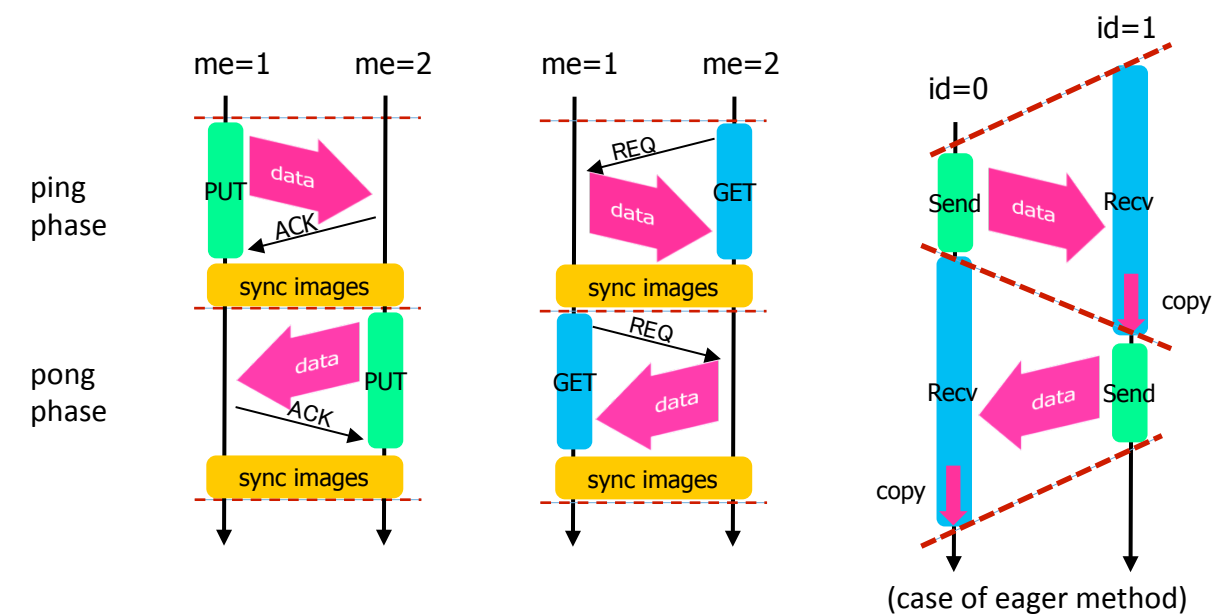
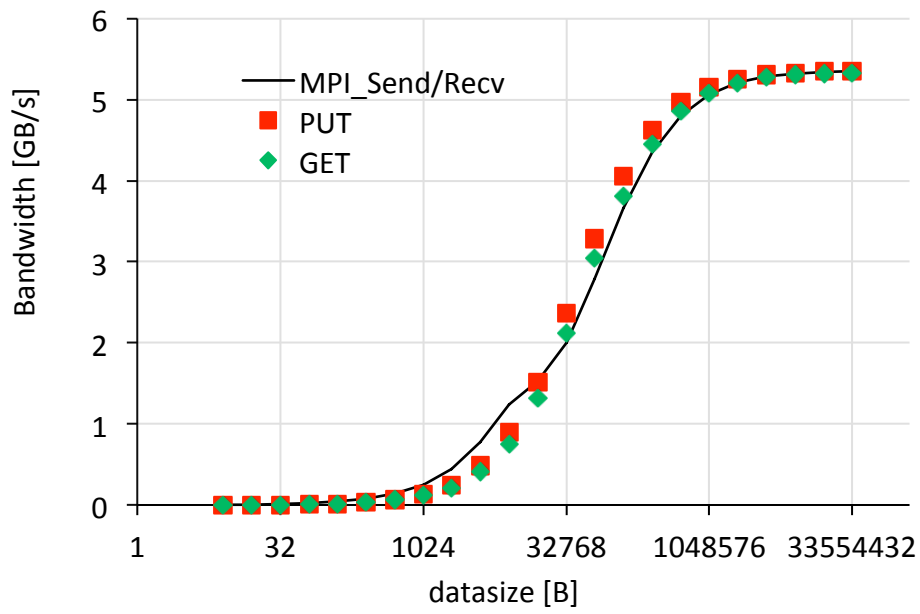
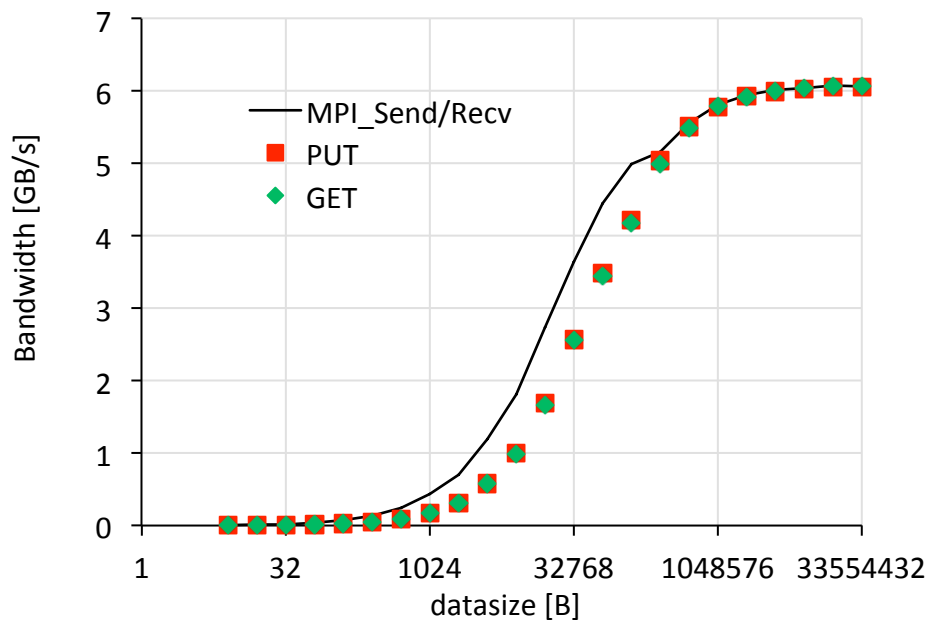


