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# Understanding applications with Paraver

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# My MPI App

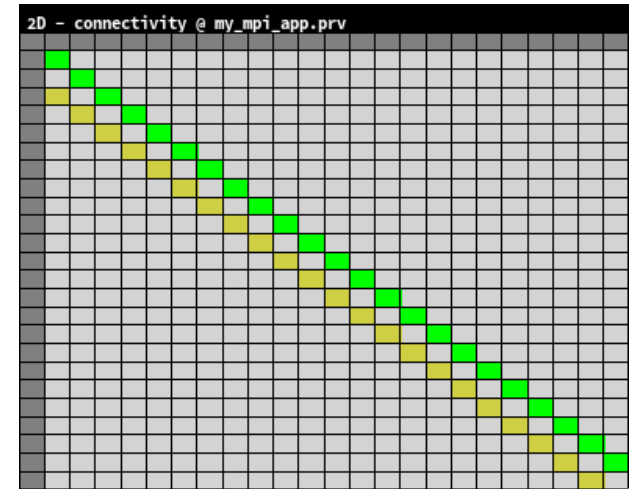
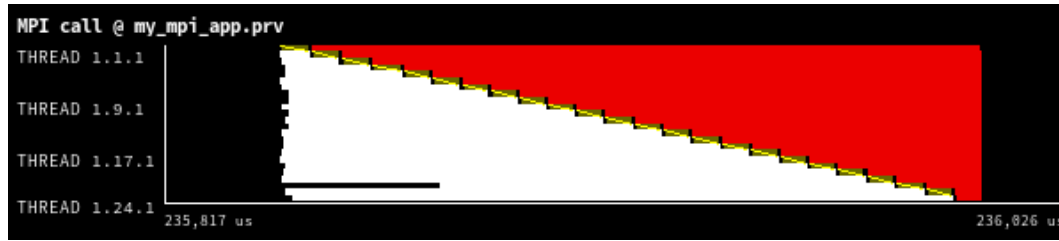
Replicating some frequent  
bad performance patterns



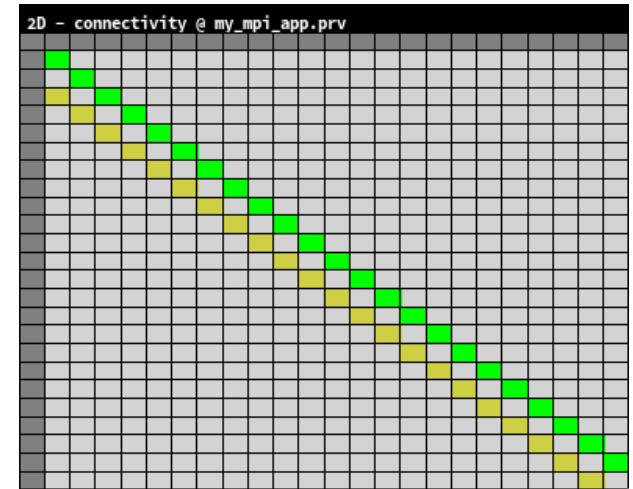
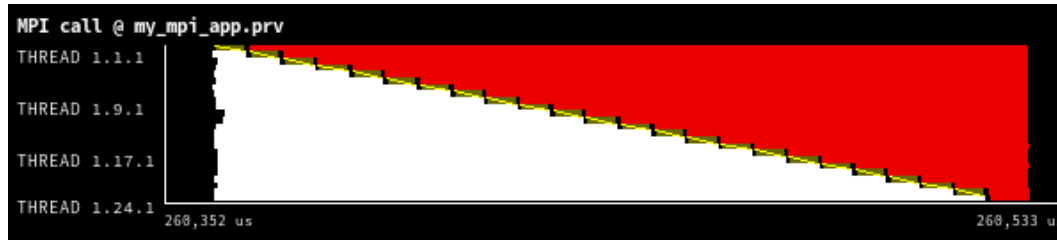
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# My MPI App – Pattern 1

