



Installation Guide

MR-11

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PortaUM Installation Guide, August 2005

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Preface

This document provides a general overview of the PortaUM installation process.

Where to get the latest version of this guide

The hard copy of this guide is updated at major releases only, and does not always contain the latest material on enhancements occurring in-between minor releases. The online copy of this guide is always up-to-date, integrating the latest changes to the product. You can access the latest copy of this guide at: www.portaone.com/resources/documentation/

Conventions

This publication uses the following conventions:

- Commands and keywords are given in **boldface**
- Terminal sessions, console screens, or system file names are displayed in fixed width font



Caution indicates that the described action might result in program malfunction or data loss.

NOTE: Notes contain helpful suggestions about or references to materials not contained in this manual.



Timesaver means that you can save time by performing the action described in the paragraph.



Tips provide information that might help you solve a problem.

1 . Introduction

PortaUM runs on most modern UNIX operating systems (FreeBSD, Linux, Sun Solaris, etc.), assuming that these are equipped with such basic components as an ANSI C compiler. However, it may be difficult for an inexperienced system administrator to install and configure the operating system in such a way that it meets all the requirements and provides the best performance. Installing all the pre-requisite software (libraries, Perl modules, etc.) can also be a time-consuming task.

The PortaUM JumpStart installation CD offers a quick and seamless way of performing a complete server installation from scratch in less than 15 minutes! It contains the installation media for FreeBSD 5.4, including all the necessary packages, plus PortaSIP itself.

The installation wizard employs a text-mode GUI. Use the arrow keys to change your selection, “**Tab**” to move between the fields, space bar to set the check boxes and “**Enter**” to make a choice.

Hardware and Software Requirements



PortaUM requires a *dedicated* Cisco AS 5300/5350.

Cisco requirements

- 128M RAM, 64M flash, E1 or T1 voice ports, sufficient number of DSPs. IOS 12.3.5a (or other from the 12.3 branch).
- AS5300 comes with 4 or 8 T1/E1's. You will not need more than 4 of them because of DSP resource limitation for AS5300.
- For T1 configuration maximum voice resource will be 96 and for E1 -- 120.

Recommended configuration:

Server HW

- Pentium 4 CPU 3 GHz
- Motherboard with 533 MHz system bus support
- 512 MB of RAM

Make sure that your servers have been properly installed and equipped with all the required hardware, namely:

- Network card
- CD-ROM (in the case of an IDE CD-ROM, we recommend that it be connected as a slave on a secondary IDE channel)

- Video adapter/monitor/keyboard (required only during the installation process)
- At least one disk drive of sufficient size. The size of the drive should be selected based on the anticipated amount of PortaUM users, taking the following into consideration:
 - The operating system and all software packages take up about 2GB of disk space
 - Approx. 10 GB should be reserved for system use (temporary files, operating logs and such)
 - One second of recorded audio takes about 10 kilobytes of disk space
 - One fax page takes about 120 kilobytes of disk space

Therefore, if your system is designed to serve, for example, 10,000 users and has an 80 GB disk, you can allocate 6.8 MB for each user, which will be sufficient to store audio messages with a total length of 10 minutes, or about 50 fax pages.

Please make sure that other hardware installed in your server (such as network adapter, RAID controller, etc.) is supported by the FreeBSD. You can check this on the FreeBSD web site: <http://www.freebsd.org>.

During installation you will be prompted for your network configuration parameters. Please decide on this matter before beginning installation, consulting your network administrator if necessary. While it is possible that you will have to perform installation before the network is available (in your office, for example, while the servers will be located in a server hosting center), you will still need to enter the correct data. Please have the following ready:

- IP addresses of master and slave PortaBilling100 servers
- IP address of the PortaSIP server
- Name of the MX domain designated for the hostname of the machine running PortaUM
- Subnet mask and address of the default gateway
- Address of your DNS server

If a hardware RAID controller is available in your system, configure the RAID array. Recommended configurations (depending on the number of hard drives in the system) are as follows:

- 2 disks – RAID (mirroring)
- 3 disks – RAID 1 (mirroring) on the first two disks, with the third one left as a hot spare.

