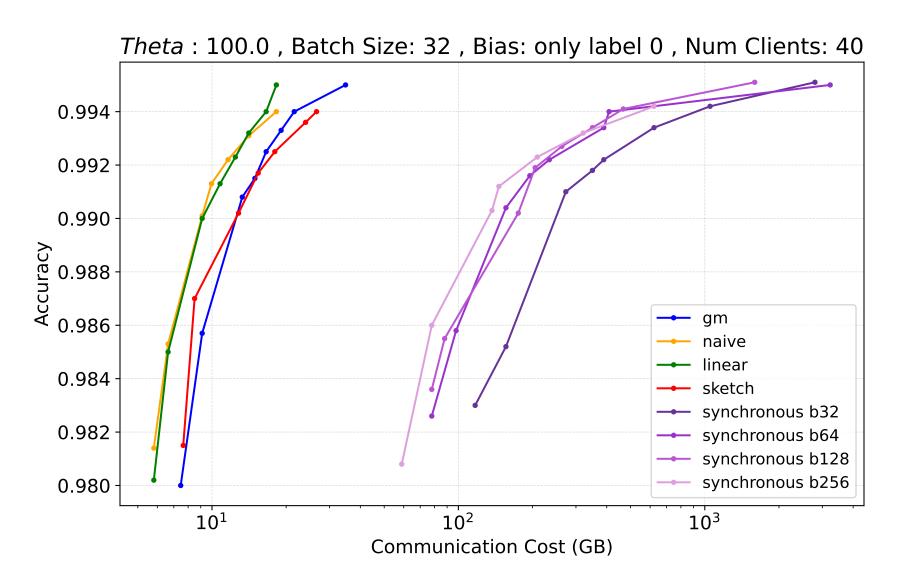


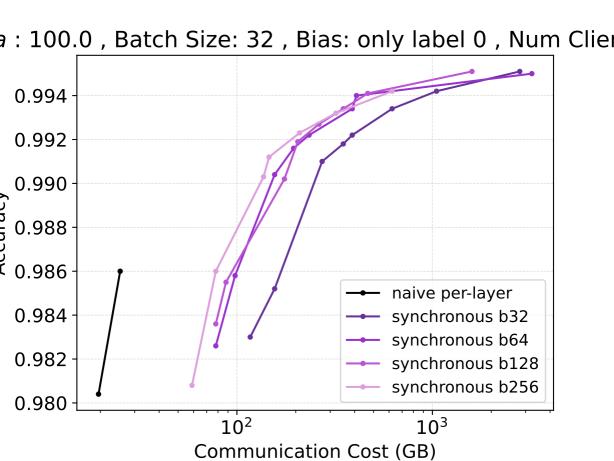


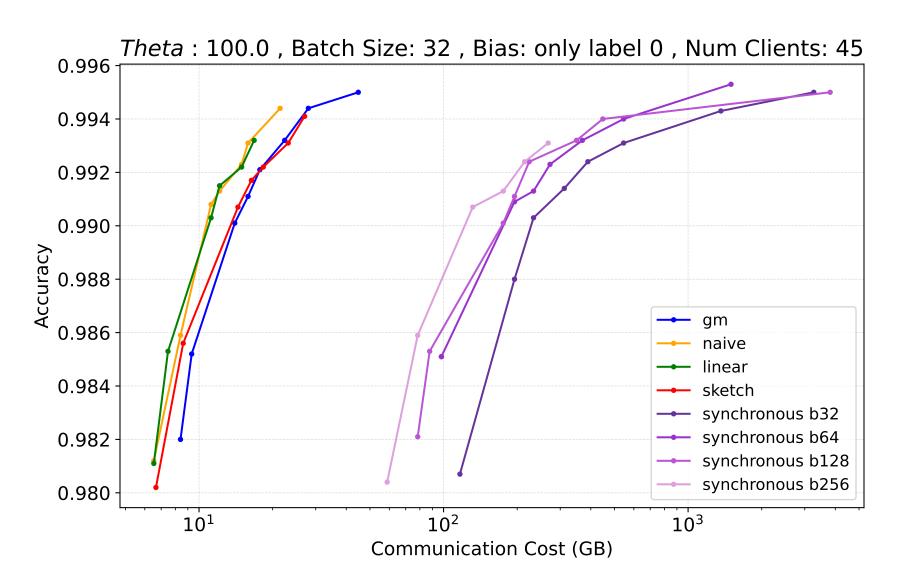


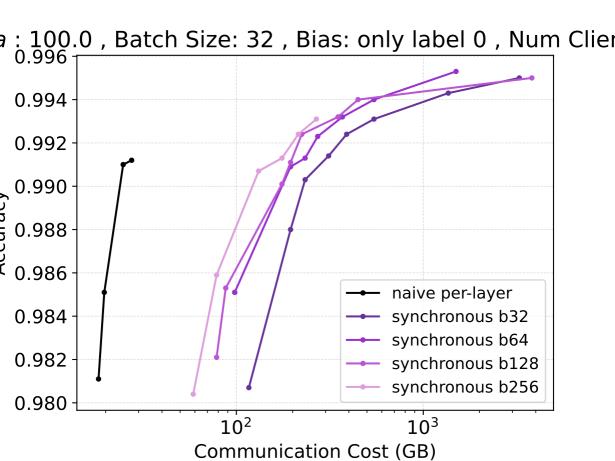


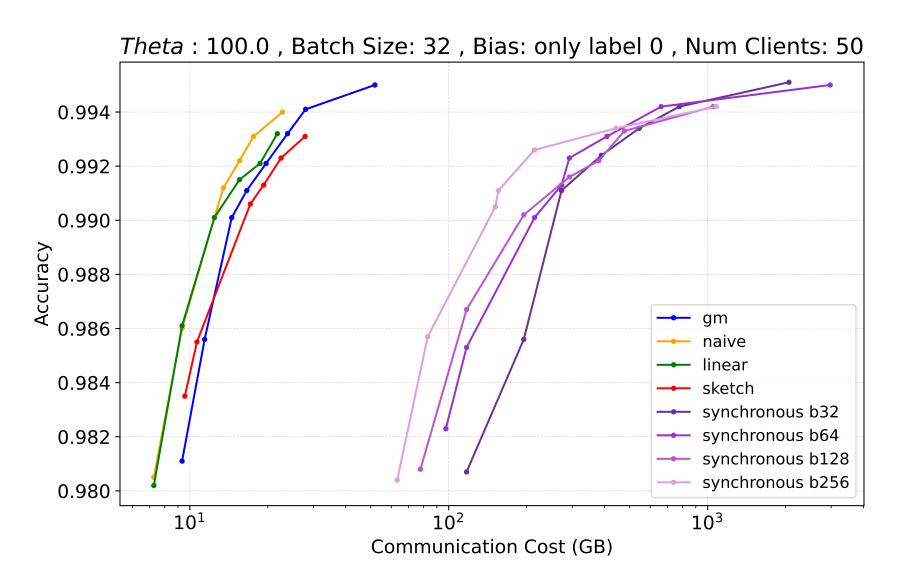


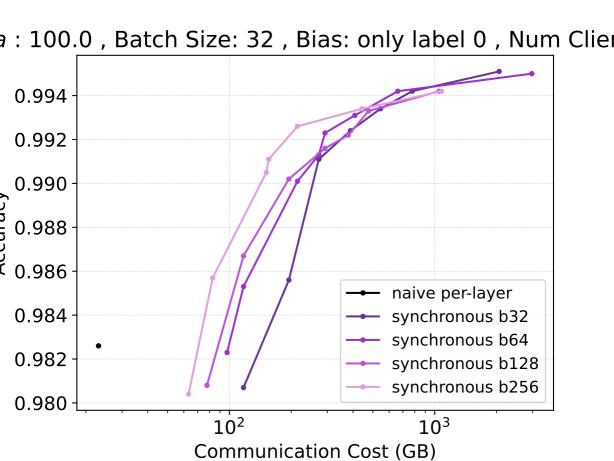






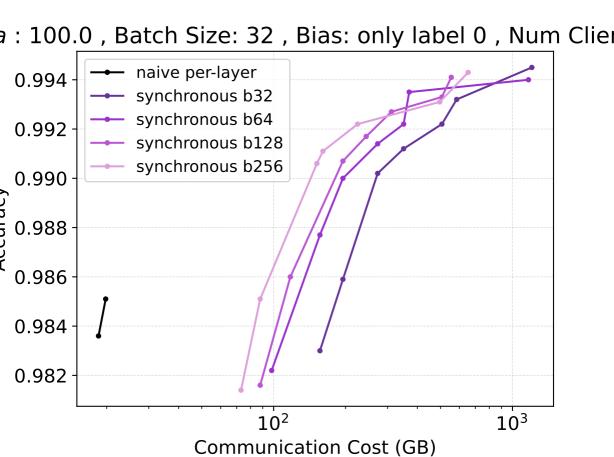


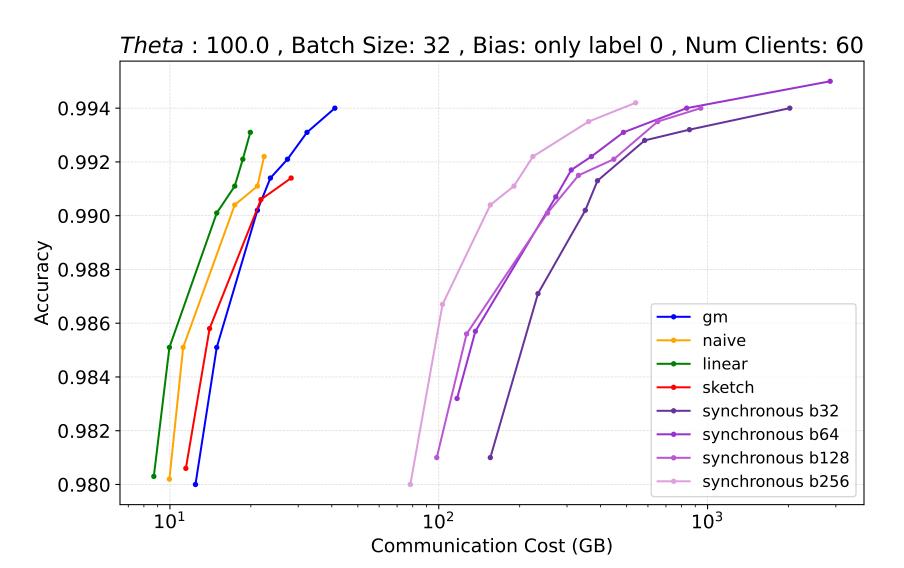


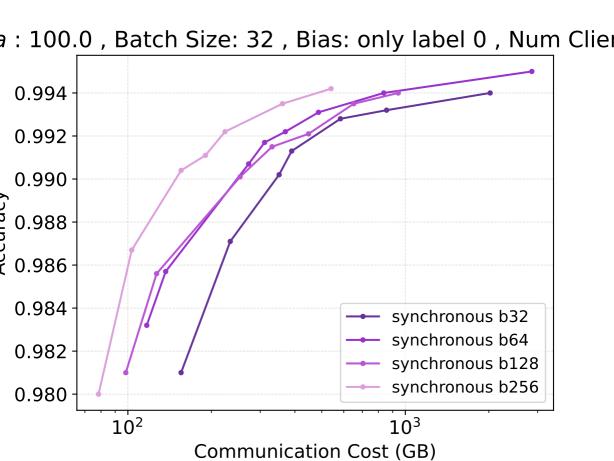


Theta: 100.0, Batch Size: 32, Bias: only label 0, Num Clients: 55 0.994 0.992 0.990 Accuracy 886.0 986.0 gm naive linear 0.984 sketch → synchronous b32 0.982 → synchronous b64 synchronous b128 synchronous b256 0.980  $10^{1}$ 10<sup>2</sup> 10<sup>3</sup>

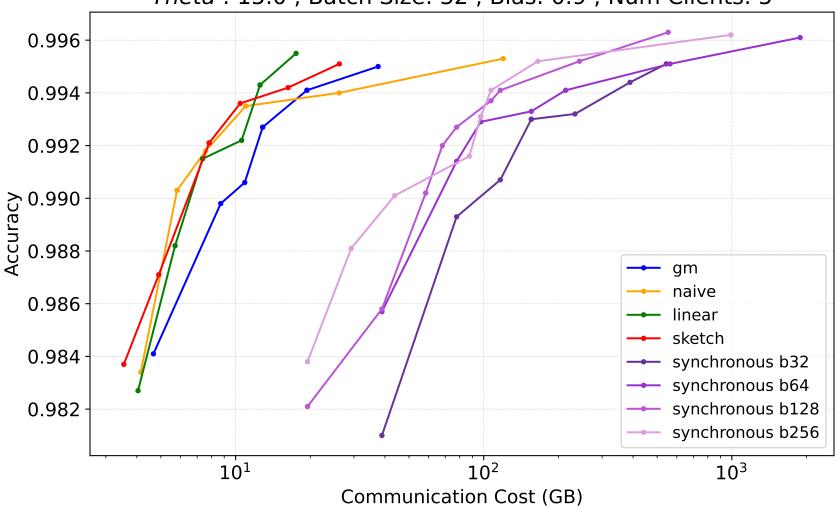
Communication Cost (GB)

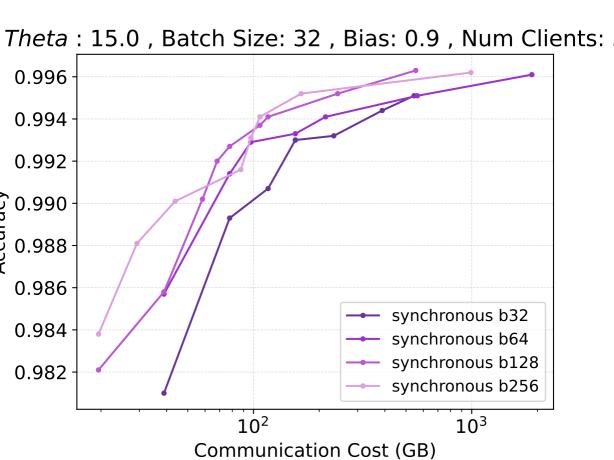


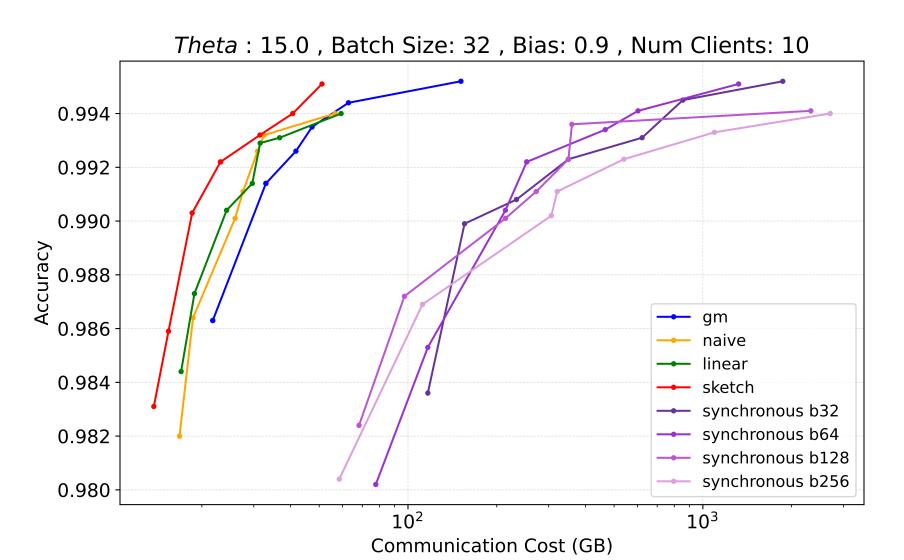


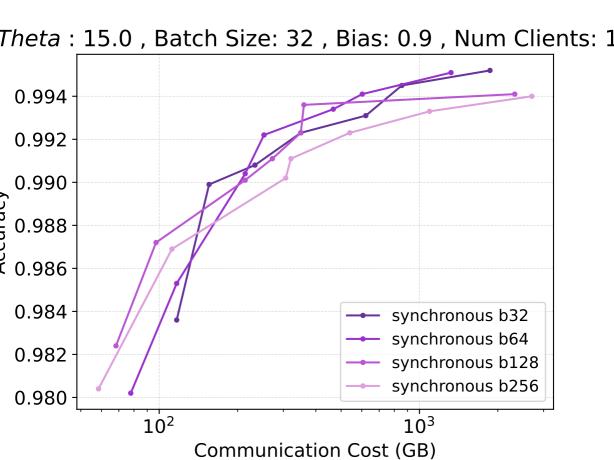


Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 5

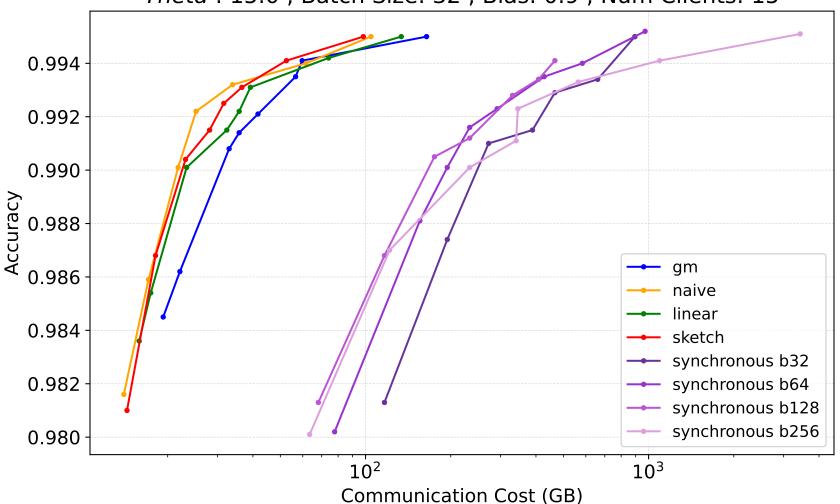


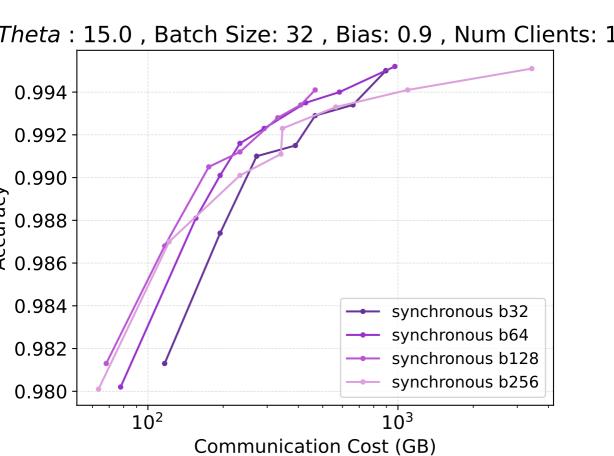




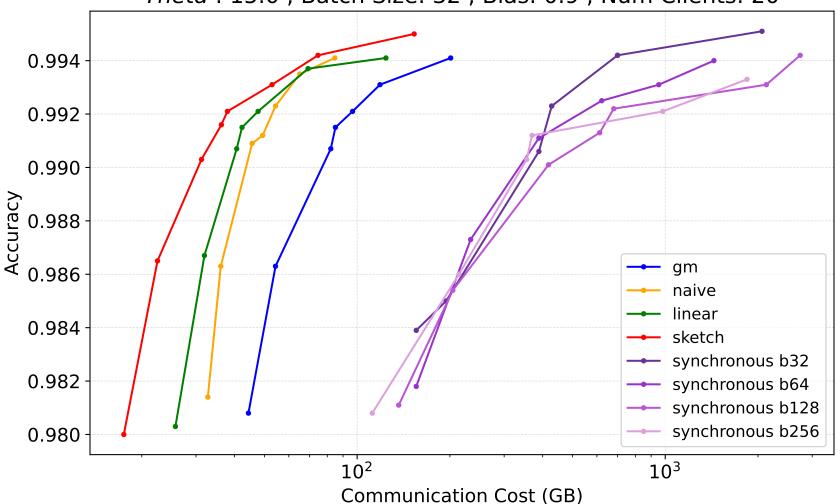


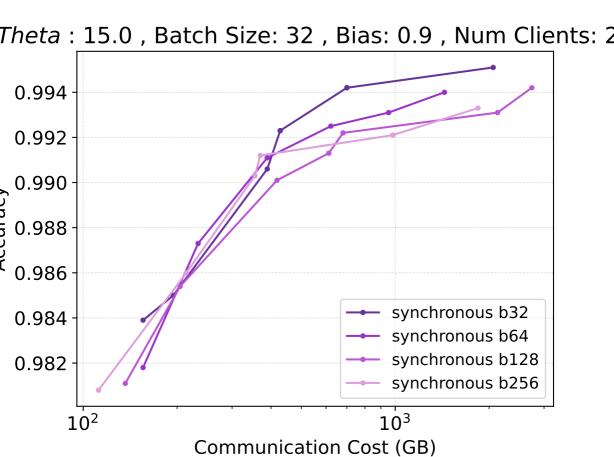
Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 15



