Running polish

polish is an option of the **star** command designed for use with STAR Spaces and databases. It is used for both maintenance operations and diagnostics, as described below.

(1) **Space reclamation**: **polish** reclaims disk space used for these types of STAR data:

- When users enter data (including corrections) into a database, STAR places the data on the disk in such a way as to make the most effective use of the allocated space. Under some circumstances when users delete data (e.g., database definitions and entire databases), STAR only removes the "pointers" to those data so that they are no longer accessible. However, the data remain on the disk, using space that could be allocated to new user data, until **polish** is run to reclaim this space.

  (Databases that have been deleted can be recovered, i.e., "un-deleted," if **polish** has not yet been run.)

- If the user of STAR's Database Definition function is the only user of the database when a new definition is installed, earlier versions are automatically deleted. However, if multiple users are using that database, the old version stays in effect for those users until they are done. Space used for old versions can only be reclaimed by running **polish**.

- When users generate online displays and sorted reports, STAR uses temporary disk space within the STAR Space to which the user's database is assigned. If a system problem occurs during report generation, the file of sort keys may still be on disk and **polish** will reclaim this space.

- If the system crashes (Unix or the hardware stops working, without an orderly shutdown) or is turned off while STAR is processing, temporary STAR workspace may be left on the disk. **polish** will reclaim this space.

(2) **Data Analysis and Error Detection**. The updating of databases and their indexes involves critically important writing of data to disk. Although several safeguards are built into STAR to help prevent problems during this dynamic process, certain types of hardware problems (particularly disk I/O errors) can result in structural errors in STAR databases.

Even before **polish** is run, such errors may be reported in a STAR log file (see Monitoring the Status of STAR and Unix) or by STAR itself (e.g., a user doing data entry or searching may automatically be ended out of STAR and returned to the system prompt).

In the event of such problems (or problems detected by **polish** in your regularly scheduled run), **polish** becomes a diagnostic tool and, to the extent possible, a tool for repairing such errors. However, for certain types of errors (e.g., when the structure of an index has been damaged), **polish** cannot repair the problem and you will need to reindex the database or, in rare instances when data have been corrupted from system problems, you must be prepared to restore the system from a backup.

polish should always be run immediately *after* your STAR system backup. If any errors are discovered by **polish**, you should take appropriate action and immediately take another backup. Until that new backup is taken, file the hard-copy **polish** listing with the physical backup medium or note the date of the backup with which it is associated, so that in the event a system restore is required, you will know the state of the system when the backup was taken.

Instructions for running your regular **polish** (or a special **polish** for reclaiming space) are provided in this chapter. Errors that can be reported by **polish** and the actions to be taken are presented separately in Troubleshooting Guide 2: Interpreting polish Error Messages.

1. Running polish

When running a full-system **polish**, the following conditions must prevail:

- the STAR system must be turned on and
- the two CASPERs must be off

If you are **polish**ing all Spaces or the SYSTEM Space, users cannot be in STAR and cannot use STAR during the course of the **polish** (a restriction that is enforced by STAR). If you are **polish**ing a single Space other than the SYSTEM Space or a single database, the databases in that Space or the particular database cannot be used.

This section covers general instructions for running **polish. polish**ing a single Space or database while STAR users are on the system is discussed separately in Section 4.

Follow the steps below to run **polish**.

Step 1: Login as user **star**:

```
Hostname login: star
(enter password)
```

Step 2: Check that no users are in STAR:

```
% starsys users
```

If users are in STAR, request that they logout.

Step 3: Turn the CASPERs off:

```
% starsys casper off
```

Step 4: Decide whether to **polish** all Spaces, a particular Space, or a particular database. (For a display of STAR Space names and numbers, select ***Manage System*** (Option 5)from STAR's Main Menu, and then ***Display Space Use*** (Option 2).

