

**ULTRIX-32**  
**Guide to Remote Installation Service**  
**for RISC and VAX Processors**

Order No. AA-MF02B-TE

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ULTRIX-32, Version 3.1

Digital Equipment Corporation


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## About This Manual

This manual describes how to install and maintain your network distribution kit using the remote installation service utility, RIS. Users install software products over the network using the network kit on the server as the distribution device.

### Audience

The audience for this manual is anyone installing and maintaining the network distribution kit. The manual assumes that:

- You, or a Digital Field Service representative, have checked the hardware to ensure that it is working properly.
- You have read the Owner's Manuals supplied with your hardware.
- You know the location and function of the controls and indicators on your hardware.
- You understand how to load and unload the installation media and any disks needed during the installation.
- You know how to use ULTRIX software.

### Organization

Chapter 1	Overview Describes the network distribution kit and introduces the RIS utility.
Chapter 2	Remote Installation Service Setup Preparation Describes the knowledge, information, and tasks required before you set up the network distribution kit.
Chapter 3	Server Setup and Maintenance Describes how to install software into a network distribution kit and how to manage client information.

### Related Documentation

The following list suggests the order in which you should read the related documentation:

1. Hardware documentation

You should have on hand the hardware documentation associated with your processor, particularly the Owner's Manual. These manuals show you how to set up the

troubleshooting guidelines.

2. Release Notes

Before beginning the installation, you should read the current version of the Release Notes.

3. ULTRIX-32 system and network management guides

Read the appropriate ULTRIX-32 system and network management guides to help you prepare to install the network distribution kit.

## Conventions

The following conventions are used in this manual:

special	In text, each mention of a specific command, option, partition, pathname, directory, or file is presented in this type.
command(x)	In text, cross-references to the programmer's manuals include the section number in the manual where the command is documented. For example, see the <code>cat(1)</code> command in the <i>ULTRIX Reference Pages</i> .
example	In examples, computer output text is printed in this type.
<b>example</b>	In examples, user input is printed in this bold type.
#	This is the default superuser prompt.
>>	This is the console subsystem prompt.
.	In examples, a vertical ellipsis indicates that not all of the lines of the example are shown.
<KEYNAME>	In examples, a word or abbreviation in angle brackets indicates that you must press the named key on the terminal keyboard.
Mbyte	Throughout the text, the abbreviation Mbyte is used for megabyte. One megabyte equals 1,048,576 bytes.

# Overview 1

This chapter presents an overview of the remote installation service and introduces the remote installation service utility, RIS, for setting up and managing the network distribution kit.

## 1.1 Description of the Network Kit

Software distribution kits can be set up on a server so that users can install software products on the MicroVAX, VAXstation and DECstation series of processors over the network.

To understand the network distribution kit, you must be familiar with:

- The network distribution kit environment
- The network distribution kit directories
- Software products and software subsets
- Model files

## 1.2 The Network Kit Environment

The environment for a network distribution kit consists of the following components:

- A server  
The server can be any Digital-supported processor. The software subset containing support for the maintenance operations protocol, MOP, must be installed in order for your system to be used as a server. See the Guide to Server Setup for software subset descriptions and dependencies.
- A distribution device on the server  
The distribution device could be an MT9 tape drive, a TK50 tape drive, or a TK70 tape drive. You use the distribution device to transfer the software subsets for one or more specific products and architectures to the disk on the server that contains the network distribution kit. Then, registered clients can access the software.
- A system disk  
The system disk associated with the server contains the software subsets for the products you install.
- The Ethernet  
You must set up the server and all client processors as hosts on the Ethernet. Clients use the Ethernet to access the network distribution kit.

- **Clients**

Clients are members of the MicroVAX, VAXstation, and DECstation series of processors. Users do not load any media on the client processor to install software products. Instead, they type a command and the installation software transfers the software subsets residing on the server's network distribution kit to their system disks.

### **1.2.1 Directories**

When you install an ULTRIX operating system, the installation software creates two directories, `/usr/var/adm/ris` and `/usr/var/adm/ris/clients`, that are necessary for RIS.

