Roofline Performance model:
How-tos

Roofline access and how-to **command line** example

FLOP/S = #FLOP/Seconds

```
> source advixe-vars.sh
```

1st pass Obtain "Seconds" 1.1x overhead

```
> advixe-cl --collect survey --project-dir ./your_project --
<your-executable-with-parameters>
```

2nd pass Obtain #FLOP count: 3x-5x overhead

```
> advixe-cl --collect tripcounts -flops-and-masks --project-dir
./your_project -- <your-executable-with-parameters>
```

```
> advixe-gui ./your_project
```

Launch GUI

MPI example (slurm)

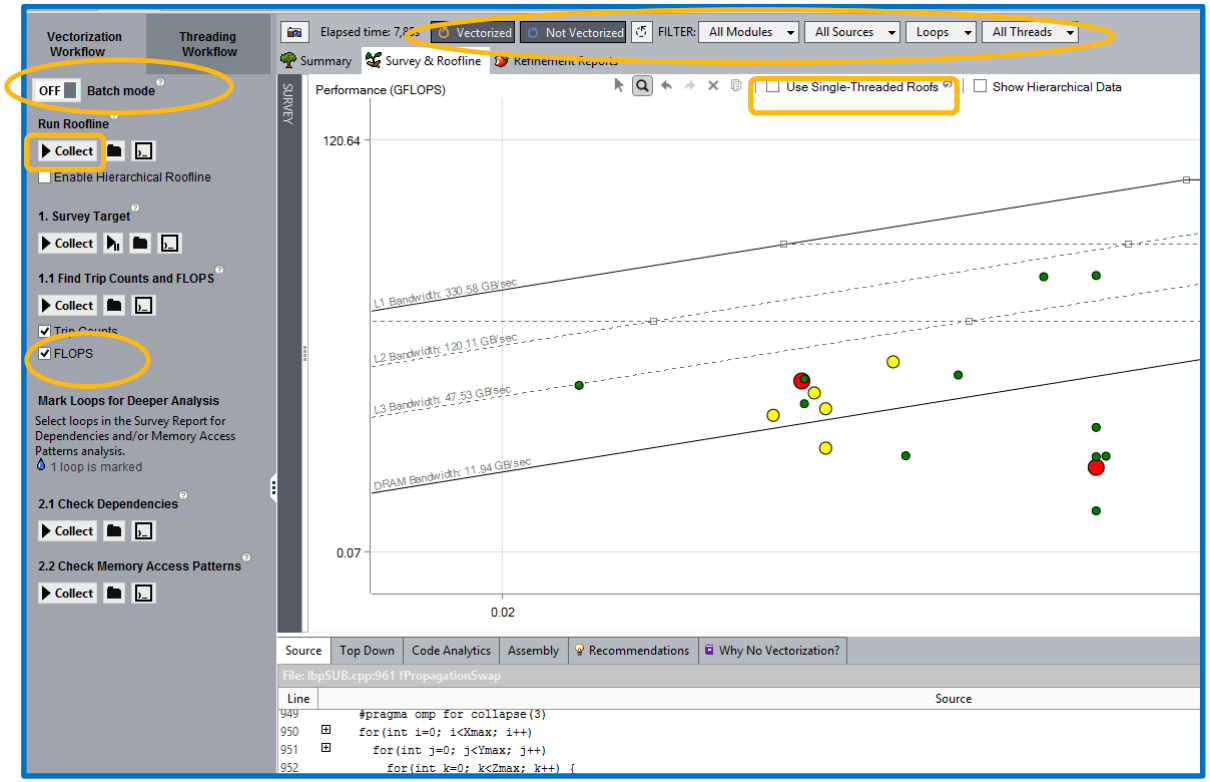
1st step:

srun -n <num-of-ranks> -c <num_of_cores_per_rank> **advixe-cl** -v -**collect survey** -project-dir=<same_dir_name> -data-limit=0 <your_executable>

2nd step:

srun -n <num-of-ranks> -c <num_of_cores_per_rank> **advixe-cl** -v -**collect tripcounts -flops-and-masks** -project-dir=<same_dir_name> -data-limit=0 <your_executable>