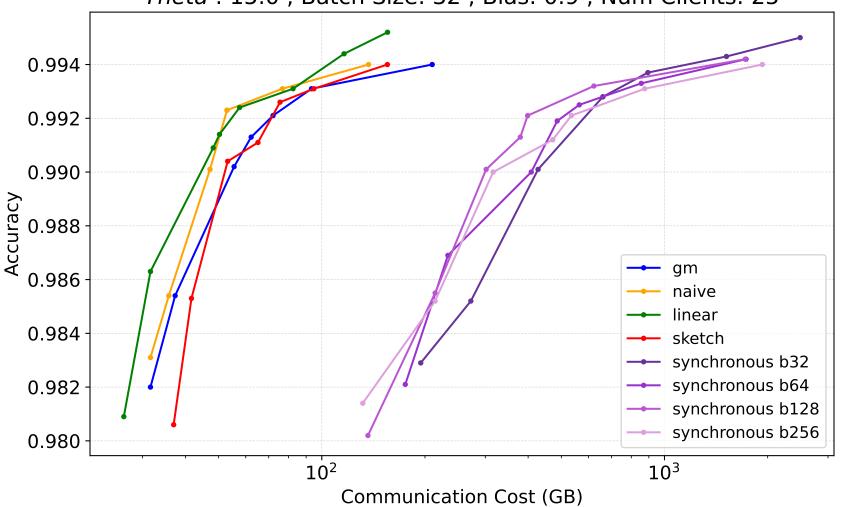


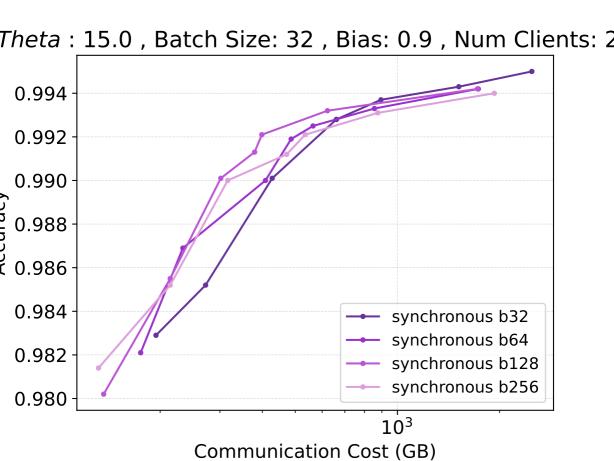
Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 20



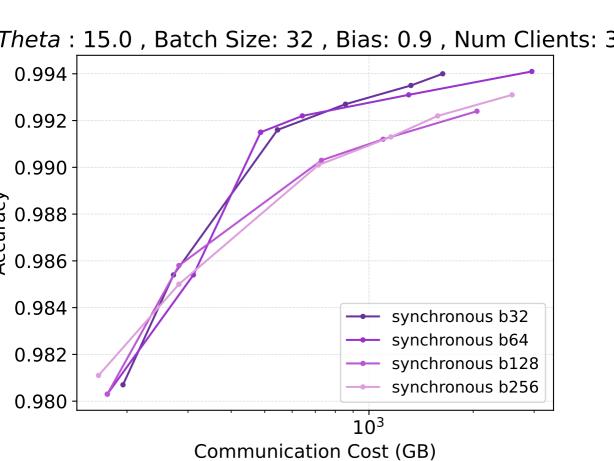


Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 25

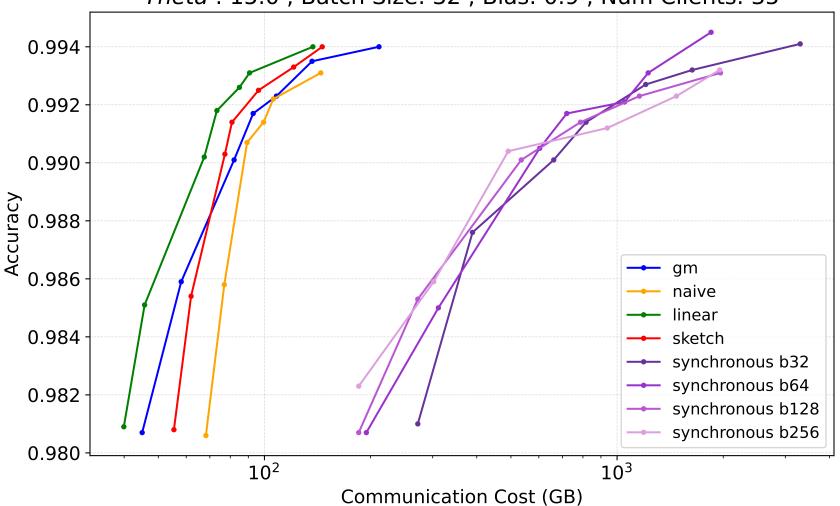


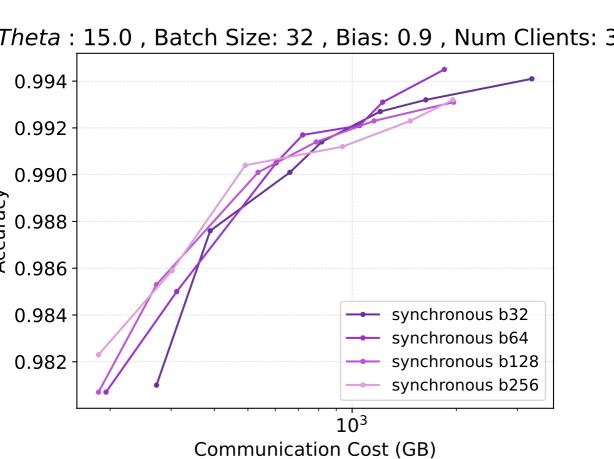


Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 30 0.994 0.992 0.990 Accuracy 986.0 986.0 gm naive linear 0.984 sketch synchronous b32 0.982synchronous b64 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup> Communication Cost (GB)

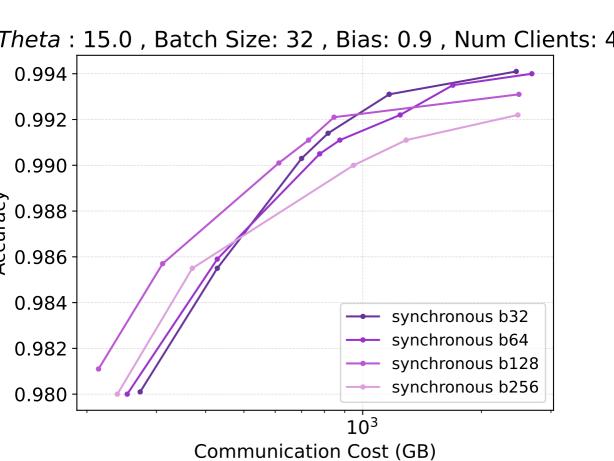


Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 35



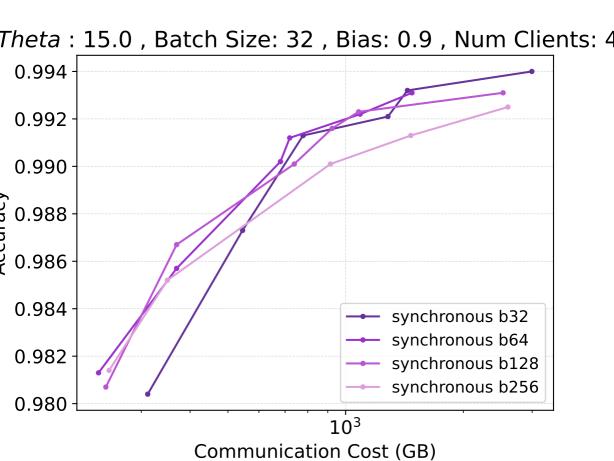


Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 40 0.994 0.992 0.990 Accuracy 0.988 0.986 gm naive linear 0.984 sketch → synchronous b32 0.982 → synchronous b64 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup> Communication Cost (GB)

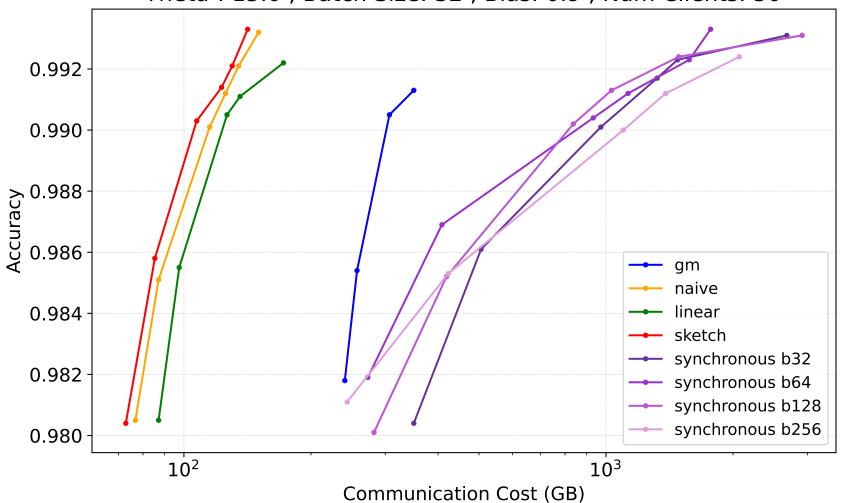


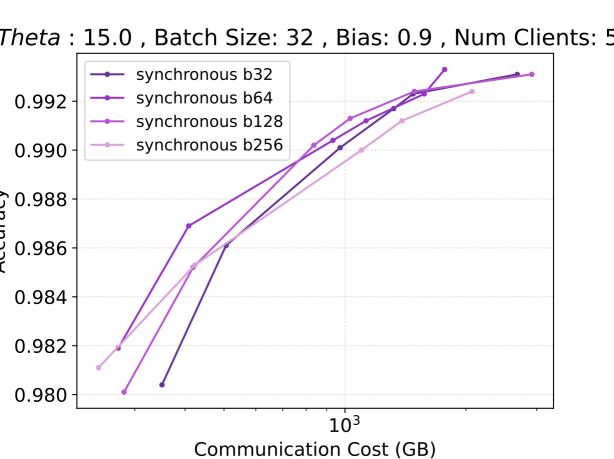
Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 45 0.994 0.992 0.990 Accuracy 986.0 gm naive linear 0.984 sketch synchronous b32 synchronous b64 0.982 synchronous b128 synchronous b256 0.980  $10^2$ 10<sup>3</sup>

Communication Cost (GB)

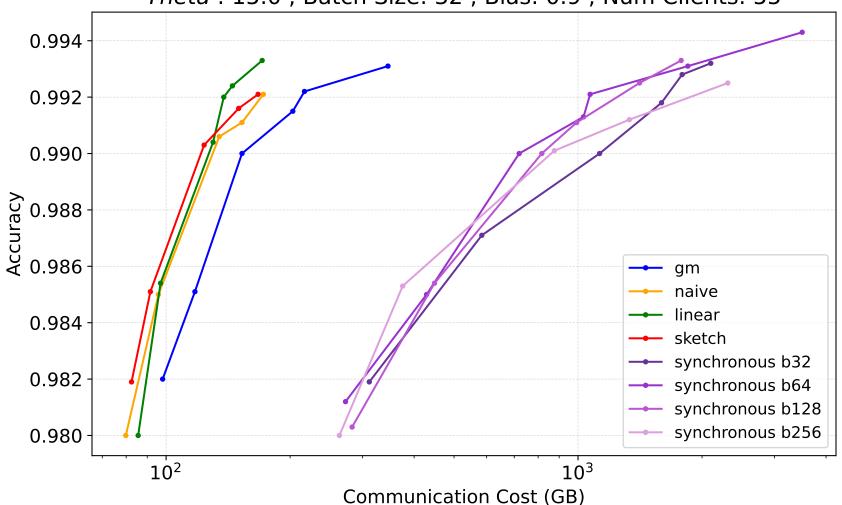


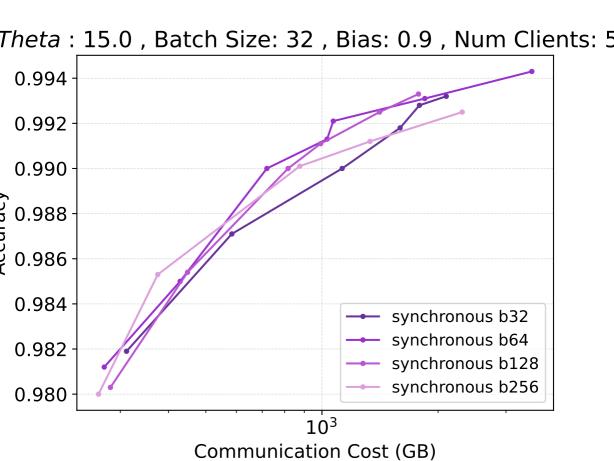
Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 50





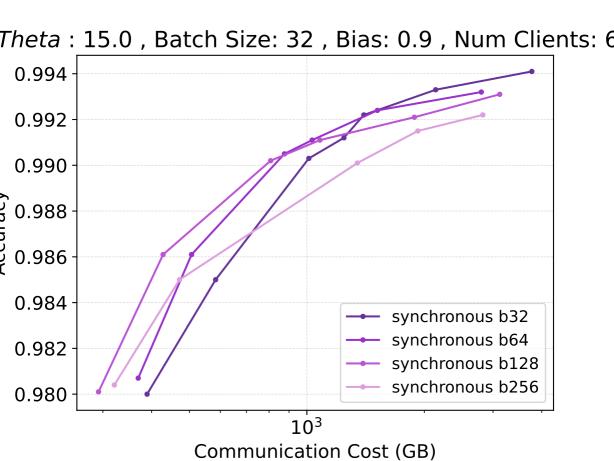
Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 55

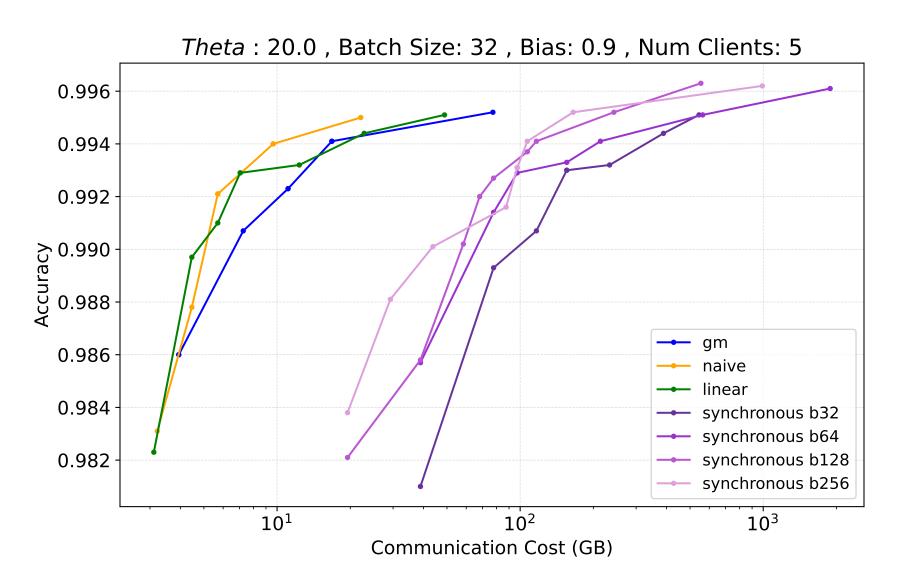


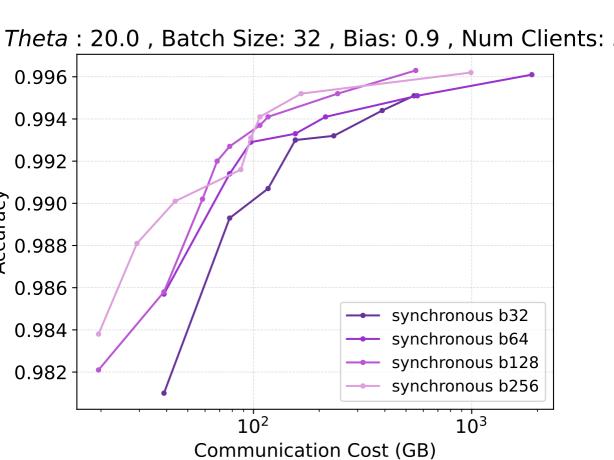


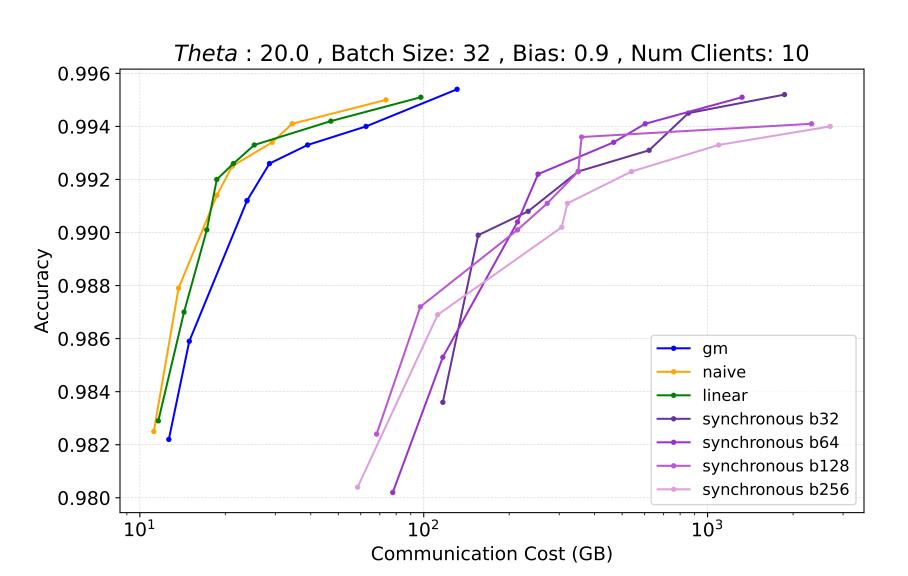
Theta: 15.0, Batch Size: 32, Bias: 0.9, Num Clients: 60 0.994 0.992 0.990 Accuracy 986.0 gm naive linear 0.984 sketch → synchronous b32 0.982 → synchronous b64 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup>

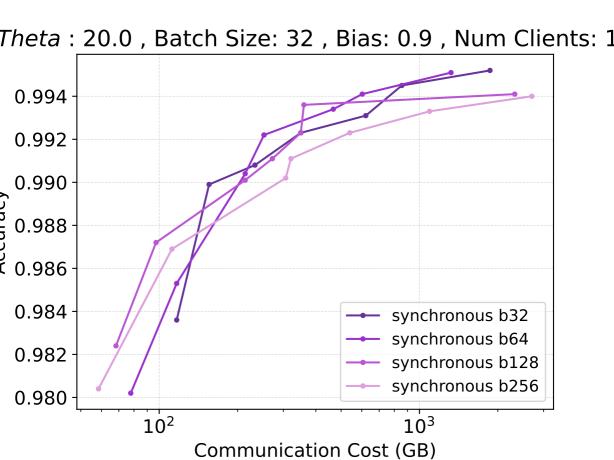
Communication Cost (GB)



