



ThinkStation Hardware Maintenance Manual



ThinkThink**ThinkStation**Think

Machine Types: 4105, 4155, 4157, 4158, 4217, and 4218



ThinkStation Hardware Maintenance Manual

Note: Before using this information and the product it supports, be sure to read the information under Appendix A, "Notices," on page 257.

Sixth Edition (February 2010)

© Copyright Lenovo 2008.

LENOVO products, data, computer software, and services have been developed exclusively at private expense and are sold to governmental entities as commercial items as defined by 48 C.F.R. 2.101 with limited and restricted rights to use, reproduction and disclosure.

LIMITED AND RESTRICTED RIGHTS NOTICE: If products, data, computer software, or services are delivered pursuant a General Services Administration "GSA" contract, use, reproduction, or disclosure is subject to restrictions set forth in Contract No. GS-35F-05925.

Contents

Chapter 1. About this manual 1

Important Safety Information	1
Important information about replacing RoHS compliant FRUs	2

Chapter 2. Safety information 3

General safety	3
Electrical safety	3
Voltage-selection switch.	5
Safety inspection guide	5
Handling electrostatic discharge-sensitive devices	6
Grounding requirements	7
Safety notices (multi-lingual translations).	7

Chapter 3. General information 39

Lenovo Welcome Center	39
Additional information resources	39
Specifications.	40

Chapter 4. General Checkout 43

Problem determination tips	43
--------------------------------------	----

Chapter 5. Diagnostics 45

Lenovo ThinkVantage Tools	45
PC-Doctor for Windows PE	45
Running diagnostics from the Rescue and Recovery workspace	45
PC-Doctor for DOS.	46
Creating a diagnostic CD/DVD image	46
Running diagnostics from the disc.	46
Running diagnostics from the Rescue and Recovery workspace	47
Navigating through the diagnostics programs	47
Running tests.	47
Viewing the test log	49

Chapter 6. Using the Setup Utility 51

Starting the Setup Utility program.	51
Viewing and changing settings	51
Using passwords	51
Password considerations	52
User Password	52
Administrator Password	52
Setting, changing, and deleting a password.	52
Enabling or disabling a device	52
Selecting a startup device.	53
Selecting a temporary startup device	53
Selecting or changing the startup device sequence	53
Advanced settings	54
Exiting from the Setup Utility program	54

Chapter 7. Installing hard disk drives and configuring RAID (types 4105, 4157, 4217) 55

Installing SATA hard disk drives and configuring RAID	55
Installing SATA hard disk drives	55
Configuring the system BIOS to enable SATA RAID functionality	55
Creating RAID volumes	56
Deleting RAID volumes	56
Installing SAS hard disk drives and configuring RAID	57
Installing SAS hard disk drives.	57
Entering the Marvell BIOS Setup to configure SAS RAID.	57
Configuring the Marvell BIOS Setup to enable SAS RAID 0, 1, or 5 functionality	57
Configuring the Marvell BIOS Setup to set an optional hot spare hard disk drive.	58
Configuring the Marvell BIOS Setup to delete an optional hot spare hard disk drive.	58
Configuring the Marvell BIOS Setup to delete an array	58

Chapter 8. Installing hard disk drives and configuring RAID (types: 4155, 4158, 4218) 61

Installing SATA or SAS hard disk drives and configuring RAID	61
Installing SATA or SAS hard disk drives.	61
Entering the Marvell BIOS Setup to configure SATA or SAS RAID.	61
Configuring the Marvell BIOS Setup to enable SATA or SAS RAID 0, 1, 5, or 10 functionality	62
Configuring the Marvell BIOS Setup to set an optional hot spare hard disk drive.	62
Configuring the Marvell BIOS Setup to delete an optional hot spare hard disk drive.	62
Configuring the Marvell BIOS Setup to delete an array	63

Chapter 9. Symptom-to-FRU Index 65

Hard disk drive boot error	65
Power Supply Problems	65
Diagnostic error codes.	66
Beep symptoms	87
POST error codes	88
Miscellaneous error messages	90
Undetermined problems	91

Chapter 10. Replacing FRUs (Type 4105, 4157, 4217) 93

Locating controls and connectors on the front of your computer	94
Rear connectors	95
Removing the cover	96
Locations	97

Locating parts on the system board	98
Removing the front bezel	99
Replacing the power supply	100
Replacing a memory module	102
Replacing a PCI adapter card	104
Replacing the heat sink	109
Replacing the microprocessor	111
Replacing the system board	114
Replacing a hard disk drive	117
Replacing the hard disk drive fan assembly	121
Replacing an optical drive	123
Replacing the diskette drive or card reader	124
Replacing the front and rear fan assemblies	126
Replacing the front panel connectors assembly	127
Replacing the power switch/LED assembly	128
Replacing the battery	129
Replacing the internal speaker	130
Completing the FRU replacement	131

Chapter 11. Replacing FRUs (Type 4155, 4158, 4218). 133

Locating controls and connectors on the front of your computer	133
Rear connectors	134
Removing the cover	135
Locations	136
Locating parts on the system board	137
Removing the front bezel	137
Replacing the power supply	138
Installing or replacing a memory module	141
Replacing a PCI adapter card	144
Replacing the heat sink	147
Replacing the microprocessor	149
Replacing the system board	151
Replacing a hard disk drive	154
Replacing the hard disk drive fan assembly	157
Replacing an optical drive	159
Replacing the diskette drive or card reader	160

Replacing the front and rear fan assemblies	162
Replacing the front panel connectors assembly	163
Replacing the power switch/LED assembly	164
Replacing the battery	165
Replacing the internal speaker	166
Completing the FRU replacement	167

Chapter 12. FRU lists 169

Machine Type 4105	169
Machine Type 4155	185
Machine Type 4157	199
Machine Type 4158	216
Machine Type 4217	231
Machine Type 4218	243

Chapter 13. Additional Service Information 253

Security features	253
Hardware controlled Passwords	253
Operating system password	253
Vital product data	253
BIOS levels	253
Flash update procedures	253
Updating (flashing) BIOS from a disc	254
Updating (flashing) BIOS from the operating system	254
Recovering from a POST/BIOS update failure	254
Power management	256
Automatic configuration and power interface (ACPI) BIOS	256
Automatic Power-On features	256

Appendix A. Notices 257

Television output notice	258
Trademarks	258

Appendix B. System memory speed 259

Chapter 1. About this manual

This manual contains service and reference information for ThinkStation™ computers listed on the cover. It is intended only for trained servicers who are familiar with Lenovo® computer products.

Before servicing a Lenovo product, be sure to read the Safety Information. See Chapter 2, "Safety information," on page 3.

The Symptom-to-FRU Index and Additional Service Information chapters are not specific to any machine type and are applicable to all ThinkStation computers.

This manual includes a complete FRU part number listing for each machine type and model listed on the cover. If you have internet access, FRU part numbers are also available at:

<http://www.lenovo.com/support>

Important Safety Information

Be sure to read all caution and danger statements in this book before performing any of the instructions.

Veuillez lire toutes les consignes de type DANGER et ATTENTION du présent document avant d'exécuter les instructions.

Lesen Sie unbedingt alle Hinweise vom Typ "ACHTUNG" oder "VORSICHT" in dieser Dokumentation, bevor Sie irgendwelche Vorgänge durchführen

Leggere le istruzioni introdotte da ATTENZIONE e PERICOLO presenti nel manuale prima di eseguire una qualsiasi delle istruzioni

Certifique-se de ler todas as instruções de cuidado e perigo neste manual antes de executar qualquer uma das instruções

Es importante que lea todas las declaraciones de precaución y de peligro de este manual antes de seguir las instrucciones.

تأكد من قراءة كل التحذيرات الموجودة في هذا الكتاب قبل اتباع هذه التعليمات .

执行任何说明之前，请确保已阅读本书中的所有警告和危险声明。

執行任何指示前，請確實閱讀本書中的所有警告及危險聲明。

ודאו שקראתם את כל הודעות האזהרה והסכנה במסמך זה לפני שתבצעו פעולה כלשהי.

본 사용 설명서에 기재된 내용을 실행하기 전에 모든 주의사항 및 위험사항을 숙지하십시오.

Important information about replacing RoHS compliant FRUs

RoHS, The Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive (2002/95/EC) is a European Union legal requirement affecting the global electronics industry. RoHS requirements must be implemented on Lenovo products placed on the market and sold in the European Union after June 2006. Products on the market before June 2006 are not required to have RoHS compliant parts. If the parts are not compliant originally, replacement parts can also be noncompliant, but in all cases, if the parts are compliant, the replacement parts must also be compliant.

Note: RoHS and non-RoHS FRU part numbers with the same fit and function are identified with unique FRU part numbers.

Lenovo plans to transition to RoHS compliance well before the implementation date and expects its suppliers to be ready to support Lenovo's requirements and schedule in the EU. Products sold in 2005, will contain some RoHS compliant FRUs. The following statement pertains to these products and any product Lenovo produces containing RoHS compliant parts.

RoHS compliant ThinkCentre parts have unique FRU part numbers. Before or after June, 2006, failed RoHS compliant parts must always be replaced using RoHS compliant FRUs, so only the FRUs identified as compliant in the system HMM or direct substitutions for those FRUs can be used.

Products marketed before June 2006		Products marketed after June 2006	
Current or original part	Replacement FRU	Current or original part	Replacement FRU
Non-RoHS	Can be Non-RoHS	Must be RoHS	Must be RoHS
Non-RoHS	Can be RoHS		
Non-RoHS	Can sub to RoHS		
RoHS	Must be RoHS		

Note: A direct substitution is a part with a different FRU part number that is automatically shipped by the distribution center at the time of order.

Chapter 2. Safety information

This chapter contains the safety information that you need to be familiar with before servicing a computer.

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
 1. Ensure you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.
Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical safety



CAUTION:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server/workstation covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important: Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
 - Performing a mechanical inspection
 - Working near power supplies
 - Removing or installing Field Replaceable Units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
 - Ensure that another person, familiar with the power-off controls, is near you.
Remember: Another person must be there to switch off the power, if necessary.
 - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
 - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
 - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.

- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generatorsand similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
 - Use caution; do not become a victim yourself.
 - Switch off power.
 - Send another person to get medical aid.

Voltage-selection switch

Some computers are equipped with a voltage-selection switch located near the power-cord connection point on the computer. If your computer has a voltage-selection switch, ensure that you set the switch to match the voltage available at your electrical outlet. Setting the voltage-selection switch incorrectly can cause permanent damage to the computer.

If your computer does not have a voltage-selection switch, your computer is designed to operate only at the voltage provided in the country or region where the computer was originally purchased.

If you relocate your computer to another country, be aware of the following:

- If your computer does not have a voltage-selection switch, do not connect the computer to an electrical outlet until you have verified that the voltage provided is the same as it was in the country or region where the computer was originally purchased.
- If your computer has a voltage selection switch, do not connect the computer to an electrical outlet until you have verified that the voltage-selection switch is set to match the voltage provided in that country or region.

If you are not sure of the voltage provided at your electrical outlet, contact your local electric company or refer to official Web sites or other literature for travelers to the country or region where you are located.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
 - b. The power cord should be the appropriate type as specified in the parts listings.
 - c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious alterations. Use good judgment as to the safety of any alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people while handling the part.
- Wear a grounded wrist strap against your skin to eliminate static on your body.

- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

Note: The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Safety notices (multi-lingual translations)

The caution and danger safety notices in this section are provided in the following languages:

- English
- Arabic
- Brazilian/Portuguese
- Chinese (simplified)
- Chinese (traditional)
- French
- German
- Hebrew
- Italian
- Korean
- Spanish



DANGER

Electrical current from power, telephone and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**

- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following tables when installing, moving, or opening covers on this product or attached devices.**

To Connect	To Disconnect
1. Turn everything OFF. 2. First, attach all cables to devices. 3. Attach signal cables to connectors. 4. Attach power cords to outlet. 5. Turn device ON.	1. Turn everything OFF. 2. First, remove power cords from outlet. 3. Remove signal cables from connectors. 4. Remove all cables from devices.



CAUTION:

When replacing the lithium battery, use only Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.



CAUTION:

When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER: Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

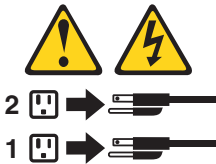
CAUTION:

Use safe practices when lifting.



CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.





خطر

التيار الكهربائي الموجود بمصدر الطاقة أو أجهزة التليفون أو أسلاك الاتصالات يشكل خطورة.

لتفادي مخاطر الصدمات الكهربائية:

لا تحاول توصيل أو فصل أي أسلاك أو القيام بعمليات تركيب أو صيانة أو إعادة توصيف لهذا المنتج أثناء وجود عاصفة كهربائية.

يجب توصيل كل أسلاك الكهرباء في مخارج كهرباء ذات توصيلات أسلاك وتوصيلات أرضية صحيحة.
يجب توصيل أي جهاز سيتم الحاقه بهذا المنتج في مخارج كهرباء ذات توصيلات أسلاك صحيحة.

وإن أمكن يجب استخدام يد واحدة فقط في توصيل أو فصل أسلاك الإشارة.

لا تحاول تشغيل أي جهاز إذا كان هناك أثر لحرق أو مياه أو تلف بالمكونات

يجب فصل أسلاك الكهرباء وأنظمة الاتصالات وشبكات الاتصال وأجهزة المودم الملحقة قبل فتح أغطية الجهاز، ما لم يتم طلب خلاف ذلك في التعليمات الخاصة بالتركيب والتوصيف.
قم بتوصيل وفصل الأسلاك كما هو موضح في الجدول التالي وذلك عند القيام بعمليات التركيب أو النقل أو فتح أغطية هذا المنتج أو الأجهزة الملحقة.

للتوصيل:

قم بإيقاف كل شيء.

أولاً، قم بتوصيل كل الأسلاك بالأجهزة.

قم بتوصيل أسلاك الإشارة في لموصلات.

قم بتوصيل أسلاك الكهرباء في المخارج.

قم بتشغيل الجهاز.

للفصل:

قم بإيقاف كل شيء.

أولاً، قم بفصل كل أسلاك الكهرباء من المخرج.

قم بفصل أسلاك الإشارة من الموصلات.

قم بفصل كل الأسلاك من الأجهزة.



تنبيه :

عند استبدال البطارية الليثيوم، استخدم فقط رقم الجزء الخاص **Part Number 45C1566** أو نوع آخر يكون على نفس مستوى الكفاءة يحدده لك المصنع.
إذا كان النظام الخاص يستخدم معه بطارية ليثيوم قم باستبدالها بنفس النوع الذي تم صناعته من خلال نفس المصنع. تحتوي البطارية على مادة الليثيوم ويمكن أن تنفجر في حالة عدم استخدامها أو التعامل معها بطريقة صحيحة أو عند التخلص منها بطريقة خطأ.

لا تقم بـ:

- القاء البطارية أو غمرها في الماء
- تسخينها أعلى من ١٠٠ درجة مئوية و(٢١٢ ° فهرنهايت)
- بتصليحها أو فكها

تخلص من البطارية طبقاً للقانون أو النظام المحلي .



تنبيه :

أثناء تركيب منتجات ليزر (مثل **CD-ROMs** أو وحدة تشغيل **DVD** أو أجهزة **Fiber Optic** أو وحدات الإرسال) يجب مراعاة الآتي:

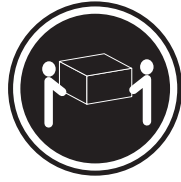
لا تنزع الأغشية. قد ينتج عن نزع أغشية منتج الليزر انفجار أشعة الليزر شديدة الخطورة.
لا يوجد أجزاء يمكن تغييرها داخل الجهاز. قد ينتج عن استخدام تحكمات أو تعديلات أو عمل أي تصرفات أخرى تخالف ما هو محدد هنا إلى انفجار أشعة شديدة الخطورة.



خطر

تحتوي بعض منتجات الليزر على الفئة دايود ليزر مدمج من الفئة **Class 3A** أو **Class 3B**. يجب مراعاة الآتي .

أشعة الليزر عند الفتح. لا تحقق إلى الإشعاع و لا تنظر إليه مباشرة بواسطة أي أجهزة مرئية وتجنب التعرض المباشر للإشعاع .



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)

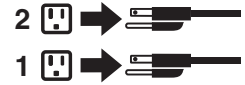


≥55 kg (121.2 lbs)

تنبيه :
يجب استخدام ممارسات آمنة عند الرفع



تنبيه :
لا يرقم زر التحكم في التشغيل الموجود على الجهاز والمفتاح الكهربائي الموجود على لوحة التحكم بإيقاف التيار الكهربائي المار بالجهاز. قد يكون للجهاز أكثر من سلك كهربائي واحد. لايقاف التيار الكهربائي المار بالجهاز، تأكد من فصل جميع أسلاك الكهرباء من مصدر الكهرباء .





PERIGO

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque elétrico:

- Não conecte nem desconecte nenhum cabo ou execute instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Todo equipamento que for conectado a este produto deve ser conectado a tomadas corretamente instaladas.
- Quando possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue nenhum equipamento quando houver evidência de fogo, água ou danos estruturais.
- Antes de abrir tampas de dispositivos, desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems conectados, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte os cabos conforme descrito na tabela apresentada a seguir ao instalar, mover ou abrir tampas deste produto ou de dispositivos conectados.

Para Conectar:	Para Desconectar:
1. DESLIGUE Tudo. 2. Primeiramente, conecte todos os cabos aos dispositivos. 3. Conecte os cabos de sinal aos conectores. 4. Conecte os cabos de alimentação às tomadas. 5. LIGUE os dispositivos.	1. DESLIGUE Tudo. 2. Primeiramente, remova os cabos de alimentação das tomadas. 3. Remova os cabos de sinal dos conectores. 4. Remova todos os cabos dos dispositivos.



CUIDADO:

Ao substituir a bateria de lítio, utilize apenas uma bateria com Número de Peça 33F8354 ou um tipo de bateria equivalente recomendado pelo Se o seu sistema possui um módulo com uma bateria de lítio, substitua-o apenas por um módulo do mesmo tipo e do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada ou descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Descarte a bateria conforme requerido pelas leis ou regulamentos locais.



PRECAUCIÓN:

Quando produtos a laser (como unidades de CD-ROMs, unidades de DVD-ROM, dispositivos de fibra ótica ou transmissores) estiverem instalados, observe o seguinte:

- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Não existem peças que podem ser consertadas no interior do dispositivo.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.

PERIGO

Alguns produtos a laser contêm diodo de laser integrado da Classe 3A ou da Classe 3B. Observe o seguinte:

Radiação a laser quando aberto. Não olhe diretamente para o feixe a olho nu ou com instrumentos ópticos e evite exposição direta ao feixe.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

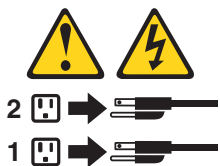
CUIDADO:

Utilize procedimentos de segurança para levantar equipamentos.



CUIDADO:

O botão de controle de alimentação do dispositivo e o botão para ligar/desligar da fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de alimentação.





危险

电源、电话和通信电缆中的电流是危险的。

为避免电击危险：

- 请勿在雷电期间连接或断开任何电缆的连接，或者对本产品进行安装、维护或重新配置。
- 将所有电源线连接到正确连线和妥善接地的电源插座。
- 将所有要连接到该产品的设备连接到正确连线的插座。
- 如果可能，请仅使用一只手来连接或断开信号电缆的连接。
- 切勿在有火、水、结构损坏迹象的情况下开启任何设备。
- 在打开设备外盖之前请断开已连接的电源线、远程通信系统、网络和调制解调器，除非在安装和配置过程中另有说明。
- 当安装、移动或打开该产品或连接设备的外盖时，请按照下表所述来连接或断开电缆的连接。

要连接	要断开连接
1. 切断所有电源。 2. 首先将所有电缆连接到设备。 3. 将信号电缆连接到接口。 4. 将电源线连接到插座。 5. 开启设备。	1. 切断所有电源。 2. 首先从插座上拔出电源线。 3. 从接口上拔出信号电缆。 4. 从设备上拔出所有电缆。



警告：
更换锂电池时，请仅使用部件号为 45C1566 的电池或制造商推荐的同类电池。如果您的系统有包含锂电池的模块，请仅使用同一制造商生产的相同模块类型来替换该模块。该电池中含有锂，如果使用、操作或处理不当，可能会发生爆炸。

切勿：

- 投入或浸入水中
- 加热到 100 °C（212 °F）以上
- 维修或拆卸

请按照当地法令或条例的要求处理电池。



警告：
安装激光产品（例如 CD-ROM、DVD-ROM 驱动器、光纤设备或发射设备）时，
请注意以下声明：

- 请勿卸下外盖。卸下激光产品的外盖可能导致遭受激光辐射的危险。该设备内没有可维修的部件。
- 如果不按照此处指定的过程进行控制、调整或操作，则有可能导致遭受辐射的危险。



危险

某些激光产品包含嵌入式 3A 类或 3B 类激光二极管。请注意以下声明：

打开后有激光辐射。请勿注视光束，请勿直接用光学仪器查看，并请避免直接暴露在光束中。



≥18 千克（37 磅）



≥32 千克（70.5 磅）

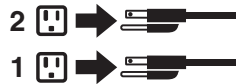


≥55 千克（121.2 磅）

警告：
抬起时请采取安全措施。



警告：
设备上的电源控制按钮和电源上的电源开关不会切断供给该设备的电流。该设备还可能有多条电源线。要切断该设备的所有电流，请确保所有电源线都与电源断开连接。





危險

電源、電話及通訊纜線上的電流都具有危險性。

若要避免觸電危險：

- 請勿在雷雨期間，連接或拔除纜線、執行安裝、維護或重新配置本產品。
- 將所有電源線連接到正確配線及接地的電源插座。
- 任何與本產品連接的設備都必須連接到配線妥當的電源插座。
- 請盡可能用單手連接或拔除信號線。
- 發生火災、水災或結構損害時，絕對不要開啟任何設備。
- 除非在安裝及配置程序中另有指示，否則在開啟裝置機蓋之前，請拔掉連接的電源線、電信系統、網路及數據機。
- 安裝、移動或開啟本產品或附屬裝置的機蓋時，請遵循下列說明連接及拔掉纜線。

連線	切斷連線
1. 關閉所有開關。 2. 首先，連接所有接線到裝置。 3. 連接信號線到接頭。 4. 連接電源線到插座。 5. 開啟裝置。	1. 關閉所有開關。 2. 首先，拔掉插座上的電源線。 3. 拔掉接頭上的信號線。 4. 拔掉裝置上所有接線。



警告：

更換鋰電池時，請僅使用產品編號 **45C1566** 或製造商所建議的同類型電池。

如果您的系統中含有鋰電池模組，請僅使用同一家製造商所生產的相同模組進行更換。

如果未以正確方式使用、處理或棄置含鋰的電池，會有爆炸的危險。

請勿：

- 沾溼或浸入水中
 - 置於 **100°C (212°F)** 以上的高溫環境
 - 修理或拆開
- 請按照各地區有關廢棄電池的法令和規定處理舊電池。



警告：

- 請勿移除機蓋。移除雷射產品的機蓋，可能會導致暴露在危險的雷射輻射中。裝置內部並無可自行維修的零件。
- 利用或執行非本文中所指定的控制、調整及執行政序，可能會導致危險的輻射外洩。



危險

部分雷射產品含有內嵌式 **Class 3A** 或 **Class 3B** 雷射二極體。請注意下列事項：

在開啟光碟機時，會發生雷射輻射。請勿直視光束或用光學儀器直接檢視，並避免直接暴露在光束中。





≥ 18 公斤 (37 磅)



≥ 32 公斤 (70.5 磅)



≥ 55 公斤 (121.2 磅)

警告：
搬運時請注意安全。



警告：
裝置上的電源控制按鈕及電源供應器上的電源開關，無法關閉裝置所產生的電流。
該裝置可能有多條電源線。若要除去裝置流出的所有電流，請確認已切斷所有電源線的電源。





DANGER

Le courant électrique provenant de l'alimentation, du téléphone et des câbles de transmission peut présenter un danger.

Pour éviter tout risque de choc électrique :

- Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.
- Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.
- Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.
- Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.
- Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.
- Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).
- Lorsque vous installez, que vous déplacez, ou que vous manipulez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.

Connexion	Déconnexion
1. Mettez les unités HORS TENSION. 2. Commencez par brancher tous les cordons sur les unités. 3. Branchez les câbles d'interface sur des connecteurs. 4. Branchez les cordons d'alimentation sur des prises. 5. Mettez les unités SOUS TENSION.	1. Mettez les unités HORS TENSION. 2. Débranchez les cordons d'alimentation des prises. 3. Débranchez les câbles d'interface des connecteurs. 4. Débranchez tous les câbles des unités.



ATTENTION:

Remplacer la pile au lithium usagée par une pile de référence identique exclusivement, (référence 33F8354), ou suivre les instructions du fabricant qui en définit les équivalences. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et peut exploser en cas de mauvaise utilisation, de mauvaise manipulation ou de mise au rebut inappropriée.

Ne pas :

- la jeter à l'eau,
- l'exposer à des températures supérieures à 100°C,
- chercher à la réparer ou à la démonter.

Ne pas mettre la pile à la poubelle. Pour la mise au rebut, se reporter à la réglementation en vigueur.



ATTENTION:

Si des produits à laser (tels que des unités de CD-ROM, de DVD-ROM, des unités à fibres optiques, ou des émetteurs) sont installés, prenez connaissance des informations suivantes :

- Ne retirez pas le carter. En ouvrant l'unité de CD-ROM ou de DVD-ROM, vous vous exposez au rayonnement dangereux du laser. Aucune pièce de l'unité n'est réparable.
- Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent manuel.



DANGER

Certains produits à laser contiennent une diode à laser intégrée de classe 3A ou 3B. Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. Evitez toute exposition directe au rayon laser. Evitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

ATTENTION:

Soulevez la machine avec précaution.



ATTENTION:

L'interrupteur de contrôle d'alimentation de l'unité et l'interrupteur dubloc d'alimentation ne coupent pas le courant électrique alimentant l'unité. En outre, le système peut être équipé de plusieurs cordons d'alimentation. Pour mettre l'unité hors tension, vous devez déconnecter tous les cordons de la source d'alimentation.





VORSICHT

An Netz-, Telefon- und Datenleitungen können gefährliche Spannungen anliegen.

Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.
- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Die Signalkabel nach Möglichkeit einhändig anschließen oder lösen, um einen Stromschlag durch Berühren von Oberflächen mit unterschiedlichem elektrischem Potenzial zu vermeiden.
- Geräte niemals einschalten, wenn Hinweise auf Feuer, Wasser oder Gebäudeschäden vorliegen.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem Öffnen des Gehäuses zu unterbrechen, sofern in den Installations- und Konfigurationsprozeduren keine anders lautenden Anweisungen enthalten sind.
- Zum Installieren, Transportieren und Öffnen der Abdeckungen des Computers oder der angeschlossenen Einheiten die Kabel gemäß der folgenden Tabelle anschließen und abziehen.

Zum Anschließen der Kabel gehen Sie wie folgt vor	Zum Abziehen der Kabel gehen Sie wie folgt vor
1. Schalten Sie alle Einheiten AUS. 2. Schließen Sie erst alle Kabel an die Einheiten an. 3. Schließen Sie die Signalkabel an die Buchsen an. 4. Schließen Sie die Netzkabel an die Steckdose an. 5. Schalten Sie die Einheit EIN.	1. Schalten Sie alle Einheiten AUS. 2. Ziehen Sie zuerst alle Netzkabel aus den Netzsteckdosen. 3. Ziehen Sie die Signalkabel aus den Buchsen. 4. Ziehen Sie alle Kabel von den Einheiten ab.



CAUTION:

Eine verbrauchte Lithiumbatterie nur durch eine Batterie mit der Teilenummer 33F8354 oder eine gleichwertige, vom Hersteller empfohlene Batterie ersetzen. Enthält das System ein Modul mit einer Lithiumbatterie, dieses nur durch ein Modul desselben Typs und von demselben Hersteller ersetzen. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100 °C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.



ACHTUNG:

Bei der Installation von Lasergeräten (wie CD-ROM-Laufwerken, DVD-Laufwerken, Einheiten mit Lichtwellenleitertechnik oder Sendern) Folgendes beachten:

- Die Abdeckungen nicht entfernen. Durch Entfernen der Abdeckungen des Lasergeräts können gefährliche Laserstrahlungen freigesetzt werden. Das Gerät enthält keine zu wartenden Teile.
- Werden Steuerelemente, Einstellungen oder Durchführungen von Prozeduren anders als hier angegeben verwendet, kann gefährliche Laserstrahlung auftreten.



VORSICHT

Einige Lasergeräte enthalten eine Laserdiode der Klasse 3A oder 3B. Beachten Sie Folgendes:

Laserstrahlung bei geöffneter Verkleidung. Nicht in den Strahl blicken. Keine Lupen oder Spiegel verwenden. Strahlungsbereich meiden.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

ACHTUNG:

Arbeitsschutzrichtlinien beim Anheben der Maschine beachten.



ACHTUNG:

Mit dem Netzschalter an der Einheit und am Netzteil wird die Stromversorgung für die Einheit nicht unterbrochen. Die Einheit kann auch mit mehreren Netzkabeln ausgestattet sein. Um die Stromversorgung für die Einheit vollständig zu unterbrechen, müssen alle zum Gerät führenden Netzkabel vom Netz getrennt werden.





סכנה

זרם חשמלי המועבר בכבלי חשמל, טלפון ותקשורת הוא מסוכן.

כדי להימנע מסכנת התחשמלות:

- אל תחברו או תנתקו כבלים, ואל תבצעו פעולת התקנה, תחזוקה או שינוי תצורה במוצר זה במהלך סופת ברקים.
- חברו את כל כבלי החשמל לשקע חשמל מחווט ומוארק כהלכה.
- חברו כל ציוד שיחובר למוצר זה לשקעי חשמל מחוטים כהלכה.
- במידת האפשר, השתמשו ביד אחת בלבד לחיבור או לניתוק של כבלי אותות.
- לעולם אל תפעילו ציוד כלשהו כאשר יש עדות לנזק מבני או לנזק כתוצאה מאש או ממים.
- נתקו את כבלי החשמל, מערכות התקשורת, התקני הרשת והמודמים המחוברים לפני פתיחת כיסויי ההתקן, אלא אם הליכי ההתקנה וקביעת התצורה מורים אחרת.
- בעת התקנה, העברה או פתיחת כיסויים במוצר זה או בהתקנים המחוברים, חברו ונתקו את הכבלים כמתואר בטבלה שלהלן.

כדי לחבר	כדי לנתק
1. כבו הכל.	1. כבו הכל.
2. ראשית, חברו את כל הכבלים להתקנים.	2. ראשית, נתקו את כבלי החשמל מהשקעים.
3. חברו את כבלי האותות למחברים.	3. נתקו את כבלי האותות מהמחברים.
4. חברו את כבלי החשמל לשקעים.	4. הסירו את כל הכבלים מההתקנים.
5. הפעילו את ההתקן.	



זהירות:

בעת החלפת סוללת הליתיום, השתמשו רק בסוללה בעלת מק"ט 45C1566 או בסוג תואם שהומלץ על ידי היצרן. אם המערכת כוללת מודול המכיל סוללת ליתיום, החליפו אותו רק במודול מאותו סוג ומתוצרת אותו יצרן. הסוללה מכילה ליתיום, ועלולה להתפוצץ אם לא משתמשים ומטפלים בה או משליכים אותה כראות.

לעולם:

- אל תטבלו במים

- אל תחממו לטמפרטורה הגבוהה מ-100°C (212°F)

- אל תתקנו או תפרקו

השליכו את הסוללה כנדרש לפי התקנות והחוקים המקומיים.



זהירות:

בעת התקנת מוצרי לייזר (כגון כונני תקליטורים ו-DVD, התקני סיב אופטי או משדרים), שימו לב לאזהרות הבאות:

- אל תסירו את הכיסויים. הסרת הכיסויים של מוצר הלייזר עלולה לגרום לחשיפה לקרינת לייזר מסוכנת. אין חלקים ברי טיפול בתוך ההתקן.

- שינויים, שימוש בבקורות או ביצוע הליכים אחרים מאלה המתוארים כאן, עלולים לגרום לחשיפה לקרינה מסוכנת.



סכנה

מוצרי לייזר מסוימים מכילים דיודת לייזר מסוג Class 3A או Class 3B. שימו לב לאזהרה הבאה:

כאשר הוא פתוח, המוצר פולט קרינת לייזר. אל תביטו ישירות בקרן, אל תביטו ישירות בעזרת ציוד אופטי, והימנעו מחשיפה לקרן.



≤ 18 ק"ג (37 ליב')



≤ 32 ק"ג (70.5 ליב')

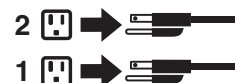


≤ 55 ק"ג (121.2 ליב')

זהירות:
השתמשו בהליכים
הנאותים בעת
הרמת הצידוד.



זהירות:
לחצן ההפעלה של ההתקן ומתג ההפעלה של ספק החשמל אינם מפסיקים את זרם החשמל המסופק להתקן.
בנוסף, ההתקן עשוי לכלול יותר מכבל חשמל אחד. כדי לסלק את כל הזרם החשמלי מההתקן,
ודאו שכל כבלי החשמל מנותקים ממקור החשמל.





PERICOLO

La corrente elettrica proveniente dai cavi di alimentazione, del telefono e di comunicazione può essere pericolosa.

Per evitare il rischio di scosse elettriche:

- Non collegare o scollegare qualsiasi cavo oppure effettuare l'installazione, la manutenzione o la riconfigurazione del prodotto durante un temporale.
- Collegare tutti i fili elettrici a una presa di alimentazione correttamente cablata e dotata di messa a terra.
- Collegare alle prese elettriche appropriate tutte le apparecchiature che verranno utilizzate per questo prodotto.
- Se possibile, utilizzare solo una mano per collegare o scollegare i cavi di segnale.
- Non accendere assolutamente apparecchiature in presenza di incendi, perdite d'acqua o danno strutturale.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazione, le reti e il modem prima di aprire i coperchi del dispositivo, salvo istruzioni contrarie relative alle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando vengono effettuate operazioni di installazione, spostamento o apertura dei coperchi di questo prodotto o delle unità collegate.

Per collegarsi	Per scollegarsi
1. SPEGNERE le apparecchiature. 2. Innanzitutto, collegare tutti i cavi alle unità. 3. Collegare i cavi di segnale ai connettori. 4. Collegare i cavi di alimentazione alla presa. 5. Accendere l'unità.	1. SPEGNERE le apparecchiature. 2. Innanzitutto, rimuovere i cavi di alimentazione dalla presa. 3. Rimuovere i cavi di segnale dai connettori. 4. Rimuovere tutti i cavi dalle unità.



ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo il Numero parte 33F8354 o un tipo di batteria equivalente consigliato dal produttore. Se sul sistema è presente un modulo che contiene una batteria al litio, sostituirlo solo con un tipo di modulo dello stesso tipo della stessa casa di produzione. La batteria contiene litio e può esplodere se usata, maneggiata o smaltita in modo non corretto.

Non:

- Gettare o immergere la batteria nell'acqua
- Riscaldarla ad una temperatura superiore ai 100 gradi C (212 gradi F)
- Smontarla, ricaricarla o tentare di ripararla

Le batterie usate vanno smaltite in accordo alla normativa in vigore (DPR 915/82 e successive disposizioni e disposizioni locali).



ATTENZIONE:

Quando vengono installati prodotti laser (quali CD-ROM, unità DVD-ROM, unità a fibre ottiche o trasmettenti), tener presente quanto segue:

- Non rimuovere gli sportelli. L'apertura di un'unità laser può determinare l'esposizione a radiazioni laser pericolose. All'interno dell'unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.



PERICOLO

Alcune unità laser contengono un diodo laser di Classe 3A o Classe 3B. Tener presente quanto segue:

Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione al fascio.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

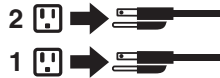
ATTENZIONE:

Prestare attenzione nel sollevare l'apparecchiatura.



ATTENZIONE:

Il pulsante di controllo dell'alimentazione presente sull'unità e l'interruttore dell'alimentatore non disattivano l'alimentazione corrente fornita all'unità. E' possibile che l'unità disponga di più cavi di alimentazione. Per disattivare l'alimentazione dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla fonte di alimentazione.





위험

전원, 전화, 통신 케이블의 전류는 위험합니다.

감전의 위험을 피하려면 다음과 같이 하십시오.

- 번개가 치는 날에는 케이블을 연결 또는 분리하거나 본 제품을 설치, 보수, 재구성하지 마십시오.
- 모든 전원 코드는 올바르게 접지된 전기 콘센트에 연결하십시오.
- 본 제품에 연결될 장치는 올바르게 배선된 콘센트에 연결하십시오.
- 신호 케이블을 연결 또는 분리할 때 가능하면 한 손만을 사용하십시오.
- 불 또는 물로 인한 손상이나 구조적인 손상이 있을 경우 장치의 전원을 절대 켜지 마십시오.
- 설치 및 구성 과정에 별도의 지시 사항이 없는 경우, 장치의 덮개를 열기 전에 연결된 전원 코드, 원격 통신 시스템, 네트워크, 모뎀을 분리하십시오.
- 본 제품이나 연결된 장치를 설치, 이동하거나 덮개를 열 때 다음 표와 같은 순서로 케이블을 연결하거나 분리하십시오.

연결할 때:	분리할 때:
1. 모든 장치의 전원을 끄십시오. 2. 먼저 모든 케이블을 장치에 연결하십시오. 3. 커넥터에 신호 케이블을 연결하십시오. 4. 콘센트에 전원 코드를 연결하십시오. 5. 장치의 전원을 켜십시오.	1. 모든 장치의 전원을 끄십시오. 2. 먼저 콘센트에서 전원 코드를 분리하십시오. 3. 커넥터에서 신호 케이블을 분리하십시오. 4. 장치에서 모든 케이블을 분리하십시오.



주의:

배터리를 교환할 때는 Part Number 45C1566 또는 제조업체에서 지정한 동일한 종류의 제품을 사용하십시오. 사용자의 시스템이 리튬 배터리를 포함하는 모듈일 경우, 동일한 제조업체에서 동일한 모듈 유형으로 생산된 제품으로 교체하십시오. 배터리에는 리튬이 함유되어 있어 잘못 사용, 취급 또는 폐기할 경우 폭발의 위험이 있습니다.

사고를 방지하려면 다음 사항을 준수하십시오.

- 배터리를 물 속에 던지거나 침수시키지 마십시오.
- 100℃(212°F) 이상 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

배터리를 폐기할 때는 법령 또는 회사의 안전 수칙에 따라 폐기하십시오.



주의:

CD-ROM, DVD-ROM 장치, 광섬유 장치 또는 송신 장치와 같은 레이저 제품을 설치할 때, 다음과 같은 취급 주의사항을 참고하십시오.

- 덮개를 열지 마십시오. 덮개를 열면 레이저 복사 에너지에 노출될 위험이 있습니다. 장치 내부에는 사용자가 조정하거나 수리할 수 있는 부품이 없습니다.
- 규정된 것 이외의 절차 수행, 제어 조정 등의 행위로 인해 해로운 레이저 복사에 노출될 수 있습니다.



위험

일부 장비에는 임베디드 클래스 3A 또는 클래스 3B 레이저 다이오드가 있습니다. 다음 주의사항에 유의하십시오.

드라이브가 열리면 레이저 복사 에너지가 방출됩니다. 광선이 눈에 직접 쏘이지 않도록 하십시오. 나안 또는 광학 기구를 착용한 상태에서 광선을 직접 바라보지 않도록 하십시오.



≥ 18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

주의:

제품을 들어 올릴 때
안전 규제를 따르십시오.



주의:

장치의 전원 제어 버튼 및 전원 공급 장치의 전원 스위치를 사용하여 장치에 공급되는 전기를 차단하지 마십시오. 장치는 둘 이상의 코드를 가지고 있을 수 있습니다. 장치에서 모든 전원을 차단하려면 콘센트에서 코드가 모두 분리되어 있는지 확인하십시오.





PELIGRO

La corriente eléctrica procedente de cables de alimentación, teléfonos y cables de comunicación puede ser peligrosa.

Para evitar el riesgo de descarga eléctrica:

- No conecte ni desconecte los cables ni realice ninguna tarea de instalación, mantenimiento o reconfiguración de este producto durante una tormenta eléctrica.
- Conecte todos los cables de alimentación a tomas de corriente debidamente cableadas y conectadas a tierra.
- Cualquier equipo que se conecte a este producto también debe conectarse a tomas de corriente debidamente cableadas.
- Siempre que sea posible, utilice una sola mano para conectar o desconectar los cables de señal.
- No encienda nunca un equipo cuando hay señales de fuego, agua o daños estructurales.
- Desconecte los cables de alimentación, los sistemas de telecomunicaciones, las redes y los módems conectados antes de abrir las cubiertas de los dispositivos, a menos que se indique lo contrario en los procedimientos de instalación y configuración.
- Conecte y desconecte los cables, como se describe en la tabla siguiente, cuando instale, mueva o abra las cubiertas de este producto o de los dispositivos conectados.

Para conectar	Para desconectar
1. APÁGUELO todo. 2. En primer lugar, conecte todos los cables a los dispositivos. 3. Conecte los cables de señal a los conectores. 4. Enchufe los cables de alimentación a las tomas de corriente. 5. Encienda el dispositivo.	1. APÁGUELO todo. 2. En primer lugar, desenchufe los cables de alimentación de las tomas de corriente. 3. Desconecte los cables de señal de los conectores. 4. Desconecte todos los cables de los dispositivos.



PRECAUCIÓN:

Cuando sustituya una batería de litio, utilice solamente una batería número de pieza 33F8354 u otra de tipo equivalente recomendada por el fabricante. Si su sistema dispone de un módulo que contiene una batería de litio, reemplácelo sólo con el mismo tipo de módulo, del mismo fabricante. La batería contiene litio y puede explotar si no se utiliza, manipula o desecha correctamente.

No debe:

- Arrojarla al agua o sumergirla en ella
- Exponerla a temperaturas superiores a 100°C (212°F)
- Repararla o desmontarla

Deshágase de la batería según especifiquen las leyes o normas locales.



PRECAUCIÓN:

Cuando haya productos láser (como unidades de CD-ROM, unidades de DVD, dispositivos de fibra óptica o transmisores) instalados, tenga en cuenta lo siguiente:

- No quite las cubiertas. Si quita las cubiertas del producto láser, podría quedar expuesto a radiación láser peligrosa. Dentro del dispositivo no existe ninguna pieza que requiera servicio técnico.
- Si usa controles o ajustes o realiza procedimientos que no sean los especificados aquí, podría exponerse a radiaciones peligrosas.



PELIGRO

Algunos productos láser tienen incorporado un diodo láser de clase 3A o clase 3B. Tenga en cuenta lo siguiente:

Cuando se abre, queda expuesto a radiación láser. No mire directamente al rayo láser, ni siquiera con instrumentos ópticos, y evite exponerse directamente al rayo láser.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

PRECAUCIÓN:

Adopte procedimientos seguros al levantar el equipo.



PRECAUCIÓN:

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no desconectan la corriente eléctrica suministrada al dispositivo. Además, el dispositivo podría tener más de un cable de alimentación. Para suprimir toda la corriente eléctrica del dispositivo, asegúrese de que todos los cables de alimentación estén desconectados de la toma de corriente.



Chapter 3. General information

This chapter provides general information that applies to all machine types supported by this publication.

Lenovo Welcome Center

The Lenovo Welcome program introduces you to some innovative built-in features of Lenovo and guides you through a few important setup tasks to help you make the most of your computer.

Additional information resources

If you have Internet access, the most up-to-date information for your computer is available from the World Wide Web.

You can find the following information:

- CRU removal and installation instructions
- Publications
- Troubleshooting information
- Parts information
- Downloads and drivers
- Links to other useful sources of information

To access this information, point your browser to <http://www.lenovo.com/support>.

Specifications

This section lists the physical specifications for your ThinkStation computer.

For machine types 4105, 4157, and 4217.

This section lists the physical specifications for your computer.

Dimensions

Width: 175 mm (6.9 inches)

Height: 478 mm (18.8 inches) floor to top of handle

Depth: 460 mm (18.1 inches)

Weight

Maximum configuration: 16.33 kg (36 lbs)

Dimensions rack mounted:

Width: 427 mm (16.8 inches)

Height: 210 mm (8.0 inches)

Depth: 579 mm (22.8 inches)

Environment

Air temperature:

Operating at 0 - 3000 ft (914.4 m): 10° to 35°C (50° to 95°F)

Non-operating: -10° to 60°C (14° to 140°F)

Humidity:

Operating: 10% to 80%

Non-operating: 10% to 90%

Transit: 10% to 90%

Maximum altitude: 7000 ft (2133.6 m)

Electrical input

Input voltage:

Range 100 V - 240 V

Input kilovolt-amperes (kVA) (approximate)

Minimum configuration as shipped: 0.17 kVA

Maximum configuration: 0.8 kVA

For machine types 4155, 4158, and 4218.

Dimensions

Width: 210 mm (8.3 inches)

Height: 485 mm (19.1 inches) floor to top of handle

Depth: 602 mm (23.7 inches)

Weight

Maximum configuration: 26.00 kg (57 lbs)

Rack mounted dimensions:

Width: 427 mm (16.8 inches)

Height: 210 mm (8.3 inches)

Depth: 602 mm (23.7 inches)

Environment

Air temperature:

Operating at 0 - 3000 ft (914.4 m): 10° to 35°C (50° to 95°F)

Non-operating: -10° to 60°C (14° to 140°F)

Humidity:

Operating: 10% to 80% (10% per hour)

Non-operating: 10% to 90% (10% per hour)

Transit: 10% to 90% (10% per hour)

Maximum altitude: 7000 ft (2133.6 m)

Electrical input

Input voltage:

Range 100 V - 240 V

Input kilovolt-amperes (kVA) (approximate)

Minimum configuration as shipped: 0.17 kVA

Maximum configuration: 1.2 kVA

Chapter 4. General Checkout

Attention

The drives in the computer you are servicing might have been rearranged or the drive startup sequence changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

General error messages appear if a problem or conflict is found by an application program, the operating system, or both. For an explanation of these messages, refer to the information supplied with that software package.

Before replacing any FRUs, ensure that the latest level of BIOS is installed on the system. A down-level BIOS might cause false errors and unnecessary replacement of the system board. For more information on how to determine and obtain the latest level BIOS, see “BIOS levels” on page 253.

Use the following procedure to help determine the cause of the problem:

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Power-on all external devices.
5. Power-on the computer.
 - Look for displayed error codes
 - Listen for beep codes
 - Look for readable instructions or a main menu on the display.If you **did not** receive the correct response, proceed to step 6.
If you **do** receive the correct response, proceed to step 7.
6. Look at the following conditions and follow the instructions:
 - If you hear beep codes during POST, go to “Beep symptoms” on page 87.
 - If the computer displays a POST error, go to “POST error codes” on page 88.
 - If the computer hangs and no error is displayed, continue at step 7.
7. Run the Diagnostic programs. See Chapter 5, “Diagnostics,” on page 45.
 - If you receive an error, replace the part that the diagnostic program calls out or go to “Diagnostic error codes” on page 66.
 - If the test stops and you cannot continue, replace the last device tested.

Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk upgrades
- Failure symptom
 - Do diagnostics indicate a failure?

- What, when, where, single, or multiple systems?
- Is the failure repeatable?
- Has this configuration ever worked?
- If it has been working, what changes were made prior to it failing?
- Is this the original reported failure?
- Diagnostics version
 - Type and version level
- Hardware configuration
 - Print (print screen) configuration currently in use
 - BIOS level
- Operating system software
 - Type and version level

Note: To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same Diagnostic Diskettes (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operating system control files

Comparing the configuration and software set-up between “working and non-working” systems will often lead to problem resolution.

Chapter 5. Diagnostics

Diagnostic programs are used to test hardware components of your computer and report operating-system-controlled settings that can cause hardware failures. There are two diagnostic programs preinstalled on your computer:

- Lenovo ThinkVantage Toolbox (used to diagnose problems while running the Windows operating system)
- PC-Doctor for Windows PE (used when your Windows operating system does not start)

Notes:

1. You can also download the latest version of the Lenovo ThinkVantage Toolbox and PC-Doctor for DOS diagnostic programs from:
<http://www.lenovo.com/support>.
See “Lenovo ThinkVantage Tools” and “PC-Doctor for DOS” on page 46 for detailed information.
2. If you are unable to isolate and repair the problem yourself after you run Lenovo ThinkVantage Toolbox and PC-Doctor for Windows PE, save and print the log files created by both diagnostic programs. You will need the log files when you speak to a Lenovo technical support representative. (The log file created by Lenovo ThinkVantage Toolbox is automatically saved in C:\PCDR\DETAILED.txt.)

Lenovo ThinkVantage Tools

The Lenovo ThinkVantage Tools program guides you to a host of information sources and provides easy access to various tools to help you work more easily and securely.

Note: The Lenovo ThinkVantage Tools program is only available on computers preinstalled with Windows 7 from Lenovo.

PC-Doctor for Windows PE

The PC-Doctor for Windows PE diagnostic program is part of the Rescue and Recovery workspace on each Lenovo computer. Use PC-Doctor for Windows PE if you are unable to start the Windows operating system or if Lenovo ThinkVantage Toolbox has not been successful in isolating a possible problem.

Running diagnostics from the Rescue and Recovery workspace

You can run the PC-Doctor for Windows PE diagnostic program from the Rescue and Recovery workspace. To run diagnostics from the Rescue and Recovery workspace, use the following procedure:

1. Shut down the operating system and turn off the computer.
2. Repeatedly press and release the F11 key when you turn on the computer.
3. When you hear beeps or see a logo screen, stop pressing the F11 key. The Rescue and Recovery workspace opens.
4. From the Rescue and Recovery workspace, select **Launch Advanced Rescue and Recovery** → **Diagnose hardware**.

5. The diagnostic program opens automatically. Select the diagnostic test you want to run. Press the F1 key for additional help.
6. Follow the instructions on the screen.

Note: Rescue media includes PC-Doctor for Windows PE.

PC-Doctor for DOS

Use PC-Doctor for DOS, if you are unable to start the Windows operating system or if PC-Doctor for Windows has not been successful in isolating a possible problem. You can run PC-Doctor for DOS from a diagnostic CD image or diagnostic diskettes that have been created.

Note: It is important to create a diagnostic CD image or diagnostic diskettes in case PC-Doctor for Windows PE cannot be run from the Rescue and Recovery workspace.

You can also download the latest version of the PC-Doctor for DOS diagnostic program from:

<http://www.lenovo.com/support>.

The PC-Doctor for DOS diagnostic program is part of the Rescue and Recovery workspace and runs independently of the Windows operating system. Use PC-Doctor for DOS, if you are unable to start the Windows operating system or if Lenovo ThinkVantage Toolbox and PC-Doctor for Windows PE have not been successful in isolating a possible problem. You can run PC-Doctor for DOS from a diagnostic CD/DVD image that you create. You can also run PC-Doctor for DOS from the Rescue and Recovery workspace.

Note: It is important to create a diagnostic CD/DVD image in case PC-Doctor for DOS cannot be run from the Rescue and Recovery workspace.

Creating a diagnostic CD/DVD image

To create a diagnostic CD/DVD image, download a self-starting bootable CD/DVD image (known as an ISO image) of the diagnostic program from <http://www.lenovo.com/support>.

After you download the image, you can create the CD/DVD using any CD/DVD burning software.

Running diagnostics from the disc

To run diagnostics from the diagnostic CD/DVD image that you created, use the following procedure:

1. Make sure the computer is turned off.
2. Insert the disc into the optical drive.
3. Restart the computer.

Note: If the diagnostic program does not start, you might not have your optical drive set as a startable device. See “Selecting a startup device” on page 53 for instructions on how to change the startup device.

4. When the diagnostics program opens, follow the instructions on the screen.
5. When the program finishes, be sure to remove the disc from the drive.
6. Select the diagnostic test you want to run. Press the F1 key for additional help.

Running diagnostics from the Rescue and Recovery workspace

To run diagnostics from the Rescue and Recovery workspace, use the following procedure:

Note: If you did not create a diagnostic CD/DVD image, you can run the PC-Doctor for DOS diagnostic program from the Rescue and Recovery workspace.

1. Shut down the operating system and turn off the computer.
2. Repeatedly press and release the F11 key when you turn on the computer.
3. When you hear beeps or see a logo screen, stop pressing the F11 key. The Rescue and Recovery workspace opens.

Note: For some models, press the Esc key to enter the Rescue and Recovery.

4. From the Rescue and Recovery workspace, select **Launch Advanced Rescue and Recovery → Diagnose hardware**.
5. Follow the prompts on the screen. The computer will restart.
6. When the computer restarts, the diagnostic program opens automatically. Select the diagnostic test you want to run. Press the F1 key for additional help.

Navigating through the diagnostics programs

Use the cursor movement keys to navigate within the menus.

- The **Enter** key is used to select a menu item.
- The **Esc** key is used to back up to the previous menu.
- For online help select **F1**.

Running tests

There are four ways to run the diagnostic tests.

- Using the cursor movement keys, highlight **Run Normal Test** or **Run Quick Test** from the Diagnostics menu and then press **Enter**.
This automatically runs a pre-defined group of tests from each test category. **Run Normal Test** runs a more extensive set of tests than does **Run Quick Test** and takes longer to complete.
- Press **F5** to automatically run all selected tests in all categories.
- From within a test category, press **Ctrl-Enter** to automatically run only the selected tests in that category.
- Using the cursor movement keys, highlight a single test within a test category, and then press **Enter**. This runs only that test.

Press **Esc** at any time to stop the testing process.

Test results (N/A, PASSED, FAILED, ABORTED) are displayed in the field beside the test description and in the test log. See “Viewing the test log” on page 49.

To select one or more tests, use the following procedure.

1. Open the corresponding test category.
2. Using the cursor movement keys, highlight the desired test.
3. Press the space bar.

A selected test is marked by >>. Pressing the space bar again de-selects a test and removes the >>.

- Repeat steps 2 and 3 above to select all desired tests.

Test results

Diagnostics test results produce the following error code format:

Function Code	Failure Type	DeviceID	Date	ChkDigits	Text
---------------	--------------	----------	------	-----------	------

- **Function Code:**
Represents the feature or function within the PC.
- **Failure Type:**
Represents the type of error encountered.
- **DeviceID:**
Contains the component's unit-ID which corresponds to either a fixed disk drive, removable media drive, serial or parallel port, processor, specific RIMM, or a device on the PCI bus.
- **Date:**
Contains the date when the diagnostic test was run. The date is retrieved from CMOS and displayed using the YYYYMMDD format.
- **ChkDigits:**
Contains a 2-digit check-digit value to ensure the following:
 - Diagnostics were run on the specified date.
 - Diagnostics were run on the specified computer.
 - The diagnostic error code is recorded correctly.
- **Text:**
Description of the error.

Note: See "Diagnostic error codes" on page 66 for error code listings.

Quick and Full erase - hard drive

The diagnostics program offers two hard drive format utilities:

- Quick Erase Hard Drive
- Full Erase Hard Drive

The Quick Erase Hard Drive provides a DOS utility that performs the following:

- Destroys the Master Boot Record (MBR) on the hard drive.
- Destroys all copies of the FAT Table on all partitions (both the master and backup).
- Destroys the partition table.
- Provides messages that warn the user that this is a non-recoverable process.

The Full Erase Hard Drive provides a DOS utility that performs the following:

- Performs all the steps in Quick Erase.
- Provides a DOS utility that writes random data to all sectors of the hard drive.
- Provides an estimate of time to completion along with a visual representation of completion status.
- Provides messages that warn the user about non-recoverable process.

Important: Make sure that all data is backed up before using the Quick or Full Erase functions.

To select the Quick Erase or Full Erase Hard Drive utility, use the following procedure:

1. Select the UTILITY option on the toolbar and press **Enter**.
2. Select either the QUICK ERASE or FULL ERASE HARD DISK option and follow the instructions.

Viewing the test log

Errors reported by the diagnostic test will be displayed by the program as a failed test.

To view details of a failure or to view a list of test results, use the following procedure from any test category screen:

1. Press **F3** to activate the log file.
2. Press **F3** again to save the file to diskette or press **F2** to print the file.

Chapter 6. Using the Setup Utility

The Setup Utility program is used to view and change the configuration settings of your computer, regardless of which operating system you are using. However, the operating-system settings might override any similar settings in the Setup Utility program.

Starting the Setup Utility program

To start the Setup Utility program, do the following:

1. If your computer is turned on when you start this procedure, shut down the operating system and turn off the computer.
2. Press and hold the F1 key then turn on the computer. When you hear multiple beeps, release the F1 key.

Notes:

- a. If you are using a USB keyboard and the Setup Utility program does not display using this method, repeatedly press and release the F1 key rather than leaving it pressed when turning on the computer.
- b. If a user password or an administrator password has been set, the Setup Utility program menu is not displayed until you type your password. For more information, see "Using passwords."

The Setup Utility program might start automatically when POST detects that hardware has been removed or new hardware has been installed in your computer.

Viewing and changing settings

The Setup Utility program menu lists items that identify system configuration topics. To view or change settings, see "Starting the Setup Utility program."

When working with the Setup Utility program menu, you must use the keyboard. The keys used to perform various tasks are displayed at the bottom of each screen.

Using passwords

By using the Setup Utility program, you can set passwords to prevent unauthorized persons from gaining access to your computer and data. See "Starting the Setup Utility program." The following types of passwords are available:

- User Password
- Administrator Password

You do not have to set any passwords to use your computer. However, if you decide to set any passwords, read the following sections.

Password considerations

A password can be any combination of up to 12 alphabetic and numeric characters (a-z and 0-9). For security reasons, it is a good idea to use a strong password that cannot be easily compromised. Passwords should adhere to the following rules:

- To set a strong password, have at least eight characters in length and contain at least one alphabetic character and one numeric character
- Setup Utility program and hard disk drive passwords are not case sensitive
- Not be your name or your user name
- Not be a common word or a common name
- Be significantly different from your previous password

User Password

When a User Password is set, the computer cannot be used until a valid password is typed from the keyboard.

Administrator Password

When an Administrator Password is set, it deters unauthorized persons from changing configuration settings. If you are responsible for maintaining the settings of several computers, you might want to set an Administrator Password.

