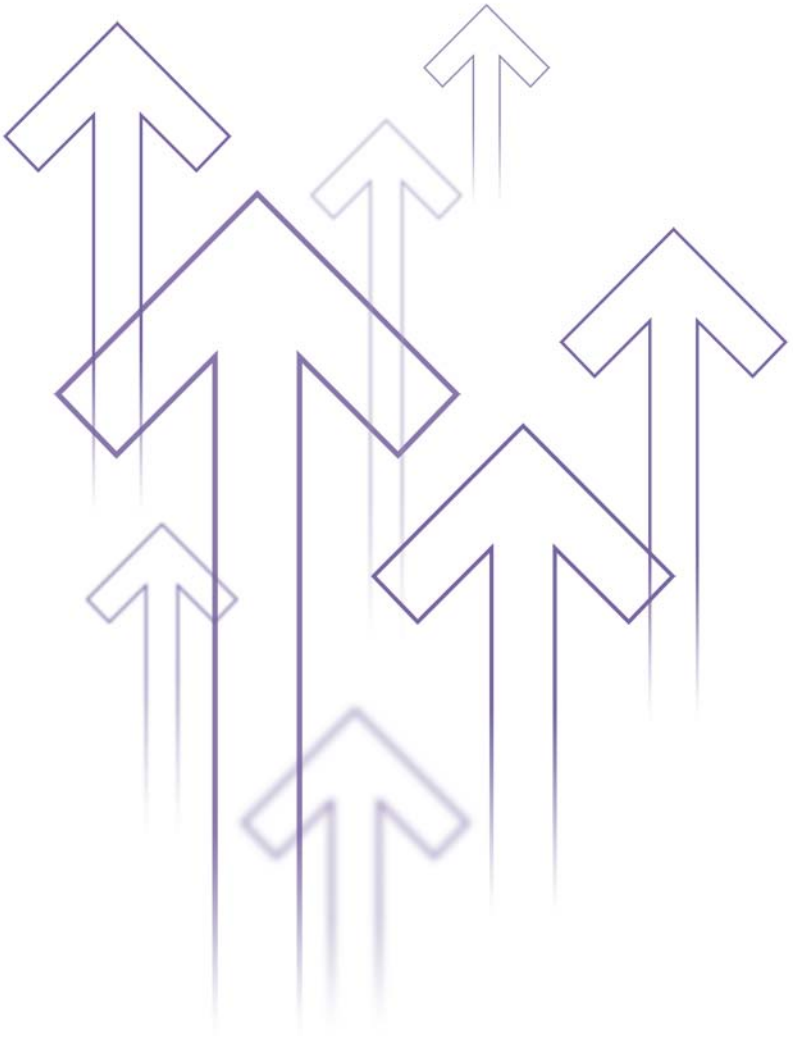
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INFORMATION SOLUTIONS



Reality on UNIX

V14.0

Installation Guide

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Contents

Overview 5
- Product Overview 5
- Contents of the Installation CD 5

Prerequisites 6
- Reality 6
- UNIX-Connect 6
- On-line Documentation 6

Information You Must Supply 7

Set up Before Installation 8
- General 8
- Solaris Systems 9
- AIX Systems 9
- Linux Systems 9
- Resilience Features 10

Installation 11
- Overview 11
- Preliminary 11
- Loading the Reality Software 12
- Installing UNIX-Connect 13
- Building the Reality Executable 14
- Installing the On-line Documentation 15

Set Up after Installation 16
- Installing the Software Keys 16
- Running realstart 16
- Creating a Database 17
- Configuring a Database 17
- Configuring Resilience Features 19
- Making the New Version LIve 21

Troubleshooting 22
- Error Numbers 22
- Example Messages 22

Upgrading from an Earlier Release 23
- Software Upgrade 23
- SYS-UPDATE Details 26
- Changing Lower- to Upper-Case Dates 26
- Upgrading FailSafe 26
- Installing Database Overlays 27
- Remote Tape Server 27
- Running Multiple Versions of Reality 27
- Troubleshooting 28

Installing an Update 30
- Procedure 30

Overview

This Installation Guide describes installation of Reality on a UNIX system.

Before starting the installation or upgrade, ensure that you have the necessary *prerequisites* (see page 6) and *information you must supply* (see page 7).

If upgrading, read *Upgrading from an Earlier Release* on page 23.

Product Overview

Reality is a software environment supporting multiple databases on a UNIX or Windows host. For information about the extensive capabilities of the Reality database management system, see the Introduction to Reality in the online documentation.

Resilience

Transaction Handling is a feature that maintains the consistency of the database by keeping defined transactions (sets of updates) intact. Rapid Recovery File System, Transaction Logging, Shadow Database, and FailSafe are features offering further levels of resilience. Transaction Logging and Rapid Recovery require a single ‘raw log’, per Reality version being run at the same time, to be configured. Further resilience features require at least one clean log per database to be configured. Minimum configuration is described in this guide, with additional information in resilience reference material.

Networking and UNIX-Connect

Comprehensive communications facilities enable communications between a Reality database environment and another Reality database, or a host system environment (UNIX or Windows). UNIX-Connect forms an integral part of the Reality software and must be installed on a UNIX host along with the base Reality software.

User Documentation

Reality is supplied with comprehensive on-line documentation that you can view in a Web browser.

Contents of the Installation CD

There is one installation CD containing the PDS History Tool, Reality, the online documentation and all of the Reality client and server components. Refer to the Reality Release Information for details.

The PDS History Tool must always be installed first and will be installed automatically if not already present.

For a description of how to install the client components and the Reality remote tape server, please refer to the Reality Client Components Installation Guide.