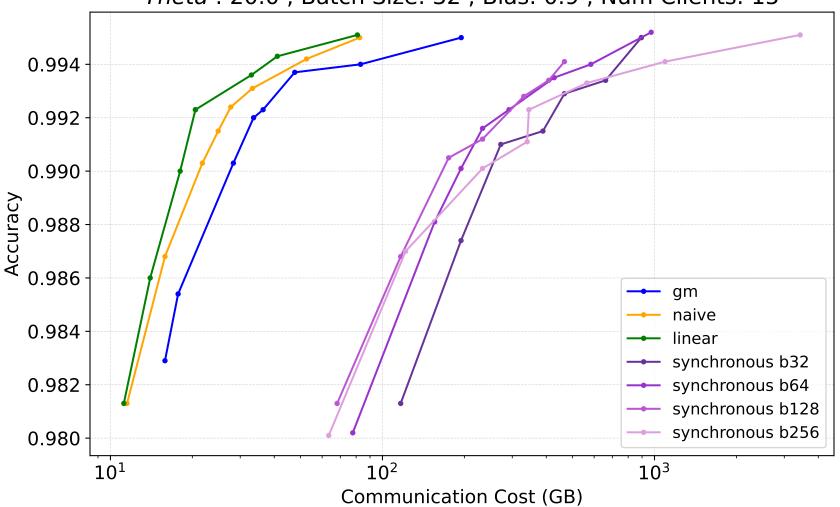


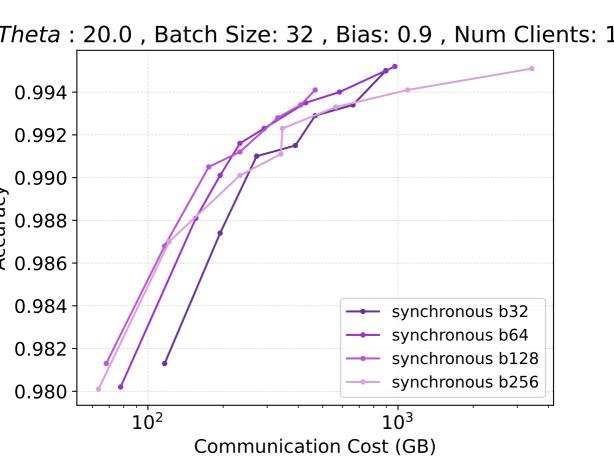




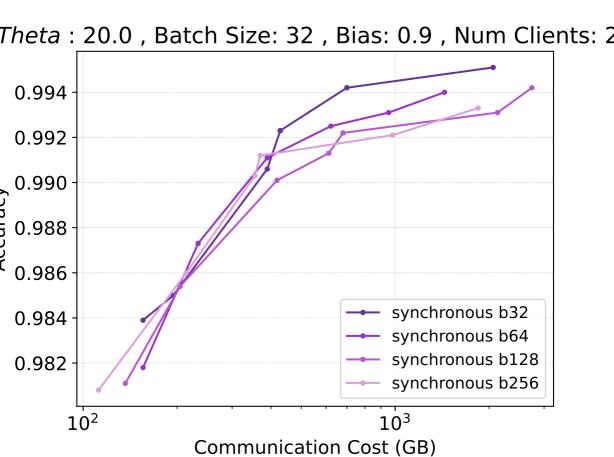


Theta: 20.0, Batch Size: 32, Bias: 0.9, Num Clients: 15

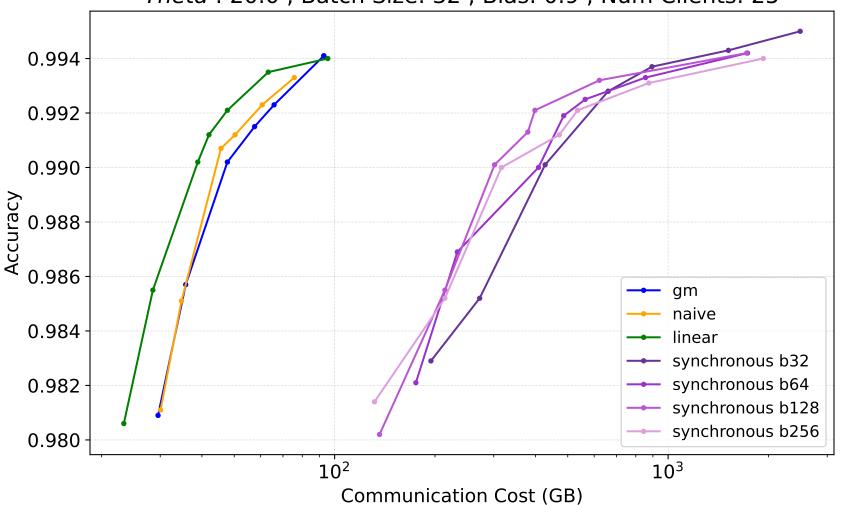


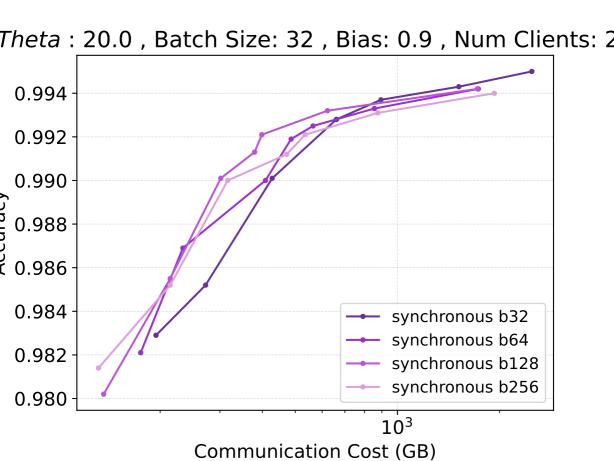




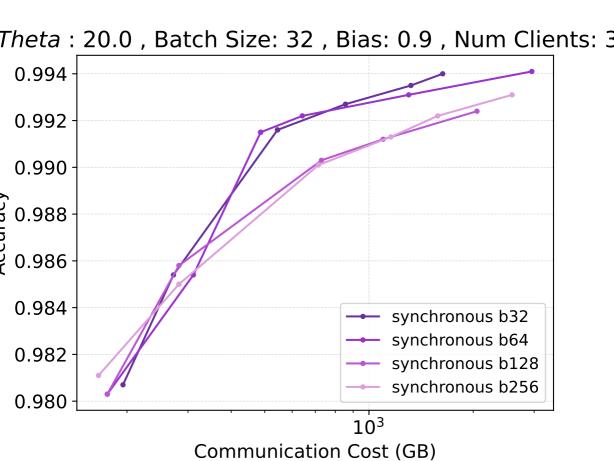


Theta: 20.0, Batch Size: 32, Bias: 0.9, Num Clients: 25

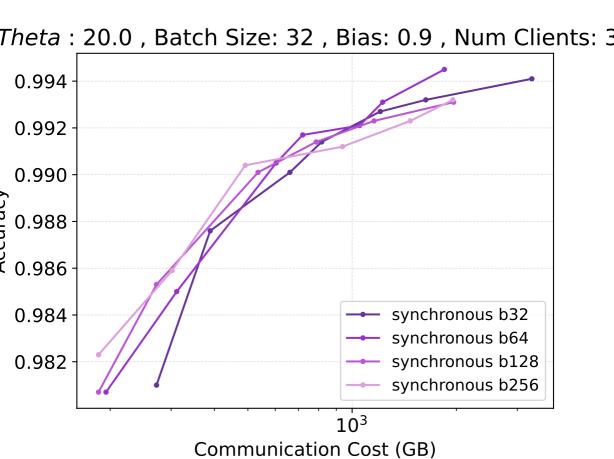


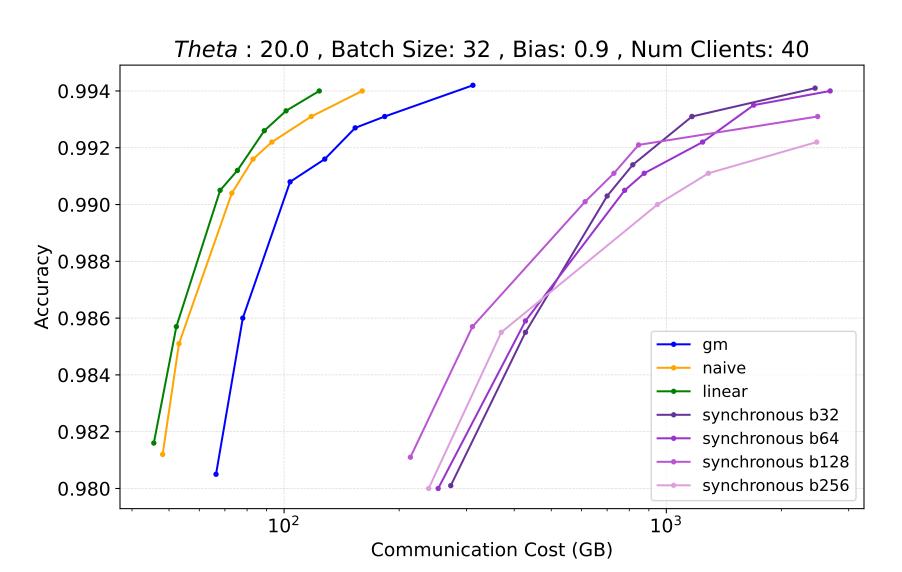


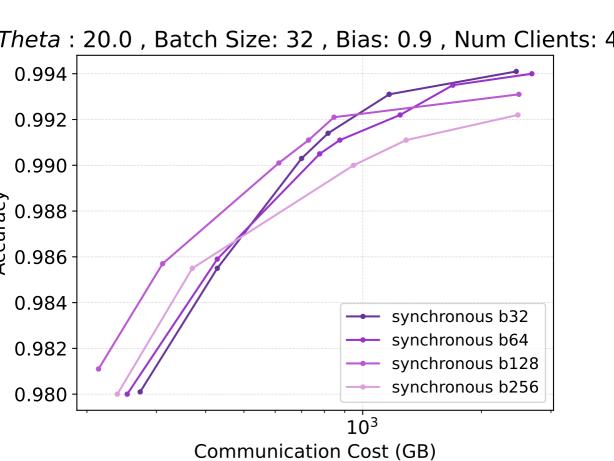
Theta: 20.0, Batch Size: 32, Bias: 0.9, Num Clients: 30 0.994 0.992 0.990 Accuracy 986.0 986.0 gm naive 0.984 linear synchronous b32 synchronous b64 0.982 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup> Communication Cost (GB)

