Chapter 2

Before you install

Prior to installing UnixWare 7 on your system, you need to:

- Read the *Runtime Release Notes* for late-breaking hardware and installation notes.
- Obtain or locate your license. This might be a printed license included in the box by SCO or your software vendor, or a license you obtained from a web site when purchasing and downloading your software. The license contains data you must enter to successfully install the system.
- If you are migrating from a previous SCO system, back up your entire system, including partitions containing other operating systems. If you are migrating data from SCO UnixWare 2.X, read the *Upgrade Guide* (available on the UnixWare 7 Installation CD-ROM at */info/upgrade/upgrade.htm*) before proceeding.
- Ensure that your hardware meets minimum system requirements for memory and disk space (page 12).
- Verify that your hardware is supported (page 13).
- Install and configure your hardware devices, if necessary (page 13).
- Complete the appropriate installation checklists (page 14).

System requirements

SCO recommends that your system meet or exceed the following requirements:

Processor

At least one Intel Pentium, Intel Pentium II, or Intel Pentium Pro microprocessor, or a microprocessor that is 100% compatible with the same.

The minimum processor supported is the Intel486DX processor. Intel486SX systems with math coprocessors are not supported.

Architecture

Conformance to the Industry Standard Architecture (ISA) (also called an AT bus), Extended Industry Standard Architecture (EISA), Micro Channel Architecture (MCA), Peripheral Component Interface (PCI), or Intelligent Input/Output (I2O) standards.

Memory

32MB or more of RAM (Random Access Memory), or, for optimal CDE desktop performance, 64MB of RAM. Performance is enhanced as more RAM is added.

Small Footprint installations can run on systems with only 16MB of RAM installed. All other installation types require a minimum 32MB of RAM.

UnixWare 7 supports up to 4GB of RAM for general purpose usage and up to 64GB for use by the dynamic shared memory (DSHM) and fine-grained affinity shared memory (FGA-SHM) subsystems, which are licensed separately. See the *Runtime Release Notes* for information on configuring your system for DSHM and FGA-SHM.

Disk size and partitions

A hard disk of 1GB or larger is recommended.

Small footprint installations can run on systems with 300MB or larger UNIX® partitions. Other installation types can run on a UNIX partition of 500MB or larger.

The UNIX partition must begin below cylinder 1024 of the hard disk.

In order to run large Java™ programs, like Java Workshop or Java Studio (on the UnixWare and OpenServer Development Kit CD-ROM), you need 350MB of swap space on disk. Please change the default size of the swap partition during installation to that value. You also need 64MB of RAM memory to run these large applications efficiently.

Mouse A serial, bus, or PS/2-compatible mouse is recommended to access all graphical desktop functionality.

Video A Super VGA monitor and video adapter capable of at least 800x600 resolution is required to run the graphical desktop.

Media devices

A 3.5-inch diskette drive, for booting the UnixWare 7 system and installing additional software, is required.

The system must also have either of the following installation media devices:

- a CD-ROM drive
- a supported network adapter, and a preconfigured network installation server

Verifying supported hardware

Your SCO software includes HBA (Host Bus Adapter) drivers for supported hardware. See the *Runtime Release Notes* and the Compatible Hardware Web Pages (*http://www.sco.com/chwp*) for help on determining whether your hardware is supported.

HBA drivers are contained on the HBA diskette provided with UnixWare 7. Your hardware or software vendor might have provided you with one or more HBA additional diskettes to support the hardware you purchased. When prompted, you must load these drivers to successfully install the system.

NOTE Any vendor-supplied disk must have been created specifically for the UnixWare 7 system; otherwise, the drivers will not successfully load.

If you use drivers and peripherals which are not listed as supported, your peripherals might not work.

Installing and configuring hardware devices

Installing and configuring hardware consists of physically installing hardware controllers, running hardware setup programs, and configuring software controllers to support the new devices.

For information on physically installing hardware and running setup programs before installing UnixWare 7, see steps 4-6 of "Adding hardware controllers" (page 70).

After the hardware is physically installed and configured, you are ready to install UnixWare 7. Software controllers for most hardware devices are configured automatically by the installation. If you need to manually configure software drivers, you can do so by entering the Device Configuration Utility (DCU) during the installation.

For information on the DCU, see Appendix A, "Configuring installation hardware" (page 91).

