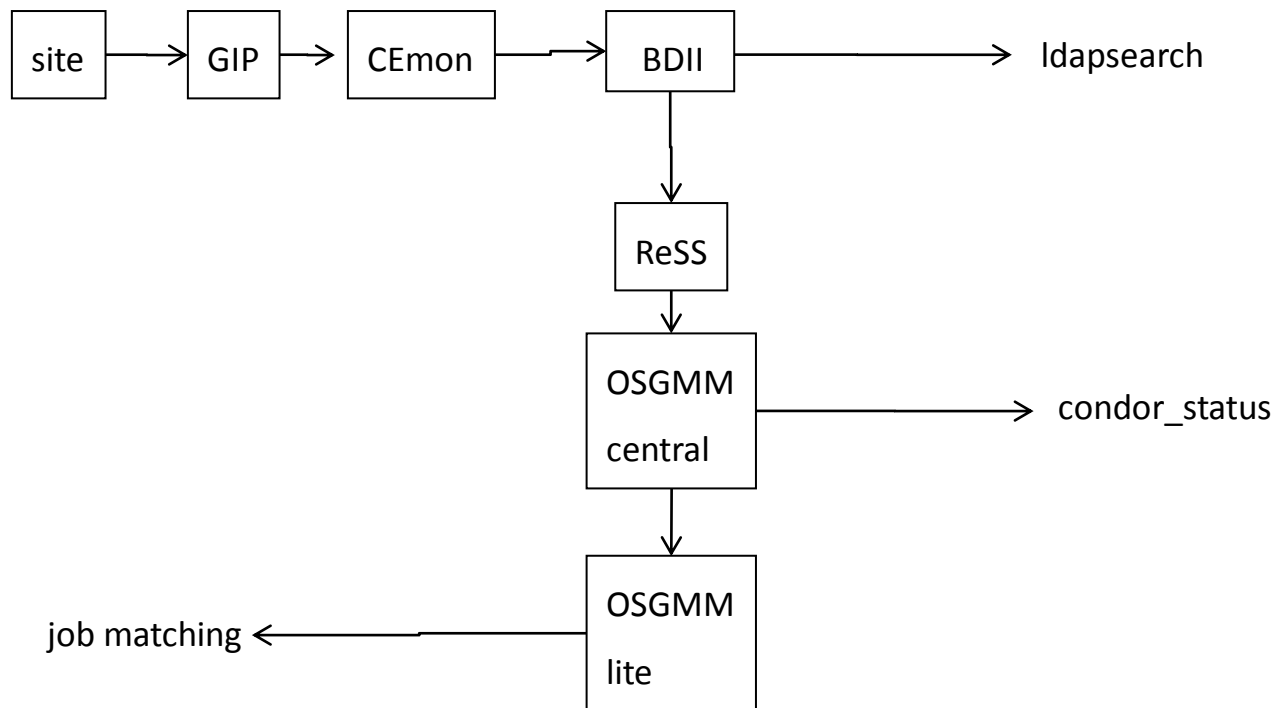


# OSG Discovery Tool

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# Resource Information Flow



# Current Methods: Idapsearch

*Command line interface ldap server, output in ldif*

## Usage

```
ldapsearch [-x] [-L[L[L]]] [-H ldapuri] [-b searchbase] filter [attrs...]
```

## Example

### Command

```
ldapsearch -x -LLL -H ldap://is.grid.iu.edu:2170 -b o=grid \  
"(&(objectclass=GlueVOInfo)(GlueVOInfoAccessControlBaseRule=engage))" \  
GlueVOInfoAccessControlBaseRule
```

### Output

```
dn: GlueVOInfoLocalID=grid.rc.rit.edu,GlueSALocalID=grid.rc.rit.edu,GlueSEUniq  
ueID=grid.rc.rit.edu,Mds-Vo-name=NYSGRID_RIT,Mds-Vo-name=local,o=grid  
GlueVOInfoAccessControlBaseRule: mis  
GlueVOInfoAccessControlBaseRule: osg  
GlueVOInfoAccessControlBaseRule: ops  
GlueVOInfoAccessControlBaseRule: engage  
GlueVOInfoAccessControlBaseRule: nysgrid  
...
```