Prerequisites

Reality

- Refer to the Reality Release Information for details of supported hardware and operating systems.
- 128Mb memory minimum (512Mb recommended, 2-6Mb per Reality user)
- 500 Mb of available disk space to accommodate setup (actual hard disk used once installed will be between 220Mb and about 350Mb, depending on the system components installed).
- 'realman' UNIX user-id (see *Set up Before Installation* on page 8).
- Korn shell.
- Perl – this is normally supplied with the operating system.
- 'pam' libraries (for Linux only).
- UNIX-Connect for networking (supplied on Reality Solutions CD).
- C compiler and debugger. These are supplied with Linux. On Solaris, if a C compiler is not available you can install the GNU C Compiler from the Northgate Solaris Customisation CD. For AIX, refer to *Compiler and Debugger* on page 9.
- The Northgate Customisation program appropriate to your UNIX system. For *AIX*, customisation programs are provided on the Reality Solutions CD (see page 9 onwards), while a separate CD is available for Solaris. There is no customisation program for Linux.

UNIX-Connect

'rosi' UNIX user-id with a home directory on a file system with at least 25 Mbytes free.

On-line Documentation

The on-line documentation can be installed on a web or file server, or on your local system. On Windows systems, it can also be viewed from the Reality CD.

To view the on-line documentation you will require one of the following web browsers:

- Internet Explorer 6.0 or 7.0 (PC only).
  –or–
- Mozilla Firefox 2.0 (PC or UNIX).

Note: You can also view the on-line documentation on some earlier versions of the above browsers and on some other types of browser. A message will warn you that your browser is not fully supported.

Information You Must Supply

The table below lists the information you will need when installing Reality. You can fill in the second column of the table so that you have the information to hand during the installation process (print out this page if you are viewing it on-line).

Contact Northgate for software keys. These are normally supplied in a keyfile (held anywhere on the system) and loaded from that file or you can type them in during the installation procedure.

Note: The serial number key is only valid for installation on the specified date and for the two days following.

Name and location of keyfile.	
Serial number key for date of software install.	
Customer ID.	
Version number key for Reality V14.0.	
User Licences key (see Note 1).	
Despooler Licences key (optional).	
FailSafe or Shadow key (optional).	
Disaster Recovery key (optional)	
root password.	
realman password.	
rosi password.	
Location for the on-line documentation (see Note 2).	

Refer to the topic Licences in the online documentation for more information about user licences and other software keys.

Notes:

1. If you intend using Database Isolation, you will need a User Licences key for each instance of Reality.

2. If you already have a Web server installed, this can be the document root directory for your Web server. Alternatively, the documentation can be installed in the default location and accessed through the Reality mini web server, which is designed to handle simple document requests with no risk to system security. See *Installing the On-line Documentation* on page 15.

Set up Before Installation

When you purchase your hardware from Northgate, the system is configured for Reality according to your requirements; for example, the number of users and the resilience options will be defined. If you purchase your hardware from an alternative vendor, you need to carry out the procedures described in this section.

This section gives some details of the requirements of UNIX to support the Reality product. It does not, however, deal with the performance related configuration parameters of UNIX.

General

The realman and rosi user-ids

On the host system there must be a user-id called **`realman`** (Reality manager). If one is not present, the system administrator should create one. The Reality software will be installed in the `realman` user's home directory, so it must be on a partition with at least 250Mb of free space.

A soft link to the `realman` home directory must be set up in `/usr` by the administrator:

`ln -s` */filesystem*/**`realman /usr/realman`**

where *filesystem* is the partition holding the `realman` home directory. Root privileges are required to set up this link.

The host system must also have a user-id called `rosi`. This must have a home directory on a partition with at least 25Mb of free space.

Note: On Linux systems, 'group' and 'other' need read, write and execute permissions to be set up on the home directories for the realman and rosi user-ids.

Tape Device Drivers

Reality requires tape device drivers to have certain characteristics for successful operation. The name of the device driver is not important, because Reality cross references the device number as used in the **`ASSIGN`** statement with the UNIX device name as detailed in *Configuration Parameters for Database* on page 17. The characteristics required are that the device needs to be a no-rewind device and to run the Berkeley tape driver (if available). Some examples are:

- Solaris – `/dev/rmt/0mbn`
- AIX – `/dev/rmt0.1`
- Linux – `/dev/nst0`

The Users' Reference: Administration gives more detailed examples.

Terminal Characteristics

Reality uses the UNIX terminal independence mechanism, **`terminfo`**. A set of **`terminfo`** definitions for use with Northgate PRISM terminals is supplied on the Northgate Customisation CD.

Hosts File

Check that the file **/etc/hosts** includes an entry for the local system; that is, an entry that specifies the IP address of the system with the name returned by the command **uname –n**. On Linux systems, the host name must be fully qualified. For example:

```
152.114.226.12  aharries1       aharries1.northgate-is.com
```

Solaris Systems

The Northgate Solaris Customisation CD configures Solaris to run Reality. After running the configuration program, you will need to build a new kernel by rebooting the system.

Shared Memory

Reality uses shared memory to exchange data between processes and to cache common data used by many processes. Solaris systems default to a small limit on shared memory and this limit will need to be raised in order to run a Reality database. The actual amount of shared memory required is dependant on the number of users and the size of the application. A good starting point is to set the shared memory limit to 16 Mbytes (you can make this change by using the Northgate Solaris Customisation CD).

OSI and X.25

On Solaris, if you are going to install UNIX-Connect and you also want to use any OSI transport services or X.25, you must install these first.

AIX Systems

The Northgate *AIX Customisation program* (see page 12) configures AIX to run Reality. You will also need to configure the system as described below.

File System Options

On AIX installations, the file system on which Reality will be installed (typically under `/usr/realman`) must not have the ‘nosuid’ mount option set. You can use the **smit** utility to change the characteristics of the file system concerned.

Compiler and Debugger

On AIX, if you have no licensed complier and debugger, those on the AIX Tools CD can be used. Refer to the README file in the base directory on AIX Tools CD for more information.

Linux Systems

No customisation program is available for Linux. Configure the system as follows.

