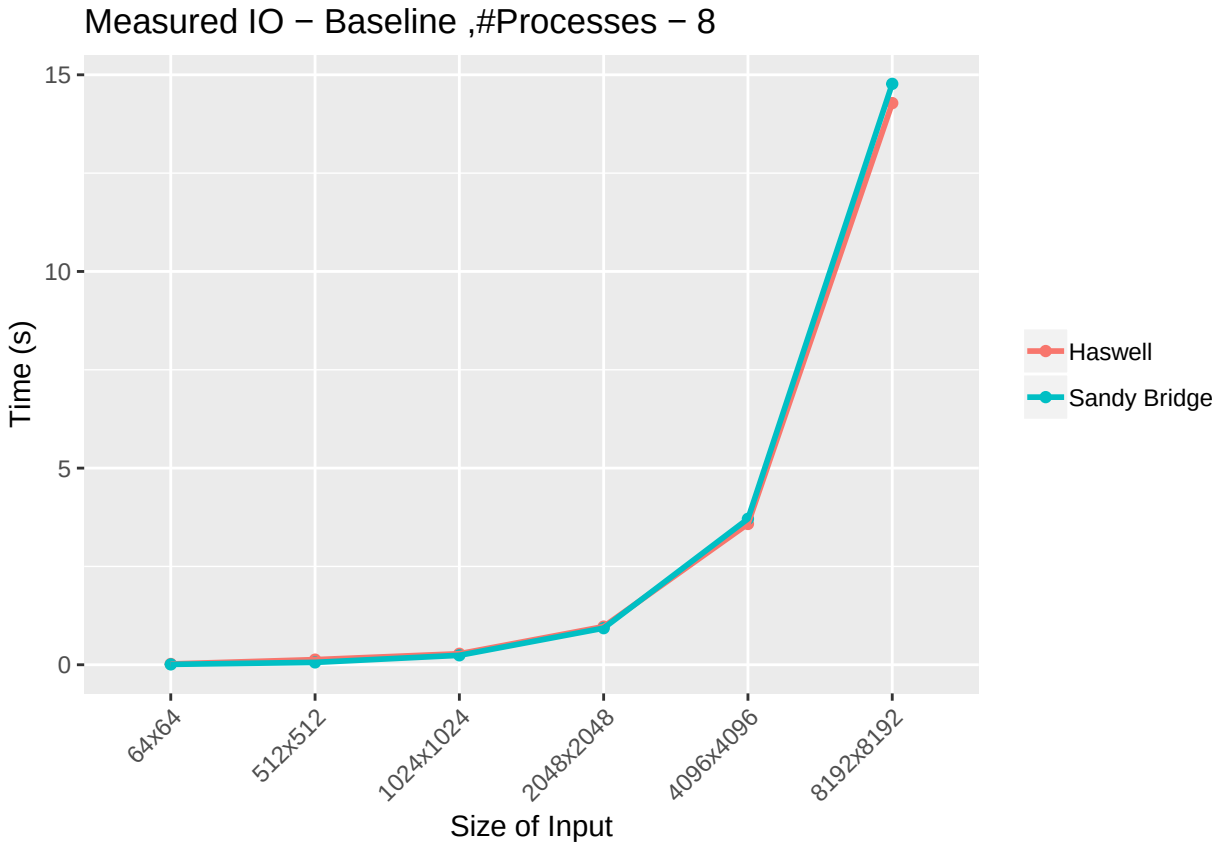
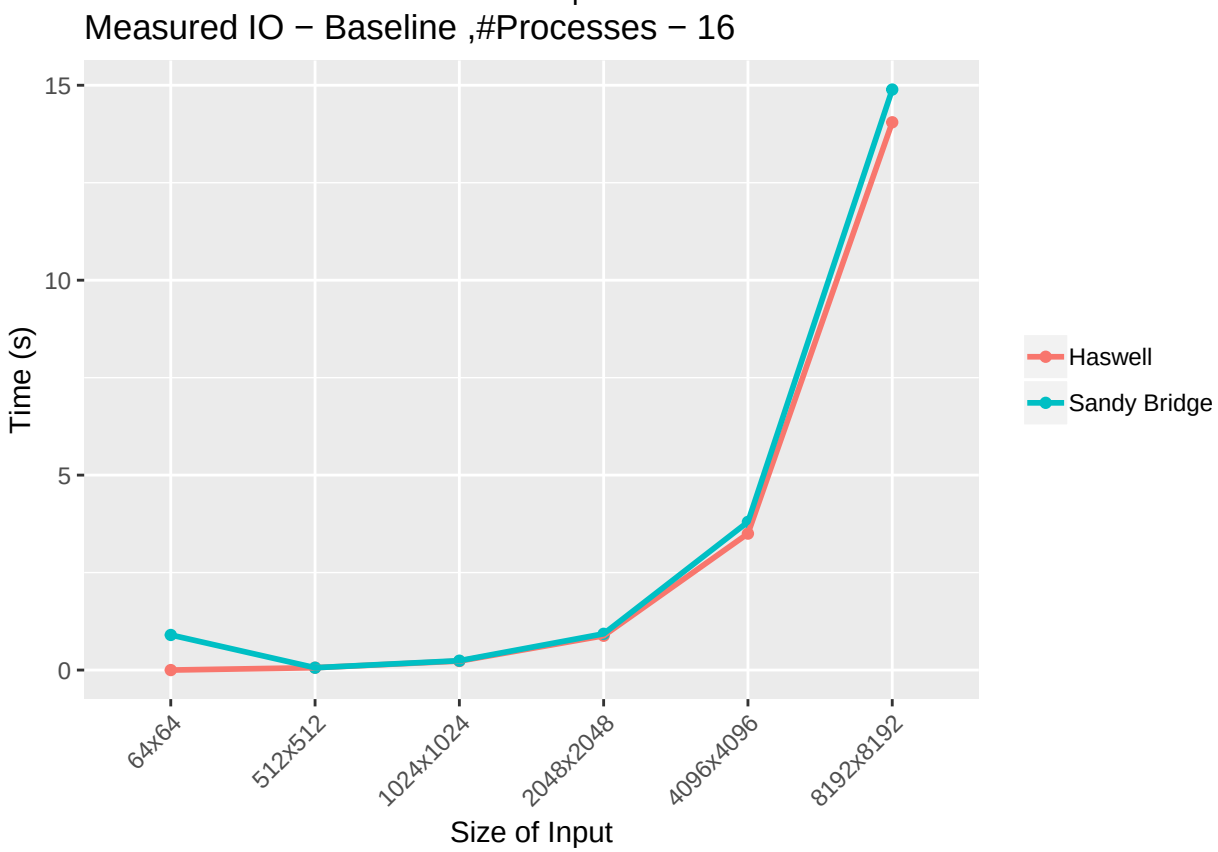
POS_assign3_plots

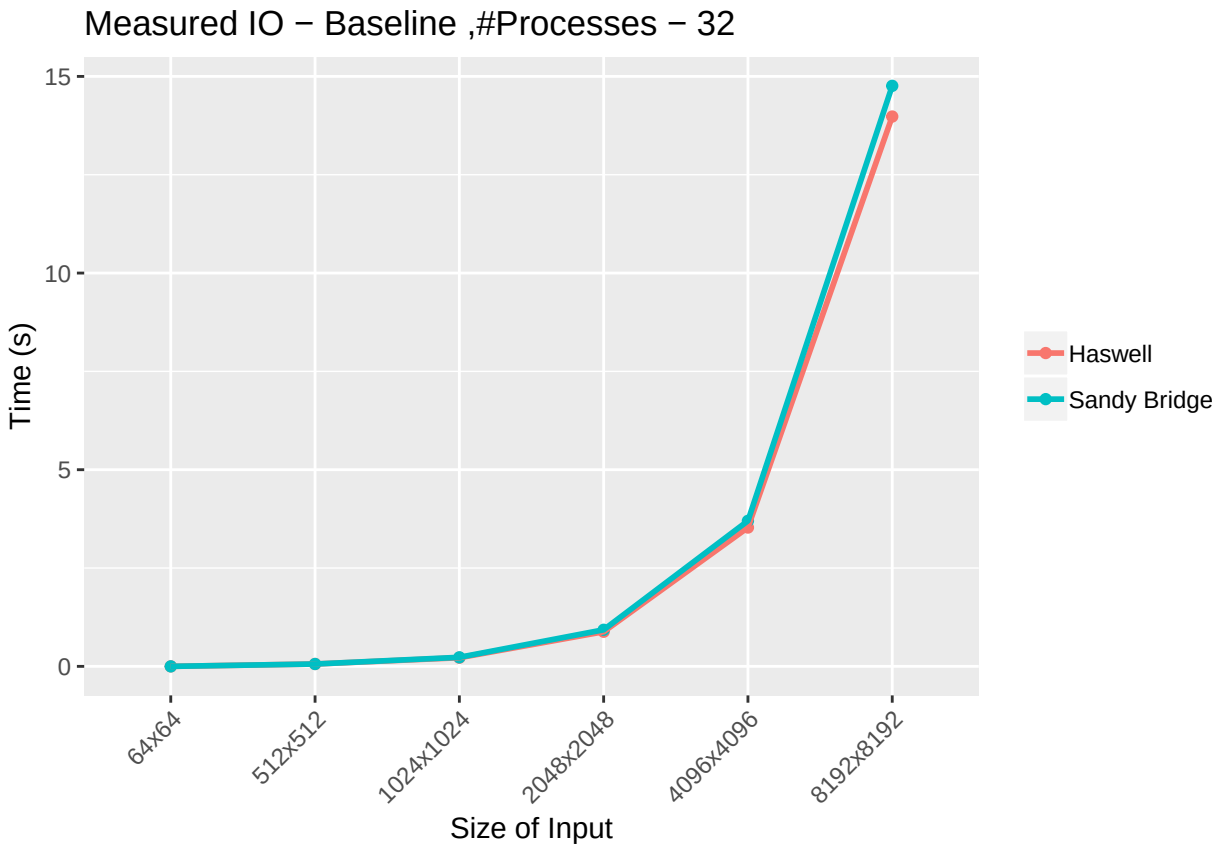
```
plot_type <- function(data_dt,type,title,xaxis){
  size <- c("64x64","512x512","1024x1024","2048x2048","4096x4096","8192x8192")
  proc <- c("8","16","32","64")

  if(xaxis == "Size")
  {
    p <- ggplot(data_dt[Type == type,],aes(x=factor(Data,levels = unique(Data)),y=Time,group = Node,col
      geom_point() + geom_line(stat = "identity",size =1) + facet_wrap(~factor(Processes,levels = unique
      labs(x = "Size of Input", y = "Time (s)") +
      theme(axis.text.x = element_text(angle = 45, hjust = 1),legend.title = element_blank()) +
      scale_y_continuous(breaks = seq(min(data_dt[Type == type,]$Time),max(data_dt[Type == type,]$Time)
      ggtitle(title)

    for(i in proc)
    {
      print(ggplot(data_dt[Type == type & Processes == i,],aes(x=factor(Data,levels = unique(Data)),y=T
        geom_point() + geom_line(stat = "identity",size =1) +
        labs(x = "Size of Input", y = "Time (s)") +
        theme(axis.text.x = element_text(angle = 45, hjust = 1),legend.title = element_blank()) +
        ggtitle(paste0(title," ,#Processes - ",i)))
    }
  }
  else if(xaxis == "Processes")
  {
    p <- ggplot(data_dt[Type == type,],aes(x=factor(Processes,levels = unique(Processes)),y=Time,group =
      geom_point() + geom_line(stat = "identity",size =1) + facet_wrap(~factor(Data,levels = unique(Data
      labs(x = "#Processes", y = "Time (s)") +
      theme(axis.text.x = element_text(angle = 45, hjust = 1),legend.title = element_blank()) +
      scale_y_continuous(breaks = seq(min(data_dt[Type == type,]$Time),max(data_dt[Type == type,]$Time)
      ggtitle(title)

    for(i in size)
    {
      print(ggplot(data_dt[Type == type & Data == i,],aes(x=factor(Processes,levels = unique(Processes)
              geom_point() + geom_line(stat = "identity",size =1) +
              labs(x = "#Processes", y = "Time (s)") +
              theme(axis.text.x = element_text(angle = 45, hjust = 1),legend.title = element_blank()) +
              ggtitle(paste0(title," ,Size of Input - ",i)))
    }
  }


  return(p)
}

pos_plot <- function(filetype,base_title)
{
  library(readxl)
  library(data.table)
  library(tidyr)
```

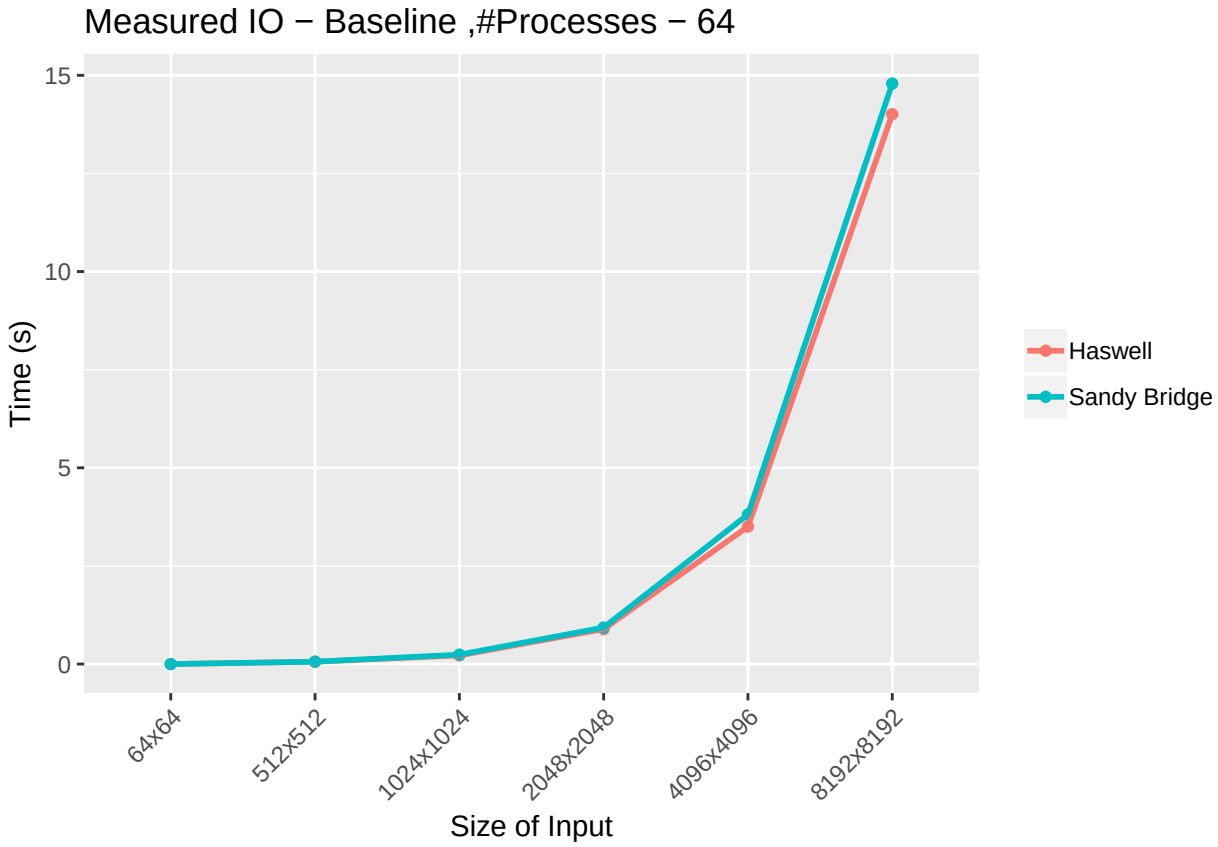
```
  library(ggplot2)

  hw_baseline <- read_excel(paste0("~/Desktop/TUM WS18/Programming of Supercomputer/Assignment3/results/
  sb_baseline <- read_excel(paste0("~/Desktop/TUM WS18/Programming of Supercomputer/Assignment3/results/

  hw_tidy <- gather(hw_baseline,key = "Processes",value = "Time",-c("Data","Type"))
  sb_tidy <- gather(sb_baseline,key = "Processes",value = "Time",-c("Data","Type"))

  hw_b_dt <- as.data.table(hw_tidy)
  sb_b_dt <- as.data.table(sb_tidy)

  hw_b_dt[,"Time"] <- round(hw_b_dt$Time,2)
  sb_b_dt[,"Time"] <- round(sb_b_dt$Time,2)

  hw_b_dt[,Node := "Haswell"]
  sb_b_dt[,Node := "Sandy Bridge"]

  data_dt <- rbind(hw_b_dt,sb_b_dt)

  print(plot_type(data_dt,"IO",paste0("Measured IO - ",base_title),"Size"))
  print(plot_type(data_dt,"IO",paste0("Measured IO - ",base_title),"Processes"))

  print(plot_type(data_dt,"Setup",paste0("Measured Setup - ",base_title),"Size"))
  print(plot_type(data_dt,"Setup",paste0("Measured Setup - ",base_title),"Processes"))

  print(plot_type(data_dt,"Compute",paste0("Measured Compute - ",base_title),"Size"))
  print(plot_type(data_dt,"Compute",paste0("Measured Compute - ",base_title),"Processes"))

  print(plot_type(data_dt,"MPI",paste0("Measured MPI - ",base_title),"Size"))
  print(plot_type(data_dt,"MPI",paste0("Measured MPI - ",base_title),"Processes"))

  print(plot_type(data_dt,"Total",paste0("Measured Total - ",base_title),"Size"))
  print(plot_type(data_dt,"Total",paste0("Measured Total - ",base_title),"Processes"))

  return(data_dt)
}
```

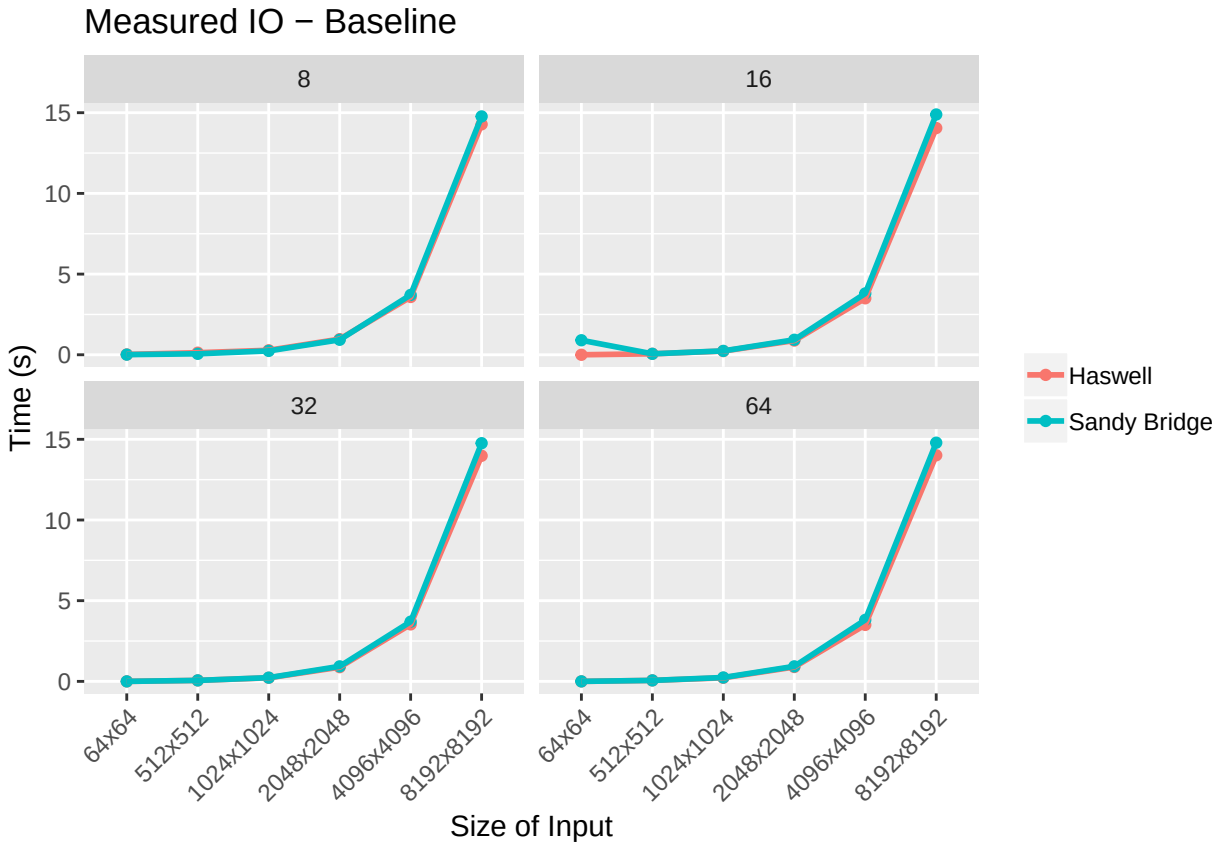
```
test <- pos_plot("baseline","Baseline")
```

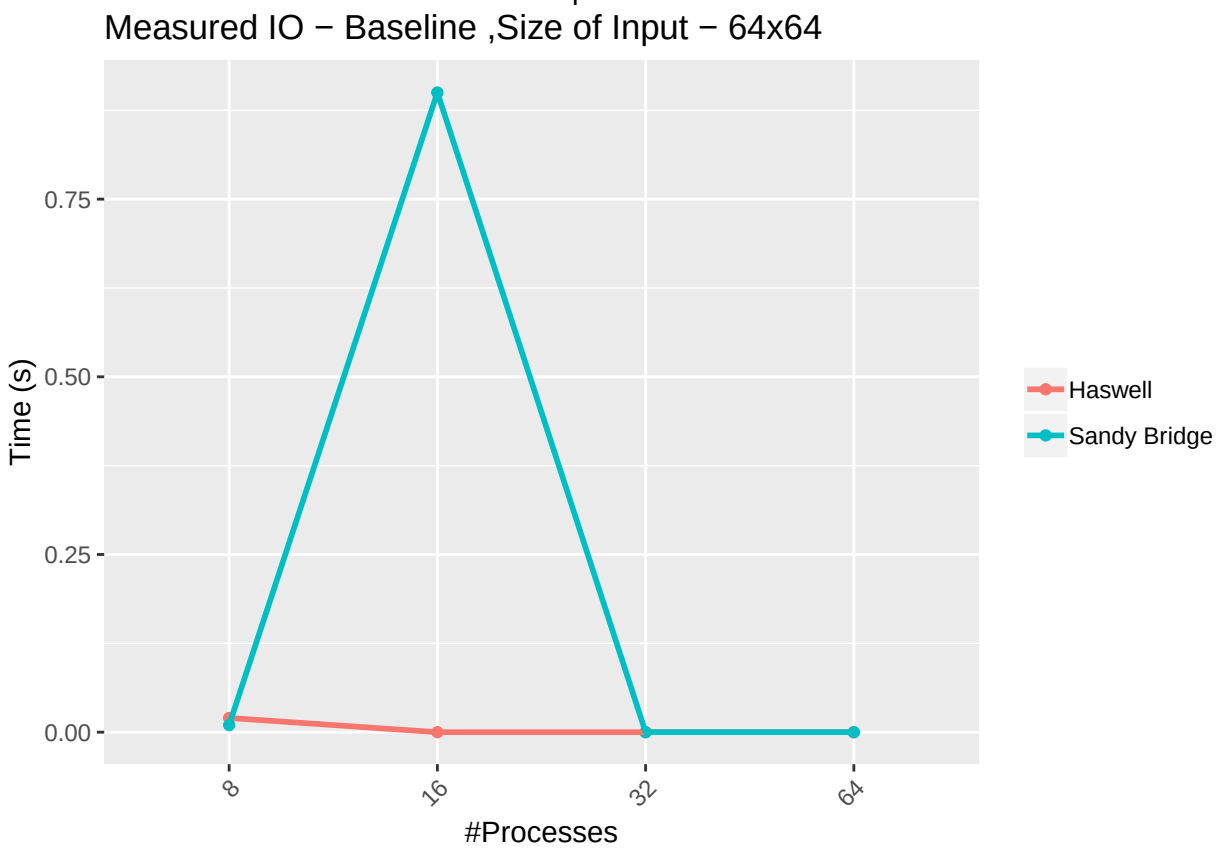

Measured IO − Baseline ,#Processes − 8
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

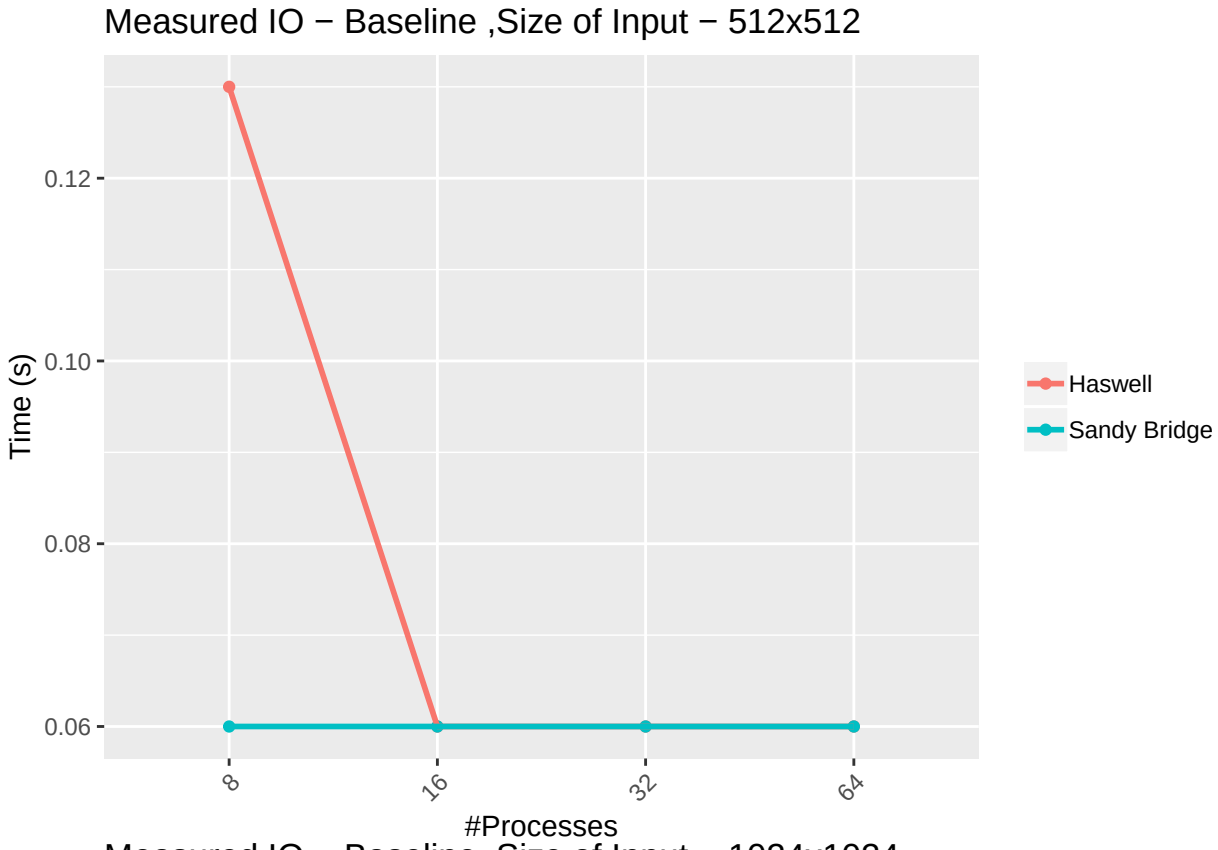

Measured IO − Baseline ,#Processes − 16
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

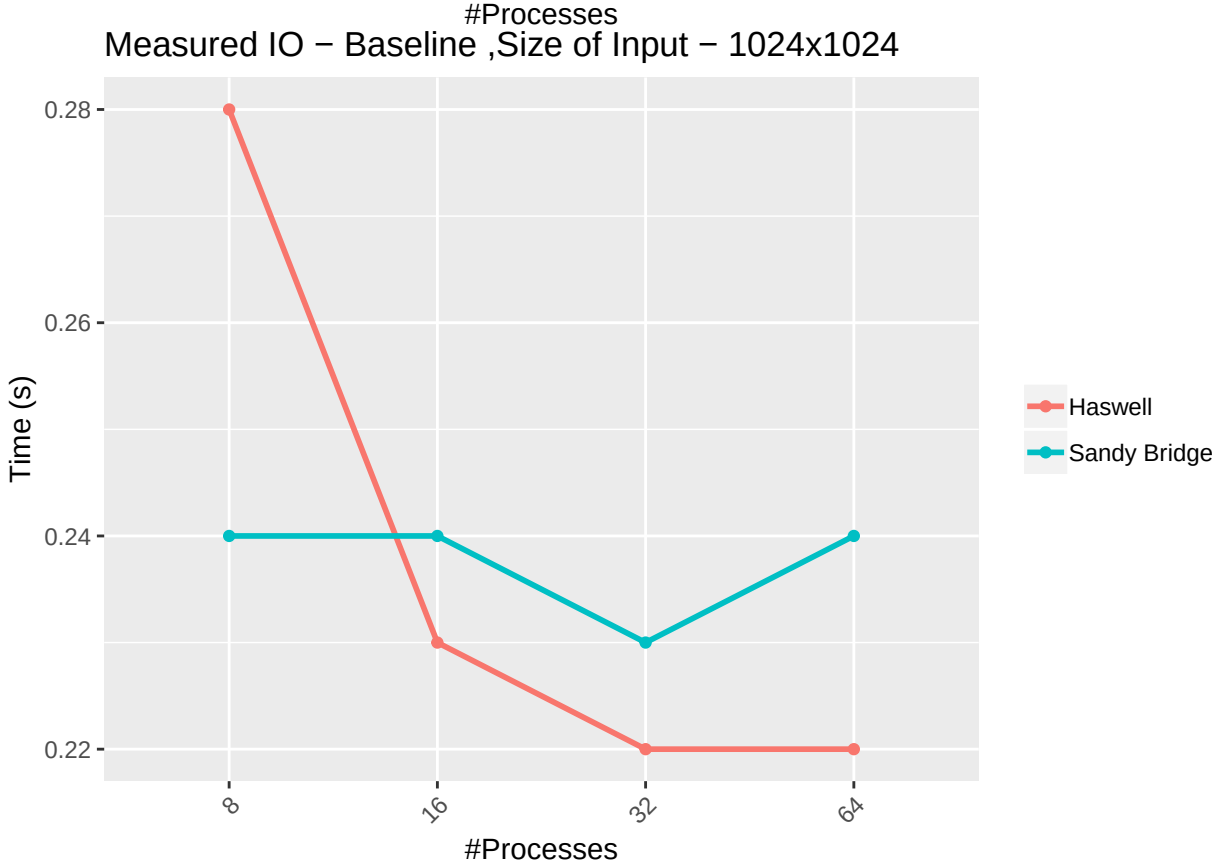

Measured IO − Baseline ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

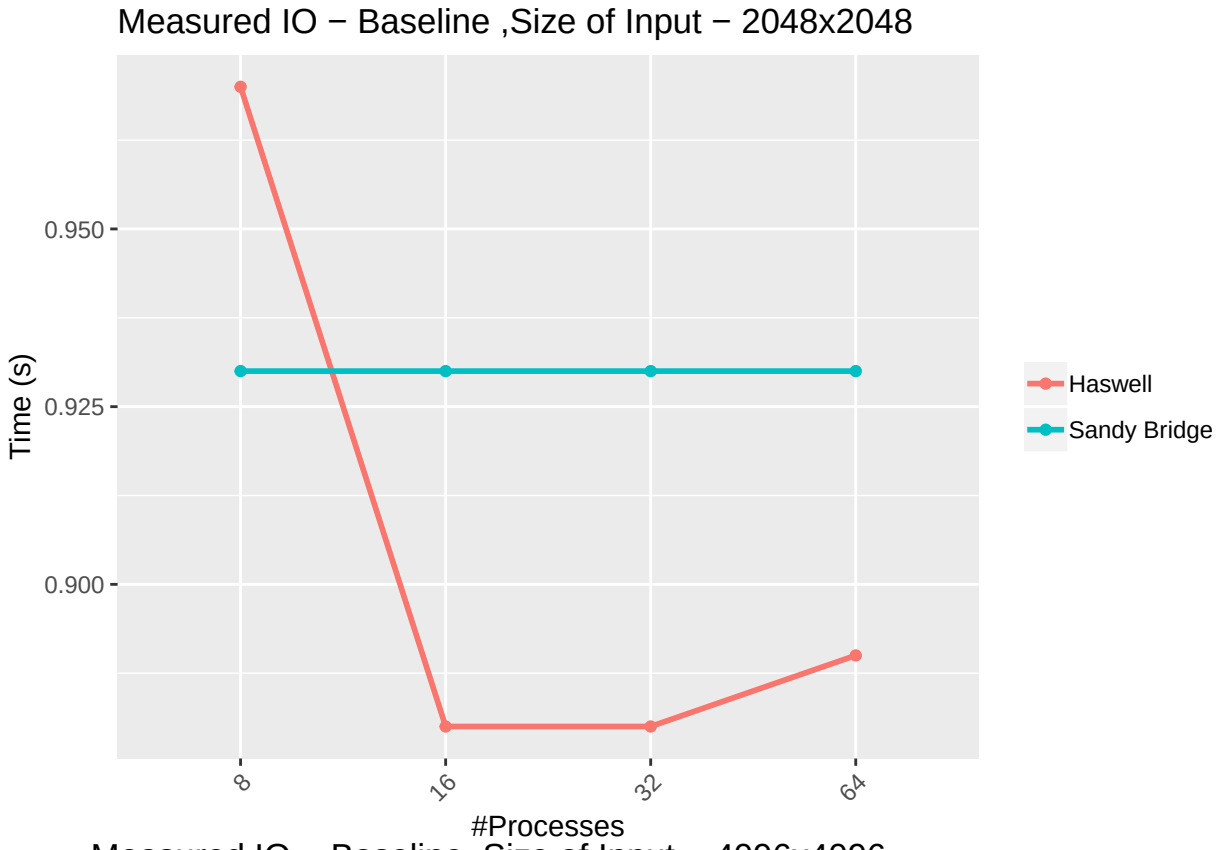

Measured IO − Baseline ,#Processes − 64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

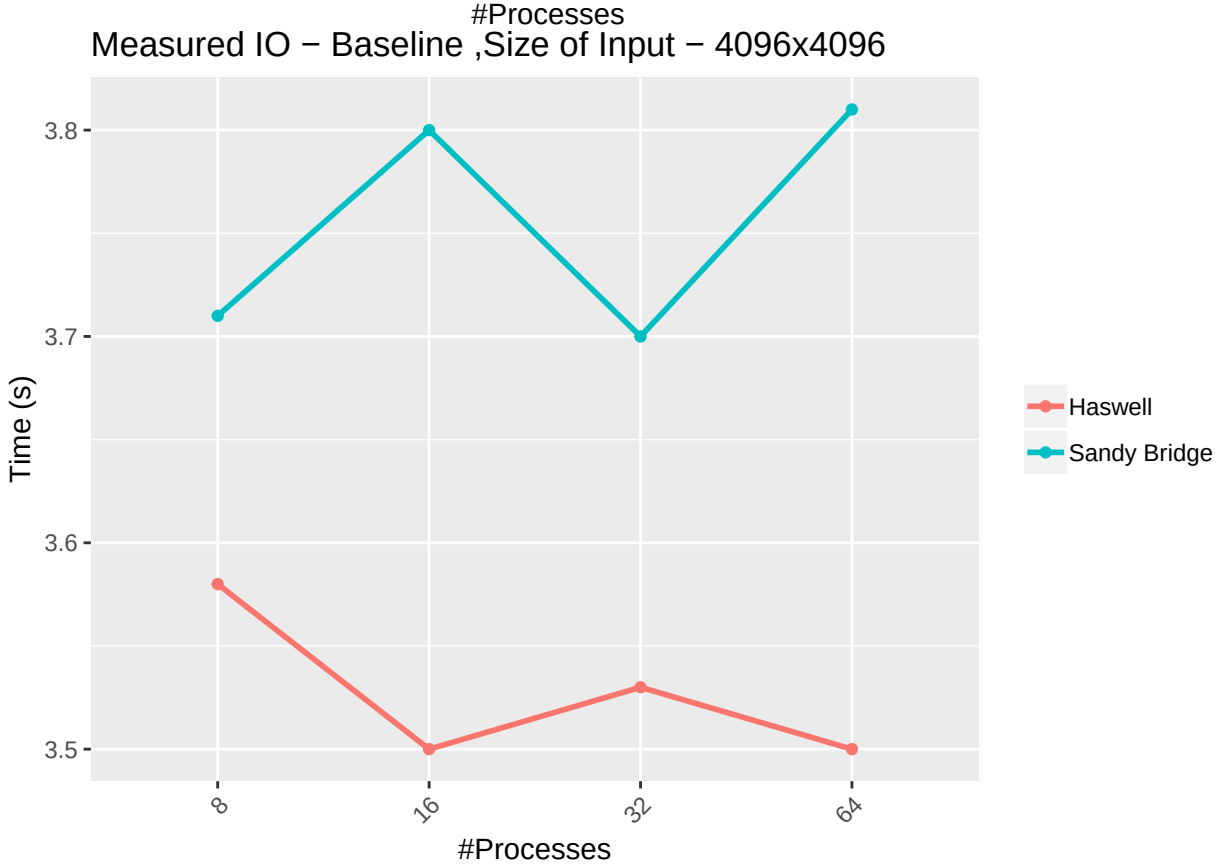

Measured IO − Baseline
8
16
32
64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

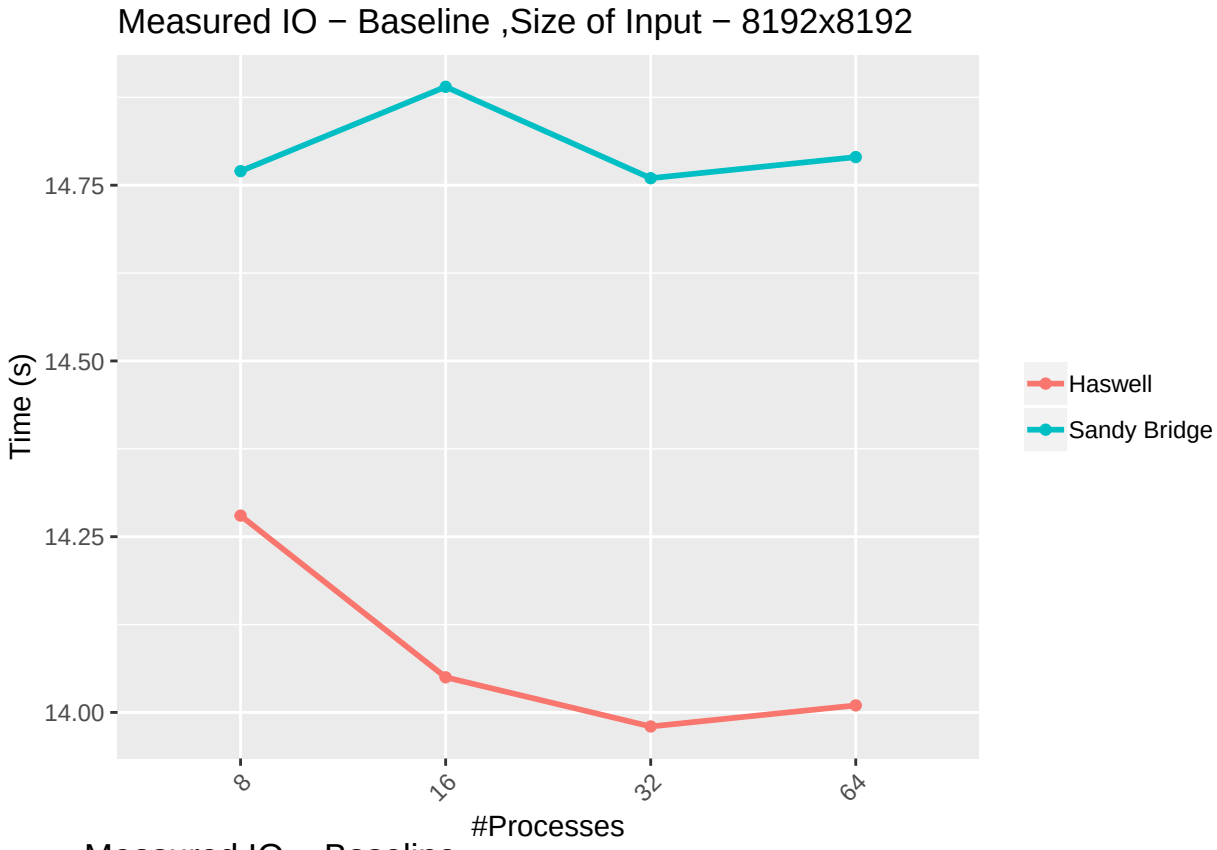

Measured IO − Baseline ,Size of Input − 64x64
Time (s)
0.75
0.50
0.25
0.00
8
16
32
64
#Processes
Haswell
Sandy Bridge

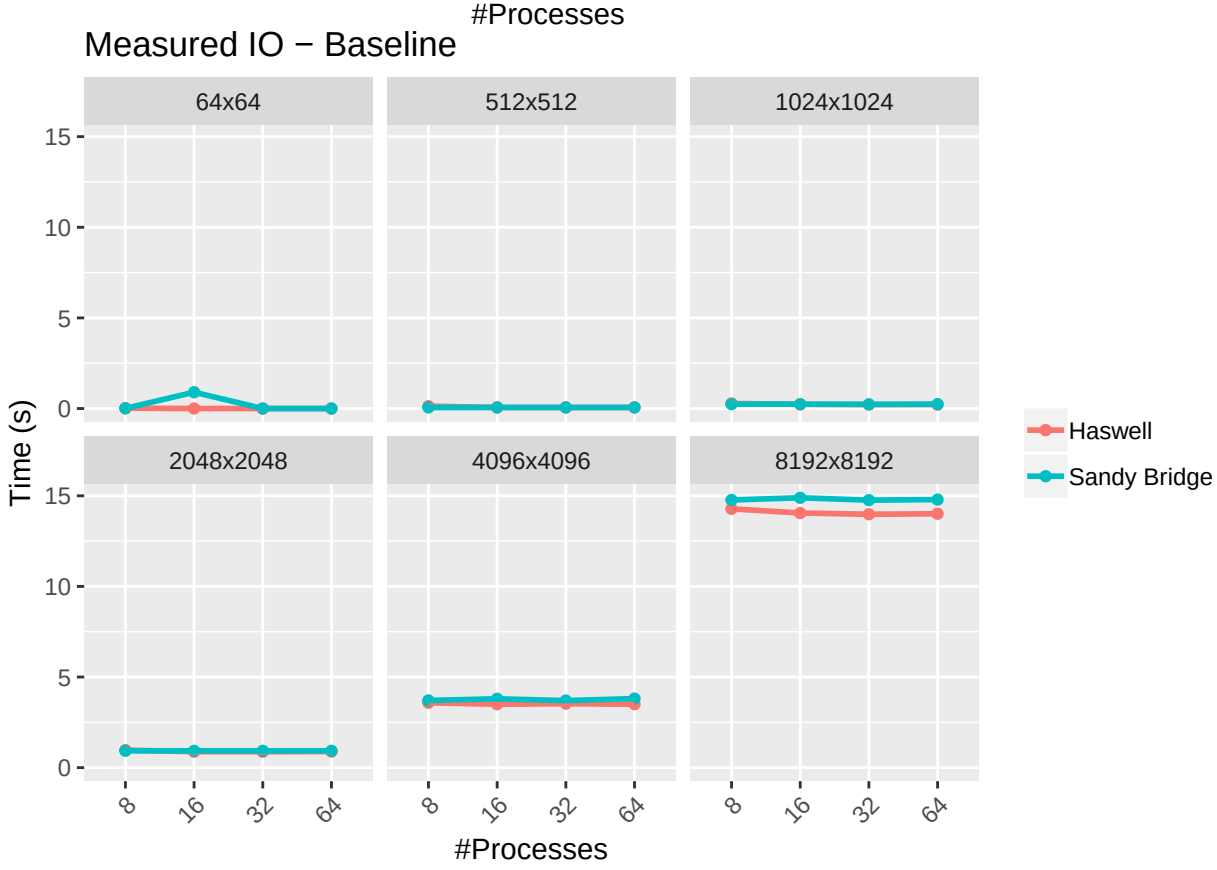

Measured IO − Baseline ,Size of Input − 512x512
Time (s)
0.12
0.10
0.08
0.06
8
16
32
64
#Processes
Haswell
Sandy Bridge

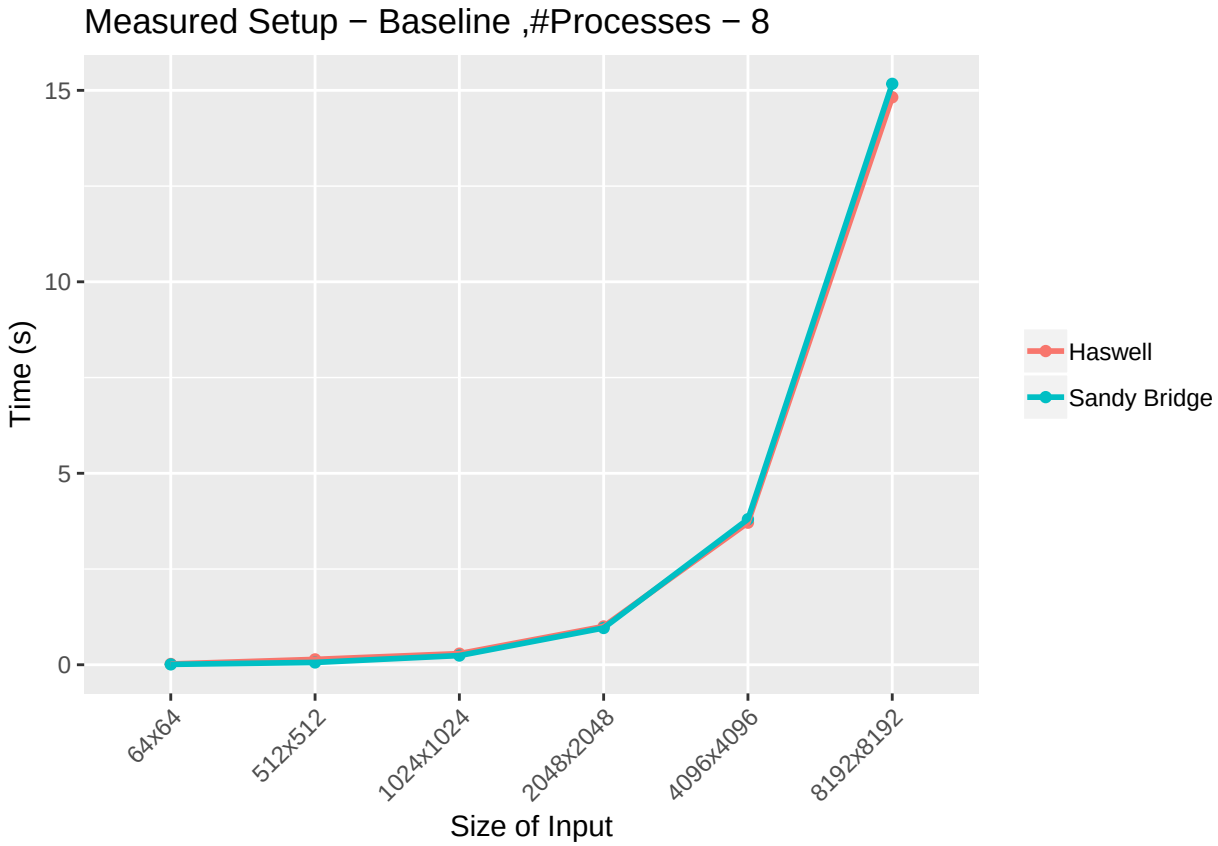

Measured IO − Baseline ,Size of Input − 1024x1024
Time (s)
0.28
0.26
0.24
0.22
8
16
32
64
#Processes
Haswell
Sandy Bridge

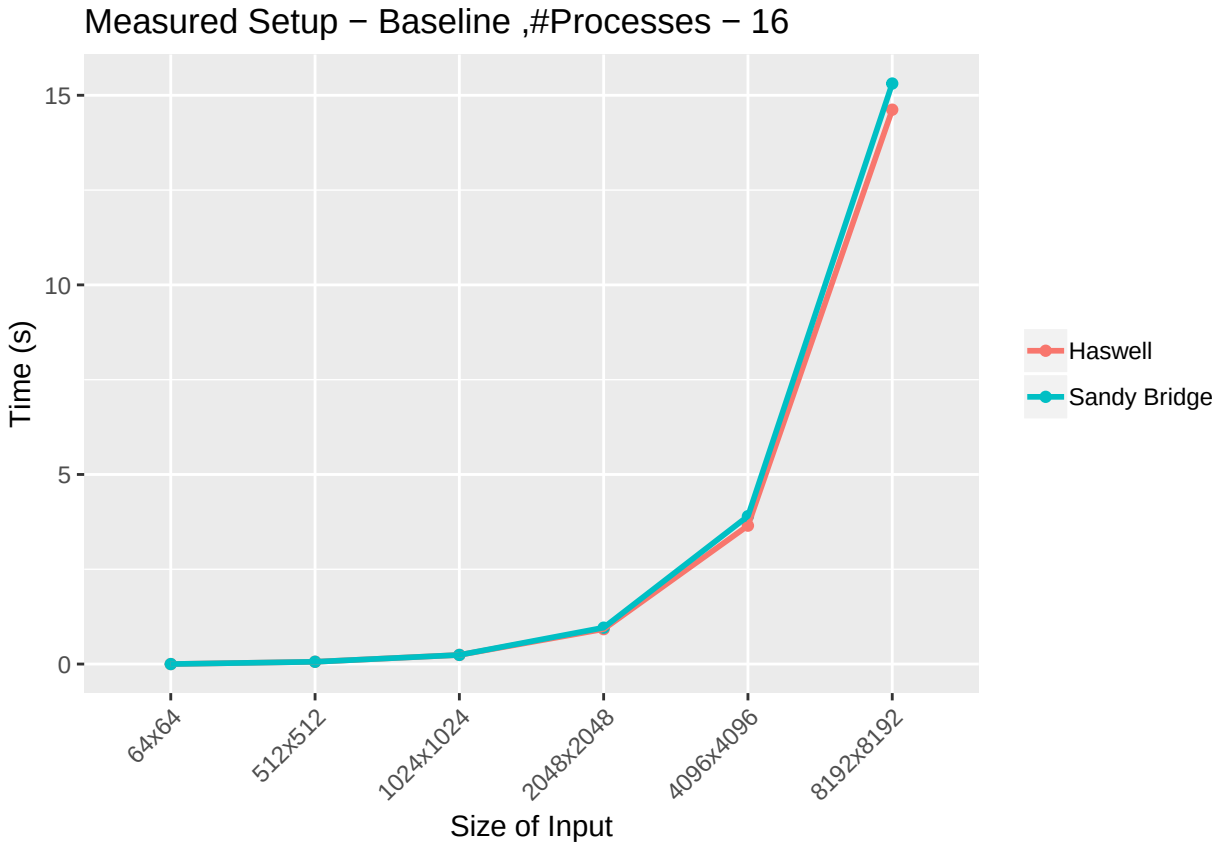

Measured IO − Baseline ,Size of Input − 2048x2048
Time (s)
0.950
0.925
0.900
8
16
32
64
#Processes
Haswell
Sandy Bridge

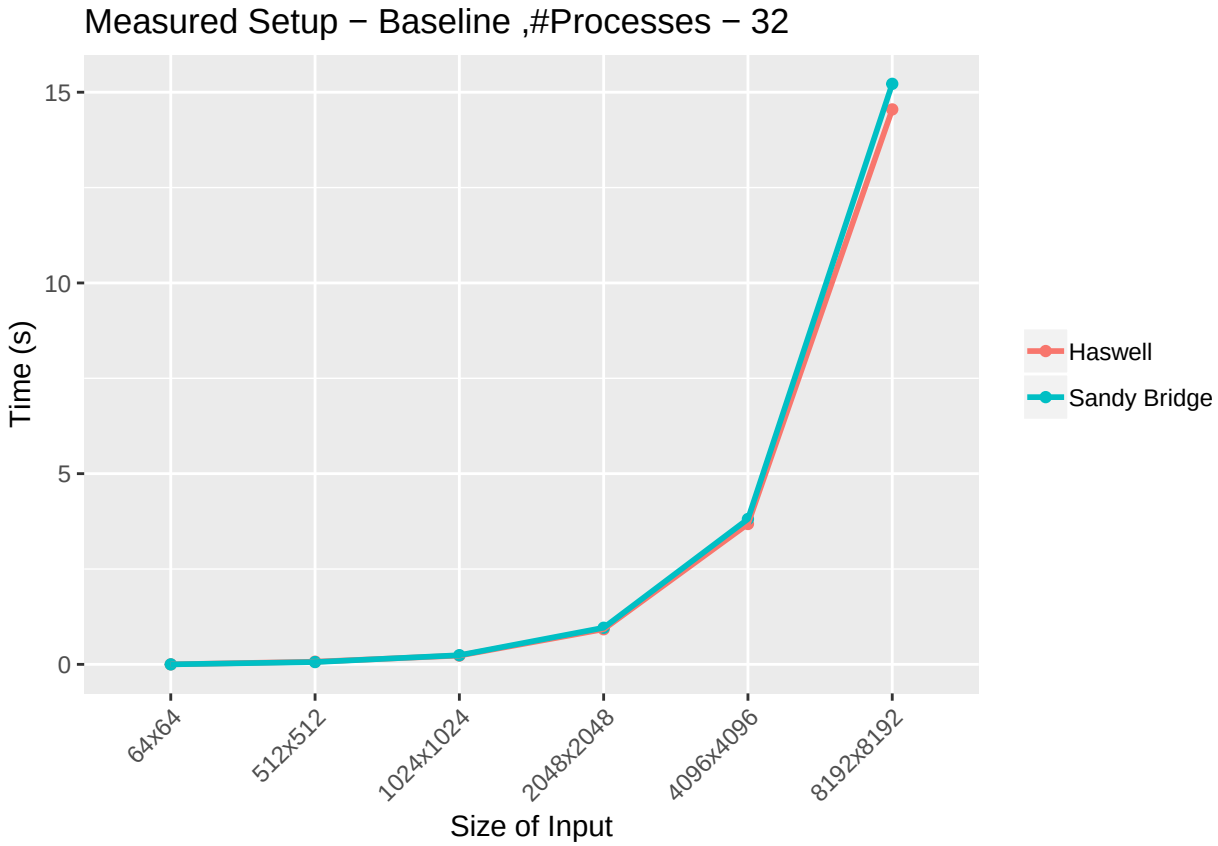

Measured IO − Baseline ,Size of Input − 4096x4096
Time (s)
3.8
3.7
3.6
3.5
8
16
32
64
#Processes
Haswell
Sandy Bridge

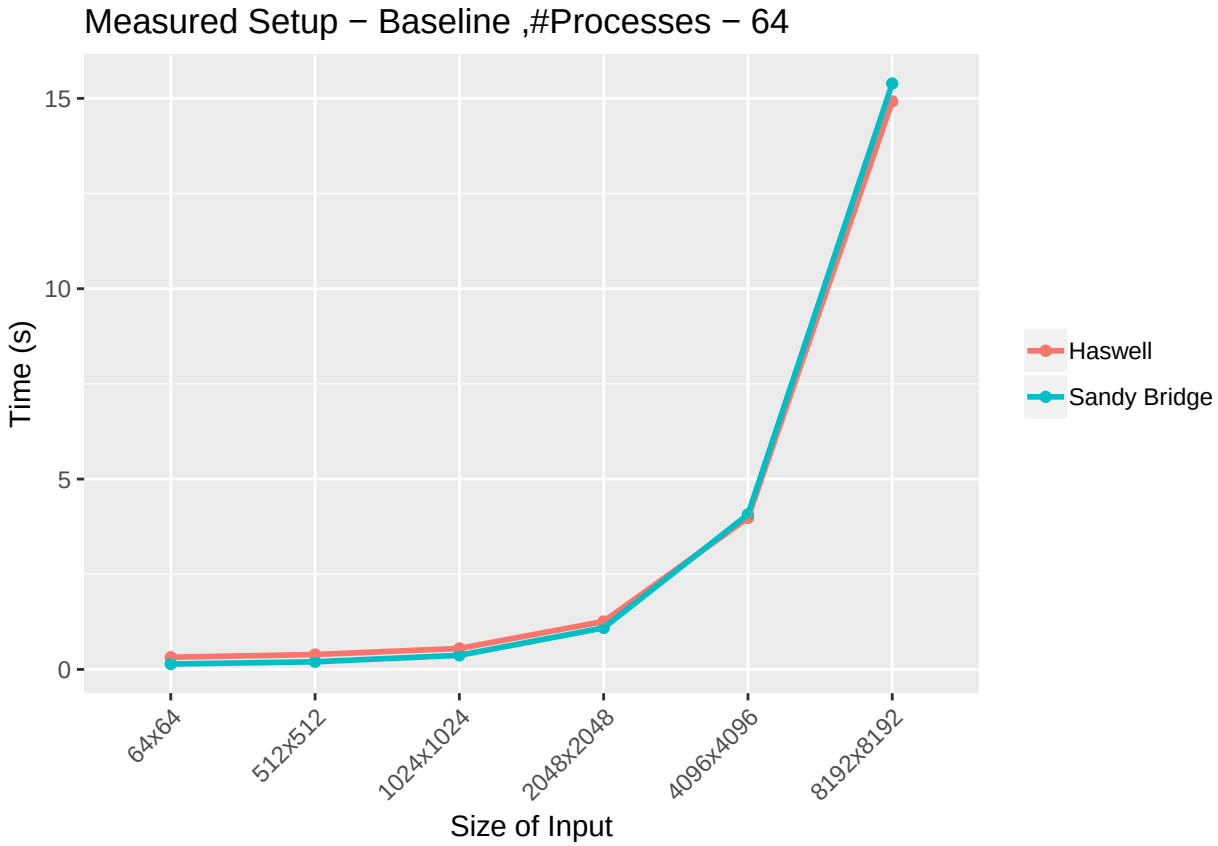

Measured IO − Baseline ,Size of Input − 8192x8192
Time (s)
14.75
14.50
14.25
14.00
8
16
32
64
#Processes
Haswell
Sandy Bridge

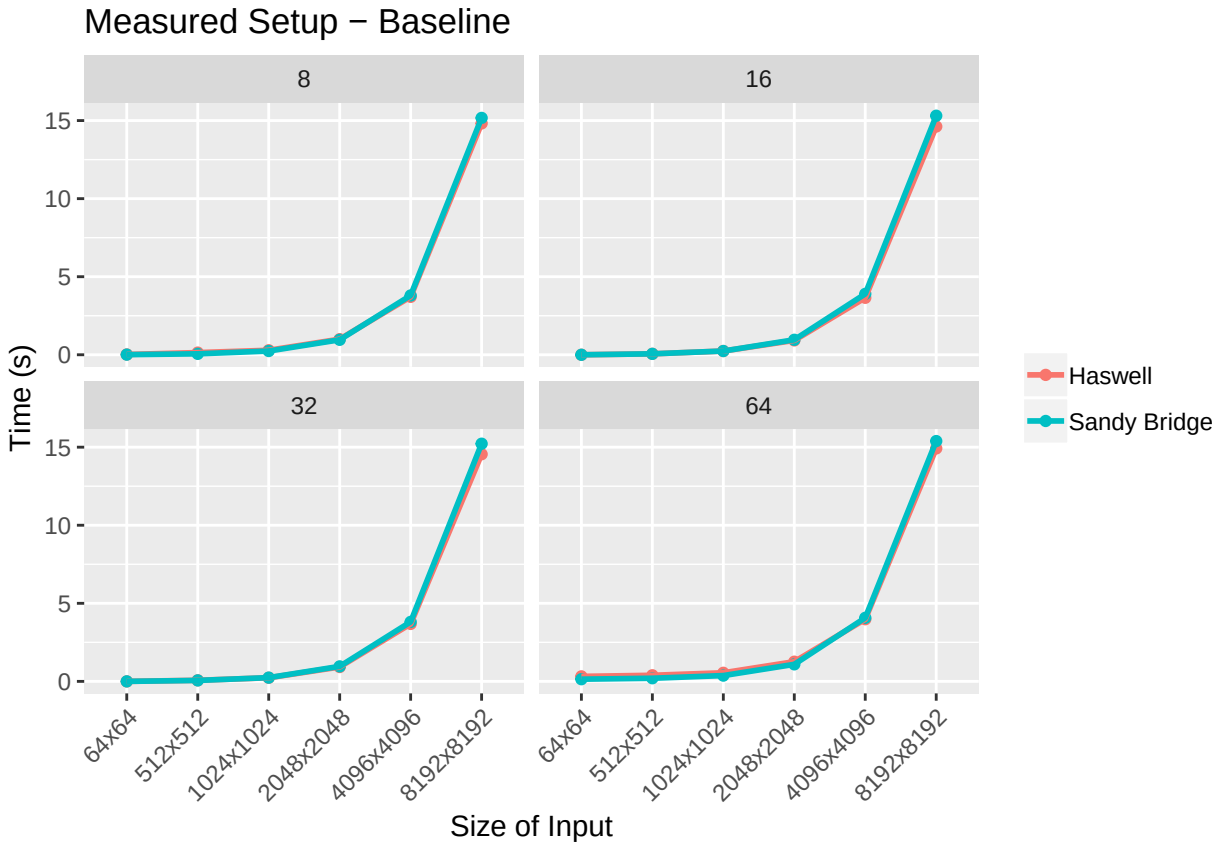

Measured IO − Baseline
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
15
10
5
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

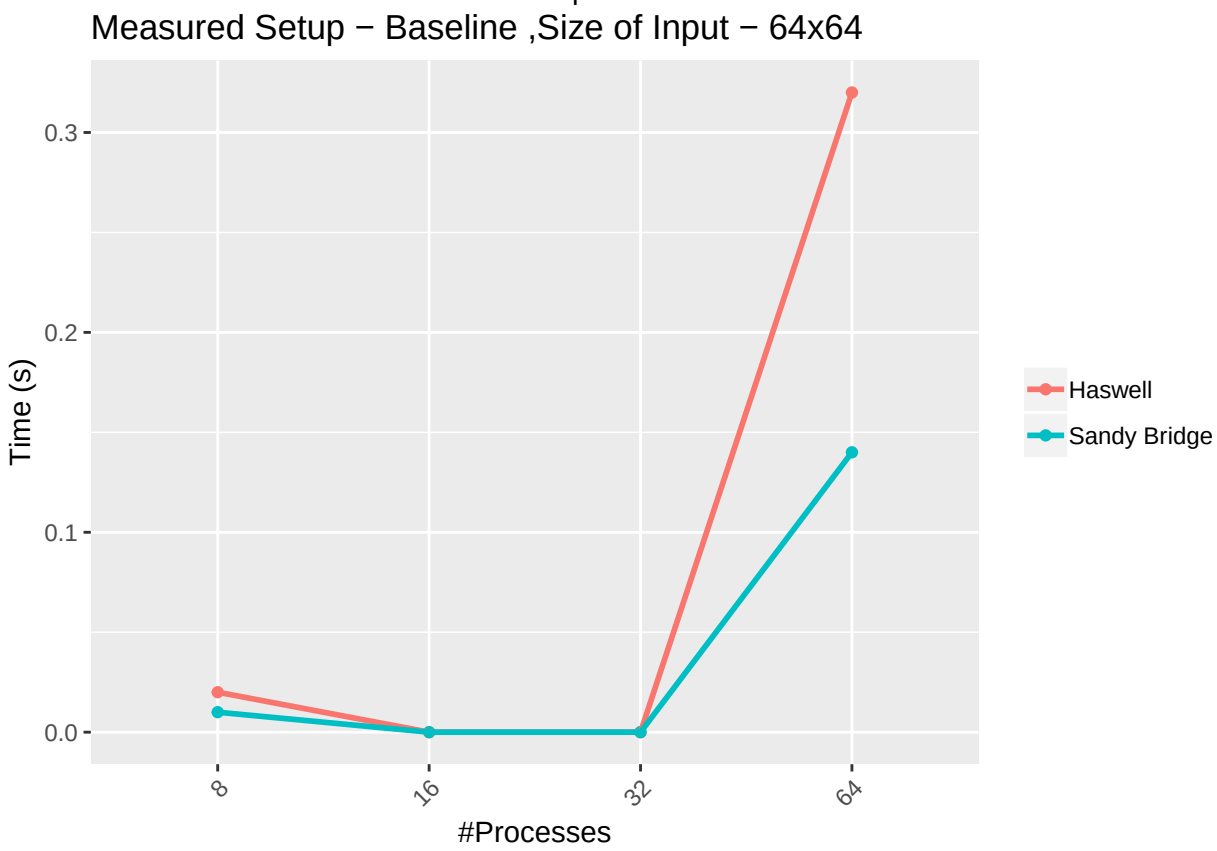

Measured Setup − Baseline ,#Processes − 8
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

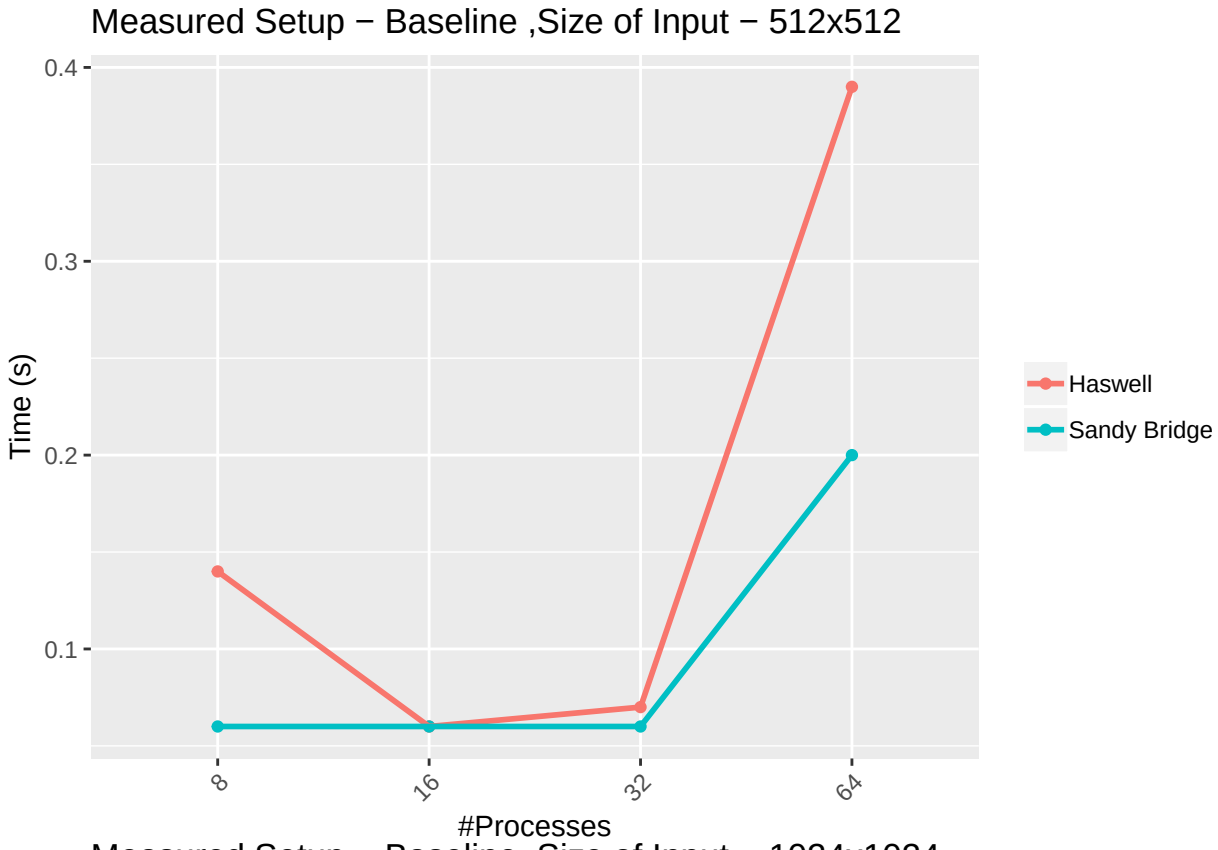

Measured Setup − Baseline ,#Processes − 16
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

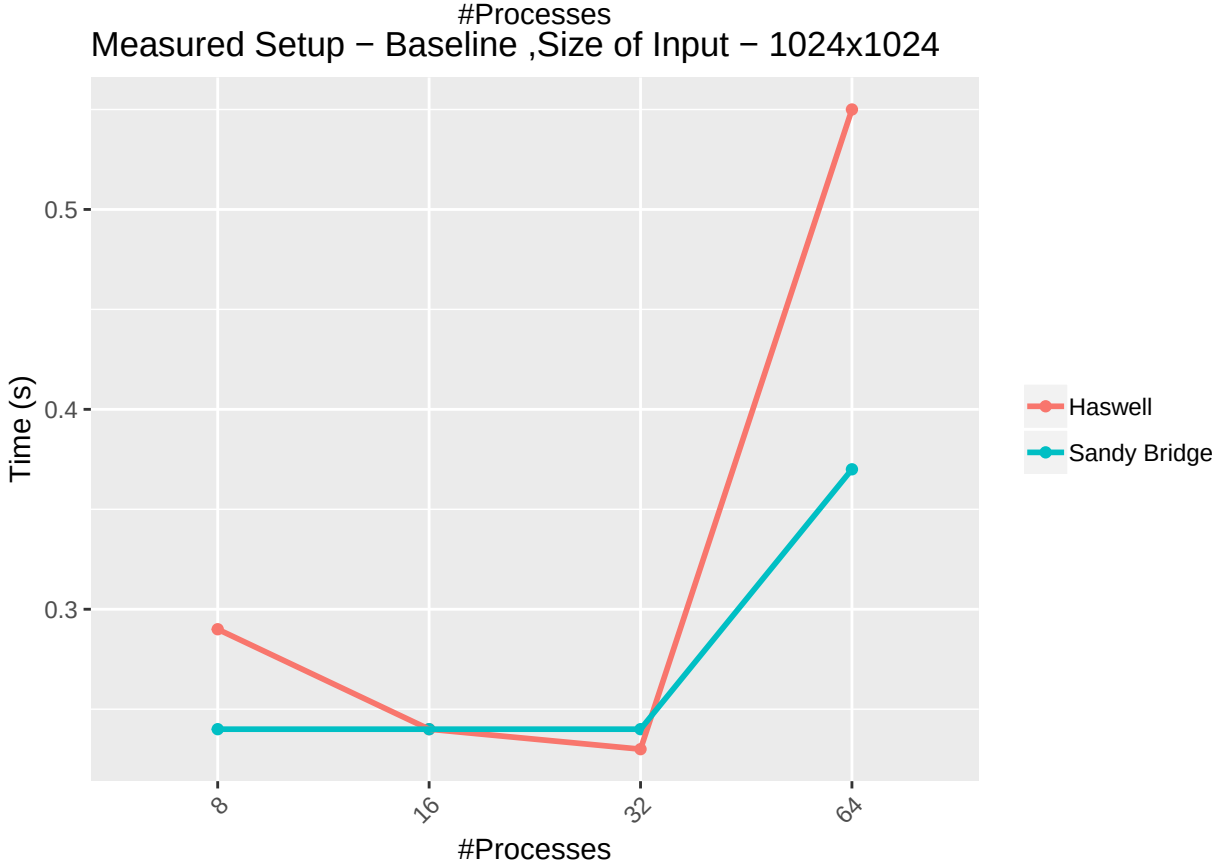

Measured Setup − Baseline ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge


Measured Setup − Baseline ,#Processes − 64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

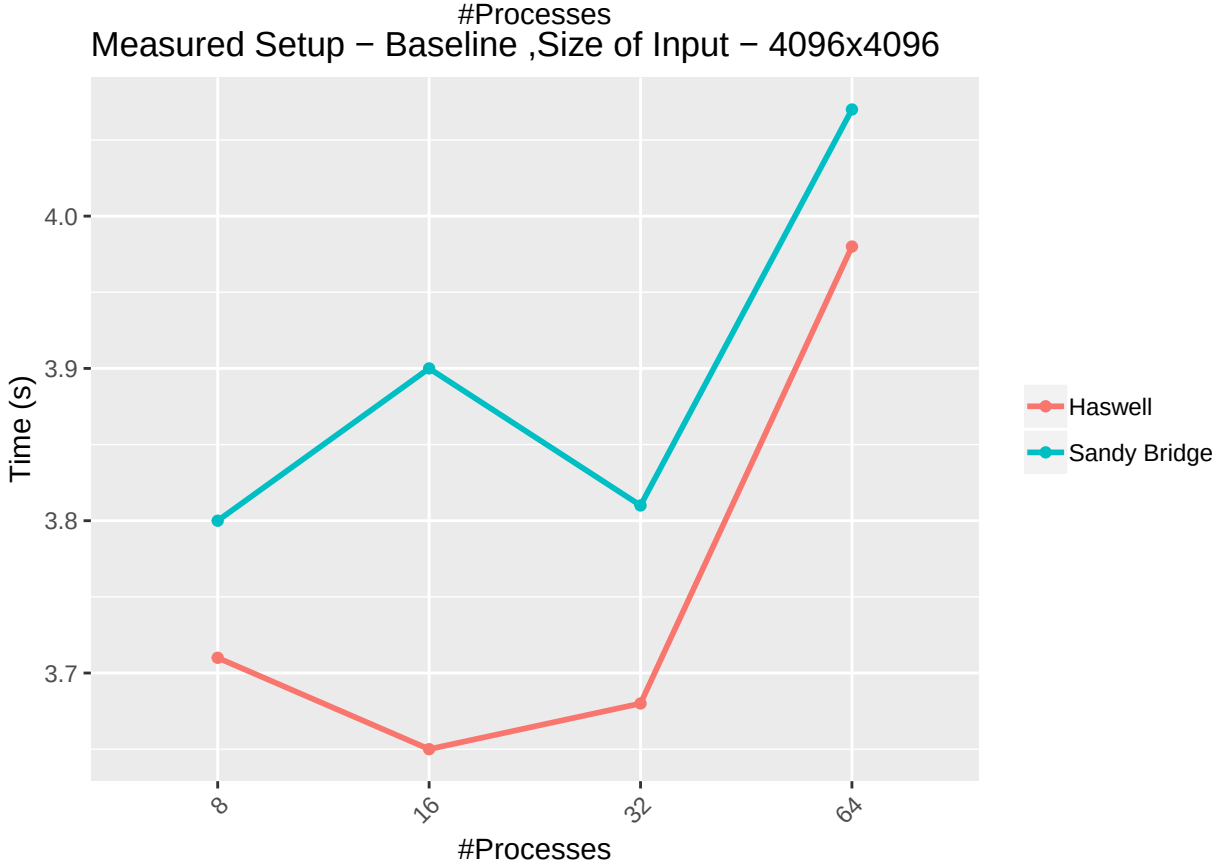

Measured Setup − Baseline
8
16
32
64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

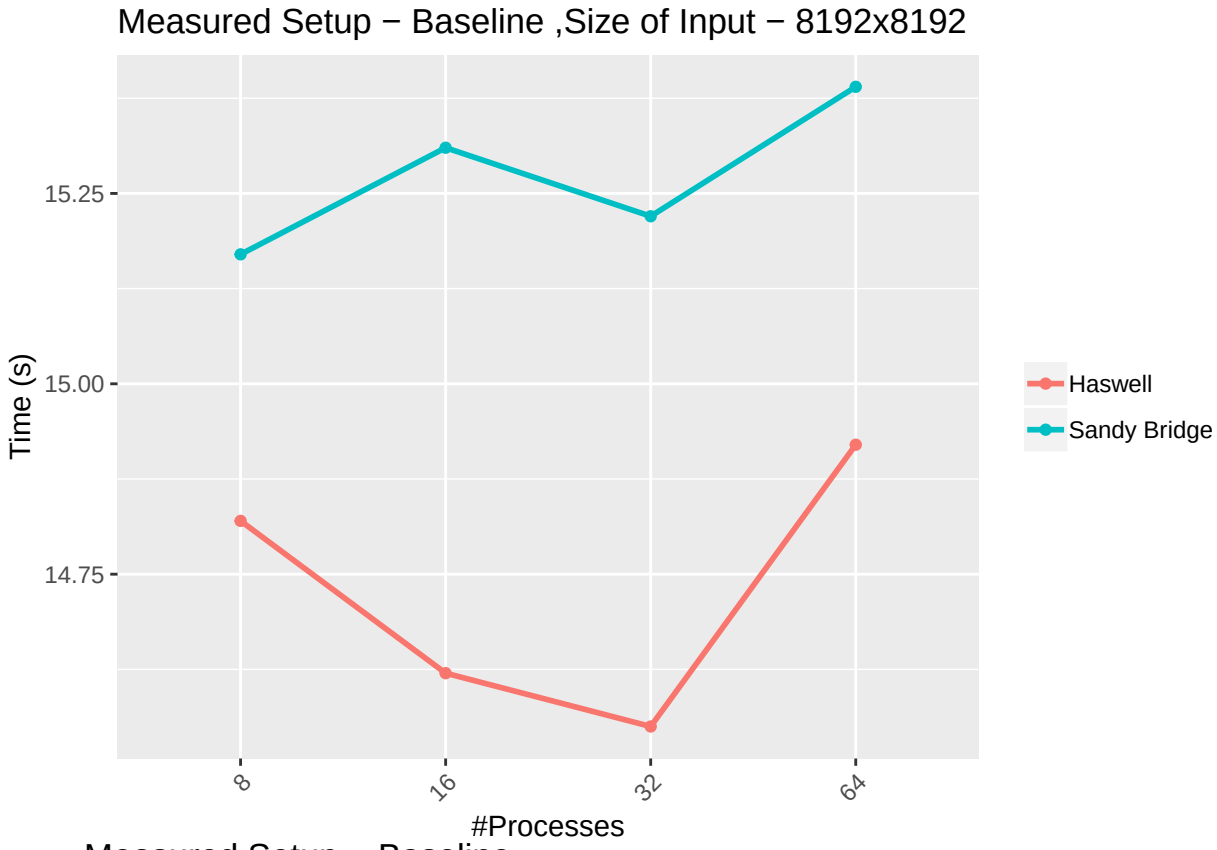

Measured Setup − Baseline ,Size of Input − 64x64
Time (s)
0.3
0.2
0.1
0.0
8
16
32
64
#Processes
Haswell
Sandy Bridge