# Current Methods: condor\_status

*Command line interface to classads (in Resource Selection Service or OSGMM).*

## *Usage*

```
condor_status [ -debug ] [ help options ] [ query options ] [ display options ] \  
[ custom options ] [ hostname ... ]
```

## *Example*

### *Command*

```
condor_status -l -pool ligo-osgmm.renci.org \  
-format "%s, " GlueSAPath -format "%s, " GlueVOInfoPath \  
-format "%s \n " GlueCESEBindMountInfo \  
-constraint "GlueSEAccessProtocolType == \"file\" && GlueSiteName == \"Nebraska\""
```

### *Output*

```
/mnt/hadoop/user/, /mnt/hadoop/user/ligo, //
```

# Gap Analysis

## Complexity of using BDII info

- Idapsearch
  - Parse Idif
  - Take care of line wrapping
  - Combine results of several searches
- condor\_status
  - Schema info is lost in classad conversion
  - Post-processing of results may be needed.

## Architectural Principles

- Model already decided
  - Info from sites using Glue Schema
    - Installed resources and their configuration
- Simplify Access
  - Hide service details from user
- Integration with other software
- Transition to future information service

# Strategy

- Use XML
  - Standard unifying technology for information services
  - Glue Schema expressible in xsd
  - Access via knowledge of schema alone
- Generic Access Tool
  - Using Xpath expressions
- Scripts
  - xquery-based

# Implementation

- Xpath-based LDAP Search
  - Convert to ldap search expression, query bdi server.
- Xpath evaluation
  - convert bdi results to XML, evaluate.
- Xqueries
  - Extract xpaths, search, evaluate.
- Caching



# Software Development Process

- Requirements Document
  - <https://twiki.grid.iu.edu/bin/view/InformationServices/OSGStorageDiscoveryRequirements>
- Design Document
  - <https://twiki.grid.iu.edu/bin/view/InformationServices/OSGStorageDiscoveryDesign>
- Development versions tested by STG, others
  - <http://gratiax15.fnal.gov:8888/maven/opensciencegrid/osg-discovery/>
- Pre-release versions to be tested by ITB, others
  - <https://twiki.grid.iu.edu/bin/view/Storage/OSGStorageDiscoveryTool>

# Generic Access: xpathsearch

*Searches BDII using Xpath expressions*

## *Usage*

```
xpathsearch [options] xpathexpression1 [ xpathexpression2 ... ]
```

## *Example*

### *Command*

```
bin/xpathsearch "//GlueSE/GlueSEControlProtocol/@GlueSEControlProtocolEndpoint"
```

### *Output*

```
httpg://abitibi.sbgrid.org:10443/srm/v2/server  
httpg://sigmorgh.hpcc.ttu.edu:49443/srm/v2/server  
httpg://se01.cmsaf.mit.edu:8443/srm/managerv2  
httpg://se01.cmsaf.mit.edu:8443/srm/managerv1  
httpg://cit-se.ultralight.org:8443/srm/v2/server  
httpg://cms-xen19.fnal.gov:8443/srm/v2/server  
httpg://se.tier3.ucdavis.edu:8443/srm/v2/server  
httpg://cmsrm.hep.wisc.edu:8443/srm/managerv1  
...
```

# Generic Access: xpathsearch

*Searches BDII using Xpath expressions*

## *Usage*

```
xpathsearch [options] xpathexpression1 [ xpathexpression2 ... ]
```

## *Example*

### *Command*

```
bin/xpathsearch "//GlueSE[GlueSEAccessProtocol\  
[@GlueSEAccessProtocolType='gsiftp' or  
@GlueSEAccessProtocolType='gsidcap']]\  
GlueSA/GlueVOInfo[@GlueVOInfoAccessControlBaseRule='dzero']\  
/../../../../GlueSEControlProtocol[@GlueSEControlProtocolType='SRM' and \  
@GlueSEControlProtocolVersion='2.2.0']/../../../../@GlueSEUniqueID" 2>/dev/null
```