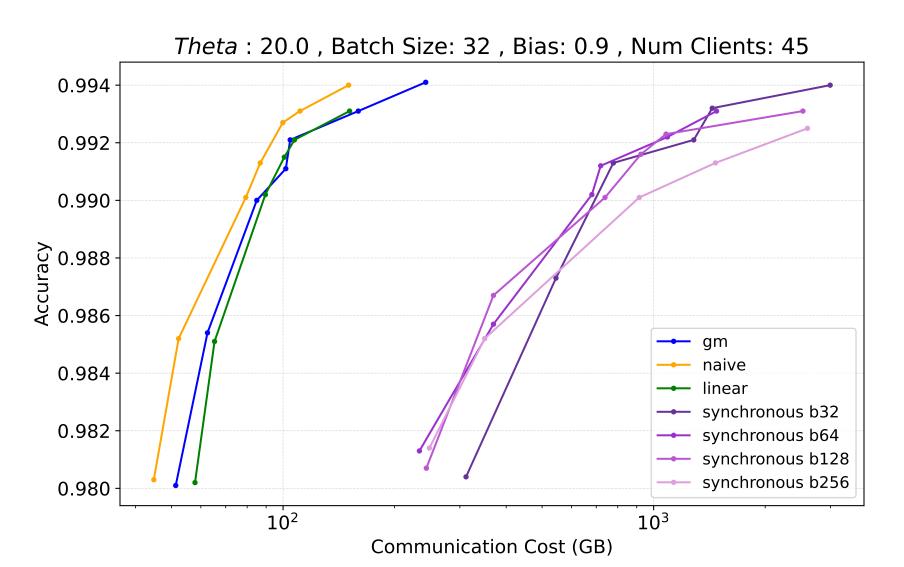


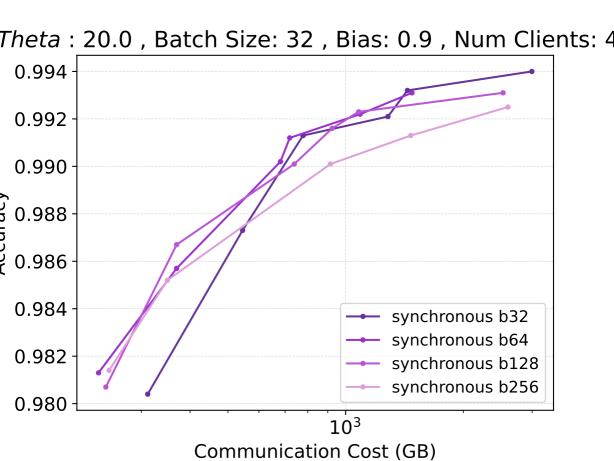


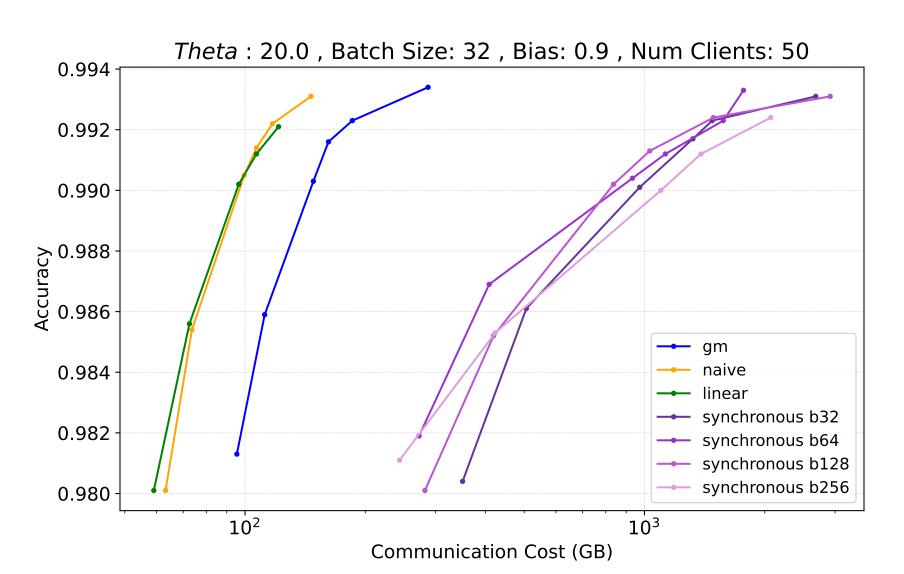


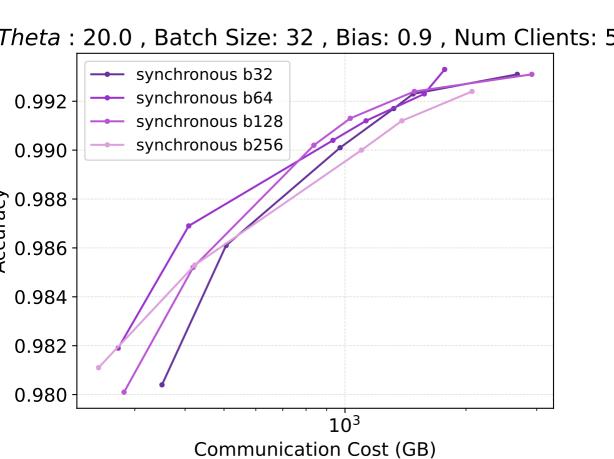


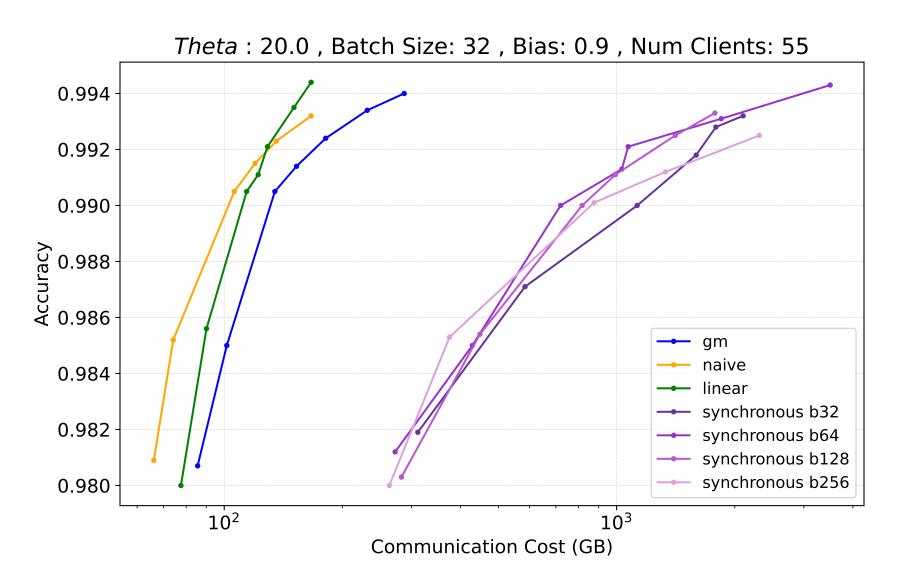


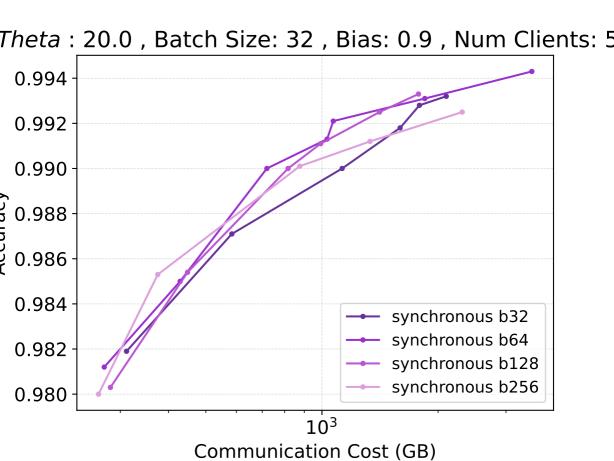




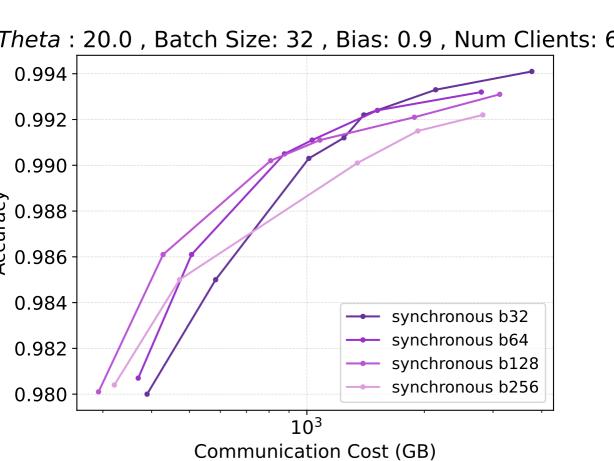


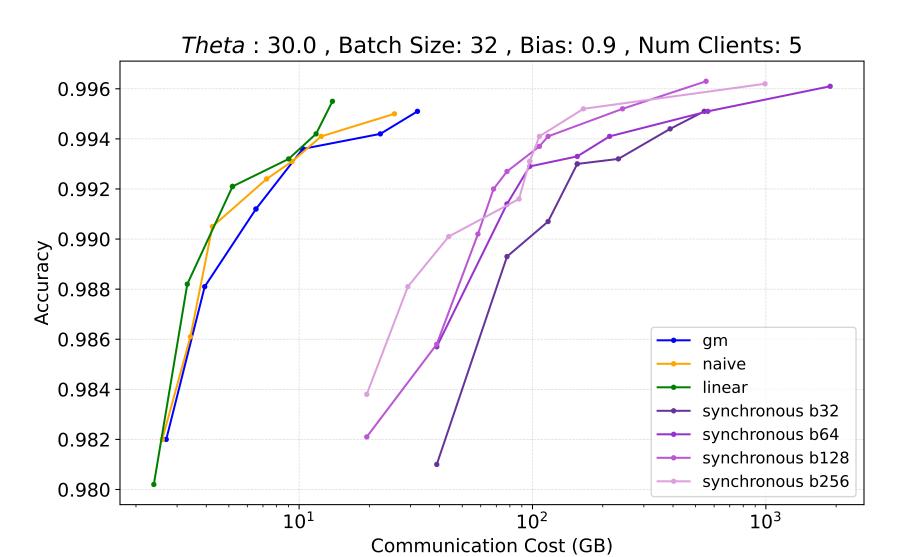


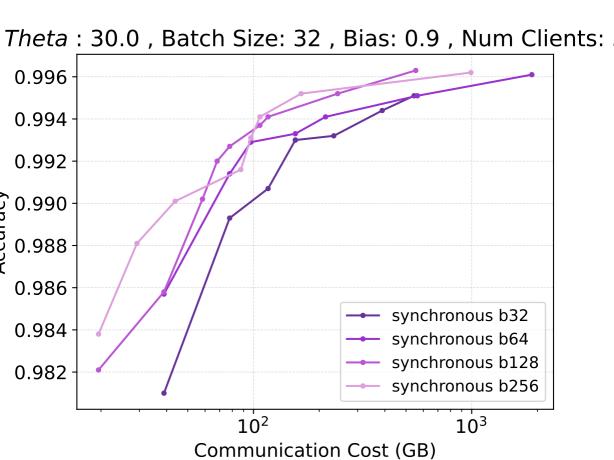




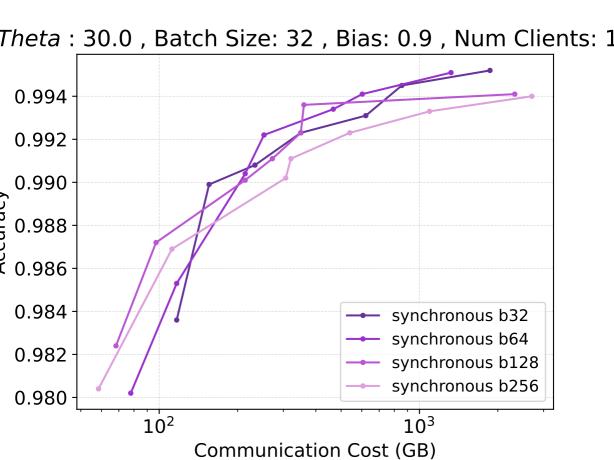


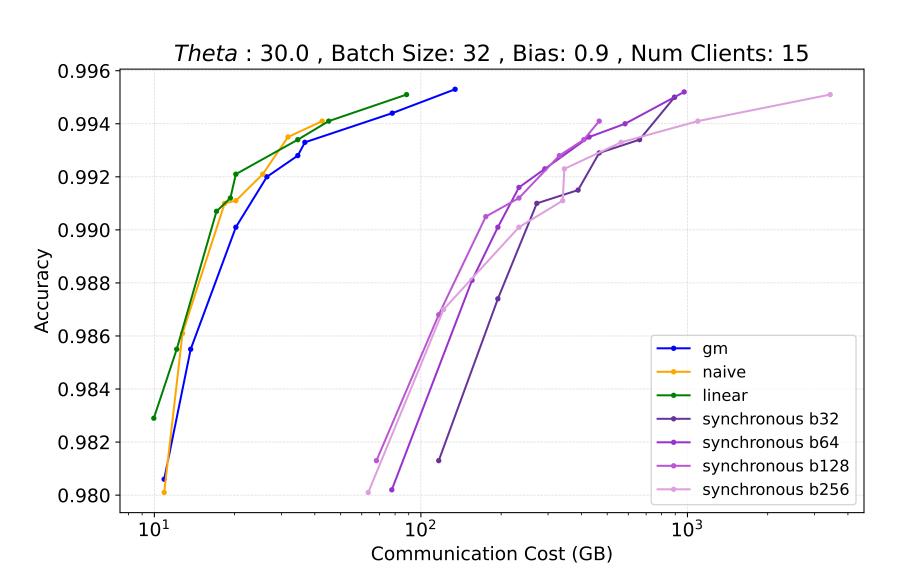


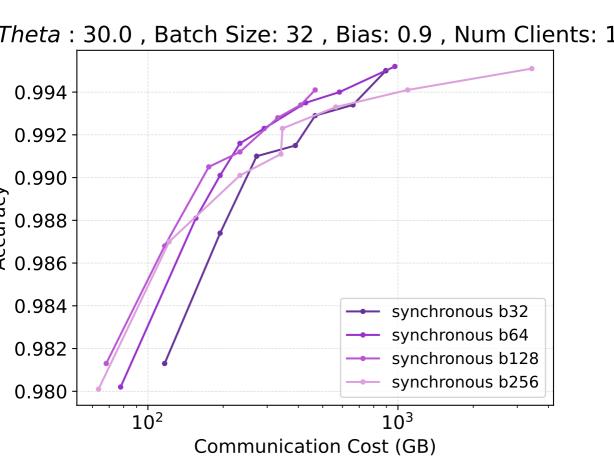


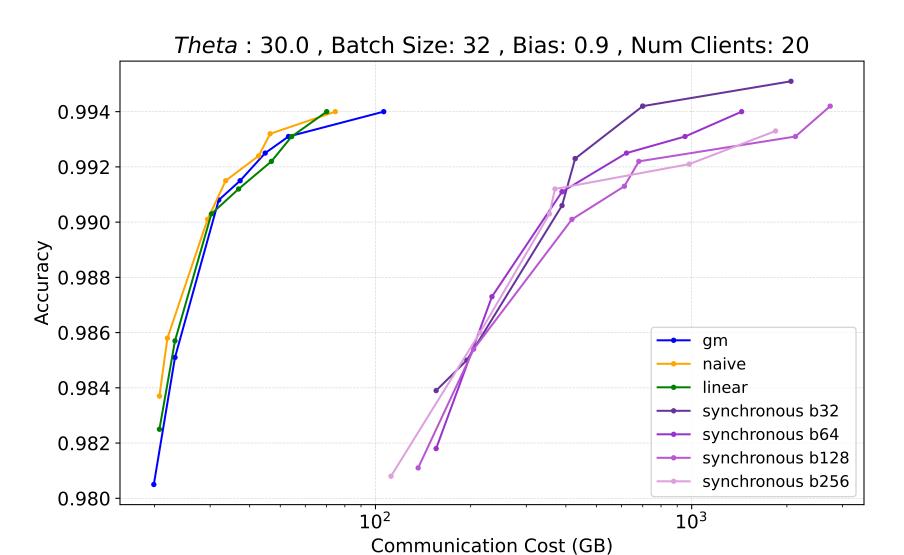


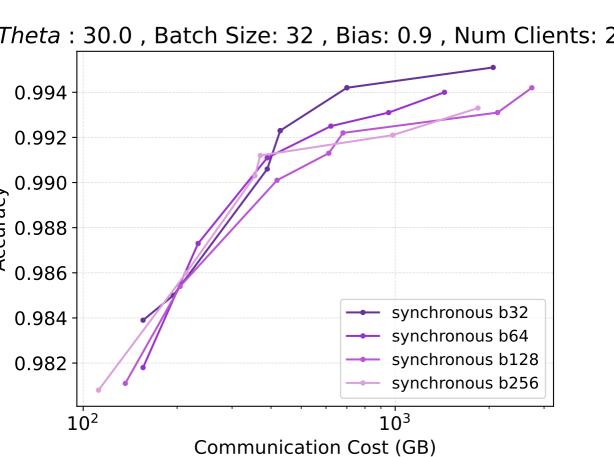


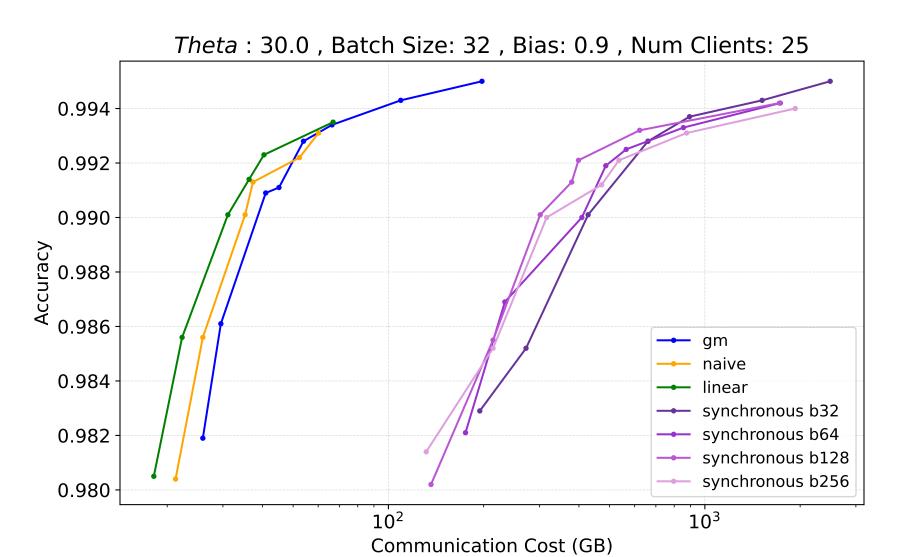


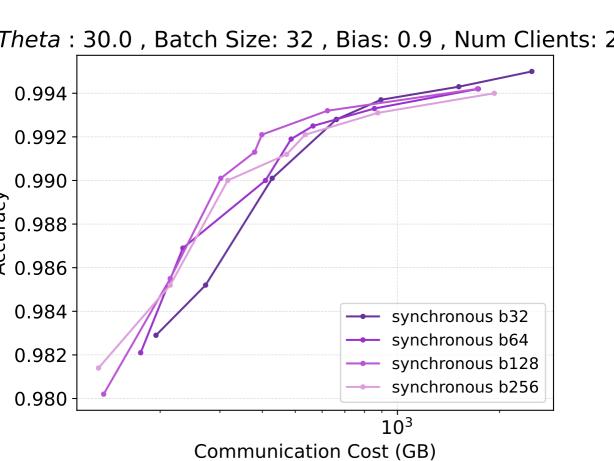










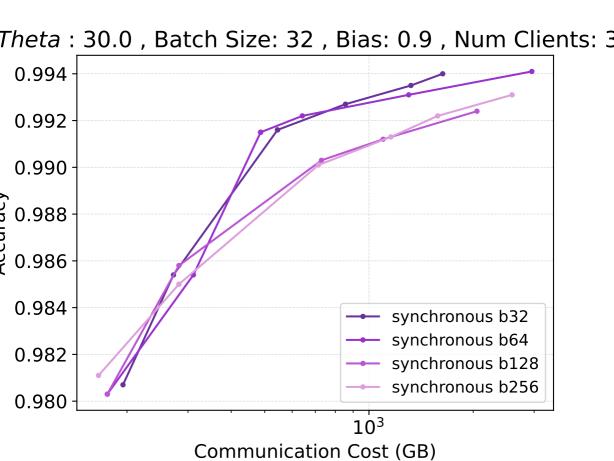


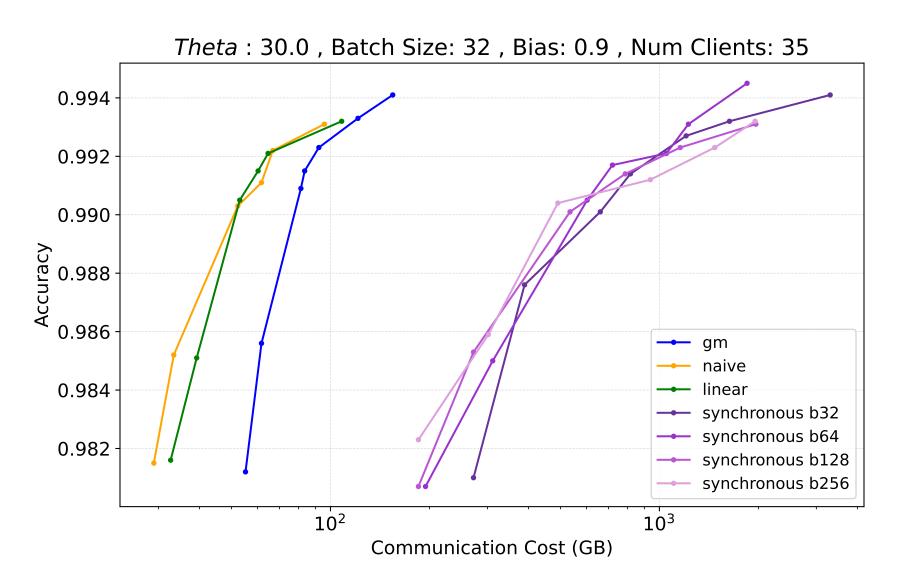
Theta: 30.0, Batch Size: 32, Bias: 0.9, Num Clients: 30 0.994 0.992 0.990 Accuracy 986.0 986.0 gm naive 0.984 linear synchronous b32 0.982 → synchronous b64 synchronous b128 synchronous b256 0.980

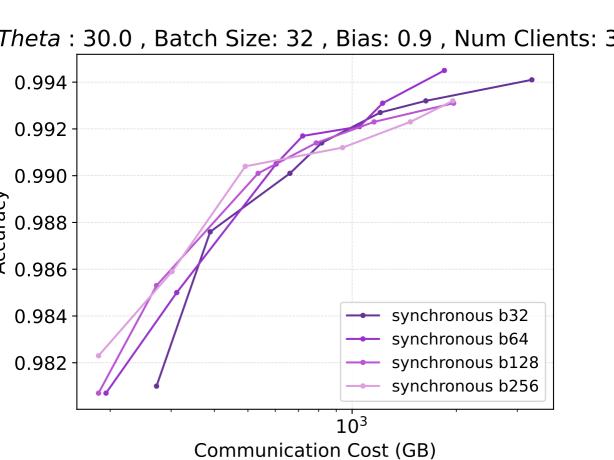
Communication Cost (GB)

10<sup>3</sup>

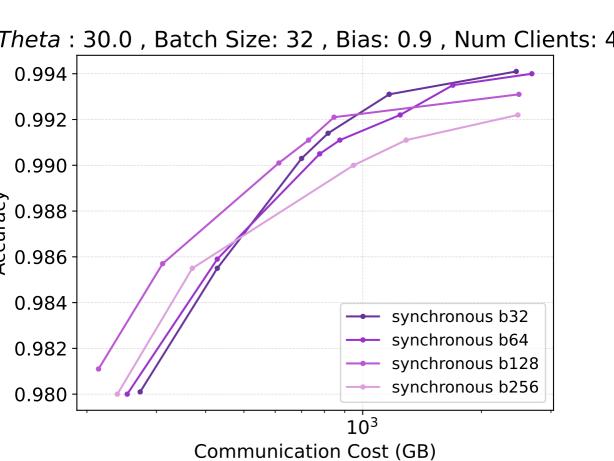
10<sup>2</sup>



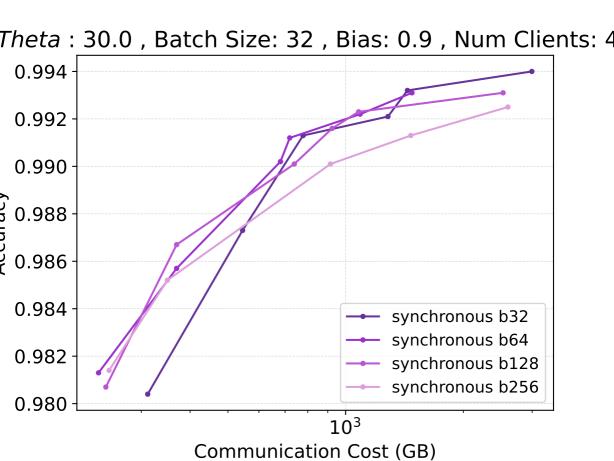


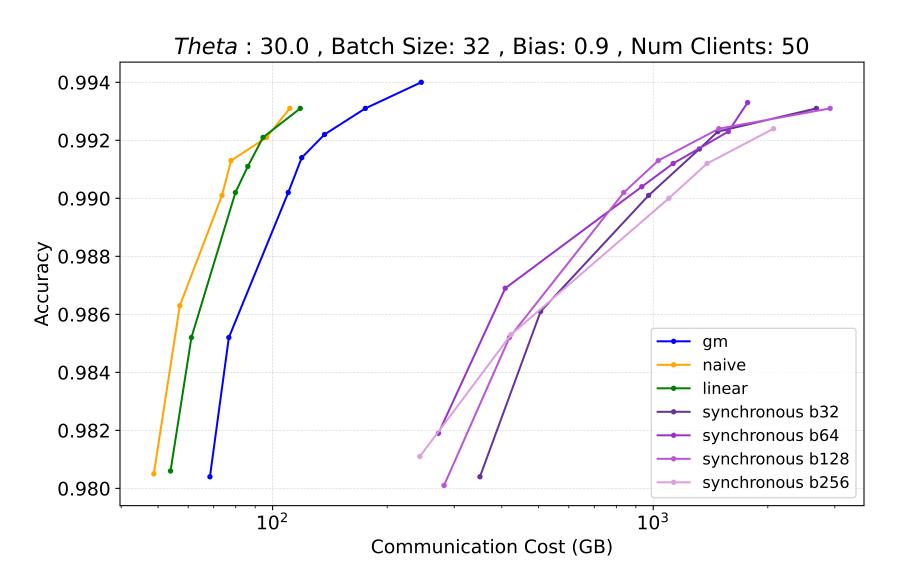


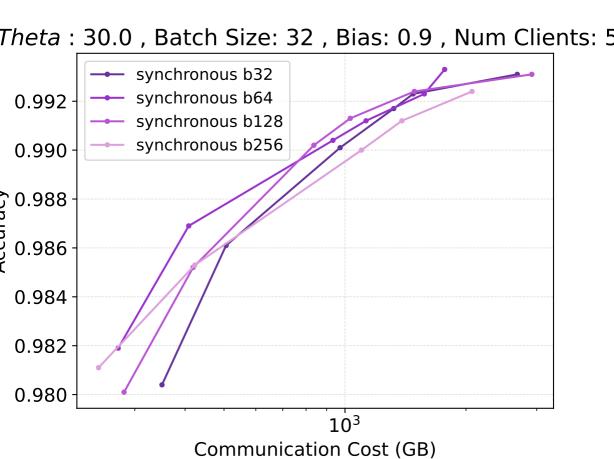




Theta: 30.0, Batch Size: 32, Bias: 0.9, Num Clients: 45 0.994 0.992 0.990 Accuracy 986.0 gm naive 0.984 linear synchronous b32 synchronous b64 0.982 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup> Communication Cost (GB)