	PUT version	GET version	MPI version
ping phase	if (me == 1) then $x(1:n)[2] = x(1:n)$ sync images(2) else if (me == 2) then $x(1:n)[1] = x(1:n)$ sync images(1) end if	if (me == 1) then sync images(1) else if (me == 2) then $x(1:n) = x(1:n)[1]$ sync images(1) end if	if (id == 0) then call MPI_Send( x, n, ... 1, ...) else if (id == 1) then call MPI_Recv( x, n, ... 0, ...) end if
pong phase	if (me == 1) then sync images(2) else if (me == 2) then $x(1:n)[1] = x(1:n)$ sync images(1) end if	if (me == 1) then $x(1:n) = x(1:n)[2]$ sync images(2) else if (me == 2) then sync images(1) end if	if (id == 0) then call MPI_Recv( x, n, ... 1, ...) else if (id == 1) then call MPI_Send( x, n, ... 0, ...) end if

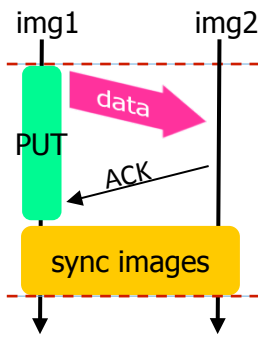




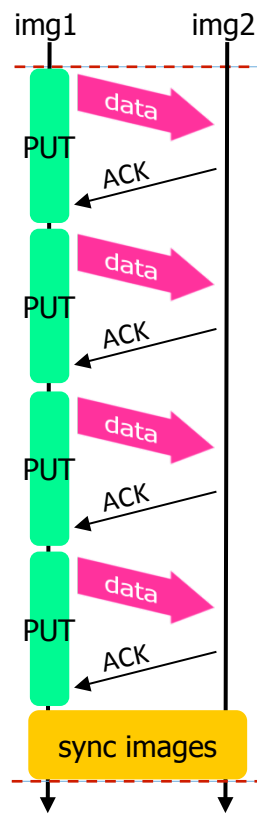
**(a) PRIMEHPC FX100  
(FJ-RDMA, CA-method)**