### *Output*

```
se01.cmsaf.mit.edu  
cit-se.ultralight.org  
cit-se2.ultralight.org  
dcache07.unl.edu  
dcslrm.usatlas.bnl.gov  
...
```

# Generic Access: xpathsearch

*Searches BDII using Xpath expressions*

## *Example*

### *Command*

```
bin/xpathsearch "//GlueSE[GlueSEAccessProtocol\  
[@GlueSEAccessProtocolType='gsiftp' or  
@GlueSEAccessProtocolType='gsidcap']]\  
GlueSA/GlueVOInfo[@GlueVOInfoAccessControlBaseRule='dzero']\  
/../../GlueSEControlProtocol[@GlueSEControlProtocolType='SRM' and \  
@GlueSEControlProtocolVersion='2.2.0']/../../@GlueSEUniqueID" 2>/dev/null
```

### *Output*

```
se01.cmsaf.mit.edu  
cit-se.ultralight.org  
cit-se2.ultralight.org  
dcache07.unl.edu  
dcsrcm.usatlas.bnl.gov  
...
```

# Script Example - surl

*Returns a list of example site URLs for Storage Elements on which the specified VO is authorized.*

## Usage

```
surl --vo <VO name> [--storage_element_id <GlueSEUniqueID>]
```

## Example

### Command

```
surl --vo atlas
```

### Output

```
Cache not present.
```

```
Loading cache /home/tdh/testing/osg-discovery-0.8-r334/cache/bdii.xml
```

```
Done.
```

```
srm://abitibi.sbggrid.org:10443/srm/v2/server?SFN=/opt/osg-shared/se/data/vo/atlas/TESTFILE
```

```
srm://bsrm-1.t2.ucsd.edu:8443/srm/v2/server?SFN=/hadoop/atlas/TESTFILE
```

```
srm://charm.ucr.edu:10443/srm/v2/server?SFN=/data/charm/cms/TESTFILE
```

```
srm://cit-se2.ultralight.org:8443/srm/v2/server?SFN=/mnt/hadoop/osg/TESTFILE
```

```
srm://dcache07.unl.edu:8443/srm/v2/server?SFN=/mnt/hadoop/user/atlas/TESTFILE
```

```
...
```

# Script Example – srm\_sp\_reserve\_cmd

*Returns a list of srm-sp-reserve commands for Storage Elements on which the specified VO is authorized.*

## Usage

```
srm_sp_reserve_cmd --vo <VO name> --requested_size <Size requested> \  
[--storage_element_id <GlueSEUniqueID>] [--guaranteed_size <Size to be guaranteed>] \  
[--lifetime <Time to expiration>] [--description <Space token description>]
```

## Example

### Command

```
srm_sp_reserve_cmd --vo ligo --requested_size 1000000000
```

### Output

```
srm-sp-reserve -serviceurl srm://abitibi.sbgrid.org:10443/srm/v2/server -size 1000000000  
srm-sp-reserve -serviceurl srm://bsrm-1.t2.ucsd.edu:8443/srm/v2/server -size 1000000000  
srm-sp-reserve -serviceurl srm://condor.hpcc.nd.edu:8443/srm/v2/server -size 1000000000  
srm-sp-reserve -serviceurl srm://srm-dcache.rcac.purdue.edu:8443/srm/managerv2 -size 1000000000  
srm-sp-reserve -serviceurl srm://dcache07.unl.edu:8443/srm/v2/server -size 1000000000  
srm-sp-reserve -serviceurl srm://dcsrm.usatlas.bnl.gov:8443/srm/managerv2 -size 1000000000  
...
```