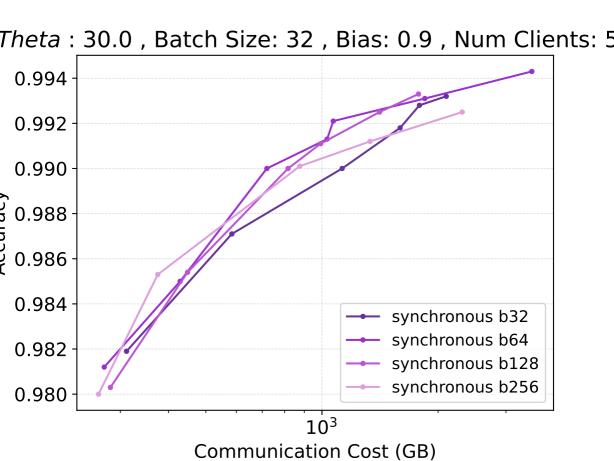


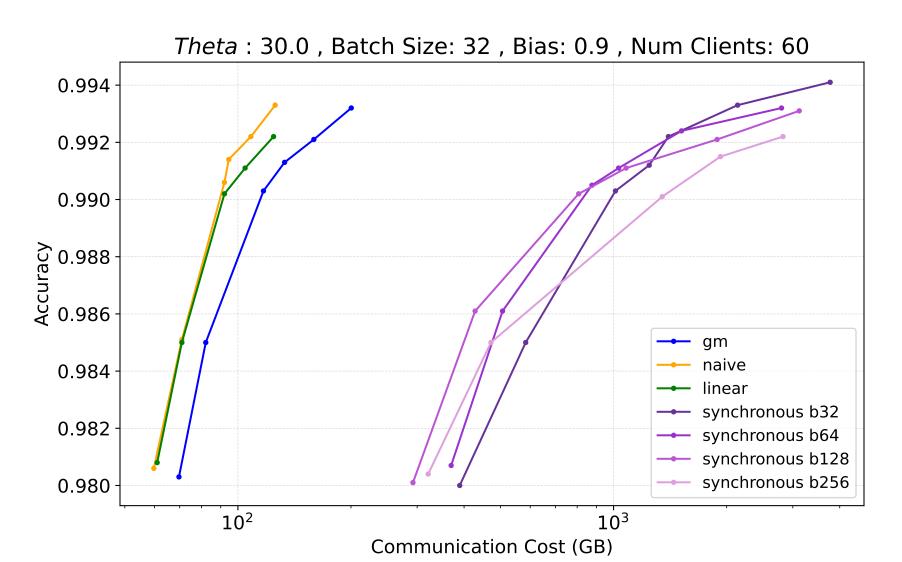


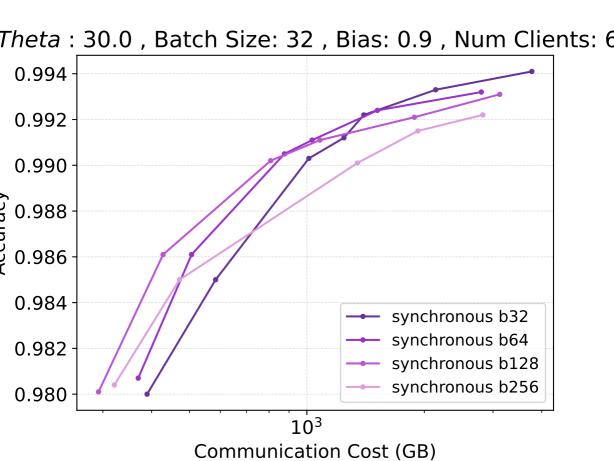


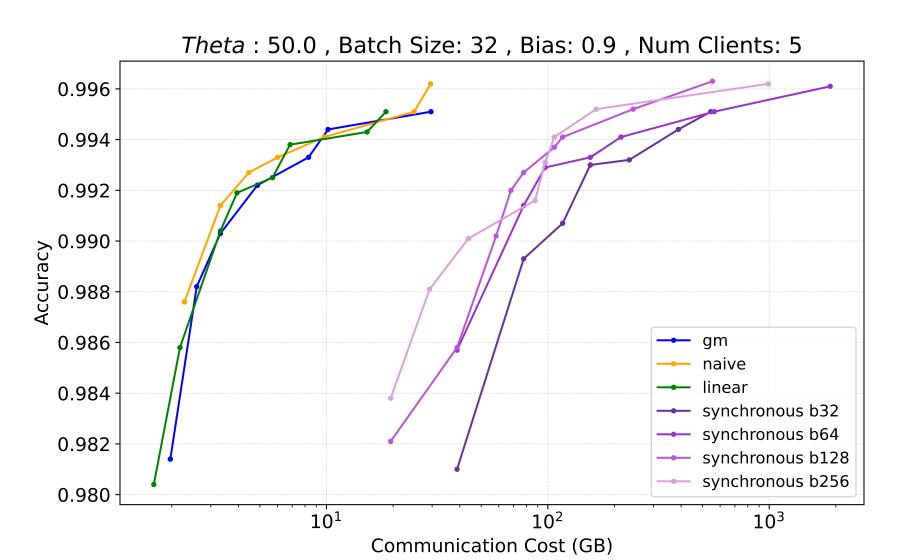
Theta: 30.0, Batch Size: 32, Bias: 0.9, Num Clients: 55 0.994 0.992 0.990 Accuracy 986.0 986.0 gm naive 0.984 linear synchronous b32 0.982 synchronous b64 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup>

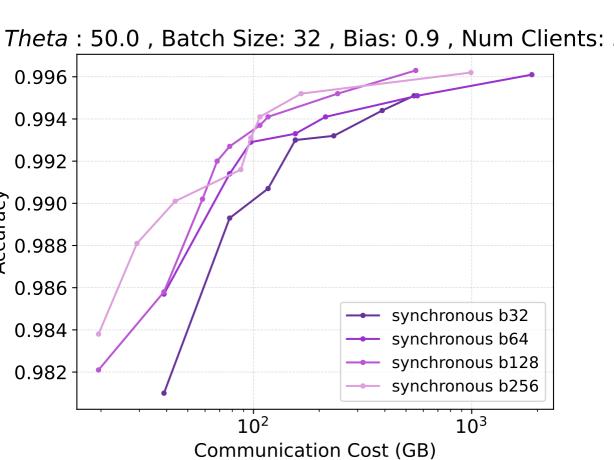
Communication Cost (GB)

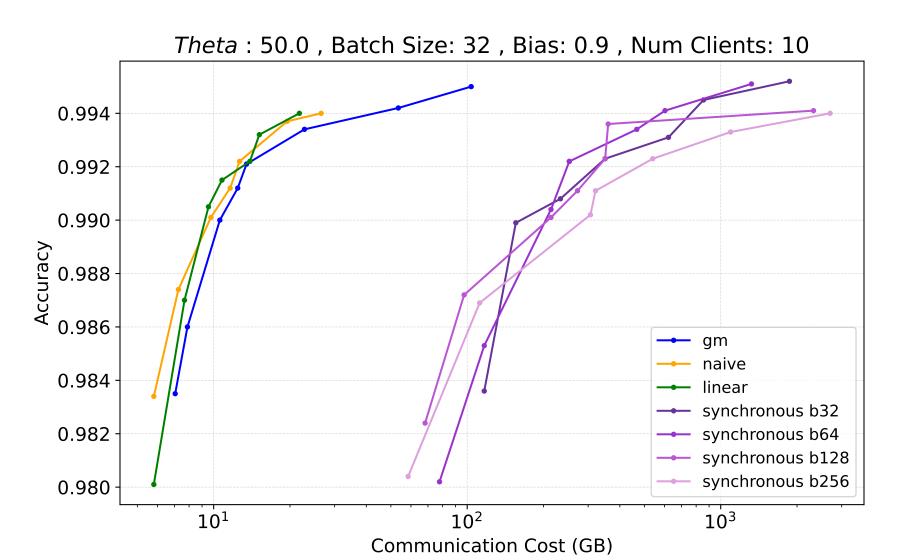


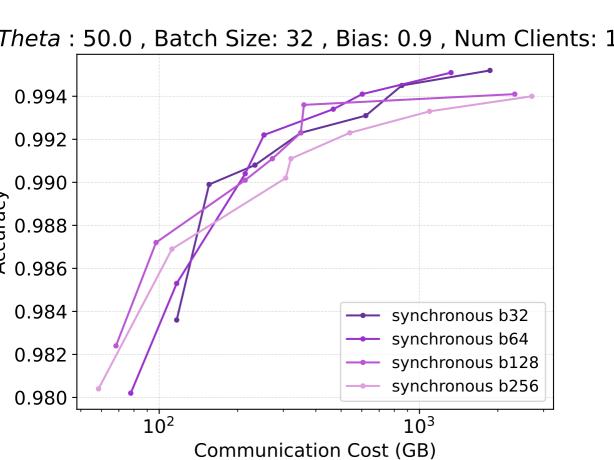




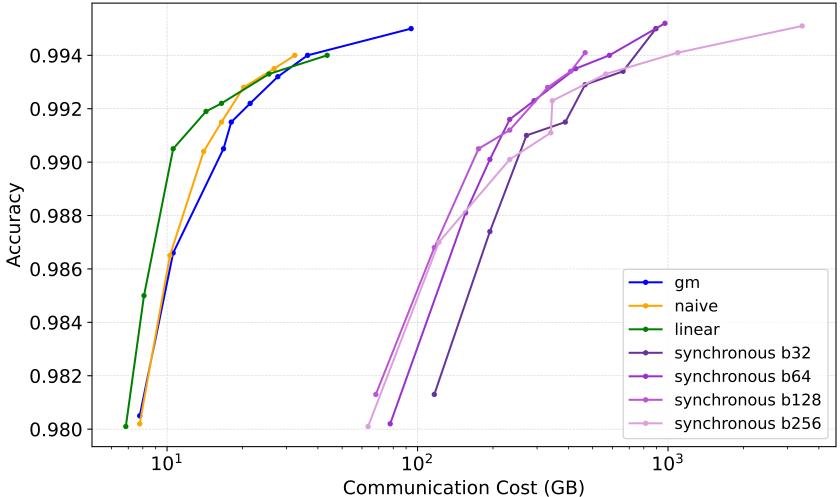


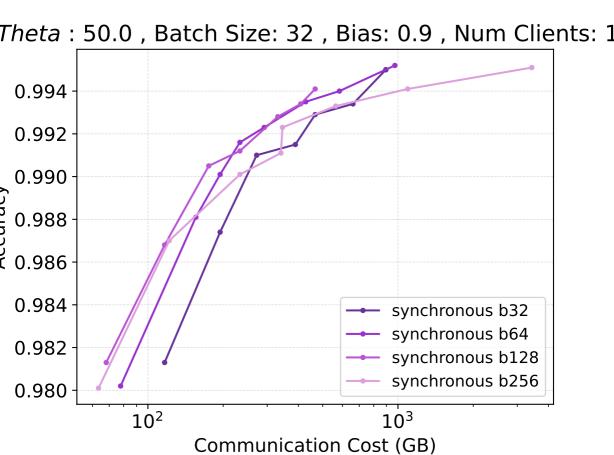




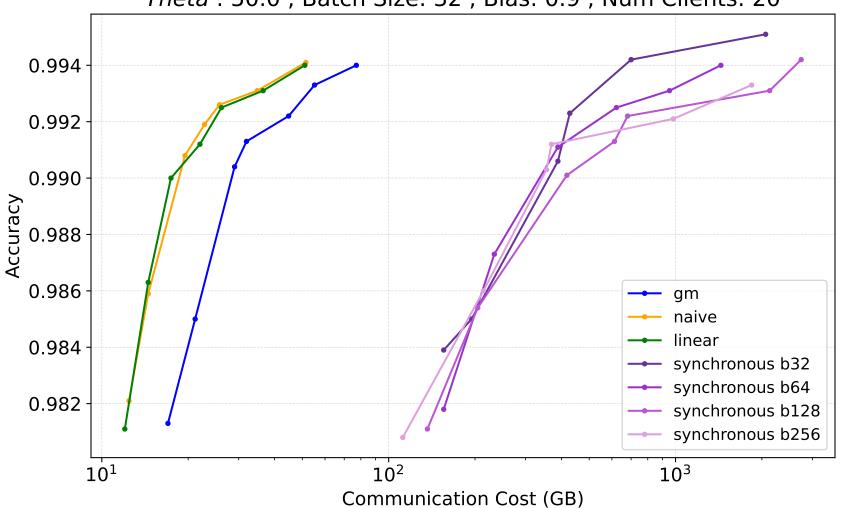


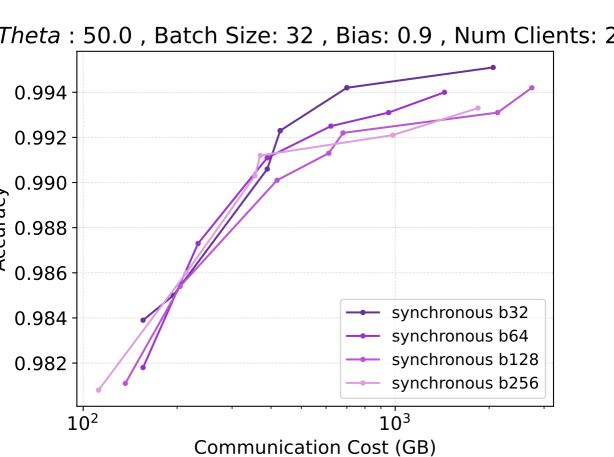
Theta: 50.0, Batch Size: 32, Bias: 0.9, Num Clients: 15

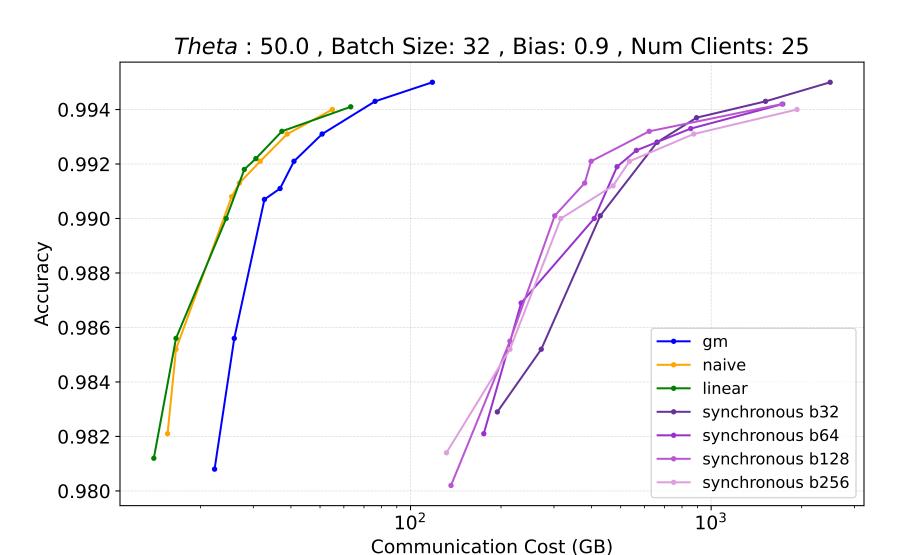


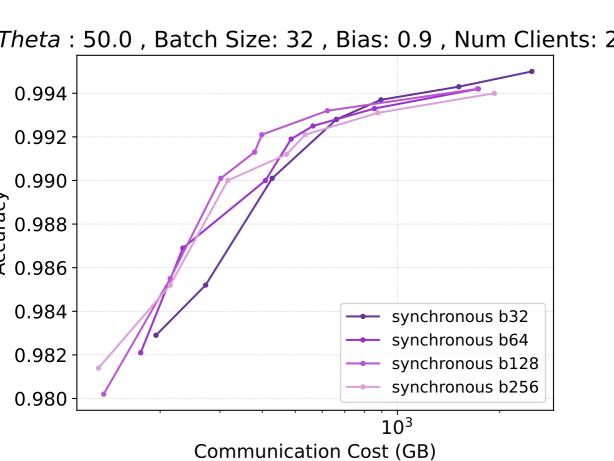


Theta: 50.0, Batch Size: 32, Bias: 0.9, Num Clients: 20

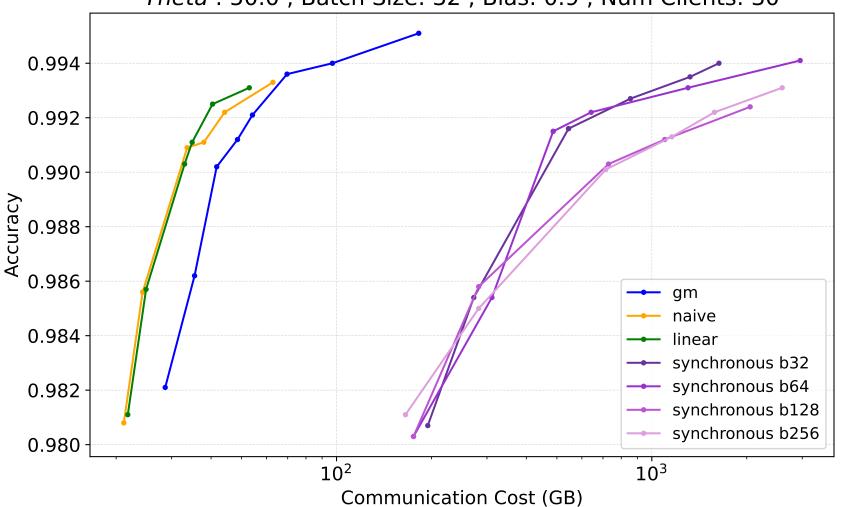


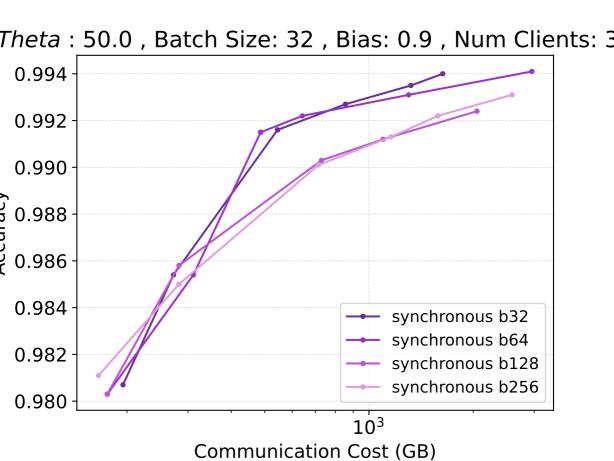




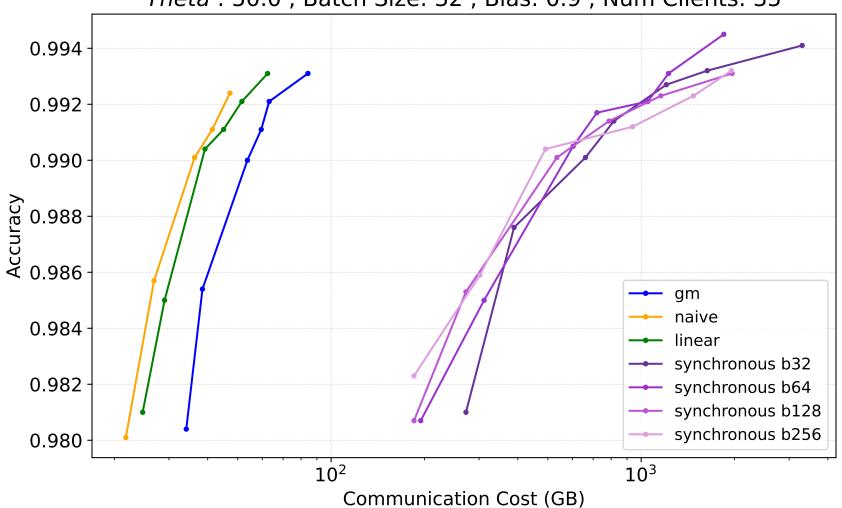


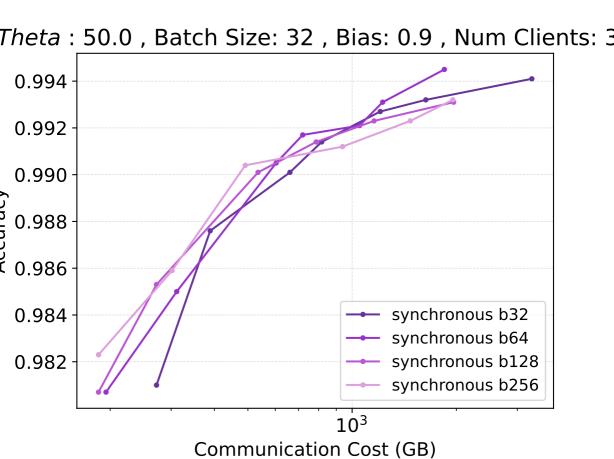
Theta: 50.0, Batch Size: 32, Bias: 0.9, Num Clients: 30