After you set an Administrator Password, a password prompt is displayed each time you try to access the Setup Utility program.

If both the user and administrator passwords are set, you can type either password. However, to change any configuration settings, you must use your administrator password.

Setting, changing, and deleting a password

To set, change, or delete a password, do the following:

Note: A password can be any combination of up to 12 alphabetic and numeric characters. For more information, see “Password considerations.”

1. Start the Setup Utility program (see Chapter 6, “Using the Setup Utility,” on page 51).
2. From the Setup Utility program menu, select **Security** → **Set Passwords**.
3. Select **Set User Password** or **Set Administrator Password**.
4. Read the information displayed on the right side of the screen.

Enabling or disabling a device

You can enable or disable user access to a device.

ICH SATA Controller	When this feature is set to Disabled , any optical drives or eSATA devices are disabled and will not be displayed in the system configuration.
Marvell SATA/SAS Controller	When this feature is set to Disabled , all internal hard disk drives are disabled and will not be displayed in the system configuration. When disabling this feature, make sure your system has an alternate boot method, such as LAN PXE boot, or a bootable floppy diskette, memory key, or optical disc.
Legacy diskette A	When this feature is set to Disabled , the diskette drive cannot be accessed.

To set the ICH SATA Controller or Marvell SATA/SAS Controller, do the following:

1. Start the Setup Utility program (see “Starting the Setup Utility program” on page 51).
2. Depending on which device you want to set, select either **Devices → SAS/SATA Drive Setup → ICH SATA Controller** or **Devices → SAS/SATA Drive Setup → Marvell SATA/SAS Controller** from the Setup Utility program menu.
3. Select the desired settings and press Enter.
4. Return to the Setup Utility program menu and select **Exit → Save and exit the Setup Utility**.

Note: If you do not want to save the settings, select **Exit the Setup Utility without saving**.

To set the Legacy diskette A, do the following:

1. Start the Setup Utility program (see “Starting the Setup Utility program” on page 51).
2. From the Setup Utility program menu, select **Devices → Legacy diskette A**.
3. Select the desired settings and press Enter.
4. Return to the Setup Utility program menu and select **Exit → Save and exit the Setup Utility**.

Note: If you do not want to save the settings, select **Exit the Setup Utility without saving**.

Selecting a startup device

If your computer does not start up (boot) from a device such as the disc, diskette, or hard disk drive as expected, use one of the following procedures to select a startup device.

Selecting a temporary startup device

Use this procedure to start up from any boot device.

Note: Not all discs, hard disk drives, and diskettes are bootable.

1. Turn off your computer.
2. Press and hold the F12 key then turn on the computer. When the Startup Device Menu appears, release the F12 key.

Note: If you are using a USB keyboard and the Startup Device Menu does not display using this method, repeatedly press and release the F12 key rather than leaving it pressed when turning on the computer.

3. Select the desired startup device from the Startup Device Menu and press Enter to begin.

Note: Selecting a startup device from the Startup Device Menu does not permanently change the startup sequence.

Selecting or changing the startup device sequence

To view or permanently change the configured startup device sequence, do the following:

1. Start the Setup Utility program (see “Starting the Setup Utility program” on page 51).

2. Select **Startup** → **Startup Sequence**, and see the information displayed on the right side of the screen.
3. Select the devices for the Primary Startup Sequence, the Automatic Startup Sequence, and the Error Startup Sequence.
4. Select **Exit** from the **Setup Utility** menu and then **Save Settings** or **Save and exit the Setup Utility**.

If you have changed these settings and want to return to the default settings, select **Load Default Settings** on the **Exit** menu.

Advanced settings

On some computer models, the **Advanced settings** menu includes a setting to enable or disable HyperThreading. This feature works only with HyperThreading-aware operating systems, such as Windows Vista. The default setting for HyperThreading is **Enabled**. However, if you select **Set Defaults** and are using an operating system other than Windows Vista, your computer performance might be degraded. Therefore, you should always set HyperThreading to **Disabled** unless you are sure your operating system supports HyperThreading.

Exiting from the Setup Utility program

After you finish viewing or changing settings, press Esc to return to the Setup Utility program menu (you might have to press Esc several times). If you want to save the new settings, select **Save Settings** or **Save and exit the Setup Utility**. Otherwise, your changes will not be saved.

Chapter 7. Installing hard disk drives and configuring RAID (types 4105, 4157, 4217)

This chapter contains information about installing hard disk drives and configuring Redundant Array of Independent Disks (RAID) for this product.

Note: The information about configuring RAID in this chapter is applicable only for a Windows environment. For information about configuring RAID in a Linux environment, contact your Linux software provider.

Installing SATA hard disk drives and configuring RAID

This section contains information about the required number of SATA hard disk drives for the supported level of RAID and SATA RAID configuration.

Installing SATA hard disk drives

Your computer must have the minimum number of SATA hard disk drives installed for the supported level of RAID below:

- RAID Level 0 – Striped disk array
 - Two hard disk drives minimum
 - Better performance without fault tolerance
- RAID Level 1 – Mirrored disk array
 - Two hard disk drives minimum
 - Improved read performance and 100% redundancy
- RAID Level 5 – Block-level striped disk array with distributed parity
 - Three hard disk drives minimum
 - Data striped at the byte level
 - Stripe error correction information
 - Better performance and fault tolerance

To install a new SATA hard disk drive, refer to the installation procedure in “Replacing a hard disk drive” in the *ThinkStation Hardware Installation and Replacement Guide*.

Configuring the system BIOS to enable SATA RAID functionality

This section describes how to configure the system BIOS to enable SATA RAID functionality.

Note: Use the arrow keys on the keyboard to make selections.

1. Press F1 to enter the system BIOS setup. See “Starting the Setup Utility program” on page 51.
2. Select **Devices → IDE Drives Setup** and press Enter.
3. Select **SATA RAID Enable** and press Enter.
4. Select **Enabled** and press Enter.
5. Press F10 to save the new settings and exit.

Creating RAID volumes

This section describes how to use the Intel Matrix Storage Manager option ROM configuration utility to create RAID volumes.

1. Press Ctrl+I when prompted to enter the Intel Matrix Storage Manager option ROM configuration utility.

Note: To make enough physical hard disk drives available to create a RAID volume.

2. Use the up and down arrow keys to select **Create RAID Volume** and press Enter.
3. Type a proper RAID Volume name in the **Name** field and press Tab.
4. Use the arrow keys to select a RAID level in the **RAID Level** field and press Tab.
5. If appropriate, use the arrow keys to select a Stripe Size in the **Stripe Size** field and press Tab.
6. Type a volume size in the **Capacity** field and press Tab.
7. Press Enter to initiate volume creation.
8. When prompted, press Y to accept the warning message and create the volume.
9. Return to step 2 to create additional RAID volumes, or select **Exit** and press Enter.
10. Press Y when prompted to confirm the exit.

Deleting RAID volumes

This section describes how to use the Intel Matrix Storage Manager option ROM configuration utility to delete RAID volumes.

1. Press Ctrl+I when prompted to enter the Intel Matrix Storage Manager option ROM configuration utility.
2. Use the up and down arrow keys to select **Delete RAID Volume** and press Enter.
3. Use the arrow keys to select the RAID volume to be deleted and press Delete.
4. When prompted, press Y to confirm the deletion of the selected RAID volume. Deleting a RAID volume will reset the hard disk drives to non-RAID.
5. After deleting a RAID volume, you can:
 - Return to step 2 to delete additional RAID volumes.
 - See “Creating RAID volumes” for RAID volume creation.
 - Use the up and down arrow keys to select **Exit** and press Enter.
 - Use the up and down arrow keys to select **Reset Disks to Non-RAID** and press Enter.
 - a. Use the arrow keys and the space key to mark individual physical hard disk drives to be reset, and then press Enter to complete the selection.
 - b. When prompted, press Y to confirm the reset action.
 - c. After completing the Reset Disks to Non-RAID function, you can:
 - Return to step 2 to delete additional RAID volumes.
 - See “Creating RAID volumes” for RAID volume creation.
 - Use the up and down arrow keys to select **Exit** and press Enter.

Installing SAS hard disk drives and configuring RAID

This section contains information about the required number of SAS hard disk drives for the supported level of RAID and SAS RAID configuration.

Installing SAS hard disk drives

Your computer must have the minimum number of SAS hard disk drives installed for the supported level of RAID below:

- RAID Level 0 – Striped disk array
 - Two hard disk drives minimum
 - Better performance without fault tolerance
- RAID Level 1 – Mirrored disk array
 - Two hard disk drives minimum
 - Improved read performance and 100% redundancy
- RAID Level 5 – Block-level striped disk array with distributed parity
 - Three hard disk drives minimum
 - Data striped at the byte level
 - Stripe error correction information
 - Better performance and fault tolerance

To install a new SAS hard disk drive, refer to the installation procedure in “Replacing a hard disk drive” in the *ThinkStation Hardware Installation and Replacement Guide*.

Entering the Marvell BIOS Setup to configure SAS RAID

This section describes how to enter the Marvell BIOS Setup to configure SAS RAID.

1. Your computer must have a Marvell SAS adapter card (Marvell SAS controller) installed to configure SAS RAID. For installing or replacing a Marvell SAS adapter card, refer to “Replacing an adapter card” in the *ThinkStation Hardware Installation and Replacement Guide*.
2. Turn on the computer after you have installed the required number of SAS hard disk drives and the Marvell SAS adapter card.
3. Press Ctrl+M when prompted to enter the Marvell BIOS Setup to configure SAS RAID.

Configuring the Marvell BIOS Setup to enable SAS RAID 0, 1, or 5 functionality

To enable SAS RAID 0, 1, or 5 functionality, use the Marvell BIOS Setup configuration utility as the SAS configuration utility. This utility assumes that the system has the required number of hard disk drives.

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Create array**.
4. Use the arrow keys and the Enter key to select each free hard disk drive that you want to include in the array.
5. Select **Next** and press Enter.

6. From the **Create array** menu, select **RAID level** and press Enter.

Note: Only the valid RAID levels will be active.
7. Select the SAS RAID level you want (**RAID 0**, **RAID 1**, or **RAID 5**) and press Enter.
8. From the **Stripe size** menu, you can change the stripe size or keep it as default.
9. Type a proper array name in the **Array name** field.
10. Select **Next** and press Enter. When prompted, press Y to complete the array creation and RAID configuration.

Configuring the Marvell BIOS Setup to set an optional hot spare hard disk drive

To configure the Marvell BIOS Setup to set an optional hot spare hard disk drive:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Spare Management**.
4. Use the arrow keys to select the hard disk drive you want to set as an optional hot spare hard disk drive.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to set the optional hot spare hard disk drive.

Configuring the Marvell BIOS Setup to delete an optional hot spare hard disk drive

To configure the Marvell BIOS Setup to delete an optional hot spare hard disk drive:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Spare Management**.
4. Use the arrow keys to select the optional hot spare hard disk drive you want to delete.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to delete the optional hot spare hard disk drive.

Configuring the Marvell BIOS Setup to delete an array

To configure the Marvell BIOS Setup to delete an array:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Delete array**.
4. Use the arrow keys and the Enter key to select the array you want to delete from the list.
5. Use the arrow keys to select **Next** and press Enter.

6. Press Y when prompted to complete the deletion.

Chapter 8. Installing hard disk drives and configuring RAID (types: 4155, 4158, 4218)

This chapter contains information about installing hard disk drives and configuring Redundant Array of Independent Disks (RAID) for this product.

Note: The information about configuring RAID in this chapter only applies for a Windows environment. For information about configuring RAID in a Linux environment, contact your Linux software provider.

Installing SATA or SAS hard disk drives and configuring RAID

This section contains information about the required number of SATA or SAS hard disk drives for the supported level of RAID configuration.

Note: Your computer must have either all SATA hard disk drives or all SAS hard disk drives installed. However, be sure that you do not install both the SATA and SAS hard disk drives into the same computer.

Installing SATA or SAS hard disk drives

Your computer must have the minimum number of SATA or SAS hard disk drives installed for the supported level of RAID below:

- RAID Level 0 – Striped disk array
 - Two hard disk drives minimum
 - Better performance without fault tolerance
- RAID Level 1 – Mirrored disk array
 - Two hard disk drives minimum
 - Improved read performance and 100% redundancy
- RAID Level 5 – Block-level striped disk array with distributed parity
 - Three hard disk drives minimum
 - Data striped at the byte level
 - Stripe error correction information
 - Better performance and fault tolerance
- RAID Level 10 – Combining features of RAID 0 and RAID 1
 - Four hard disk drives minimum
 - Very high reliability combined with high performance
 - Fault tolerance

To install a new SATA or SAS hard disk drive, refer to the installation procedure in “Replacing a hard disk drive” in the *ThinkStation Hardware Installation and Replacement Guide*.

Entering the Marvell BIOS Setup to configure SATA or SAS RAID

This section describes how to enter the Marvell BIOS Setup to configure a SATA or SAS RAID.

1. Turn on the computer after you have installed the required number of SATA or SAS hard disk drives.
2. Press Ctrl+M when prompted to enter the Marvell BIOS Setup to configure SATA/SAS RAID.

Configuring the Marvell BIOS Setup to enable SATA or SAS RAID 0, 1, 5, or 10 functionality

To enable SATA/SAS RAID functionality, use the Marvell BIOS Setup configuration utility as the SATA/SAS configuration utility. This utility assumes that the system has the required number of hard disk drives.

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Create array**.
4. Use the arrow keys and the Enter key to select each free hard disk drive that you want to include in the array.
5. Select **Next** and press Enter.
6. From the **Create array** menu, select **RAID level** and press Enter.

Note: Only the valid RAID levels will be active.

7. Select your desired RAID level (**RAID 0**, **RAID 1**, **RAID 5**, or **RAID 10**) and press Enter.
8. From the **Stripe size** menu, you can change the stripe size or keep it as default.
9. Type a proper array name in the **Array name** field.
10. Select **Next** and press Enter.
11. When prompted, press Y to complete the array creation and RAID configuration.

Configuring the Marvell BIOS Setup to set an optional hot spare hard disk drive

To configure the Marvell BIOS Setup to set an optional hot spare hard disk drive:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Spare Management**.
4. Use the arrow keys to select the hard disk drive you want to set as an optional hot spare hard disk drive.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to set the optional hot spare hard disk drive.

Configuring the Marvell BIOS Setup to delete an optional hot spare hard disk drive

To configure the Marvell BIOS Setup to delete an optional hot spare hard disk drive:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.

2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Spare Management**.
4. Use the arrow keys to select the optional hot spare hard disk drive you want to delete.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to delete the optional hot spare hard disk drive.

Configuring the Marvell BIOS Setup to delete an array

To configure the Marvell BIOS Setup to delete an array:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Delete array**.
4. Use the arrow keys and the Enter key to select the array you want to delete from the list.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to complete the deletion.

Chapter 9. Symptom-to-FRU Index

The Symptom-to-FRU index lists error symptoms and possible causes. The most likely cause is listed first. Always begin with Chapter 4, “General Checkout,” on page 43. This index can also be used to help you decide which FRUs to have available when servicing a computer. If you are unable to correct the problem using this index, go to “Undetermined problems” on page 91.

Notes:

- If you have both an error message and an incorrect audio response, diagnose the error message first.
- If you cannot run the diagnostic tests or you get a diagnostic error code when running a test, but did receive a POST error message, diagnose the POST error message first.
- If you did not receive any error message, look for a description of your error symptoms in the first part of this index.

Hard disk drive boot error

A hard disk drive boot error can have the following causes.

Error	FRU/Action
The start-up drive is not in the boot sequence in configuration.	Check the configuration and ensure the start-up drive is in the boot sequence.
No operating system installed on the boot drive.	Install an operating system on the boot drive.
The boot sector on the start-up drive is corrupted.	The drive must be formatted, do the following: 1. Attempt to back-up the data on the failing hard disk drive. 2. Using the operating systems programs, format the hard disk drive.
The drive is defective.	Replace the hard disk drive.

Power Supply Problems

If you suspect a power problem, use the following procedures.

Check/Verify	FRU/Action
Check the following for proper installation. • Power Cord • On/Off Switch connector • On/Off Switch Power Supply connector • System Board Power Supply connectors • Microprocessor(s) connection	Reseat connectors
Check the power cord for continuity.	Power Cord
Check the power-on switch for continuity.	Power-on Switch

Diagnostic error codes

Refer to the following diagnostic error codes when using the diagnostic tests. See “Running tests” on page 47 for the specific type for information about the Diagnostic programs.

In the following index, X can represent any number.

Diagnostic Error Code	FRU/Action
000-000-XXX BIOS Test Passed	No action
000-002-XXX BIOS Timeout	1. Flash the system. See “Flash update procedures” on page 253 2. System board
000-024-XXX BIOS Addressing test failure	1. Flash the system. See “Flash update procedures” on page 253 2. System board
000-025-XXX BIOS Checksum Value error	1. Flash the system. See “Flash update procedures” on page 253 2. System board
000-026-XXX FLASH data error	1. Flash the system. See “Flash update procedures” on page 253 2. System board
000-027-XXX BIOS Configuration/Setup error	1. Run Setup 2. Flash the system. See “Flash update procedures” on page 253 3. System board
000-034-XXX BIOS Buffer Allocation failure	1. Reboot the system 2. Flash the system. See “Flash update procedures” on page 253 3. Run memory test 4. System board
000-035-XXX BIOS Reset Condition detected	1. Flash the system. See “Flash update procedures” on page 253 2. System board
000-036-XXX BIOS Register error	1. Flash the system. See “Flash update procedures” on page 253 2. System board
000-038-XXX BIOS Extension failure	1. Flash the system. See “Flash update procedures” on page 253 2. Adapter card 3. System board
000-039-XXX BIOS DMI data error	1. Flash the system. See “Flash update procedures” on page 253 2. System board
000-195-XXX BIOS Test aborted by user	Information only Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
000-196-XXX BIOS test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
000-197-XXX BIOS test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
000-198-XXX BIOS test aborted	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and retest. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
000-199-XXX BIOS test failed, cause unknown	1. Go to "Undetermined problems" on page 91 2. Flash the system and re-test 3. Replace component under function test
000-250-XXX BIOS APM failure	1. Flash the system. See "Flash update procedures" on page 253 2. System board
000-270-XXX BIOS ACPI failure	1. Flash the system. See "Flash update procedures" on page 253 2. System board
001-000-XXX System Test Passed	No action
001-00X-XXX System Error	System board
001-01X-XXX System Error	System board
001-024-XXX System Addressing test failure	System board
001-025-XXX System Checksum Value error	1. Flash the system. See "Flash update procedures" on page 253 2. System board
001-026-XXX System FLASH data error	1. Flash the system. See "Flash update procedures" on page 253 2. System board
001-027-XXX System Configuration/Setup error	1. Run Setup 2. Flash the system. See "Flash update procedures" on page 253 3. System board

Diagnostic Error Code	FRU/Action
001-032-XXX System Device Controller failure	System board
001-034-XXX System Device Buffer Allocation failure	1. Reboot the system 2. Flash the system. See “Flash update procedures” on page 253 3. Run memory test 4. System board
001-035-XXX System Device Reset condition detected	System board
001-036-XXX System Register error	System board
001-038-XXX System Extension failure	1. Adapter card 2. System board
001-039-XXX System DMI data structure error	1. Flash the system. See “Flash update procedures” on page 253 2. System board
001-040-XXX System IRQ failure	1. Power-off/on system and re-test 2. System board
001-041-XXX System DMA failure	1. Power-off/on system and re-test 2. System board
001-195-XXX System Test aborted by user	Information only Re-start the test, if necessary
001-196-XXX System test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
001-197-XXX System test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, “Using the Setup Utility,” on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
001-198-XXX System test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, “Using the Setup Utility,” on page 51 2. Flash the system and retest. See “Flash update procedures” on page 253 3. Go to “Undetermined problems” on page 91
001-199-XXX System test failed, cause unknown	1. Go to “Undetermined problems” on page 91 2. Flash the system and re-test 3. Replace component under function test
001-250-XXX System ECC error	System board

Diagnostic Error Code	FRU/Action
001-254-XXX 001-255-XXX 001-256-XXX 001-257-XXX System DMA error	System board
001-260-XXX 001-264-XXX System IRQ error	System board
001-268-XXX System IRQ1 failure	1. Device on IRQ1 2. System board
001-269-XXX System IRQ2 failure	1. Device on IRQ2 2. System board
001-270-XXX System IRQ3 failure	1. Device on IRQ3 2. System board
001-271-XXX System IRQ4 failure	1. Device on IRQ4 2. System board
001-272-XXX System IRQ5 failure	1. Device on IRQ5 2. System board
001-273-XXX System IRQ6 (diskette drive) failure	1. Diskette Cable 2. Diskette drive 3. System board
001-274-XXX System IRQ7 failure	1. Device on IRQ7 2. System board
001-275-XXX System IRQ8 failure	1. Device on IRQ8 2. System board
001-276-XXX System IRQ9 failure	1. Device on IRQ9 2. System board
001-277-XXX System IRQ10 failure	1. Device on IRQ10 2. System board
001-278-XXX System IRQ11 failure	1. Device on IRQ11 2. System board
001-279-XXX System IRQ12 failure	1. Device on IRQ12 2. System board
001-280-XXX System IRQ13 failure	1. Device on IRQ13 2. System board
001-281-XXX System IRQ14 (hard disk drive) failure	1. Hard disk drive cable 2. Hard disk drive 3. System board
001-282-XXX System IRQ15 failure	1. Device on IRQ15 2. System board

Diagnostic Error Code	FRU/Action
001-286-XXX 001-287-XXX 001-288-XXX System Timer failure	System board
001-292-XXX System CMOS RAM error	1. Run Setup and re-test 2. System board
001-293-XXX System CMOS Battery	1. CMOS Battery 2. System board
001-298-XXX System RTC date/time update failure	1. Flash the system. See “Flash update procedures” on page 253 2. System board
001-299-XXX System RTC periodic interrupt failure	System board
001-300-XXX System RTC Alarm failure	System board
001-301-XXX System RTC Century byte error	1. Flash the system. See “Flash update procedures” on page 253 2. System board
005-000-XXX Video Test Passed	No action
005-00X-XXX Video error	1. Video card, if installed 2. System board
005-010-XXX 005-011-XXX 005-012-XXX 005-013-XXX Video Signal failure	1. Video card, if installed 2. System board
005-016-XXX Video Simple Pattern test failure	1. Video Ram 2. Video card, if installed 3. System board
005-024-XXX Video Addressing test failure	1. Video card, if installed 2. System board
005-025-XXX Video Checksum Value error	1. Video card, if installed 2. System board
005-027-XXX Video Configuration/Setup error	1. Run Setup 2. Video drivers update 3. Video card, if installed 4. System board
005-031-XXX Video Device Cable failure	1. Video cable 2. Monitor 3. Video card, if installed 4. System board
005-032-XXX Video Device Controller failure	1. Video card, if installed 2. System board

Diagnostic Error Code	FRU/Action
005-036-XXX Video Register error	1. Video card, if installed 2. System board
005-038-XXX System BIOS extension failure	1. Video card, if installed 2. System board
005-040-XXX Video IRQ failure	1. Video card, if installed 2. System board
005-195-XXX Video Test aborted by user	Information only Re-start the test, if necessary
005-196-XXX Video test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
005-197-XXX Video test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component called out in warning statement 4. Replace the component under test
005-198-XXX Video test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
005-199-XXX Video test failed, cause unknown	1. Go to "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
005-2XX-XXX 005-3XX-XXX Video subsystem error	1. Video card, if installed 2. System board
006-000-XXX Diskette interface Test Passed	No action
006-0XX-XXX Diskette interface error	1. Diskette drive Cable 2. Diskette drive 3. System board
006-195-XXX Diskette interface Test aborted by user	Information only Re-start the test, if necessary
006-196-XXX Diskette interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
006-197-XXX Diskette interface test warning	1. If a component is called out, make sure it is connected and/or enabled 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
006-198-XXX Diskette interface test aborted	1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
006-199-XXX Diskette interface test failed, cause unknown	1. Go to "Undetermined problems" on page 91 2. Flash the system and re-test 3. Replace component under function test
006-25X-XXX Diskette interface Error	1. Diskette drive cable 2. Diskette drive 3. System board
011-000-XXX Serial port Interface Test Passed	No action
011-001-XXX Serial port Presence	1. Remove external serial device, if present 2. Run setup, enable port 3. System board
011-002-XXX 011-003-XXX Serial port Timeout/Parity error	System board
011-013-XXX 011-014-XXX Serial port Control Signal/Loopback test failure	System board
011-015-XXX Serial port External Loopback failure	1. Wrap plug 2. System board
011-027-XXX Serial port Configuration/Setup error	1. Run Setup, enable port 2. Flash the system. See "Flash update procedures" on page 253 3. System board
011-03X-XXX 011-04X-XXX Serial port failure	System board
011-195-XXX Serial port Test aborted by user	Information only Re-start the test, if necessary
011-196-XXX Serial port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
011-197-XXX Serial port test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
011-198-XXX Serial port test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
011-199-XXX Serial port test failed, cause unknown	1. Go to "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
011-2XX-XXX Serial port signal failure	1. External serial device 2. System board
014-000-XXX Parallel port Interface Test Passed	No action
014-001-XXX Parallel port Presence	1. Remove external parallel device, if present 2. Run setup, enable port 3. System board
014-002-XXX 014-003-XXX Parallel port Timeout/Parity error	System board
014-013-XXX 014-014-XXX Parallel port Control Signal/Loopback test failure	System board
014-015-XXX Parallel port External Loopback failure	1. Wrap plug 2. System board
014-027-XXX Parallel port Configuration/Setup error	1. Run Setup, enable port 2. Flash the system. See "Flash update procedures" on page 253 3. System board
014-03X-XXX 014-04X-XXX Parallel port failure	System board
014-195-XXX Parallel port Test aborted by user	Information only Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
014-196-XXX Parallel port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
014-197-XXX Parallel port test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
014-198-XXX Parallel port test aborted	1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
014-199-XXX Parallel port test failed, cause unknown	1. Go to "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
014-2XX-XXX 014-3XX-XXX Parallel port failure	1. External parallel device 2. System board
015-000-XXX USB port Interface Test Passed	No action
015-001-XXX USB port Presence	1. Remove USB device(s) and re-test 2. System board
015-002-XXX USB port Timeout	1. Remove USB device(s) and re-test 2. System board
015-015-XXX USB port External Loopback failure	1. Remove USB device(s) and re-test 2. System board
015-027-XXX USB port Configuration/Setup error	1. Flash the system. See "Flash update procedures" on page 253 2. System board
015-032-XXX USB port Device Controller failure	System board
015-034-XXX USB port buffer allocation failure	1. Reboot the system 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Run memory test 4. System board
015-035-XXX USB port Reset condition detected	1. Remove USB device(s) and re-test 2. System board

Diagnostic Error Code	FRU/Action
015-036-XXX USB port Register error	System board
015-040-XXX USB port IRQ failure	1. Run setup and check for conflicts 2. Flash the system. See “Flash update procedures” on page 253 3. System board
015-195-XXX USB port Test aborted by user	Information only Re-start the test, if necessary
015-196-XXX USB port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
015-197-XXX USB port test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, “Using the Setup Utility,” on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
015-198-XXX USB port test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, “Using the Setup Utility,” on page 51 2. Flash the system and re-test. See “Flash update procedures” on page 253 3. Go to “Undetermined problems” on page 91
015-199-XXX USB port test failed, cause unknown	1. Go to “Undetermined problems” on page 91 2. Flash the system and re-test. See “Flash update procedures” on page 253 3. Replace component under function test
018-000-XXX PCI Card Test Passed	No action
018-0XX-XXX PCI Card Failure	1. Riser card, if installed 2. System board
018-195-XXX PCI Card Test aborted by user	1. PCI card 2. Information only Re-start the test, if necessary
018-196-XXX PCI Card test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
018-197-XXX PCI Card test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
018-198-XXX PCI Card test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
018-199-XXX PCI Card test failed, cause unknown	1. Go to "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
018-250-XXX PCI Card Services error	1. PCI card 2. Riser card, if installed 3. System board
020-000-XXX PCI Interface Test Passed	No action
020-0XX-XXX PCI Interface error	1. PCI card 2. Riser card, if installed 3. System board
020-195-XXX PCI Test aborted by user	Information only Re-start the test, if necessary
020-196-XXX PCI test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
020-197-XXX PCI test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test

Diagnostic Error Code	FRU/Action
020-198-XXX PCI test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, “Using the Setup Utility,” on page 51 2. Flash the system and re-test. See “Flash update procedures” on page 253 3. Go to “Undetermined problems” on page 91
020-199-XXX PCI test failed, cause unknown	1. Go to “Undetermined problems” on page 91 2. Flash the system and re-test. See “Flash update procedures” on page 253 3. Replace component under function test
020-262-XXX PCI system error	1. PCI card 2. Riser card, if installed 3. System board
025-000-XXX IDE interface Test Passed	No action
025-00X-XXX 025-01X-XXX IDE interface failure	1. IDE signal cable 2. Check power supply voltages 3. Reseat IDE signal cable 4. IDE device 5. System board
025-027-XXX IDE interface Configuration/Setup error	1. IDE signal cable 2. Flash the system. See “Flash update procedures” on page 253 3. Reseat IDE signal cable 4. IDE device 5. System board
025-02X-XXX 025-03X-XXX 025-04X-XXX IDE Interface failure	1. IDE signal cable 2. Check power supply 3. Reseat IDE signal cable 4. IDE device 5. System board
025-195-XXX IDE interface Test aborted by user	Information only Re-start the test, if necessary
025-196-XXX IDE interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
025-197-XXX IDE interface test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, “Using the Setup Utility,” on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test

Diagnostic Error Code	FRU/Action
025-198-XXX IDE interface test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
025-199-XXX IDE interface test failed, cause unknown	1. Go to "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
030-000-XXX SCSI interface Test Passed	No action
030-00X-XXX 030-01X-XXX SCSI interface failure	1. SCSI signal cable 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-027-XXX SCSI interface Configuration/Setup error	1. SCSI signal cable 2. Flash the system. See "Flash update procedures" on page 253 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-03X-XXX 030-04X-XXX SCSI interface error	1. SCSI signal cable 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-195-XXX SCSI interface Test aborted by user	Information only Re-start the test, if necessary
030-196-XXX SCSI interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
030-197-XXX SCSI interface test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test

Diagnostic Error Code	FRU/Action
030-198-XXX SCSI interface test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
030-199-XXX SCSI interface test failed, cause unknown	1. Go to "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
035-000-XXX RAID interface Test Passed	No action
035-0XX-XXX RAID interface Failure	1. RAID signal cable 2. RAID device 3. RAID adapter card, if installed 4. System board
035-195-XXX RAID interface Test aborted by user	Information only Re-start the test, if necessary
035-196-XXX RAID interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
035-197-XXX RAID interface test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
035-198-XXX RAID interface test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
035-199-XXX RAID interface test failed, cause unknown	1. See "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
071-000-XXX Audio port Interface Test Passed	No action

Diagnostic Error Code	FRU/Action
071-00X-XXX 071-01X-XXX 071-02X-XXX Audio port error	1. Run Setup 2. Flash the system. See “Flash update procedures” on page 253 3. System board
071-03X-XXX Audio port failure	1. Speakers 2. Microphone 3. Audio card, if installed 4. System board
071-04X-XXX Audio port failure	1. Run Setup 2. Audio card, if installed 3. System board
071-195-XXX Audio port Test aborted by user	Information only Re-start the test, if necessary
071-196-XXX Audio port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
071-197-XXX Audio port test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, “Using the Setup Utility,” on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
071-198-XXX Audio port test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, “Using the Setup Utility,” on page 51 2. Flash the system and re-test. See “Flash update procedures” on page 253 3. Go to “Undetermined problems” on page 91
071-199-XXX Audio port test failed, cause unknown	1. See “Undetermined problems” on page 91 2. Flash the system and re-test. See “Flash update procedures” on page 253 3. Replace component under function test
071-25X-XXX Audio port failure	1. Speakers 2. Audio card, if installed 3. System board
080-000-XXX Game Port interface Test Passed	No action
080-XXX-XXX Game Port interface Error	1. Remove the game port device and re-test the system
080-195-XXX Game Port interface Test aborted by user	Information only Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
080-196-XXX Game Port interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
080-197-XXX Game Port interface test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
080-198-XXX Game Port interface test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
080-199-XXX Game Port interface test failed, cause unknown	1. See "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
086-000-XXX Mouse Port interface Test Passed	No action
086-001-XXX Mouse Port interface Presence	1. Mouse 2. System board
086-032-XXX Mouse Port interface Device controller failure	1. Mouse 2. System board
086-035-XXX Mouse Port interface Reset	1. Mouse 2. System board
086-040-XXX Mouse Port interface IRQ failure	1. Run Setup 2. Mouse 3. System board
086-195-XXX Mouse Port interface Test aborted by user	Information only Re-start the test, if necessary
086-196-XXX Mouse Port interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
086-197-XXX Mouse Port interface test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
086-198-XXX Mouse Port interface test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
086-199-XXX Mouse Port interface test failed, cause unknown	1. See "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
089-000-XXX Microprocessor Test Passed	No action
089-XXX-XXX Microprocessor failure	1. Microprocessor(s) 2. System board
089-195-XXX Microprocessor Test aborted by user	Information only Re-start the test, if necessary
089-196-XXX Microprocessor test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
089-197-XXX Microprocessor test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
089-198-XXX Microprocessor test aborted	1. Flash the system. See "Flash update procedures" on page 253 2. Go to "Undetermined problems" on page 91
089-199-XXX Microprocessor test failed, cause unknown	1. See "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
170-000-XXX Voltage Sensor(s) Test Passed	No action

Diagnostic Error Code	FRU/Action
170-0XX-XXX Voltage Sensor(s) failure	1. Flash system 2. System board
170-195-XXX Voltage Sensor(s) Test aborted by user	Information only Re-start the test, if necessary
170-196-XXX Voltage Sensor(s) test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
170-197-XXX Voltage Sensor(s) test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
170-198-XXX Voltage Sensor(s) test aborted	1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
170-199-XXX Voltage Sensor(s) test failed, cause unknown	1. See "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
170-250-XXX 170-251-XXX Voltage Sensor(s) Voltage limit error	1. Power supply 2. System board
170-254-XXX Voltage Sensor(s) Voltage Regulator Module error	1. Voltage Regulator Module (VRM) 2. Microprocessor 3. System board
175-000-XXX Thermal Sensor(s) Test Passed	No action
175-0XX-XXX Thermal Sensor(s) failure	1. Flash system 2. System board
175-195-XXX Thermal Sensor(s) Test aborted by user	Information only Re-start the test, if necessary
175-196-XXX Thermal Sensor(s) test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
175-197-XXX Thermal Sensor(s) test warning	1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 51 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
175-198-XXX Thermal Sensor(s) test aborted	1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Go to "Undetermined problems" on page 91
175-199-XXX Thermal Sensor(s) test failed, cause unknown	1. See "Undetermined problems" on page 91 2. Flash the system and re-test. See "Flash update procedures" on page 253 3. Replace component under function test
175-250-XXX 175-251-XXX Thermal Sensor(s) limit error	1. Check fans 2. Check Power supply voltages 3. Microprocessor 4. System board
185-000-XXX Asset Security Test Passed	No action
185-XXX-XXX Asset Security failure	1. Flash system 2. System board
185-278-XXX Asset Security Chassis Intrusion	1. Assure Asset Security Enabled 2. C2 Cover Switch 3. System board
201-000-XXX System Memory Test Passed	No action
201-XXX-XXX System Memory error	1. Replace the memory module called out by the test 2. System board
202-000-XXX System Cache Test Passed	No action
202-XXX-XXX System Cache error	1. Cache, if removable 2. System board 3. Microprocessor
206-000-XXX Diskette Drive Test Passed	No action
206-XXX-XXX Diskette Drive error	1. Diskette Drive Cable 2. Check power supply voltages 3. Diskette drive 4. System board

Diagnostic Error Code	FRU/Action
215-000-XXX CD-ROM Drive Test Passed	No action
215-XXX-XXX CD-ROM Drive error	1. CD-ROM Drive Cable 2. Check power supply voltages 3. CD-ROM drive 4. System board
217-000-XXX Hard Disk Drive Test Passed	No action
217-25X-XXX 217-26X-XXX Hard Disk Drive (IDE) error	1. Hard Disk Drive Cable 2. Check power supply voltages 3. Reseat the hard disk drive cable 4. Hard Disk drive (IDE) 5. System board
217-28X-XXX 217-29X-XXX Hard Disk Drive (SCSI) error	1. Hard Disk Drive Cable 2. Check power supply voltages 3. Reseat the hard disk drive cable 4. Hard Disk drive (SCSI) 5. SCSI adapter card 6. System board
220-000-XXX Hi-Capacity Cartridge Drive Test Passed	No action
220-XXX-XXX Hi-Capacity Cartridge Drive error	1. Remove the Hi-Capacity Cartridge Drive and re-test the system
301-XXX-XXX Keyboard error	1. Keyboard 2. Check and test mouse 3. System board
301-000-XXX Keyboard Test Passed	No action
302-000-XXX Mouse Test Passed	No action
302-XXX-XXX Mouse error	1. Mouse 2. Check and test Keyboard 3. System board
303-000-XXX Joystick Test Passed	No action
303-XXX-XXX Joystick error	Remove the Joystick and re-test the system
305-000-XXX Monitor DDC Test Passed	No action
305-250-XXX Monitor DDC self test failure	1. Run Setup to enable DDC 2. Cable 3. Monitor 4. Video card 5. System board

Diagnostic Error Code	FRU/Action
415-000-XXX Modem Test Passed	No action
415-XXX-XXX Modem error	Remove the Modem and re-test the system

Beep symptoms

Beep symptoms are tones or a series of tones separated by pauses (intervals without sound) during POST.

The following tables describes beep symptoms.

Beep Symptom	FRU/Action
2 short beeps CMOS setting error	Perform the following actions in order. 1. Start the Setup Utility program and press F10 to Save and exit. See Chapter 6, "Using the Setup Utility," on page 51. 2. Start the Setup Utility program and press F7 to load defaults and then press F10 to Save and exit. 3. Perform a Boot block recovery. See "Recovering from a POST/BIOS update failure" on page 254.
1 long and 2 short beeps Monitor or video adapter card error	Perform the following actions in order. 1. Make sure the monitor is properly connected to the computer. 2. Replace the video adapter card (if present). 3. Replace the system board.
1 long and 3 short beeps Keyboard error	Perform the following actions in order. 1. Make sure the keyboard is properly connected to the keyboard connector. 2. Replace the keyboard. 3. Replace the system board.
1 long and 9 short beeps BIOS ROM error	Perform the following actions in order. 1. Start the Setup Utility program and press F7 to load defaults and then press F10 to Save and exit. See Chapter 6, "Using the Setup Utility," on page 51. 2. Perform a Boot block recovery. See "Recovering from a POST/BIOS update failure" on page 254. 3. Replace the system board.
Continuos long beeps DRAM memory error	Perform the following actions in order. 1. Make sure the memory module(s) are properly seated in the connector(s). 2. Replace the memory module(s). 3. Replace the system board.

POST error codes

Each time you power-on the system, it performs a series of tests that check the operation of the system and some options. This series of tests is called the *Power-On Self-Test*, or *POST*. POST does the following operations.

- Checks some basic system-board operations
- Checks the memory operation
- Starts the video operation
- Verifies that the boot drive is working

If the POST detects a problem, an error message appears on the screen. A single problem can cause several error messages to appear. When you correct the cause of the first error message, the other error messages probably will not appear on the screen the next time you turn on the system.

POST Error Message	Description/Action
CMOS battery failed	The CMOS battery is no longer functional. Replace the battery.
CMOS checksum error - defaults loaded	Checksum of CMOS is incorrect. The computer loads the default configuration settings. This error might indicate that CMOS has become corrupt due to a weak CMOS battery.
CPU at nnnn	nnnn is the running speed of the microprocessor.
Press Esc to skip memory test	Pressing Esc skips the full memory test
HARD DISK INSTALL FAILURE	Cannot find or initialize the hard disk drive controller or the drive. Make sure the hard disk drive is correctly installed. If no hard disk drives are installed, make sure the hard disk drive selection in Setup is set to NONE.
Keyboard error or no keyboard present	Cannot initialize the keyboard. Make sure the keyboard is properly connected to the computer and that no keys are held pressed during POST. To purposely configure the computer without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. The BIOS then ignores the missing keyboard during POST.
Memory Test:	This message displays during a full memory test, counting down the memory areas being tested.
Memory test fail	If POST detects an error during memory testing, additional information appears. This information gives specifics about the type and location of the memory error.

POST Error Message	Description/Action
Press TAB to show POST screen	Pressing the TAB key permits the user to toggle between the default POST display screen and a custom POST display screen.
Error: Non-System disk or disk error Replace and press any key when ready	The BIOS was unable to find a suitable boot device. Make sure the boot drive is properly connected to the computer. Make sure you have bootable media.

Miscellaneous error messages

Message/Symptom	FRU/Action
Changing display colors	Display/Monitor
Computer will <i>not</i> power-off. See “Power Supply Problems” on page 65.	Power Switch - System Board - Riser card, if installed
Computer will <i>not</i> RPL from server	Ensure that network is in startup sequence as first device or first device after diskette - Ensure that network adapter is enabled for RPL - Network adapter (Advise network administrator of new MAC address)
Computer will <i>not</i> perform a Wake On LAN [®] (if applicable)	Check power supply and signal cable connections to network adapter - Ensure that the operating system settings are set to enable Wake on LAN - Ensure Wake On LAN feature is enabled in Setup/Configuration (see “Starting the Setup Utility program” on page 51) - Ensure network administrator is using correct MAC address - Ensure no interrupt or I/O address conflicts - Network adapter (advise network administrator of new MAC address)
Dead computer. See “Power Supply Problems” on page 65.	Power Supply - System Board
Diskette drive in-use light remains on or does not light when drive is active.	Diskette Drive - System Board - Diskette Drive Cable
Flashing cursor with an otherwise blank display.	System Board - Primary Hard Disk Drive - Hard Disk Drive Cable
Incorrect memory size during POST	Run the Memory tests - Memory Module - System Board
“Insert a Diskette” icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	System Board - Diskette Drive Cable - Network Adapter
Intensity or color varies from left to right of characters and color bars	Display - Video adapter (if present) - System Board
No power or fan not running	See “Power Supply Problems” on page 65.

Message/Symptom	FRU/Action
Non-system disk or disk error-type message with a known-good diagnostic diskette.	1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Other display symptoms not listed above (including blank or illegible display)	1. Display 2. System Board
Power-on indicator or hard disk drive in-use light not on, but computer works correctly	1. Power switch/LED assembly 2. System Board
Printer problems	1. Printer 2. System Board
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive	1. Run Setup and check Startup sequence. 2. Diskette Drive 3. Diskette Drive Cable 4. System Board 5. Power Supply
RPL computer cannot access programs from its own hard disk.	1. If network administrator is using LCCM Hybrid RPL, check startup sequence: a. First device - network b. Second device - hard disk 2. Hard disk drive
RPL computer does not RPL from server	1. Check startup sequence 2. Check the network adapter LED status
Serial or parallel port device failure (system board port)	1. External Device Self-Test OK? 2. External Device 3. Cable 4. System Board
Serial or parallel port device failure (adapter port)	1. External Device Self-Test OK? 2. External Device 3. Cable 4. Alternate Adapter 5. System Board
Some or all keys on the keyboard do not work	1. Keyboard 2. Keyboard Cable 3. System Board

Undetermined problems

If this computer has a parallel ATA hard disk drive, make sure that the hard disk drive is jumpered as a master and the optical drive is jumpered as a slave.

1. Power-off the computer.
2. Remove or disconnect the following components (if installed) one at a time.
 - a. External devices (modem, printer, or mouse)
 - b. Any adapters

- c. Memory modules
 - d. Extended video memory
 - e. External Cache
 - f. External Cache RAM
 - g. Hard disk drive
 - h. Diskette drive
3. Power-on the computer to re-test the system.
 4. Repeat steps 1 through 3 until you find the failing device or adapter.

If all devices and adapters have been removed, and the problem continues, replace the system board.

Chapter 10. Replacing FRUs (Type 4105, 4157, 4217)

Important

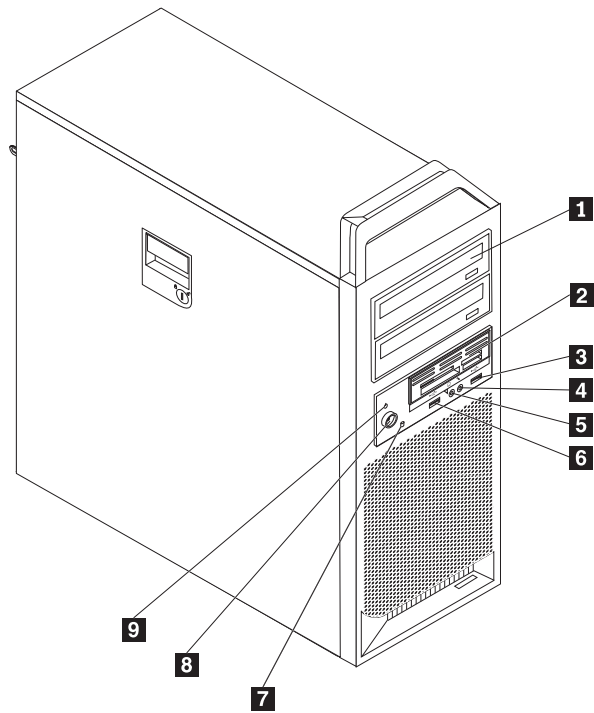
Before you replace any FRU, read Chapter 2, "Safety information," on page 3. These precautions and guidelines will help you work safely.

FRU replacements are to be done by trained service technicians only.

This chapter does not contain a remove and replace procedure for all FRUs. Only the major FRUs are documented.

Locating controls and connectors on the front of your computer

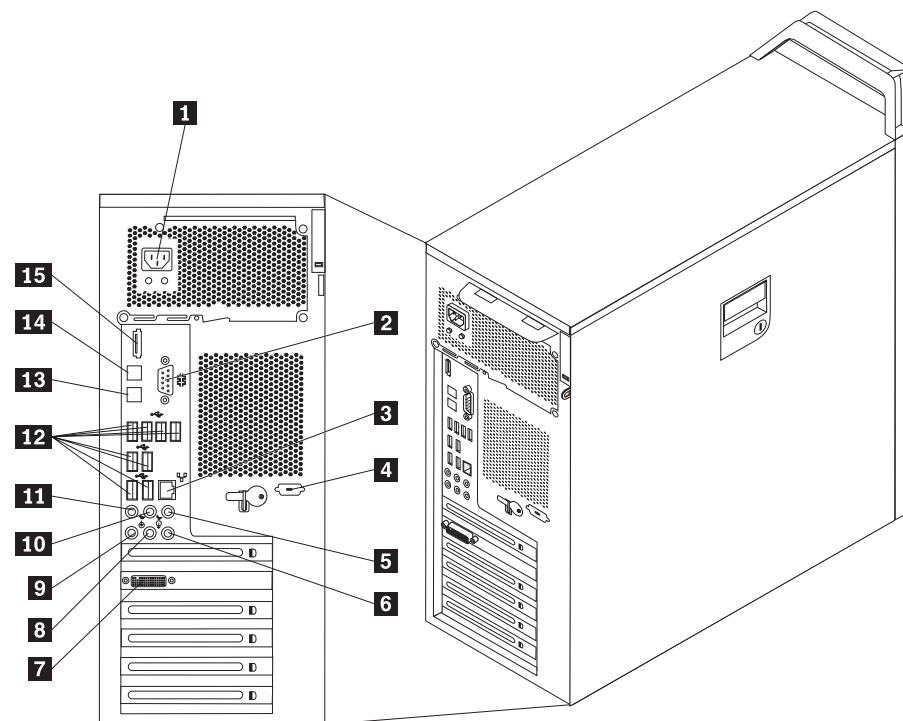
The following illustration shows the location of the controls and connectors on the front of your computer.



- | | | | |
|----------|--|----------|--------------------------------|
| 1 | Optical drive (some models) | 6 | USB connector |
| 2 | 3.5-inch diskette drive or card reader (some models) | 7 | Hard disk drive activity light |
| 3 | USB connector | 8 | Power button |
| 4 | Microphone connector | 9 | Power-on indicator |
| 5 | Headphone connector | | |

Rear connectors

The following illustration shows the locations of the connectors on the rear of the computer.



1 Power cord connector

2 Serial port

3 Ethernet connector

4 Serial port (some models)

5 Audio line-out subwoofer/center speakers connector

6 Audio line-in connector

7 Video connector (some models)

8 Audio line-out front speakers connector

9 Microphone connector

10 Audio line-out rear speakers connector

11 SPDIF (Sony Philips Digital Interconnect Format) out connector

12 USB connectors (8)

13 Optical SPDIF in connector

14 Optical SPDIF out connector

15 eSATA connector

Removing the cover

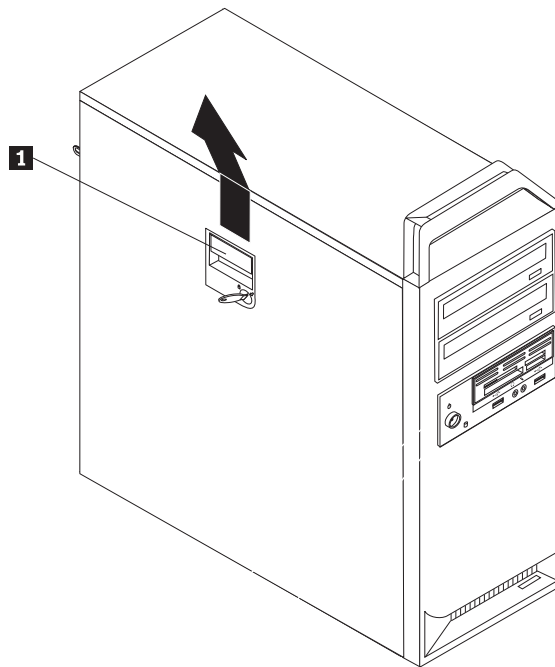
CAUTION:



The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

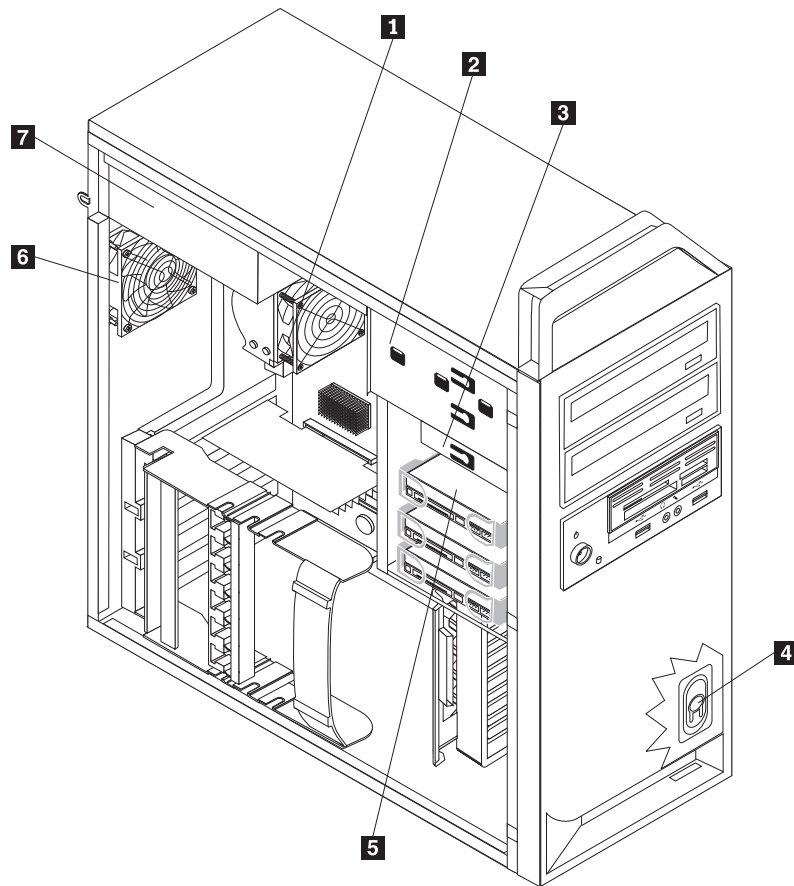
To remove the computer cover:

1. Remove any media from the drives and shut down your operating system. Turn off all attached devices. Turn off the computer.
2. Unplug all power cords from electrical outlets.
3. Disconnect the cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables that are connected to the computer. See “Locating controls and connectors on the front of your computer” on page 94 and “Rear connectors” on page 95.
4. Remove any locking devices, such as a cable lock or padlock that secures the computer cover. Open the keylock if it is in the locked position.
5. Disengage the cover latch **1** and remove the cover. Place the cover on a flat surface.



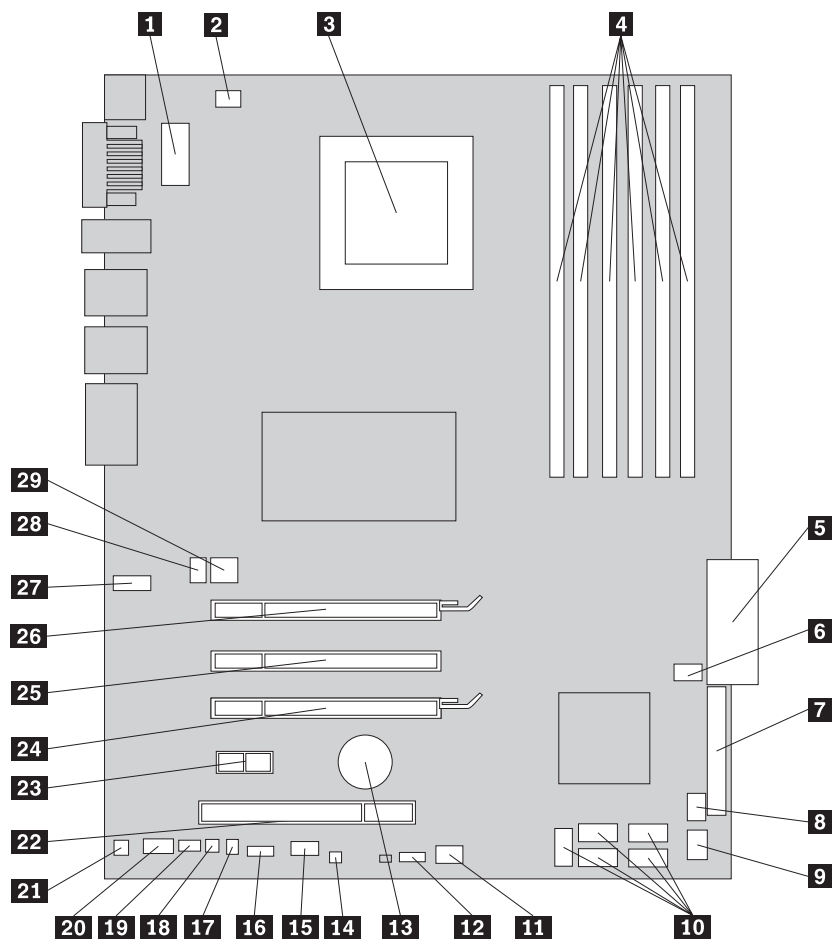
Locations

The following illustration will help you locate the major FRUs in the computer.



- | | | | |
|----------|---|----------|-------------------|
| 1 | Microprocessor, heat sink, and heat sink fan assembly | 5 | Hard disk drives |
| 2 | Optical drive | 6 | Rear fan assembly |
| 3 | 3.5-inch diskette drive or card reader | 7 | Power supply |
| 4 | Internal speaker | | |

Locating parts on the system board

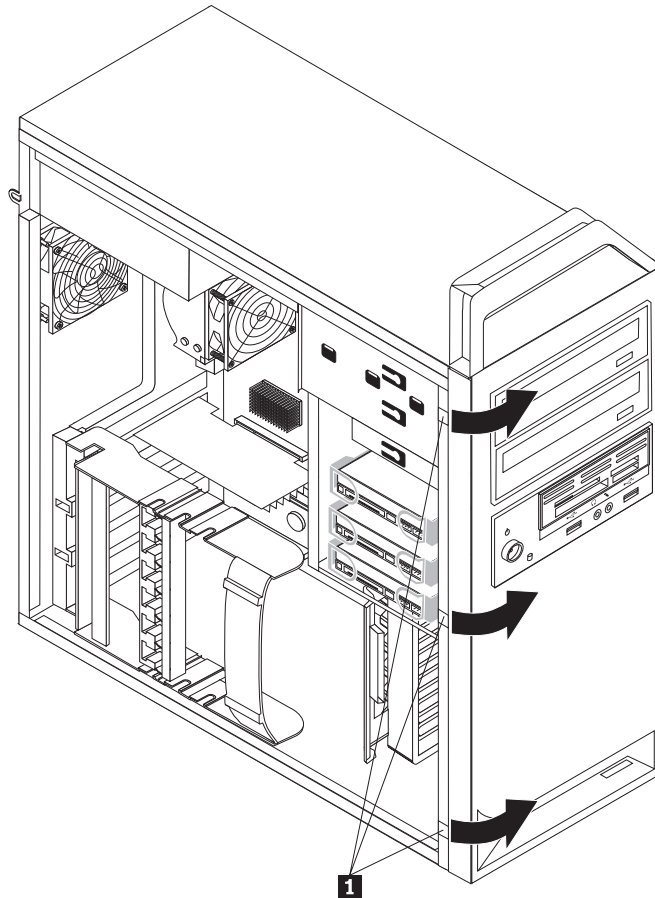


- | | | | |
|-----------|--|-----------|--|
| 1 | Microprocessor 12 V power connector | 16 | Front panel connector |
| 2 | Microprocessor fan connector | 17 | Cover presence switch connector |
| 3 | Microprocessor | 18 | Thermal sensor connector |
| 4 | Memory slots (6) | 19 | PS/2 connector |
| 5 | 24-pin system power connector | 20 | Front audio connector |
| 6 | Hard disk drive fan assembly connector | 21 | Internal speaker connector |
| 7 | Diskette drive connector | 22 | PCI adapter card slot |
| 8 | Card reader connector | 23 | PCI Express x1 adapter card slot |
| 9 | Front USB connector | 24 | PCI Express x16 graphics adapter card slot |
| 10 | SATA connectors (5) | 25 | PCI Express x4 adapter card slot |
| 11 | Adapter card fan connector | 26 | PCI Express x16 graphics adapter card slot |
| 12 | SAS (Serial Attached SCSI) LED connector | 27 | Second COM port connector |
| 13 | Battery | 28 | Rear fan assembly connector |
| 14 | Clear CMOS/Recovery jumper | 29 | Auxiliary 12 V power connector |
| 15 | Auxiliary LED connector | | |

Removing the front bezel

To remove the front bezel:

1. Remove the cover. See “Removing the cover” on page 96.
2. Remove the front bezel by releasing the three plastic tabs **1** on the left side and pivoting the bezel outward.