Korn Shell

On Linux, the Korn shell needed by Reality is not installed by default. It can be loaded as follows:

1. Insert Red Hat Linux CD 2 into the CD drive and, if necessary, mount it.
2. From the KDE Desktop run System/Package Manager.
3. Select the new tab and then search for “pdksh”.
4. When found, tag the package and install it.

Tape Device Drivers

On Linux, by default only root can access tape devices. To make them available to all users, change the permissions for the relevant device nodes (use `chmod 666` *deviceNode*).

Telnet Service

Remote user access to a Reality database uses incoming telnet. On Red Hat Linux, only outgoing telnet is configured. Incoming telnet can be enabled from the KDE Desktop by using KDE Control Panel/Services Configuration and selecting telnet.

Resilience Features

Transaction Handling and Rapid Recovery

For transaction handling and rapid recovery, you will need a raw log, but no clean logs. It is recommended that this is held on a separate disk in its own partition. Alternatively, you can use a file as the raw log – this must be created after you install Reality.

Transaction Logging, Shadow Database and FailSafe

For transaction logging, shadow database and FailSafe, you will need a single raw log, used by all databases on the system, plus a clean log directory for each database. It is recommended that you allocate a separate disk for these logs, with one partition for the raw log and a second for the clean logs. Using a file as a raw log is not recommended for transaction logging and shadow database.

Note: Linux does not support raw disk access. For the raw log, use a block mode partition or a file instead.

Configuring a Log Disk

The disk used for the raw and clean logs must be configured as follows:

- There must be no swap partitions – if there are any, they should be disabled and their use prevented in the future.
- There must be no virtual partitions. If there are any, they should be unmounted, disabled and their use prevented in the future.
- There must be no existing user file systems.

Carry out the following steps to create raw log and clean log partitions.

1. Check all partitions defined for the disk and ensure they are freed off as above.
2. Repartition the disk to define raw log and clean log partitions. There are no restrictions on the sizes of these partitions.

> ***Caution***
>
> You should be extremely careful to name the partitions correctly; otherwise, another valid file system may be corrupted.

3. Make the mount point for the clean log file system.
4. Set general read/write permissions

Installation

Overview

To install Reality on a UNIX host, you must do the following:

1. Run the Reality installation program (see *Preliminary*)
2. *Load the Reality software*.
3. *Install UNIX-Connect*.
4. *Build the Reality Executable*.
5. *Install the On-line Documentation* (optional).

Preliminary

1. Log in using the `root`/`superuser` user-id.
2. Confirm that the partition (for example, `/realman`) has enough space for the new release. You will need at least 220Mb.
3. Load the Reality Solutions CD into the drive.
4. Mount the CD:
   - On Solaris the CD is normally automatically mounted to the `/cdrom/cdrom0` directory.

     Note: If the CD is not automatically mounted, it can be mounted manually using:

     ```
     mount –F hsfs –r /dev/sr0 /cdrom
     ```

   - On other systems, create a mount point using:

     ```
     mkdir –p /mnt/cdrom
     ```

     then:

     - ❑ On AIX manually mount the device 0 CD using:

       ```
       mount -vcdrfs -oro /dev/cd0 /mnt/cdrom
       ```

     - ❑ On Linux, manually mount the CD using:

       ```
       mount /dev/cdrom /mnt/cdrom
       ```

5. Change directory to the mount point:

   `cd /cdrom/cdrom0` (Solaris)

   `cd /mnt/cdrom` (other systems)

6. If you are installing Reality on AIX, run the customisation program by entering:

```
./custom/setup
```

7. Run the installation procedure by entering:

```
ksh ./setup
```

8. The Reality licence agreement is displayed. Press the space bar to move through the agreement page by page, or **q** to skip to the end. You will then be asked if you accept the licence – you must answer **y** to continue the installation.

   A menu similar to the following is then displayed:

```
Current CD-ROM:                    Version:
Please select one of

a)   Install Reality
b)   Install Client Components
e)   Install Remote Tape
f)   Install on-line documentation
g)   Install ODBC Driver

u)   Install UNIX-CONNECT

l)   List image components
v)   List image versions

q)   Quit

 ?
```

Loading the Reality Software

9. From the top level Installation Menu, select option `a) Install Reality:`. A menu similar to the following is displayed.

```
Reality Installation Menu

Please select one of

  a)    Install base software
  u)    Install UNIX-CONNECT
  f)    Install common files

  m)    Build this release

  r)    Archive and remove an earlier release
  p)    Install 5.0 Failsafe patch
  l)    List image components
  v)    List image versions
  q)    Quit

   ?
```

10. Select option **a.** You will be prompted to enter your name or initials for the history file record.

11. If you are upgrading from a previous version, you will be asked if you want to overwrite the previous version. If you answer **Y**, you will be asked if you want to save the previous version.

Note: The previous version will be saved in cpio format.

12. The installation will then proceed (this might take several minutes). Follow the prompts that appear.

13. When the installation is complete you will be asked if you want to install the Reality keys.

    Both the Reality system itself and some of its features are targeted. This means that you must obtain a date-sensitive **Serial Number Key**, and a set of feature keys that must include a **Version Key** and **User Licences Key**, from the Northgate commercial department for each system on which Reality and any targeted features are being installed (see *Information You Must Supply* on page 7). The feature keys are supplied in a "keyfile".

    You can install the keys at this point, as part of the main installation (strongly recommended), or as part of the set-up after installation.

    Note: If you are upgrading from a release prior to V10.0, you *must* install the keys at this point; you cannot install them later.

    If you prefer, you can choose an evaluation version. You do not need any software keys for this option, but will be limited to 3 concurrent users.

    - If you already have the necessary keys, or intend using the evaluation version, enter **y**. You will then be asked if you want to install the evaluation version – enter **y** or **n** as appropriate. Then follow the prompts that appear.

    - If you do not have the keys available, enter **n**. Refer to *Installing the Software Keys* on page 16 for how to install the keys at a later time.

    Notes:

    - If your Serial Number Key was supplied separately from the other keys (that is, not in the keyfile), enter this first and then load the remaining keys from the keyfile.