Installation checklists

Installation checklists show you what information you will need to install UnixWare 7 correctly. If you complete the checklists, the installation will go more quickly and you will have a written log of your responses, in case you ever need to troubleshoot or reinstall your system.

Information relevant to all types of installations is contained in the general installation checklist (page 15). The following checklists might also apply to your environment:

Hardware	Complete this checklist (page 19) to indicate hardware parameters for non-detected hardware. The UnixWare 7 installation detects most computer peripherals. However, if it does not detect a device needed for installation, you must enter the Device Configuration Utility (DCU) during the installation process to manually configure the device.
Network	Complete these checklists (page 21) if you are configuring TCP/IP or IPX/SPX as part of the installation process. You must configure the network to install UnixWare 7 from an installation server.
Partitions	Complete this checklist (page 25) if you want to customize partitions. If you do not, the installation uses the partition table already on your system, or creates a single partition using the entire disk for UnixWare 7.
Filesystems	Complete this checklist (page 27) if you want to alter the default filesystem layout on your active UNIX partition, including changing filesystem types and sizes and enabling user filesystems.

General installation checklist

Complete this checklist for all installations.

1. Installation language	☐ English ☐ French ☐ German ☐ Spanish
2. Zone/Locale/Keyboard These three interrelated options determine your keyboard choices and how the system displays currency, punctuation, and other special characters. If you do not know the correct zone, choose **All Locales**. Choose a locale that maps to your country or geographic region when the list is presented. If you choose the **C** or **POSIX** locales, special characters will not be displayable and sorting will be performed in ASCII order.	☐ Americas (Latin-1) ☐ Eastern Europe (Latin-5) ☐ Central Europe (Latin-2) ☐ Western Europe (Latin-1) ☐ Northeast Asia ☐ Other ☐ All Locales Locale: ____________________ Keyboard: ____________________
3. License Number/Code/Data Obtain your license information from a printed license shipped with your software, or from your vendor's licensing web page. If you choose to defer licensing, you are issued a 60-day evaluation license. License Data is only prompted for when required.	License Number: ____________________ License Code: ____________________ License Data: ____________________
4. Additional Host Bus Adapter diskettes required? If your vendor supplied you with one or more additional HBA diskettes, check **Yes** here.	☐ Yes ☐ No

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5. Manual hardware configuration required? The UnixWare 7 installation auto-detects most common hardware devices. In some cases, such as when a device is not auto-detected or two devices share the same interrupt vector, you must manually configure the driver with the Device Configuration Utility. If so, check **Yes** here and complete the hardware checklist (page 19).	☐ Yes ☐ No
6. System node name The name must be unique, begin with a letter, and contain only lowercase letters, numbers, and the dash character. The maximum length is 63 characters.	______________________________
7. Installation type Choose to install from a CD-ROM or a network installation server. If you choose a network installation type, also complete the appropriate network checklists (page 21) before installing the system.	☐ CD-ROM ☐ SPX network server ☐ TCP network server
8. Use whole disk for installation? For both your primary and secondary hard disks, you can use the whole disk to install UnixWare 7 or partition the disk. If you choose to customize partitions, also complete the partitions checklist (page 25) before installing the system.	Disk One: ☐ Use whole disk for UNIX ☐ Customize disk partitions Disk Two: ☐ Use whole disk for UNIX ☐ Customize disk partitions ☐ Do not modify
9. Configure filesystems on active partition? You can configure multiple filesystems on the active partition. If you choose to customize filesystems, also complete the filesystems checklist (page 27) before installing the system.	☐ Use default filesystems ☐ Customize filesystems on the active partition

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10. Configure special disk operations? You can analyze the disk surface, overwrite boot code, or reset disk geometry. **These options might erase some or all of the data on your hard disk**. **NOTE** If you installed a previous version of UnixWare, such as SCO® UnixWare® 2.1, you must choose to overwrite the boot code.	☐ Do not configure special disk operations ☐ Configure special disk operations
11. System profiles System profiles simplify the installation process by ensuring that the appropriate services and packages are installed on your system. You can choose default software based on the license you entered, a small footprint server, a full installation, or you can create your own custom configuration. For a description of system profiles, see "UnixWare 7 system profiles" (page 7).	☐ License-Based Defaults ☐ Small Footprint Server ☐ Full (All Packages) ☐ Custom Configuration
12. System services If you choose to customize your configuration, list one or more system services to install or remove from the services list. A complete list of services appears in the *Runtime Release Notes*.	____________________ ____________________ ____________________ ____________________ ____________________
13. System packages If you configure services, you can select additional packages to install or remove from the packages list. A full package list appears in the *Runtime Release Notes*.	____________________ ____________________ ____________________ ____________________ ____________________

