

Cluster Man Application

Cluster Man is a web application that is used to manage a Brown Dog Cluster. It is designed to be re-skinned so it could be bundled with Clowder to provide this functionality without an explicit Brown Dog dependency.

It manages configuration around:

1. Docker Swarm for starting/stopping and deleting tool instances.
2. RabbitMQ for binding exchanges to the queues of running tools.

With it you can:

1. Deploy new tools
2. Bind tools deployments to one or more projects
3. Create new projects
4. Perform bulk bindings of tools to a project

There are two views:

Tools

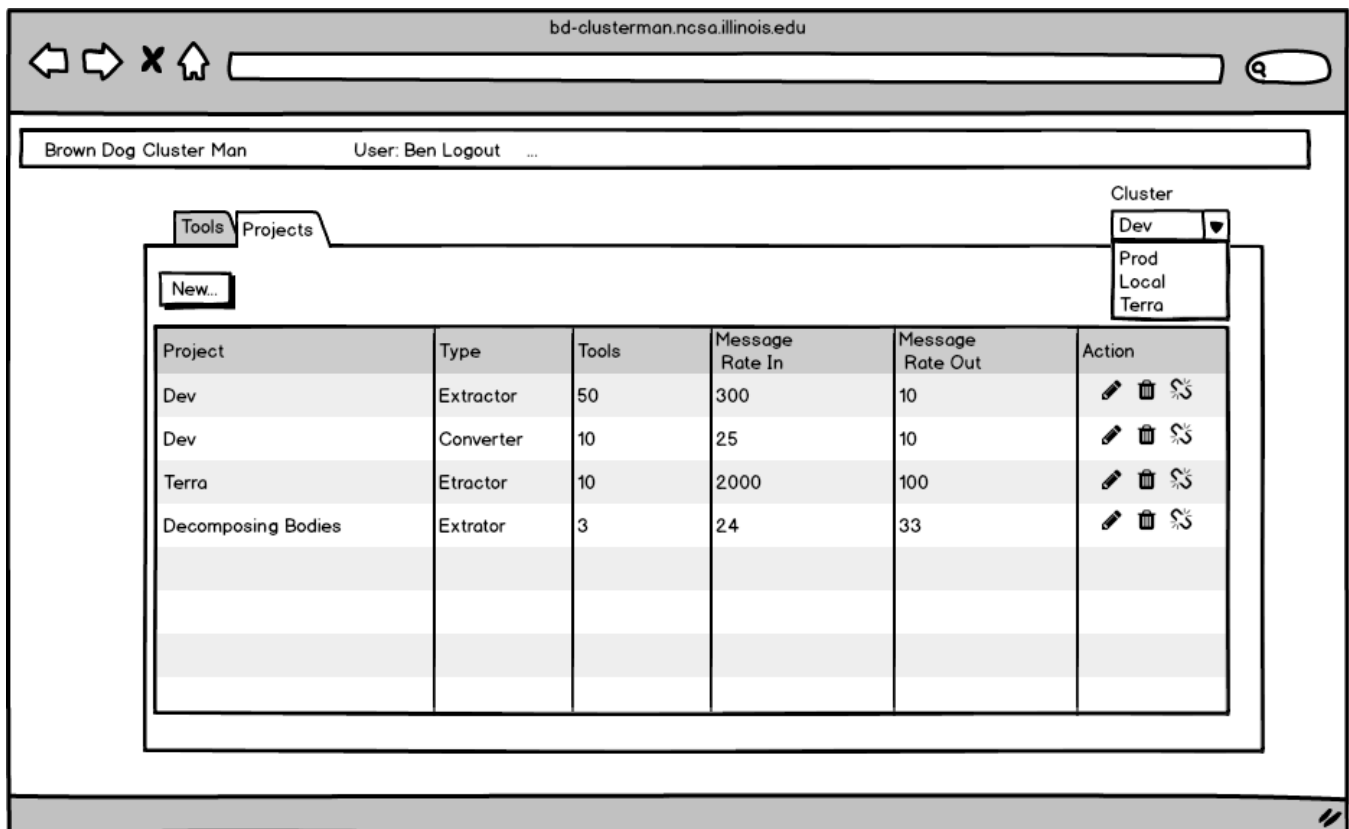
Docker Swarm services are represented as running instances of tools. The Service Name is unique, but has no system significance. There can be multiple instances of a tool running since the queue name and service name are unique.