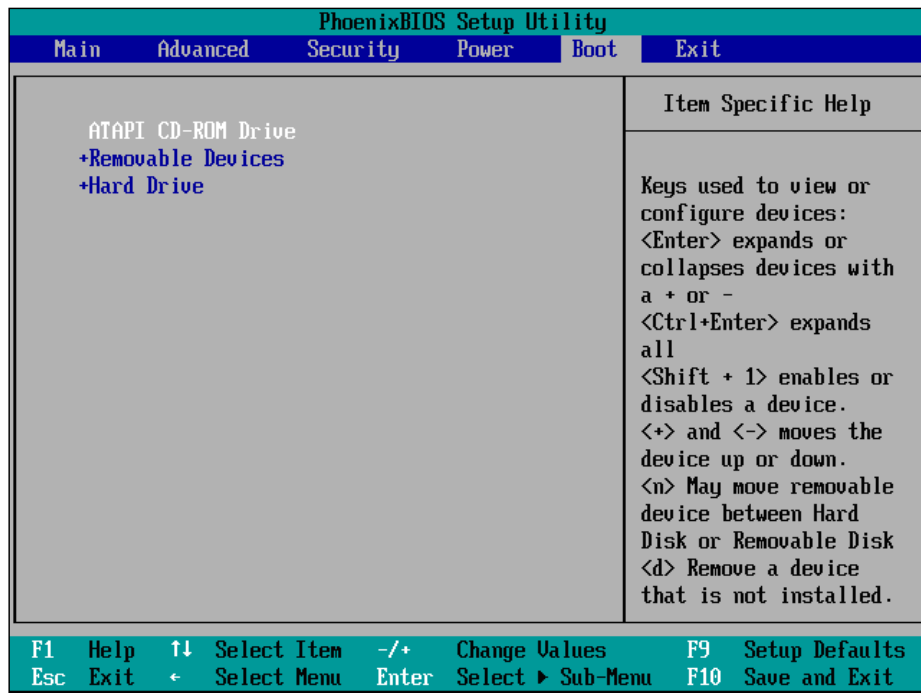
2. Installation Process

Step 1: Insert the USB dongle

Before you will start the installation, insert the provided USB dongle in one of the available USB ports.

Step 2: Power-Up, Boot Order Setup

Power-up the computer which you plan to use as a server. Enter the BIOS setup, making sure that the CD-ROM is first in the list of boot devices. If you are installing a dual-server configuration, start your installation with a master server.



Note: This image is only an example. The BIOS on your system might look different.

Save your changes and exit.

Step 3: Insert the CD-ROM

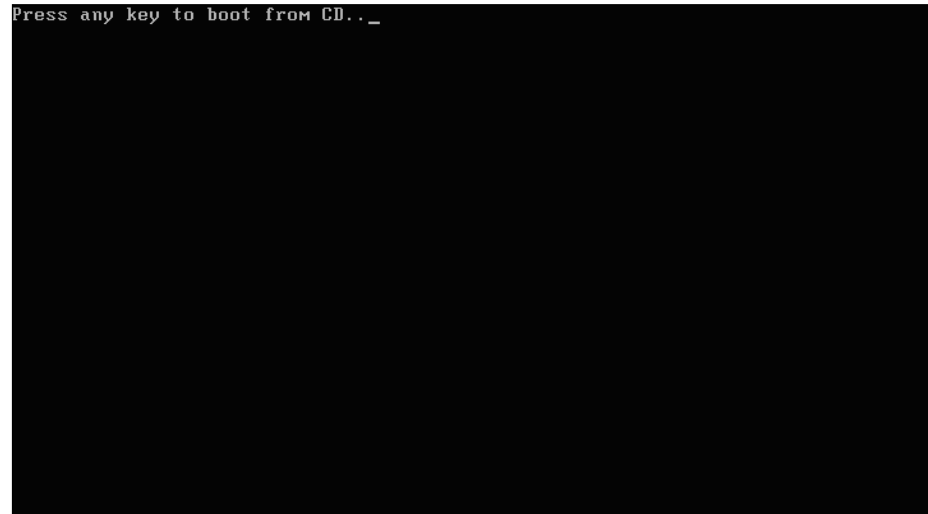
While rebooting the system, insert the PortaUM installation CD in the CD-ROM drive. If you do not insert it quickly enough and get a “no operation system” error (or a previously installed operating system starts

its boot-up process), press the “Reset” button and make sure that you are booting from the CD.

Step 4: Launch the installation process

First, it asks for your clarification to boot from the CD

```
Press any key to boot from CD.._
```



You will know that JumpStart installation has begun if you see a screen similar to the following one:

```
CD Loader 1.2
Building the boot loader arguments
Looking up /BOOT/LOADER... Found
Relocating the loader and the BTX
Starting the BTX loader

BTX loader 1.00 BTX version is 1.01
Console: internal video/keyboard
BIOS CD is cd0
BIOS drive A: is disk0
BIOS drive C: is disk1
BIOS drive D: is disk2
BIOS 638kB/128960kB available memory

FreeBSD/i386 bootstrap loader, Revision 1.1
(root@pre-release.portaone.com, Fri Aug 12 12:39:01 UTC 2005)
Loading /boot/defaults/loader.conf
=
```

Now, before proceeding any further you will see the following screen.

```
Welcome to PortaOne installation program!

1. Proceed with PortaUM Installation
2. Disable APIC
3. Disable ACPI
4. Escape to the command line prompt (for advanced users)
5. Reboot

Press 1 or Enter to proceed with installation or [Space] to pause timer 5 _
```

If you select first choice it will start the installation for many hardware configurations. But in some cases with the choice 1, it will give you a device mounting error due to some different hardware systems. In this case start the installation again and when you see this screen select the option 2, 3 or both to enable/disable the APIC/ACPI features.