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14. Date and time Select your location and time zone from the choices provided.	Continent: ____________________________ Geographic area: ____________________________ Time zone name: ____________________________
15. Security level Choose **Low** for systems not widely or publicly accessed; **Traditional** to maintain compatibility with existing UNIX systems; or **Improved** if you require C2 security. Use **High** only on highly confidential systems which do not allow remote access (including **telnet**, **rlogin**, and **ftp**).	☐ Low ☐ Traditional ☐ Improved (C2) ☐ High (above C2)
16. System owner The system owner is an account with special privileges on the system. See "The root account and system owner" in the *UnixWare 7 System Handbook* for more information. The *owner* password should not be shared with other users, and you may not want to record it here.	Owner name: ____________________________ Owner account name: ____________________________ Owner user ID (UID): ____________________________ Owner password: ____________________________
17. root password The *root* account, or superuser, has unlimited privileges to view files and run programs on the installed system. The *root* password should not be shared with other users, and you may not want to record it here.	root password: ____________________________
18. Save installation responses? After you answer installation prompts and before loading software, you can save your installation prompt responses to diskette for future use in reinstalling this system or another UnixWare 7 system.	☐ Yes ☐ No

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19. Mouse

☐ Bus mouse
☐ PS/2 compatible mouse
☐ Serial mouse
☐ No mouse

Number of buttons
☐ 2 ☐ 3

Installation hardware checklist

To configure an installation device (CD-ROM or tape drive) that is not automatically detected by the installation, you must:

1. Load the appropriate hardware driver onto the system. In most instances, the driver loads automatically from the second installation diskette at the beginning of the installation. If the driver you want is on an additional, vendor-supplied, driver diskette, you will need to load it manually at step 9 of the installation.
2. Use the Device Configuration Utility (DCU) to activate the driver, if necessary (step 10 of the installation).
3. Use the DCU to configure the driver to support the device (step 10 of the installation).

When you use the DCU to configure a driver (page 91), you must enter some or all of the following configuration information:

1. **Device name** ______________________________
   The manufacturer's name of the device.
2. **Driver name** ______________________________
   The driver name corresponding to the manufacturer's name.
3. **Unit number** ______________________________
   An optional parameter that identifies a subdevice attached to a particular controller. In most cases, this value should be set to 0.

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4. **IPL** ______________________
   The interrupt priority level. Set to 0 if interrupt priority handling is disabled for this device, or a value from 1 (lowest priority) to 7 (highest priority).

5. **ITYPE** ______________________
   The interrupt vector sharing type. Set to 0 if interrupt sharing is not supported or the device does not use interrupts; 1 if the device uses an IRQ that cannot be shared; 2 if the device uses an IRQ that can only be shared with another instance of the same module; 3 if the IRQ can be shared with any module; or 4 if the device uses an EISA level-sensitive IRQ that can be shared with any module.

6. **IRQ** ______________________
   The interrupt vector used by this device. Be sure the IRQ you select matches the setup (software or jumpers) of your hardware.

7. **I/O start address** ______________________
   The lowest I/O address through which the device communicates. This is a hexadecimal value from 0 through FFFF.

8. **I/O end address** ______________________
   The highest I/O address through which the device communicates. This is a hexadecimal value from 0 through FFFF.

9. **Memory start address** ______________________
   The lowest memory address through which the device communicates. This is a hexadecimal value from 10000 through FFFFFFFF.

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10. Memory end address ________________________
The highest memory address through which the device communicates. This is a hexadecimal value from 10000 through FFFFFFFF.

11. DMA channel ________________________
The direct memory access channel for this device. If this device has no DMA channel, set it to -1.

12. Bind CPU ________________________
The CPU to which this device is bound. If the device is not CPU-specific, leave this value blank.

These values should not conflict with the values for any other device on your system.

