

## Paraver Installation

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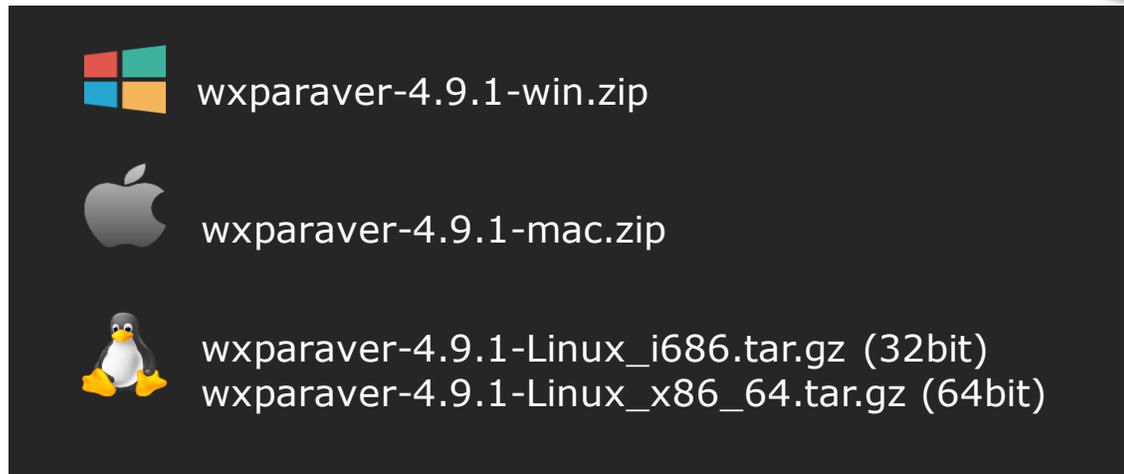
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# Install Paraver in your laptop

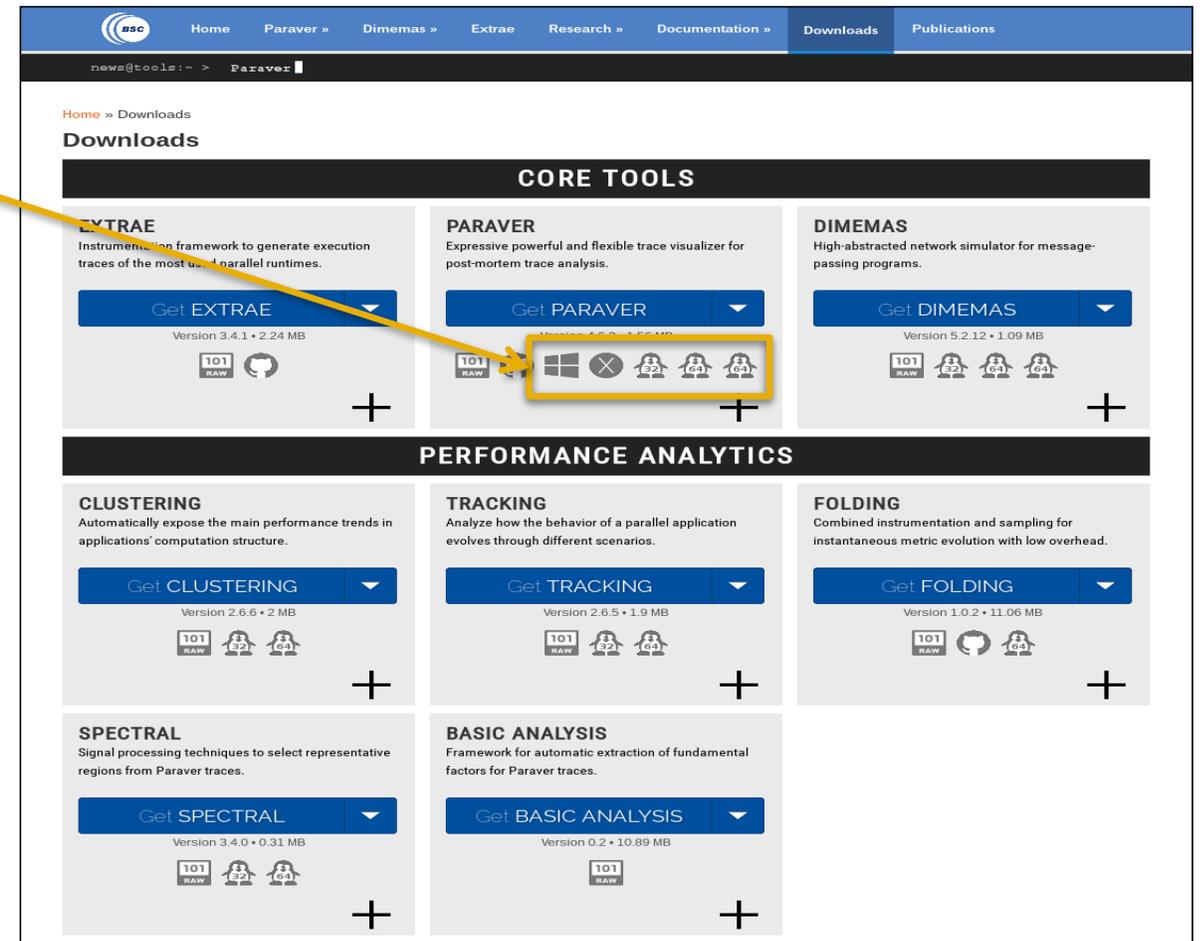
- Download a binary for your OS
  - <https://tools.bsc.es/downloads>