For example if you are installing in a computer with a motherboard ASUS P4VP-MX, you have to disable the APIC. In this case at the above screen select 2. Then it will show you the disabled features and asks to press 1 or enter to proceed.

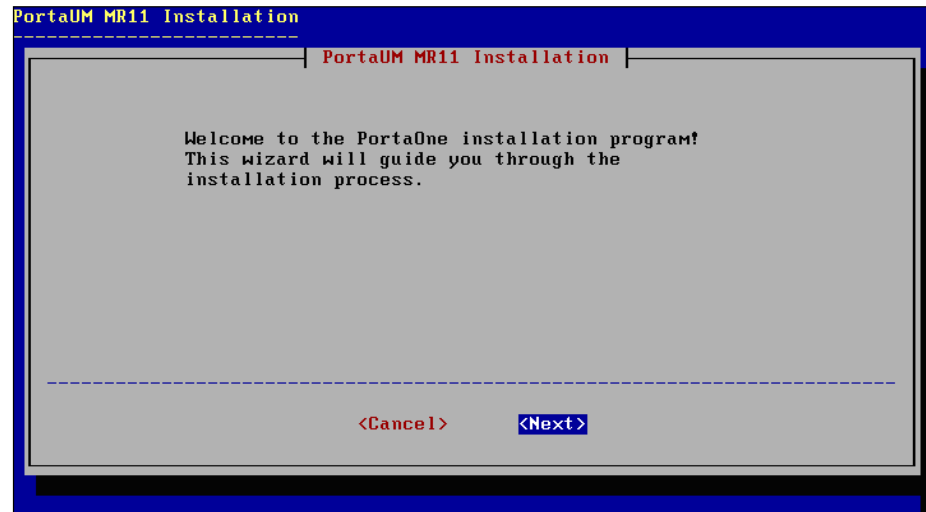
```
Welcome to PortaOne installation program!

1. Proceed with PortaUM Installation
2. Enable APIC
3. Disable ACPI
4. Escape to the command line prompt (for advanced users)
5. Reboot

Press 1 or Enter to proceed with installation
APIC disabled
```

Step 5: Welcome Screen

Next, the installation process starts. First you will see the PortaUM welcome screen:



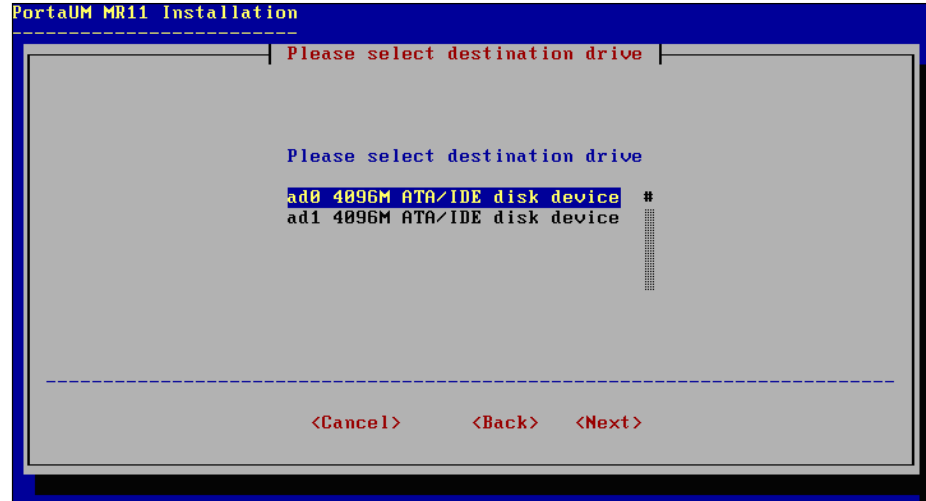
Press “**Enter**” to proceed.

Step 6: Disk Partitioning - Overview

Now you must allocate the hard drive partitions where FreeBSD and PortaUM will be installed. If you have only one hard drive in your system, or your available disks are configured as a single volume array, then next step will be skipped automatically – and you will proceed to Step 8.