The `/usr/var/adm/ris` directory contains the software subsets for one or more specific products. This directory is the distribution kit for installation over the network, just as tape cartridges, 9-track tapes, and diskettes are physical distribution kits for installing software subsets on a processor.

### **1.2.2 Software Products and Software Subsets**

A software product consists of one or more software subsets. A software subset is a collection of executable files and data files needed to perform a specific function or to provide a particular class of services for a specific product.

You can install any software product from media that is compatible with the `setld` utility to the `/usr/var/adm/ris` directory. You can set up a network distribution kit on any processor supported by the installed version of the ULTRIX operating system. However, you can install software subsets from the network distribution kit only if your processor is a member of the MicroVAX, the VAXstation, or the DECstation series of processors.

### **1.2.3 Model Files**

A model file, which resides in the `/usr/var/adm/ris/clients` directory, contains a list of the software subsets for a particular product. Before a client processor can install software from the network distribution kit, you must assign the client a model file. See Section 3.4 for information about creating model files.

## **1.3 Remote Installation Service Utility**

You use the Remote Installation Service utility, RIS, to set up the network distribution kit and register network kit clients. You also use the RIS utility to manage your client processors. See `ris(8)` in the *ULTRIX Reference Pages* for a summary of the RIS functionality.



# Remote Installation Service Setup Preparation 2

This chapter describes how to prepare to set up your network distribution kit. The chapter describes how to:

- Gather prerequisite information.
- Complete prerequisite tasks.

## 2.1 Gathering Prerequisite Information

As the system manager at the server, you should:

- Know your superuser password.
- Make sure that the /usr file system has enough room to accommodate the software subsets for the products you want to place in the network distribution kit if the var area on your system is a directory in the /usr file system. See the documentation supplied with your product to learn the sizes of its software subsets.
- Make sure that your clients are licensed for all the software that they access in the network distribution kit.
- Understand that the more users who access the network distribution kit at the same time, the slower the system will run.
- Let your users know when you have finished setting up the network distribution kit, so that they can use it to install the software subsets for a specific product over the network. Tell your users to read the Basic Installation Guide for their processor when they want to perform an installation using the network distribution kit. Tell your users to read the Advanced Installation Guide as well, when they want to perform an advanced installation using the network distribution kit.
- Tell them to read the setid(8) manual pages in the *ULTRIX Reference Pages*. They can use setid to add and delete software subsets. Proper use of setid will help manage disk space.

## 2.2 Completing Prerequisite Tasks

Before you set up the network distribution kit, you should complete the tasks described in this section:

- Install an ULTRIX operating system on the server.
- Set up a local area network.

- Obtain the host name for each client processor.
- Place each client's host name and IP address in `/etc/hosts`.
- Obtain the full pathname of the device special file name or mount point for the distribution media.
- Identify the distribution media.
- Obtain the client processor's hardware Ethernet address.
- Fill out the Network Kit Setup Worksheet, located at the end of this chapter.

### **2.2.1 Installing an ULTRIX Operating System on the Server**

When you install an ULTRIX operating system, you do not have to choose the advanced installation option. However, the advanced installation lets you specify where you want to allocate the `/usr` file system and whether you want to allocate the `var` area as a directory under the `/usr` file system, or as a separate `/var` file system.

The network distribution kit is located in the `var` area. The network distribution kit significantly affects the size of `/usr`, if you allocate the `/var` area as a directory under `/usr`. Be sure you have enough space for the subsets you want to install. See the documentation provided with each product to find out the subset sizes.

This guide assumes you allocated the `var` area as a directory under the `/usr` file system. The Basic Installation Guide for your processor explains how to install an ULTRIX operating system. The Advanced Installation Guide tells you how to perform an advanced installation. It also provides a table that lists supported software subset sizes.

### **2.2.2 Setting Up a Local Area Network**

You must connect the RIS server and all of your client processors to the Ethernet. See the Guide to Local Area Networks for instructions on how to set up a local area network (LAN).

