The D System v0.6 Installation Guide

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dsystem-info@cs.rice.edu

Rice University
CITI/CRPC - MS 41
6100 South Main Street
Houston, Texas 77005-1892

http://www.cs.rice.edu/fortran-tools/DSystem/DSystem.html

The D System v0.6 Installation Guide

Contents

Selecting a Package

1.1 Introduction

The first step in installing the D System is deciding which D System package you want. Currently three packages are available, the Developer's Package and two End-user Packages. These packages are discussed below.

The Developer's Package

If you plan to examine or modify the D System source code, you'll need the Developer's Package. As Table 1 shows, the Developer's Package contains the D System source code and the D Developer's Toolkit, a set of scripts that are used to modify the D System. System requirements and installation instructions for the D System Developer's Package are provided in Section 2.

End-user Packages

If you just want to use the D System tools on a particular platform, that is, you're not interested in looking at the source code, you'll need the End-user Package for that platform. As Table 1 shows, the D System is available for

- the Sparc architecture running SunOS 4.1.3
- the Sparc architecture running SunOS 5.3

System requirements and installation instructions for the D System End-user Packages are provided in Section 3.

Table 1: Available D System packages.

<table>
<tr><th>Package</th><th>Contents include...</th><th>Installation Instructions</th></tr>
<tr><td>Developer's Package</td><td>source code, the D Developer's Toolkit, and related documentation</td><td>Section 2</td></tr>
<tr><td>End-user Package for Sparc/SunOS 4.x</td><td>binaries for Sparc/SunOS 4.x, plus related documentation</td><td rowspan="2">Section 3</td></tr>
<tr><td>End-user Package for Sparc/SunOS 5.x</td><td>binaries for Sparc/SunOS 5.x (Solaris), plus related documentation</td></tr>
</table>

1.2 What next?

Once you've decided which package you want, go to Section 2 or 3 and begin the installation.

Installing the Developer's Package

2.1 What You'll Need

To retrieve the D System Developer's Package and its required utilities, you will need Internet or World Wide Web access. To install and use the D System Developer's Package, you will need the following:

- A Sparc workstation running SunOS 4.1.3 or SunOS 5.3
- X Windows Version 11 Release 5 (X11R5)
- GNU make, perl, and a C/C++ compiler (see Section 2.2)

You should also be familiar with Unix. If you're new to Unix, you may want to ask a system administrator to help you with this installation, especially with installing the utilities.

If you meet these requirements, use the instructions in the following sections to install the D System on your machine. In summary, the installation process involves

1. Retrieving and installing the required utilities,
2. Retrieving and installing any recommended utilities, and
3. Retrieving and installing the Developer's Package.

2.2 Required Utilities

If you plan to use the Developer's Package, you must have the utilities in Table 2 available somewhere on your system. If necessary, ask your system administrator to help you retrieve and install these utilities, then get the full pathname for each utility. Later, you will use these pathnames to tell the D System where each utility lives.

Next, review the list of recommended utilities presented in Section 2.3.

Table 2: Utilities required for the Developer's Package.

Utility	ftp Site
GNU make *v.* 3.70*	prep.ai.mit.edu
perl *v.* 4.036*	ftp.uu.net
C/C++ compiler** Note: Support for templates and exception handling is currently not required. (At Rice, we've had good luck with the C/C++ compilers from Sun's SC 2.0.1 release for Sun OS 4.1.3 and the C/C++ compilers from Sun's SC 3.0 release for Solaris 2.3.)	Contact SunPro at sunpro-info@sun.com or 1-800-278-6776

*These versions work; other versions may not work. **gcc and g++ versions 2.5.8 or earlier will not work with the D System, because they currently do not handle multiple inheritance correctly. Furthermore, later versions of gcc and g++ may not work with the D System, if they do not handle multiple inheritance correctly.

2.3 Recommended Utilities

Developers at Rice recommend the utilities listed in Table 3. If necessary, ask your system administrator to help you retrieve and install these utilities, then get the full pathname for each utility. Later, you will use these pathnames to tell the D System where each utility lives.

Next, use the instructions in Section 2.4 to retrieve the D System Developer's Package.

Table 3: Utilities recommended for the Developer's Package.