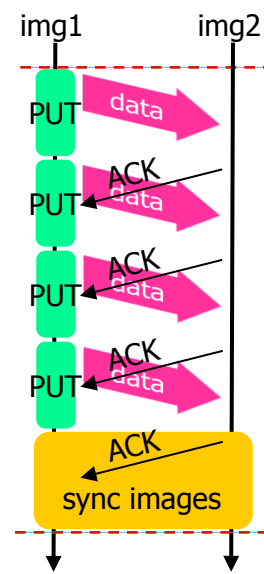
**(b) HA-PACS**  
**(MPI-3, RS-method)**



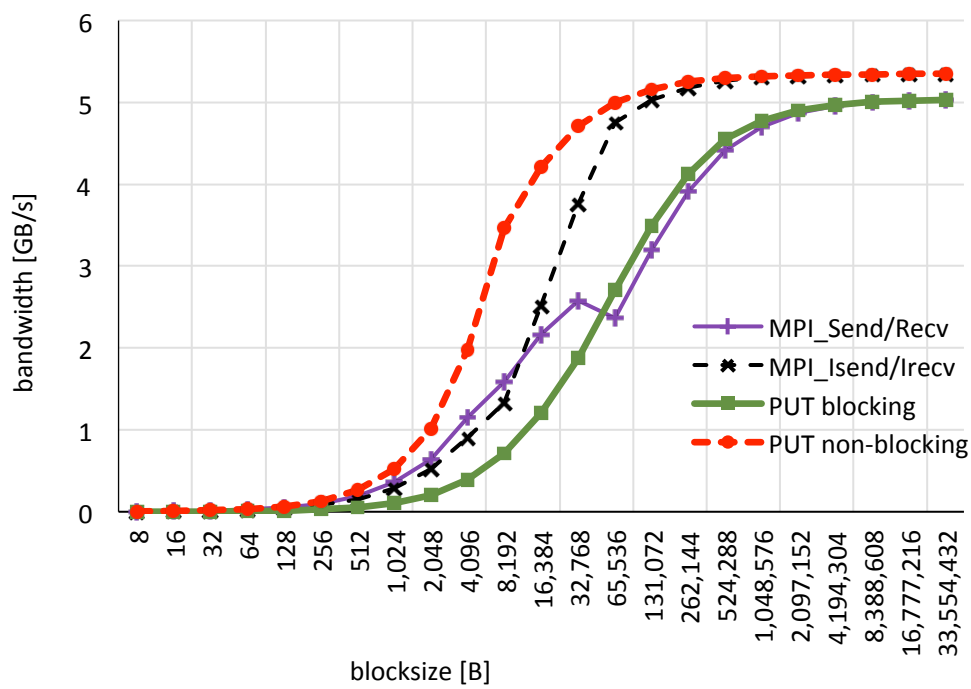
(a) 1-variable/  
blocking



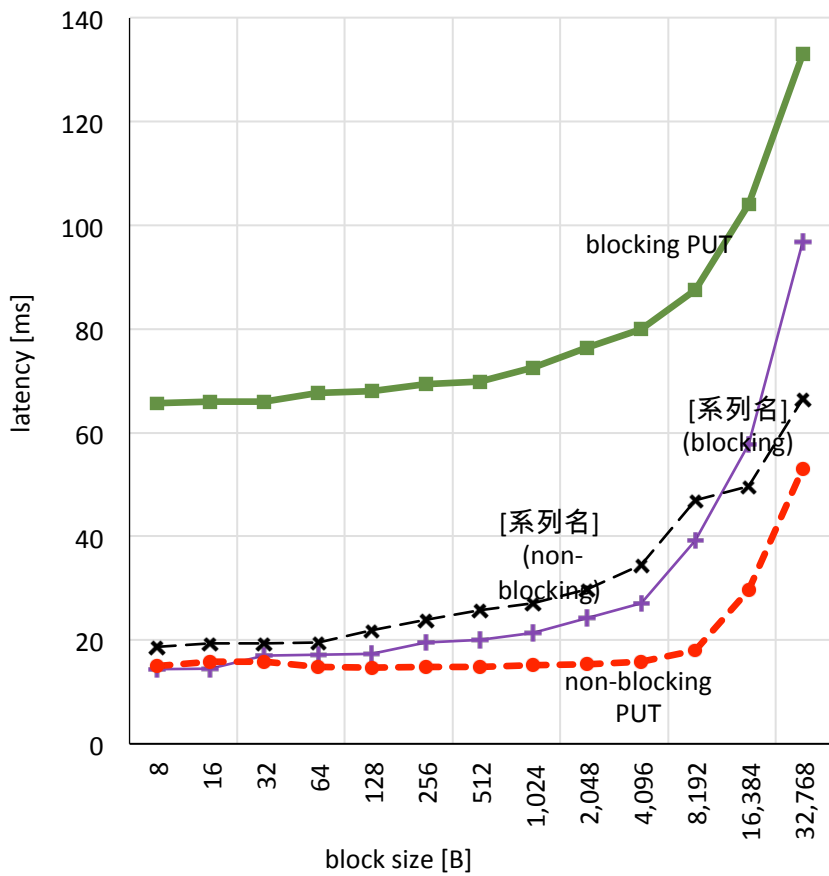
(b)  $n$ -variable/  
blocking



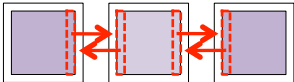
(c)  $n$ -variable/  
nonblocking



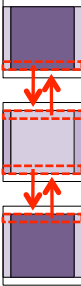