# Configuration

## conf/xpathsearch.rc

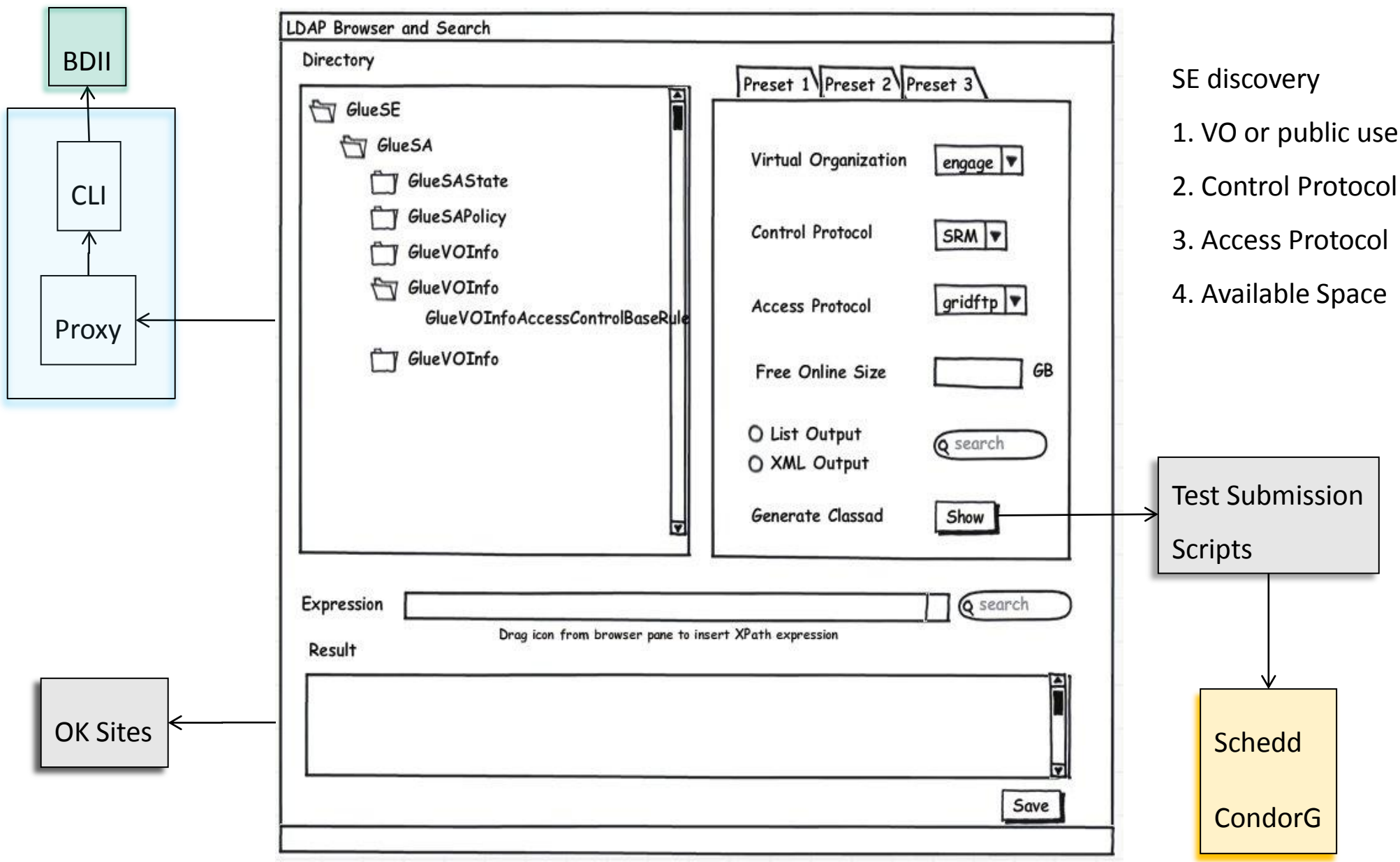
```
LDAP_URI="ldap://is.grid.iu.edu:2170"  
LDAP_BASE="o=grid"  
XPATHCACHE_DIR=$XPATHSEARCH_HOME/cache  
MAX_CACHE_AGE=86400
```