### **2.2.3 Obtaining Clients' Host Names**

The setup procedure requests the host name for each client processor that will use the network distribution kit. You specified this host name when you set up the LAN. When a client installs the software subsets for a product from the network distribution kit, the installation software displays the client's host name. The host name is equivalent to the system name discussed in the Basic Installation Guide for your processor.

You should enter this information on the Network Kit Setup Worksheet (Figure 2-1).

### **2.2.4 Placing Clients' Host Names and IP Addresses in `/etc/hosts`**

You automatically place each client processor's host name and Internet Protocol (IP) address in the `/etc/hosts` file when you initially set up your LAN using the `netsetup` utility. The `netsetup` utility is described in the Guide to Local Area Networks.

You can also place the host name and IP address in the `/etc/hosts` file by using a text editor, such as `vi`. The host name and IP address for each client processor must be unique.

### Note

If the host system is a Berkeley Internet Name Domain (BIND) server, see the *Guide to the BIND Service* for information about modifying and propagating a host file.

## 2.2.5 Obtaining the Device Special File Name or Mount Point

Obtain the full path for the device special file name or mount point associated with your software distribution media. The device special file name points to the device on which you mount the media containing the software subsets.

Table 2-1 lists possible distribution media and, where applicable, the device special file name for each. The first column lists the distribution media type, the second column lists the full pathname for the device special file or mount point, and the last column contains the DIGITAL name for the distribution media.

The question mark (?) in the device special file name represents the unit number of the distribution device. For example, if the distribution device is a TU81 unit 0, then the device special file name is `dev/nrmt0l`. You should enter this information on the Network Kit Setup Worksheet (Figure 2-1).

**Table 2-1: Device Special File Names**

Media Type	Device Special File Name	DIGITAL Name
TK50 tape cartridge	<code>/dev/rmt?h</code>	TK50, TK70
9-track magnetic tape	<code>/dev/rmt?h</code>	TS05, TU80 TU45, TE16 TU77
	<code>/dev/rmt?l</code>	TA78, TA79, TA81 TU81, TU81E TU78, TU79

### **2.2.6 Identifying the Distribution Media**

See the bill of materials for the distribution media types and associated labels for your products. You should enter this information on the Network Kit Setup Worksheet (Figure 2-1).

### **2.2.7 Obtaining the Hardware Ethernet Address**

See the Guide to Ethernet Communications Servers for information about obtaining the hardware Ethernet address for each client processor. You should enter this information on the Network Kit Setup Worksheet (Figure 2-1).

### **2.2.8 Filling Out the Network Kit Setup Worksheet**

Use the Network Kit Setup Worksheet to record the information you need to set up a client processor using the RIS utility option, Add Client Processor, which is described in Chapter 3. Fill out a worksheet for each network kit client processor you plan to add.

Figure 2-2 shows a sample network distribution kit setup worksheet. Many of the items that appear in this sample are used in the examples that appear in Chapter 3.

## Network Kit Setup Worksheet

1. List the device special file or mount point associated with the software distribution device you are going to use: \_\_\_\_\_.
2. List the distribution media type and its associated label for the software subsets you plan to install on the network kit:

Media Type	Label
_____	_____
_____	_____
_____	_____
_____	_____

3. List the host name, hardware Ethernet address, and model

Hostname	Hardware Ethernet Address	Model File
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Figure 2-1: Network Kit Setup Worksheet

## Network Kit Setup Worksheet

1. List the device special file or mount point associated with the software distribution device you are going to use: \_\_\_\_\_.
2. List the distribution media type and its associated label for the software subsets you plan to install on the network kit:

Media Type	Label
_____	_____
_____	_____
_____	_____
_____	_____

3. List the host name, hardware Ethernet address, and model

Hostname	Hardware Ethernet Address	Model File
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Figure 2-2: Sample Network Kit Setup Worksheet

## Server Setup and Maintenance 3

This chapter describes the tasks you perform to set up and maintain the network distribution kit. The instructions tell you how to perform the following tasks:

- Install software into a network distribution kit.
- Add a client.
- Remove a client.
- Create alternate model files.
- Delete old software versions.