Step 5: To run a standard **polish**, enter the **star** command, with the **polish** option:

```
% star -polish
```

If you forgot to do a **starsys on** command, you will get the message:

```
STAR system not active.
```

If someone released the CASPER jobs and they are active, or if a user started a STAR session, you will get the message:

```
Other users using STAR.  polish run aborted.
```

Step 6: If no problems were encountered, **polish** reports that it is initializing and you will be prompted to:

```
Enter space name or press RETURN for all spaces: _____
```

To **polish** a single Space, enter its name (or number), e.g.:

```
Enter space name or press RETURN for all spaces: serial
```

and press RETURN.

If you specify a Space name or number that is not defined, **polish** will terminate.

To **polish** all STAR Spaces, press RETURN.

If certain critical records in the SYSTEM Space have been lost or damaged, you will almost immediately receive one of these messages.

```
Internal database of databases not found.  polish run aborted.
```

(or)

```
Internal database of spaces not found.  polish run aborted.
```

In either case, no automatic recovery is possible. Contact CA Customer Services for assistance in restoring your SYSTEM Space in order to recover your STAR databases.

Step 7: If you specified a Space name (or number) and no problems were encountered, you will be prompted to:

```
Enter database name or press RETURN for all databases: _______
```

To **polish** a single database, enter its name, e.g.:

```
Enter database name or press RETURN for all databases: serials
```

and press RETURN.

To **polish** all databases in the Space, press RETURN.

Unless you submit the **polish** job as a background task (*see* Section 5), your Unix session will be tied up while the program is running.

By default, **polish** will generate the log report on your screen at the same time it is being written to a file in STAR's ***log*** directory, *~star/log/polish.lst.*

When **polish** is completed and if all is well, you will receive the following message on your screen, e.g.:

```
polish completed on 6/4/2002 at 15:30:19.
No errors detected.
```

If problems were encountered, you will see the following message:

```
Errors detected.  See polish.lst
```

See Section 7 for the set of steps to be followed after a **polish** run.

2. Interrupting and Terminating polish

When running **polish** interactively, you can interrupt it to get a status report on its progress or to terminate the run.

Step 1: To interrupt **polish**, press CTRL-C.

This action generates one of several displays, depending on where **polish** is in the process: analyzing file and data structures or reclaiming space. The message displayed when CTRL-C is pressed identifies the phase in progress and the Space/Database that is being processed, e.g.:

```
polish program is running....
Analyzing space SYSTEM, database PAGES (5 of 22).
7 records left to process.
Enter STOP to terminate or press RETURN to continue:
```

Step 2: To have **polish** resume processing, press RETURN. Interrupting and resuming **polish** does not change **polish**'s diagnostic or repair steps in any way.

To terminate **polish**, type the word stop and press RETURN:

```
Enter STOP to terminate or press RETURN to continue: stop
```

Stopping a **polish** does not harm STAR data. It simply stops diagnosis and repair before all Spaces or databases have been checked.

3. polish Options

Several **polish** options that can be specified are listed in the chart below. At any time, you can request an online summary of these options by typing:

```
% star -polish -help
```

polish options are specified after the **star -polish** command. Some options are specified with a hyphen, others with the "keyword=" syntax:

```
% star -polish -q space=system
```

