HDF Java Products Support

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This internal document attempts to organize and enumerate the technical activities related to the HDF Java Products, as a basis for estimating resource requirements.

Contents

1   Introduction

A variety of technical activities are performed in relation to the HDF Java Products. Some of the activities are per-product, others are per-release, and still others are per-platform. All of these should be taken into account when considering the resources needed to maintain, release, port, support, and improve the HDF Java Products.

This document attempts to enumerate these technical activities in a structured manner, as a basis for further discussion and for use in estimating the associated resource requirements, providing quotes for requested work, and tracking actual efforts.

This should be considered a living document.

2   HDF Java Products

There are four distinct HDF Java Products:

- Java HDF4 Interface (JHI)
- Java HDF5 Interface (JHI5)
- Java HDF Object Package
- HDFView

2.1   Java HDF4 Interface (JHI)

The Java Native Interface to the standard HDF4 library. JHI is used to access the HDF4 library.

2.1.1   Dependencies

- HDF4 features and release
- Java Version
- Platform (System, OS, and development environment.)
- External libraries: szip, zlib, and jpeg.

2.1.2   Tests

There are currently no tests that directly exercise the JHI product.

2.1.3   Documentation

Documentation includes:

- HDF4 JNI webpages: JNI/jhi/
- Java docs: javadocs/ncsa/hdf/hdflib

2.1.4   Examples

There are no direct examples.

Some examples can be found on the webpages or as part of the object package examples.

2.2   Java HDF5 Interface (JHI5)

The Java Native Interface to the standard HDF5 library. JHI5 is used to access the HDF5 library.

2.2.1   Dependencies

- HDF5 features and release
- Java Version
- Platform (System, OS, and development environment.)
- External libraries: szip, zlib, and jpeg.

2.2.2   Tests

Unit tests exist for all the new methods added to support HDF5 1.8.
Some methods developed for HDF5 1.6 are also tested.

2.2.3   Documentation

Documentation includes:

- HDF5 JNI webpages: JNI/jhi5/
- Java docs: javadocs/ncsa/hdf/hdf5lib

2.2.4   Examples

There are examples under the directory "examples/" in the source distribution.

Some examples can be also found in the examples for the object package.

One can also access the examples through the HDF5 example page at
http://www.hdfgroup.org/ftp/HDF5/examples/.

2.3   Java HDF Object Package

A Java package that implements HDF4 and HDF5 data objects in an object-oriented form.

2.3.1   Dependencies

- HDF4 features and release
- HDF5 features and release
- JHI
- JHI5
- Java Version
- Platform (System, OS, and development environment)

2.3.2   Tests

There are unit tests that exercise features related to HDF5 files. These unit tests are incorporated into the daily tests on 32 bit and 64 bit Linux and Solaris platforms. These unit tests were funded by a customer.

There are no unit tests that exercise features related to HDF4 files.

2.3.3   Documentation

Documentation includes:

- Webpages: hdf-object/
- Java docs:
  - javadocs/ncsa/hdf/object
  - javadocs/ncsa/hdf/object/h4
  - javadocs/ncsa/hdf/object/h5

2.3.4   Examples

Examples on the use of the Java HDF Object Package are published at hdf-object/use.html.

2.4   HDFView

HDFView is a visual tool for browsing and editing HDF4 and HDF5 files.

2.4.1   Dependencies

- HDF4 features and release
- HDF5 features and release
- Java HDF Object Package
- Java Version
- Platform (System, OS, and development environment)
- Installation software: Install Anywhere (Enterprise Version)

2.4.2   Tests

Tests are currently conducted manually prior to release. Tests should be conducted per-platform.

A testing guideline document helps achieve reasonable feature coverage; however, the tests are not exhaustive.

Additional testing of HDFView's ability to handle the full range of HDF5 file contents is desirable.