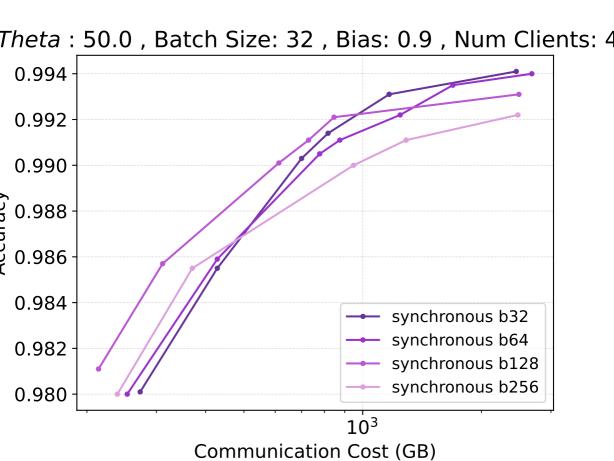
Theta: 50.0, Batch Size: 32, Bias: 0.9, Num Clients: 35

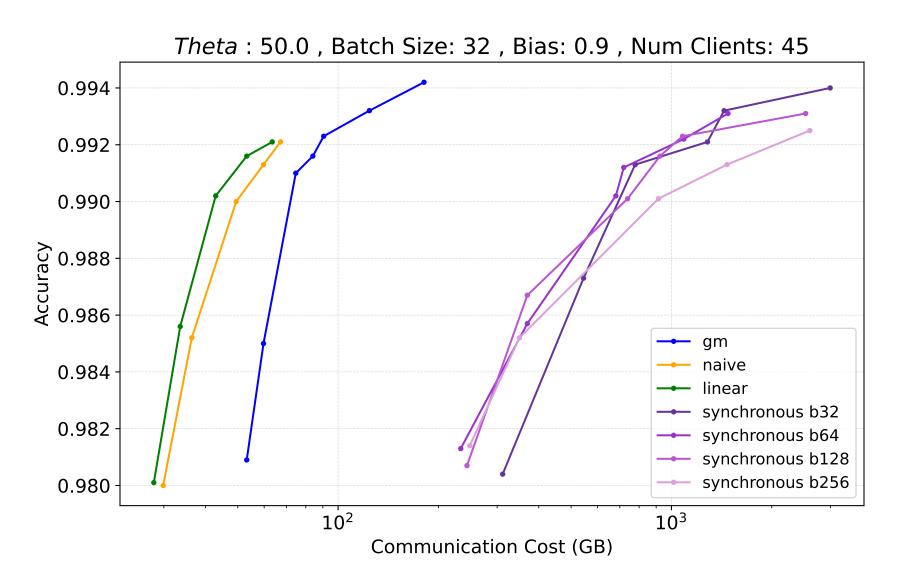


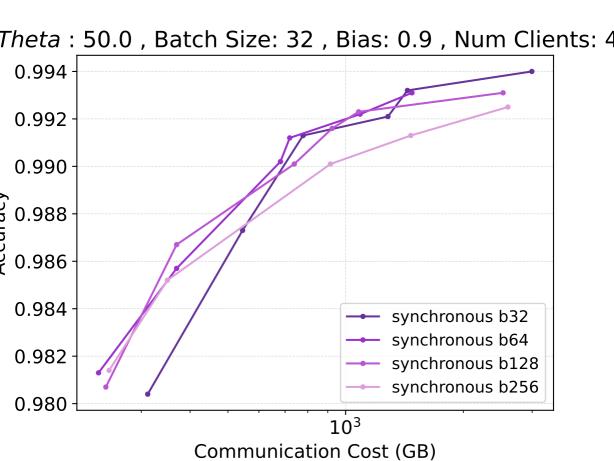


Theta: 50.0, Batch Size: 32, Bias: 0.9, Num Clients: 40 0.994 0.992 0.990 Accuracy 986.0 gm naive 0.984 linear synchronous b32 0.982 → synchronous b64 synchronous b128 synchronous b256 0.980 10<sup>2</sup> 10<sup>3</sup>

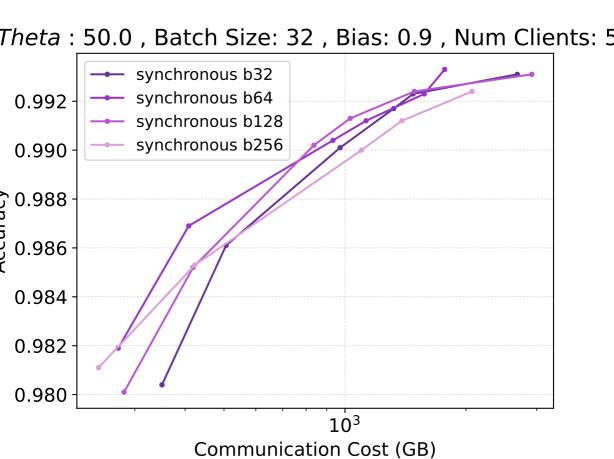
Communication Cost (GB)



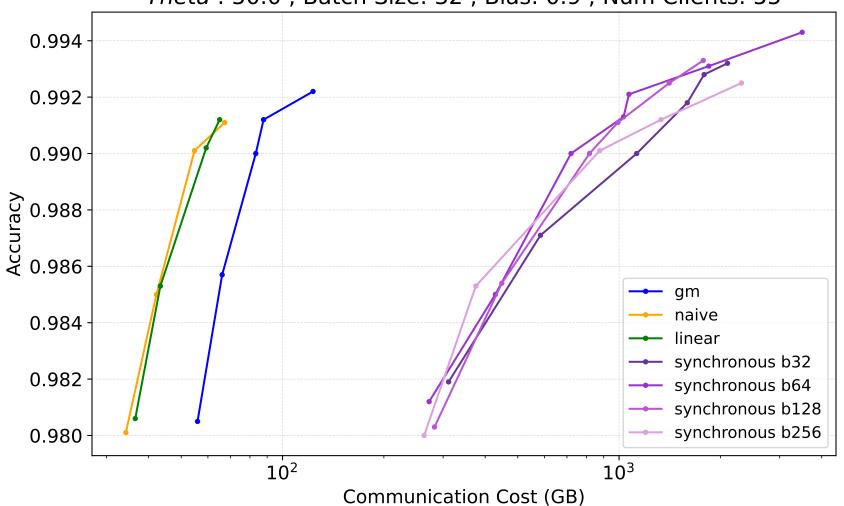


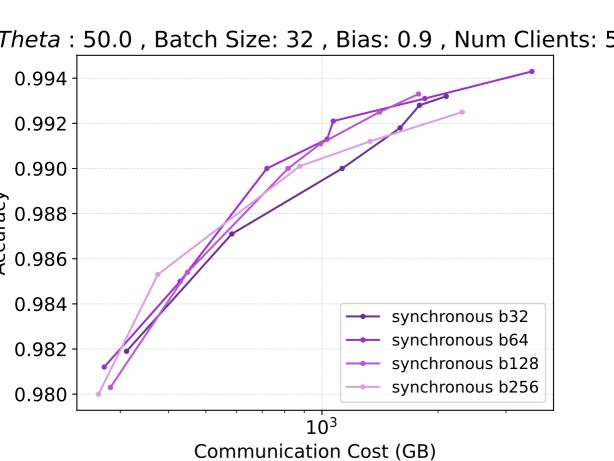


Theta: 50.0, Batch Size: 32, Bias: 0.9, Num Clients: 50 0.992 0.990 Accuracy 986.0 986.0 gm 0.984 naive linear synchronous b32 0.982 synchronous b64 synchronous b128 synchronous b256 0.980 102 10<sup>3</sup> Communication Cost (GB)



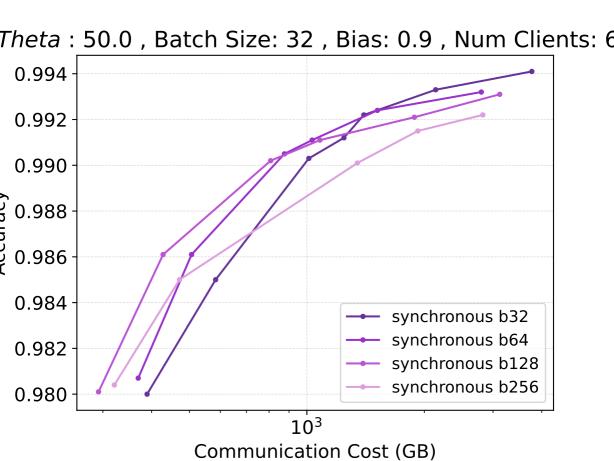
Theta: 50.0, Batch Size: 32, Bias: 0.9, Num Clients: 55



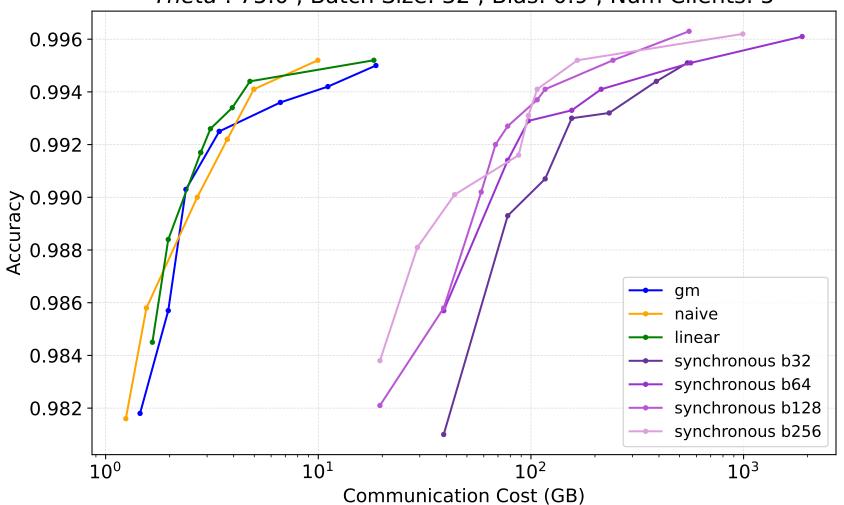


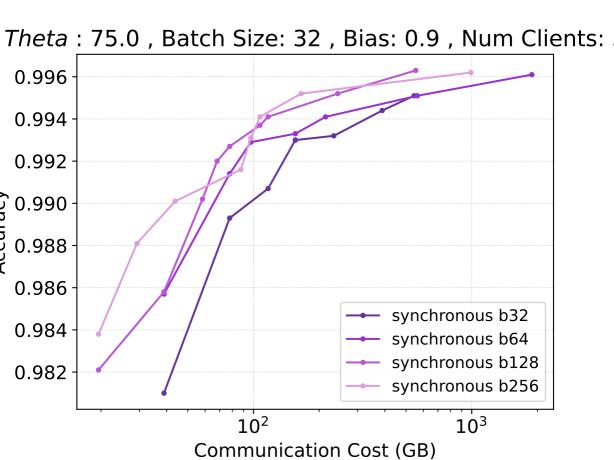
Theta: 50.0, Batch Size: 32, Bias: 0.9, Num Clients: 60 0.994 0.992 0.990 Accuracy 986.0 gm naive 0.984 linear synchronous b32 0.982 synchronous b64 synchronous b128 synchronous b256 0.980 102 10<sup>3</sup>

Communication Cost (GB)

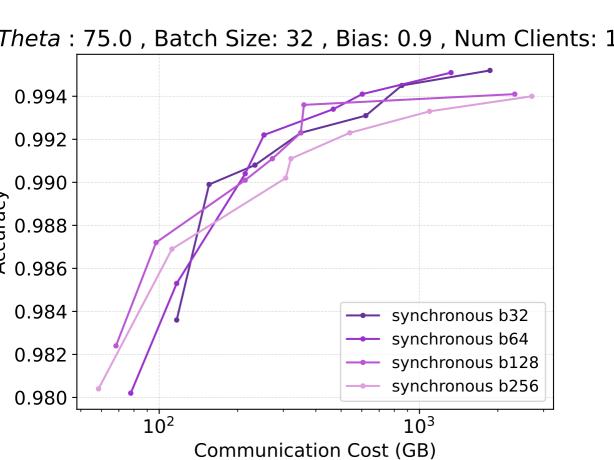


Theta: 75.0, Batch Size: 32, Bias: 0.9, Num Clients: 5









Theta: 75.0, Batch Size: 32, Bias: 0.9, Num Clients: 15 gm naive linear synchronous b32 synchronous b64 synchronous b128 synchronous b256

10<sup>2</sup>

Communication Cost (GB)