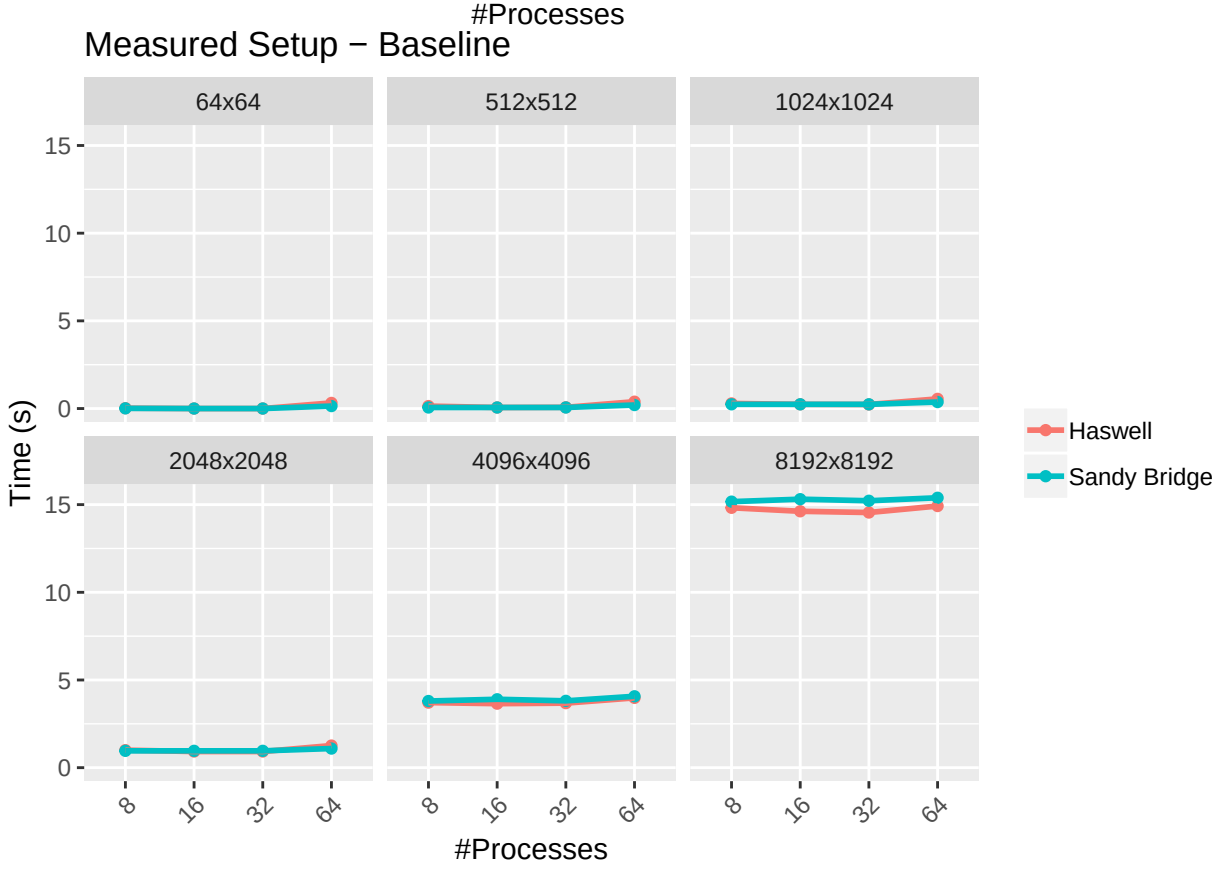

Measured Setup − Baseline ,Size of Input − 512x512
Time (s)
0.4
0.3
0.2
0.1
8
16
32
64
#Processes
Haswell
Sandy Bridge

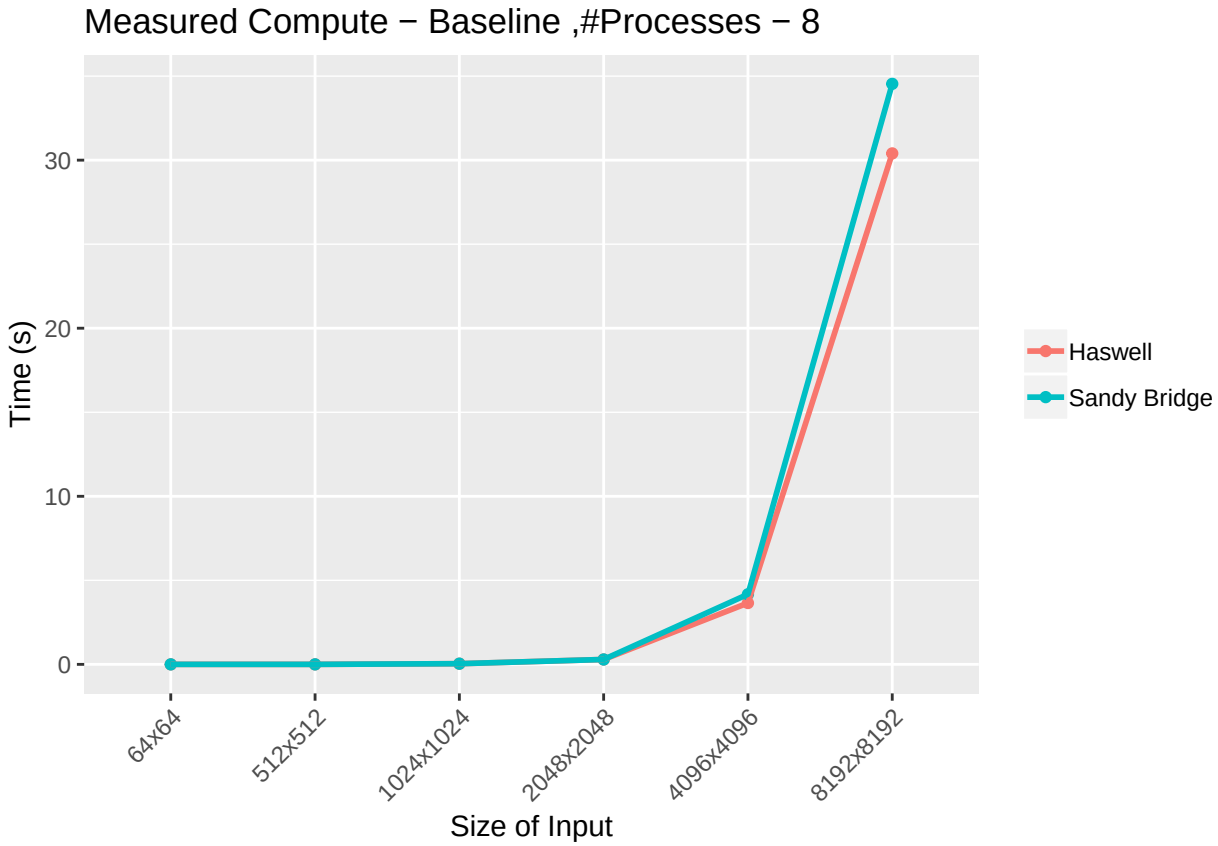

Measured Setup − Baseline ,Size of Input − 1024x1024
Time (s)
0.5
0.4
0.3
8
16
32
64
#Processes
Haswell
Sandy Bridge

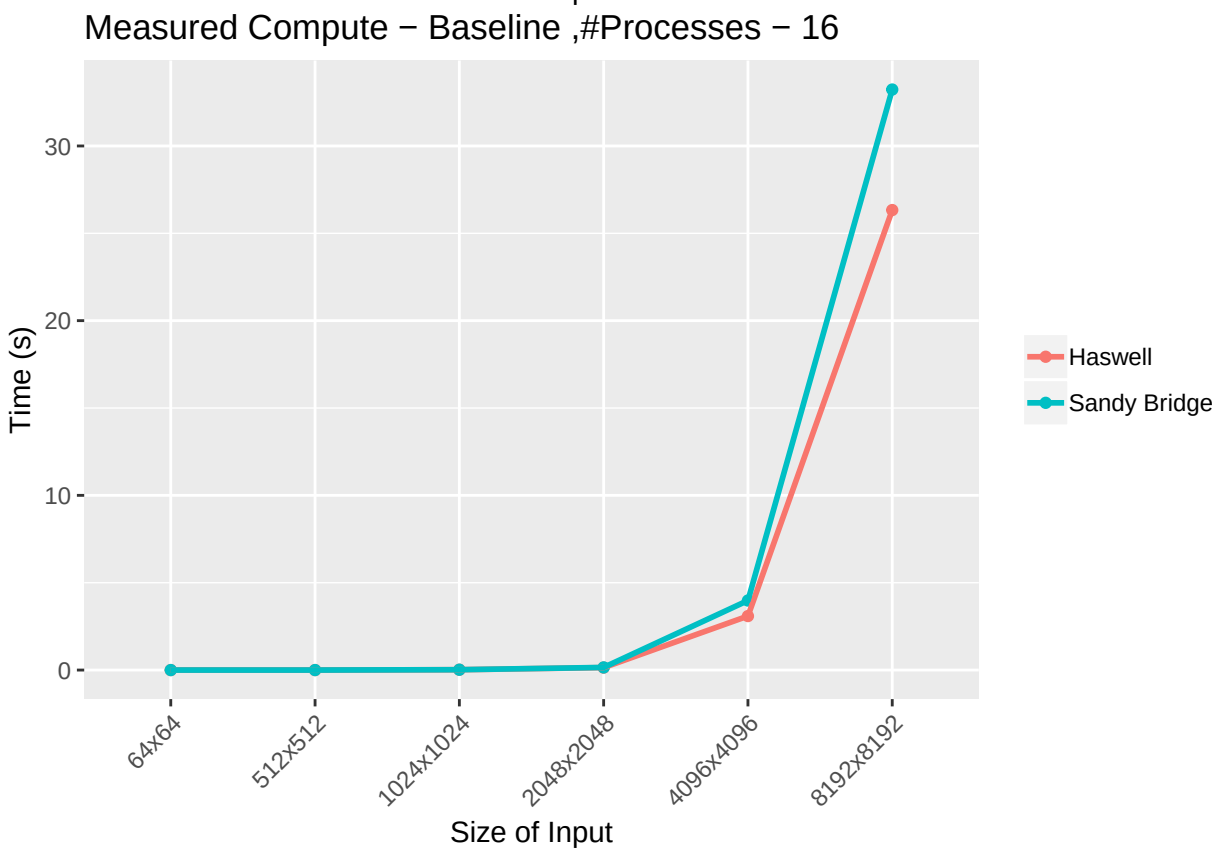

Measured Setup − Baseline ,Size of Input − 2048x2048
Time (s)
1.2
1.1
1.0
8
16
32
64
#Processes
Haswell
Sandy Bridge

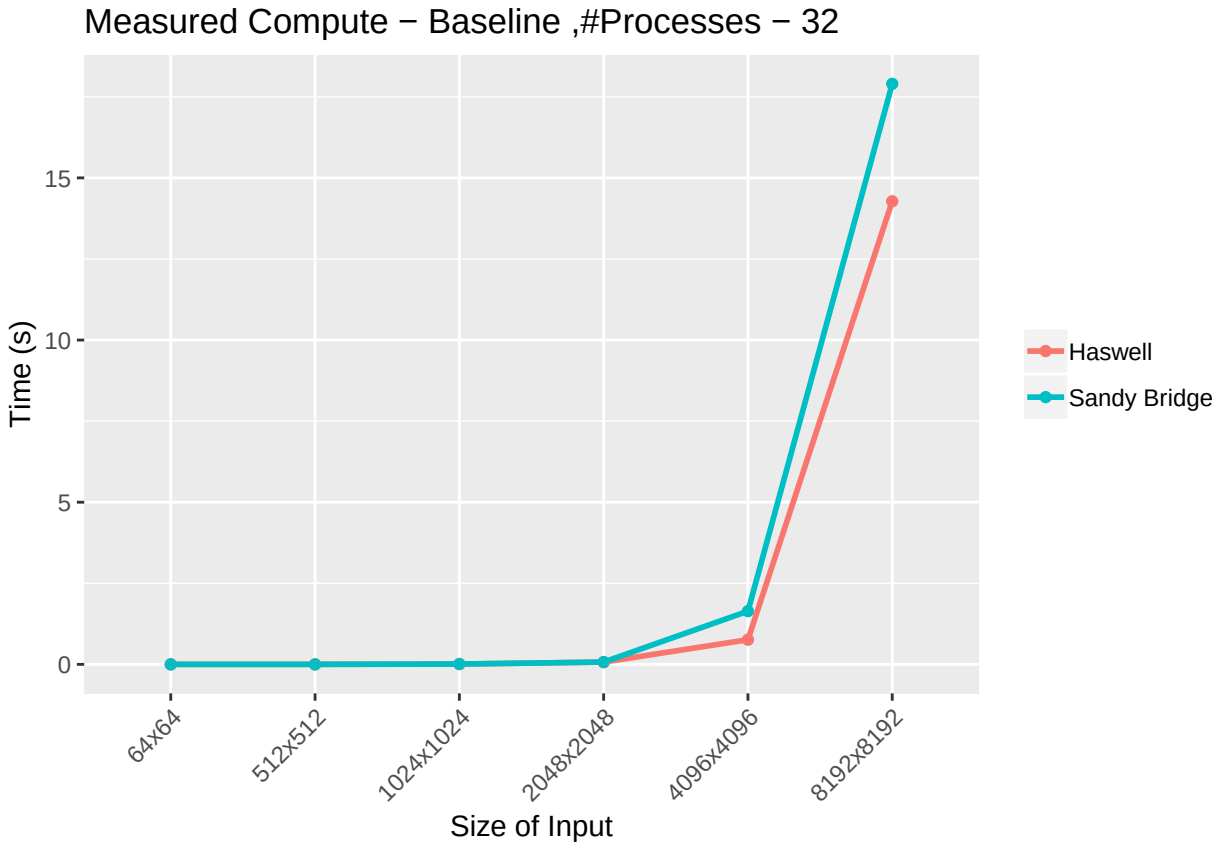

Measured Setup − Baseline ,Size of Input − 4096x4096
Time (s)
4.0
3.9
3.8
3.7
8
16
32
64
#Processes
Haswell
Sandy Bridge

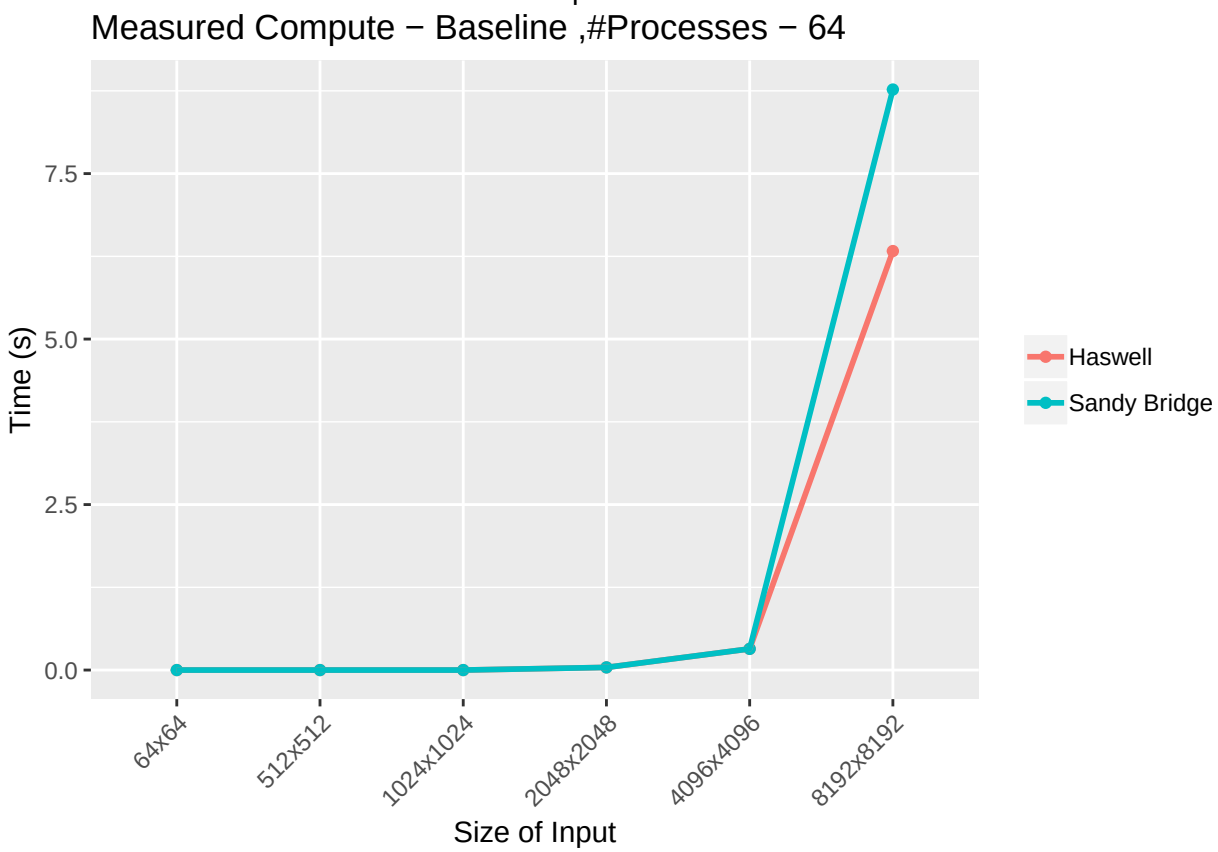

Measured Setup − Baseline ,Size of Input − 8192x8192
Time (s)
15.25
15.00
14.75
8
16
32
64
#Processes
Haswell
Sandy Bridge

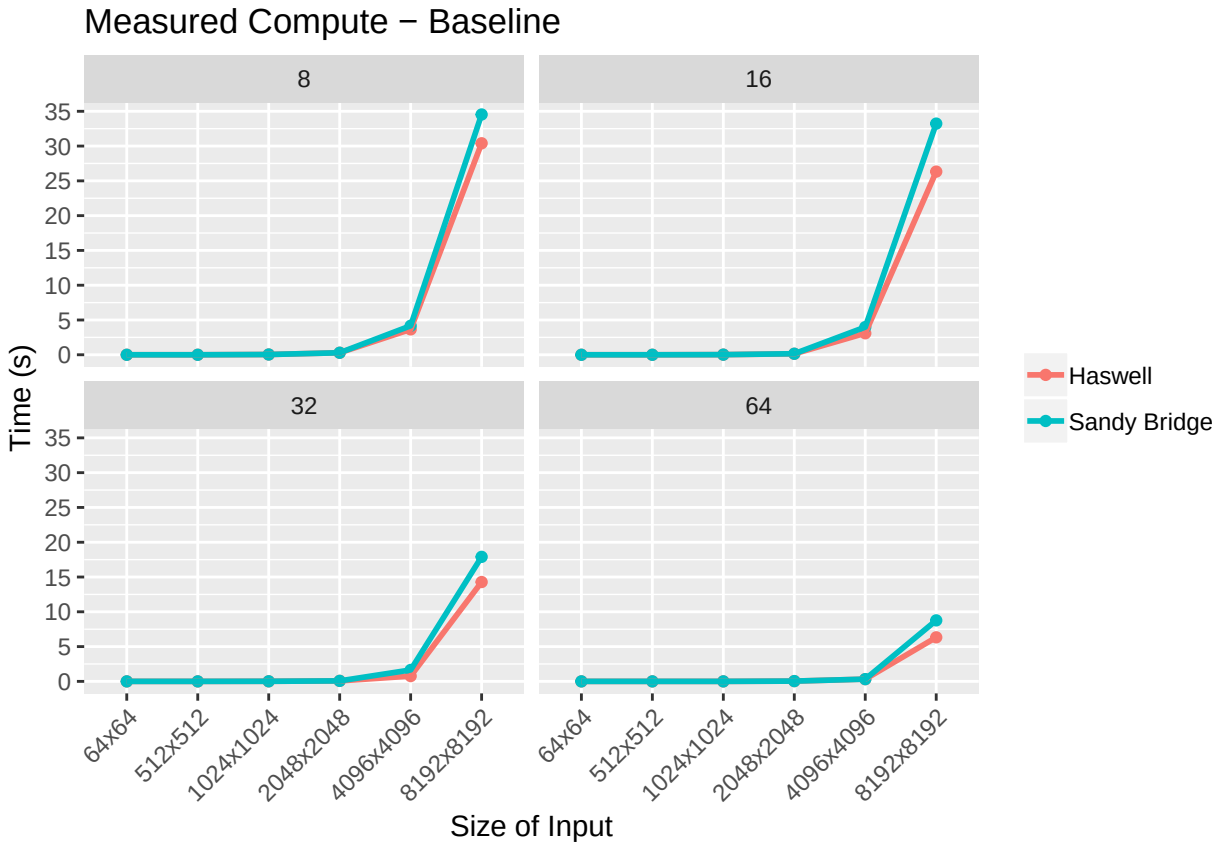

Measured Setup − Baseline
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
15
10
5
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

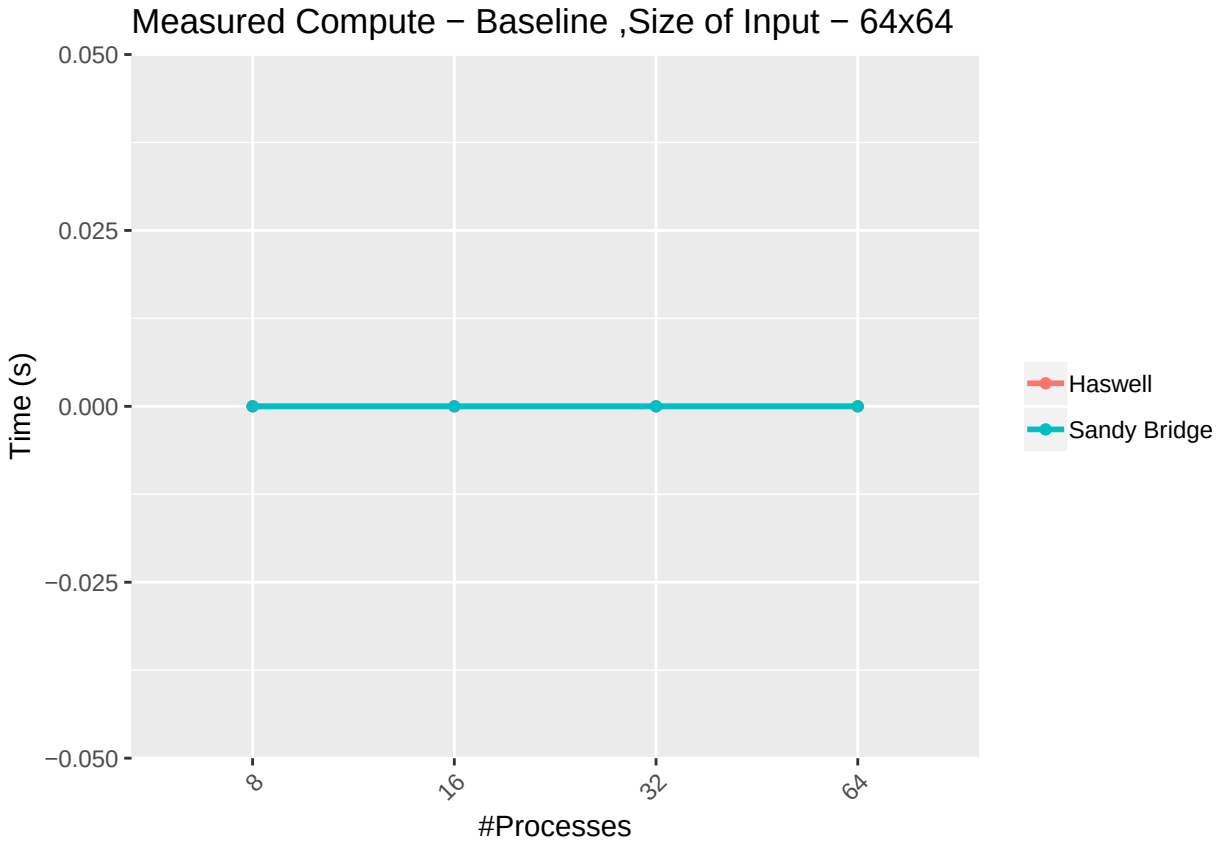

Measured Compute − Baseline ,#Processes − 8
Time (s)
30
20
10
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

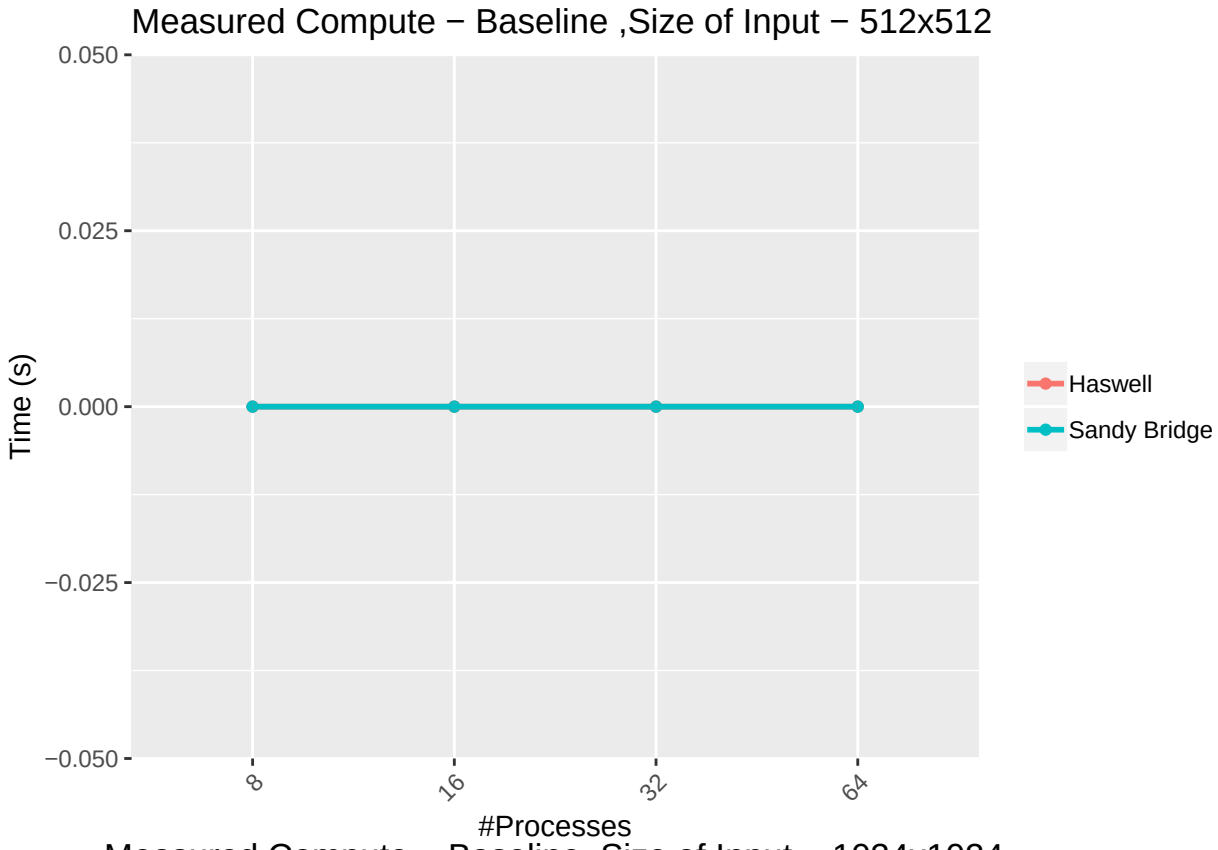

Measured Compute − Baseline ,#Processes − 16
Time (s)
30
20
10
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

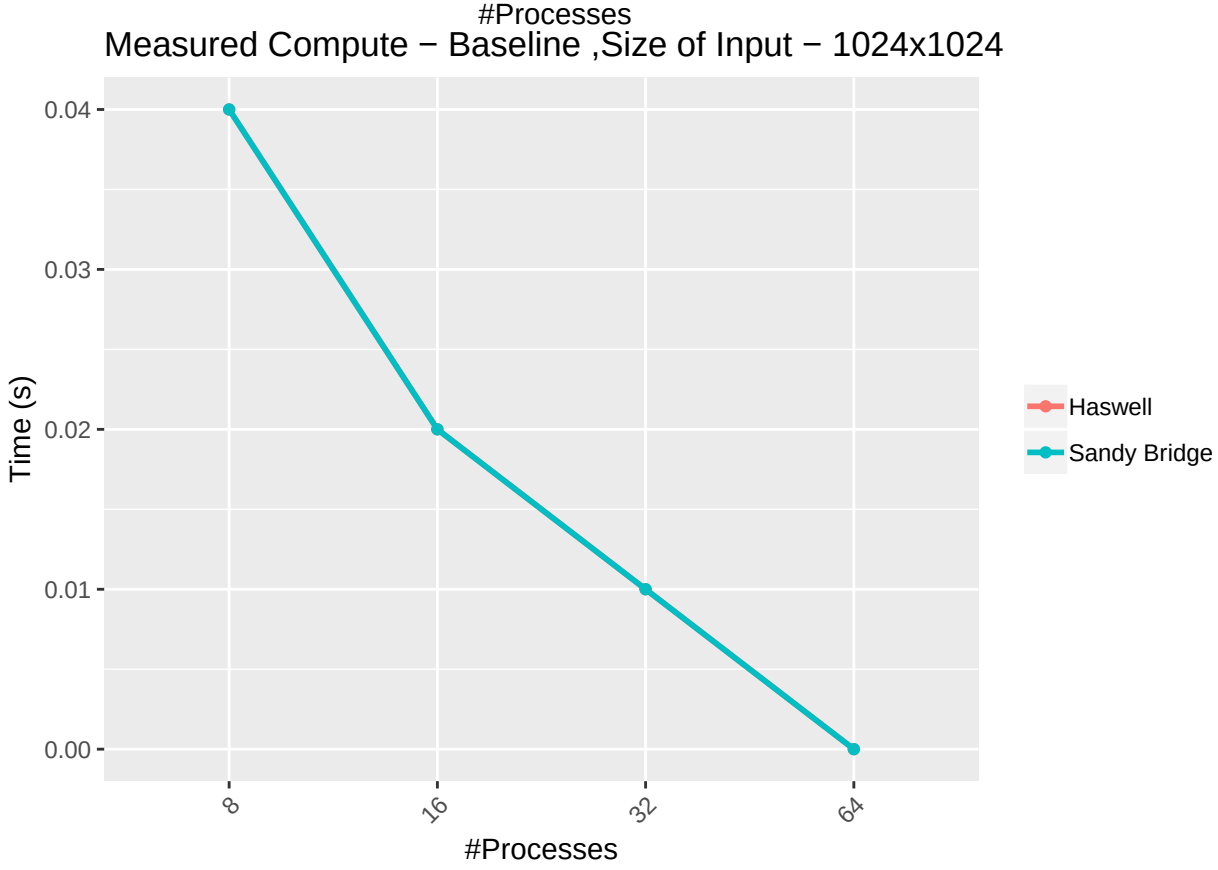

Measured Compute − Baseline ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

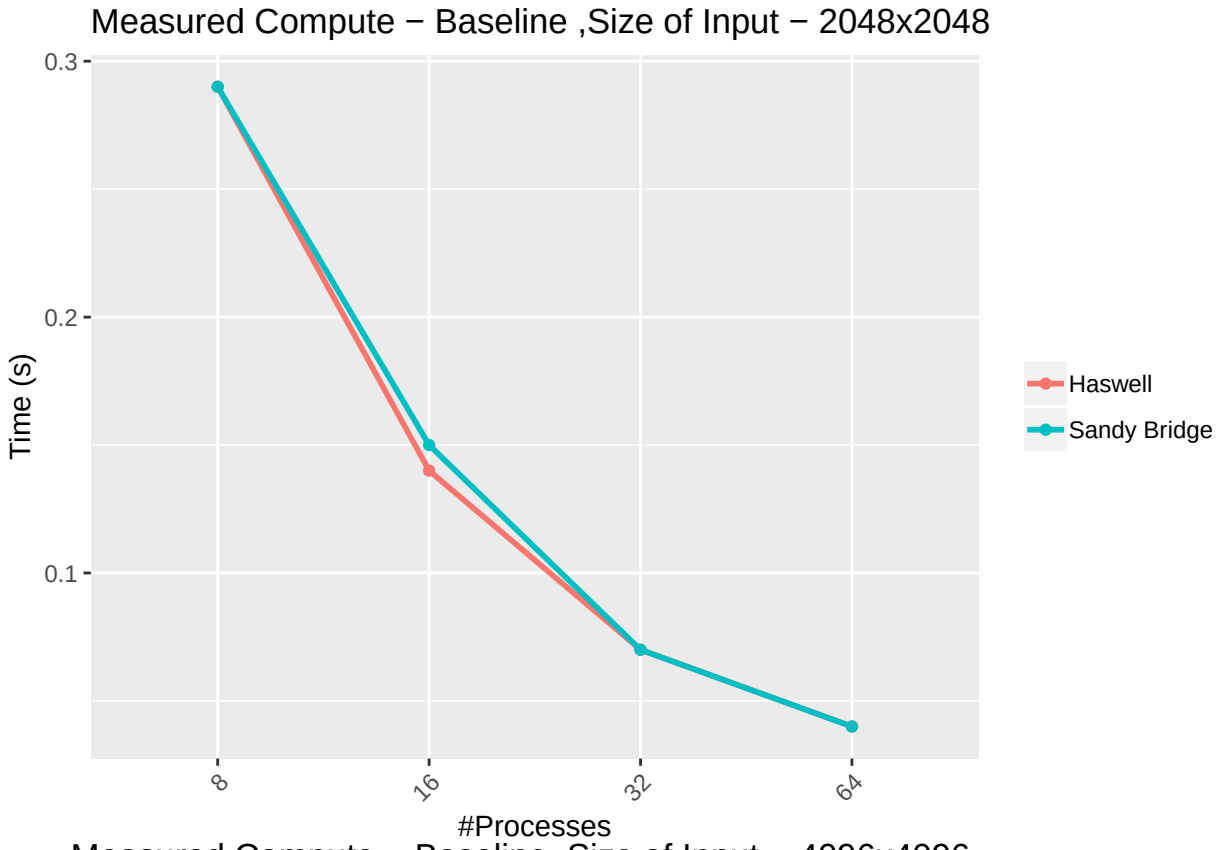

Measured Compute − Baseline ,#Processes − 64
Time (s)
7.5
5.0
2.5
0.0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

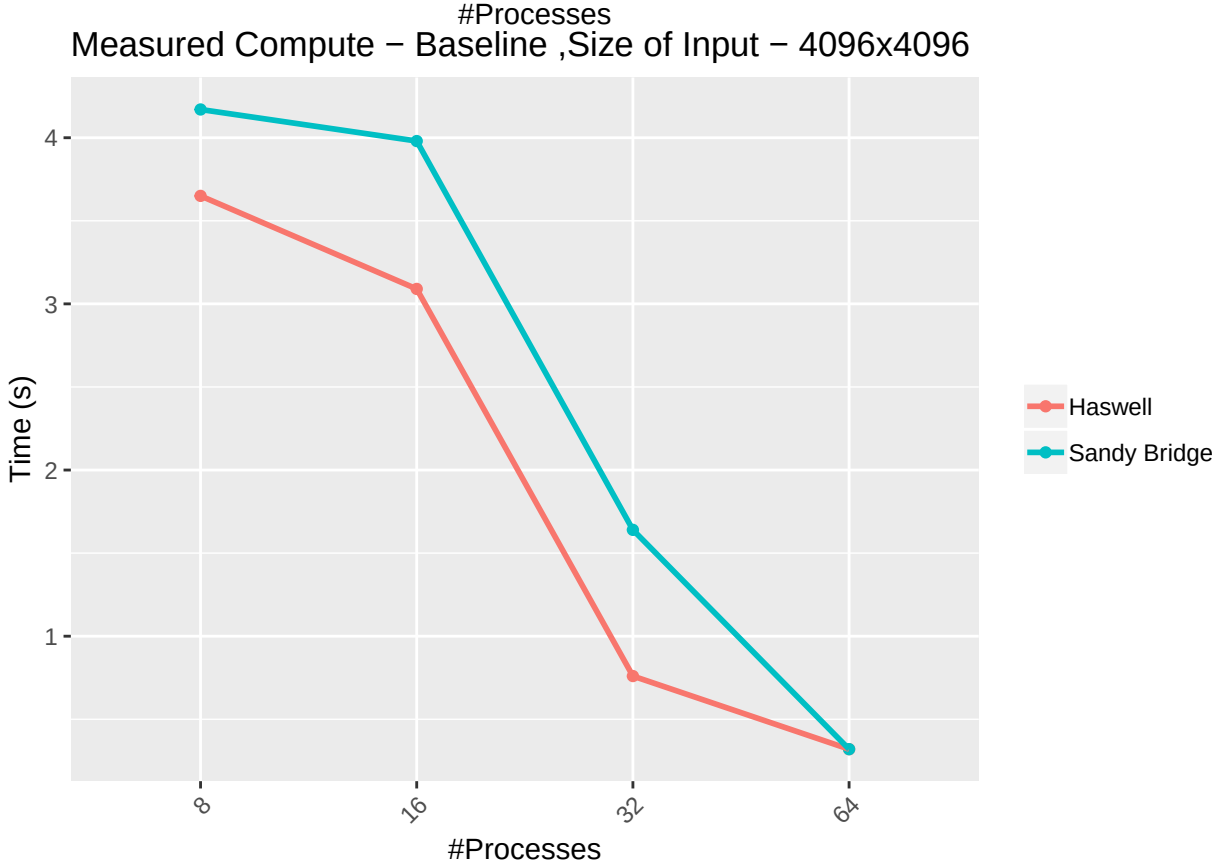

Measured Compute − Baseline
8
16
32
64
Time (s)
0
5
10
15
20
25
30
35
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

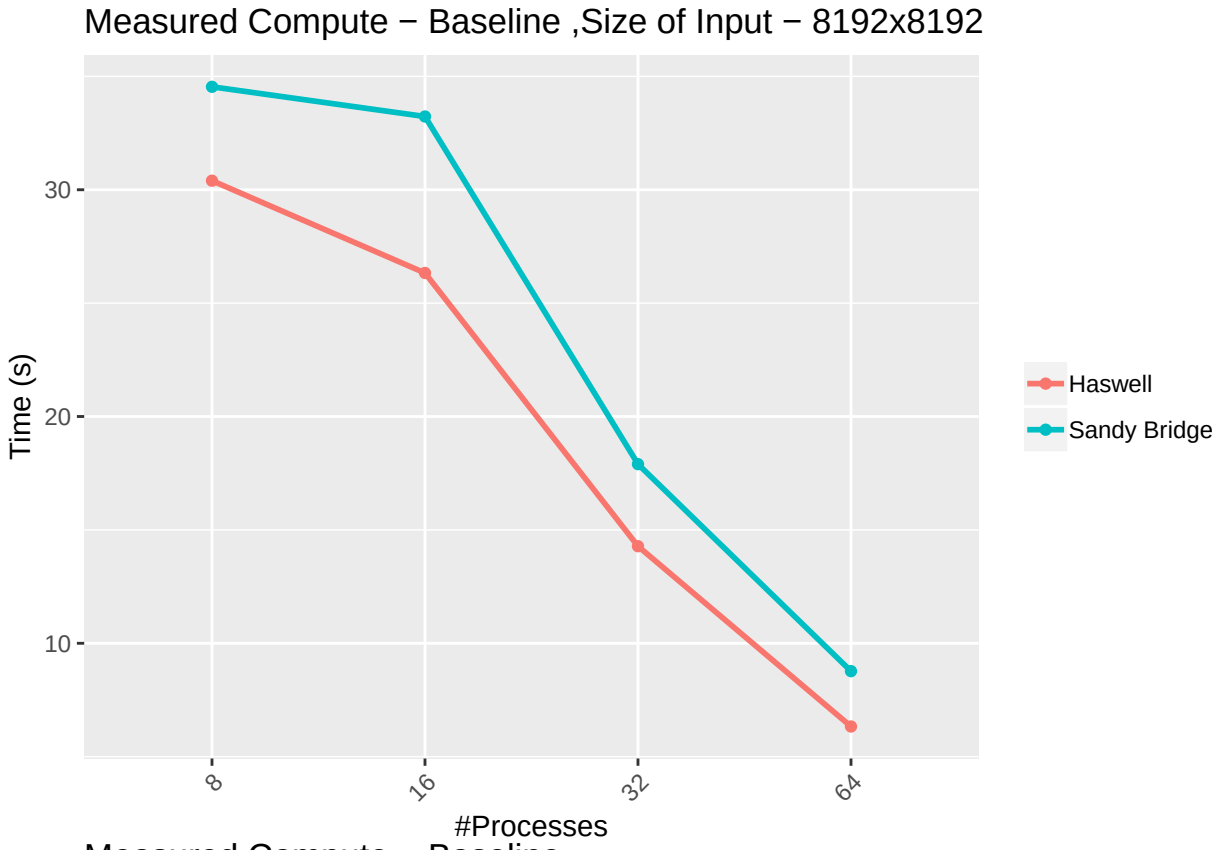

Measured Compute − Baseline ,Size of Input − 64x64
Time (s)
0.050
0.025
0.000
−0.025
−0.050
8
16
32
64
#Processes
Haswell
Sandy Bridge

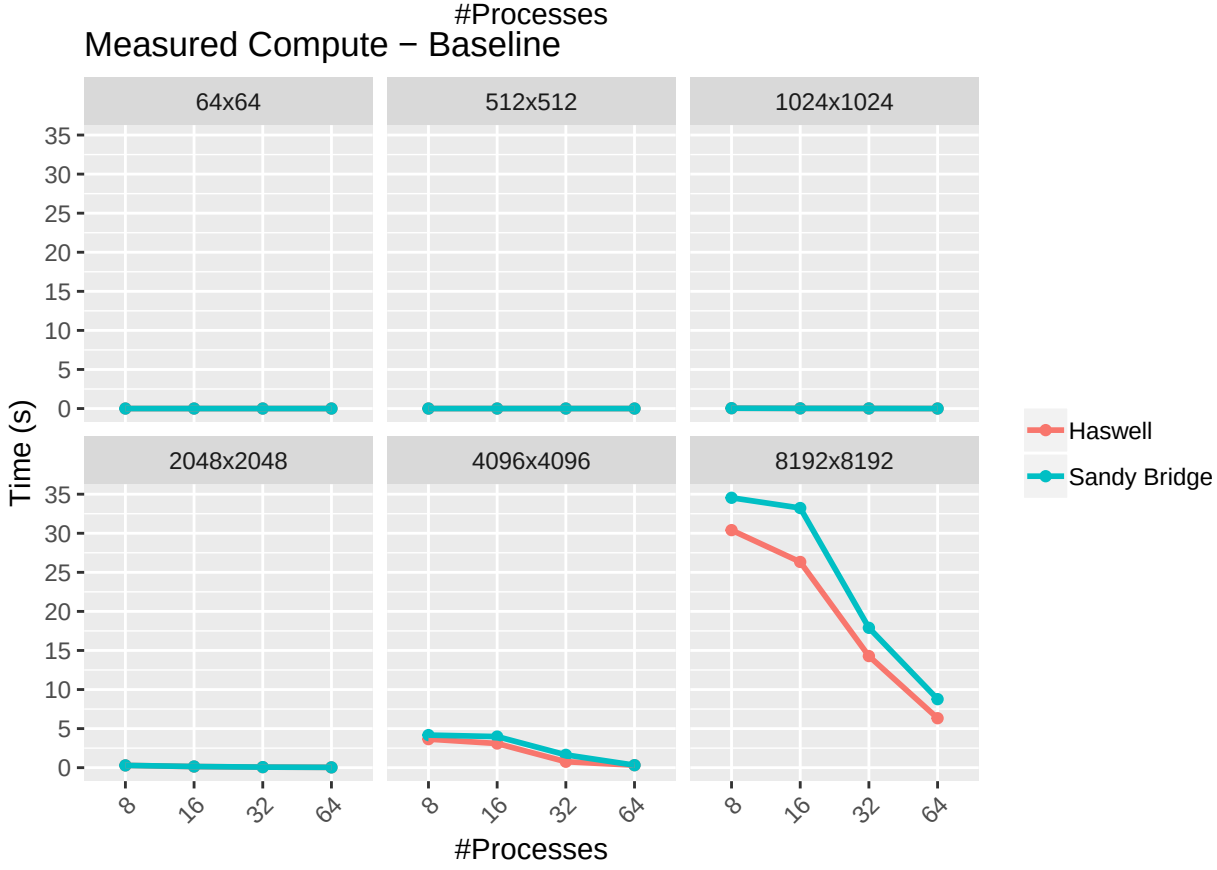

Measured Compute − Baseline ,Size of Input − 512x512
0.050
0.025
0.000
−0.025
−0.050
Time (s)
8
16
32
64
#Processes
Haswell
Sandy Bridge

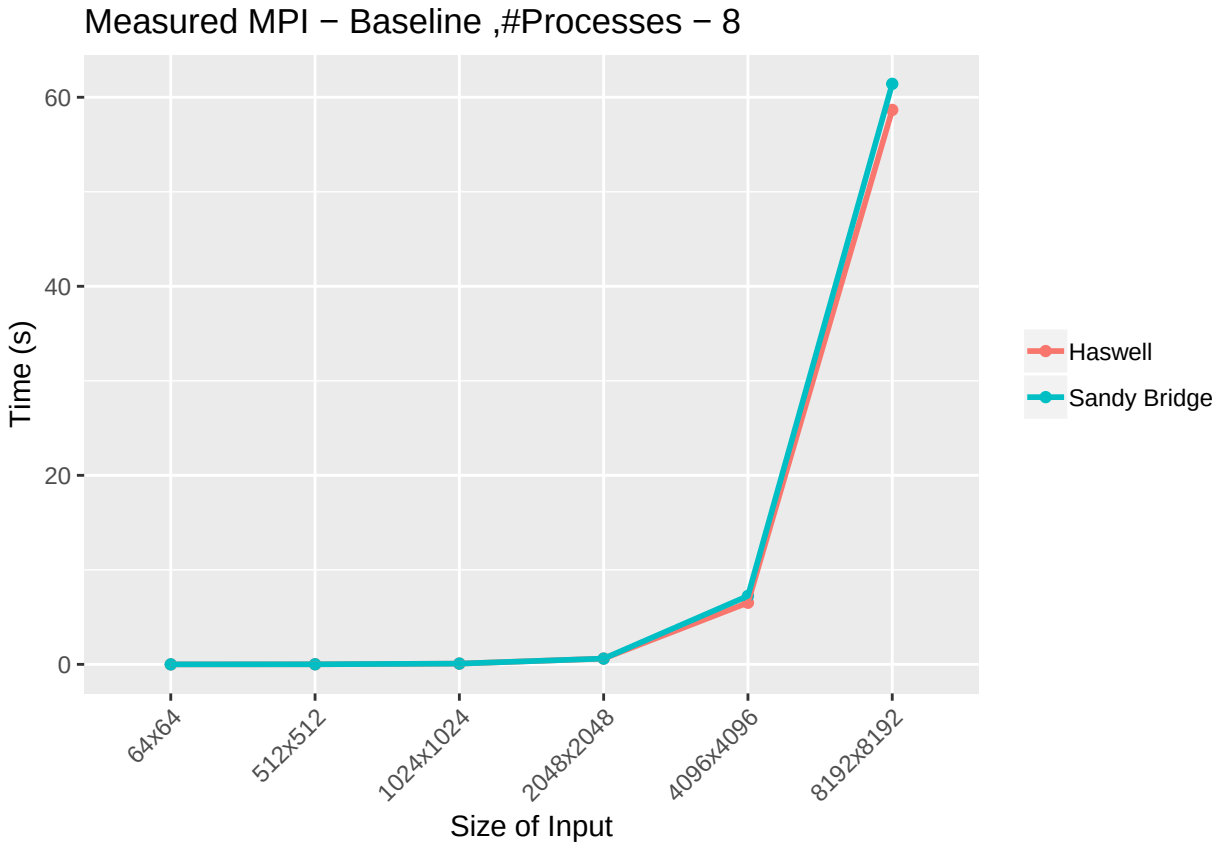

Measured Compute − Baseline ,Size of Input − 1024x1024
0.04
0.03
0.02
0.01
0.00
Time (s)
8
16
32
64
#Processes
Haswell
Sandy Bridge

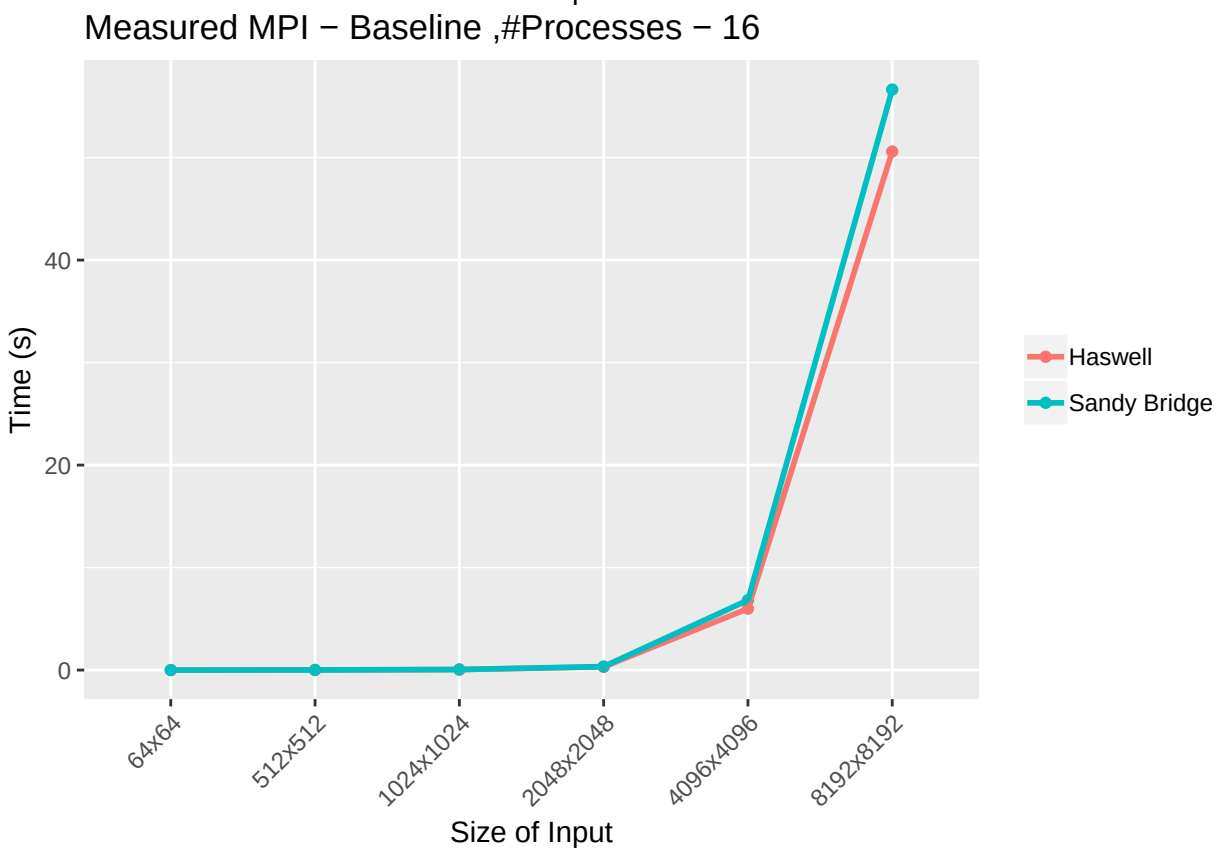

Measured Compute − Baseline ,Size of Input − 2048x2048
Time (s)
0.3
0.2
0.1
8
16
32
64
#Processes
Haswell
Sandy Bridge

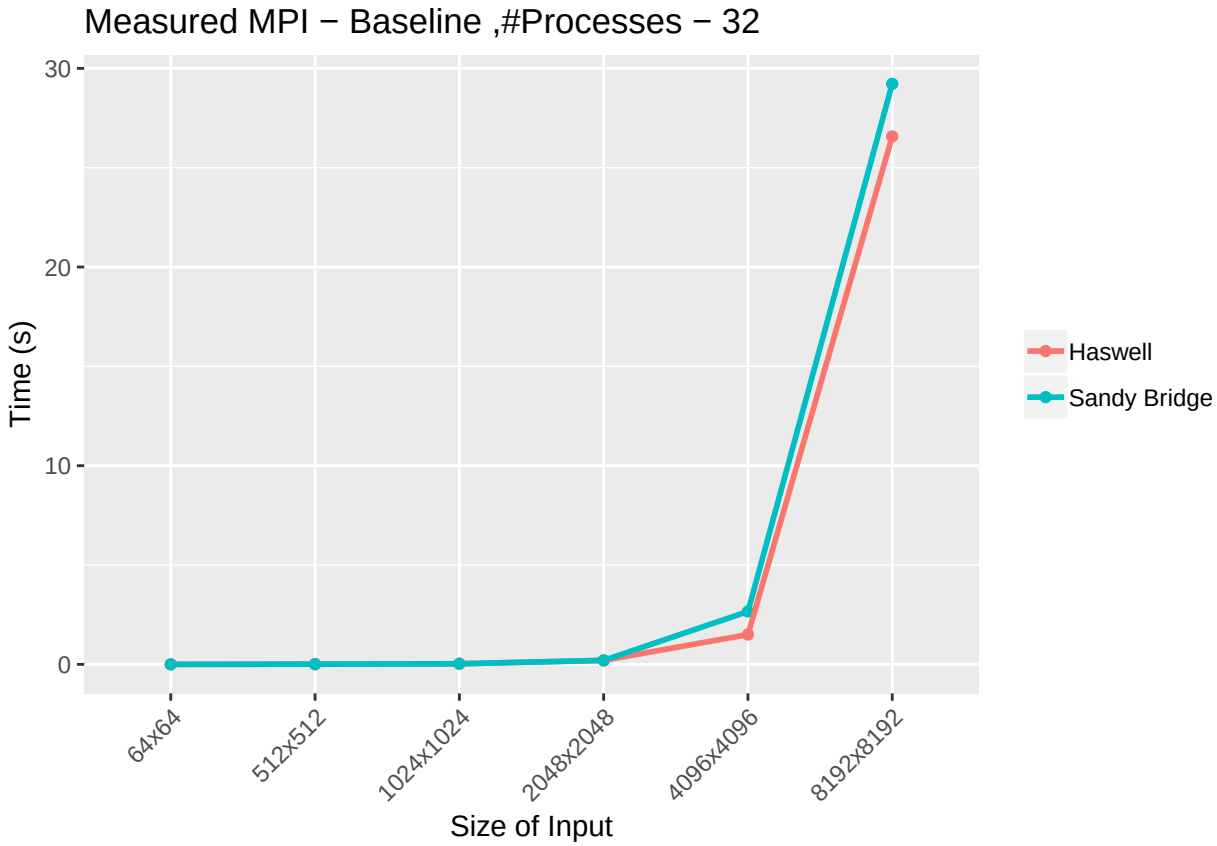

Measured Compute − Baseline ,Size of Input − 4096x4096
Time (s)
4
3
2
1
8
16
32
64
#Processes
Haswell
Sandy Bridge

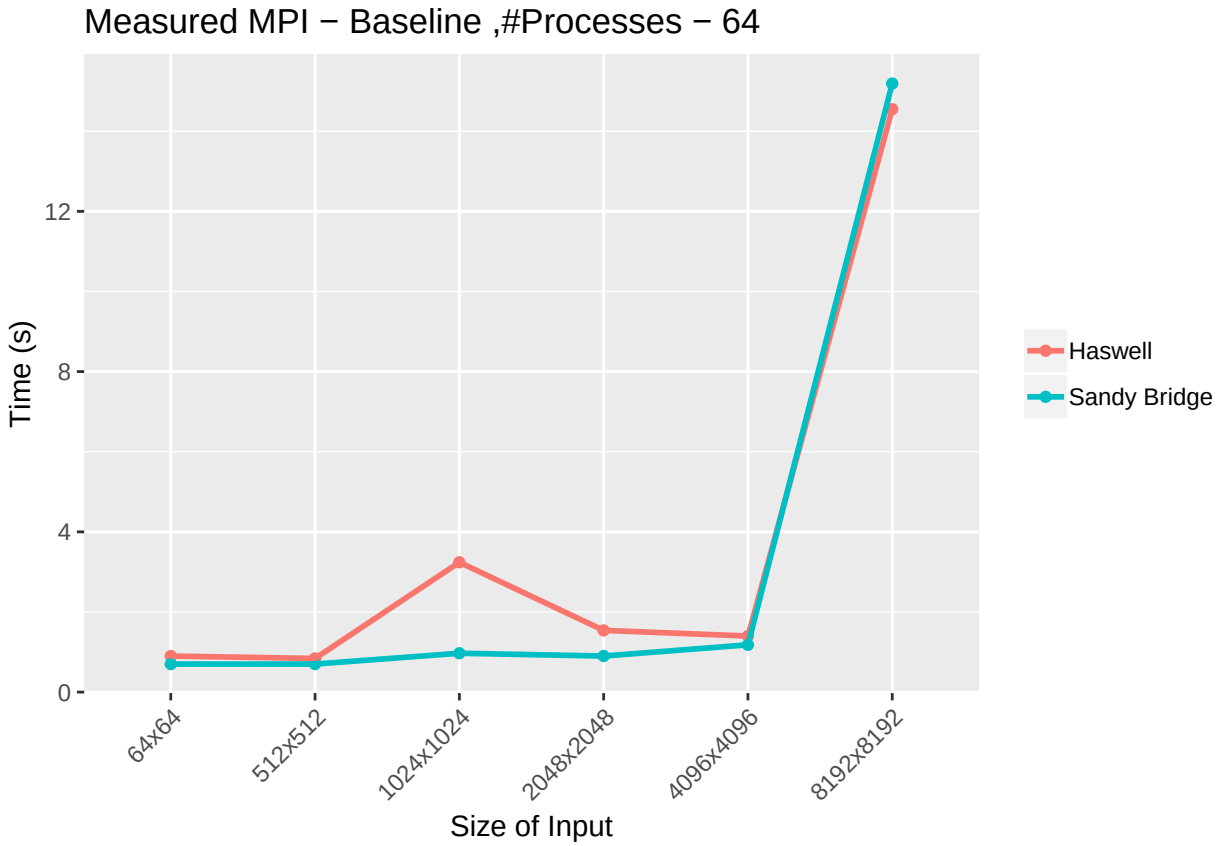

Measured Compute − Baseline ,Size of Input − 8192x8192
Time (s)
30
20
10
8
16
32
64
#Processes
Haswell
Sandy Bridge

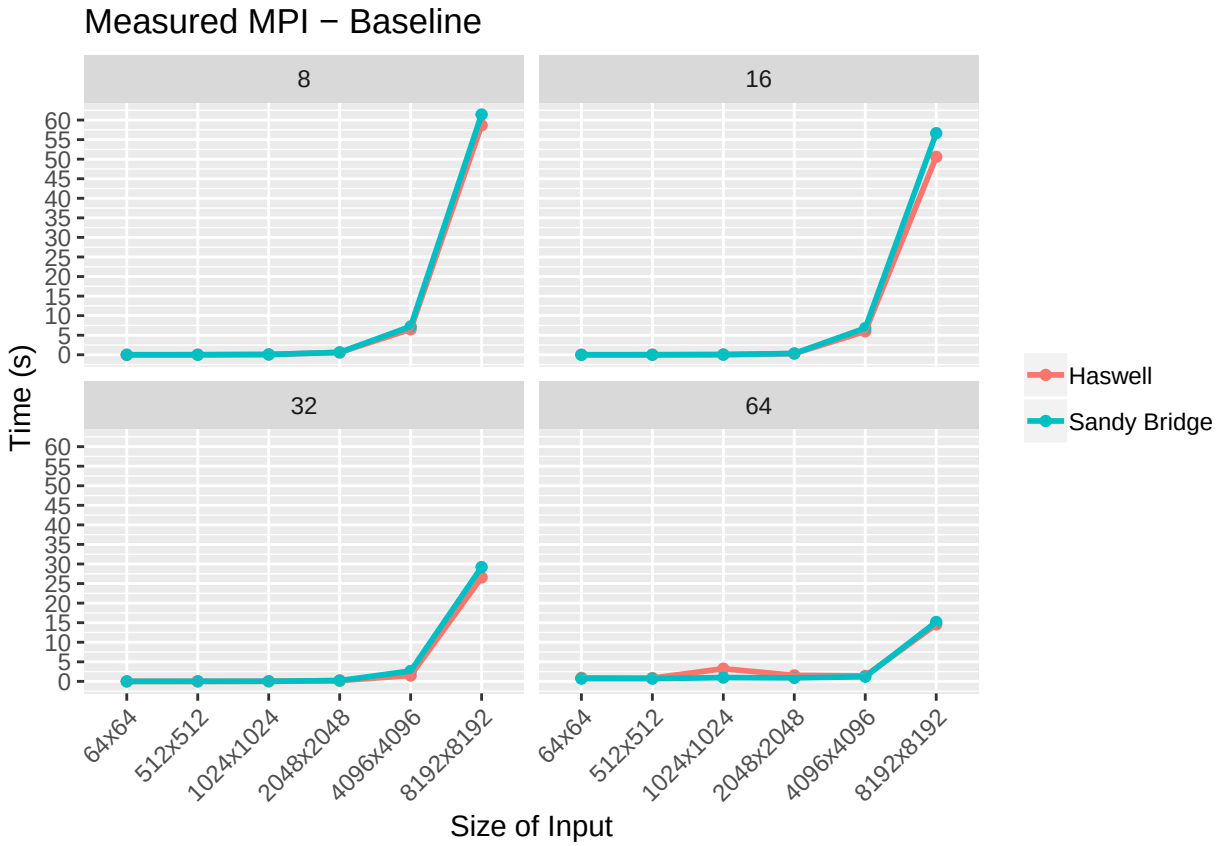

Measured Compute − Baseline
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
35
30
25
20
15
10
5
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

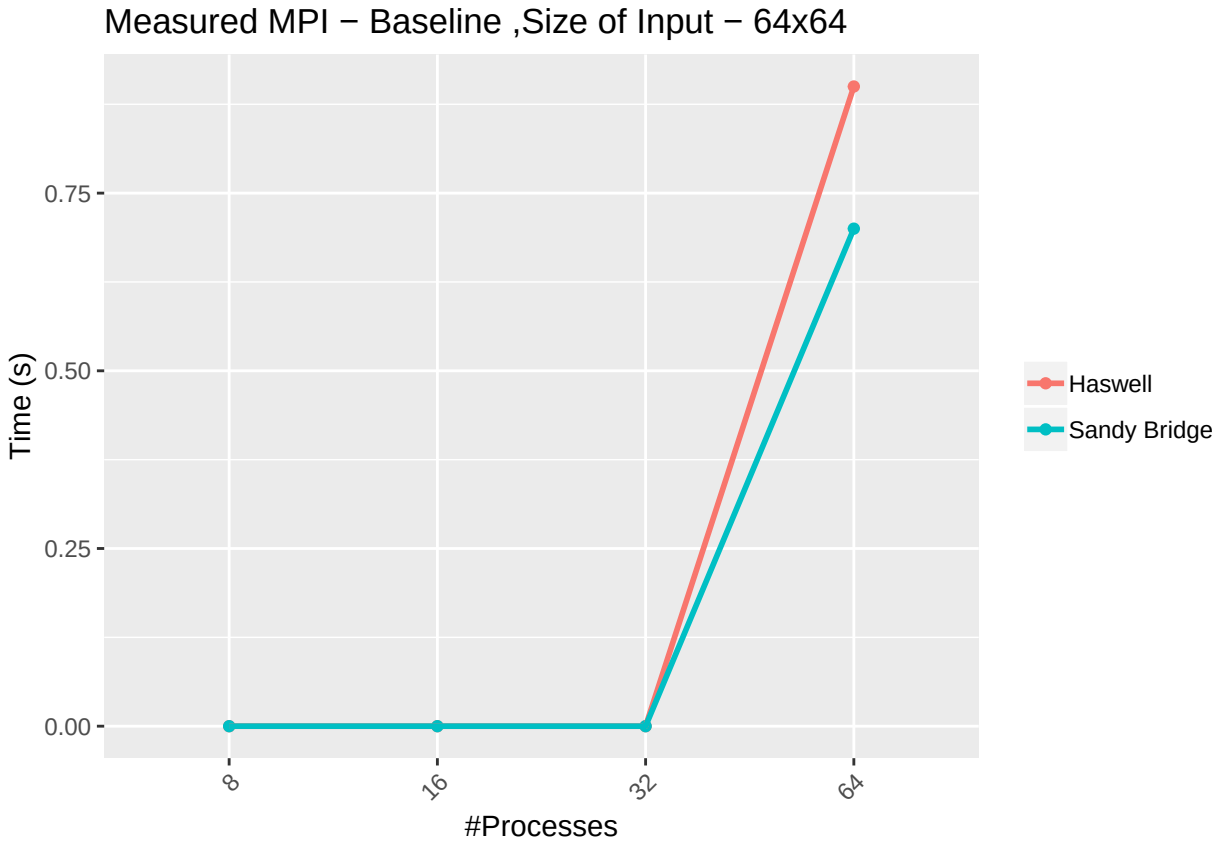

Measured MPI − Baseline ,#Processes − 8
Time (s)
60
40
20
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

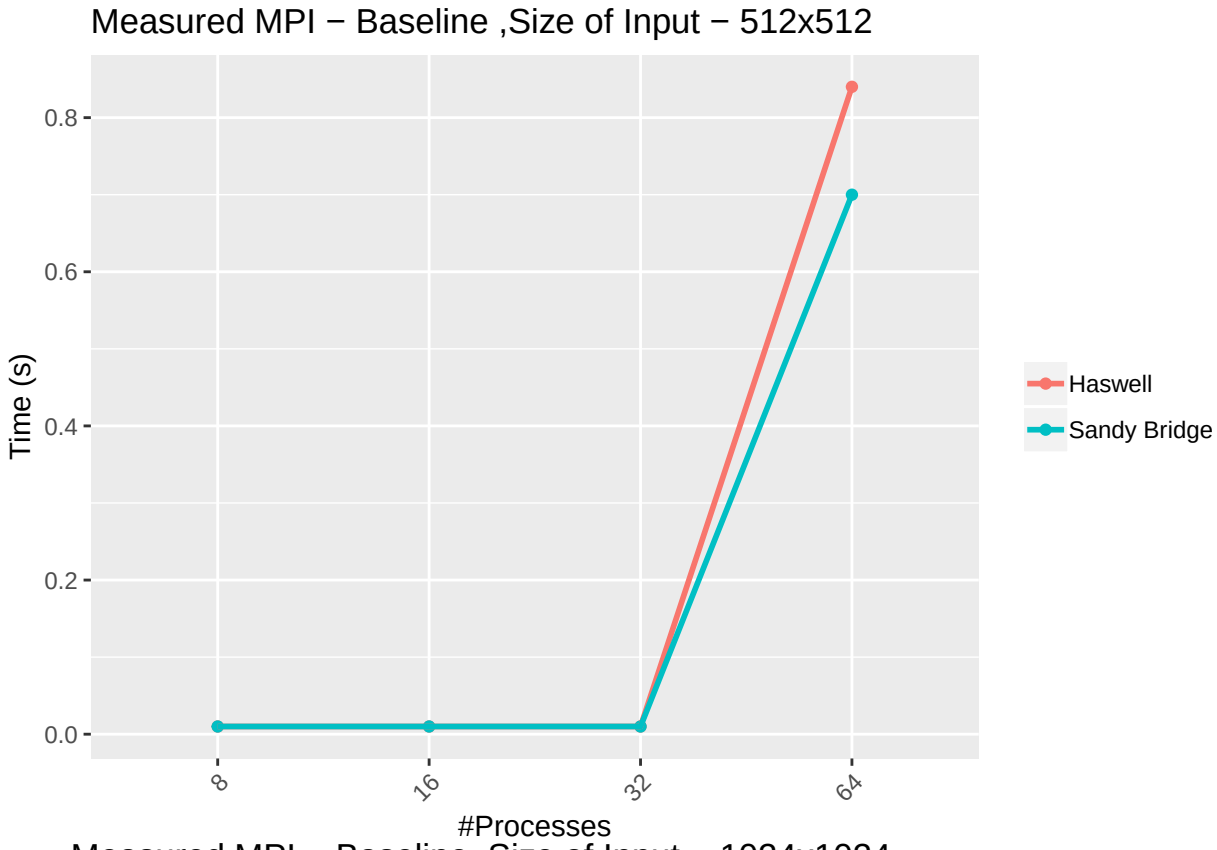

Measured MPI − Baseline ,#Processes − 16
Time (s)
40
20
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

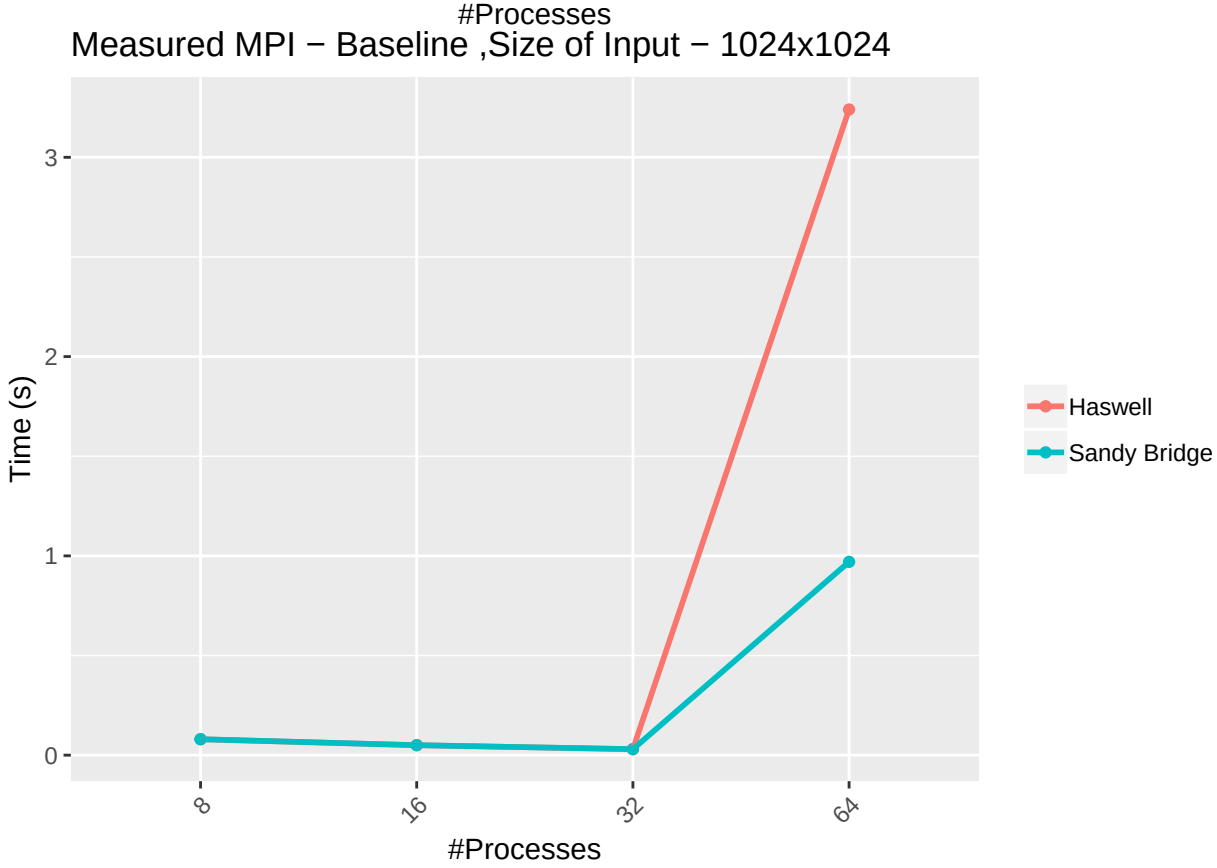

Measured MPI − Baseline ,#Processes − 32
Time (s)
30
20
10
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

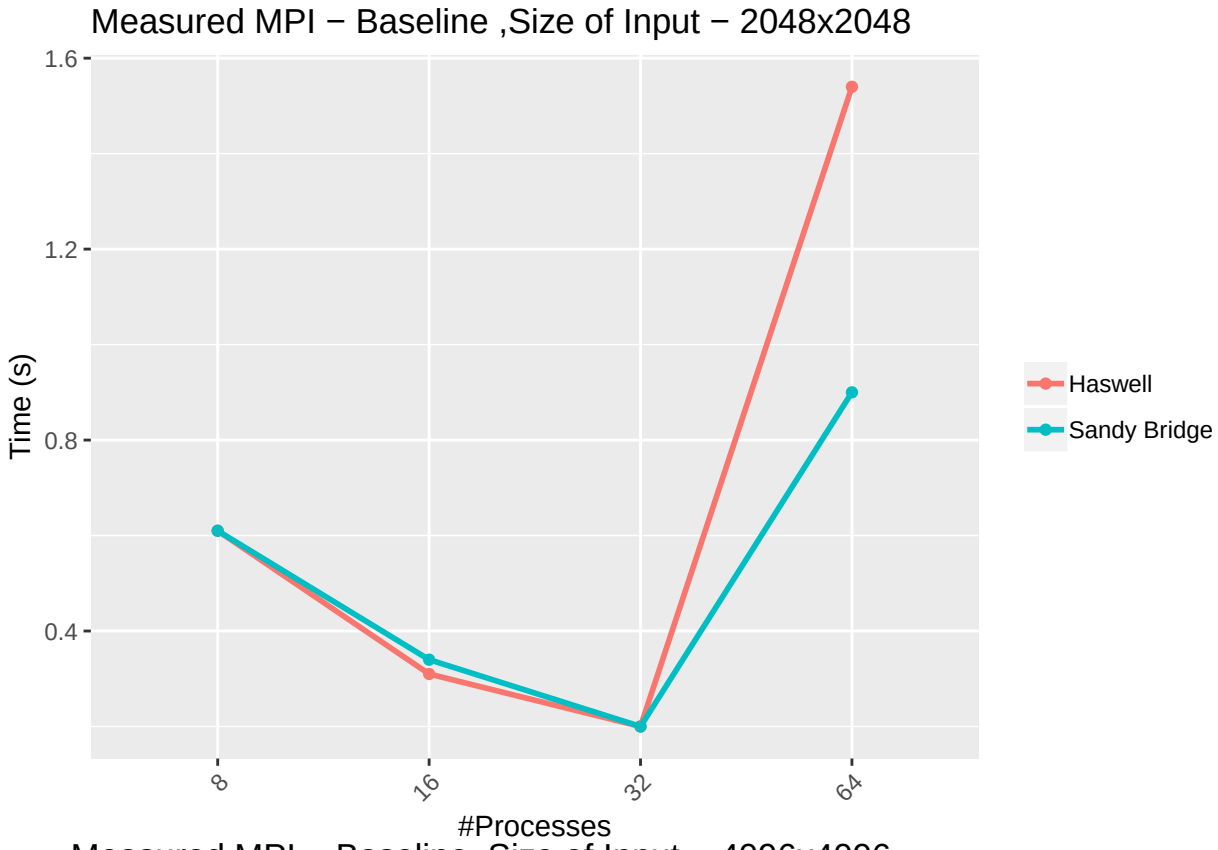

Measured MPI − Baseline ,#Processes − 64
Time (s)
12
8
4
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