    - If you wish to use the evaluation version to carry out performance/stress testing, you can increase the number of users for a 30-day period by registering with Northgate via the *Northgate web site* – www.northgate-is.com/reality.

Installing UNIX-Connect

14. Enter option **u** to install UNIX-Connect.

    Note: If upgrading, you must remove the previous version of UNIX-Connect first.

15. Enter the `rosi` password if prompted. A menu similar to the following is displayed:

```
UNIX-Connect CD-ROM Component Installation Utility
Current CD-ROM: /cdimage/5/uxc     Version: V1.4.1.2

Please select one of

  a)    Install base
  b)    Install service pack
  c)    Install a fix
  m)    Rebuild the installed version
  p)    What is the installed version ?
  r)    Remove the installed version
  i)    What is the current userid ?
  u)    Switch userid
  v)    List image versions
  t)    Run the installation check
  k)    Run a shell
  q)    Quit

    ?
```

16. Select option **a**. You may be prompted to enter the `root` password in order to run the install script.

17. When prompted to confirm that you want to install UNIX-Connect enter **y**.

18. An onsite link of UNIX-Connect is run automatically. When this is complete, press RETURN to return to the UNIX-Connect menu, and then enter **q** to return to the Reality Installation Menu. Then enter **q** again to return to the top level Installation Menu.

Building the Reality Executable

19. From the top level Installation Menu, select option `a) Install Reality:`. Then select option `m` to build the release.

20. The modules that will be excluded from the build are listed and you are asked for confirmation before continuing. If you want to include any overlays, RPQs or fixes, answer **n** and follow the prompts.

21. When you enter **y** in response to the confirmation prompt, the build completes.

    Note: If any error messages are displayed during the build process, take a note of them and contact Northgate support.

22. If you have not yet installed the software keys, you will be prompted to enter them.

23. When the build completes, you will be asked if you want to start the Reality central daemon by running **realstart**.

    - Enter **y** to start the Reality central daemon.

    - If you have not installed the Reality keys, enter **n**. Refer to *Installing the Software Keys* on page 16 for how to install the keys at a later time. Once you have installed the keys, run realstart as described in the section *Running realstart* on page 16.

24. If you are upgrading from a previous version, you will then be prompted:

```
Rawlog currently pointed to by /usr/realman/n.n/bin/Rawlog

Continue y/n [n]
```

- If you intend to continue using your existing raw log with the new version of Reality, enter **y**.

- If you enter **n**, you will need to create a new raw log (see *Configuring a Log Disk* on page 10).

25. If you are building a new installation of Reality, you will be asked if you want to make the new version LIVE. (If you do not enter **y** here, you can edit the file `/usr/realman/installed` to make the new version LIVE at a later date.)

    Note: The LIVE version of Reality is the version that is used automatically when a user logs on to the UNIX host. Non-LIVE versions require special actions, after host logon, in order to use them.

Installing the On-line Documentation

To install the on-line documentation, select option **`f`**, Install On-line Documentation, from the top-level installation menu. When prompted, enter the required location – the documentation will be placed in the subfolder **onlinedocs** relative to the install location you specify.

It is recommended that you install the Reality documentation on a Web Server, though it can also be installed on a file server or on individual PCs (for details, refer to the Reality on Windows, Installation Guide). In all cases, the file system must support long file names.

Note: If you do not have a suitable web server, you can install the documentation on the Reality server in `/usr/realman/html` and access it via the Reality mini web server. The mini web server listens on port 3080 (see below).

Viewing the On-line Documentation

The Reality documentation can be viewed in a web browser (see *On-line Documentation* on page 6 for details of supported browsers).

Note: PDF topics are displayed in a separate browser window. To view these topics you must configure your browser's popup blocker feature to allow popups from the location where you have installed the Reality documentation.

If you install the documentation in your web server's document root, your users will be able to access it via a URL such as:

`http://`*systemname*`/onlinedocs/default.htm.`

If you are using the Reality mini web server, they will need to include the port number in the URL; that is, use:

`http://`*systemname*`:3080/onlinedocs/default.htm.`

If you do not use a web server, you will have to open the file **default.htm** in the folder *installLocation***/onlinedocs**.

Set Up after Installation

If the LIVE version of Reality has been changed during the installation process, logoff and logon again to ensure that the environment variables REALROOT and PATH are set correctly.

Installing the Software Keys

You will normally install the system serial number and software keys during the installation process.

Note: If you are upgrading from a release prior to V10.0, you must install software keys during the main installation – you cannot enter them subsequently.

If the key file was not available at that time, the keys can be installed by running:

{**$REALROOT/bin/**}**installkeys** *keyFile*

(Entering the full path should be unnecessary, because a successful installation adds `$REALROOT/bin/` to the executable path.)

Caution

If the root partition of the system or the `/etc` directory are reloaded for any reason, the installed serial number will become invalid, and will have to be re-installed from a new key file.

Running realstart

Before you can start using Reality you must start the Reality central daemon. If you did not run **`realstart`** when building the Reality executable, you can do this as follows:

1. Change user to `root`.

```
su
password:
```

2. Ensure that the environment variable REALROOT is defined and exported.

```
REALROOT=/usr/realman/14.0
export REALROOT
```

3. Run the `realstart` script:

```
cd $REALROOT/bin
./realstart
...
...    (A commentary will be given as various tasks are completed by realstart)
...
DAEMON nn WRITING TO realman/realman/14.0/files/daemon.log
exit
```

The new Reality is now installed (and LIVE if you accepted that option).

Creating a Database

Before you can start using Reality you must create at least one database. Different types of database are available (refer to Types of Database in the Reality On-line Documentation) – this section shows you how to create a partition database using files on a single disk partition so that you can start using Reality. You can create this type of database at any convenient location in the UNIX file system.