Name	Available from
RCS *v.* 5.6.0.1*	prep.ai.mit.edu
Purify	Pure Software Inc. info@pure.com phone 408-720-1600 fax 408-720-9200 1309 South Mary Avenue Sunnyvale, CA 94087
Solaris Debugger	SunPro sunpro-info@sun.com phone 1-800-278-6776
Solaris Source Browser	

2.4 Retrieving the Developer's Package

Note: Every time you retrieve a file from the D System file server, your machine name, email address, and the name of the file you're retrieving are recorded. If you don't want this information recorded, don't retrieve any files from the D System file server.

via World Wide Web

To retrieve the Developer's Package from the World Wide Web (WWW), launch your favorite WWW viewer with the URL

`http://www.cs.rice.edu/fortran-tools/DSystem/v0.6`

then click on **Developer's Package**, which is a compressed tar file named DSystem-0.6.tar.Z. Note that some WWW clients automatically uncompress files ending in .Z; if this is the case with your client, save the Developer's Package as `DSystem-0.6.tar` in the directory of your choice. Otherwise, save the Developer's Package as `DSystem-0.6.tar.Z`. When this transfer is complete, use the instructions in Section 2.5 to install the Developer's Package.

via anonymous ftp

To retrieve the Developer's Package via anonymous ftp, ftp to softlib.rice.edu, log in as anonymous, and give your userid as the password. From there, cd into pub/DSystem/Release-0.6 and get DSystem-0.6.tar.Z:

```
ftp softlib.rice.edu
login: anonymous
```

```
password: (your email address, no parentheses)
cd pub/DSystem/Release-0.6
ls
binary
get DSystem-0.6.tar.Z
quit
```

This downloads DSystem-0.6.tar.Z into your present working directory. When this transfer is complete, use the instructions in Section 2.5 to install the Developer's Package.

2.5 Installing the Developer's Package

Once you've installed the required utilities (Section 2.2) and any recommended utilities (Section 2.3), the next step is to install the Developer's Package itself. This involves

- Extracting the D System Files
- Linking in your utilities
- Installing & Customizing RCS
- Linking in your compilers
- Updating your path
- Building the executables

Extracting the D System Files

Note: By using the D System, you are agreeing to the D System General Public License and the Pablo Performance Analysis Environment License. These licenses, which are provided with each D System package, are available via ftp and World Wide Web (Section 2.4).

The file DSystem-0.6.tar.Z is a compressed tar file containing the D System source code, the D Developer's Toolkit, and related documentation. This file uncompresses and untars into an enormous directory structure, so you'll probably want to give some thought to where you put it.

Separate Accounts?

At Rice, the D System is installed in one account, and then developers check source code out of this account and into their private accounts. With this approach, developers edit, compile, and debug in their private accounts; then, when they want to update the actual source code, they are forced to log in to a separate account. You don't have to have a separate account to install the D System; however, a separate account may keep you from accidentally trampling on the source code.

Once you've decided where you want to put the D System, follow the steps below to get the installation started.

Step 1. Move `DSystem-0.6.tar.Z` (or `DSystem-0.6.tar`) into the directory where you want the D System installed:

```
mv DSystem-0.6.tar.Z <dir>/.
```

Step 2. Go to the directory where you want the D System installed:

```
cd <dir>
```

Step 3. If necessary, uncompress the archive, then extract the D System files:

```
uncompress DSystem-0.6.tar.Z
tar xvf DSystem-0.6.tar
```

This creates the DSystem directory and all of its subdirectories.

Linking in Your Utilities

Now that you've extracted the D System files, you'll need to create symbolic links to the utilities you plan to use. For a complete list of recommended and required utilities, see Section 2.2 and Section 2.3.

Step 1. From the DSystem directory, go to the tools/develop/bin directory:

```
cd /<path>/DSystem/tools/develop/bin
```

Step 2. Use the darch command to create a directory for the operating system you want to compile for:

```
mkdir `./darch`
```

Step 3. Go to the directory you created in Step 2 (choose `SunOS-4.x` or `SunOS-5.x`). For example, if you want to compile for SunOS 5.x, type

```
ls
cd SunOS-5.x
```

Step 4. Within the SunOS-4.x or SunOS-5.x directory, create symbolic links to all of the utilities you will be using, for example:

```
ln -s <perl-path> perl
ln -s <gmake-path> gmake
ln -s <rcs-path> rcs
```

In this example, `<perl-path>` points to the directory where the perl executable lives. If you're not using one of the utilities listed here, don't create a link to it. (For a complete list of recommended and required utilities, see Section 2.2 and Section 2.3.)

Step 5. Repeat Steps 1 through 4 until you have created symbolic links for each operating system you plan to compile for.

Installing & Customizing RCS

Now that you've extracted the D System files and linked in your utilities, we recommend that you install RCS v.5.6.0.1 and customize it for the D Developer's Toolkit.

Step 1. If necessary, create a directory for RCS v.5.6.0.1 and use the RCS installation guide to install RCS there.

Step 2. Using the same userid that you used to extract the D System files, go to `/<path>/DSystem/tools/develop/bin/SunOS-*.x/rcs` and copy the RCS tools co, ci, rcs, rlog, and rcsdiff into this directory. In order for the D Developer's Toolkit to work as described in the D System Developer's Guide, these tools must be owned by the same userid as the rest of the D System files.