2.4.3   Documentation

- Installation guide at http://www.hdfgroup.org/hdf-java-html/install_use_hdf_java_products.pdf
- HDFView User's Guide at http://www.hdfgroup.org/hdf-java-html/hdfview/UsersGuide/index.html
- Module Guide at http://www.hdfgroup.org/hdf-java-html/hdfview/ModularGuide/index.html
- Release Notes

3   Per-Product Activities

A number of activities are related to each of the HDF Java Products. These activities are, for the most part, independent of the platforms where the products are installed and of the release activities related to the product.

3.1   Management (42 hours/year)

Supervising staff, working on standard/spec, prioritizing short/long term tasks, allocating resources and tracking tasks, etc.

3.2   Bug Fixes (416 hours/year)

Fix problems in the product.

The level of effort required will vary dramatically depending on the nature of the problem. A complex bug may require RFC, design, coding, testing (including development of test(s)), incorporation of test(s) into test harness, documentation, and examples.

3.3   User Support (104 hours/year)

Assist Barbara with user questions related to the product (for non-paying customers). As time allows, monitor and respond to hdf-forum discussions about product-related issues.

3.4   Keeping up with the library (62 hours/year)

Changes in underlying software that the product depends on may require updates to the product code. Here we consider only software library (HDF, Java, compression library, graphics library, etc.) dependencies, not platform (System/OS/development environment) dependencies.

The level of effort required will vary dramatically depending on the nature of the change. A complex change may require RFC, design, coding, testing (including development of test(s)), incorporation of test(s) into test harness, documentation, and examples.

3.5   Quality improvement (104 hours/year)

Improve quality and maintainability of existing code.

The level of effort required will vary dramatically depending on the nature of the refactoring. A complex refactoring may require RFC, design, coding, testing (including development of test(s)), incorporation of test(s) into test harness, documentation, and examples.

3.6   Features from the library (416 hours/year)

Catch up with features added to the libraries (design, implementation, testing, and documentation).

3.7   Other new features (estimated case by case)

This includes new features or tools that are initiated by THG or requested by the community.

The level of effort required will vary dramatically depending on the nature of the change. Most will involve requirements gathering, RFC, design, coding, testing (including development of test(s)), incorporation of test(s) into test harness, documentation, and examples.

4   Per-Release Activities (88 hours per major release)

A number of activities are related to producing a release of the HDF Java Products. Some of these activities are affected by the number of platforms involved, while others are relatively independent of the platforms.

For the purposes of this document, we account for activities undertaken to produce a release of the HDF Java products in this section. Activities related to porting the products to new platforms, and ongoing tests on each platform not related to a specific release appear in the Per-Platform Activities section.

For details of HDF-Java release procedures, please read

https://www.hdfgroup.uiuc.edu/RFC/HDF5/hdf-java/HDF-Java-release-procedure.pdf.

4.1   Revise Documentation (8 hours)

Revise the documentation beyond what was done as part of the per-product activities. For example, update installation instructions, release notes, and final edits based on feedback from technical editor.

4.2   Build Binaries (4 hours)

Build the binaries for supported platforms. Platforms supported for each release vary.

Release 2.7 was built and tested for the following platforms:

- 32-bit distribution -- runs on 32-bit systems or 64-bit systems with 32-bit JRE

    o Linux
    o Mac Intel
    o Solaris
    o Windows

- 64-bit distribution -- runs on 64-bit systems with 64-bit JRE only

    o Linux
    o Mac Intel
    o Solaris
    o Windows

The time spent building the underlying HDF software is not included in this estimate. We build hdf4 and hdf5 libraries for hdf-java products for some platforms when special flags are needed (e.g., –fPIC for 64-bit), or when the binaries are not provided by the library release. The time spent on this is minimal since we have scripts to build the libraries.

We build all hdf-java binaries (JNI C code and all Java code) for each release.

Binaries built automatically as part of the daily tests are not used for the Java products release since daily tests are built from the trunk and branches and the hdf-java release must use the official release of the HDF4 and HDF5 libraries. Building hdf-java is not a lot of work since we have scripts.