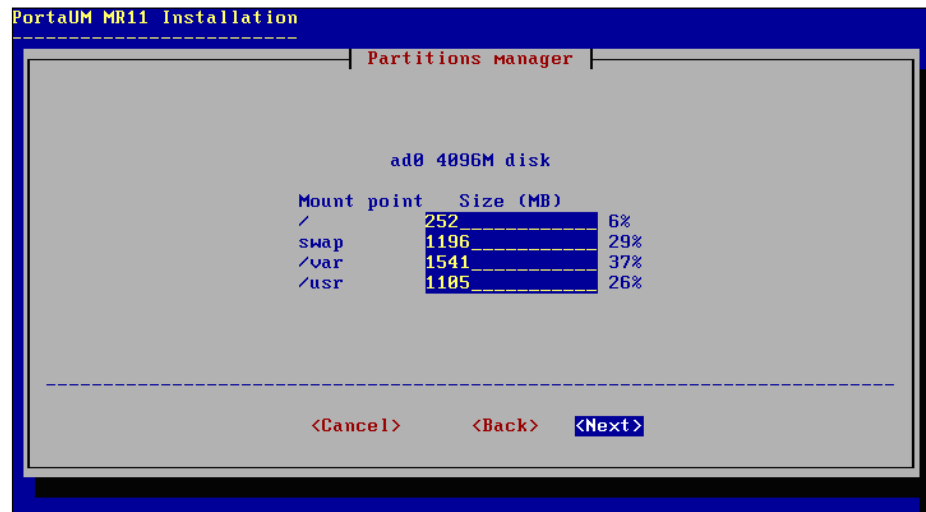
Step 7: Disk Partitioning - Choose Disk

If you have more than one disk in your system, you will have to choose which one you would like to create the FreeBSD partitions on. If in doubt, choose the first disk on the list.



Step 8: Disk Partitioning – Slice layout

It will prompt you to enter or choose the default slice sizes to hold different file systems.

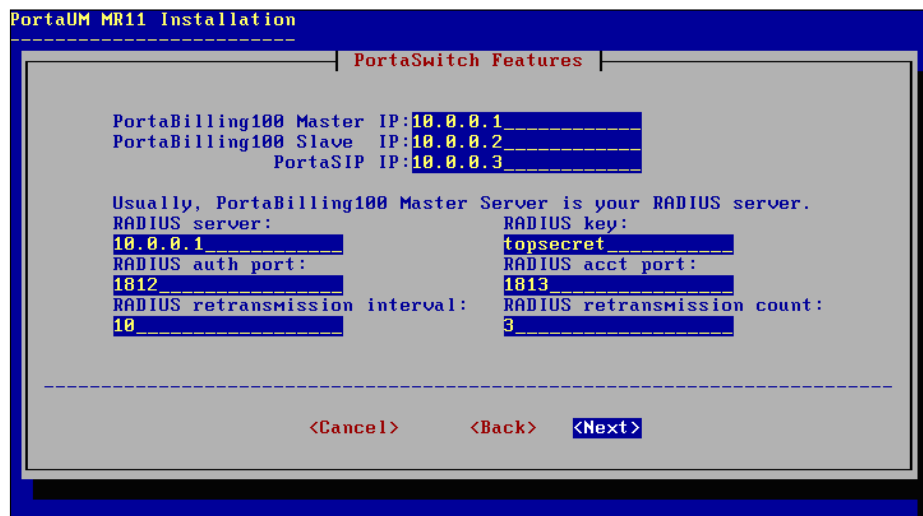


Step 9: PortaSwitch parameters

Parameter	Description
RADIUS server	IP address of the PB100 master host
RADIUS secret	authentication key for all radius interactions; select a password and write it down, as you will need to enter it later when adding the PortaSIP node to your PB100 system
RADIUS auth	number of UDP ports at which your PB100 accepts

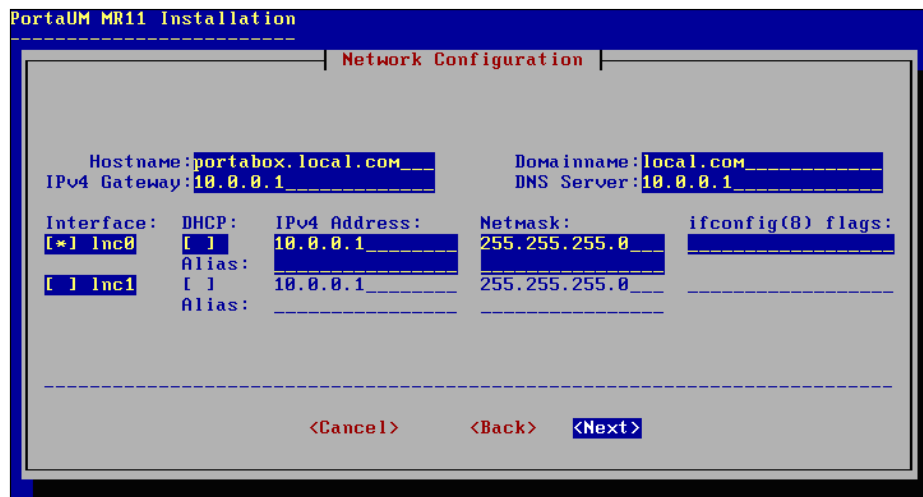
port	authorization requests
RADIUS acct port	UDP port which RADIUS server listens for accounting requests
RADIUS retransmission interval	number of seconds to wait for reply before retransmitting a RADIUS request
RADIUS retransmission count	maximum number of retransmissions

Note: Only radius server and radius key are mandatory to enter. Usually you can just retain the default values for the last 4 parameters.