Windows logo: wxparaver-4.9.1-win.zip

Apple logo: wxparaver-4.9.1-mac.zip

Tux logo: wxparaver-4.9.1-Linux\_i686.tar.gz (32bit)  
wxparaver-4.9.1-Linux\_x86\_64.tar.gz (64bit)



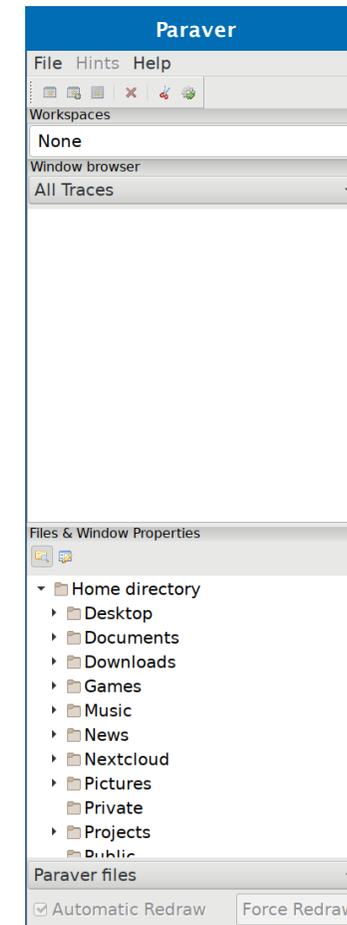
The screenshot shows the 'Downloads' page of the Paraver website. The page is organized into two main sections: 'CORE TOOLS' and 'PERFORMANCE ANALYTICS'. Under 'CORE TOOLS', there are three tool cards: 'EXTRAIE', 'PARAVER', and 'DIMEMAS'. The 'PARAVER' card is highlighted with a yellow box, and a yellow arrow points from the text in the left sidebar to this box. The 'PARAVER' card shows a 'Get PARAVER' button and a set of icons representing supported operating systems: Windows, macOS, Linux 32-bit, and Linux 64-bit. Below 'CORE TOOLS' is the 'PERFORMANCE ANALYTICS' section, which includes cards for 'CLUSTERING', 'TRACKING', 'FOLDING', 'SPECTRAL', and 'BASIC ANALYSIS', each with a 'Get' button and system compatibility icons.