To create a Reality database, log on to UNIX, change to the directory that will hold the database and then run the mkdbase command. For a database on a single partition, include the **–S** option to specify the size of the database:

mkdbase -S *size* **–N** *databaseName*

Where *size* is the size of the database in Mbytes (**M** suffix) or Gigabytes (**G** suffix). For example:

```
mkdbase -S 100M –N pdbase
```

creates a 100Mbyte database called pdbase.

Notes:

1. By default, a new database consists of 10 equal-sized host files. It can easily be enlarged by adding more files.

2. When you create a new database, a Reality user-id is created for the database owner (the UNIX user who created it). This user-id should be used when connecting to the database for administration purposes. The database owner's user-id does not initially have a password.

When a database is created, it is locked to all users except the database owner. It can be unlocked with the unlockdbase host command or the TCL command ENABLE-LOGONS (refer to the Reality Online Documentation for details).

Starting Reality

When you create a new database, a Reality user-id with SYSMAN privileges is created for the database owner (the Windows user who created it). The owner of the database can log on even when the database is locked, without specifying a user-id. If you need to administer the database, you should log on as the database owner.

Note: The database owner's user-id does not initially have a password.

To start reality and log on as the database owner, use the reality command, specifying the database required. For example, to log on to the database **dbase0**, enter:

```
reality dbase0
```

Configuring a Database

Reality V14.0 can be configured to suit particular user requirements by using the following configuration parameters. The parameters required should be defined in the config file `/usr/realman/14.0/files/config` if they are applicable to all new databases. Otherwise change the config file for the database concerned (*DatabasePath*`/configs/config`). Missing parameters are given their default value.

Note: Changes to a specific database config file only take effect when the daemon for the database is restarted. Hence, all users should be logged off and the daemon shut down using the command:

```
killreal -d database
```

Parameter	Default Value	Purpose
MaxPortNum	400	MaxPortNum defines the maximum real port number which may connect to this database. A real port is one that is referenced in the devices file. Such ports are always allocated the same device ID. Reality will map such port identifiers, in a fixed way, to real port numbers.
NumPseudoPorts	400	NumPseudoPorts defines the number of pseudo ports that may connect to this database. A pseudo port is one which made its connection to the host dynamically, for instance by using the rlogin or telnet protocol or via some form of network server. Pseudo ports are also always used for TIPHs. Pseudo ports are allocated device IDs dynamically. Reality will map such port identifiers to the next available pseudo port.
NumConnections	128	NumConnections is the maximum number of connections that may be active on the database at any one time. This includes TIPHs, despoolers, etc.
DateFormat	International	DateFormat defines the format in which the days' date will be represented in certain English expressions and DATA/BASIC OCONV statements. • "Standard" for mm/dd/yy • "International" for dd/mm/yy
NumItemLocks	NumConnections*3	NumItemLocks defines the maximum number of item locks that can be held on the database at any one time.
NumDataSects	400	NumDataSects defines the maximum number of data sections that may be OPEN at any one time.
NumIndexSects	50	NumIndexSects defines the maximum number of index sections that may be OPEN at any one time.
ShareSize	8000	ShareSize defines the size of memory available for shared DataBasic programs. The default is 8000Kb. Details of assessing the ShareSize and ShareModulo requirements are given in the User's Reference: Administration.
ShareModulo	101	ShareModulo defines the modulo of the shared item hash table.
HashType		If HashType is set to 1 or omitted, any new database created will use the old hashing algorithm. If HashType set to 2, the new hashing algorithm will be used.

Tape Parameters

Parameter	Default Value	Purpose
TapeNum	2	TapeNum defines the number of tape drives on the database, named Tape1, Tape2, etc.
TapeDevTypen	3	TapeDevType1, TapeDevType2, etc define the type of tape drive for TAPE1, TAPE2, etc, respectively. The types currently supported are: 2 8mm (Exabyte) cartridge 3 ¼ inch (QIC) cartridge 5 4mm (DAT) cartridge 8 remote tape 9 tape image
TapeDevSize*n*		TapeDevSize1, TapeDevSize2, etc defines the tape capacity size of the tape used in dbsave. Still relevant with virtual tape drives.
Tape*n*	As defined in the supplied config file	Associates a tape number with a UNIX device name.
CompressTapeImage	0	Specifies the default compression level (0 to 9) for tape images created from this database. 0 is no compression (fastest); 9 is maximum compression (slowest). Recommended level: 2.

The Tape*n* entries define the default devices for tape attachments without density specifications. For example, the TCL command **`T-ATT 2`** will use Tape2. Additional entries in the form **Tape*n*:***density*** can be used to define different devices. For example, the command **`T-ATT 1 DEN = 6250`** would require an entry `Tape1:6250=/dev/rmt/0cbn`.

How to configure tape devices is described in greater detail in the User's Reference: Administration.

Configuring Resilience Features

For all resilience features - Transaction Handling, Rapid Recovery, Transaction Logging, Shadow Database or FailSafe – you must use the mklog command to create the raw log.

When you have created the rawlog, for all resilience features other than Shadow Database, you should then refer to the Resilience section of the on-line documentation for details of how to complete the configuration using tlmenu. If you are running Shadow Database, you should initially refer to the topic *Shadow Database* later in this section.

Creating a Raw Log using mklog

- If you intend using a dedicated partition for the raw log, you should have already created this – refer to *Configuring a Log Disk* on page 10. Now log in as **root** and use the mklog command to create the raw log. For example:

```
# mklog –r /dev/rdsk/ct01d0s1
```

- If you intend using a file as your raw log, log in as **root** and use the mklog command to create a raw log file. For example:

```
# $REALROOT/bin/mklog -r -ts10 /user5/rawlog
```

  This command creates a 10 MB file /user5/rawlog, to be used as the raw log.

Note: Linux does not support raw disk access. For the raw log, use a block mode partition or a file instead.

When you have run mklog, stop and restart the central Reality daemon:

```
# killreal
# realstart
```

Shadow Database

Shadow Database is an optional feature that, when installed on a standalone host platform, provides all the functionality of Transaction Logging for data security and resilience, but in addition maintains a copy of the database in a separate disk partition that shadows the live database.