3. Lay the front bezel on a flat surface.
4. To reinstall the bezel, align the plastic tabs on the right side of the bezel with the corresponding holes in the chassis, then pivot the bezel inward until it snaps into position on the left side.

Replacing the power supply

Attention

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no servicable parts inside these components.

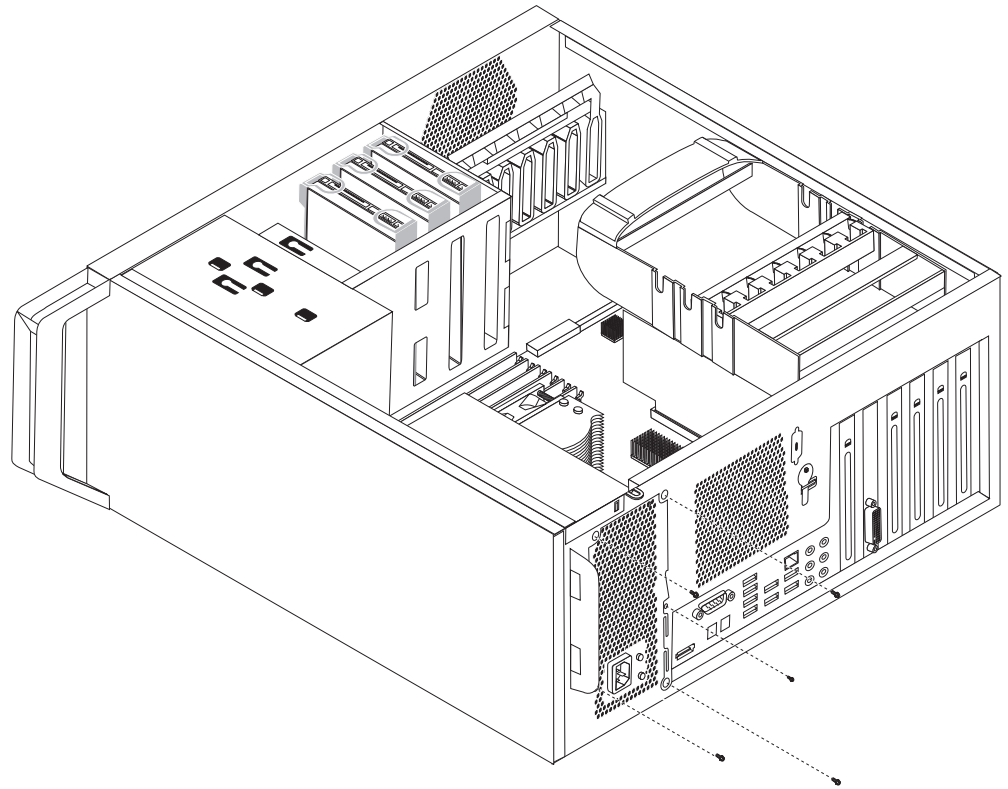
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

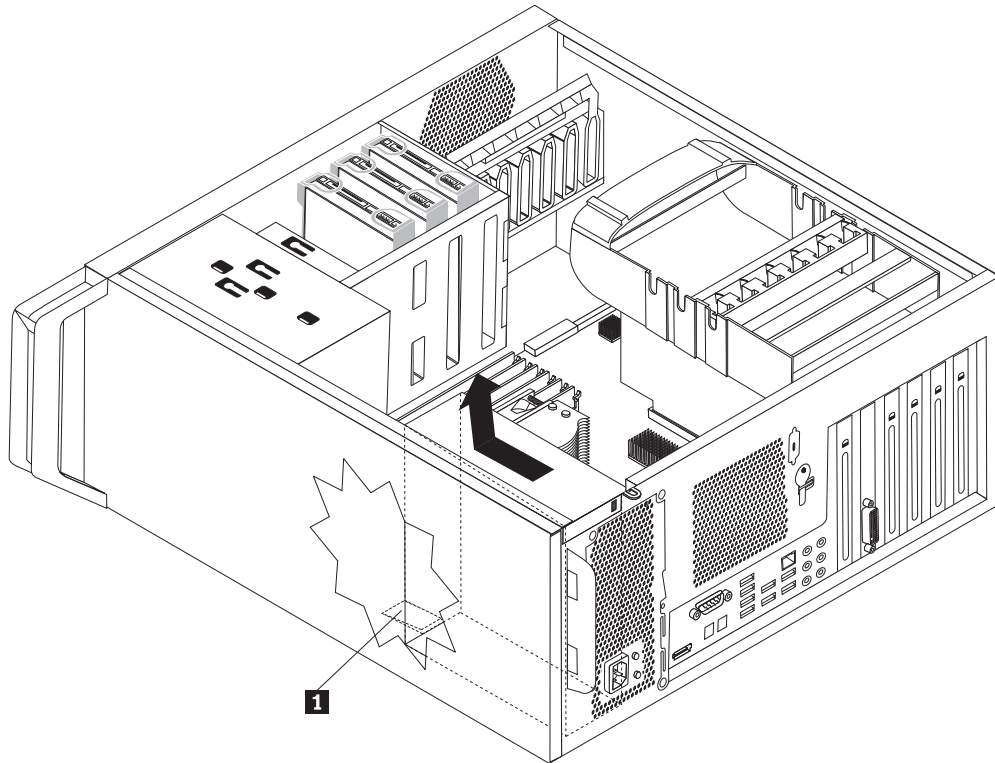
This section provides information on how to remove or replace the power supply.

To replace the power supply, do the following:

1. Remove the computer cover and then lay the computer on its side. See “Removing the cover” on page 96.
2. Locate the power supply assembly. See “Locations” on page 97.
3. Disconnect the power supply cables from the system board connectors. Disconnect the power supply cables from all adapter cards (some models) and from all drives.
4. Remove the power supply cables from the cable clips and ties.
5. Remove the five screws at the rear of the chassis that secure the power supply.



6. Depress the power supply latch **1**. Slide the power supply assembly toward the front of the computer and remove it from the chassis.



7. Ensure that the new power supply is the correct replacement. Some power supplies automatically sense the voltage, some power supplies are voltage specific, and some power supplies have a voltage-selection switch. If there is a voltage-selection switch, use a ballpoint pen to slide the switch, if necessary.

Note: For models that have a switch:

- If the voltage supply range is 100–127 V AC, set the switch to 115 V.
- If the voltage supply range is 200–240 V AC, set the switch to 230 V.

8. Install the new power supply into the chassis so that the screw holes in the power supply align with those in the chassis.

Note: Use only the screws provided by Lenovo.

9. Install and tighten the five screws at the rear of the chassis to secure the power supply. Reconnect all power supply cables to the drives, adapter cards, and the system board. Make sure to reconnect the power cable to the graphics cards that require an additional cable.
10. Go to “Completing the FRU replacement” on page 131.

Replacing a memory module

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

CAUTION:



The memory module might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

This section provides instructions on how to replace a memory module.

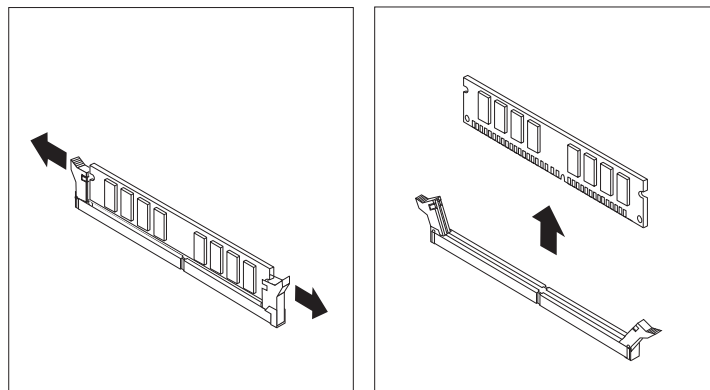
Your computer has 6 slots for installing or replacing DDR3 UDIMMs (double data rate 3 error correction code unbuffered dual inline memory modules).

When installing or replacing memory modules, use the following guidelines:

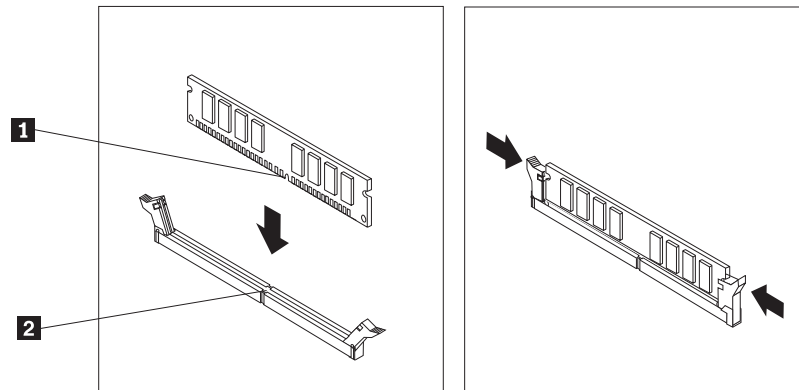
- Always install DIMMs in the numerical order printed on the system board (DIMM1, DIMM2, DIMM3, and so on).
- Install memory modules into the blue memory slots first. Install memory modules into the black memory slots only after all the blue memory slots are occupied.
- Be sure to install memory modules starting with the memory slots adjacent to the CPU.

To remove or replace the memory module, do the following:

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Locate the memory module slots. See “Locating parts on the system board” on page 98.
3. Remove the memory module being replaced by opening the retaining clips.



4. Position the replacement memory module over the memory slot. Make sure the notch **1** on the memory module aligns correctly with the slot key **2** on the system board. Push the memory module straight down into the slot until the retaining clips close. See “Installing or replacing a memory module” on page 141.



5. Go to “Completing the FRU replacement” on page 131.

Replacing a PCI adapter card

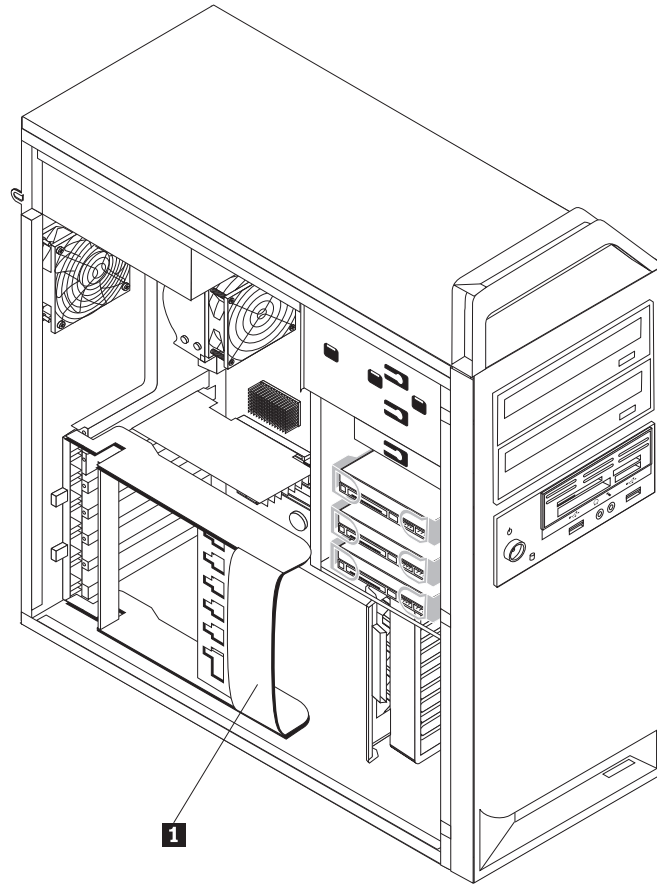
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides information on how to remove or replace a PCI adapter card.

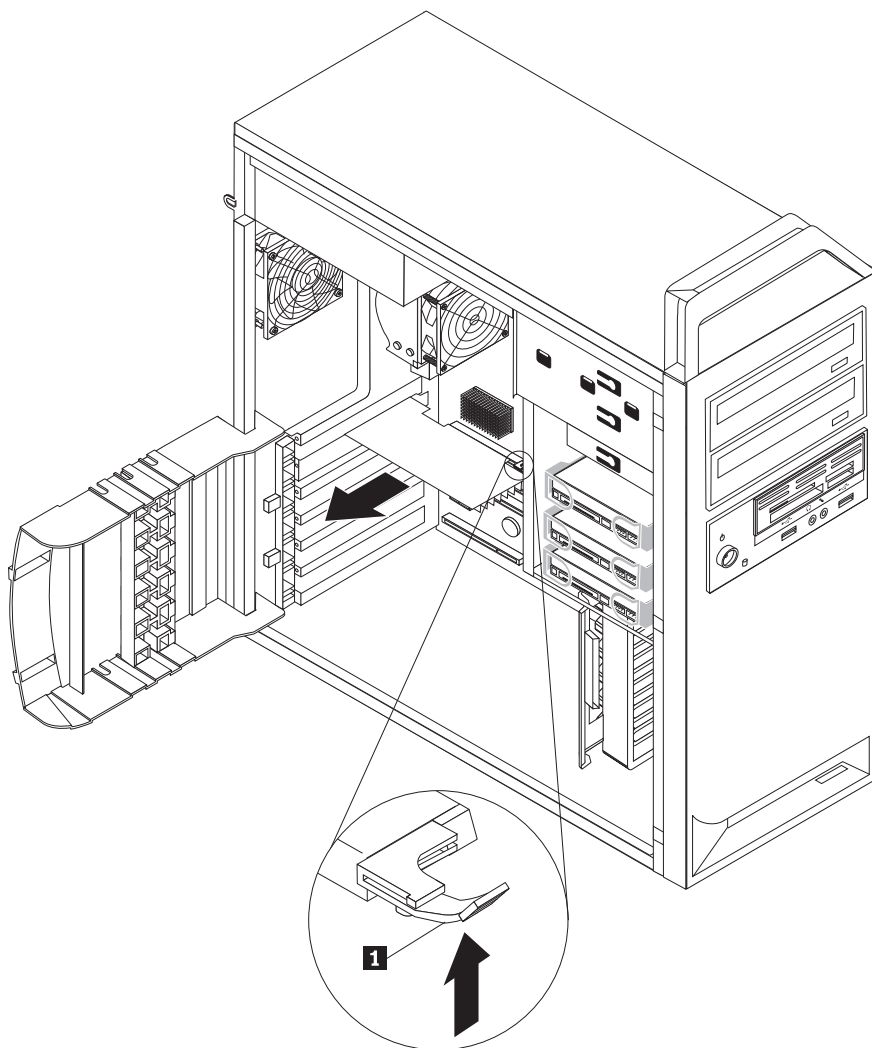
To remove or replace the PCI adapter card, do the following:

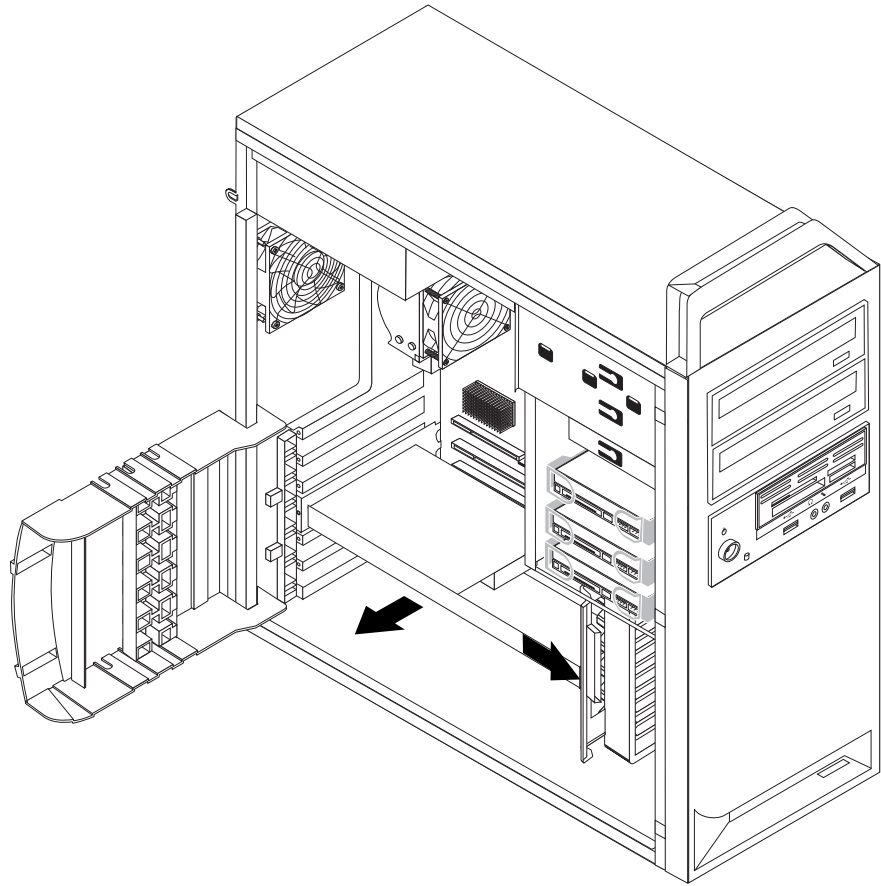
1. Remove the computer cover. See “Removing the cover” on page 96.
2. Unlatch and open the adapter card retainer **1**.



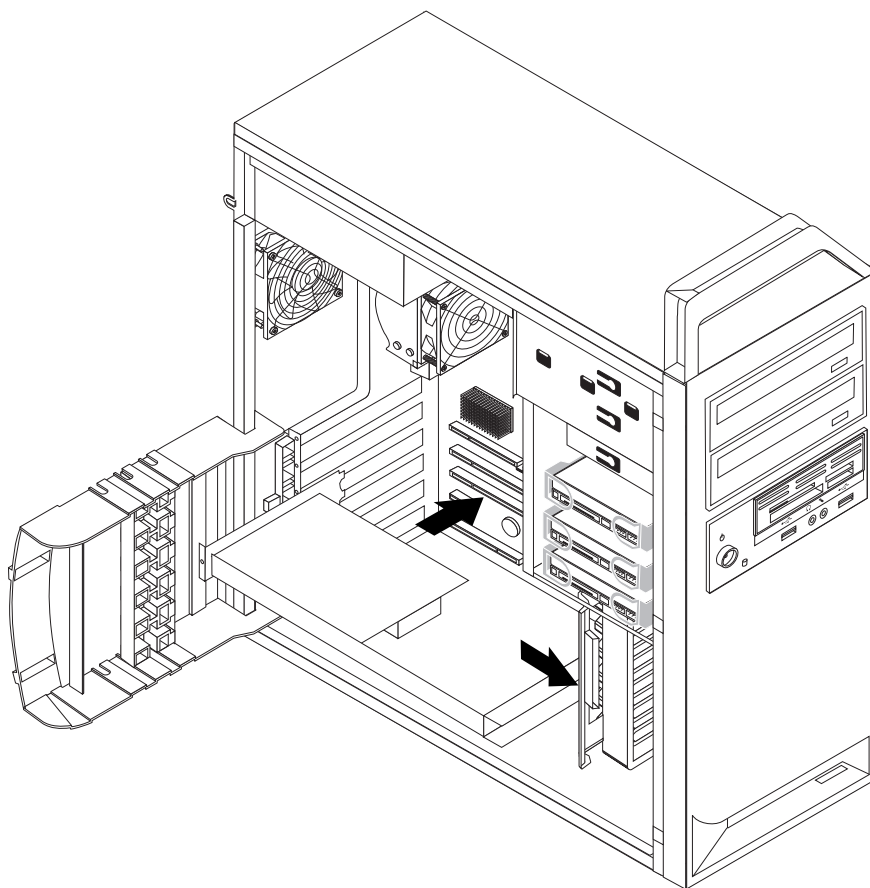
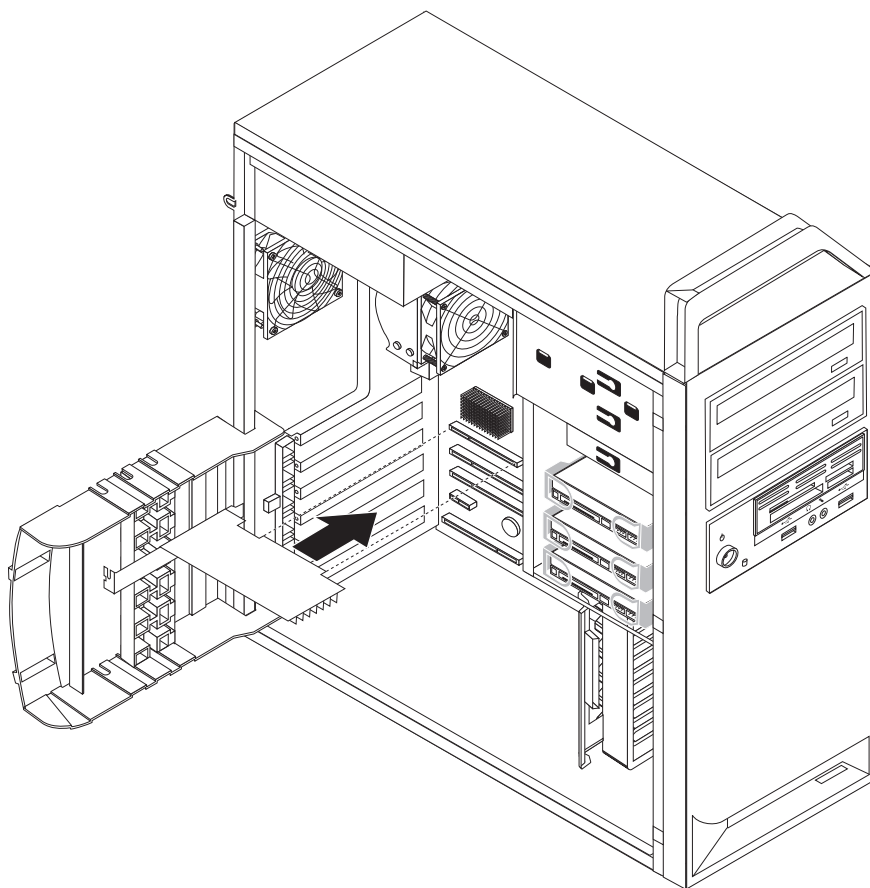
3. Take note of the location of all cable connections on the adapter card. It will be necessary to reconnect them properly when installing a new adapter card.
4. Disconnect all cables connected to the adapter card. See "Locating parts on the system board" on page 98.
5. Some models have:
 - A screw installed in the adapter bracket, remove this screw.
 - An additional retention feature located on the card guide end. Push the retention feature toward the front of the chassis before removing the adapter card.
6. Release the adapter card support retaining latch **1** if necessary. Grasp the failing adapter card and pull the adapter card out of the slot.

Note: The adapter card fits tightly into the card slot. If necessary, alternate moving each side of the adapter card a small amount until it is removed from the adapter card slot.





7. Remove the new adapter card from its static-protective package.
8. Install the new adapter card into the appropriate adapter card slot on the system board. See "Locating parts on the system board" on page 98.



9. Connect any adapter card cables to the system board.
10. Latch the adapter card retainer.
11. Go to “Completing the FRU replacement” on page 131.

Replacing the heat sink

CAUTION:



The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

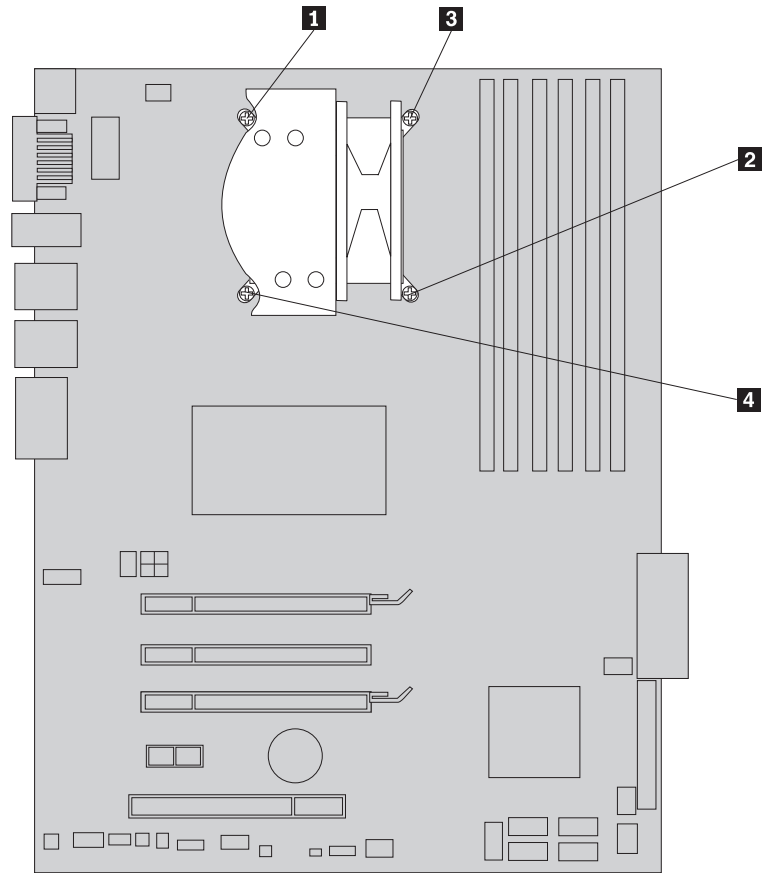
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace and install the heat sink.

To replace the heat sink:

1. Open the computer cover. See “Removing the cover” on page 96.
2. Lay the computer on its side for easier access to the heat sink.
3. Remove the heat sink and fan assembly cable from the system board. Note the cable location. See “Locating parts on the system board” on page 98.
4. Follow this sequence to remove the heat sink from the system board:
 - a. Partially remove screw **1**, then fully remove screw **2**, and fully remove screw **1**.
 - b. Partially remove screw **3**, then fully remove screw **4**, and fully remove screw **3**.



5. Carefully lift the heat sink off of the system board.
6. Remove the plastic cover from the bottom of the new heat sink to expose the heat sink grease (this cover protects the heat sink grease from contamination).

Notes:

- a. Do not remove the plastic cover until you are ready to install the heat sink and fan assembly on the microprocessor. Do not touch the grease on the heat sink and fan assembly. Do not put the heat sink and fan assembly anywhere except on the microprocessor after the plastic cover has been removed and the grease exposed.
 - b. Some heat sink part numbers will have orientation labels showing "Front of System." Heat Sinks that do not have orientation labels should be oriented so the fan cable is toward the board connector labeled "CPU Fan."
7. Place the new heat sink into position.

Important: Do not touch the thermal grease while handling the heat sink.

8. Align the four screws on the heat sink with the four mounting studs in the chassis.
9. Follow this sequence to install the screws, noting that fully tight is 5 in-lbs +/- 0.5 in-lbs:
 - a. Partially tighten screw **1**, then fully tighten screw **2**, and fully tighten screw **1**.
 - b. Partially tighten screw **3**, then fully tighten screw **4**, and fully tighten screw **3**.
10. Reconnect the heat sink fan cable. See "Locating parts on the system board" on page 98.

11. Go to “Completing the FRU replacement” on page 131.

Replacing the microprocessor

CAUTION:



The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

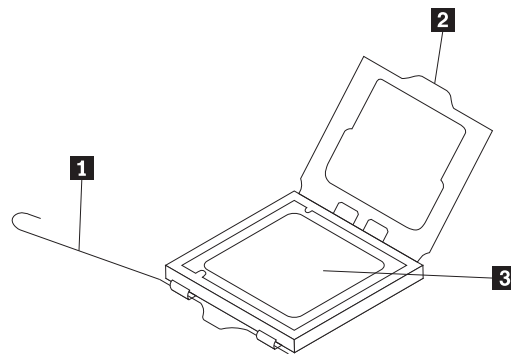
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the microprocessor.

To replace the microprocessor:

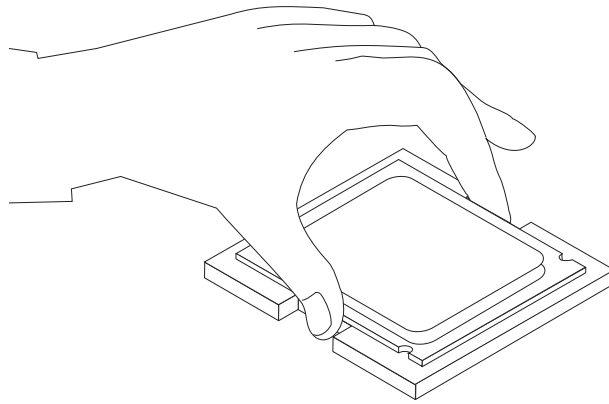
1. Open the computer cover. See “Removing the cover” on page 96.
2. Place the computer on its side to help make the system board more accessible.
3. Remove the heat sink from the system board. See “Replacing the heat sink” on page 109.
4. To remove the microprocessor **3** from the system board, lift the small handle **1** and open the retainer **2**.



Important

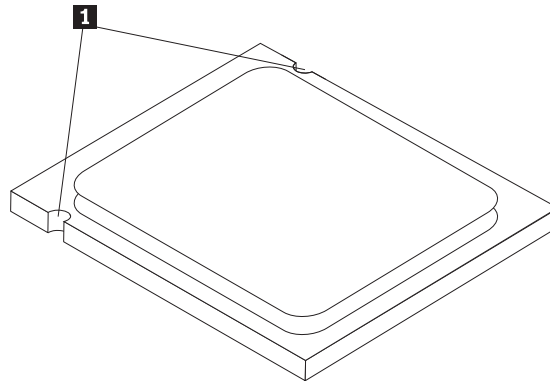
Touch only the sides of the microprocessor. Do not touch the gold contacts on the bottom.

5. Lift the microprocessor straight up and out of the socket.



Notes:

- a. Note the orientation of the notches **1** on the microprocessor. This is important when reinstalling the microprocessor on the new system board.

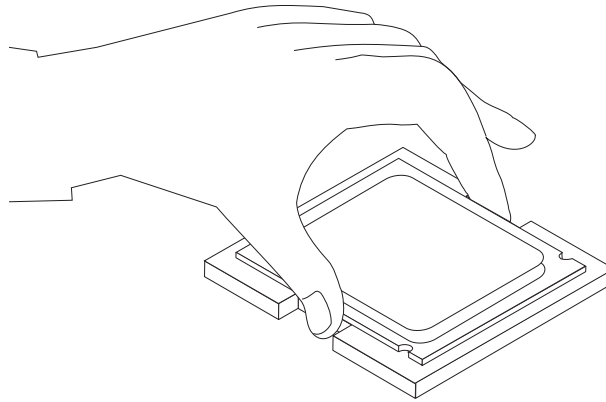


- b. Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.
6. Holding the microprocessor with your fingers, position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket.

Important

To avoid damaging the microprocessor contacts, do not tilt the microprocessor when installing it into the socket.

7. Lower the microprocessor straight down into the microprocessor socket of the system board.



8. Close the microprocessor retainer and clamp it with the small handle.
9. Place the heat sink into position and replace the 4 screws to secure the heat sink to the system board.
10. Reconnect the heat sink fan cable.
11. Go to "Completing the FRU replacement" on page 131.

Replacing the system board

CAUTION:



The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

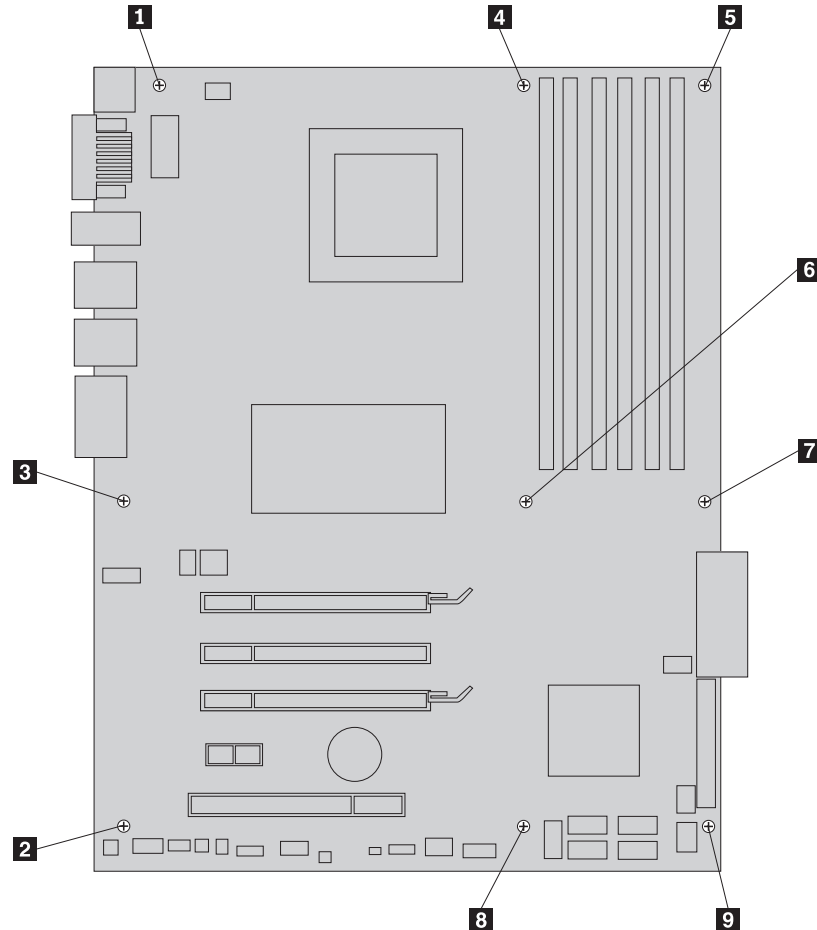
Note: When replacing the system board a new retention module for the microprocessor heat sink is required. Make sure you have a new retention module before beginning this procedure.

This section provides instructions on how to remove and install the system board.

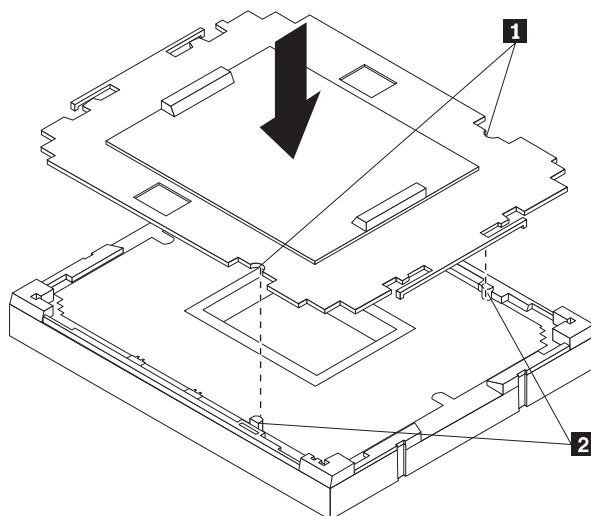
To replace the system board:

1. Open the cover. See "Removing the cover" on page 96.
2. Lay the computer on its side for easier access to the system board.
3. Remove any adapter cards installed in the PCI connectors. See "Replacing a PCI adapter card" on page 104.
4. Remove the hard disk drive fan. See "Replacing the hard disk drive fan assembly" on page 121.
5. Remove the memory modules from the failing system board.

6. Remove the heat sink from the failing system board. See “Replacing the heat sink” on page 109.
7. Note the location of all cable connections on the system board and disconnect all cables. See “Locating parts on the system board” on page 98.
8. Remove the nine screws that secure the system board to the chassis, following the sequence shown in the figure:

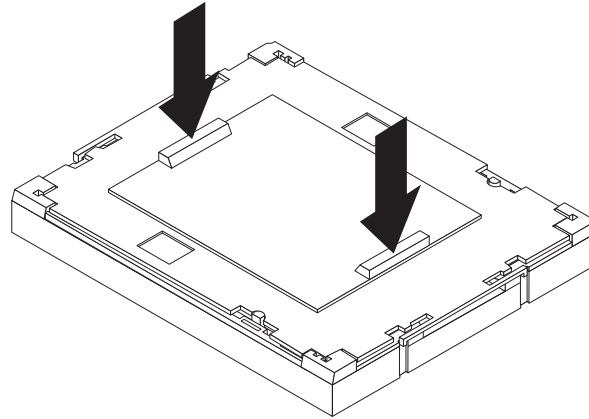


9. Carefully lift the system board out of the chassis.
10. Remove the microprocessor socket cover from the new system board.
11. Remove the microprocessor from the failing system board and install it on the new system board. See “Replacing the microprocessor” on page 111.
12. The failing system board must be returned with a microprocessor socket cover to protect the pins during shipping and handling. Install the microprocessor socket cover removed from the new system board on the failing system board.
To install the microprocessor socket cover:
 - a. Release the lever securing the microprocessor retainer and open the retainer to access the microprocessor.
 - b. Grasp the microprocessor on the sides and lift it straight up and out of the socket. Do not touch the contacts on the microprocessor socket.
 - c. Align the notches **1** of the microprocessor socket cover with the alignment keys **2** of the microprocessor socket. Lower the socket cover straight down into the microprocessor socket on the system board.



Note: Your microprocessor socket and cover might look slightly different from the illustration.

- d. Carefully press the socket cover straight downwards until it is secured into the socket.



- e. Lower the microprocessor retainer and then lower the lever to secure the retainer. Make sure the lever is securely locked into position.
 - f. Follow any additional instructions included with the replacement part you received.
13. Install the new system board into the chassis and align the screw holes with those in the chassis. Insert and tighten the screws that secure the system board following the sequence shown in the figure above.
 14. Install the memory modules in the same location on the new system board.
 15. Install the microprocessor on the new system board. See “Replacing the microprocessor” on page 111
 16. Install the heat sink and fan assembly on the new system board. See “Replacing the heat sink” on page 109.
 17. Connect the heat sink and fan assembly cable to the new system board. See “Locating parts on the system board” on page 98.
 18. Install the hard disk drive fan. See “Replacing the hard disk drive fan assembly” on page 121.
 19. Connect all cables to the system board. See the system board illustration for your machine type at “Locating parts on the system board” on page 98.
 20. Go to “Completing the FRU replacement” on page 131.

Replacing a hard disk drive

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace a hard disk drive.

Important

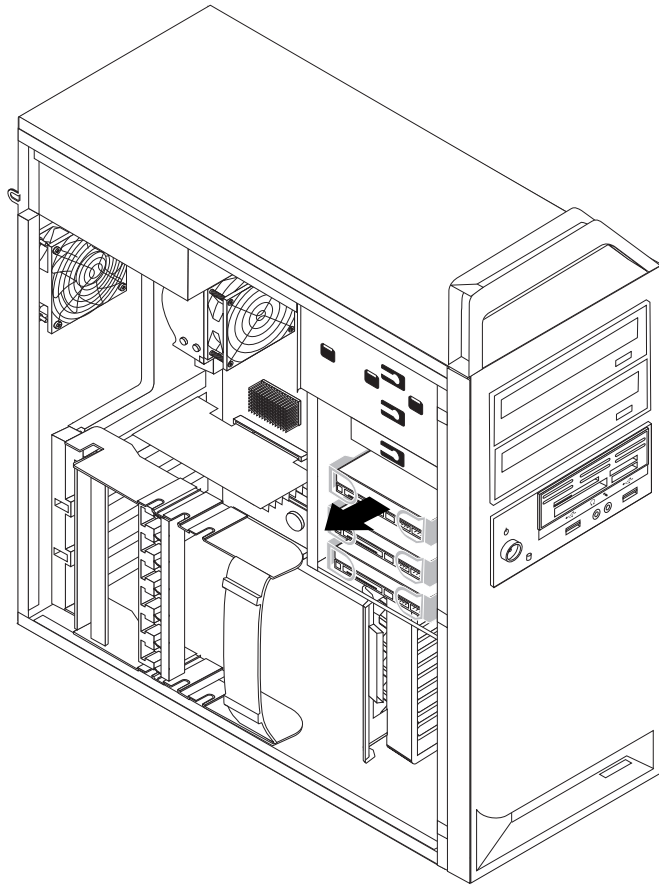
When you receive a new hard disk drive, you also receive a set of *Product Recovery discs*. The set of *Product Recovery discs* will enable you to restore the contents of the hard disk drive to the same state as when your computer was originally shipped from the factory. For more information on recovering factory-installed software, refer to “Recovering software” in your *ThinkStation User Guide*.

Attention: Your computer supports both SAS hard disk drives and SATA hard disk drives. However, be sure that you do not install both the SAS and SATA hard disk drives into the same computer.

To replace a hard disk drive, do the following:

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Locate the hard disk drive. See “Locations” on page 97.
3. Disconnect the signal and power cables from the hard disk drive.

4. Pull the bracket handle out to remove the hard disk drive from the chassis.



5. Remove the failing hard disk drive from the bracket by flexing the bracket.

6. To install the new hard disk drive into the bracket, flex the bracket, and then align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the holes in the hard disk drive. Do not touch the circuit board **5** on the bottom of the hard disk drive.

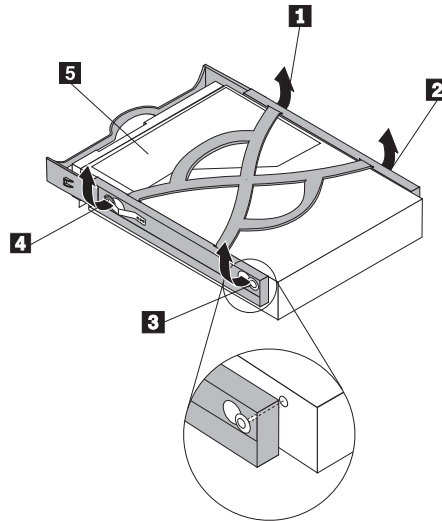


Figure 1. Installing a 3.5-inch hard disk drive into the bracket

Note: If you are installing a 2.5-inch hard disk drive into the bracket, flex the bracket, and then align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the holes in the hard disk drive adapter **5**.

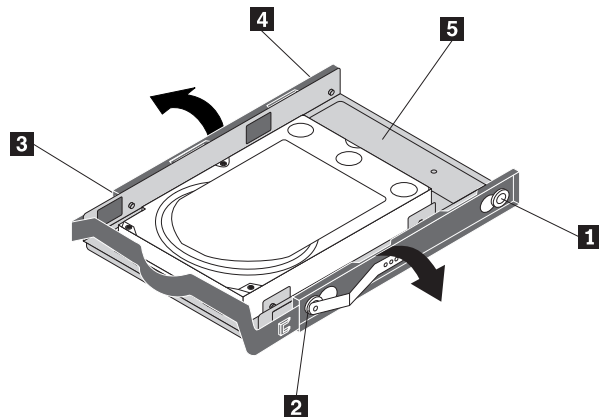


Figure 2. Installing a 2.5-inch hard disk drive into the bracket

7. Install the hard disk drive and bracket into the drive bay.
8. Using the signal cable that came with the new drive, connect one end of the signal cable to the drive. Locate one of the extra five-wire power cables and connect it to the drive.

Note: The signal cable will be different depending on whether you are installing a SATA hard disk drive or a SAS hard disk drive.

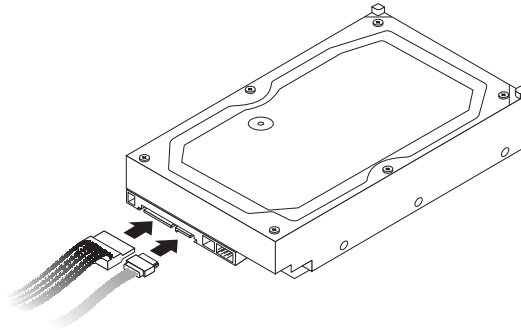


Figure 3. Connecting a 3.5-inch SATA hard disk drive

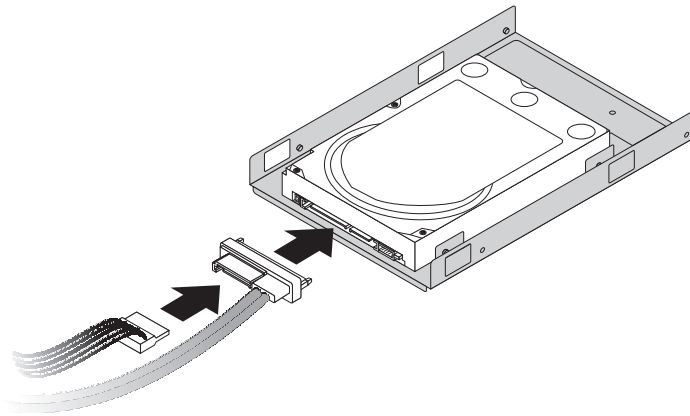


Figure 4. Connecting a 2.5-inch SATA hard disk drive

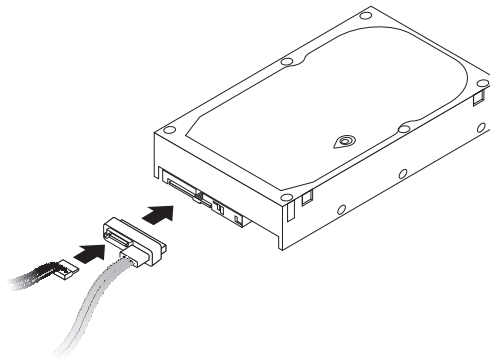


Figure 5. Connecting a 3.5-inch SAS hard disk drive

9. Go to “Completing the FRU replacement” on page 131.

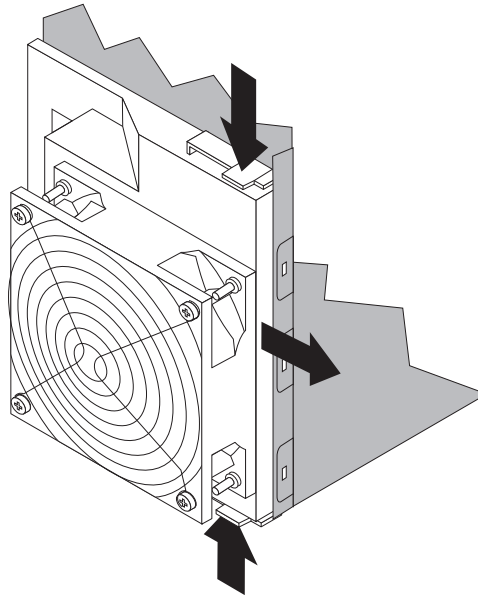
Replacing the hard disk drive fan assembly

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

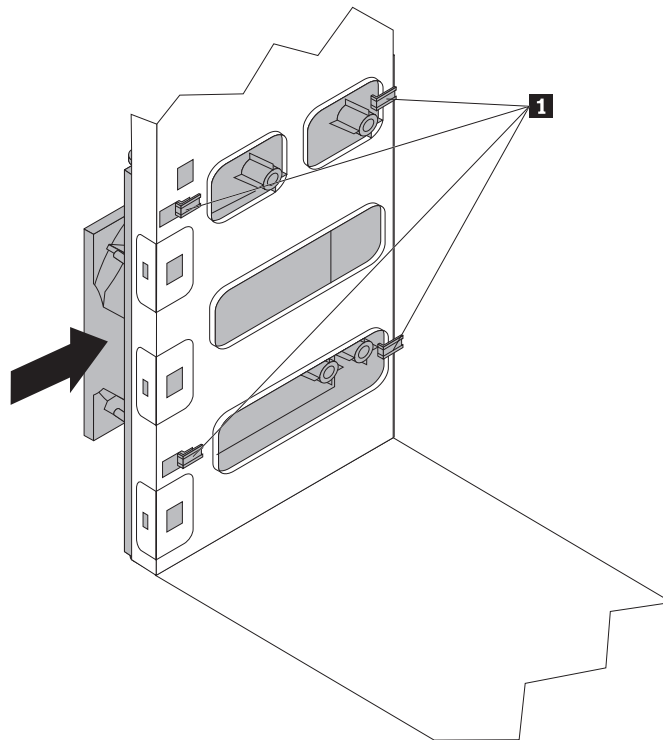
Your computer might have a hard disk drive fan assembly installed. To replace the hard disk drive fan assembly:

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Locate the hard disk drive fan assembly. The hard disk drive fan assembly is attached to the side of the hard disk drive bay.
3. Disconnect the hard disk drive fan assembly cable from the system board. See “Locating parts on the system board” on page 98.
4. Press the two latches on the hard disk drive fan assembly bracket and then slide the fan assembly bracket free from the chassis.



5. Connect the new hard disk drive fan assembly cable to the hard disk drive fan assembly connector on the system board.

6. Install the new hard disk drive fan assembly bracket into the chassis by aligning the four latches **1** on the bracket with the corresponding holes in the chassis and pushing the bracket inward until it snaps into position.



7. Go to “Completing the FRU replacement” on page 131.

Replacing an optical drive

Attention

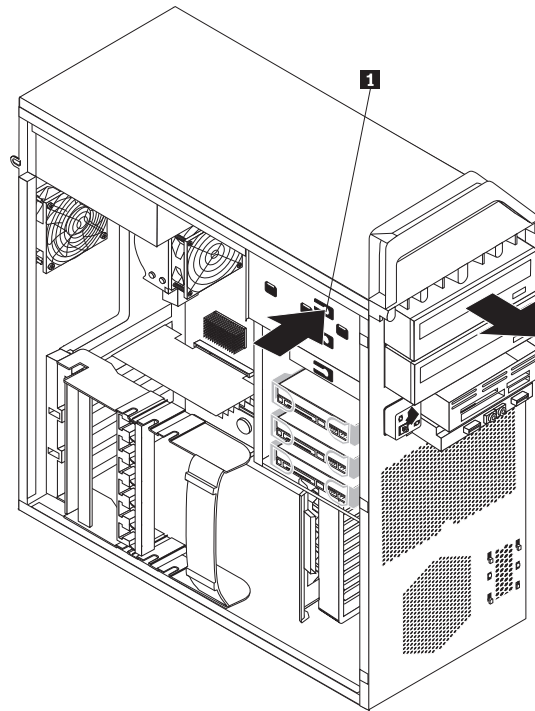
Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace an optical drive.

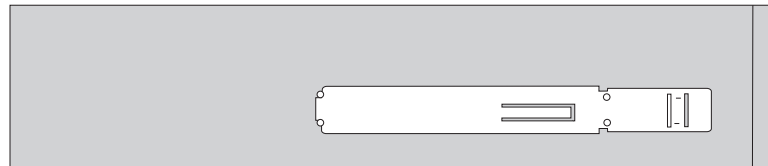
To remove or replace the optical drive, do the following:

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Remove the front bezel. See “Removing the front bezel” on page 99.
3. Locate the optical drive. See “Locations” on page 97.
4. Note the location of the optical drive cables. Disconnect the signal and power cables from the rear of the optical drive.

5. Press the drive latch **1** (for the drive you want to remove) and slide the optical drive from the chassis.



6. Remove the retainer bracket from the drive being replaced and install it on the new drive.



7. Slide the new optical drive into the bay from the front until it snaps into position.
8. Reconnect the signal and power cables to the new drive.
9. Go to “Completing the FRU replacement” on page 131.

Replacing the diskette drive or card reader

Attention

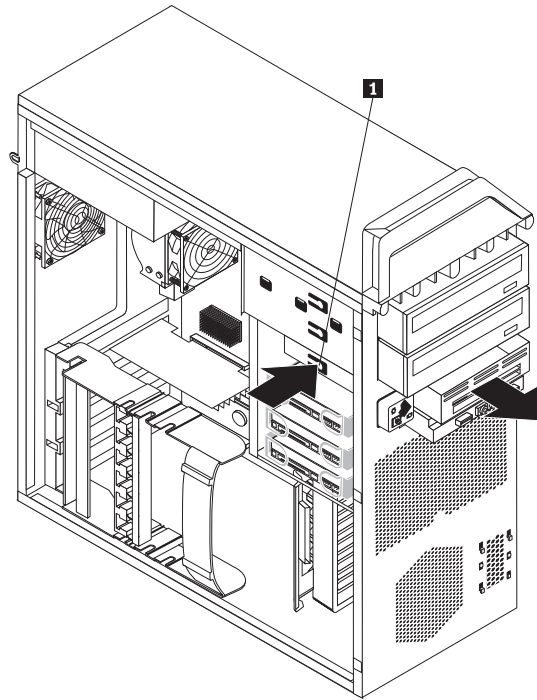
Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the diskette drive or card reader.

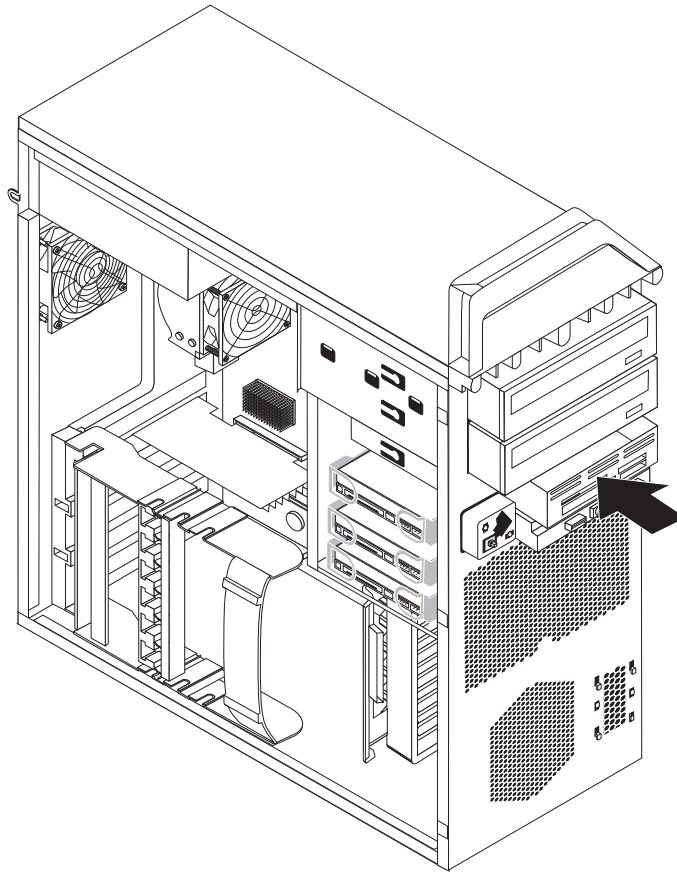
To remove or replace the diskette drive or card reader, do the following:

1. Remove the computer cover. See “Removing the cover” on page 96.

2. Remove the front bezel. See “Removing the front bezel” on page 99.
3. Locate the diskette drive or card reader. See “Locations” on page 97.
4. Disconnect the signal and power cables from the rear of the diskette drive. If you are replacing a card reader, disconnect the card reader cable from the system board. See “Locating parts on the system board” on page 98.
5. Press the drive latch **1** and slide the drive out the front of the computer.



6. Slide the new diskette drive or card reader into the drive bay until it snaps into position.



7. Connect the signal cable and power cable to the new diskette drive. If you are installing a card reader, connect the card reader cable to the card reader connector on the system board. See "Locating parts on the system board" on page 98.
8. Go to "Completing the FRU replacement" on page 131.

Replacing the front and rear fan assemblies

Attention

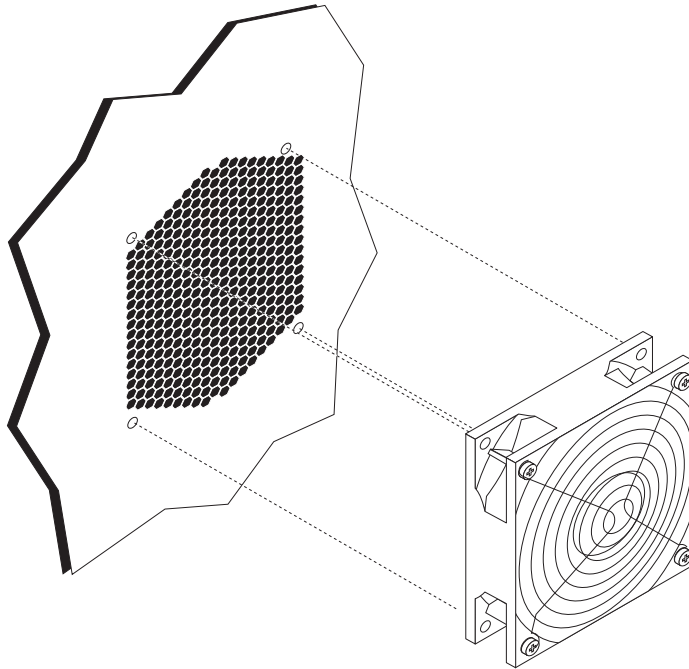
Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the front or rear fan assembly.

To remove or replace the front or rear fan assembly, do the following:

1. Remove the computer cover. See "Removing the cover" on page 96.
2. Locate the fan assembly that you want to replace. Your computer has one front fan assembly and one rear fan assembly. See "Locations" on page 97.

3. Remove the front bezel if you are replacing the front fan assembly. See "Removing the front bezel" on page 99.
4. Disconnect the fan assembly cable from the system board. See "Locating parts on the system board" on page 98.
5. The fan assembly is attached to the chassis by four rubber mounts. Carefully remove the four rubber mounts by breaking them or cutting them with scissors and then remove the fan assembly out of the chassis.



6. Install the new fan assembly by aligning the four rubber mounts of the fan assembly with the holes on the chassis and push the rubber mounts through the holes.
7. Pull on the tips of the rubber mounts until the fan assembly is in place.
8. Depending on which fan assembly you are replacing, reconnect the fan assembly cable to the adapter card fan assembly connector or the rear fan assembly connector on the system board. See "Locating parts on the system board" on page 98.
9. If you are installing the hard disk drive fan assembly, reinstall the front bezel.
10. Go to "Completing the FRU replacement" on page 131.

