

## Starlink's Software Distribution System

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**Abstract.** The Starlink Software is a collection of astronomical packages and utilities comprising over 120 separate components. When built, the system needs between 500 and 650 MB disk space (without source) making it ideal for distribution on CD-ROM. Each component has been individually packaged into an easy-to-install bundle for users to obtain over the Internet via a “point and click” WWW interface from the Starlink Software Store.

### 1. Introduction

The Starlink Software is a large collection of applications, subroutine libraries and utilities for processing and reducing astronomical data. Traditionally the Starlink Project distributed the collection via magnetic tape and frequent network updates. However, with three different hardware and operating system types to support and the increasing size of the collection and frequency of updates, the Project decided to offer two releases per year and move over to using CD-ROM as the primary distribution medium, backed up by a repository of the packages which is accessible from the WWW.

CD-ROM offers the convenience of speed of access, random access to software on disk and a more reliable transport medium. Its capacity of 650 MB is ideally suited to offering a complete software system that can be run directly from the CD-ROM. The WWW offers ease of use and user-selection of packages for an installation tailored to a user's requirements.

### 2. Starlink CD-ROM Distribution

The Starlink Software is supported on three different hardware/operating systems: Alpha/Digital Unix, PC/RedHat Linux and SPARC/Solaris. A set of CD-ROMs is issued twice a year, in Spring and Autumn. Each issue consists of one CD for each system containing the directly runnable software, and an extra Updates CD-ROM which may be used to tailor installations to specific data

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<sup>1</sup>Managed by the Council for the Central Laboratory of the Research Councils on behalf of the Particle Physics and Astronomy Research Council

<sup>2</sup><http://www.starlink.rl.ac.uk/>

processing and reduction needs. The software on the directly runnable disks may also be copied to hard disk for faster access.

Each CD has brief instructions on the inlay card, and has a more detailed installation note in an `INSTALL` file on the CD itself. In addition, there is a comprehensive guide to the CD-ROMs: *Starlink Software CD-ROMs User's Guide*. This document<sup>3</sup> contains detailed instructions to enable users to use the tools provided on the CD-ROMs to install complete copies of the Starlink Software or create tailored installations.

Starlink CD-ROMs are distributed by post from the Rutherford Appleton Laboratory (RAL). Users should send an email request to the distribution request address at `cdrom@star.rl.ac.uk` and should include their name, post and email addresses, and details of which CD-ROMs are required. Each CD set dispatched includes a copy of the User's Guide.

### 3. Starlink Software Store

To enhance ease of access to individual components of the Starlink Software Collection the Starlink Project has produced the Starlink Software Store<sup>4</sup>. The Software Store is a WWW-based "point-and-click" series of menus linked to some CGI scripts and a repository of package distribution sets, all residing on the Starlink WWW server at RAL.

To use the Software Store, users start at the top page and follow the hyperlinks to the index pages. These list the inventory of packages available in three sets: Subroutine Libraries, Applications and User Interfaces, and Utilities. There is also a Latest News page which gives details of the most recent CD issues.

When a user selects a package to download, he or she is presented with a form which asks him to choose which of the available hardware/software combinations he wants. Information stored within the Software Store system at RAL also allows the Store scripts to tailor the form to offer a menu of additional packages that might be needed to run or build the software chosen. The user may opt to obtain the additional packages then, or can come back and get them individually later. In the case of applications packages which require parts of the Starlink infrastructure software in order to run, a second form is presented which gives the user the opportunity to download the required components.

Once the selection process is complete, a request is sent to a CGI script on the server at RAL which makes a bundle of the components for download. The bundle is a self-unpacking shell script with binary components `uuencoded` within it. The bundle is offered to the browser for download and the user saves it to disk with an appropriate name.

To unpack the bundle (script), the user runs it. The bundle unpacks itself to produce the compressed tar file distribution sets and a script which is used to complete the installation. At each stage the user is asked questions about the intended installation configuration to allow the unpacking of the compressed tar

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<sup>3</sup><http://www.starlink.rl.ac.uk/star/docs/sun212.htx/sun212.html>

<sup>4</sup><http://www.starlink.rl.ac.uk/cgi-store/storetop>

files and the installation process to proceed. The installation script may also be used to uninstall the software.

The applications and utilities are available in ready built form without source, for the three supported systems. The subroutine libraries are available ready built with and without source, and in source only form. The distribution sets for the Starlink applications can be quite large, up to some tens of megabytes in some cases, so the download bundles are also quite large. It may not be possible for sites with poor or slow network connectivity to obtain such large packages via download in one try, so the Store also provides "point-and-click" access to the components of a bundle via standard FTP.

The repository of package distribution sets is updated twice yearly to coincide with the CD-ROM distributions. Individual distribution sets are updated to provide major bug fixes between CD-ROM releases.

#### **4. Conclusion**

Together, the Starlink Software Store and the CD-ROM distributions provide an efficient, easy to use and reliable method of distribution for multi-component software collections such as the Starlink Software.