This section covers how to create the first shadow, `pair0`, using mount points `/real0` (primary) and `/real1` (secondary). A second shadow pair would be `pair1` with mounts `/real2` and `/real3`, etc.

1. Log on as superuser.

2. Create the directories to act as mount points for the primary and secondary databases.

```
# mkdir /real0
# mkdir /real1
```

3. Change the ownership of the database directories. For example:

```
# cd /real0
# chown dbaseowner .
# chgrp other .
# cd /real1
# chown dbaseowner .
# chgrp other .
```

   where *dbaseowner* is the user-id of the intended database owner.

4. Logon as the database owner.

5. Create the databases. For example:

```
$ mkdbase /real0/pdbase1
$ mkdbase /real1/pdbase1
```

6. Refer to the Resilience section of the on-line documentation for details of how to complete the configuration of shadow database using tlmenu.

Making the New Version Live

If you did not accept the option to make the new version of Reality live on installation, you can do so now by editing the /usr/realman/installed file to show a space and then the word LIVE (all caps) after the entry for the new version, and removing the word LIVE against any other version.

Troubleshooting

Reality records error details in various error logs depending on what class of error has occurred. Below is a list of useful log files for diagnosing problems when starting and running Reality on UNIX:

Daemon Log
$REALROOT/files/daemon.log

Records major events and errors with Reality daemons and Reality processes.

Session Log
/var/adm/RCS/RCS_SESS_LOG

Records incoming and outgoing connections both successful and failed.

Event Log
/var/adm/RCS/RCS_EVENT_LOG

Records other SMANAGER (Reality session manager) activity.

Error Numbers

Reality error numbers can be converted into human readable messages by using the **perror** command from the UNIX shell; for example:

```
$ perror 2004
Error  2004: RFE_NOITEM              Item does not exist
```

From Reality TCL you can use:

```
: sys perror 2004
```

Example Messages

Below is an example of a message logged in the daemon log.

```
Oct 30 07:55:20 #2240  tlrestore WARNING: Image 000000E4 Result
(2027) File section already exists
```

This message indicates that an attempt was made by the 'tlrestore' process (part of Reality resilience) to create a file, which already exists on the database. Running **perror** 2027 would report:

```
Error  2027: RFE_SECTEXISTS          File section already exists.
```

Note: More verbose error logging can be activated by running **killreal -l 6** from the UNIX shell prompt.

Below is an example of information logged in the session log:

```
Session :11  Thu, 21 Nov 2002  15:14:29  IC
    System :demodb, User Id :SYSMAN, Account :SYSMAN, Server
:SQLSRVR
    Client Id :, PLID :INET-207.238.117.133-9
    Class :Process, Flags :0, Timeout 1

Session :11  Thu, 21 Nov 2002  15:14:29  Session Terminated by
Server Rejection
    Database Initialisation Failed 2008
```

Running **perror 2008** would report:

```
Error  2008: RFE_INVACCPASS          Invalid logon attempt
```

Upgrading from an Earlier Release

There are three ways in which you can upgrade to Reality V14.0:

- If you have a UNIX system with RealityX Release 5.0x, or Reality Release 8.1 or later, you can upgrade directly to V14.0 (see *Software Upgrade* below).

  Note: You can run two Reality versions on a system – the latest installed version and the previous version. However, you cannot run V14.0 together with V9.1 or any earlier version.

- If you have a Series 18/19 system, a Windows system with Reality, or an older UNIX system, you might wish to replace your old system with a new UNIX system with Reality V14.0 (hardware upgrade). To do this, you will need to install Reality V14.0 on the new system and then transfer your database(s) from the old system to the new. For details, see the separate document Transferring a Database.

- If you have a supported UNIX system with RealityX Release 3.1C or 4.1x, you can upgrade that system to V14.0, but must create new databases and transfer your data as described in the separate document Transferring a Database.

Note: To ensure that your databases operate at maximum efficiency, you should periodically save the files to tape and then restore to a new database. It can be convenient to carry this out when upgrading the Reality software.

Software Upgrade

Caution

Before starting the upgrade, make sure you have the Reality V14.0 software keys available. A complete new set of keys is essential. Also, if you are upgrading from V9.1 or earlier, these keys must be installed during the main installation – they cannot be installed separately.

Pre-Upgrade

1. For each Reality database:

   - Save to elsewhere in the database any system file items that you have customised. Files that might have been customised include SYSPROG-PL, PROCLIB, BP, SYSBP, SYSBP.MSGS, SYSPL, SYS.BASLIB, BASIC.COMPILERS and NEWAC.

   - Check that all users are logged off

   - Carry out FILE-SAVE and VERIFY-SAVE.

2. Save any communications software overlays loaded on the `/realman` partition.

3. Save any RPQ directories.

4. If Transaction handling is enabled, a raw log will be required:

   - If the new release will replace the current release, the current raw log can be used. Save the file containing the raw log configuration information (**/usr/realman/***RealityVersion***/bin/RawLog**, where *RealityVersion* is the version number of the current Reality release).

   - If V14.0 is to be used in parallel with the previous release, a new raw log must be created after V14.0 is installed.

5. Save any printer interface scripts from `$REALROOT/files/interfaces` to a safe location.

6. Save any customised configuration files, such as `config` and `realityrc`. These are located in the UNIX directory **/usr/realman/***RealityVersion***/files** (where *RealityVersion* is the version number of the current Reality release).

Note: Option r (Archive and remove an earlier release) on the Reality Installation Menu can be used to save the raw log configuration, printer interface scripts and customised configuration files (steps 4, 5 and 6 above).

7. From Reality V9.1, the default amount of shared memory available to DataBasic programs has been increased from 256Kb to 8Mb. If you are running Reality on Solaris, you may need to configure your system to increase the maximum size of a shared memory segment by 8Mb. You can use the Northgate Customisation CD to make this change.