Step 10: Network Configuration

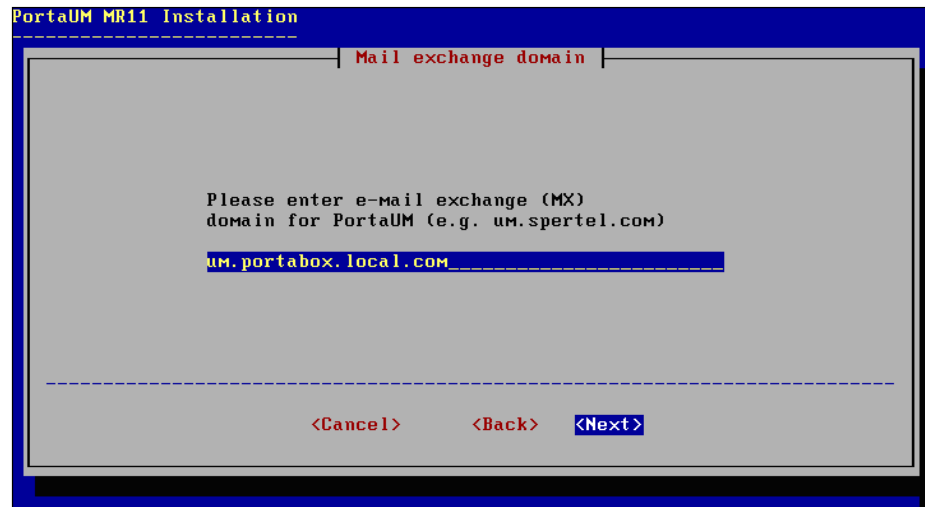
Fill the desired fields in this menu for network configuration.



Use the space bar to set the check boxes for interface and DHCP. Use the tab key to proceed to the next field. Set the interface that connects to the internet, you can unset the other interfaces, if you have multiple. If you do not use DHCP please unset this box. You can leave empty the alias and ifconfig(8) flags.

Step 11: MX Domain Configuration

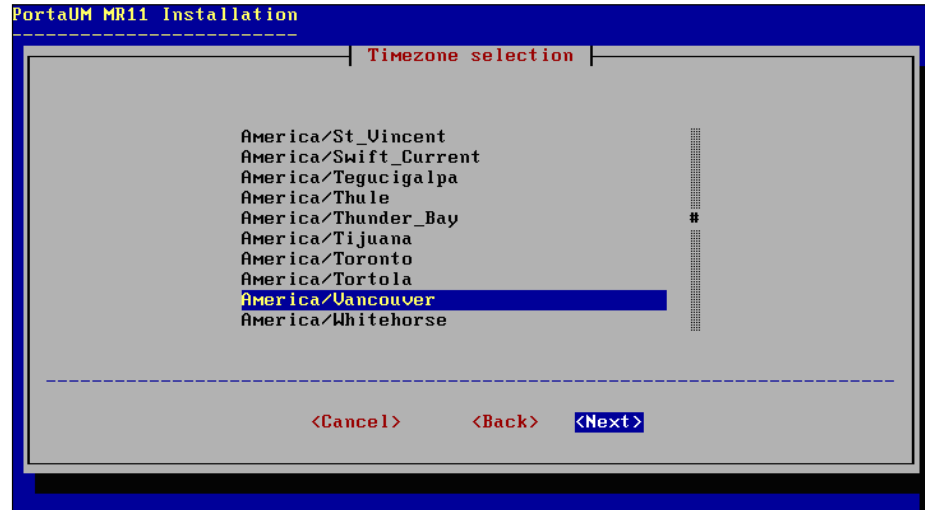
You will need to enter the name of the mail exchange (MX) domain which you plan to use for PortaUM (that is, the name appearing after '@' in mail sent to/from the PortaUM system). You will also have to register this name in the DNS server for your domain.



The screenshot shows a terminal window titled "PortaUM MR11 Installation". The window has a blue border and a grey background. At the top, it says "Mail exchange domain". Below that, it prompts the user: "Please enter e-mail exchange (MX) domain for PortaUM (e.g. um.spertel.com)". The user has entered "um.portabox.local.com" in a blue input field. At the bottom, there are three buttons: "<Cancel>", "<Back>", and "<Next>".