STAR polish Options	
Option	**Command**
Delete index (i.e., used only if a previously run **polish** reports an error for which re-indexing is required).	`% star -polish -d` (or) `% star -polish -delete`
"Flush" files (i.e., STAR is to close and then re-open the **polish** report file after it completes each database so that managers can check the status of a **polish**, particularly if dialing in remotely).	`% star -polish -f` (or) `% star -polish -flush`
Query you for confirmation before actually deleting each database marked for deletion. You will be asked this question at the beginning of the **polish** so that, after you respond, you can leave **polish** running unattended. (After **polish** has deleted a database, that database can no longer be recovered with the Recover Deleted Database option of Database Maintenance).	`% star -polish -q` (or) `% star -polish -query`
Specify the Space or database to be **polish**ed, thereby bypassing the standard **polish** prompts.	
– all databases in all Spaces (i.e., the default)	`% star -polish space=all` (or) `% star -polish sp=all`
– all databases in a specific Space	`% star -polish space=name` (or) `% star -polish sp=name`
– a specific database	`% star -polish database=name` (or) `% star -polish db=name` (or) `% star -polish da=name`
polish with varying levels of on-screen reporting:	
– suppress screen display of *polish.lst* report	`% star -polish r=1` (or) `% star -polish report=1`
– display standard *polish.lst* report (the default)	`% star -polish r=5` (or) `% star -polish report=5`
Diagnostic options (see *Troubleshooting Guide 2*):	
– analyze only; errors will be detected but not repaired and space will not be reclaimed.	`% star -polish -a` (or) `% star -polish -analyze`
– run a "quick" **polish** to report signs of disk I/0 errors (called "hash total errors"). Other errors are not detected and space will not be reclaimed.	`% star -polish -h` (or) `% star -polish -hash`

The examples below illustrate use of these options in several different combinations.

(1) **polish** all Spaces, bypassing the standard prompt, and request the "Query" option to confirm deletion of databases marked to be deleted:

```
% star -polish -q sp=all
```

(2) **polish** all databases in a given Space, bypassing the standard prompts (e.g., to reclaim space before running a global):

```
% star -polish sp=models
```

(3) **polish** a specific database and delete its index (because it was reported to have a problem in a previous **polish**):

```
% star -polish -delete db=cat
```

(4) **polish** all databases in a given Space, suppressing the report being written to your screen but requesting that you be asked to confirm deletion of any databases marked for deletion:

```
% star -polish r=1 -q sp=archiv
```

(5) Run a quick **polish** on the TITLES Space after receiving a disk hash total error message:

```
% star -polish -h sp=titles
```

4. Running polish and STAR Concurrently

To minimize downtime associated with running **polish** to reclaim space (in a Space or for a database) and in diagnosing hardware problems, **polish** can be run while users continue to use STAR. For example, after getting a hash total error report, you could run **polish** (e.g., with the "analyze" or "check hash totals" option) on a single database or Space.

The restrictions to concurrent use of STAR and **polish** are:

- This concurrent use does not apply if you must **polish** the SYSTEM Space or any STAR System database, since these databases are critical to the functionality of STAR.
- If **polish**ing a single database, users cannot access that database.
- If **polish**ing a Space, users cannot access any database in that Space, either directly (e.g., Data Entry or Search/Report) or indirectly (e.g., lookups, target databases in a global cross-load, SuperSEARCHes).

To run STAR and **polish** concurrently, follow these steps:

Step 1: Alert users to end out of the databases that will be affected.

Step 2: Login as user **star**.

Step 3: Make sure there are no active entries in the CASPER Queues for the database to be **polish**ed or the databases in a Space to be **polish**ed.

Step 4: Enter your **star** command with the **polish** option and any other options, e.g.:

```
% star -polish -a sp=archiv
```

If all of your databases are in the SYSTEM Space or in only one or two other Spaces, you may want to consider re-organizing your key databases into separate Spaces. The ***Move Database*** option in the **Database Maintenance** option can be used to facilitate such re-organizations.

5. Running polish as a Background Job

You can free up your Unix session by running **polish** as a background job. Note that STAR will still not be available to you (or other users) until **polish** has completed.