Step 3. Rename these tools for the D Developer's Toolkit:

```
mv co dco
mv ci dci
mv rcs drcs
mv rlog dlog
mv rcsdiff ddiff
```

Step 4. Set the sticky bit for user and group on dco, dci, and drcs:

```
chmod ug+s dco dci drcs
```

Now the D Developer's Toolkit will work as described in the D System Developer's Guide.

Linking in Your Compilers

Next you will edit a file named Makeinclude.config so that it contains the full pathname of the compilers you plan to use.

Step 1. Go to the DSystem/develop/src directory and look for `Makeinclude.config`:

```
cd /<path>/DSystem/develop/src
ls Make*
```

Step 2. Edit Makeinclude.config so that the section corresponding to your operating system contains the absolute paths for your compilers, X Windows, and other utilities. For example, if you want to compile for SunOS 5.x, open Makeinclude.config and go to the section that begins with

```
#----------------------------------------------------
# Start SunOS-5.x (Solaris 2.x) configuration
#----------------------------------------------------
```

Then update that section to include the absolute paths for your Fortran compiler, non-ANSI C compiler, ANSI C compiler, C++ compiler, and any other utilities listed.

Updating Your Path

Next you will edit a file named SourceMe to contain the correct environment variable.

Step 1. Go to the DSystem/develop directory and look for `SourceMe`:

```
cd /<path>/DSystem/develop
ls Source*
```

Step 2. Edit SourceMe so that the line containing the environment variable DSYSTEM has the absolute path for the DSystem directory. If you're using C-Shell, the line would look like

```
setenv DSYSTEM /<path>/DSystem
```

Step 3. Source SourceMe:

```
source SourceMe
```

Building the Executables

Now you're ready to compile the D System for SunOS 4.x or SunOS 5.x. To build the D System executables for a given operating system, run the dmakeall command twice with options for installing that operating system:

```
dmakeall -create -SunOS_5x
dmakeall -install -SunOS_5x
```

or

```
dmakeall -create -SunOS_4x
dmakeall -install -SunOS_5x
```

This builds the archives and executables for the operating system you specify. If you want to compile the D System for a second operating system, run the dmakeall command twice with options for installing that operating system.

2.6 What next?

Now that the installation is complete, you're ready to set up what's called your *private world* and start modifying the D System. However, we should warn you that modifying the D System is not a trivial task. In fact, the package that you just installed represents an enormous directory structure, with more than a thousand source code files and an elaborate make system. So, before you start editing the source code, we recommend that you

1. Read DSystem/README,
2. Read DSystem/ReleaseNotes,
2. Take the D System Hypertext Directory Tour (http://www.cs.rice.edu/fortran-tools/DSystem/v0.6), and
3. Go over *A Developer's Guide to the D System* (see DSystem/docs/).

This material will introduce you to the conceptual components of the D System and show you how to set up and work within a private world.

Installing an End-user Package

3.1 What You'll Need

To retrieve a D System end-user package, you will need Internet or World Wide Web access. To install an end-user package, you will need the following:

- A Sparc workstation running SunOS 4.1.3 or SunOS 5.3
- X Windows Version 11 Release 5 (X11R5) (see Section 3.2)

You should also have some knowledge of Unix. If you're new to Unix, you may want to ask a system administrator to help you with this installation.

If you meet these requirements, use the instructions in the following sections to install the D System on your machine. In summary, the installation process involves

1. Retrieving and installing X11R5, if necessary,
2. Retrieving the end-user package of your choice, and
3. Installing the end-user package.

3.2 Obtaining X11R5

In order to use a D System end-user package, you must have X Windows Version 11 Release 5 (X11R5). X11R5 is available from the MIT Software Distribution Center, Technology Licensing Office, Room E32-300, 77 Massachusetts Avenue, Cambridge, MA 02139, (phone 617-253-1000) or via ftp to export.lcs.mit.edu or ftp.x.org. If necessary, ask your system administrator to help you retrieve and install X11R5, then use the instructions in Section 3.3 to retrieve the D System end-user package of your choice.

3.3 Retrieving an End-user Package

Note: Every time you retrieve a file from the D System file server, your machine name, email address, and the name of the file you're retrieving are recorded. If you don't want this information recorded, don't retrieve any files from the D System file server.

via World Wide Web

To retrieve an end-user package from the World Wide Web (WWW), launch your favorite WWW viewer with the URL

`http://www.cs.rice.edu/fortran-tools/DSystem/v0.6`

then click on **SunOS-4.1.3 Binaries** or **SunOS-5.3 Binaries**, which are compressed tar files. Note that some WWW clients automatically uncompress files ending in .Z. If your client does this, save the package you selected as `DSysSun4-0.6.tar` or `DSysSun5-0.6.tar` in the directory of your choice. Otherwise, save the package you selected as `DSysSun4.tar.Z` or `DSysSun5.tar.Z`. When this transfer is complete, use the instructions in Section 3.4 to install the end-user package you selected.

