Inca Workshop
August 26, 2010

Hands-on Tutorial #1
Reporter API and Repository

**Review reporter APIs:**
1) Overview of APIs: [http://inca.sdsc.edu/releases/2.6/guide/userguide-one.html#REPORTER-APICopy](http://inca.sdsc.edu/releases/2.6/guide/userguide-one.html#REPORTER-APICopy)
2) Perl APIs: [http://inca.sdsc.edu/releases/2.6/repdocs/perl.html](http://inca.sdsc.edu/releases/2.6/repdocs/perl.html)
3) Python APIs: [http://inca.sdsc.edu/releases/2.6/repdocs/python.html](http://inca.sdsc.edu/releases/2.6/repdocs/python.html)

**Download a default set of reporters:**
1) Get repository and untar it
   ```
   % wget http://inca.sdsc.edu/releases/2.6/Inca-Reporter.tar.gz
   % tar -zxvf Inca-Reporter.tar.gz
   % cd Inca-Reporter-5.13398/bin
   ```
2) Set environment variables to include reporter libs
   ```
   % setenv PERL5LIB ../lib/perl; setenv PYTHONPATH ../lib/python
   ```
3) Execute a reporter. Try running with -help, -version, and -log to see how the output changes.
   ```
   % ./cluster.compiler.gcc.version
   ```

**Write some reporters:**
1) A base Reporter that reports the path of the user’s shell (“$ENV{SHELL}” contains this) using the following <body> format:
   ```
   <body>
   <shell>
   <ID>shell</ID>
   <path>/bin/bash</path>
   </shell>
   </body>
   ```

2) A Version Reporter that determines the version of tcsh (“tcsh –c ‘echo $version’ ” reports this), failing if tcsh is unavailable

3) A SimpleUnit Reporter that determines whether “finger” command can provide the user’s name.

4) A Performance Reporter that reports system page swap activity over a specified interval (the program sar reports this; on some systems the command is “sar –g interval 1”; on others it’s “sar –B interval 1”). Allow the user to specify the interval via the --interval
command-line option, with 30 seconds the default. Try using the “reportBodyShort” method to change the reporter body.

5) (Extra credit) A Version Reporter that extracts the manifests from the Java jar files found in a specified directory, then reports the Implementation-Version attribute found in each manifest as a subpackage version. Require the user to specify the directory to search for .jar files. (You can unpack the manifest from a jar file via “jar xf jar META-INF/MANIFEST.MF”. Use the reporter’s tempFile method to remove the META-INF directory when the reporter exits.)

6) Create a repository catalog for your reporters by running incpack in the directory where you created your reporters.
1) A base Reporter that reports the path of the user’s shell

use Inca::Reporter;
my $reporter = new Inca::Reporter
  (version => 1, description => 'Reports the SHELL path');
$reporter->processArgv(@ARGV);
$reporter->setBody(
    $reporter->xmlElement('shell', 0,
        $reporter->xmlElement('ID', 1, 'shell'),
        $reporter->xmlElement('path', 1, $ENV{SHELL})
    )
);
$reporter->setResult(1);
$reporter->print();

2) A Version Reporter that determines the version of tcsh

use Inca::Reporter::Version;
my $reporter = new Inca::Reporter::Version(
    version => 1,
    description => 'Reports the version of tcsh',
    package_name => 'tcsh'
);
$reporter->processArgv(@ARGV);
$reporter->setVersionByExecutable
    ('tcsh --c \"echo $version\", ^tcsh ((\d\.)+)');
$reporter->print();

3) A SimpleUnit Reporter that determines whether “finger” command can provide the user’s name

use Inca::Reporter::SimpleUnit;
my $reporter = new Inca::Reporter::SimpleUnit(
    version => 1,
    description => 'Reports whether finger provides a name',
    unit_name => 'finger'
);
$reporter->processArgv(@ARGV);
my $output =
    $reporter->loggedCommand("finger $ENV{USER}");
if(!defined($output)) {
    $reporter->unitFailure("finger command failed: $!");
} elsif($? || $output !~ /Name:.*$/) {
    $reporter->unitFailure(0, "finger command failed: $output");
} else {
    $reporter->unitSuccess();
}
$reporter->print();
A Performance Reporter that reports system page swap activity over a specified interval

```perl
use Inca::Reporter::Performance;
my $reporter = new Inca::Reporter::Performance(
    version => 1,
    description => 'Reports page swap activity',
    measurement_name => 'swap'
);
$reporter->addArg
    ('interval', 'interval over which to measure', 30, '\d+');
$reporter->processArgv(@ARGV);
my $interval = $reporter->argValue('interval');
my $output = $reporter->loggedCommand("sar -g $interval 1");
if($? != 0) {
    $output = $reporter->loggedCommand("sar -B $interval 1");
}
if(!defined($output)) {
    $reporter->setResult(0, "sar command failed: $!");
} elsif($? ||
    $output !~ /^Average:\s*([\d.]+)(\s*([\d.]+))*/m) {
    $reporter->setResult(0, "sar command failed: $output");
} else {
    my $pgIn = defined($3) ? $1 : undef;
    my $pgOut = defined($3) ? $3 : $1;
    my $benchmark = $reporter->addNewBenchmark('swap');
    $benchmark->setParameter('interval', $interval);
    $benchmark->setStatistic('pagesout', $pgOut);
    $benchmark->setStatistic('pagesin', $pgIn) if defined($pgIn);
    $reporter->setResult(1);
}
$reporter->print();
```

A Version reporter that extracts the manifests from the Java jar files found in a specified directory, then reports the Implementation-Version attribute found in each manifest as a subpackage version

```perl
use Inca::Reporter::Version;
my $reporter = new Inca::Reporter::Version
    (version => 1, description => 'Reports jar file versions');
$reporter->addArg('dir', 'directory path');
$reporter->processArgv(@ARGV);
my $dir = $reporter->argValue('dir');
my $manifest = 'META-INF/MANIFEST.MF';
$reporter->tempFile('META-INF');
foreach my $jar(glob "$dir/*.jar") {
    $reporter->loggedCommand("jar xf $jar $manifest");
    next if $? != 0;
    my $output = $reporter->loggedCommand
        ("grep 'Implementation-Version:' $manifest");
```
next if !defined($output) ||
    $output !~ /Implementation-Version:\s*\((S+)\)/;
my $version = $1;
my ($subpackage) = $jar =~ m#.*/(.*)#;
$reporter->setSubpackageVersion($subpackage, $version);
}
$reporter->setResult(1);
$reporter->print();

6) From the Inca-Reporter-5.13398 directory:
   % sbin/incpack bin/* -I lib/perl -I lib/python