## Possible Future Development

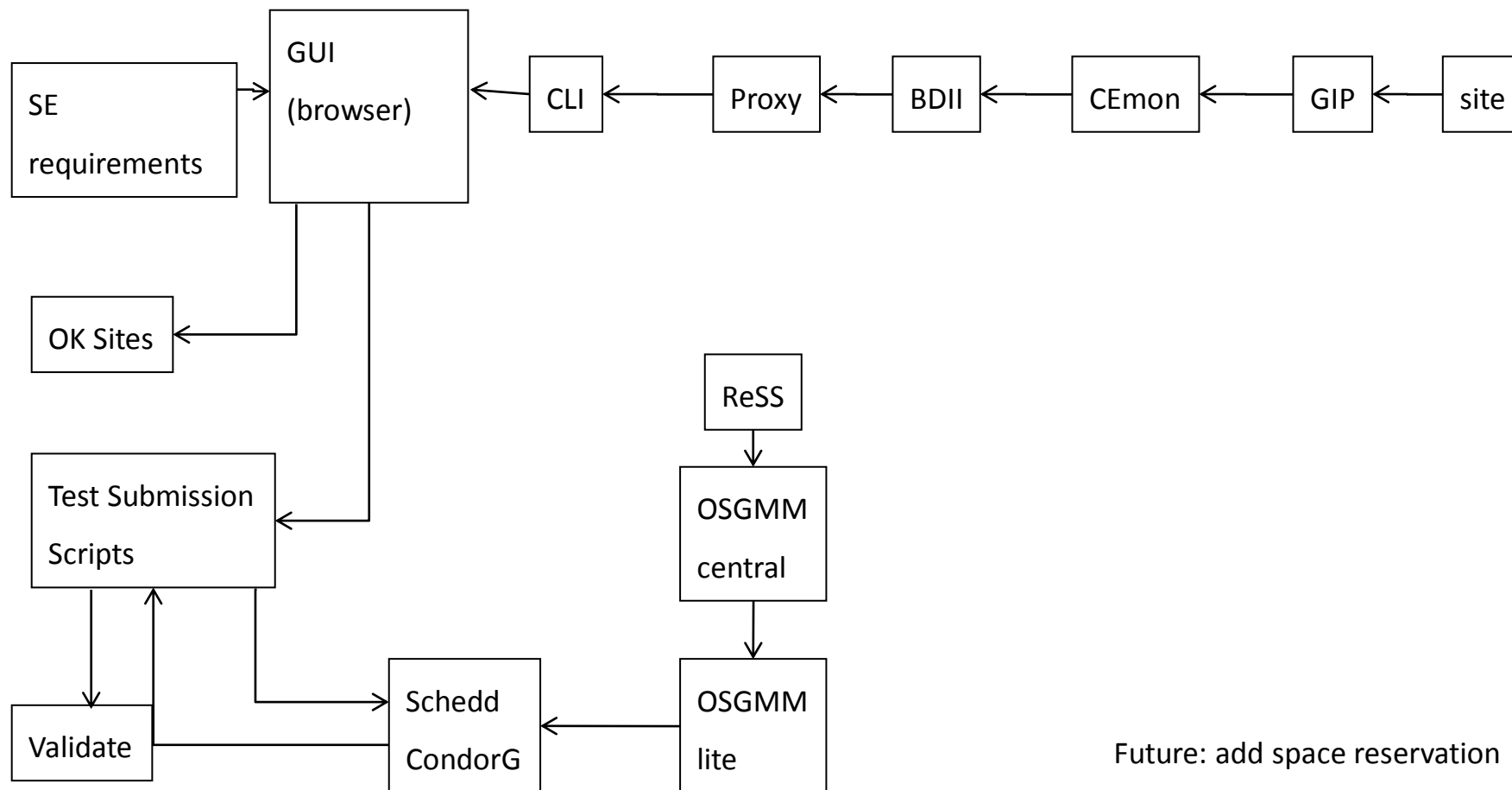
- Proxy server for XML representation of BDII data
- Tool to produce test job submission and script
- GUI for browsing BDII and composing searches
- Integration with MyOSG for select information.



# Browser-based UI



# GUI and Test Job Process



Future: add space reservation  
discovery/request feature.