Pipelines in Perl With eHive

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www.ebi.ac.uk

www.ensembl.org

https://github.com/Ensembl/ensembl-hive

@enscore

EMBL-EBI

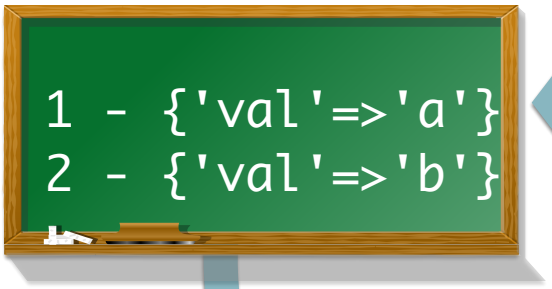
Processing Workflows with Perl and eHive

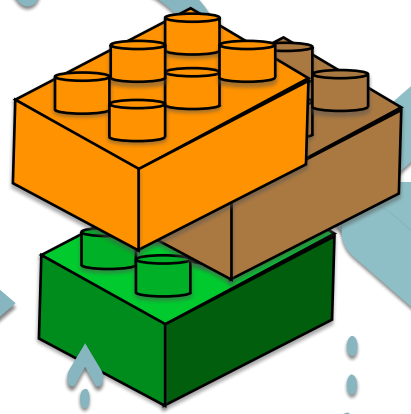
- https://github.com/Ensembl/ensembl-hive
- A workflow management system in Perl
- Uses traditional schedulers (LSF/OpenLava) to submit work
- Workflows are DAGs using semaphores to replicate programming constructs

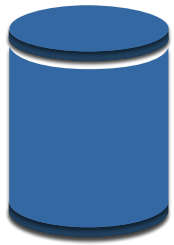
eHive: How it Works

The central blackboard holds a list of jobs to process

An analysis can create more jobs on the blackboard to preconfigured endpoints

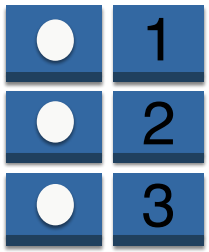






Output can flow into a database table ...

… or perform a custom action e.g. writing a collection of files to disk ...



… or accumulate data for a funnelled downstream analysis

Jobs are given to an analysis as a collection of key/value pairs defining the unit of work. Analyses responding to the incoming parameters by executing a set of instructions similar to a subroutine call

Failed jobs are automatically retried

```perl
package CountATGC;

use strict;
use warnings;
use Bio::SeqIO;
use base qw/Bio::EnsEMBL::Hive::Process/;

sub fetch_input {
  my ($self) = @_;
  my $chunkfile = $self->param_required('chunk_name');
  $self->param('chunk_in', Bio::SeqIO->new(-file => $chunkfile));
  return;
}

sub run {
  my ($self) = @_;
  my ($at, $gc) = (0,0);
  foreach my $chunkseq ($self->param('chunk_in')->next_seq()) {
    my $seqstring = $chunkseq->seq();
    $at += @{[$seqstring =~ /([AaTt])/g]};
    $gc += @{[$seqstring =~ /([GgCc])/g]};
  }
  $self->param('at', $at);
  $self->param('gc', $gc);
  return;
}

sub write_output {
  my ($self) = @_;
  $self->dataflow_output_id({
    at => $self->param('at'),
    gc => $self->param('gc'),
  });
  return;
}

1;
```

Get your input data sets

Get a path to a data file, initalise another object for reading and stash it

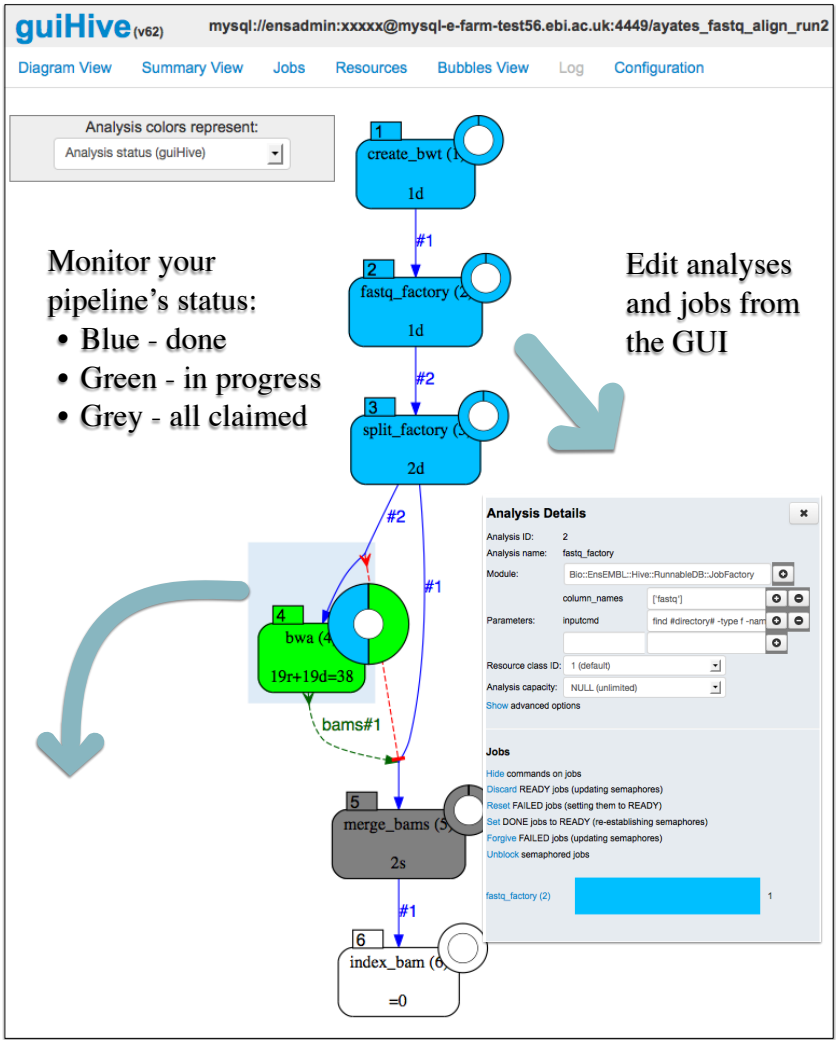
Do your processing

We are using the object to get sequence, counting the number of AT/GC by regex and stashing the result

Send a hash to the next task

Current task does not need to know what will consume the hash

guiHive for Monitoring Your Application



- Written in GO with D3.js
- Persistent web server talking to multiple hives
- Edit your pipeline as it is running
- Watch your application execute if you really want to

Tutorial from

https://github.com/andrewyatz/eHiveDemo-yapceu2016

The Entire Ensembl Team

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