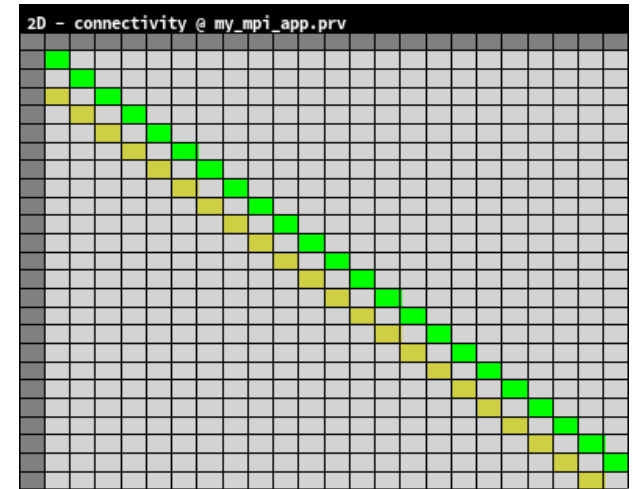


# My MPI App – Pattern 1



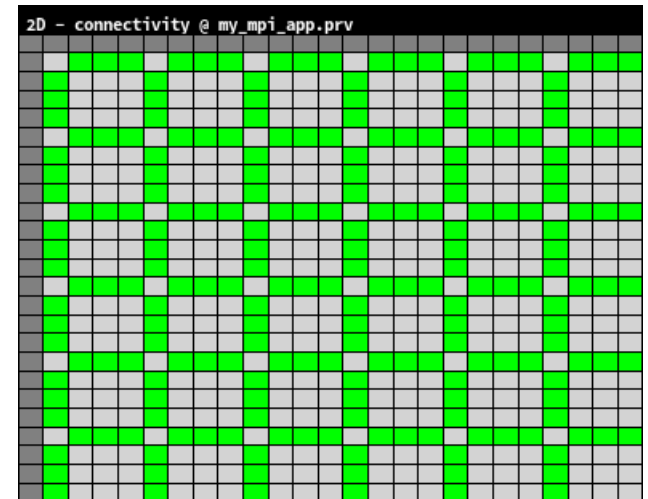
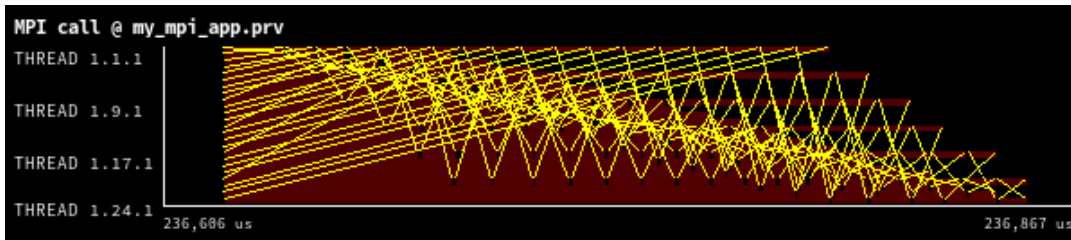
```
if (rank .eq. 0) then
  call MPI_Bsend(r, rank+1)
else
  call MPI_Recv(r2, MPI_ANY_SOURCE)
  if (rank .lt. biggest_rank) then
    call MPI_Bsend(r, rank+1)
  end if
end if
call MPI_Barrier(MPI_COMM_WORLD, error)
```

# My MPI App revisited – Pattern 1

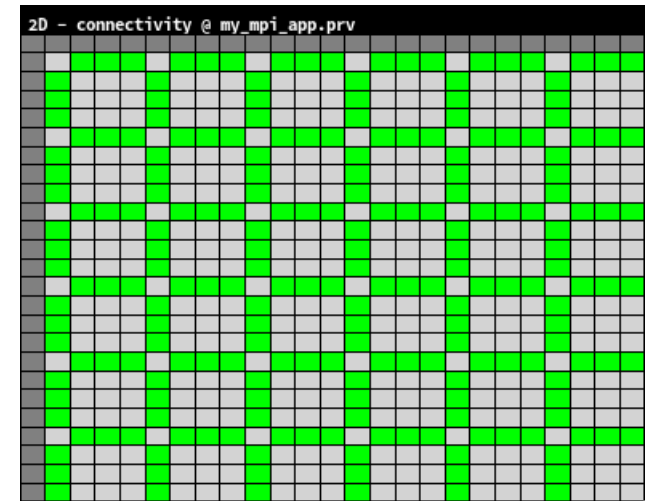
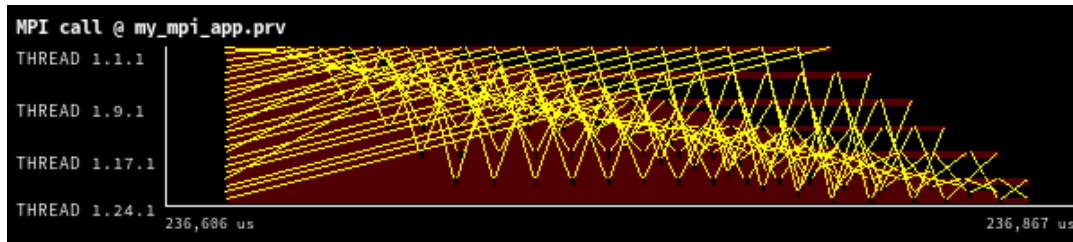


```
if (rank .lt. biggest_rank) then
    call MPI_Isend(r, rank+1)
end if
if (rank .gt. 0) then
    call MPI_Recv(r2, rank-1)
end if
call MPI_Barrier(MPI_COMM_WORLD, error)
```