PRIMEHPC FX100  
8-var Ping-pong

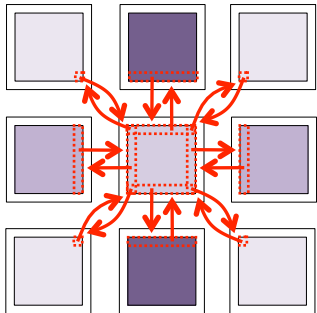


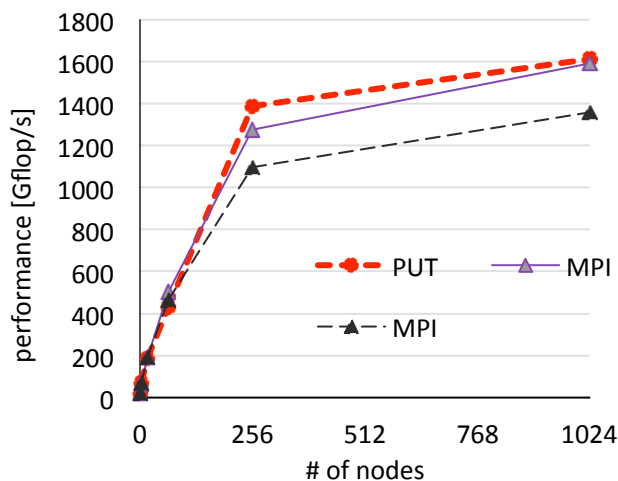
PRIMEHPC FX100  
8-variable Ping-pong



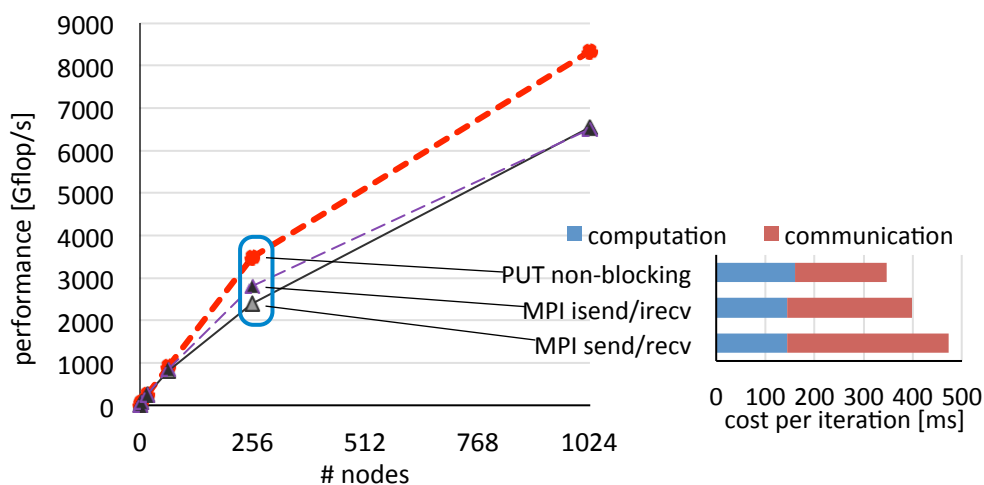




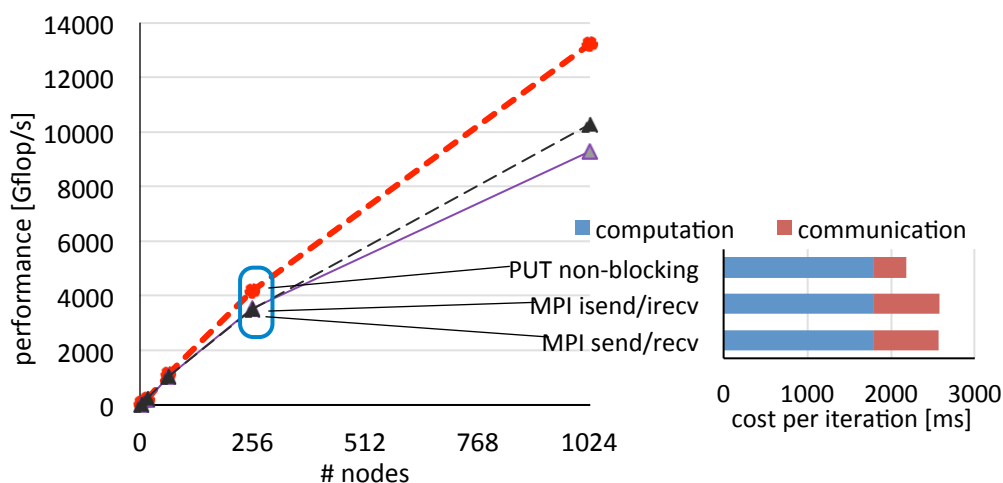




(a) Himeno Size-M (256x128x128)



(b) Himeno Size-L (512x256x256)