   Note: This will only be necessary if you have not set the ShareSize parameter (see *Configuration Parameters for Database* on page 17).

Installing the New Release

1. Follow the procedure described in the *Installation* section on page 8 – install both Reality and UNIX-Connect (you must remove the previous version of UNIX-Connect first) and build a new executable. Select the options to include the overlays (ALL, RPL and Wordmate) as required. You can opt to make Reality V14.0 the live version immediately, or you can delay this until configuration is complete.

2. Install the Version key for the new release. See *Installing the Software Keys* on page 16.

3. Restore any customised configuration by editing the configuration files in the UNIX directory **/usr/realman/14.0/files**. You should have saved the previous configuration files in step 6 of the previous section.

4. Update any customised files in the **/usr/realman** directory.

5. If Transaction handling is enabled, you will need to remake the raw log:

   - If this version is replacing the previous version the current raw log can be used. In this case, copy the raw log configuration file saved in step 4 of the previous section into the UNIX directory **/usr/realman/14.0/bin/RawLog**. Run the command **`mklog -rv`** to upgrade the raw log, then stop and restart the Reality services.

- If this release is to run in parallel with the previous release, a new raw log must be created – see *Configuring Resilience Features* on page 19.

6. Change any entries in /etc/ROUTE-FILE that contain the absolute path name, to $REALROOT or the Reality executable path. A script is provided for this purpose, called **rc.***OldRelease***.***NewRelease*; for example, the script for conversion from Release 8.1D to V14.0 is called **rc.8.1D.14.0**.

7. Change any users' **.profile** and **.realityrc** entries that contain the absolute path name, to $REALROOT or the Reality executable path.

8. If this is a FailSafe system, refer to the section *Upgrading FailSafe* on page 26.

Post-Upgrade

On each Reality database:

1. Log on to the database as SYSMAN and enter the following commands:

2. **INHIBIT-LOGONS ***

3. If applicable, run **TL-STOP** to stop Transaction handling.

4. If upgrading from a version earlier than Reality V9.1, load the system tools. Enter the following commands:

```
T-DEVICE 4 $REALROOT/files/upgfile.rti
ASSIGN = TAPE 4
T-REW
INSTALL
```

Follow the prompts to install the upgrade bootstrap. Then enter

```
CLEAR-ASSIGN
```

5. Run **SYS-UPDATE**, entering the release of Reality from which you are upgrading (see *SYS-UPDATE Details* on page 26).

6. Log into the database and integrate any customised changes made in SYSPROG-PL, PROCLIB, BP, SYSBP, SYSBP.MSGS, etc. (saved in *Pre-upgrade step 1* – see page 23). Note that customised changes to NEWAC must be moved to the USER data section of that file.

7. **FILE-SAVE** and **VERIFY-SAVE**.

8. Start Transaction Processing, if applicable.

9. **ENABLE-LOGONS ***

SYS-UPDATE Details

This section gives details of the prompts you might see when running the SYS-UPDATE utility from TCL.

When you make a selection on the System Conversion Facility screen, the following prompt is displayed:

```
Restore from a different machine type? (Y/N) :
```

At this prompt enter **Y** if you are restoring from a save from a system with a different binary format; otherwise, enter **N**. This is to indicate to the update process that the byte order of the binary data has changed, enabling it to correctly update the system. The systems on which Reality is supported have the following binary formats:

Byte normal: Solaris, AIX.

Byte reversed: Windows, Linux.

Therefore, when restoring a save from a Solaris system onto an AIX system, for example, enter **N**. When restoring a save from an AIX system onto a Linux system, however, enter **Y**. If the platform is the same - for example, from one Solaris system to another- enter **N**.

During the SYS-UPDATE procedure, cataloged DataBasic programs in the POINTER-FILE will be upgraded if necessary. Two accounts are also populated during this procedure: BASIC.CONVERSION and UPGRADE.ACCOUNT. These two accounts are quite large and will only be required if a problem had occurred during the SYS-UPDATE. An explanation of this process is given in the separate document Transferring a Database.

Data/Basic Conversion

If the database being upgraded is a release prior to RealityX 4.0 or ROS 7.2, the DataBasic object code will be converted. For more information, see the separate document Transferring a Database.

Changing Lower- to Upper-Case Dates

From RealityX 5.0 onwards, Reality has used mixed-case month names. If you have older applications that rely on having all upper case month names for date verification, you will have to force dates into upper case. This is described in the separate document Transferring a Database.

Upgrading FailSafe

If FailSafe is to be run between Reality V5.0 and V14.0, you must install the 5.0 FailSafe Patch (option p on the Reality Installation Menu.) For further information on upgrading a FailSafe system, please refer to the Resilience section of the on-line documentation.

5.0 FailSafe Patch

This patch is only available for Solaris.

The patch should be installed on a 5.0 failsafe system. It enables `tlmenu` to operate correctly when failsafe is set up between Reality V5.0 and V14.0.

The patch does NOT require the 5.0 system to be shut down. However, `tlmenu` should not be running while installing the patch.

Once the binary part of the patch has been installed, all databases MUST be upgraded using the tape image provided.

The new `tlmenu` is not compatible with the old database PROCs.

You need the root password to install this patch.

The patch will be installed to `/usr/realman/5.0{x}`

Once the patch is installed, you must update each database with the TCL command

```
CDINSTALL $REALROOT/files/fspatch 50FSPATCH
```

Installing Database Overlays

If you want to install database overlays – for example, ALL, RPL, or Wordmate – you should install these by running **`CDINSTALL`** from within Reality.

Remote Tape Server

It is recommended that you reinstall the Remote Tape server on all systems that provide this service.

Running Multiple Versions of Reality

You can run different versions of Reality on the same system provided the system has enough disk space. In addition to the different versions of the Reality software, if you are using transaction handling or other resilience feature, you will require a separate raw log for each version.