The order in which you perform these tasks depends on the situation. Table 2-1 helps you determine the order in which you should perform the tasks. The left column of the table describes some possible situations. The right column lists the order in which you should perform the tasks, based on the situation.

Be sure you have read Chapter 1 before starting to set up your network distribution kit. The examples used in the following sections use some of the items that appear in the sample network distribution kit worksheet (Figure 2-2).

**Table 3-1: Network Kit Setup Situations**

<b>Situation</b>	<b>Tasks</b>
Setting up a software product	Installing software subsets (Section 3.1).
Adding a client processor	Optionally, creating alternate model files (Section 3.4). Adding a client (Section 3.2).
Setting up a product that not all clients are licensed to use	Installing software subsets (Section 3.1). Creating alternate model files for those clients that have licenses (Section 3.4).
Removing clients	Removing a client (Section 3.3).

### **3.1 Installing Software into a Network Kit**

Follow these instructions when you install software subsets. The examples used in this section illustrate how you install the software subsets for the ULTRIX base product.

#### **Note**

You must use only the Server Setup Kit to set up a network distribution kit.

To install a product's software subsets:

1. Log in and become the superuser.
2. Type the following at the system prompt:  

```
# /etc/ris
```
3. A network distribution kit menu follows this message. Select the Install Software option by typing **i**:

```
REMOTE INSTALLATION SERVICE (RIS) UTILITY MENU
```

```
a - Add Client Processor  
r - Remove Client Processor  
i - Install Software Subsets  
d - Delete Old Software Versions  
e - Exit RIS
```

```
Type your choice: i
```

A message appears indicating that you have chosen to install software subsets in the `/usr/var/adm/ris` directory.



4. A prompt asks for the full pathname of the device special file name or mount point for the distribution media.

Enter the device special file name or mount point of your distribution media. See the worksheet you filled out in Chapter 2 for the correct entry.

In the following example, the system manager plans to mount the 9-track magnetic tape labeled ULTRIX WS V2.0 (RISC) SUPPORTED BASE on a TU81 tape drive, unit 0:

```
Enter the device special file name or mount point of the distribution
media, for example, /dev/rmt0h: dev/nrmt01
```

A message tells you to press the RETURN key after you mount the software distribution media. Make sure the device is on-line and ready.

After you press the RETURN key, another message appears to make sure that you have loaded the media. The message asks you to type y when you are ready:

```
Extracting software subsets.
```

```
Please make sure your installation tape is mounted and on-line
```

```
Ready (y/n)? y
```

The RIS utility loads the software subsets for the specified product into the /usr/var/adm/ris directory. In this example, RIS loads the software subsets for the ULTRIX Worksystem Software (RISC) product. The RIS utility creates the model.UDT030 and model.UDT030.mand model files, which appear in the /usr/var/adm/ris/clients directory.

5. A prompt asks whether you want to update the default model files and the model files for your clients with the software subsets you have just installed. If you have not yet added your client processors to the /usr/var/adm/ris/clients directory, type no to the prompt. You can assign the model file to the client when you perform the Add a Client task, described in Section 3.2.

The prompt also tells you how it updates these model files. If you have already added clients and you want them to be able to install these software subsets, type yes.

In this example, the system manager did not add clients:

```
Updating the default model files.
```

```
Do you want the model files for your client
processors and model files to be updated with the
new version of UDT modules?
```

```
.
.
.
```

```
Type yes or no [yes]: no
```

If you type **no**, the RIS utility returns you to the system prompt. A message appears indicating that you chose not to update your client's model files with these software subsets.

If you type **yes**, the next prompt appears.

6. This prompt appears for each client model file in the `/usr/var/adm/ris/clients` directory. If this directory contains 10 client model files, the prompt appears 10 times. The prompt asks you to indicate whether you want to update the model file for this processor with the previously installed software subsets.