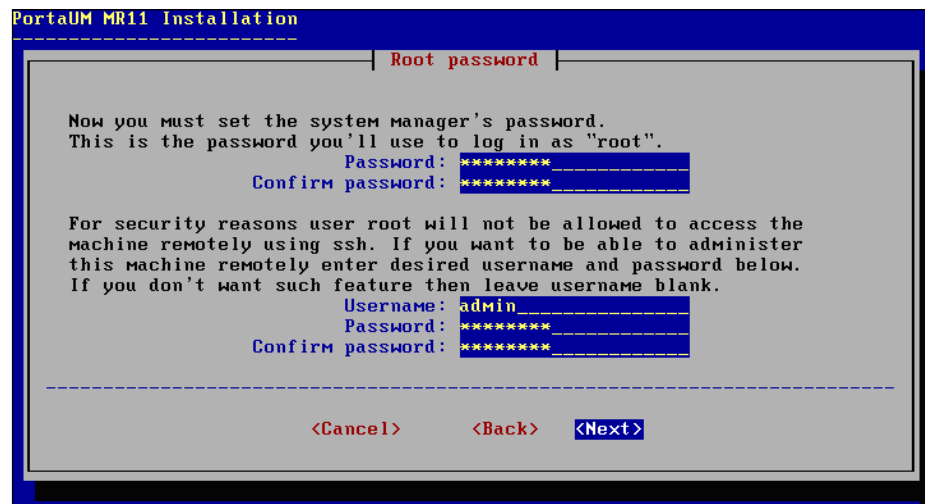
Step 12: Time Zone Configuration

Having your clock adjusted properly and setting up a time zone correctly are essential for accurate billing.



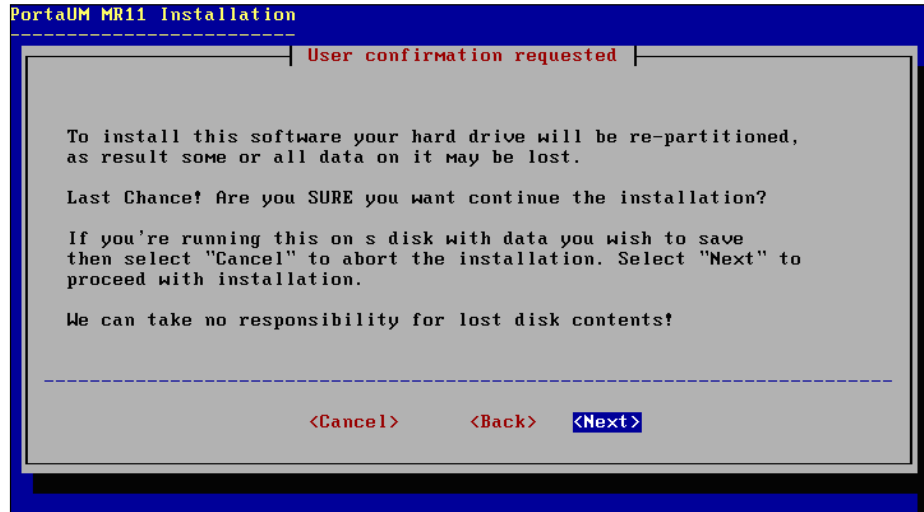
Step 13: Setting-up Root Password and User account

Choosing the super user password is very important. You will need it to perform system administration or system recovery. Choose a password which is difficult to guess or crack. Add another user account especially for remote administration.

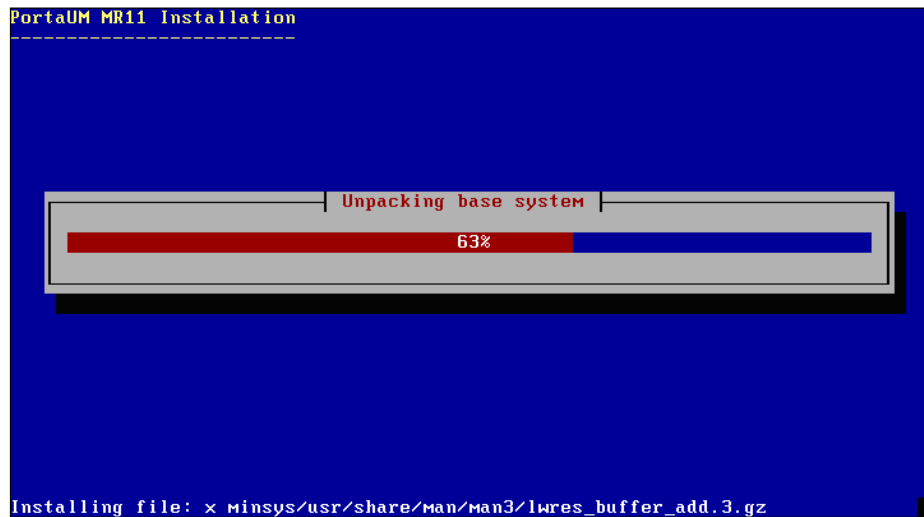


Step 14: Start the Installation

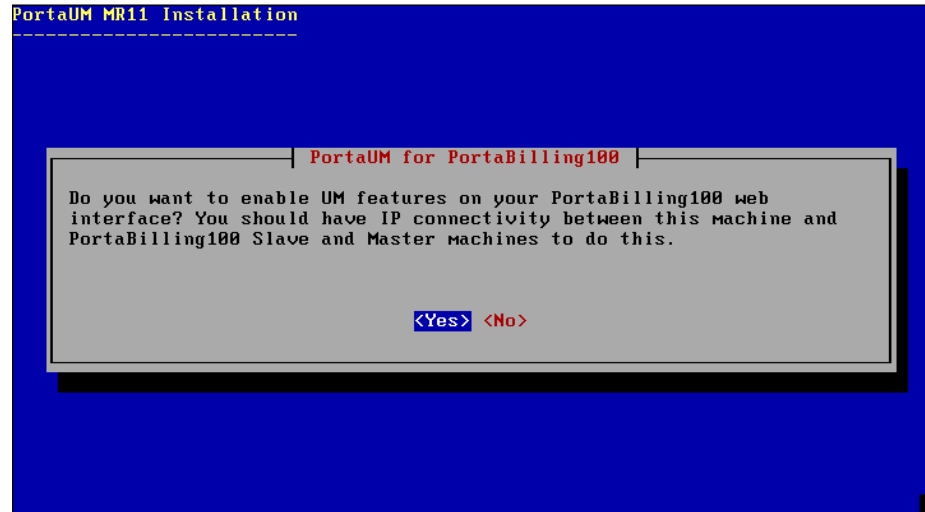
Your confirmation is required before the disk layout is changed and the partitions reformatted. Press **“Enter”** to proceed.



You will see the progress similar to the following screen.



During the installation it will ask you to verify UM features enabling on your PortaBilling web interface.

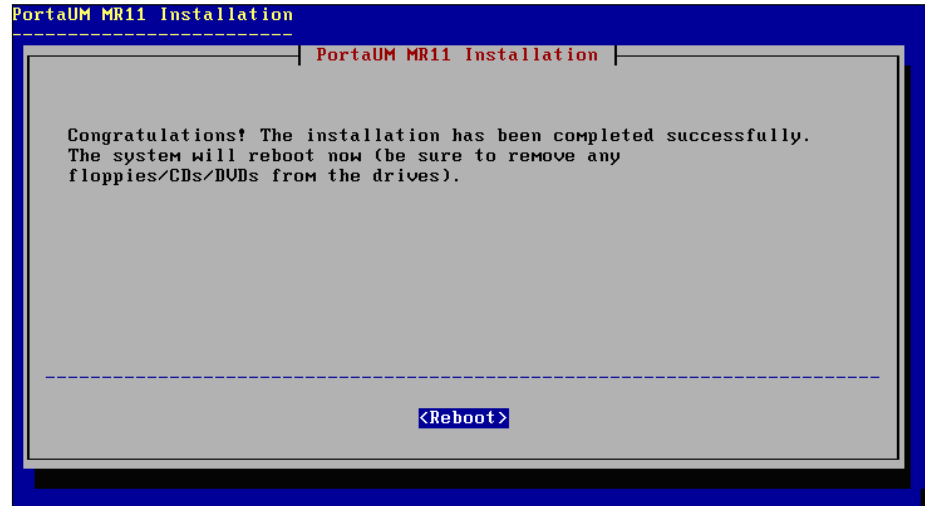


If you select yes on the above screen and if you don't have IP connectivity to PortaBilling slave machine it will prompt you the following screen. If you don't have the connectivity choose **No** to proceed.



Step 15: Prepare to Reboot

Installation is now finished. Press “**Enter**” when you reach the following screen. Once the system begins its reboot process, remove the installation CD from the CD-ROM. Do not forget to enter BIOS again and change the priority of boot devices so that the hard drive will now be the first boot device attempted. (This ensures faster reboot when recycling the server.)



