

LDAS Tutorial

How Do I Write Search Code To Run Under LDAS?

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1. Fundamentals

LIGO/LSC Algorithm Library (LAL)

- Contains functions to perform data analysis
- LAL functions form a shared object library
- Cannot perform data analysis on its own

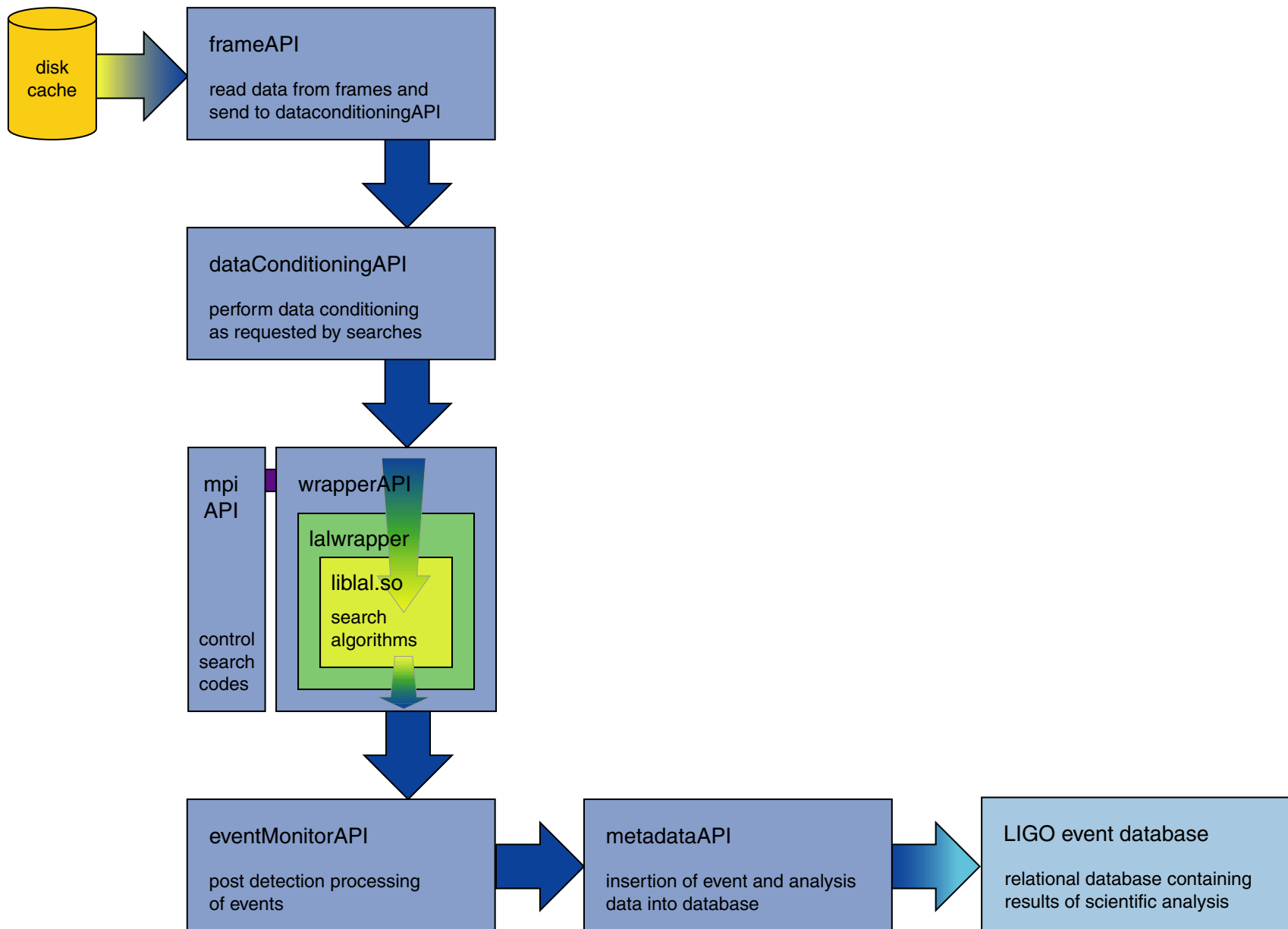
LIGO Data Analysis System (LDAS)

- Flexible, powerful infrastructure for data analysis
- Provides an framework to build analysis pipelines
- Cannot perform full data analysis on its own

The LAL/LDAS Interface (lalwrapper)

- Is the bridge between LAL and LDAS
- Allows LAL programmers to build analysis engines
- Allows these engines to be run under LDAS

2. Where Does My Search Go?



3. What Do I have to Write?

LAL search algorithms (e.g. `lal/packages/findchirp`)

- LAL compliant functions to perform data analysis
- Build up complex functions from simpler LAL functions
- Available in LAL shared object library

`lalwrapper` functions (e.g. `lalwrapper/contrib/inspiral`)

- Links to LAL shared object library
- Consists of four functions
- Executed by wrapperAPI

LDAS user command

- Don't actually have to write user command, just command arguments
- Plenty of examples available (mpiMDC document)
- Very simple tcl script to execute mpi job in LDAS

Just Four Functions?

LALInitSearch()

- Parse arguments from user command (`char *argv[]`)
- Allocate memory for search within shared object

LALConditionData()

- Parse generic input structure into useful LAL structures
- Highly search specific data conditioning not done in `dataConditioningAPI`

LALApplySearch()

- Executed in loop until search reports finished
- Performs main logic of search algorithm
- Can use mpi communication within nodes performing search
- Management of search algorithm
- Put search output into generic output structure

LALFinalizeSearch()

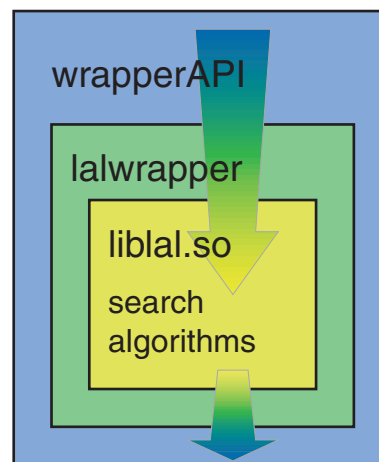
- Free any memory allocated

What is the wrapperAPI?

LDAS API that is responsible for executing search codes on beowulf

One instance of wrapperAPI for each mpi job

All wrapperAPI's report to the mpiAPI

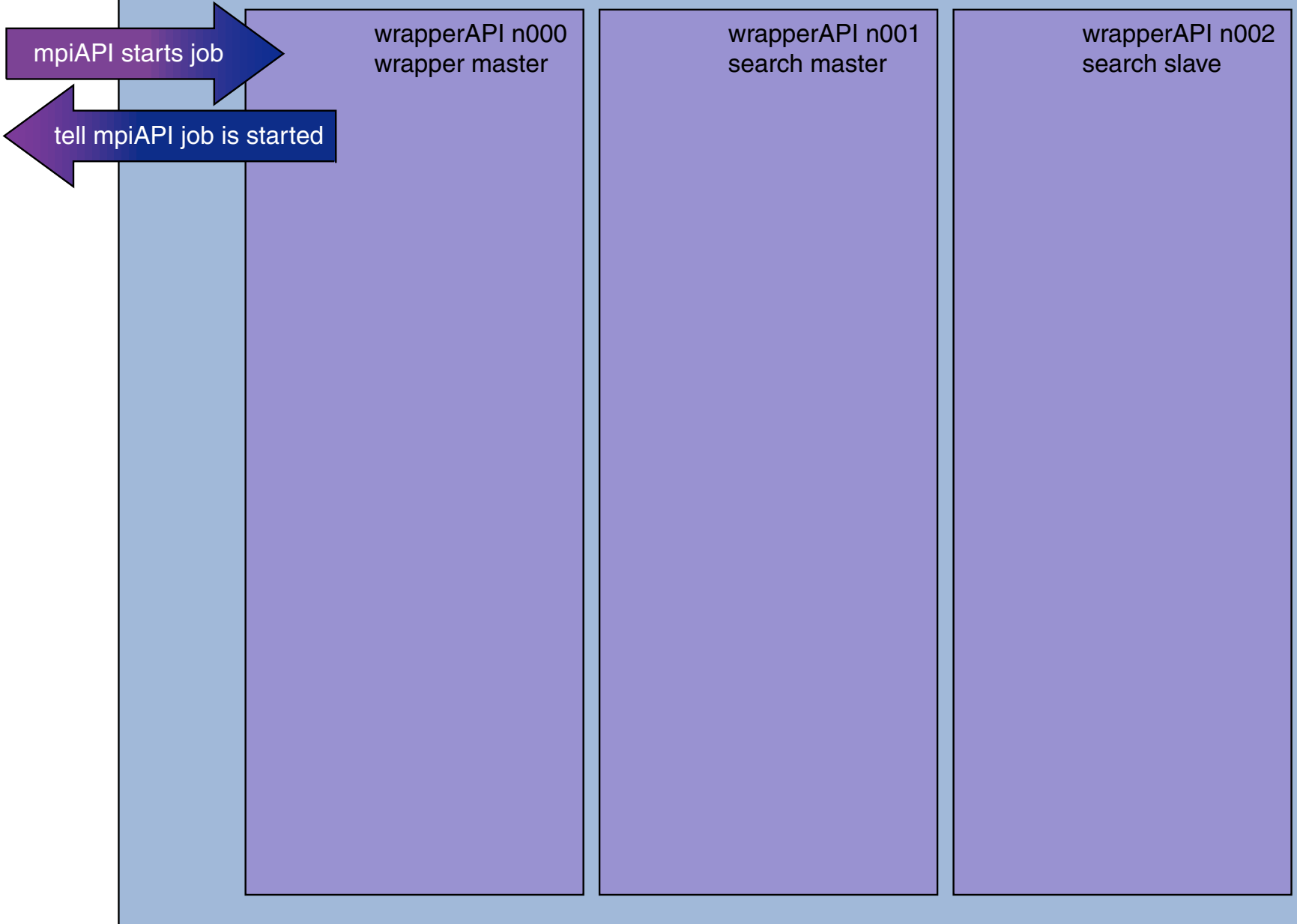


Beowulf System

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