Network checklists

If you are configuring TCP/IP or IPX/SPX networking, or the Network Information Service (NIS), complete these checklists. The values you record here are used when you configure the system to pull UnixWare 7 from an installation server, or when you configure your network after selecting software packages.

Network adapter checklist

If your network adapter is a “smart” bus adapter (for example, an EISA or PCI adapter), UnixWare 7 will detect and autoconfigure the appropriate network driver. If it is an ISA or PCMCIA/PC Card adapter, you must manually enter the configuration parameters prompted for during the installation. Parameters common to many adapters are listed in items 1-7. Use items 8-12 to list any additional parameters your adapter uses. See your network adapter’s manual for the correct values.

1. Network adapter Vendor and model number.	______________________________
2. Interrupt vector (IRQ)	______________________________
3. I/O Address Range	______________________________
4. ROM Address	______________________________
5. DMA Channel	______________________________
6. Memory (RAM) Address Range	______________________________
7. RAM size	______________________________
8.	______________________________
9.	______________________________
10.	______________________________
11.	______________________________
12.	______________________________

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TCP/IP checklist

1. **System IP Address**. ________________________
   Four integers separated by periods (for example, 172.16.20.9).
2. **System Netmask** ________________________
   If you are not configuring a subnetwork, accept the default value.
3. **Broadcast Address** ________________________
   This value is automatically computed by the installation based on the System Netmask.
4. **Default Router** ________________________
   This parameter is optional. Enter it if you know the IP address of another system that your system will use to route packets.
5. **Server IP Address** ________________________
   If you are configuring a network installation, specify the IP address of the TCP/IP Install Server to which you will connect.
6. **Domain Name** ________________________
   The name of your network's domain, such as *sco.com*.
7. **Primary DNS Address** ________________________
   This parameter is optional. Enter it if you know the IP address of the Domain Name Service server for your network.
8. **Other DNS addresses** ________________________
   These parameters are optional. Enter them if you know the IP address of alternate DNS servers on your network. ________________________
9. **Frame Format** ________________________
   Choose from the list displayed by the installation. The default is ETHERNET_II.

IPX/SPX checklist

1. **IPX Net Number** ______________________________
   If this is the first machine on a cable segment, enter the network number. Or, set this number to 0 to auto-detect a network number.

2. **Frame Format** ______________________________
   Choose from the list detected by the installation. The most common frame format used by NetWare servers on Ethernet networks is ETHERNET_802.2.

3. **Install Server** ______________________________
   Only prompted for when performing a networked installation. Specify a server name (not an IPX Net Number address).

Network Information Server checklist

If you install the Network Information Service (NIS), you can configure the following parameters during the installation process:

1. **NIS system type**
   ☐ Master
   ☐ Slave
   ☐ Client

2. **NIS domain** ______________________________

3. **NIS master server** ______________________________
   The master server for this slave or client.

4. **NIS slave server(s)**
   One or more slave servers for this master.
   ____
   ____
   ____

Partitions and filesystems checklists

When installing the UnixWare 7 operating system, you can define the partition(s) for the primary hard disk and an optional second hard disk. You can also modify filesystem types and sizes for active UNIX system partition. Read this section and complete the checklist below if you want to:

- preserve the existing partitions and filesystems on your UnixWare® system, including data in non-root filesystems
- configure multiple partitions on your primary hard disk, so that you can boot multiple operating systems
- modify the filesystem types or layout on your active UNIX partition

NOTE If you do not want to configure partitions and filesystems manually, the UnixWare 7 installation will set them up automatically. When prompted by the installation, choose to:

- **Use the whole disk for UNIX** at the Disk Configuration window.
- **Accept default filesystems** at the Default/Customized Slices window.

Partitions checklist and notes

You can define up to four partitions for each hard disk during the installation.

Primary hard disk partitions

Partition	Type	% of disk	Starting cylinder
1	________	__________	___________
2	________	__________	___________
3	________	__________	___________
4	________	__________	___________

Secondary hard disk partitions

Partition	Type	% of disk	Starting cylinder
1	________	__________	___________
2	________	__________	___________
3	________	__________	___________
4	________	__________	___________

Partition types are:

UNIX System	Use for SCO UnixWare, SCO OpenServer™, or other UNIX systems.
Pre-5.0 DOS	Use for DOS systems release 5.0 and earlier. This system must be loaded in partition 1 and start at block 0. You must install this system **before** installing UNIX. To boot a pre-5.0 DOS partition, it must be smaller than 32MB and must start at cylinder 0.
DOS	Use for DOS systems after release 5.0. This system can be loaded onto any partition.
Other	Use for other operating systems, such as OS/2.
System	This partition contains autodetected hardware information. If this partition is listed, **do not** remove or reconfigure it. This partition contains information specific to your hardware setup.