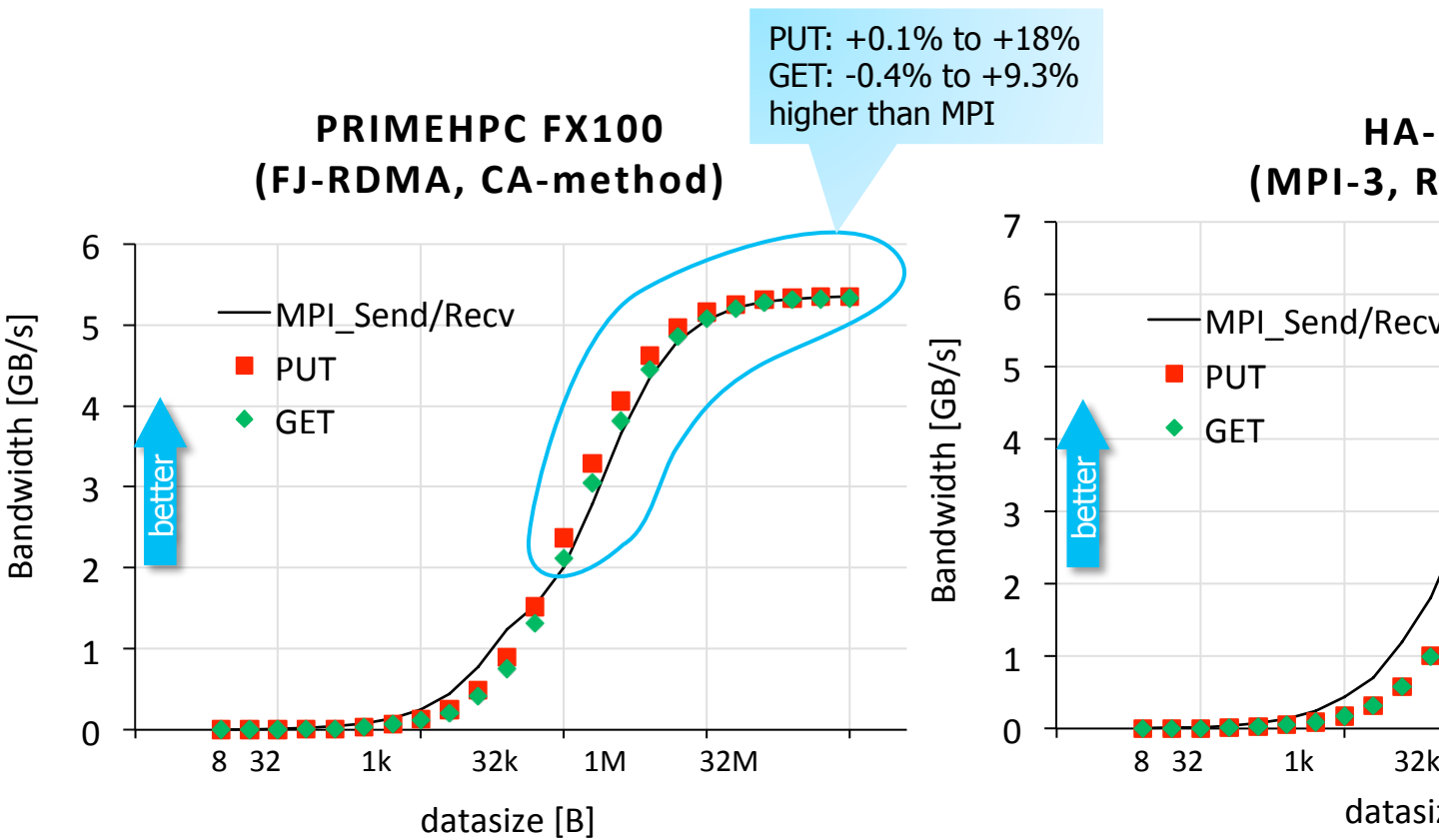


(c) Himeno Size-XL (1024x512x512)

予備

- Result

- One-sided communication slightly