The screenshot shows the Cluster Man web application interface. At the top, the browser address bar displays 'bd-clusterman.ncsa.illinois.edu'. Below the browser window, the application header includes 'Brown Dog Cluster Man' and 'User: Ben Logout ...'. The main content area features a 'Tools' tab and a 'Projects' tab. A 'Deploy...' button is visible. On the right, a 'Cluster' dropdown menu is set to 'Dev', with options for 'Prod', 'Local', and 'Terra'. The central table lists the following tools:

Tool	Type	Instances	Jobs	Message Rate In	Message Rate Out	Action
Image Magik	Extractor	3	0	10	10	[Icons: Stop, Play, Edit, Delete, Refresh]
GDAL	Converter	4	2	10	3	[Icons: Stop, Play, Edit, Delete, Refresh]
Ghostscript	Converter	1	0	0	1	[Icons: Stop, Play, Edit, Delete, Refresh]
OpenCV Faces	Extractor	1	0	10	10	[Icons: Stop, Play, Edit, Delete, Refresh]

And projects

RabbitMQ Exchanges are represented as projects. The exchanges are tagged with the tool type they support. There can be multiple exchanges in a project as long as they support different tool types.



Tool Deployment

Tool Deployment is a two-step workflow.

In the first step you choose the tool by selecting a tool type and then entering the name of the tool. The form will attempt to auto-complete the tool name as you type.

Choose Tool to Deploy

Tool Type

Extractor ▼

Tool Name

OpenCV/Faces
OpenCV/Faces
OpenCV/Eyes
OpenCV/Profiles

Tool Catalog: browndog.ncsa.illinois.edu
Docker Image Name: clowder/extractors-opencv-faces
Updated: Sep 26, 2017
Description: Find faces in an image.
Script submitter: mchenry@illinois.edu
Number of downloads: 0

Cancel

Next

In the second step you can enter deployment parameters. ClusterMan will generate a unique queue name that is based on the default queue name specified in the tool definition.

Clicking *Deploy* will attempt to deploy the tool to the cluster.

Deploy OpenCV Faces Extractor to Dev

Service Name	<input type="text" value="Fluffy bunny plays in the fields"/>	
Min Instances	<input type="text" value="3"/>	<input type="button" value="▲"/> <input type="button" value="▼"/>
Max Instances	<input type="text" value="3"/>	<input type="button" value="▲"/> <input type="button" value="▼"/>
Memory	<input type="text" value="4"/>	GBytes
CPU Limit	<input type="text" value="2"/>	Cores
<input type="button" value="Cancel"/> <input type="button" value="Deploy"/>		

Once the tool has been successfully deployed, the user will be asked to manage bindings for the new tool to the existing projects.

For an extractor they will have some choices to make:

Bind Projects to OpenCV/Faces

Fluffy Bunny plays in the fields successfully deployed to dev

Project	Binding
Dev	<input type="text" value="All messages"/> ▼
Terra	<input type="text" value="None"/> ▼
Decomposing Bodies	<input type="text" value="None"/> ▼
Dark Energy Survey	<input type="text" value="All messages"/> ▼ <input type="text" value="Tool messages only"/>
<input type="button" value="Cancel"/> <input type="button" value="Bind"/>	

For converters, there is no choice. Remind the user that the new converter has been bound to every project in the cluster.

Clusterwide Project Bindings for Converter

Fluffy Bunny plays in the fields successfully deployed to dev

Project	Binding
Dev	All Messages
Terra	All Messages
Decomposing Bodies	All Messages
Dark Energy Survey	All Messages

Ok

New Project

Authorized users can add new projects to the application when a new exchange is added to RabbitMQ. When the project is created, the user can specify which users have administrative rights over this project. They will be entitled to bind and unbind tools within their project.

New Project

Name

Terra

Tool Type

Extractor ▼

Exchange

Dev-Clowder ▼
Terra-Clowder

Administrators

☐ Moe

☒ Larry

☐ Curly

☐ Shemp

☒ Joe

Cancel

Submit

Note that converters don't allow binding so we don't need to capture the exchange.

New Project

Name

Tool Type

Administrators

<input type="checkbox"/>	Moe
<input checked="" type="checkbox"/>	Larry
<input type="checkbox"/>	Curly
<input type="checkbox"/>	Shemp
<input checked="" type="checkbox"/>	Joe

Bind tools to a project

Bind Tools to Terra Project on Dev

Tool Name	Binding
OpenCV/Faces	<input type="text" value="All messages"/>
OpenCV/Profiles	<input type="text" value="None"/>
OpenCV/Eyes	<input type="text" value="All messages"/> <input type="text" value="Tool messages"/>