# My MPI App – Pattern 2



# My MPI App – Pattern 2



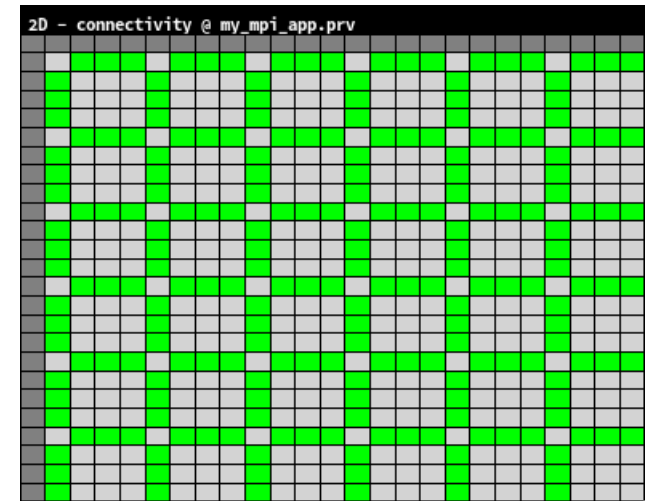
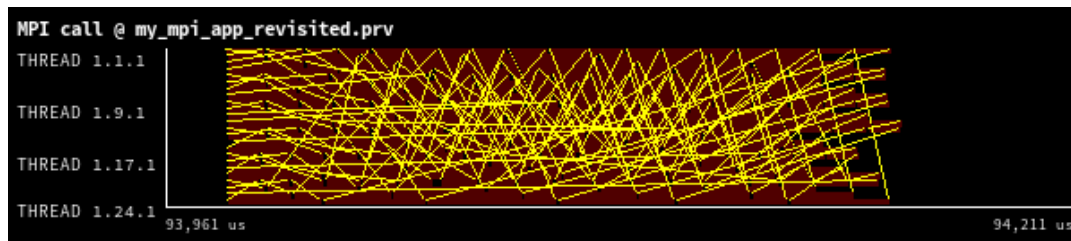
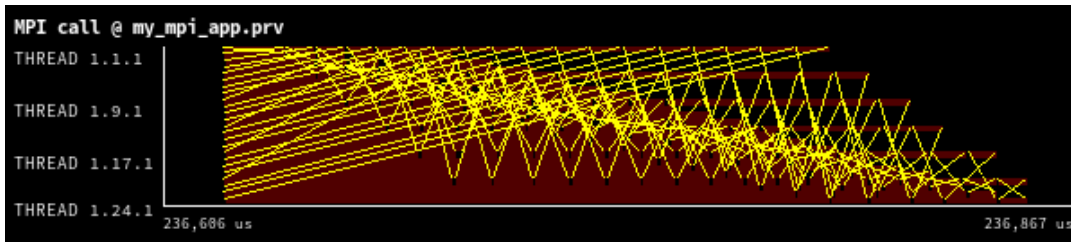
```

if blue then
  do ir=all ranks
    if (ir .eq. red) call MPI_Sendrecv(sndmsg,ir)
  end do
else
  do ir=0, 5
    call MPI_Sendrecv(sndmsg,ir*4,rank)
  end do
end if

```

|    |    |  |    |
|----|----|--|----|
| 0  | 1  |  | 3  |
| 4  |    |  |    |
|    |    |  |    |
|    |    |  |    |
|    |    |  |    |
| 20 | 21 |  | 23 |