outperforms MPI rendezvous for large data.

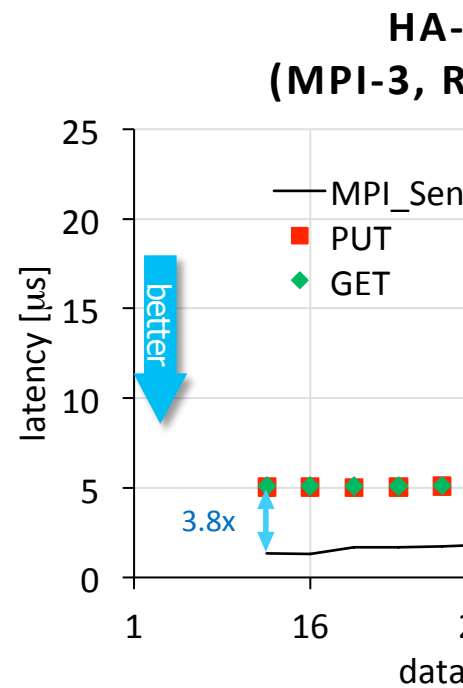
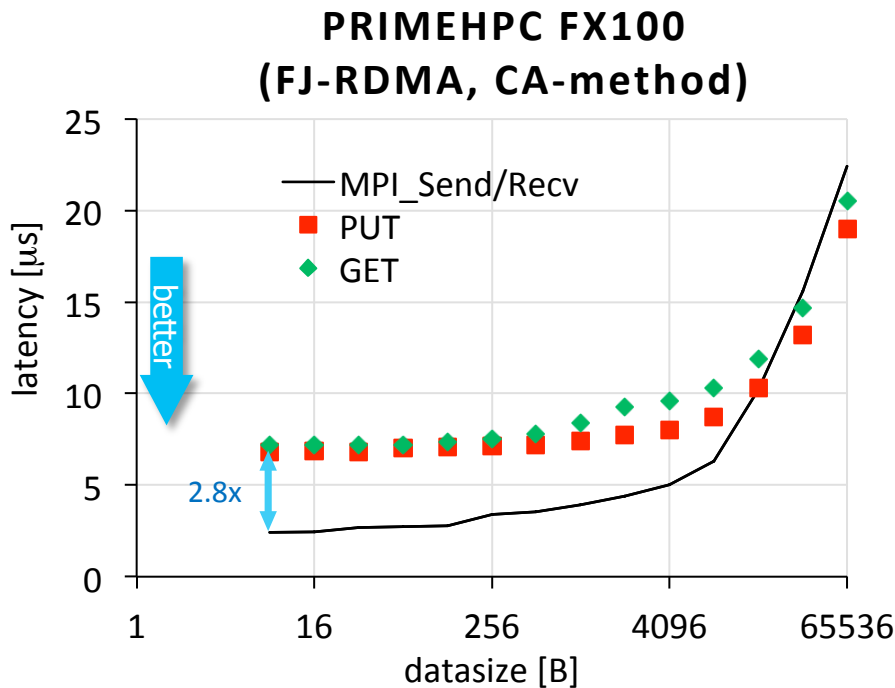