4.3   Test HDFView GUI (50 hours)

The HDFView GUI is tested as part of each release.

4.4   Make and Test Installation Program (8 hours)

HDFView is distributed as a one-click installation program. We use InstallationAnywhere to make the installation programs for each supported platforms.

4.5   Revise HDF Java Products Webpages (8 hours)

Update content to reflect new release.

4.6   Pack and Release (8 hours)

This step includes the work of packing the binaries and source, and uploading the final products to the FTP site. Packing the release is carried out for all supported platforms.

- HDFView installation programs
- pre-built binaries for each of the supported platforms
- source code

4.7   Edit and Send Newsletter (1 hour)

Prepare and send announcement.

4.8   Source branch (1 hour)

Make a new source branch.

5   Per-Platform Activities

Activities related to porting the HDF Java Products to new platforms, and to ongoing testing on each platform, not related to a specific release, appear in this section.

5.1   Daily test and platform watcher (87 hours/year)

5.1.1   Platform Watch (4 platforms, 2 minutes per platform per day, 35 hours/year)

Monitor the Java Product tests on the platform.

5.1.2   General Maintenance (4 platforms, 3 minutes per platform per day, 52 hours/year)

Determine cause of failure in daily test, and fix cause of failure if it is platform-specific. Failures caused by problems in the software that are independent of the platform are covered under the Per-Product Activities, Bug Fixes.

5.2   Port HDF Java Products to a new Platform (80 hours)

These activities assume that all underlying software (HDF libraries, Java, compression libraries) is available on the platform. If that is not the case, an additional 8 hours should be added to build jpeg, zlib, szip, hdf4, and hdf5.

5.2.1   Modify and test the configuration and build scripts (8 hours)

5.2.2   Write Instructions for Configuration and Build (16 hours)

5.2.3   Build Binaries (8 hours)

Build static JNI libraries, and Java source code JVM.

5.2.4   Test Products on Platform (8 hours)

5.2.5   Make Installation Program (6 hours)

Make packages and installation programs for pre-built binaries.

5.2.6   Pack and Deliver to Customer (4 hours)

5.2.7   Add Daily Tests (30 hours)

If the platform is to be supported on an ongoing basis, the daily test harness on that platform must be updated to run the HDF Java Products tests.

6   Resource Requirements

The following table show estimated work to support the HDF-Java products. The FTE% is based on 40 hours/week for a FTE. The estimation does not include work requested and paid for by customers.

Activity	Description	Hours/Year	FTE %
3.1 Management	Supervising staff, working on standard/spec, prioritizing short/long term tasks, allocating resources and tracking tasks, etc	42	2
3.2 Bug fixes and Testing	Working on a list of prioritized the bugs. The bugs will be prioritized on regular basis.	416	20
3.3 User support	Tracking and participating in forum discussions; assisting help desk	104	5
3.4 Keeping up with the library	Making the current products work with the latest version of the library. Additional features are not included.	62	3
3.5 Quality improvement	Investigating the current problems, refactoring code, developing general APIs and better testing framework, improving performance, etc	104	5
3.6 Features from the library	Catch up with features added to the libraries (design, implementation, testing, and documentation).	416	20
3.7 Other new features	Features/tools initiated by THG or requested by the community.		
4. Release	Assume one major release per year	88	4
5.1 Daily test and platform watcher	Being a daily test and platform watcher : tracking the daily test failure and identifying what test failed. This work does not include adding a new platform, which takes about 80 hours.	87	4
Total		1319	63

The HDF Group

Revision History

July 26, 2009:   Version 1 is based on materials from Peter and discussions among Peter, Mike, and Ruth.

July 29, 2009:   Version 2 includes additional detailed information.

November 19, 2010: Version 3 adds the information of levels of support.

December 6, 2010:   Version 4 adds the information for unsupported features.

January 5, 2011:   Version 5 move unsupported features to a separate document. Have an overall resource table .