Remember these restrictions when filling out the partitions tables:

- You must define an active UNIX partition, which must be at least 80MB in size. If you do not, the installation will not proceed until you create one.
- Only one partition can be active at one time.

  If partitions already exist on your disk, but the active partition is not large enough to install UnixWare, the installation software informs you of this and requires that you either modify your partitions or cancel the installation.
- Any change in the size, type, or cylinder position (location on the disk for the partition) of an existing partition results in the partition being removed and recreated. In this case, all data in the partition is lost.

> **NOTE** If you expand the size of one partition and, as a result, then need to change the cylinder location of a second, existing partition, the data in both partitions is lost.
>
> For any partition you are changing in this way, it is crucial that you back up your existing applications, files, and directories.

Filesystems checklist

You can modify several default filesystems and "slices" (portions of the active partition with no kernel-managed filesystem defined) during the installation:

Name	Filesystem	(Default type)	Type	Size	(Disk 1 or 2)
/	Root filesystem	vxfs	vxfs	_____(MB)	1
/stand	Boot filesystem	bfs	bfs	_____(MB)	1
/dev/swap	Swap slice	slice	slice	_____(MB)	1
/dev/dump	Dump slice	off	________	_____(MB)	1
/home	User filesystem	off	________	_____(MB)	(1/2)
/home2	2nd user filesystem	off	________	_____(MB)	(1/2)
/var	Installation filesystem	off	________	_____(MB)	(1/2)
/tmp	Temporary filesystem	off	________	_____(MB)	(1/2)
/var/tmp	Temporary filesystem	off	________	_____(MB)	(1/2)
/dev/volprivate	Private volume	slice	________	_____(MB)	1
ALTS TABLE	Alt/Sector slice	slice	________	_____(MB)	1
ALTS TABLE	Alt/Sector slice	slice	________	_____(MB)	2

Filesystems notes

This section describes each of the filesystems you can configure.

NOTE By default, each filesystem has a 64K inode limit. This limits the number of files and directories you can create in a given filesystem. You can remove this restriction in step 14 of the installation (page 36).

Root filesystem (/)

Contains the bulk of the system, including files, commands, log files, and other data.

This filesystem is required, and can be of type **vxfs** (default, recommended) or **ufs**.

Boot filesystem (*/stand*)

Contains all stand-alone programs and text files necessary to boot UnixWare 7.

The filesystem type must be **bfs**, and the default size provided should be adequate for your system.

Swap slice (*/dev/swap*)

Used to swap processes into and out of memory.

The default swap value is adequate for most systems; you may consider increasing its size if you are running large applications which consume system resources. If you increase the the swap slice size, you decrease the amount of space on your disk to store user data.

NOTE If you configure Large Physical Memory, read the section "Configuring swap space for systems with large physical memory" (page 29) to determine the correct swap size.

Dump slice (*/dev/dump*)

Stores a core image of the system should the system crash.

This slice is not enabled by default, and in most cases is not necessary. If you create a dump slice, it should be as large as your system's RAM.

NOTE If you configure Large Physical Memory, read the section "Configuring dump space for systems with large physical memory" (page 30) to determine the correct dump size.

User filesystems (*/home*, */home2*)

If enabled, contain user accounts and data.

These filesystems should be configured as the same type you chose for the root filesystem. If you do not enable these filesystems, they are created as subdirectories of the root filesystem.

Installation filesystem (*/var*)

If enabled, contains installation data and administration files.

This filesystem should be configured as the same type you chose for the root filesystem. If you do not enable this filesystem, */var* is created as a subdirectory of the root filesystem.

Temporary filesystem (*/tmp*)

Contains files which might be removed at any time.

This filesystem can be configured as **memfs**, in which case all files and directories are automatically flushed during each reboot, or as the same type you chose for the root filesystem.