If you want the processor model file to contain the installed software subsets, type **yes**. Otherwise, type **no**. This example illustrates this sequence:

```
Do you want the model file for your client processor, largo,
to contain the newly installed software subsets.
Type yes or no [no default]: yes
```

```
Do you want the model file for your client processor, poppin,
to contain the newly installed software subsets.
Type yes or no [no default]: no
```

```
Do you want the model file for your client processor, messal,
to contain the newly installed software subsets.
Type yes or no [no default]: yes
```

The RIS utility returns you to the system prompt after it displays this question for all the processor model files contained in the `/usr/var/adm/ris/clients` directory.

If you want to install another product, run RIS again and repeat the software subset installation procedure.

## 3.2 Adding a Client

If you plan to assign alternate model files for any client you add, create those model files before adding the client processor. See Section 3.4 for information about creating model files.

To add a client processor:

1. Log in and become the superuser.
2. Type the following at the system prompt:

```
# /etc/ris
```

3. A network distribution kit menu follows this message.
4. Select the Add Client Processor option by typing **a**:

REMOTE INSTALLATION SERVICE (RIS) UTILITY MENU

a - Add Client Processor  
r - Remove Client Processor  
i - Install Software Subsets  
d - Delete Old Software Versions  
e - Exit RIS

Enter your choice: **a**

5. A message appears indicating that you have chosen to add a client processor. The message also supplies some additional information.
6. A prompt asks if you want to continue with the add client processor procedure. If you plan to assign the default model file for the product (in this example it is model.UDT030) to any of your clients, then answer **yes** to this prompt.  
  
If you plan to assign an alternate model file to any of your clients, then you should already have created this file. If you did not create this file, answer **n** to this question. Then create the necessary model files. See Section 3.4 for information about creating model files. If you already created the model files, answer **yes** to the question.
7. After you confirm that you want to continue, a prompt asks you to enter the client's host name.

**Note**

For registration, the MOP protocol and DECnet/ULTRIX software recognize only six characters for the host name, so you should enter a host name in which the first six characters are unique. The name must contain alphanumeric characters only and be entered in lower case, with the initial character an alphabet character.

Enter the host name from the Network Kit Setup Worksheet. For example:

Enter the client processor's host name: **bergal**

If you did not enter the client processor's host name in the /etc/hosts file, the RIS utility displays an appropriate error message and repeats the prompt.

8. The next prompt asks you to type the hardware Ethernet address for the client. See the worksheet you filled out in Chapter 2 for the correct entry.  
  
In this example, the system manager specifies the hardware Ethernet address for the client **bergal**:

Enter the client processor's hardware Ethernet address, for example, 08-00-2f-03-f5-08: **08-00-2B-03-05-8B**

If you do not enter the address in the correct format, the RIS utility displays an appropriate error message and repeats the prompt.

9. A prompt asks you to specify which model file you want to assign to this client. The prompt lists the model files that currently reside in the `/usr/var/adm/ris/clients` directory. The display might look like this:

```
You must now specify which model file to
assign the client you specified in a
previous prompt. Your options are as follows:
```

```
model.UDT030.all
model.UDT030.mand
model.RISC.all
model.RISC.mand
```

Type your choice: **model.RISC.all**

Choose the model file you want to assign to the client from the list. In this example, the system manager specifies an alternate model file. If you make a mistake in typing a name, an appropriate error message appears and the prompt repeats.

The RIS utility checks the alternate model file to ensure the necessary mandatory and dependent software subsets are in it. If not, the RIS utility includes any mandatory and dependent software subsets in the alternate model file.

Otherwise, the RIS utility assigns the alternate model file to the client you specified in step 5.

10. A prompt asks if you want to add another client. If you type `no`, the RIS utility returns you to the system prompt. In this example, the system manager decides to add more clients:

```
Do you want to add another client processor to the
directory (y/n)? [n]: y
```

The RIS utility displays the prompts asking you to type the information required to register a client.

### 3.3 Removing a Client

To remove a client:

1. Log in and become the superuser.
2. Type the following at the system prompt:

```
# /etc/ris
```

3. A network distribution kit menu follows this message.
4. Invoke the RIS utility and select the Remove Client Processor option by typing r:

```
REMOTE INSTALLATION SERVICE (RIS) UTILITY MENU
```

```
a - Add Client Processor
r - Remove Client Processor
i - Install Software Subsets
d - Delete Old Software Versions
e - Exit RIS
```

```
Enter your choice: r
```

A message appears indicating that you have chosen to remove a client processor.