Replacing the front panel connectors assembly

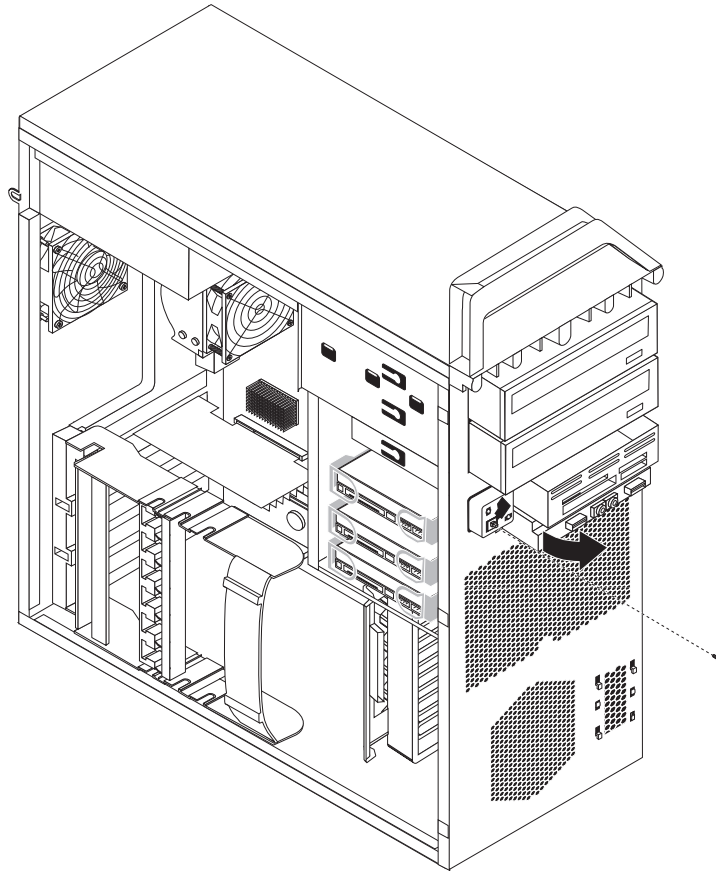
Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the front panel connectors assembly.

To remove or replace the front panel connectors assembly, do the following:

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Remove the front bezel. See “Removing the front bezel” on page 99.
3. Locate the front panel connectors assembly.
4. Disconnect the front audio, front USB, and auxiliary LED cables from the system board and note the cables routing. See “Locating parts on the system board” on page 98.
5. Remove the screw that secures the front panel connectors assembly to the chassis. Rotate the assembly to release it completely from the chassis.



6. Install the new front panel connectors assembly into the chassis and secure it with the screw.
7. Reconnect the cables to the system board.
8. Go to “Completing the FRU replacement” on page 131.

Replacing the power switch/LED assembly

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This procedure describes how to remove and replace the power switch/LED assembly.

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Remove the front bezel. See “Removing the front bezel” on page 99.
3. Disconnect the power switch/LED assembly cable from the system board. See “Locating parts on the system board” on page 98.
4. Note the power switch/LED assembly cable routing and the position of the two LEDs.
5. Remove the switch and the LEDs from the bezel.
6. Route the cable for the new power switch/LED assembly through the hole in the chassis and to the system board.
7. Install the new power switch/LED assembly into the bezel. Make sure that the LEDs are in the correct position.
8. Connect the power switch/LED cable to the system board.
9. Reinstall the front bezel.
10. Go to “Completing the FRU replacement” on page 167.

Replacing the battery

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

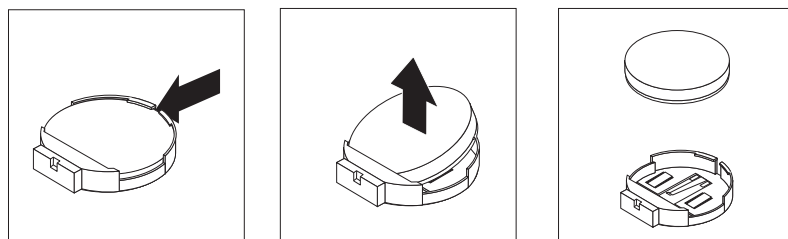
Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as serial-port assignments (configuration). A battery keeps this information active when you turn off the computer.

The battery normally requires no charging or maintenance throughout its life; however, no battery lasts forever. If the battery fails, the date, time, and configuration information (including passwords) are lost. An error message is displayed when you turn on the computer.

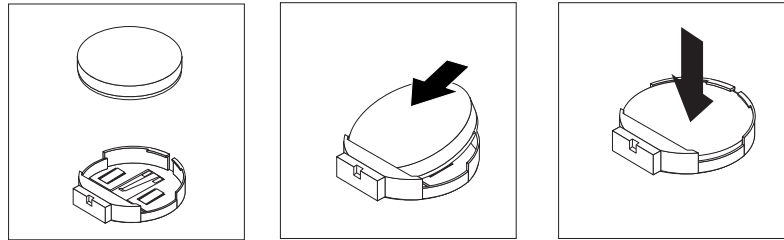
This section provides information on how to replace the battery.

To change the battery, do the following:

1. Open the computer cover. See “Removing the cover” on page 96.
2. Access the system board.
3. Locate the battery. See “Locating parts on the system board” on page 98.
4. Remove the old battery.



5. Install the new battery.



6. Replace the computer cover and connect the cables. See “Completing the FRU replacement” on page 131.

Note: When the computer is turned on for the first time after battery replacement, an error message might be displayed. This is normal after replacing the battery.

7. Turn on the computer and all attached devices.
8. Use the Setup Utility program to set the date and time and any passwords.
9. Go to “Completing the FRU replacement” on page 131.

Replacing the internal speaker

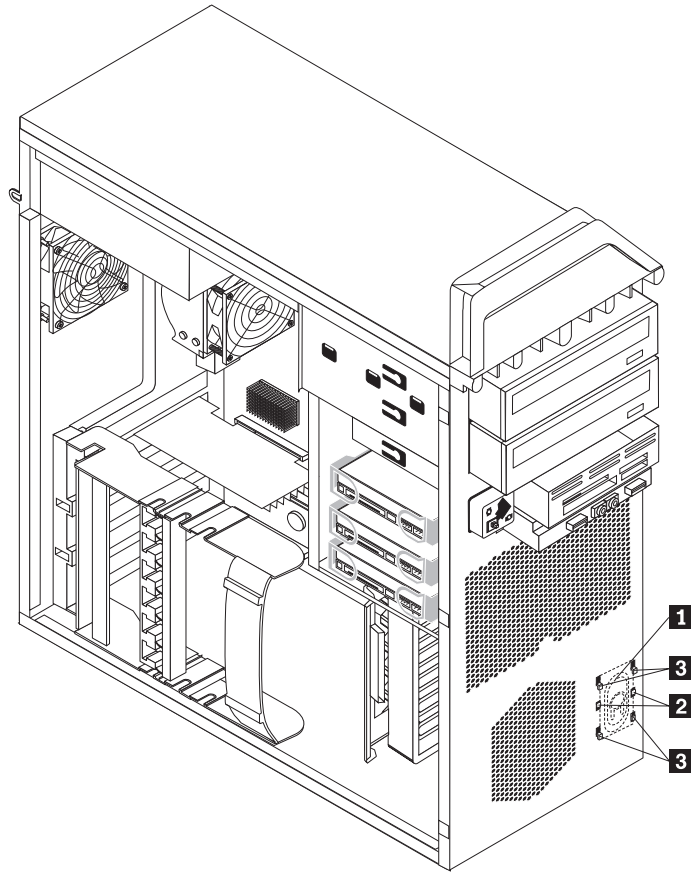
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the internal speaker.

To remove or replace the internal speaker, do the following:

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Remove the front bezel. See “Removing the front bezel” on page 99.
3. Locate the internal speaker connector on the system board. See “Locations” on page 97.
4. Note the location of the internal speaker cable connection. Note the routing of the internal speaker cable. Disconnect the internal speaker cable from the system board. See “Locating parts on the system board” on page 98.
5. Use a blunt instrument (such as, the top of a ball point pen) to disengage one of the internal speaker locking tabs **2** and slide that side of the speaker **1** upward enough to keep the locking tab disengaged. Then disengage the other internal speaker locking tab and slide the internal speaker upward until the speaker is released.



6. Remove the speaker and speaker cable from the computer.
7. Route the new speaker cable and then position the new internal speaker tabs **3** into the metal speaker slots and then push the internal speaker downward until the speaker locking tabs snap into position.
8. Connect the speaker cable to the system board. See "Locating parts on the system board" on page 98.
9. Go to "Completing the FRU replacement."

Completing the FRU replacement

After replacing FRUs, you need to install any removed parts, replace the cover, and reconnect any cables, including telephone lines and power cords. Also, depending on the FRU that is replaced, you might need to confirm the updated information in the Setup Utility program.

Note: When the power cord is first plugged in, the computer might appear to turn on for a few seconds and then turn off. This is a normal sequence to enable the computer to initialize.

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer.
2. Replace the cover.
3. Reconnect the external cables and power cords to the computer. See "Rear connectors" on page 134.
4. If you have replaced the system board, you must update (flash) the BIOS. See "Flash update procedures" on page 253.

5. Some FRU replacements require the configuration to be updated. See Chapter 6, “Using the Setup Utility,” on page 51.

Chapter 11. Replacing FRUs (Type 4155, 4158, 4218)

Important

Before you replace any FRU, read Chapter 2, "Safety information," on page 3. These precautions and guidelines will help you work safely.

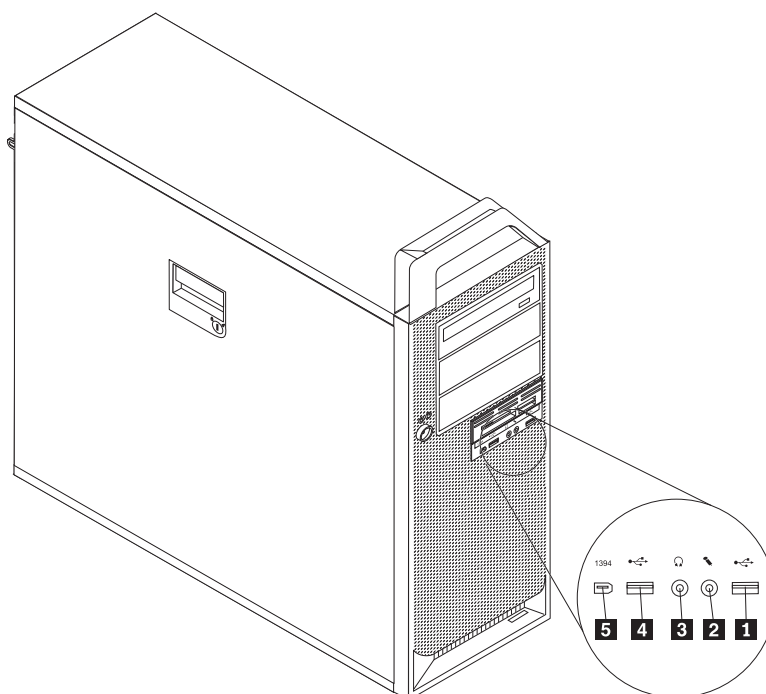
FRU replacements are to be done by trained service technicians only.

This chapter does not contain a remove and replace procedure for all FRUs. Only the major FRUs are documented.

Locating controls and connectors on the front of your computer

The following illustration shows the location of the controls and connectors on the front of your computer.

Note: Not all computer models will have the following controls and connections.

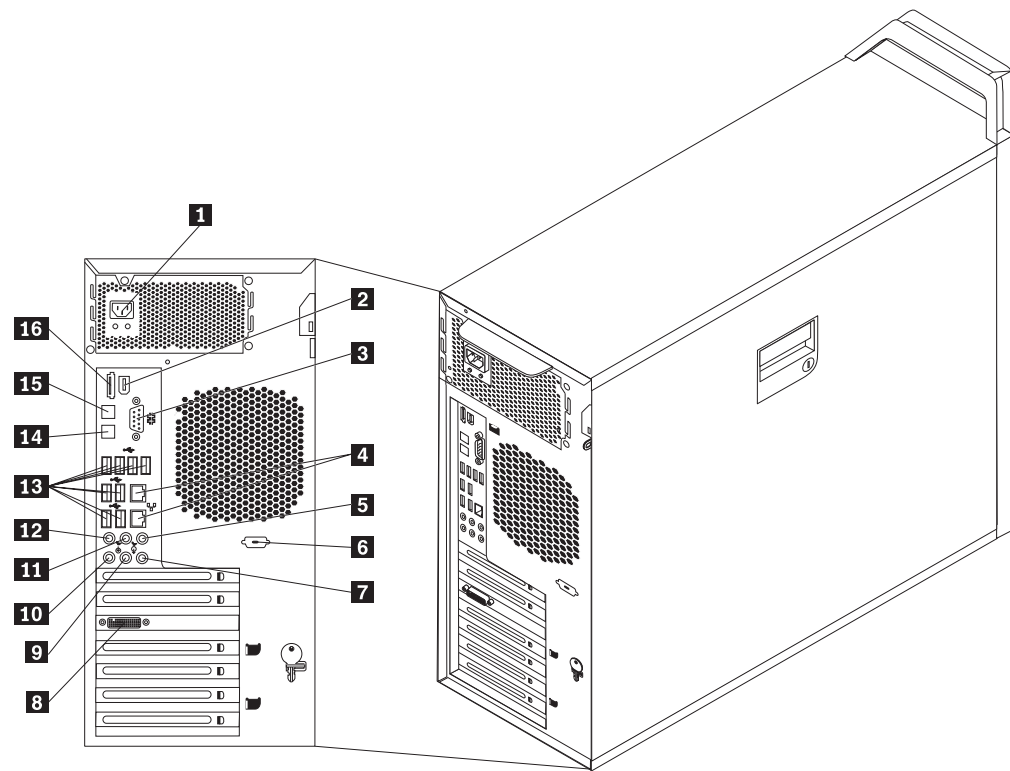


- 1** USB connector
- 2** Microphone connector
- 3** Headphone connector

- 4** USB connector
- 5** IEEE 1394 connector

Rear connectors

The following illustration shows the locations of the connectors on the rear of the computer.



- | | | | |
|----------|--|-----------|--|
| 1 | Power cord connector | 9 | Audio line-out front speakers connector |
| 2 | IEEE 1394 connector | 10 | Microphone connector |
| 3 | Serial port | 11 | Audio line-out rear speakers connector |
| 4 | Ethernet connectors (2) | 12 | Audio line-out side speaker connector |
| 5 | Audio line-out subwoofer/center speakers connector | 13 | USB connectors (8) |
| 6 | Serial port (some models) | 14 | Optical SPDIF (Sony Philips Digital Interconnect Format) out connector |
| 7 | Audio line-in connector | 15 | Optical SPDIF in connector |
| 8 | Video connector (some models) | 16 | eSATA connector |

Removing the cover

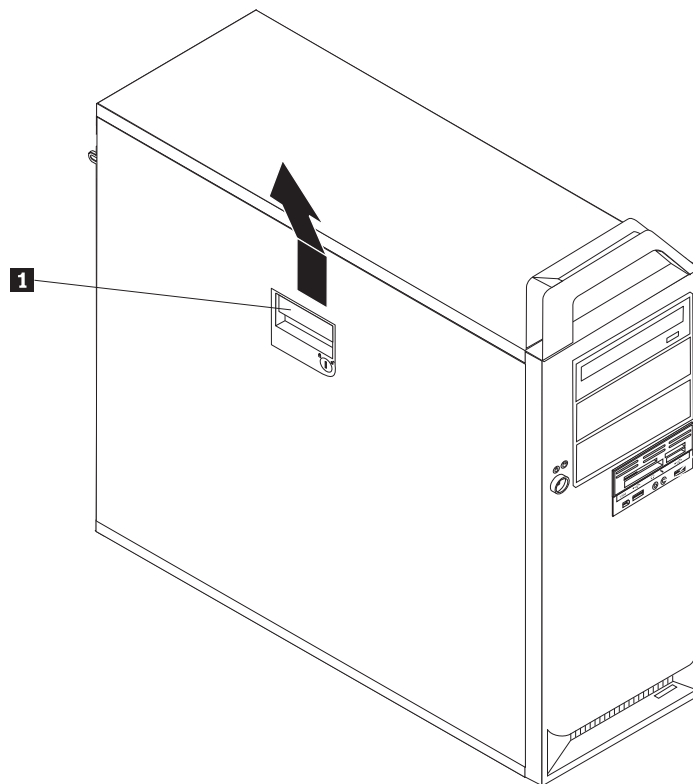
CAUTION:



The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

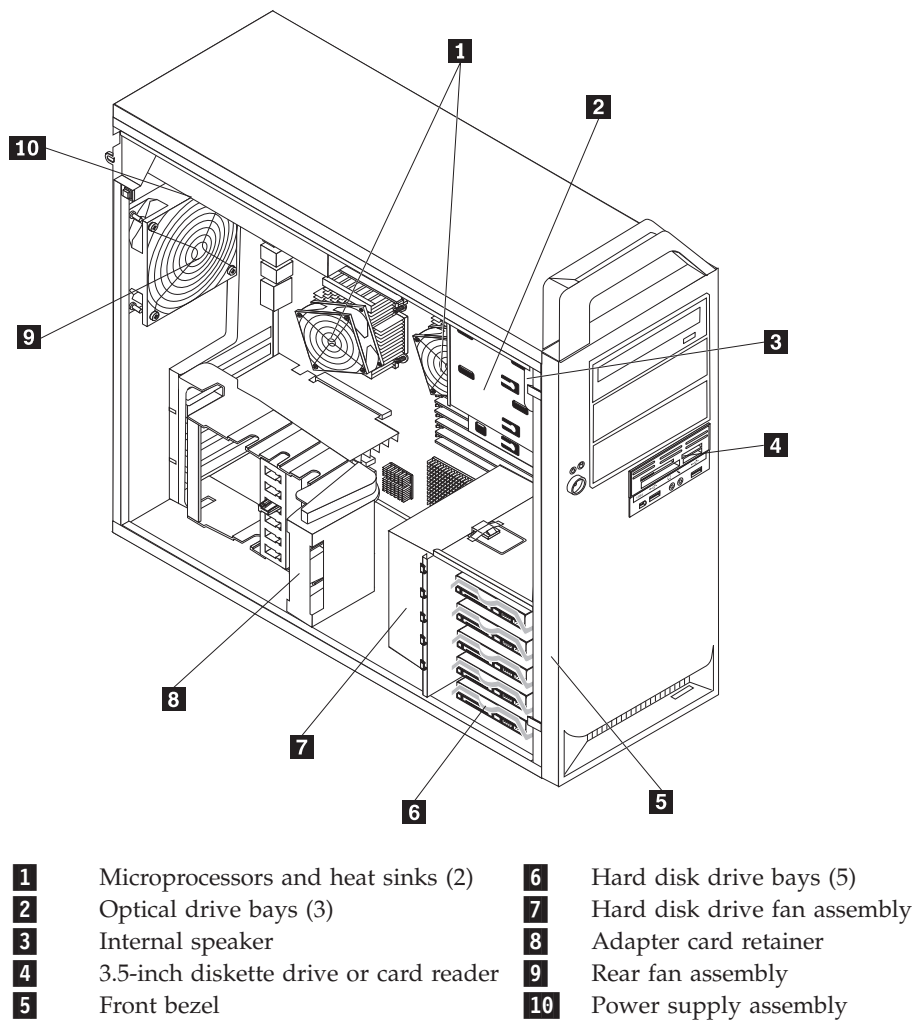
To remove the computer cover:

1. Remove any media from the drives and shut down your operating system. Turn off all attached devices. Turn off the computer.
2. Unplug all power cords from electrical outlets.
3. Disconnect the cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables that are connected to the computer. See “Locating controls and connectors on the front of your computer” on page 94 and “Rear connectors” on page 134.
4. Remove any locking devices, such as a cable lock or padlock that secures the computer cover. Open the keylock if it is in the locked position.
5. Disengage the cover latch **1** and remove the cover. Place the cover on a flat surface.

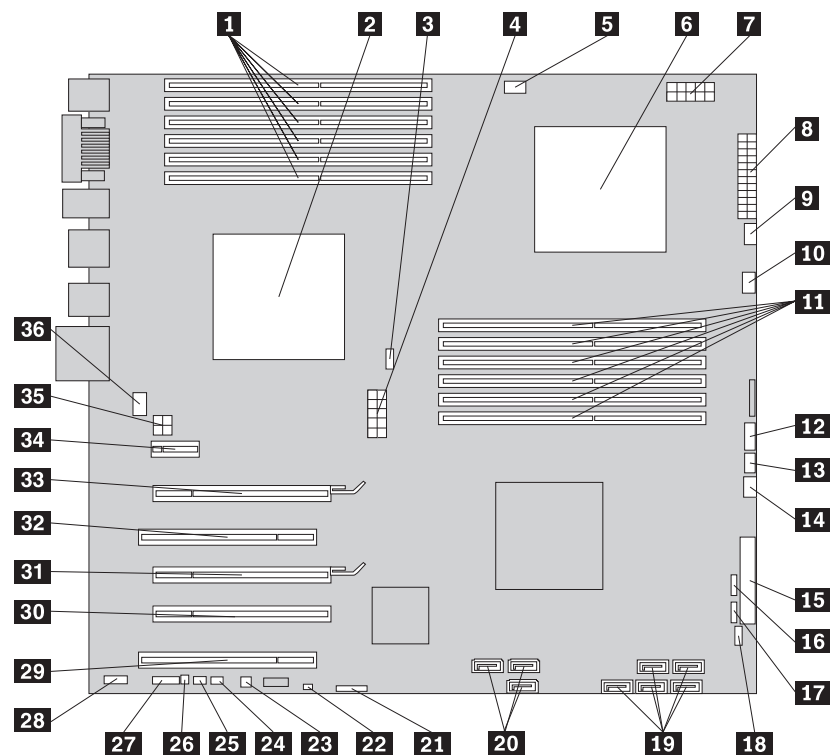


Locations

The following illustration will help you locate the major FRUs in the computer.



Locating parts on the system board



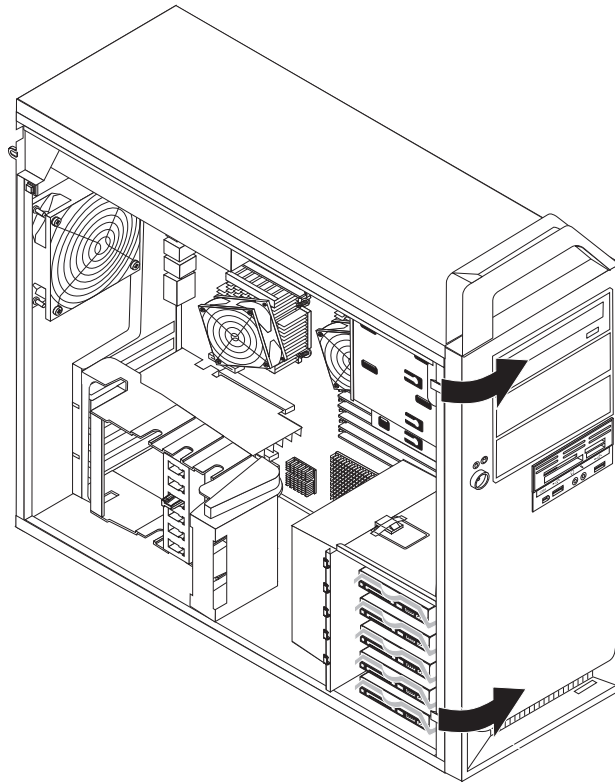
- | | |
|---|--|
| 1 CPU 1 memory slots (6) | 19 Hard disk drive connectors (5) |
| 2 Microprocessor and heat sink 1 | 20 Optical drive connectors (3) |
| 3 CPU 1 fan connector | 21 Battery |
| 4 CPU 1 12 V power connector | 22 Clear CMOS/Recovery jumper |
| 5 CPU 1 memory fan connector | 23 Thermal sensor connector |
| 6 Microprocessor and heat sink 2 | 24 Cover presence switch connector |
| 7 CPU 2 12 V power connector | 25 PS/2 keyboard and mouse connector |
| 8 24-pin power connector | 26 Internal speaker connector |
| 9 CPU 2 fan connector | 27 COM 2 connector |
| 10 CPU 2 memory fan connector | 28 Front audio connector |
| 11 CPU 2 memory slots (6) | 29 PCI adapter card slot |
| 12 Power switch/LEDs connector | 30 PCI Express x4 graphics adapter card slot (x16 mechanical) |
| 13 Auxiliary LED connector | 31 PCI Express x16 graphics adapter card slot |
| 14 Hard disk drive fan connector | 32 PCI adapter card slot |
| 15 Diskette drive connector | 33 PCI Express x16 graphics adapter card slot |
| 16 Card reader connector | 34 PCI Express x1 adapter card slot |
| 17 Front USB connector | 35 Graphic card power connector |
| 18 Front IEEE 1394 connector | 36 Rear fan connector |

Removing the front bezel

To remove the front bezel:

1. Remove the cover. See "Removing the cover" on page 96.

2. Remove the front bezel by releasing the three plastic tabs **1** on the left side and pivoting the bezel outward.



3. Lay the front bezel on a flat surface.
4. To reinstall the bezel, align the plastic tabs on the right side of the bezel with the corresponding holes in the chassis, then pivot the bezel inward until it snaps into position on the left side.

Replacing the power supply

Attention

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no servicable parts inside these components.

Attention

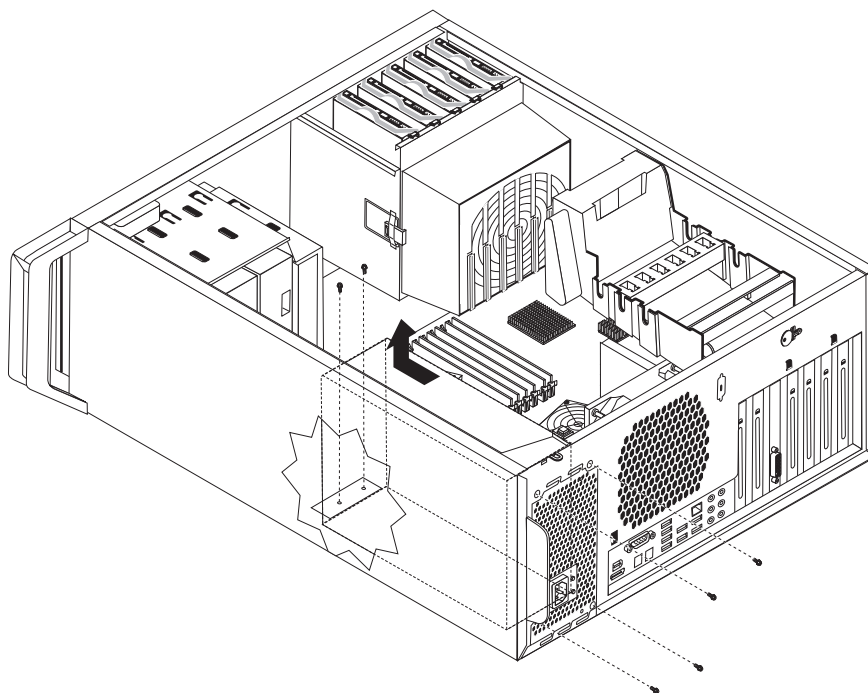
Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides information about how to move and replace the power supply.

To replace the power supply, do the following:

1. Remove the computer cover and then lay the computer on its side. See "Removing the cover" on page 96.
2. Locate the power supply. See "Locations" on page 97.
3. Disconnect the power supply cables from the system board connectors. Disconnect the power supply cables from all adapter cards (some models) and from all drives.
4. Remove the power supply cables from the cable clips and ties.

5. Remove the six power supply retaining screws at the rear of the chassis and inside the chassis.



6. Slide the power supply assembly toward the front of the computer and lift it out from the chassis.
7. Ensure that the new power supply is the correct replacement. Some power supplies automatically sense the voltage, some power supplies are voltage specific, and some power supplies have a voltage-selection switch. If there is a voltage-selection switch, use a ballpoint pen to slide the switch, if necessary.

Note: For models that have a voltage-selection switch:

- If the voltage supply range is 100–127 V AC, set the switch to 115 V.
- If the voltage supply range is 200–240 V AC, set the switch to 230 V.

8. Install the new power supply into the chassis so that the screw holes in the power supply align with those in the chassis.

Note: Use only the screws provided by Lenovo.

9. Install and tighten the four screws at the rear of the chassis to secure the power supply.
10. Install and tighten the two screws that secure the power supply to the inside of the chassis.
11. Reconnect all power supply cables to the drives, adapter cards, and the system board. Make sure to reconnect the power cable to the graphics cards that require an additional cable.
12. Go to “Completing the FRU replacement” on page 131.

Installing or replacing a memory module

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

CAUTION:



The memory module might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

Your computer has 12 slots for installing or replacing DDR3 ECC UDIMMs (double data rate 3 error correction code unbuffered dual in-line memory modules) or DDR3 ECC RDIMMs (double data rate 3 error correction code registered dual inline memory modules).

When installing or replacing memory modules, use the following guidelines:

- Use either DDR3 ECC UDIMMs or DDR3 ECC RDIMMs for your computer. Do not install both the UDIMMs and RDIMMs into the same computer.
- If your computer has only one CPU installed, be sure to install memory modules only in the memory slots adjacent to that CPU.
- If your computer has two CPUs installed, install equal numbers of memory modules in both sets of CPU DIMM slots for maximum performance. And the total amount of memory should be evenly balanced between the 2 banks. For

example: If you are to install six 1 GB DIMMs in a dual-processor system, three of the 1 GB DIMMs should be installed in the CPU1 slots, and the other three should be installed in the CPU2 slots.

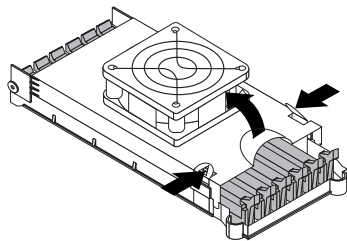
- Memory must always be installed in the blue sockets first, starting with the blue socket closest to each respective CPU. Install in the black sockets only after all blue sockets are occupied.

To install or replace a memory module:

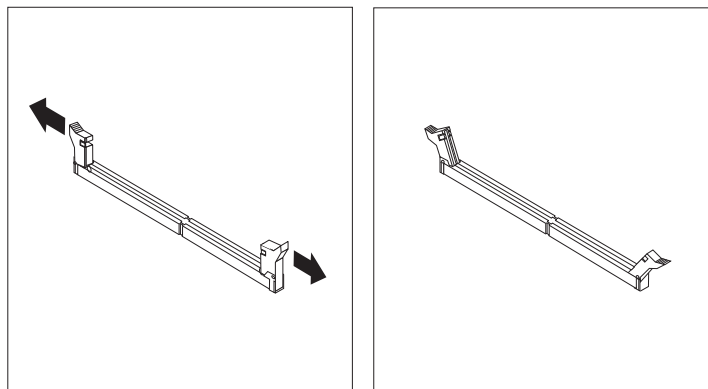
1. Remove the computer cover. See “Removing the cover” on page 96.
2. Lay the computer on its side.
3. Locate the memory slots. See “Locating parts on the system board” on page 137.

Note: If it is the first time that the memory module being replaced, you might have to remove the blue shipping clip before removing the memory fan duct. If the computer is to be repackaged and shipped, the shipping clip must be reinstalled.

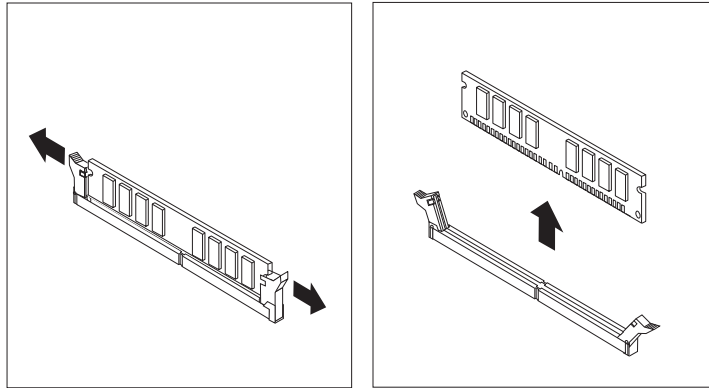
4. For some computer models, you might need to remove the memory fan duct to access the memory slots. To remove the memory fan duct, remove the blue shipping clip, disconnect the memory fan cable from the system board, press inward on the two tabs, pivot the fan duct, and then disengage the other end of the duct.



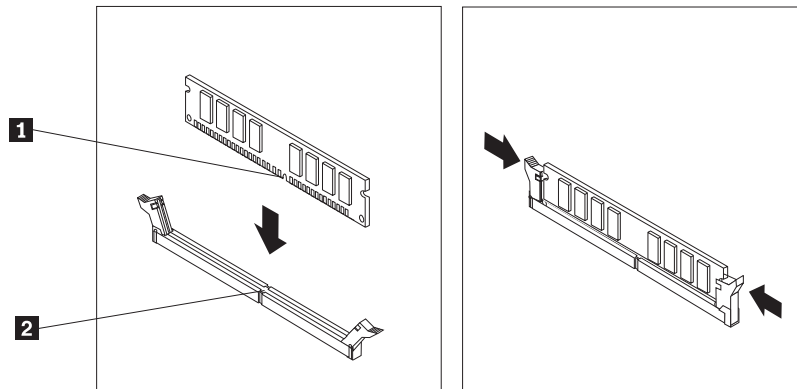
5. Open the retaining clips as shown.



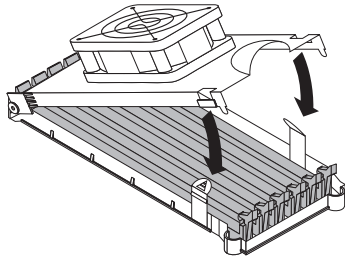
If you are replacing an old memory module, open the retaining clips and remove the memory module being replaced as shown.



6. Position the new memory module over the memory slot. Make sure the notch **1** on the memory module aligns correctly with the slot key **2** on the system board. Push the memory module straight down into the slot until the retaining clips close.



7. To install the memory fan, engage the rear of the duct with the retainer on the system board and then pivot the duct downwards until the duct snaps into position. Reconnect the memory fan cable to the system board.



8. Go to “Completing the FRU replacement” on page 131.

Note: Your system memory speed is determined by a number of factors, including the microprocessor model and the type, speed, size (capacity), and number of DIMMs installed.

Replacing a PCI adapter card

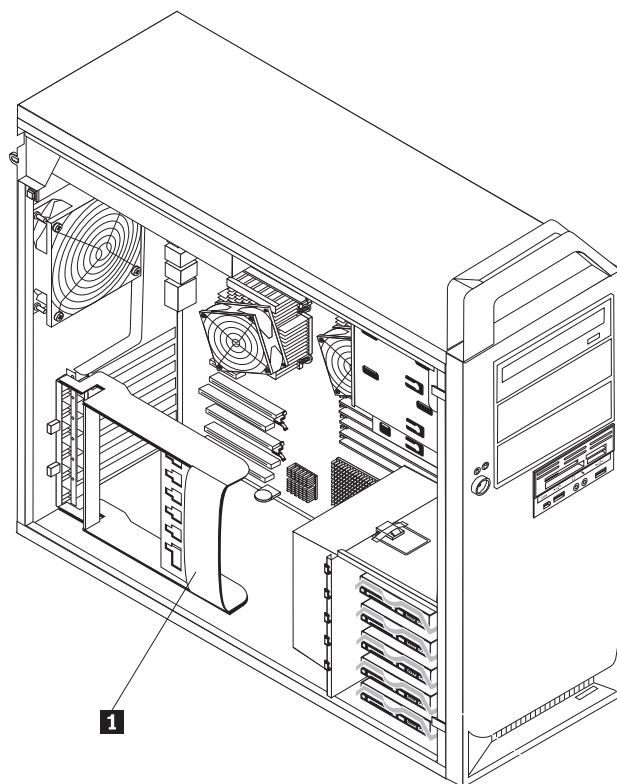
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides information about how to replace a PCI adapter card.

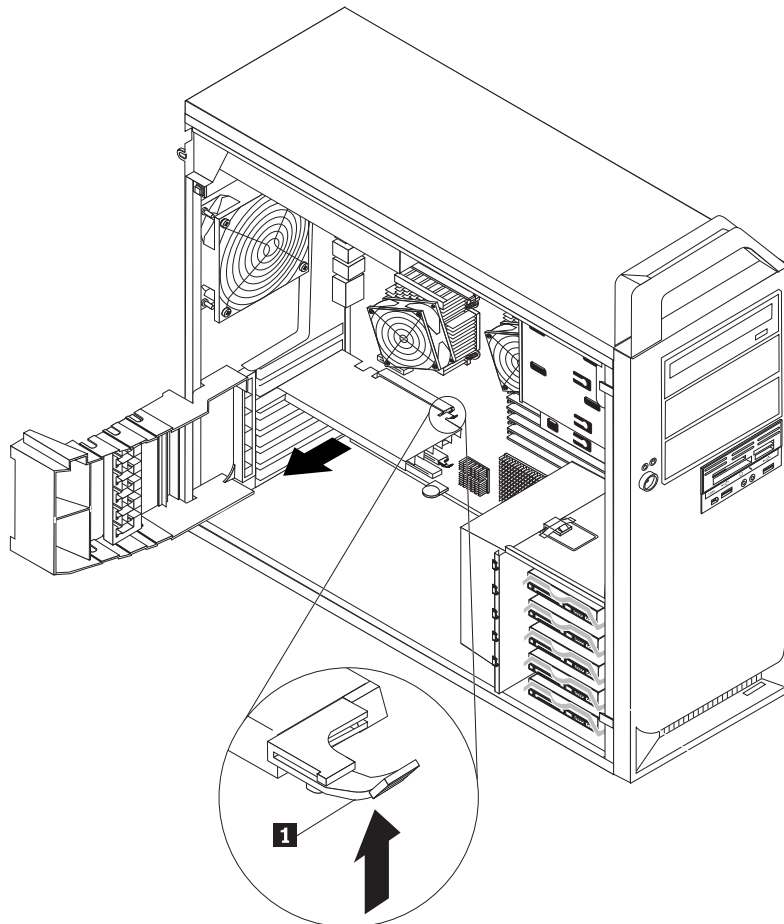
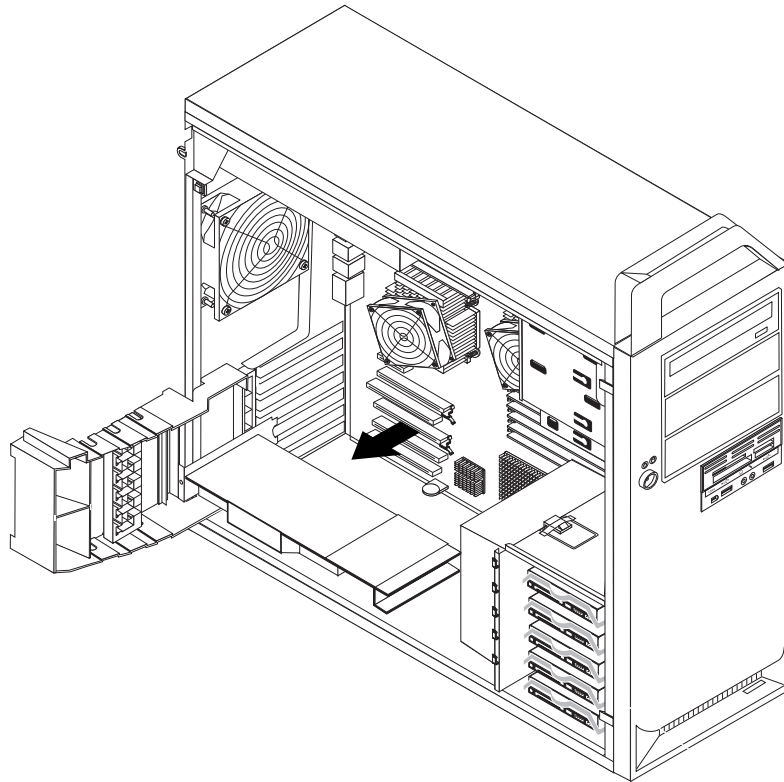
To replace a PCI adapter card, do the following:

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Unlatch and open the card retainer .



3. Take note of the location of all cable connections on the adapter card. It will be necessary to reconnect them properly when installing a new card.
4. Disconnect all cables connected to the adapter card. See "Locating parts on the system board" on page 137.
5. Some models have:
 - A screw installed in the adapter bracket, remove this screw.
 - An additional retention feature located on the card guide end. Push the retention feature toward the front of the chassis before removing the adapter card.
6. Release the card support retaining latches. Grasp the adapter card and pull the card out of the slot.

Note: The card is a tight fit, so it might be necessary to remove each side a little at a time until the card is removed from the card slot.



7. Reverse this procedure to install the card.
8. Go to “Completing the FRU replacement” on page 131.

Replacing the heat sink

CAUTION:



The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

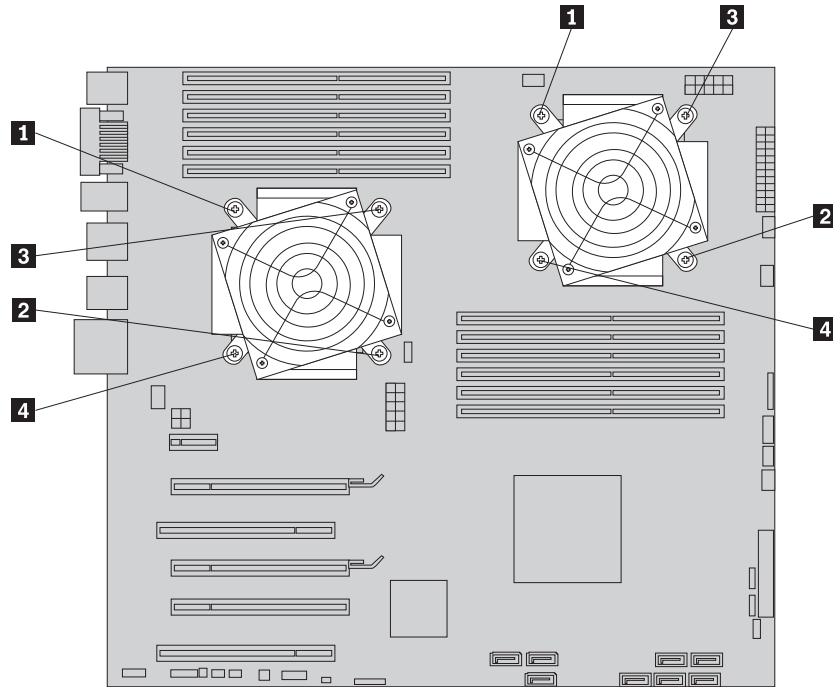
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace and install the heat sink.

To replace the heat sink:

1. Open the computer cover. See “Removing the cover” on page 96.
2. Lay the computer on its side for easier access to the heat sink.
3. Remove the heat sink and fan assembly cables from the system board. Note the cable location. See “Locating parts on the system board” on page 137.
4. Follow this sequence to remove the heat sink from the system board:
 - a. Partially remove screw **1**, then fully remove screw **2**, and fully remove screw **1**.
 - b. Partially remove screw **3**, then fully remove screw **4**, and fully remove screw **3**.



5. Carefully lift the heat sink off of the system board.
6. Remove the plastic cover from the bottom of the new heat sink to expose the heat sink grease (this cover protects the heat sink grease from contamination).

Notes:

- a. Do not remove the plastic cover until you are ready to install the heat sink and fan assembly on the microprocessor. Do not touch the grease on the heat sink and fan assembly. Do not put the heat sink and fan assembly anywhere except on the microprocessor after the plastic cover has been removed and the grease exposed.
- b. Some heat sink part numbers will have orientation labels showing "Front of System." Heat Sinks that do not have orientation labels should be oriented so the fan cable is toward the board connector labeled "CPU Fan."
7. Place the new heat sink into position.

Important: Do not touch the thermal grease while handling the heat sink.

8. Align the four screws on the heat sink with the four mounting studs in the chassis.
9. Follow this sequence to install the screws, noting that fully tight is 5 in-lbs +/- 0.5 in-lbs:
 - a. Partially tighten screw **1**, then fully tighten screw **2**, and fully tighten screw **1**.
 - b. Partially tighten screw **3**, then fully tighten screw **4**, and fully tighten screw **3**.
10. Reconnect the heat sink fan cable. See "Locating parts on the system board" on page 137.
11. Go to "Completing the FRU replacement" on page 131.

Replacing the microprocessor

CAUTION:



The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

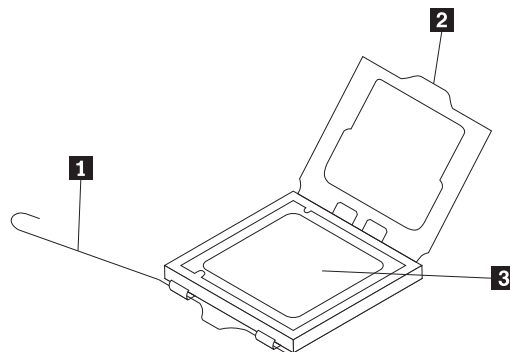
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the microprocessor.

To replace the microprocessor:

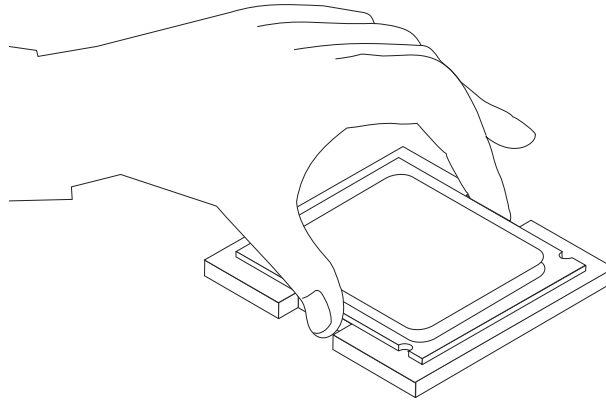
1. Open the computer cover. See “Removing the cover” on page 96.
2. Place the computer on its side to help make the system board more accessible.
3. Remove the heat sink from the system board. See “Replacing the heat sink” on page 109.
4. To remove the microprocessor **3** from the system board, lift the small handle **1** and open the retainer **2**.



Important

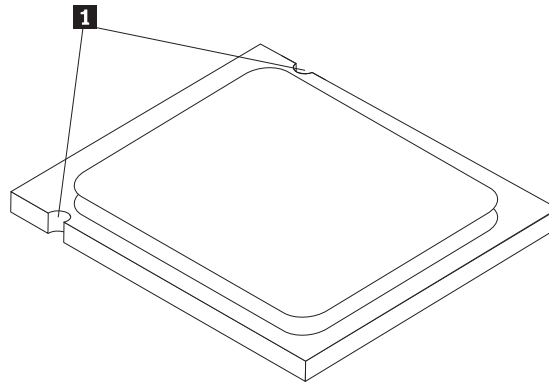
Touch only the sides of the microprocessor. Do not touch the gold contacts on the bottom.

5. Lift the microprocessor straight up and out of the socket.



Notes:

- a. Note the orientation of the notches **1** on the microprocessor. This is important when reinstalling the microprocessor on the new system board.

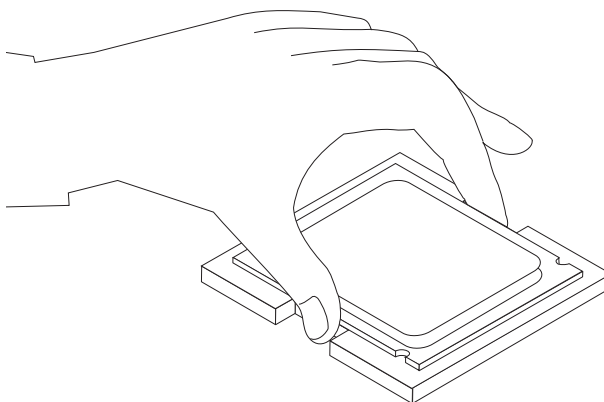


- b. Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.
6. Holding the microprocessor with your fingers, position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket.

Important

To avoid damaging the microprocessor contacts, do not tilt the microprocessor when installing it into the socket.

7. Lower the microprocessor straight down into the microprocessor socket of the system board.



8. Close the microprocessor retainer and clamp it with the small handle.
9. Place the heat sink into position and replace the 4 screws to secure the heat sink to the system board.
10. Reconnect the heat sink fan cable.
11. Go to "Completing the FRU replacement" on page 131.

Replacing the system board

CAUTION:



The heat sink, microprocessor, and memory module might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

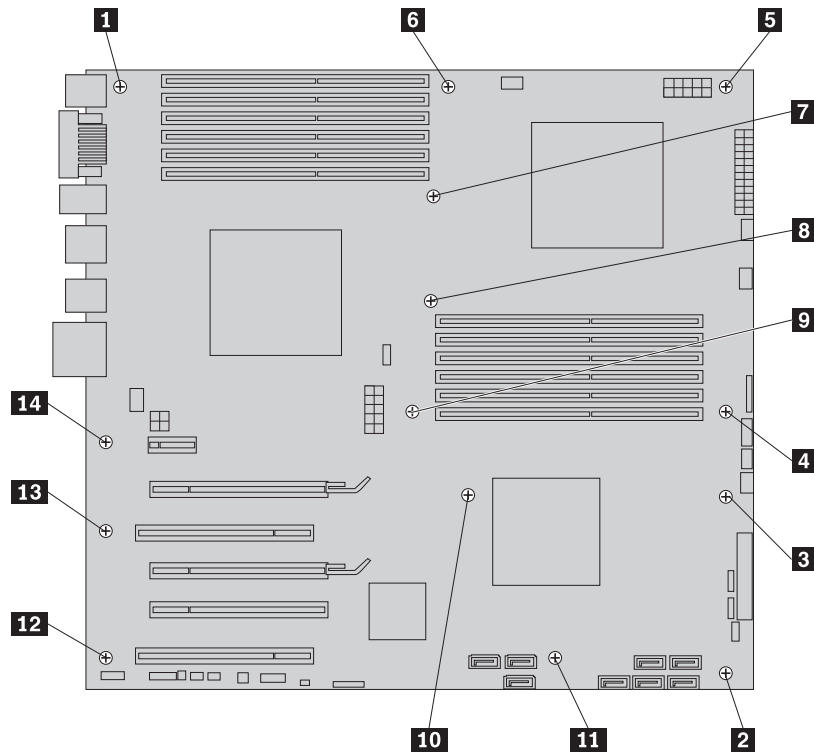
Note: When replacing the system board a new retention module for the microprocessor heat sink is required. Make sure you have a new retention module before beginning this procedure.

This section provides instructions on how to remove and install the system board.

To replace the system board:

1. Open the cover. See "Removing the cover" on page 96.
2. Lay the computer on its side for easier access to the system board.
3. Remove the hard disk drive fan. See "Replacing the hard disk drive fan assembly" on page 121.
4. Remove any adapter cards installed in the PCI connectors. See "Replacing a PCI adapter card" on page 104.
5. Remove the memory modules from the failing system board.
6. Remove the heat sink from the failing system board. See "Replacing the heat sink" on page 109.

7. Note the location of all cable connections on the system board and disconnect all cables. See “Locating parts on the system board” on page 137.
8. Remove the nine screws that secure the system board to the chassis, following the sequence shown in the figure:

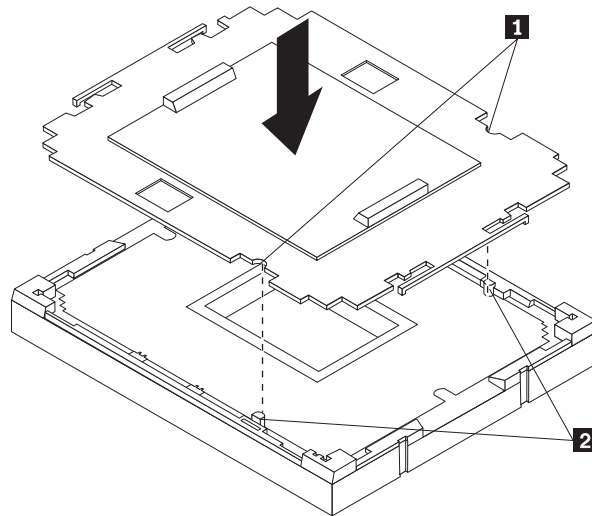


9. Carefully lift the system board out of the chassis.
10. Remove the microprocessor socket cover from the new system board.
11. Remove the microprocessor from the failing system board and install it on the new system board. See “Replacing the microprocessor” on page 111.
12. The failing system board must be returned with a microprocessor socket cover to protect the pins during shipping and handling. Install the microprocessor socket cover removed from the new system board on the failing system board.

Note: The microprocessor socket cover installation procedure should be performed on both processors.

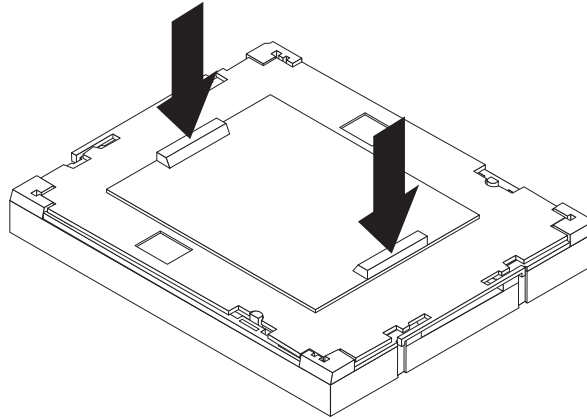
To install the microprocessor socket cover:

- a. Release the lever securing the microprocessor retainer and open the retainer to access the microprocessor.
- b. Grasp the microprocessor on the sides and lift it straight up and out of the socket. Do not touch the contacts on the microprocessor socket.
- c. Align the notches **1** of the microprocessor socket cover with the alignment keys **2** of the microprocessor socket. Lower the socket cover straight down into the microprocessor socket on the system board.



Note: Your microprocessor socket and cover might look slightly different from the illustration.

- d. Carefully press the socket cover straight downwards until it is secured into the socket.



- e. Lower the microprocessor retainer and then lower the lever to secure the retainer. Make sure the lever is securely locked into position.
 - f. Follow any additional instructions included with the replacement part you received.
13. Install the new system board into the chassis and align the screw holes with those in the chassis. Insert and tighten the screws that secure the system board following the sequence shown in the figure above.
 14. Install the memory modules in the same location on the new system board.
 15. Install the microprocessor on the new system board. See “Replacing the microprocessor” on page 111
 16. Install the heat sink and fan assembly on the new system board. See “Replacing the heat sink” on page 109.
 17. Connect the heat sink and fan assembly cable to the new system board. See “Locating parts on the system board” on page 137.
 18. Install the hard disk drive fan. See “Replacing the hard disk drive fan assembly” on page 121.
 19. Connect all cables to the system board. See the system board illustration for your machine type at “Locating parts on the system board” on page 137.
 20. Go to “Completing the FRU replacement” on page 131.

Replacing a hard disk drive

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the hard disk drive.

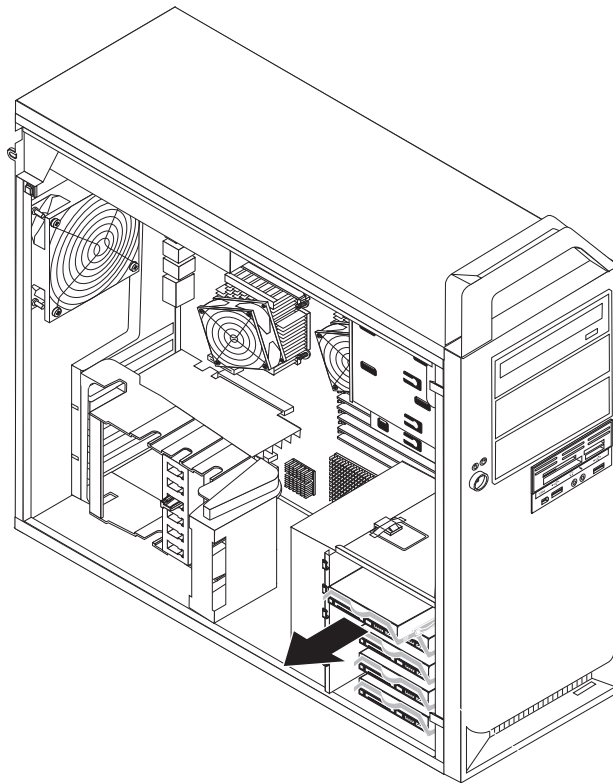
Important

When you receive a new hard disk drive, you also receive a set of *Product Recovery discs*. The set of *Product Recovery discs* will enable you to restore the contents of the hard disk drive to the factory-installed state. For more information on recovering factory-installed software, refer to "Recovering software" in your *ThinkStation User Guide*.

Attention: Your computer supports both SAS hard disk drives and SATA hard disk drives. However, be sure that you do not install both the SAS and SATA hard disk drives into the same computer.

To replace a hard disk drive:

1. Remove the computer cover. See "Removing the cover" on page 96.
2. Locate the hard disk drive. See "Locations" on page 97.
3. Disconnect the signal and power cables from the hard disk drive.
4. Pull the handle to remove the hard disk drive.



5. Remove the failing hard disk drive from the bracket by flexing the bracket.
6. To install the new hard disk drive into the bracket, flex the bracket, and then align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the holes in the hard disk drive. Do not touch the circuit board **5** on the bottom of the hard disk drive.

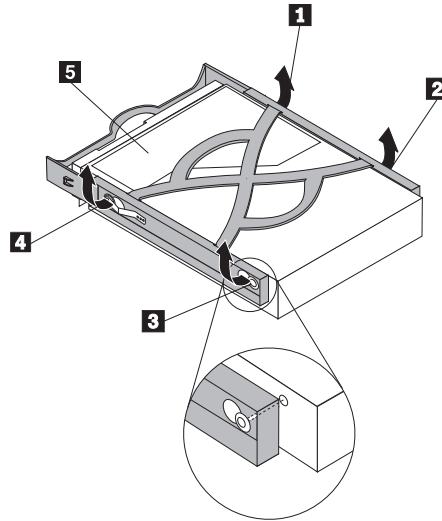


Figure 6. Installing a 3.5-inch hard disk drive into the bracket

Note: If you are installing a 2.5-inch hard disk drive into the bracket, flex the bracket, and then align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the holes in the hard disk drive adapter **5**.