Roofline GUI access and how-to: **GUI**



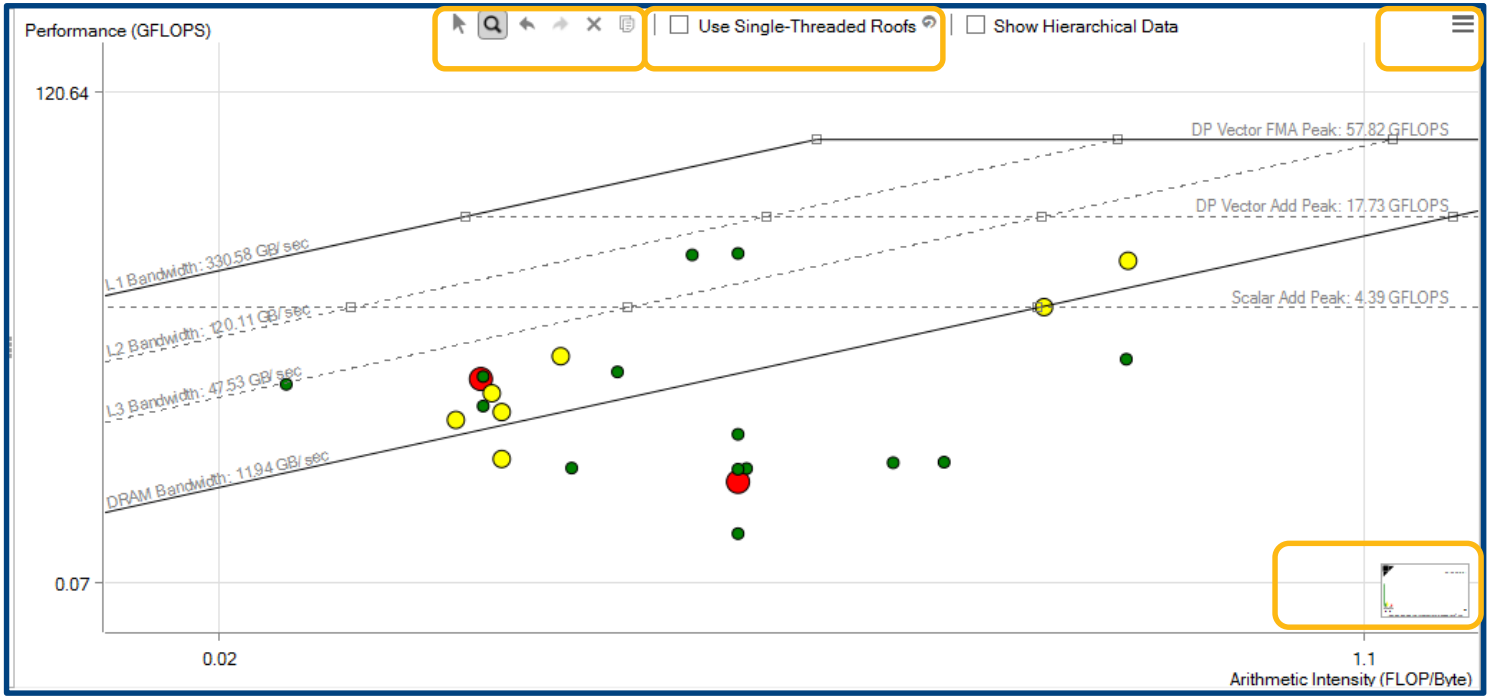
1) “**Run Roofline**” : most automated way.

2) You can also use **two separate runs**:

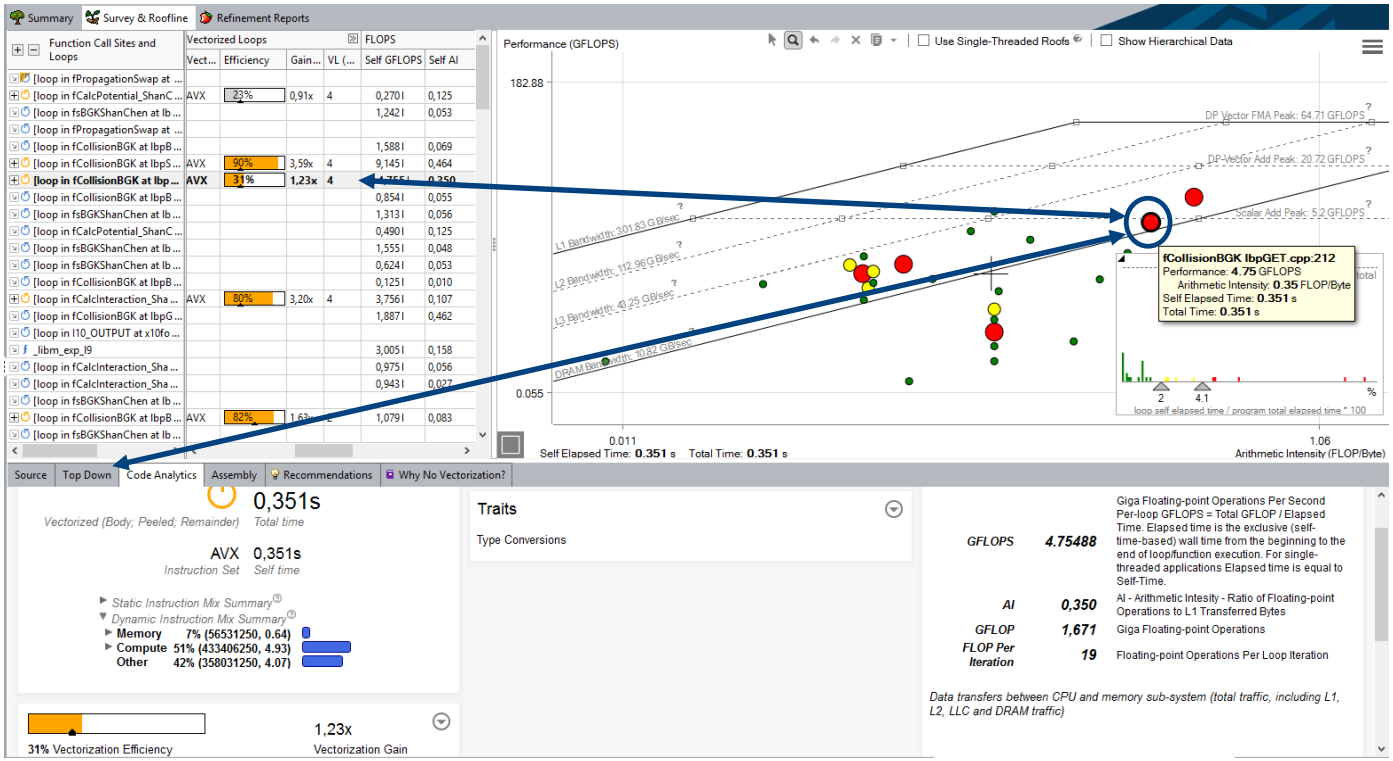
1. Survey
2. TripCounts (remember to switch **FLOPs** ON)

3) **Batch** Mode

Roofline Chart



Use Vectorization and Roofline views together



Observe slower Survey analysis or “finalization”?

(1.5x analysis slow-down or more)

Change default call stacks processing mode (***especially for Fortran***)

advixe-cl -collect survey –stackwalk-mode=online –no-stack-stitching

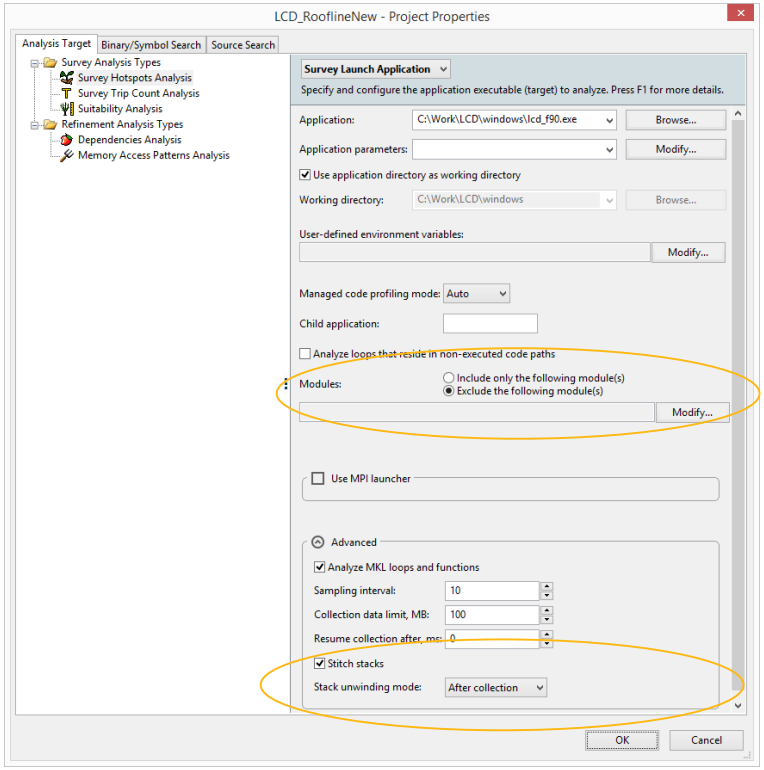
Consider disabling system modules and non-interesting modules processing:

advixe-cl -collect survey -module-filter-mode=include -module-filter=**foo.so**

Observe slower Survey analysis or “finalization”?

(1.5x slower than native run and more)

Configuration via GUI:



Observe slow tripcounts/FLOP analysis ??

(> 8x slower than native and more)

Consider combinations:

1. FLOPS **only**, no TripCounts:

   advixe-cl -collect tripcounts –flops-and-masks –no-trip-countss

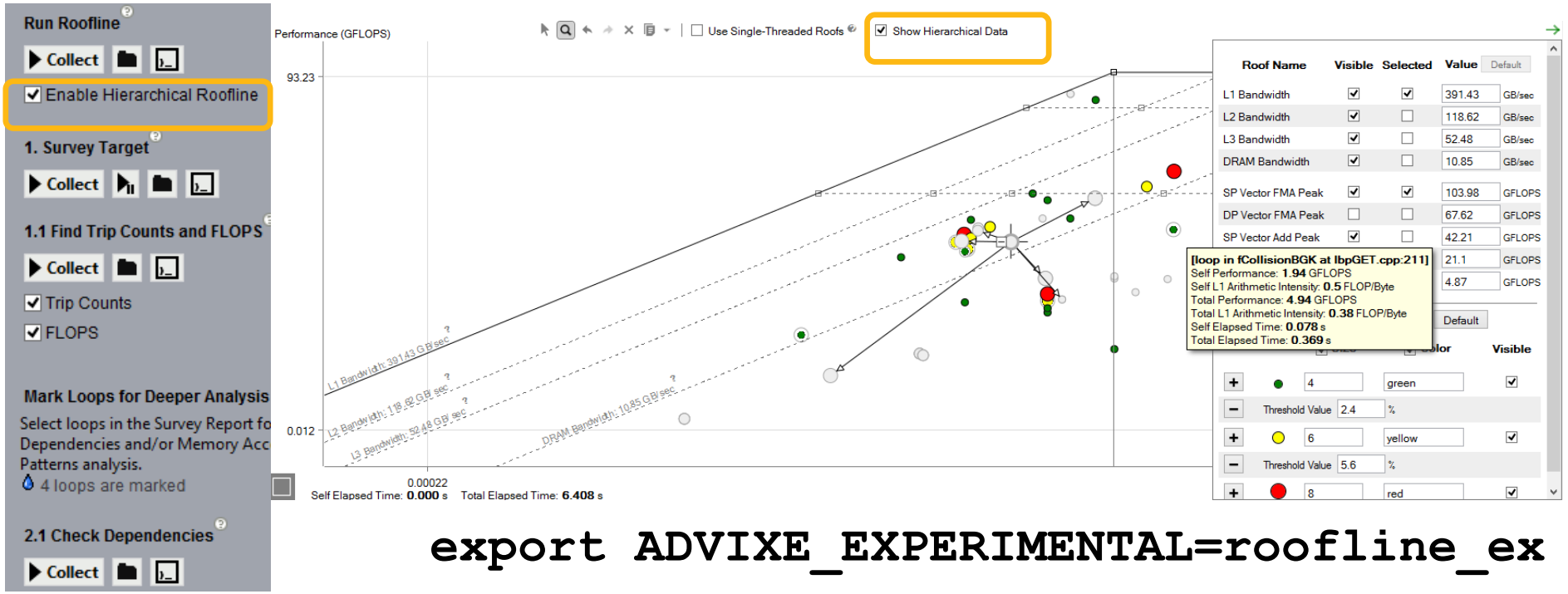
2. no FLOPS , TripCounts **only**, (->No Roofline):

   advixe-cl -collect tripcounts

3. FLOPS **and** TripCounts :

   advixe-cl -collect tripcounts –flops-and-masks

Hierarchical (top-down) Roofline: new in 2018 release

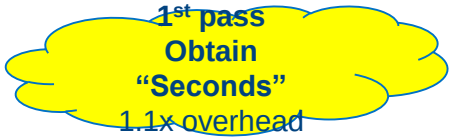



```
export ADVIXE_EXPERIMENTAL=roofline_ex
```

Hierarchical Roofline (based on stacks w/ FLOPS)

```
> source advixe-vars.sh
```

```
> export ADVIXE_EXPERIMENTAL=roofline_ex
```




```
> advixe-cl --collect survey --project-dir ./your_project --
<your-executable-with-parameters>
```


```
> advixe-cl --collect tripcounts -flops-and-masks -callstack-flops --project-dir
./your_project -- <your-executable-with-parameters>
```

```
> export ADVIXE_EXPERIMENTAL=roofline_ex
```

```
> advixe-gui ./your_project
```

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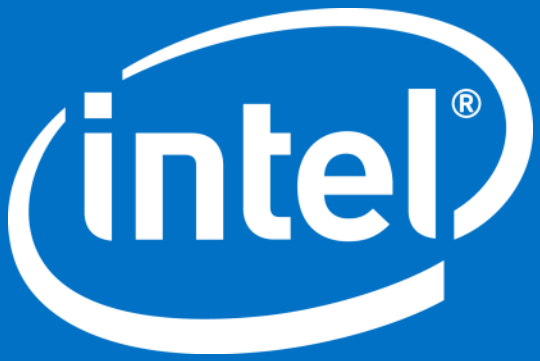
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