- Result

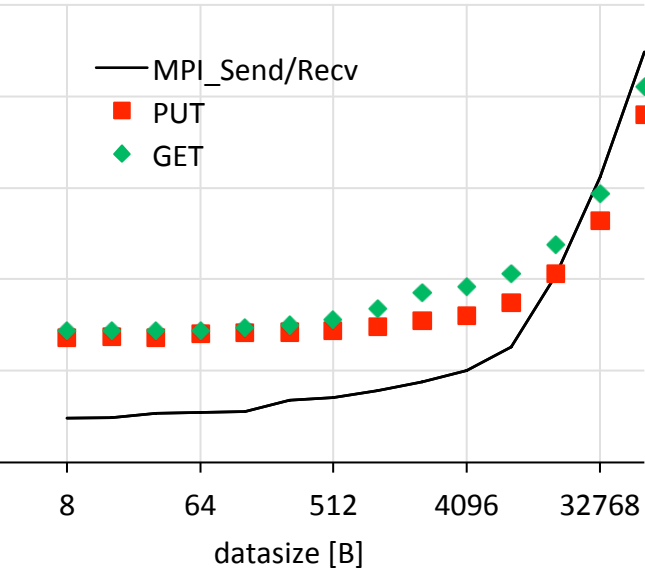
- For small data, PUT and GET are several times slower than MPI

- Issue

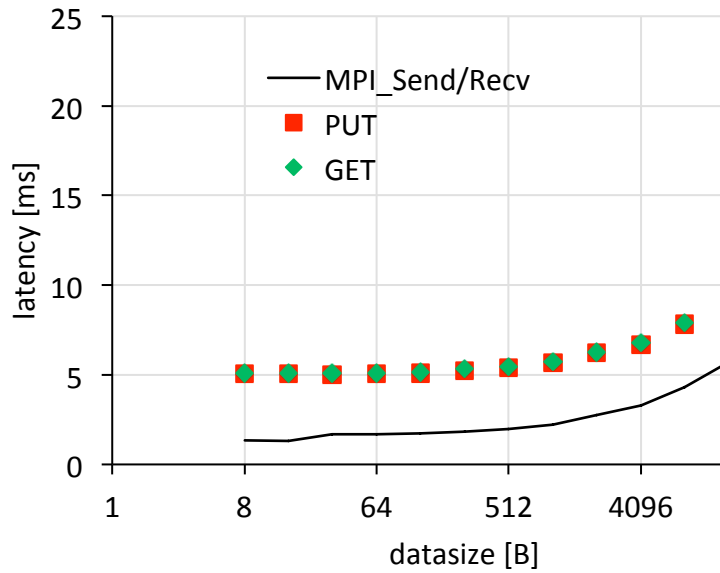
- Analysis of the reason
  - Modification of the ping-pong program and improvement of the