Notes:

1. Additional versions of Reality are limited to 8 concurrent users across all databases used.

2. You can only run two Reality versions on a system – the latest installed version and the previous version. You cannot run V14.0 together with V9.1 or any earlier version.

If there is insufficient space on the filesystem containing the /usr/realman directory (see *Prerequisites* on page 6), you can install the new version of Reality on a different filesystem. Create a directory to hold Reality on this filesystem and define a variable called REALMAN containing the location of the additional Reality directory. For example, if your alternate filesystem is called filesys1, you might do the following:

```
$ cd /filesys1
$ mkdir realman
$ chown realman realman
$ REALMAN=/filesys1/realman; export REALMAN
```

You can now install Reality in the normal way (see *Installation* on page 10).

Once the installation has completed, edit the file **/usr/realman/installed** and add the line `/usr/realman/14.0` if it is not already there.

Note: The file **/usr/realman/installed** must list all installed versions of Reality. The installation program creates a symbolic link from **/usr/realman/14.0** to **/filesys1/realman/14.0**.

Running Reality Locally

To run a version of Reality other than the live version locally, enter the following at the command prompt:

```
$ REALROOT=/filesys1/realman/n.n; export REALROOT
$ PATH=$REALROOT/bin:$PATH; export PATH
```

where *n.n* is the version number of the required version. Then start the Reality services by entering:

```
$ runrealcd
```

You can then run Reality in the normal way.

Note: Each Reality database is associated with a particular version and must only be accessed when running that version. Having carried out the procedure above, you will need to use **mkdbase** to create a new database. You will then have to specify this database when starting Reality.

Running Reality Remotely

To make a version of Reality other than the live version available remotely, log on as **root** and use the netadmin utility (normally found in **/usr/RCS/bin**) to create a Reality-type entry in the ROUTE-FILE (see The ROUTE-FILE in *UNIX-Connect System Administration*) for each database associated with that version of Reality. Give the entry a unique name (normally the name of the database) and specify:

- The full Reality database path.
- The full REALROOT path of the required version of Reality. For example:

  ```
  /filesys1/realman/14.0
  ```

You do not need to enter the path to the Reality executable.

Troubleshooting

This section describes problems you might experience when upgrading to Reality V14.0.

Message 'No Space' when starting the Reality Database Daemon (realdd)

There are two reasons why this error might occur:

- Reality V9.0 and later require more shared memory than earlier versions, because item-ids have been increased in size from 98 to 240 bytes. The extra space required can be calculated as follows:

  For each database, open the database configuration file (*DatabasePath*`/configs/config`) and find the value of the NUMINDEXSECTS parameter. If this is not set, it can be calculated by finding the value of the NUMDATASECTS parameter and dividing it by 2. If NUMDATASECTS is not set, its default value is 400.

The additional shared memory needed for a Reality V9.0 or later database can then be calculated by multiplying the increase in the size of an item-id (142) by the value of NUMINDEXSECTS (calculated if necessary). For example, if neither NUMINDEXSECTS nor NUMDATASECTS are set, NUMINDEXSECTS is 400 / 2 = 200, and the additional shared memory needed for this database is 142 * 200 = 28400.

Add the values for each of the databases together and increase the shared memory size configured in the kernel by this amount. Refer to your UNIX system documentation for details of how to do this.

- From Reality V9.1, the default amount of shared memory available to DataBasic programs has been increased from 256Kb to 8Mb. You may need to configure your UNIX system to increase the maximum size of a shared memory segment by 8Mb.

  Note: On Solaris and AIX systems, you can use the appropriate Northgate Customisation CD to make this change.

Installing an Update

host command" command"Updates to Reality are made available on the Northgate web site in the Reality Knowledge Base (*http://www.northgate-reality.com/support.php*). In the list on the left of the page, click the **V14.0 support** link to see a list of relevant updates. Click the update you require and download the attachment file.

Other support information is available on the Reality web pages (*http://www.northgate-is.com/reality/*).

Before downloading, please read the documents *Description of Recommended Updates* and *Installation Info File* for details of the contents of the updates and any additional configuration that might be necessary.

Caution

Before you install an update, ensure that you have an up-to-date backup of your existing data.

Procedure

1. Download the required update from the Northgate web site to your UNIX system. It is recommended that you create an **updates** subdirectory in the **realman** user's home directory and save the update there.

   Note: If you have several updates to install, save them all in the same directory.

2. Ensure that no users are logged into Reality. If necessary use the LOGOFF command.

3. Login to UNIX as **root**.

4. Execute the command:

   ```
   $REALROOT/bin/killreal
   ```

   to shut down the Reality daemons.

5. Switch UNIX user-id to **realman**.

6. Run the command:

   install_fix *update*

   where *update* is the full path of the file containing the downloaded update.

   For example, for update V14.0.0.0001 saved in the directory **/usr/realman/updates** the command would be:

   ```
   install_fix /usr/realman/updates/V14.0.0.0001.tar
   ```

   Note: If you have several updates to install, run **install_fix** with the **–a** option and specify only the path of the directory containing the updates. For example:

```
install_fix -a /usr/realman/updates
```

7. **install_fix** will ask you for your name or initials. Once you have supplied this information, the process will display a description of the update and ask you to confirm installation. If you are installing several updates you will be asked to confirm each update in turn.

   Note: If the process detects that the current version of the update is already loaded, a message is displayed and the update is not installed.

   If necessary, the installation process then rebuilds Reality and/or informs you that you should logon to each database to complete the installation.

8. Log into UNIX as **root** and run the command:

   ```
   $REALROOT/bin/realstart
   ```

   to restart the Reality daemons.

9. If your were informed that you need to log onto each database to complete the operation, log on to each database as the database owner and ensure that you are logged on to the SYSMAN account. Then from TCL run:

   DBUPDATE *updateNumber*

   where *updateNumber* is the number of the update you have installed (for example, `14.0.0.0001`) or `*` for all updates. Follow the on-screen prompts.