10<sup>3</sup>

0.994

0.992

0.990

0.988

0.986

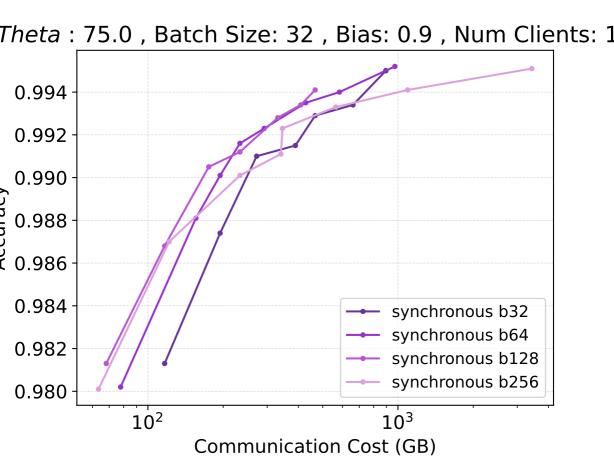
0.984

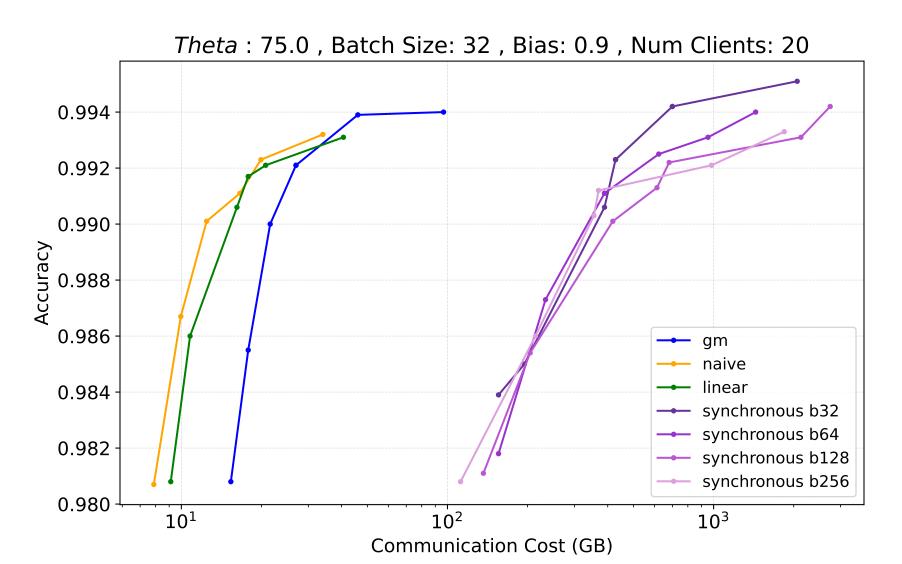
0.982

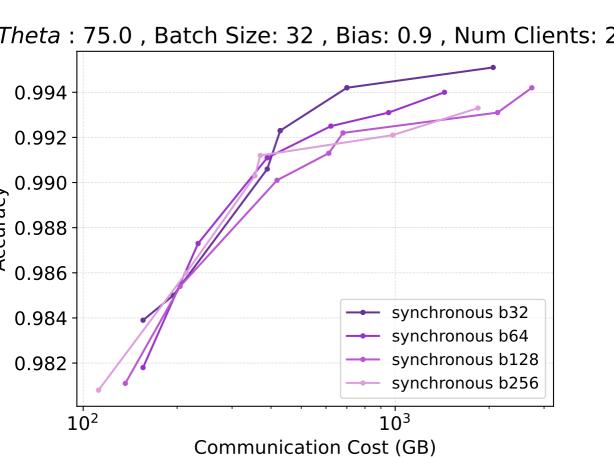
0.980

101

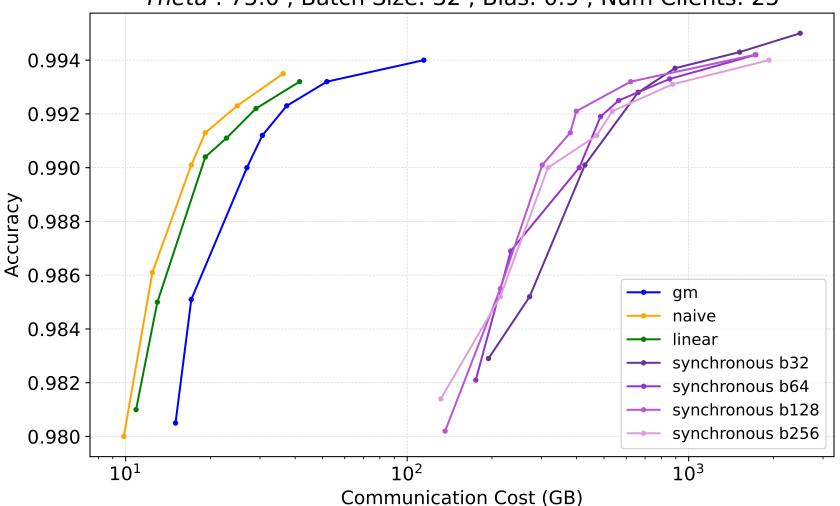
Accuracy

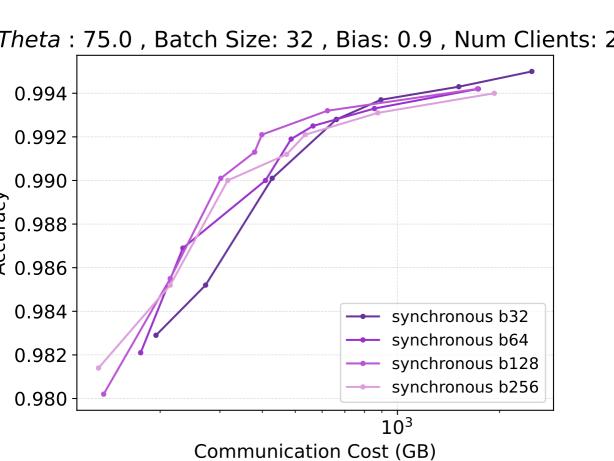


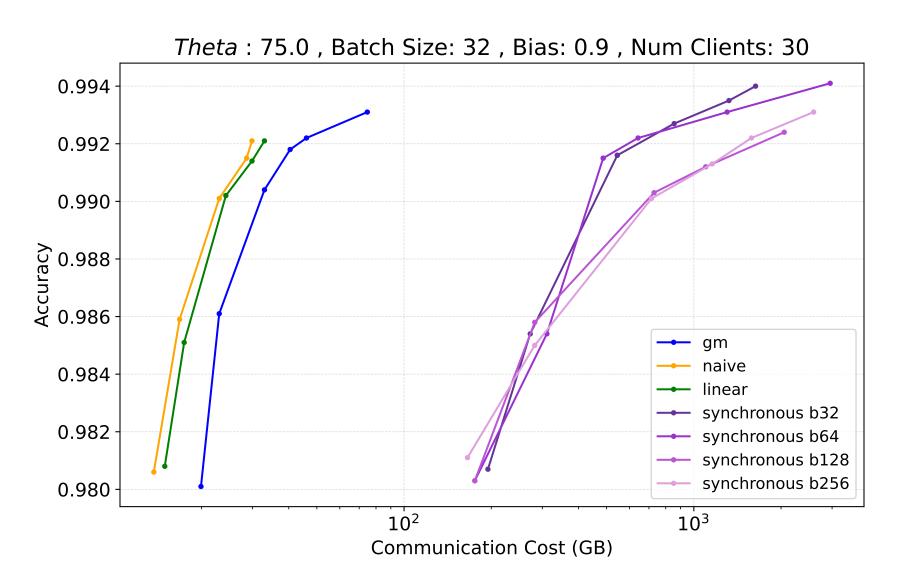


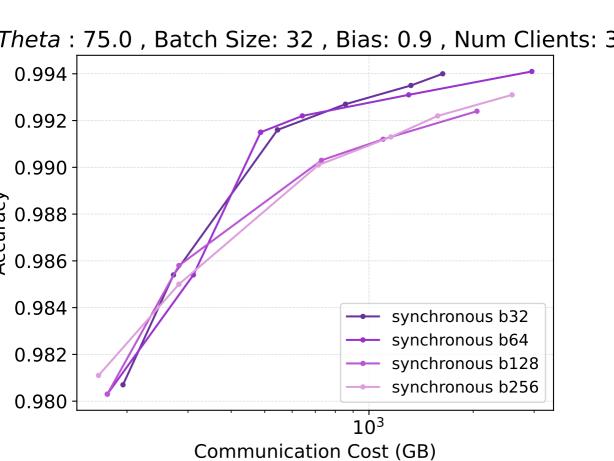


Theta: 75.0, Batch Size: 32, Bias: 0.9, Num Clients: 25

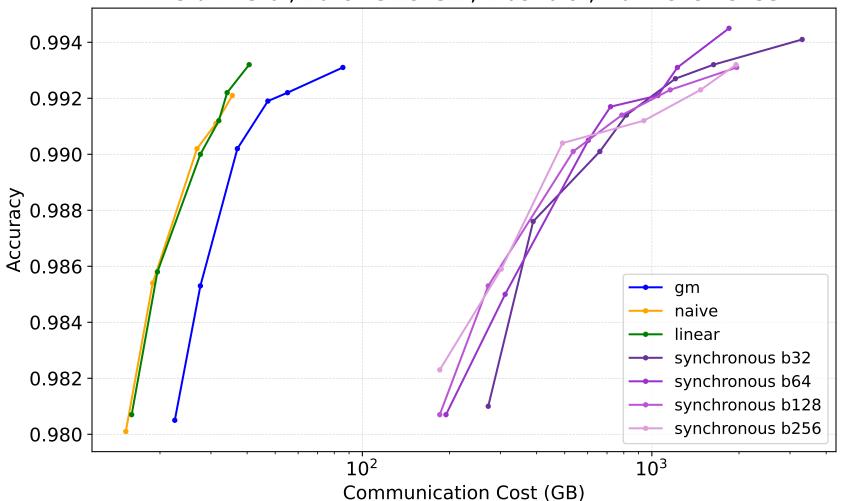


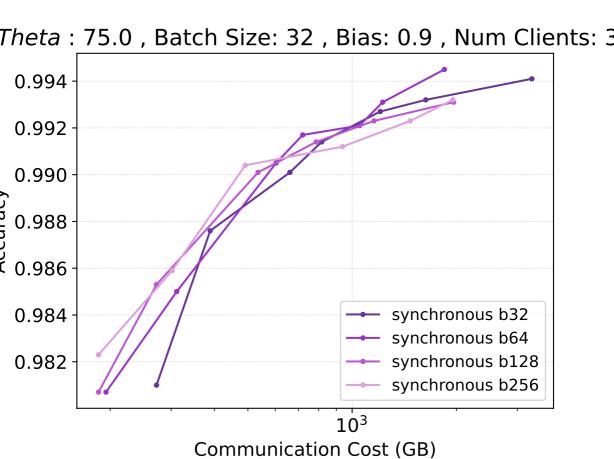


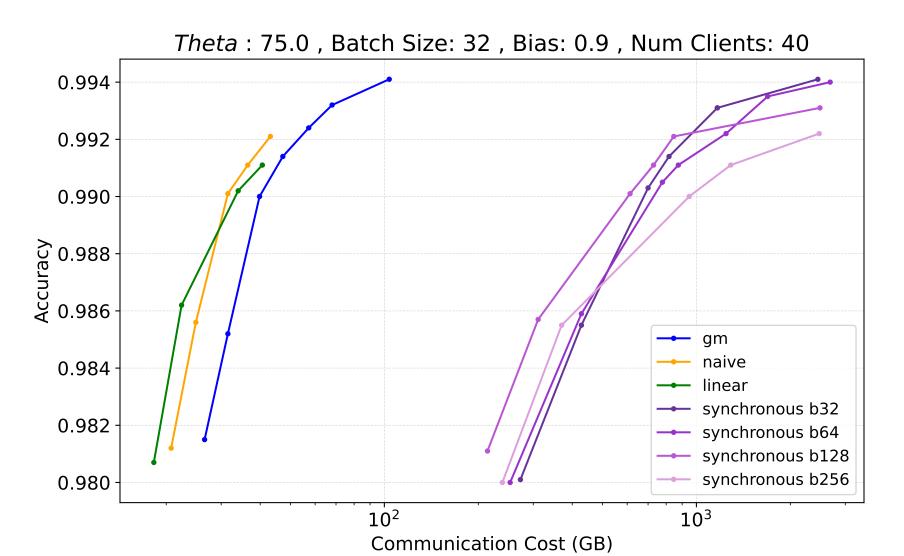


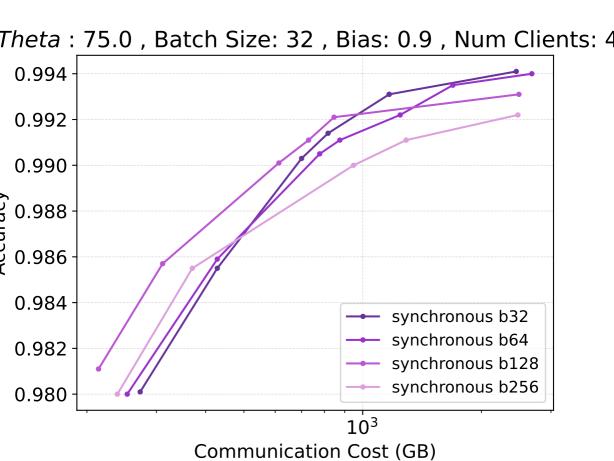


Theta: 75.0, Batch Size: 32, Bias: 0.9, Num Clients: 35

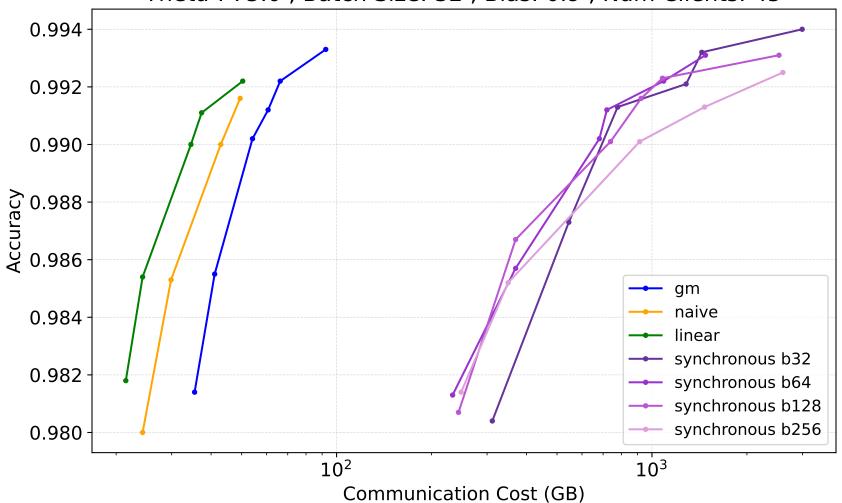


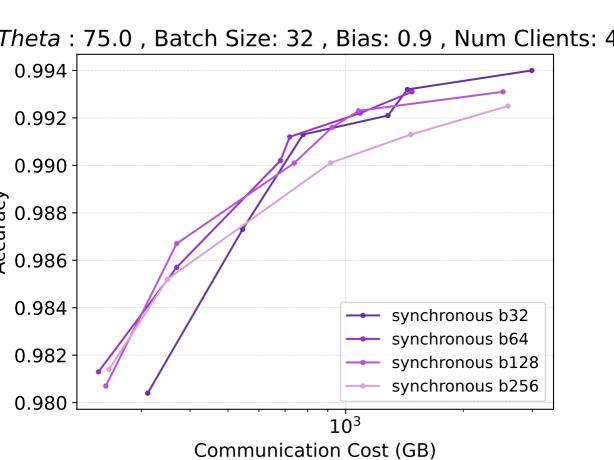


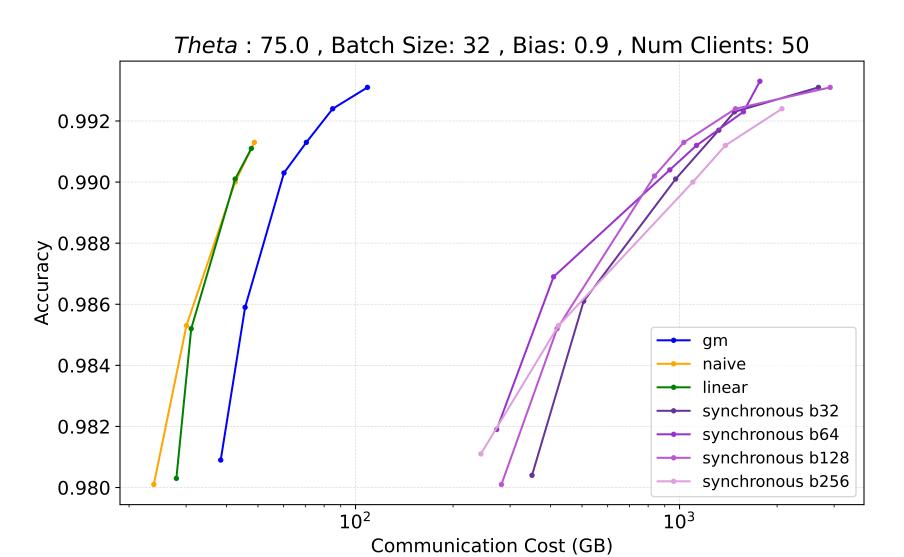


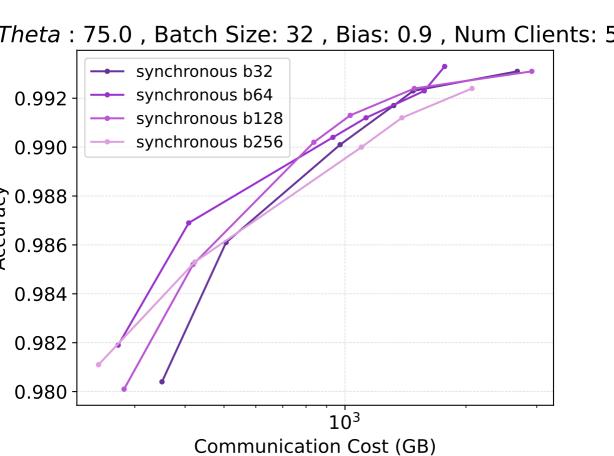


Theta: 75.0, Batch Size: 32, Bias: 0.9, Num Clients: 45

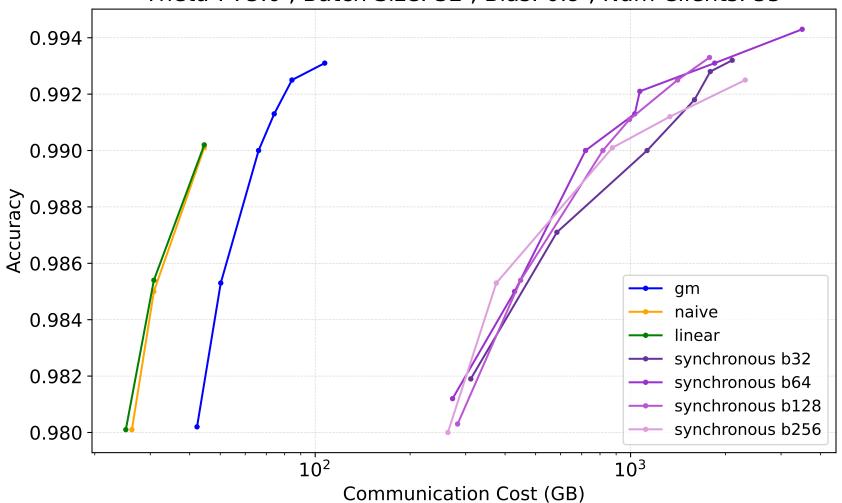


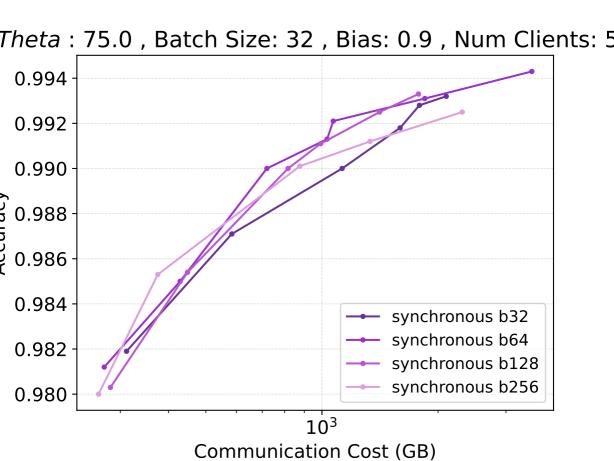


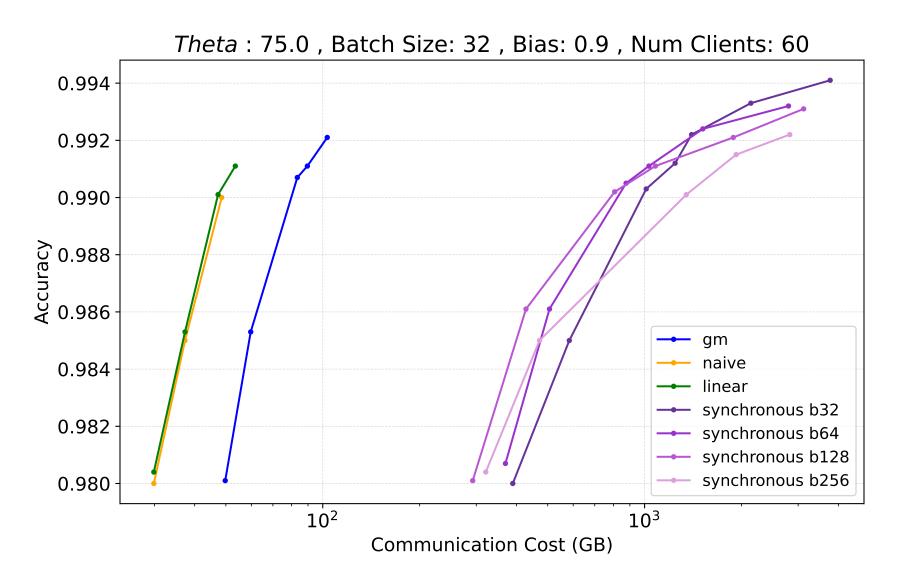


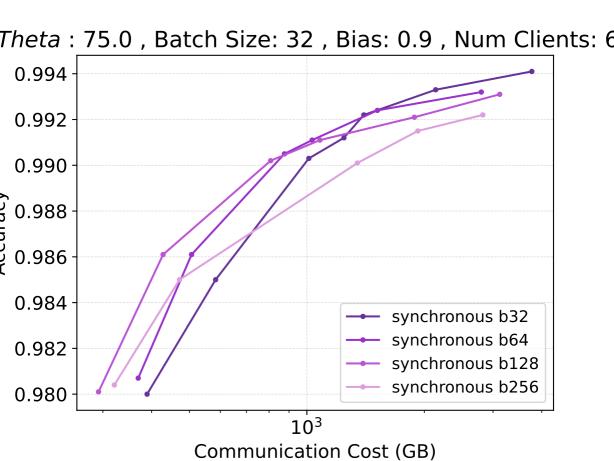


Theta: 75.0, Batch Size: 32, Bias: 0.9, Num Clients: 55