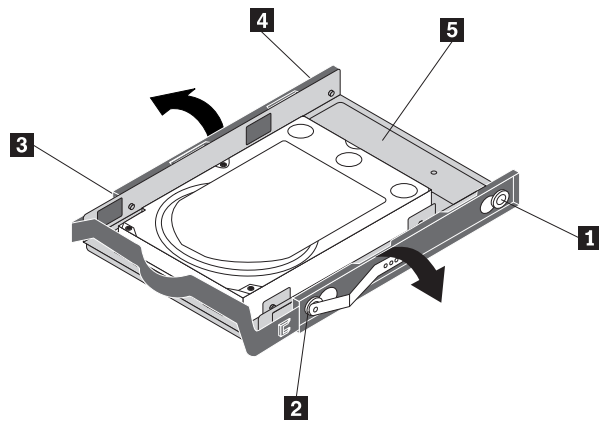


Figure 7. Installing a 2.5-inch hard disk drive into the bracket

7. Install the hard disk drive and bracket into the drive bay.
8. Using the signal cable that came with the new drive, connect one end of the signal cable to the drive. Locate one of the extra five-wire power cables and connect it to the drive.

Note: The signal cable will be different depending on whether you are installing a SATA hard disk drive or a SAS hard disk drive.

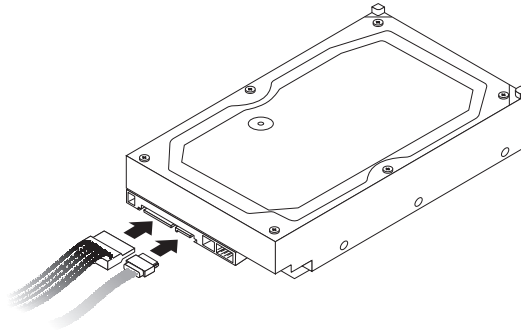


Figure 8. Connecting a 3.5-inch SATA hard disk drive

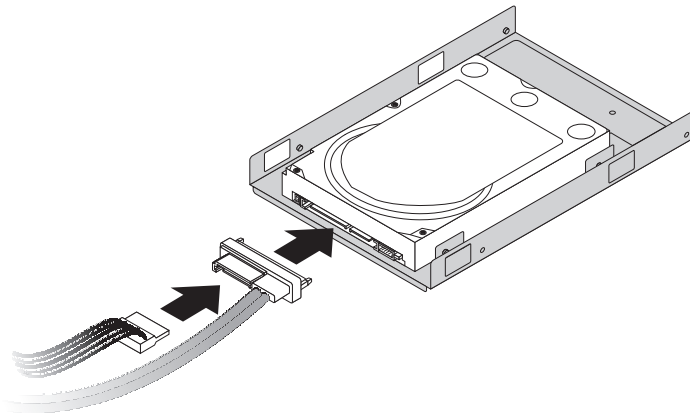


Figure 9. Connecting a 2.5-inch SATA hard disk drive

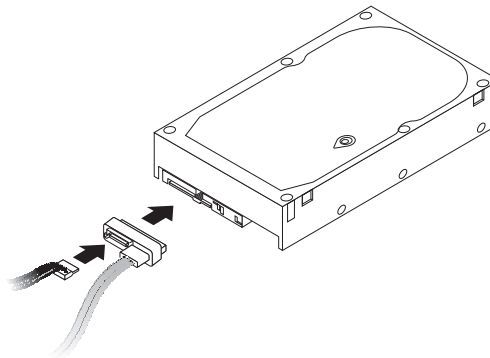


Figure 10. Connecting a 3.5-inch SAS hard disk drive

9. Go to “Completing the FRU replacement” on page 131.

Replacing the hard disk drive fan assembly

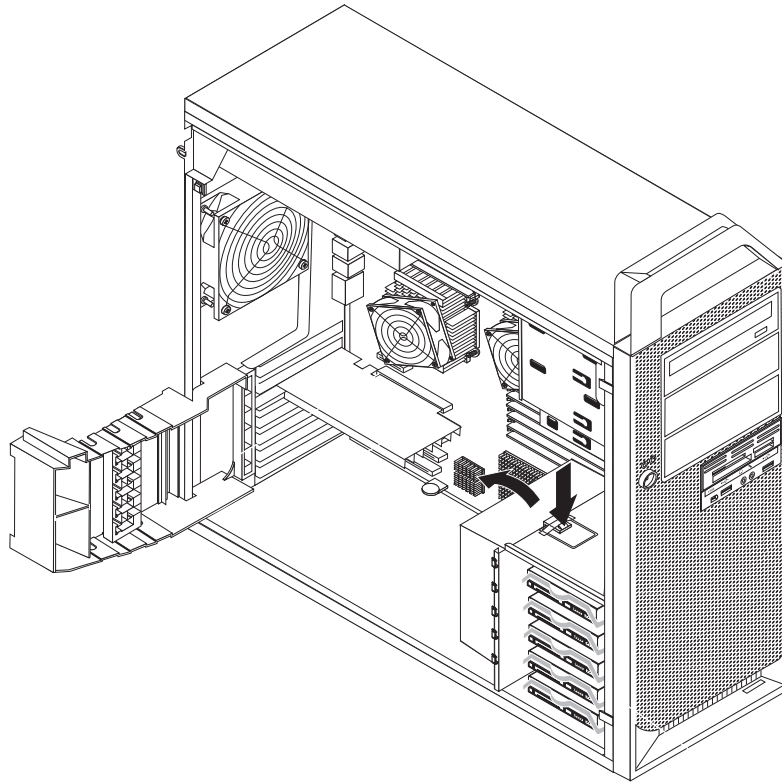
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

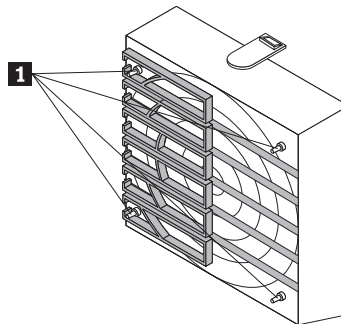
This section provides instructions on how to replace the hard disk drive fan assembly.

To replace the hard disk drive fan assembly:

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Locate the hard disk drive fan assembly. See “Locations” on page 97.
3. Unlatch and open the adapter card retainer.
4. Press the hard disk drive fan assembly bracket latch downwards and pivot the bracket to remove it from the chassis.



5. Disconnect the hard disk drive fan assembly cable from the system board.
6. The hard disk drive fan assembly is attached to the bracket by four rubber mounts **1**. Remove the fan assembly by gently pulling it out of the bracket.



7. Install the new hard disk drive fan assembly by aligning the rubber mounts of the fan assembly with the holes in the hard disk drive fan assembly bracket and pushing the rubber mounts through the holes.

8. Connect the hard disk drive fan assembly cable to the system board, and then install the bracket and hard disk drive fan assembly to the chassis.
9. Go to “Completing the FRU replacement” on page 131.

Replacing an optical drive

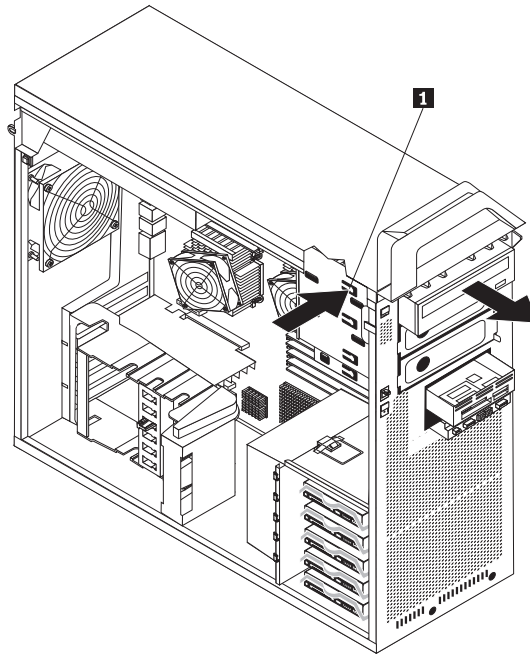
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

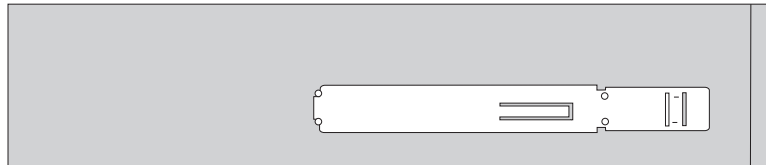
This section provides instructions on how to replace an optical drive.

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Remove the front bezel. See “Removing the front bezel” on page 99.
3. Locate the optical drive. See “Locations” on page 97.
4. Note the location of the optical drive cables. Disconnect the signal and power cables from the rear of the optical drive.

5. Press the drive latch **1** (for the drive you want to remove) and slide the optical drive from the chassis.



6. Remove the retainer bracket from the drive being replaced and install it on the new drive.



7. Slide the new optical drive into the bay from the front until it snaps into position.
8. Reconnect the signal and power cables to the new drive.
9. Go to “Completing the FRU replacement” on page 131.

Replacing the diskette drive or card reader

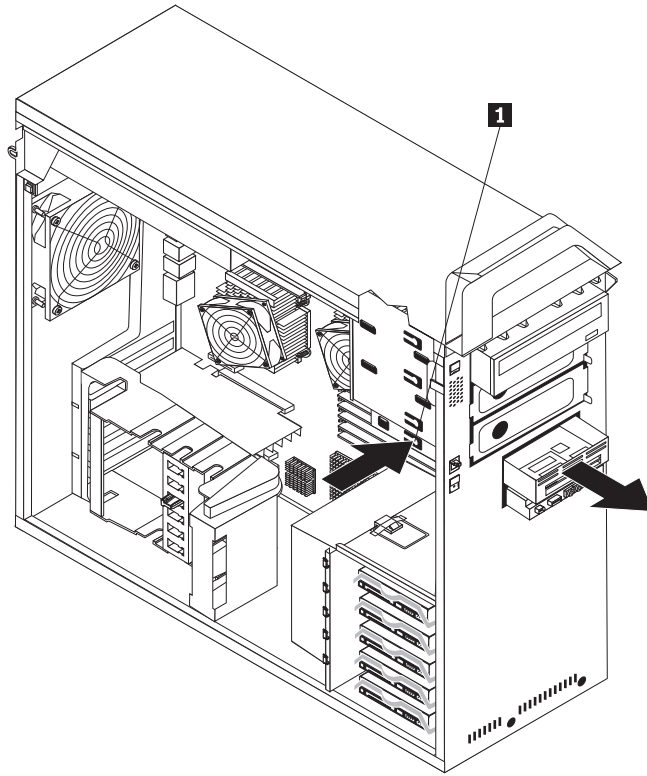
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

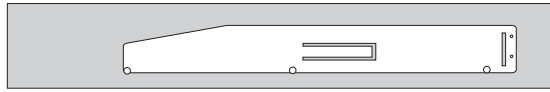
This section provides instructions on how to replace the diskette drive or card reader.

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Remove the front bezel. See “Removing the front bezel” on page 99.
3. Locate the diskette drive or card reader. See “Locations” on page 97.

4. Access system board components.
5. Note the routing of the signal cable. Disconnect the signal cable from the system board.
6. Press the drive latch **1** and slide the diskette drive or card reader out the front of the chassis.



7. Install the retainer bracket on the new diskette drive or card reader.



8. Disconnect the signal cable from the failing diskette drive or card reader and connect it to the new drive.
9. Slide the new diskette drive or card reader into the drive bay until it snaps into position.
10. Connect the diskette drive cable to the diskette drive connector on the system board. If you are installing a card reader, connect it to the card reader connector on the system board. See "Locating parts on the system board" on page 137.
11. Reinstall the hard disk drive fan bracket if removed.
12. Reinstall the front bezel.
13. Go to "Completing the FRU replacement" on page 131.

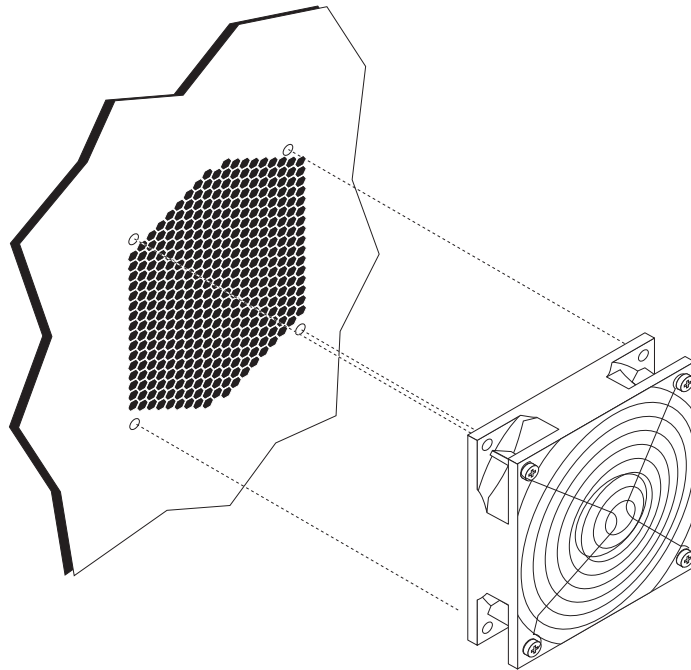
Replacing the front and rear fan assemblies

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the front and rear fan assemblies.

1. Remove the computer cover. See "Removing the cover" on page 96.
2. Locate the fan assembly that you want to replace. Your computer has one front fan assembly and one rear fan assembly. See "Locations" on page 97.
3. Disconnect the fan assembly cable from the system board. See "Locating parts on the system board" on page 137.
4. The fan assembly is attached to the chassis by four rubber mounts. Carefully remove the four rubber mounts by breaking them or cutting them with scissors and then remove the fan assembly out of the chassis.



5. Install the new fan assembly by aligning the four rubber mounts of the fan assembly with the holes on the chassis and push the rubber mounts through the holes.
6. Pull on the tips of the rubber mounts until the fan assembly is in place.
7. Depending on which fan assembly you are replacing, reconnect the fan assembly cable to the adapter card fan assembly connector or the rear fan assembly connector on the system board. See "Locating parts on the system board" on page 137.
8. Go to "Completing the FRU replacement" on page 131.

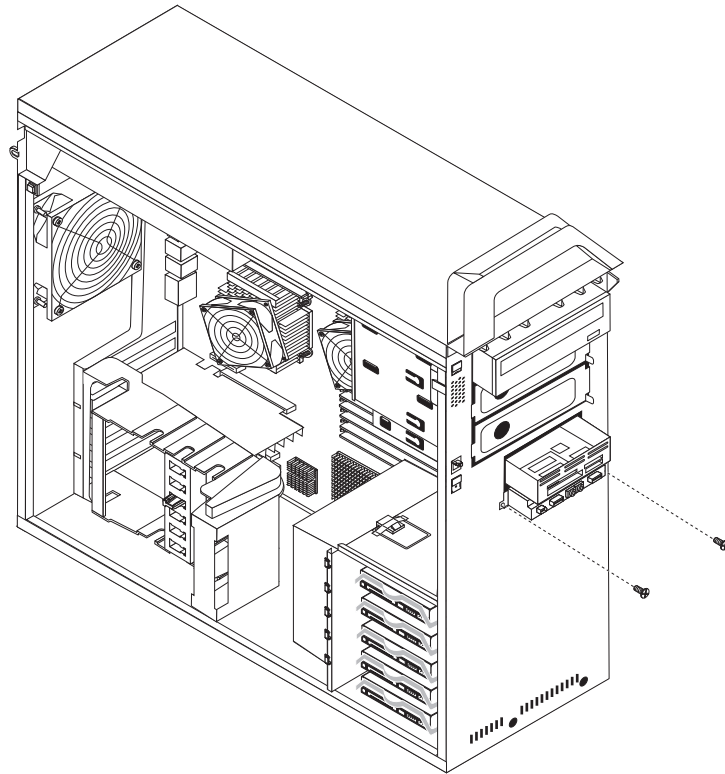
Replacing the front panel connectors assembly

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the front panel connectors assembly.

1. Remove the computer cover. See "Removing the cover" on page 96.
2. Remove the front bezel. See "Removing the front bezel" on page 99.
3. Locate the front panel connectors assembly.
4. Access system board components.
5. Disconnect the front audio, front USB, auxiliary LED, and IEEE 1394 cables from the system board and note the cables routing.
6. Remove the two screws that secure the front panel connectors assembly to the chassis and then release the front panel connectors assembly from the chassis.



7. Align the screw holes in the new front panel connectors assembly with the holes in the chassis. Install the two screws to secure the assembly.
8. Reconnect all the cables to the system board. See “Locating parts on the system board” on page 137.
9. Reinstall the hard disk drive fan bracket if removed.
10. Reinstall the front bezel.
11. Go to “Completing the FRU replacement” on page 131.

Replacing the power switch/LED assembly

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This procedure describes how to remove and replace the power switch/LED assembly.

1. Remove the computer cover. See “Removing the cover” on page 135.
2. Remove the front bezel. See “Removing the front bezel” on page 137
3. Disconnect the power switch/LED assembly cable from the system board. See “Removing the front bezel” on page 137.
4. Note the power switch/LED assembly cable routing and the position of the two LEDs.
5. Remove the switch and the LEDs from the bezel.

6. Route the cable for the new power switch/LED assembly through the hole in the chassis and to the system board.
7. Install the new power switch/LED assembly into the bezel. Make sure that the LEDs are in the correct position.
8. Connect the power switch/LED cable to the system board.
9. Reinstall the front bezel.
10. Go to "Completing the FRU replacement" on page 167.

Replacing the battery

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

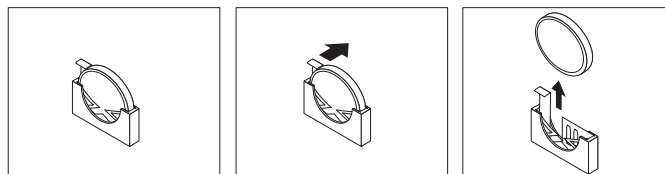
Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as serial-port assignments (configuration). A battery keeps this information active when you turn off the computer.

The battery normally requires no charging or maintenance throughout its life; however, no battery lasts forever. If the battery fails, the date, time, and configuration information (including passwords) are lost. An error message is displayed when you turn on the computer.

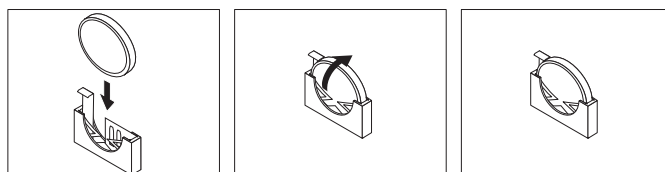
Refer to the "Lithium battery notice" in the *ThinkStation Safety and Warranty Guide* for information about replacing and disposing of the battery.

To replace the battery:

1. Turn off the computer and disconnect the power cord from the electrical outlet and from the computer.
2. Open the computer cover. See "Removing the cover" on page 96.
3. Access the system board.
4. Locate the battery. See "Locating parts on the system board" on page 137.
5. Remove the old battery.



6. Install the new battery.



7. Replace any adapter card that was removed. Replace the computer cover and connect the cables. See “Completing the FRU replacement” on page 131.

Note: When the computer is turned on for the first time after replacing the battery, an error message might be displayed. This is normal after replacing the battery.

8. Turn on the computer and all attached devices.
9. Use the Setup Utility program to set the date and time and any passwords. See “Using the Setup Utility” in the *ThinkStation User Guide*.

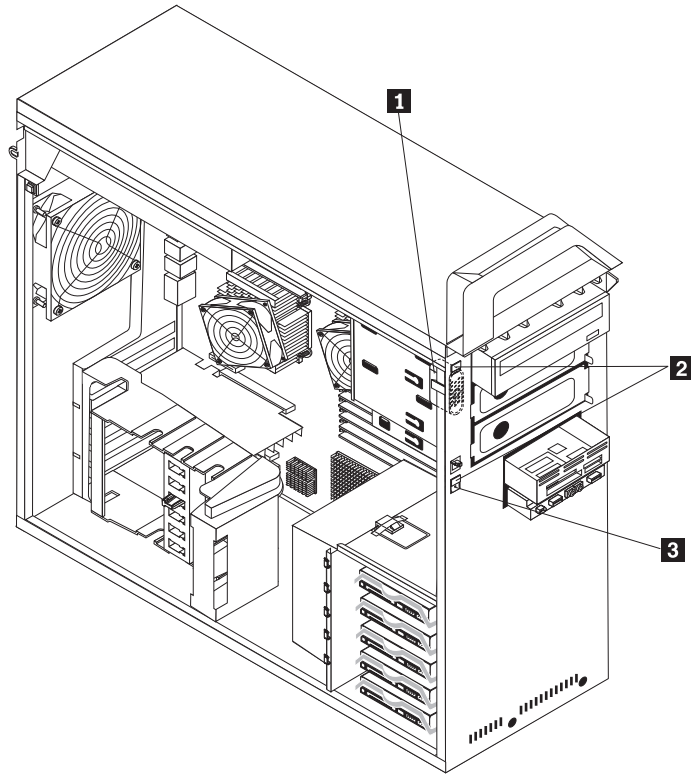
Replacing the internal speaker

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: <http://www.lenovo.com/support>.

This section provides instructions on how to replace the internal speaker.

1. Remove the computer cover. See “Removing the cover” on page 96.
2. Remove the front bezel. See “Removing the front bezel” on page 99.
3. Locate the internal speaker. See “Locations” on page 97.
4. Access system board components. Note the routing of the internal speaker cable and power LED cable, and then disconnect these cables from the system board. See “Locating parts on the system board” on page 137.
5. Disengage the internal speaker locking tab **3** and slide the internal speaker **1** downwards to completely remove it from the chassis.



6. Route the new internal speaker cable and power LED cable, and then position the two internal speaker latches **2** into the metal slots in the chassis, then push the internal speaker upwards until it snaps into position.
7. Connect the internal speaker cable and the power LED cable to the system board. See “Locating parts on the system board” on page 137.
8. Reinstall the hard disk drive fan bracket if removed.
9. Reinstall the front bezel.
10. Go to “Completing the FRU replacement” on page 131.

Completing the FRU replacement

After replacing FRUs, you need to install any removed parts, replace the cover, and reconnect any cables, including telephone lines and power cords. Also, depending on the FRU that is replaced, you might need to confirm the updated information in the Setup Utility program.

Note: When the power cord is first plugged in, the computer might appear to turn on for a few seconds and then turn off. This is a normal sequence to enable the computer to initialize.

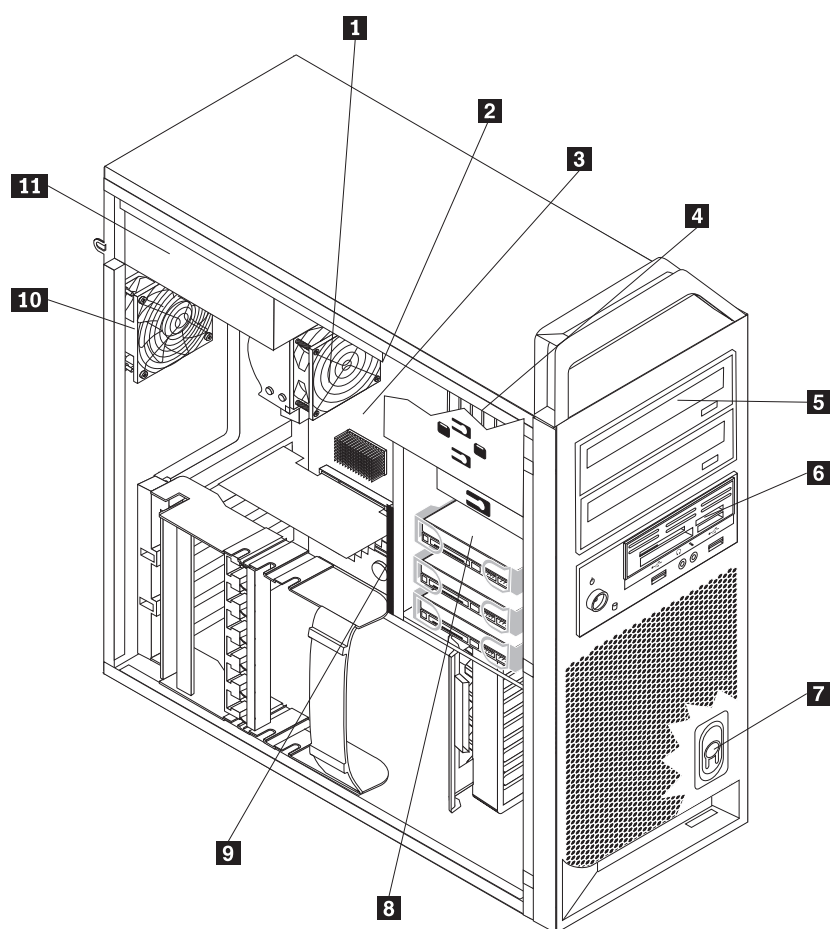
1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer.
2. Replace the cover.
3. Reconnect the external cables and power cords to the computer. See “Rear connectors” on page 134.
4. If you have replaced the system board, you must update (flash) the BIOS. See “Flash update procedures” on page 253.
5. Some FRU replacements require the configuration to be updated. See Chapter 6, “Using the Setup Utility,” on page 51.

Chapter 12. FRU lists

Attention: Read "Important information about replacing RoHS compliant FRUs" on page 2 before replacing any FRUs.

Note: In the following tables, a CRU (Customer Replaceable Unit) is identified as either "1", "2", or "N" in the CRU column. "N" means that the part is not a CRU, "1" means that the part is a Self-service CRU, and "2" means that the part is an Optional-service CRU.

Machine Type 4105



Item #	4105 FRUs	FRU#	CRU Tier
1	Fan sink, Bloomfield performance (all models)	41R5578	2
1	Fan sink, Bloomfield workstation (all models)	41R5580	2
2	Microprocessor, Intel Xeon W3520 - 2.66Ghz, Quad Core - 4.8 QPI, 4MB L2, DDR3-1066, Turbo, SMT, 130W (models 34C 34B 34H 34V 34C18H 18V 18B 42Q 43Q 44A 44T 44K 36M 23G 53C 53B 53H 53V 56U 56F 62G 63G 75M C3C C5B C5H B2M B3M A1J A2J 94G 99U 99F 99S C9A C7A C7Q C7K CTO)	46R6405	N
2	Microprocessor, Intel Xeon W3540 - 2.93GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 130W (models 39U 39F 57U 57F C8A C8Q C8K CTO)	46R6406	N

Item #	4105 FRUs	FRU#	CRU Tier
2	Microprocessor, Intel Xeon W3570 - 3.20GHz, Quad Core- 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models 58U 58F CTO)	46R6407	N
2	Microprocessor, Intel Xeon W3550 - Quad Core - 3.06GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, SMT, 130W (models 64G 68J 69J 72J 76M 78M 79U 79F 82C 83C 84H 88V 89Q 89C 93Q A9M B1M A3J A4J A5J D4J CTO)	64Y9827	N
2	Microprocessor, Intel Xeon W3580 - Quad Core -3.33GHz - 6.4 QPI, 8MB Cache, DDR3 1333, Turbo, SMT, 130W (models 71J 73J 81C 85H 86V 91Q 91C C4C A6J D5J E1M)	64Y9829	N
2	Microprocessor, Intel Xeon E5502 - 1.86GHz, Dual Core 4.8 QPI, 4MB L2, DDR3-800, 80W (models 18C 19C 19B 19H 19V 17U 17F 27G 32B 32H 32V 32C 28G 95G CTO)	46R6630	N
2	Microprocessor, Intel Xeon E5503 - Dual Core - 2.00GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9029	N
2	Microprocessor, Intel Xeon E5504 - 2.00GHz, Quad Core- 4.8QPI, 4MB L2, DDR3-800, 80W (models 21C 21B 21H 21V 11U 11F 12U 12F 33B 33H 33V 33C 52C 52B 52H 52V CTO)	46R6631	N
2	Microprocessor, Intel Xeon E5506 - 2.13GHz, Quad Core - 4.8QPI, 4MB L2, DDR3-800, 80W (models 15U 15F 25G 41U 29G CTO)	46R6632	N
2	Microprocessor, Intel Xeon E5507 - Quad Core - 2.26GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9031	N
2	Microprocessor, Intel Xeon E5520 - 2.26GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 46M 46A 46Q 46T 47J 51C 51B 51H 51V 66G A8J C1M A7J CTO)	46R6633	N
2	Microprocessor, Intel Xeon E5530 - 2.40GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 31G 48M 48A 48Q 48T 49J B9M C2J CTO)	46R6634	N
2	Microprocessor, Intel Xeon E5540 - 2.53GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 13U 13F 24G 35M 37M 38U 38F B7M CTO)	46R6635	N
2	Microprocessor, Intel Xeon E5620 - Quad Core - 2.40GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9049	N
2	Microprocessor, Intel Xeon E5630 - Quad Core - 2.53GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9047	N
2	Microprocessor, Intel Xeon E5640 - Quad Core - 2.66GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9045	N
2	Microprocessor, Intel Xeon X5550 - 2.66GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 45A 45T 45K CTO)	46R6638	N
2	Microprocessor, Intel Xeon X5560 - 2.80GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 14U 14F CTO)	46R6639	N
2	Microprocessor, Intel Xeon X5650 - 6 Core - 2.66GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9043	N
2	Microprocessor, Intel Xeon X5660 - 6 Core - 2.80GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9041	N
2	Microprocessor, Intel Xeon X5667 - Quad Core - 3.06GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9039	N
2	Microprocessor, Intel Xeon X5570 - 2.93GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 67G CTO)	46R6640	N
2	Microprocessor, Intel Xeon X5680 - 6 Cores - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9033	N
2	Microprocessor, Intel Xeon X5677 - Quad Core - 3.46GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9035	N

Item #	4105 FRUs	FRU#	CRU Tier
2	Microprocessor, Intel Xeon X5670 - 6 Core - 2.93GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9037	N
2	Microprocessor, Intel Xeon W5580 - 3.20GHz, Quad Core 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models 16U 16F CTO)	46R6641	N
2	Microprocessor, Intel Xeon W3503 - Dual Core - 2.4Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models 54U 54F 59G 74M 77M B5M B6M 96G 97U 97F 97S D1G D3G C6A C6Q C6K CTO)	63Y9159	N
2	Microprocessor, Intel Xeon W3505 - Dual Core - 2.53Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models 55U 55F 61G 65G B4M 98U 98F 98S CTO)	63Y9161	N
2	Microprocessor, Intel Xeon W5590 - Quad Core - 3.33GHz - 6.4 QPI, 8MB Cache, DDR3 - 1333, Turbo, HT, 130W (models 87V 92Q 92C CTO)	64Y9831	N
2	Microprocessor, Intel Xeon W3680 - 6 Core - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9025	N
2	Microprocessor, Intel Xeon W3670 - 6 Cores - 3.20GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models K9J L1U L1F CTO)	71Y9027	N
2	Microprocessor, Intel Xeon W3565 - Quad Core - 3.2GHz - 4.8 QPI, 8MB Cache, DDR3-1066, 130W (models D2G D6J D7J D8M D9M CTO)	71Y8842	N
3	System Board, 1P Intel LGA 1366 (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 27G 24G 25G 26G 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C18H 18V 18K 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 29G 31G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 65G 66G 67G 68J 69J 71J 72J 73J 74M 75M 76M 77M 78M 79U 79F 81C 82C 83C 84H 85H 86V 87V 88V 89Q 89C 91Q 91C 92Q 92C 93Q C3C C4C C5B C5H A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A5J A6J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S C6A C6Q C6K C7A C7Q C7K C8A C8Q C8K C9A D1G D2G D3G D4J D5J D6J D7J D8M D9M E1M CTO K9J L1U L1F)	64Y7517	N
3	System Board, 1P Intel LGA 1366 Tylersburg 36S, ICH10R (Russia Only) (models 27G 24G 25G 26G 23G 28G 29G 31G 94G 95G 96G CTO)	64Y6337	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.35 , TPM enabled) (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 27G 24G 25G 26G 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C18H 18V 18K 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 29G 31G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 65G 66G 67G 68J 69J 71J 72J 73J 74M 75M 76M 77M 78M 79U 79F 81C 82C 83C 84H 85H 86V 87V 88V 89Q 89C 91Q 91C 92Q 92C 93Q C3C C4C C5B C5H A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A5J A6J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S C6A C6Q C6K C7A C7Q C7K C8A C8Q C8K C9A D1G D2G D3G D4J D5J D6J D7J D8M D9M E1M CTO K9J L1U L1F)	71Y8819	N
3	System Board, 1P Intel LGA 1366, Tylersburg 36S, ICH10R (v1.35, TPM disabled) (models 27G 24G 25G 26G 23G 28G 29G 31G 94G 95G 96G CTO)	71Y8823	N

Item #	4105 FRUs	FRU#	CRU Tier
3	System Board, 1P Intel LGA 1366, Tylersburg 36S, ICH10R (v1.45, TPM enabled) (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 27G 24G 25G 26G 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C18H 18V 18K 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 29G 31G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 65G 66G 67G 68J 69J 71J 72J 73J 74M 75M 76M 77M 78M 79U 79F 81C 82C 83C 84H 85H 86V 87V 88V 89Q 89C 91Q 91C 92Q 92C 93Q C3C C4C C5B C5H A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A5J A6J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S C6A C6Q C6K C7A C7Q C7K C8A C8Q C8K C9A D1G D2G D3G D4J D5J D6J D7J D8M D9M E1M CTO K9J L1U L1F)	71Y8820	N
3	System Board, 1P Intel LGA 1366, Tylersburg 36S, ICH10R (v1.45, TPM disabled) (models 27G 24G 25G 26G 23G 28G 29G 31G 94G 95G 96G CTO)	71Y8824	N
4	Memory module, 1GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models 11U 11F 12U 12F 15U 15F 17U 17F 27G 32B 32H 32V 32C 33B 33H 33V 33C 85H 91Q 91C 93Q C2J 97U 97F 97S 98U 98F 98S D1G C6A C6Q C6K CTO)	46R6026	1
4	Memory module, 2GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 13U 13F 16U 16F 24G 25G 26G 58U 58F 67G 71J 73J 92Q 92C C4C A6J 99U 99F 99S C8A C8Q C8K C9A D2G D5J E1M C7A C7Q C7K CTO K9J L1U L1F)	46R6027	1
4	Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models 34B 34H 34V 34C18H 18V 18B 44A 44T 44K 45A 45T 45K 38U 38F 39U 39F 41U 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 59G 61G 63G 65G 74M 84H 88V 89Q 89C C5B C5H A8J B4M B6M B9M C1M A1J A2J A7J 95G D3G CTO)	53Y6195	1
4	Memory module, 4GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) (models 81C 86V 87V CTO)	64Y9570	1
4	Memory module, 2GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models 42Q 43Q 35M 37M 36M 23G 28G 29G 31G 52C 52B 52H 52V 53C 53B 53H 53V 62G 64G 66G 68J 69J 72J 75M 76M 77M 78M 79U 79F 82C 83C C3C A9M B1M B2M B3M B5M B7M A2J A3J A4J A5J 94G 96G D4J D6J D7J D8M D9M CTO)	53Y6197	1
5	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models CTO)	41N3325	1
5	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models CTO)	71Y5543	1
5	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 27G 24G 25G 26G 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C 18H 18V 18B 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 29G 31G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 65G 66G 67G 68J 69J 71J 72J 73J 74M 75M 76M 77M 78M 79U 79F 82C 83C 84H 85H 88V 89Q 89C 91Q 91C 92Q 92C 93Q C3C C5B C5H A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A5J A6J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S C8A C8Q C8K C9A D1G D2G D3G D4J D5J D6J D7J D8M D9M E1M C6A C6Q C6K C7A C7Q C7K CTO K9J L1U L1F)	43C1042	1

Item #	4105 FRUs	FRU#	CRU Tier
5	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 27G 24G 25G 26G 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C 18H 18V 18B 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 29G 31G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 65G 66G 67G 68J 69J 71J 72J 73J 74M 75M 76M 77M 78M 79U 79F 82C 83C 84H 85H 88V 89Q 89C 91Q 91C 92Q 93Q C3C C5B C5H A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A5J A6J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S C8A C8Q C8K C9A D1G D2G D3G D4J D5J D6J D7J D8M D9M E1M C6A C6Q C6K C7A C7Q C7K CTO K9J L1U L1F)	71Y5545	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 81C 86V 87V C4C CTO)	53Y3365	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 81C 86V 87V C4C CTO)	53Y7643	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - XP/Vista (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 81C 86V 87V C4C CTO)	71Y5547	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-ALPS (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C 42Q C8A C8Q C8K C9A E1M C6A C6Q C6K C7A C7Q C7K CTO)	40Y9105	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-SONY (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C 42Q C8A C8Q C8K C9A E1M C6A C6Q C6K C7A C7Q C7K CTO)	40Y9107	1
7	Power switch/LED assembly (all models)	41R5651	2
8	Internal speaker (all models)	41R5494	2
9	Hard disk drive, 250GB SATA - 7200 rpm (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 11U 11F 17U 17F 25G 32B 32H 32V32C33B 33H 33V 33C 18H 18V 18B 42Q 43Q 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 59G 65G 68J 69J 72J 75M 76M 77M 78M 89Q 89C 93Q A8J A9M B1M B2M B3M B4M B5M B7M B9M C1M C2J A1J A2J A3J A4J A5J A7J 95G D1G D4J D6J D7J D8M D9M C6A C6Q C6K CTO K9J)	46R6029	1
9	Hard disk drive, 500GB SATA - 7200 rpm (models 12U 12F 13U 13F 14U 14F 24G 34B 34H 34V 34C 31G 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 66G 71J 73J 74M 79U 79F 84H 85H 91Q 91C 92Q 92C C3C C5B C5H B6M A6J 94G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S D2G D3G D5J C7A C7Q C7K CTO L1U L1F)	46R6030	1
9	Hard disk drive, 750GB SATA - 7200 rpm (models CTO)	43C3671	1
9	Hard disk drive, 1TB SATA - 7200 rpm (models C4C CTO)	46R6031	1
9	Hard disk drive, 74GB SATA - 10000 rpm (models CTO)	46R6032	2
9	Hard disk drive, 150GB SATA - 10000 rpm (models 15U 15F 16U 16F 27G 44A 44T 44K 29G 82C 83C CTO)	46R6400	2
9	Hard disk drive, 300GB SATA - 10000 rpm (models 81C 86V 87V 88V CTO)	46R6401	2
9	Hard disk drive, 147GB SAS, 15000 rpm (models 26G 67G CTO)	46R6033	1
9	Hard disk drive, 147GB SAS - 15000 rpm (models 26G 67G CTO)	45K0608	1
9	Hard disk drive, 300GB SAS, 15000 rpm (models CTO)	43C6969	1
9	Hard disk drive, 300GB SAS - 15000 rpm (models CTO)	45K0609	1
9	Hard disk drive, 450GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" (models C8A C8Q C8K CTO)	45J4899	1

Item #	4105 FRUs	FRU#	CRU Tier
9	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models C9A E1M CTO)	45N7953	1
9	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models C9A E1M CTO)	45N8203	1
9	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N7959	1
10	Fan bracket assembly, 70 x 25 fan (all models)	41R5589	2
11	Exhaust fan assembly (all models)	41R5583	2
12	Power supply, 625 Watt Power Supply—1P (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 27G 24G 25G 26G 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C18H 18V 18K 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 29G 31G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 65G 66G 67G 68J 69J 71J 72J 73J 74M 75M 76M 77M 78M 79U 79F 81C 82C 83C 84H 85H 86V 87V 88V 89Q 89C 91Q 91C 92Q 92C 93Q C3C C4C C5B C5H A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A5J A6J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S C6A C6Q C6K C7A C7Q C7K C8A C8Q C8K C9A D1G D2G D3G D4J D5J D6J D7J D8M D9M E1M CTO K9J L1U L1F)	41A9758	2

The FRUs listed in the following tables are not illustrated.

4105 FRUs	FRU#	CRU Tier
Fan assembly, 92 mm Front PCI (all models)	41R5595	2
PS2 keyboard/Mouse card and cable assembly (all models)	41R5604	2
Adapter bracket, 2.5 to 3.5 HDD (all models)	41R5625	2
EMC shield assembly (all models)	41R5621	2
Label, Martell 2/Menorca Information (all models)	41R5626	1
Second serial port cable (all models)	41R5544	2
FDD cable (all models)	41N8294	2
RM assembly (all models)	41R5592	2
Cable assembly, Marvell SAS LED (all models)	41R5667	2
Cable assembly, SAS LED with diodes (all models)	41R5696	2
Handle with screws (all models)	41R5490	1
Cable assembly, HDD SATA, Martell (all models)	41N8298	2
Cable assembly, SAS HDD (all models)	41R5482	2
Martell access cover assembly with tape (all models)	41R5670	2
Thermal sense cable (all models)	41R2511	2
Motherboard Screw Kit (all models)	41R5547	2
Cable assembly, SATA ODD, Remy (Hard from 41R5481) (all models)	41R5517	2
Miscellaneous Parts Kit, Martell 2(hard from 41R5560) (all models)	41R5673	2
Cable assembly, cover detect switch (all models)	41R5497	2
Martell 2 FPIO cable and bezel assembly kit (no 1394) (all models)	41R5690	2
Mechanical Shell Kit, no 1394 (all models)	41R5691	2
PS/2 Card and bracket assembly (all models)	41R5694	2

4105 FRUs	FRU#	CRU Tier
PS/2 Cable assembly (all models)	41R5604	2
SAS HDD filler (all models)	41R5552	2
Handle filler with screws (all models)	41R5699	2

4105 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --US English (models 19H 21H 11U 12U 13U 14U 15U 16U 17U 27G 24G 25G 26G 32H 33H 34H 18H 42Q 43Q 44A 45A 35M 36M 37M 38U 39U 41U 23G 28G 29G 31G 46M 46A 46Q 48M 48A 48Q 54U 55U 56U 57U 58U 59G 61G 62G 63G 64G 65G 66G 67G 74M 75M 76M 77M 78M 79U 84H 85H 89Q 91Q 92Q 92C 93Q C5H A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M 94G 95G 96G 97U 98U 99U C8A C8Q C9A D1G D2G D3G D8M D9M E1M C6A C6Q C7A C7Q CTO L1U)	41A5289	1
USB --Arabic (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5290	1
USB --Arabic/French (models CTO)	41A5291	1
USB --Belgian/French (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5292	1
USB --Belgium English (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5293	1
USB --Brazilian Portuguese (models CTO)	41A5294	1
USB --Bulgarian (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5295	1
USB -- Hong Kong/Taiwan (models 32B 32V 33B 33V 34B 34V 18B 18V 51B 51V 52B 52V 53B 53V 86V 87V 88V C5B)	41A5296	1
USB --Czech (ABB) (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5297	1
USB --Danish (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5298	1
USB --Dutch (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5299	1
USB --French (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5300	1
USB --French Canadian (models 11F 12F 13F 14F 15F 16F 17F 38F 39F 54F 55F 56F 57F 58F 79F 97F 98F 99F L1F)	41A5301	1
USB --French Canadian (models 11F 12F 13F 14F 15F 16F 17F 38F 39F 54F 55F 56F 57F 58F 79F 97F 98F 99F L1F)	41A5302	1
USB --German (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5303	1
USB --Greek (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5304	1
USB --Greek/US (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5305	1
USB --Hebrew (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5306	1
USB --Hungarian (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5307	1
USB --Iceland (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5308	1

4105 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --Italy (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5309	1
USB --Japanese (models 47J 49J 68J 69J 71J 72J 73J A8J C2J A1J A2J A3J A4J A5J A6J A7J D4J D5J D6J D7J K9J)	41A5310	1
USB --Korean (models 44K 45K C8K C7K C6K CTO)	41A5311	1
USB --LA Spanish (models CTO)	41A5312	1
USB --Norwegian (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5313	1
USB --Polish (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5314	1
USB --Portuguese (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5315	1
USB --Romanian (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5316	1
USB --Romanian (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5317	1
USB --Russian/Cyrillic (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5318	1
USB --Serbian/Cyrillic (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5319	1
USB --Slovak (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5320	1
USB --Spanish (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5321	1
USB --Swedish/Finnish (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5322	1
USB --Swiss F/G (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5323	1
USB --Thailand (models 44T 45T 46T CTO)	41A5324	1
USB --Turkish (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5325	1
USB --Turkish (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5326	1
USB --UK English (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5327	1
USB --US Euro (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5328	1
USB --Slovenian (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41A5329	1

4105 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
US English (models CTO)	41R0038	1
Arabic (models CTO)	41R0039	1
Arabic/French (models CTO)	41R0040	1
Belgium French (models CTO)	41R0041	1
Belgium English (models CTO)	41R0042	1

4105 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Brazilian Portuguese (models CTO)	41R0043	1
Bulgarian (models CTO)	41R0044	1
Chinese/US (models CTO)	41R0045	1
Czech (ABB) (models CTO)	41R0046	1
Danish (models CTO)	41R0047	1
Dutch (models CTO)	41R0048	1
French (models CTO)	41R0049	1
French Canadian (models CTO)	41R0050	1
French Canadian (models CTO)	41R0051	1
German (models CTO)	41R0052	1
Greek (models CTO)	41R0053	1
Greek/US (models CTO)	41R0054	1
Hebrew (models CTO)	41R0055	1
Hungarian (models CTO)	41R0056	1
Iceland (models CTO)	41R0057	1
Italy (models CTO)	41R0058	1
Japanese (models CTO)	41R0059	1
Korean (models CTO)	41R0060	1
LA Spanish (models CTO)	41R0061	1
Norwegian (models CTO)	41R0062	1
Polish (models CTO)	41R0063	1
Portuguese (models CTO)	41R0064	1
Romanian (models CTO)	41R0065	1
Romanian (models CTO)	41R0066	1
Russian/Cyrillic (models CTO)	41R0067	1
Serbian/Cyrillic (models CTO)	41R0068	1
Slovak (models CTO)	41R0069	1
Spanish (models CTO)	41R0070	1
Swedish/Finnish (models CTO)	41R0071	1
Swiss French/German (models CTO)	41R0072	1
Thailand (models CTO)	41R0073	1
Turkish (models CTO)	41R0074	1
Turkish (models CTO)	41R0075	1
UK English (models CTO)	41R0076	1
US Euro (models CTO)	41R0077	1
Slovenian (models CTO)	41R0078	1

4105 Mice	FRU#	CRU
Optical Wheel Mouse (400 DPI), USB - red wheel (Primary) (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 27G 24G 25G 26G 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C 18H 18V 18B 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 65G 66G 67G 69J 74M 75M 76M 77M 78M 79U 79F 84H 85H 89Q 89C 91Q 91C 92Q 92C 93Q C3C C4C C5B C5H A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S A5J A6J C8A C8Q C8K C9A D1G D2G D3G D4J D5J D6J D7J D8M D9M E1M C6A C6Q C6K C7A C7Q C7K CTO K9J L1U L1F)	41U3013	1
Optical Wheel Mouse (400 DPI), USB - red wheel (Secondary) (models 18C 19C 19B 19H 19V 21C 21B 21H 21V 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 27G 24G 25G 26G 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C 18H 18V 18B 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 59G 61G 62G 63G 64G 65G 66G 67G 69J 74M 75M 76M 77M 78M 79U 79F 84H 85H 89Q 89C 91Q 91C 92Q 92C 93Q C3C C4C C5B C5H A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S A5J A6J C8A C8Q C8K C9A D1G D2G D3G D4J D5J D6J D7J D8M D9M E1M C6A C6Q C6K C7A C7Q C7K CTO K9J L1U L1F)	41U3030	1
PS/2 Three Button ball mouse scroll point (models 29G 31G 68J 71J 72J 73J 81C 82C 83C 86V 87V 88V CTO)	41U3078	1

4105 Adapters and miscellaneous FRUs	FRU#	CRU
3.5" 20-in-1 Media Card Reader (w/GPIO detect) (models CTO 32B 32H 32V 32C 33B 33H 33V 33C 34B 34H 34V 34C 42Q 43Q 44A 44T 44K 45A 45T 45K 35M 36M 37M 38U 38F 39U 39F 41U 23G 28G 29G 31G 46M 46A 46Q 46T 47J 48M 48A 48Q 48T 49J 52C 52B 52H 52V 53C 53B 53H 53V 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F C3C C4C A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A5J A6J A7J 94G 95G 96G 97U 97F 97S 98U 98F 98S 99U 99F 99S D4J D5J D6J D7J D8M D9M)	45R8139	1
L1 IEEE 1394 PCI Adapter (models CTO A8J A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M C2J A1J A2J A3J A4J A5J A6J A7J D4J D5J D6J D7J D8M D9M E1M)	41D2781	1
Speakers (2-piece) Lenovo Logo (Primary) (models CTO)	41A5331	1
Speakers (2-piece) Lenovo Logo (Secondary) (models CTO)	41A5334	1
Lenovo 3 pieces Speakers (China Only) (models CTO)	45C8640	1
Lenovo 2 pieces Speakers (China Only) (models CTO)	45C8641	1
Speaker Power brick (models CTO)	89P8571	1
256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models CTO)	42Y6329	1
256MB NVIDIA FX380 (DVI + DP) (Hard from 46R2784) (models 11U 11F 17U 17F 27G 54U 54F 56U 56F B6M 95G 97U 97F 97S C6A C6Q C6K C7A C7Q C7K D3G CTO K9J L1U L1F)	71Y6863	1
512MB NVIDIA FX580 (DVI + DP + DP) (models 19C 19B 19H 19V 21C 21B 21H 21V 24G 32B 32H 32V 32C 33B 33H 33V 33C 35M 46M 46A 46Q 46T 47J 55U 55F 57U 57F 58U 58F 61G 74M 79U 79F 84H A8J B4M C1M A1J A7J 98U 98F 98S C8A C8Q C8K C9A CTO)	46R2786	1
768MB NVIDIA FX1800 (DVI + DP + DP) (models 18C 12U 12F 13U 13F 15U 15F 25G 26G 34B 34H 34V 34C 18H 18V 18B 42Q 43Q 37M 41U 48M 48A 48Q 48T 49J 51C 51B 51H 51V 52C 52B 52H 52V 53C 53B 53H 53V 62G 66G 67G 68J 72J 75M 83C 85H 93Q C3C C5B C5H B3M B7M B9M C2J A3J A5J 99U 99F 99S D4J D6J CTO)	46R2788	1
1.5GB NVIDIA FX4800 (DVI + DP + DP + ST), 2x3 Pwr Conn (models 14U 14F 16U 16F 71J 73J 81C 86V 87V A6J D5J CTO)	46R2792	1
256MB NVIDIA NVS295 (Dual DP) (models CTO)	46R2782	1

4105 Adapters and miscellaneous FRUs	FRU#	CRU
1GB NVIDIA FX3800 (DVI + DP + ST), 2x3 Pwr Conn. (models 76M 82C 88V C4C A9M D9M E1M CTO)	89Y0429	1
4GB NVIDIA FX5800 (DVI + DVI + DP + ST), 2*2X3 Pwr Conn. (models CTO)	46R2794	1
256MB ATI FirePro V3700 (Dual DVI) (models 44A 44T 44K 39U 39F 59G 77M 89Q 89C B5M A2J CTO)	53Y8569	1
512MB ATI FirePro V5700 (DP+DP+DVI) (models 45A 45T 45K 36M 38U 38F 63G 69J 91Q 91C 92Q 92C B2M A4J D7J CTO)	53Y8571	1
1GB ATI FirePro V7700 (DP+DP+DVI) (models CTO)	53Y8573	1
Soft Modem V.90/V.44 (models CTO)	29R9729	1
Dongle Cable (DMS59 to dual DVI) (models CTO)	41X6398	1
Nvidia Tesla C1060 Compute Card (computer adapter) (models CTO)	46R6041	1
SAS Controller Card - 3Gb/s, 4-port Host Bus Adapter (models CTO)	46R3460	1
SoundBlaster Titanium Audio Card (PCIe) (models CTO)	46T0407	1
Modem Phone Cable (models CTO)	39K5120	1
DVI to VGA Dongle (models CTO)	45C7816	1
DP to DVI Dongle 200 mm (models CTO)	43N9160	1
512MB NVIDIA Quadro NVS 450 GDDR3 (DP+DP+DP+DP) (models CTO)	64Y9895	1

4105 Power Cords	FRU#	CRU
Power cord - US (models 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 44A 44T 45A 45T 35M 36M 37M 38U 38F 39U 39F 41U 46M 46A 46T 48M 48A 48T 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 74M 75M 76M 77M 78M 79U 79F 84H 85H C3C C4C 97U 97F 97S 98U 98F 98S 99U 99F 99S C6A C7A C9A CTO L1U L1F)	41R3184	1
Power cord - US (models 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 16U 16F 17U 17F 44A 44T 45A 45T 35M 36M 37M 38U 38F 39U 39F 41U 46M 46A 46T 48M 48A 48T 54U 54F 55U 55F 56U 56F 57U 57F 58U 58F 74M 75M 76M 77M 78M 79U 79F 84H 85H C3C C4C 97U 97F 97S 98U 98F 98S 99U 99F 99S C6A C7A C9A CTO L1U L1F)	41R3185	1
Power cord - China (models 18C 19C 21C 32C 33C 34C 51C 53C 81C 82C 83C 91C 92C C3C C4C CTO)	41R3256	1
Power cord - China (models 18C 19C 21C 32C 33C 34C 51C 53C 81C 82C 83C 91C 92C C3C C4C CTO)	41R3257	1
Power cord - Japanese and Japanese English (models 47J 49J 68J 69J 71J 72J 73J A8J C2J A1J A2J A3J A4J A5J A6J A7J D4J D5J D6J D7J CTO K9J)	41R3248	1
Power cord - Japanese and Japanese English (models 47J 49J 68J 69J 71J 72J 73J A8J C2J A1J A2J A3J A4J A5J A6J A7J D4J D5J D6J D7J CTO K9J)	41R3249	1
Power cord - Brazil (Portuguese) (models CTO)	41R3270	1
Power cord - Brazil (Portuguese) (models CTO)	41R3271	1
Power cord - LA High Volt (APU) (models CTO)	41R3176	1
Power cord - LA High Volt (APU) (models CTO)	41R3177	1
Power cord - ANZ (models A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M D8M D9M E1M CTO)	41R3196	1
Power cord - ANZ (models A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M D8M D9M E1M CTO)	41R3197	1
Power cord - Korea (models 44K 45K C8K C6K C7K CTO)	41R3260	1
Power cord - Korea (models 44K 45K C8K C6K C7K CTO)	41R3261	1

4105 Power Cords	FRU#	CRU
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong (models 19B 19H 21B 21H 32B 32H 33B 33H 34B 34H 18H 18B 51B 51H 52B 52H 53B 53H C5B C5H CTO)	41R3224	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong (models 19B 19H 21B 21H 32B 32H 33B 33H 34B 34H 18H 18B 51B 51H 52B 52H 53B 53H C5B C5H CTO)	41R3225	1
Power cord - Taiwan (models 19V 18V 51V 52V 53V 86V 87V 88V CTO)	41R3278	1
Power cord - Taiwan (models 19V 18V 51V 52V 53V 86V 87V 88V CTO)	41R3279	1
Power cord - Italy (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G 97S 98S 99S D1G D2G D3G CTO)	41R3232	1
Power cord - Italy (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G 97S 98S 99S D1G D2G D3G CTO)	41R3233	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models CTO)	41R3208	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models CTO)	41R3209	1
Power cord - Denmark (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41R3212	1
Power cord - Denmark (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41R3213	1
Power cord - Switzerland (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41R3228	1
Power cord - Switzerland (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41R3229	1
Power cord - Israel (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41R3236	1
Power cord - Israel (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41R3237	1
Power cord - South Africa (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41R3220	1
Power cord - South Africa (models 27G 24G 25G 26G 23G 28G 29G 31G 59G 61G 62G 63G 64G 65G 66G 67G 94G 95G 96G D1G D2G D3G CTO)	41R3221	1
Power cord - India (models 42Q 43Q 46Q 48Q 89Q 91Q 93Q C8Q C7Q C6Q CTO)	41R3341	1
Power cord - India (models 42Q 43Q 46Q 48Q 89Q 91Q 93Q C8Q C7Q C6Q CTO)	41R3175	1
Power cord - Japan and Japanese English (models 47J 49J 68J 69J 71J 72J 73J A8J C2J A1J A2J A3J A4J A5J A6J A7J D4J D5J D6J D7J CTO K9J)	43N9057	1
Power cord - Japan and Japanese English (models 47J 49J 68J 69J 71J 72J 73J A8J C2J A1J A2J A3J A4J A5J A6J A7J D4J D5J D6J D7J CTO K9J)	43N9058	1

4105 Windows XP Pro Recovery DVDs	FRU#	CRU
US English/UK/Asia Pacific (models 59G 61G 65G 74M 75M 76M 77M 78M 89Q 91Q 92Q 93Q CTO)	03T5024	1
French/French Canadian (models 59G 61G 65G CTO)	03T5025	1
German (models 59G 61G 65G CTO)	03T5026	1
Italy (models 59G 61G 65G CTO)	03T5029	1
Brazil (models CTO)	03T5028	1
Spanish/LA Spanish (models 59G 61G 65G CTO)	03T5027	1

4105 Windows XP Pro Recovery DVDs	FRU#	CRU
Danish (models 59G 61G 65G CTO)	03T5033	1
Dutch (models 59G 61G 65G CTO)	03T5034	1
Arabic English (models 59G 61G 65G CTO)	03T5039	1
SV (Swedish) (models 59G 61G 65G CTO)	03T5032	1
Hebrew (models 59G 61G 65G CTO)	03T5037	1
Finland (models 59G 61G 65G CTO)	03T5036	1
Norwegian (models 59G 61G 65G CTO)	03T5031	1
Polish (models 59G 61G 65G CTO)	03T5038	1
Portuguese (models 59G 61G 65G CTO)	03T5045	1
Russian (models 59G 61G 65G CTO)	03T5040	1
Russian English (models 59G 61G 65G CTO)	03T5041	1
Hungarian (models 59G 61G 65G CTO)	03T5043	1
Czech (models 59G 61G 65G CTO)	03T5035	1
Turkish (models 59G 61G 65G CTO)	03T5042	1
Greek (models 59G 61G 65G CTO)	03T5044	1
Slovakian (models 59G 61G 65G CTO)	03T5046	1
Japanese (models 69J 72J 73J CTO)	03T5030	1
Simplified Chinese (models 92C 91C 89C CTO)	03T5047	1
Traditional Chinese Taiwan (models CTO)	03T5048	1
Traditional Chinese Hong Kong (models CTO)	03T5049	1
Korean (models CTO)	03T5050	1