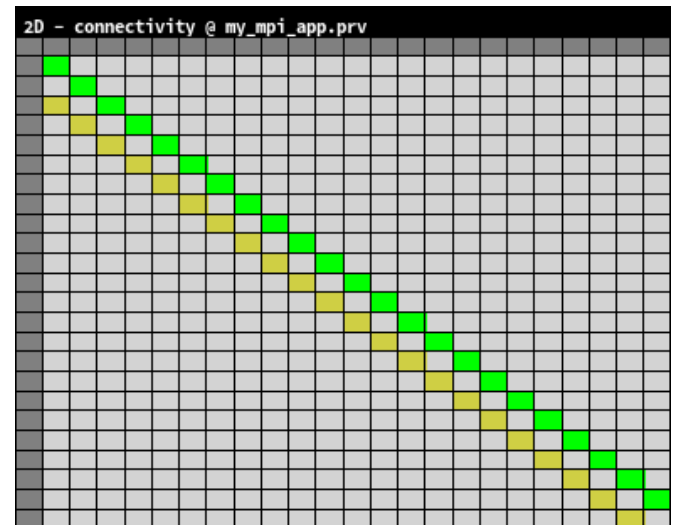
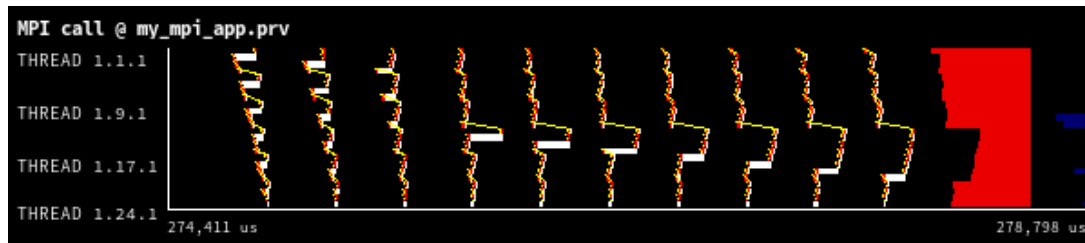
# My MPI App revisited – Pattern 2



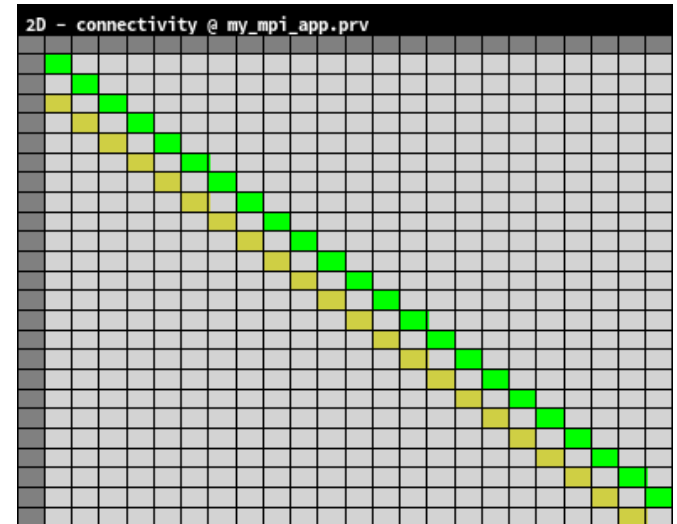
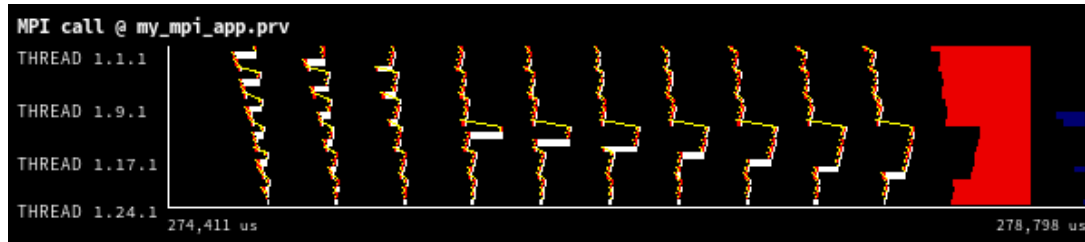
```
if blue then
  do ir=all ranks starting from mine
    if (ir .eq. red) call MPI_Sendrecv(sndmsg,ir)
  end do
else
  do ir=0, 5 starting from my row
    call MPI_Sendrecv(sndmsg,ir*4,rank)
  end do
end if
```



# My MPI App – Pattern 3



# My MPI App – Pattern 3



```
do ir=0,9  
  call Compute()  
  if (rank .lt. biggest_rank) call MPI_Isend(r, rank+1)  
  if (rank .gt. 0) call MPI_Recv(r2, rank-1)  
end do
```