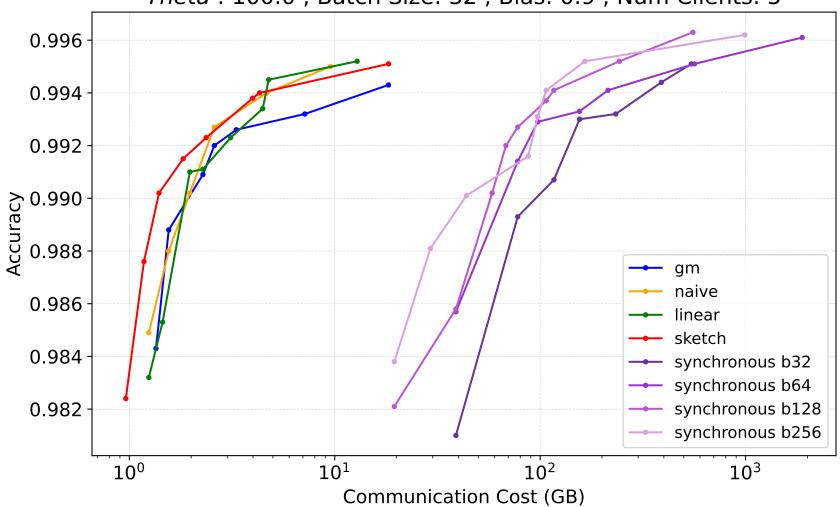


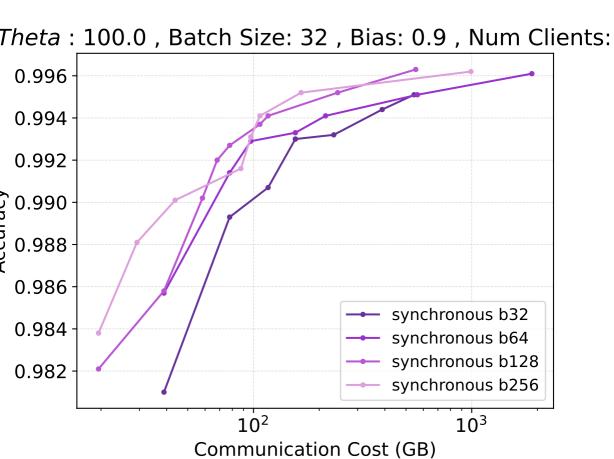


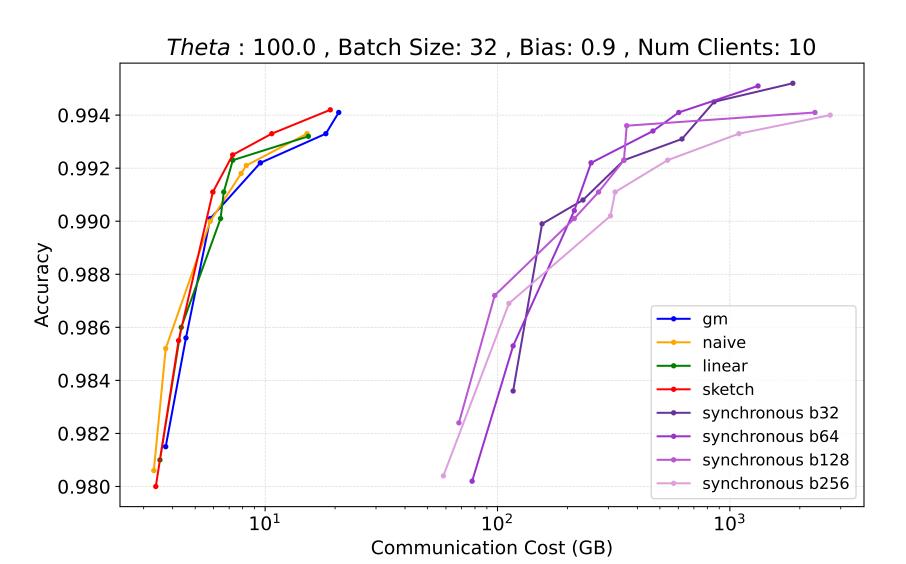


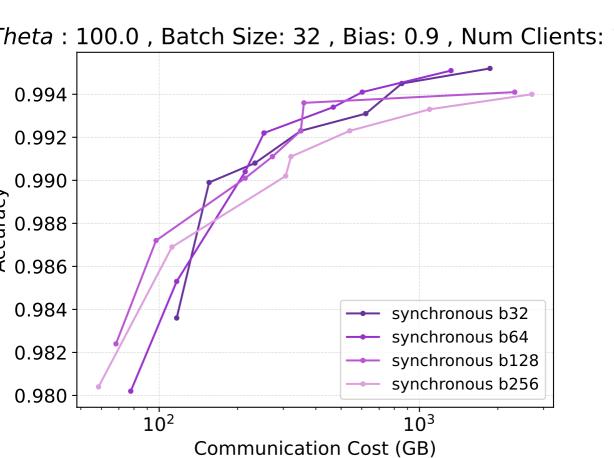


Theta: 100.0, Batch Size: 32, Bias: 0.9, Num Clients: 5

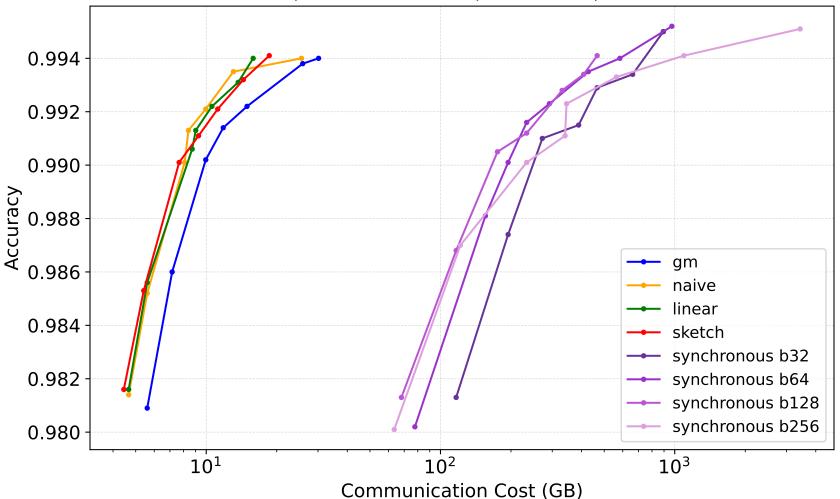


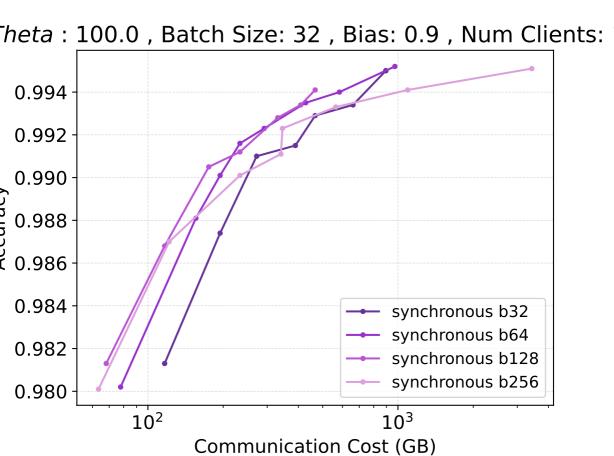


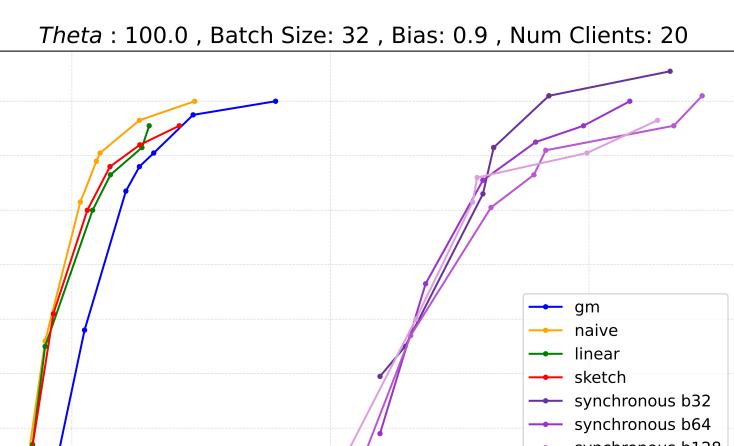


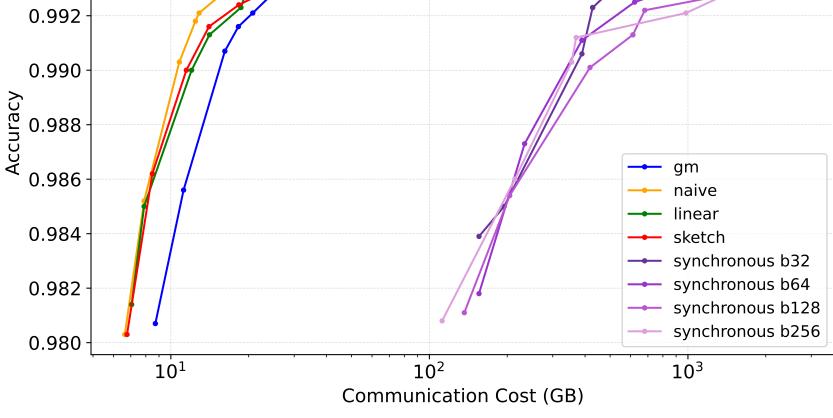


Theta: 100.0, Batch Size: 32, Bias: 0.9, Num Clients: 15

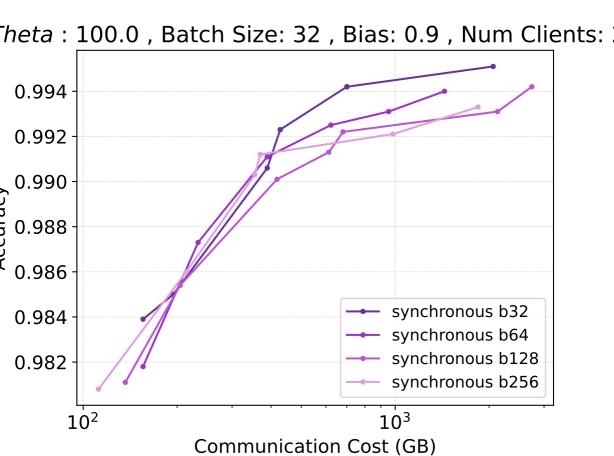


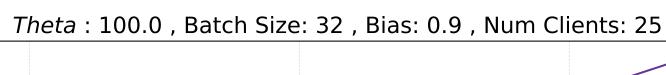


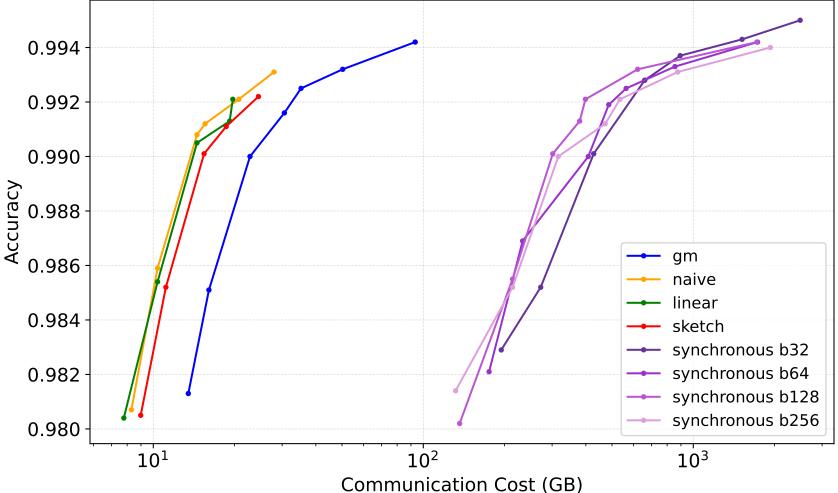


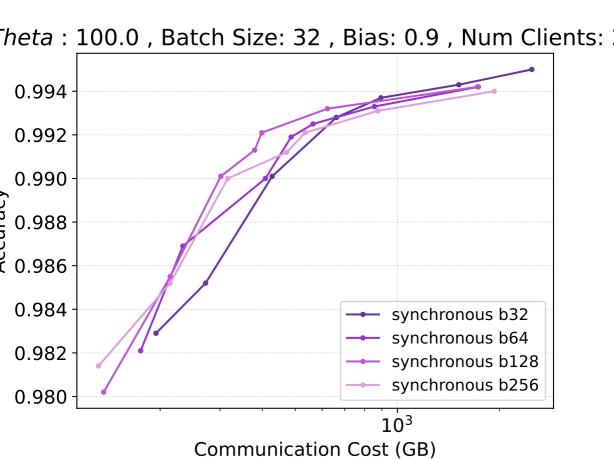


0.994

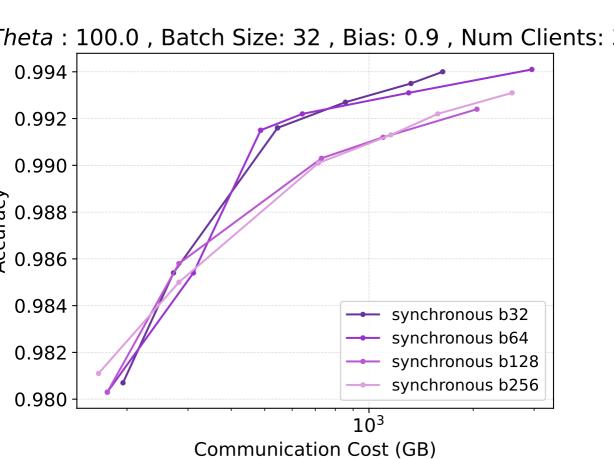




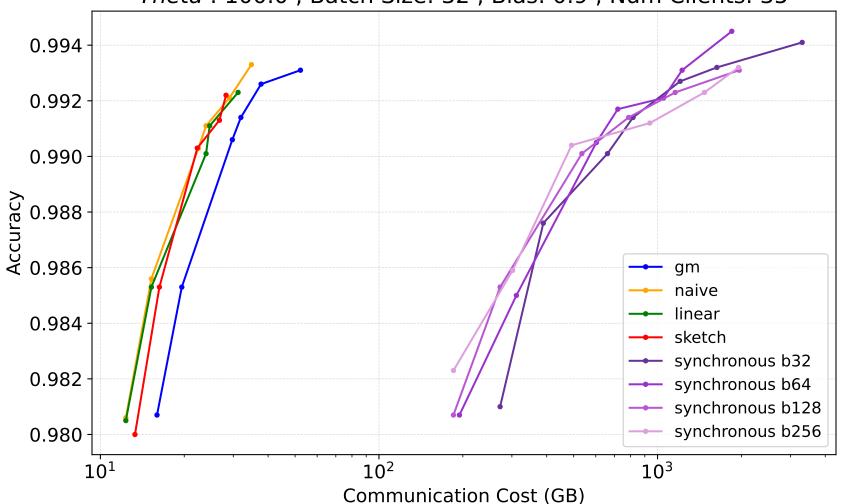


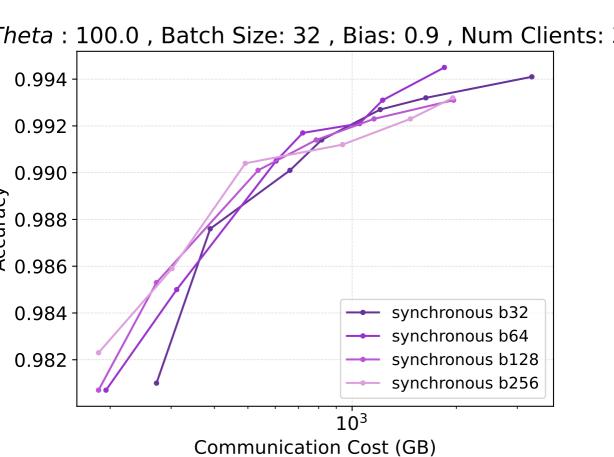


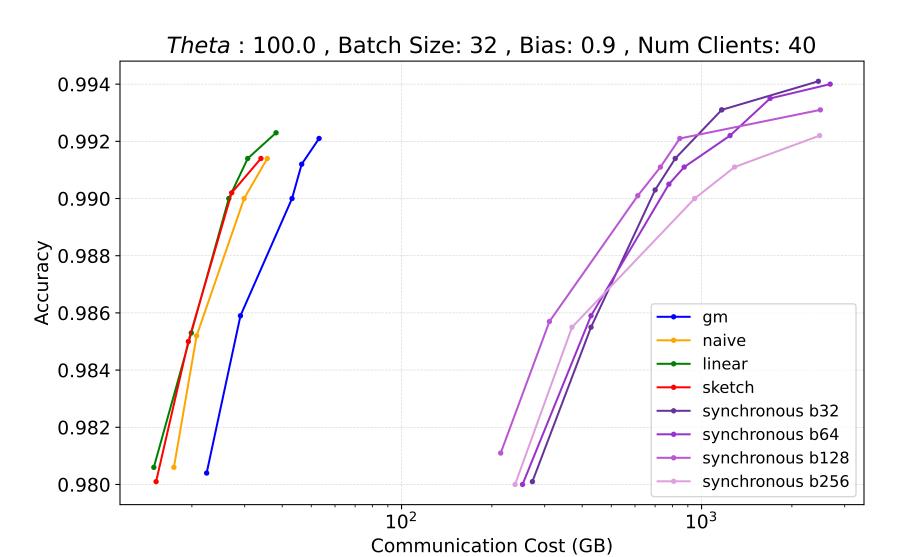


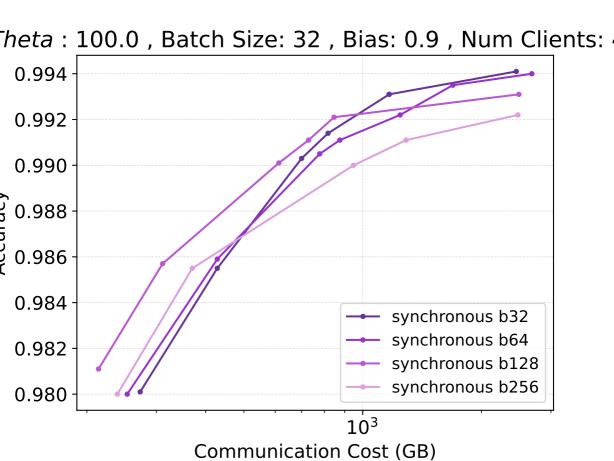


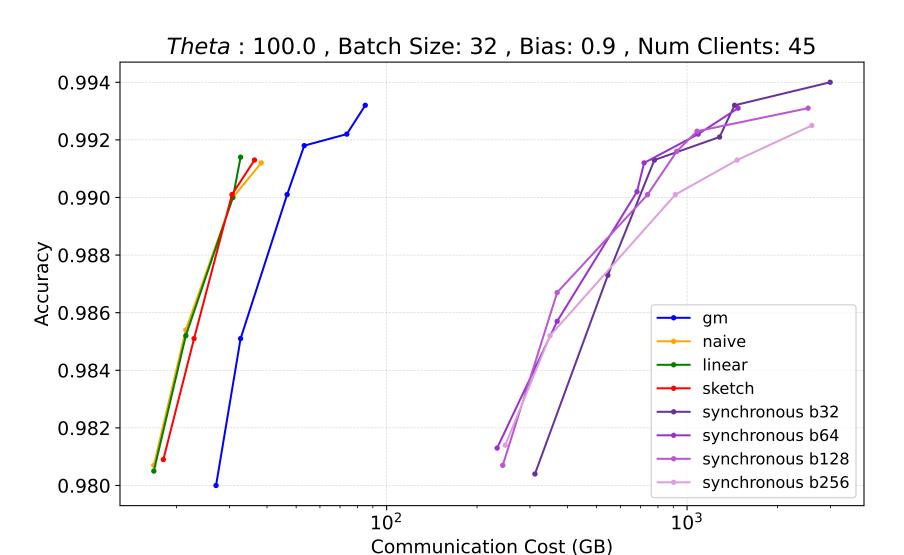
Theta: 100.0, Batch Size: 32, Bias: 0.9, Num Clients: 35

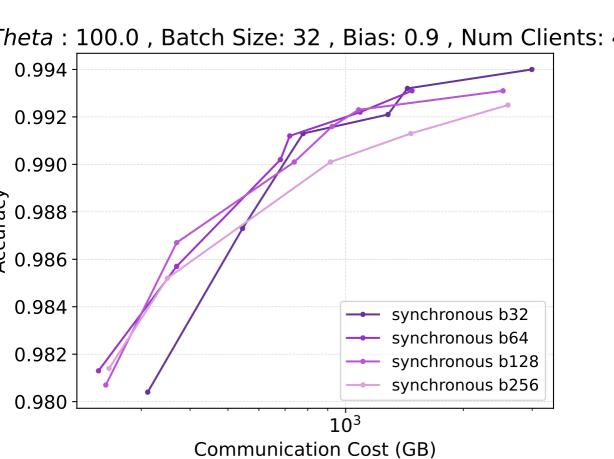


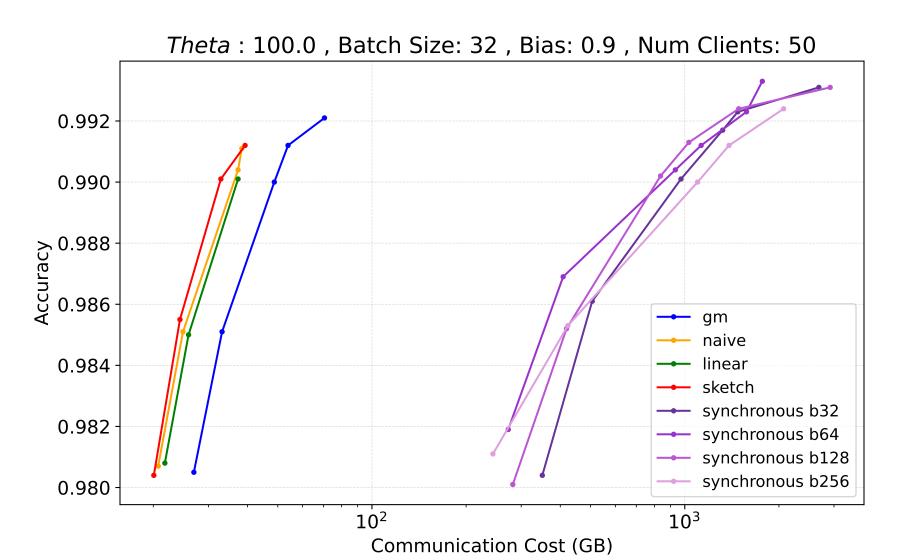


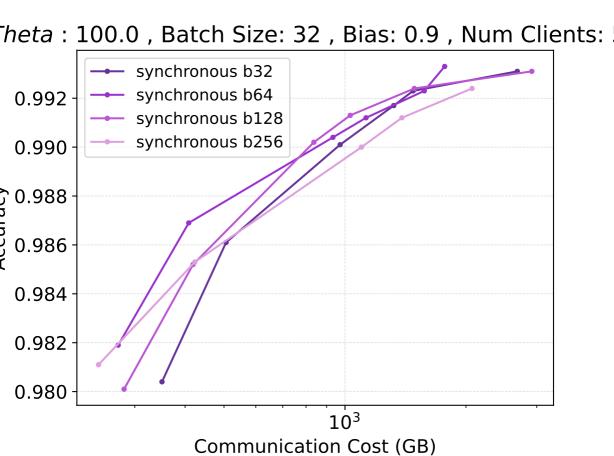












Theta: 100.0, Batch Size: 32, Bias: 0.9, Num Clients: 55 gm naive linear