4105 Vista Business 32 Recovery DVDs	FRU#	CRU
English (models 19H 21H 12U 17U 44A 45A 35M 36M 39U 23G 28G 46M 46A 48M 48A CTO)	64Y5661	1
Russian English (models 23G 28G CTO)	64Y3672	1
French (models 12F 17F 39F CTO)	64Y3673	1
German (models 23G 28G CTO)	64Y3674	1
Spanish (models 23G 28G CTO)	64Y3675	1
Brazilian (models CTO)	64Y3676	1
Italian (models 23G 28G CTO)	64Y3677	1
Japanese (models CTO)	64Y5662	1
Norwegian (models 23G 28G CTO)	64Y3699	1
Swedish (models 23G 28G CTO)	64Y3700	1
Danish (models 23G 28G CTO)	64Y3697	1
Dutch (models 23G 28G CTO)	64Y3691	1
Czech (models 23G 28G CTO)	64Y3678	1
Finnish (models 23G 28G CTO)	64Y3698	1
Polish (models 23G 28G CTO)	64Y3679	1
Russian (models 23G 28G CTO)	64Y3680	1
Turkish (models 23G 28G CTO)	64Y3681	1

4105 Vista Business 32 Recovery DVDs	FRU#	CRU
Hungarian (models 23G 28G CTO)	64Y3682	1
Greek (models 23G 28G CTO)	64Y3683	1
Simplified Chinese (models 18C 19C 21C CTO)	64Y5663	1
Traditional Chinese TC (models 19V 21V CTO)	64Y3686	1
Traditional Chinese HK (models 19B 21B CTO)	64Y3687	1
Korean (models 44K 45K CTO)	64Y3688	1
Slovenian (models 23G 28G CTO)	64Y3689	1
Romanian (models 23G 28G CTO)	64Y3693	1
Portuguese (models 23G 28G CTO)	64Y3694	1
Sebian-Latin (models 23G 28G CTO)	64Y3695	1
Slovakian (models 23G 28G CTO)	64Y3696	1
Arabic Localized (models CTO)	64Y3690	1
Hebrew (models CTO)	64Y3692	1
MUL DVD P/Ns VB32 C&L1 Nordics (EN DK FI NO SV) (models 23G 28G CTO)	64Y3701	1
MUL DVD P/Ns VB32 C&L 2 Switzerland (EN FR GR IT) (models 23G 28G CTO)	64Y3702	1
MUL DVD P/Ns VB32 C&L 3 Bel Lux (EN FR GR NL) (models 23G 28G CTO)	64Y3703	1
English for India (models 43Q 48Q 46Q CTO)	71Y3620	1

4105 Vista Business 64 Recovery DVDs	FRU#	CRU
English (models 11U 13U 14U 15U 16U 27G 24G 25G 26G 32H 33H 34H 37M 38U 41U 29G 31G 51H 52H 53H 54U 55U 56U 57U 58U 62G 63G 64G 79U 84H 85H CTO)	64Y5664	1
Russian English (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3771	1
French (models 11F 13F 14F 15F 16F 38F 54F 55F 56F 57F 58F 79F CTO)	64Y3772	1
German (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3773	1
Spanish (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3774	1
Brazilian (models CTO)	64Y3775	1
Italian (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3776	1
Japanese (models 47J 49J CTO)	64Y5665	1
Norwegian (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3796	1
Swedish (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3797	1
Danish (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3794	1
Dutch (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3790	1
Czech (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3777	1
Finnish (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3795	1
Polish (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3778	1
Russian (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3779	1
Turkish (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3780	1
Hungarian (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3781	1
Greek (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3782	1
Simplified Chinese (models 32C 33C 34C 51C 52C 53C 81C 82C 83C CTO)	64Y5666	1
Trad Chinese (models 32V 33V 34V 18V 52V 53V 86V 87V 88V CTO)	64Y3785	1

4105 Vista Business 64 Recovery DVDs	FRU#	CRU
Trad Chinese (models 32B 33B 34B 18B 51B 52B 53B CTO)	64Y3786	1
Korean (models CTO)	64Y3787	1
Slovenian (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3788	1
Portuguese (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3792	1
Slovakian (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3793	1
Arabic Localized (models CTO)	64Y3789	1
Hebrew (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3791	1
MUL DVD P/Ns VB64 C&L1 Nordics (EN DK FI NO SV) (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3798	1
MUL DVD P/Ns VB64 C&L 2 Switzerland (EN FR GR IT) (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3799	1
MUL DVD P/Ns VB64 C&L3 Bel Lux (EN FR GR NL) (models 27G 24G 25G 26G 29G 31G 62G 63G 64G CTO)	64Y3800	1

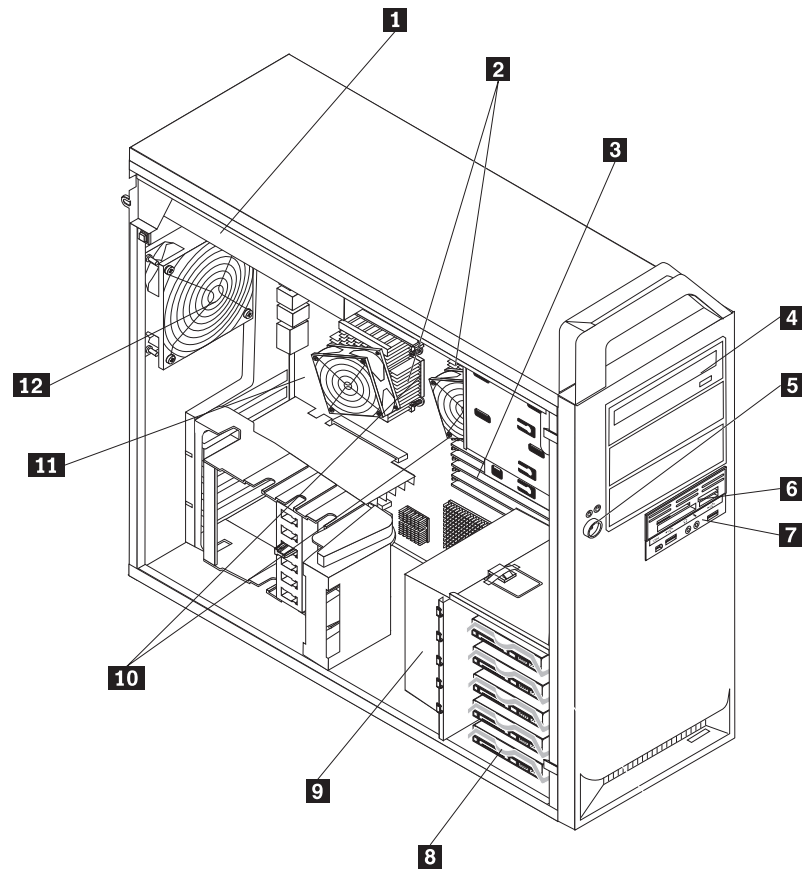
4105 Windows XP 64 Recovery DVDs	FRU#	CRU
English (models 41U 31G CTO)	89Y0802	1
Japanese (models A3J 16J CTO)	71Y9060	1

4105 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models C5H A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M 97U 98U 99U C6A D8M D9M E1M CTO L1U)	03T5020	1
French (models 94G 95G 96G 97F 98F 99F D1G D2G D3G CTO L1F)	03T5006	1
German (models 94G 95G 96G 97F 98F 99F D1G D2G D3G CTO)	03T5008	1
Czech (models 94G 95G 96G 97F 98F 99F D1G D2G D3G CTO)	03T5004	1
Polish (models 94G 95G 96G 97F 98F 99F D1G D2G D3G CTO)	03T5013	1
Turkish (models 94G 95G 96G 97F 98F 99F D1G D2G D3G CTO)	03T5019	1
Greek (models 94G 95G 96G 97F 98F 99F D1G D2G D3G CTO)	03T5007	1
Japanese (models A8J C2J A1J A2J A4J A5J A7J D4J D5J D6J D7J CTO K9J)	03T5011	1
Korean (models C6K C7K CTO)	03T5012	1
Slovenian (models 94G 95G 96G D1G D2G D3G CTO)	03T5017	1
Russian English (models 94G 95G 96G D1G D2G D3G CTO)	03T5014	1
Slovakian (models 94G 95G 96G D1G D2G D3G CTO)	03T5016	1
Hebrew (models 94G 95G 96G D1G D2G D3G CTO)	03T5001	1
Simplified English (models CTO)	03T5002	1
Traditional English (models CTO)	03T5003	1
India English (models C6Q C7Q)	03T5005	1
Hong Kong (models CTO)	03T5009	1
Italian (models 94G 95G 96G D1G D2G D3G CTO)	03T5010	1
Russian (models 94G 95G 96G D1G D2G D3G CTO)	03T5015	1
Spanish (models 94G 95G 96G D1G D2G D3G CTO)	03T5018	1
C&L Bel Lux (EN FR GR NL) (models 94G 95G 96G D1G D2G D3G CTO)	03T5021	1
C&L Nordics (EN DK FI NO SV) (models 94G 95G 96G D1G D2G D3G CTO)	03T5022	1

4105 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
C&L Switzerland (EN FR GR IT) (models 94G 95G 96G D1G D2G D3G CTO)	03T5023	1

4155 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models C5H A9M B1M B2M B3M B4M B5M B6M B7M B9M C1M 97U 98U 99U C6A D8M D9M E1M CTO L1U)	03T5287	1
French (models 94G 95G 96G 97F 98F 99F D1G D2G D3G CTO L1F)	03T5274	1
German (models 94G 95G 96G D1G D2G D3G CTO)	03T5276	1
Czech (models 94G 95G 96G D1G D2G D3G CTO)	03T5272	1
Polish (models 94G 95G 96G D1G D2G D3G CTO)	03T5280	1
Turkish (models 94G 95G 96G D1G D2G D3G CTO)	03T5286	1
Greek (models 94G 95G 96G D1G D2G D3G CTO)	03T5275	1
Korean (models C6K C7K CTO)	03T5279	1
Slovenian (models 94G 95G 96G D1G D2G D3G CTO)	03T5284	1
Russian English (models 94G 95G 96G D1G D2G D3G CTO)	03T5281	1
Arabic Localized (models 94G 95G 96G D1G D2G D3G CTO)	03T5269	1
Slovakian (models 94G 95G 96G D1G D2G D3G CTO)	03T5283	1
Simplified English (models CTO)	03T5270	1
Traditional English (models CTO)	03T5271	1
India English (models C6Q C7Q)	03T5273	1
Hong Kong (models CTO)	03T5277	1
Italian (models 94G 95G 96G D1G D2G D3G CTO)	03T5278	1
Russian (models 94G 95G 96G D1G D2G D3G CTO)	03T5282	1
Spanish (models 94G 95G 96G D1G D2G D3G CTO)	03T5285	1
C&L Bel Lux (EN FR GR NL) (models 94G 95G 96G D1G D2G D3G CTO)	03T5288	1
C&L Nordics (EN DK FI NO SV) (models 94G 95G 96G D1G D2G D3G CTO)	03T5289	1
C&L Switzerland (EN FR GR IT) (models 94G 95G 96G D1G D2G D3G CTO)	03T5290	1

Machine Type 4155



The FRUs listed in the following tables are not illustrated.

Item #	4155 FRUs	FRU#	CRU Tier
1	Power supply, 1060 Watt Power Supply (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V 15G 16G 19G 17G 18G 35C 35B 35H 35V 25J 26Q 27U 28U 28F 29U 29F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 36C 36B 36H 36V 37C 37B 37H 37V 38C 38B 38H 38V 42G 43G 44J 45M 46M 47U 47F 48C 49C 51H 52V 53V 54Q 54C 55Q 55C 67B 67H 66C 63M 64M 65M 56J 57J 58J 59J 61J 62J 68U 68F 68S 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 74G 75G 76J 77J 78J CTO C9J D1G D2G D3G D4G)	41A9761	2
2	Heat sink, Workstation, 130 Watt (all models)	41R5580	2
3	Memory module, 1GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models 35C 35B 35H 35V 28U 28F 29U 29F 31U 31F 32U 32F 54Q 54C 62J CTO)	46R6026	1
3	Memory module, 2GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models 37C 37B 37H 37V 38C 38B 38H 38V 49C 55Q 55C 66C 57J 68U 68F 68S 69A 69Q 69K 71A 71Q 71K 71A 71Q 71K 75G 78J CTO D1G D2G D3G D4G)	46R6027	1
3	Memory module, 4GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) (models 48C 53V 58J 59J 61J 76J 77J CTO C9J)	64Y9570	1
3	Memory module, 1GB DDR3 1RX8 RDIMM PC3-8500 (1066MHz) (models 17G 27U 21G 22G 23G 24G 64M CTO)	46R6022	1
3	Memory module, 2GB DDR3 2RX8 RDIMM PC3-8500 (1066MHz) (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 14C 14B 14H 14V 15G 19G 18G 39U 39F 41U 41F 51H 63M 65M 56J CTO)	46R6023	1

Item #	4155 FRUs	FRU#	CRU Tier
3	Memory module, 4GB DDR3 2RX4 RDIMM PC3-8500 (1066MHz) (models 25J 26Q CTO)	46R6024	1
3	Memory module, 8GB DDR3 4RX4 RDIMM PC3-8500 (1066MHz) (models CTO)	46R6025	1
3	Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models 33U 33F 34U 34F 36B 36H 36V 74G CTO)	53Y6195	1
3	Memory module, 2GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models 42G 43G 45M 46M 47U 47F 52V 67B 67H 73G CTO)	53Y6197	1
4	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models 44J CTO)	41N3325	1
4	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models 44J CTO)	71Y5543	1
4	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models 15G 16G 19G 17G 18G 35C 35B 35H 35V 25J 26Q 27U 28U 28F 29U 29F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 36C 36B 36H 36V 37C 37B 37H 37V 38C 38B 38H 38V 39U 39F 41U 41F 42G 43G 45M 46M 47U 47F 49C 51H 52V 53V 54Q 54C 55Q 55C 67B 67H 66C 63M 64M 65M 56J 57J 58J 59J 61J 62J 68U 68F 68S 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 74G 75G 76J 77J 78J CTO C9J D1G D2G D3G D4G)	43C1042	1
4	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models 15G 16G 19G 17G 18G 35C 35B 35H 35V 25J 26Q 27U 28U 28F 29U 29F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 36C 36B 36H 36V 37C 37B 37H 37V 38C 38B 38H 38V 39U 39F 41U 41F 42G 43G 45M 46M 47U 47F 49C 51H 52V 53V 54Q 54C 55Q 55C 67B 67H 66C 63M 64M 65M 56J 57J 58J 59J 61J 62J 68U 68F 68S 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 74G 75G 76J 77J 78J CTO C9J D1G D2G D3G D4G)	71T5545	1
4	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V CTO)	53Y7643	1
4	Optical drive, Blu-Ray Disc Burner (SATA) - Vista (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V CTO)	53Y3365	1
4	Optical drive, Blu-Ray DVD Burner (SATA) - XP/Vista (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V 48C CTO)	71Y5547	1
5	Power switch/LED assembly and the internal speaker (all models)	41R5532	2
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-ALPS (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V 25J 28U 28F 44J 59J CTO)	40Y9105	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-SONY (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V 25J 28U 28F 44J 59J CTO)	40Y9107	1
7	Front panel cable, front panel cable assembly (USB, audio, 1394) (all models)	41R5657	2
8	Hard disk drive, 250GB SATA - 7200 rpm (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V 16G 19G 17G 29U 29F 32U 32F 21G 45M 46M 65M 56J 74G CTO)	46R6029	1
8	Hard disk drive, 500GB SATA - 7200 rpm (models 25J 26Q 28U 28F 34U 34F 23G 39U 39F 42G 44J 47U 47F 51H 52V 54Q 54C 55Q 55C 67B 67H 57J 58J 59J 61J 62J 68U 68F 68S 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 75G 76J 77J 78J CTO C9J D2G D3G D4G)	46R6030	1
8	Hard disk drive, 750GB SATA - 7200 rpm (models CTO)	43C3671	1
8	Hard disk drive, 1TB SATA - 7200 rpm (models CTO)	46R6031	1
8	Hard disk drive, 74GB SATA - 10000 rpm (models CTO)	46R6032	2
8	Hard disk drive, 150GB SATA - 10000 rpm (models 18G 24G CTO)	46R6400	2
8	Hard disk drive, 300GB SATA - 10000 rpm (models 27U 31U 31F 33U 33F 41U 41F 48C 63M 64M CTO)	46R6401	2
8	Hard disk drive, 147GB SAS - 15000 rpm (models 15G 35C 35B 35H 35V 22G CTO)	46R6033	1

Item #	4155 FRUs	FRU#	CRU Tier
8	Hard disk drive, 147GB SAS - 15000 rpm (models 15G 35C 35B 35H 35V 22G 43G 49C 53V 66C CTO)	45K0608	1
8	Hard disk drive, 300GB SAS - 15000 rpm (models CTO D1G)	43C6969	1
8	Hard disk drive, 300GB SAS - 15000 rpm (models CTO D1G)	45K0609	1
8	Hard disk drive, 450GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" (models CTO)	45J4899	1
8	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N7953	1
8	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N8203	1
8	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N7959	1
8	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N8207	1
9	Hard disk drive fan, Front 120 mm (HDD/PCI) with grommets (all models)	45J9606	1
10	Microprocessor, Intel Xeon W3520, 2.66GHz, Quad Core, 4.8 QPI, 4MB L2, DDR3-1066, Turbo, SMT, 130W (models CTO)	46R6405	N
10	Microprocessor, Intel Xeon W3540, 2.93GHz, Quad Core, 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 130W (models CTO)	46R6406	N
10	Microprocessor, Intel Xeon W3570, 3.20GHz, Quad Core, 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models CTO)	46R6407	N
10	Microprocessor, Intel Xeon W3550, Quad Core, 3.06GHz, 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, SMT, 130W (models CTO)	64Y9827	N
10	Microprocessor, Intel Xeon W3580, Quad Core -3.33GHZ, 6.4 QPI, 8MB Cache, DDR3 1333, Turbo, SMT, 130W (models CTO)	64Y9829	N
10	Microprocessor, Intel Xeon E5502, 1.86GHz, Dual Core 4.8 QPI, 4MB L2, DDR3-800, 80W (models 11C 11B 11H 11V 12C 12B 12H 12V 17G 35C 35B 35H 35V 29U 29F 37C 37B 37H 37V 69A 69Q 69K CTO)	46R6630	N
10	Microprocessor, Intel Xeon E5503 - Dual Core - 2.00GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9029	N
10	Microprocessor, Intel Xeon E5504, 2.00GHz, Quad Core, 4.8QPI, 4MB L2, DDR3-800, 80W (models 14C 14B 14H 14V 38C 38B 38H 38V 71A 71Q 71K CTO)	46R6631	N
10	Microprocessor, Intel Xeon E5506, 2.13GHz, Quad Core - 4.8QPI, 4MB L2, DDR3, 800, 80W (models 15G 18G 32U 32F 21G 74G CTO)	46R6632	N
10	Microprocessor, Intel Xeon E5507 - Quad Core - 2.26GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO D2G D3G)	71Y9031	N
10	Microprocessor, Intel Xeon E5520, 2.26GHz, Quad Core 5.86 QPI, 8MB L2, DDR3, 1066, Turbo, SMT, 80W (models 22G 39U 39F 41U 41F 68U 68F 68S 72A 72Q 73G CTO)	46R6633	N
10	Microprocessor, Intel Xeon E5530, 2.40GHz, Quad Core, 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 23G 36C 36B 36H 36V 45M 46M 52V 65M CTO)	46R6634	N
10	Microprocessor, Intel Xeon E5540, 2.53GHz, Quad Core 5.86 QPI, 8MB L2, DDR3, 1066, Turbo, SMT, 80W (models 19G 27U 28U 28F 33U 33F 34U 34F 24G 47U 47F 67B 67H 64M 56J 62J 75G CTO)	46R6635	N
10	Microprocessor, Intel Xeon E5620 - Quad Core - 2.40GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO D1G D4G)	71Y9049	N
10	Microprocessor, Intel Xeon E5630 - Quad Core - 2.53GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9047	N
10	Microprocessor, Intel Xeon E5640 - Quad Core - 2.66GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9045	N

Item #	4155 FRUs	FRU#	CRU Tier
10	Microprocessor, Intel Xeon X5550, 2.66GHz, Quad Core, 6.4 QPI, 8MB L2, DDR3, 1333, Turbo, SMT, 95W (models 16G 49C 53V 66C 63M CTO)	46R6638	N
10	Microprocessor, Intel Xeon X5560, 2.80GHz, Quad Core, 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 31U 31F 42G 57J CTO)	46R6639	N
10	Microprocessor, Intel Xeon X5650 - 6 Core - 2.66GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9043	N
10	Microprocessor, Intel Xeon X5660 - 6 Core - 2.80GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models 78J CTO)	71Y9041	N
10	Microprocessor, Intel Xeon X5667 - Quad Core - 3.06GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9039	N
10	Microprocessor, Intel Xeon X5570, 2.93GHz, Quad Core, 6.4 QPI, 8MB L2, DDR3, 1333, Turbo, SMT, 95W (models 25J 26Q 43G 58J 59J 77J CTO)	46R6640	N
10	Microprocessor, Intel Xeon X5680 - 6 Cores - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO C9J)	71Y9033	N
10	Microprocessor, Intel Xeon X5677 - Quad Core - 3.46GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9035	N
10	Microprocessor, Intel Xeon X5670 - 6 Core - 2.93GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9037	N
10	Microprocessor, Intel Xeon W5580, 3.20GHz, Quad Core 6.4 QPI, 8MB L2, DDR3, 1333, Turbo, SMT, 130W (models CTO)	46R6641	N
10	Microprocessor, Intel Xeon W5590, Quad Core, 3.33GHz, 6.4 QPI, 8MB Cache, DDR3, 1333, Turbo, HT, 130W (models 44J 48C 51H 54Q 54C 55Q 55C 61J 76J CTO)	64Y9831	N
10	Microprocessor, Intel Xeon W3503, Dual Core, 2.4Ghz, 4.8 QPI, 4MB L2, DDR3, 1066, 130W (models CTO)	63Y9159	N
10	Microprocessor, Intel Xeon W3505, Dual Core, 2.53Ghz, 4.8 QPI, 4MB L2, DDR3 1066, 130W (models CTO)	63Y9161	N
10	Microprocessor, Intel Xeon W3680 - 6 Core - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9025	N
11	System board, 2P Intel LGA 1366, 36D, ICH10 (Russia Only) (models 15G 16G 19G 17G 18G 22G 23G 24G 67B 67H 66C 63M 64M 65M 56J 57J 58J 59J 61J 62J 68U 68F 68S CTO)	64Y9121	N
11	System board, 2P Intel LGA 1366 (models 42G 43G 44J 45M 46M 47U 47F 48C 49C 51H 52V 53V 54Q 54C 55Q 55C 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 74G 75G 7J 77J 78J CTO C9J D1G D2G D3G D4G)	71Y7061	N
11	System board, 2P Intel LGA 1366, Tylersburg 36D, ICH10 (GA Level v1.5, TPM enabled) (models 42G 43G 44J 45M 46M 47U 47F 48C 49C 51H 52V 53V 54Q 54C 55Q 55C 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 74G 75G 7J 77J 78J CTO C9J D1G D2G D3G D4G)	71Y8826	N
11	System board, 2P Intel LGA 1366, Tylersburg 36D, ICH10 (GA Level v1.5, TPM enabled) (models 42G 43G 44J 45M 46M 47U 47F 48C 49C 51H 52V 53V 54Q 54C 55Q 55C 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 74G 75G 7J 77J 78J CTO)	71Y8828	N
12	Rear system fan, 120 mm system exhaust (all models)	45J9605	2

The FRUs listed in the following tables are not illustrated.

4155 FRUs	FRU#	CRU Tier
Second Serial Port Cable (all models)	41R5544	2
FDD cable (all models)	41N8294	2

4155 FRUs	FRU#	CRU Tier
SATA cable (ODD) (all models)	41R5517	2
FDD Cable assembly (all models)	41N8294	2
Handle with screws (all models)	41R5526	1
Cable assembly, SATA (all models)	41R5481	2
Miscellaneous parts Kit (all models)	41R5630	2
Cable assembly, cover detect switch (all models)	41R5534	2
Thermal Sense Cable (all models)	41R2511	2
Motherboard Screw Kit (all models)	41R5547	2
Cable assembly, HDD SAS (all models)	41R5513	2
Rail Kit, Remy with filler (all models)	41R5597	2
Filler Plate (all models)	41R5636	1
Cover assembly (access panel), Flex (all models)	41R5654	1
Label kit (all models)	41R5656	1
Mechanical Shell Kit (all models)	41R5658	N
MB_Shield (all models)	45K2256	2
Fan, memory cooling (all models)	45J9607	2
Memory chiller assembly (all models)	41R5655	2
Bezel kit (all models)	45K2268	2
SLI cable (models CTO)	63Y9163	2
Heat sink, performance (all models)	41R5578	2
Cable, SATA HDD (all models)	26K1186	2
1.8 SSD to 3.5 HDD Conversion Kit with PCB (all models)	43N9593	2
PS/2 card and bracket assembly (all models)	41R5694	2
PS/2 cable assembly (all models)	41R5604	2

4155 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --US English (models 11H 12H 15G 16G 19G 17G 35H 26Q 27U 28U 31U 32U 33U 34U 21G 22G 23G 24G 36H 37H 38H 39U 41U 42G 43G 45M 46M 47U 51H 54Q 55Q 67H 63M 64M 65M 68U 69A 69Q 71A 71Q 72A 72Q 73G 74G 75G CTO D1G D2G D3G D4G)	41A5289	1
USB --Arabic (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5290	1
USB --Arabic/French (models CTO)	41A5291	1
USB --Belgian/French (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5292	1
USB --Belgium English (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5293	1
USB --Brazilian Portuguese (models CTO)	41A5294	1
USB --Bulgarian (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5295	1
USB -- Hong Kong/Taiwan (models 11V 12V 35B 35V 36B 36V 37B 37V 38B 38V 52V 53V 67B CTO)	41A5296	1
USB --Czech (ABB) (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5297	1

4155 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --Danish (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5298	1
USB --Dutch (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5299	1
USB --French (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5300	1
USB --French Canadian (models 31F 32F 33F 34F 39F 41F 47F 68F CTO)	41A5301	1
USB --French Canadian (models 31F 32F 33F 34F 39F 41F 47F 68F CTO)	41A5302	1
USB --German (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5303	1
USB --Greek (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5304	1
USB --Greek/US (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5305	1
USB --Hebrew (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5306	1
USB --Hungarian (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5307	1
USB --Iceland (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5308	1
USB --Italy (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5309	1
USB --Japanese (models 25J 44J 56J 57J 58J 59J 61J 62J 76J 77J 78J CTO C9J)	41A5310	1
USB --Korean (models 69K 71K CTO)	41A5311	1
USB --LA Spanish (models 68S CTO)	41A5312	1
USB --Norwegian (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5313	1
USB --Polish (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5314	1
USB --Portuguese (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5315	1
USB --Romanian (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5316	1
USB --Romanian (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5317	1
USB --Russian/Cyrillic (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5318	1
USB --Serbian/Cyrillic (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5319	1
USB --Slovak (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5320	1
USB --Spanish (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5321	1
USB --Swedish/Finnish (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5322	1
USB --Swiss F/G (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5323	1

4155 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --Thailand (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5324	1
USB --Turkish (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5325	1
USB --Turkish (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5326	1
USB --UK English (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5327	1
USB --US Euro (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5328	1
USB --Slovenian (models 15G 16G 19G 17G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO D1G D2G D3G D4G)	41A5329	1

4155 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
US English (models 18G 29U CTO)	41R0038	1
Arabic (models 18G CTO)	41R0039	1
Arabic/French (models CTO)	41R0040	1
Belgium French (models 18G CTO)	41R0041	1
Belgium English (models 18G CTO)	41R0042	1
Brazilian Portuguese (models CTO)	41R0043	1
Bulgarian (models 18G CTO)	41R0044	1
Chinese/US (models CTO)	41R0045	1
Czech (ABB) (models 18G CTO)	41R0046	1
Danish (models 18G CTO)	41R0047	1
Dutch (models 18G CTO)	41R0048	1
French (models 18G CTO)	41R0049	1
French Canadian (models 29F CTO)	41R0050	1
French Canadian (models 29F CTO)	41R0051	1
German (models 18G CTO)	41R0052	1
Greek (models 18G CTO)	41R0053	1
Greek/US (models 18G CTO)	41R0054	1
Hebrew (models 18G CTO)	41R0055	1
Hungarian (models 18G CTO)	41R0056	1
Iceland (models 18G CTO)	41R0057	1
Italy (models 18G CTO)	41R0058	1
Japanese (models CTO)	41R0059	1
Korean (models CTO)	41R0060	1
LA Spanish (models CTO)	41R0061	1
Norwegian (models 18G CTO)	41R0062	1
Polish (models 18G CTO)	41R0063	1
Portuguese (models 18G CTO)	41R0064	1
Romanian (models 18G CTO)	41R0065	1

4155 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Romanian (models 18G CTO)	41R0066	1
Russian/Cyrillic (models 18G CTO)	41R0067	1
Serbian/Cyrillic (models 18G CTO)	41R0068	1
Slovak (models 18G CTO)	41R0069	1
Spanish (models 18G CTO)	41R0070	1
Swedish/Finnish (models 18G CTO)	41R0071	1
Swiss French/German (models 18G CTO)	41R0072	1
Thailand (models CTO)	41R0073	1
Turkish (models 18G CTO)	41R0074	1
Turkish (models 18G CTO)	41R0075	1
UK English (models 18G CTO)	41R0076	1
US Euro (models 18G CTO)	41R0077	1
Slovenian (models 18G CTO)	41R0078	1

4155 Mice	FRU#	CRU
Optical Mouse (400 DPI), USB - red wheel (Primary) (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V 15G 16G 19G 17G 18G 35C 35B 35H 35V 25J 26Q 27U 28U 28F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 36C 36B 36H 36V 37C 37B 37H 37V 38C 38B 38H 38V 42G 43G 44J 45M 46M 47U 51H 52V 53V 54Q 54C 55Q 55C 47F 67B 67H 66C 63M 64M 65M 57J 59J 61J 62J 68U 68F 68S 56J 58J 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 74G 75G 76J 77J 78J CTO C9J D1G D2G D3G D4G)	41U3013	1
Optical Mouse (400 DPI), USB - red wheel (Secondary) (models 11C 11B 11H 11V 12C 12B 12H 12V 14C 14B 14H 14V 15G 16G 19G 17G 18G 35C 35B 35H 35V 25J 26Q 27U 28U 28F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 36C 36B 36H 36V 37C 37B 37H 37V 38C 38B 38H 38V 42G 43G 44J 45M 46M 47U 51H 52V 53V 54Q 54C 55Q 55C 47F 67B 67H 66C 63M 64M 65M 57J 59J 61J 62J 68U 68F 68S 56J 58J 69A 69Q 69K 71A 71Q 71K 72A 72Q 73G 74G 75G 76J 77J 78J CTO C9J D1G D2G D3G D4G)	41U3030	1
3 Button Laser Mouse (1600 DPI), USB (models 29U 29F 48C 49C CTO)	41U3078	1

4155 Adapters and miscellaneous FRUs	FRU#	CRU
3.5" 20-in-1 Media Card Reader (w/GPIO detect) (models 35C 35B 35H 35V 25J 26Q 27U 28U 28F 29U 29F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 37C 37B 37H 37V 38C 38B 38H 38V 36C 39U 39F 41U 41F 66C 63M 64M 65M 56J 57J 58J 61J 62J 68U 68F 68S 59J 69A 69Q 69K 71A 71Q 71K 72A 72Q 76J 77J 78J CTO)	45R8139	1
L1 IEEE 1394 PCI Adapter (models 17G CTO)	41D2781	1
Speakers (2-piece) Lenovo Logo (Primary) (models CTO)	41A5331	1
Speakers (2-piece) Lenovo Logo (Secondary) (models CTO)	41A5334	1
Lenovo 3 pieces Speakers (China Only) (models CTO)	45C8640	1
Lenovo 2 pieces Speakers (China Only) (models CTO)	45C8641	1
Speaker Power brick (models CTO)	89P8571	1
256MB NVIDIA NVS290 (DMS59 Connector) (models CTO)	42Y6329	1
256MB NVIDIA FX380 (DVI + DP) (Hard from 46R2784) (models CTO)	71Y6863	1
512MB NVIDIA FX580 (DVI + DP + DP) (models 12C 12B 12H 12V 15G 17G 29U 29F 34U 34F 39U 39F 68U 68F 68S 69A 69Q 69K 71A 71Q 71K 72A 72Q CTO)	46R2786	1

4155 Adapters and miscellaneous FRUs	FRU#	CRU
768MB NVIDIA FX1800 (DVI + DP + DP) (models 12C 12B 12H 12V 15G 17G 35C 35B 35H 35V 31U 31F 32U 32F 36C 36B 36H 36V 37C 37B 37H 37V 38C 38B 38H 38V 41U 41F 46M 51H 54Q 54C 64M 56J 57J 73G 78J CTO)	46R2788	1
1.5GB NVIDIA FX4800 (DVI + DP + DP + ST), 2x3 power connector. (models 25J 26Q 27U 33U 33F 44J 48C 52V 55Q 55C 63M 58J 59J 61J 76J 77J 76J 77J CTO)	46R2792	1
Dual FX4800 SLI Enabled (2P) (models CTO)	46R2792	1
256MB NVIDIA NVS295 (Dual DP) (models CTO)	46R2782	1
1GB NVIDIA FX3800 (DVI + DP + ST), 2x3 power connector (models 42G 45M 47U 47F 49C 53V 67B 67H 66C 65M CTO)	89Y0429	1
4GB NVIDIA FX5800 (DVI + DVI + DP + ST), 2*2X3 power connector (models CTO)	46R2794	1
256MB ATI FirePro V3700 (Dual DVI) (models CTO)	53Y8569	1
512MB ATI FirePro V5700 (DP+DP+DVI) (models 28U 28F 62J)	53Y8571	1
1GB ATI FirePro V7700 (DP+DP+DVI) (models CTO)	53Y8573	1
Soft Modem V.90/V.44 (models CTO)	29R9729	1
Dongle Cable (DMS59 to dual DVI) (models CTO)	41X6398	1
Nvidia Tesla C1060 Compute Card (computer adapter) (models CTO)	46R6041	1
SAS Controller Card - 3Gb/s, 4-port Host Bus Adapter (models CTO)	46R3460	1
SoundBlaster Titanium audio card (PCIe) (models CTO)	46T0407	1
Modem Phone Cable (models CTO)	39K5120	1
DVI to VGA Dongle (models CTO)	45C7816	1
512MB NVIDIA Quadro NVS 450 GDDR3 (DP+DP+DP+DP) (models CTO)	64Y9895	1

4155 Power Cords	FRU#	CRU
Power cord - US (models 27U 28U 28F 29U 29F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 39U 39F 41U 41F 47U 47F 51H 68U 68F 68S 69A 71A 73G 74G 75G CTO)	41R3184	1
Power cord - US (models 27U 28U 28F 29U 29F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 39U 39F 41U 41F 47U 47F 51H 68U 68F 68S 69A 71A 73G 74G 75G CTO)	41R3185	1
Power cord - China (models 11C 12C 14C 35C 37C 38C 48C 49C 54C 55C 66C CTO)	41R3256	1
Power cord - China (models 11C 12C 14C 35C 37C 38C 48C 49C 54C 55C 66C CTO)	41R3257	1
Power cord - Japanese and Japanese English (models 25J 44J 56J 57J 58J 59J 61J 62J 76J 77J 78J CTO C9J)	41R3248	1
Power cord - Japanese and Japanese English (models 25J 44J 56J 57J 58J 59J 61J 62J 76J 77J 78J CTO C9J)	41R3249	1
Power cord - Brazil (Portuguese) (models CTO)	41R3270	1
Power cord - Brazil (Portuguese) (models CTO)	41R3271	1
Power cord - LA High Volt (APU) (models CTO)	41R3176	1
Power cord - LA High Volt (APU) (models CTO)	41R3177	1
Power cord - ANZ (models 45M 46M 63M 64M 65M CTO)	41R3196	1
Power cord - ANZ (models 45M 46M 63M 64M 65M CTO)	41R3197	1
Power cord - Korea (models 69K CTO)	41R3260	1
Power cord - Korea (models 69K CTO)	41R3261	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong (models 11B 11H 12B 12H 14B 14H 35B 35H 36B 36H 37B 37H 38B 38H 67B 67H CTO)	41R3224	1

4155 Power Cords	FRU#	CRU
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong (models 11B 11H 12B 12H 14B 14H 35B 35H 36B 36H 37B 37H 38B 38H 67B 67H CTO)	41R3225	1
Power cord - Taiwan (models 11V 12V 14V 35V 36V 37V 38V 52V 53V CTO)	41R3278	1
Power cord - Taiwan (models 11V 12V 14V 35V 36V 37V 38V 52V 53V CTO)	41R3279	1
Power cord - Italy (models 68S CTO)	41R3232	1
Power cord - Italy (models 68S CTO)	41R3233	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models CTO)	41R3208	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models CTO)	41R3209	1
Power cord - Denmark (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO)	41R3212	1
Power cord - Denmark (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO)	41R3213	1
Power cord - Switzerland (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO)	41R3228	1
Power cord - Switzerland (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO)	41R3229	1
Power cord - Israel (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO)	41R3236	1
Power cord - Israel (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO)	41R3237	1
Power cord - South Africa (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO)	41R3220	1
Power cord - South Africa (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 73G 74G 75G CTO)	41R3221	1
Power cord - India (models 26Q 54Q 55Q 69Q 72Q CTO)	41R3341	1
Power cord - India (models 26Q 54Q 55Q 69Q 72Q CTO)	41R3175	1
Power cord - Japan and Japanese English (models 25J 44J 56J 57J 58J 59J 61J 62J 76J 77J 78J CTO C9J)	43N9057	1
Power cord - Japan and Japanese English (models 25J 44J 56J 57J 58J 59J 61J 62J 76J 77J 78J CTO C9J)	43N9058	1
Power cord - US (for use on 2P systems only) (models 27U 28U 28F 29U 29F 31U 31F 32U 32F 33U 33F 34U 34F 21G 22G 23G 24G 39U 39F 41U 41F 47U 47F 51H 68U 68F 68S 69A 71A 73G 74G 75G CTO)	45J9502	1
Power cord - Taiwan (for use on 2P systems only) (models 11V 52V 53V CTO)	45J9503	1

4155 Windows XP Pro Recovery DVDs	FRU#	CRU
US English/UK/Asia Pacific (models CTO)	03T5024	1
French/French Canadian (models CTO)	03T5025	1
German (models CTO)	03T5026	1
Italy (models CTO)	03T5029	1
Brazil (models CTO)	03T5028	1
Spanish/LA Spanish (models CTO)	03T5027	1

4155 Windows XP Pro Recovery DVDs	FRU#	CRU
Danish (models CTO)	03T5033	1
Dutch (models CTO)	03T5034	1
Arabic English (models CTO)	03T5039	1
SV (Swedish) (models CTO)	03T5032	1
Hebrew (models CTO)	03T5037	1
Finland (models CTO)	03T5036	1
Norwegian (models CTO)	03T5031	1
Polish (models CTO)	03T5038	1
Portuguese (models CTO)	03T5045	1
Russian (models CTO)	03T5040	1
Russian English (models CTO)	03T5041	1
Hungarian (models CTO)	03T5043	1
Czech (models CTO)	03T5035	1
Turkish (models CTO)	03T5042	1
Greek (models CTO)	03T5044	1
Slovakian (models CTO)	03T5046	1
Japanese (models CTO)	03T5030	1
Simplified Chinese (models CTO)	03T5047	1
Traditional Chinese Taiwan (models CTO)	03T5048	1
Traditional Chinese Hong Kong (models CTO)	03T5049	1
Korean (models CTO)	03T5050	1

4155 Vista Business 32 Recovery DVDs	FRU#	CRU
English (models 11H 12H 14H CTO)	64Y5661	1
Russian English (models CTO)	64Y3672	1
French (models CTO)	64Y3673	1
German (models CTO)	64Y3674	1
Spanish (models CTO)	64Y3675	1
Brazilian (models CTO)	64Y3676	1
Italian (models CTO)	64Y3677	1
Japanese (models CTO)	64Y5662	1
Norwegian (models CTO)	64Y3699	1
Swedish (models CTO)	64Y3700	1
Danish (models CTO)	64Y3697	1
Dutch (models CTO)	64Y3691	1
Czech (models CTO)	64Y3678	1
Finnish (models CTO)	64Y3698	1
Polish (models CTO)	64Y3679	1
Russian (models CTO)	64Y3680	1
Turkish (models CTO)	64Y3681	1
Hungarian (models CTO)	64Y3682	1

4155 Vista Business 32 Recovery DVDs	FRU#	CRU
Greek (models CTO)	64Y3683	1
Simplified Chinese (models 11C 12C 14C CTO)	64Y5663	1
Traditional Chinese TC (models 11V 12V 14V CTO)	64Y3686	1
Traditional Chinese HK (models 11B 12B 14B CTO)	64Y3687	1
Korean (models CTO)	64Y3688	1
Slovenian (models CTO)	64Y3689	1
Romanian (models CTO)	64Y3693	1
Portuguese (models CTO)	64Y3694	1
Sebian-Latin (models CTO)	64Y3695	1
Slovakian (models CTO)	64Y3696	1
Arabic Localized (models CTO)	64Y3690	1
Hebrew (models CTO)	64Y3692	1
MUL DVD P/Ns VB32 C&L1 Nordics (EN DK FI NO SV) (models CTO)	64Y3701	1
MUL DVD P/Ns VB32 C&L 2 Switzerland (EN FR GR IT) (models CTO)	64Y3702	1
MUL DVD P/Ns VB32 C&L 3 Bel Lux (EN FR GR NL) (models CTO)	64Y3703	1
English for India (models CTO)	71Y3620	1

4155 Vista Business 64 Recovery DVDs	FRU#	CRU
English (models 15G 16G 19G 17G 18G 35H 26Q 27U 28U 29U31U 32U 33U 34U 21G 22G 23G 24G 36H 37H 38H 39U 41U 42G 43G 45M 46M 47U 51H 54Q 55Q CTO)	64Y5664	1
Russian English (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G CTO)	64Y3771	1
French (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3772	1
German (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3773	1
Spanish (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3774	1
Brazilian (models CTO)	64Y3775	1
Italian (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3776	1
Japanese (models 25J 44J CTO)	64Y5665	1
Norwegian (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3796	1
Swedish (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3797	1
Danish (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3794	1
Dutch (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3790	1
Czech (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3777	1
Finnish (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3795	1
Polish (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3778	1
Russian (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3779	1
Turkish (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3780	1
Hungarian (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3781	1
Greek (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y3782	1
Simplified Chinese (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G 47F CTO)	64Y5666	1
Trad Chinese (models 35V 36V 37V 38V 52V 53V CTO)	64Y3785	1
Trad Chinese (models 35B 36B 37B 38B CTO)	64Y3786	1

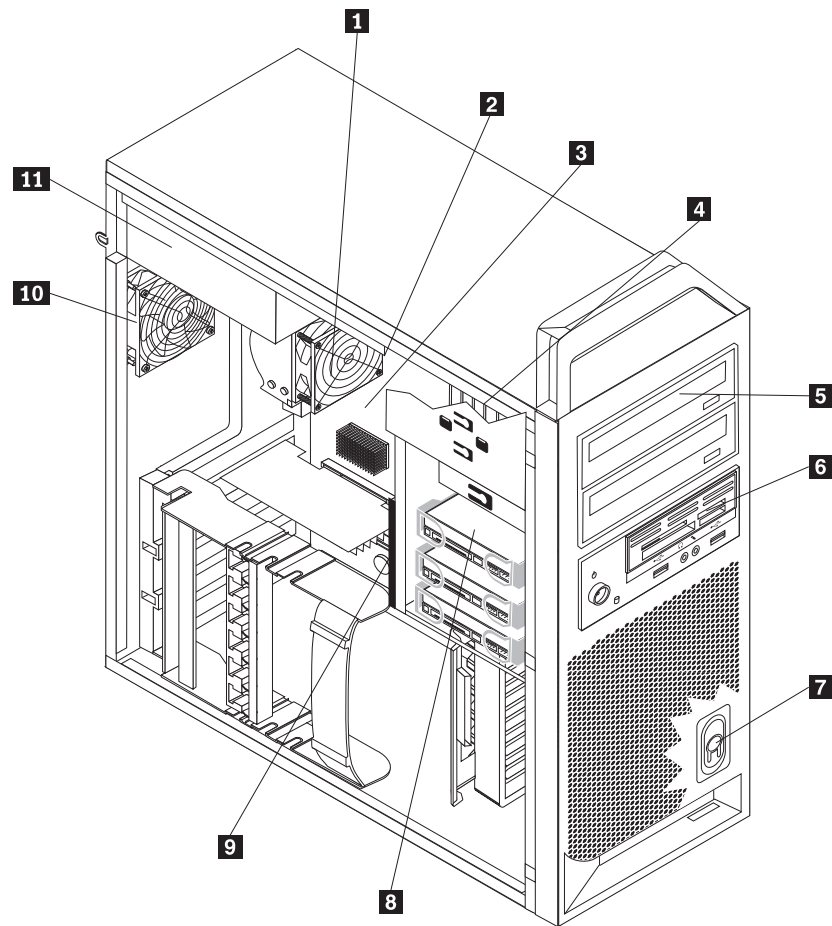
4155 Vista Business 64 Recovery DVDs	FRU#	CRU
Korean (models CTO)	64Y3787	1
Slovenian (models CTO)	64Y3788	1
Portuguese (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G CTO)	64Y3792	1
Slovakian (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G)	64Y3793	1
Arabic Localized (models CTO)	64Y3789	1
Hebrew (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G CTO)	64Y3791	1
MUL DVD P/Ns VB64 C&L1 Nordics (EN DK FI NO SV) (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G CTO)	64Y3798	1
MUL DVD P/Ns VB64 C&L 2 Switzerland (EN FR GR IT) (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G CTO)	64Y3799	1
MUL DVD P/Ns VB64 C&L3 Bel Lux (EN FR GR NL) (models 15G 16G 19G 17G 18G 21G 22G 23G 24G 42G 43G CTO)	64Y3800	1

4155 Windows XP 64 Recovery DVDs	FRU#	CRU
Japanese (models 25J 57J 59J 61J CTO)	64Y6595	1
English (models 23G CTO)	89Y0803	1

4155 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models 67H 63M 64M 65M 68U 69A 71A 72A 73G 74G 75G CTO D1G D2G D3G D4G)	03T5020	1
French (models 68F 73G 74G 75G CTO D1G D2G D3G D4G)	03T5006	1
German (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5008	1
Czech (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5004	1
Polish (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5013	1
Turkish (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5019	1
Greek (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5007	1
Japanese (models 56J 58J 59J 62J 76J 77J 78J CTO C9J)	03T5011	1
Korean (models 69K 71K CTO)	03T5012	1
Slovenian (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5017	1
Russian English (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5014	1
Slovakian (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5016	1
Hebrew (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5001	1
Simplified English (models CTO)	03T5002	1
Traditional English (models CTO)	03T5003	1
India English (models 69Q 71Q 72Q CTO)	03T5005	1
Hong Kong (models CTO)	03T5009	1
Italian (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5010	1
Russian (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5015	1
Spanish (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5018	1
C&L Bel Lux (EN FR GR NL) (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5021	1
C&L Nordics (EN DK FI NO SV) (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5022	1
C&L Switzerland (EN FR GR IT) (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5023	1

4155 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models 67H 63M 64M 65M 68U 69A 71A 72A 73G 74G 75G CTO D1G D2G D3G D4G)	03T5287	1
French (models 68F 73G 74G 75G CTO D1G D2G D3G D4G)	03T5274	1
German (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5276	1
Czech (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5272	1
Polish (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5280	1
Turkish (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5286	1
Greek (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5275	1
Korean (models 69K 71K CTO)	03T5279	1
Slovenian (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5284	1
Russian English (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5281	1
Arabic Localized (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5269	1
Slovakian (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5283	1
Simplified English (models CTO)	03T5270	1
Traditional English (models CTO)	03T5271	1
India English (models 69Q 71Q 72Q CTO)	03T5273	1
Hong Kong (models CTO)	03T5277	1
Italian (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5278	1
Russian (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5282	1
Spanish (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5285	1
C&L Bel Lux (EN FR GR NL) (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5288	1
C&L Nordics (EN DK FI NO SV) (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5289	1
C&L Switzerland (EN FR GR IT) (models 73G 74G 75G CTO D1G D2G D3G D4G)	03T5290	1

Machine Type 4157



Item #	4157 FRUs	FRU#	CRU Tier
1	Fan sink, Bloomfield Performance (all models)	41R5578	2
1	Fan sink, Bloomfield Workstation (all models)	41R5580	2
2	Microprocessor, Intel Xeon W3520 - 2.66Ghz, Quad Core - 4.8 QPI, 4MB L2, DDR3-1066, Turbo, SMT, 130W (models 25M 41G 57G 58G 69G 77M 79U 79F 81U 81F 91J 93M 94M 98G A2U A2F A7G B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO)	46R6405	N
2	Microprocessor, Intel Xeon W3540 - 2.93GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 130W (models 21J 22J 48U 48F 34G CTO)	46R6406	N
2	Microprocessor, Intel Xeon W3570 - 3.20GHz, Quad Core- 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models CTO)	46R6407	N
2	Microprocessor, Intel Xeon W3550 - Quad Core - 3.06GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, SMT, 130W (models 54G 62G 66G 68G 72J 73J 75J 76J 78M 86Q 88J 89J 96M CTO)	64Y9827	N
2	Microprocessor, Intel Xeon W3580 - Quad Core -3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 1333, Turbo, SMT, 130W (models 63G 64G 71J 74J 82U 82F 84A 84T 87Q A5G A9M CTO)	64Y9829	N
2	Microprocessor, Intel Xeon E5502 - 1.86GHz, Dual Core 4.8 QPI, 4MB L2, DDR3-800, 80W (models 35G 46G 53C 53B 53H 53V 13U 13F 16U 16F CTO)	46R6630	N
2	Microprocessor, Intel Xeon E5503 - Dual Core - 2.00GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9029	N

Item #	4157 FRUs	FRU#	CRU Tier
2	Microprocessor, Intel Xeon E5504 - 2.00GHz, Quad Core- 4.8QPI, 4MB L2, DDR3-800, 80W (models 36G 33G 37G 41G 67G CTO)	46R6631	N
2	Microprocessor, Intel Xeon E5506 - 2.13GHz, Quad Core - 4.8QPI, 4MB L2, DDR3-800, 80W (models 14U 14F 15U 15F 15S 15P 15Y 32G 38G 49U 49F 52U 52F 47G 42G 59G CTO)	46R6632	N
2	Microprocessor, Intel Xeon E5507 - Quad Core - 2.26GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9031	N
2	Microprocessor, Intel Xeon E5520 - 2.26GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 39G 32G CTO)	46R6633	N
2	Microprocessor, Intel Xeon E5530 - 2.40GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models CTO)	46R6634	N
2	Microprocessor, Intel Xeon E5540 - 2.53GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 27M 27A 27Q 29A 29Q 29T 29K 18U 18F 42G 43S 43P 43Y 51U 51F 44G 26M 37G 61G 95M CTO)	46R6635	N
2	Microprocessor, Intel Xeon E5620 - Quad Core - 2.40GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9049	N
2	Microprocessor, Intel Xeon E5630 - Quad Core - 2.53GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9047	N
2	Microprocessor, Intel Xeon E5640 - Quad Core - 2.66GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9045	N
2	Microprocessor, Intel Xeon X5550 - 2.66GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 23M 45G 65G CTO)	46R6638	N
2	Microprocessor, Intel Xeon X5560 - 2.80GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models CTO)	46R6639	N
2	Microprocessor, Intel Xeon X5650 - 6 Core - 2.66GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9043	N
2	Microprocessor, Intel Xeon X5660 - 6 Core - 2.80GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9041	N
2	Microprocessor, Intel Xeon X5667 - Quad Core - 3.06GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9039	N
2	Microprocessor, Intel Xeon X5570 - 2.93GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 24M 97M CTO)	46R6640	N
2	Microprocessor, Intel Xeon X5680 - 6 Cores - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9033	N
2	Microprocessor, Intel Xeon X5677 - Quad Core - 3.46GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9035	N
2	Microprocessor, Intel Xeon X5670 - 6 Core - 2.93GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9037	N
2	Microprocessor, Intel Xeon W5580 - 3.20GHz, Quad Core 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models 19J 17U 17F CTO)	46R6641	N
2	Microprocessor, Intel Xeon W5590 - Quad Core - 3.33GHz - 6.4 QPI, 8MB Cache, DDR3 - 1333, Turbo, HT, 130W (models 85A 85T 92J CTO)	64Y9831	N
2	Microprocessor, Intel Xeon W3503 - Dual Core - 2.4Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models 55G A1U A1F A3G A6G CTO)	63Y9159	N
2	Microprocessor, Intel Xeon W3505 - Dual Core - 2.53Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models 56G 99G CTO)	63Y9161	N
2	Microprocessor, Intel Xeon W3680 - 6 Core - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9025	N

Item #	4157 FRUs	FRU#	CRU Tier
2	Microprocessor, Intel Xeon W3670 - 6 Cores - 3.20GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J CTO)	71Y9027	N
2	Microprocessor, Intel Xeon W3565 - Quad Core - 3.2GHz - 4.8 QPI, 8MB Cache, DDR3-1066, 130W (models A4G A8M CTO)	71Y8842	N
3	System Board, 1P Intel LGA 1366 (models 23M 24M 25M 26M 27M 28A 28Q 28T 28K 19J 21J 22J 29A 29Q 29T 29K 31A 31K 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15P 15Y 16U 16F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 43S 43P 43Y 48U 48F 49U 49F 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 71J 72J 73J 74J 75J 76J 77M 78M 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T 86Q 87Q 88J 89J 91J 92J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F A3G A4G A5G A6G A7G A8M A9M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	64Y7517	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (Russia Only) (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 98G 99G A3G A4G A5G A6G A7G B1G CTO 53C B1C F1G F1C)	64Y6337	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.35 , TPM enabled) (models 23M 24M 25M 26M 27M 28A 28Q 28T 28K 19J 21J 22J 29A 29Q 29T 29K 31A 31K 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15P 15Y 16U 16F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 43S 43P 43Y 48U 48F 49U 49F 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 71J 72J 73J 74J 75J 76J 77M 78M 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T 86Q 87Q 88J 89J 91J 92J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F A3G A4G A5G A6G A7G A8M A9M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	71Y8819	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.35, TPM disabled) (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 98G 99G A3G A4G A5G A6G A7G B1G CTO 53C B1C F1G F1C)	71Y8823	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.45, TPM enabled) (models 23M 24M 25M 26M 27M 28A 28Q 28T 28K 19J 21J 22J 29A 29Q 29T 29K 31A 31K 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15P 15Y 16U 16F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 43S 43P 43Y 48U 48F 49U 49F 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 71J 72J 73J 74J 75J 76J 77M 78M 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T 86Q 87Q 88J 89J 91J 92J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F A3G A4G A5G A6G A7G A8M A9M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	71Y8820	N
3	System Board, 1P Intel LGA 1366, Tylersburg 36S, ICH10R (v1.45, TPM disabled) (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 98G 99G A3G A4G A5G A6G A7G B1G CTO 53C B1C F1G F1C)	71Y8824	N
4	Memory module, 1GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models 26M 14U 14F 15U 15F 15S 15P 15Y 35G 46G 53C 53B 53H 53V 49U 49F 52U 52F 84A 84T 88J 89J A1U A1F CTO)	46R6026	1
4	Memory module, 2GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models 23M 24M 19J 31A 31K 13U 13F 16U 16F 17U 17F 34G 39G 36G 32G 33G 37G 38G 41G 47G 45G 63G 64G 65G 71J 74J 82U 82F 85A 85T 92J A2U A2F A4G A5G A9M CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	46R6027	1

Item #	4157 FRUs	FRU#	CRU Tier
4	Memory module, 4GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) (models CTO)	64Y9570	1
4	Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models 54G 58G 61G 62G 66G 68G 77M 78M 79U 79F 81U 81F 87Q 94M 96M 97M 98G A7G A8M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO)	53Y6195	1
4	Memory module, 2GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models 55G 56G 57G 59G 67G 69G 72J 73J 75J 76J 83A 83T 86Q 91J 93M 95M 99G A3G A6G CTO)	53Y6197	1
5	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models 48U 48F 49U 49F CTO)	41N3325	1
5	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models 48U 48F 49U 49F CTO)	71Y5543	1
5	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models 23M 24M 25M 26M 27M 27A 27Q 28A 28Q 28T 28K 21J 22J 29A 29Q 29T 29K 31A 31K 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15P 15Y 16U 16F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 43S 43P 43Y 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 72J 73J 72J 73J 75J 76J 77M 78M 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T 86Q 87Q 88J 89J 91J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F A3G A4G A5G A6G A7G A8M A9M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	43C1042	1
5	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models 23M 24M 25M 26M 27M 27A 27Q 28A 28Q 28T 28K 21J 22J 29A 29Q 29T 29K 31A 31K 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15P 15Y 16U 16F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 43S 43P 43Y 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 72J 73J 72J 73J 75J 76J 77M 78M 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T 86Q 87Q 88J 89J 91J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F A3G A4G A5G A6G A7G A8M A9M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	71Y5545	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models 19J 71J 74J 92J CTO)	53Y3365	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models 19J 71J 74J 92J CTO)	53Y7643	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - XP/Vista (models 19J 71J 74J 92J CTO)	71Y5547	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD (models 19J 21J 22J 71J 72J 73J 74J 75J 76J A9M CTO)	40Y9105	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD (models 19J 21J 22J 71J 72J 73J 74J 75J 76J A9M CTO)	40Y9107	1
7	Power switch/LED assembly (all models)	41R5651	2
8	Internal speaker (all models)	41R5494	2
9	Hard disk drive, 250GB SATA - 7200 rpm (models 23M 25M 26M 27M 27A 27Q 29A 29Q 29T 29K 11U 11F 14U 14F 15U 15F 15S 15P 15Y 18U 18F 34G 35G 36G 48U 48F 49U 49F 52U 52F 46G 53C 53B 53H 53V 55G 62G 66G 69G 77M 78M 83A 83T 86Q 87Q 91J 93M 94M 95M 96M A6G A8M CTO)	46R6029	1
9	Hard disk drive, 500GB SATA - 7200 rpm (models 19J 22J 12U 12F 16U 16F 32G 38G 43S 43P 43Y 45G 56G 57G 58G 63G 67G 68G 71J 73J 74J 76J 79U 79F 81U 81F 82U 82F 84A 84T 85A 85T 92J 98G 99G A1U A1F A2U A2F A3G A4G A5G B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	46R6030	1

Item #	4157 FRUs	FRU#	CRU Tier
9	Hard disk drive, 750GB SATA - 7200 rpm (models 42G 44G 41G CTO)	43C3671	1
9	Hard disk drive, 1TB SATA - 7200 rpm (models 59G 61G CTO)	46R6031	1
9	Hard disk drive, 74GB SATA - 10000 rpm (models CTO)	46R6032	2
9	Hard disk drive, 150GB SATA - 10000 rpm (models 28A 28Q 28T 28K13U 13F 33G CTO)	46R6400	2
9	Hard disk drive, 300GB SATA - 10000 rpm (models 17U 17F 51U 51F 72J 75J CTO)	46R6401	2
9	Hard disk drive, 147GB SAS - 15000 rpm (models 31A 31K 37G 39G 64G 65G CTO)	46R6033	1
9	Hard disk drive, 147GB SAS - 15000 rpm (models 31A 31K 37G 39G 64G 65G CTO)	45K0608	1
9	Hard disk drive, 300GB SAS - 15000 rpm (models 24M 21J 41G 54G 97M 88J 89J CTO)	43C6969	1
9	Hard disk drive, 300GB SAS - 15000 rpm (models 24M 21J 41G 54G 97M 88J 89J CTO)	45K0609	1
9	Hard disk drive, 450GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" (models CTO)	45J4899	1
9	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models A7G A9M CTO)	45N7953	1
9	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models A7G A9M CTO)	45N8203	1
9	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N7959	1
9	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N8207	1
10	Fan bracket assembly, 70 x 25 fan (all models)	41R5589	2
11	Exhaust Fan assembly (all models)	41R5583	2
12	Power supply, 625 Watt Power Supply (models 23M 24M 25M 26M 27M 28A 28Q 28T 28K 19J 21J 22J 29A 29Q 29T 29K 31A 31K 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15P 15Y 16U 16F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 43S 43P 43Y 48U 48F 49U 49F 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 71J 72J 73J 74J 75J 76J 77M 78M 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T 86Q 87Q 88J 89J 91J 92J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F A3G A4G A5G A6G A7G A8M A9M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	41A9758	2

The FRUs listed in the following tables are not illustrated.