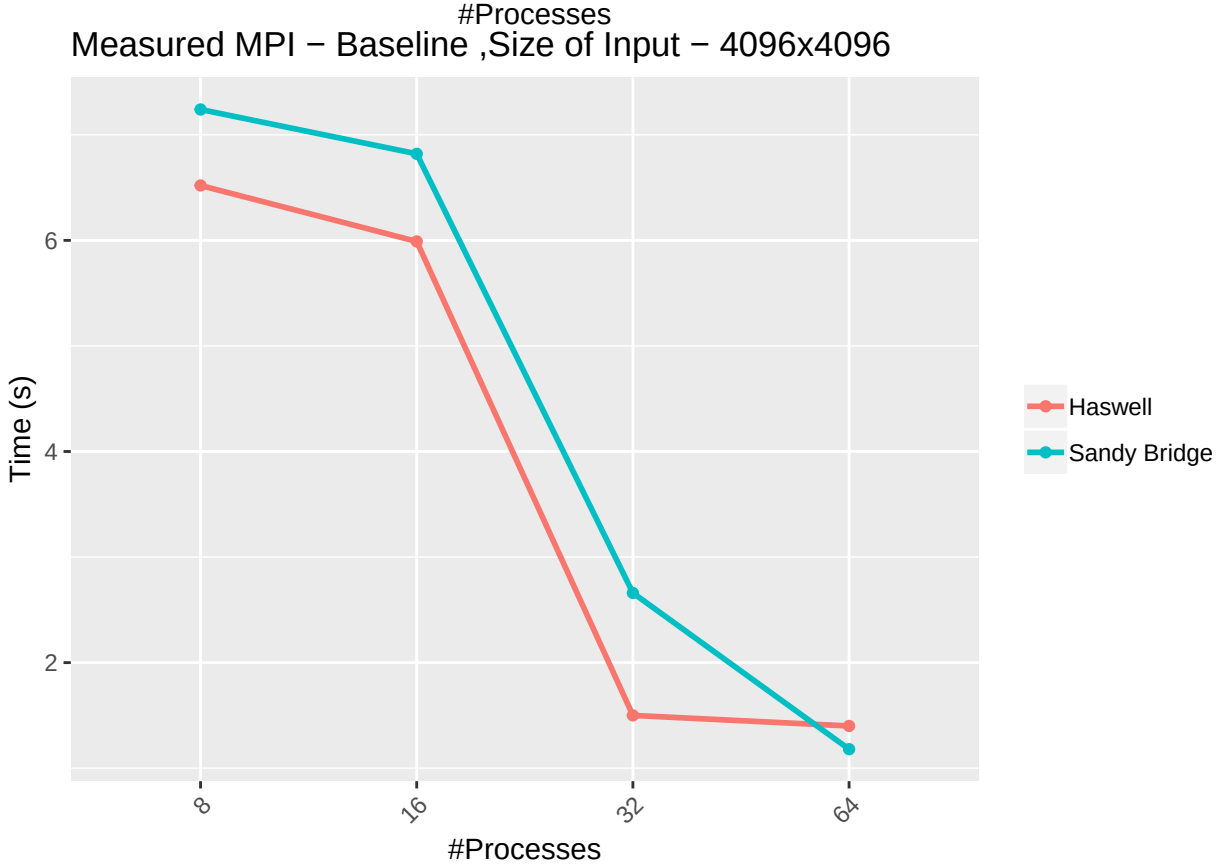

Measured MPI − Baseline
8
16
32
64
Time (s)
0
5
10
15
20
25
30
35
40
45
50
55
60
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

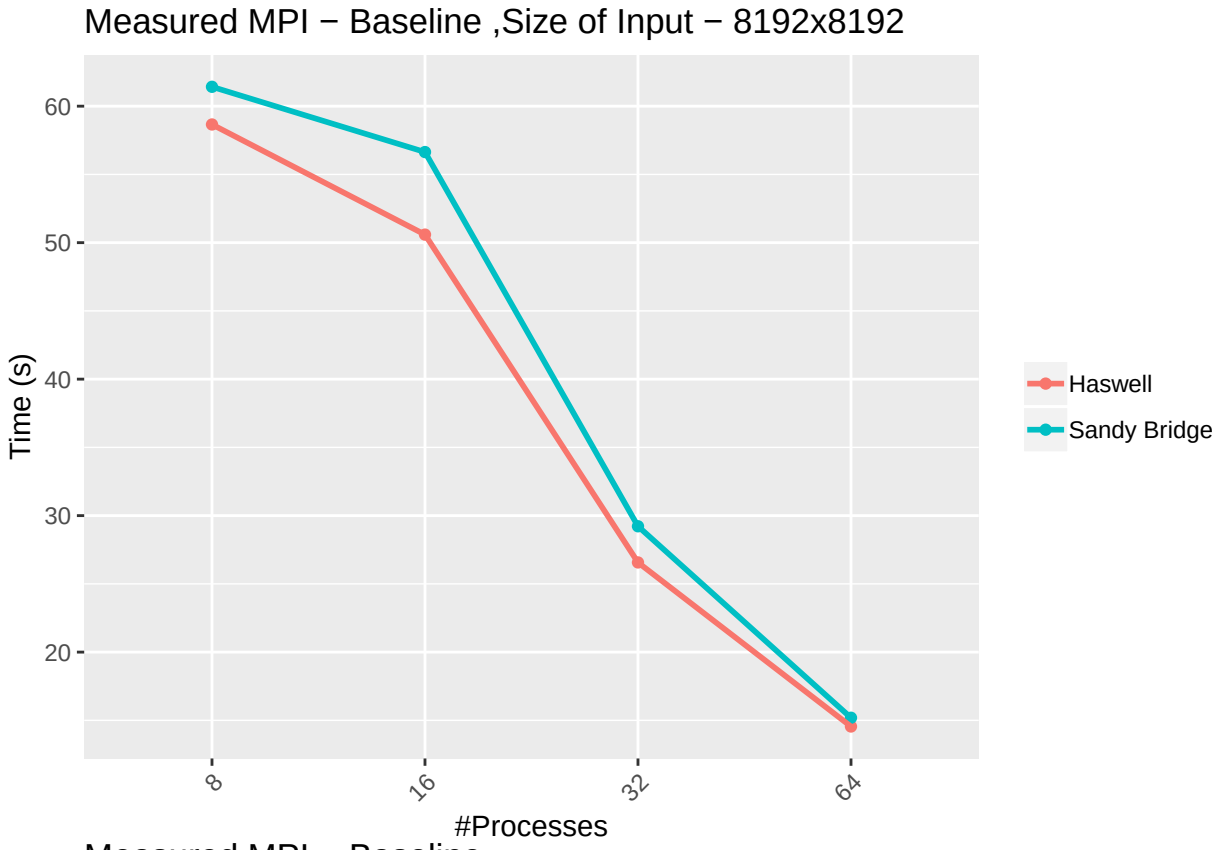

Measured MPI − Baseline ,Size of Input − 64x64
Time (s)
0.00
0.25
0.50
0.75
8
16
32
64
#Processes
Haswell
Sandy Bridge

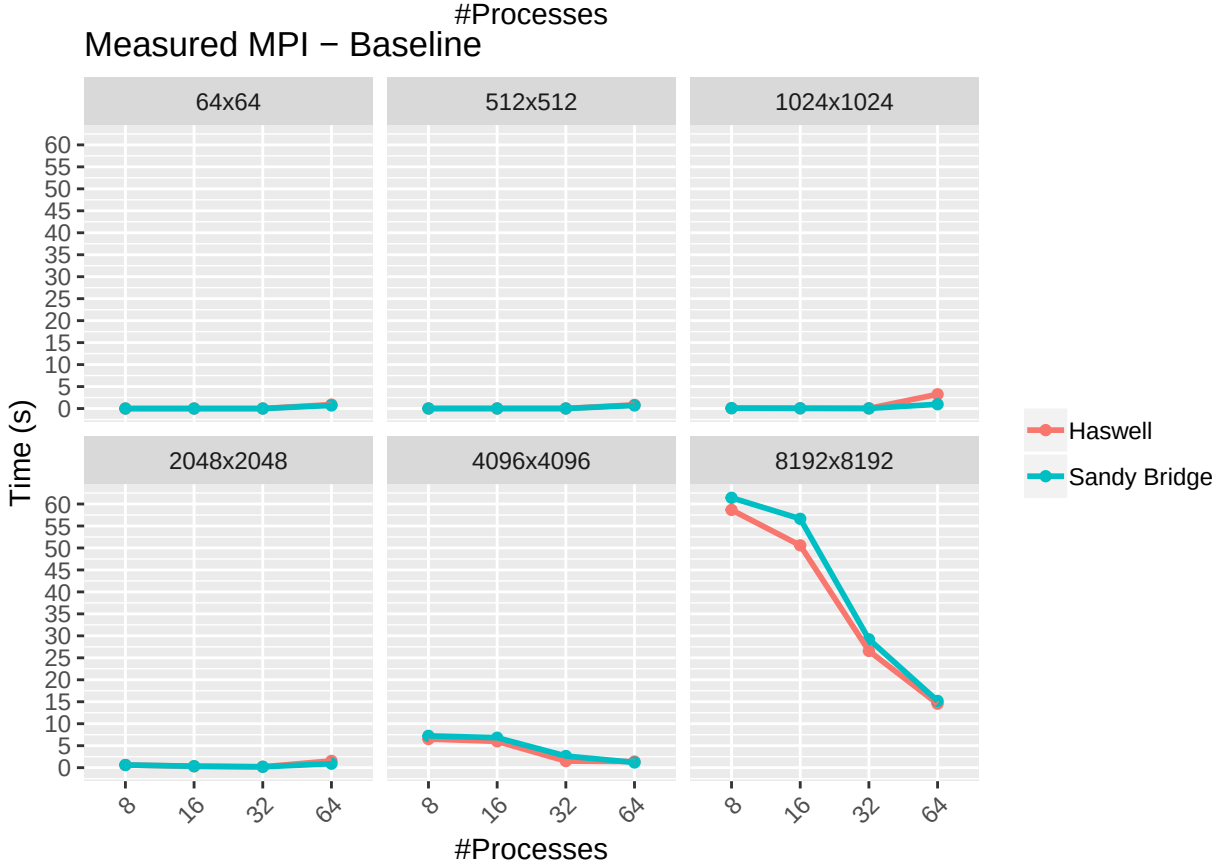

Measured MPI − Baseline ,Size of Input − 512x512
Time (s)
0.0
0.2
0.4
0.6
0.8
8
16
32
64
#Processes
Haswell
Sandy Bridge

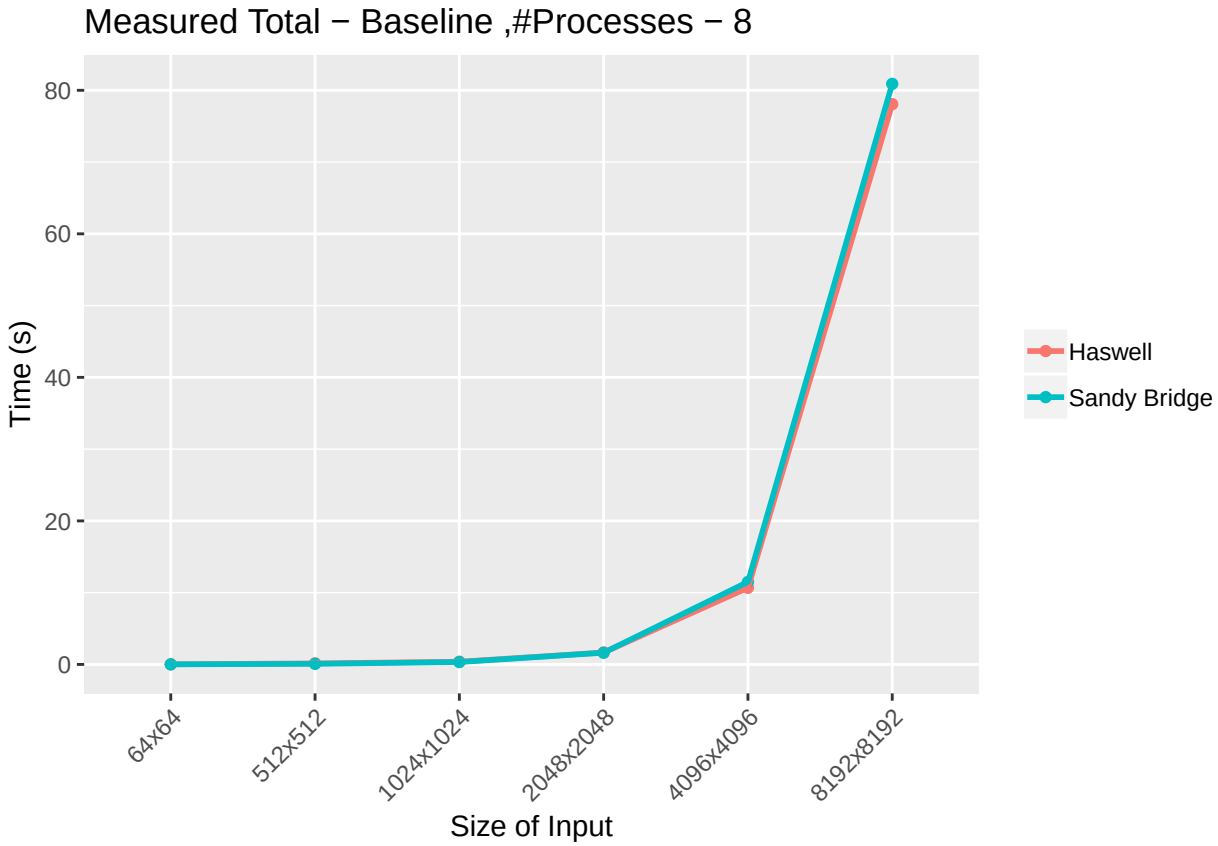

Measured MPI − Baseline ,Size of Input − 1024x1024
Time (s)
0
1
2
3
8
16
32
64
#Processes
Haswell
Sandy Bridge

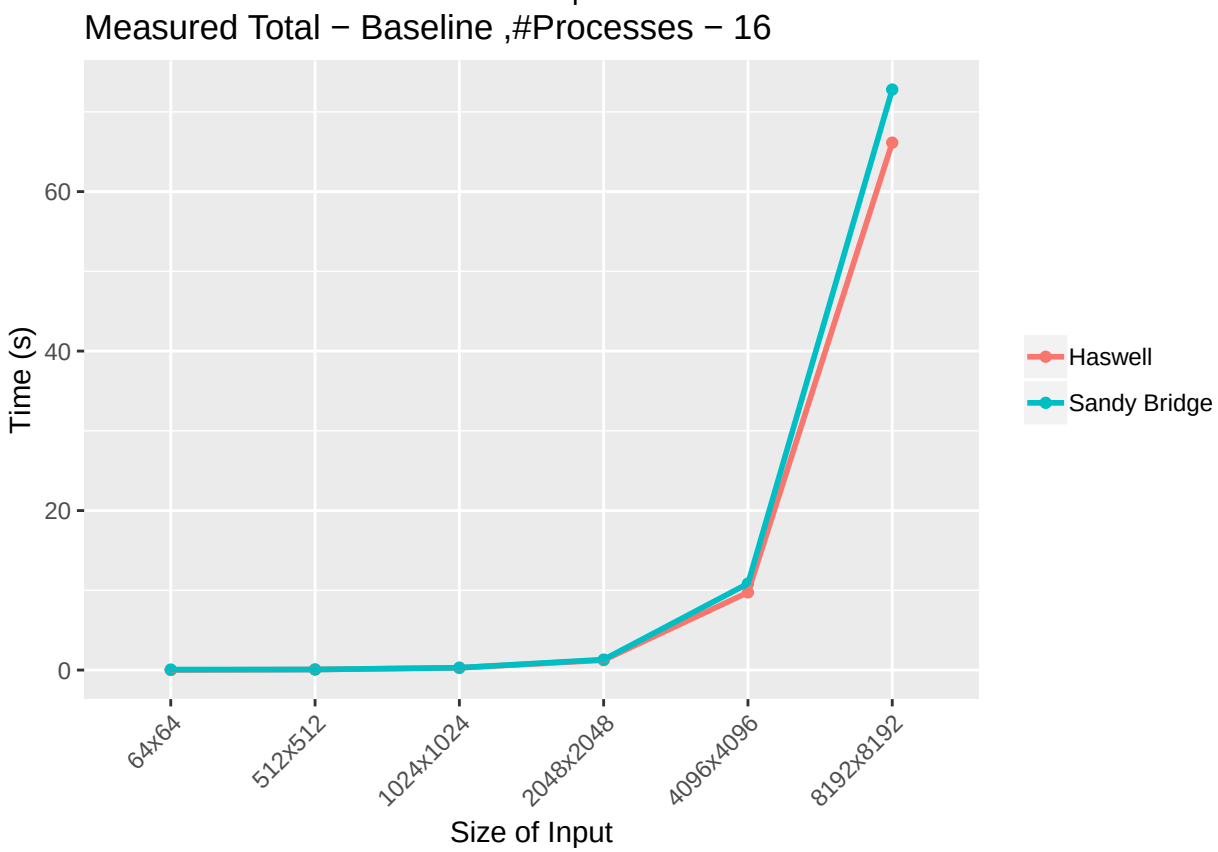

Measured MPI − Baseline ,Size of Input − 2048x2048
Time (s)
1.6
1.2
0.8
0.4
8
16
32
64
#Processes
Haswell
Sandy Bridge

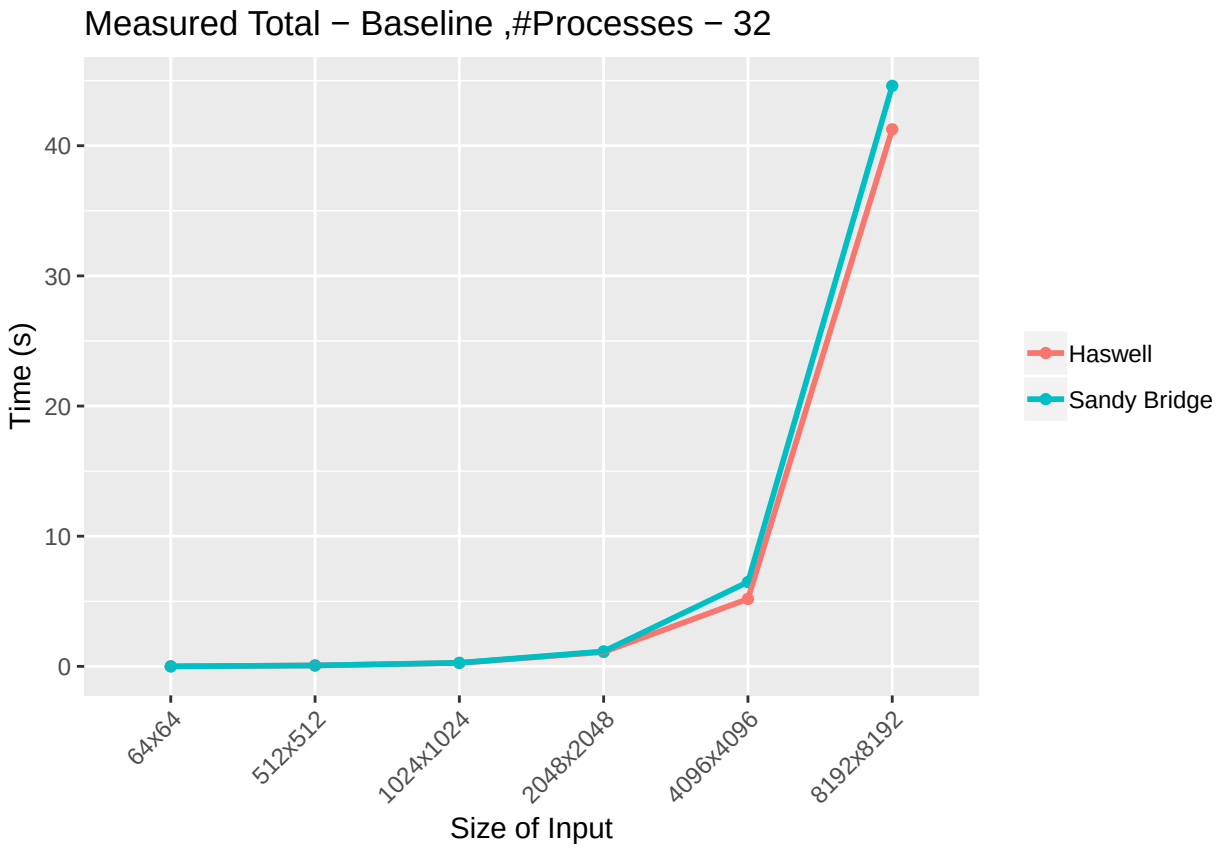

Measured MPI − Baseline ,Size of Input − 4096x4096
Time (s)
6
4
2
8
16
32
64
#Processes
Haswell
Sandy Bridge

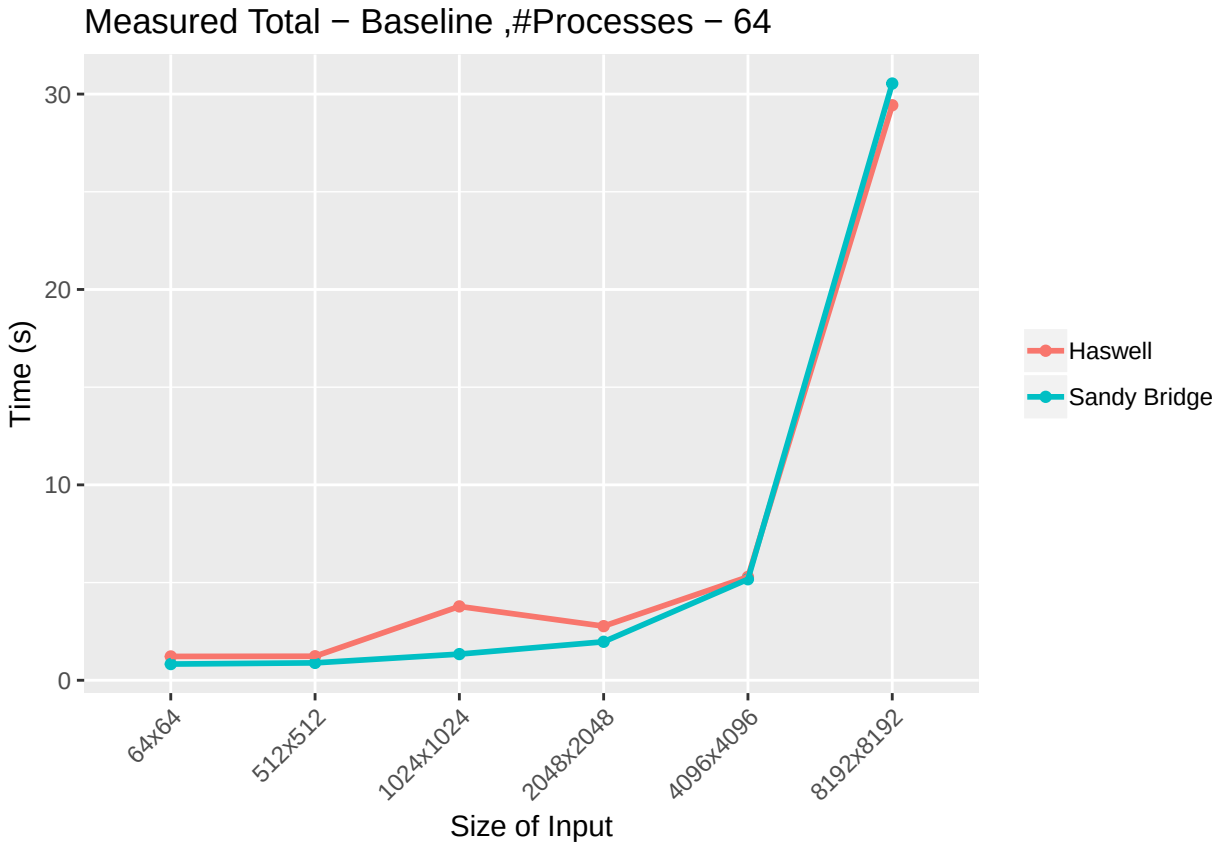

Measured MPI − Baseline ,Size of Input − 8192x8192
Time (s)
60
50
40
30
20
8
16
32
64
#Processes
Haswell
Sandy Bridge

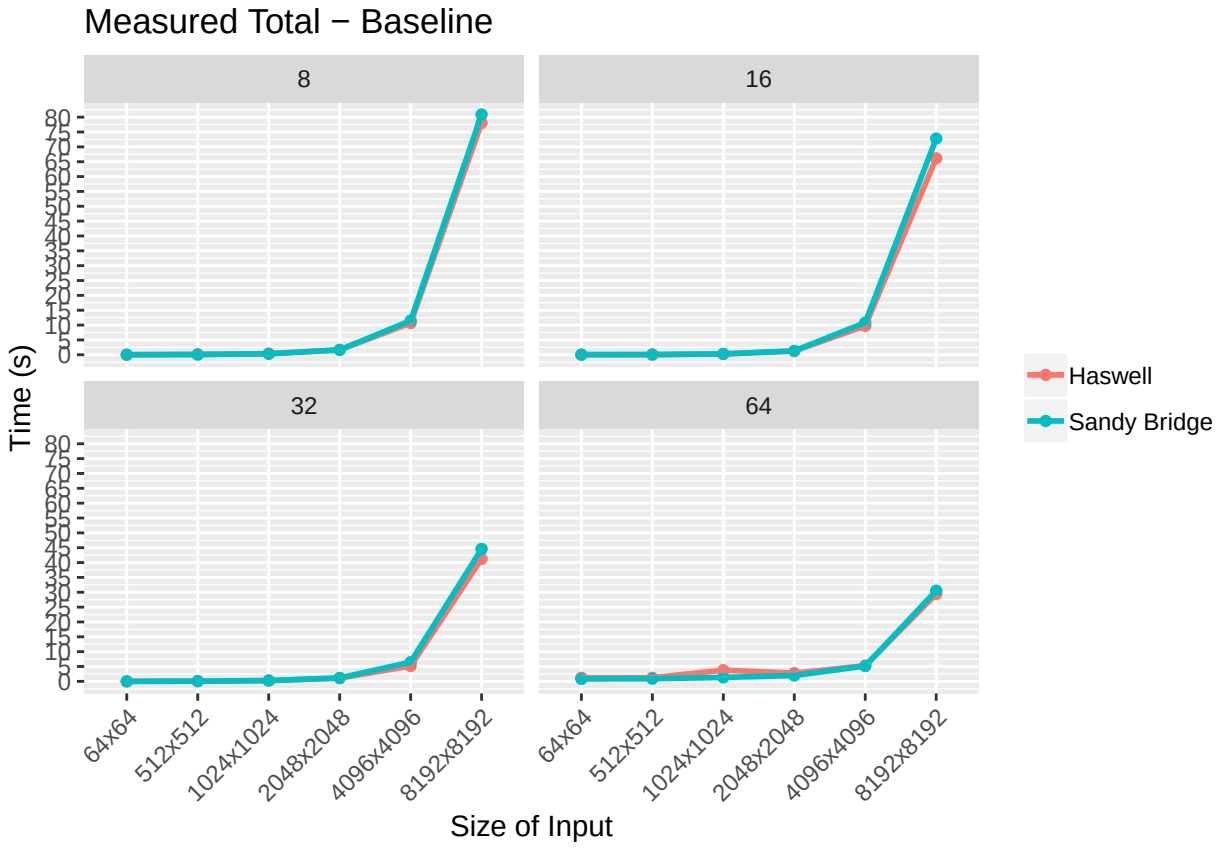

Measured MPI − Baseline
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
60
55
50
45
40
35
30
25
20
15
10
5
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

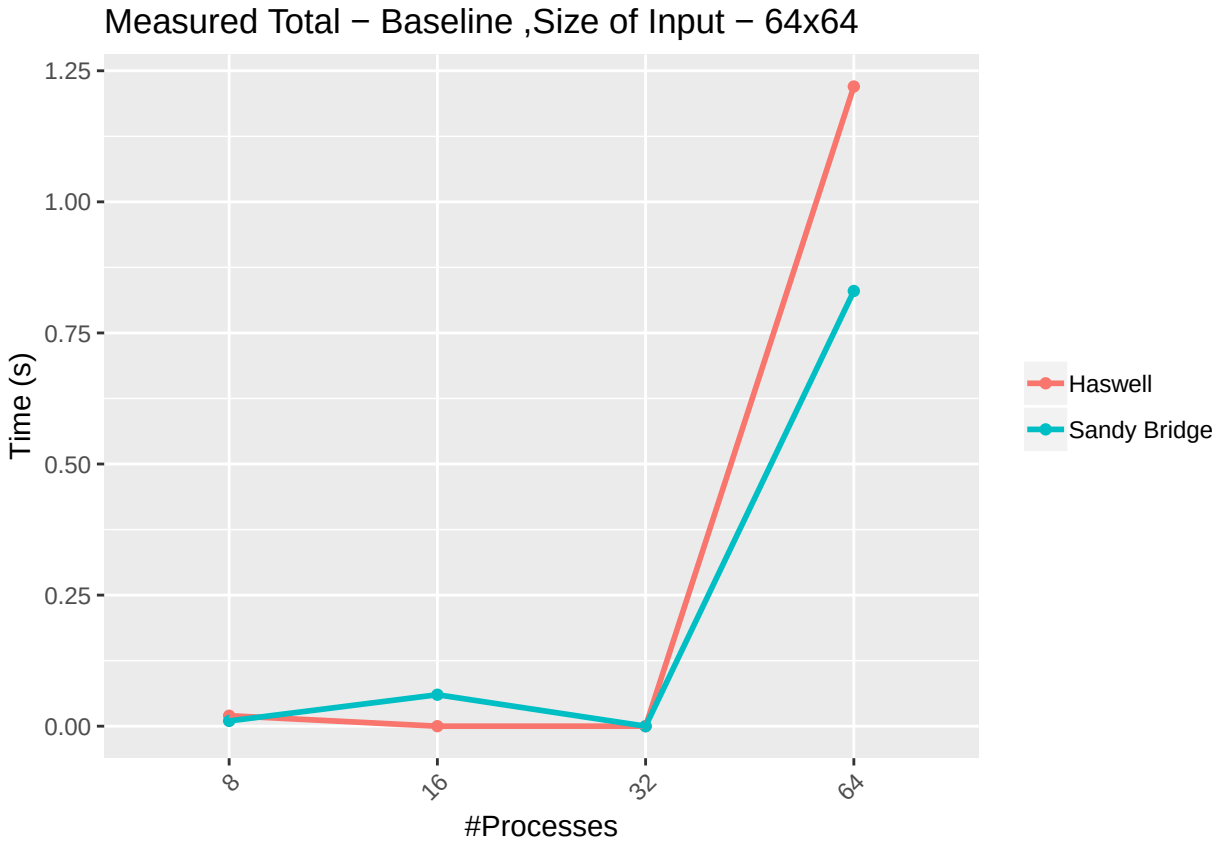

Measured Total − Baseline ,#Processes − 8
Time (s)
80
60
40
20
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

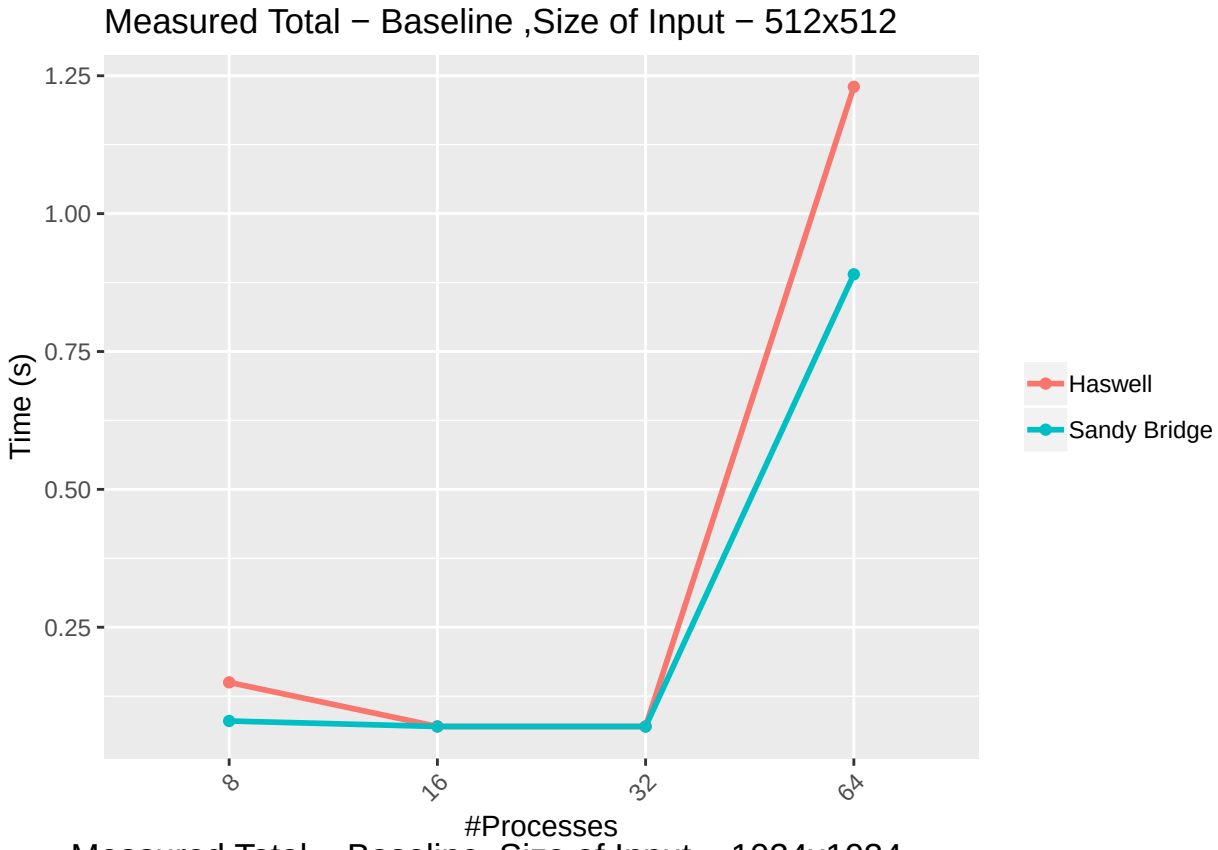

Measured Total − Baseline ,#Processes − 16
Time (s)
60
40
20
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

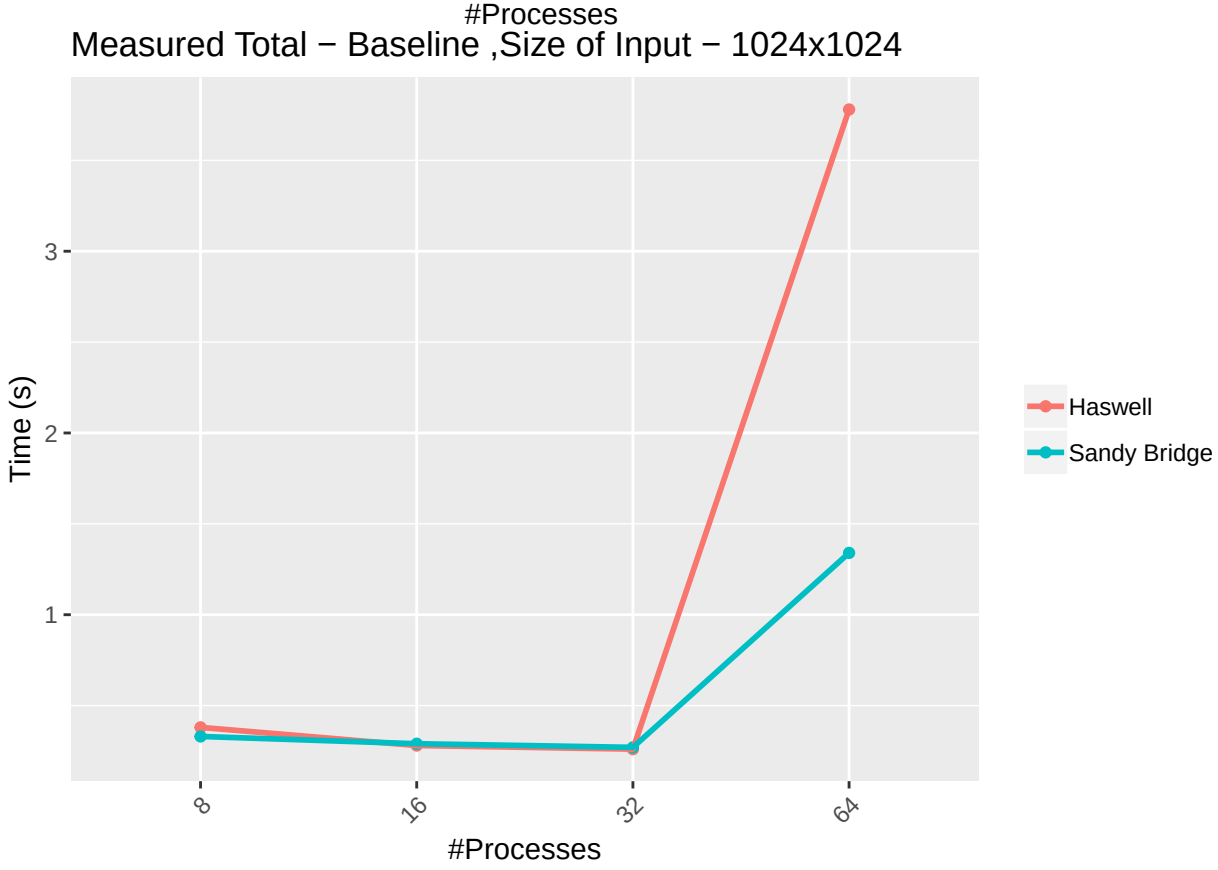

Measured Total − Baseline ,#Processes − 32
Time (s)
0
10
20
30
40
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

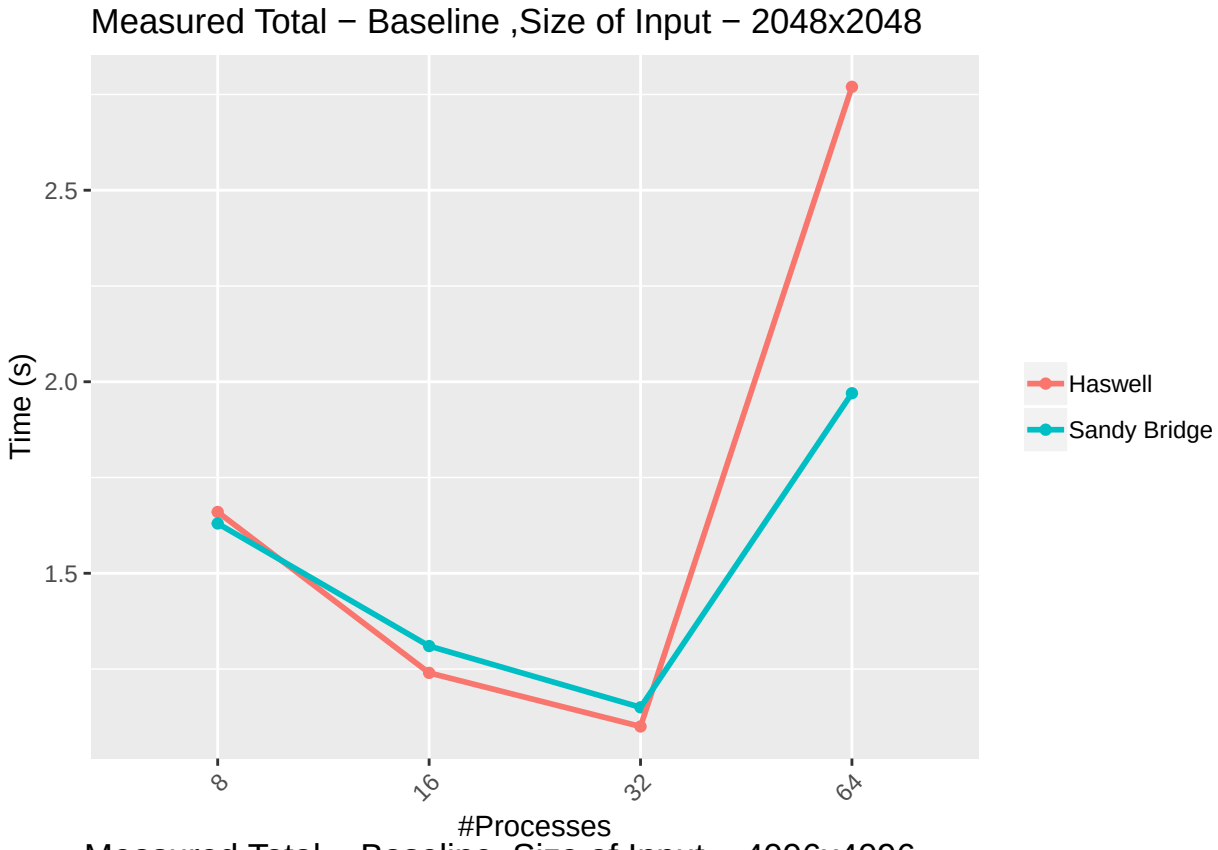

Measured Total − Baseline ,#Processes − 64
Time (s)
0
10
20
30
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

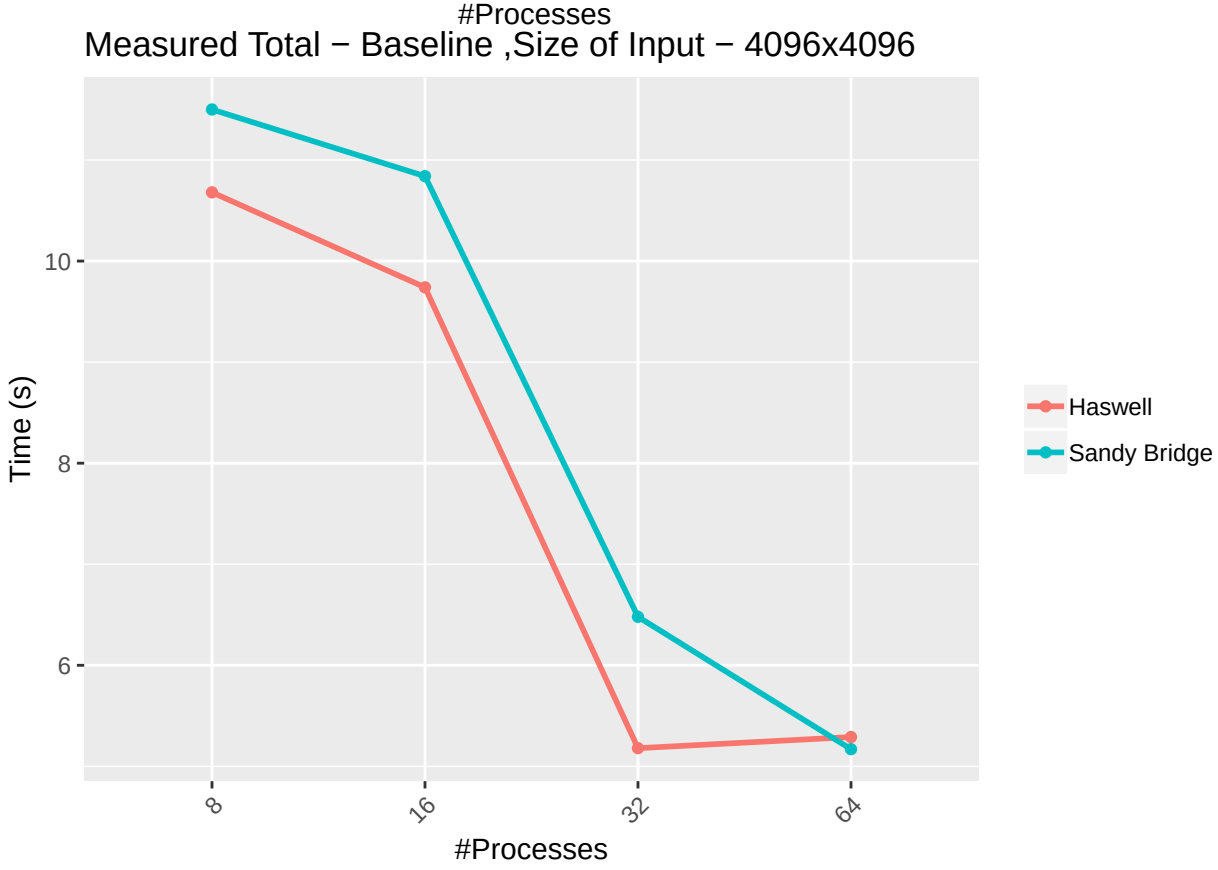

Measured Total − Baseline
8
16
32
64
Time (s)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

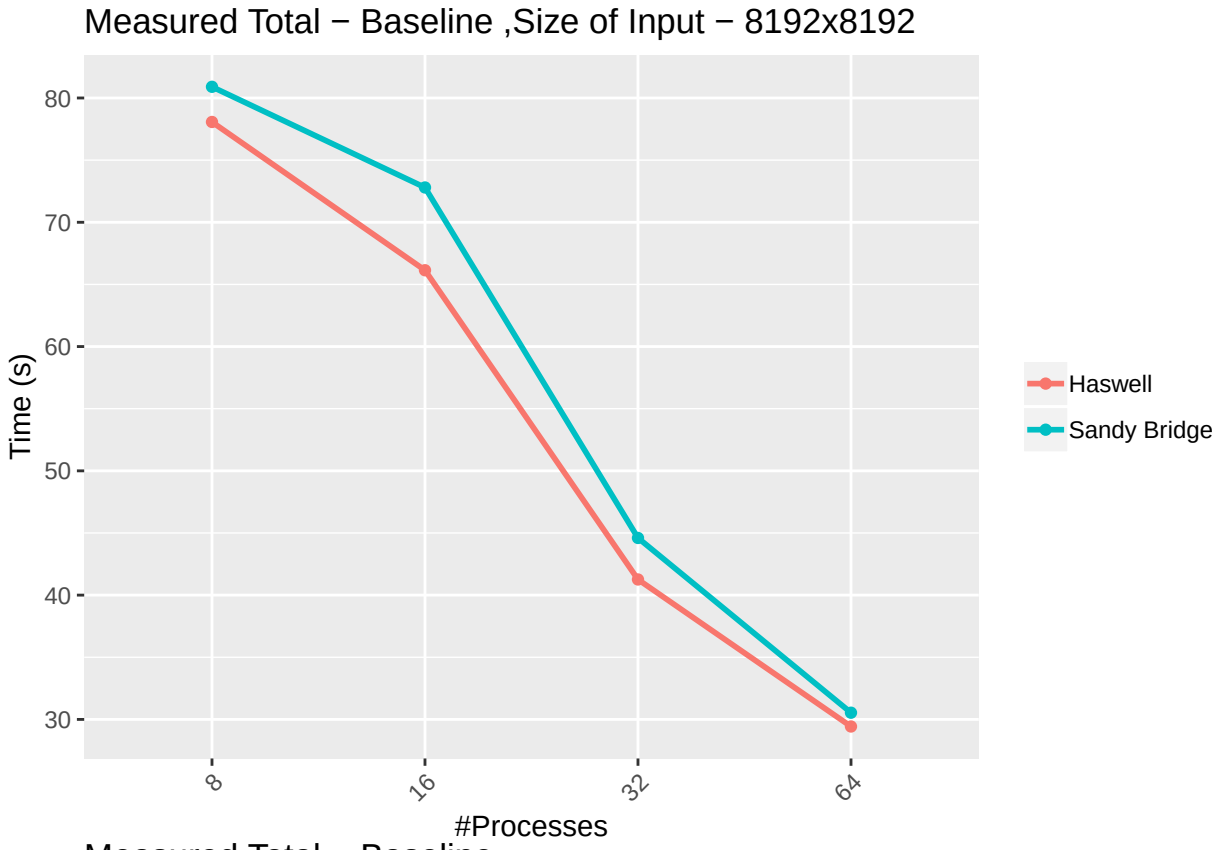

Measured Total − Baseline ,Size of Input − 64x64
Time (s)
0.00
0.25
0.50
0.75
1.00
1.25
8
16
32
64
#Processes
Haswell
Sandy Bridge

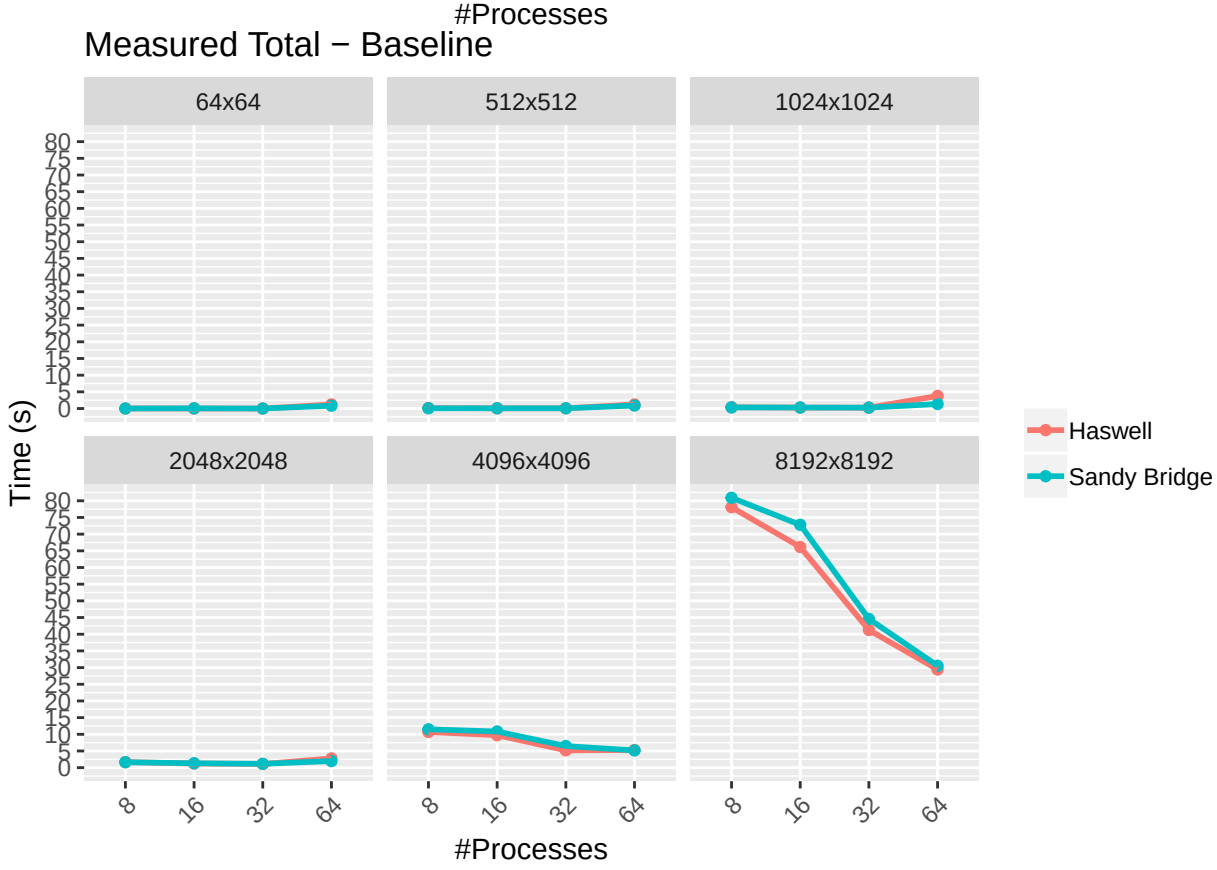

Measured Total − Baseline ,Size of Input − 512x512
Time (s)
1.25
1.00
0.75
0.50
0.25
8
16
32
64
#Processes
Haswell
Sandy Bridge


Measured Total − Baseline ,Size of Input − 1024x1024
Time (s)
3
2
1
8
16
32
64
#Processes
Haswell
Sandy Bridge

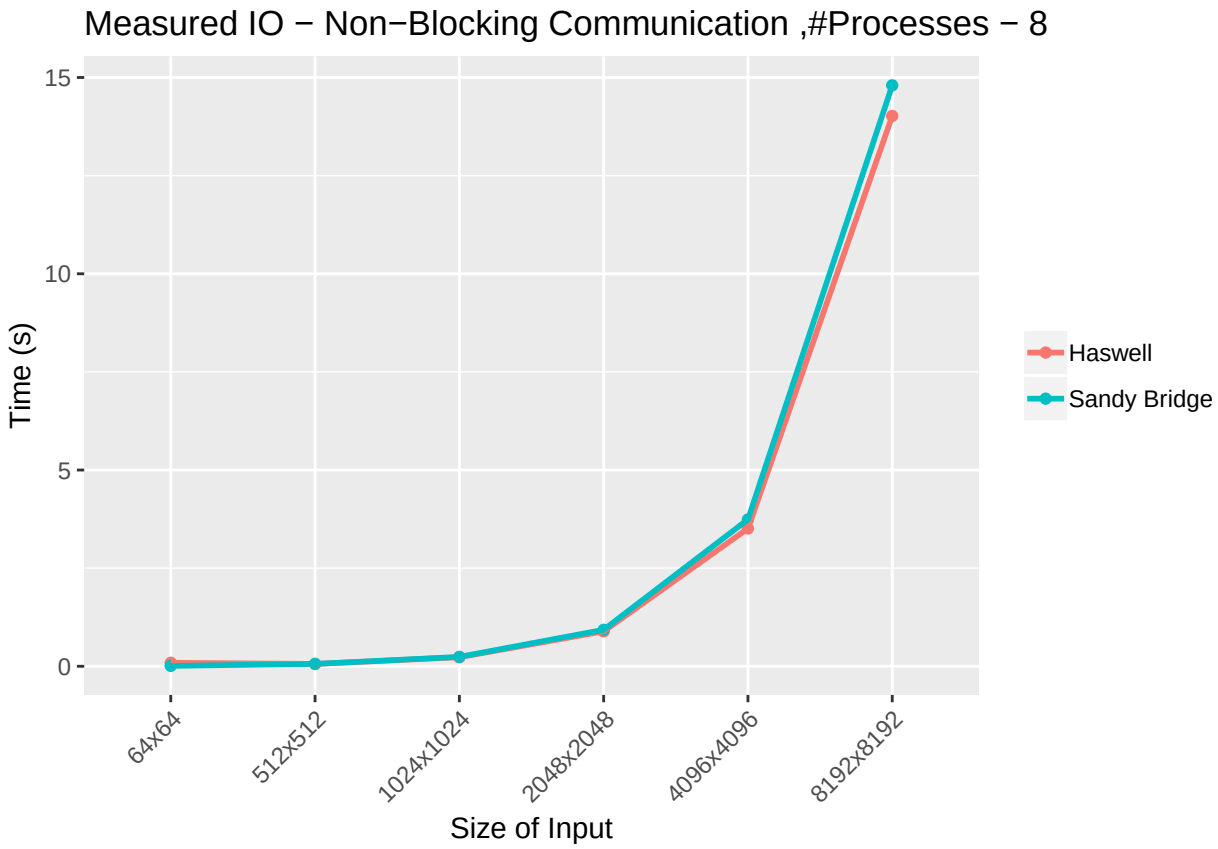

Measured Total − Baseline ,Size of Input − 2048x2048
Time (s)
2.5
2.0
1.5
8
16
32
64
#Processes
Haswell
Sandy Bridge

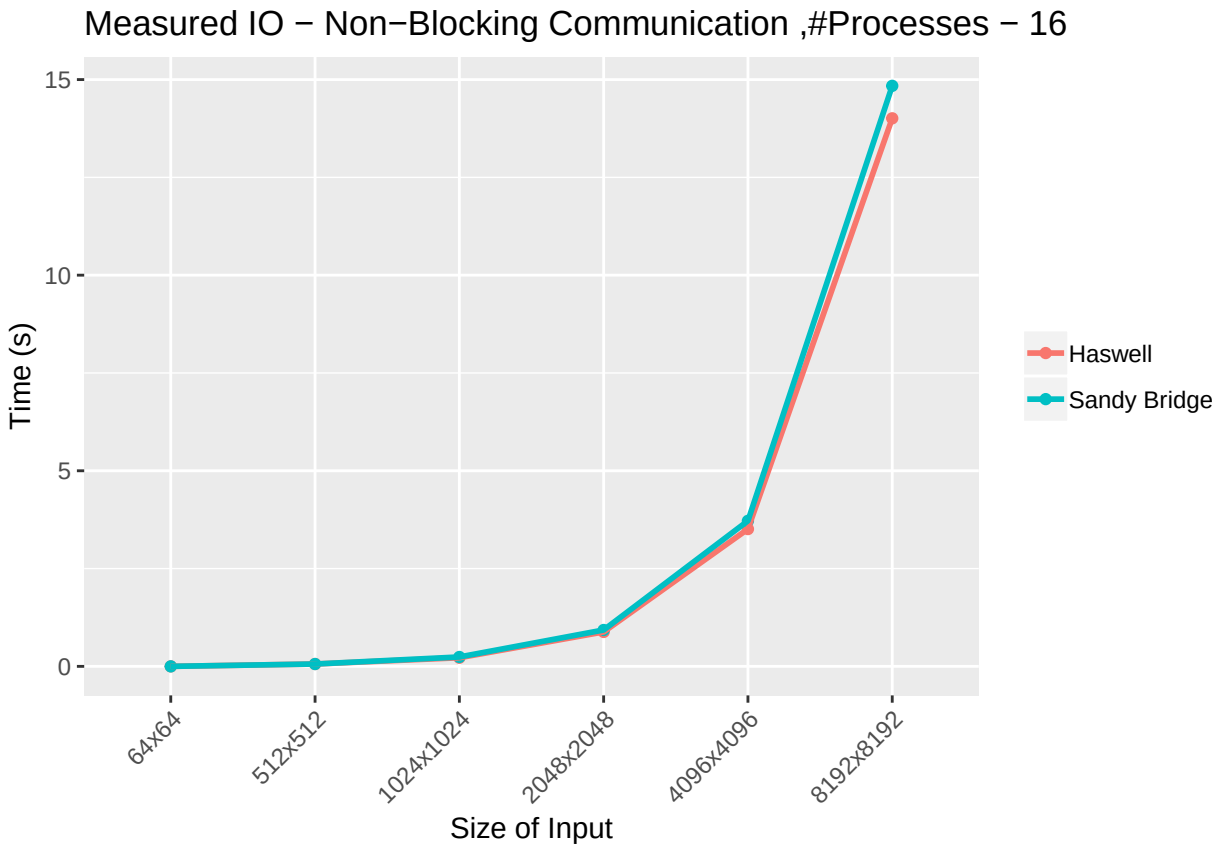

Measured Total − Baseline ,Size of Input − 4096x4096
Time (s)
10
8
6
8
16
32
64
#Processes
Haswell
Sandy Bridge

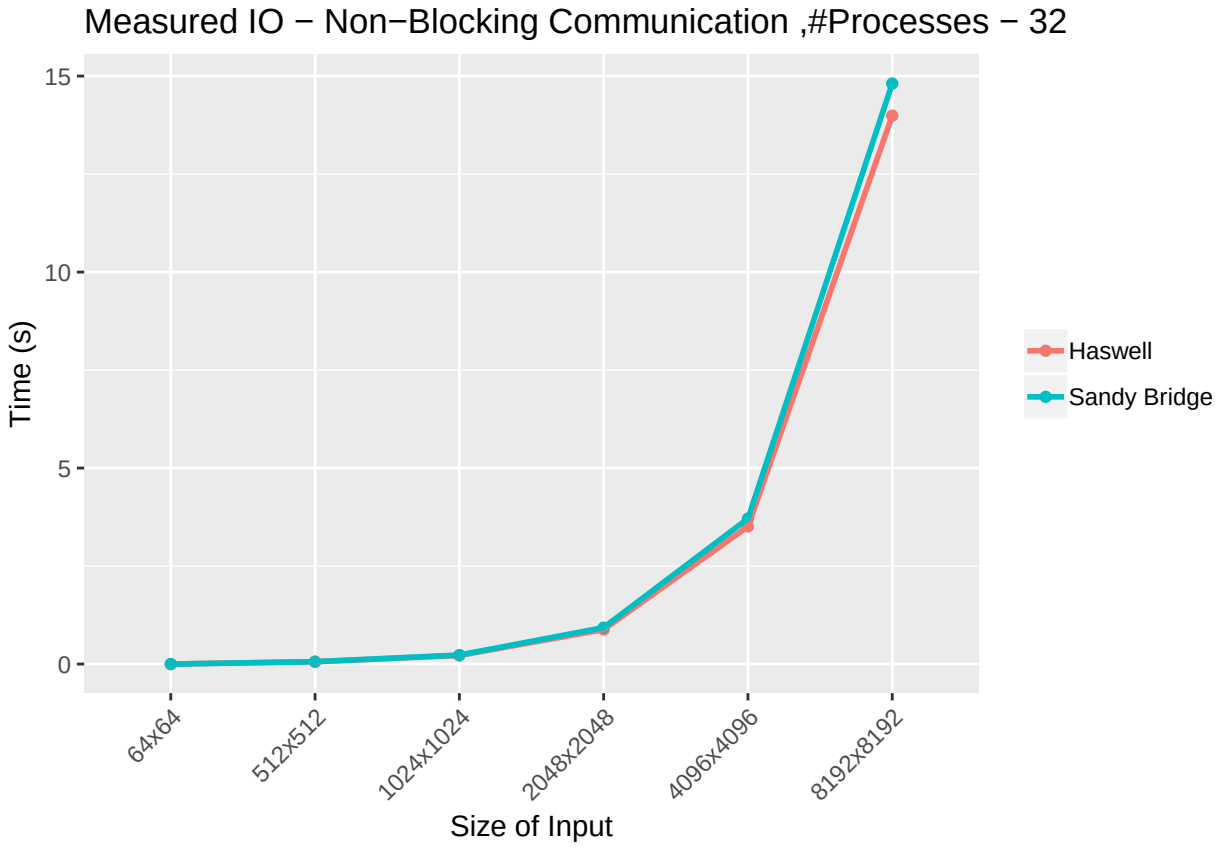

Measured Total − Baseline ,Size of Input − 8192x8192
Time (s)
80
70
60
50
40
30
8
16
32
64
#Processes
Haswell
Sandy Bridge

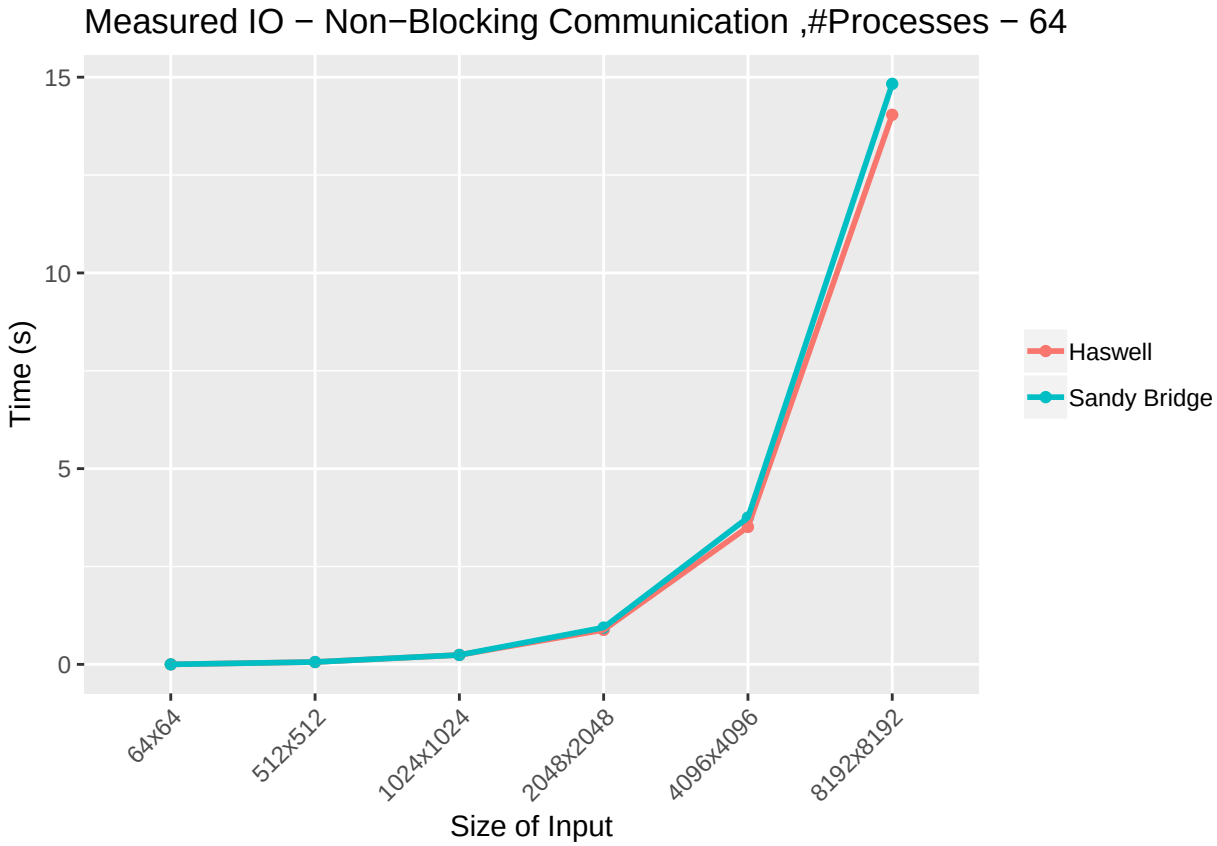

Measured Total − Baseline
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
#Processes
Haswell
Sandy Bridge

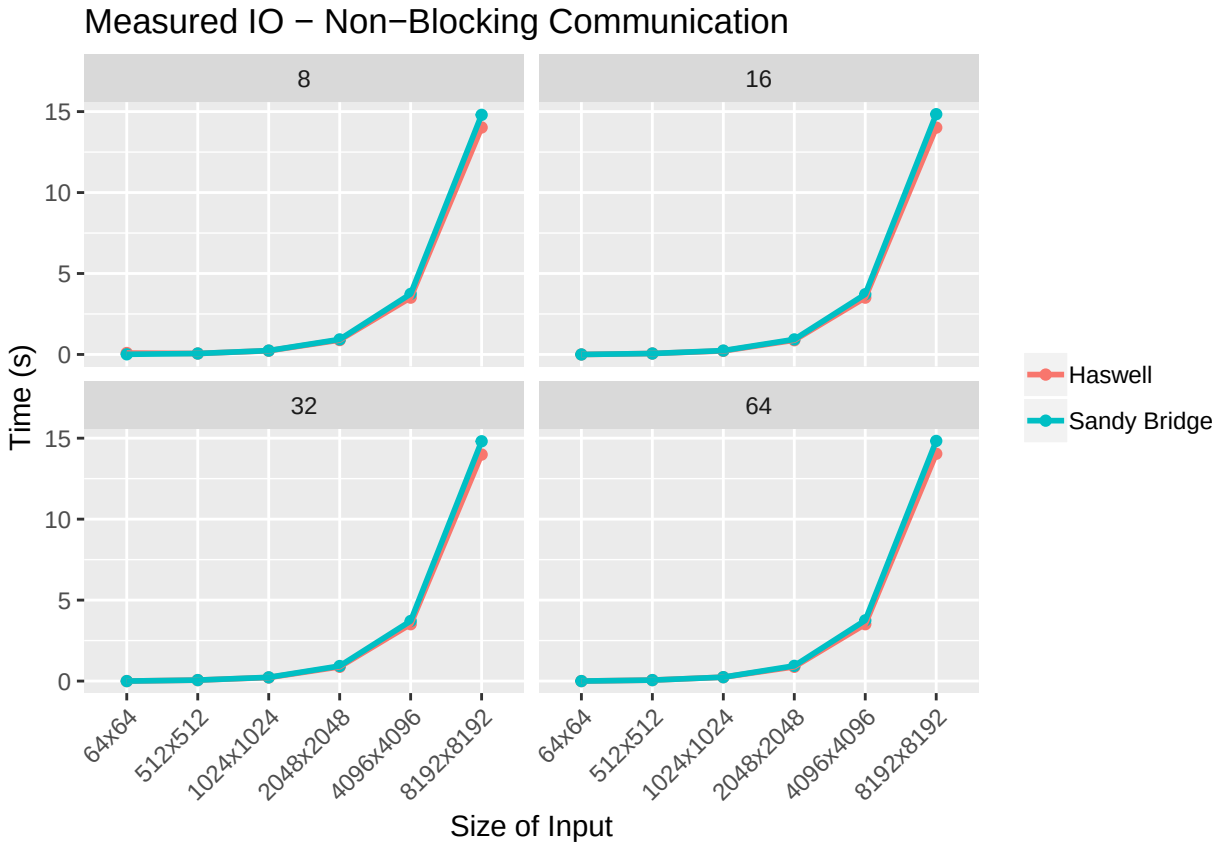
```
test <- pos_plot("nonblock","Non-Blocking Communication")
```

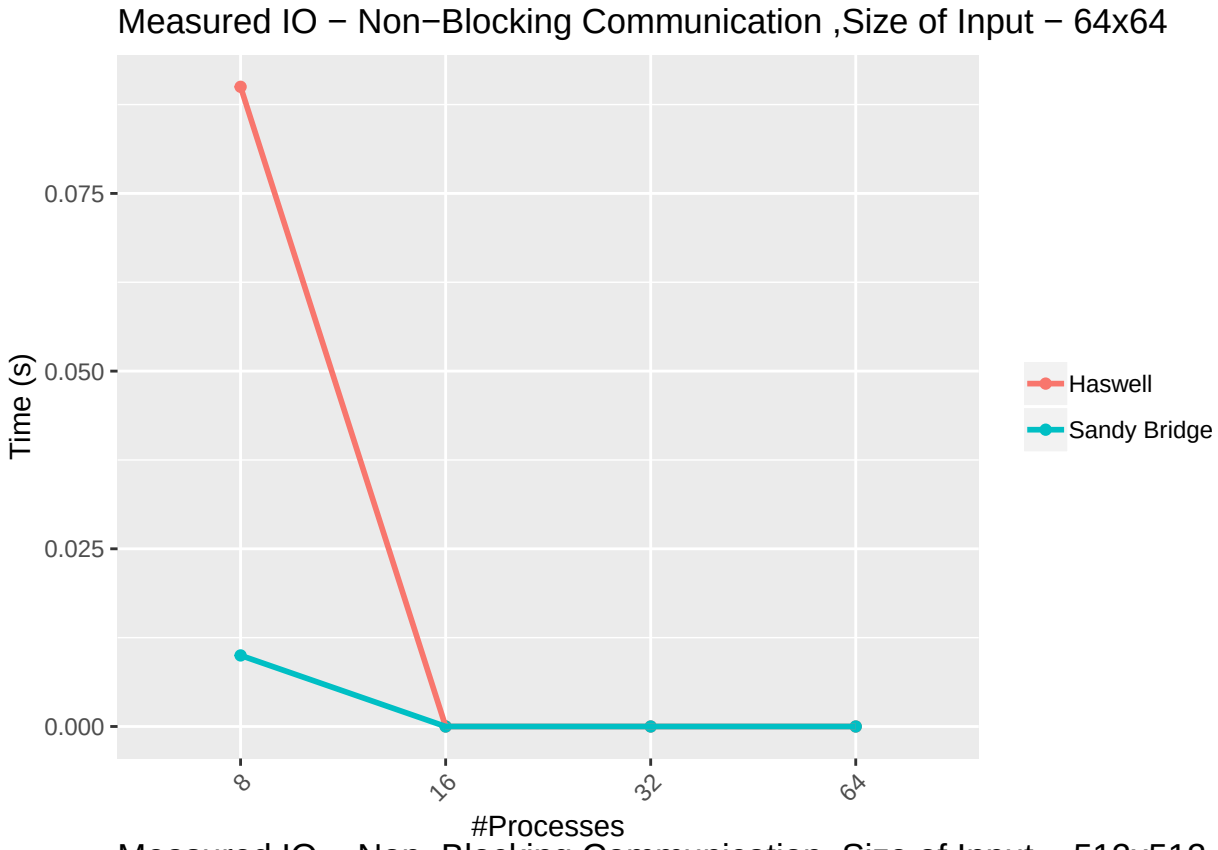


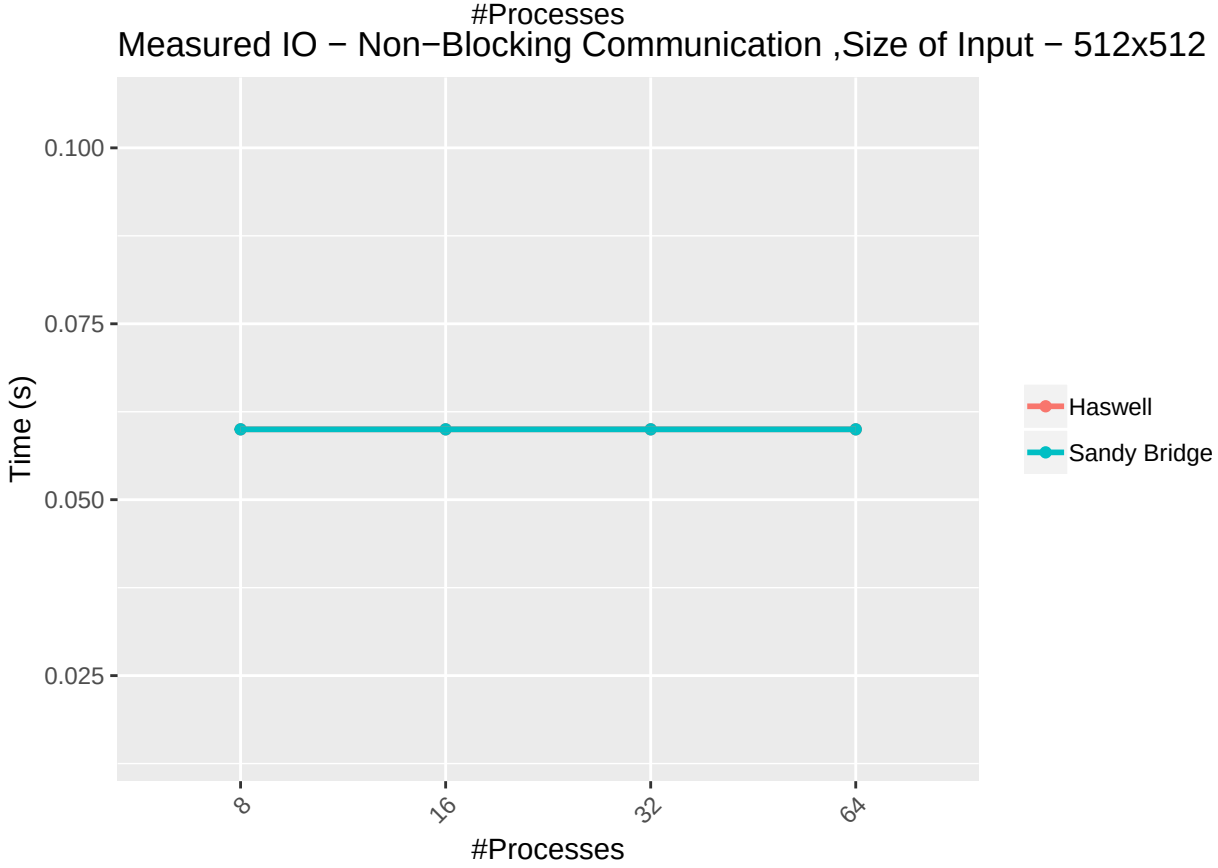

Measured IO − Non−Blocking Communication ,#Processes − 16
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

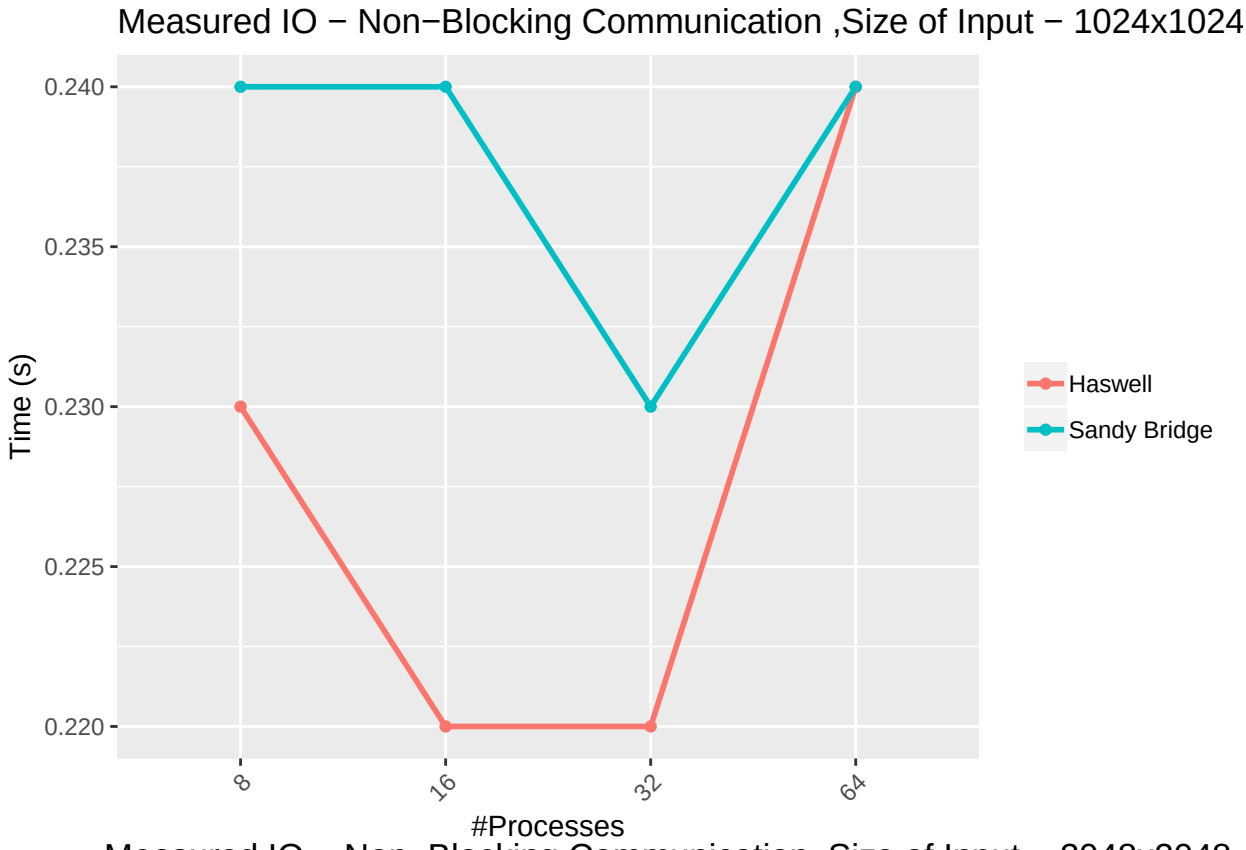

Measured IO − Non−Blocking Communication ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

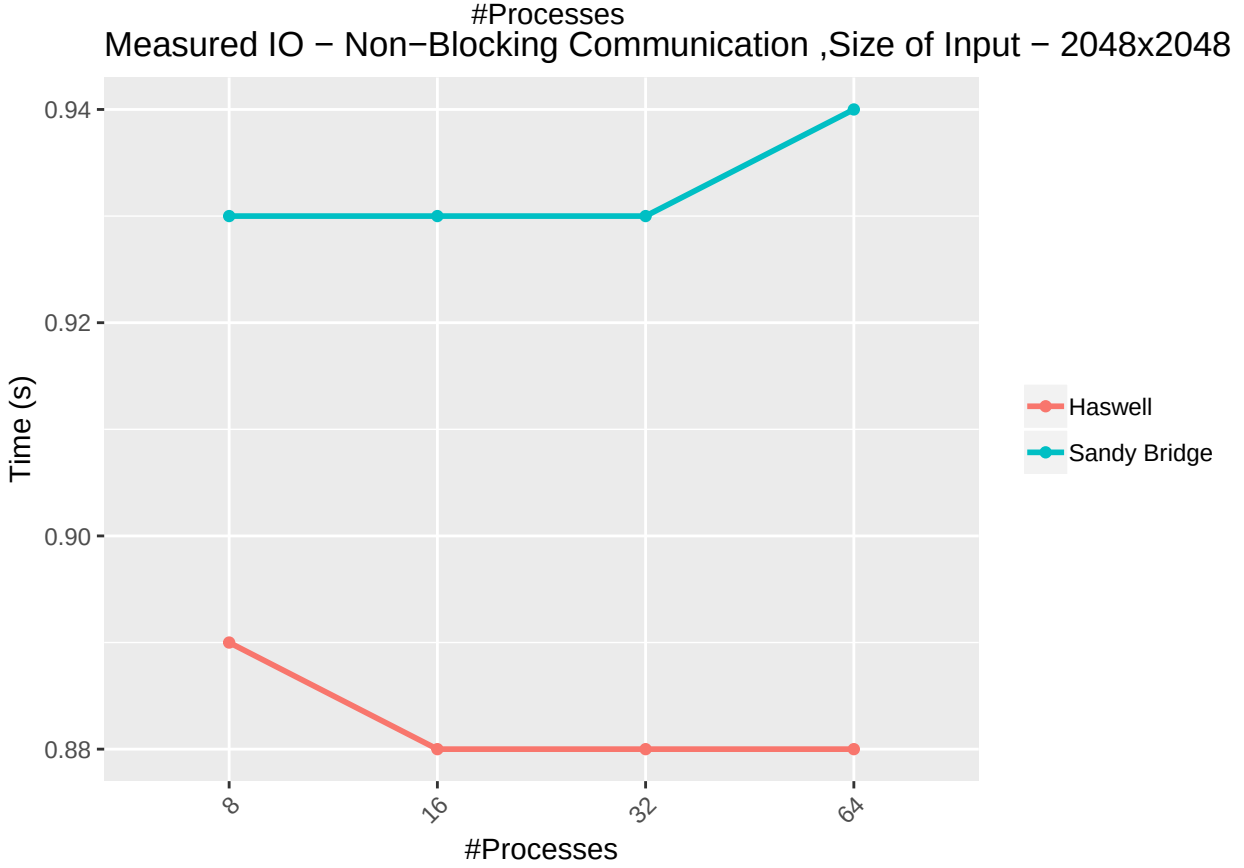

Measured IO − Non−Blocking Communication ,#Processes − 64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

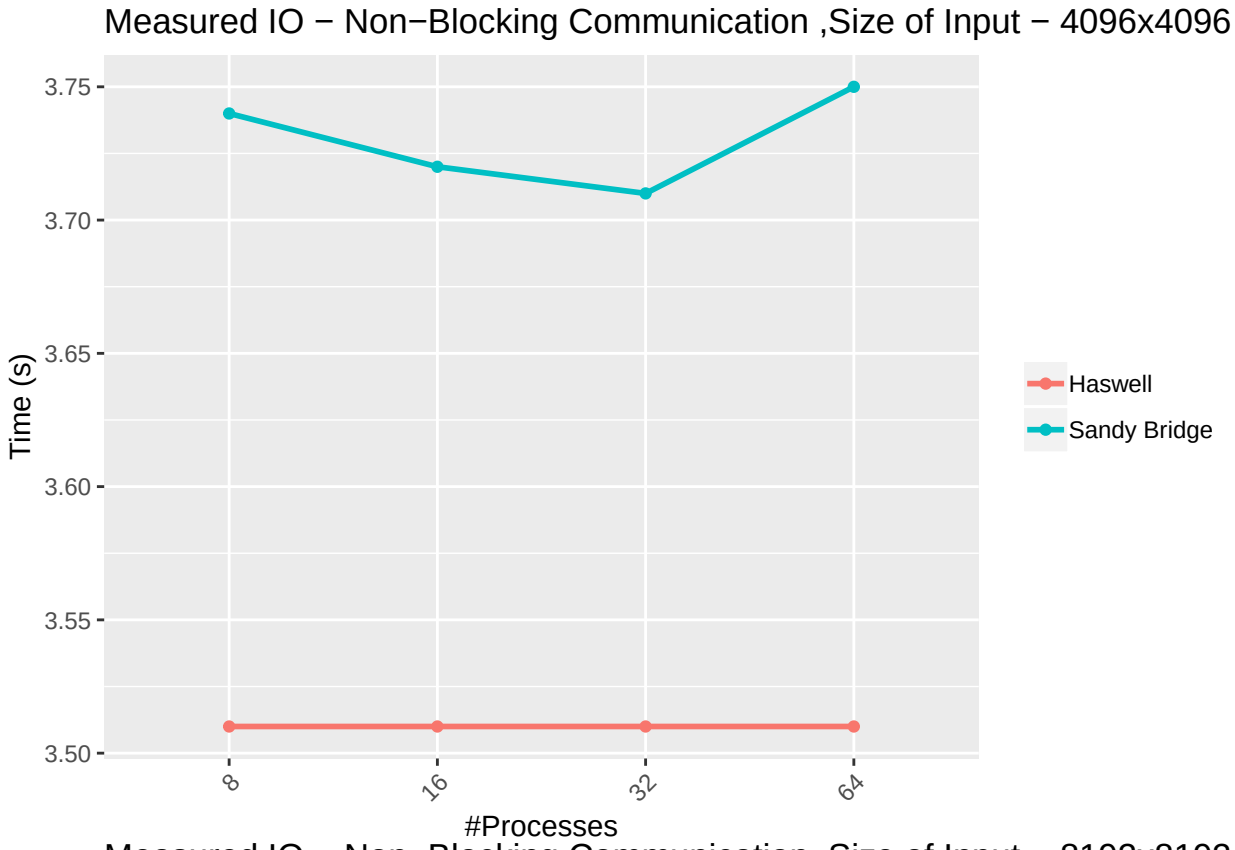

Measured IO − Non−Blocking Communication
8
16
32
64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

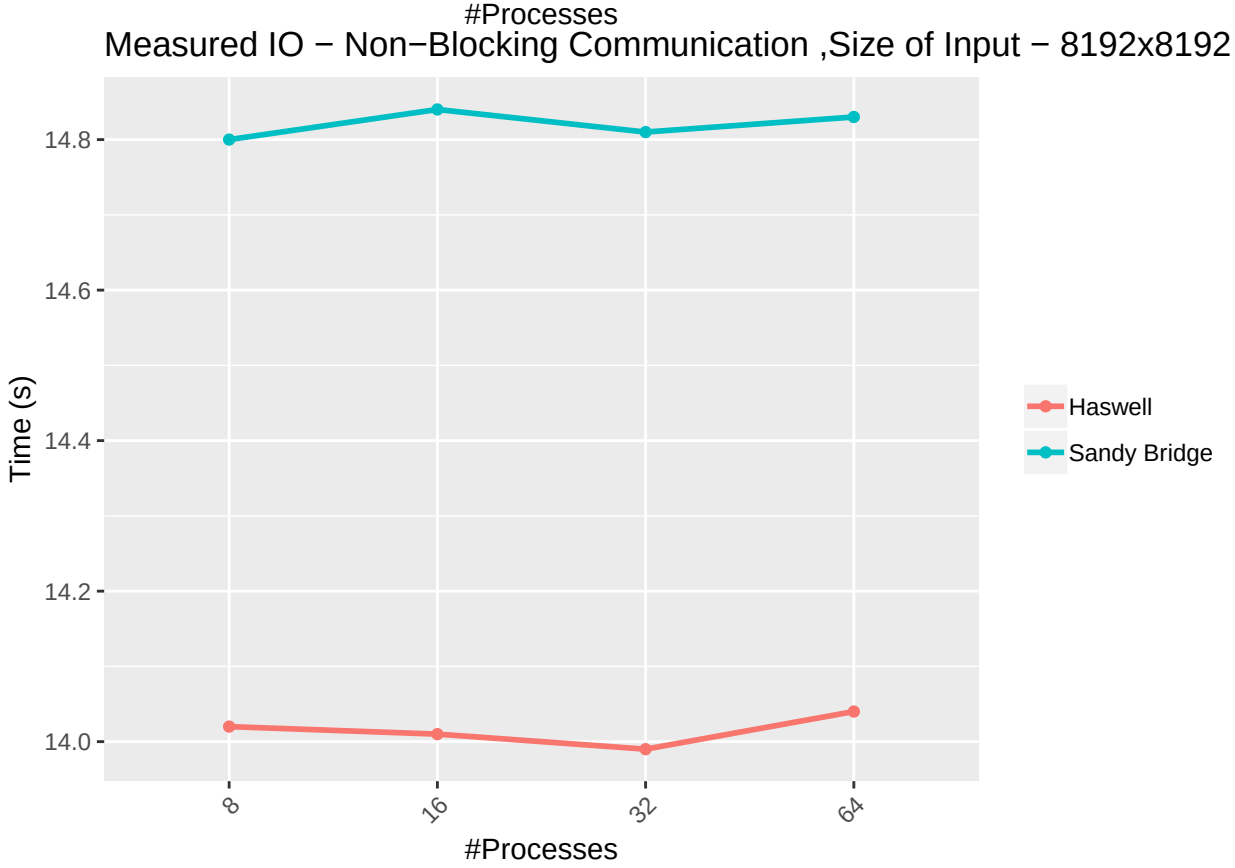

Measured IO − Non−Blocking Communication ,Size of Input − 64x64
Time (s)
0.075
0.050
0.025
0.000
8
16
32
64
#Processes
Haswell
Sandy Bridge

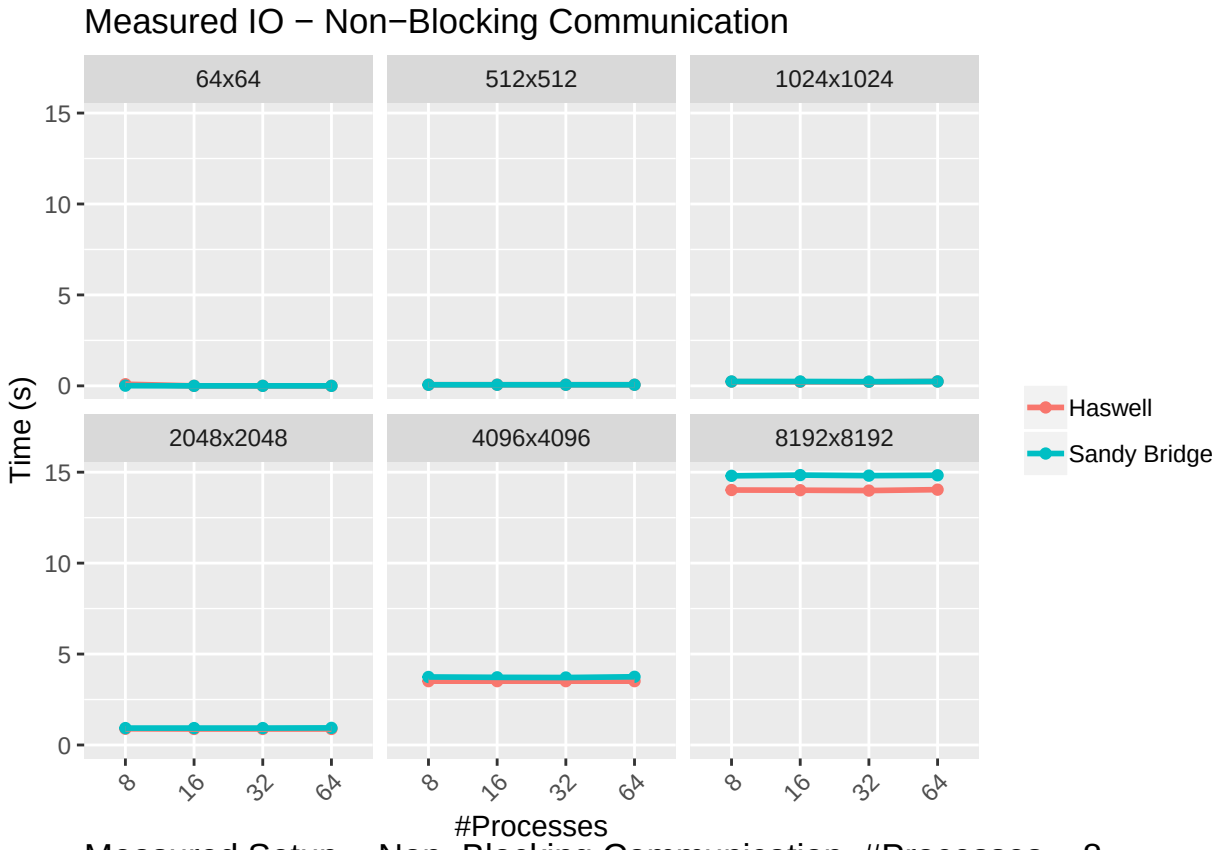

Measured IO − Non−Blocking Communication ,Size of Input − 512x512
Time (s)
0.100
0.075
0.050
0.025
8
16
32
64
#Processes
Haswell
Sandy Bridge

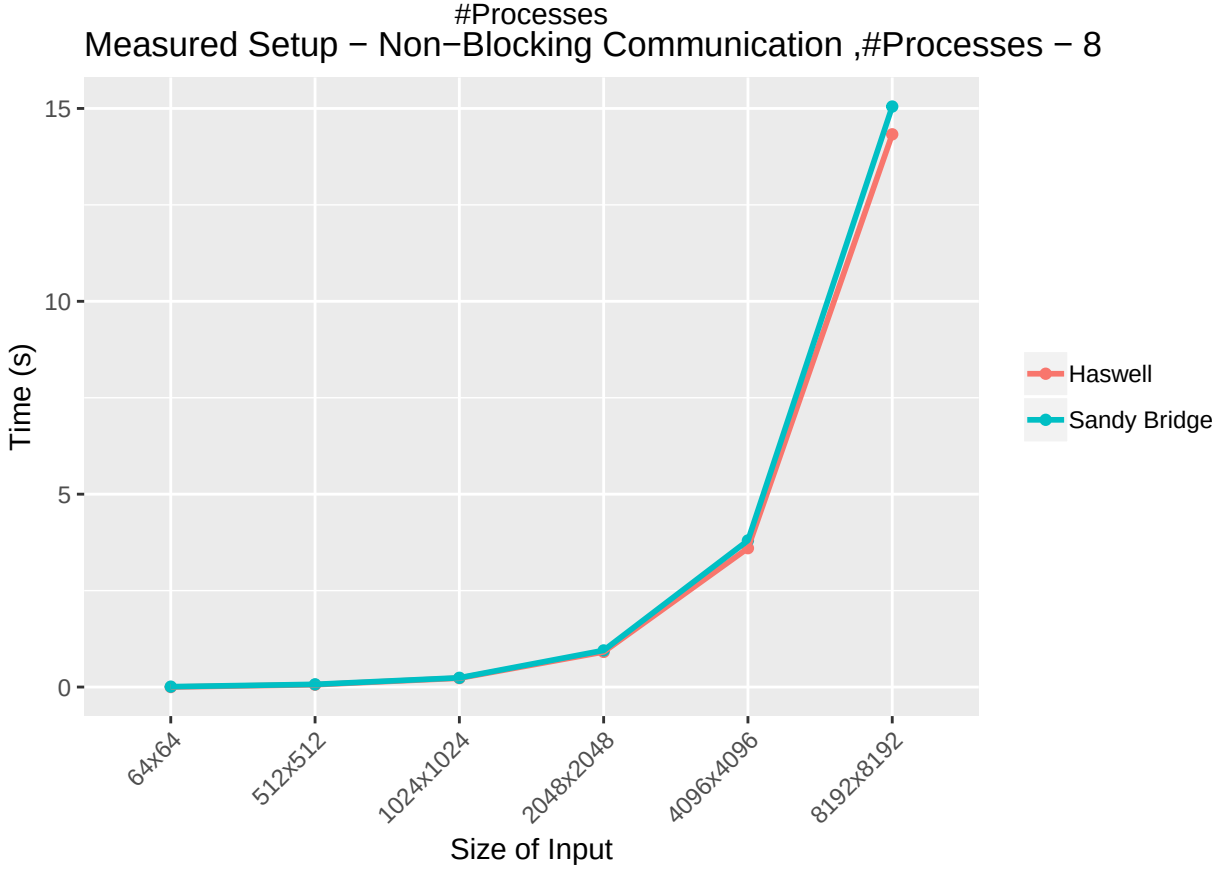

Measured IO − Non−Blocking Communication ,Size of Input − 1024x1024
Time (s)
0.240
0.235
0.230
0.225
0.220
8
16
32
64
#Processes
Haswell
Sandy Bridge

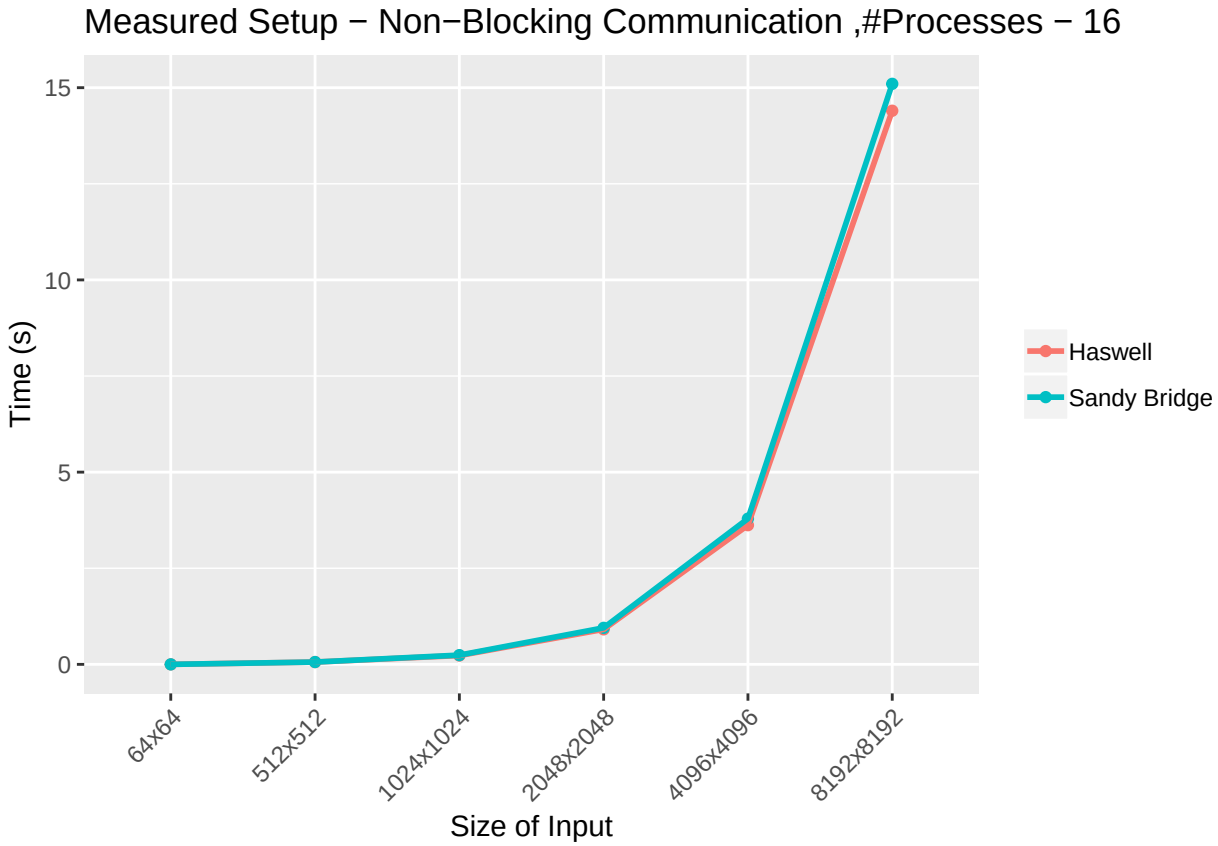

Measured IO − Non−Blocking Communication ,Size of Input − 2048x2048
Time (s)
0.94
0.92
0.90
0.88
8
16
32
64
#Processes
Haswell
Sandy Bridge

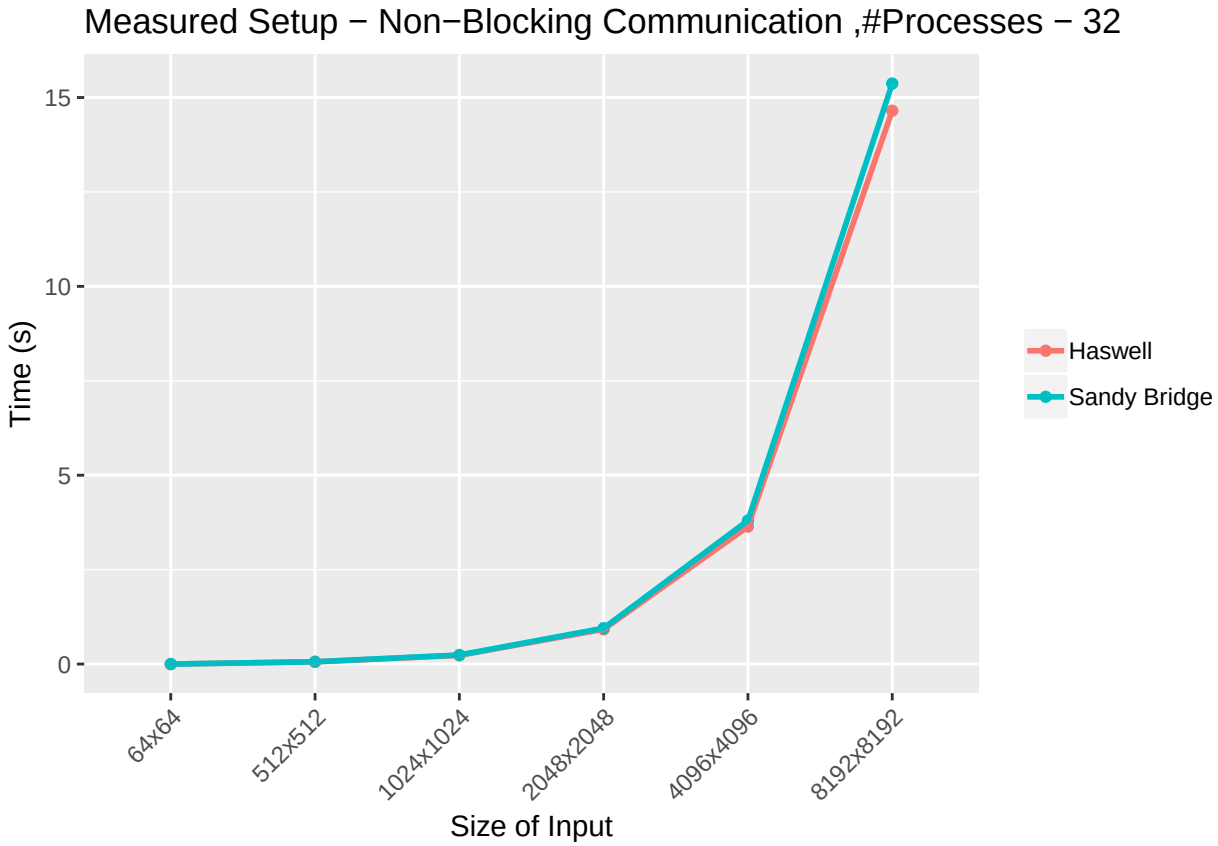

Measured IO − Non−Blocking Communication ,Size of Input − 4096x4096
Time (s)
3.75
3.70
3.65
3.60
3.55
3.50
8
16
32
64
#Processes
Haswell
Sandy Bridge

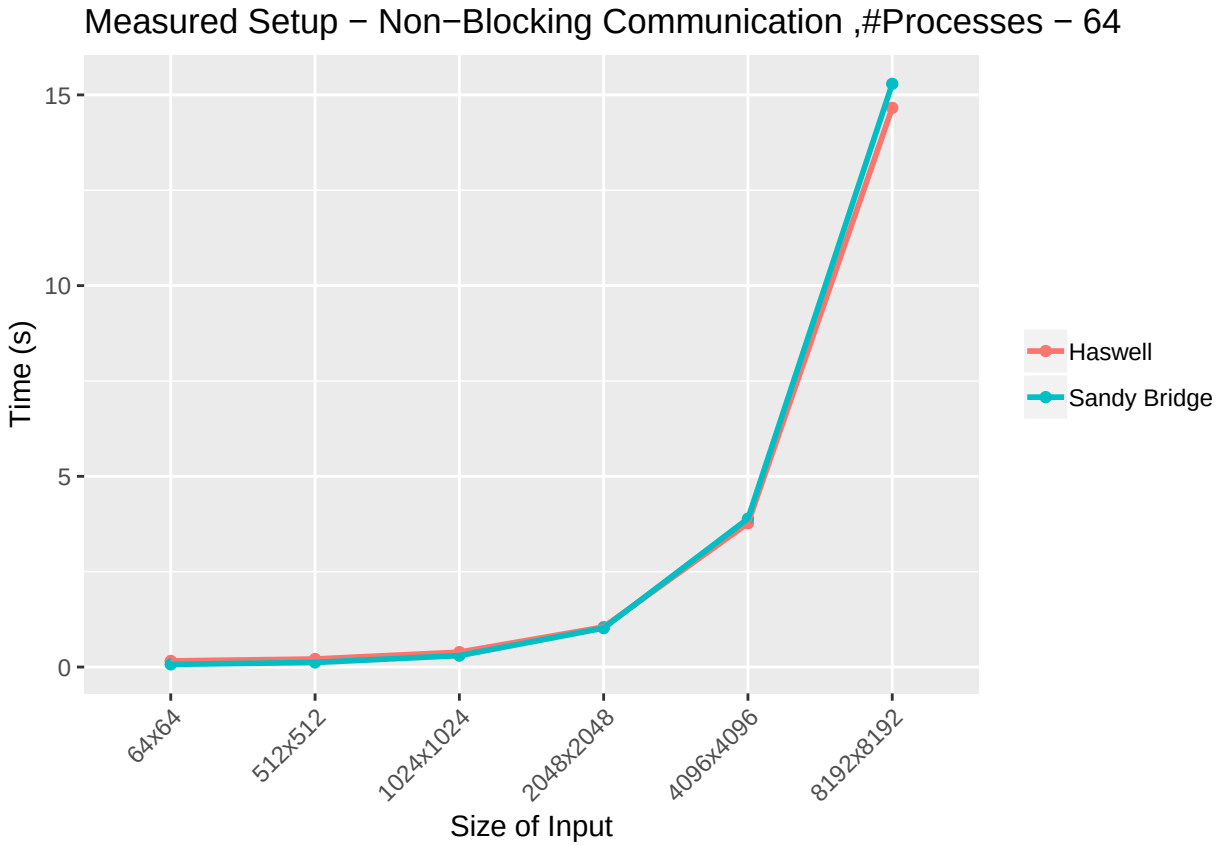

Measured IO − Non−Blocking Communication ,Size of Input − 8192x8192
Time (s)
14.8
14.6
14.4
14.2
14.0
8
16
32
64
#Processes
Haswell
Sandy Bridge

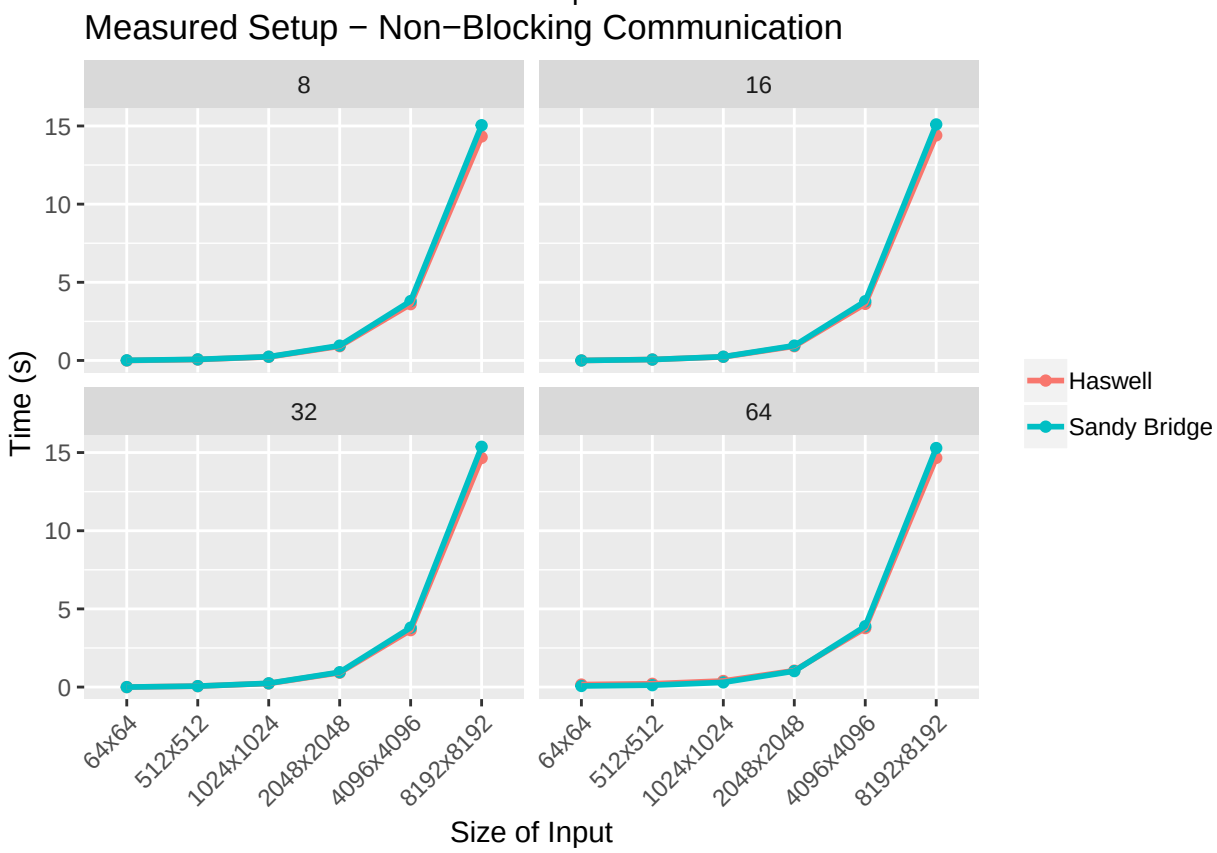

Measured IO − Non−Blocking Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
15
10
5
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

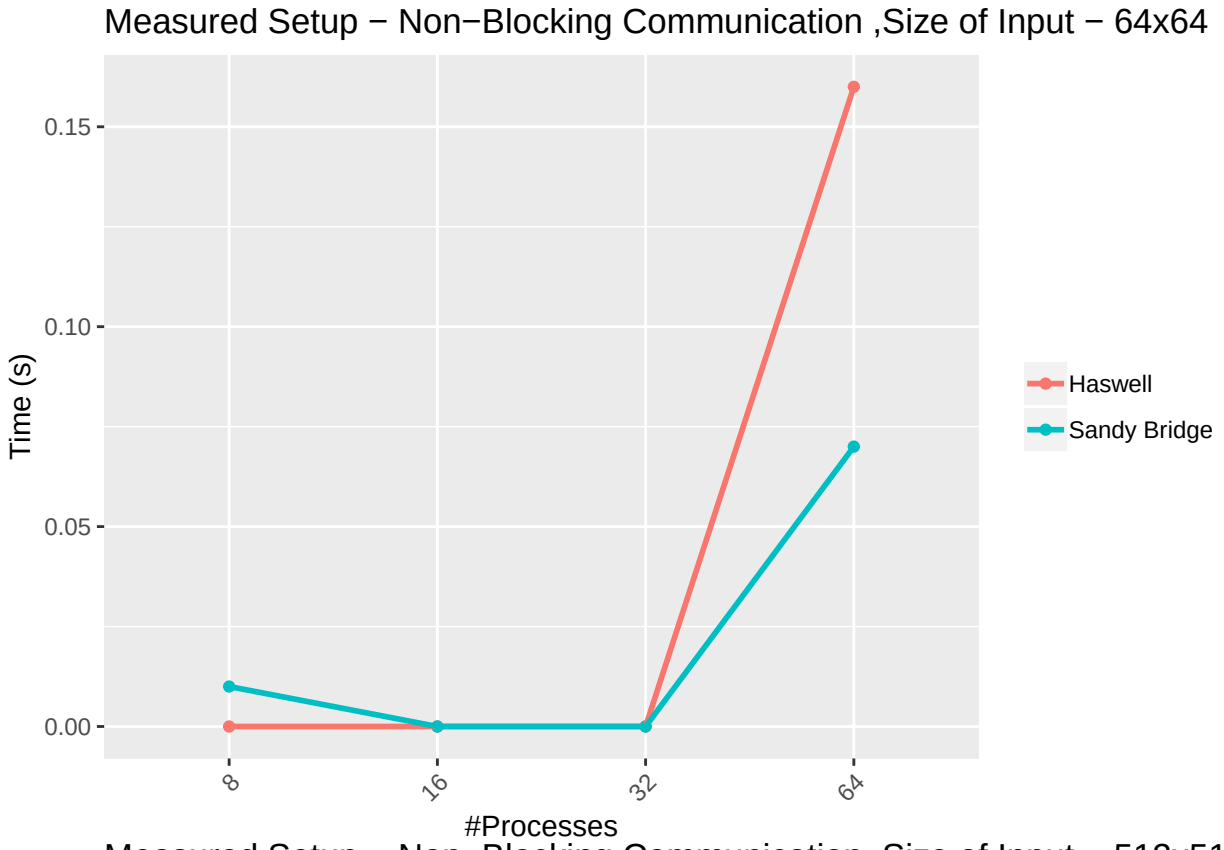

Measured Setup − Non−Blocking Communication ,#Processes − 8
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

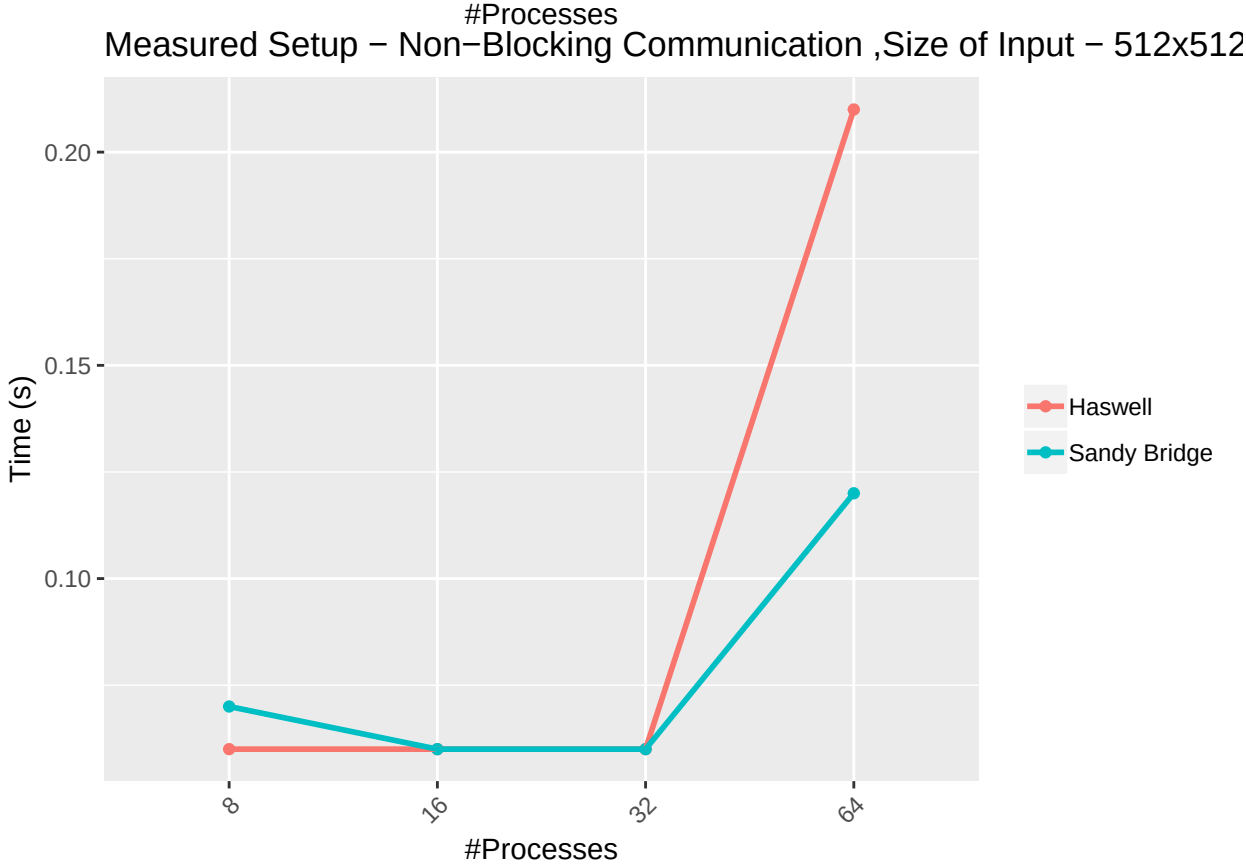

Measured Setup − Non−Blocking Communication ,#Processes − 16
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

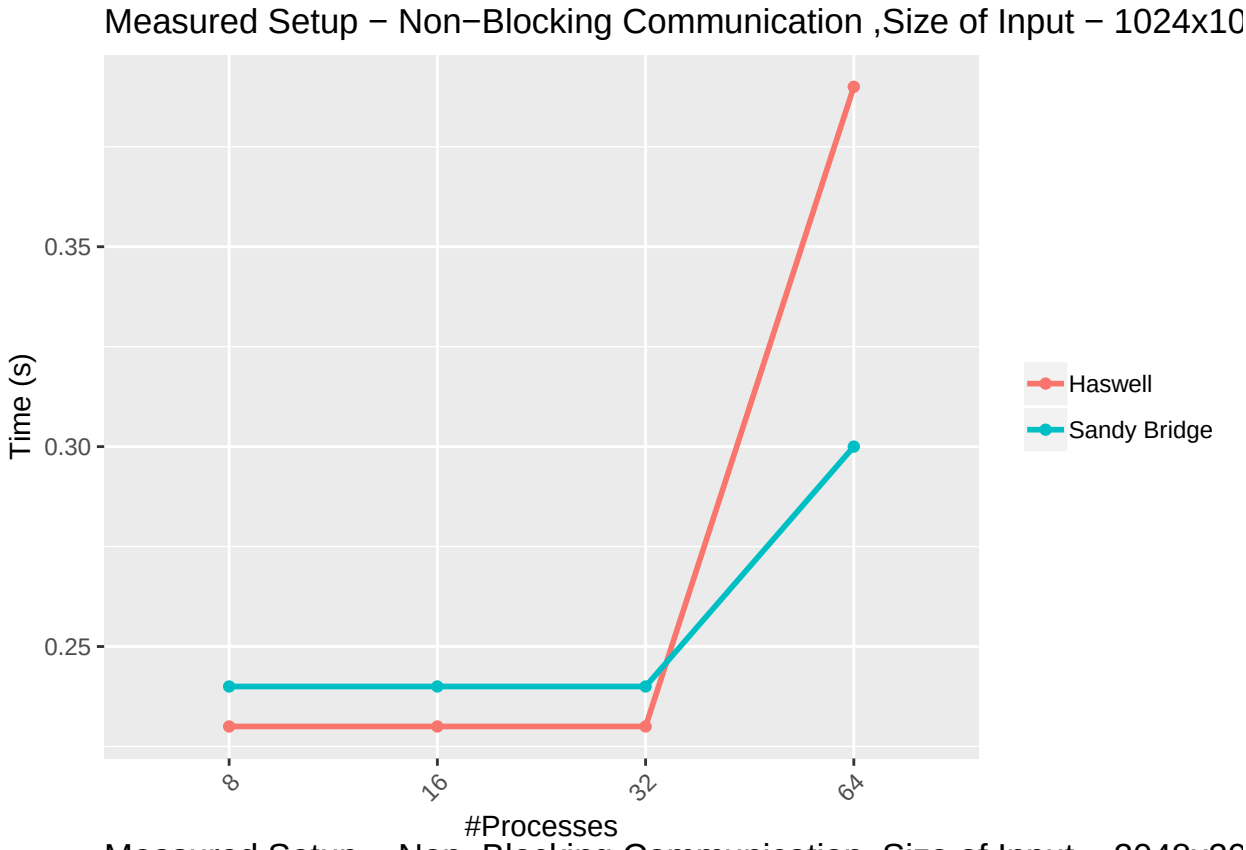

Measured Setup − Non−Blocking Communication ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

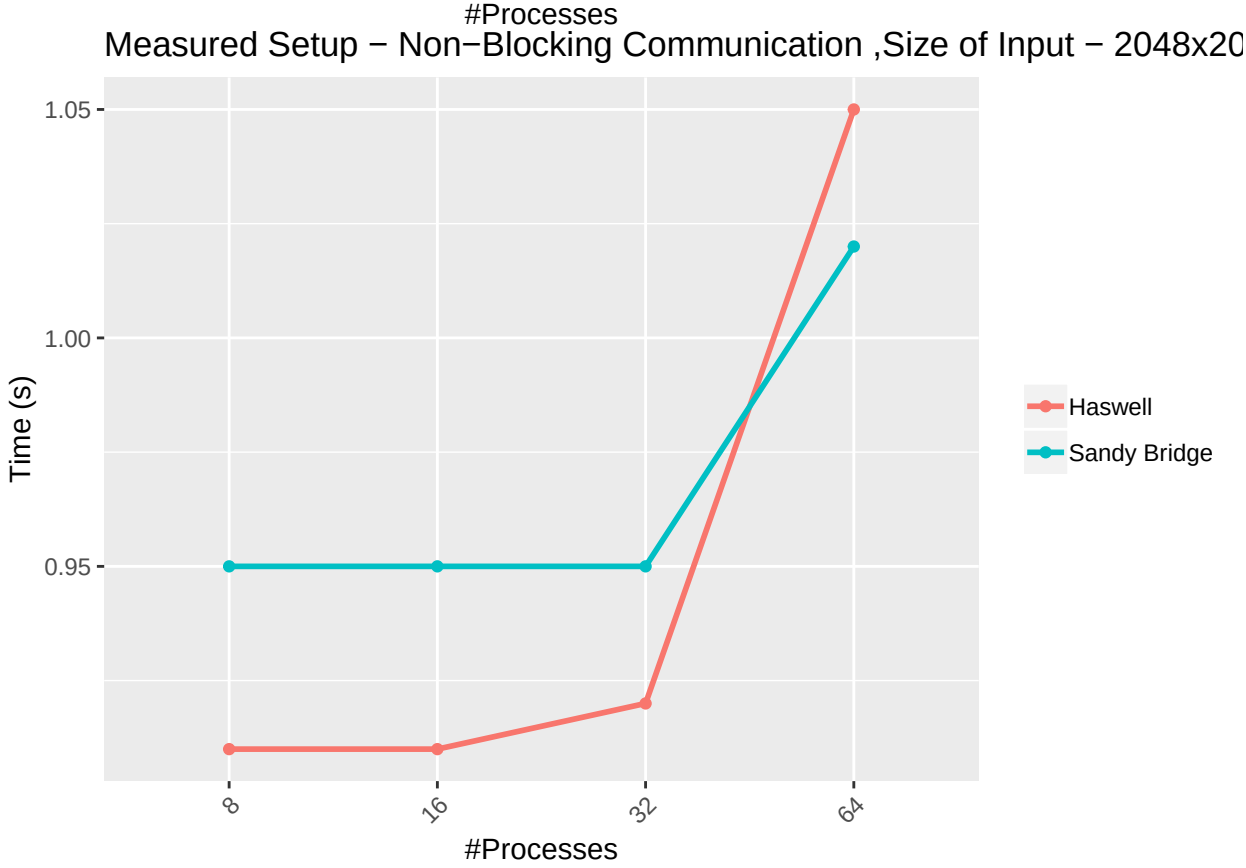

Measured Setup − Non−Blocking Communication ,#Processes − 64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

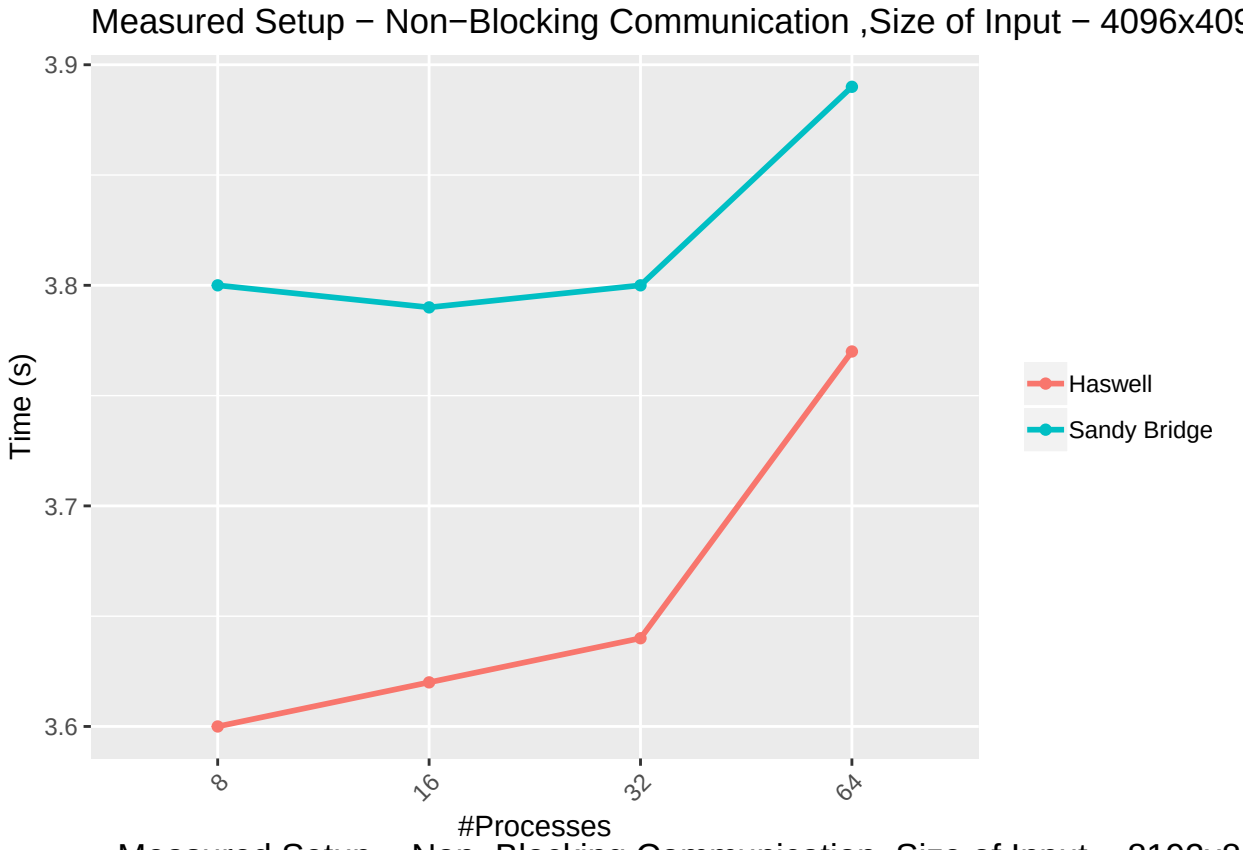

Measured Setup − Non−Blocking Communication
8
16
32
64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

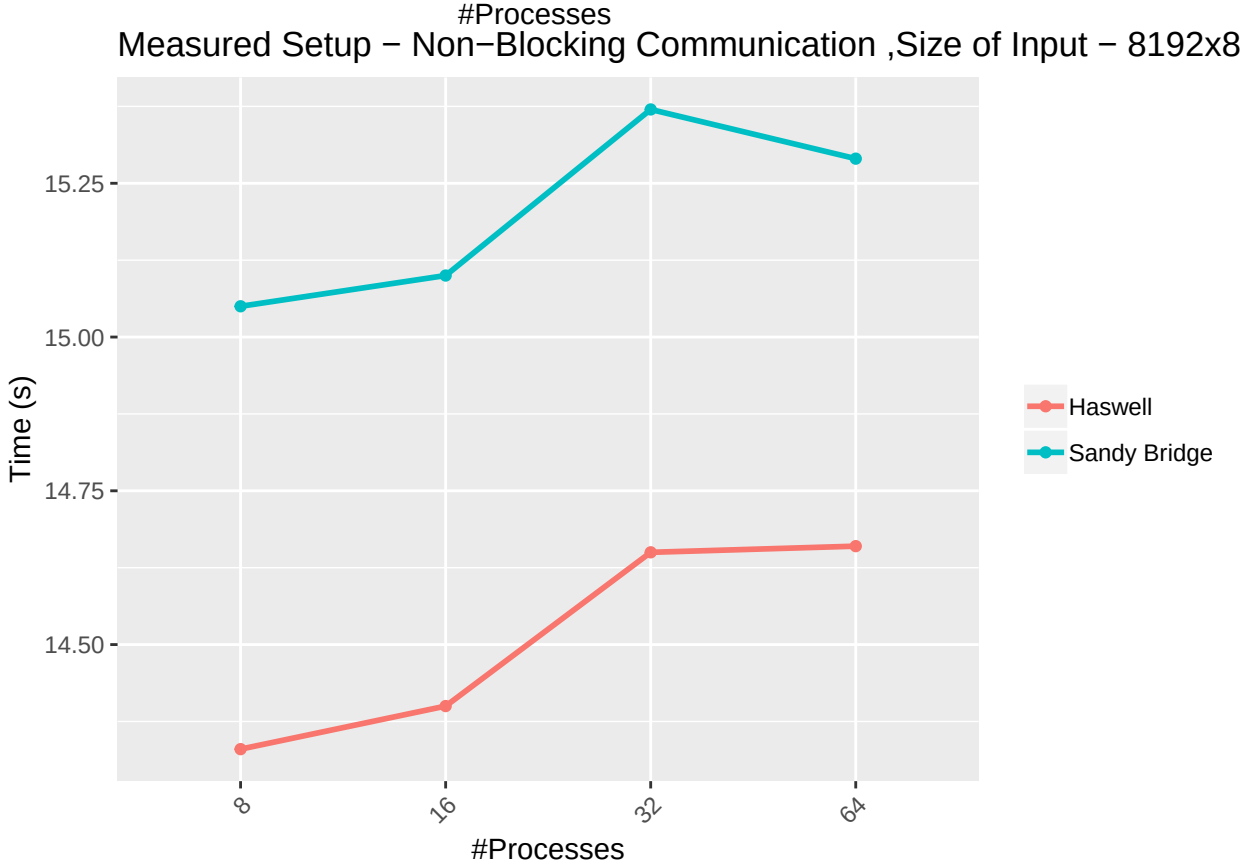

Measured Setup − Non−Blocking Communication ,Size of Input − 64x64
Time (s)
0.15
0.10
0.05
0.00
8
16
32
64
#Processes
Haswell
Sandy Bridge

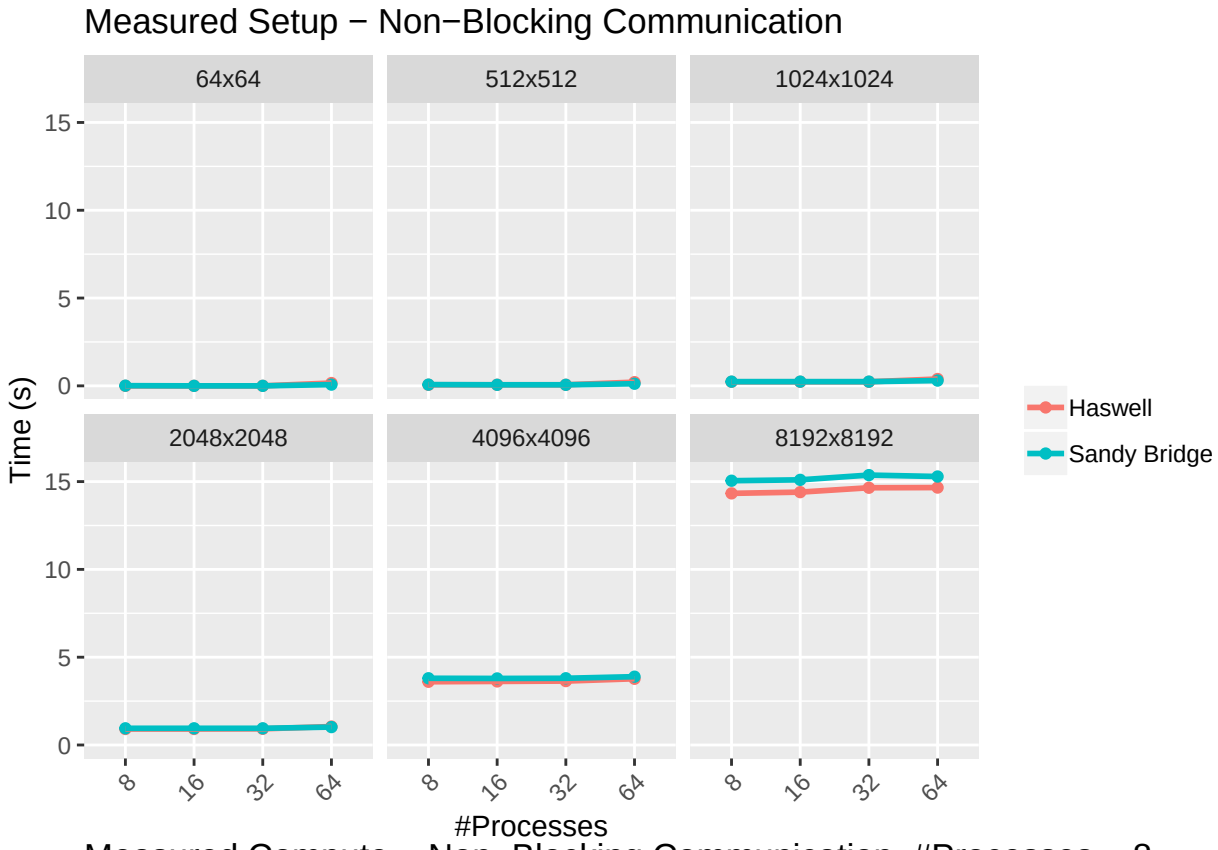

Measured Setup − Non−Blocking Communication ,Size of Input − 512x512
Time (s)
0.20
0.15
0.10
8
16
32
64
#Processes
Haswell
Sandy Bridge

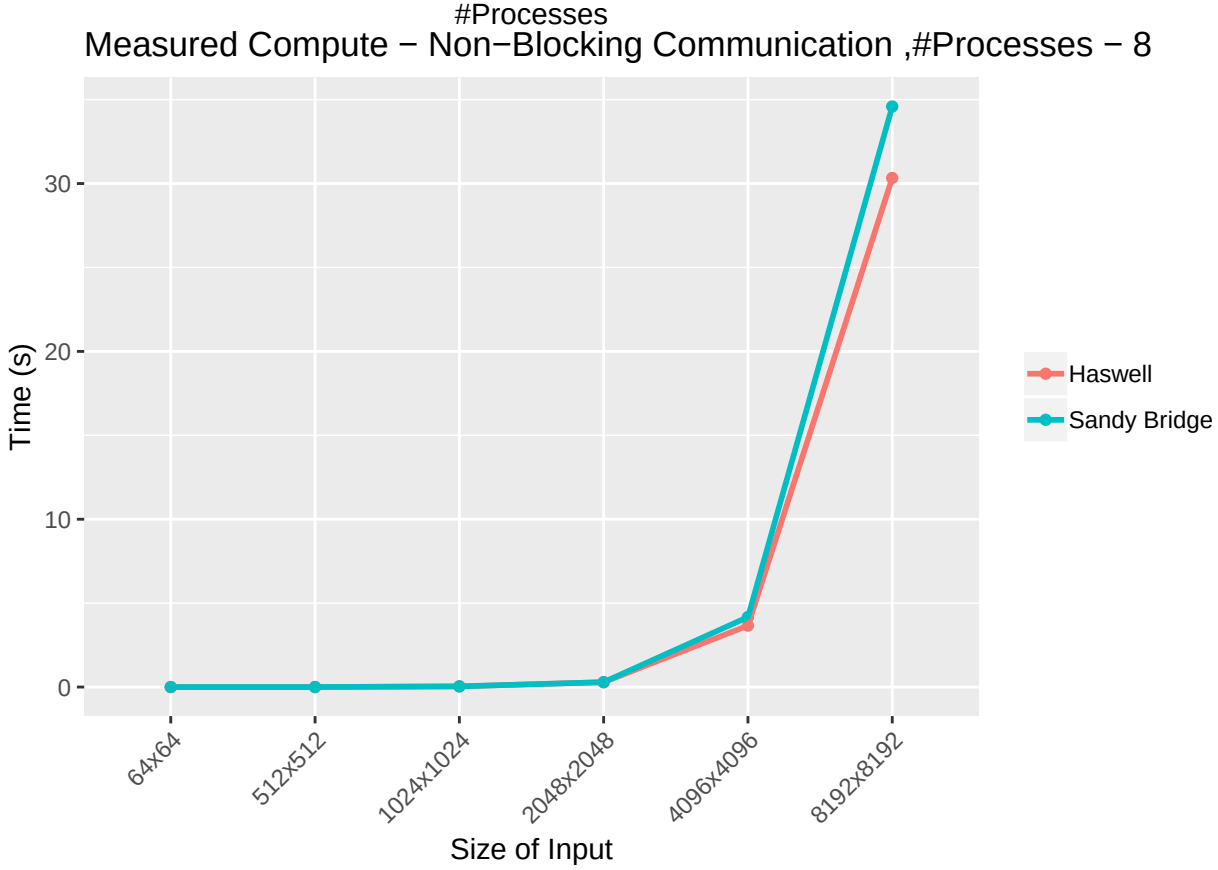

Measured Setup − Non−Blocking Communication ,Size of Input − 1024x10
Time (s)
0.35
0.30
0.25
8
16
32
64
#Processes
Haswell
Sandy Bridge

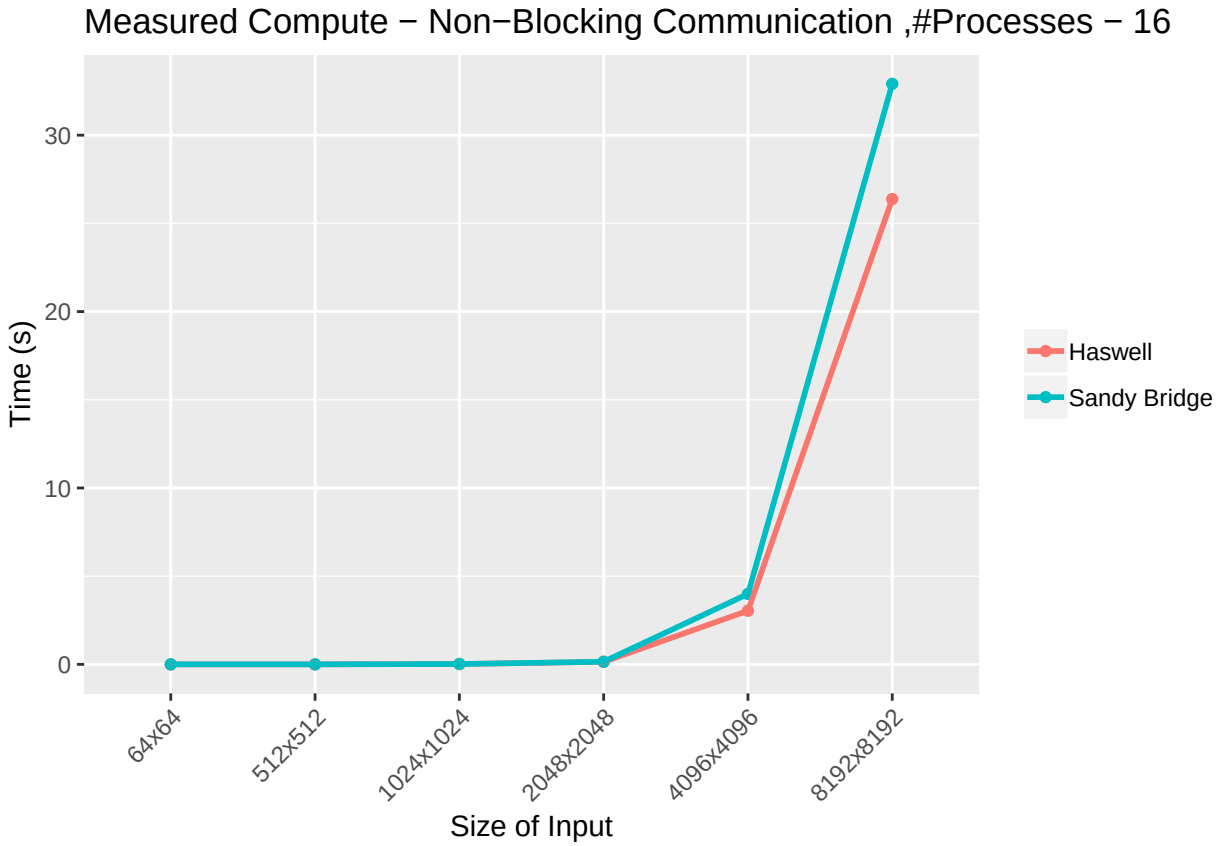

Measured Setup − Non−Blocking Communication ,Size of Input − 2048x20
Time (s)
1.05
1.00
0.95
8
16
32
64
#Processes
Haswell
Sandy Bridge

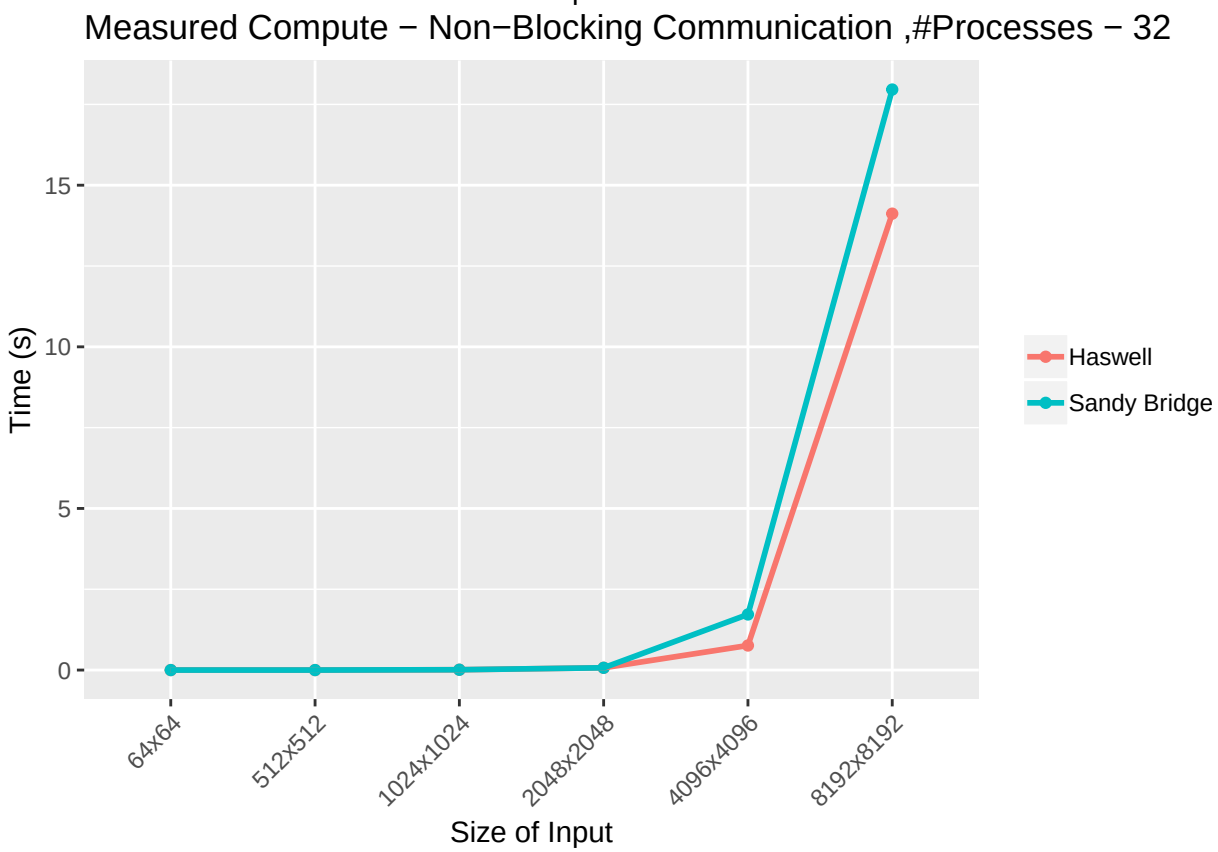

Measured Setup − Non−Blocking Communication ,Size of Input − 4096x409
Time (s)
3.9
3.8
3.7
3.6
8
16
32
64
#Processes
Haswell
Sandy Bridge

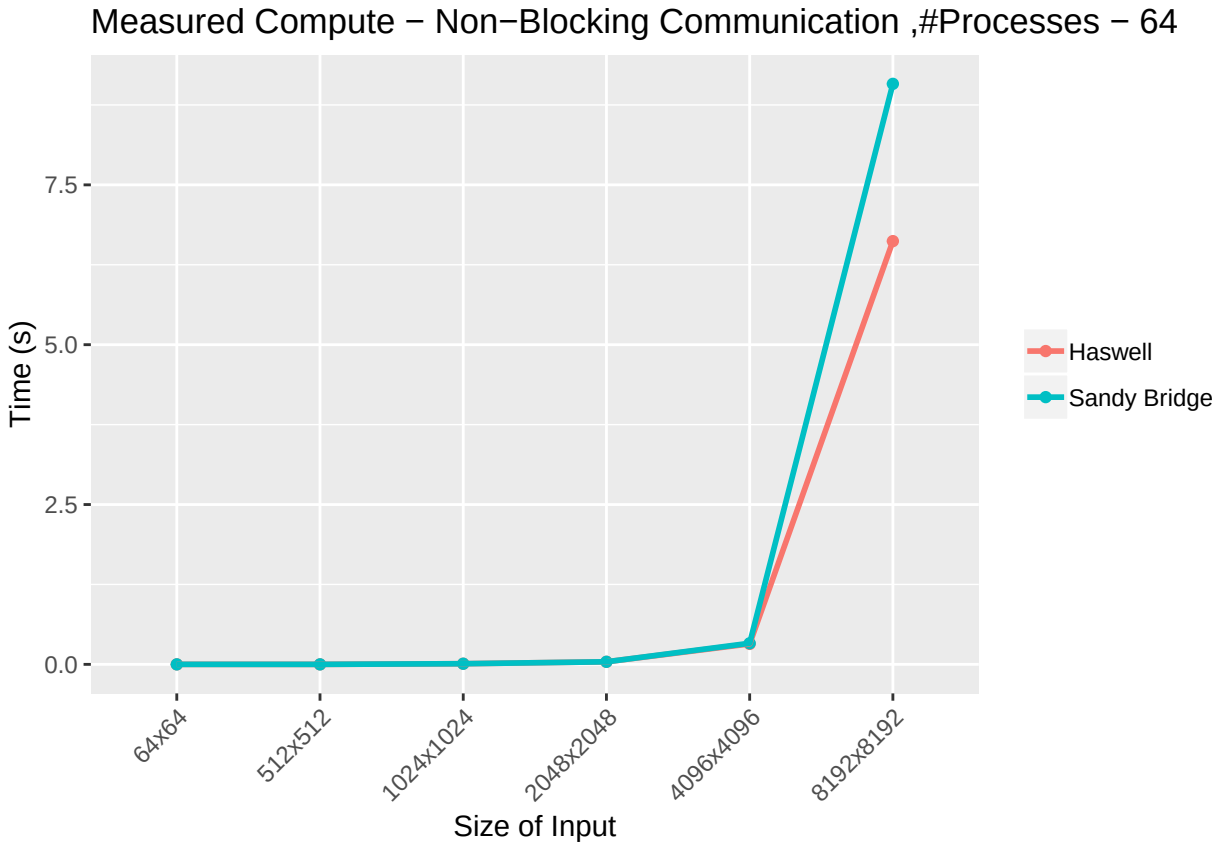

Measured Setup − Non−Blocking Communication ,Size of Input − 8192x8
Time (s)
15.25
15.00
14.75
14.50
8
16
32
64
#Processes
Haswell
Sandy Bridge

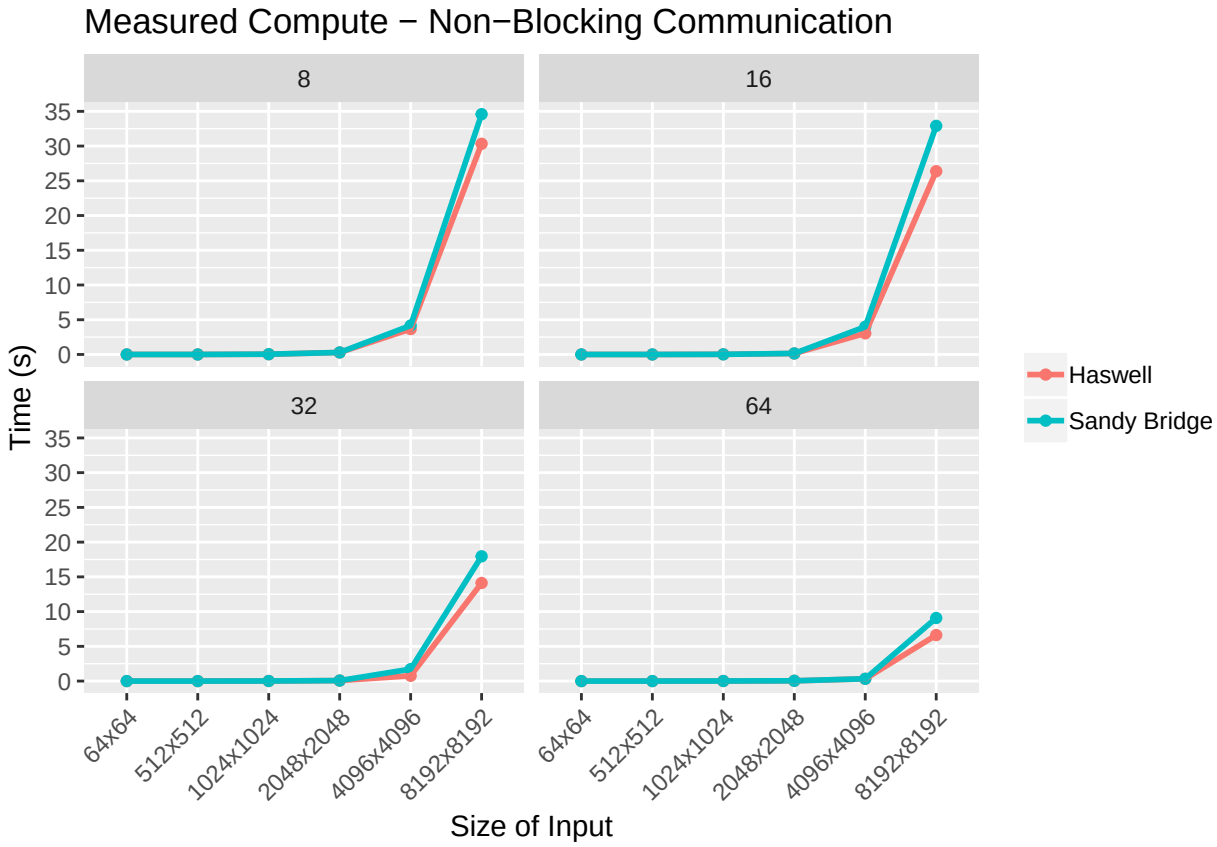

Measured Setup − Non−Blocking Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
0
5
10
15
8
16
32
64
#Processes
Haswell
Sandy Bridge

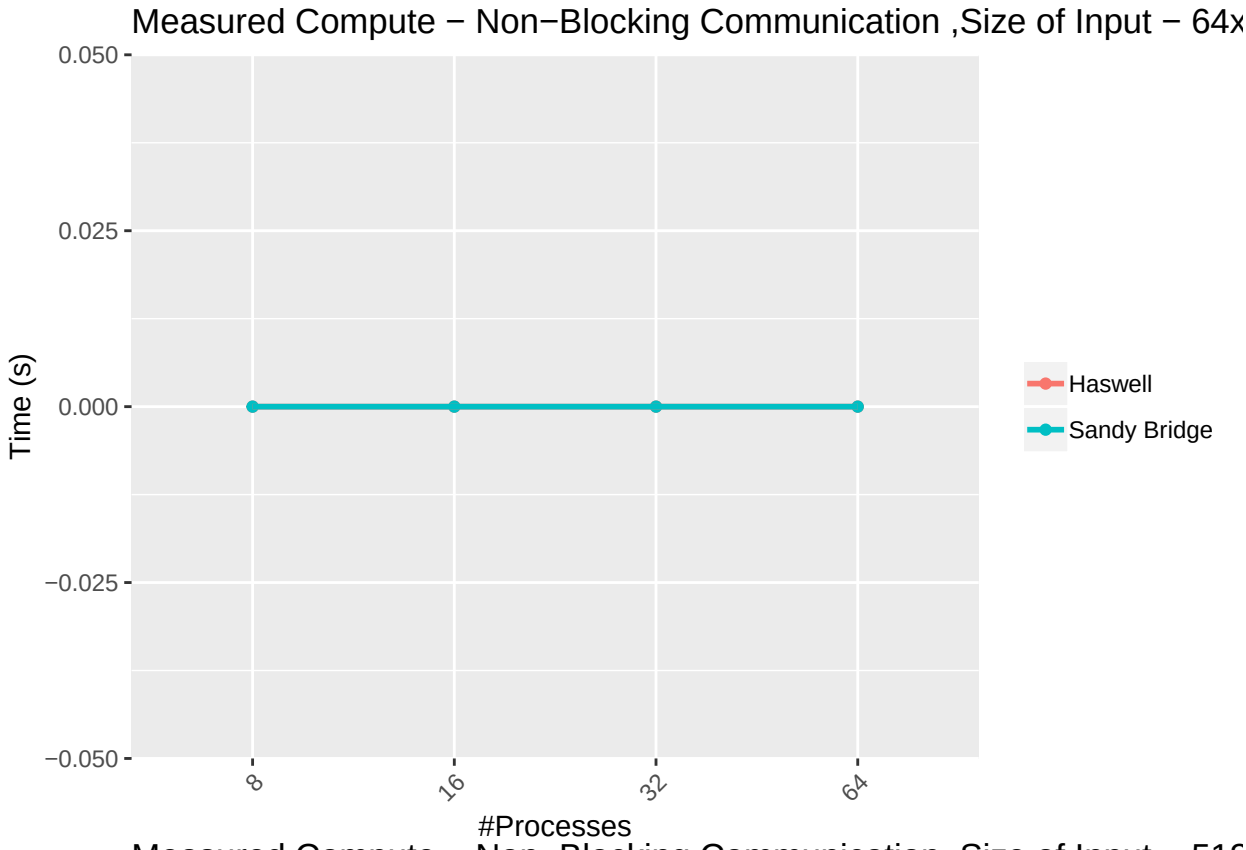

Measured Compute − Non−Blocking Communication ,#Processes − 8
Time (s)
0
10
20
30
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

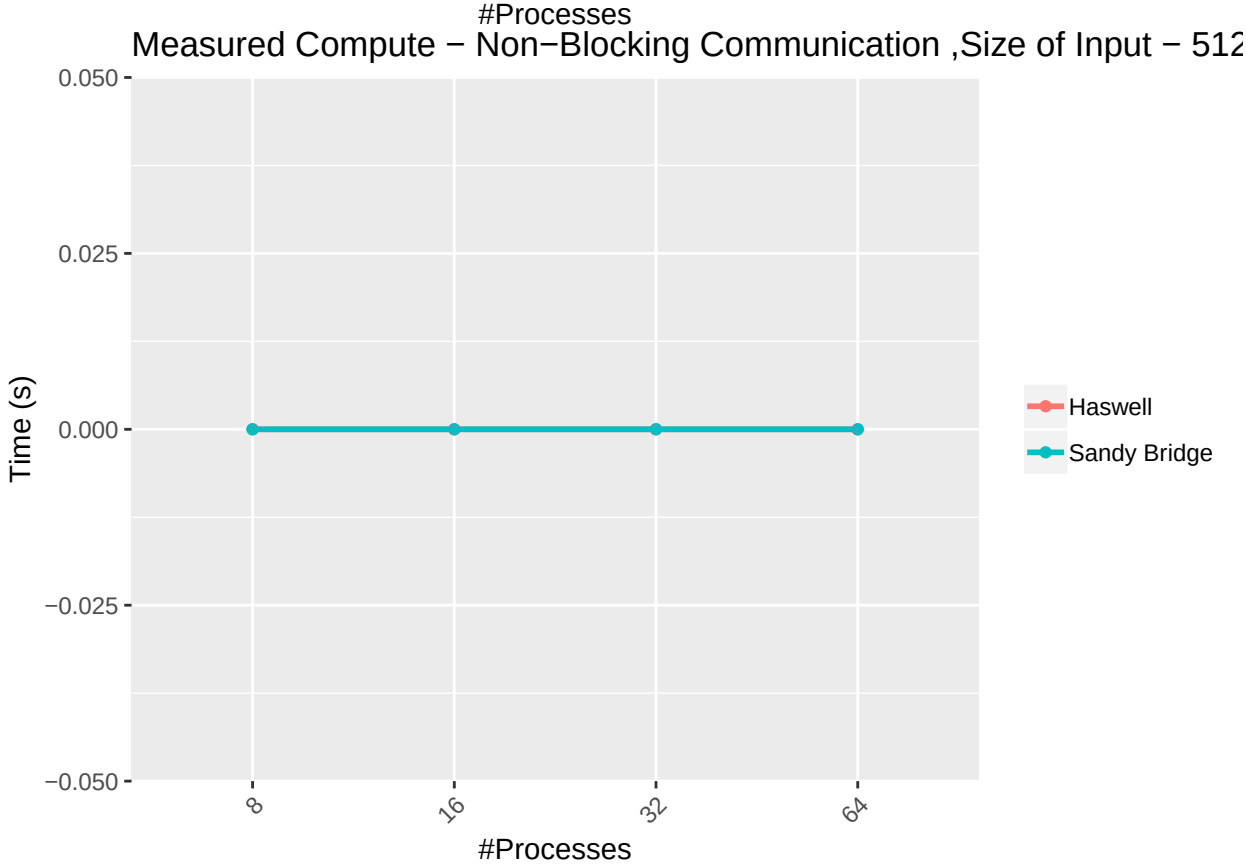

Measured Compute − Non−Blocking Communication ,#Processes − 16
Time (s)
30
20
10
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

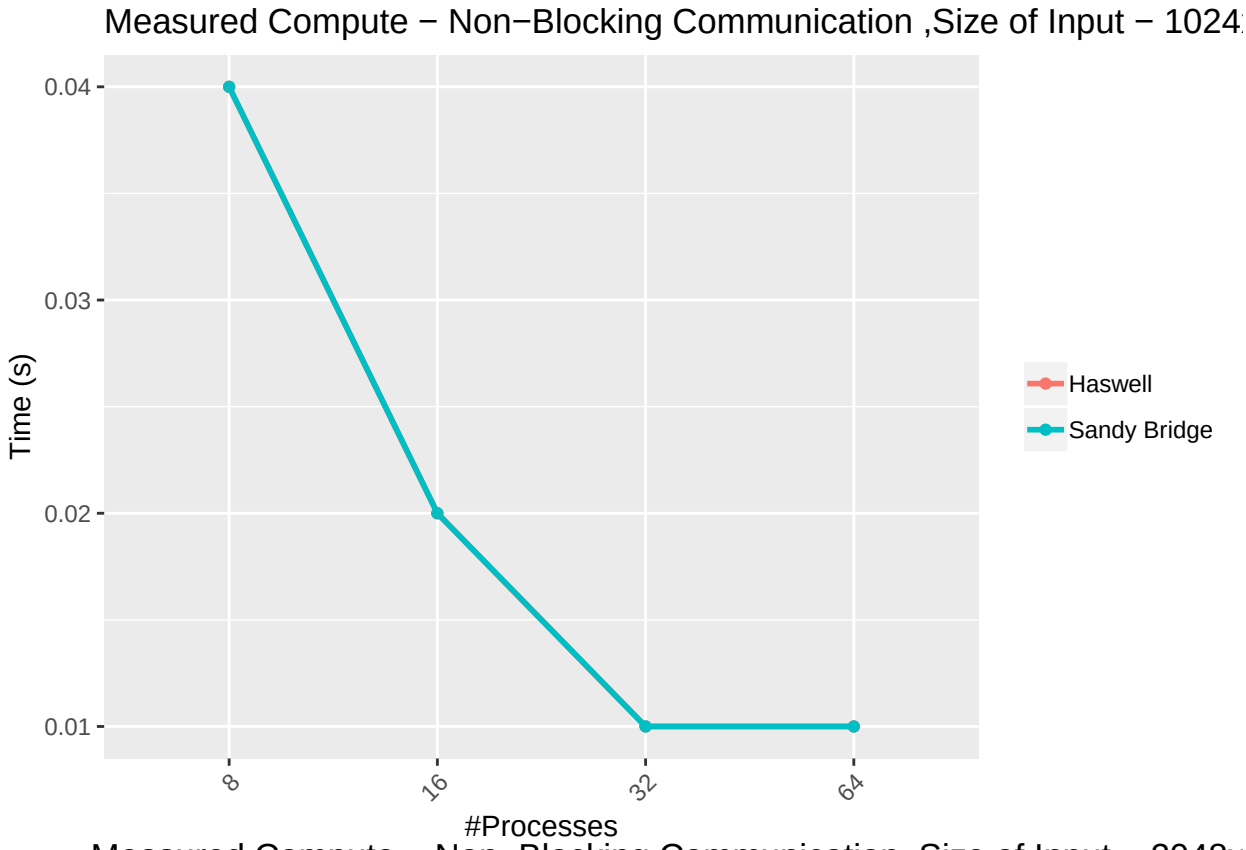

Measured Compute − Non−Blocking Communication ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

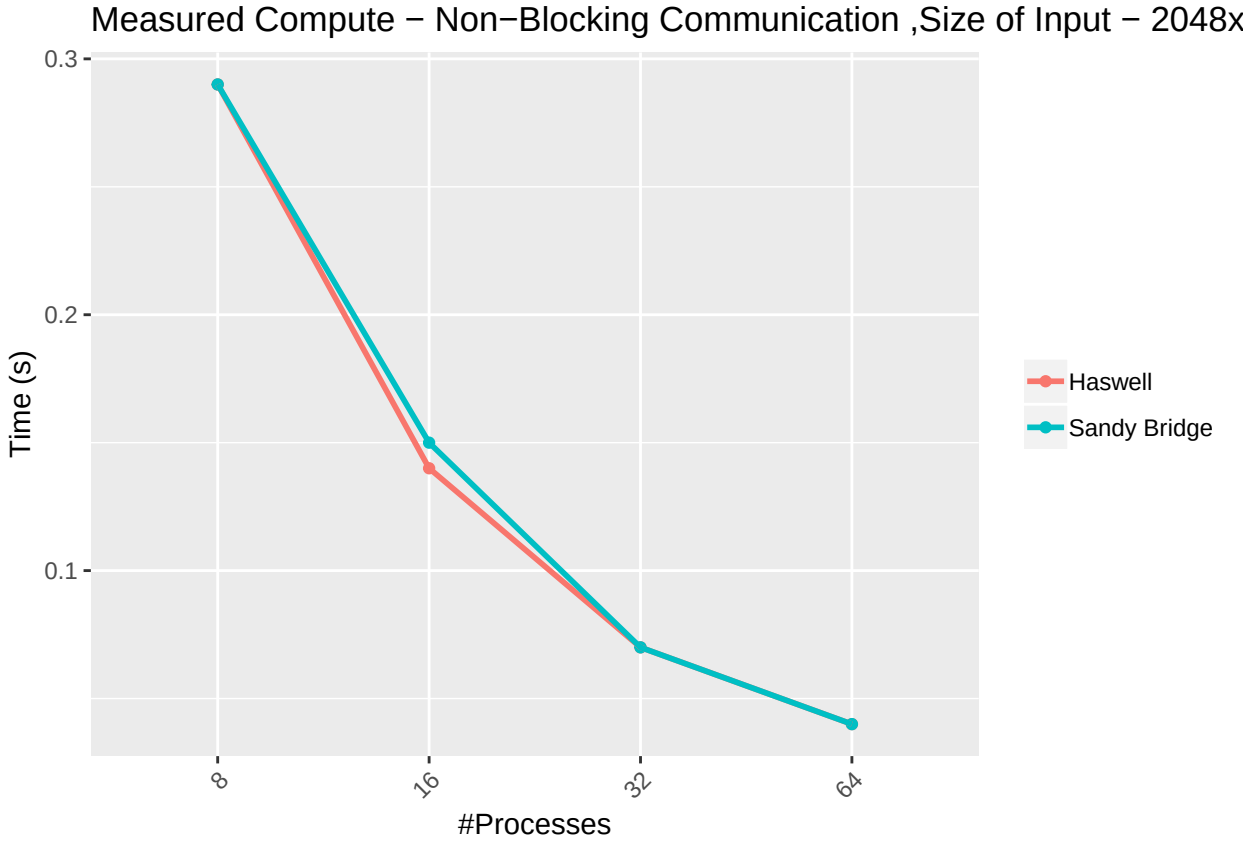

Measured Compute − Non−Blocking Communication ,#Processes − 64
Time (s)
7.5
5.0
2.5
0.0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

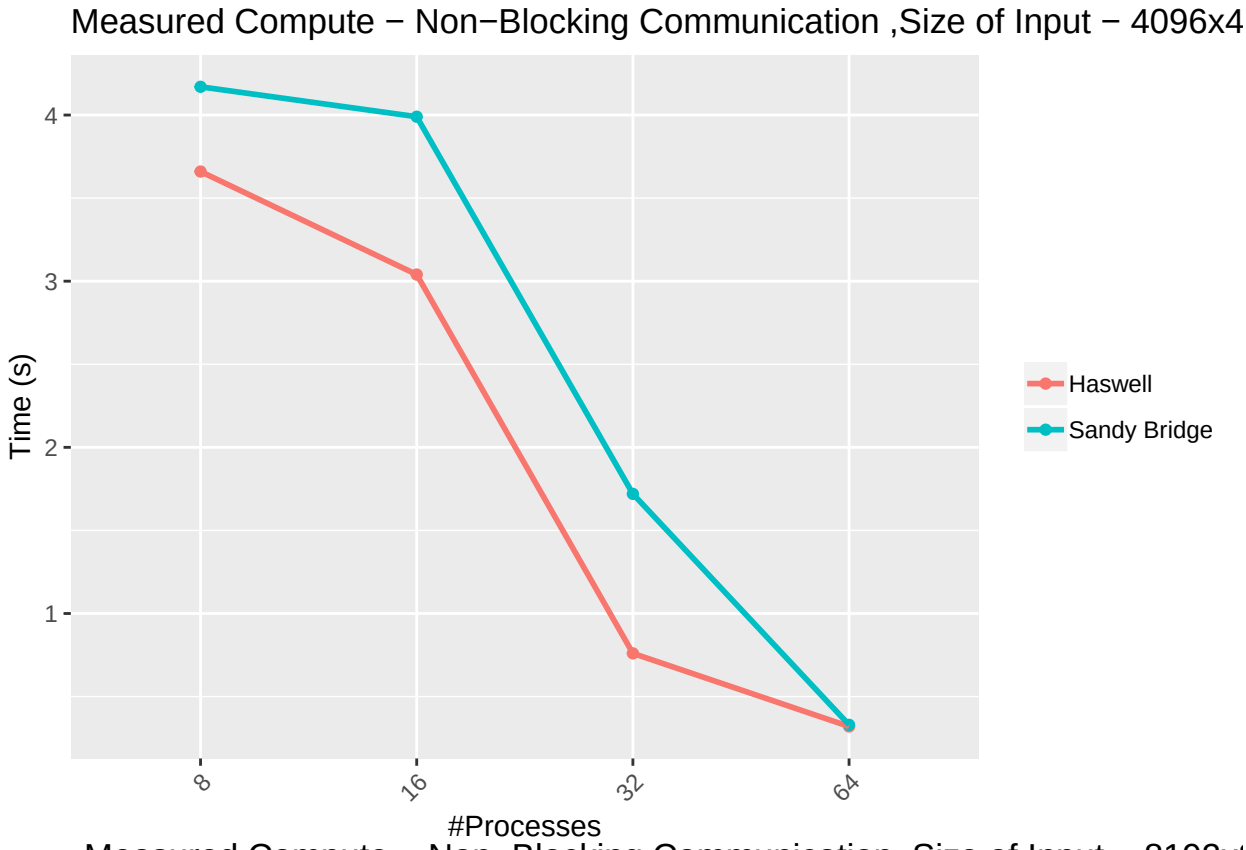

Measured Compute − Non−Blocking Communication
8
16
32
64
Time (s)
35
30
25
20
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

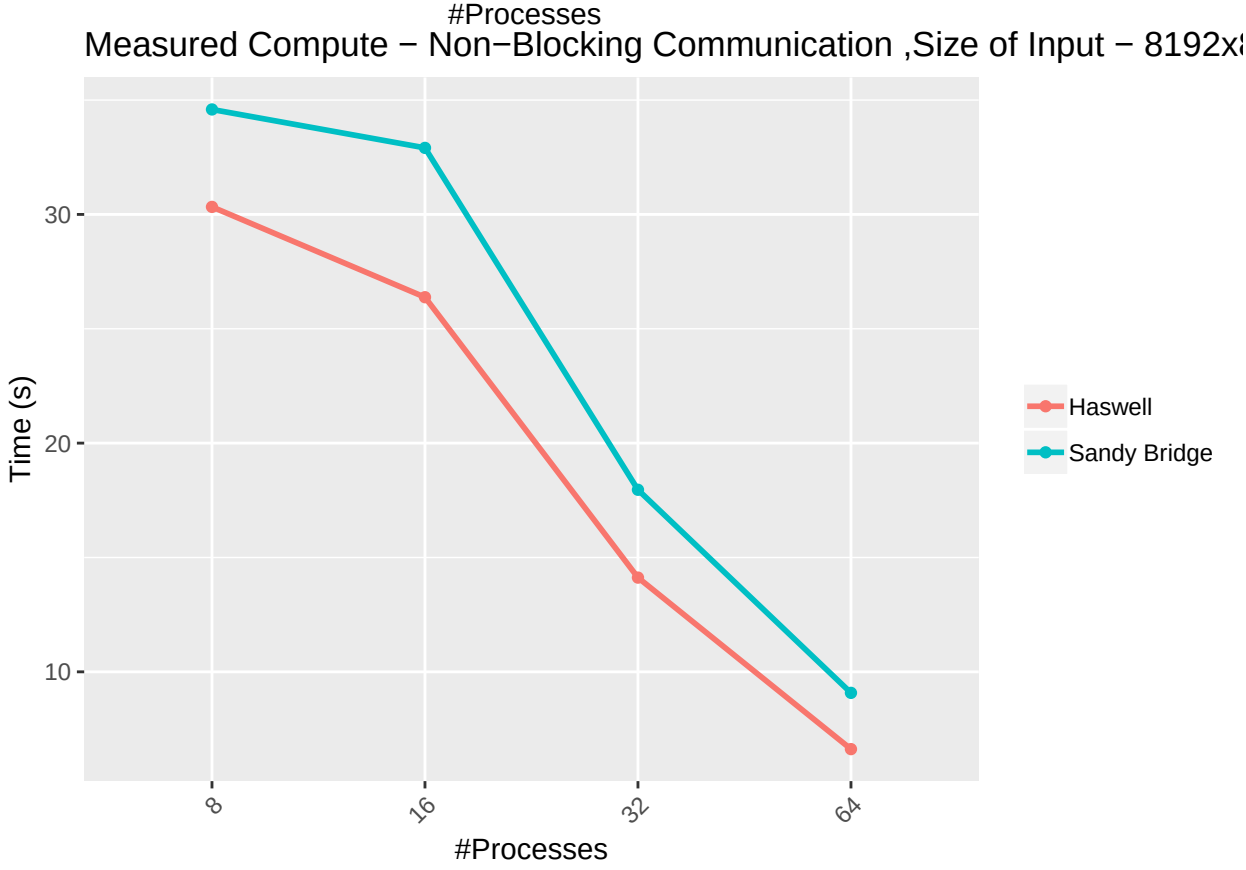

Measured Compute − Non−Blocking Communication ,Size of Input − 64x
0.050
0.025
0.000
−0.025
−0.050
Time (s)
8
16
32
64
#Processes
Haswell
Sandy Bridge

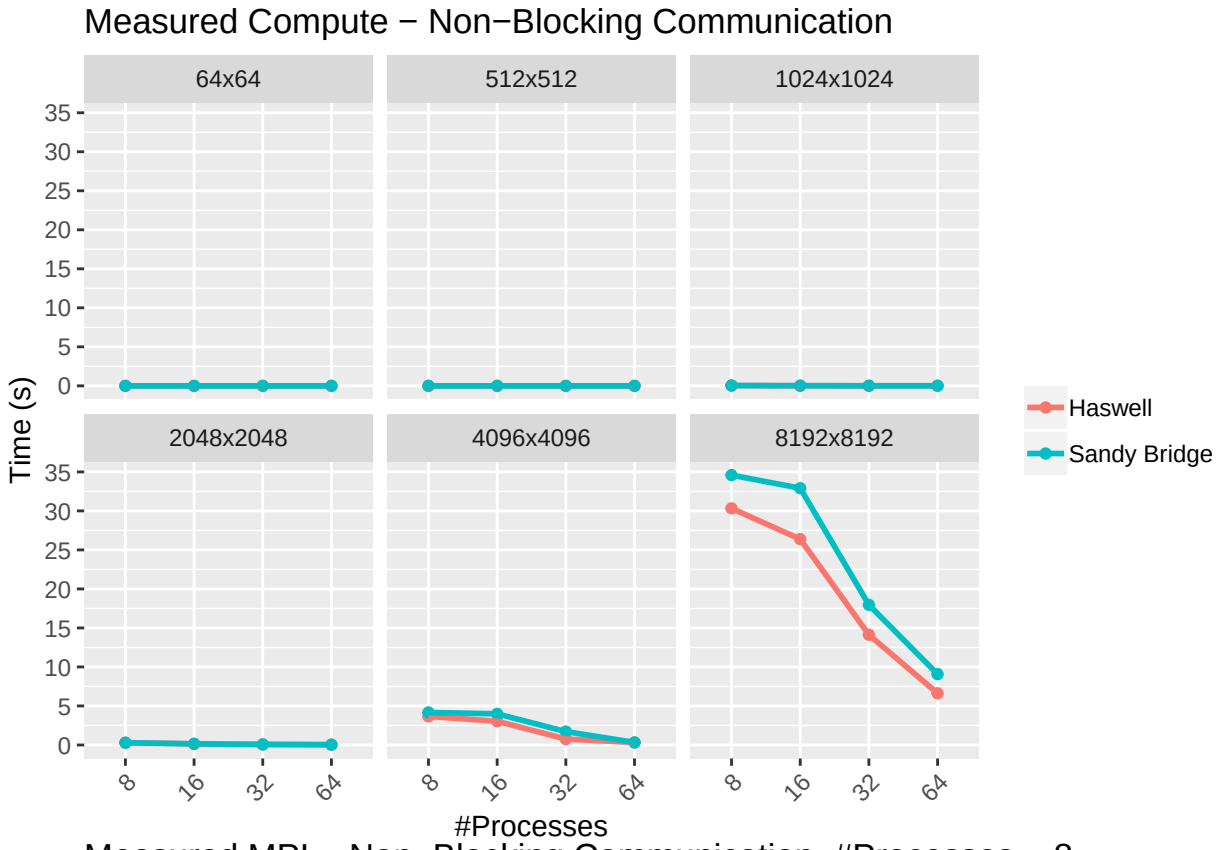

Measured Compute − Non−Blocking Communication ,Size of Input − 512
0.050
0.025
0.000
−0.025
−0.050
Time (s)
8
16
32
64
#Processes
Haswell
Sandy Bridge

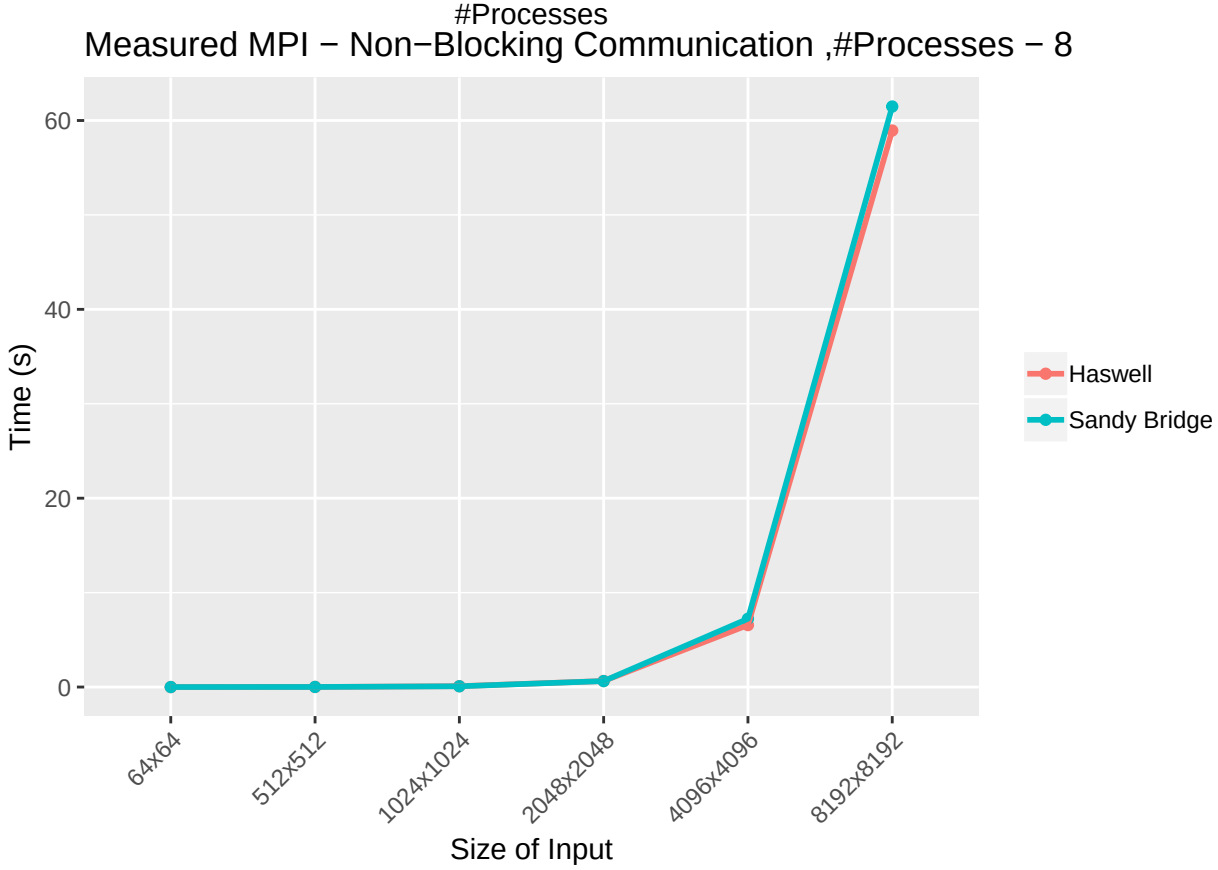

Measured Compute − Non−Blocking Communication ,Size of Input − 1024
0.04
0.03
0.02
0.01
Time (s)
8
16
32
64
#Processes
Haswell
Sandy Bridge

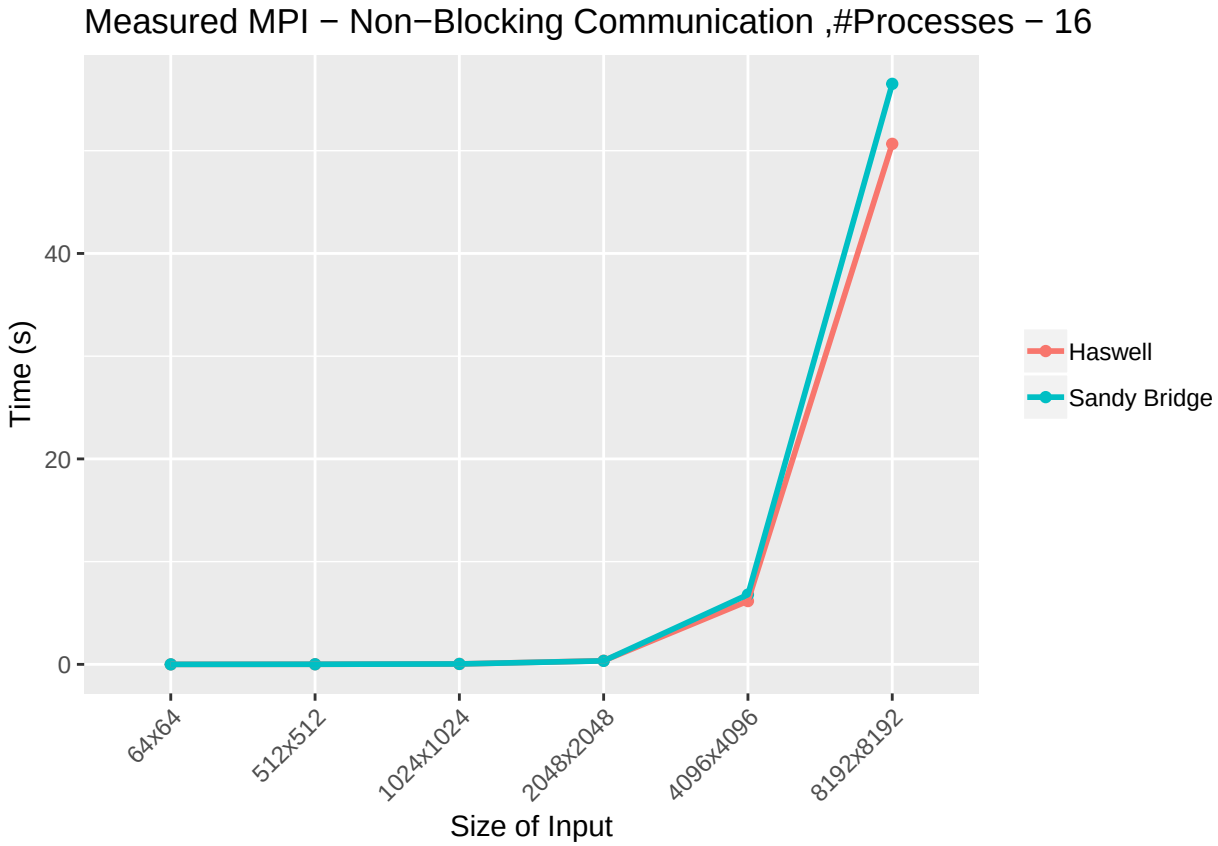

Measured Compute − Non−Blocking Communication ,Size of Input − 2048x
0.3
0.2
0.1
Time (s)
8
16
32
64
#Processes
Haswell
Sandy Bridge

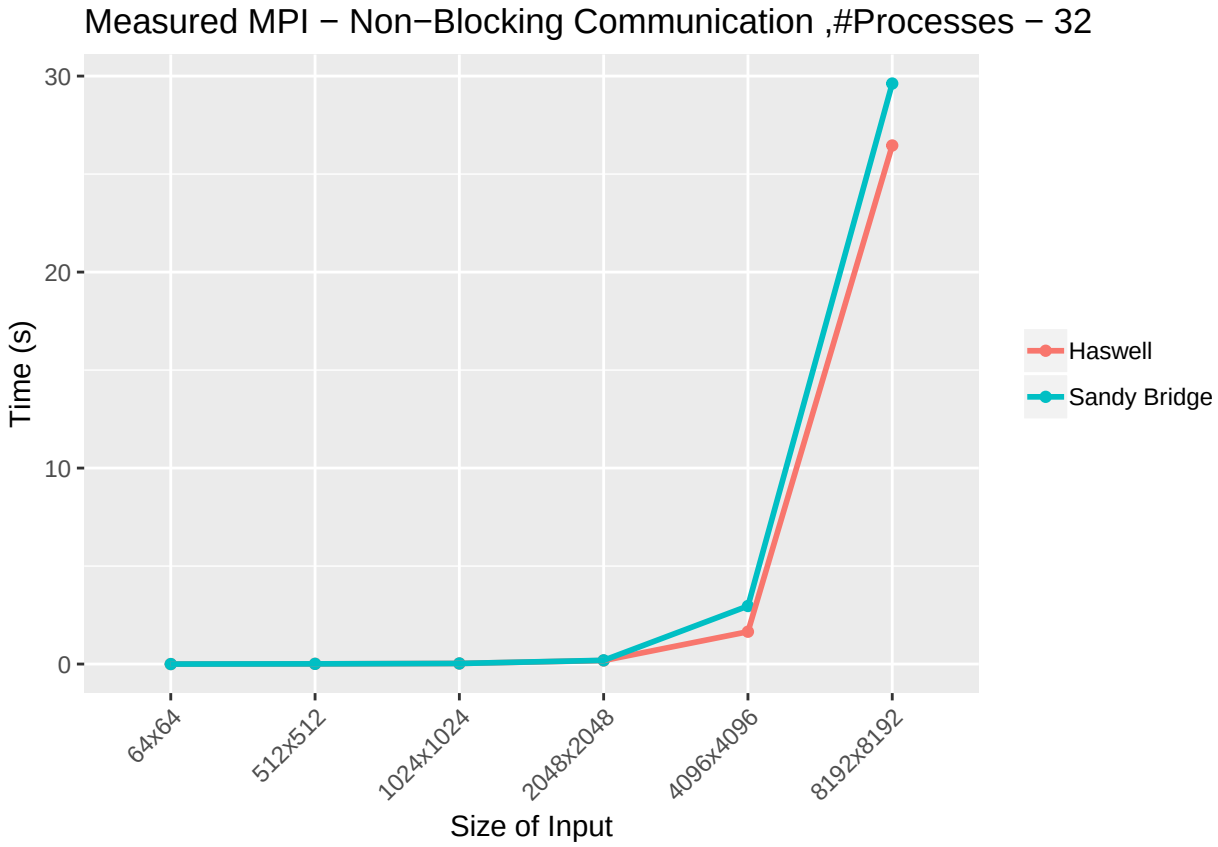

Measured Compute − Non−Blocking Communication ,Size of Input − 4096x4
Time (s)
4
3
2
1
8
16
32
64
#Processes
Haswell
Sandy Bridge

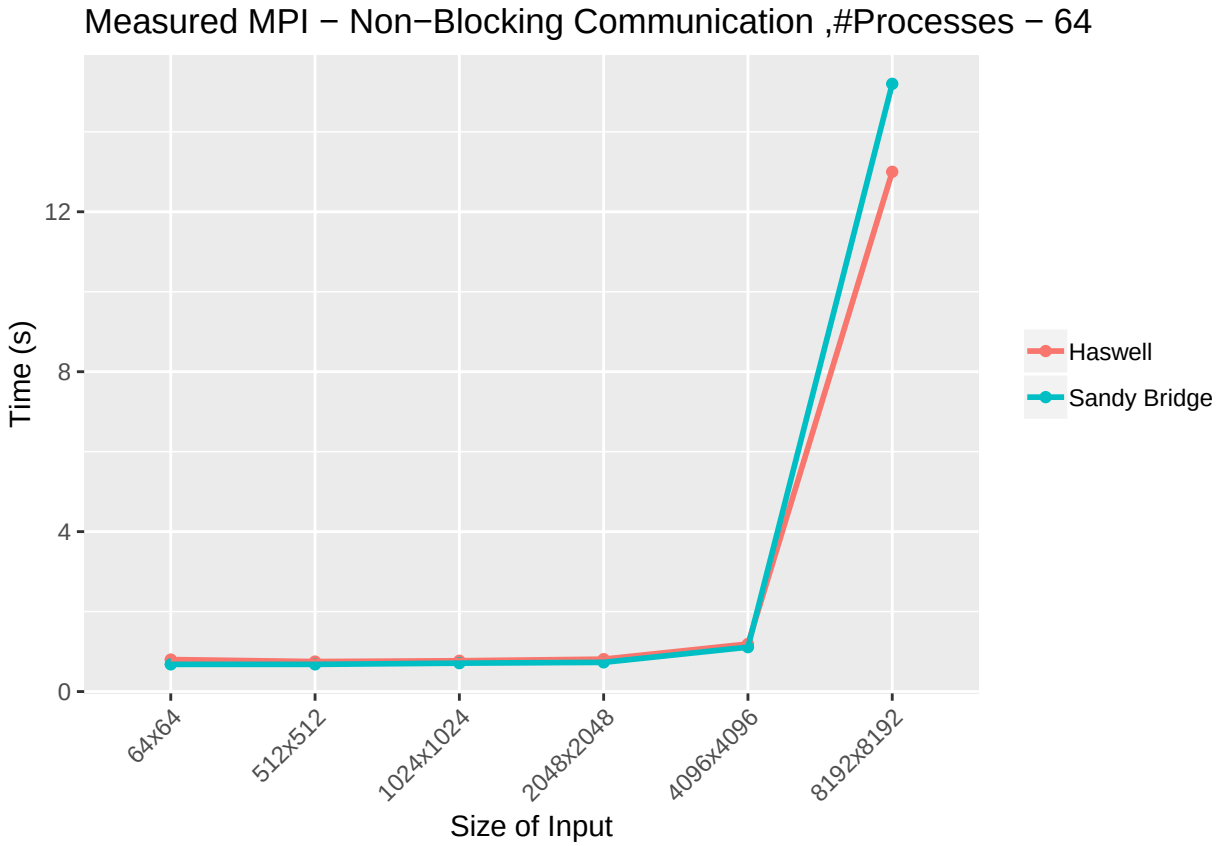

Measured Compute − Non−Blocking Communication ,Size of Input − 8192x8
Time (s)
30
20
10
8
16
32
64
#Processes
Haswell
Sandy Bridge

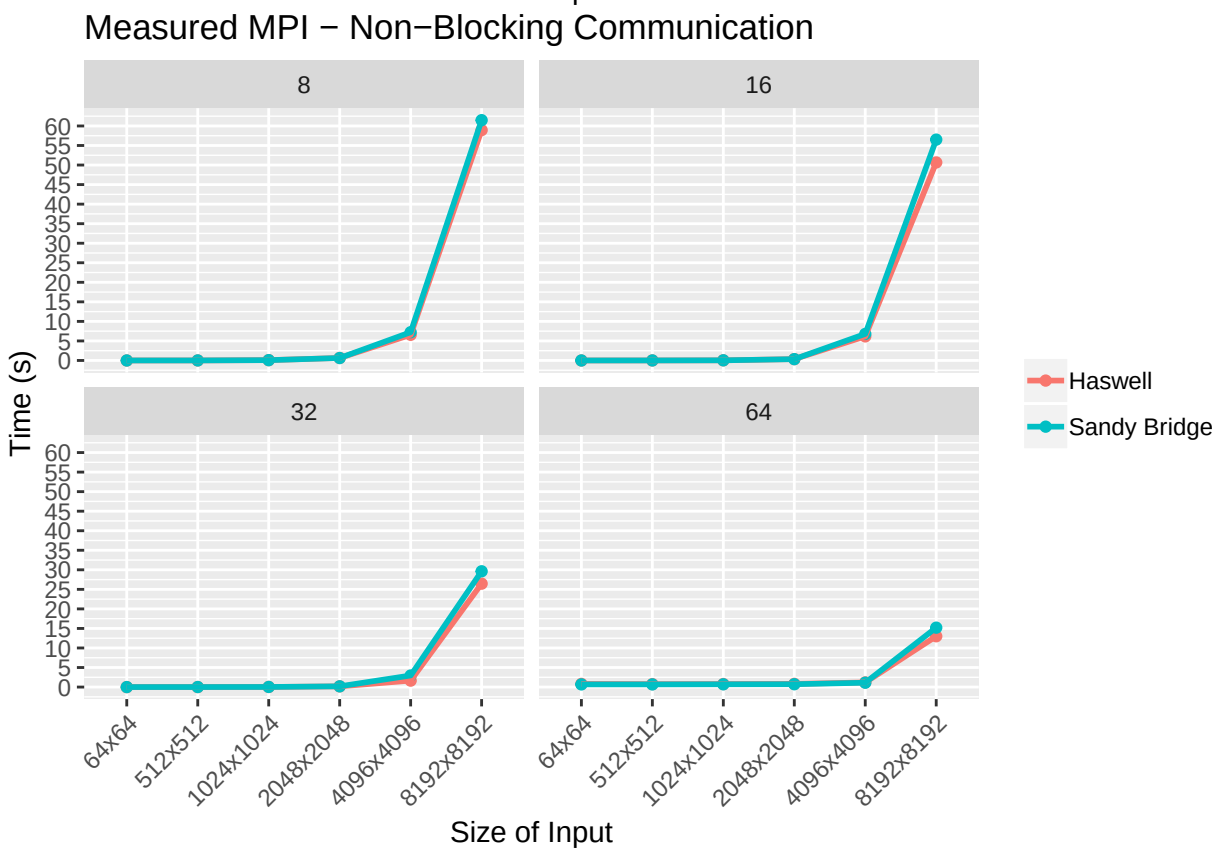

Measured Compute − Non−Blocking Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
#Processes
Haswell
Sandy Bridge

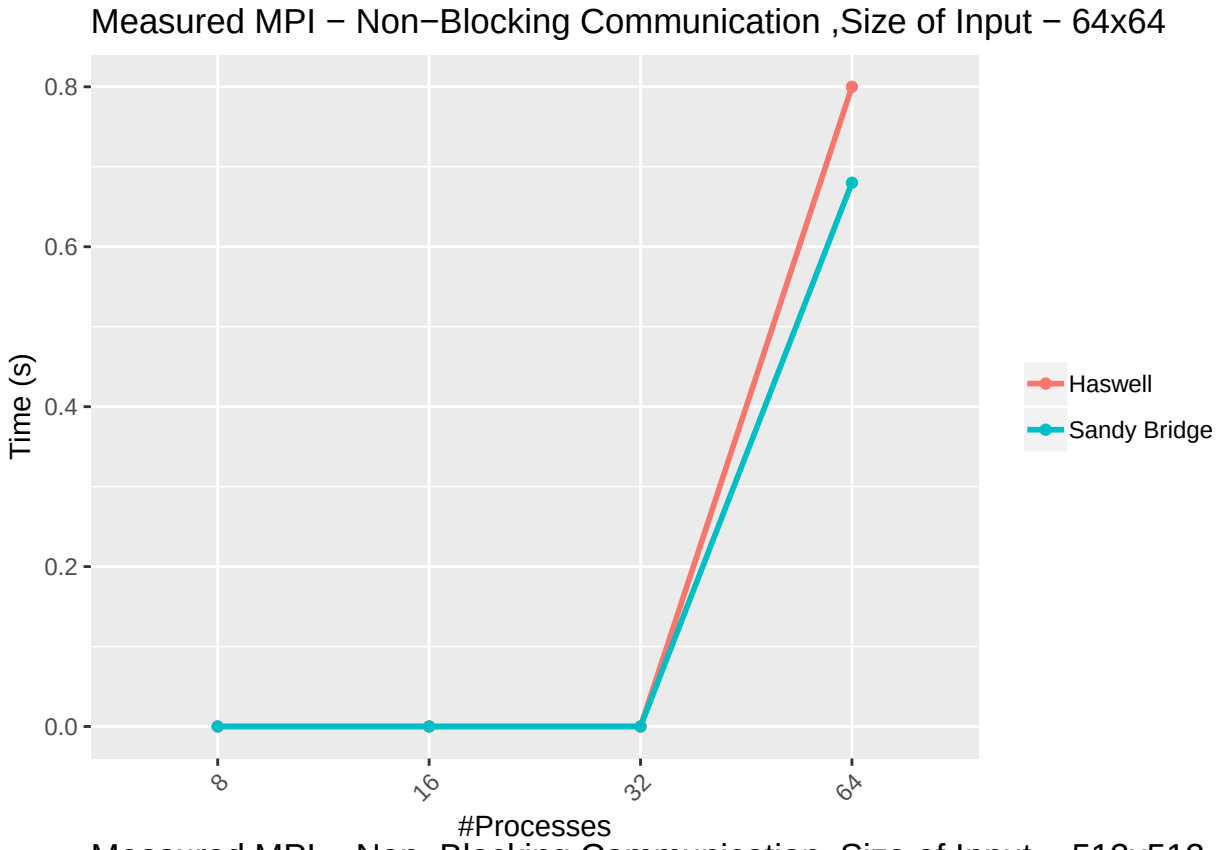

Measured MPI − Non−Blocking Communication ,#Processes − 8
Time (s)
Size of Input
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Haswell
Sandy Bridge

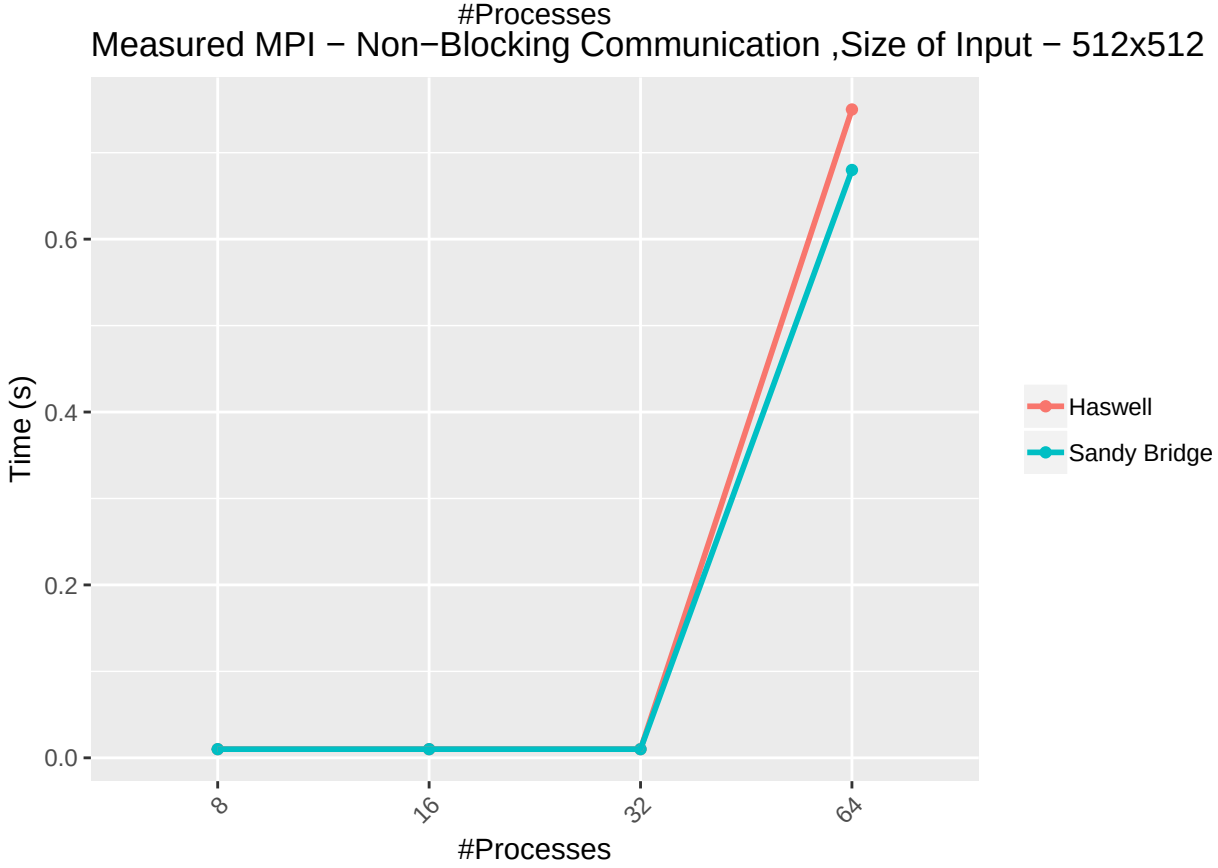

Measured MPI − Non−Blocking Communication ,#Processes − 16
Time (s)
0
20
40
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

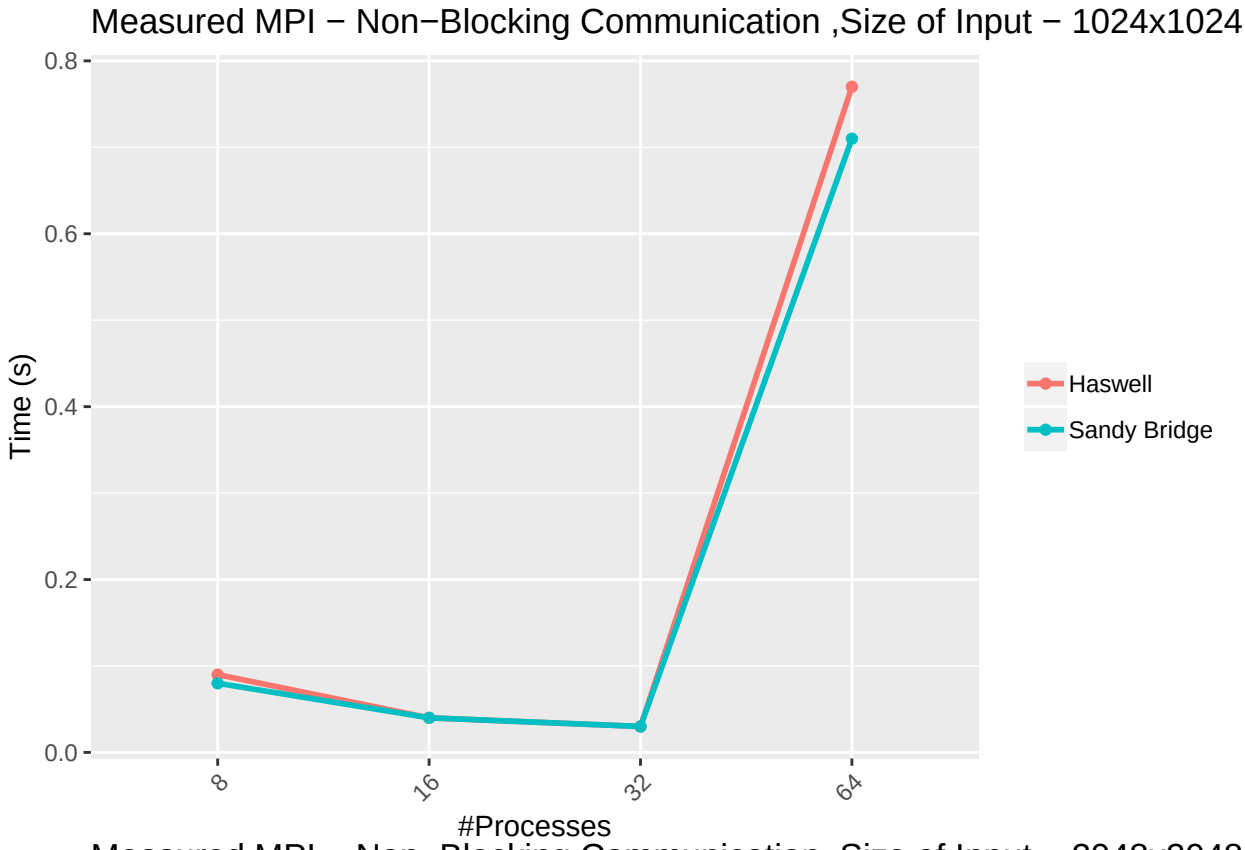

Measured MPI − Non−Blocking Communication ,#Processes − 32
Time (s)
0
10
20
30
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

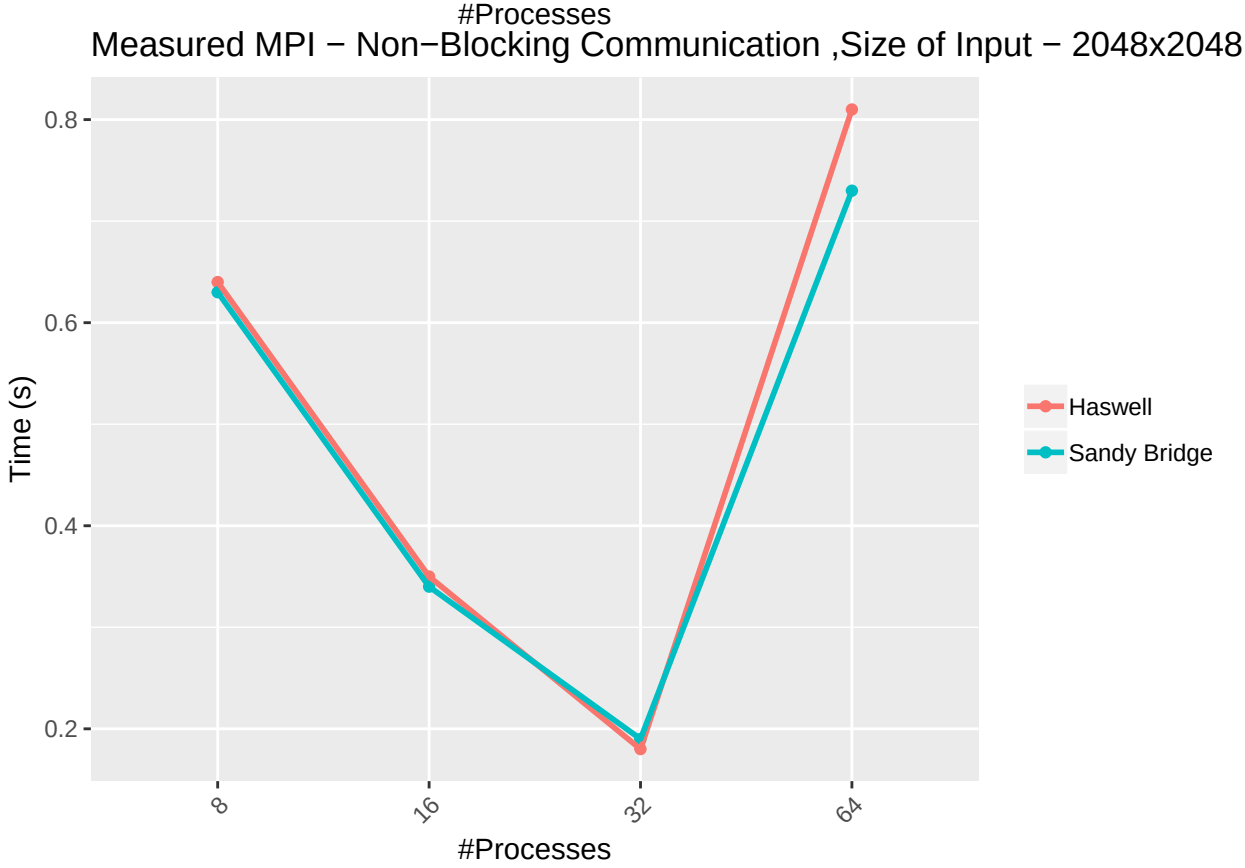

Measured MPI − Non−Blocking Communication ,#Processes − 64
Time (s)
0
4
8
12
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

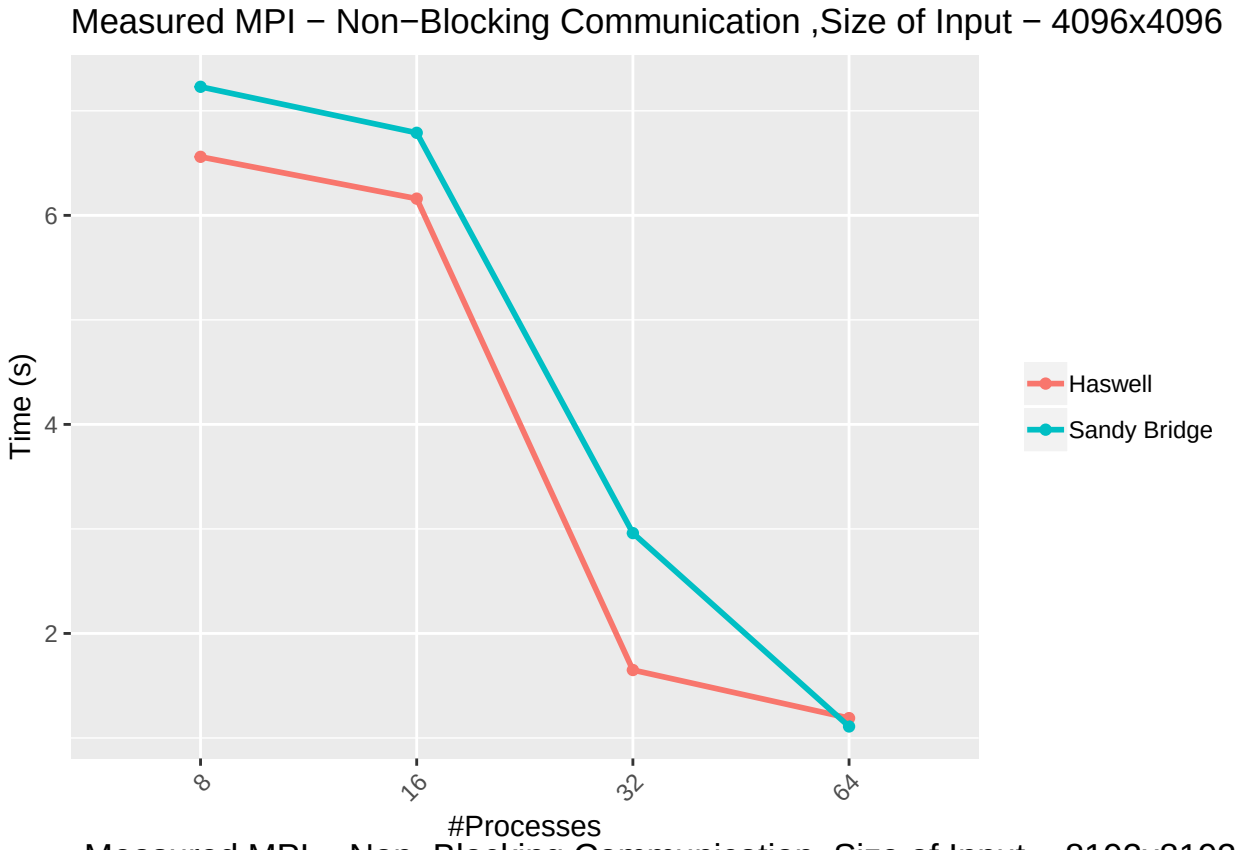

Measured MPI − Non−Blocking Communication
8
16
32
64
Time (s)
0
5
10
15
20
25
30
35
40
45
50
55
60
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

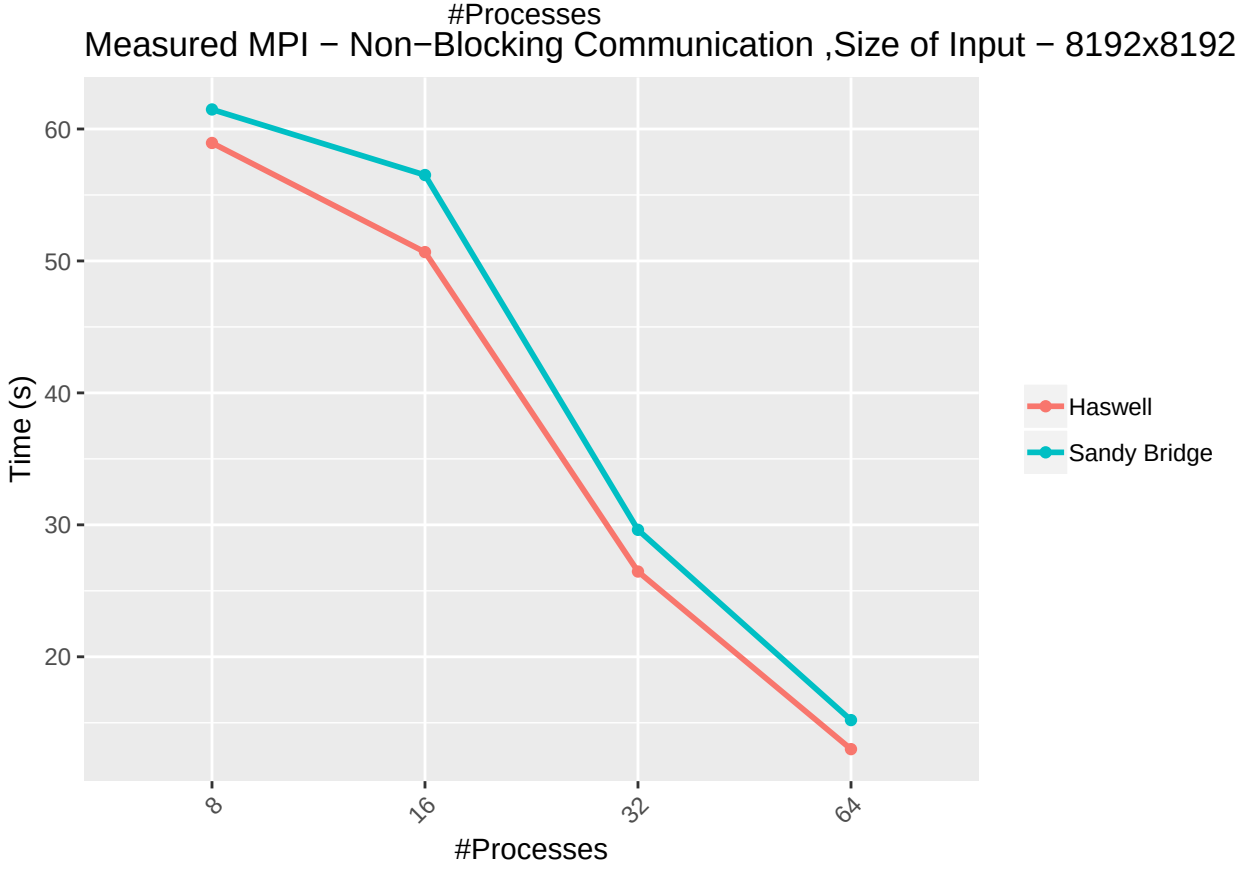

Measured MPI − Non−Blocking Communication ,Size of Input − 64x64
Time (s)
0.0
0.2
0.4
0.6
0.8
8
16
32
64
#Processes
Haswell
Sandy Bridge

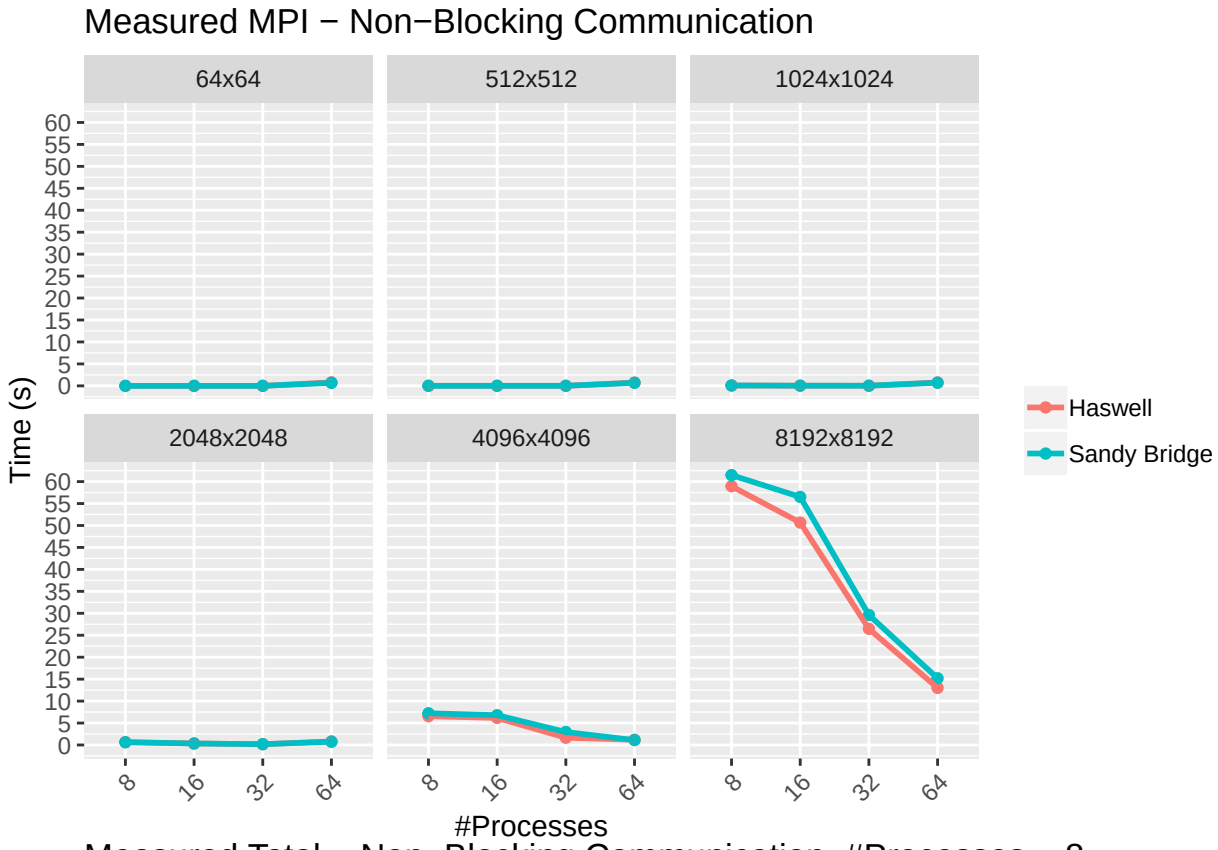

Measured MPI − Non−Blocking Communication ,Size of Input − 512x512
Time (s)
0.0
0.2
0.4
0.6
8
16
32
64
#Processes
Haswell
Sandy Bridge

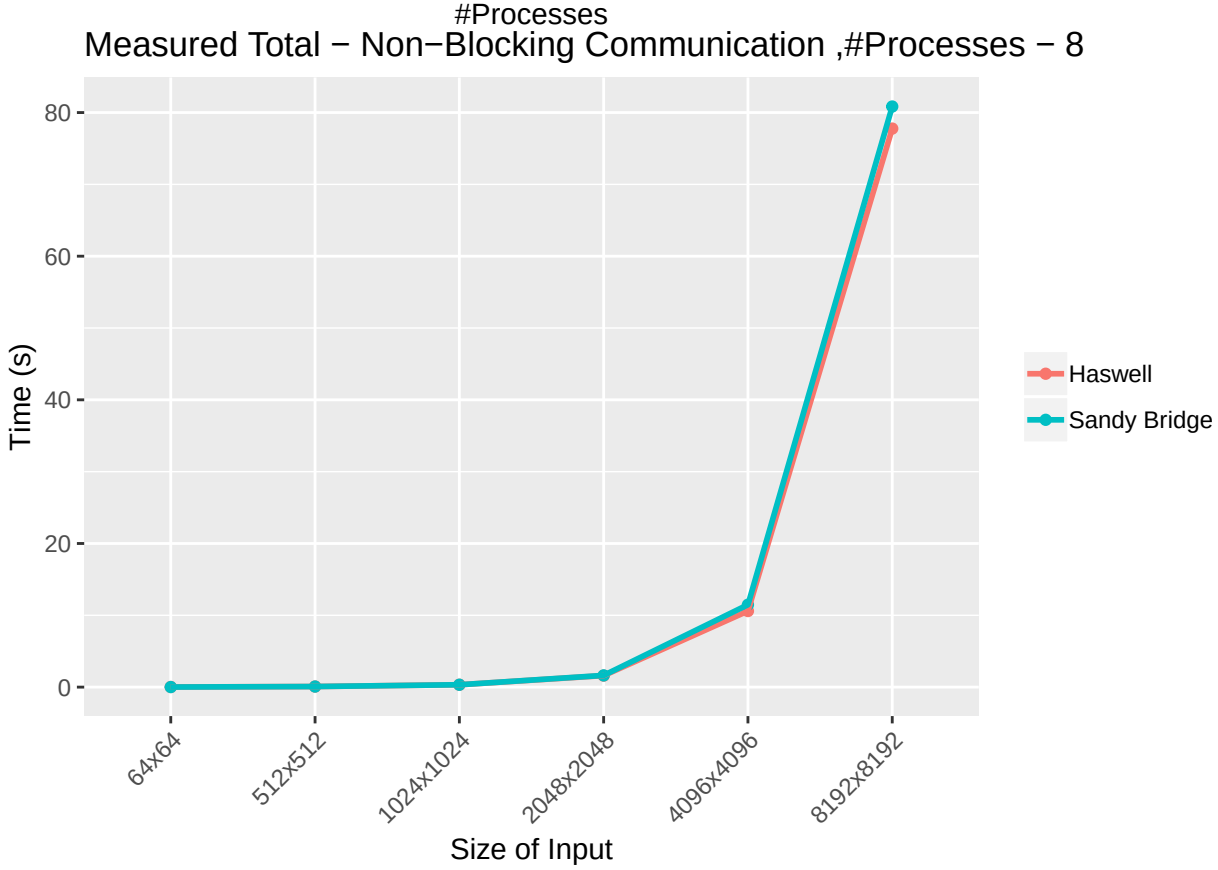

Measured MPI − Non−Blocking Communication ,Size of Input − 1024x1024
Time (s)
0.8
0.6
0.4
0.2
0.0
8
16
32
64
#Processes
Haswell
Sandy Bridge

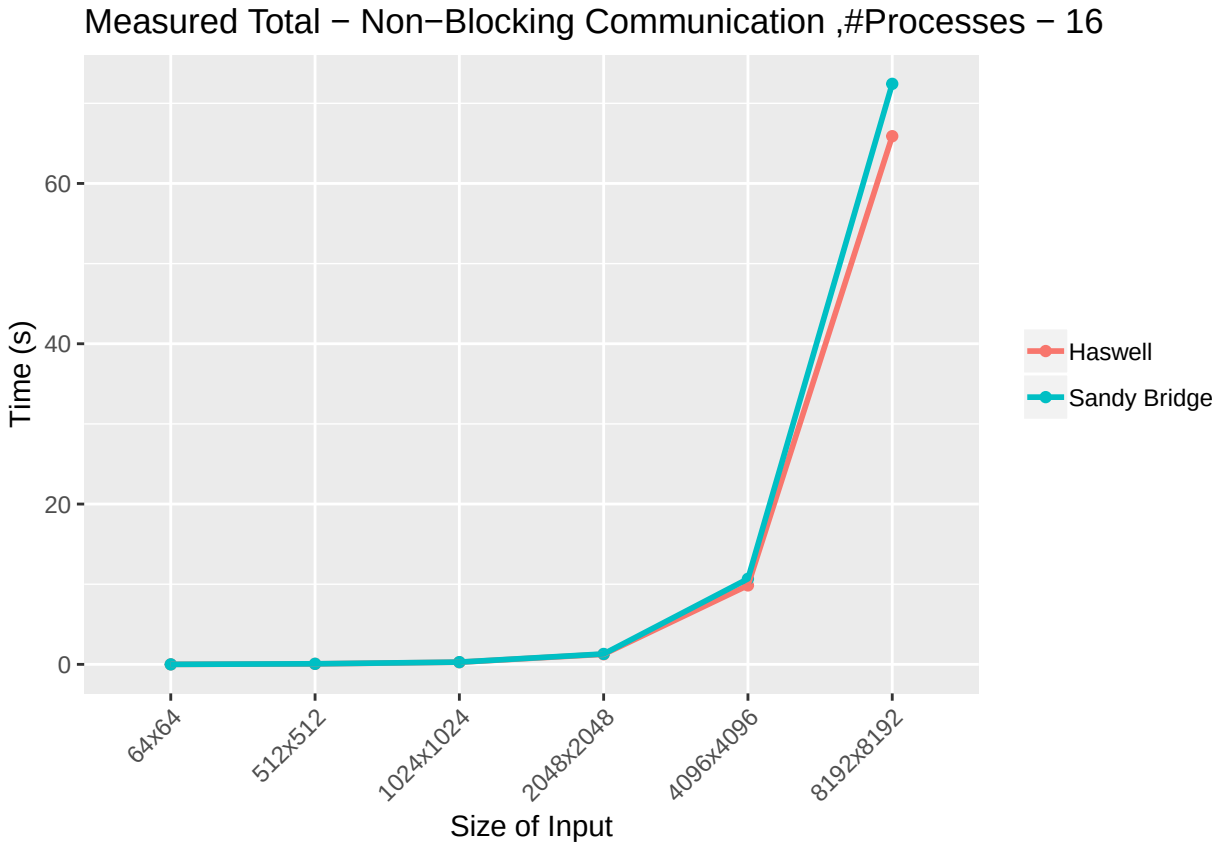

Measured MPI − Non−Blocking Communication ,Size of Input − 2048x2048
Time (s)
0.8
0.6
0.4
0.2
8
16
32
64
#Processes
Haswell
Sandy Bridge

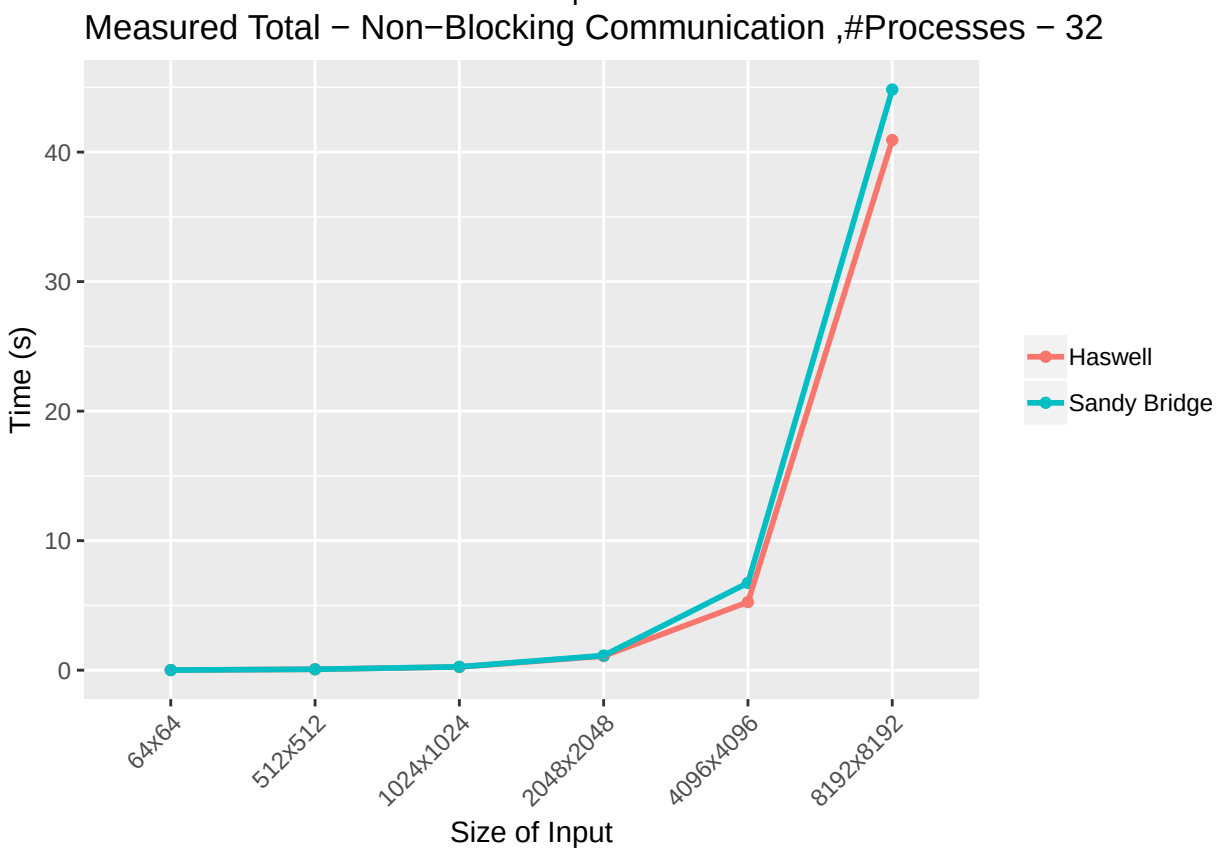

Measured MPI − Non−Blocking Communication ,Size of Input − 4096x4096
Time (s)
6
4
2
8
16
32
64
#Processes
Haswell
Sandy Bridge

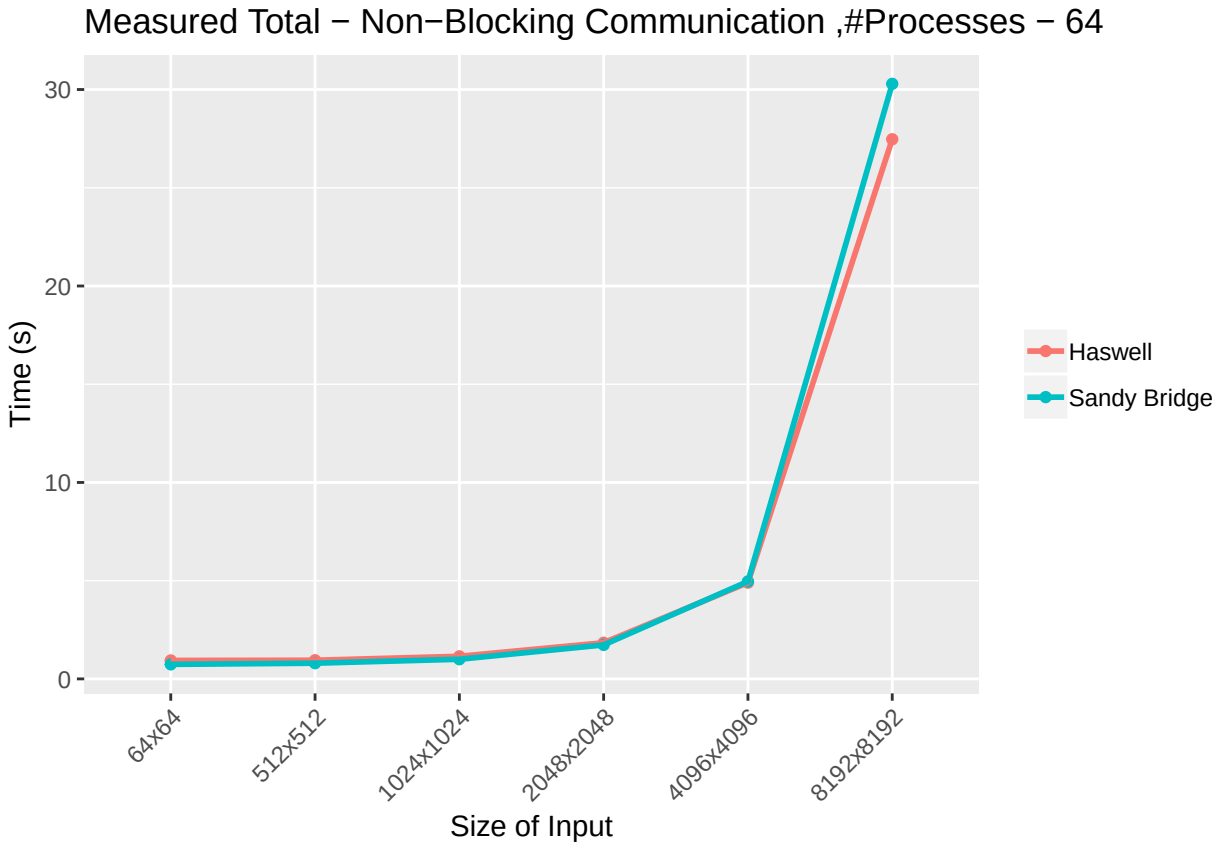

Measured MPI − Non−Blocking Communication ,Size of Input − 8192x8192
Time (s)
60
50
40
30
20
8
16
32
64
#Processes
Haswell
Sandy Bridge

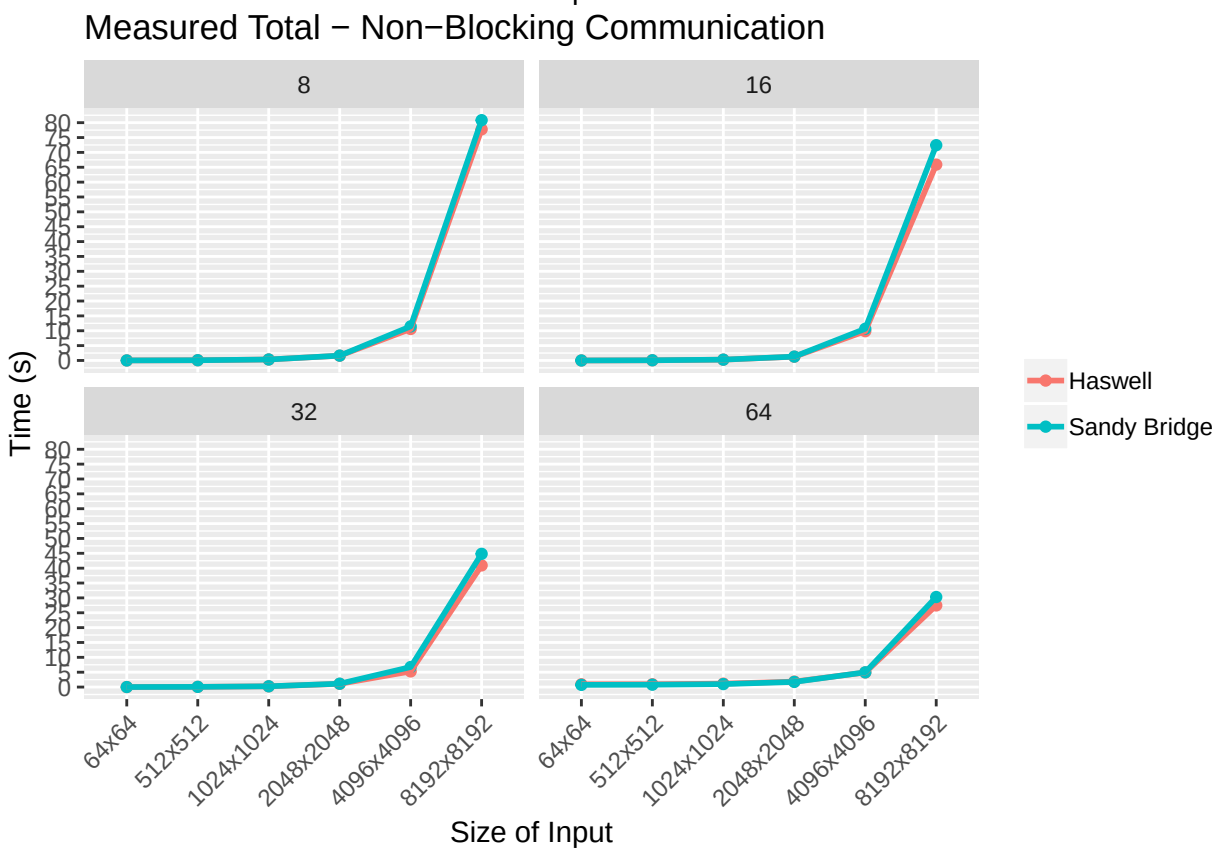

Measured MPI − Non−Blocking Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
#Processes
Haswell
Sandy Bridge

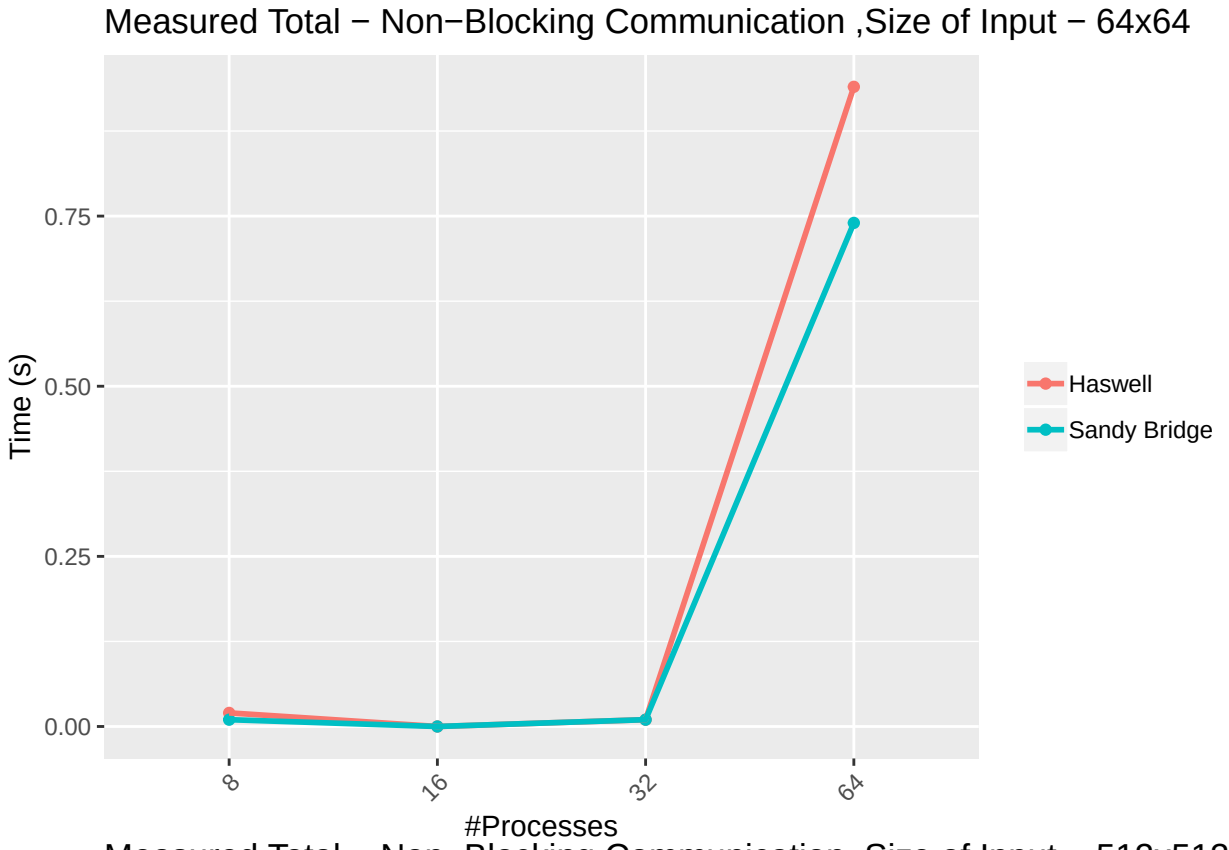

Measured Total − Non−Blocking Communication ,#Processes − 8
Time (s)
Size of Input
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Haswell
Sandy Bridge

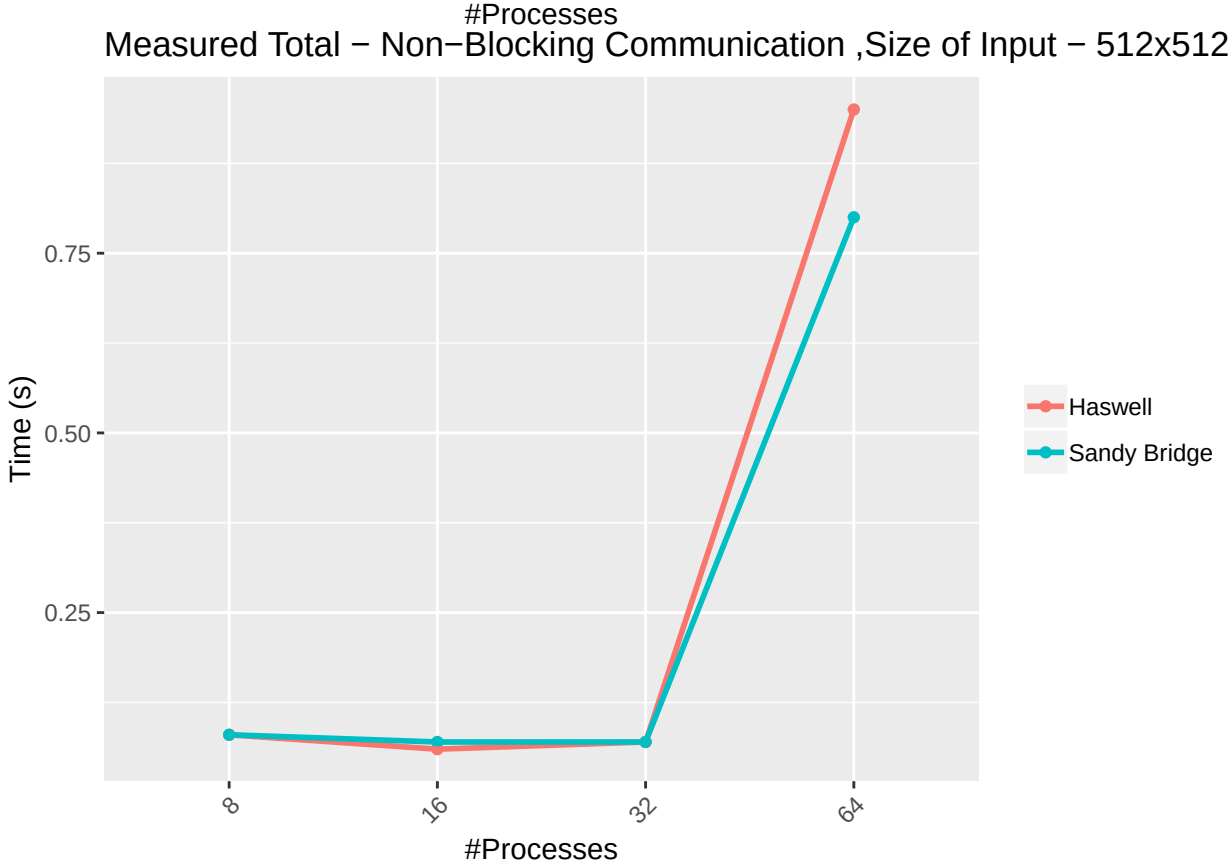

Measured Total − Non−Blocking Communication ,#Processes − 16
Time (s)
0
20
40
60
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

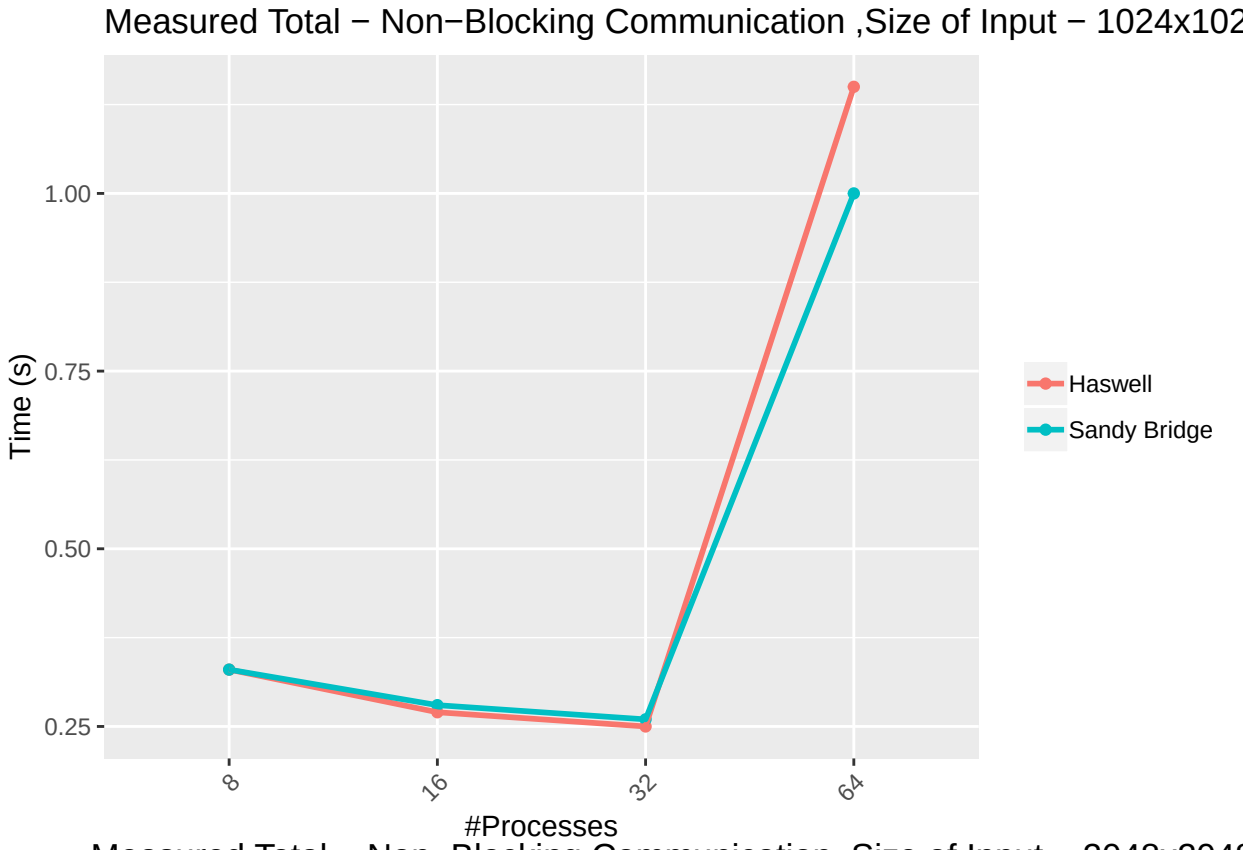

Measured Total − Non−Blocking Communication ,#Processes − 32
Time (s)
0
10
20
30
40
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

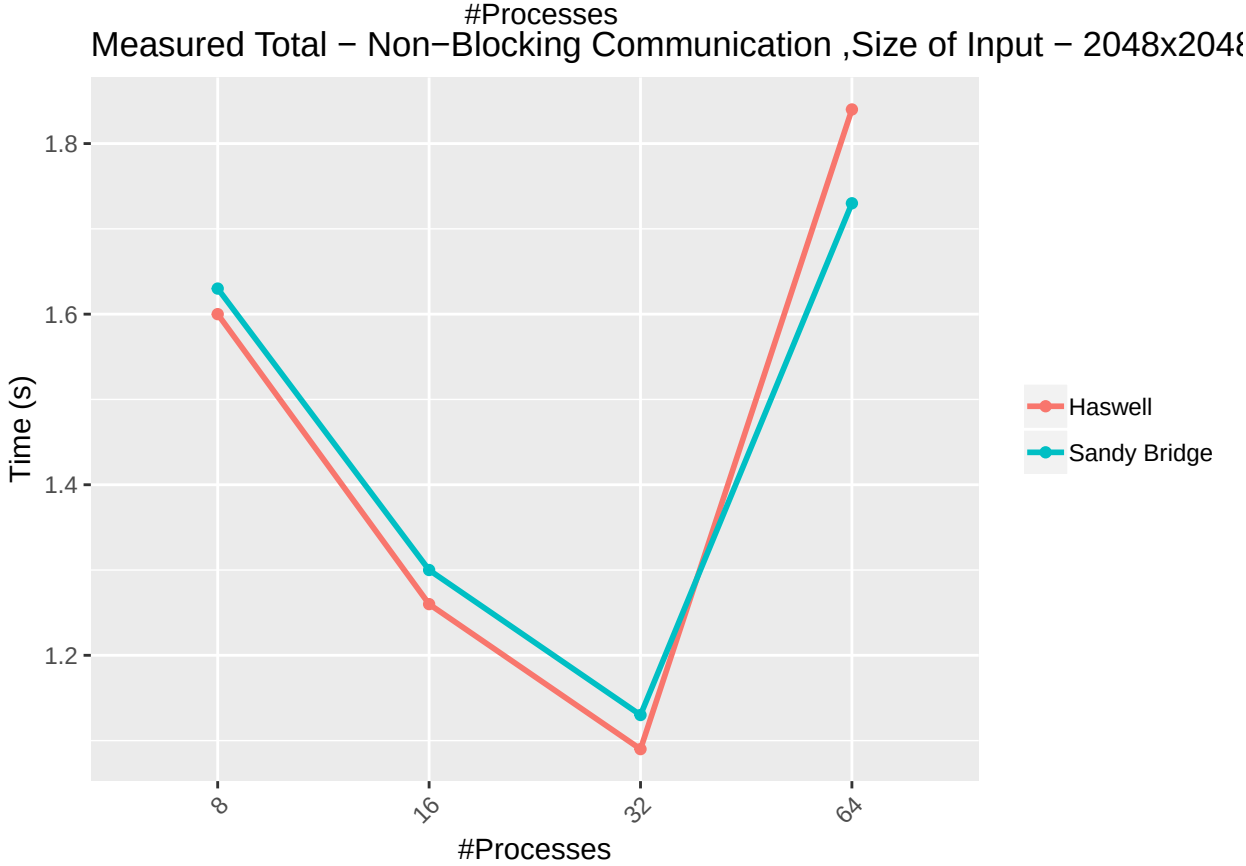

Measured Total − Non−Blocking Communication ,#Processes − 64
Time (s)
30
20
10
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

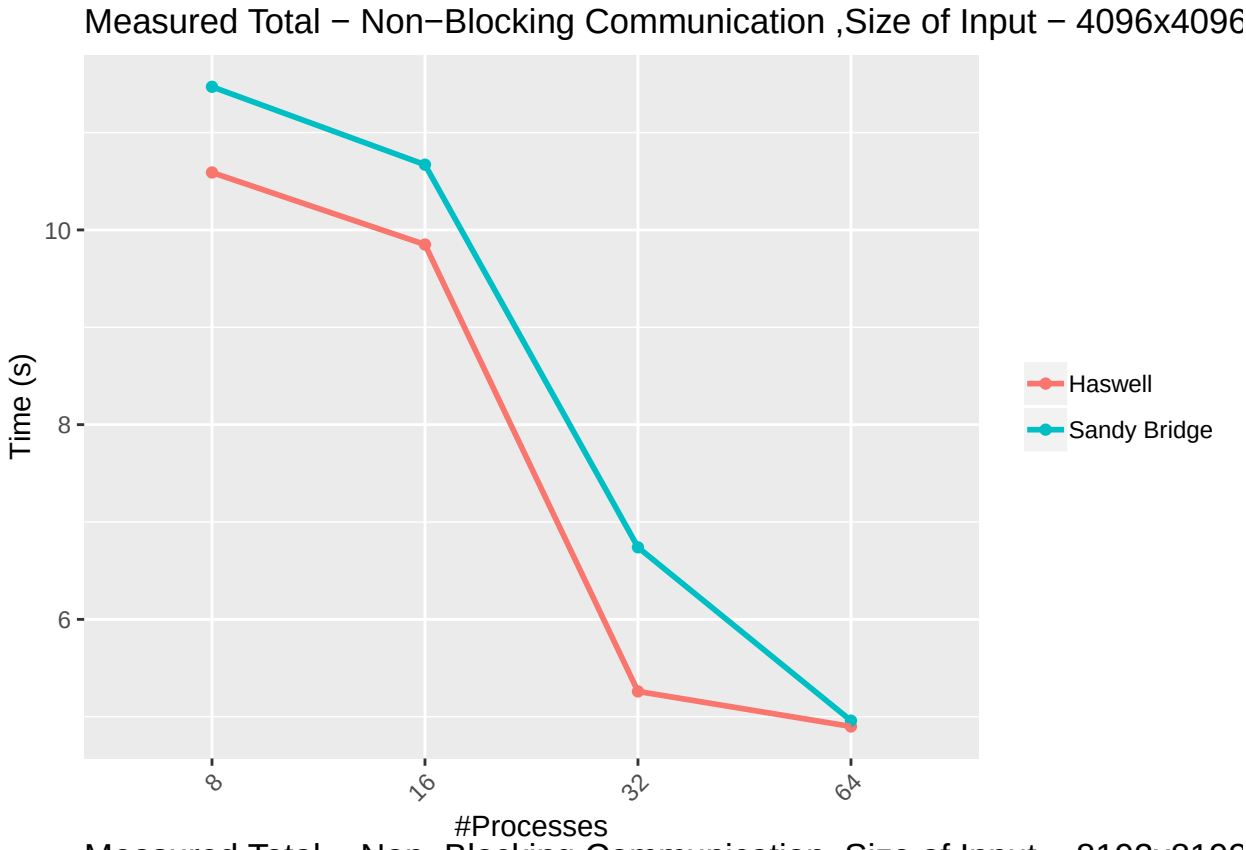

Measured Total − Non−Blocking Communication
8
16
32
64
Time (s)
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

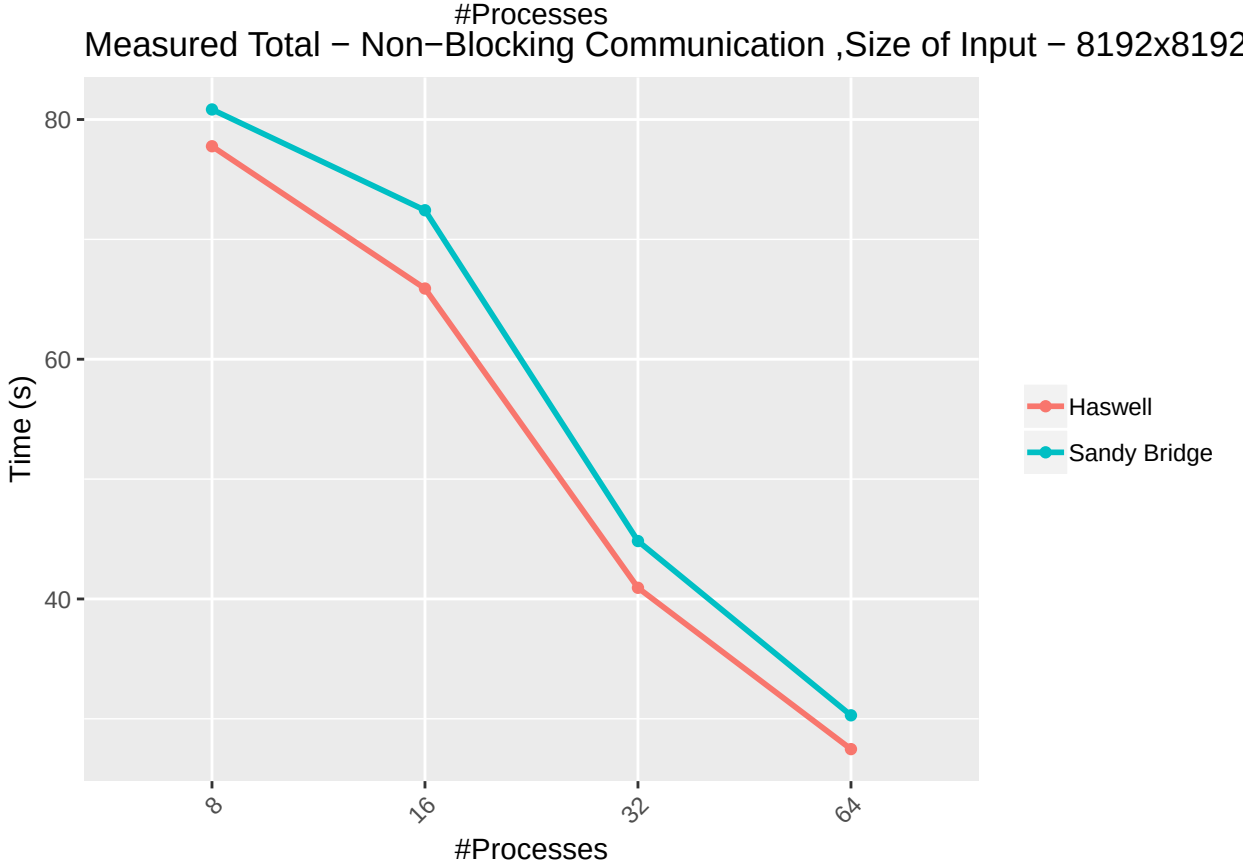

Measured Total − Non−Blocking Communication ,Size of Input − 64x64
Time (s)
0.00
0.25
0.50
0.75
8
16
32
64
#Processes
Haswell
Sandy Bridge

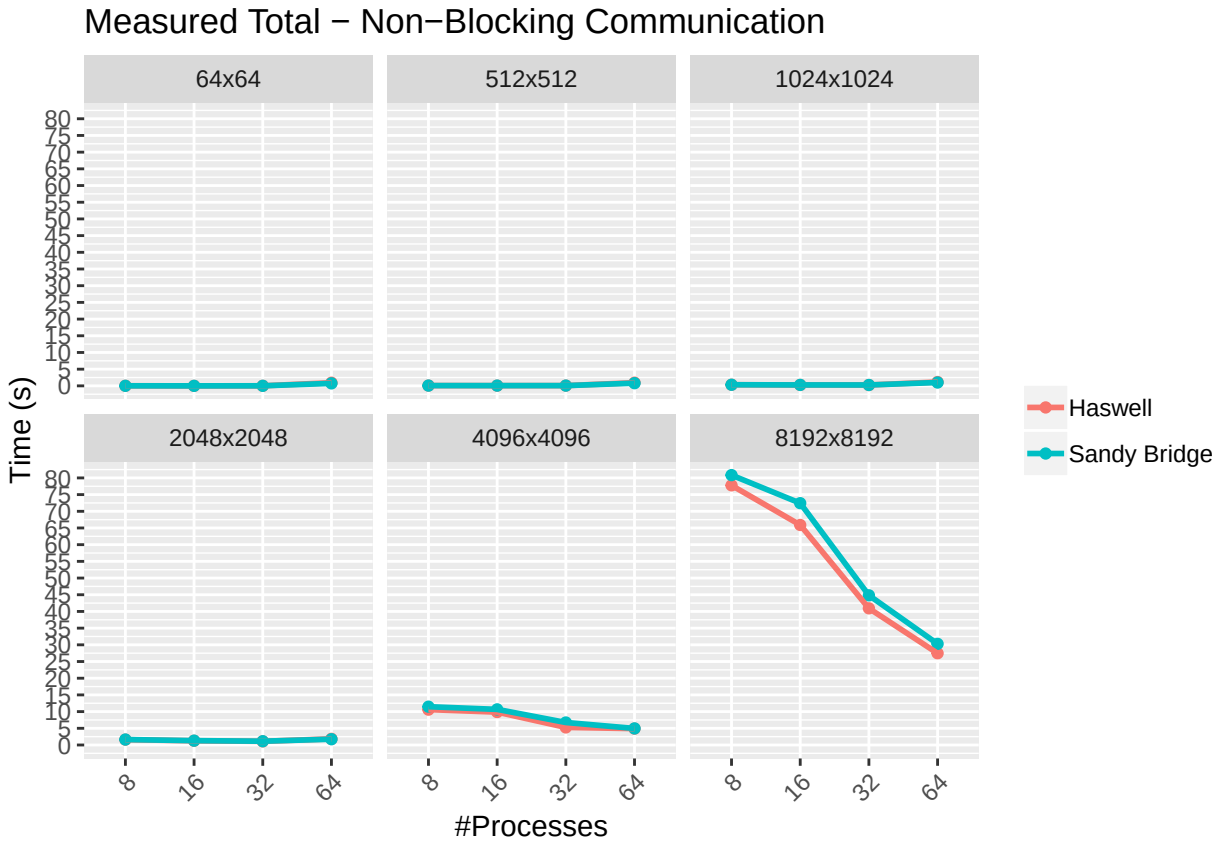

Measured Total − Non−Blocking Communication ,Size of Input − 512x512
Time (s)
0.25
0.50
0.75
8
16
32
64
#Processes
Haswell
Sandy Bridge


Measured Total − Non−Blocking Communication ,Size of Input − 1024x102
Time (s)
1.00
0.75
0.50
0.25
8
16
32
64
#Processes
Haswell
Sandy Bridge

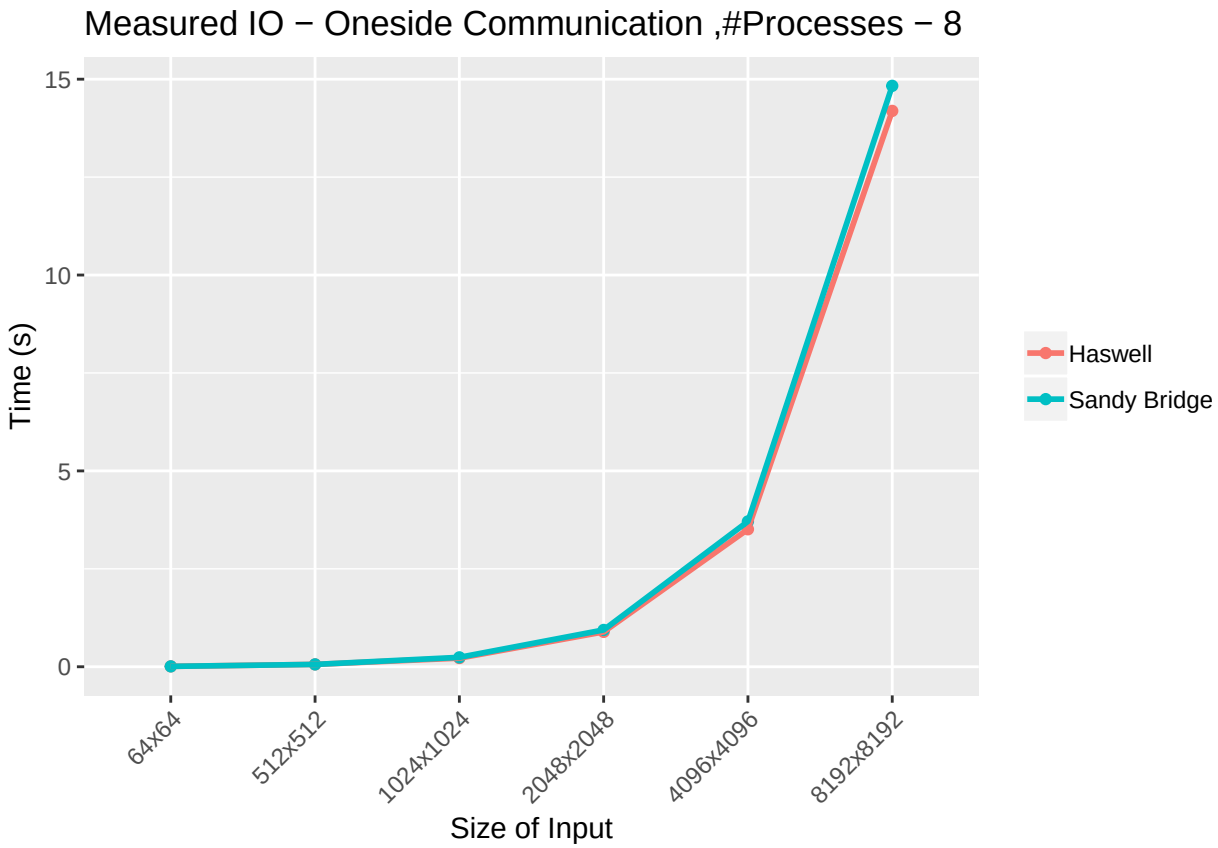

Measured Total − Non−Blocking Communication ,Size of Input − 2048x204
Time (s)
1.8
1.6
1.4
1.2
8
16
32
64
#Processes
Haswell
Sandy Bridge

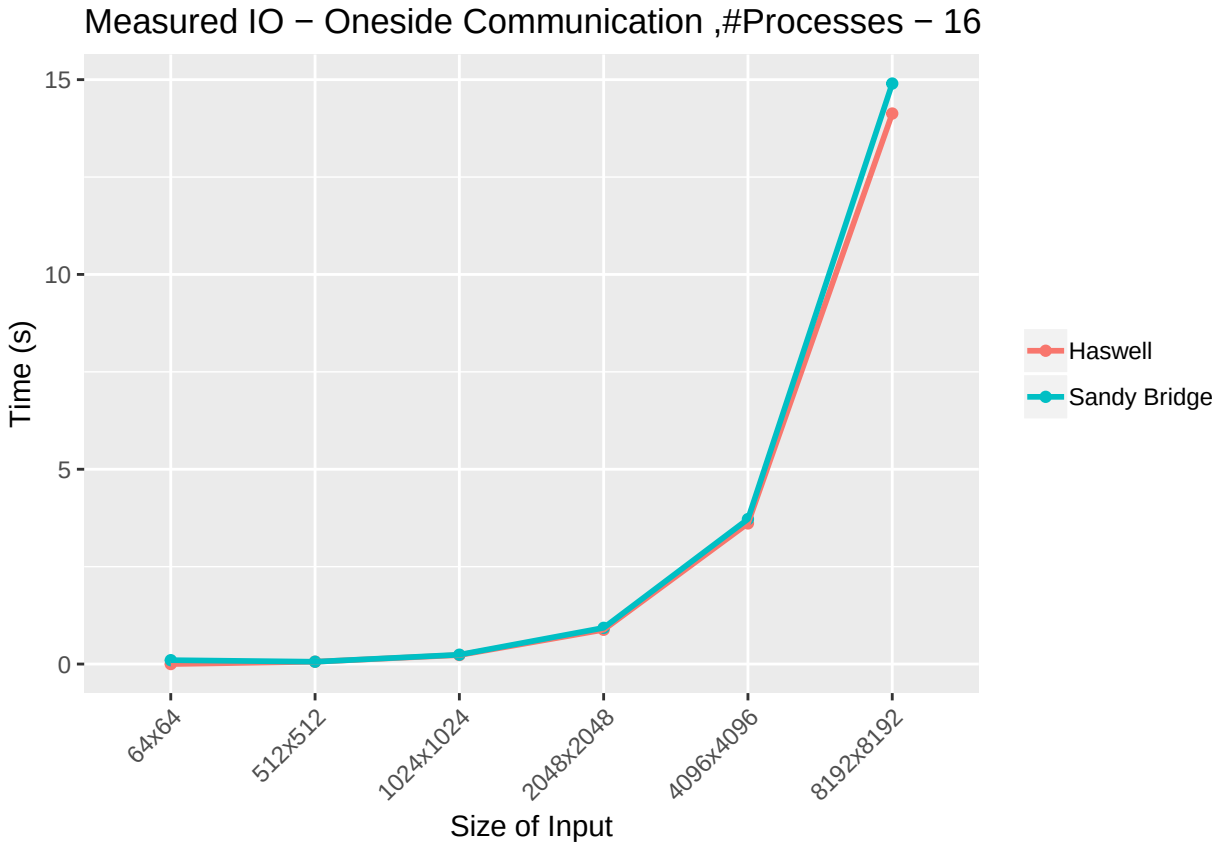

Measured Total − Non−Blocking Communication ,Size of Input − 4096x4096
Time (s)
10
8
6
8
16
32
64
#Processes
Haswell
Sandy Bridge

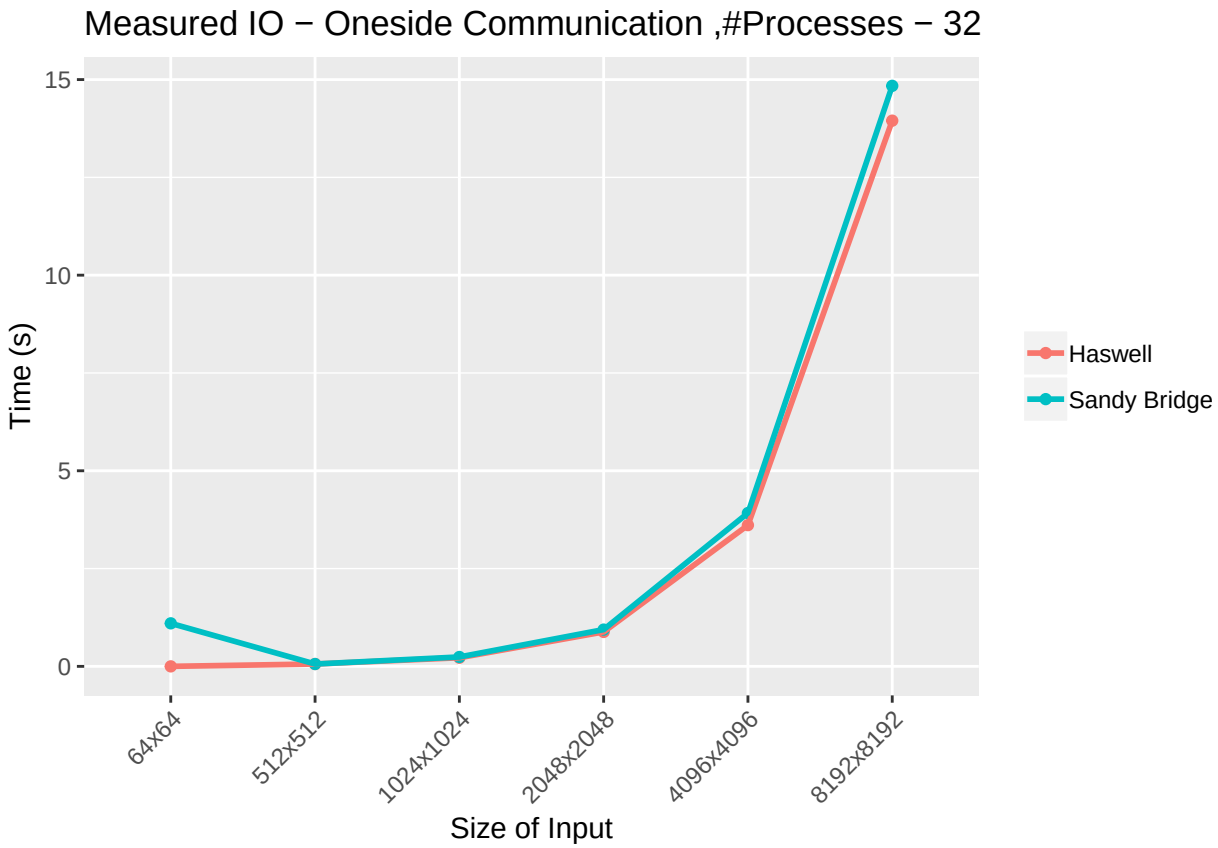

Measured Total − Non−Blocking Communication ,Size of Input − 8192x8192
Time (s)
80
60
40
8
16
32
64
#Processes
Haswell
Sandy Bridge

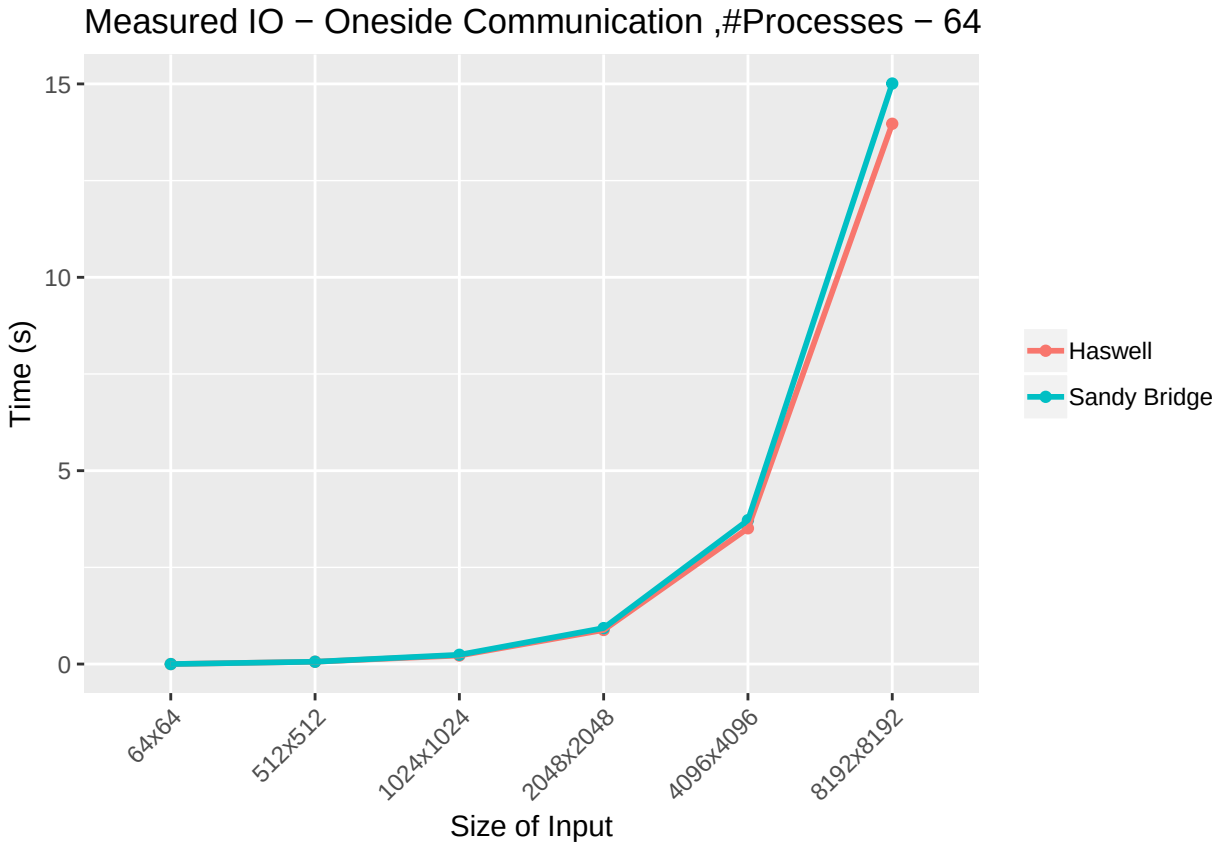


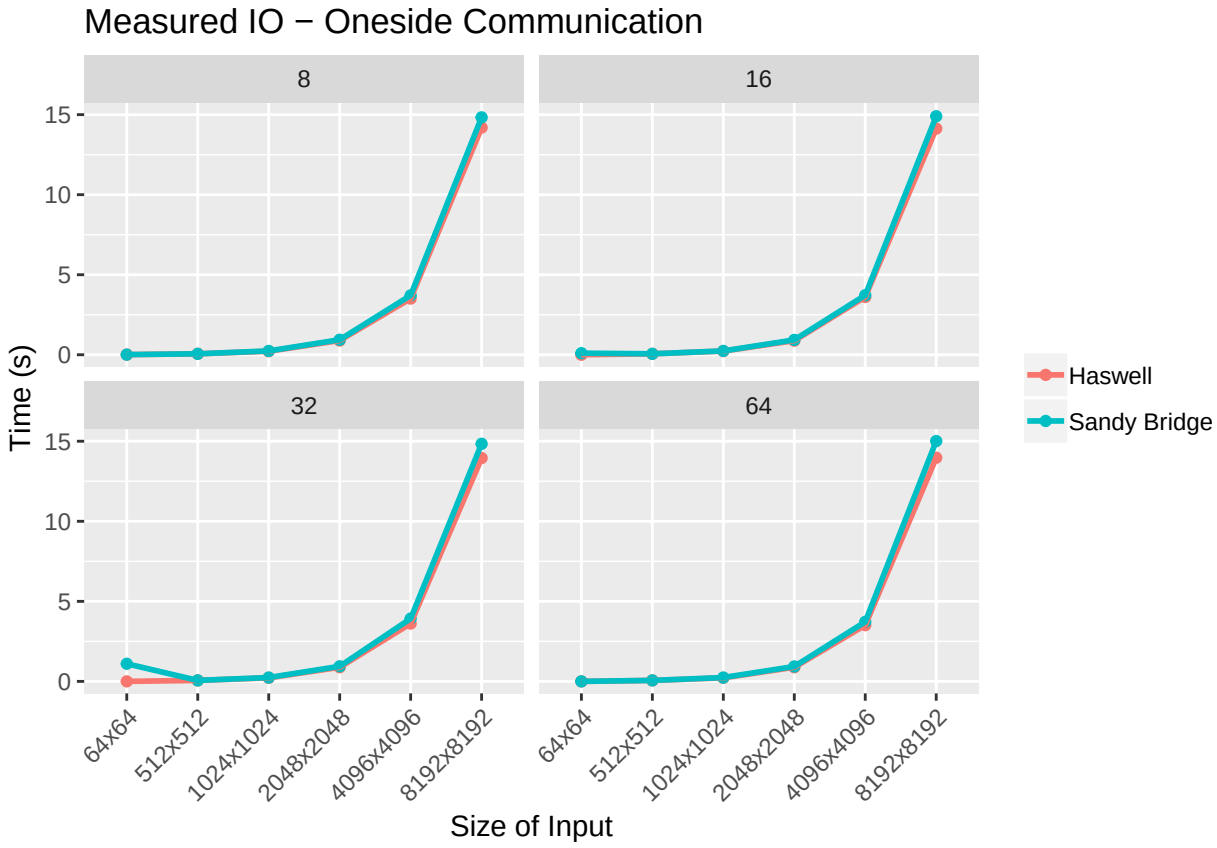

```
test <- pos_plot("oneside","Oneside Communication")
```

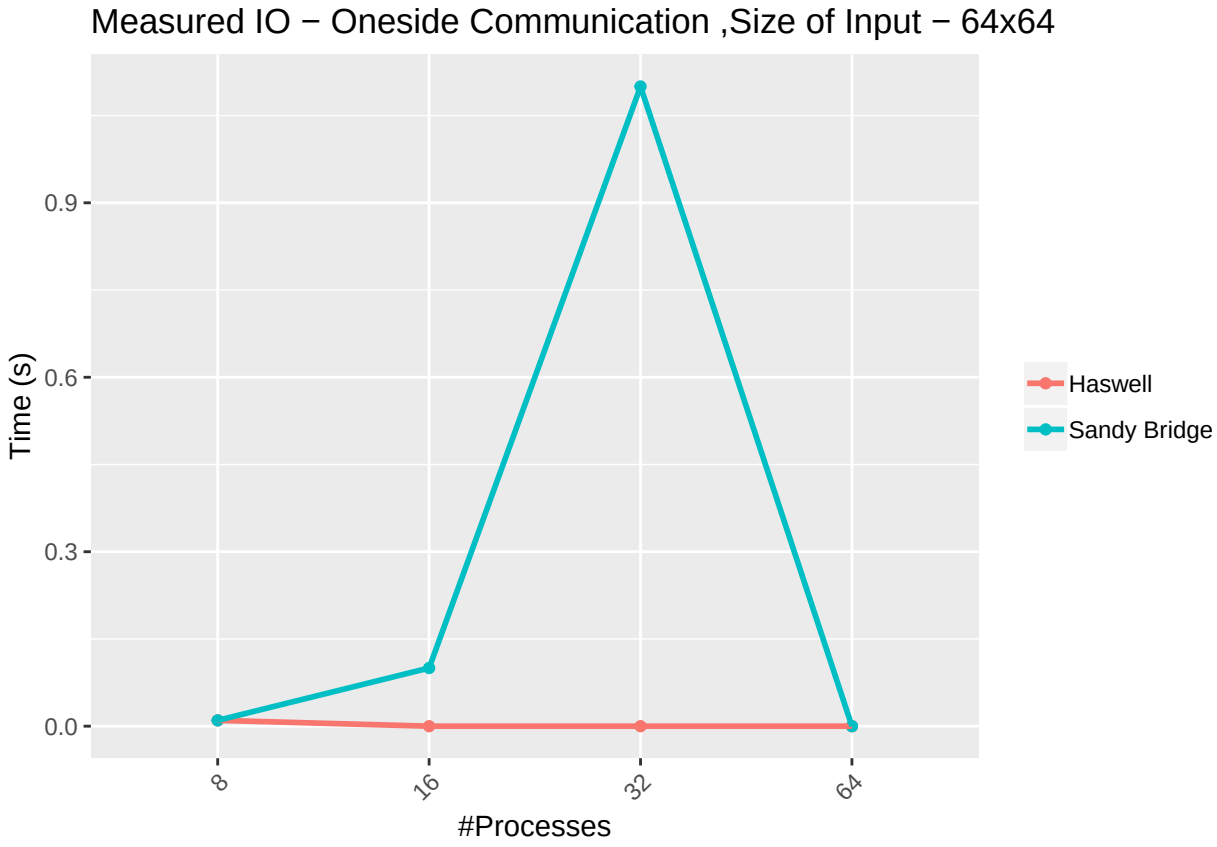

Measured IO − Oneside Communication ,#Processes − 8
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

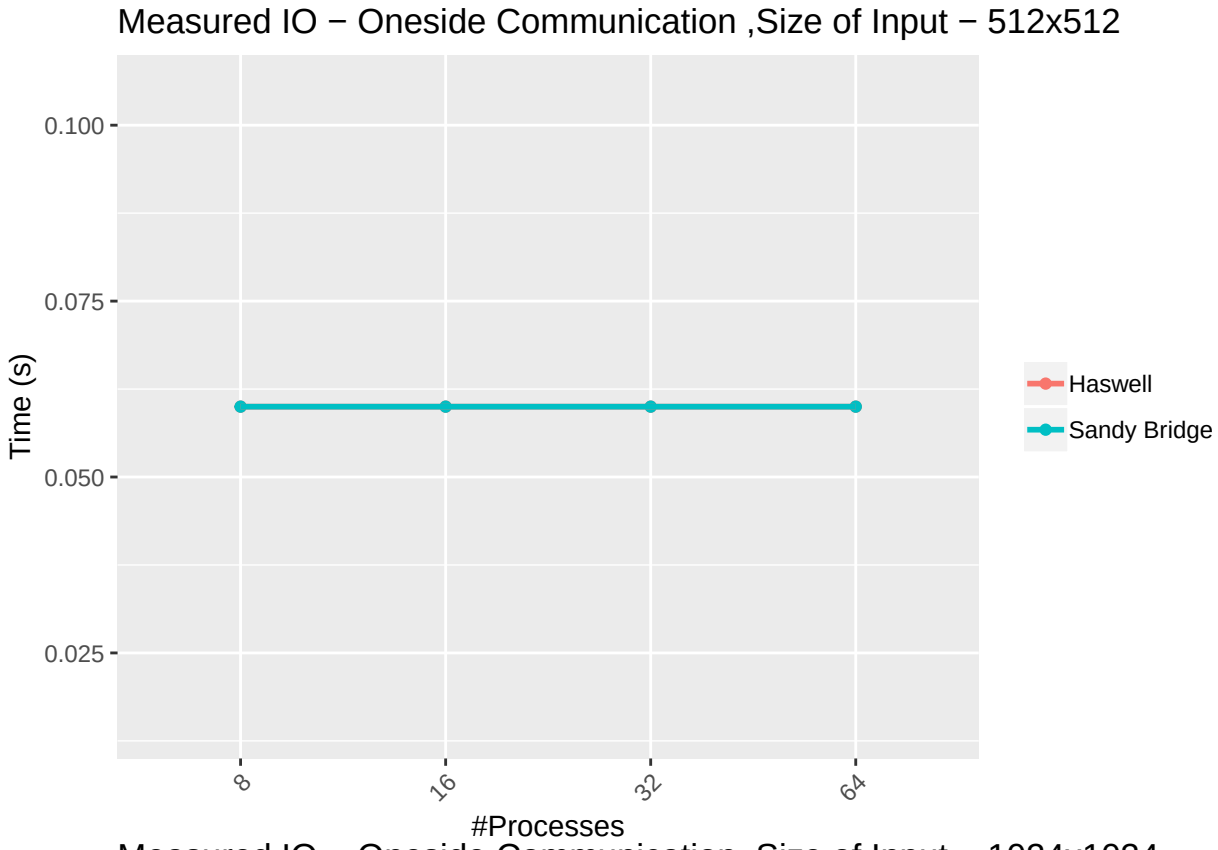

Measured IO − Oneside Communication ,#Processes − 16
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

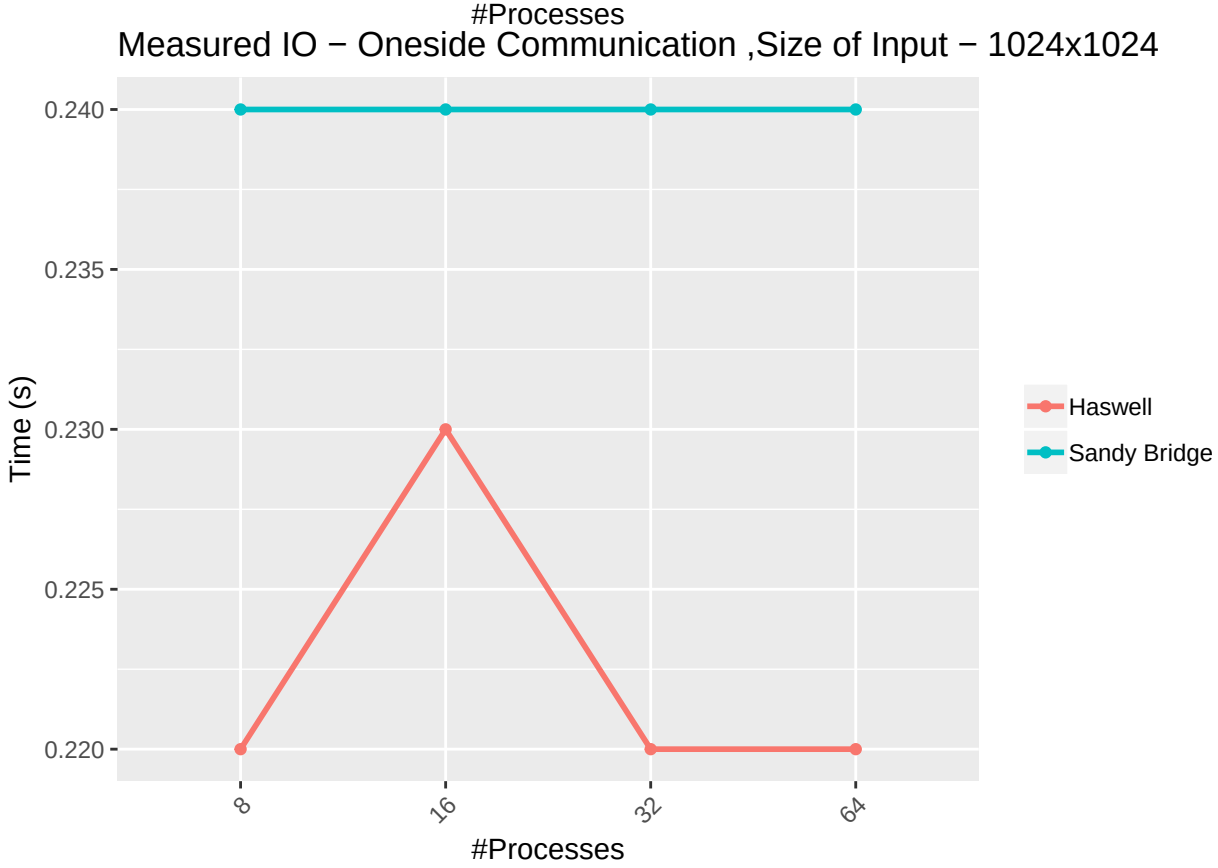

Measured IO − Oneside Communication ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

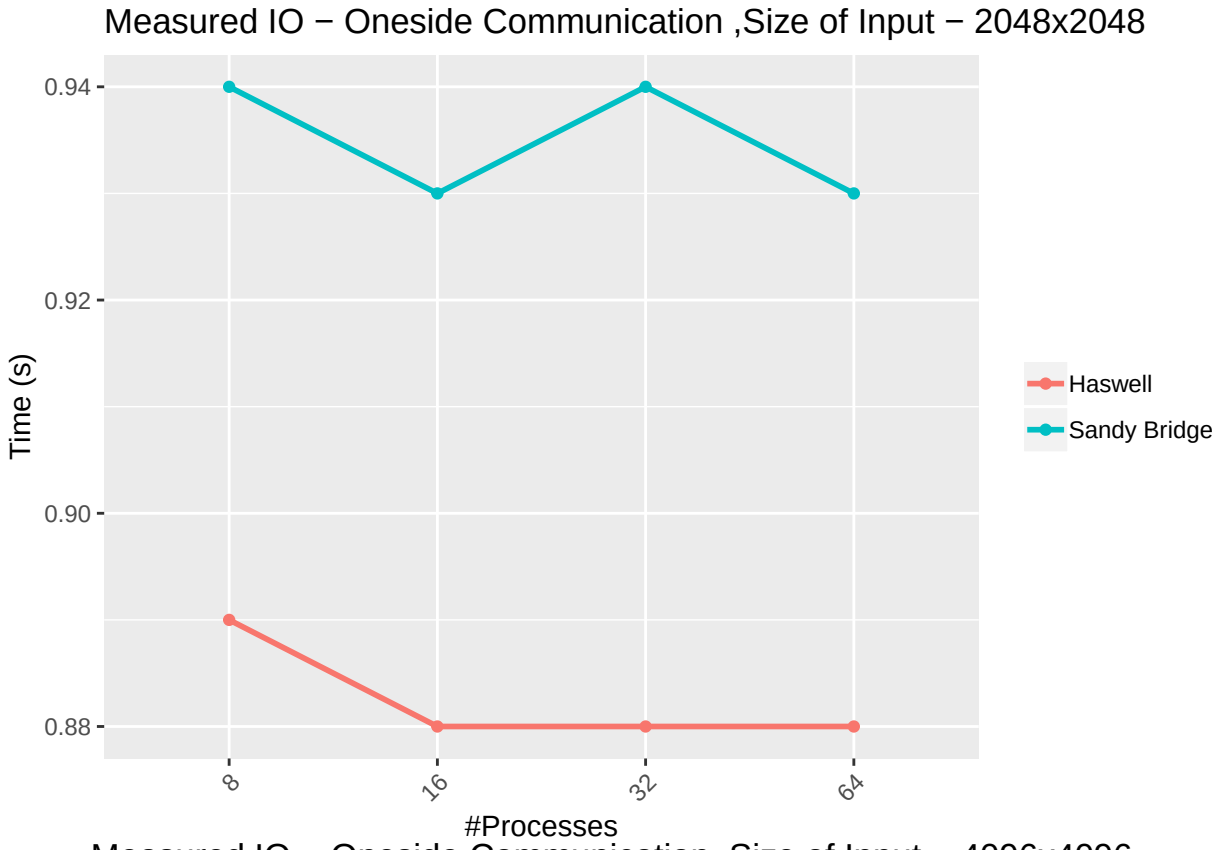

Measured IO − Oneside Communication ,#Processes − 64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

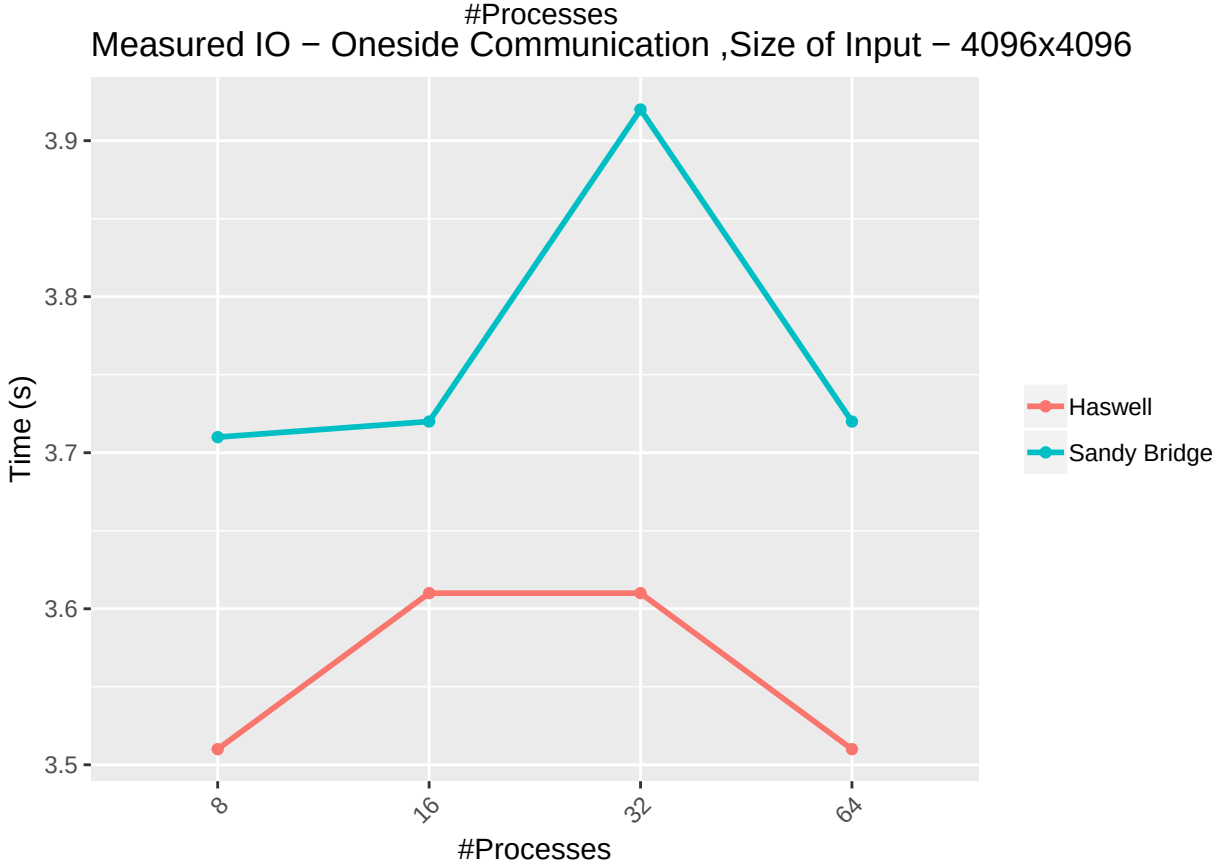

Measured IO − Oneside Communication
8
16
32
64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

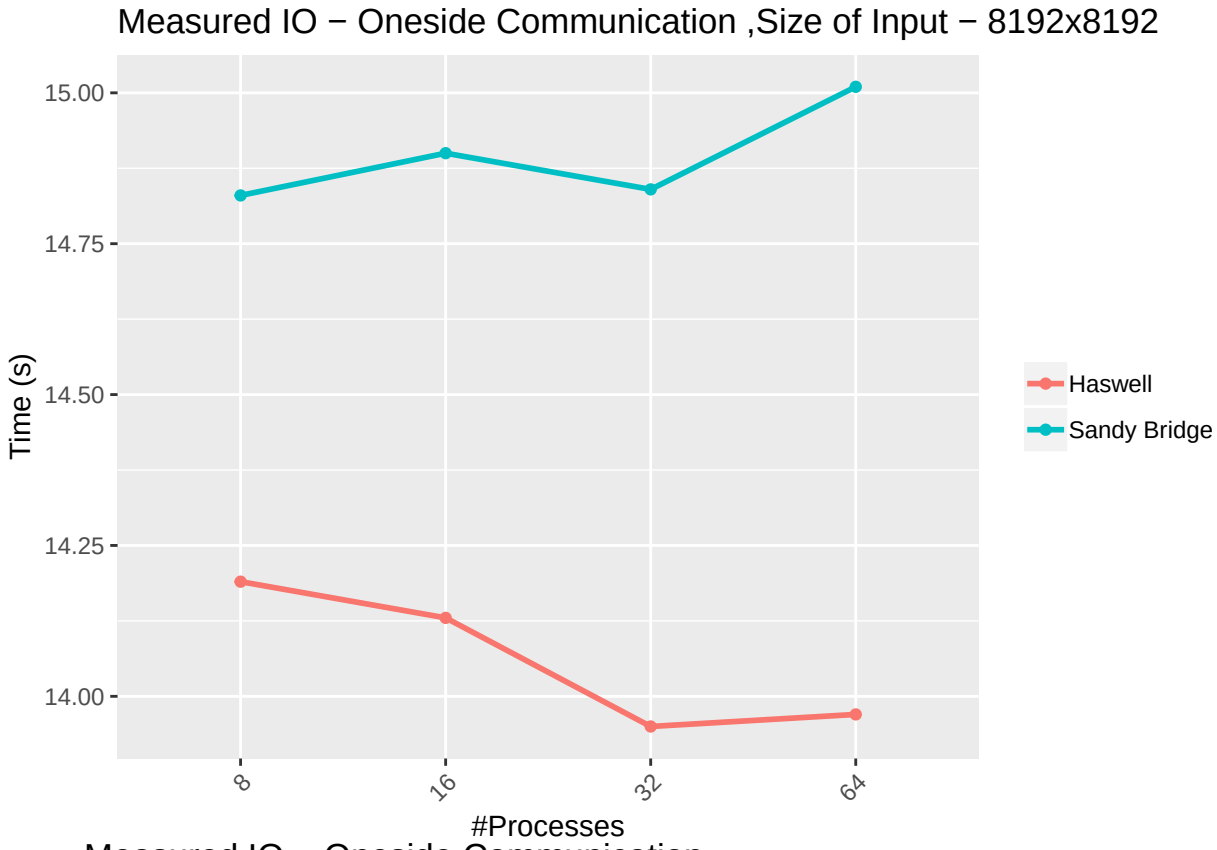

Measured IO − Oneside Communication ,Size of Input − 64x64
Time (s)
0.9
0.6
0.3
0.0
8
16
32
64
#Processes
Haswell
Sandy Bridge

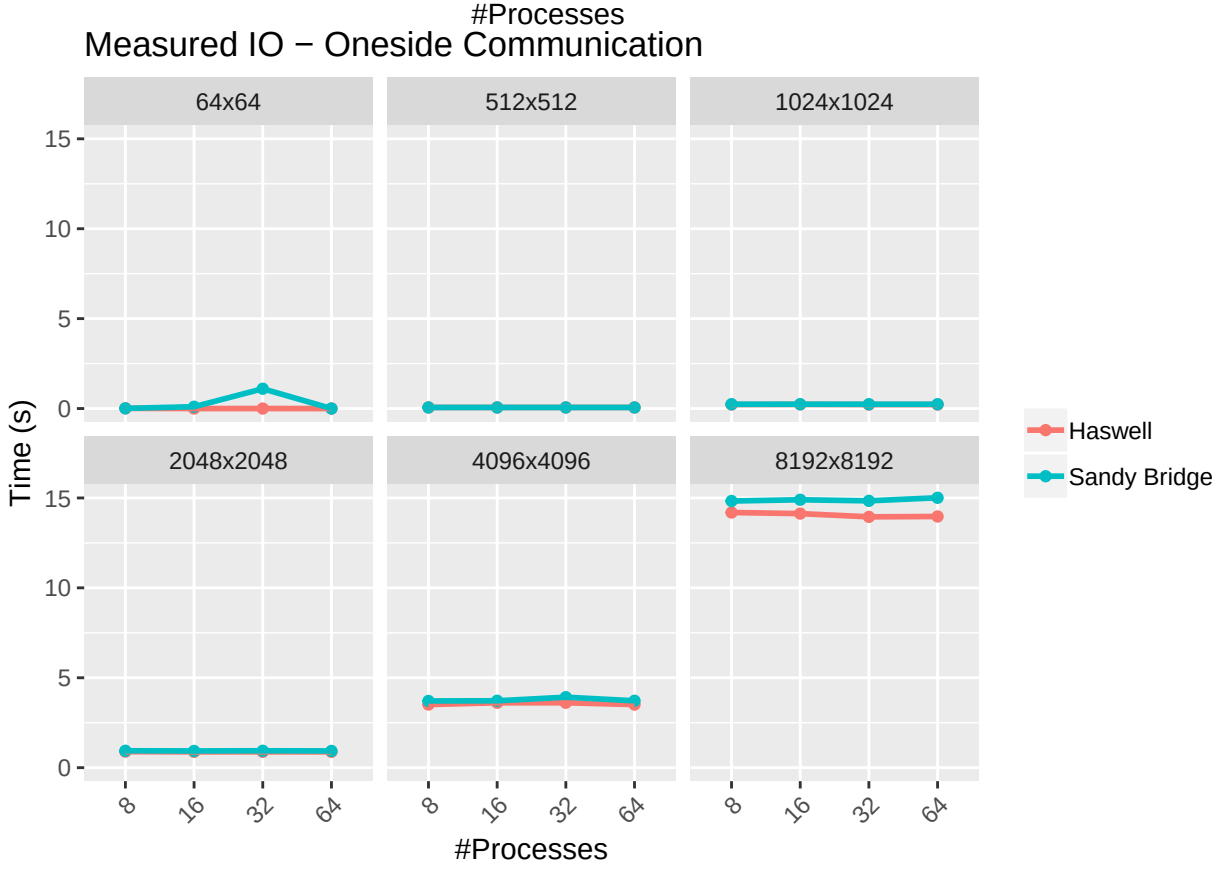

Measured IO − Oneside Communication ,Size of Input − 512x512
Time (s)
0.100
0.075
0.050
0.025
8
16
32
64
#Processes
Haswell
Sandy Bridge

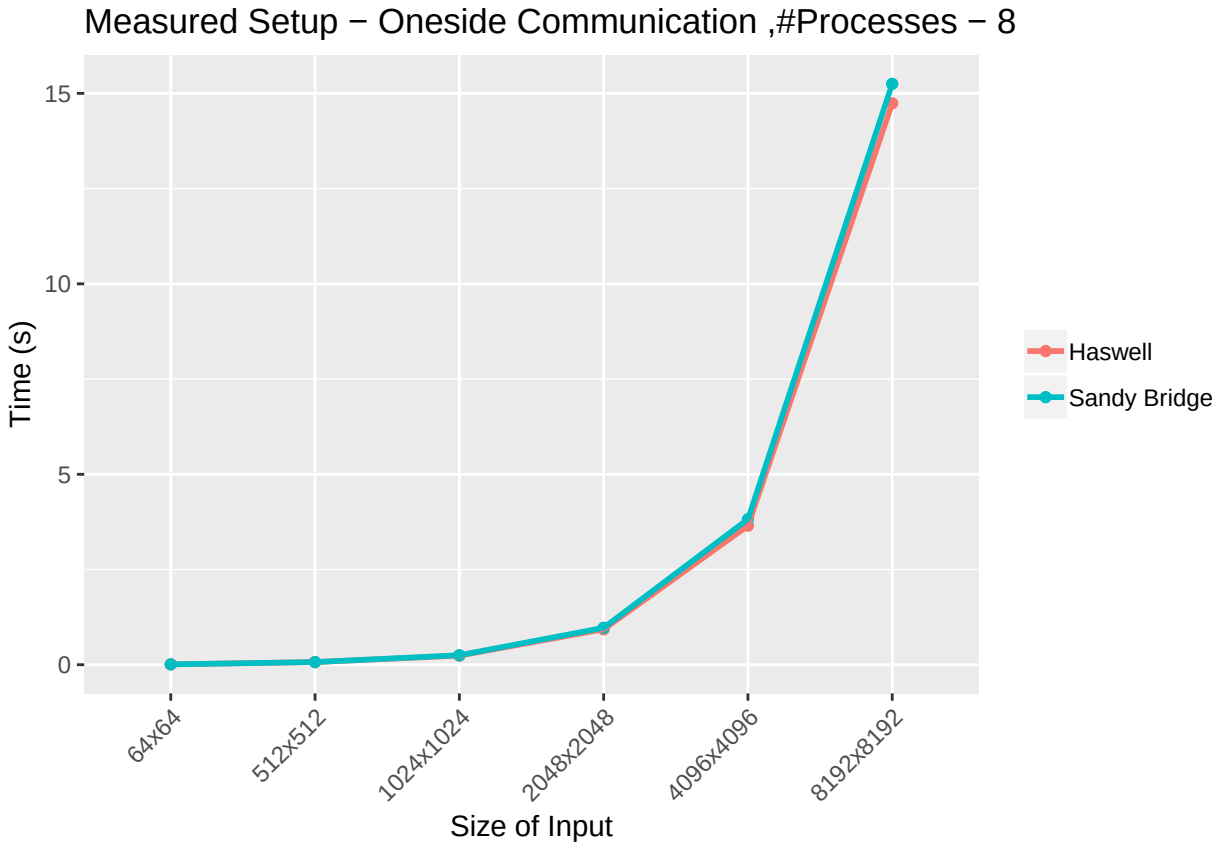

Measured IO − Oneside Communication ,Size of Input − 1024x1024
Time (s)
0.240
0.235
0.230
0.225
0.220
8
16
32
64
#Processes
Haswell
Sandy Bridge

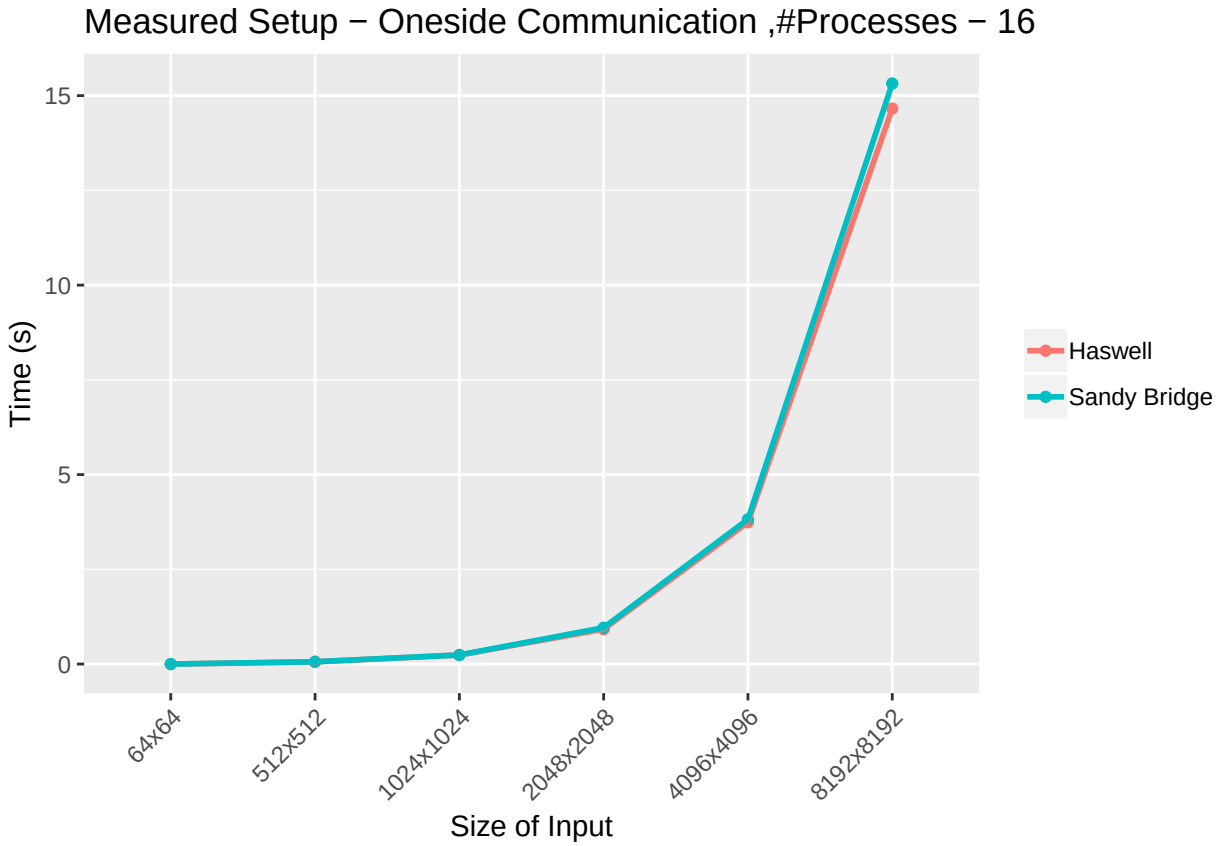

Measured IO − Oneside Communication ,Size of Input − 2048x2048
Time (s)
0.94
0.92
0.90
0.88
8
16
32
64
#Processes
Haswell
Sandy Bridge

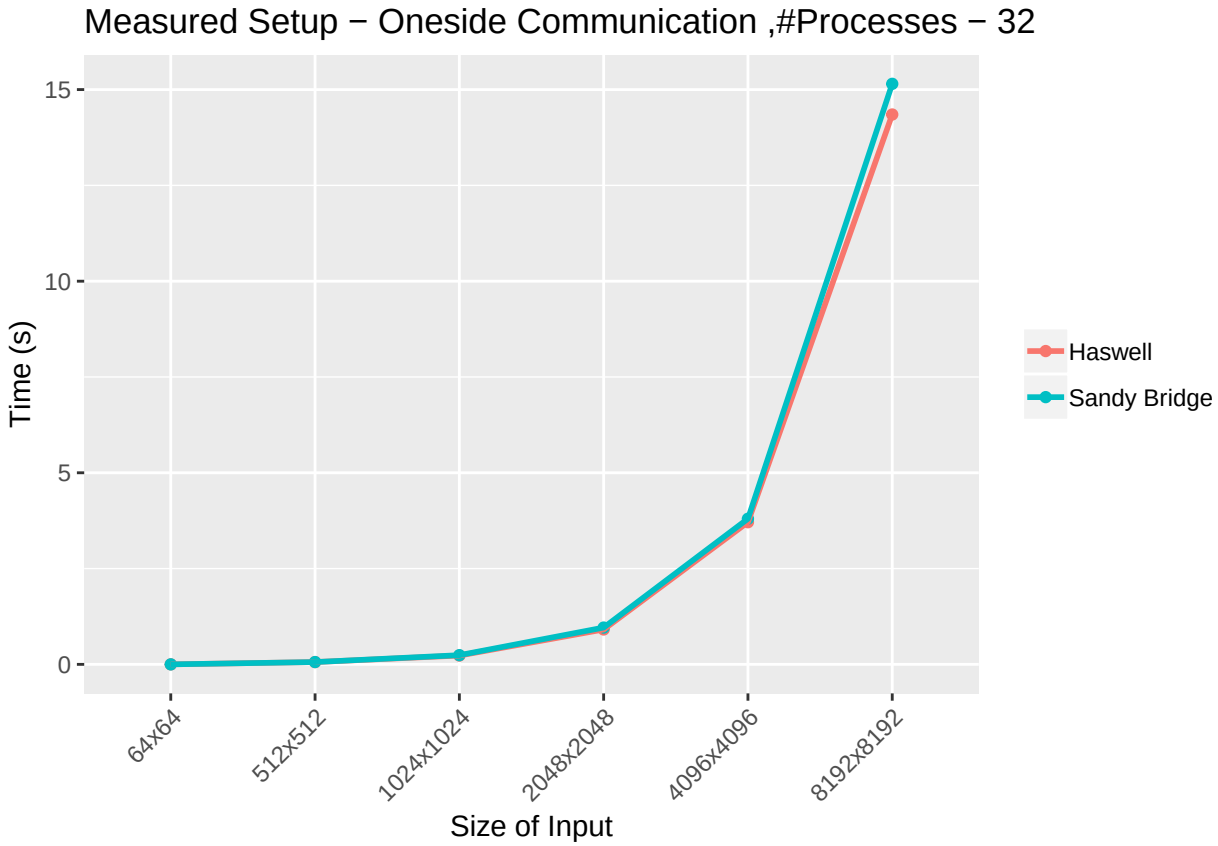

Measured IO − Oneside Communication ,Size of Input − 4096x4096
Time (s)
3.9
3.8
3.7
3.6
3.5
8
16
32
64
#Processes
Haswell
Sandy Bridge

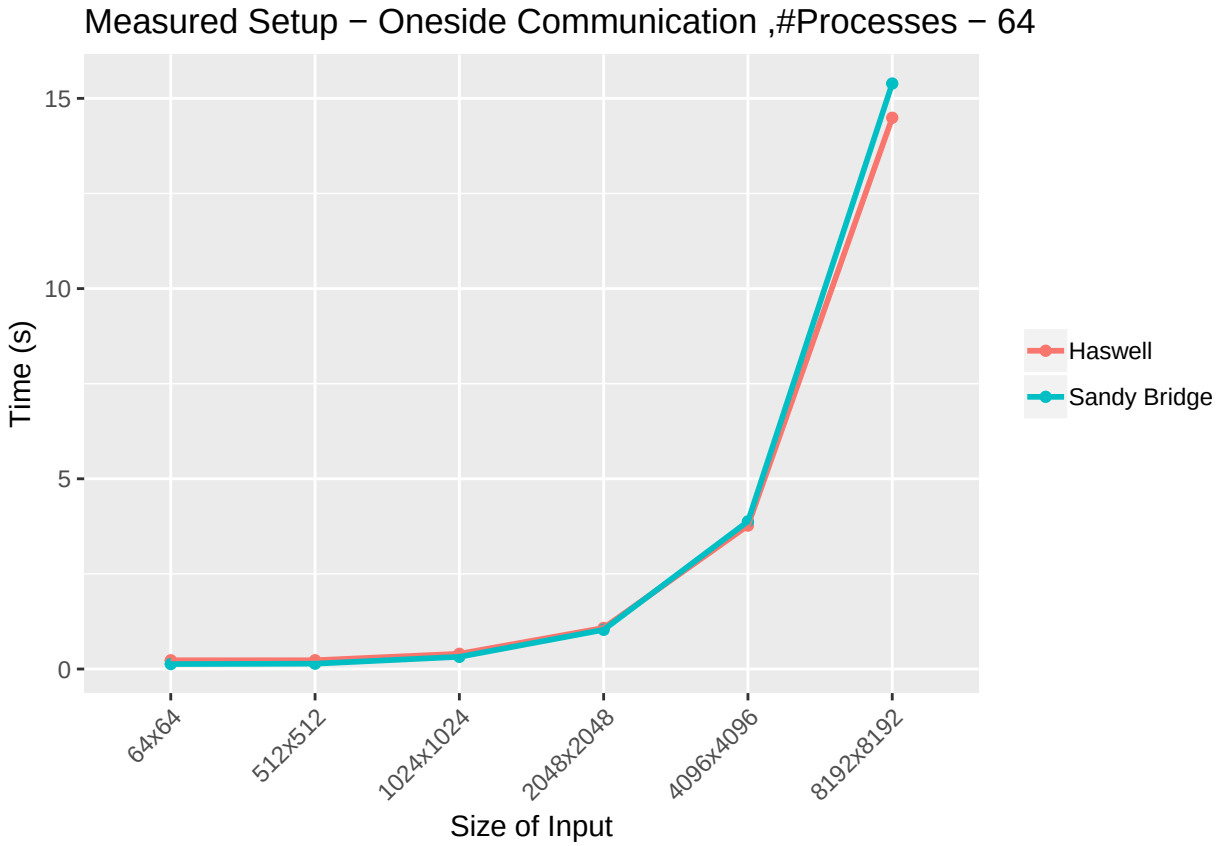

Measured IO − Oneside Communication ,Size of Input − 8192x8192
15.00
14.75
14.50
14.25
14.00
Time (s)
8
16
32
64
#Processes
Haswell
Sandy Bridge

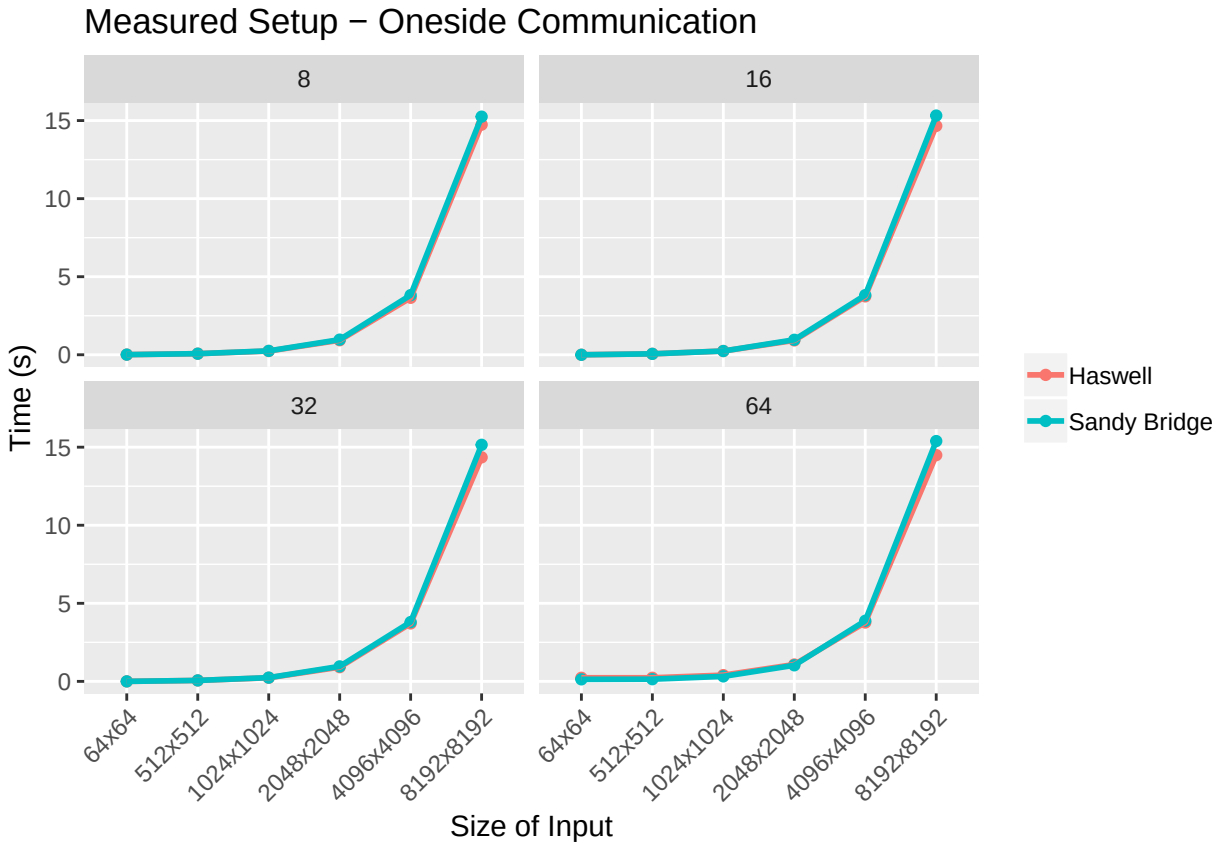

Measured IO − Oneside Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
15
10
5
0
Time (s)
8
16
32
64
#Processes
Haswell
Sandy Bridge

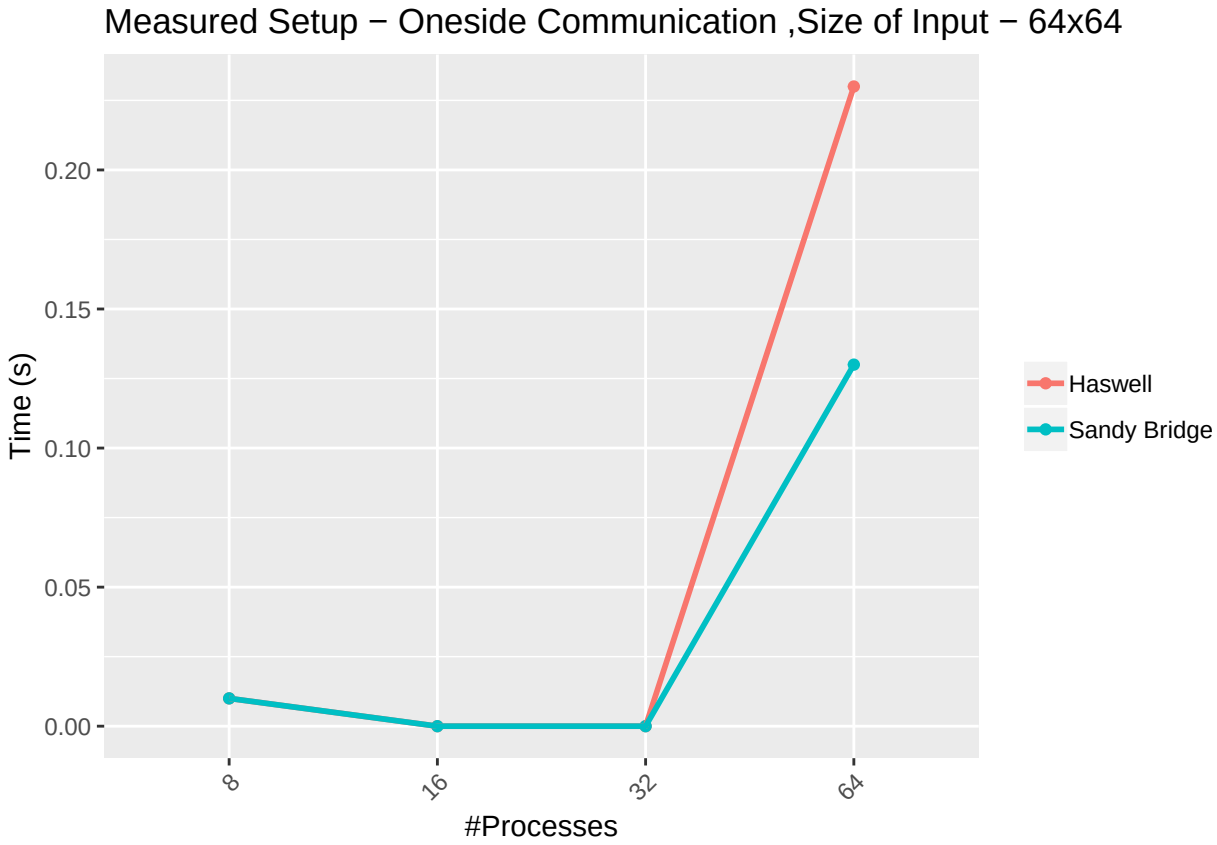

Measured Setup − Oneside Communication ,#Processes − 8
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

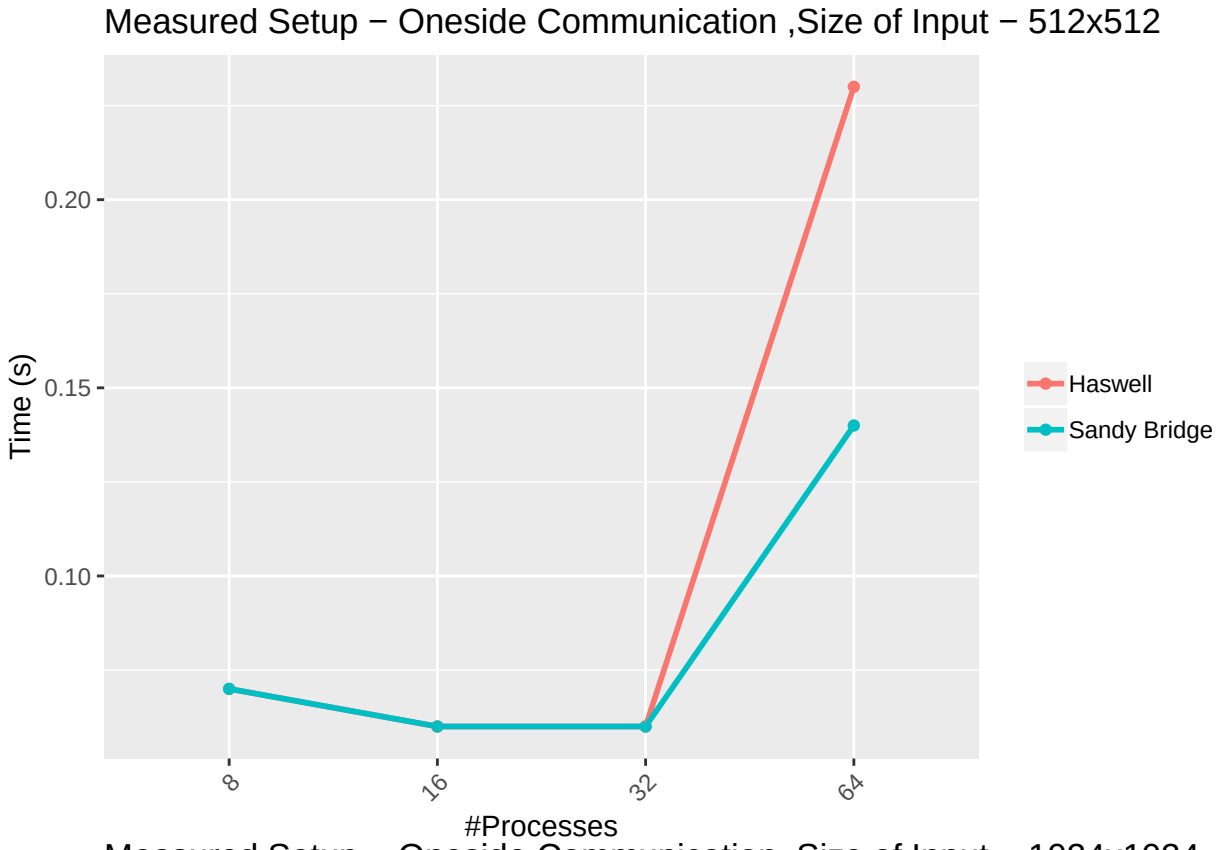

Measured Setup − Oneside Communication ,#Processes − 16
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

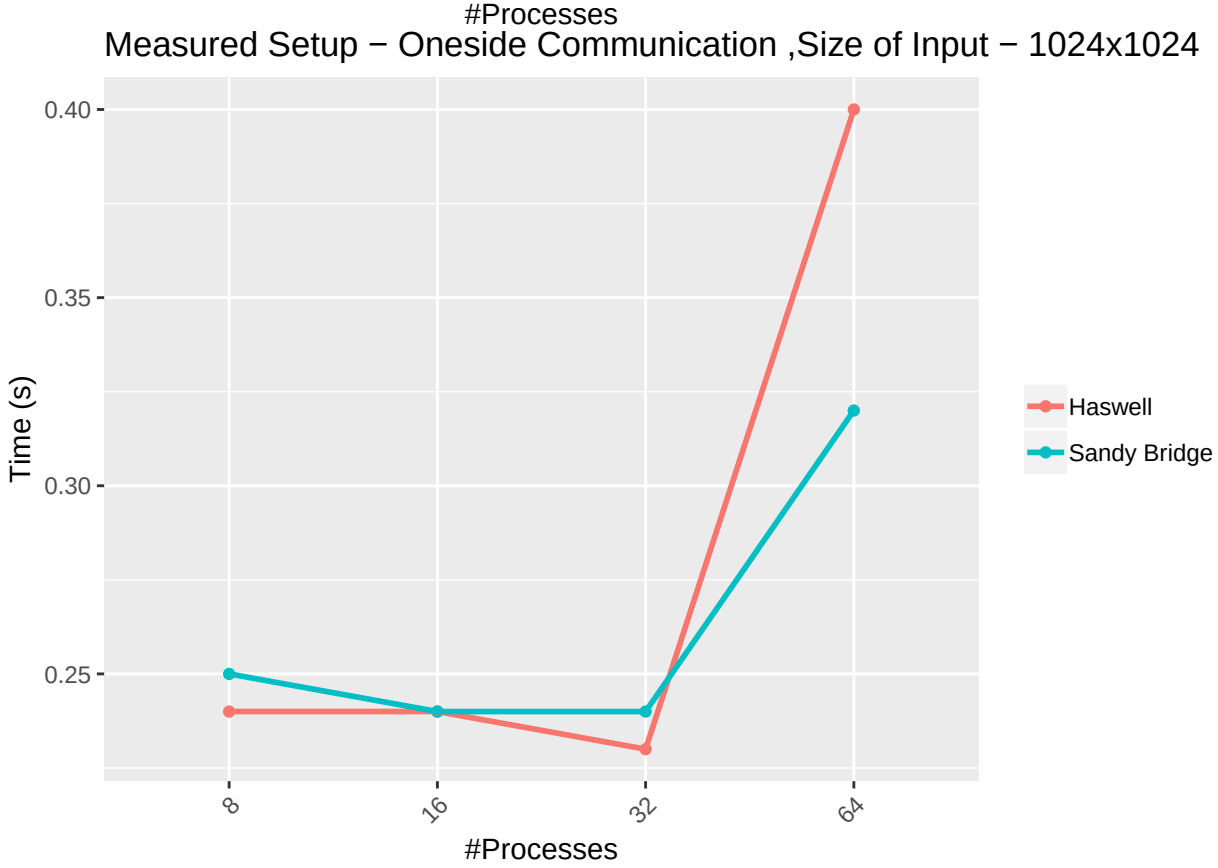

Measured Setup − Oneside Communication ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

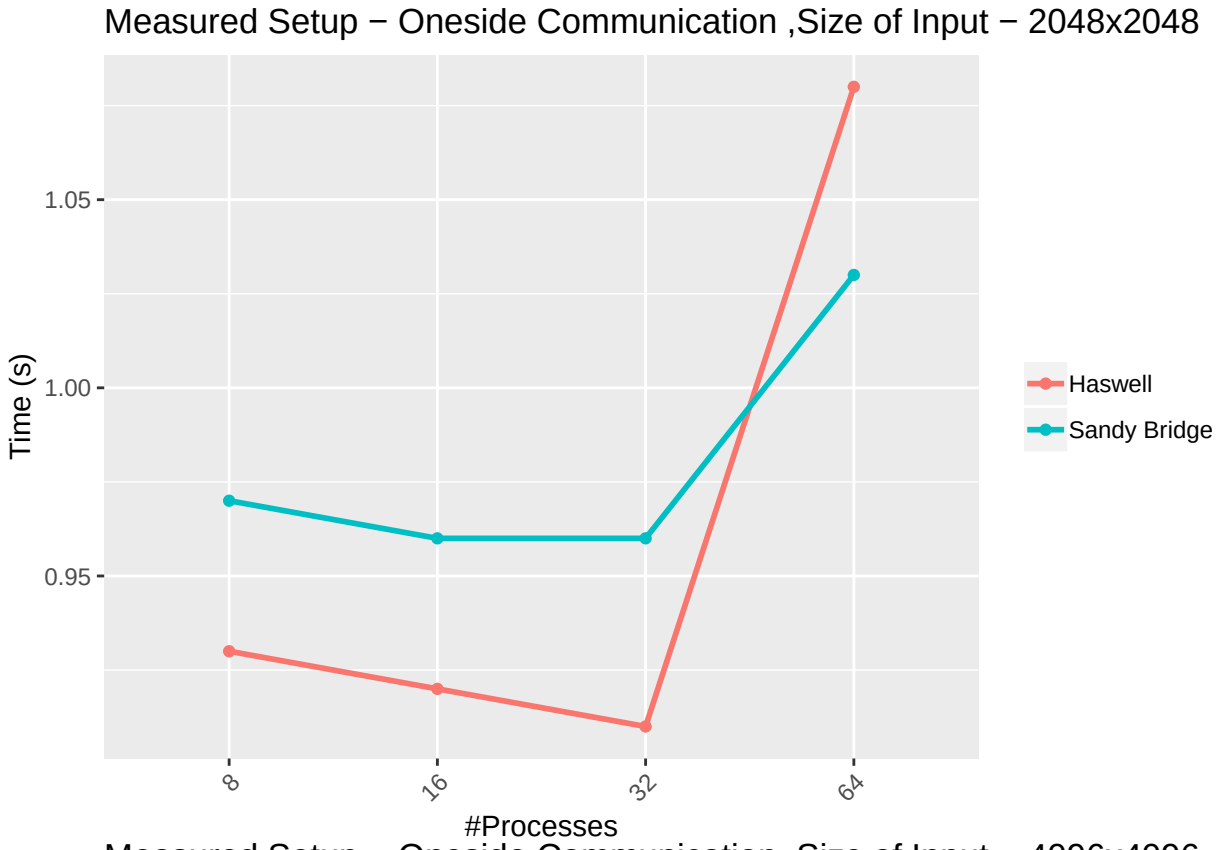

Measured Setup − Oneside Communication ,#Processes − 64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

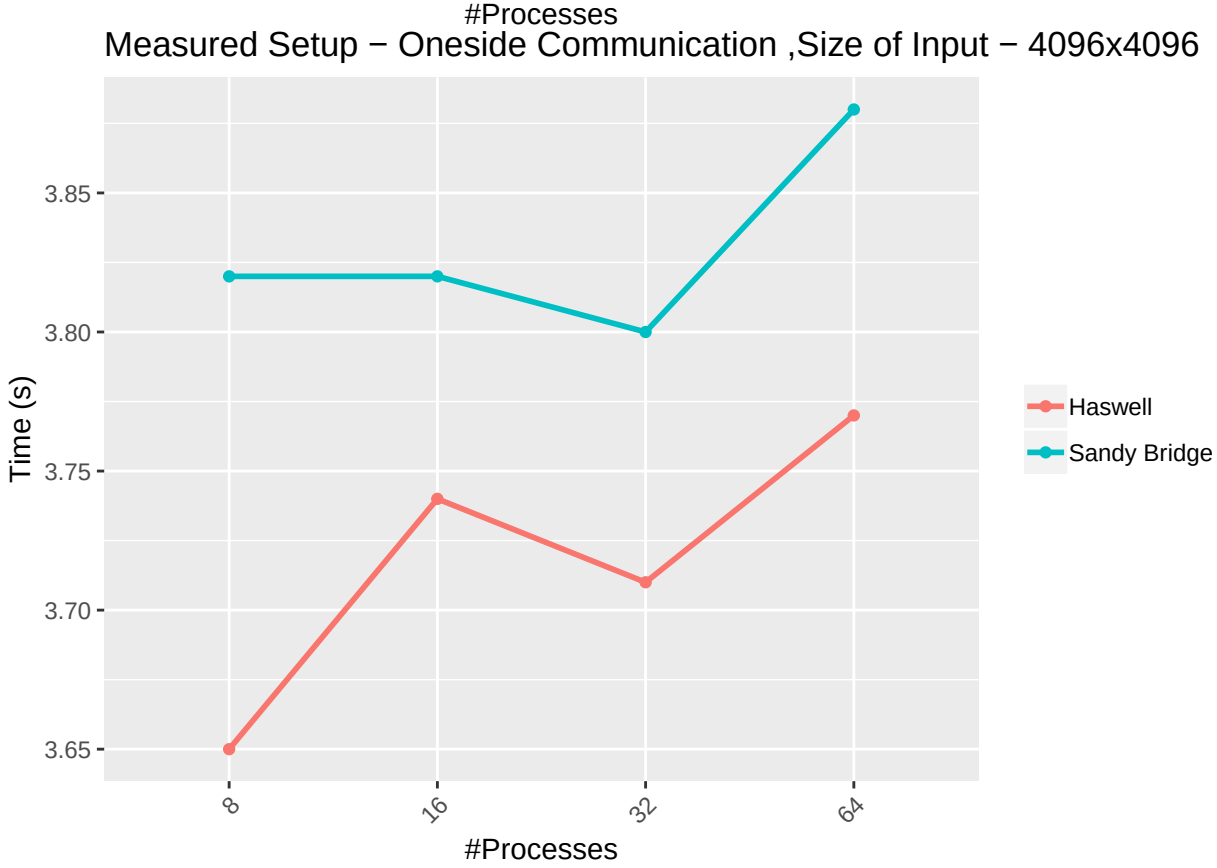

Measured Setup − Oneside Communication
8
16
32
64
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

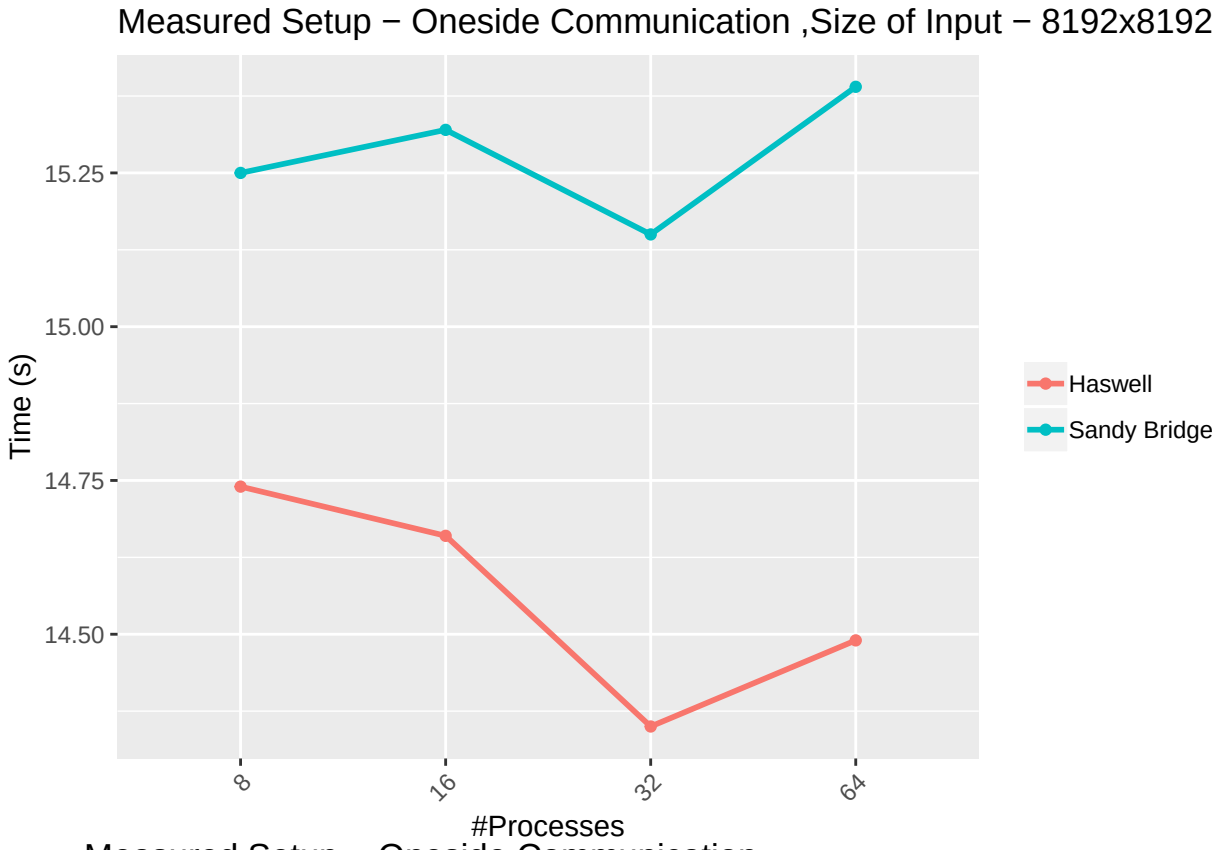

Measured Setup − Oneside Communication ,Size of Input − 64x64
Time (s)
0.20
0.15
0.10
0.05
0.00
8
16
32
64
#Processes
Haswell
Sandy Bridge

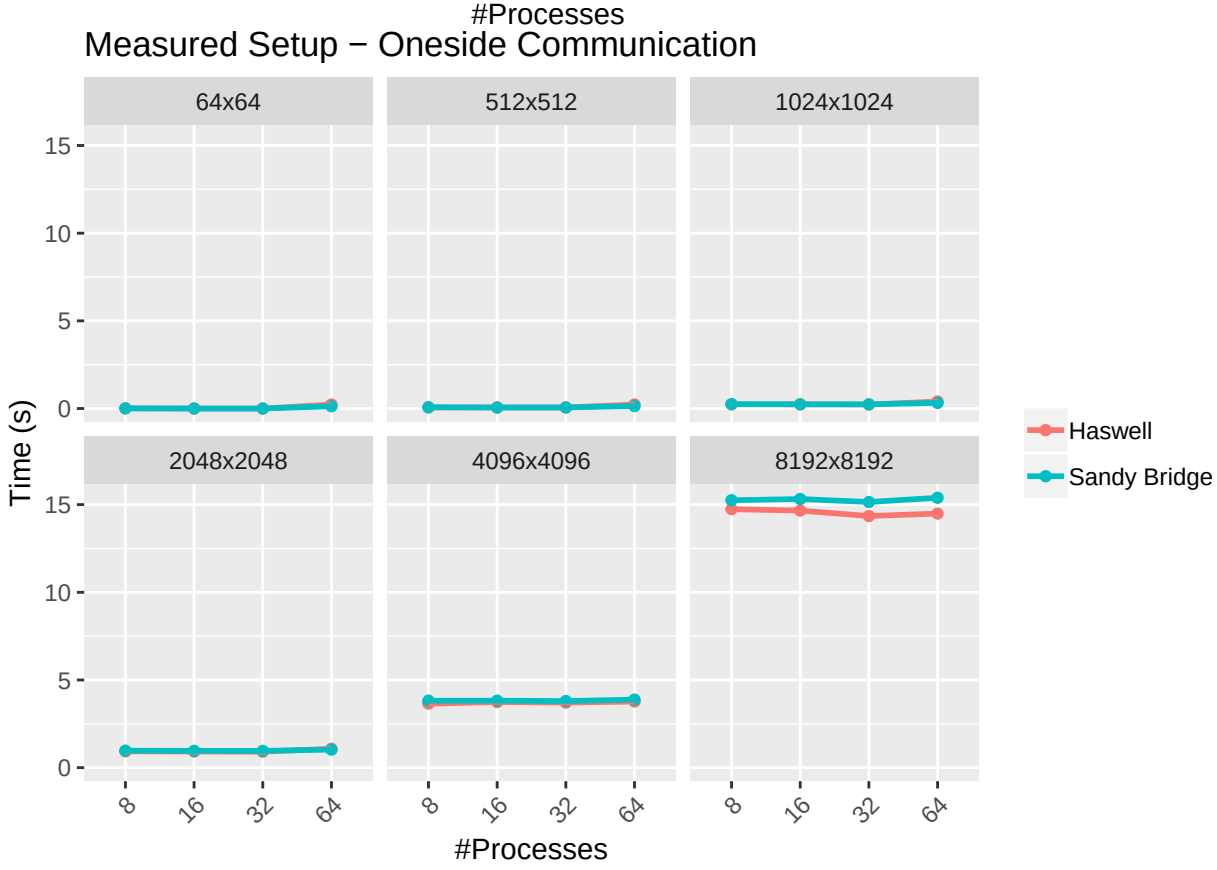

Measured Setup − Oneside Communication ,Size of Input − 512x512
Time (s)
0.20
0.15
0.10
8
16
32
64
#Processes
Haswell
Sandy Bridge

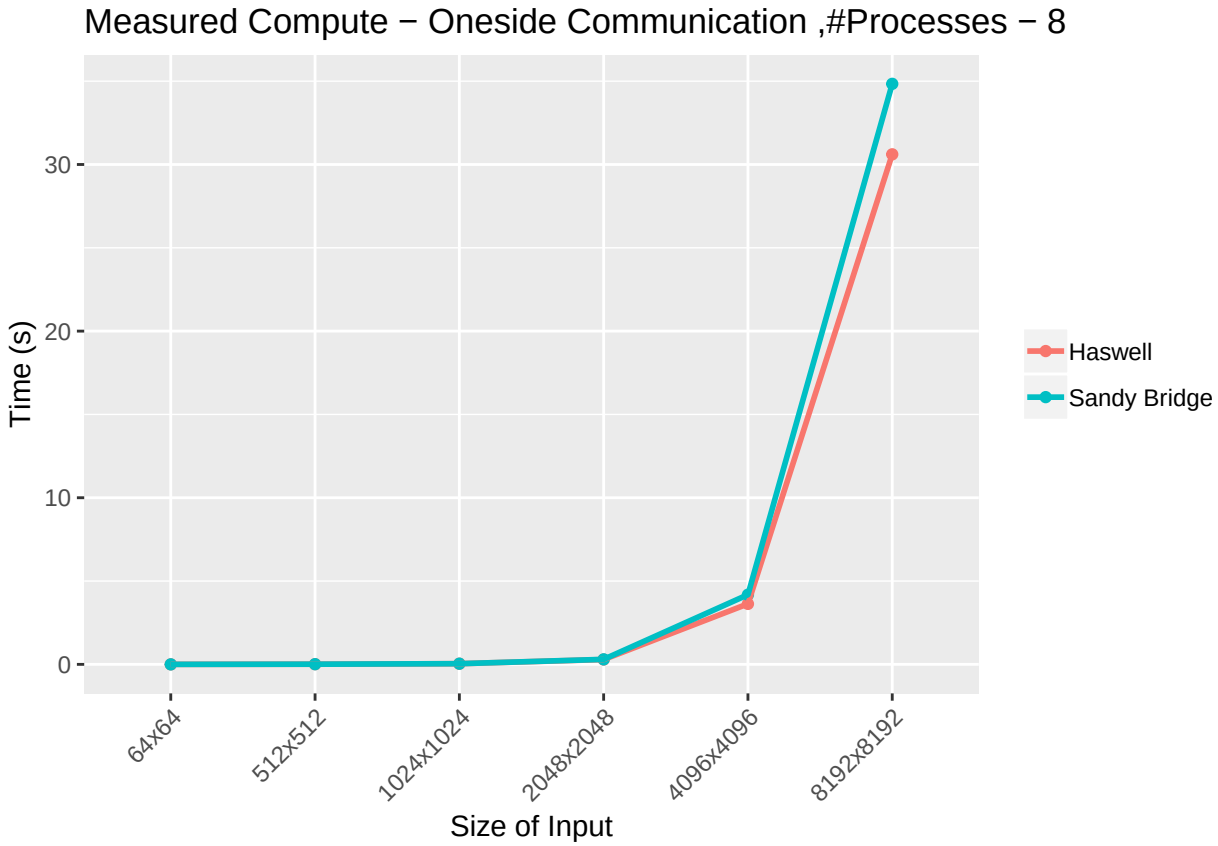

Measured Setup − Oneside Communication ,Size of Input − 1024x1024
Time (s)
0.40
0.35
0.30
0.25
8
16
32
64
#Processes
Haswell
Sandy Bridge

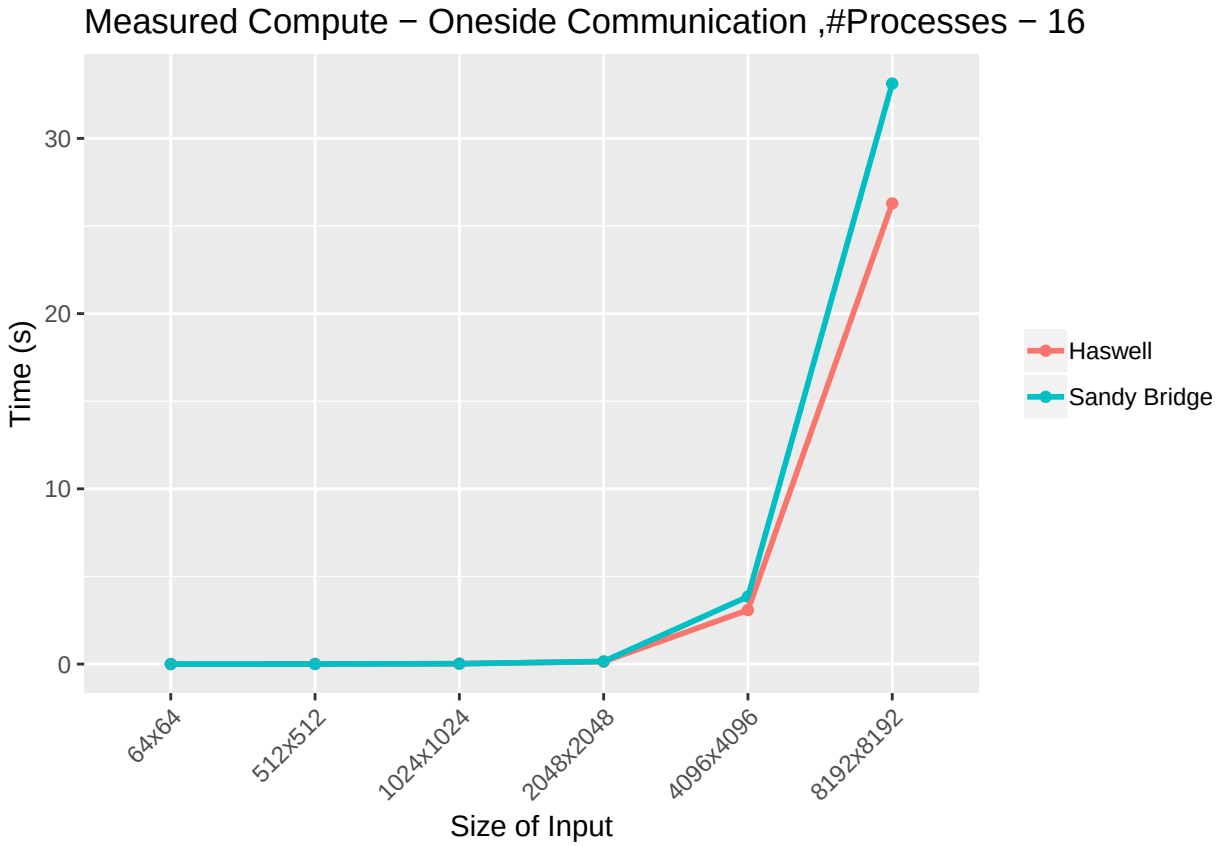

Measured Setup − Oneside Communication ,Size of Input − 2048x2048
Time (s)
1.05
1.00
0.95
8
16
32
64
#Processes
Haswell
Sandy Bridge

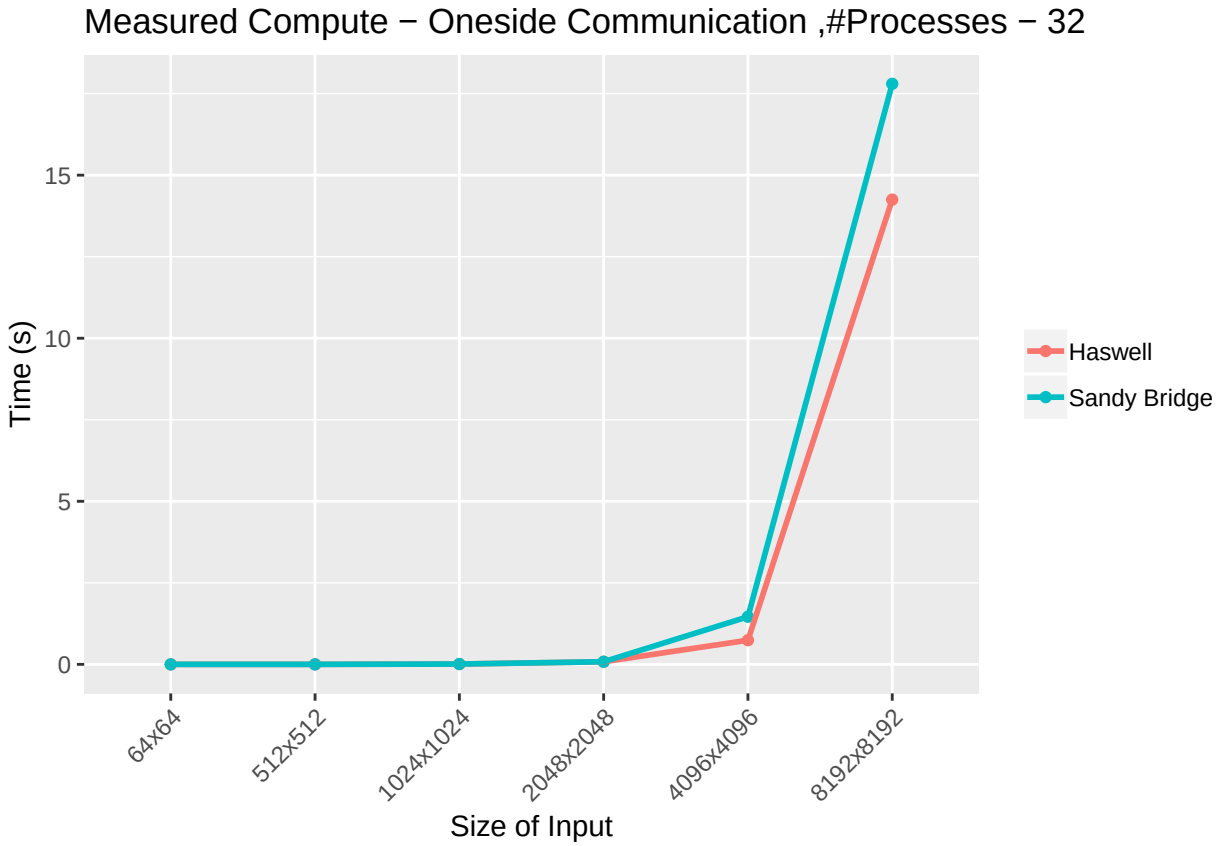

Measured Setup − Oneside Communication ,Size of Input − 4096x4096
Time (s)
3.85
3.80
3.75
3.70
3.65
8
16
32
64
#Processes
Haswell
Sandy Bridge

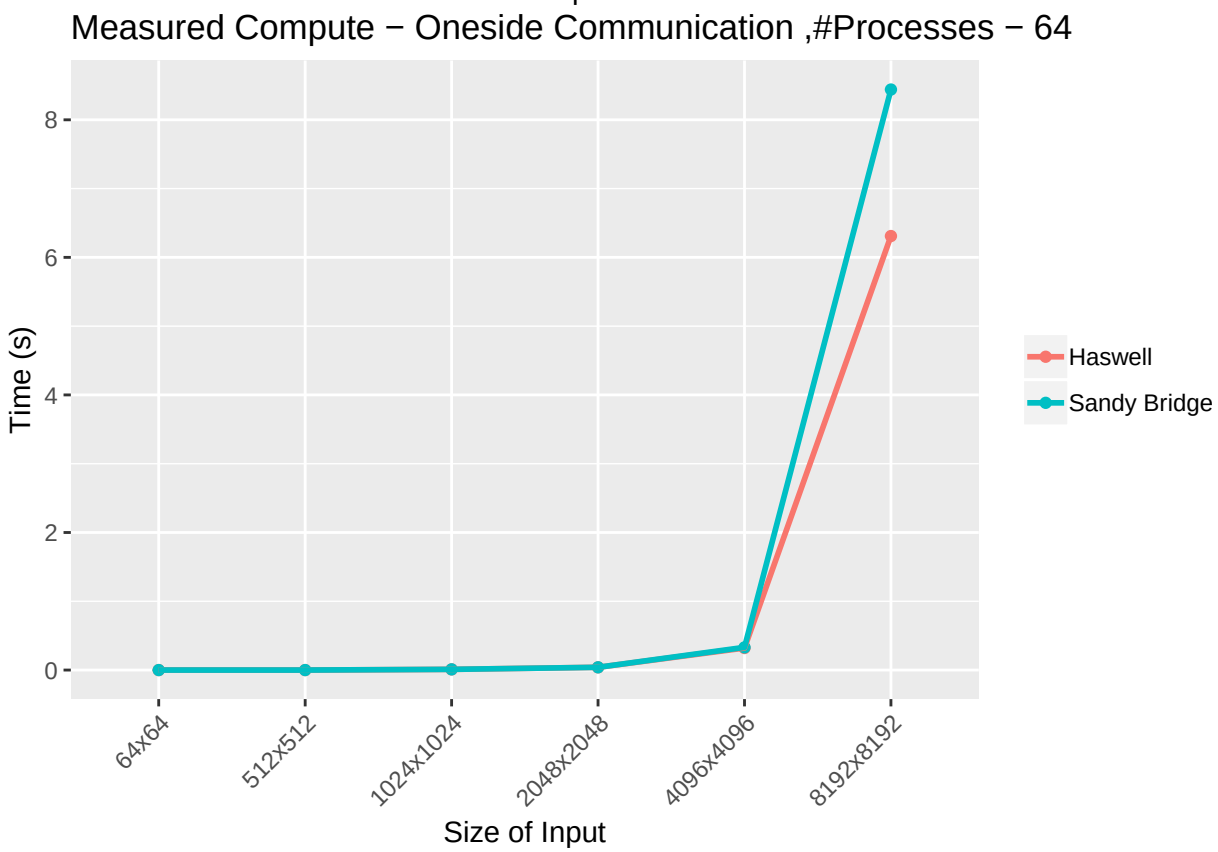

Measured Setup − Oneside Communication ,Size of Input − 8192x8192
Time (s)
15.25
15.00
14.75
14.50
8
16
32
64
#Processes
Haswell
Sandy Bridge

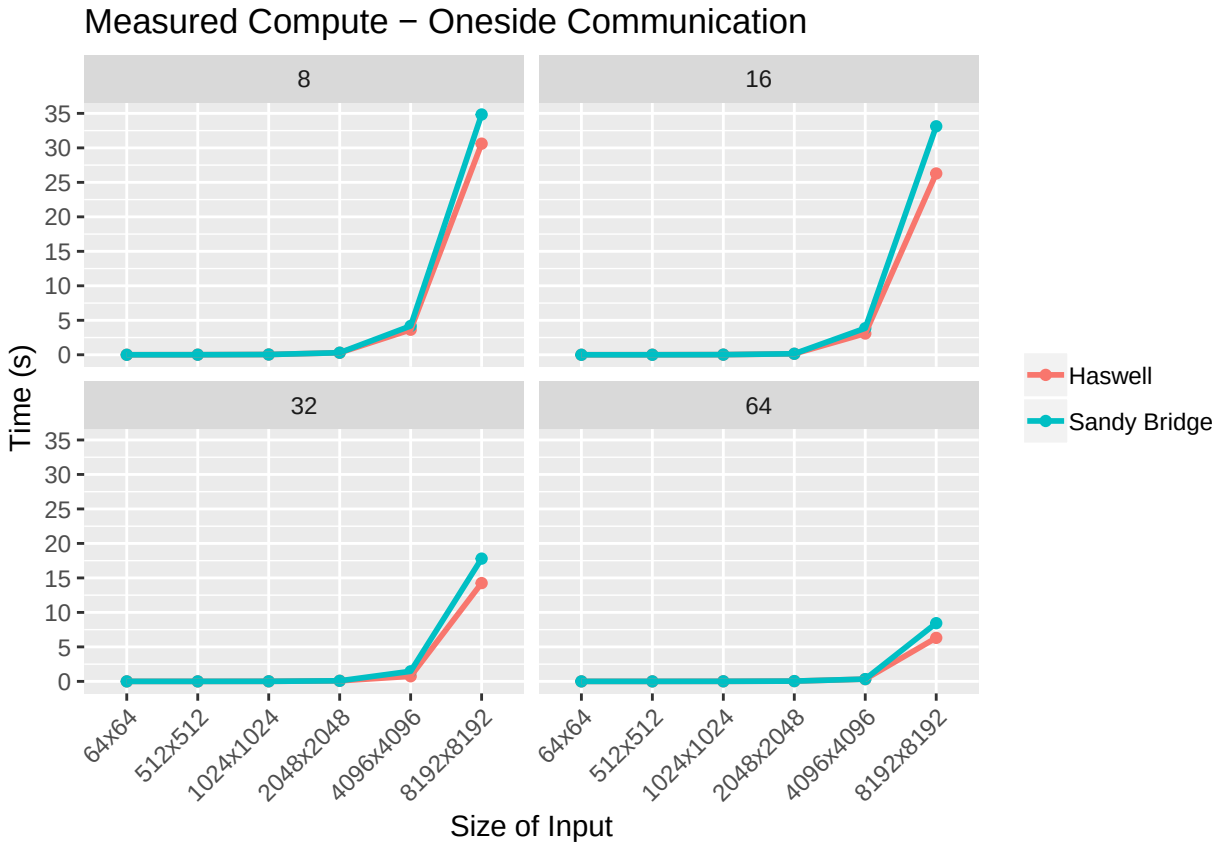

Measured Setup − Oneside Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
15
10
5
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

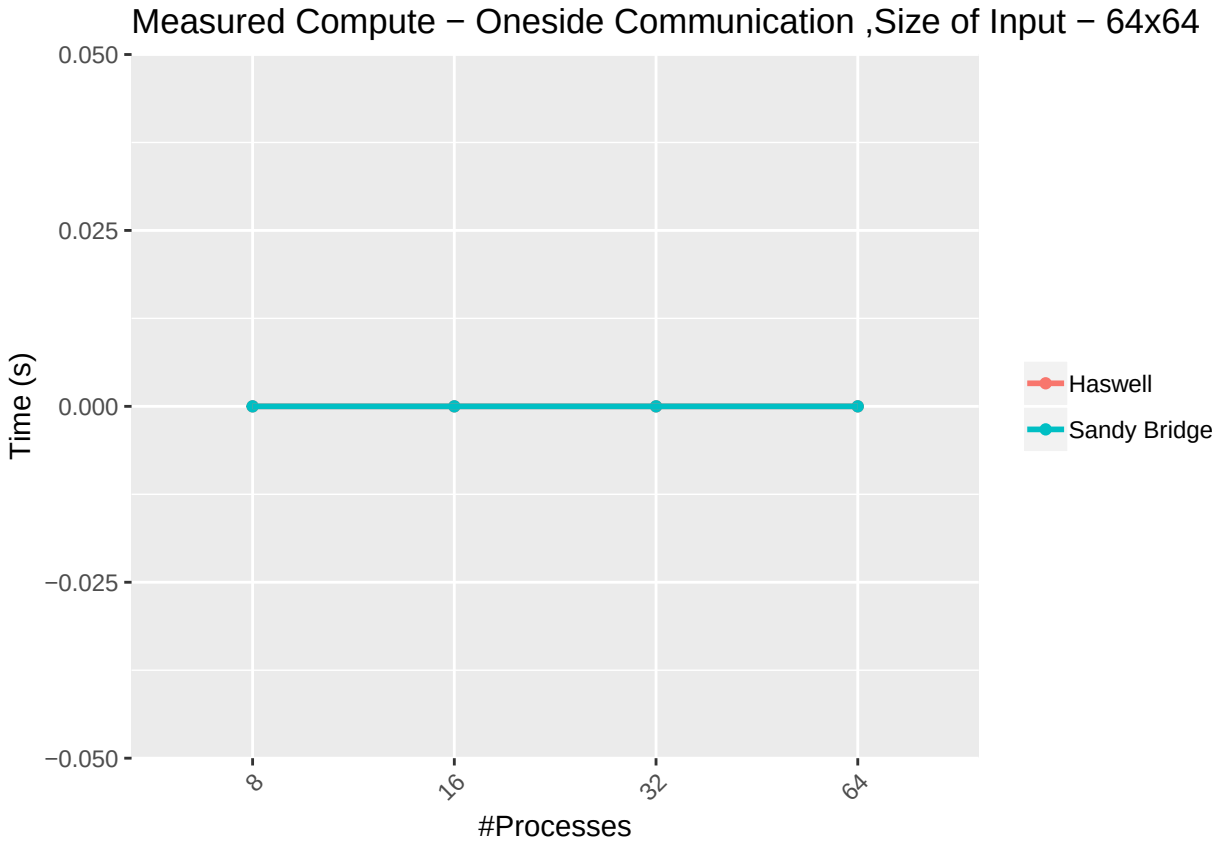

Measured Compute − Oneside Communication ,#Processes − 8
Time (s)
30
20
10
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

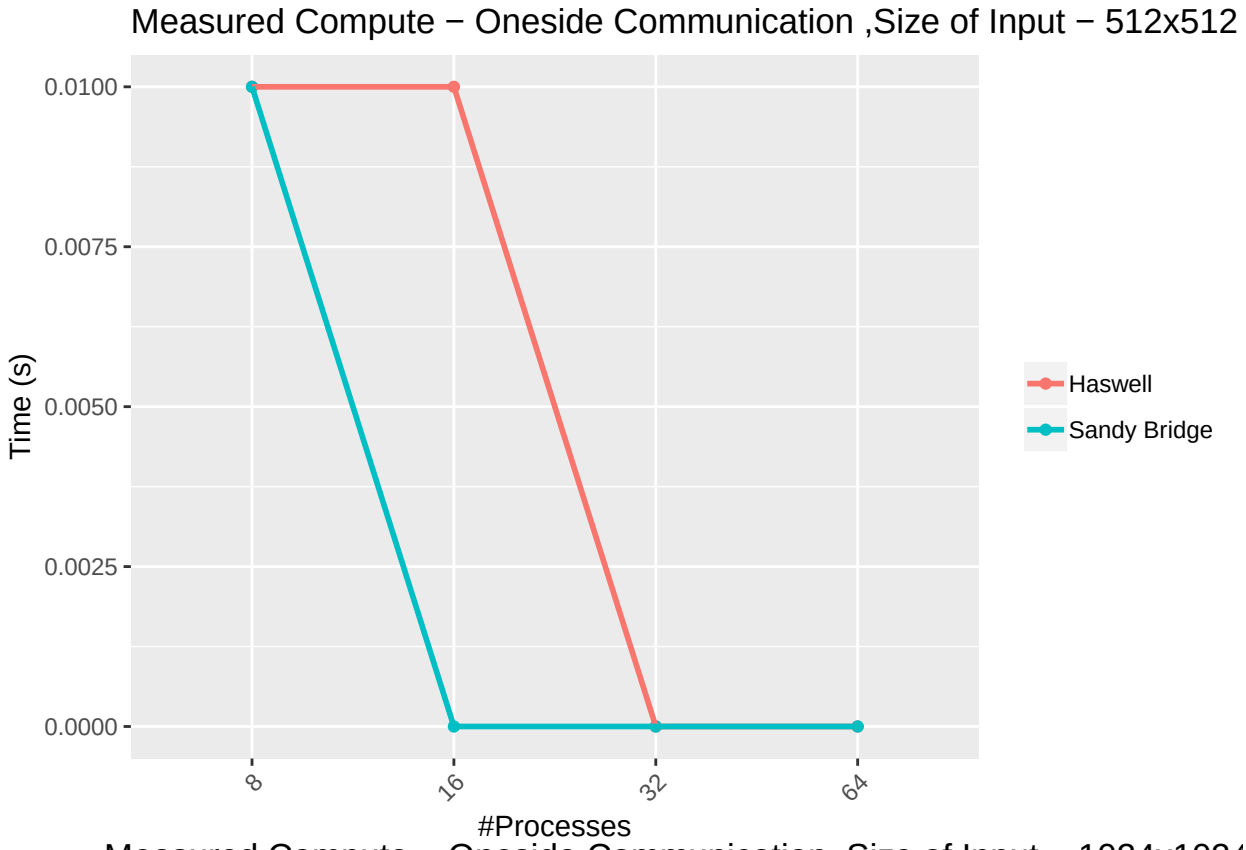

Measured Compute − Oneside Communication ,#Processes − 16
Time (s)
30
20
10
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

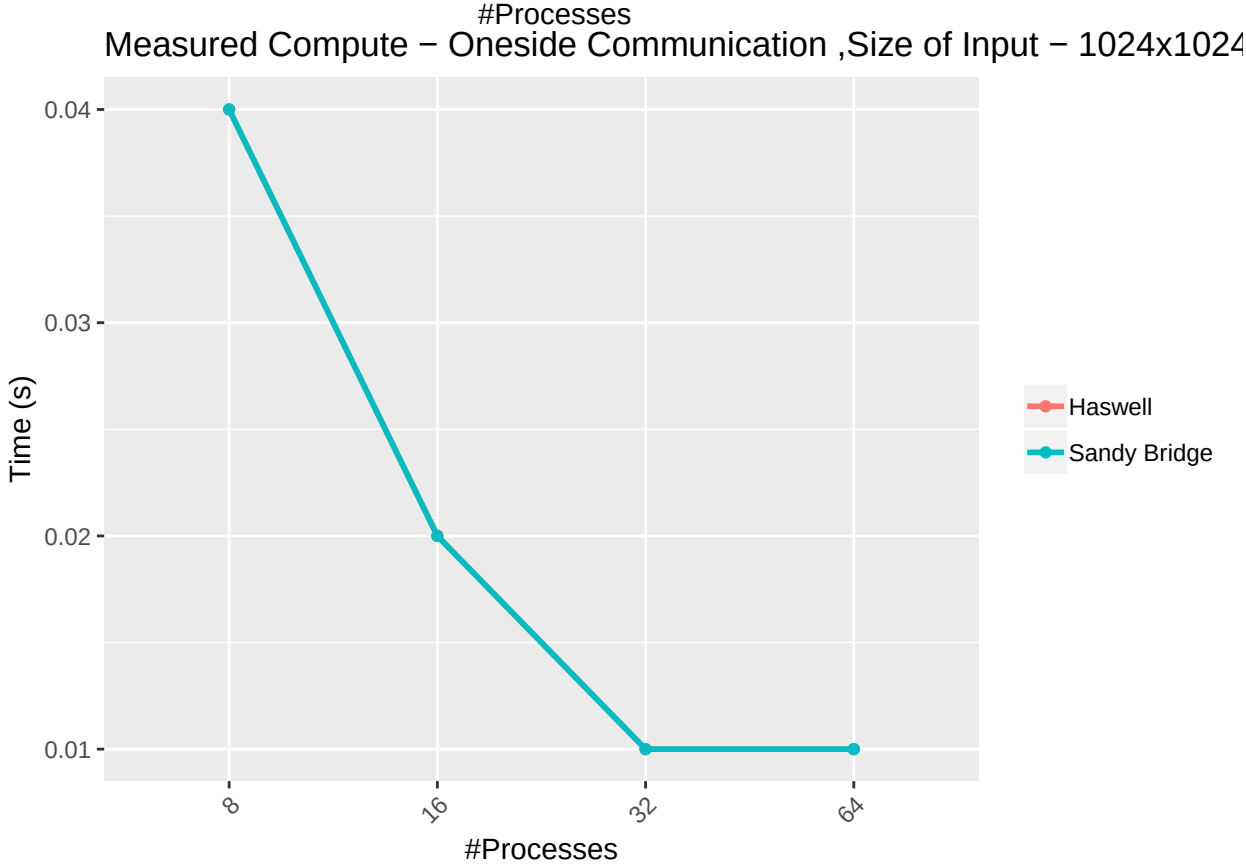

Measured Compute − Oneside Communication ,#Processes − 32
Time (s)
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

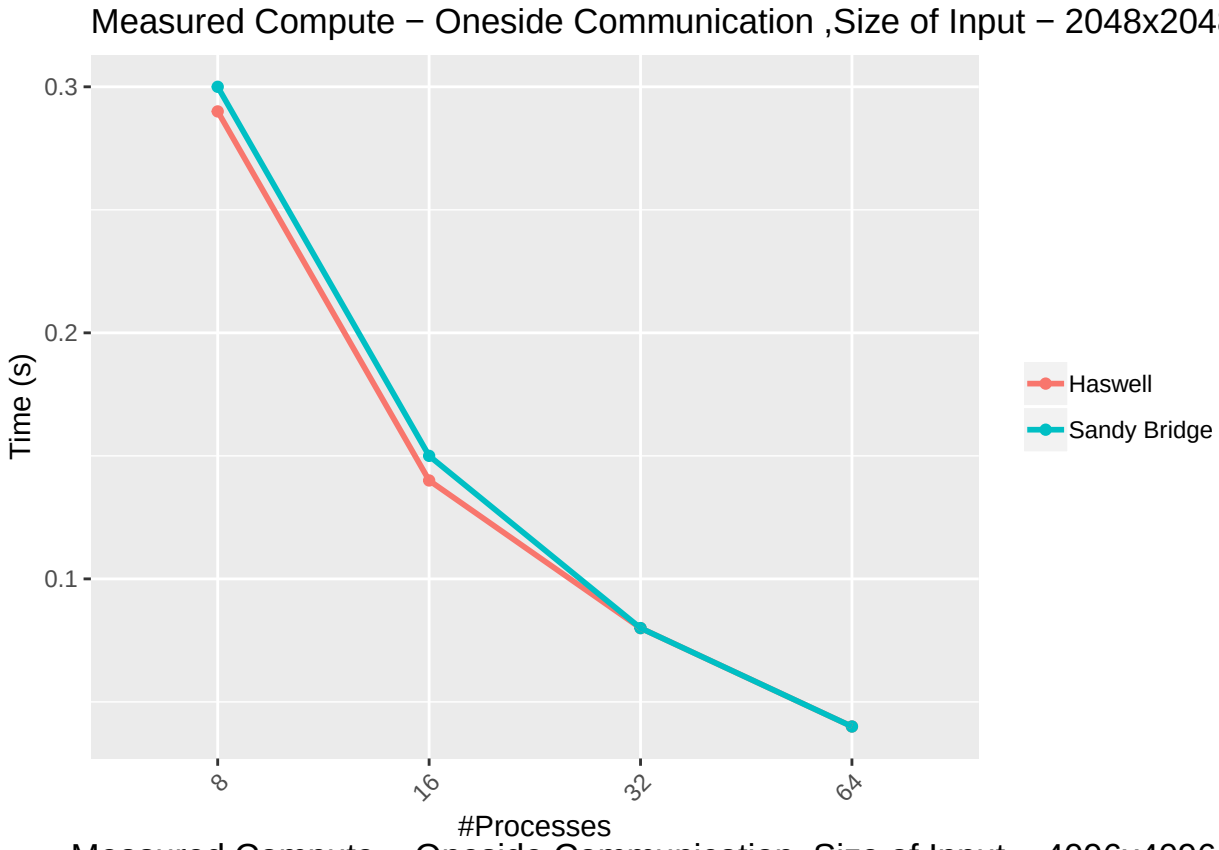

Measured Compute − Oneside Communication ,#Processes − 64
Time (s)
8
6
4
2
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

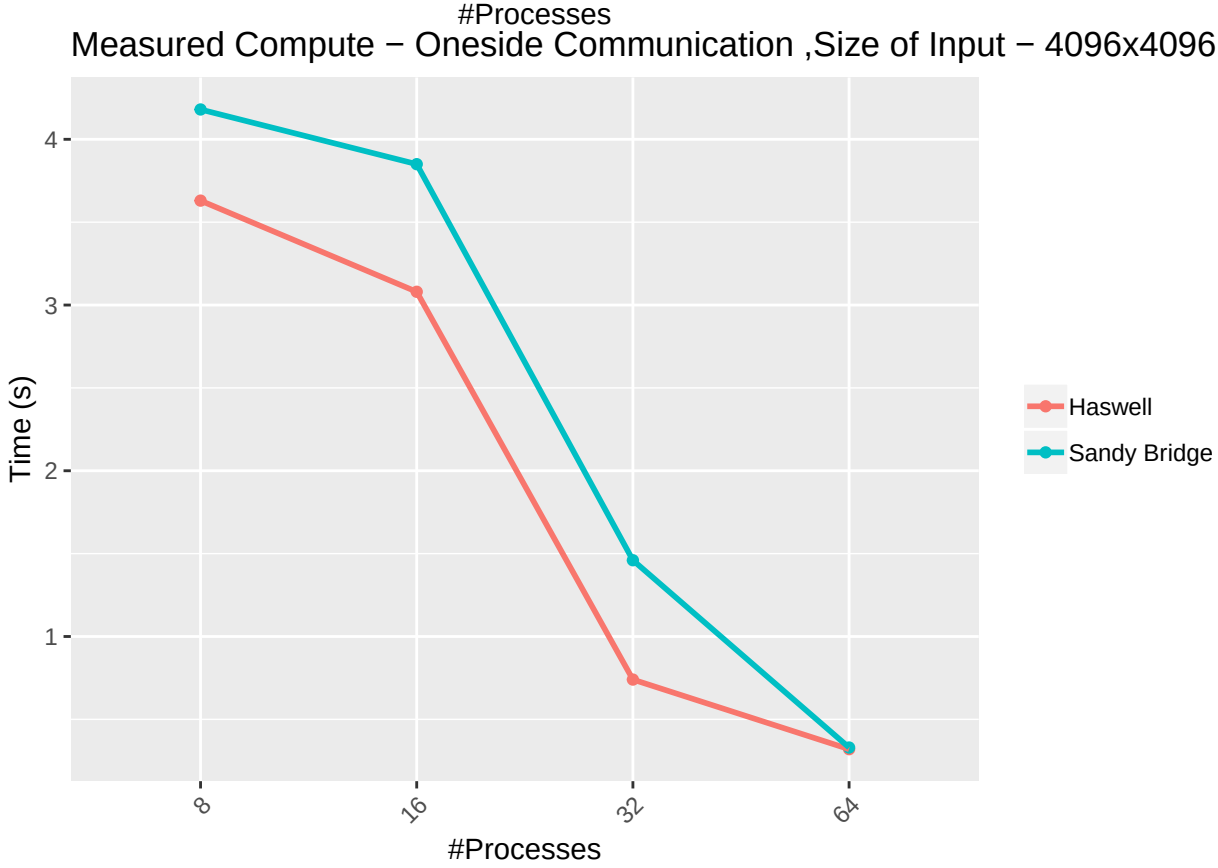

Measured Compute − Oneside Communication
8
16
32
64
Time (s)
35
30
25
20
15
10
5
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

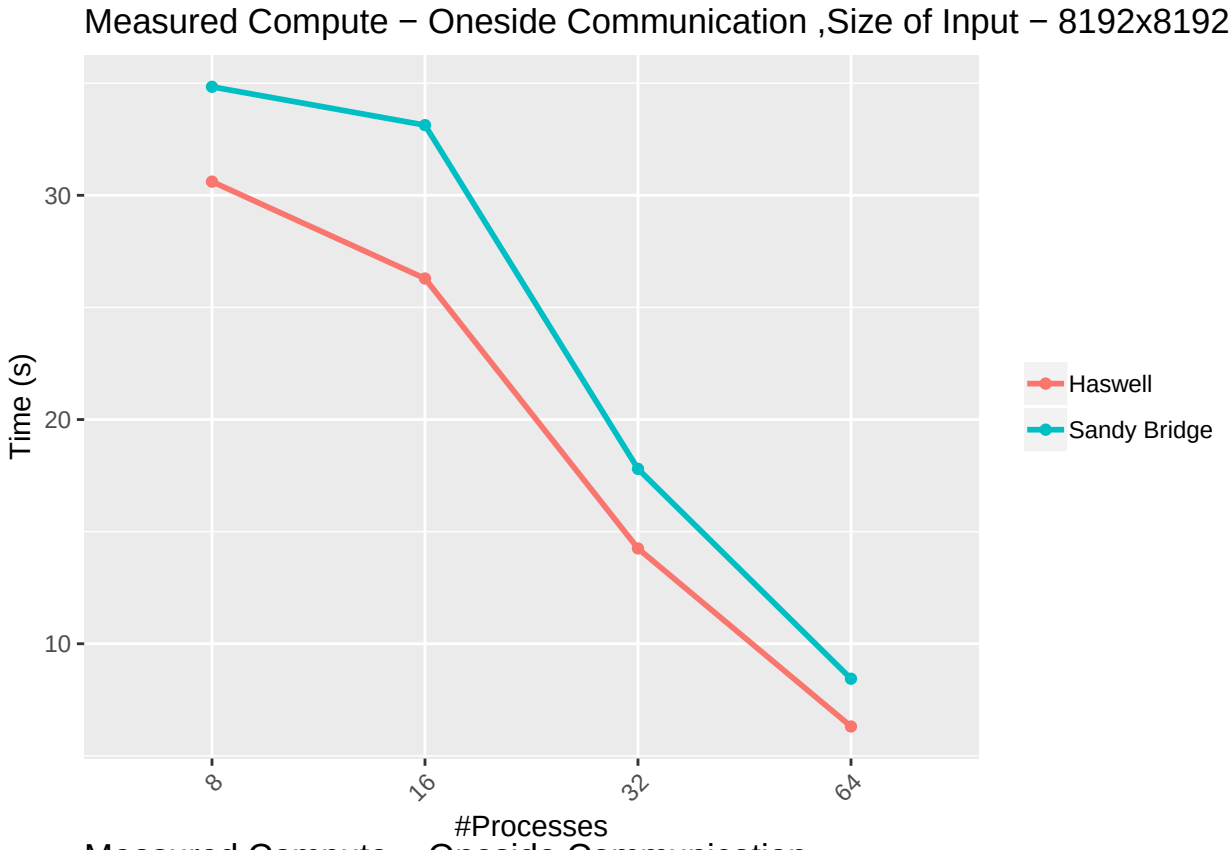

Measured Compute − Oneside Communication ,Size of Input − 64x64
Time (s)
0.050
0.025
0.000
−0.025
−0.050
8
16
32
64
#Processes
Haswell
Sandy Bridge

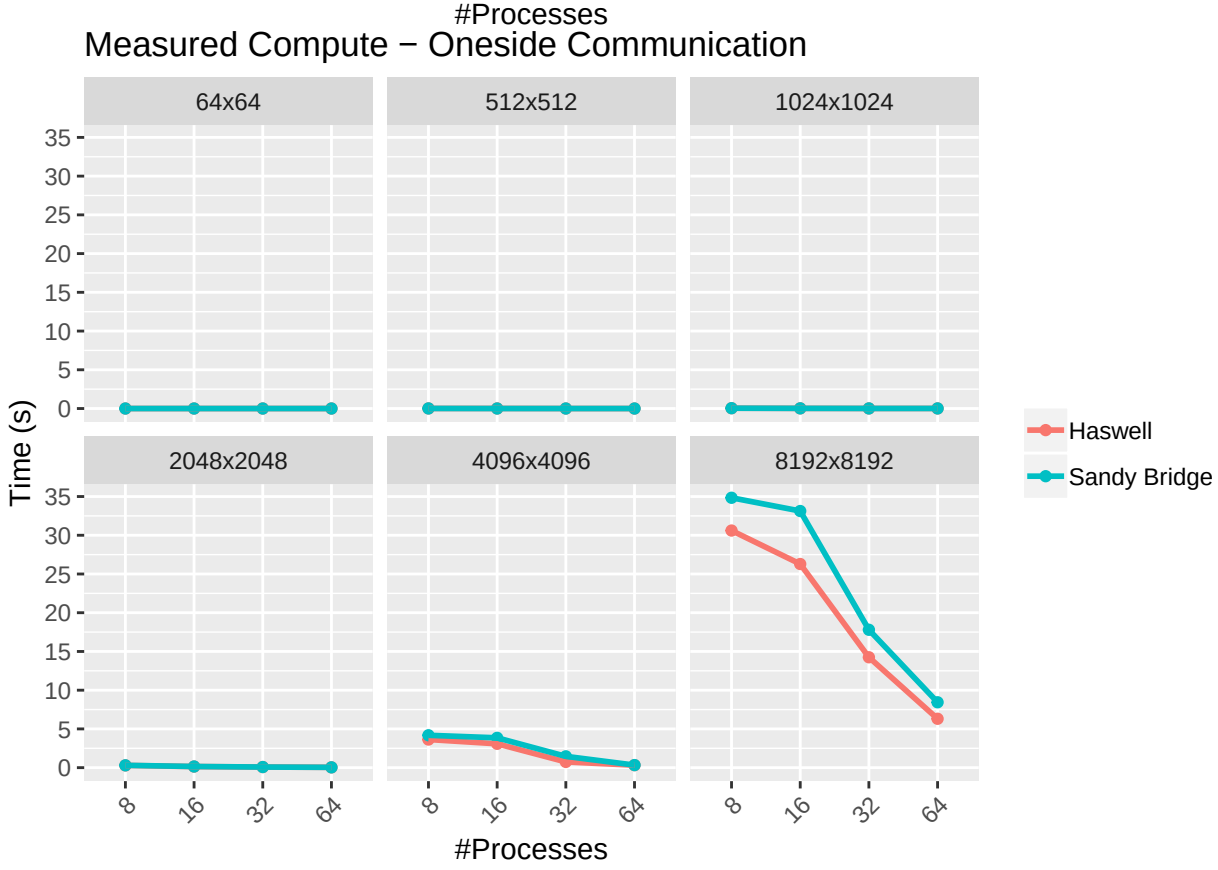

Measured Compute − Oneside Communication ,Size of Input − 512x512
Time (s)
0.0100
0.0075
0.0050
0.0025
0.0000
8
16
32
64
#Processes
Haswell
Sandy Bridge

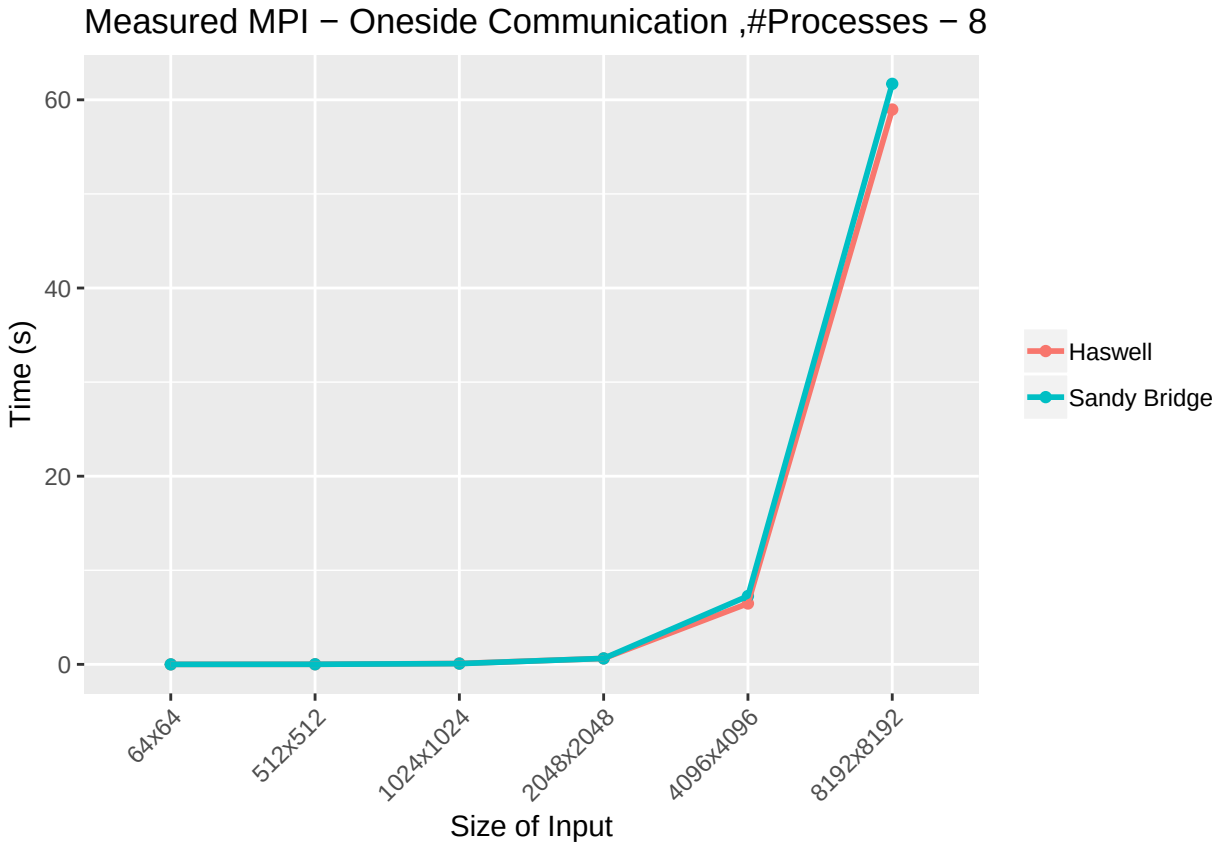

Measured Compute − Oneside Communication ,Size of Input − 1024x1024
Time (s)
0.04
0.03
0.02
0.01
8
16
32
64
#Processes
Haswell
Sandy Bridge

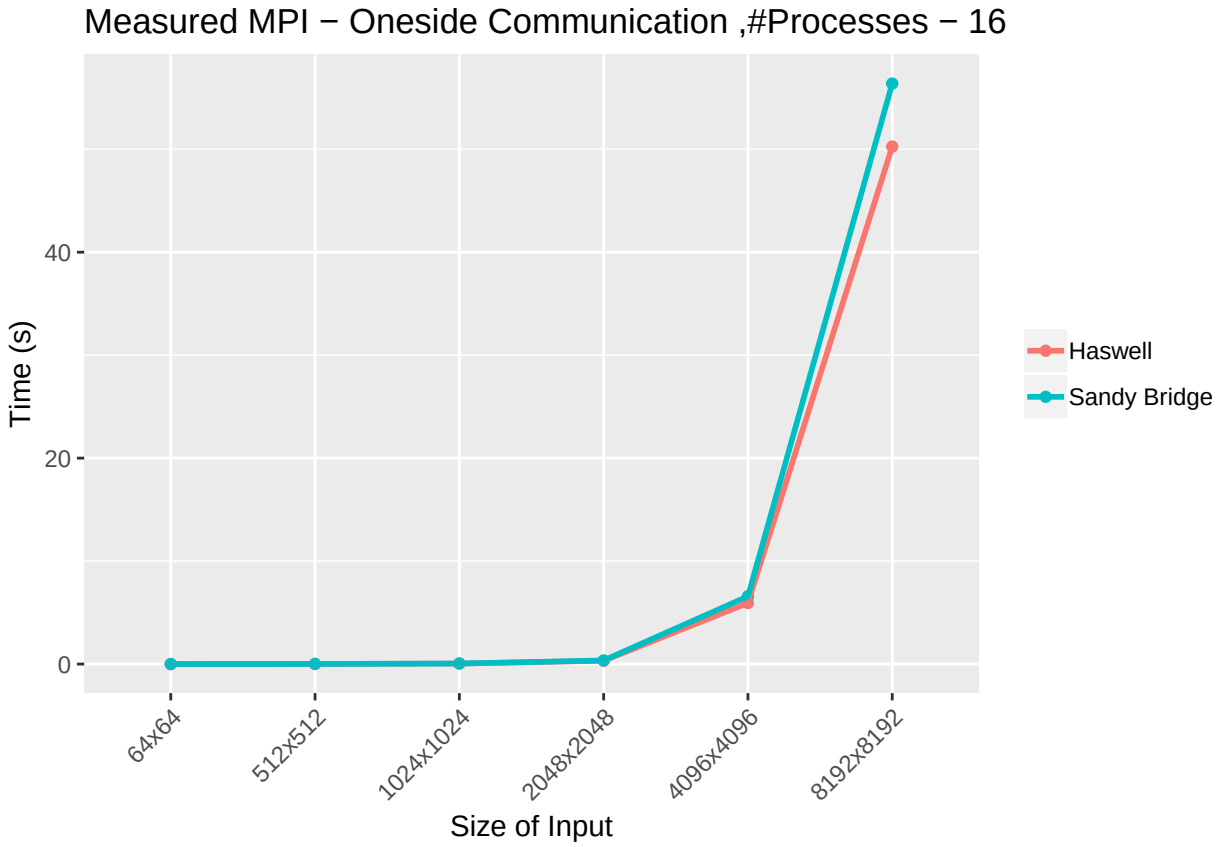

Measured Compute − Oneside Communication ,Size of Input − 2048x2048
Time (s)
0.3
0.2
0.1
8
16
32
64
#Processes
Haswell
Sandy Bridge

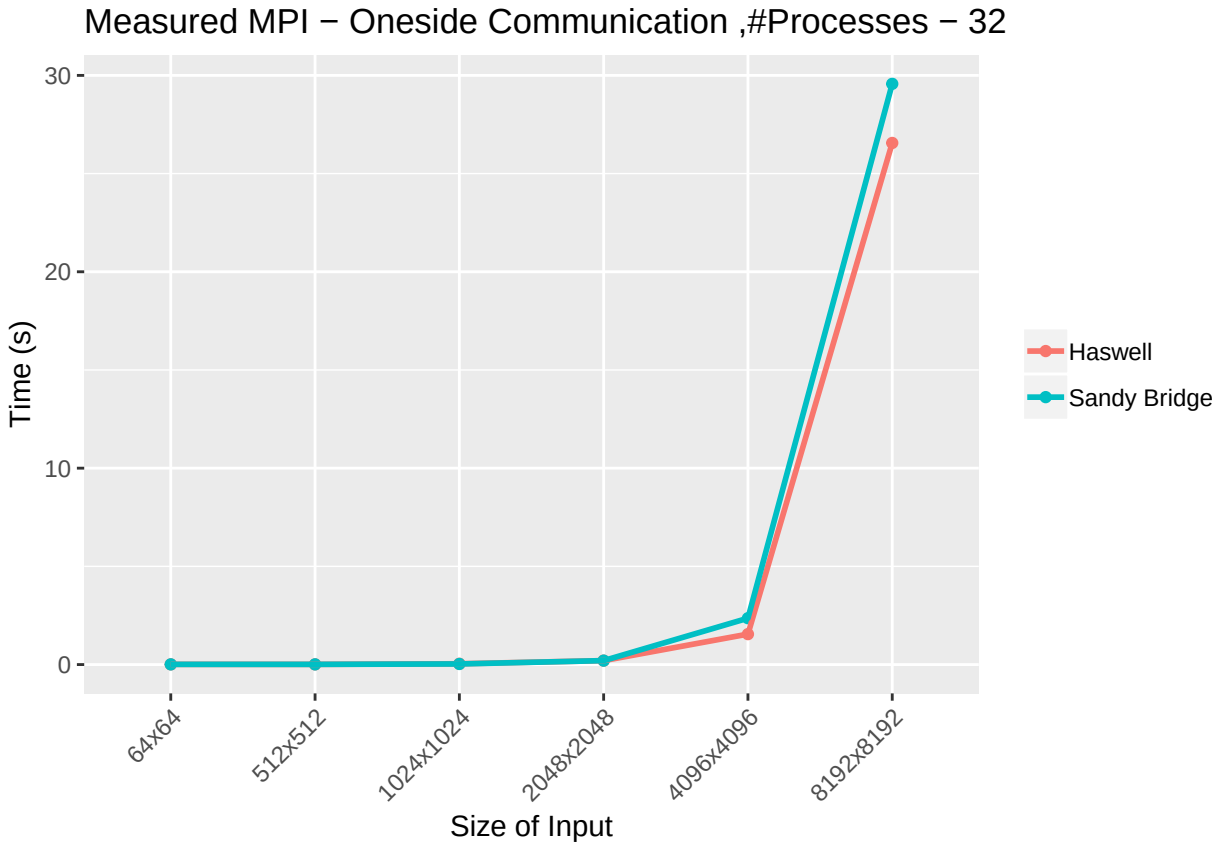

Measured Compute − Oneside Communication ,Size of Input − 4096x4096
Time (s)
4
3
2
1
8
16
32
64
#Processes
Haswell
Sandy Bridge

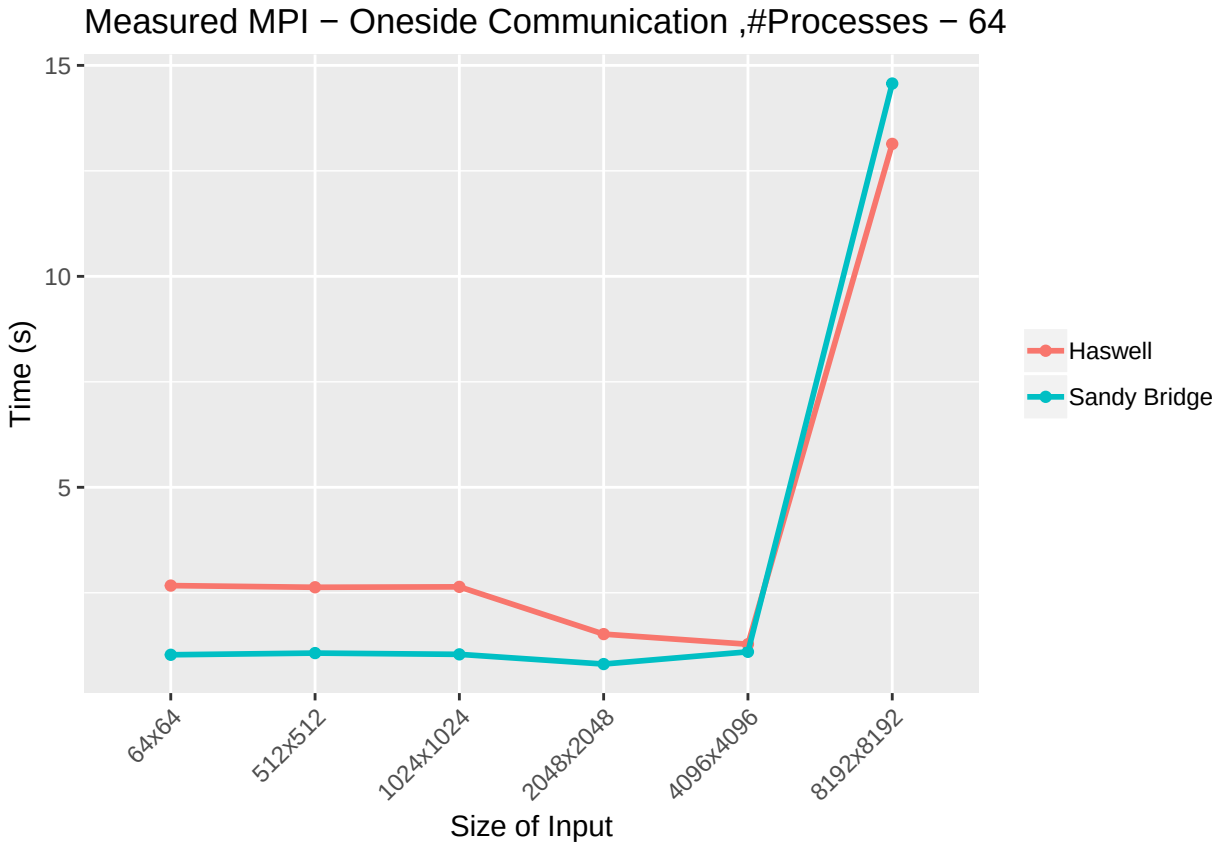

Measured Compute − Oneside Communication ,Size of Input − 8192x8192
Time (s)
30
20
10
8
16
32
64
#Processes
Haswell
Sandy Bridge

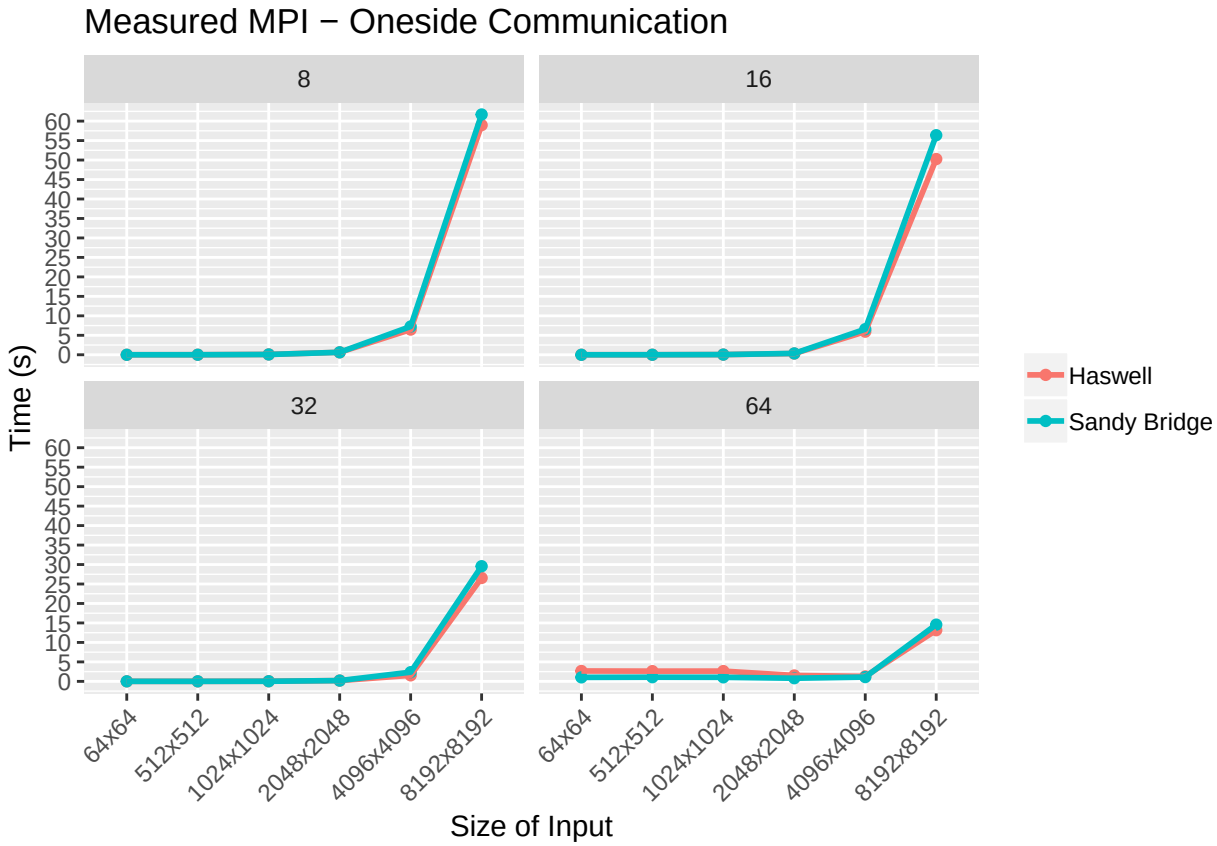

Measured Compute − Oneside Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
35
30
25
20
15
10
5
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

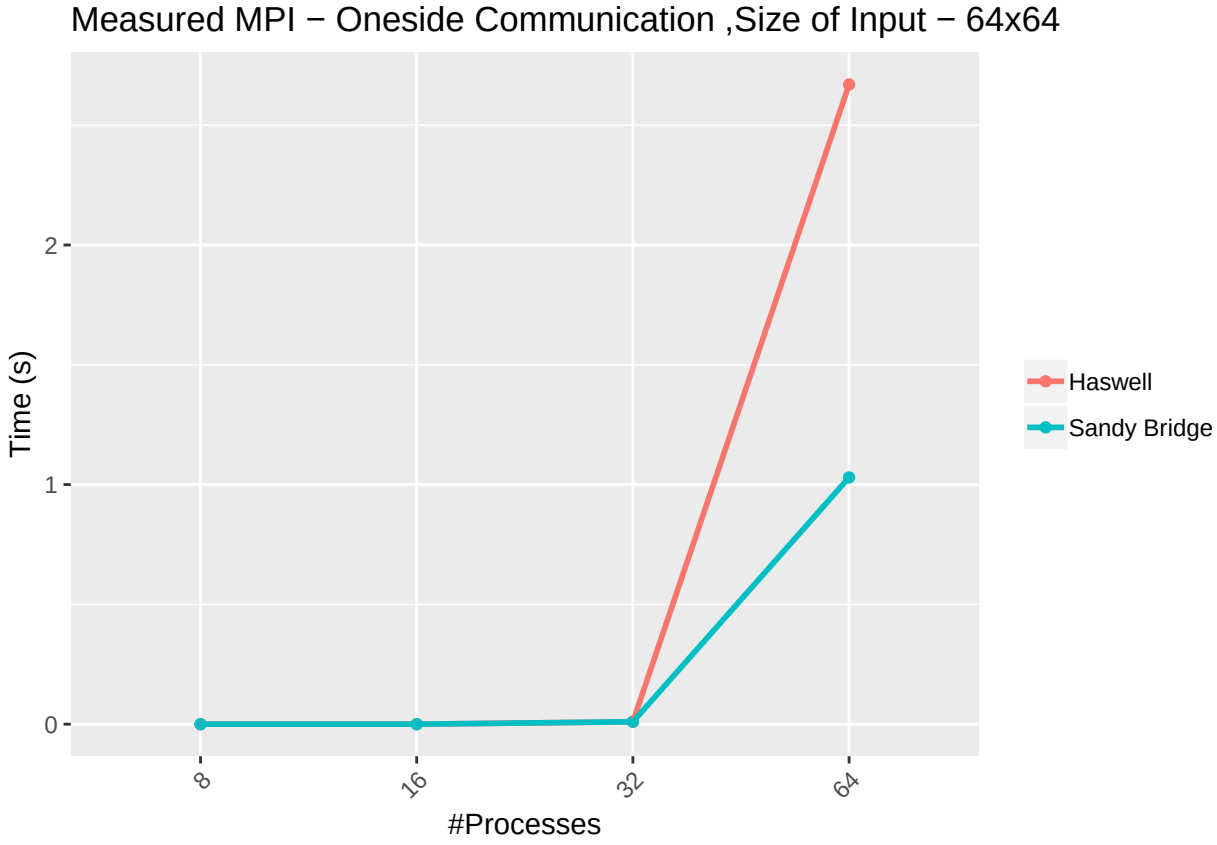

Measured MPI − Oneside Communication ,#Processes − 8
Time (s)
60
40
20
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

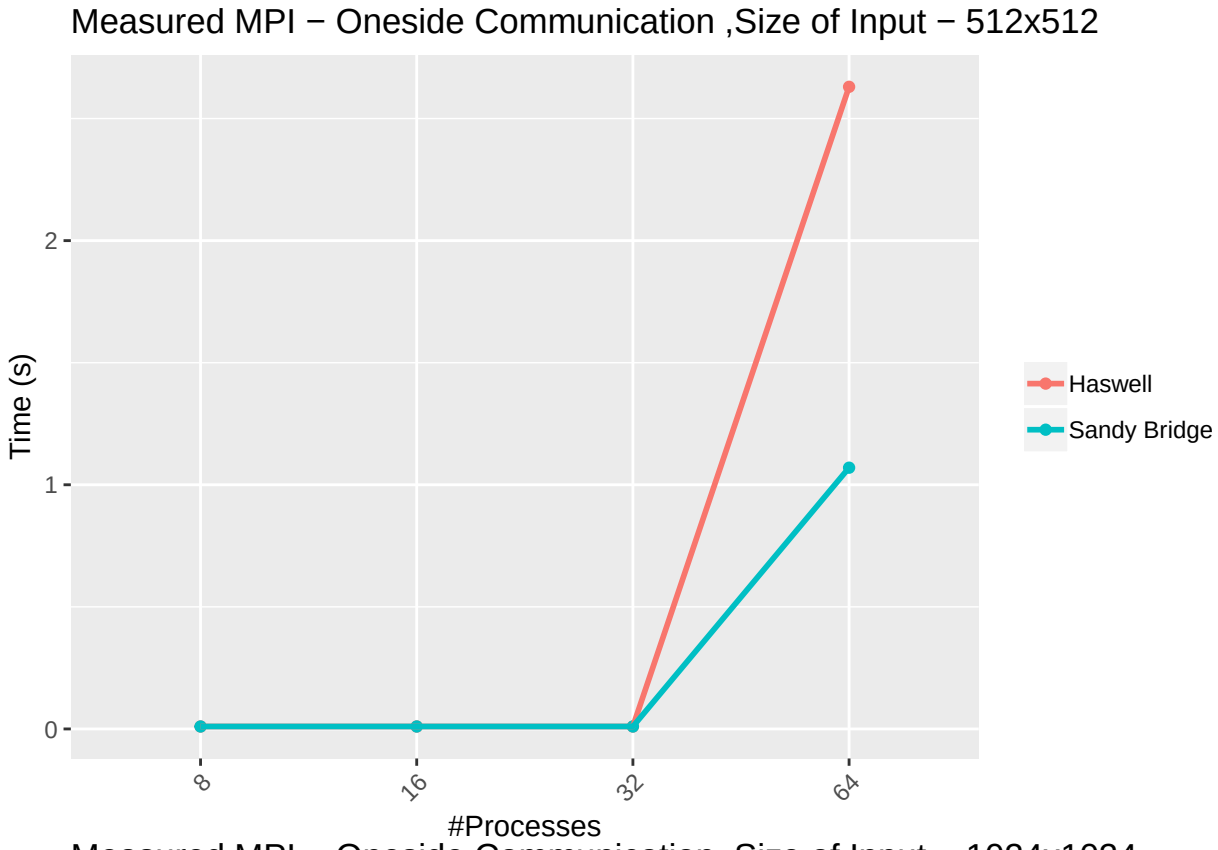

Measured MPI − Oneside Communication ,#Processes − 16
Time (s)
40
20
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

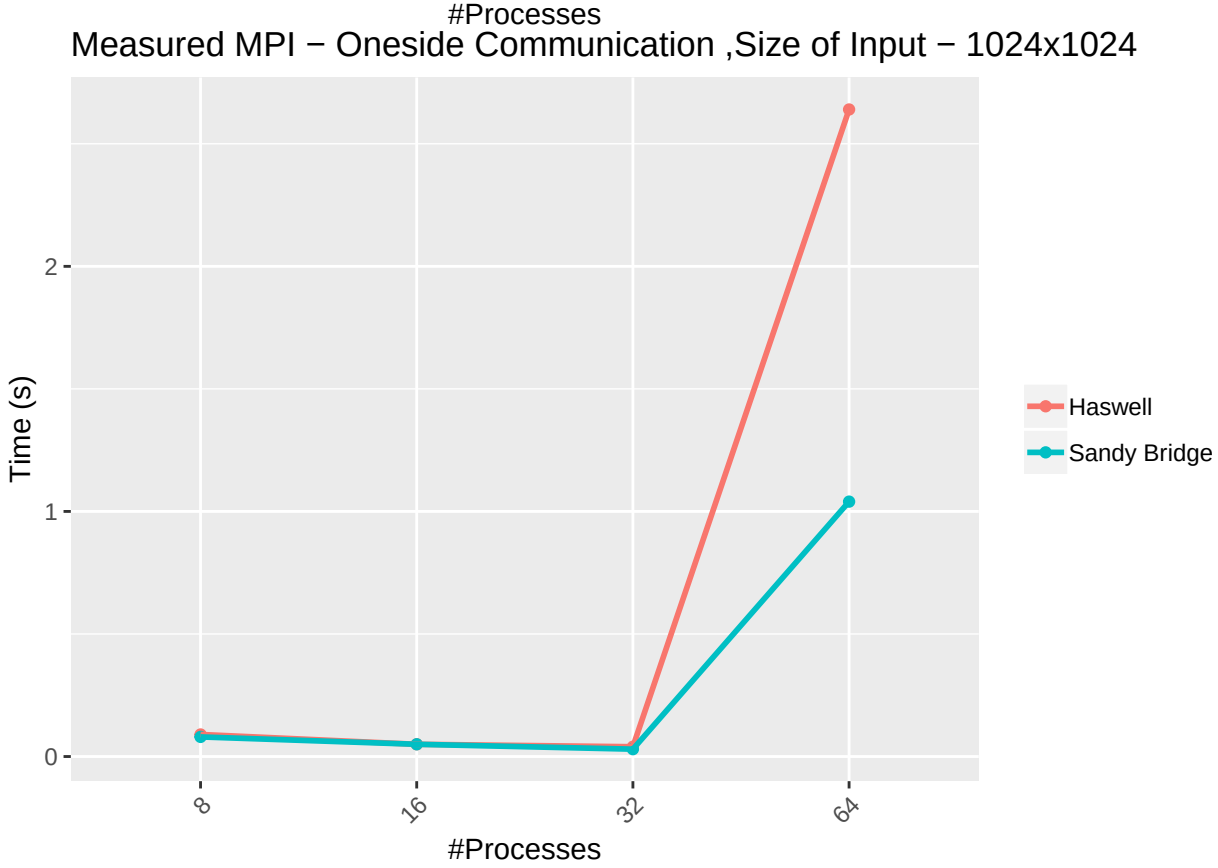

Measured MPI − Oneside Communication ,#Processes − 32
Time (s)
30
20
10
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

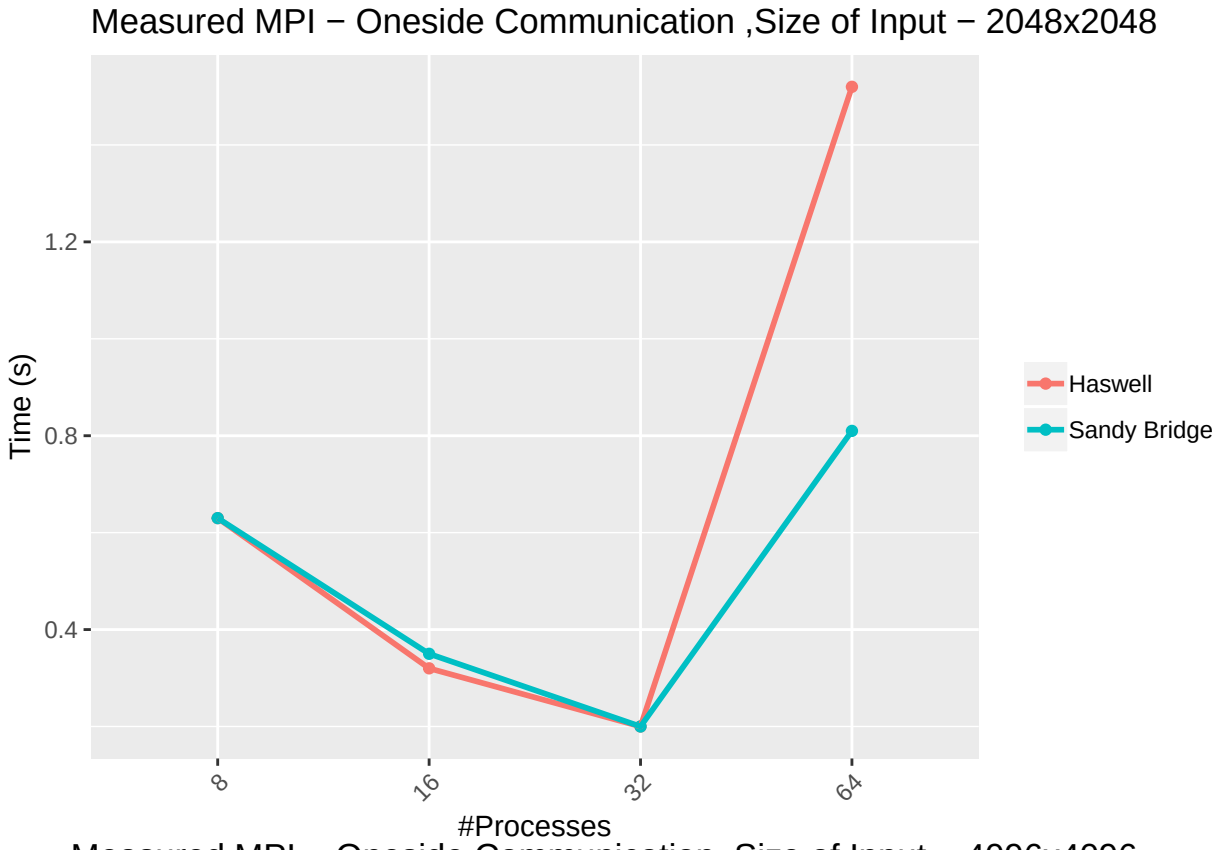

Measured MPI − Oneside Communication ,#Processes − 64
Time (s)
15
10
5
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

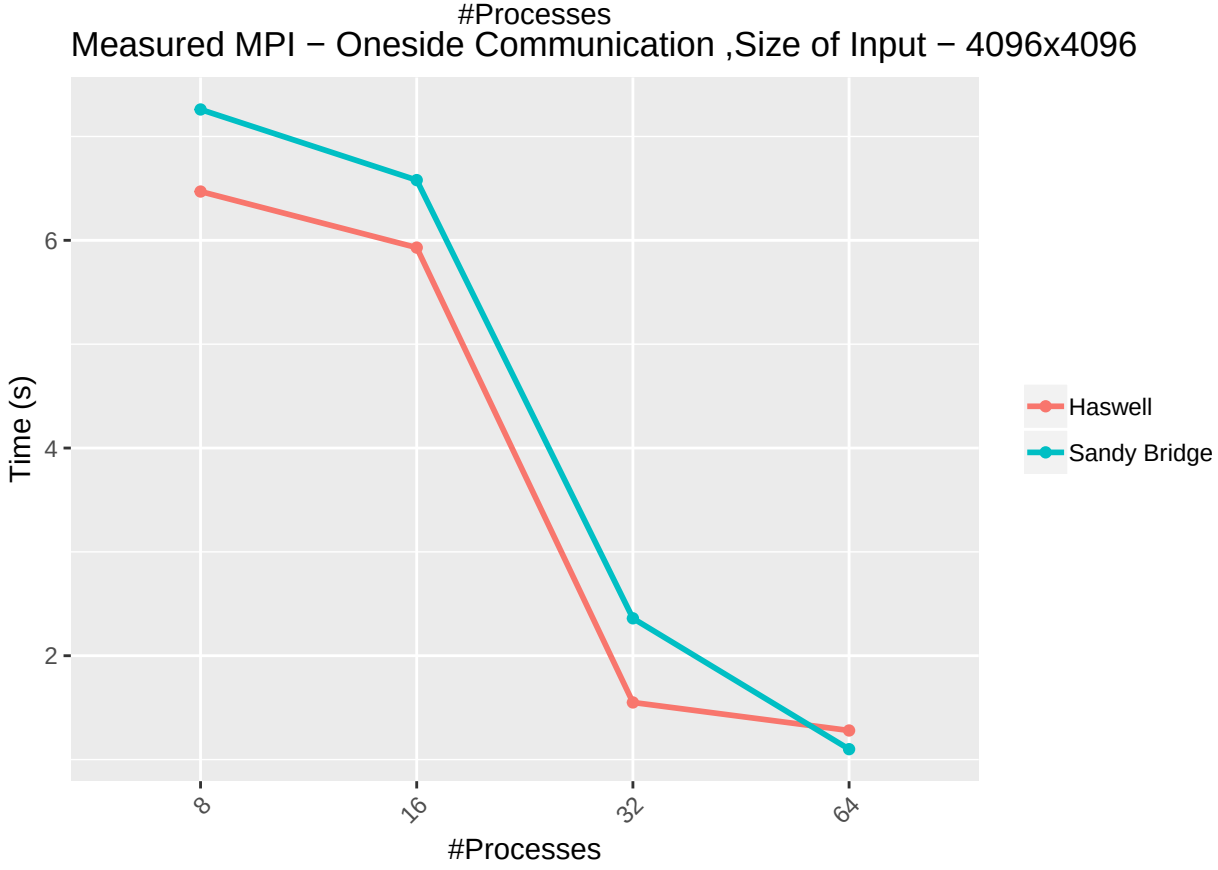

Measured MPI − Oneside Communication
8
16
32
64
Time (s)
0
5
10
15
20
25
30
35
40
45
50
55
60
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

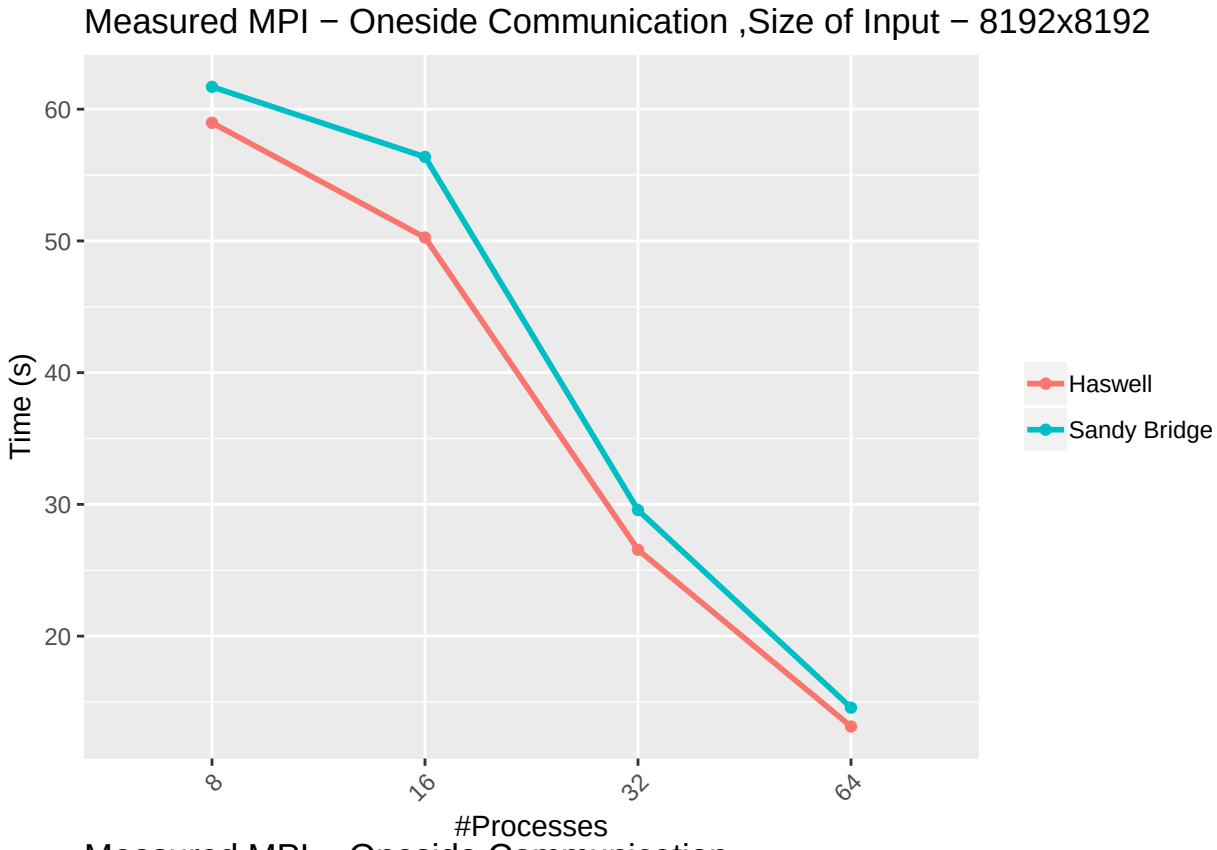

Measured MPI − Oneside Communication ,Size of Input − 64x64
Time (s)
0
1
2
8
16
32
64
#Processes
Haswell
Sandy Bridge

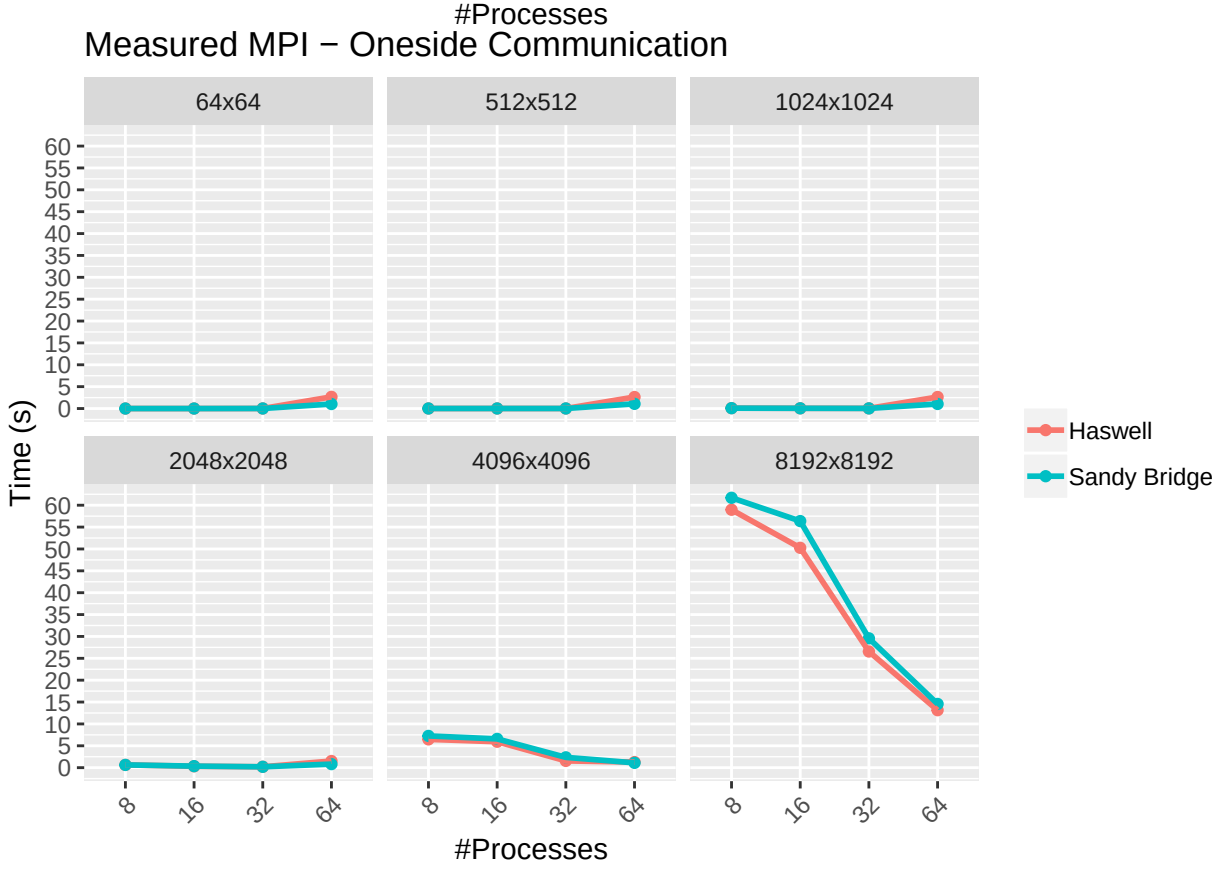

Measured MPI − Oneside Communication ,Size of Input − 512x512
Time (s)
0
1
2
8
16
32
64
#Processes
Haswell
Sandy Bridge

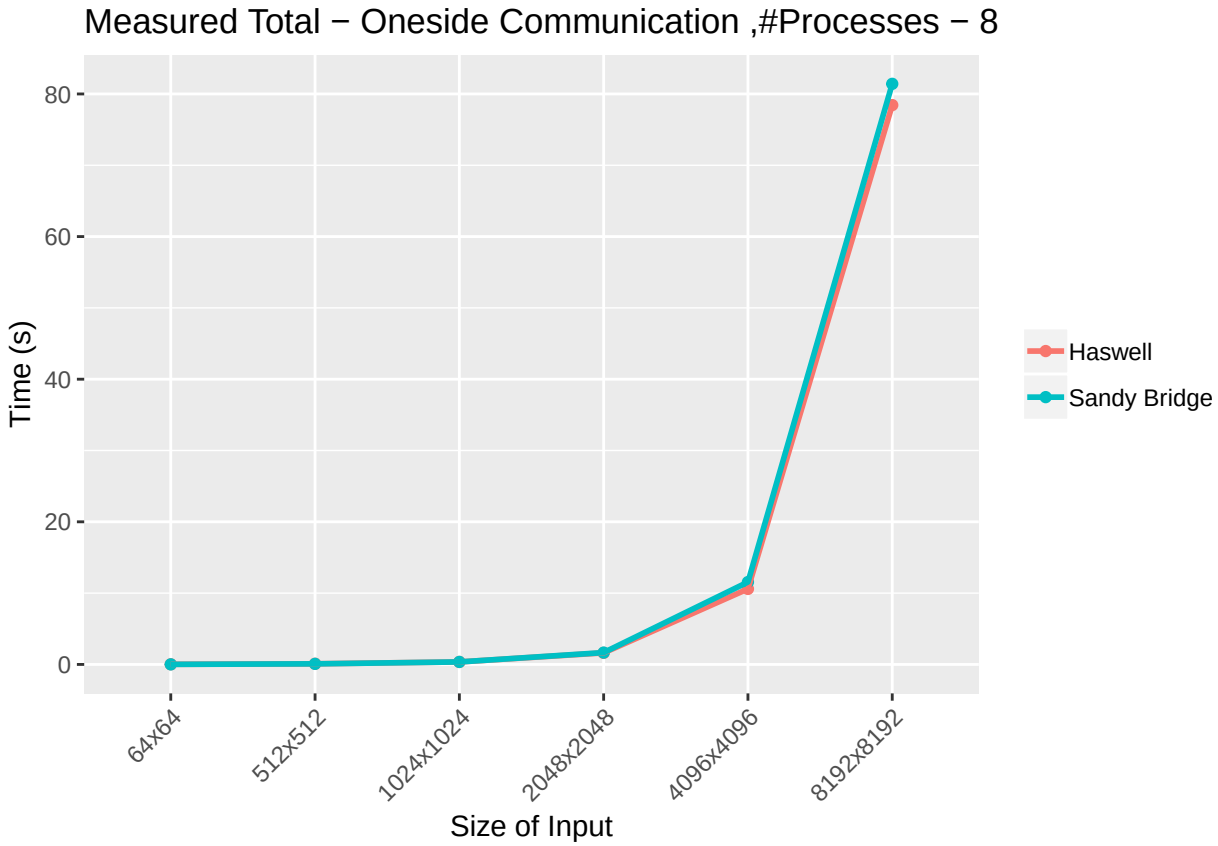

Measured MPI − Oneside Communication ,Size of Input − 1024x1024
Time (s)
0
1
2
8
16
32
64
#Processes
Haswell
Sandy Bridge

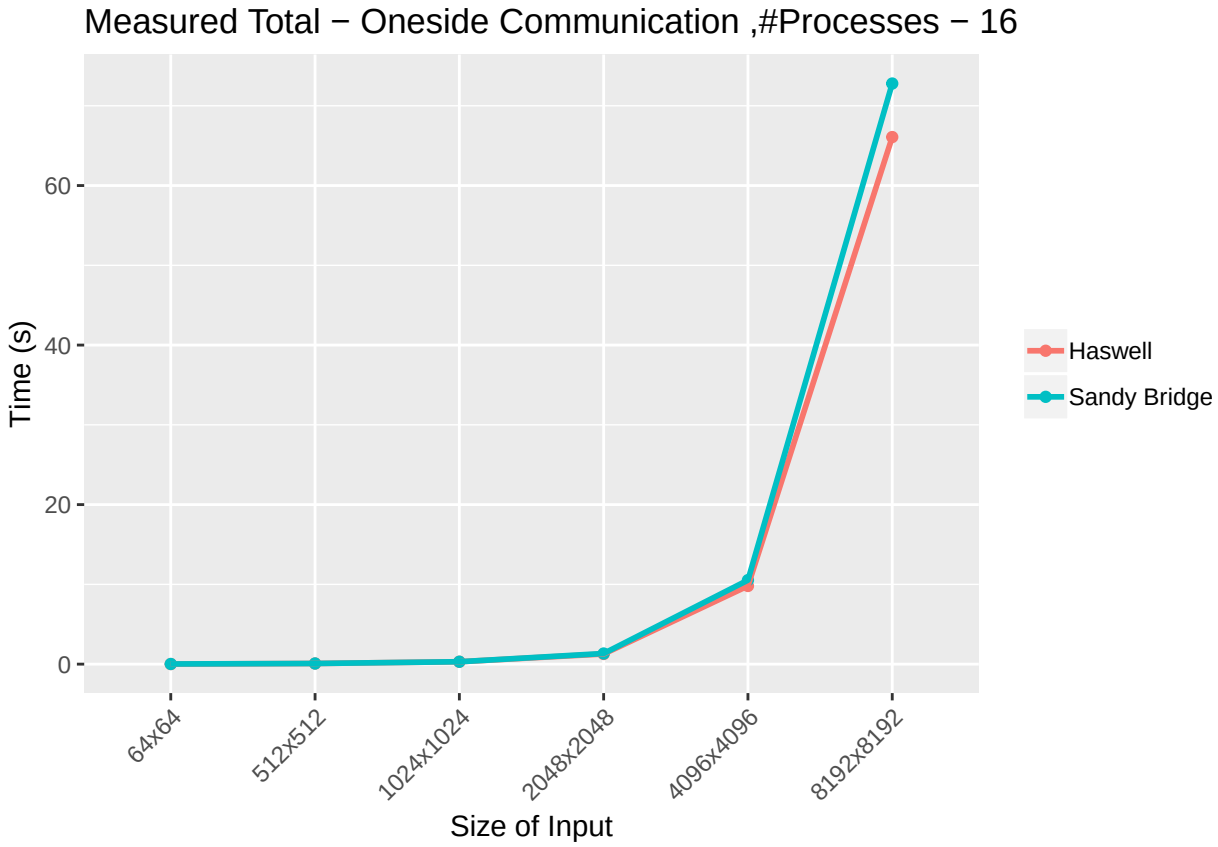

Measured MPI − Oneside Communication ,Size of Input − 2048x2048
Time (s)
1.2
0.8
0.4
8
16
32
64
#Processes
Haswell
Sandy Bridge

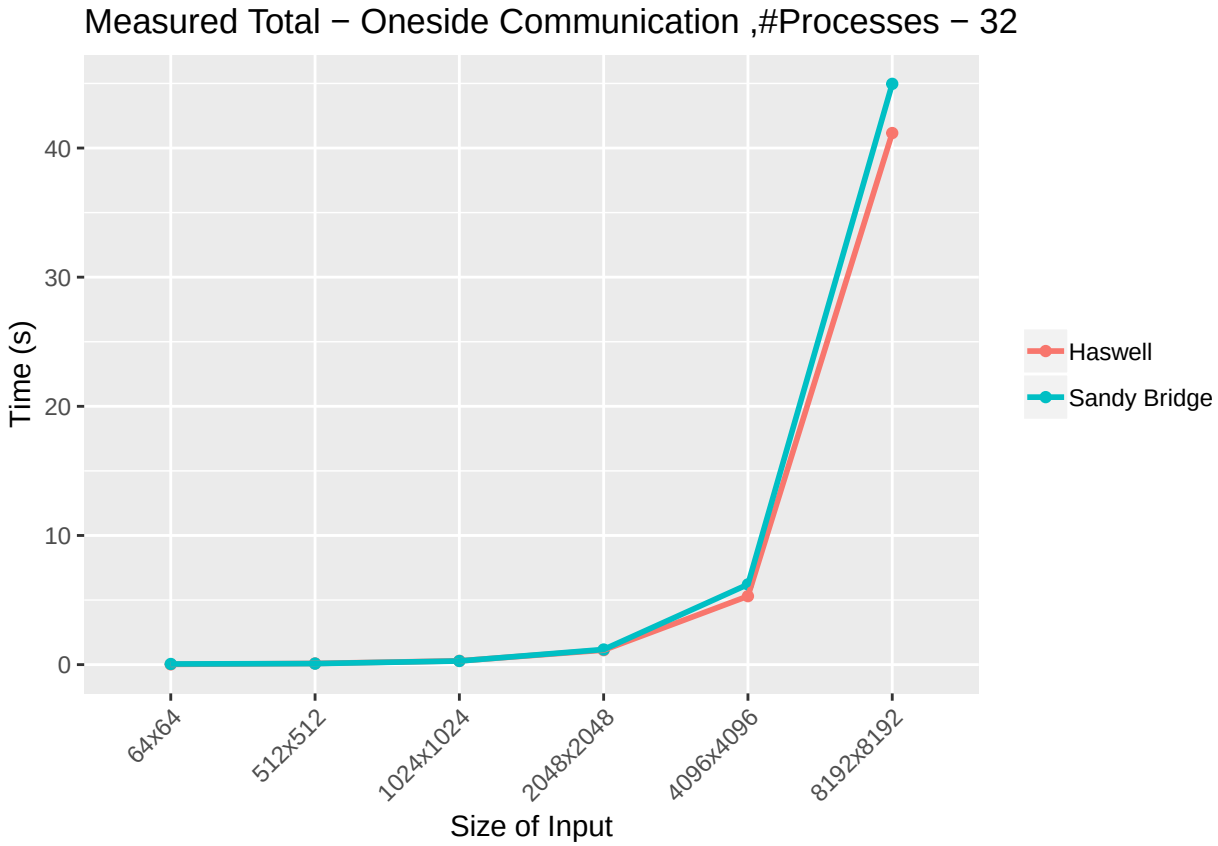

Measured MPI − Oneside Communication ,Size of Input − 4096x4096
Time (s)
6
4
2
8
16
32
64
#Processes
Haswell
Sandy Bridge

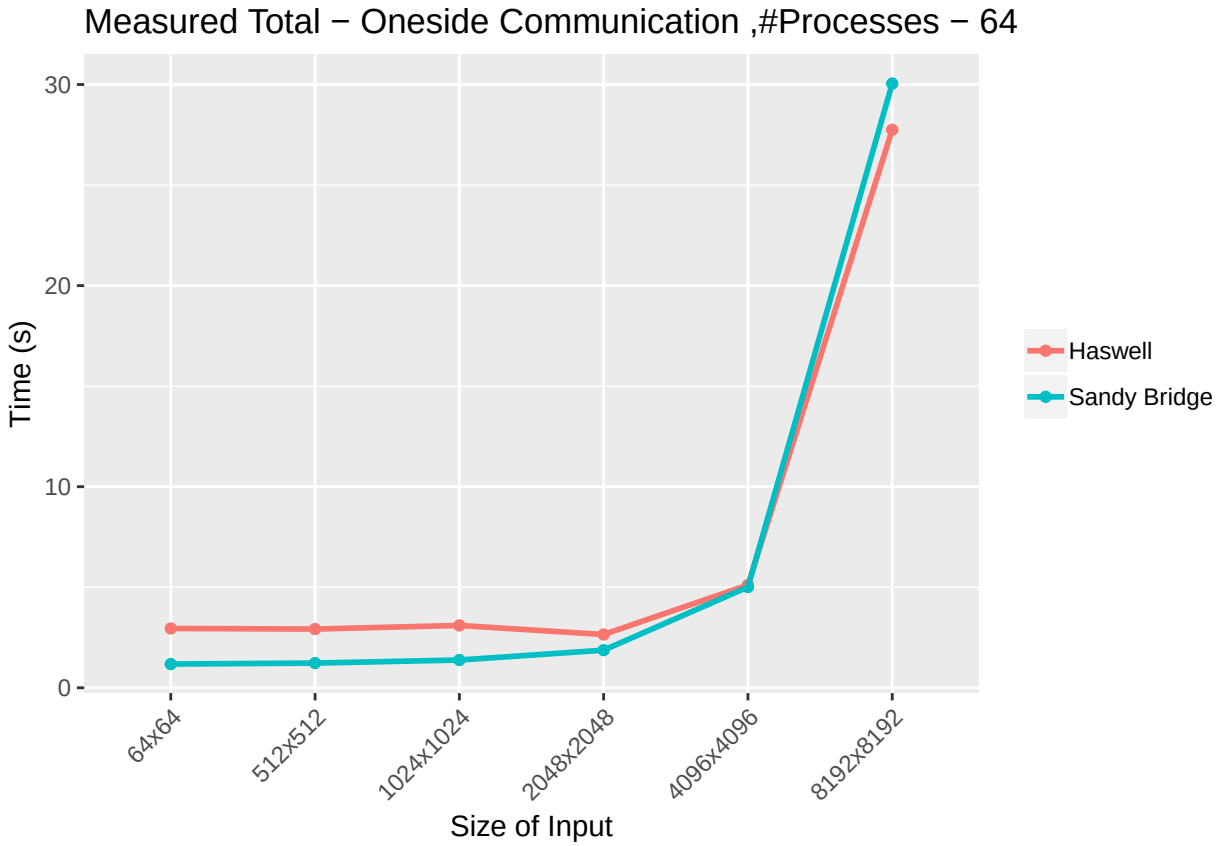

Measured MPI − Oneside Communication ,Size of Input − 8192x8192
Time (s)
60
50
40
30
20
8
16
32
64
#Processes
Haswell
Sandy Bridge

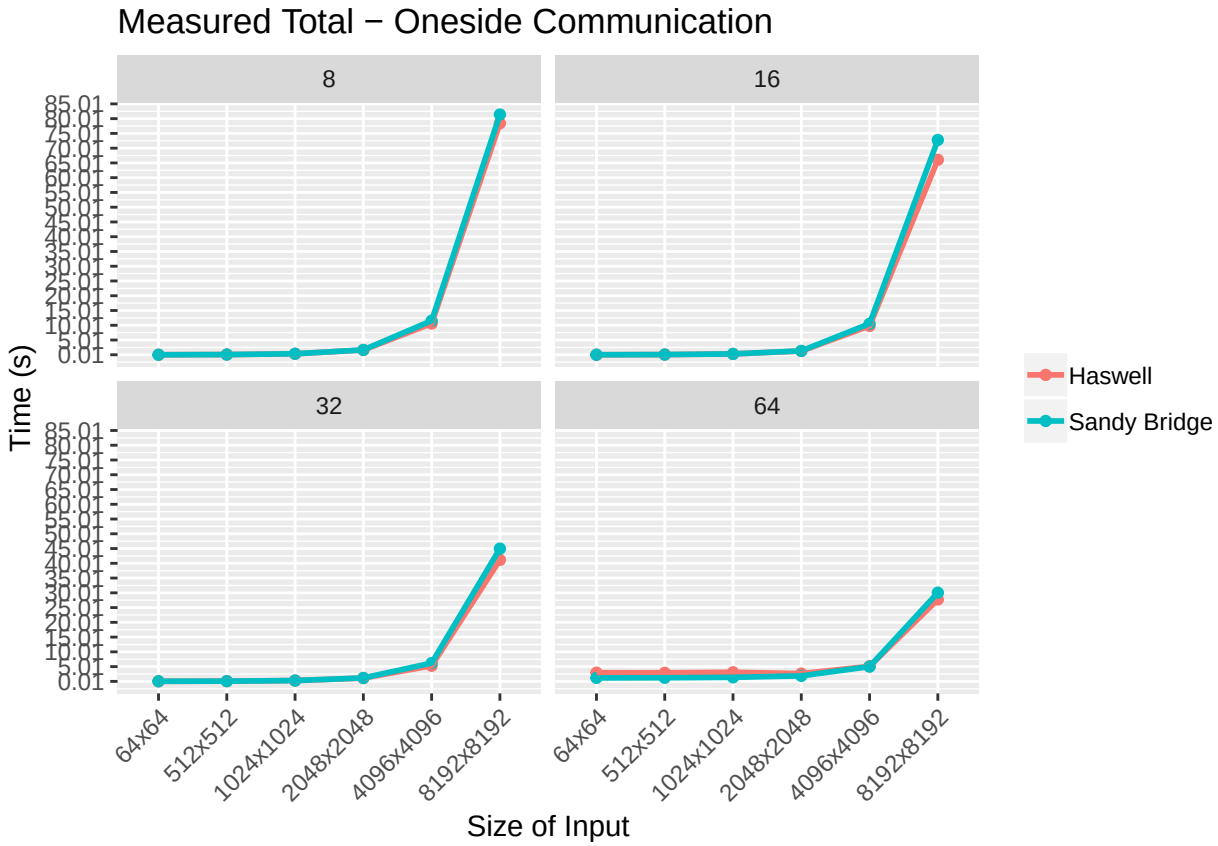

Measured MPI − Oneside Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
60
55
50
45
40
35
30
25
20
15
10
5
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

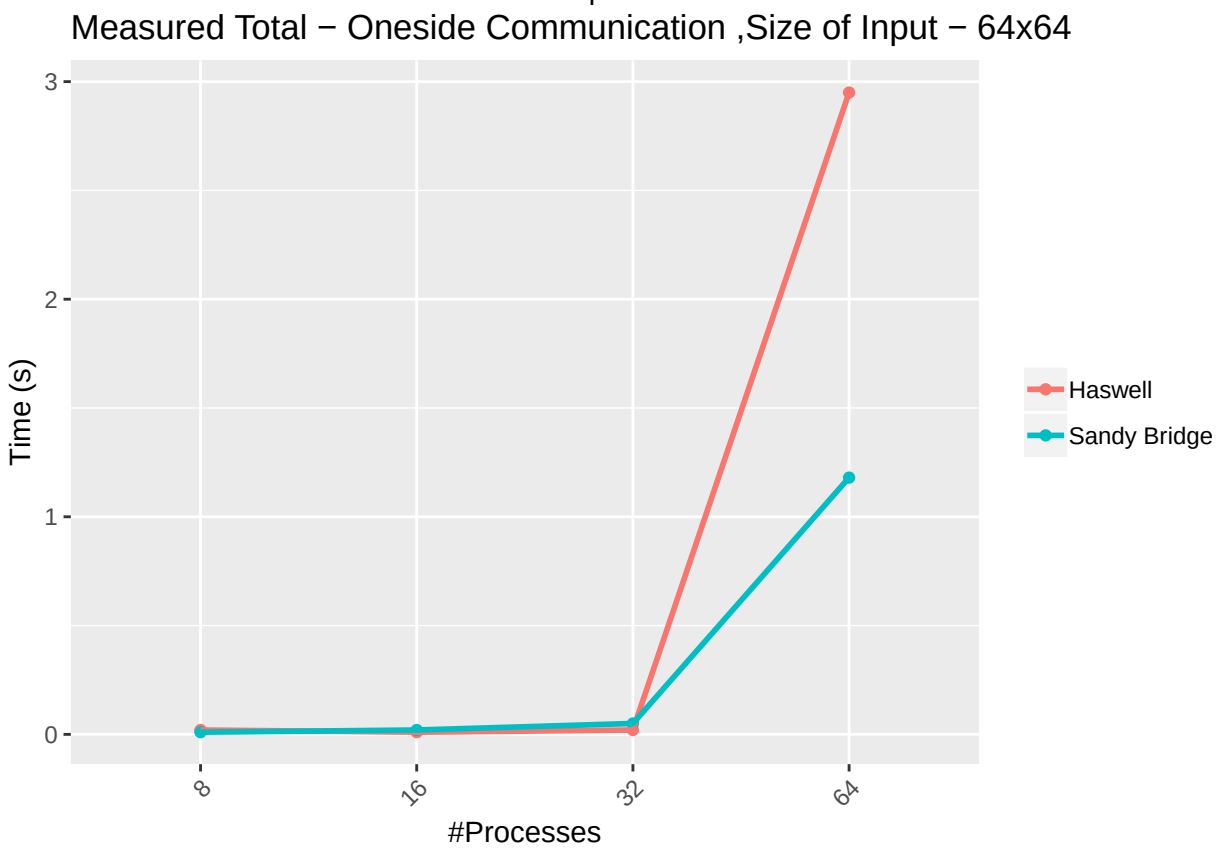

Measured Total − Oneside Communication ,#Processes − 8
Time (s)
80
60
40
20
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

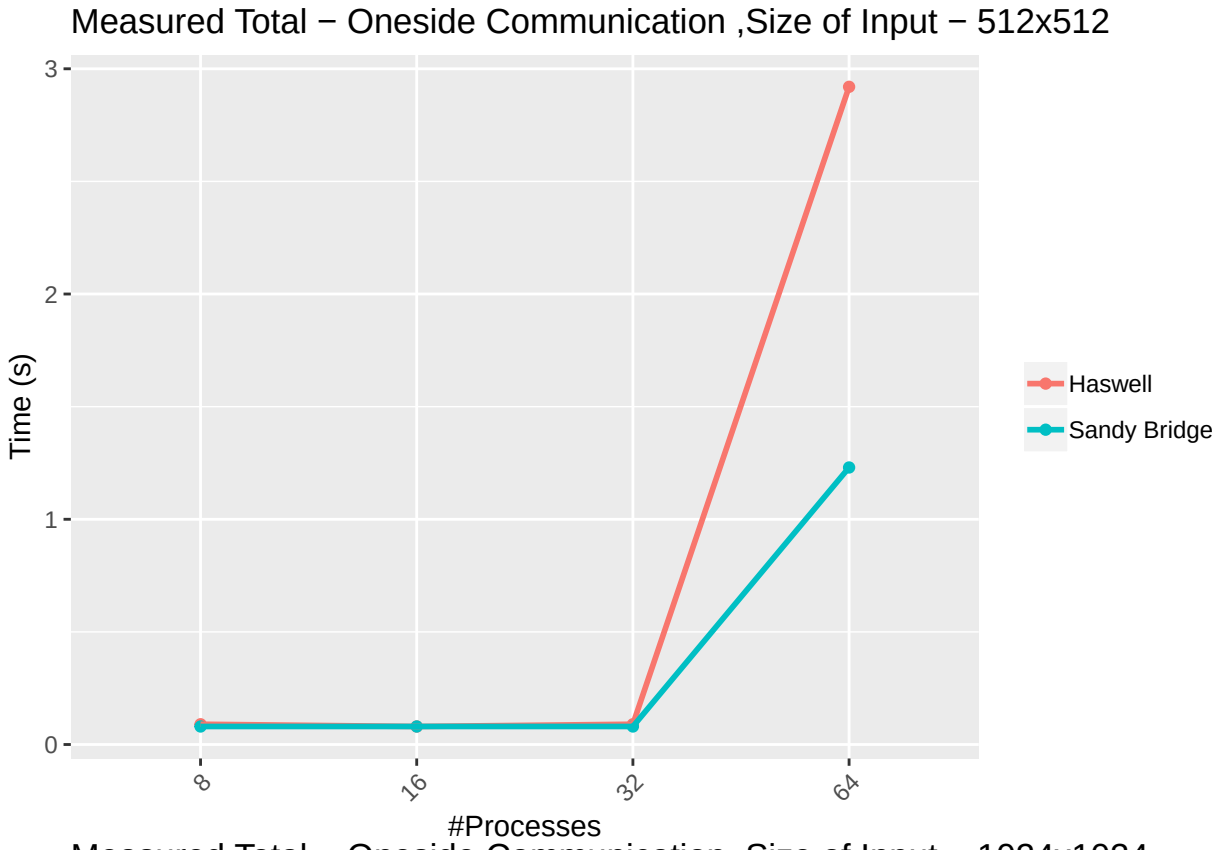

Measured Total − Oneside Communication ,#Processes − 16
Time (s)
60
40
20
0
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

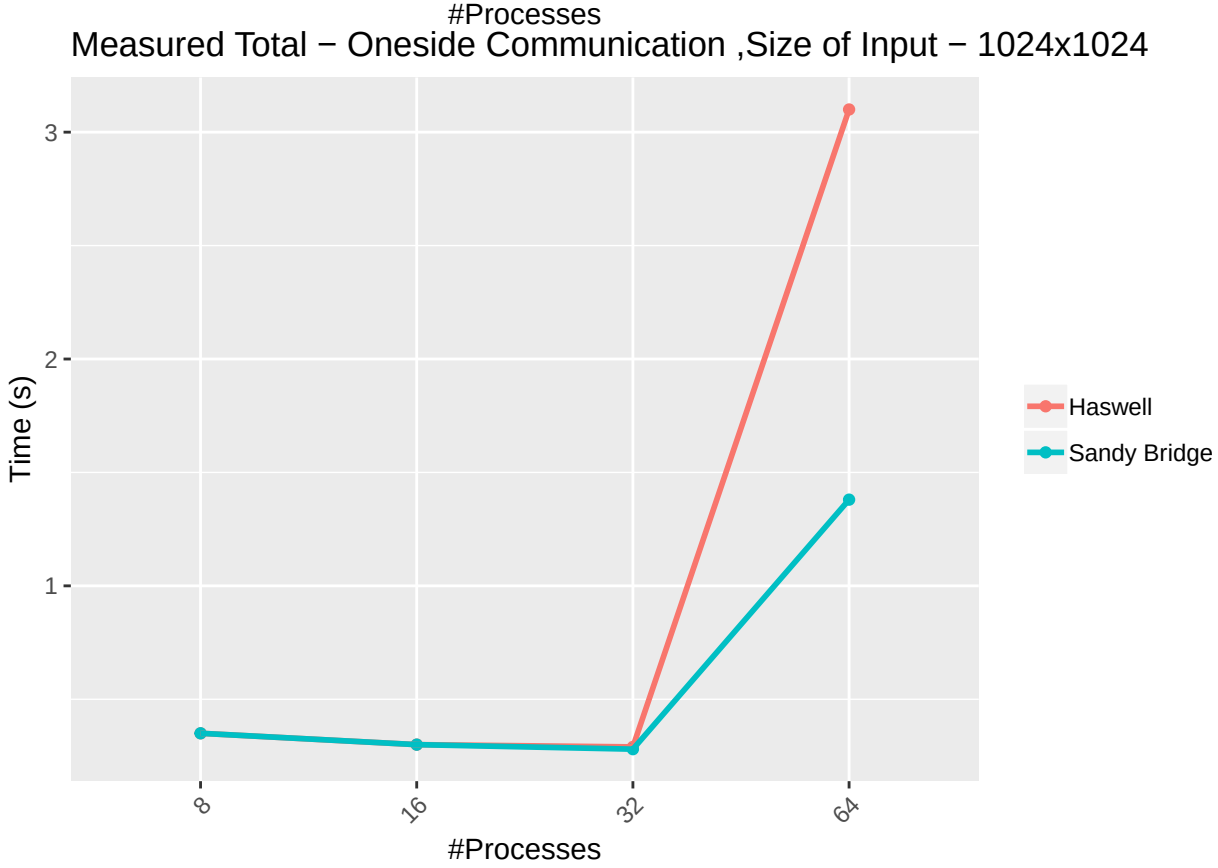

Measured Total − Oneside Communication ,#Processes − 32
Time (s)
0
10
20
30
40
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge


Measured Total − Oneside Communication ,#Processes − 64
Time (s)
0
10
20
30
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

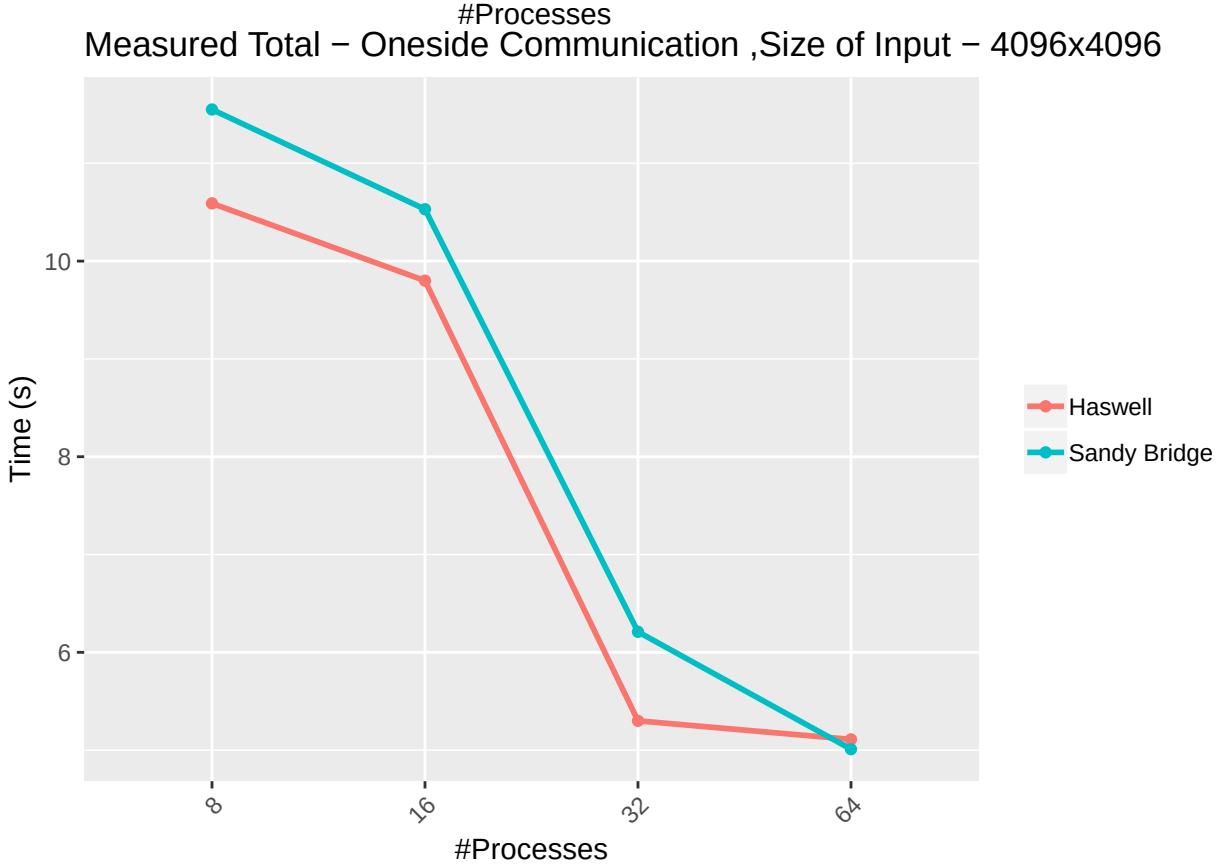

Measured Total − Oneside Communication
8
16
32
64
Time (s)
85.01
80.01
75.01
70.01
65.01
60.01
55.01
50.01
45.01
40.01
35.01
30.01
25.01
20.01
15.01
10.01
5.01
0.01
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Size of Input
Haswell
Sandy Bridge

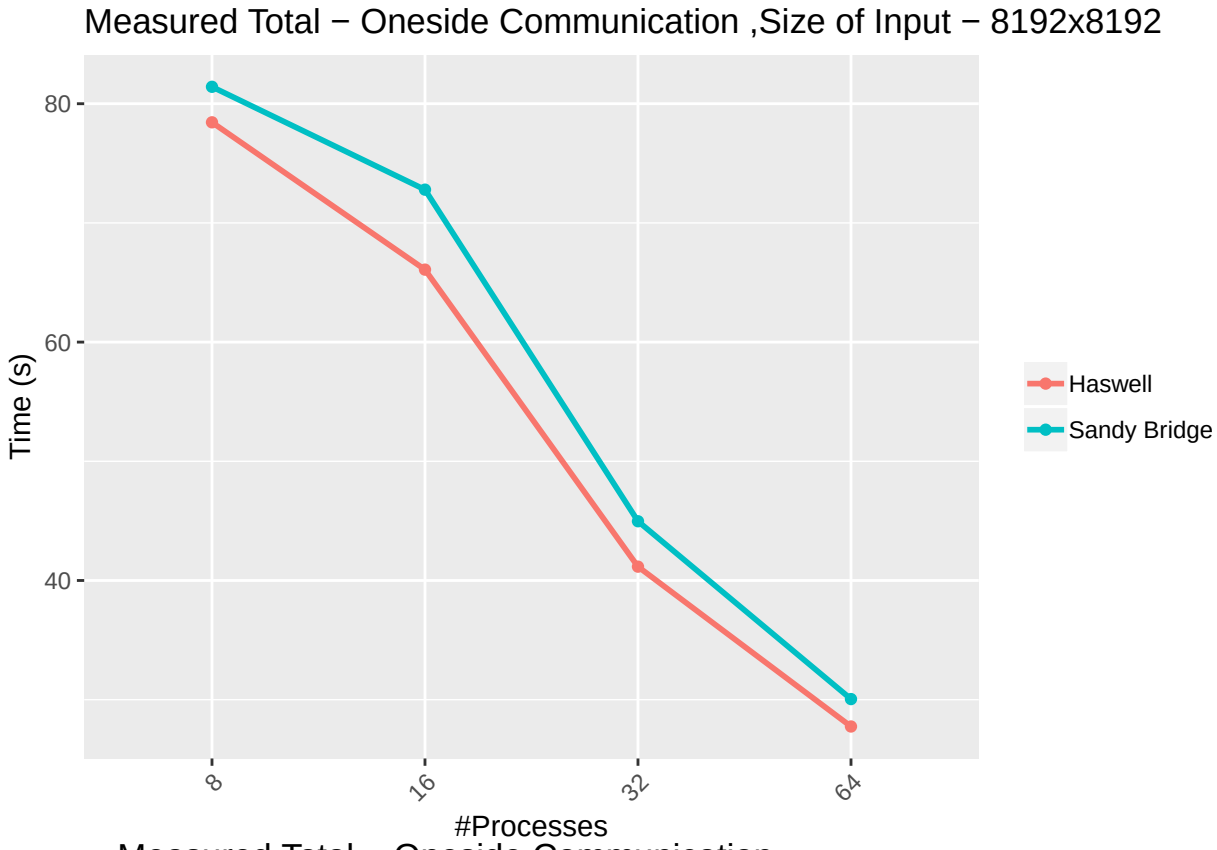

Measured Total − Oneside Communication ,Size of Input − 64x64
Time (s)
3
2
1
0
8
16
32
64
#Processes
Haswell
Sandy Bridge

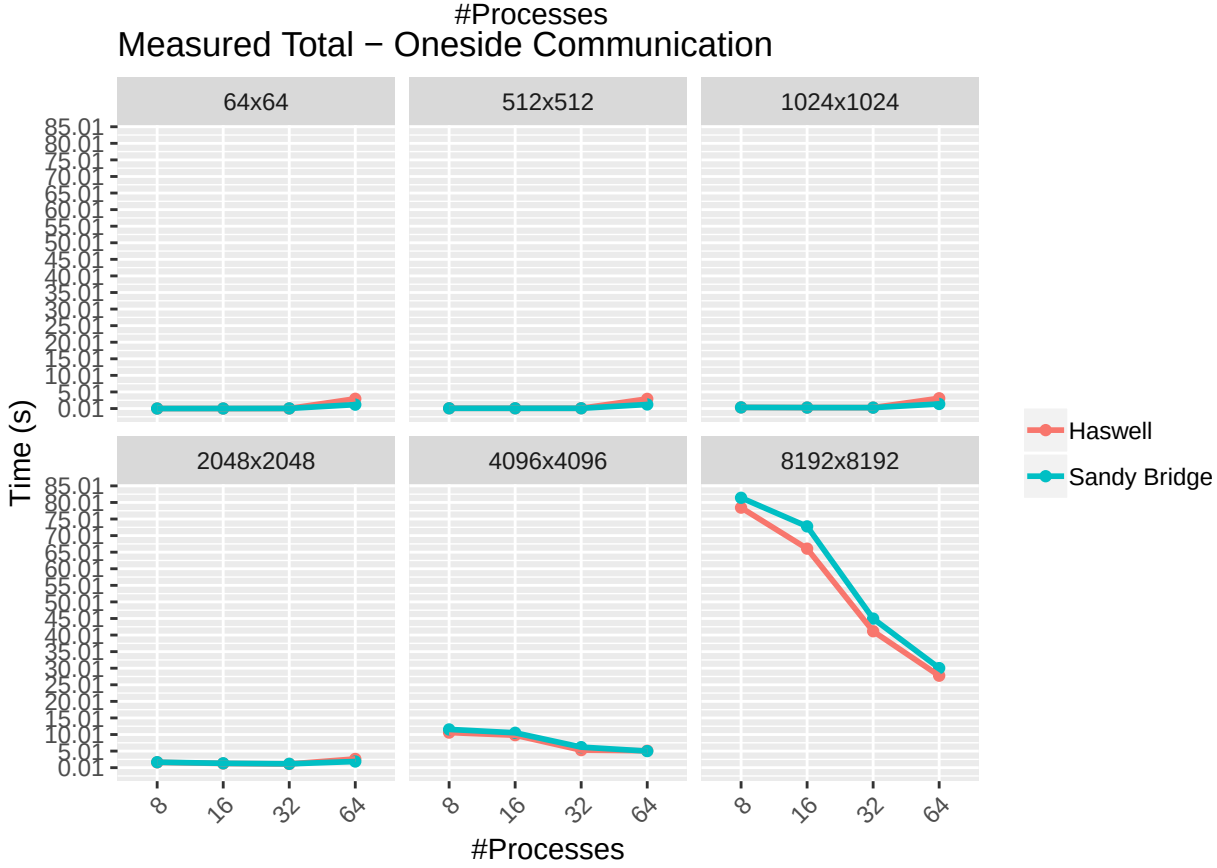

Measured Total − Oneside Communication ,Size of Input − 512x512
Time (s)
3
2
1
0
8
16
32
64
#Processes
Haswell
Sandy Bridge


Measured Total − Oneside Communication ,Size of Input − 1024x1024
Time (s)
3
2
1
8
16
32
64
#Processes
Haswell
Sandy Bridge


Measured Total − Oneside Communication ,Size of Input − 2048x2048
Time (s)
2.5
2.0
1.5
8
16
32
64
#Processes
Haswell
Sandy Bridge


Measured Total − Oneside Communication ,Size of Input − 4096x4096
Time (s)
10
8
6
8
16
32
64
#Processes
Haswell
Sandy Bridge


Measured Total − Oneside Communication ,Size of Input − 8192x8192
Time (s)
80
60
40
8
16
32
64
#Processes
Haswell
Sandy Bridge


Measured Total − Oneside Communication
64x64
512x512
1024x1024
2048x2048
4096x4096
8192x8192
Time (s)
85.01
80.01
75.01
70.01
65.01
60.01
55.01
50.01
45.01
40.01
35.01
30.01
25.01
20.01
15.01
10.01
5.01
0.01
8
16
32
64
#Processes
Haswell
Sandy Bridge