Pipeline Engine
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Audience: XNAT Site administrators and developers
Goals: How does one create a pipeline and integrate it with XNAT.
http://nrg.wikispaces.com/Pipeline+Engine

Pipeline Engine

- A pipeline is a sequence of steps described in a XML document, called the pipeline descriptor. A step results in calling many executables.
- Invoking an executable involves knowing the path to the executable, its arguments, the prefix to use and their order. Each executable is described in a XML document, called resource descriptor.
- The parameters to a pipeline can be provided within the pipeline descriptor, on the command line or as a separate XML file, called parameter document. The parameters to the pipeline can be XPATH expressions.
- Pipeline engine is a JAVA based framework which takes as input the pipeline descriptor, resource descriptors and the parameter document.
- Pipeline engine can be started in two modes – by interfacing with XNAT or without XNAT.
- PIPELINE_HOME/bin/PipelineRunner runs the engine without interfacing with XNAT
- PIPELINE_HOME/bin/XNATPipelineLauncher runs the engine by updating XNAT workflow as the pipeline executes.
- Pipeline engine supports the SUN Grid engine through the DRMAA API.

XNAT and Pipelines

- Site administrators makes a pipeline available to the site.
- A project owner sets up a pipeline relevant to the project.
- A project member launches the pipeline for an experiment.

Creating a pipeline

- Creating a pipeline involves:
  o Installing the executables
  o Creating resource descriptors for each of the executables
  o Creating pipeline descriptor

o In case a custom page is desired to launch a pipeline, velocity template page, screen and action class need to be created.

Developers Tips

- If the pipeline consists of a step to notify the user(s), set the suppressNotification(true) on the XnatPipelineLauncher object. This way the user wont get two emails – one from the pipeline and the other from the pipeline engine.
- Overload the PIPELINE_HOME/bin/schedule script to schedule jobs in a queue as per scheduling policy in your site
- Invoking launch(null) on XnatPipelineLauncher object bypasses the scheduler and runs the job on the TOMCAT_HOST.

REST calls to Pipelines
Only pipeline that have input-parameters which are either schema XPATH statements or constants can be invoked via the rest call.

Monitoring
The links

- Administer -> More Options -> Summary
- Administer -> More Options -> View Workflows

Are useful to keep track of the pipelines

Troubleshooting
TOMCAT_HOME/webapp/XNAT_PROJECT/logs/application.log contains call to XnatPipelineLauncher

The STDOUT and STDERR files generated by the pipeline contain clues about why the pipeline failed.

PIPELINE_HOME/logs/pipeline_TIMESTAMP.log is created before the STDOUT and STDERR files are generated.