4157 FRUs	FRU#	CRU Tier
Fan assembly, 92 mm Front PCI (all models)	41R5595	2
PS2 Keyboard/Mouse Card and Cable assembly (all models)	41R5604	2
Adapter Bracket, 2.5 to 3.5 HDD (all models)	41R5625	2
EMC Shield assembly, Menorca motherboard (all models)	41R5621	2
Label, Martell 2/Menorca Information (all models)	41R5626	1
Second Serial Port Cable - Martell-2 (all models)	41R5544	2
FDD Cable - Martell-2 (all models)	41N8294	2
RM assembly (all models)	41R5592	2
Cable assembly, Marvell SAS LED (all models)	41R5667	2

4157 FRUs	FRU#	CRU Tier
Cable assembly, SAS LED with diodes (all models)	41R5696	2
Handle with screws (all models)	41R5490	1
Cable assembly, HDD SATA (all models)	41N8298	2
Cable assembly, SAS HDD (all models)	41R5482	2
Martel access cover assembly with tape (all models)	41R5670	2
Thermal sense cable (all models)	41R2511	2
Motherboard screw kit (all models)	41R5547	2
SAS HDD filler (all models)	41R5552	2
Cable assembly, SATA ODD (Hard from 41R5481) (all models)	41R5517	2
Miscellaneous parts kit (hard from 41R5560) (all models)	41R5673	2
Cable assembly, Cover Detect Switch (all models)	41R5497	2
Martell 2 FPIO cable and bezel assembly kit (no 1394) (all models)	41R5690	2
Mechanical Shell Kit, Martell 2, no 1394 (all models)	41R5691	2
PS/2 card and bracket assembly (all models)	41R5694	2
PS/2 cable assembly (all models)	41R5604	2
SAS HDD filler (all models)	41R5552	2
Handle filler with screws (all models)	41R5699	2

4157 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Full size --US English (models 23M 24M 25M 26M 27M 28A 28Q 29A 29Q 31A 11U 12U 13U 14U 15U 16U 17U 18U 34G 35G 36G 32G 33G 37G 38G 39G 41G 48U 49U 51U 52U 53H 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 77M 78M 79U 81U 82U 83A 84A 86Q 87Q 93M 94M 95M 96M 97M A3G A4G A5G A6G A7G A8M A9M B1U B1L B1G B1M B1A B1Q B1H B1R B1E CTO F1U F1G F1M F1A F1Q F1H F1R F1E)	41A5289	1
Full size --Arabic (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5290	1
Full size --Arabic/French (models CTO)	41A5291	1
Full size --Belgian/French (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5292	1
Full size --Belgium English (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5293	1
Full size --Brazilian Portuguese (models 15P CTO)	41A5294	1
Full size --Bulgarian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5295	1
Full size -- Hong Kong/Taiwan (models 53B 53V B1B B1V CTO F1B F1V)	41A5296	1
Full size --Czech (ABB) (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5297	1
Full size --Danish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5298	1

4157 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Full size --Dutch (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5299	1
Full size --French (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5300	1
Full size --French Canadian (models 11F 12F 13F 14F 15F 16F 17F 18F 48F 49F 51F 52F 79F 81F 82F B1F CTO F1F)	41A5301	1
Full size --French Canadian (models 11F 12F 13F 14F 15F 16F 17F 18F 48F 49F 51F 52F 79F 81F 82F B1F CTO F1F)	41A5302	1
Full size --German (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5303	1
Full size --Greek (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5304	1
Full size --Greek/US (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5305	1
Full size --Hebrew (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5306	1
Full size --Hungarian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5307	1
Full size --Iceland (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5308	1
Full size --Italy (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5309	1
Full size --Japanese (models 19J 21J 22J 71J 72J 73J 74J 75J 76J 88J 89J 91J 92J B1J CTO F1J)	41A5310	1
Full size --Korean (models 28K 31K B1K CTO F1K)	41A5311	1
Full size --LA Spanish (models 15S 15Y B1S B1D B1Y CTO F1S F1Y)	41A5312	1
Full size --Norwegian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5313	1
Full size --Polish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5314	1
Full size --Portugese (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5315	1
Full size --Romanian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5316	1
Full size --Romanian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5317	1

4157 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Full size --Russian/Cyrillic (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5318	1
Full size --Serbian/Cyrillic (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5319	1
Full size --Slovak (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5320	1
Full size --Spanish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5321	1
Full size --Swedish/Finnish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5322	1
Full size --Swiss F/G (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5323	1
Full size --Thailand (models 28T 29T 83T 84T B1T CTO F1T)	41A5324	1
Full size --Turkish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5325	1
Full size --Turkish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5326	1
Full size --UK English (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5327	1
Full size --US Euro (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5328	1
Full size --Slovenian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G A3G A4G A5G A6G A7G B1G CTO F1G)	41A5329	1

4157 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Full size -- US English (models CTO)	41R0038	1
Full size -- Arabic (models CTO)	41R0039	1
Full size -- Arabic/French (models CTO)	41R0040	1
Full size -- Belgium French (models CTO)	41R0041	1
Full size -- Belgium English (models CTO)	41R0042	1
Full size -- Brazilian Portuguese (models CTO)	41R0043	1
Full size -- Bulgarian (models CTO)	41R0044	1
Full size -- Chinese/US (models CTO)	41R0045	1
Full size -- Czech (ABB) (models CTO)	41R0046	1
Full size -- Danish (models CTO)	41R0047	1
Full size -- Dutch (models CTO)	41R0048	1

4157 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Full size -- French (models CTO)	41R0049	1
Full size -- French Canadian (models CTO)	41R0050	1
Full size -- French Canadian (models CTO)	41R0051	1
Full size -- German (models CTO)	41R0052	1
Full size -- Greek (models CTO)	41R0053	1
Full size -- Greek/US (models CTO)	41R0054	1
Full size -- Hebrew (models CTO)	41R0055	1
Full size -- Hungarian (models CTO)	41R0056	1
Full size -- Iceland (models CTO)	41R0057	1
Full size -- Italy (models CTO)	41R0058	1
Full size -- Japanese (models CTO)	41R0059	1
Full size -- Korean (models CTO)	41R0060	1
Full size -- LA Spanish (models CTO)	41R0061	1
Full size -- Norwegian (models CTO)	41R0062	1
Full size -- Polish (models CTO)	41R0063	1
Full size -- Portuguese (models V)	41R0064	1
Full size -- Romanian (models CTO)	41R0065	1
Full size -- Romanian (models CTO)	41R0066	1
Full size -- Russian/Cyrillic (models CTO)	41R0067	1
Full size -- Serbian/Cyrillic (models CTO)	41R0068	1
Full size -- Slovak (models CTO)	41R0069	1
Full size -- Spanish (models CTO)	41R0070	1
Full size -- Swedish/Finnish (models CTO)	41R0071	1
Full size -- Swiss French/German (models CTO)	41R0072	1
Full size -- Thailand (models CTO)	41R0073	1
Full size -- Turkish (models CTO)	41R0074	1
Full size -- Turkish (models CTO)	41R0075	1
Full size -- UK English (models CTO)	41R0076	1
Full size -- US Euro (models CTO)	41R0077	1
Full size -- Slovenian (models CTO)	41R0078	1

4157 Wireless Keyboards	FRU#	CRU Tier
US English (models CTO)	41A5219	1
Belgium French (models CTO)	41A5220	1
Belgium English (models CTO)	41A5221	1
Chinese/US (models CTO)	41A5222	1
Czech (ABB) (models CTO)	41A5223	1
Danish (models CTO)	41A5224	1
Dutch (models CTO)	41A5225	1
French (models CTO)	41A5226	1
French Canadian (models CTO)	41A5227	1

4157 Wireless Keyboards	FRU#	CRU Tier
French Canadian (models CTO)	41A5228	1
German (models CTO)	41A5229	1
Greek (models CTO)	41A5230	1
Greek/US (models CTO)	41A5231	1
Hungarian (models CTO)	41A5232	1
Iceland (models CTO)	41A5233	1
Italy (models CTO)	41A5234	1
Japanese (models CTO)	41A5235	1
Norwegian (models CTO)	41A5236	1
Polish (models CTO)	41A5237	1
Portuguese (models CTO)	41A5238	1
Slovak (models CTO)	41A5239	1
Spanish (models CTO)	41A5240	1
Swedish/Finnish (models CTO)	41A5241	1
Swiss French/German (models V)	41A5242	1
UK English (models V)	41A5243	1
US Euro (models CTO)	41A5244	1
Slovenian (models CTO)	41A5245	1

4157 Mice	FRU#	CRU
Optical Mouse (400 DPI), full size- - red wheel (Primary) (models 23M 24M 25M 26M 27M 27A 27Q 28A 28Q 28T 28K 29A 29Q 29T 29K 31A 31K 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15P 15Y 16U 16F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 43S 43P 43Y 48U 48F 49U 49F 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 77M 78M 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T 86Q 87Q 91J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F 88J 89J 92J A3G A4G A5G A6G A7G A8M A9M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	41U3013	1
Optical Mouse (400 DPI), full size- - red wheel (Secondary) (models 23M 24M 25M 26M 27M 27A 27Q 28A 28Q 28T 28K 29A 29Q 29T 29K 31A 31K 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15P 15Y 16U 16F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 43S 43P 43Y 48U 48F 49U 49F 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 77M 78M 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T 86Q 87Q 91J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F 88J 89J 92J A3G A4G A5G A6G A7G A8M A9M B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	41U3030	1
3 Button Laser Mouse (1600 DPI) (models 19J 21J 22J 71J 72J 73J 74J 75J 76J 91J CTO)	41U3078	1

4157 Adapters and miscellaneous FRUs	FRU#	CRU
3.5" 20-in-1 Media Card Reader (w/GPIO detect) (models CTO 88J 89J 91J 92J 93M 94M 95M 96M 97M 98G 99G A1U A1F A2U A2F A8M)	45R8139	1
L1 IEEE 1394 PCI Adapter (models 23M 24M 25M 26M 27M 27A 27Q 28A 28Q 28T 28K 19J 21J 22J 29A 29Q 29T 29K 31A 31K 13U 13F 14U 14F 15U 15F 15S 15P 15Y 43S 43P 43Y CTO 88J 89J 91J 92J 93M 94M 95M 96M CTO)	41D2781	1
Speakers (2-piece) Lenovo Logo(Primary) (models CTO)	41A5331	1

4157 Adapters and miscellaneous FRUs	FRU#	CRU
Speakers (2-piece) Lenovo Logo(Secondary) (models CTO)	41A5334	1
Lenovo 3 pieces Speakers (China Only) (models CTO)	45C8640	1
Lenovo 2 pieces Speakers (China Only) (models CTO)	45C8641	1
Speaker Power brick (models CTO)	89P8571	1
256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models 15U 15F 36G CTO)	42Y6329	1
256MB NVIDIA FX380 (DVI + DP) (Hard from 46R2784) (models 26M 11U 11F 35G 38G 47G 48U 48F 49U 49F 51U 51F 52U 52F 47G 44G 45G 46G 53C 53B 53H 53V 99G A1U A1F A6G CTO)	71Y6863	1
512MB NVIDIA FX580 (DVI + DP + DP) (models 25M 28A 28Q 28T 28K 12U 12F 14U 14F 18U 18F 33G 41G 43S 43P 43Y 56G 64G 65G 83A 83T 91J 93M CTO F1U F1F F1S F1L F1D F1Y F1G F1M F1A F1Q F1T F1C F1B F1H F1V F1K F1R F1E F1J)	46R2786	1
768MB NVIDIA FX1800 (DVI + DP + DP) (models 23M 27M 27A 27Q 21J 22J 29A 29Q 29T 29K 13U 13F 34G 32G 37G 39G 42G 52U 52F 44G 54G 57G 61G 62G 63G 72J 73J 75J 75J 76J 77M 79U 79F 84A 84T 85A 85T 86Q 88J 89J 94M 95M 98G A2U A2F A4G A5G B1U B1F B1S B1L B1D B1Y B1G B1M B1A B1Q B1T B1C B1B B1H B1V B1K B1R B1E B1J CTO)	46R2788	1
1.5GB NVIDIA FX4800 (DVI + DP + DP + ST), 2x3 Pwr Conn. (models 24M 19J 31A 31K 16U 16F 17U 17F 87Q 45G 71J 74J 92J 97M CTO)	46R2792	1
256MB NVIDIA NVS295 (Dual DP) (models 69G CTO)	46R2782	1
1GB NVIDIA FX3800 (DVI + DP + ST), 2x3 Pwr Conn. (models 68G 78M 81U 81F 82U 82F 96M A8M A9M CTO)	89Y0429	1
4GB NVIDIA FX5800 (DVI + DVI + DP + ST), 2*2X3 Pwr Conn. (models CTO)	46R2794	1
256MB ATI FirePro V3700 (Dual DVI) (models 48U 48F 46G 55G 59G 67G CTO)	53Y8569	1
512MB ATI FirePro V5700 (DP+DP+DVI) (models 49U 49F 58G 66G CTO)	53Y8571	1
1GB ATI FirePro V7700 (DP+DP+DVI) (models CTO)	53Y8573	1
Soft Modem V.90/V.44 (models CTO)	29R9729	1
Dongle Cable (DMS59 to dual DVI) (models CTO)	41X6398	1
Nvidia Tesla C1060 Compute Card (computer adapter) (models CTO)	46R6041	1
SAS Controller Card - 3Gb/s, 4-port Host Bus adapter (models CTO)	46R3460	1
SoundBlaster Titanium Audio Card (PCIe) (models CTO)	46T0407	1
Modem Phone Cable (models CTO)	39K5120	1
DVI to VGA Dongle (models CTO)	45C7816	1
DP to DVI Dongle 200 mm (models CTO)	43N9160	1
512MB NVIDIA Quadro NVS 450 GDDR3 (DP+DP+DP+DP) (models CTO)	64Y9895	1

4157 Power Cords	FRU#	CRU
Power cord - US (models 27A 28A 28T 29A 29T 31A 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15Y 16U 16F 43S 43Y 48U 48F 49U 49F 51U 51F 52U 52F 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T A1U A1F A2U A2F B1U B1F B1S B1D B1A B1T CTO F1U F1F F1S F1D F1L F1A F1T)	41R3184	1
Power cord - US (models 27A 28A 28T 29A 29T 31A 11U 11F 12U 12F 13U 13F 14U 14F 15U 15F 15S 15Y 16U 16F 43S 43Y 48U 48F 49U 49F 51U 51F 52U 52F 79U 79F 81U 81F 82U 82F 83A 83T 84A 84T 85A 85T A1U A1F A2U A2F B1U B1F B1S B1D B1A B1T CTO F1U F1F F1S F1D F1L F1A F1T)	41R3185	1
Power cord - China (models 53C B1C CTO F1C)	41R3256	1
Power cord - China (models 53C B1C CTO F1C)	41R3257	1

4157 Power Cords	FRU#	CRU
Power cord - Japanese and Japanese English (models 19J 71J 72J 73J 74J 75J 76J 88J 89J 91J 92J B1E B1J CTO F1E F1J)	41R3248	1
Power cord - Japanese and Japanese English (models 19J 71J 72J 73J 74J 75J 76J 88J 89J 91J 92J B1E B1J CTO F1E F1J)	41R3249	1
Power cord - Brazil (Portuguese) (models CTO)	41R3270	1
Power cord - Brazil (Portuguese) (models CTO)	41R3271	1
Power cord - LA High Volt (APU) (models B1L B1Y CTO F1L F1Y)	41R3176	1
Power cord - LA High Volt (APU) (models B1L B1Y CTO F1L F1Y)	41R3177	1
Power cord - ANZ (models 77M 78M 93M 94M 95M 96M 97M A8M A9M B1M CTO F1M)	41R3196	1
Power cord - ANZ (models 77M 78M 93M 94M 95M 96M 97M A8M A9M B1M CTO F1M)	41R3197	1
Power cord - Korea (models B1K B1R CTO F1K F1R)	41R3260	1
Power cord - Korea (models B1K B1R CTO F1K F1R)	41R3261	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong (models 53B 53H 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 83A 84A 85A 98G 99G A3G A4G A5G A6G A7G B1G B1A B1B B1H CTO F1H F1G F1B)	41R3224	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong (models 53B 53H 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 83A 84A 85A 98G 99G A3G A4G A5G A6G A7G B1G B1A B1B B1H CTO F1H F1G F1B)	41R3225	1
Power cord - Taiwan (models 53V B1V CTO F1V)	41R3278	1
Power cord - Taiwan (models 53V B1V CTO F1V)	41R3279	1
Power cord - Italy (models 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 98G 99G A3G A4G A5G A6G A7G B1S B1Y B1G CTO F1S F1Y F1L F1G)	41R3232	1
Power cord - Italy (models 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 98G 99G A3G A4G A5G A6G A7G B1S B1Y B1G CTO F1S F1Y F1L F1G)	41R3233	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models 83A 84A 85A B1A CTO F1A)	41R3208	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models 83A 84A 85A B1A CTO F1A)	41R3209	1
Power cord - Denmark (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 98G 99G A3G A4G A5G A6G A7G B1G CTO F1G)	41R3212	1
Power cord - Denmark (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 98G 99G A3G A4G A5G A6G A7G B1G CTO F1G)	41R3213	1
Power cord - Switzerland (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 98G 99G A3G A4G A5G A6G A7G B1G CTO F1G)	41R3228	1
Power cord - Switzerland (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 98G 99G A3G A4G A5G A6G A7G B1G CTO F1G)	41R3229	1
Power cord - Israel (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 98G 99G A3G A4G A5G A6G A7G B1G CTO F1G)	41R3236	1
Power cord - Israel (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 98G 99G A3G A4G A5G A6G A7G B1G CTO F1G)	41R3237	1

4157 Power Cords	FRU#	CRU
Power cord - South Africa (models 23M 24M 25M 26M 27M 27A 28A 29A 31A 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 77M 78M 83A 84A 85A 93M 94M 95M 96M 97M 98G 99G A3G A4G A5G A6G A7G A8M A9M B1G B1M B1A CTO F1G F1M F1A)	41R3220	1
Power cord - South Africa (models 23M 24M 25M 26M 27M 27A 28A 29A 31A 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 47G 44G 45G 46G 54G 55G 56G 57G 58G 59G 61G 62G 63G 64G 65G 66G 67G 68G 69G 77M 78M 83A 84A 85A 93M 94M 95M 96M 97M 98G 99G A3G A4G A5G A6G A7G A8M A9M B1G B1M B1A CTO F1G F1M F1A)	41R3221	1
Power cord - India (models 27Q 28Q 29Q 86Q 87Q B1Q CTO F1Q)	41R3341	1
Power cord - India (models 27Q 28Q 29Q 86Q 87Q B1Q CTO F1Q)	41R3175	1
Power cord - Japan and Japanese English (models 19J 71J 72J 73J 74J 75J 76J 88J 89J 91J 92J B1E B1J CTO F1E F1J)	43N9057	1
Power cord - Japan and Japanese English (models 19J 71J 72J 73J 74J 75J 76J 88J 89J 91J 92J B1E B1J CTO F1E F1J)	43N9058	1

4157 Windows XP Pro Recovery DVDs	FRU#	CRU
US English/UK/Asia Pacific (models 55G 56G 67G 83A 84A 85A CTO)	03T5024	1
French/French Canadian (models 55G 56G 67G CTO)	03T5025	1
German (models 55G 56G 67G CTO)	03T5026	1
Italy (models 55G 56G 67G CTO)	03T5029	1
Brazil (models CTO)	03T5028	1
Spanish/LA Spanish (models 55G 56G 67G CTO)	03T5027	1
Danish (models 55G 56G 67G CTO)	03T5033	1
Dutch (models 55G 56G 67G CTO)	03T5034	1
Arabic English (models 55G 56G 67G CTO)	03T5039	1
SV (Swedish) (models 55G 56G 67G CTO)	03T5032	1
Hebrew (models 55G 56G 67G CTO)	03T5037	1
Finland (models 55G 56G 67G CTO)	03T5036	1
Norwegian (models 55G 56G 67G CTO)	03T5031	1
Polish (models 55G 56G 67G CTO)	03T5038	1
Portuguese (models 55G 56G 67G CTO)	03T5045	1
Russian (models 55G 56G 67G CTO)	03T5040	1
Russian English (models 55G 56G 67G CTO)	03T5041	1
Hungarian (models 55G 56G 67G CTO)	03T5043	1
Czech (models 55G 56G 67G CTO)	03T5035	1
Turkish (models 55G 56G 67G CTO)	03T5042	1
Greek (models 55G 56G 67G CTO)	03T5044	1
Slovakian (models 55G 56G 67G CTO)	03T5046	1
Japanese (models CTO)	03T5030	1
Simplified Chinese (models CTO)	03T5047	1
Traditional Chinese Taiwan (models CTO)	03T5048	1
Traditional Chinese Hong Kong (models CTO)	03T5049	1
Korean (models CTO)	03T5050	1

4157 Vista Business 32 Recovery DVDs	FRU#	CRU
English (models 11U 12U 14U 15U 16U 18U 48U 47G 46G CTO)	64Y5661	1
Russian English (models 47G 46G CTO)	64Y3672	1
French (models 11F 12F 14F15F 16F 18F 48F CTO)	64Y3673	1
German (models 47G 46G CTO)	64Y3674	1
Spanish (models 15S 15Y CTO)	64Y3675	1
Brazilian (models 15P CTO)	64Y3676	1
Italian (models 47G 46G CTO)	64Y3677	1
Japanese (models CTO)	64Y5662	1
Norwegian (models 47G 46G CTO)	64Y3699	1
Swedish (models 47G 46G CTO)	64Y3700	1
Danish (models 47G 46G CTO)	64Y3697	1
Dutch (models 47G 46G CTO)	64Y3691	1
Czech (models 47G 46G CTO)	64Y3678	1
Finnish (models 47G 46G CTO)	64Y3698	1
Polish (models 47G 46G CTO)	64Y3679	1
Russian (models 47G 46G CTO)	64Y3680	1
Turkish (models 47G 46G CTO)	64Y3681	1
Hungarian (models 47G 46G CTO)	64Y3682	1
Greek (models 47G 46G CTO)	64Y3683	1
Simplified Chinese (models CTO)	64Y5663	1
Traditional Chinese TC (models CTO)	64Y3686	1
Traditional Chinese Hong Kong (models CTO)	64Y3687	1
Korean (models CTO)	64Y3688	1
Slovenian (models 47G 46G CTO)	64Y3689	1
Romanian (models 47G 46G CTO)	64Y3693	1
Portuguese (models 47G 46G CTO)	64Y3694	1
Sebian-Latin (models 47G 46G CTO)	64Y3695	1
Slovakian (models 47G 46G CTO)	64Y3696	1
Arabic Localized (models CTO)	64Y3690	1
Hebrew (models 47G CTO)	64Y3692	1
MUL DVD P/Ns VB32 C&L1 Nordics (EN DK FI NO SV) (models 47G 46G CTO)	64Y3701	1
MUL DVD P/Ns VB32 C&L 2 Switzerland (EN FR GR IT) (models 47G 46G V)	64Y3702	1
MUL DVD P/Ns VB32 C&L 3 Bel Lux (EN FR GR NL) (models 47G 46G CTO)	64Y3703	1
English for India (models CTO)	71Y3620	1

4157 Vista Business 64 Recovery DVDs	FRU#	CRU
English (models 23M 24M 25M 26M 27M 28A 28Q 29A 29Q 31A 13U 17U 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 49U 51U 52U 44G 45G 53H 54G 57G 58G 59G 61G 62G 63G 64G 65G 66G 68G 69G 79U 81U 82U 86Q 87Q CTO)	64Y5664	1
Russian English (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 61G 62G 63G 64G 65G 66G 68G 69G CTO)	64Y3771	1

4157 Vista Business 64 Recovery DVDs	FRU#	CRU
French (models 13F 17F 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 49F 51F 52F 54G 57G 58G 59G 61G 62G 63G 64G 65G 66G 68G 69G 79F 81F 82F CTO)	64Y3772	1
German (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3773	1
Spanish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3774	1
Brazilian (models CTO)	64Y3775	1
Italian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3776	1
Japanese (models 19J 21J 22J 71J 72J 73J 74J 75J 76J CTO)	64Y5665	1
Norwegian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3796	1
Swedish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3797	1
Danish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3794	1
Dutch (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3790	1
Czech (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3777	1
Finnish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3795	1
Polish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3778	1
Russian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3779	1
Turkish (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3780	1
Hungarian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3781	1
Greek (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3782	1
Simplified Chinese (models 53C CTO)	64Y5666	1
Trad Chinese (models 53V CTO)	64Y3785	1
Trad Chinese (models 53H CTO)	64Y3786	1
Korean (models 28K 29K 31k CTO)	64Y3787	1
Slovenian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 61G 62G 63G 64G 65G 66G CTO)	64Y3788	1
Portuguese (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3792	1
Slovakian (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3793	1
Arabic Localized (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3789	1
Hebrew (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3791	1

4157 Vista Business 64 Recovery DVDs	FRU#	CRU
MUL DVD P/Ns VB64 C&L1 Nordics (EN DK FI NO SV) (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3798	1
MUL DVD P/Ns VB64 C&L 2 Switzerland (EN FR GR IT) (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3799	1
MUL DVD P/Ns VB64 C&L3 Bel Lux (EN FR GR NL) (models 34G 35G 36G 32G 33G 37G 38G 39G 41G 42G 44G 45G 54G 57G 58G 59G 68G 69G CTO)	64Y3800	1

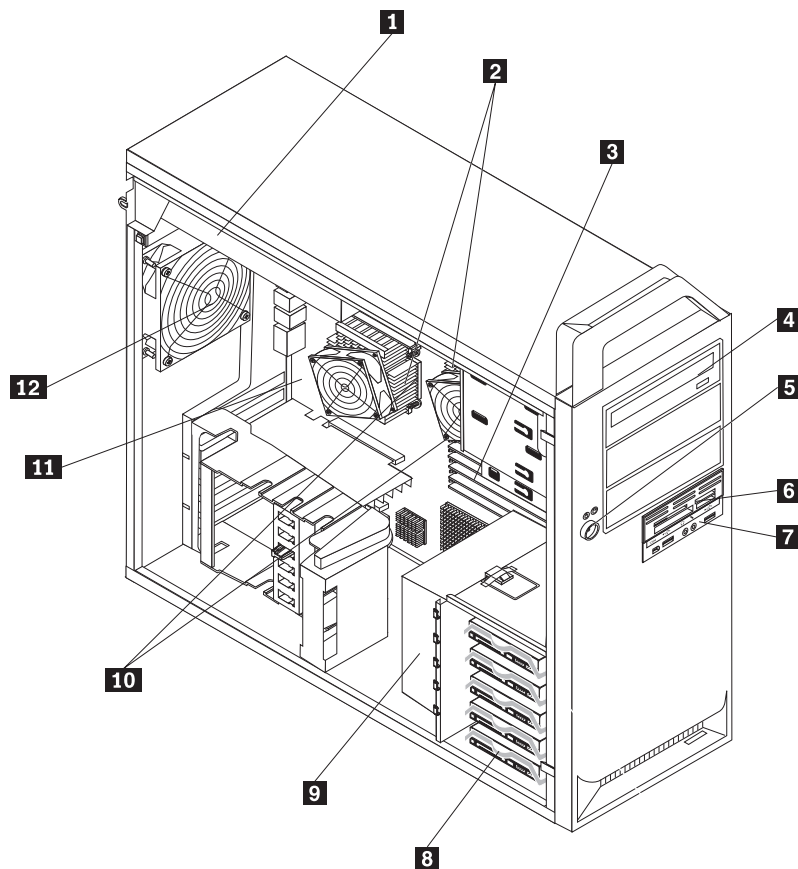
4157 Windows XP 64 Recovery DVDs	FRU#	CRU
English (models 52U 44G 45G CTO)	89Y0802	1
Japanese (models 89J CTO)	71Y9060	1

4157 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models 93M 94M 95M 96M 97M 98G 99G A3G A4G A5G A6G A7G B1G A8M A9M B1U B1L B1M B1A B1H B1R B1E CTO F1U F1L F1G F1M F1A F1Q F1H F1R F1E)	03T5020	1
French (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5006	1
German (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5008	1
Czech (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5004	1
Polish (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5013	1
Turkish (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5019	1
Greek (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5007	1
Japanese (models 88J 91J 92J B1J CTO F1J)	03T5011	1
Korean (models B1K CTO F1K)	03T5012	1
Slovenian (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5017	1
Russian English (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5014	1
Slovakian (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5016	1
Hebrew (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5001	1
Simplified English (models B1C CTO F1C)	03T5002	1
Traditional English (models B1V CTO F1V)	03T5003	1
India English (models 98G 99G A3G A4G A5G A6G A7G B1G CTO)	03T5005	1
Hong Kong (models B1C CTO F1C)	03T5009	1
Italian (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5010	1
Russian (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5015	1
Spanish (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5018	1
C&L Bel Lux (EN FR GR NL) (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5021	1
C&L Nordics (EN DK FI NO SV) (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5022	1
C&L Switzerland (EN FR GR IT) (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5023	1

4157 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models 93M 94M 95M 96M 97M 98G 99G A3G A4G A5G A6G A7G B1G A8M A9M B1U B1L B1M B1A B1H B1R B1E CTO F1U F1L F1G F1M F1A F1Q F1H F1R F1E)	03T5287	1
French (models 98G 99G B1F A3G A4G A5G A6G A7G B1G CTO F1G)	03T5274	1
German (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5276	1

4157 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
Czech (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5272	1
Polish (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5280	1
Turkish (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5286	1
Greek (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5275	1
Korean (models B1K CTO F1K)	03T5279	1
Slovenian (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5284	1
Russian English (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5281	1
Arabic Localized (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5269	1
Slovakian (models 94G 95G 96G D1G D2G D3G CTO F1G)	03T5283	1
Simplified English (models CTO)	03T5270	1
Traditional English (models CTO)	03T5271	1
India English (models B1C CTO F1C)	03T5273	1
Hong Kong (models CTO)	03T5277	1
Italian (models 94G 95G 96G D1G D2G D3G CTO)	03T5278	1
Russian (models 94G 95G 96G D1G D2G D3G CTO)	03T5282	1
Spanish (models 94G 95G 96G D1G D2G D3G CTO)	03T5285	1
C&L Bel Lux (EN FR GR NL) (models 94G 95G 96G D1G D2G D3G CTO)	03T5288	1
C&L Nordics (EN DK FI NO SV) (models 94G 95G 96G D1G D2G D3G CTO)	03T5289	1
C&L Switzerland (EN FR GR IT) (models 94G 95G 96G D1G D2G D3G CTO)	03T5290	1

Machine Type 4158



The FRUs listed in the following tables are not illustrated.

Item #	4158 FRUs	FRU#	CRU Tier
1	Power supply, 1060 Watt Power Supply—2P (models 18A 18T 18K 19A 19K 13J 14M 15M 16M 17M 21U 21F 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 28U 28F 29U 29F 31U 31F 32G 33G 34G 35G 36G 37G 44S 44P 44Y 45S 52U 53U 49U 49F 51U 51F 46G 47G 48G 54C 54B 54H 54V 55G 56G 57G 58G 59G 61G 62G 63M 64J 65Q 66Q 67Q 68Q 69Q 71M 72M 73M 74M 75J 76Q 76J 77J 78J 79U 79F 81G 82G 83G 84M 85J 86J 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	41A9761	2
2	Heat sink, Workstation, 130 Watt (all models)	41R5580	2
3	Memory module, 1GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models 16M 26U 26F 27U 27F 28U 28F 49U 49F 54C 54B 54H 54V CTO)	46R6026	1
3	Memory module, 2GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models 19A 19K 14M 15M 23U 23F 31U 31F 81G 84M CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	46R6027	1
3	Memory module, 4GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) (models 75J 76Q 76J 77J 78J 85J 86J CTO)	64Y9570	1
3	Memory module, 1GB DDR3 1RX8 RDIMM PC3-8500 (1066MHz) (models 21U 21F 22U 22F 44S 52U 53U 73M CTO)	46R6022	1
3	Memory module, 2GB DDR3 2RX8 RDIMM PC3-8500 (1066MHz) (models 32G 34G 37G 67Q 72M 74M CTO)	46R6023	1

Item #	4158 FRUs	FRU#	CRU Tier
3	Memory module, 4GB DDR3 2RX4 RDIMM PC3-8500 (1066MHz) (models 42G 79U 79F CTO)	46R6024	1
3	Memory module, 8GB DDR3 4RX4 RDIMM PC3-8500 (1066MHz) (models 64J CTO)	46R6025	1
3	Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models 51U 51F 62G CTO)	53Y6195	1
3	Memory module, 2GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models 46G 47G 48G 55G 56G 57G 58G 59G 61G 63M 65Q 66Q 68Q 69Q 71M 82G 83G 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO)	53Y6197	1
4	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models CTO)	41N3325	1
4	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models CTO)	71Y5543	1
4	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models 18A 18T 18K 19A 19K 13J 14M 15M 16M 17M 21U 21F 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 28U 28F 29U 29F 31U 31F 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 44S 44P 44Y 45S 52U 53U 49U 49F 51U 51F 46G 47G 48G 54C 54B 54H 54V 55G 56G 57G 58G 59G 61G 62G 63M 65Q 66Q 67Q 68Q 69Q 71M 72M 73M 74M 79U 79F 81G 82G 83G 84M 85J 86J 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	43C1042	1
4	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models 18A 18T 18K 19A 19K 13J 14M 15M 16M 17M 21U 21F 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 28U 28F 29U 29F 31U 31F 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 44S 44P 44Y 45S 52U 53U 49U 49F 51U 51F 46G 47G 48G 54C 54B 54H 54V 55G 56G 57G 58G 59G 61G 62G 63M 65Q 66Q 67Q 68Q 69Q 71M 72M 73M 74M 79U 79F 81G 82G 83G 84M 85J 86J 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	71Y5545	1
4	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models 64J CTO)	53Y7643	1
4	Optical drive, Blu-Ray Disc Burner (SATA) - Vista (models 64J CTO)	53Y3365	1
4	Optical drive, Blu-Ray DVD Burner (SATA) - XP/Vista (models 64J 75J 76Q 76J 77J 78J CTO)	71Y5547	1
5	Power switch/LED assembly and the internal speaker (all models)	41R5532	2
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-ALPS (models 11J 12J 49U 49F 51U 51F 46G 47G 48G 64J CTO)	40Y9105	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-SONY (models 11J 12J 49U 49F 51U 51F 46G 47G 48G 64J CTO)	40Y9107	1
7	Front panel cable assembly (USB, audio, 1394) (all models)	41R5657	2
8	Hard disk drive, 250GB SATA - 7200 rpm (models 18A 18T 18K 22U 22F 26U 26F 32G 41G 59G 63M 71M CTO)	46R6029	1
8	Hard disk drive, 500GB SATA - 7200 rpm (models 11J 13J 28U 28F 29U 29F 43G 35G 38G 51U 51F 47G 48G 55G 57G 58G 61G 64J 65Q 66Q 68Q 69Q 75J 77J 78J 79U 79F 81G 82G 83G 85J 86J 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	46R6030	1
8	Hard disk drive, 750GB SATA - 7200 rpm (models 33G 46G CTO)	43C3671	1
8	Hard disk drive, 1TB SATA - 7200 rpm (models 37G 56G CTO)	46R6031	1
8	Hard disk drive, 74GB SATA - 10000 rpm (models CTO)	46R6032	2
8	Hard disk drive, 150GB SATA - 10000 rpm (models CTO)	46R6400	2

Item #	4158 FRUs	FRU#	CRU Tier
8	Hard disk drive, 300GB SATA - 10000 rpm (models 14M 16M 23U 23F 27U 27F 45S 53U 49U CTO)	46R6401	2
8	Hard disk drive, 147GB SAS - 15000 rpm (models 19A 19K 21U 21F 24U 24F 25U 25F 31U 31F 42G 34G 36G 39G 44S 44P 44Y 52U 54C 54B 54H 54V 62G 67Q CTO)	46R6033	1
8	Hard disk drive, 147GB SAS - 15000 rpm (models 19A 19K 21U 21F 24U 24F 25U 25F 31U 31F 42G 34G 36G 39G 44S 44P 44Y 52U 54C 54B 54H 54V 62G 67Q CTO)	45K0608	1
8	Hard disk drive, 300GB SAS - 15000 rpm (models 12J 15M 17M CTO)	43C6969	1
8	Hard disk drive, 300GB SAS - 15000 rpm (models 12J 15M 17M 74M 76Q 76J CTO)	45K0609	1
8	Hard disk drive, 450GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" (models CTO)	45J4899	1
8	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models 84M CTO)	45N7953	1
8	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N8203	1
8	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N7959	1
8	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N8207	1
9	Hard disk drive fan, Front 120 mm (HDD/PCI) with grommets (models CTO)	45J9606	1
10	Microprocessor, Intel Xeon W3530 - Quad Core - 2.8GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, HT, 130W (models CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	71Y9027	N
10	Microprocessor, Intel Xeon W3520 - 2.66Ghz, Quad Core - 4.8 QPI, 4MB L2, DDR3-1066, Turbo, SMT, 130W (models CTO)	46R6405	N
10	Microprocessor, Intel Xeon W3540 - 2.93GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 130W (models CTO)	46R6406	N
10	Microprocessor, Intel Xeon W3570 - 3.20GHz, Quad Core- 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models CTO)	46R6407	N
10	Microprocessor, Intel Xeon W3550 - Quad Core - 3.06GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, SMT, 130W (models CTO)	64Y9827	N
10	Microprocessor, Intel Xeon W3580 - Quad Core -3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 1333, Turbo, SMT, 130W (models CTO)	64Y9829	N
10	Microprocessor, Intel Xeon E5502 - 1.86GHz, Dual Core 4.8 QPI, 4MB L2, DDR3-800, 80W (models 16M 54C 54B 54H 54V CTO)	46R6630	N
10	Microprocessor, Intel Xeon E5503 - Dual Core - 2.00GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9029	N
10	Microprocessor, Intel Xeon E5504 - 2.00GHz, Quad Core- 4.8QPI, 4MB L2, DDR3-800, 80W (models CTO)	46R6631	N
10	Microprocessor, Intel Xeon E5506 - 2.13GHz, Quad Core - 4.8QPI, 4MB L2, DDR3-800, 80W (models 21U 21F 25U 25F 34G 44S 44P 44Y 49U 49F 83G CTO)	46R6632	N
10	Microprocessor, Intel Xeon E5507 - Quad Core - 2.26GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9031	N
10	Microprocessor, Intel Xeon E5520 - 2.26GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 65Q 79U 79F 82G CTO)	46R6633	N
10	Microprocessor, Intel Xeon E5530 - 2.40GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 56G 63M 66Q 68Q 71M CTO)	46R6634	N
10	Microprocessor, Intel Xeon E5540 - 2.53GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models 18A 18T 18K 14M 17M 24U 24F 29U 29F 32G 42G 37G 52U 53U 51U 51F 46G 47G 55G 62G 69Q 72M 81G 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO)	46R6635	N

Item #	4158 FRUs	FRU#	CRU Tier
10	Microprocessor, Intel Xeon E5620 - Quad Core - 2.40GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9049	N
10	Microprocessor, Intel Xeon E5630 - Quad Core - 2.53GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9047	N
10	Microprocessor, Intel Xeon E5640 - Quad Core - 2.66GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9045	N
10	Microprocessor, Intel Xeon X5550 - 2.66GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 26U 26F 27U 27F 31U 31F 41G 35G 45S 61G 67Q 73M CTO)	46R6638	N
10	Microprocessor, Intel Xeon X5560 - 2.80GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 19A 19K 13J 22U 22F 23U 23F 28U 28F 33G 43G 38G 39G 48G 59G CTO)	46R6639	N
10	Microprocessor, Intel Xeon X5650 - 6 Core - 2.66GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9043	N
10	Microprocessor, Intel Xeon X5660 - 6 Core - 2.80GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9041	N
10	Microprocessor, Intel Xeon X5667 - Quad Core - 3.06GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9039	N
10	Microprocessor, Intel Xeon X5570 - 2.93GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models 11J 12J 15M 36G 58G 74M 75J 76Q 76J 77J 78J 85J 86J CTO)	46R6640	N
10	Microprocessor, Intel Xeon X5680 - 6 Cores - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9033	N
10	Microprocessor, Intel Xeon X5677 - Quad Core - 3.46GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9035	N
10	Microprocessor, Intel Xeon X5670 - 6 Core - 2.93GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9037	N
10	Microprocessor, Intel Xeon W5580 - 3.20GHz, Quad Core 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models CTO)	46R6641	N
10	Microprocessor, Intel Xeon W5590 - Quad Core - 3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 - 1333, Turbo, HT, 130W (models 57G 64J 84M CTO)	64Y9831	N
10	Microprocessor, Intel Xeon W3503 - Dual Core - 2.4Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models CTO)	63Y9159	N
10	Microprocessor, Intel Xeon W3505 - Dual Core - 2.53Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models CTO)	63Y9161	N
10	Microprocessor, Intel Xeon W3680 - 6 Core - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9025	N
11	System board, 2P Intel LGA 1366, Tylersburg 36D, ICH10 (Russia Only) (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 81G 82G 83G 87G CTO B9G)	64Y9121	N
11	System board, 2P Intel LGA 1366 (models 55G 56G 57G 58G 59G 61G 62G 63M 64J 65Q 66Q 67Q 68Q 69Q 71M 72M 73M 74M 75J 76Q 76J 77J 78J 79U 79F 81G 82G 83G 84M 85J 86J 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	71Y7061	N

Item #	4158 FRUs	FRU#	CRU Tier
11	System board, 2P Intel LGA 1366, Tylersburg 36D, ICH10 (GA Level v1.5, TPM enabled) (models 55G 56G 57G 58G 59G 61G 62G 63M 64J 65Q 66Q 67Q 68Q 69Q 71M 72M 73M 74M 75J 76Q 76J 77J 78J 79U 79F 81G 82G 83G 84M 85J 86J 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	71Y8826	N
11	System board, 2P Intel LGA 1366, Tylersburg 36D, ICH10 (GA Level v1.5, TPM enabled) (models 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	71Y8828	N
12	Rear system fan, 120 mm system exhaust (all models)	45J9605	2

The FRUs listed in the following tables are not illustrated.

4158 FRUs	FRU#	CRU Tier
Second Serial Port Cable (all models)	41R5544	2
FDD Cable (all models)	41N8294	2
SATA Cable (ODD) (all models)	41R5517	2
FDD Cable assembly (all models)	41N8294	2
Handle with screws (all models)	41R5526	1
Cable assembly, SATA (all models)	41R5481	2
Miscellaneous Parts Kit (all models)	41R5630	2
Cable assembly, Cover Detect Switch (all models)	41R5534	2
Thermal Sense Cable (all models)	41R2511	2
Motherboard Screw Kit (all models)	41R5547	2
Cable assembly, HDD SAS (all models)	41R5513	2
Rail Kit, Remy with filler (all models)	41R5597	2
Filler Plate (all models)	41R5636	1
Cover assembly (access panel), Flex (all models)	41R5654	1
Label Kit (all models)	41R5656	1
Mechanical Shell Kit (all models)	41R5658	N
MB_Shield (all models)	45K2256	2
assembly, fan, 120 mm system exhaust (all models)	45J9605	2
assembly, fan, front 120 mm (HDD/PCI) with grommets (all models)	45J9606	2
assembly, fan, memory cooling (all models)	45J9607	2
Memory Chiller assembly (all models)	41R5655	2
Bezel kit (all models)	45K2268	2
Cable, signal, SLI bridge (all models)	63Y9163	2
Heat sink, performance (all models)	41R5578	2
Cable, SATA HDD (all models)	26K1186	2
1.8 SSD to 3.5 HDD Conversion Kit with PCB (all models)	43N9593	2
PS/2 card and bracket assembly (all models)	41R5694	2
PS/2 cable assembly (all models)	41R5604	2

4158 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --US English (models 18A 19A 14M 15M 16M 17M 22U 23U 24U 25U 26U 27U 28U 29U 31U 32G 33G 52U 53U 49U 51U 46G 47G 48G 54H 55G 56G 57G 58G 59G 61G 62G 63M 65Q 66Q 67Q 68Q 69Q 71M 72M 73M 74M 76Q 79U 81G 82G 83G 84M 87U 87L 87G 87M 87A 87Q 87H 87R 87E CTO B9U B9L B9G B9M B9A B9Q B9H B9R B9E)	41A5289	1
USB --Arabic (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5290	1
USB --Arabic/French (models CTO)	41A5291	1
USB --Belgian/French (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5292	1
USB --Belgium English (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5293	1
USB --Brazilian Portuguese (models 44P CTO)	41A5294	1
USB --Bulgarian (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5295	1
USB -- Hong Kong/Taiwan (models B9C B9B B9V)	41A5296	1
USB --Czech (ABB) (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5297	1
USB --Danish (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5298	1
USB --Dutch (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5299	1
USB --French (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5300	1
USB --French Canadian (models 22F 23F 24F 25F 26F 27F 28F 29F 31F 49F 51F 79F 87F CTO B9F)	41A5301	1
USB --French Canadian (models 22F 23F 24F 25F 26F 27F 28F 29F 31F 49F 51F 79F 87F CTO B9F)	41A5302	1
USB --German (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5303	1
USB --Greek (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5304	1
USB --Greek/US (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5305	1
USB --Hebrew (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5306	1
USB --Hungarian (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5307	1
USB --Iceland (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5308	1
USB --Italy (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5309	1
USB --Japanese (models 11J 12J 13J 64J 75J 76J 77J 78J 85J 86J 87J CTO B9J)	41A5310	1
USB --Korean (models 18K19K 87K CTO B9K)	41A5311	1
USB --LA Spanish (models 44S 45S 44Y 87S 87D 87Y CTO B9S B9D B9Y)	41A5312	1
USB --Norwegian (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5313	1

4158 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --Polish (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5314	1
USB --Portuguese (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5315	1
USB --Romanian (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5316	1
USB --Romanian (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5317	1
USB --Russian/Cyrillic (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5318	1
USB --Serbian/Cyrillic (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5319	1
USB --Slovak (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5320	1
USB --Spanish (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5321	1
USB --Swedish/Finnish (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5322	1
USB --Swiss F/G (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5323	1
USB --Thailand (models 18T 87T CTO B9T)	41A5324	1
USB --Turkish (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5325	1
USB --Turkish (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5326	1
USB --UK English (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5327	1
USB --US Euro (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5328	1
USB --Slovenian (models 32G 33G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41A5329	1

4158 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
US English (models 21U 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0038	1
Arabic (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0039	1
Arabic/French (models CTO)	41R0040	1
Belgium French (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0041	1
Belgium English (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0042	1
Brazilian Portuguese (models CTO)	41R0043	1
Bulgarian (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0044	1
Chinese/US (models CTO)	41R0045	1
Czech (ABB) (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0046	1
Danish (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0047	1
Dutch (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0048	1
French (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0049	1

4158 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
French Canadian (models 21F CTO)	41R0050	1
French Canadian (models 21F CTO)	41R0051	1
German (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0052	1
Greek (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0053	1
Greek/US (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0054	1
Hebrew (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0055	1
Hungarian (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0056	1
Iceland (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0057	1
Italy (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0058	1
Japanese (models CTO)	41R0059	1
Korean (models CTO)	41R0060	1
LA Spanish (models CTO)	41R0061	1
Norwegian (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0062	1
Polish (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0063	1
Portuguese (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0064	1
Romanian (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0065	1
Romanian (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0066	1
Russian/Cyrillic (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0067	1
Serbian/Cyrillic (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0068	1
Slovak (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0069	1
Spanish (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0070	1
Swedish/Finnish (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0071	1
Swiss French/German (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0072	1
Thailand (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0073	1
Turkish (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0074	1
Turkish (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0075	1
UK English (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0076	1
US Euro (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0077	1
Slovenian (models 41G 42G 43G 34G 35G 36G 37G 38G 39G CTO)	41R0078	1

4158 Mice	FRU#	CRU
Optical Mouse (400 DPI), USB - red wheel (Primary) (models 18A 18T 18K 19A 19K 14M 15M 16M 17M 21U 21F 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 28U 28F 29U 29F 31U 31F 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 44S 44P 44Y 45S 52U 53U 49U 49F 51U 51F 54C 54B 54H 54V 55G 56G 57G 58G 59G 61G 62G 63M 65Q 66Q 67Q 68Q 69Q 71M 72M 73M 74M 79U 79F 75J 76Q 76J 77J 78J 81G 82G 83G 84M 85J 86J 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	41U3013	1

4158 Mice	FRU#	CRU
Optical Mouse (400 DPI), USB - red wheel (Secondary) (models 18A 18T 18K 19A 19K 14M 15M 16M 17M 21U 21F 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 28U 28F 29U 29F 31U 31F 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 44S 44P 44Y 45S 52U 53U 49U 49F 51U 51F 54C 54B 54H 54V 55G 56G 57G 58G 59G 61G 62G 63M 65Q 66Q 67Q 68Q 69Q 71M 72M 73M 74M 79U 79F 75J 76Q 76J 77J 78J 81G 82G 83G 84M 85J 86J 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	41U3030	1
3 Button Laser Mouse (1600 DPI), USB (models 11J 12J 13J 46G 47G 48G 64J CTO)	41U3078	1

4158 Adapters and miscellaneous FRUs	FRU#	CRU
3.5" 20-in-1 Media Card Reader (w/GPIO detect) (models 71M 72M 73M 74M 75J 76Q 76J 77J 78J 79U 79F 84M 85J CTO)	45R8139	1
L1 IEEE 1394 PCI Adapter (models 18A 18T 18K19A 19K11J 12J 13J 14M 15M 16M 17M 21U 21F 25U 25F 31U 31F 33G 35G 37G 39G 44S 44P 44Y 45S 71M 72M 73M 74M 75J 76Q 76J 77J 78J 79U 79F CTO)	41D2781	1
Speakers (2-piece) Lenovo Logo (Primary) (models CTO)	41A5331	1
Speakers (2-piece) Lenovo Logo (Secondary) (models CTO)	41A5334	1
Lenovo 3 pieces Speakers (China Only) (models CTO)	45C8640	1
Lenovo 2 pieces Speakers (China Only) (models CTO)	45C8641	1
Speaker Power brick (models CTO)	89P8571	1
256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models CTO)	42Y6329	1
256MB NVIDIA FX380 (DVI + DP) (Hard from 46R2784) (models 26U 26F CTO)	71Y6863	1
512MB NVIDIA FX580 (DVI + DP + DP) (models 28U 28F 31U 31F CTO)	46R2786	1
768MB NVIDIA FX1800 (DVI + DP + DP) (models 18A 18T 18K 19A 19K 13J 14M 16M 17M 21U 21F 22U 22F 24U 24F 25U 25F 27U 27F 29U 29F 32G 42G 43G 34G 37G 39G 44S 44P 44Y 45S 46G 54C 54B 54H 54V 55G 65Q 68Q 69Q 72M 73M 79U 79F 81G 82G 87U 87F 87S 87L 87D 87Y 87G 87M 87A 87Q 87T 87C 87B 87H 87V 87K 87R 87E 87J CTO)	46R2788	1
1.5GB NVIDIA FX4800 (DVI + DP + DP + ST), 2x3 Pwr Conn. (models 19A 19K 11J 12J 15M 23U 23F 33G 41G 35G 36G 38G 52U 53U 48G 58G 64J 66Q 67Q 74M 75J 76Q 78J 84M 86J CTO B9U B9F B9S B9L B9D B9Y B9G B9M B9A B9Q B9T B9C B9B B9H B9V B9K B9R B9E B9J)	46R2792	1
256MB NVIDIA NVS295 (Dual DP) (models 62G CTO)	46R2782	1
1GB NVIDIA FX3800 (DVI + DP + ST), 2x3 Pwr Conn. (models 59G 63M 71M 77J 85J CTO)	89Y0429	1
4GB NVIDIA FX5800 (DVI + DVI + DP + ST), 2*2X3 Pwr Conn. (models CTO CTO)	46R2794	1
256MB ATI FirePro V3700 (Dual DVI) (models 51U 51F CTO)	53Y8569	1
512MB ATI FirePro V5700 (DP+DP+DVI) (models 49U 49F 47G 56G 57G CTO)	53Y8571	1
1GB ATI FirePro V7700 (DP+DP+DVI) (models CTO)	53Y8573	1
Soft Modem V.90/V.44 (models CTO)	29R9729	1
Dongle Cable (DMS59 to dual DVI) (models CTO)	41X6398	1
Nvidia Tesla C1060 compute card (computer adapter) (models CTO)	46R6041	1
SAS Controller Card - 3Gb/s, 4-port Host bus adapter (models CTO)	46R3460	1
SoundBlaster Titanium Audio Card (PCIe) (models CTO)	46T0407	1
Modem Phone Cable (models CTO)	39K5120	1
DVI to VGA Dongle (models CTO)	45C7816	1
DP to DVI Dongle 200 mm (models CTO)	43N9160	1

4158 Adapters and miscellaneous FRUs	FRU#	CRU
512MB NVIDIA Quadro NVS 450 GDDR3 (DP+DP+DP+DP) (models CTO)	64Y9895	1

4158 Power Cords	FRU#	CRU
Power cord - US (models 18A 18T 19A 21U 21F 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 28U 28F 29U 29F 31U 31F 44S 45S 52U 53U 49U 49F 51U 51F 76Q 79U 79F 87U 87F 87L 87M 87A 87T CTO B9U B9F B9S B9L B9D B9A B9T)	41R3184	1
Power cord - US (models 18A 18T 19A 21U 21F 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 28U 28F 29U 29F 31U 31F 44S 45S 52U 53U 49U 49F 51U 51F 76Q 79U 79F 87U 87F 87L 87M 87A 87T CTO B9U B9F B9S B9L B9D B9A B9T)	41R3185	1
Power cord - China (models 54C 87C CTO B9C)	41R3256	1
Power cord - China (models 54C 87C CTO B9C)	41R3257	1
Power cord - Japanese and Japanese English (models 11J 12J 13J 64J 75J 76J 77J 78J 85J 86J 87E 87J CTO B9E B9J)	41R3248	1
Power cord - Japanese and Japanese English (models 11J 12J 13J 64J 75J 76J 77J 78J 85J 86J 87E 87J CTO B9E B9J)	41R3249	1
Power cord - Brazil (Portuguese) (models 44P CTO)	41R3270	1
Power cord - Brazil (Portuguese) (models 44P CTO)	41R3271	1
Power cord - LA High Volt (APU) (models 87S 87D 87Y CTO B9S B9D B9Y)	41R3176	1
Power cord - LA High Volt (APU) (models 87S 87D 87Y CTO B9S B9D B9Y)	41R3177	1
Power cord - ANZ (models 14M 15M 16M 17M 71M 72M 73M 74M CTO B9M)	41R3196	1
Power cord - ANZ (models 14M 15M 16M 17M 71M 72M 73M 74M CTO B9M)	41R3197	1
Power cord - Korea (models 18K 19K 87K 87R CTO B9K B9R)	41R3260	1
Power cord - Korea (models 18K 19K 87K 87R CTO B9K B9R)	41R3261	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hong kong (models 55G 56G 57G 58G 59G 61G 62G 63M 81G 82G 83G 87G CTO B9G B9M)	41R3224	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hong kong (models 55G 56G 57G 58G 59G 61G 62G 63M 81G 82G 83G 87G CTO B9G B9M)	41R3225	1
Power cord - Taiwan (models 54B 54H 54V 87B 87H 87V CTO B9B B9H B9V)	41R3278	1
Power cord - Taiwan (models 54B 54H 54V 87B 87H 87V CTO B9B B9H B9V)	41R3279	1
Power cord - Italy (models 44S 45S 44Y 55G 56G 57G 58G 59G 61G 62G 63M 81G 82G 83G 87G CTO B9S B9Y B9L 9G)	41R3232	1
Power cord - Italy (models 44S 45S 44Y 55G 56G 57G 58G 59G 61G 62G 63M 81G 82G 83G 87G CTO B9S B9Y B9L 9G)	41R3233	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models 87A CTO B9A)	41R3208	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models 87A CTO B9A)	41R3209	1
Power cord - Denmark (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41R3212	1
Power cord - Denmark (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41R3213	1
Power cord - Switzerland (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41R3228	1