Step 16: Check that the System Reboots to a Normal State

It is good idea to make sure that the system is in a stable state, and that it returns to normal operations on reboot without the need for any intervention, especially if no keyboard or other peripherals are to be attached. The screen should look like this after a normal reboot:

```
Your identification has been saved in /etc/ssh/ssh_host_rsa_key.
Your public key has been saved in /etc/ssh/ssh_host_rsa_key.pub.
The key fingerprint is:
92:de:74:f8:78:8e:e0:c4:e9:af:66:65:87:2a:9e:1e root@portabox.local.com
creating ssh2 DSA host key
Generating public/private dsa key pair.
Your identification has been saved in /etc/ssh/ssh_host_dsa_key.
Your public key has been saved in /etc/ssh/ssh_host_dsa_key.pub.
The key fingerprint is:
df:28:fa:94:e3:16:7f:be:76:9d:6f:a7:37:06:02:9d root@portabox.local.com
.
ELF ldconfig path: /usr/lib /usr/lib/compat /usr/local/lib
a.out ldconfig path: /usr/lib/aout /usr/lib/compat/aout
Starting standard daemons: inetd cron sshd usbd.
Initial rc.i386 initialization:.
Configuring syscons: blanktime.
Additional ABI support:.
Local package initialization: radiusd mysqld radcheck.pl.
Additional TCP options:.
Starting background file system checks in 60 seconds.

Thu Aug  4 02:30:30 PDT 2005

FreeBSD/i386 (portabox.local.com) (ttyv0)
```

Press **Ctrl + Alt +Del** if you need to reboot.

Step 17: Prepare System for Transportation (Optional)

If you need to transport the system to another location (e.g. hosting center) or otherwise power down the system safely, proceed as follows:

- Wait until the system finishes booting
- Log in as root
- Type `shutdown -p now`
- Wait until either the system powers down on its own or a message reading “The operating system has halted” appears, and then power off the server.

3. Cisco AS5300 Gateway Setup

Setting-up a Back-to-Back T1/E1 Connection

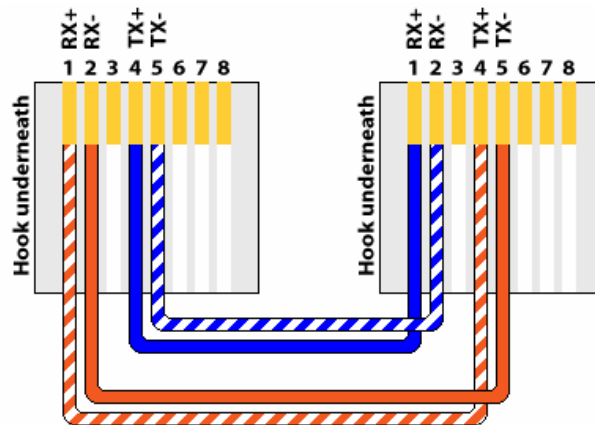
Hardware Setup

In order to use the Cisco AS5300 gateway as a media server and VXML platform in the PortaUM system, you need to physically loop one or more pairs of T1 or E1 voice ports on it, so that these can be used for the PSTN→PSTN connection. To do this, construct one or more RJ-48C cross-over cables using the following table:

T1/E1 CSU/DSU Cross-Over Pinout

From RJ 48C Pin	To RJ 48C Pin
1	4
2	5
4	1
5	2

Make sure you count the RJ-48C pins as shown in the illustration below:



PRI (T1/E1) CrossOver/Loopback Cable

Alternatively, you can order ready-made ones. You can find a number of vendors producing such cables by searching for “RJ-48C cross-over cable” on www.google.com.

Once the cable is ready, plug it into the designated pair of T1/E1 ports in your Cisco AS5300 gateway.

Software Configuration

You also have to configure the T1/E1 interfaces. The sample configuration below is for T1; adjust the time slots for E1:

```
isdn switch-type primary-5ess
!
controller T1 0
framing sf
clock source line primary
linecode ami
pri-group timeslots 1-24
!
controller T1 1
framing sf
clock source line secondary 1
linecode ami
pri-group timeslots 1-24
!
controller T1 2
framing sf
linecode ami
pri-group timeslots 1-24
!
controller T1 3
framing sf
linecode ami
pri-group timeslots 1-24
!
interface Serial0:23
no ip address
isdn switch-type primary-5ess
isdn protocol-emulate network
no cdp enable
!
interface Serial1:23
no ip address
isdn switch-type primary-5ess
no cdp enable
!
interface Serial2:23
no ip address
isdn switch-type primary-5ess
isdn protocol-emulate network
no cdp enable
!
interface Serial3:23
no ip address
isdn switch-type primary-5ess
no cdp enable
```

Other Important Considerations

Please ensure that the PortaUM machine and Cisco AS5300 gateway used as a media server and VXML platform have a good network connection between them. Ideally, they should be located on the same 100 Mbps or 1,000 Mbps LAN segment. This is important because the media server needs to load sounds interactively from the PortaUM machine in real time. Therefore, lossy and/or high-delay connections between the media server and the PortaUM machine can significantly impair service quality. Also, it is likely that there will be a significant amount of TCP traffic between the media server and the PortaUM machine, which can be quite expensive if they are not co-located.