via anonymous ftp

To retrieve an end-user package via anonymous ftp, ftp to softlib.rice.edu, log in as anonymous, and give your userid as the password. From there, cd into pub/DSystem/Release-0.6 and get the end-user package for SunOS 4.1.3 (`DSysSun4-0.6.tar.Z`) or SunOS 5.3 (`DSysSun5-0.6.tar.Z`). As an example, the steps for retrieving the end-user package for SunOS 5.3 are provided below.

```
ftp softlib.rice.edu
login: anonymous
password: (your email address, no parentheses)
cd pub/DSystem/Release-0.6
ls
binary
get DSysSun5-0.6.tar.Z
quit
```

When this transfer is complete, use the instructions in Section 3.4 to install the end-user package you selected.

3.4 Installing an End-user Package

Installing a D System end-user package involves

- Extracting the D System files
- Updating your shell rc file

Extracting the D System Files

Note: By using the D System, you are agreeing to the D System General Public License and the Pablo Performance Analysis Environment License. These licenses, which are provided with each D System package, are available via ftp and World Wide Web (Section 3.3).

Each end-user file is a compressed tar file containing the D System binaries for a particular machine. Once you've decided where you want to put these binaries, follow the steps below to get the installation started.

Step 1. Move the D System file you retrieved into the directory where you want the D System installed:

```
mv DSysSun*-0.6.tar* <dir>/.
```

Step 2. Go to the directory where you want the D System installed:

```
cd <dir>
```

Step 3. If necessary, uncompress the archive, then extract the D System files:

```
uncompress DSysSun*-0.6.tar.Z
tar xvf DSysSun*-0.6.tar
```

This creates the DSystem directory and all of its subdirectories.

Updating Your Shell rc File

Next you'll edit your shell rc file to contain the correct environment variables and path.

Step 1. Go to DSystem/bin/, and look for a directory named SunOS-4.x or SunOS-5.x. In Step 2, you'll include this directory name in your path.

```
cd /<path>/DSystem/bin
ls Sun*
```

Step 2. Edit your shell rc file to contain the correct environment variables and path. For example, if you're running C Shell and you untarred the D System for SunOS 5.x in your home directory, your .cshrc file would contain the lines

```
setenv DSYSTEM "${HOME}/DSystem"
setenv MANPATH "${MANPATH}:${DSYSTEM}/man"

set path = ( ${DSYSTEM}/bin/SunOS-5.x $path )
```

Step 3. Source your shell rc file. For example, if you're running C Shell, type

```
source .cshrc
```

Congratulations! The installation is complete.

3.5 What next?

Now that the installation is complete, see `DSystem/README` for instructions for invoking the D System executables. To learn more about this release of the D System, see `DSystem/ReleaseNotes`. To learn more about the D System in general, see "Related Documentation" in Appendix A.

About This Document

Scope & Audience

The D System v0.6 Installation Guide provides instructions for retrieving and installing version 0.6 of the D System. If you need to ask a question, report an error, or just make a suggestion about this document, use the D System Bug Report Form provided in the D System World Wide Web pages, or contact dsystem-info@cs.rice.edu.

The D System v0.6 Installation Guide was written for people who have some knowledge of Unix, the World Wide Web, and anonymous ftp. If you are not familiar with these topics, you may want ask your system administrator to help you with this installation.

Related Documentation

Users with Internet access can obtain more information about the D System via the World Wide Web (http://www.cs.rice.edu/fortran-tools/DSystem/DSystem.html) or by sending email to dsystem-info@cs.rice.edu. Currently, online documentation includes

- General Information
- Technical Papers
- *The Fortran Tools Glossary*
- *The D System Bug Report Form*
- *The D System Hypertext Directory Tour*
- *A Developer's Guide to the D System*

Obtaining Copies

The D System v0.6 Installation Guide, and other D System documentation, is available via the World Wide Web (WWW) and anonymous ftp. To access the D System WWW home page, launch your favorite WWW viewer with the URL

```
http://www.cs.rice.edu/fortran-tools/DSystem/
```

then follow the links to find the documentation you want. To access the D System documentation via anonymous ftp, ftp to www.cs.rice.edu, type `anonymous` at the log in prompt, and give your userid as the password. Next, cd into pub/DSystem, type `ls` to see a directory listing, then use the `get` command to retrieve the file you want. When you're finished, type `quit`. For an example of anonymous ftp, see Section 2.4.

The Authors

The D System v0.6 Installation Guide is the result of a collaborative effort between D System developers and their support staff. To "meet" the people behind the D System, see the D System WWW home page (http://www.cs.rice.edu/fortran-tools/DSystem/DSystem.html, click on "The D Team") or contact dsystem-info.cs.rice.edu.