To specify that **polish** is to be run as a background job, follow these steps:

Step 1: Change to the directory where you want to leave **polish**'s output, e.g.:

```
% cd ~star
```

Step 2: Erase any previous status file by typing:

```
% rm polish.status
```

Step 3: Enter your **star** command with the **polish** option, specifying that a new status file be generated. The name of the status file is entered after the ">" character. The ampersand (&) at the end of the command indicates that the job is to be run in the background.

```
% star -polish db=vendor r=1 >polish.status &
[1] 10069
```

Step 4: The system reports the job number assigned to **polish** (e.g., '10069' as shown above). The initial and final **polish** messages will be written to the *polish.status* report. If a problem has been encountered (e.g., with a misspelled Space or database name), this file will be generated immediately with **polish**'s error message. Therefore, check your status file shortly after submitting the job by typing:

```
% starcat polish.status
Initializing...
Database name not found.
```

In this example, the command would need to be re-specified, with the correct database name.

If **polish** encountered no errors, the file will be empty when first displayed. When **polish** is completed Unix will probably send you a "done" message of some type, e.g.:

```
% [1] Done  star -polish db=vendor r=1 >polish.status
```

Step 5: Display the status file by typing:

```
% starcat polish.status
Initializing...

Maximum blocks per pass:  507904.
polish completed on 10/26/1997 @ 19:42:23.
  No errors detected.
```

The complete **polish** report will be in the *polish.lst* file (*see* Section 6).

In specifying **polish** as a background task (*see* Step 3 above), note the following:

(1) The **da** or **sp** keyword option is required, to bypass the **polish** prompts for the name of the Space and database.

(2) The **r=1** ("silent") option is recommended, since you do not need the *polish.lst* report to be displayed on your terminal.

(3) Do not include the **-query** option in your script file, since it poses a question for each database marked to be deleted and **polish** will not be run until each is answered.

Only the startup and final messages will appear on your screen.

6. The polish Report

The report produced by **polish** in the *polish.lst* file is illustrated and described in this section. A summary of error messages that can appear in this report, along with advice on the appropriate actions to be taken, is provided in Troubleshooting Guide 2: Interpreting polish Error Messages.

Important facts about the **polish** report are:

- The file is automatically generated on STAR's ***log*** directory.

  To display the file, login as user **star** and type one of these commands:

  ```
  % starcat log/polish.lst
  ```

  or

  ```
  % starcat -p log/polish.lst
  ```

  or

  ```
  % vi log/polish.lst
  ```

- The **polish** report is a standard STAR report file containing control characters for standard STAR print codes.

  To display the file online, use only the CA-provided **starcat** command or the UNIX **vi** command (not the Unix **cat** or **more** display commands).

  To print the *polish.lst* file, use the **starlp** command (not the Unix **lp** or **lpr** print commands).

If you **vi** the file, you will see the standard STAR report file header on the first line:

^S^T^A^R

> **Note:** If uninterpreted control characters in a STAR report are sent to an ASCII terminal or printer, it can cause the terminal or printer to behave incorrectly.

The sample listing below illustrates the contents of *polish.lst.*

```
STAR polish run on 8/7/2002 at 16:35:59.                    [1]

               ***Database NAMES deleted.                   [2]
               ***Database ADDRESSES deleted.

                          Analysis of space SYSTEM          [3]
0  Databases  No errors detected.                           [4]
                 Number of records:            0
                 Number of index terms         0
                 Number of hits                0
                 Database records              0K
                 Index                         0K
                 DBDEF/System records          1K
2  Spaces     No errors detected.                           [4]
                 Number of records:            0
                 Number of index terms        16
                 Number of hits                0K
                 Database records              1K
                 Index                         1K
                 DBDEF/System records          3K
3  System     No errors detected.                           [4]
                 Number of records:           12
                 Number of index terms       258
                 Number of hits                0
                 Database records             23K
                 Index                         9K
                 DBDEF/System records          2K
4  USERS      No errors detected.                           [5]
                 Number of records:           15
                 Number of index terms        86
                 Number of hits              211
                 Database records              2K
                 Index                         3K
                 DBDEF/System records         12K
```