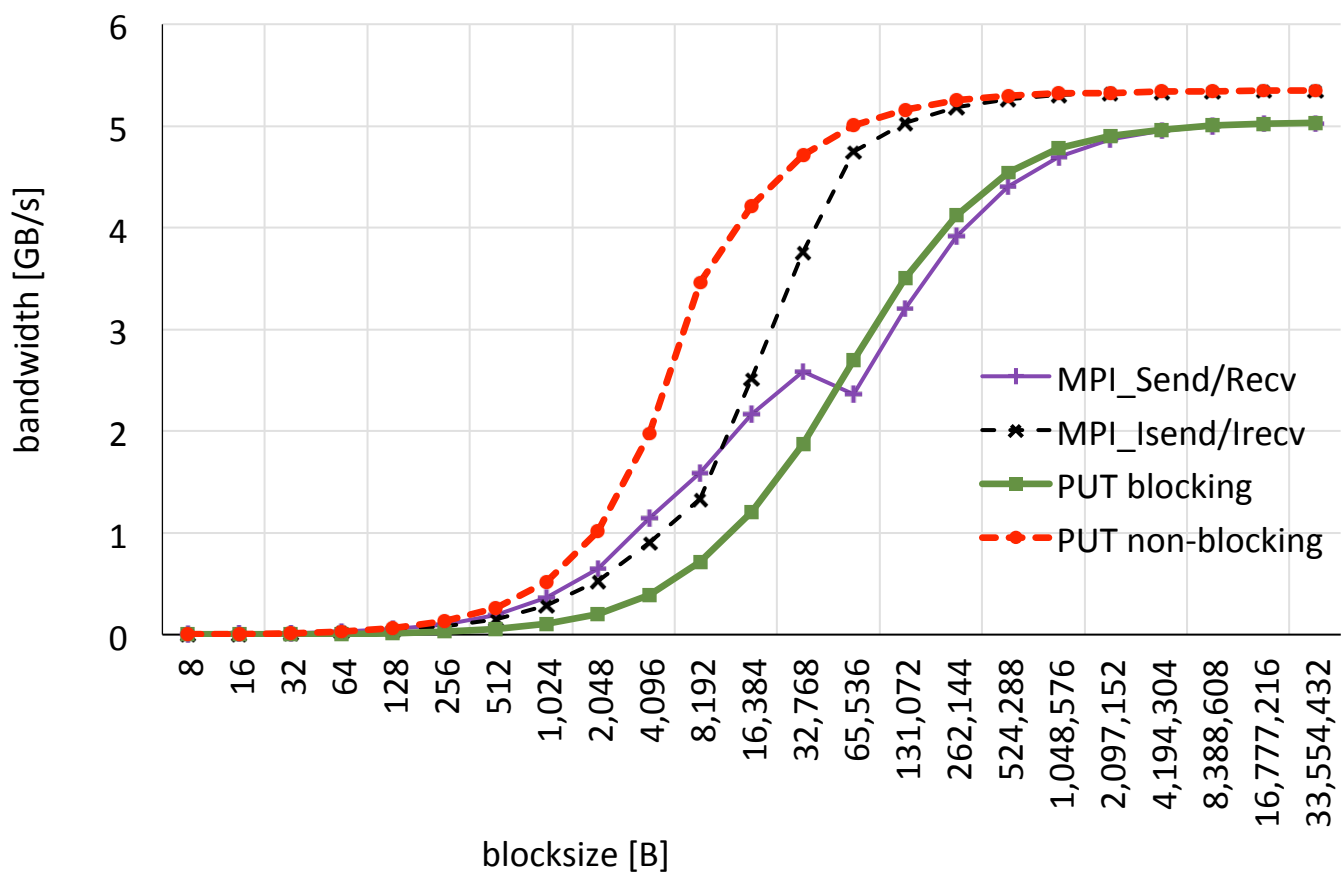
**PRIMEHPC FX100**  
**(FJ-RDMA, CA-method)**



**HA-PACS**  
**(MPI-3, RS-method)**



PRIMEHPC FX100  
8-var Ping-pong





XMP runtime library

communication library

hardware interface