## Install Paraver

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- Uncompress downloaded package
- Rename the folder:
  - wxparaver-4.9.1-\* → paraver
- Start Paraver:
  - Linux: Run the command:  

```
laptop$ paraver/bin/wxparaver
```
  - Windows: Double-click on paraver/wxparaver.exe
  - MAC: Double click on paraver/wxparaver.app



# Install Paraver

- Download tutorials

Click on Help → Tutorials

Tutorials window will pop-up

Tutorials down...

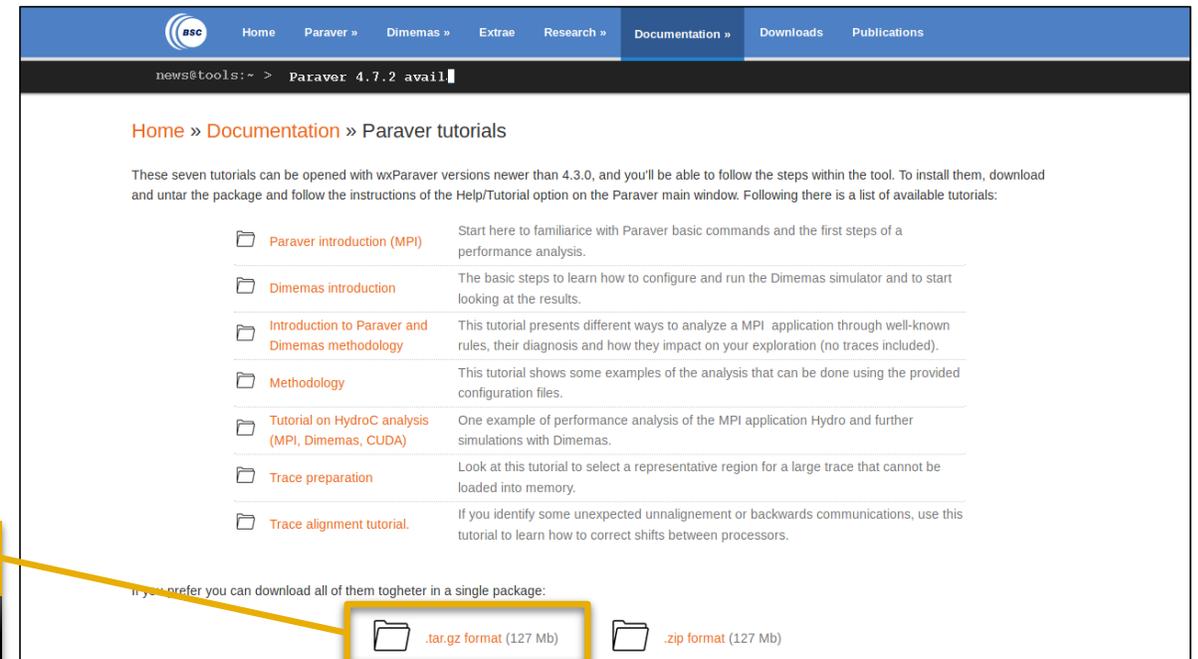
- Follow these tutorials by clicking on the hyperlinks and reading the explanations. When you click on a link, multiple views will open.

## Install Paraver tutorials (alternative method)

- Download tutorials archive
  - <https://tools.bsc.es/paraver-tutorials>

All tutorials

```
paraver-tutorials-20150526.tar.gz
```



The screenshot shows the Paraver documentation page for version 4.7.2. The page is titled "Home » Documentation » Paraver tutorials". It lists seven tutorials with brief descriptions:

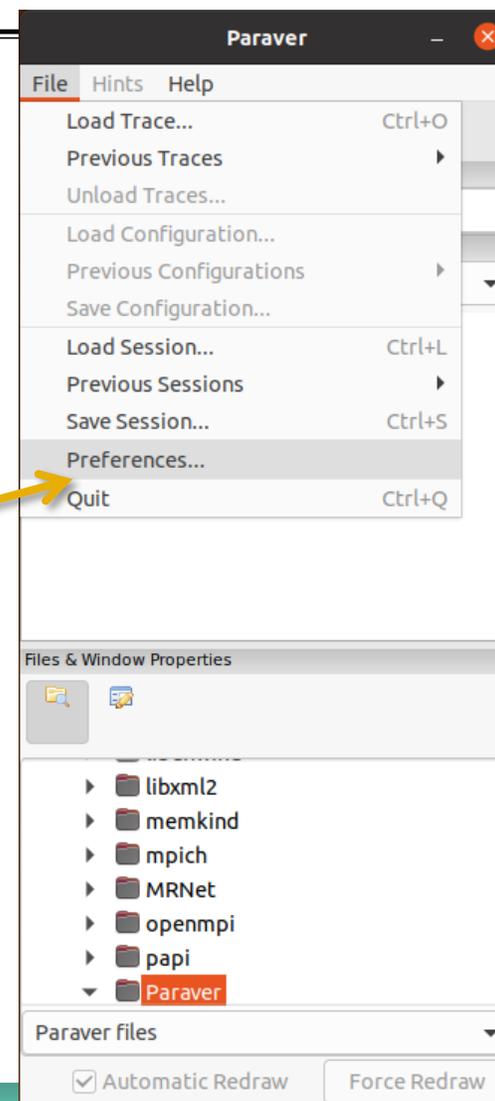
- Paraver introduction (MPI)**: Start here to familiarize with Paraver basic commands and the first steps of a performance analysis.
- Dimemas introduction**: The basic steps to learn how to configure and run the Dimemas simulator and to start looking at the results.
- Introduction to Paraver and Dimemas methodology**: This tutorial presents different ways to analyze a MPI application through well-known rules, their diagnosis and how they impact on your exploration (no traces included).
- Methodology**: This tutorial shows some examples of the analysis that can be done using the provided configuration files.
- Tutorial on HydroC analysis (MPI, Dimemas, CUDA)**: One example of performance analysis of the MPI application Hydro and further simulations with Dimemas.
- Trace preparation**: Look at this tutorial to select a representative region for a large trace that cannot be loaded into memory.
- Trace alignment tutorial**: If you identify some unexpected unalignment or backwards communications, use this tutorial to learn how to correct shifts between processors.

At the bottom of the page, there is a section for downloading all tutorials together in a single package. Two options are shown: ".tar.gz format (127 Mb)" and ".zip format (127 Mb)". A yellow box highlights the ".tar.gz format" option, and a yellow arrow points from the "All tutorials" text to this box.

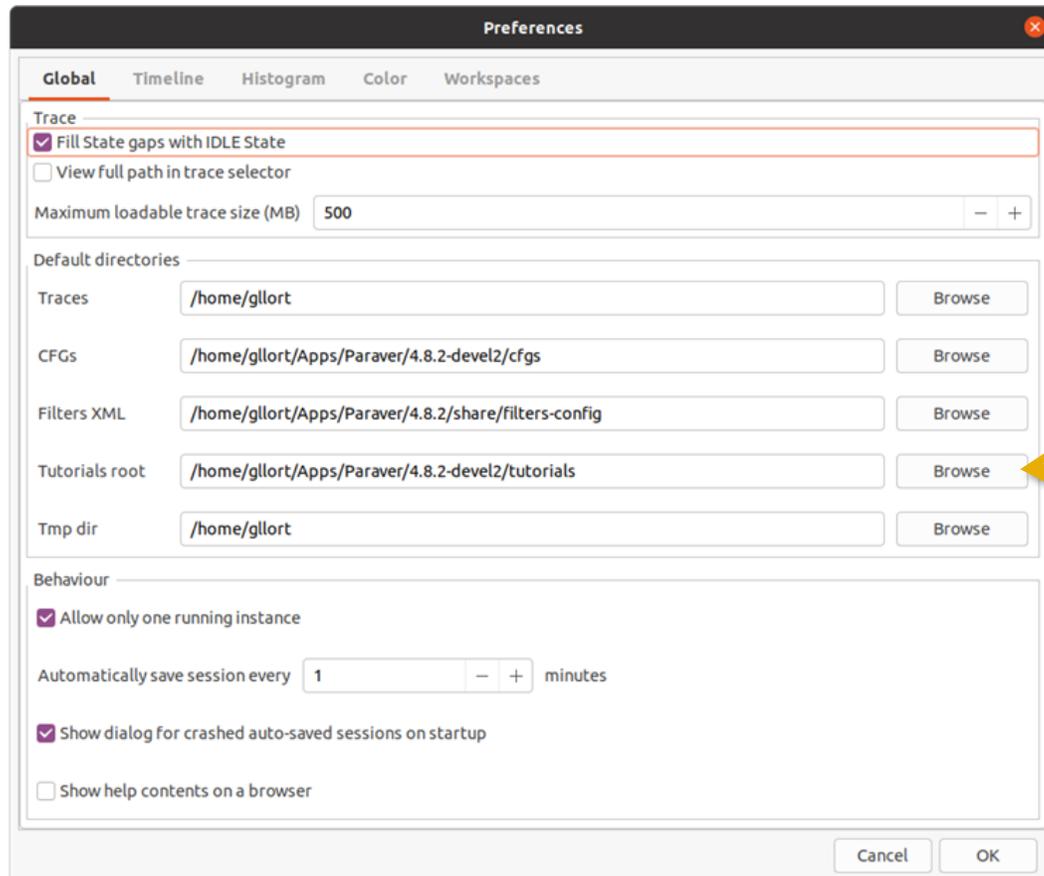
## Install Paraver tutorials (alternative method)