(listing continues on next page)

```
...
6  GLOBAL                                                    [6]
6  GLOBAL1
6  GLOBAL2
6  GLOBAL3
6  GLOBAL4     No errors detected.
                 Number of records:          3109
                 Number of index terms       8267
                 Number of hits             50159
                 Database records            2368K
                 Index                        569K
                 DBDEF/System records         141K
48844 bytes reclaimed                                        [7]

               Analysis of space TUTOR

0  Databases     No errors detected.
                 Number of records:             0
                 Number of index terms          0
                 Number of hits                 0
                 Database records              0K
                 Index                         0K
                 DBDEF/System records          1K

2  TUTOR2        No errors detected.
                 Number of records:           520
                 Number of index terms       9606
                 Number of hits             53970
                 Database records             411K
                 Index                        650K
                 DBDEF/System records          19K

...

0  bytes reclaimed.


polish completed on 8/7/2002 at 16:42:16.                    [8]
  No errors detected.
```

[1] The date and time **polish** began.

[2] The names (if any) of databases that have been deleted.

[3] The name of the STAR Space being analyzed.

[4] Databases, Spaces, and System are critically important internal databases generated and maintained by STAR in the SYSTEM Space. Without these databases and the SYSTEM Space, the STAR system cannot be started.

A "Database" database is also maintained by STAR in each defined Space.

[5] The names of your own databases and of the STAR System databases are presented in bold uppercase. Note that each has an associated database number, unique within the Space.

For each database on the system, **polish** provides a report of its analysis (e.g., "No errors detected" or one of the error messages described in *Troubleshooting Guide 2*), plus these statistics:

polish Statistics

Statistic	Meaning
Number of records	Number of records in the database
Number of index terms	Number of unique index terms in the database index
Number of hits	Total number of instances ("hits") for all index terms
Database records	Amount of disk space, in K (1024 bytes), used by the input data
Index	Amount of disk space, in K, used by the index
DBDEF/system records	Amount of disk space, in K, used by dates definitions and other STAR overhead records

These statistics can be useful in tracking the rate of growth of databases over a period of time, to help you plan for archiving databases or acquiring additional disk storage. To compute the total size of a given database, add the last three numbers in the set. To translate this number to megabytes, divide by 1024.

They can also be useful in planning for global operations when you need to know the average size of records, which you can obtain by dividing the total size by the total number of records.

[6] All view names associated with a given database are included. The first name is the database name. All other names are view names. Error messages and numbers of records reported apply to the database and all of its views, not just to a view.

If the view names are not recognizable (e.g., S29DB2V5), they have been assigned by STAR because of some error condition. Review these databases in Data Entry and then rename them, using the **Database Maintenance** subfunction of **System Management**.

[7] After the last database report in each Space, **polish** reports the number of bytes on the disk that it reclaimed (or would have reclaimed, if you use the **-analyze** option).

[8] The final messages report the date and time that **polish** finished, and its management summary error report, which will be either of these two:

```
Errors detected.  See polish.lst
```

or

```
No errors detected.
```

7. Reviewing and Maintaining polish Report Files

Review the report generated by **polish** in the *polish.lst* file after each **polish** run. You can display it online and/or print a paper copy of the file. Any error message is clearly denoted with three leading asterisks (***).

polish listings are useful for diagnostic purposes and they can help you to develop statistics on database sizes and space use. Therefore, we recommend the following file maintenance procedures:

- Print a copy of the file and maintain these paper copies for at least one month.
- Rename the file and keep it online until the next **polish**.

Step 1: Print the **polish**-generated file (do not use the Unix **lp** or **lpr** command):

```
% cd ~star/log
% starlp polish.lst
```

Step 2: Rename the file:

```
% mv -f polish.lst polish.old
```

The **-f** switch deletes any existing *polish.old* file.

The renaming of the file is not required. Each time you run **polish**, a *polish.lst* file is created or, if the file already exists, the latest (date-stamped) report is added to the current file. The procedures above are recommended to make it easy to review each report individually and, as a byproduct, manage a file that would otherwise grow over time and use considerable disk resources.