NOTE If you want to make use of UnixWare 7 emergency recovery utilities, you **must** define */tmp* as a **memfs** filesystem.

Installation temporary filesystem (*/var/tmp*)

If enabled, */var/tmp* is used when adding packages to your system.

This filesystem must be configured as **memfs**. All files and directories are automatically flushed during each reboot. If you do not enable this filesystem, */var/tmp* is created as a subdirectory of the root filesystem.

Private volume (*/dev/volprivate*)

Used by the Online Data Manager to ensure data recoverability.

If you plan on installing the Online Data Manager, you should enable this volume as type **slice** with a size of 1MB.

Alternate sector slice(s)

These slices provide a mapping of bad blocks to good blocks for use by the disk driver.

Some devices, such as SCSI hard drives, provide their own mapping scheme. If you have such a device, set each slice to a small size.

Configuring swap space for systems with large physical memory

The default size for the swap slice, as calculated during the installation, is based on the total amount of memory in the system. As system memory gets larger, the value of paging to swap diminishes, and, while it is possible to simply not configure a swap slice on a very large memory system, the swap slice actually provides utility even if the system never actually pages to it, due to the internal requirement to reserve "virtual swap" space.

On a small system, as a rough estimate, swap space should be twice the size of non-dedicated memory. Larger amounts of swap space must be allocated for systems with larger RAM. The following table shows reasonable allocations of swap space for systems of different sizes (assuming no **memfs**):

Size of system	Size of swap space
16MB	32MB
64MB	75MB
256MB	200MB
1024MB	430MB
4096MB	1330MB

If you intend to allocate a sizable amount of system memory for use as dedicated memory, more swap will be allocated, during installation, than is necessary. However, you can resize the swap space to a more reasonable value, and allocate the freed space to other slices or filesystems, during installation in the Customize Filesystems and Slices window.

NOTE If you want to add a swap slice larger than 512K blocks (or 256MB) to a system, you will need to increase **SEGKMEM_BYTES** by a value equal to 0.4% of the swap space being added, then reboot.

For example, if you are adding 1GB of swap space to a system, increase **SEGKMEM_BYTES** by 4MB (or 0x400000). (Use **/etc/conf/bin/idtune -g SEGKMEM_BYTES** to obtain the old value.)

An attempt to use a swap slice larger than 512K blocks (or 256MB) can cause problems due to depletion of kernel virtual space. If you have not increased **SEGKMEM_BYTES**, as explained, then the attempt to add the swap space can fail. If the attempt succeeds, the result can be a poorly performing system, or even a system deadlock (hang).

For complete information on performing this task, see "Adding swap space" in SCOhelp.

Configuring dump space for systems with large physical memory

You can perform normal dumps, or selective dumps, on systems with any amount of memory, including those with more than 4GB of memory. In a normal dump, all of physical memory is dumped to disk and the system dump memory image can be examined using **crash**(1M).

If you have experienced a system panic, the relevant information for diagnosis is usually in the kernel pages. On a system with large memory, it can be more practical to perform a selective dump (only the kernel mapped pages are dumped to disk). This means that the dump is quicker and smaller at the expense of certain information (user space pages). A selective dump is made at the time of the panic, but you must specify that you want a selective dump when the system is booted. Set the kernel tunable parameter **SYSDUMP_SELECTIVE** to 1 to obtain a selective dump. (For information on performing this task, see "Changing tunable parameters with the System Tuner" in SCOhelp).

You might want to specify a selective dump if your system has a large amount of physical memory or if maximum use of disk space is required (keeping the swap/dump slice as small as possible to free up disk for filesystems).

Use the following information to configure the swap/dump space for best results for the amount of memory on your system:

full dump
: dump space should be equal to physical memory size (the dump will normally be less than this)

selective dump
: dump space should be sized according to the following recommendations:

  - physical memory is less than or equal to 32MB:

    dump_space >= 16MB

  - physical memory is greater than 32MB, but less than 256MB:

    dump_space >= ***physical_memory_size***/2

  - physical memory is greater than 256MB:

    dump_space >= 128MB + (***physical_memory_size*** - 256MB)/4

  For example: a system with 16MB of physical memory should have 16MB dump space; a system with 64MB of physical memory should have 32MB dump space; a system with 512MB of physical memory should have 192MB dump space; and, a system with 1GB of physical memory should have 320MB dump space.