4158 Power Cords	FRU#	CRU
Power cord - Switzerland (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41R3229	1
Power cord - Israel (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41R3236	1
Power cord - Israel(models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 81G 82G 83G 87G CTO B9G)	41R3237	1
Power cord - South Africa (models 14M 15M 16M 17M 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 63M 71M 72M 73M 74M 81G 82G 83G 87G CTO B9M B9G)	41R3220	1
Power cord - South Africa (models 14M 15M 16M 17M 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 63M 71M 72M 73M 74M 81G 82G 83G 87G CTO B9M B9G)	41R3221	1
Power cord - India (models 65Q 66Q 67Q 68Q 69Q 87Q CTO)	41R3341	1
Power cord - India (models 65Q 66Q 67Q 68Q 69Q 87Q CTO)	41R3175	1
Power cord - Japan and Japanese English (models 11J 12J 13J 64J 75J 76J 77J 78J 85J 86J CTO B9E B9J)	43N9057	1
Power cord - Japan and Japanese English (models 11J 12J 13J 64J 75J 76J 77J 78J 85J 86J CTO B9E B9J)	43N9058	1
Power cord - US (for use on 2P systems only) (models 18A 18T 19A 21U 21F 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 28U 28F 29U 29F 31U 31F 44S 45S 52U 53U 49U 49F 51U 51F 76Q 79U 79F 87U 87F 87L 87M 87A 87T CTO B9U B9F B9S B9L B9D B9A B9T)	45J9502	1
Power cord - Taiwan (for use on 2P systems only) (models 54B 54H 54V 87B 87H 87V CTO B9B B9H B9V)	45J9503	1

4158 Windows XP Pro Recovery DVDs	FRU#	CRU
US English/UK/Asia Pacific (models CTO)	03T5024	1
French/French Canadian (models CTO)	03T5025	1
German (models CTO)	03T5026	1
Italy (models CTO)	03T5029	1
Brazil (models CTO)	03T5028	1
Spanish/LA Spanish (models CTO)	03T5027	1
Danish (models CTO)	03T5033	1
Dutch (models CTO)	03T5034	1
Arabic English (models CTO)	03T5039	1
SV (Swedish) (models CTO)	03T5032	1
Hebrew (models CTO)	03T5037	1
Finland (models CTO)	03T5036	1
Norwegian (models CTO)	03T5031	1
Polish (models CTO)	03T5038	1
Portuguese (models CTO)	03T5045	1
Russian (models CTO)	03T5040	1
Russian English (models CTO)	03T5041	1
Hungarian (models CTO)	03T5043	1
Czech (models CTO)	03T5035	1

4158 Windows XP Pro Recovery DVDs	FRU#	CRU
Turkish (models CTO)	03T5042	1
Greek (models CTO)	03T5044	1
Slovakian (models CTO)	03T5046	1
Japanese (models CTO)	03T5030	1
Simplified Chinese (models CTO)	03T5047	1
Traditional Chinese Taiwan (models CTO)	03T5048	1
Traditional Chinese Hong Kong (models CTO)	03T5049	1
Korean (models CTO)	03T5050	1

4158 Vista Business 32 Recovery DVDs	FRU#	CRU
English (models 22U CTO)	64Y5661	1
Russian English (models CTO)	64Y3672	1
French (models 22F CTO)	64Y3673	1
German (models CTO)	64Y3674	1
Spanish (models CTO)	64Y3675	1
Brazilian (models CTO)	64Y3676	1
Italian (models CTO)	64Y3677	1
Japanese (models CTO)	64Y5662	1
Norwegian (models CTO)	64Y3699	1
Swedish (models CTO)	64Y3700	1
Danish (models CTO)	64Y3697	1
Dutch (models CTO)	64Y3691	1
Czech (models CTO)	64Y3678	1
Finnish (models CTO)	64Y3698	1
Polish (models CTO)	64Y3679	1
Russian (models CTO)	64Y3680	1
Turkish (models CTO)	64Y3681	1
Hungarian (models CTO)	64Y3682	1
Greek (models CTO)	64Y3683	1
Simplified Chinese (models CTO)	64Y5663	1
Traditional Chinese-TC (models CTO)	64Y3686	1
Traditional Chinese-HK (models CTO)	64Y3687	1
Korean (models CTO)	64Y3688	1
Slovenian (models CTO)	64Y3689	1
Romanian (models CTO)	64Y3693	1
Portuguese (models CTO)	64Y3694	1
Sebian-Latin (models CTO)	64Y3695	1
Slovakian (models CTO)	64Y3696	1
Arabic Localized (models CTO)	64Y3690	1
Hebrew (models CTO)	64Y3692	1
MUL DVD P/Ns VB32 C&L1 Nordics (EN DK FI NO SV) (models CTO)	64Y3701	1

4158 Vista Business 32 Recovery DVDs	FRU#	CRU
MUL DVD P/Ns VB32 C&L 2 Switzerland (EN FR GR IT) (models CTO)	64Y3702	1
MUL DVD P/Ns VB32 C&L 3 Bel Lux (EN FR GR NL) (models CTO)	64Y3703	1
English for India (models CTO)	71Y3620	1

4158 Vista Business 64 Recovery DVDs	FRU#	CRU
English (models 18A 19A 14M 15M 16M 17M 21U 23U 24U 25U 26U 27U 28U 29U 31U 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 52U 53U 49U 51U 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G 63M 65Q 66Q 67Q 68Q 69Q CTO)	64Y5664	1
Russian English (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3771	1
French (models 21F 23F 24F 25F 26F 27F 28F 29F 31F 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 49F 51F 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3772	1
German (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3773	1
Spanish (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3774	1
Brazilian (models CTO)	64Y3775	1
Italian (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3776	1
Japanese (models 11J 12J 13J 64J CTO)	64Y5665	1
Norwegian (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3796	1
Swedish (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3797	1
Danish (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3794	1
Dutch (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3790	1
Czech (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3777	1
Finnish (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3795	1
Polish (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3778	1
Russian (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3779	1
Turkish (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3780	1
Hungarian (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3781	1
Greek (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3782	1
Simplified Chinese (models 54C CTO)	64Y5666	1
Trad Chinese (models 54V CTO)	64Y3785	1
Trad Chinese (models 54B CTO)	64Y3786	1
Korean (models 18K19K CTO)	64Y3787	1

4158 Vista Business 64 Recovery DVDs	FRU#	CRU
Slovenian (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3788	1
Portuguese (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3792	1
Slovakian (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3793	1
Arabic Localized (models CTO)	64Y3789	1
Hebrew (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3791	1
MUL DVD P/Ns VB64 C&L1 Nordics (EN DK FI NO SV) (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3798	1
MUL DVD P/Ns VB64 C&L 2 Switzerland (EN FR GR IT) (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3799	1
MUL DVD P/Ns VB64 C&L3 Bel Lux (EN FR GR NL) (models 32G 33G 41G 42G 43G 34G 35G 36G 37G 38G 39G 46G 47G 48G 55G 56G 57G 58G 59G 61G 62G CTO)	64Y3800	1

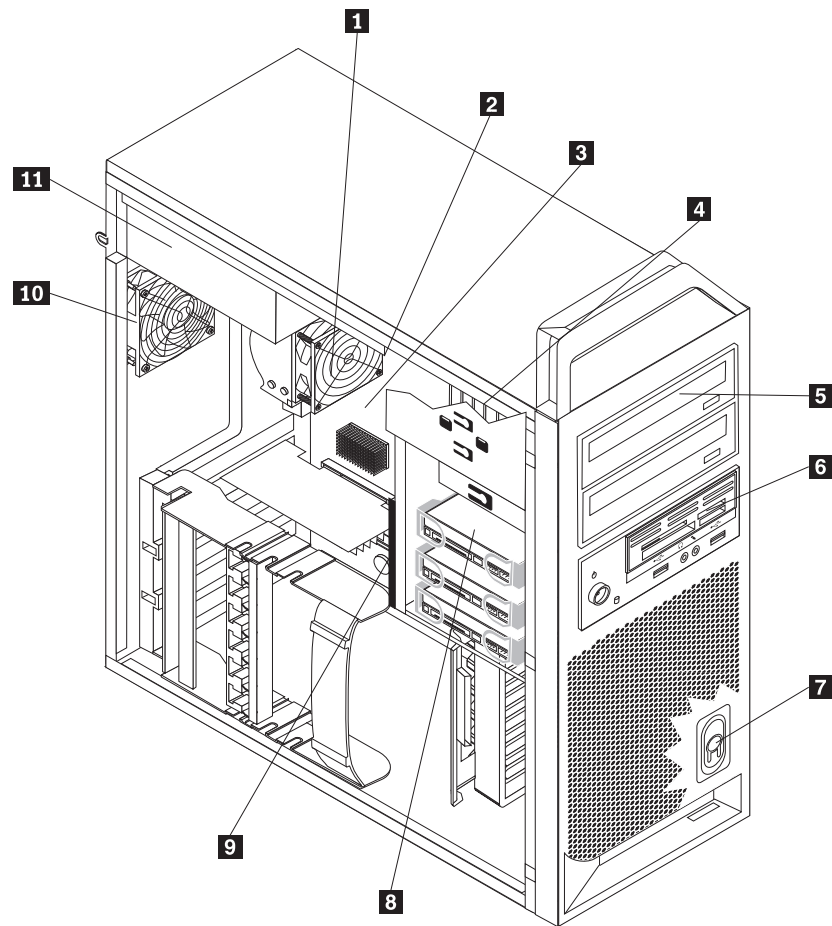
4158 Windows XP 64 Recovery DVDs	FRU#	CRU
Japanese (models 46G 48G CTO)	64Y6595	1
English (models 77J 78J CTO)	89Y0803	1

4158 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models 71M 72M 73M 74M 79U 81G 82G 83G 84M 87U 87L 87G 87M 87A 87Q 87H 87R 87E CTO B9U B9G B9M B9A B9Q B9H B9E B9J)	03T5020	1
French (models 79F 87F CTO B9F)	03T5006	1
German (models 81G 82G 83G 87G CTO B9G)	03T5008	1
Czech (models 81G 82G 83G 87G CTO B9G)	03T5004	1
Polish (models 81G 82G 83G 87G CTO B9G)	03T5013	1
Turkish (models 81G 82G 83G 87G CTO B9G)	03T5019	1
Greek (models 81G 82G 83G 87G CTO B9G)	03T5007	1
Japanese (models 75J 76J 85J 86J 87J CTO B9J)	03T5011	1
Korean (models 87K CTO B9K)	03T5012	1
Slovenian (models 81G 82G 83G 87G CTO B9G)	03T5017	1
Russian English (models 81G 82G 83G 87G CTO B9G)	03T5014	1
Slovakian (models 81G 82G 83G 87G CTO B9G)	03T5016	1
Hebrew (models 81G 82G 83G 87G CTO)	03T5001	1
Simplified English (models CTO B9C)	03T5002	1
Traditional English (models 87V CTO B9V)	03T5003	1
India English (models 81G 82G 83G 87G CTO)	03T5005	1
Hong Kong (models 76Q 87Q CTO B9Q)	03T5009	1
Italian (models 81G 82G 83G 87G CTO)	03T5010	1
Russian (models 81G 82G 83G 87G CTO)	03T5015	1
Spanish (models 87S 87D 87Y CTO)	03T5018	1
C&L Bel Lux (EN FR GR NL) (models 81G 82G 83G 87G CTO)	03T5021	1

4158 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
C&L Nordics (EN DK FI NO SV) (models 81G 82G 83G 87G CTO)	03T5022	1
C&L Switzerland (EN FR GR IT) (models 81G 82G 83G 87G CTO)	03T5023	1

4158 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models 71M 72M 73M 74M 79U 81G 82G 83G 84M 87U 87L 87G 87M 87A 87Q 87H 87R 87E CTO B9U B9G B9M B9A B9Q B9H B9E B9J)	03T5287	1
French (models 79F 87F CTO B9F)	03T5274	1
German (models 81G 82G 83G 87G CTO B9G)	03T5276	1
Czech (models 81G 82G 83G 87G CTO B9G)	03T5272	1
Polish (models 81G 82G 83G 87G CTO B9G)	03T5280	1
Turkish (models 81G 82G 83G 87G CTO B9G)	03T5286	1
Greek (models 81G 82G 83G 87G CTO B9G)	03T5275	1
Korean (models 87K CTO B9K)	03T5279	1
Slovenian (models 81G 82G 83G 87G CTO B9G)	03T5284	1
Russian English (models 81G 82G 83G 87G CTO B9G)	03T5281	1
Arabic Localized (models 81G 82G 83G 87G CTO B9G)	03T5269	1
Slovakian (models 81G 82G 83G 87G CTO B9G)	03T5283	1
Simplified English (models CTO B9C)	03T5270	1
Traditional English (models 87V CTO B9V)	03T5271	1
India English (models 76Q 87Q CTO B9Q)	03T5273	1
Hong Kong (models 87B CTO B9B)	03T5277	1
Italian (models 81G 82G 83G 87G CTO B9G)	03T5278	1
Russian (models 81G 82G 83G 87G CTO B9G)	03T5282	1
Spanish (models 81G 82G 83G 87G CTO B9G)	03T5285	1
C&L Bel Lux (EN FR GR NL) (models 81G 82G 83G 87G CTO B9G)	03T5288	1
C&L Nordics (EN DK FI NO SV) (models 81G 82G 83G 87G CTO B9G)	03T5289	1
C&L Switzerland (EN FR GR IT) (models 81G 82G 83G 87G CTO B9G)	03T5290	1

Machine Type 4217



Item #	4217 FRUs	FRU#	CRU Tier
1	Fan sink, Bloomfield Performance (all models)	41R5578	2
1	Fan sink, Bloomfield Workstation (all models)	41R5580	2
2	Microprocessor, Intel Xeon W3530 - Quad Core - 2.8GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, HT, 130W (models CTO)	71Y9027	N
2	Microprocessor, Intel Xeon W3520 - 2.66Ghz, Quad Core - 4.8 QPI, 4MB L2, DDR3-1066, Turbo, SMT, 130W (models CTO 12J 17J 18J)	46R6405	N
2	Microprocessor, Intel Xeon W3540 - 2.93GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 130W (models CTO)	46R6406	N
2	Microprocessor, Intel Xeon W3570 - 3.20GHz, Quad Core- 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models CTO)	46R6407	N
2	Microprocessor, Intel Xeon E5502 - 1.86GHz, Dual Core 4.8 QPI, 4MB L2, DDR3-800, 80W (models CTO)	46R6630	N
2	Microprocessor, Intel Xeon E5503 - Dual Core - 2.00GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9029	N
2	Microprocessor, Intel Xeon E5504 - 2.00GHz, Quad Core- 4.8QPI, 4MB L2, DDR3-800, 80W (models CTO 14G)	46R6631	N
2	Microprocessor, Intel Xeon E5506 - 2.13GHz, Quad Core - 4.8QPI, 4MB L2, DDR3-800, 80W (models CTO)	46R6632	N

Item #	4217 FRUs	FRU#	CRU Tier
2	Microprocessor, Intel Xeon E5507 - Quad Core - 2.26GHz - 4.8 QPI DDR3-800-4MB 80W (models CTO)	71Y9031	N
2	Microprocessor, Intel Xeon E5520 - 2.26GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models CTO)	46R6633	N
2	Microprocessor, Intel Xeon E5530 - 2.40GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models CTO)	46R6634	N
2	Microprocessor, Intel Xeon E5540 - 2.53GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models CTO)	46R6635	N
2	Microprocessor, Intel Xeon E5620 - Quad Core - 2.40GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9049	N
2	Microprocessor, Intel Xeon E5630 - Quad Core - 2.53GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9047	N
2	Microprocessor, Intel Xeon E5640 - Quad Core - 2.66GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W (models CTO)	71Y9045	N
2	Microprocessor, Intel Xeon X5550 - 2.66GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models CTO)	46R6638	N
2	Microprocessor, Intel Xeon X5560 - 2.80GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models CTO)	46R6639	N
2	Microprocessor, Intel Xeon X5650 - 6 Core - 2.66GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9043	N
2	Microprocessor, Intel Xeon X5660 - 6 Core - 2.80GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9041	N
2	Microprocessor, Intel Xeon X5667 - Quad Core - 3.06GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9039	N
2	Microprocessor, Intel Xeon X5570 - 2.93GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models CTO)	46R6640	N
2	Microprocessor, Intel Xeon X5680 - 6 Cores - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9033	N
2	Microprocessor, Intel Xeon X5677 - Quad Core - 3.46GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9035	N
2	Microprocessor, Intel Xeon X5670 - 6 Core - 2.93GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W (models CTO)	71Y9037	N
2	Microprocessor, Intel Xeon W5580 - 3.20GHz, Quad Core 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models CTO 11J)	46R6641	N
2	Microprocessor, Intel Xeon W5590 - Quad Core - 3.33GHz - 6.4 QPI, 8MB Cache, DDR3 - 1333, Turbo, HT, 130W (models CTO)	64Y9831	N
2	Microprocessor, Intel Xeon W3503 - Dual Core - 2.4Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models CTO 13G)	63Y9159	N
2	Microprocessor, Intel Xeon W3505 - Dual Core - 2.53Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W(models CTO)	63Y9161	N
2	Microprocessor, Intel Xeon W3550 - Quad Core - 3.06GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, SMT, 130W (models CTO)	64Y9827	N
2	Microprocessor, Intel Xeon W3580 - Quad Core -3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 1333, Turbo, SMT, 130W (models 15J 16J 19J)	64Y9829	N
2	Microprocessor, Intel Xeon W3680 - 6 Core - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9025	N

Item #	4217 FRUs	FRU#	CRU Tier
2	Microprocessor, Intel Xeon W3670 - 6 Cores - 3.20GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W (models CTO)	71Y9027	N
2	Microprocessor, Intel Xeon W3565 - Quad Core - 3.2GHz - 4.8 QPI, 8MB Cache, DDR3-1066, 130W (models 21J 22J CTO)	71Y8842	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (models CTO 11J 12J 13G 14G 15J 16J 17J 18J 19J 21J 22J)	64Y7517	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (Russia Only) (models CTO)	64Y6337	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.35 , TPM enabled) (models CTO 11J 12J 13G 14G 15J 16J 17J 18J 19J 21J 22J)	71Y8819	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.35, TPM disabled) (models CTO)	71Y8823	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.45, TPM enabled) (models CTO 11J 12J 13G 14G 15J 16J 17J 18J 19J 21J 22J)	71Y8820	N
3	System Board, 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.45, TPM disabled) (models CTO)	71Y8824	N
4	Memory module, 1GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models CTO 21J 22J)	46R6026	1
4	Memory module, 2GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models CTO 11J 15J 16J 17J 18J 19J)	46R6027	1
4	Memory module, 4GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) (models CTO)	64Y9570	1
4	Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models CTO 14G 13G)	53Y6195	1
4	Memory module, 2GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models CTO)	53Y6197	1
5	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models CTO 11J 12J 15J 16J 17J 18J 19J)	41N3325	1
5	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models CTO 11J 12J 15J 16J 17J 18J 19J)	71Y5543	1
5	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models CTO 14G 13G 21J 22J)	43C1042	1
5	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models CTO 14G 13G 21J 22J)	71Y5545	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models CTO)	53Y3365	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models CTO)	53Y7643	1
5	Optical drive, Blu-Ray DVD Burner (SATA) - XP/Vista (models CTO)	71Y5547	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-ALPS (models CTO 11J 12J 15J)	40Y9105	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-SONY (models CTO 11J 12J 15J)	40Y9107	1
7	Power switch/LED assembly (all models)	41R5651	2
8	Internal speaker (all models)	41R5494	2
9	Hard disk drive, 250GB SATA - 7200 rpm (models CTO 11J 12J 13G 15J 16J 17J 18J 19J)	46R6029	1
9	Hard disk drive, 500GB SATA - 7200 rpm (models CTO 14G)	46R6030	1
9	Hard disk drive, 750GB SATA - 7200 rpm (models CTO)	43C3671	1
9	Hard disk drive, 1TB SATA - 7200 rpm (models CTO)	46R6031	1

Item #	4217 FRUs	FRU#	CRU Tier
9	Hard disk drive, 74GB SATA - 10000 rpm (models CTO)	46R6032	2
9	Hard disk drive, 150GB SATA - 10000 rpm (models CTO)	46R6400	2
9	Hard disk drive, 300GB SATA - 10000 rpm (models CTO 21J 22J)	46R6401	2
9	Hard disk drive, 147GB SAS - 15000 rpm (models CTO)	46R6033	1
9	Hard disk drive, 147GB SAS - 15000 rpm (models CTO)	45K0608	1
9	Hard disk drive, 300GB SAS - 15000 rpm (models CTO 21J 22J)	43C6969	1
9	Hard disk drive, 300GB SAS - 15000 rpm (models CTO)	45K0609	1
9	Hard disk drive, 450GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" (models CTO)	45J4899	1
9	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N7953	1
9	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N8203	1
9	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N7959	1
9	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" (models CTO)	45N8207	1
10	Fan bracket assembly, 70 x 25 fan (all models)	41R5589	2
11	Exhaust fan assembly (all models)	41R5583	2
12	Power supply, 625 Watt power supply (models CTO 11J 12J 13G 14G 15J 16J 17J 18J 19J 21J 22J)	41A9758	2

The FRUs listed in the following tables are not illustrated.

4217 FRUs	FRU#	CRU Tier
Fan assembly, 92 mm front PCI (all models)	41R5595	2
PS2 Keyboard/Mouse card and cable assembly (all models)	41R5604	2
Adapter bracket, 2.5 to 3.5 HDD (all models)	41R5625	2
EMC Shield assembly, Menorca motherboard (all models)	41R5621	2
Label, Martell 2/Menorca Information (all models)	41R5626	1
Second serial port cable (all models)	41R5544	2
FDD Cable (all models)	41N8294	2
RM assembly (all models)	41R5592	2
Cable assembly, SAS LED with diodes (all models)	41R5696	2
Cable assembly, SAS LED (all models)	41R5667	2
Handle with screws (all models)	41R5490	1
Cable assembly, HDD SATA (all models)	41N8298	2
Cable assembly, SAS HDD (all models)	41R5482	2
Access Cover assembly with tape (all models)	41R5670	2
Thermal Sense Cable (all models)	41R2511	2
Motherboard Screw Kit (all models)	41R5547	2
Cable assembly, SATA ODD (Hard from 41R5481) (all models)	41R5517	2
Miscellaneous Parts kit, Martell 2(hard from 41R5560 (all models)	41R5673	2
Cable assembly, cover detect switch (all models)	41R5497	2
Martell 2 FPIO cable and bezel assembly kit (no 1394) (all models)	41R5690	2
Mechanical shell kit, Martell 2, no 1394 (all models)	41R5691	2

4217 FRUs	FRU#	CRU Tier
PS/2 card and bracket assembly (all models)	41R5694	2
PS/2 cable assembly (all models)	41R5604	2
SAS HDD filler (all models)	41R5552	2
Handle filler with screws (all models)	41R5699	2

4217 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --US English (models CTO 14G 13G)	41A5289	1
USB --Arabic (models CTO 14G 13G)	41A5290	1
USB --Arabic/French (models CTO)	41A5291	1
USB --Belgian/French (models CTO 14G 13G)	41A5292	1
USB --Belgium English (models CTO 14G 13G)	41A5293	1
USB --Brazilian Portuguese (models CTO)	41A5294	1
USB --Bulgarian (models CTO 14G 13G)	41A5295	1
USB -- Hong Kong/Taiwan (models CTO)	41A5296	1
USB --Czech (ABB) (models CTO 14G 13G)	41A5297	1
USB --Danish (models CTO 14G 13G)	41A5298	1
USB --Dutch (models CTO 14G 13G)	41A5299	1
USB --French (models CTO 14G 13G)	41A5300	1
USB --French Canadian (models CTO)	41A5301	1
USB --French Canadian (models CTO)	41A5302	1
USB --German (models CTO 14G 13G)	41A5303	1
USB --Greek (models CTO 14G 13G)	41A5304	1
USB --Greek/US (models CTO 14G 13G)	41A5305	1
USB --Hebrew (models CTO 14G 13G)	41A5306	1
USB --Hungarian (models CTO 14G 13G)	41A5307	1
USB --Iceland (models CTO 14G 13G)	41A5308	1
USB --Italy (models CTO 14G 13G)	41A5309	1
USB --Japanese (models CTO 11J 12J 15J 16J 17J 18J19J 21J 22J)	41A5310	1
USB --Korean (models CTO)	41A5311	1
USB --LA Spanish (models CTO 14G 13G)	41A5312	1
USB --Norwegian (models CTO 14G 13G)	41A5313	1
USB --Polish (models CTO 14G 13G)	41A5314	1
USB --Portugese (models CTO 14G 13G)	41A5315	1
USB --Romanian (models CTO 14G 13G)	41A5316	1
USB --Romanian (models CTO 14G 13G)	41A5317	1
USB --Russian/Cyrillic (models CTO 14G 13G)	41A5318	1
USB --Serbian/Cyrillic (models CTO 14G 13G)	41A5319	1
USB --Slovak (models CTO 14G 13G)	41A5320	1
USB --Spanish (models CTO 14G 13G)	41A5321	1
USB --Swedish/Finnish (models CTO 14G 13G)	41A5322	1
USB --Swiss F/G (models CTO 14G 13G)	41A5323	1

4217 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --Thailand (models CTO 14G 13G)	41A5324	1
USB --Turkish (models CTO 14G 13G)	41A5325	1
USB --Turkish (models CTO 14G 13G)	41A5326	1
USB --UK English (models CTO 14G 13G)	41A5327	1
USB --US Euro (models CTO 14G 13G)	41A5328	1
USB --Slovenian (models CTO 14G 13G)	41A5329	1

4217 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
US English (models CTO)	41R0038	1
Arabic (models CTO)	41R0039	1
Arabic/French (models CTO)	41R0040	1
Belgium French (models CTO)	41R0041	1
Belgium English (models CTO)	41R0042	1
Brazilian Portuguese (models CTO)	41R0043	1
Bulgarian (models CTO)	41R0044	1
Chinese/US (models CTO)	41R0045	1
Czech (ABB) (models CTO)	41R0046	1
Danish (models CTO)	41R0047	1
Dutch (models CTO)	41R0048	1
French (models CTO)	41R0049	1
French Canadian (models CTO)	41R0050	1
French Canadian (models CTO)	41R0051	1
German (models CTO)	41R0052	1
Greek (models CTO)	41R0053	1
Greek/US (models CTO)	41R0054	1
Hebrew (models CTO)	41R0055	1
Hungarian (models CTO)	41R0056	1
Iceland (models CTO)	41R0057	1
Italy (models CTO)	41R0058	1
Japanese (models CTO)	41R0059	1
Korean (models CTO)	41R0060	1
LA Spanish (models CTO)	41R0061	1
Norwegian (models CTO)	41R0062	1
Polish (models CTO)	41R0063	1
Portuguese (models CTO)	41R0064	1
Romanian (models CTO)	41R0065	1
Romanian (models CTO)	41R0066	1
Russian/Cyrillic (models CTO)	41R0067	1
Serbian/Cyrillic (models CTO)	41R0068	1
Slovak (models CTO)	41R0069	1
Spanish (models CTO)	41R0070	1

4217 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Swedish/Finnish (models CTO)	41R0071	1
Swiss French/German (models CTO)	41R0072	1
Thailand (models CTO)	41R0073	1
Turkish (models CTO)	41R0074	1
Turkish (models CTO)	41R0075	1
UK English (models CTO)	41R0076	1
US Euro (models CTO)	41R0077	1
Slovenian (models CTO)	41R0078	1

4217 Mice	FRU#	CRU
Optical Wheel Mouse (400 DPI), USB - red wheel (Primary) (models CTO 11J 12J 14G 13G 15J 16J 17J 18J 19J 21J 22J)	41U3013	1
Optical Wheel Mouse (400 DPI), USB - red wheel (Secondary) (models CTO 11J 12J 14G 13G 15J 16J 17J 18J 19J 21J 22J)	41U3030	1
PS/2 Three Button ball mouse scroll point (models CTO)	41U3078	1

4217 Adapters and miscellaneous FRUs	FRU#	CRU
3.5" 20-in-1 Media Card Reader (w/GPIO detect) (models CTO)	45R8139	1
L1 IEEE 1394 PCI Adapter (models CTO 11J 12J)	41D2781	1
Speakers (2-piece) Lenovo Logo(Primary) (models CTO)	41A5331	1
Speakers (2-piece) Lenovo Logo(Secondary) (models CTO)	41A5334	1
Lenovo 3 pieces Speakers (China Only) (models CTO)	45C8640	1
Lenovo 2 pieces Speakers (China Only) (models CTO)	45C8641	1
Speaker Power brick (models CTO)	89P8571	1
256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models CTO)	42Y6329	1
256MB NVIDIA FX380 (DVI + DP) (Hard from 46R2784) (models CTO 13G)	71Y6863	1
512MB NVIDIA FX580 (DVI + DP + DP) (models CTO)	46R2786	1
768MB NVIDIA FX1800 (DVI + DP + DP) (models CTO 15J 16J 17J 18J 19J 21J 22J)	46R2788	1
1.5GB NVIDIA FX4800 (DVI + DP + DP + ST), 2x3 Pwr Conn. (models CTO)	46R2792	1
256MB NVIDIA NVS295 (Dual DP) (models CTO)	46R2782	1
1GB NVIDIA FX3800 (DVI + DP + ST), 2x3 Pwr Conn. (models CTO)	89Y0429	1
4GB NVIDIA FX5800 (DVI + DVI + DP + ST), 2*2X3 Pwr Conn. (models CTO)	46R2794	1
256MB ATI FirePro V3700 (Dual DVI) (models CTO 14G)	53Y8569	1
512MB ATI FirePro V5700 (DP+DP+DVI) (models CTO)	53Y8571	1
1GB ATI FirePro V7700 (DP+DP+DVI) (models CTO)	53Y8573	1
Soft Modem V.90/V.44 (models CTO)	29R9729	1
Dongle Cable (DMS59 to dual DVI) (models CTO)	41X6398	1
Nvidia Tesla C1060 Compute Card (computer adapter) (models CTO)	46R6041	1
SAS Controller Card - 3Gb/s, 4-port Host bus adapter (models CTO)	46R3460	1
SoundBlaster Titanium Audio Card (PCIe) (models CTO)	46T0407	1
Modem Phone Cable (models CTO)	39K5120	1

4217 Adapters and miscellaneous FRUs	FRU#	CRU
DVI to VGA Dongle (models CTO)	45C7816	1
DP to DVI Dongle 200 mm (models)	43N9160	1
512MB NVIDIA Quadro NVS 450 GDDR3 (DP+DP+DP+DP) (models CTO)	64Y9895	1

4217 Power Cords	FRU#	CRU
Power cord - US (models CTO)	41R3184	1
Power cord - US (models CTO)	41R3185	1
Power cord - China (models CTO)	41R3256	1
Power cord - China (models CTO)	41R3257	1
Power cord - Japanese and Japanese English (models CTO 11J 12J 15J 16J 17J)	41R3248	1
Power cord - Japanese and Japanese English (models CTO 11J 12J 15J 16J 17J)	41R3249	1
Power cord - Brazil (Portigese) (models CTO)	41R3270	1
Power cord - Brazil (Portigese) (models CTO)	41R3271	1
Power cord - LA High Volt (APU) (models CTO)	41R3176	1
Power cord - LA High Volt (APU) (models CTO)	41R3177	1
Power cord - ANZ (models CTO)	41R3196	1
Power cord - ANZ (models CTO)	41R3197	1
Power cord - Korea (models CTO)	41R3260	1
Power cord - Korea (models CTO)	41R3261	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hongkong (models CTO 14G 13G)	41R3224	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hongkong (models CTO 14G 13G)	41R3225	1
Power cord - Taiwan (models CTO)	41R3278	1
Power cord - Taiwan (models CTO)	41R3279	1
Power cord - Italy (models CTO 14G 13G)	41R3232	1
Power cord - Italy (models CTO 14G 13G)	41R3233	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models CTO)	41R3208	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models CTO)	41R3209	1
Power cord - Denmark (models CTO 14G 13G)	41R3212	1
Power cord - Denmark (models CTO 14G 13G)	41R3213	1
Power cord - Switzerland (models CTO 14G 13G)	41R3228	1
Power cord - Switzerland (models CTO 14G 13G)	41R3229	1
Power cord - Israel (models CTO 14G 13G)	41R3236	1
Power cord - Israel (models CTO 14G 13G)	41R3237	1
Power cord - South Africa (models CTO 14G 13G)	41R3220	1
Power cord - South Africa (models CTO 14G 13G)	41R3221	1
Power cord - India (models CTO)	41R3341	1
Power cord - India (models CTO)	41R3175	1
Power cord - Japan and Japanese English (models CTO 11J 12J 15J 16J 17J 18J 19J 21J 22J)	43N9057	1

4217 Power Cords	FRU#	CRU
Power cord - Japan and Japanese English (models CTO 11J 12J 15J 16J 17J 18J 19J 21J 22J)	43N9058	1

4217 Windows XP Pro Recovery DVDs	FRU#	CRU
US English/UK/Asia Pacific (models CTO 14G 13G)	03T5024	1
French/French Canadian (models CTO 14G 13G)	03T5025	1
German (models CTO 14G 13G)	03T5026	1
Italy (models CTO 14G 13G)	03T5029	1
Brazil (models CTO)	03T5028	1
Spanish/LA Spanish (models CTO 14G 13G)	03T5027	1
Danish (models CTO 14G 13G)	03T5033	1
Dutch (models CTO 14G 13G)	03T5034	1
Arabic English (models CTO 14G 13G)	03T5039	1
SV (Swedish) (models CTO 14G 13G)	03T5032	1
Hebrew (models CTO 14G 13G)	03T5037	1
Finland (models CTO 14G 13G)	03T5036	1
Norwegian (models CTO 14G 13G)	03T5031	1
Polish (models CTO 14G 13G)	03T5038	1
Portuguese (models CTO 14G 13G)	03T5045	1
Russian (models CTO 14G 13G)	03T5040	1
Russian English (models CTO 14G 13G)	03T5041	1
Hungarian (models CTO 14G 13G)	03T5043	1
Czech (models CTO 14G 13G)	03T5035	1
Turkish (models CTO 14G 13G)	03T5042	1
Greek (models CTO 14G 13G)	03T5044	1
Slovakian (models CTO 14G 13G)	03T5046	1
Japanese (models CTO)	03T5030	1
Simplified Chinese (models CTO)	03T5047	1
Traditional Chinese Taiwan (models CTO)	03T5048	1
Traditional Chinese Hong Kong (models CTO)	03T5049	1
Korean (models CTO)	03T5050	1

4217 Vista Business 32 Recovery DVDs	FRU#	CRU
English (models CTO)	64Y5661	1
Russian English (models CTO)	64Y3672	1
French (models CTO)	64Y3673	1
German (models CTO)	64Y3674	1
Spanish (models CTO)	64Y3675	1
Brazilian (models CTO)	64Y3676	1
Italian (models CTO)	64Y3677	1
Japanese (models CTO 11J 12J)	64Y5662	1
Norwegian (models CTO)	64Y3699	1

4217 Vista Business 32 Recovery DVDs	FRU#	CRU
Swedish (models CTO)	64Y3700	1
Danish (models CTO)	64Y3697	1
Dutch (models CTO)	64Y3691	1
Czech (models CTO)	64Y3678	1
Finnish (models CTO)	64Y3698	1
Polish (models CTO)	64Y3679	1
Russian (models CTO)	64Y3680	1
Turkish (models CTO)	64Y3681	1
Hungarian (models CTO)	64Y3682	1
Greek (models CTO)	64Y3683	1
Simplified Chinese (models CTO)	64Y5663	1
Trad Chinese-TC (models CTO)	64Y3686	1
Trad Chinese-HK (models CTO)	64Y3687	1
Korean (models CTO)	64Y3688	1
Slovenian (models CTO)	64Y3689	1
Romanian (models CTO)	64Y3693	1
Portuguese (models CTO)	64Y3694	1
Sebian-Latin (models CTO)	64Y3695	1
Slovakian (models CTO)	64Y3696	1
Arabic Localized (models CTO)	64Y3690	1
Hebrew (models CTO)	64Y3692	1
MUL DVD P/Ns VB32 C&L1 Nordics (EN DK FI NO SV) (models CTO)	64Y3701	1
MUL DVD P/Ns VB32 C&L 2 Switzerland (EN FR GR IT) (models CTO)	64Y3702	1
MUL DVD P/Ns VB32 C&L 3 Bel Lux (EN FR GR NL) (models CTO)	64Y3703	1
English for India (models CTO)	71Y3620	1

4217 Vista Business 64 Recovery DVDs	FRU#	CRU
English (models CTO)	64Y5664	1
Russian English (models CTO)	64Y3771	1
French (models CTO)	64Y3772	1
German (models CTO)	64Y3773	1
Spanish (models CTO)	64Y3774	1
Brazilian (models CTO)	64Y3775	1
Italian (models CTO)	64Y3776	1
Japanese (models CTO 15J)	64Y5665	1
Norwegian (models CTO)	64Y3796	1
Swedish (models CTO)	64Y3797	1
Danish (models CTO)	64Y3794	1
Dutch (models CTO)	64Y3790	1
Czech (models CTO)	64Y3777	1
Finnish (models CTO)	64Y3795	1

4217 Vista Business 64 Recovery DVDs	FRU#	CRU
Polish (models CTO)	64Y3778	1
Russian (models CTO)	64Y3779	1
Turkish (models CTO)	64Y3780	1
Hungarian (models CTO)	64Y3781	1
Greek (models CTO)	64Y3782	1
Simplified Chinese (models CTO)	64Y5666	1
Trad Chinese (models CTO)	64Y3785	1
Trad Chinese (models CTO)	64Y3786	1
Korean (models CTO)	64Y3787	1
Slovenian (models CTO)	64Y3788	1
Portuguese (models CTO)	64Y3792	1
Slovakian (models CTO)	64Y3793	1
Arabic Localized (models CTO)	64Y3789	1
Hebrew (models CTO)	64Y3791	1
MUL DVD P/Ns VB64 C&L1 Nordics (EN DK FI NO SV) (models CTO)	64Y3798	1
MUL DVD P/Ns VB64 C&L 2 Switzerland (EN FR GR IT) (models CTO)	64Y3799	1
MUL DVD P/Ns VB64 C&L3 Bel Lux (EN FR GR NL) (models CTO)	64Y3800	1

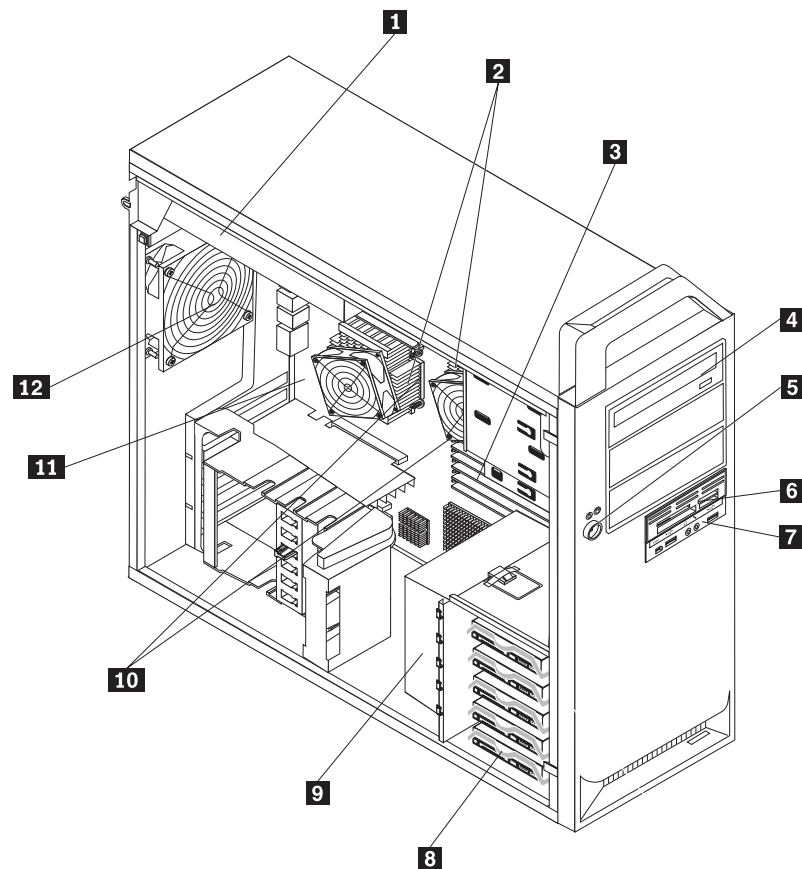
4217 Windows XP 64 Recovery DVDs	FRU#	CRU
English (models CTO)	89Y0802	1
Japanese (models 11J 12J 16J 17J 22J)	71Y9060	1

4217 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models CTO)	03T5020	1
French (models CTO)	03T5006	1
German (models CTO)	03T5008	1
Czech (models CTO)	03T5004	1
Polish (models CTO)	03T5013	1
Turkish (models CTO)	03T5019	1
Greek (models CTO)	03T5007	1
Japanese (models 18J 19J 21J)	03T5011	1
Korean (models CTO)	03T5012	1
Slovenian (models CTO)	03T5017	1
Russian English (models CTO)	03T5014	1
Slovakian (models CTO)	03T5016	1
Hebrew (models CTO)	03T5001	1
Simplified English (models CTO)	03T5002	1
Traditional English (models CTO)	03T5003	1
India English (models CTO)	03T5005	1
Hong Kong (models CTO)	03T5009	1
Italian (models CTO)	03T5010	1

4217 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
Russian (models CTO)	03T5015	1
Spanish (models CTO)	03T5018	1
C&L Bel Lux (EN FR GR NL) (models CTO)	03T5021	1
C&L Nordics (EN DK FI NO SV) (models CTO)	03T5022	1
C&L Switzerland (EN FR GR IT) (models CTO)	03T5023	1

4217 Windows 7 Professional 64 Recovery DVDs	FRU#	CRU
US English (models CTO)	03T5287	1
French (models CTO)	03T5274	1
German (models CTO)	03T5276	1
Czech (models CTO)	03T5272	1
Polish (models CTO)	03T5280	1
Turkish (models CTO)	03T5286	1
Greek (models CTO)	03T5275	1
Korean (models CTO)	03T5279	1
Slovenian (models CTO)	03T5284	1
Russian English (models CTO)	03T5281	1
Arabic Localized (models CTO)	03T5269	1
Slovakian (models CTO)	03T5283	1
Simplified English (models CTO)	03T5270	1
Traditional English (models 18J 19J 21J CTO)	03T5271	1
India English (models CTO)	03T5273	1
Hong Kong (models CTO)	03T5277	1
Italian (models CTO)	03T5278	1
Russian (models CTO)	03T5282	1
Spanish (models CTO)	03T5285	1
C&L Bel Lux (EN FR GR NL) (models CTO)	03T5288	1
C&L Nordics (EN DK FI NO SV) (models CTO)	03T5289	1
C&L Switzerland (EN FR GR IT) (models CTO)	03T5290	1

Machine Type 4218



The FRUs listed in the following tables are not illustrated.

Item #	4218 FRUs	FRU#	CRU Tier
1	Power supply, 1060 Watt Power Supply—2P (models)	41A9761	2
2	Heat sink, Workstation, 130 Watt (models)	41R5580	2
3	Memory module, 1GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models)	46R6026	1
3	Memory module, 2GB DDR3 ECC UDIMM PC3-10600 (1333MHz) (models)	46R6027	1
3	Memory module, 1GB DDR3 1RX8 RDIMM PC3-8500 (1066MHz) (models)	46R6022	1
3	Memory module, 2GB DDR3 2RX8 RDIMM PC3-8500 (1066MHz) (models)	46R6023	1
3	Memory module, 4GB DDR3 2RX4 RDIMM PC3-8500 (1066MHz) (models)	46R6024	1
3	Memory module, 8GB DDR3 4RX4 RDIMM PC3-8500 (1066MHz) (models)	46R6025	1
3	Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models)	53Y6195	1
3	Memory module, 2GB DDR3 ECC UDIMM PC3-8500 (1066MHz) (models)	53Y6197	1
3	Memory module, 4GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) (models)	64Y9570	1
4	Optical drive, DVD-ROM Drive - 16x/48x (SATA) - DOS/Linux (models)	41N3325	1
4	Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) - DOS/Linux (models)	43C1042	1
4	Optical drive, Blu-Ray DVD Burner (SATA) - Vista (models)	53Y7643	1
4	Optical drive, Blu-Ray Disc Burner (SATA) - Vista (models)	53Y3365	1
5	Power switch/LED assembly and the internal speaker (models)	41R5532	2
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-ALPS (models)	40Y9105	1

Item #	4218 FRUs	FRU#	CRU Tier
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-SONY (models)	40Y9107	1
7	Front panel cable, Front Panel Cable Asm (USB, audio, 1394) (models)	41R5657	2
8	Hard disk drive, 250GB SATA - 7200 rpm (models)	46R6029	1
8	Hard disk drive, 500GB SATA - 7200 rpm (models)	46R6030	1
8	Hard disk drive, 750GB SATA - 7200 rpm (models)	43C3671	1
8	Hard disk drive, 1TB SATA - 7200 rpm (models)	46R6031	1
8	Hard disk drive, 74GB SATA - 10000 rpm (models)	46R6032	2
8	Hard disk drive, 150GB SATA - 10000 rpm (models)	46R6400	2
8	Hard disk drive, 300GB SATA - 10000 rpm (models)	46R6401	2
8	Hard disk drive, 147GB SAS - 15000 rpm (models)	46R6033	1
8	Hard disk drive, 300GB SAS - 15000 rpm (models)	43C6969	1
9	Hard disk drive fan, Front 120 mm (HDD/PCI) with grommets (models)	45J9606	1
10	Microprocessor, Intel Xeon W3520 - 2.66GHz, Quad Core - 4.8 QPI, 4MB L2, DDR3-1066, Turbo, SMT, 130W (models)	46R6405	N
10	Microprocessor, Intel Xeon W3540 - 2.93GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 130W (models)	46R6406	N
10	Microprocessor, Intel Xeon W3570 - 3.20GHz, Quad Core- 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models)	46R6407	N
10	Microprocessor, Intel Xeon E5502 - 1.86GHz, Dual Core 4.8 QPI, 4MB L2, DDR3-800, 80W (models)	46R6630	N
10	Microprocessor, Intel Xeon E5504 - 2.00GHz, Quad Core- 4.8QPI, 4MB L2, DDR3-800, 80W (models)	46R6631	N
10	Microprocessor, Intel Xeon E5506 - 2.13GHz, Quad Core - 4.8QPI, 4MB L2, DDR3-800, 80W (models)	46R6632	N
10	Microprocessor, Intel Xeon E5520 - 2.26GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models)	46R6633	N
10	Microprocessor, Intel Xeon E5530 - 2.40GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models)	46R6634	N
10	Microprocessor, Intel Xeon E5540 - 2.53GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W (models)	46R6635	N
10	Microprocessor, Intel Xeon X5550 - 2.66GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models)	46R6638	N
10	Microprocessor, Intel Xeon X5560 - 2.80GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models)	46R6639	N
10	Microprocessor, Intel Xeon X5570 - 2.93GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W (models)	46R6640	N
10	Microprocessor, Intel Xeon W5580 - 3.20GHz, Quad Core 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W (models)	46R6641	N
10	Microprocessor, Intel Xeon W3503 - Dual Core - 2.4Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models)	63Y9159	N
10	Microprocessor, Intel Xeon W3505 - Dual Core - 2.53Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W (models)	63Y9161	N
10	Microprocessor, Intel Xeon W3550 - Quad Core - 3.06GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, SMT, 130W (models)	64Y9827	N
10	Microprocessor, Intel Xeon W3580 - Quad Core -3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 1333, Turbo, SMT, 130W (models)	64Y9829	N

Item #	4218 FRUs	FRU#	CRU Tier
10	Microprocessor, Intel Xeon W5590 - Quad Core - 3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 - 1333, Turbo, HT, 130W (models)	64Y9831	N
11	System board, 2P Intel LGA 1366 (models)	71Y7060	N
11	System board, 2P Intel LGA 1366, Tylersburg 36D, ICH10 (Russia Only) (models)	64Y9121	N
11	System board, 2P Intel LGA 1366 (models)	71Y7059	N
11	System board, 2P Intel LGA 1366 (models)	71Y7061	N
12	Rear system fan, 120 mm system exhaust (models)	45J9605	2

The FRUs listed in the following tables are not illustrated.

4218 FRUs	FRU#	CRU Tier
Second Serial Port Cable (models)	41R5544	2
FDD Cable (models)	41N8294	2
SATA Cable (ODD) (models)	41R5517	2
FDD Cable Asm (models)	41N8294	2
Handle with screws (models)	41R5526	1
Cable Asm, SATA (models)	41R5481	2
Miscellaneous Parts Kit (models)	41R5630	2
Cable Asm, Cover Detect Switch (models)	41R5534	2
Thermal Sense Cable (models)	41R2511	2
Motherboard Screw Kit (models)	41R5547	2
Cable Asm, HDD SAS (models)	41R5513	2
Rail Kit, Remy with filler (models)	41R5597	2
Filler Plate (models)	41R5636	1
Cover Asm (access panel), Remy, Flex (models)	41R5654	1
Label Kit (models)	41R5656	1
Mechanical Shell Kit, Remy (models)	41R5658	N
MB_Shield, IBIZA, Remy(models)	45K2256	2
Asm, Fan, 120 mm system exhaust (models)	45J9605	2
Asm, Fan, Front 120 mm (HDD/PCI) with grommets (models)	45J9606	2
Asm, Fan, Memory Cooling (models)	45J9607	2
Memory Chiller Asm, Remy (models)	41R5655	2
Bezel Kit, Remy (models)	45K2268	2
Cable, Signal, SLI bridge (models CTO)	63Y9163	2
SATA Cable (2.5" HDD) (models)	43N9013	2

4218 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --US English (models)	41A5289	1
USB --Arabic (models)	41A5290	1
USB --Arabic/French (models)	41A5291	1
USB --Belgian/French (models)	41A5292	1

4218 Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
USB --Belgium English (models)	41A5293	1
USB --Brazilian Portuguese (models)	41A5294	1
USB --Bulgarian (models)	41A5295	1
USB -- Hong Kong/Taiwan (models)	41A5296	1
USB --Czech (ABB) (models)	41A5297	1
USB --Danish (models)	41A5298	1
USB --Dutch (models)	41A5299	1
USB --French (models)	41A5300	1
USB --French Canadian (models)	41A5301	1
USB --French Canadian (models)	41A5302	1
USB --German (models)	41A5303	1
USB --Greek (models)	41A5304	1
USB --Greek/US (models)	41A5305	1
USB --Hebrew (models)	41A5306	1
USB --Hungarian (models)	41A5307	1
USB --Iceland (models)	41A5308	1
USB --Italy (models)	41A5309	1
USB --Japanese (models)	41A5310	1
USB --Korean (models)	41A5311	1
USB --LA Spanish (models)	41A5312	1
USB --Norwegian (models)	41A5313	1
USB --Polish (models)	41A5314	1
USB --Portugese (models)	41A5315	1
USB --Romanian (models)	41A5316	1
USB --Romanian (models)	41A5317	1
USB --Russian/Cyrillic (models)	41A5318	1
USB --Serbian/Cyrillic (models)	41A5319	1
USB --Slovak (models)	41A5320	1
USB --Spanish (models)	41A5321	1
USB --Swedish/Finnish (models)	41A5322	1
USB --Swiss F/G (models)	41A5323	1
USB --Thailand (models)	41A5324	1
USB --Turkish (models)	41A5325	1
USB --Turkish (models)	41A5326	1
USB --UK English (models)	41A5327	1
USB --US Euro (models)	41A5328	1
USB --Slovenian (models)	41A5329	1

4218 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
US English (models)	41R0038	1
Arabic (models)	41R0039	1

4218 Fingerprint Keyboards (Lenovo Preferred Pro USB)	FRU#	CRU Tier
Arabic/French (models)	41R0040	1
Belgium French (models)	41R0041	1
Belgium English (models)	41R0042	1
Brazilian Portuguese (models)	41R0043	1
Bulgarian (models)	41R0044	1
Chinese/US (models)	41R0045	1
Czech (ABB) (models)	41R0046	1
Danish (models)	41R0047	1
Dutch (models)	41R0048	1
French (models18G)	41R0049	1
French Canadian (models)	41R0050	1
French Canadian (models)	41R0051	1
German (models)	41R0052	1
Greek (models)	41R0053	1
Greek/US (models)	41R0054	1
Hebrew (models)	41R0055	1
Hungarian (models)	41R0056	1
Iceland (models)	41R0057	1
Italy (models)	41R0058	1
Japanese (models)	41R0059	1
Korean (models)	41R0060	1
LA Spanish (models)	41R0061	1
Norwegian (models)	41R0062	1
Polish (models)	41R0063	1
Portuguese (models)	41R0064	1
Romanian (models)	41R0065	1
Romanian (models)	41R0066	1
Russian/Cyrillic (models)	41R0067	1
Serbian/Cyrillic (models)	41R0068	1
Slovak (models)	41R0069	1
Spanish (models)	41R0070	1
Swedish/Finnish (models)	41R0071	1
Swiss French/German (models)	41R0072	1
Thailand (models)	41R0073	1
Turkish (models)	41R0074	1
Turkish (models)	41R0075	1
UK English (models)	41R0076	1
US Euro (models)	41R0077	1
Slovenian (models)	41R0078	1

4218 Mice	FRU#	CRU
Optical Mouse (400 DPI), USB - red wheel (Primary) (models)	41U3013	1
Optical Mouse (400 DPI), USB - red wheel (Secondary) (models)	41U3030	1
3 Button Laser Mouse (1600 DPI), USB (models)	41U3078	1

4218 Adapters and miscellaneous FRUs	FRU#	CRU
3.5" 20-in-1 Media Card Reader (w/GPIO detect) (models CTO)	45R8139	1
L1 IEEE 1394 PCI Adapter (models)	41D2781	1
Speakers (2-piece) Lenovo Logo(Primary) (models)	41A5331	1
Speakers (2-piece) Lenovo Logo(Secondary) (models)	41A5334	1
Lenovo 3 pieces Speakers (China Only) (models)	45C8640	1
Lenovo 2 pieces Speakers (China Only) (models)	45C8641	1
Speaker Power brick (models)	89P8571	1
256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models)	42Y6329	1
256MB NVIDIA FX380 (DVI + DP) (Hard from 46R2784) (models)	71Y6863	1
512MB NVIDIA FX580 (DVI + DP + DP) (models)	46R2786	1
768MB NVIDIA FX1800 (DVI + DP + DP) (models)	46R2788	1
1.5GB NVIDIA FX4800 (DVI + DP + DP + ST), 2x3 Pwr Conn. (models CTO)	46R2792	1
256MB NVIDIA NVS295 (Dual DP) (models)	46R2782	1
1GB NVIDIA FX3800 (DVI + DP + ST), 2x3 Pwr Conn. (models)	46R2790	1
4GB NVIDIA FX5800 (DVI + DVI + DP + ST), 2*2X3 Pwr Conn. (models CTO)	46R2794	1
256MB ATI FirePro V3700 (Dual DVI) (models)	53Y8569	1
512MB ATI FirePro V5700 (DP+DP+DVI) (models)	53Y8571	1
1GB ATI FirePro V7700 (DP+DP+DVI) (models)	53Y8573	1
Soft Modem V.90/V.44 (modelsCTO)	29R9729	1
Dongle Cable (DMS59 to dual DVI) (models)	41X6398	1
Nvidia Tesla C1060 Compute Card (computer adapter) — 2P (models)	46R6041	1
SAS Controller Card - 3Gb/s, 4-port Host Bus Adapter —1P (models)	46R3460	1
SoundBlaster Titanium Audio Card (PCIe) (modelsCTO)	46T0407	1
Modem Phone Cable (models)	39K5120	1
DVI to VGA Dongle (models)	45C7816	1

4218 Power Cords	FRU#	CRU
Power cord - US (models)	41R3184	1
Power cord - US (models)	41R3185	1
Power cord - China (models)	41R3256	1
Power cord - China (models)	41R3257	1
Power cord - Japanese and Japanese English (models)	41R3248	1
Power cord - Japanese and Japanese English (models)	41R3249	1
Power cord - Brazil (Portigese) (models)	41R3270	1
Power cord - Brazil (Portigese) (models)	41R3271	1
Power cord - LA High Volt (APU) (models)	41R3176	1

4218 Power Cords	FRU#	CRU
Power cord - LA High Volt (APU) (models)	41R3177	1
Power cord - ANZ (models)	41R3196	1
Power cord - ANZ (models)	41R3197	1
Power cord - Korea (models)	41R3260	1
Power cord - Korea (models)	41R3261	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hongkong (models)	41R3224	1
Power cord - UK, Ireland, Singapore, Malaysia, Brunei, Hongkong (models)	41R3225	1
Power cord - Taiwan (models)	41R3278	1
Power cord - Taiwan (models)	41R3279	1
Power cord - Italy (models)	41R3232	1
Power cord - Italy (models)	41R3233	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models)	41R3208	1
Power cord - Indonesia, