

# User Added Tasks

The *User added tasks* feature in Partek® Flow® allows administrators to add their own executables and scripts to the set of analysis tools available on a given installation. These tasks can then be run through the Partek Flow graphical user interface and can be included as part of analysis pipelines.

The process of adding a task is only available to users with administrative privileges. However, once the task has been added to an instance of Partek Flow, all other users, including regular users, can use the task.

The instructions below assume that you are logged in as an admin.

- [Licensing](#)
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## Licensing

The *User added tasks* feature is a part of the Partek Flow Enterprise offerings and requires a separate license. Having this license allows the addition of new user added tasks and allows existing user added tasks to be run individually or within pipelines. To check if your installation is licensed, go to **Settings** > **Licensing** and make sure that the *User added tasks* is licensed (Figure 1).

The screenshot shows the Partek Flow web interface. The top navigation bar includes the Partek Flow logo, a Queue dropdown, a Projects dropdown, and a user profile icon labeled 'Administrator'. The breadcrumb trail is 'Home > Settings > Licensing'. On the left, a sidebar menu lists various settings categories: Personal settings (My profile, My preferences), System settings (System information, System preferences, LDAP configuration), Partek Flow components (Filter management, Library file management, Option set management, Task management, Pipeline management), Access management (User management, Group management, **Licensing**, Directory permissions, Access control log, Failed logins), and Partek Flow usage (System queue, System resources, Usage report). The 'Licensing' option is highlighted with a red box. The main content area is titled 'Current license features' and lists various features with their expiration dates (all expire on 31 December 2016): Flow (1000 users), HPC nodes (1000 nodes), RNA-seq, User disk quotas, Dedicating licenses to groups, Usage reports, Microarray toolkit, Option sets from command lines, Reprioritizing tasks, REST API, Fluidigm single cell toolkit (Unlicensed: available for purchase), and **User-added tasks** (highlighted with a red box). Below this is the 'Update license' section, which instructs the user to copy a license key and paste it into a text field, then click the 'Update' button. At the bottom, there is a note about contacting licensing@partek.com if the user does not have a key, and the Partek product version is listed as Flow 5.0.

Figure 20. The User added tasks require a separate enterprise license

## Creation

Prior to beginning, the analysis tool needs to be downloaded and installed in a directory the Partek Flow user has access to. The executable (or a symbolic link to it) must be in this directory: FLOWhome/user\_tasks, where FLOWhome is the location of the database directory. This directory and any binaries within it must be available to all workers in a cluster install environment.

To create a new user added task, go to **Settings > Task management**. Select the **Add task** button and choose **Create new task** in the pop-up dialog (Figure 2).

The screenshot shows the 'Task management' interface in Partek Flow. The left sidebar contains a list of settings categories: Personal settings, System settings, Partek Flow components, Access management, and Partek Flow usage. 'Task management' is selected under 'Partek Flow components'. A red box highlights the '+ Add task' button. A modal dialog titled 'Add custom task' is open, showing two options: 'Create new task' and 'Import existing task'. The 'Create new task' option is highlighted by a red box and a mouse cursor.

Task name	System-wide version	Enabled	Actions
Annotate variants		<input checked="" type="checkbox"/>	
Annotate variants (SnEff)	4.1k	<input checked="" type="checkbox"/>	
Annotate variants (VEP)	84	<input checked="" type="checkbox"/>	
BWA		<input checked="" type="checkbox"/>	
Bismark		<input checked="" type="checkbox"/>	
Bowtie		<input checked="" type="checkbox"/>	
Bowtie 2		<input checked="" type="checkbox"/>	
Chromosome view		<input checked="" type="checkbox"/>	
Combine alignments		<input checked="" type="checkbox"/>	
Combine variants		<input checked="" type="checkbox"/>	
Convert alignments to unaligned reads		<input checked="" type="checkbox"/>	
Convert to FASTQ		<input checked="" type="checkbox"/>	
Convert transcriptome alignments to genome		<input type="checkbox"/>	
Coverage report		<input checked="" type="checkbox"/>	
Delly2-germline	v0.7.5	<input checked="" type="checkbox"/>	
Detect fusion genes		<input checked="" type="checkbox"/>	
Detect variants against reference	1.2-232-g87cdc4a	<input type="checkbox"/>	
Detect variants among samples	1.2-232-g87cdc4a	<input type="checkbox"/>	
Differential gene expression (ANOVA)		<input checked="" type="checkbox"/>	

Figure 21. Adding a User added Task

The creation of a new user added task has four steps:

- Task details
- Input
- Output
- Options

The task creation wizard will guide you through each step. Please consult the user documentation of the analysis tool you wish to add for details to enter into the task creation wizard.

## Task details

PartekFlow Queue ▾ Projects ▾ Administrator ▾

[Home](#) > [Settings](#) > [Task management](#) > [Create custom task](#)

**Task details** > Input > Output > Options

**Task name** ⓘ Subread Aligner

**Description** ⓘ A general-purpose read aligner which can align both genomic DNA-seq and RNA-seq reads.

**Version** ⓘ 1.50

**Section** ⓘ Custom tasks ▾

**Executable** ⓘ /home/flow/.partekflow/user\_tasks/subread-align **Browse**

**Runs on** ⓘ Each sample ▾

Each sample  
All samples

**Back** **Next**

Figure 41. Defining the task details

In the *Task details* step (Figure 3), provide the following:

- **Task name** - a unique name for the task
- **Description (optional)** - a more thorough description of the task. This text will appear when the cursor hovers over the task in the *Task Menu*
- **Version** - a unique version number for the given task name. The combination of *Task name* + *Version* must be unique (i.e., no other task already installed can have the same combination)

- **Section** - choose a section in the context-sensitive *Task Menu* in which this task will appear or define a new section by editing the text field (Figure 4)

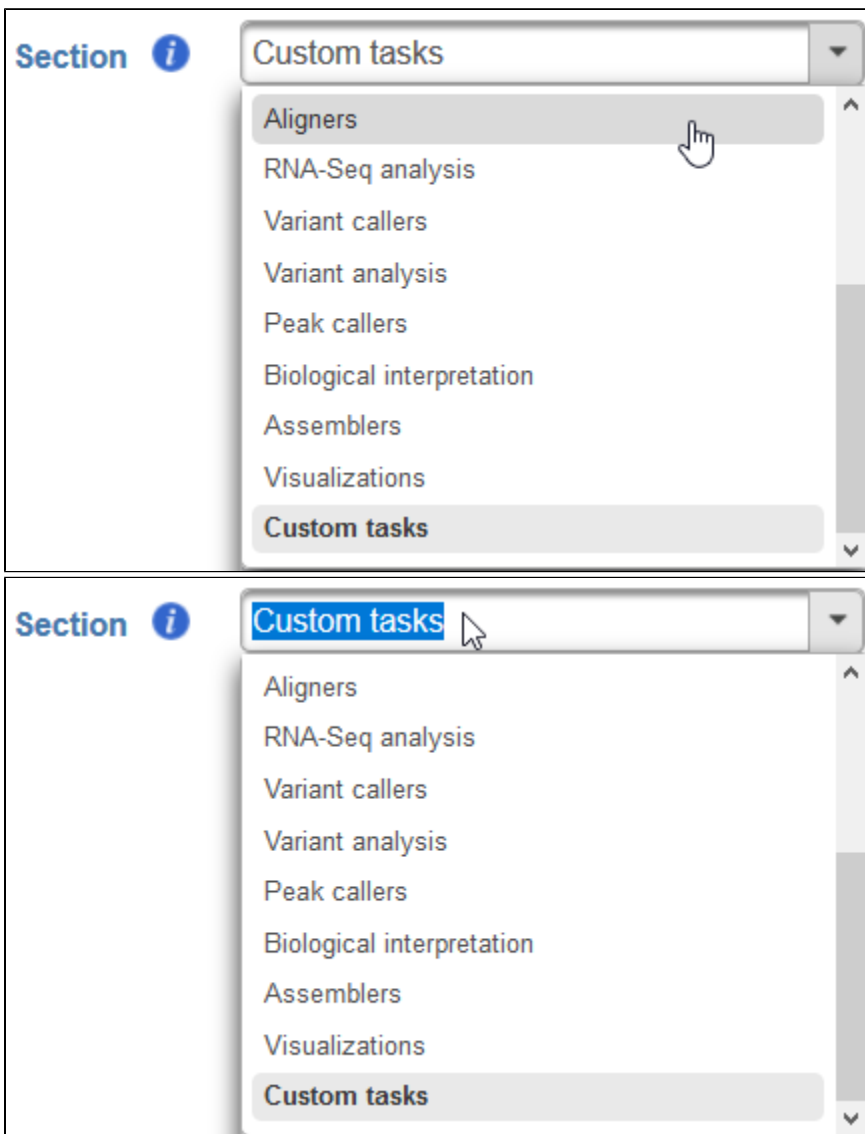


Figure 42. Choose which section in the Task Menu you want the added task to appear in. To keep all custom tasks in one section, choose 'Custom tasks' at the bottom of the drop-down list (left). To create a new section, highlight the text and manually type a new section name (right)

- **Executable** - provide a full path to the executable that this task will run (Figure 5) by clicking **Browse**. The executable is the main binary or script to call which has arguments parsed in the command-lines. See 'Integration Scripts' part at the bottom to learn more about executables in Flow. In the example in Figure 3, the full path is /home/flow/partekflow/user\_tasks. The dialog (Figure 5 inset) lists all the available executables stored in the directory. Select the file and click **Continue** to proceed. Note that the flow server user must have execute permission on the binary.

**SECURITY WARNING** - Since binaries in this folder will be accessible through the Partek Flow web user interface, this directory should be highly restricted from modification by non-administrator users.

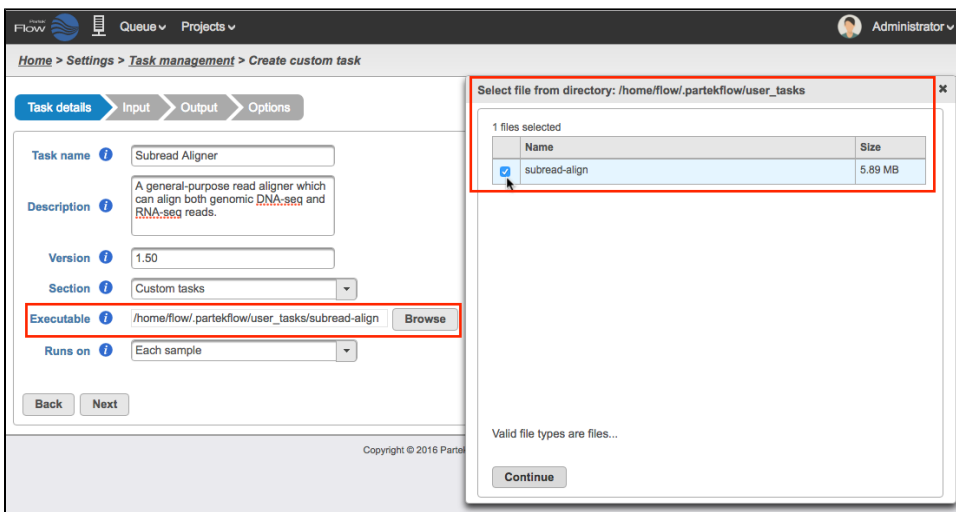


Figure 43. Selecting the executable (the inset shows the available binary saved in the folder)

- **Runs on** - choose *Each sample* to run the executable once per individual sample (i.e., run the samples in parallel) or *All samples* to run the binary once with all the samples provided in a single command line (e.g. merge all samples into a single run) (Figure 6)

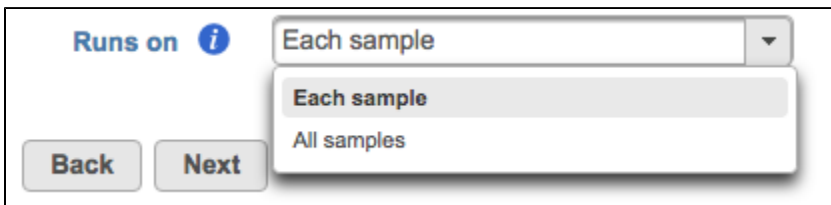





Figure 44. Selecting the run format

Click **Next** to proceed to the *Input* step

## Input

In the *Input step*, specify what type of data the task can run on and how to pass that data on the command line (Figure 7).

Partek Flow


Queue
Projects

Administrator

Home > Settings > Task management > Create custom task

Task details
Input
Output
Options

### Input

Input data type
*i*
Unaligned reads

Input from
*i*
Parameter

Accepts paired-end
*i*
Yes

Single-end parameter
*i*
-r

1st pair parameter
*i*
-r

2nd pair parameter
*i*
-R

### Sample information

Include sample info
*i*
☐

Back
Next

Figure 45. Defining the Input

- **Input data type** - This is the type of data the task can be performed on. In the Analyses tab, this is the type of data node that will be selected for to the task to appear in the context-sensitive Task menu. Partek Flow requires User added tasks to be performed on either: *Unaligned reads*, *Aligned reads*, *Quantification*, and *Variants*. Additional inputs can be specified in the Options step. The type of Input data selected from the drop-down menu will determine the additional fields that need to be defined. In Figure 7 the Subread Aligner task accepts Unaligned reads.
- **Input from** - choose Parameter if the input file(s) is specified using an option (e.g. -r) on the command line/executable or Last option if the executable assumes the input file(s) is placed at the end of the command
- **Accepts paired-end** - choose between Yes, No or Exclusively with respect to the task's behavior with paired-end reads
- **Single-end parameter** - enter the parameter to add before single-end reads
- **1st pair parameter** - enter the parameter to add before the first file (\_1) in a paired-end reads set
- **2nd pair parameter** - enter the parameter to add before the first file (\_2) in a paired-end reads set

You can optionally include **Sample information** as an argument to pass to the command (Figure 8). Select **Include sample info** and enter the **Sample info parameter**. The parameter is used to specify the sample information file on the command line.

Sample information

Include sample info

Sample info parameter

--sampleinfo

Figure 46. Including the Sample Information

A tab-delimited text file will be passed to the command line using the specified parameter. Each row in the file will be composed of the File name, Sample name, and its associated attributes in that project (Figure 9). When running the command on **All samples**, the text file will have all sample files as rows. When running the command as **Each sample** then there will be one info file per command and it will only contain the rows for the files in that sample.

File name	→	Sample Name	→	Tissue	→	Age
R001.fastq	→	Sample110	→	Brain	→	21
R002.fastq	→	sample112	→	Liver	→	23

Figure 47. Example of a tab-delimited text file containing the sample information that can be passed to the command line

## Output

The expected outputs of the task must be defined and configured. To add a new output, select the **Add output** button (Figure 10), then configure the dialog (Figure 11).

Partek Flow

Queue

Projects

Administrator

Home > Settings > Task management > Create custom task

Task details

Input

Output

Options

+ Add output

Name	Type	Parameter	Output as	Exposed	Actions
No outputs added					

Back

Next

Figure 48. Table of Output of a User Added Task

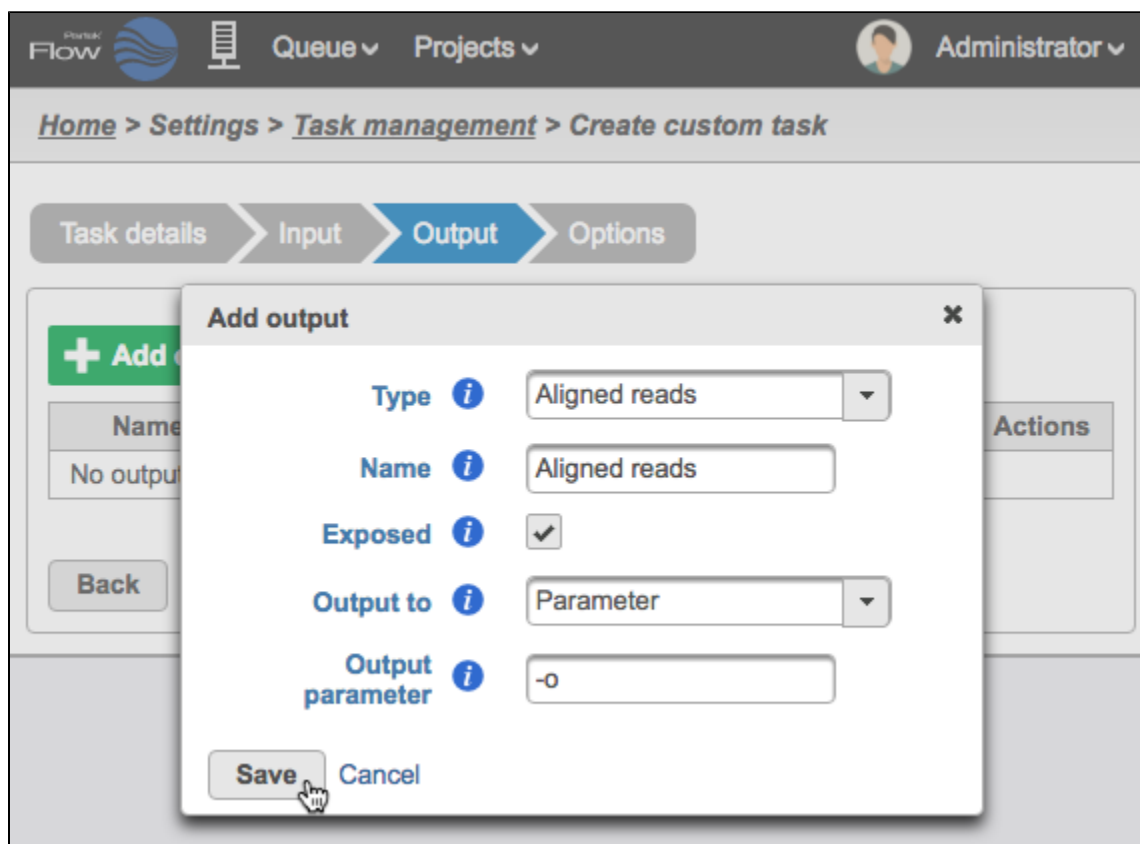




Figure 49. Configuring a task output

- **Type** - choose the type of data produced by the task from the drop-down list. The set of output types is restricted to those currently supported by downstream Partek Flow tasks: *Unaligned reads*, *Aligned reads*, *Assembled reads*, *Quantification*, *HTML*, *Image*, *Annotated counts*, or *Variants*. If you want to output a data type that is not part of this set, select *Custom* and this will produce an output that can be downloaded.
- **Name** - enter a name for the output data node (this will be the data node that will display in the *Analyses* tab)
- **Exposed** - if checked, this output will be exposed as a node on the *Analyses* tab, otherwise this task will not produce a data node and the output will be accessible through the task result page
- **Required** - if checked the task will fail if the executable failed to produce this output. If left unchecked then this output is optional and task will succeed even if this output was never be produced by the executable.
- **Output files as** - (for Custom types) choose between a *Single file output*, *All files with prefix*, and a *list of files in a Directory*
- **Output prefix** - to restrict only output files with the given prefix
- **Output to** - placement of output on the command line, which can be: *Last Option*, *Parameter*, *Standard Out*
- **Output parameter** - parameter to place on the command line before this output which is the same in executable.

After configuring the dialog, click **Save**. The Output will appear in the Table (Figure 12). Any existing output can be edited  or deleted  using the action buttons on the far right of the table.



Partek Flow
Queue
Projects
Administrator

Home > Settings > Task management > Create custom task

Task details
Input
Output
Options

+ Add output

Name	Type	Parameter	Output as	Exposed	Actions
Aligned reads	BAM (.bam)	-o	Single file	✓	✎ ✕


Back
Next

Figure 50. Defined output of a User Added Task

## Options


Additional input options to the command line can be configured. To add a new input, select the **Add option** button (Figure 13), then configure the dialog (Figure 14).

Partek  
Flow



Queue ▾

Projects ▾

 Administrator ▾

Home > Settings > Task management > Create custom task

Task details

Input

Output

Options

+

Add option

Name	Type	Parameter	Description	Required	Advanced	Values	Actions
No options added							

Back

Finish

Figure 51. Table of Options for the User Added Task

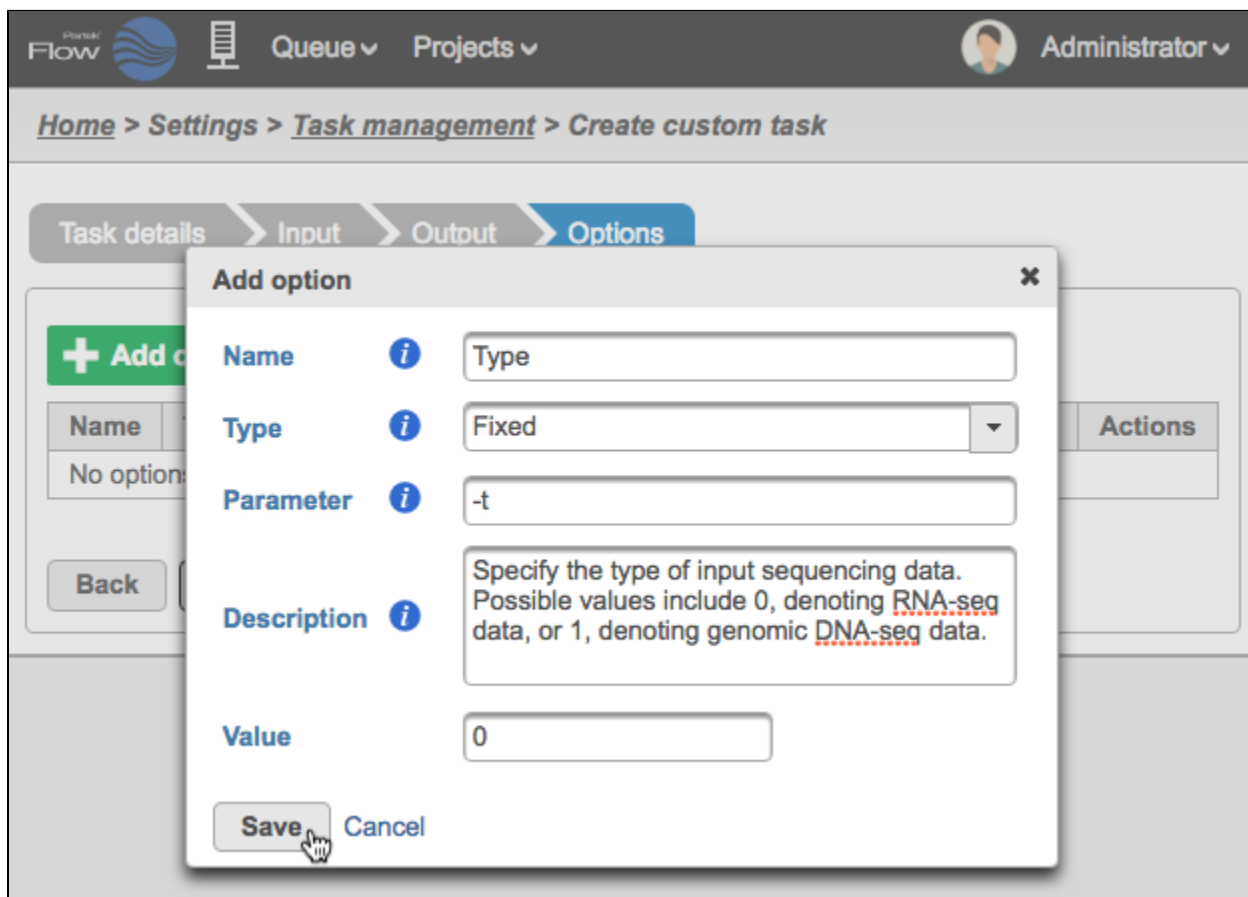




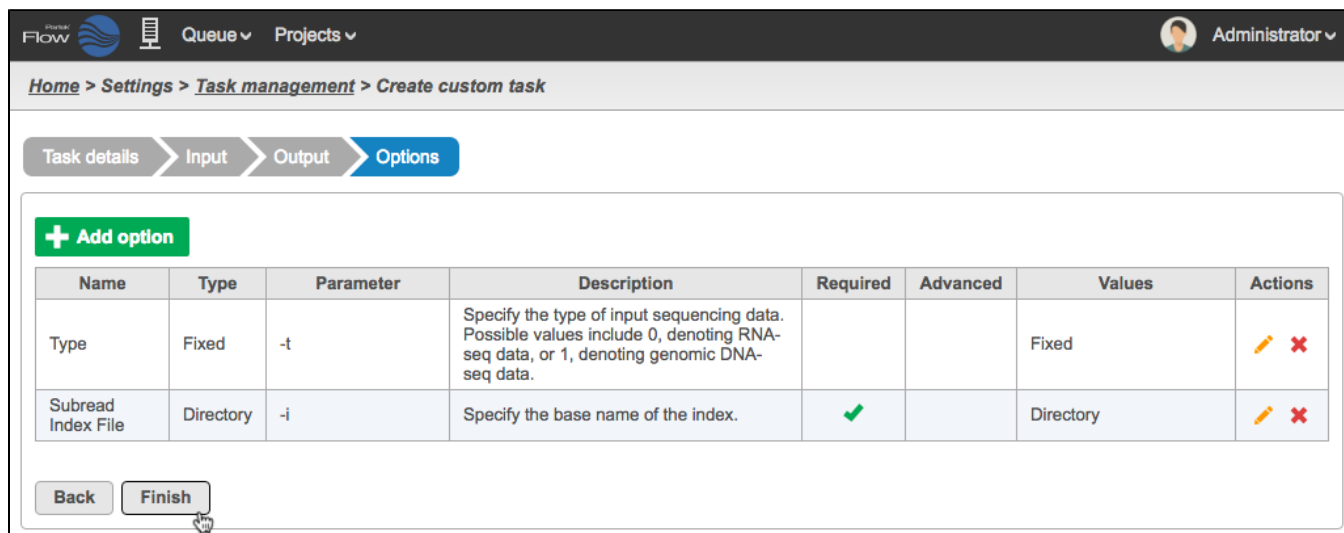
Figure 52. Configuring additional task options

- **Name** - a label that concisely describes the option, keeping this short ensures that the option label is well displayed and easy to find
- **Type** - the type of value this option can assume, which determines the interface used to choose the value during task setup
  - **Number** - spinner component to select number values
  - **Yes/No** - check box to select boolean values
  - **List** - select one or more item from a list of string values
  - **Text** - input box to select arbitrary string values
  - **Fixed** - input box to select a fixed string value (will not show up on the configuration UI of the user task)
  - **File** - file selector for a single file
  - **Directory** - file selector for a directory
  - **Library file** - selector for supported, built in library files (e.g. reference fasta, reference VCF)
- **Parameter** - the parameter used to identify this option on the command line/executable. For example: -a [value], where 'a' is the parameter
- **Description** - additional information about the option will be available in an 'info' icon (tooltip) when configuring the option
- **Advanced** - options that are set to advanced will be moved to the advanced options dialog, and can be saved to option sets

- **Required** - options that are set to required must be filled with a value when configured, otherwise the option is something that can be left off the command line
- **Only Integers** - if checked, this option will not allow fractional numbers, such as 74.42
- **Values range** - enter two values to define a range of values
- **Default value** - enter a default value
- **Allow multiple** - if checked, allows one or more of the list items to be selected
- **Add Value** - (for List types) enter one or more strings
- **Library type** - (for Library file types) can be a *Reference sequence* or *Variant database*

After configuring the dialog field, click **Save**. The Option will appear in the Table as in Figure 15. Any existing option can be edited  or deleted  using the action buttons on the far right of the table.






Complete the addition of the *User added task* by clicking the **Finish** button from the *Options* step.



Home > Settings > Task management > Create custom task

Task details > Input > Output > Options

**+ Add option**

Name	Type	Parameter	Description	Required	Advanced	Values	Actions
Type	Fixed	-t	Specify the type of input sequencing data. Possible values include 0, denoting RNA-seq data, or 1, denoting genomic DNA-seq data.			Fixed	 
Subread Index File	Directory	-i	Specify the base name of the index.			Directory	 

Back Finish

Figure 53. Defined additional input options a User Added Task

## Management

The new task will show up as an entry in the Task management table (Figure 16).

Queue ▾
Projects ▾

Administrator ▾

[Home](#) > [Settings](#) > [Task management](#)

Personal settings

My profile

My preferences

System settings

System information

System preferences

LDAP configuration

Partek Flow components

Filter management

Library file management

Option set management

Task management

Pipeline management

Access management

User management

Group management

Licensing

Directory permissions

Access control log

Failed logins

+ Add task

Task name	System-wide version	Enabled	Actions
Samtools	1.2	<input checked="" type="checkbox"/>	
SeqDuo analysis		<input checked="" type="checkbox"/>	
Subread Aligner	1.50	<input checked="" type="checkbox"/>	
Subsample reads		<input checked="" type="checkbox"/>	
Summarize cohort mutations		<input checked="" type="checkbox"/>	
TMAP	5.0.0 ▾	<input checked="" type="checkbox"/>	
TopHat	1.4.1 with bowtie 1.0.0 ▾	<input checked="" type="checkbox"/>	
TopHat 2	2.1.0 ▾	<input checked="" type="checkbox"/>	
Torrent variant caller	5.0-3	<input checked="" type="checkbox"/>	
Transcript expression analysis (Cuffdiff)	2.2.1 ▾	<input checked="" type="checkbox"/>	
Trim adapters	1.2.1	<input checked="" type="checkbox"/>	
Trim bases		<input checked="" type="checkbox"/>	
Validate variants		<input checked="" type="checkbox"/>	
Velvet	1.2.08	<input type="checkbox"/>	
View variants		<input checked="" type="checkbox"/>	


Rows per page
25 ▾

(3 of 3)

Figure 54. Task management table showing a User added task

Like native Partek Flow tasks this task can have its system wide version set, and can be globally enabled or disabled. Unlike native Partek Flow tasks, there are additional actions that can be taken on user added tasks:

- Download: Downloads the task definition as a file that can be imported into other Partek Flow installations.

 - Edit: Opens the add task wizard with all fields pre-filled. This is a clone operation, so a new task name or version must be selected.

 - Delete: Removes the task

## Running a Task

User added tasks appear in the context sensitive Task Menu when a selected data node matches the Input data type (Figure 17).

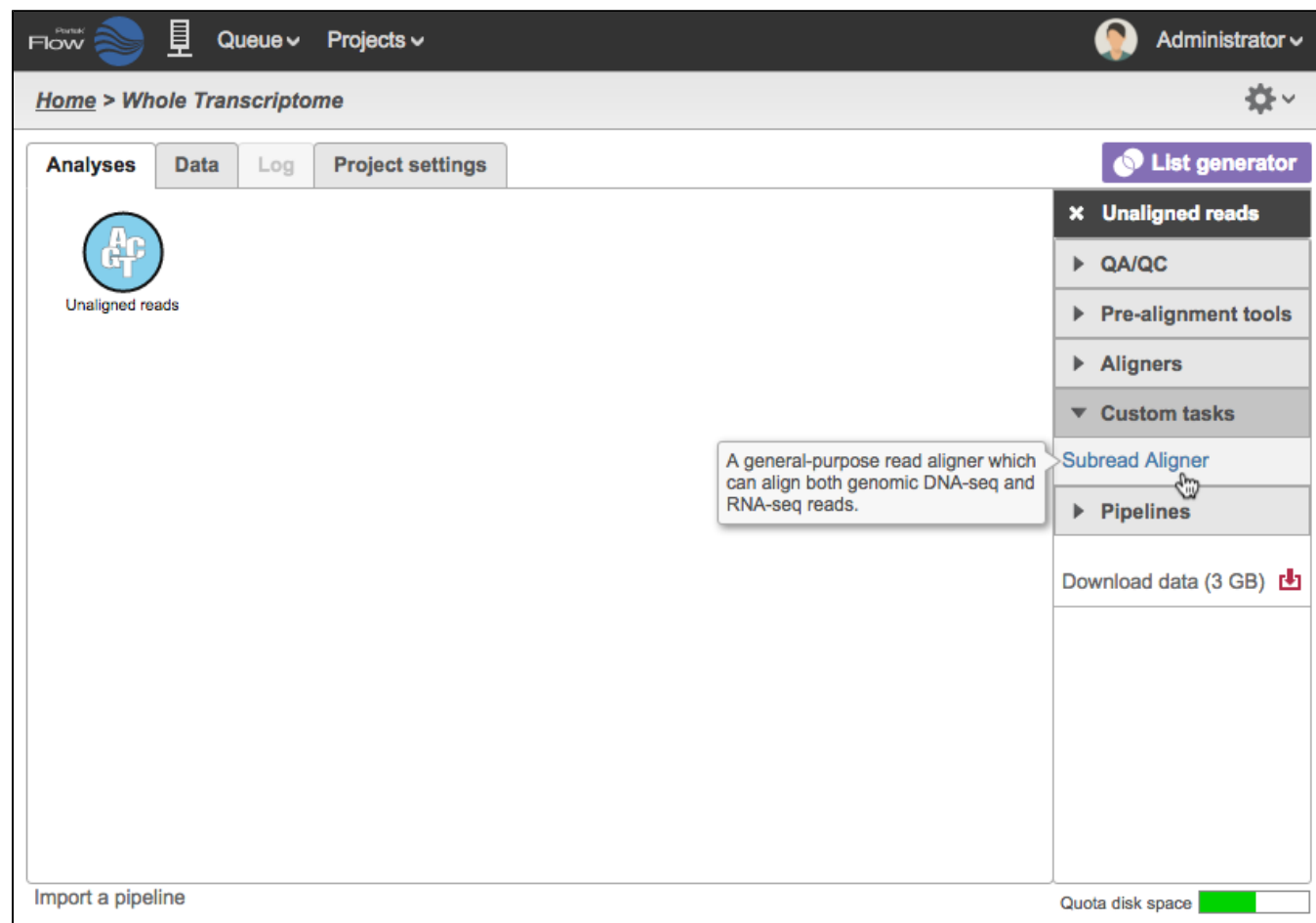


Figure 55. User added tasks appear in the Task Menu

If there are additional options that need to be defined, a task wizard will appear (Figure 18).

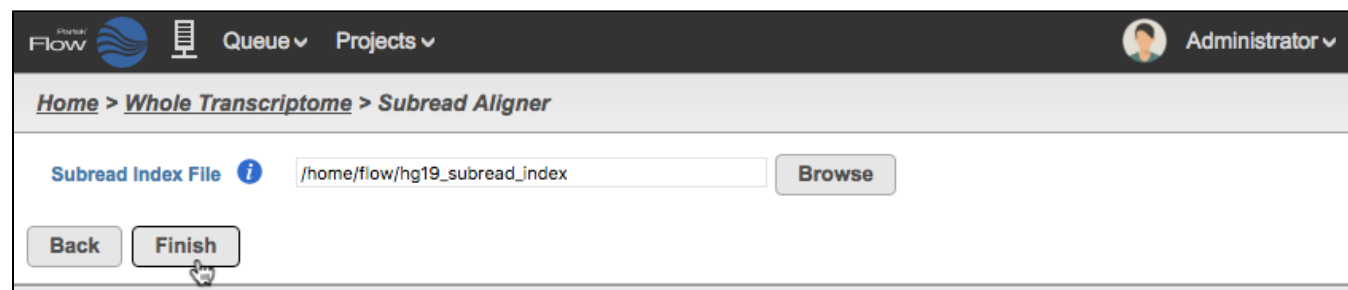


Figure 56. A task wizard will appear depending on the task options

The Name of the User added task will appear as a task node in the Analyses tab (Figure 19).

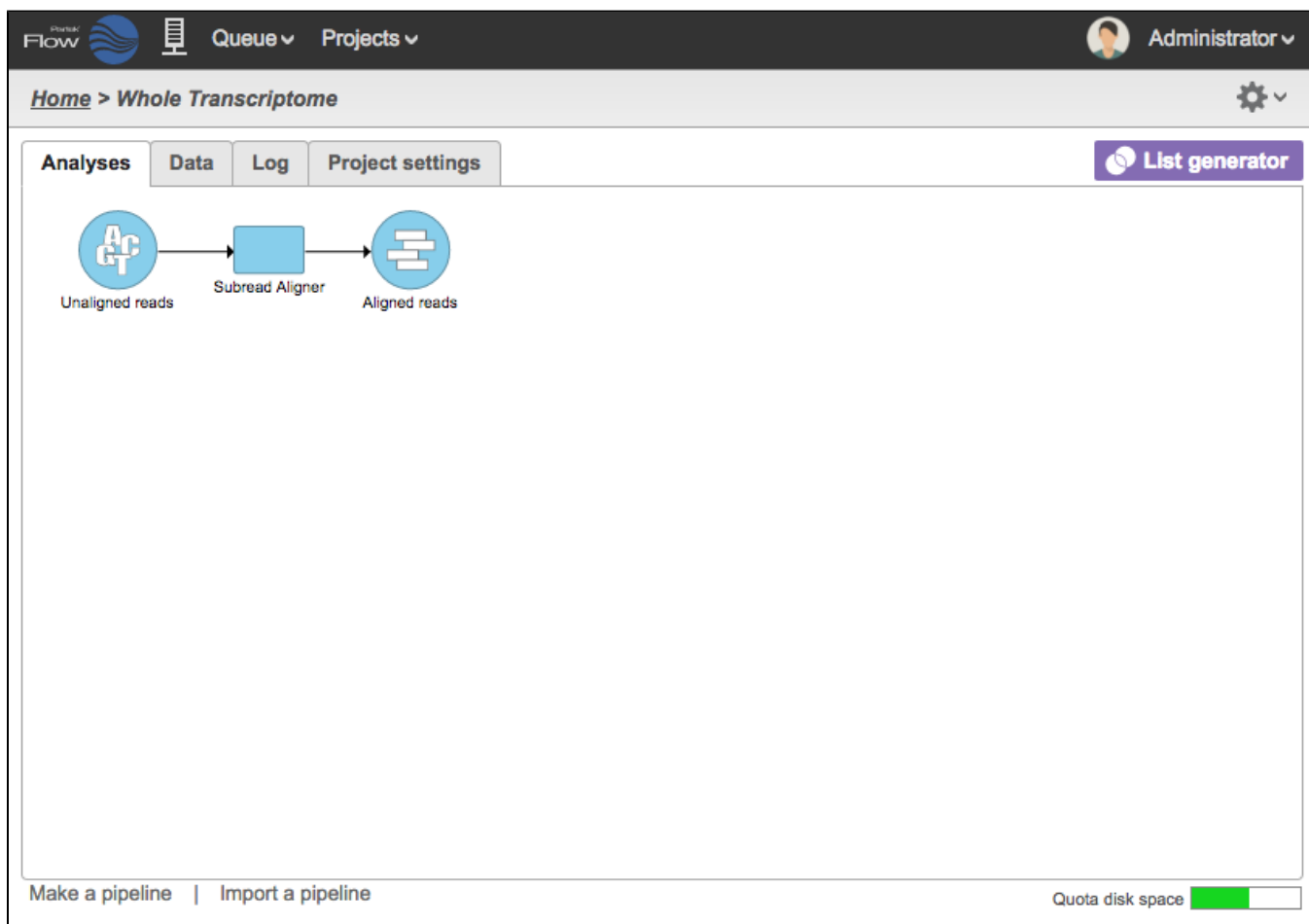


Figure 57. A successful run of a User added task

## Integration Scripts

*User added tasks* has some format restrictions for passing arguments to the command line.

For example, a binary that has multiple positional arguments cannot be directly wrapped. To execute these binaries through Partek Flow's *User added tasks*, one must first wrap the binary in a script that can, for example, parse parameterized arguments into positional arguments. This can be done using any scripting language executable by the Partek Flow server.

*User added tasks* also require a single binary per task. So if you wish to execute multiple steps and have that represented as a single task in Partek Flow, one must first wrap those steps in a script that can be imported into Partek Flow.

## Additional Assistance

If you need additional assistance, please visit [our support page](#) to submit a help ticket or find phone numbers for regional support.



Your Rating:  Results:  39 rates