- Uncompress downloaded package
- Rename the folders:
  - paraver-tutorials-20150526 → tutorials
- Start Paraver:
  - Linux: Run the command:  

```
laptop$ paraver/bin/wxparaver
```
  - Windows: Double-click on paraver/wxparaver.exe
  - MAC: Double click on paraver/wxparaver.app
- Open File → Preferences



## Install Paraver tutorials (alternative method)



- Setup the "Tutorials root" pointing to your folder "tutorials"

Click Browse and select your folder "tutorials"

## Paraver Introduction

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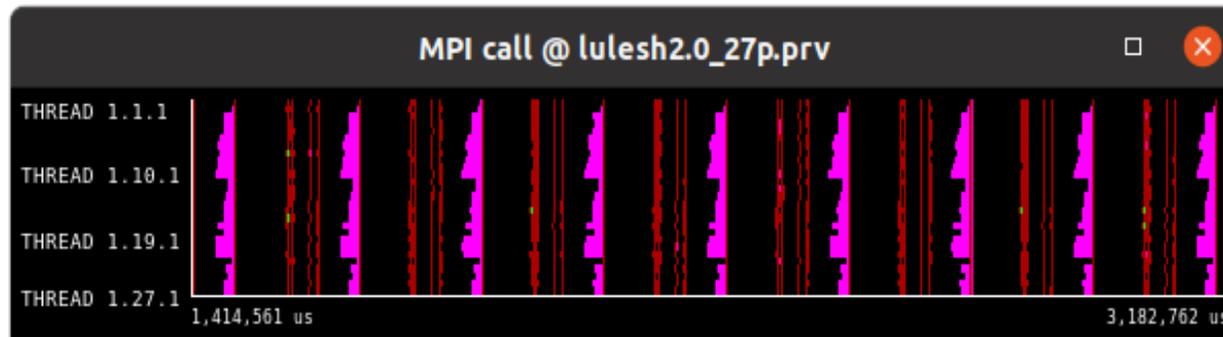
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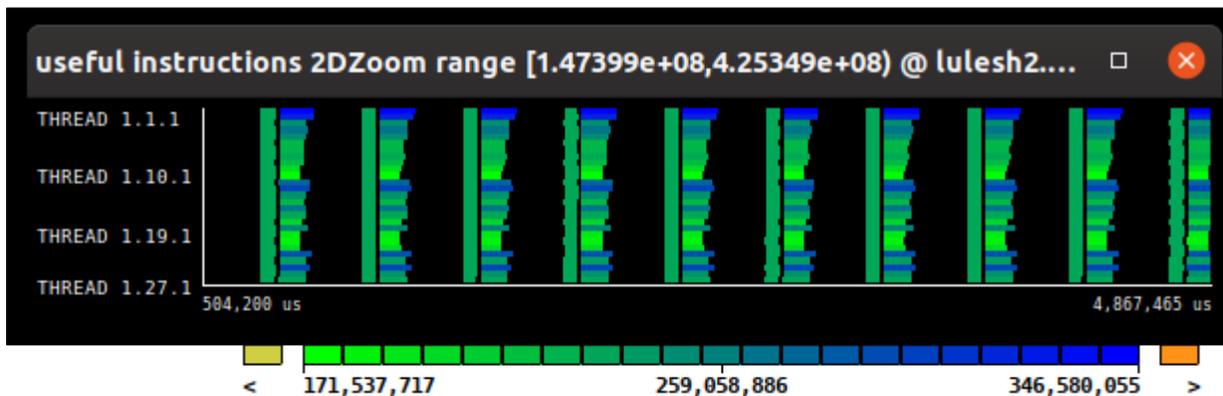
## 3 main views of Paraver (I)

### Timeline



**Code color**  
(e.g. 1 color for each MPI call)

- Outside MPI
- MPI\_Isend
- MPI\_Irecv
- MPI\_Wait
- MPI\_Waitall
- MPI\_Barrier
- MPI\_Reduce
- MPI\_Allreduce
- MPI\_Comm\_rank
- MPI\_Finalize



**Gradient color**  
(e.g. from low #instructions to high #instructions)



## 3 main views of Paraver (II)

- Table (Profile)

The table can display a variety of statistics (e.g. % of time, # of calls, etc.) with gradient coloring showing from low values to high values

Processes (and threads)

Categories (e.g. MPI calls)

	Outside MPI	MPI_Isend	MPI_Irecv	MPI_Wait	MPI_Waitall	MPI_Barrier	MPI_Reduce	MPI
THREAD 1.1.1	99.04 %	0.05 %	0.06 %	0.35 %	0.30 %	0.03 %	0.00 %	
THREAD 1.2.1	97.37 %	0.07 %	0.08 %	0.20 %	0.82 %	0.03 %	0.00 %	
THREAD 1.3.1	93.79 %	0.05 %	0.05 %	0.22 %	0.52 %	0.03 %	0.02 %	
THREAD 1.4.1	93.93 %	0.07 %	0.08 %	0.17 %	0.61 %	0.03 %	0.00 %	
THREAD 1.5.1	93.75 %	0.11 %	0.11 %	0.38 %	0.19 %	0.01 %	0.00 %	
THREAD 1.6.1	91.64 %	0.08 %	0.08 %	0.10 %	0.74 %	0.02 %	0.00 %	
THREAD 1.7.1	91.24 %	0.06 %	0.05 %	0.16 %	0.42 %	0.03 %	0.11 %	
THREAD 1.8.1	91.93 %	0.08 %	0.08 %	0.16 %	0.76 %	0.03 %	0.00 %	
THREAD 1.9.1	91.20 %	0.06 %	0.05 %	0.14 %	0.59 %	0.02 %	0.50 %	
THREAD 1.10.1	90.47 %	0.08 %	0.07 %	0.33 %	0.37 %	0.03 %	0.00 %	
THREAD 1.11.1	89.19 %	0.12 %	0.11 %	0.35 %	0.30 %	0.01 %	0.70 %	
THREAD 1.12.1	95.80 %	0.09 %	0.07 %	0.19 %	0.83 %	0.03 %	0.00 %	
THREAD 1.13.1	96.04 %	0.12 %	0.10 %	0.41 %	0.33 %	0.01 %	0.00 %	
THREAD 1.14.1	94.61 %	0.18 %	0.15 %	0.15 %	0.35 %	0.00 %	0.00 %	
THREAD 1.15.1	93.28 %	0.13 %	0.10 %	0.10 %	1.21 %	0.01 %	0.00 %	
THREAD 1.16.1	91.67 %	0.09 %	0.07 %	0.26 %	2.01 %	0.03 %	0.00 %	
THREAD 1.17.1	93.28 %	0.13 %	0.10 %	0.11 %	1.06 %	0.01 %	0.45 %	
THREAD 1.18.1	89.56 %	0.09 %	0.07 %	0.16 %	1.72 %	0.03 %	0.00 %	
THREAD 1.19.1	94.06 %	0.06 %	0.04 %	0.13 %	0.47 %	0.03 %	0.00 %	
THREAD 1.20.1	89.39 %	0.10 %	0.06 %	0.25 %	1.05 %	0.03 %	0.00 %	
THREAD 1.21.1	89.62 %	0.07 %	0.04 %	0.22 %	0.30 %	0.03 %	0.90 %	
THREAD 1.22.1	88.08 %	0.09 %	0.06 %	0.26 %	2.02 %	0.03 %	0.00 %	
THREAD 1.23.1	98.19 %	0.14 %	0.10 %	0.16 %	0.62 %	0.01 %	0.00 %	
THREAD 1.24.1	94.10 %	0.10 %	0.06 %	0.12 %	1.24 %	0.02 %	0.00 %	
THREAD 1.25.1	96.05 %	0.07 %	0.04 %	0.29 %	0.26 %	0.02 %	0.00 %	
THREAD 1.26.1	93.10 %	0.10 %	0.06 %	0.13 %	1.13 %	0.03 %	0.00 %	
THREAD 1.27.1	94.24 %	0.08 %	0.04 %	0.18 %	0.39 %	0.02 %	0.00 %	
<b>Total</b>	2,514.62 %	2.44 %	1.99 %	5.69 %	20.63 %	0.60 %	2.72 %	
<b>Average</b>	93.13 %	0.09 %	0.07 %	0.21 %	0.76 %	0.02 %	0.10 %	
<b>Maximum</b>	99.04 %	0.18 %	0.15 %	0.41 %	2.02 %	0.03 %	0.90 %	
<b>Minimum</b>	88.08 %	0.05 %	0.04 %	0.10 %	0.19 %	0.00 %	0.00 %	
<b>StDev</b>	2.79 %	0.03 %	0.03 %	0.09 %	0.51 %	0.01 %	0.24 %	
<b>Avg/Max</b>	0.94	0.50	0.49	0.52	0.38	0.72	0.11	

Summary

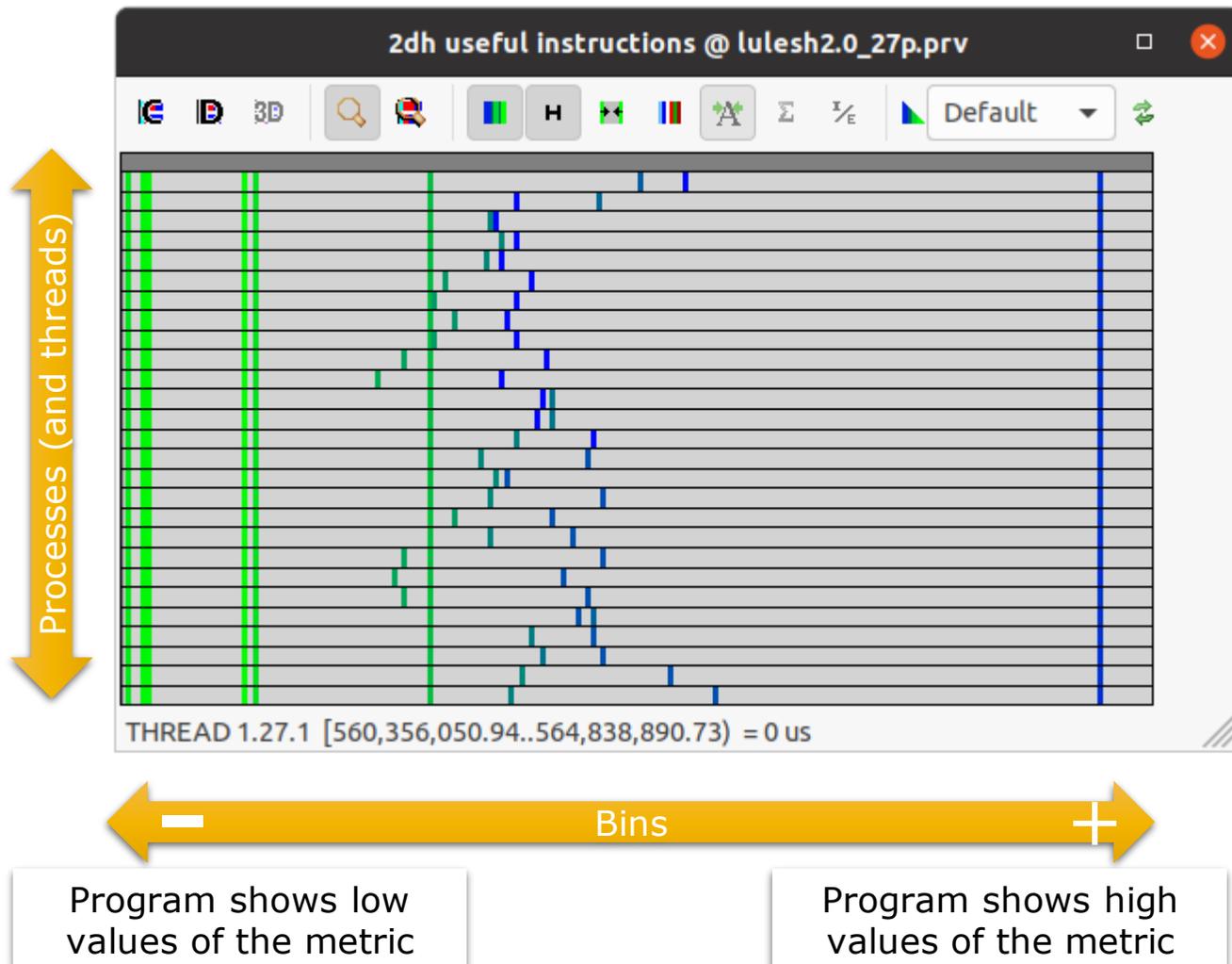
## 3 main views of Paraver (III)

### ■ Histogram

Displays continuous metrics (e.g. **instructions executed**, duration of computations, bytes sent/received, etc. )

Gradient color represents if the value for that behavior is **high** or **low**

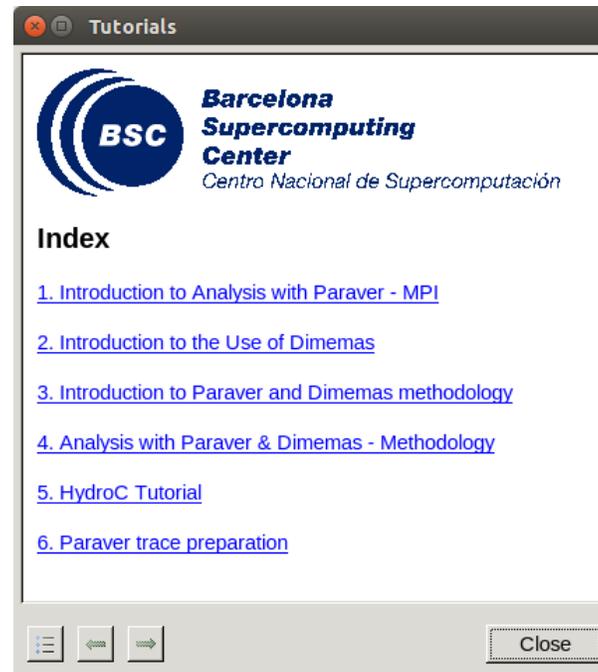
**General tip: straight lines are good (all processes show same behavior), while variabilities usually indicate imbalances**



## First steps with Paraver

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- Follow tutorial number..
  - 1 → Explains basic navigation with the tool
  - 3 → Basic analysis methodology (first 4 bullets, Clustering and Dimemas part not covered)
  - 5 → Analysis methodology applied to a real application



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