5. A list of existing environments appears. Select the environment you want.
6. A list of clients registered for that environment appears.
7. A prompt appears asking you to specify the name of the client that you want to remove. In the following example, the system manager removes the client called profun.

```
You have chosen to remove a client from the remote installation service.
Type the name of the client processor you want to
remove: profun
```

If you type an invalid name, an appropriate error message appears.

After you specify a valid client processor, the RIS utility prompts for verification. For example:

```
Remove profun? (y/n) [n]: y
```

After you specify a valid client processor, the RIS utility deletes it and returns you to the system prompt.

### 3.4 Creating Alternate Model Files

If you plan to assign alternate model files for any client you add, create those model files before adding the client processor.

To create alternate model files, you need to have superuser privileges and to understand the format of the model file.

Model files reside in the `/usr/var/adm/ris/clients` directory. A listing of this directory might show contents similar to those in the following example:

```
# cd /usr/var/adm/ris/clients
# ls
bergal                model.UDX030 tigris
model.UDT030          noturn
model.UDT030.mand    profun
```

Files in this directory have two types of file names:

- Model files which begin with the prefix `model`, followed by a period (`.`), followed by any sequence of characters.
- Alternate model files assigned to specific clients. The RIS utility copies the contents of the alternate model file to a file specified by the client's host name. Therefore, `bergal`, `nottur`, and `profun` are clients that have been assigned model files.

To create your own model files you can use a text editor such as `vi`, or you can use `cat`. In the following example, the system manager creates a model file called `model.RISC.mand` by concatenating the `model.UDT030.mand` and `model.UDW020.mand` model files:

```
# cd /usr/var/adm/ris/clients
# cat model.UDT030.mand model.UDW020.mand > model.RISC.mand
```

The sample model file `model.RISC.mand` contains the mandatory ULTRIX-32 subsets along with the mandatory ULTRIX Worksystem Software subsets,

Do not be concerned about mandatory and dependent software subsets when creating your own model files; the RIS utility checks to make sure all mandatory and dependent software subset names appear in the appropriate order in this file. If they do not, the RIS utility edits the file when you choose the Install Software Subsets option or the Add Client Processor option.

Note that the `model.RISC` model file was assigned to the client `bergal`. See Section 3.2.

### 3.5 Deleting Old Software Versions

You can delete old versions of software products from the network distribution kit. Use the following procedure to delete old versions of software:

1. Log in and become the superuser.
2. Type the following at the system prompt:

```
# /etc/ris
```

3. A network distribution kit menu follows this message.
4. Select the Delete Old Software Versions option by typing `d`:

REMOTE INSTALLATION SERVICE (RIS) UTILITY MENU

a - Add Client Processor  
r - Remove Client Processor  
i - Install Software Subsets  
d - Delete Old Software Versions  
e - Exit RIS

Enter your choice [ ]: **d**

5. A message describing the process appears followed by a list of the products contained in the network distribution kit. The display ends with a prompt to enter the 3-character product prefix for the product you want to remove, for example, ULT. If there are no previous versions of products in the network distribution kit, a message appears saying that there are no products to remove.
6. After you enter the 3-character product prefix, a message appears listing the versions of the product contained in the network distribution kit followed by a prompt to enter the 3-digit version number of the product you want to remove, for example, 020.





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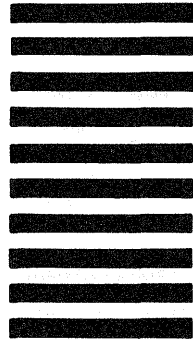
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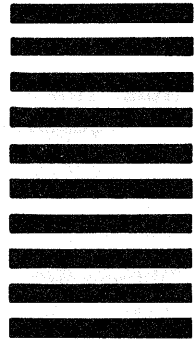
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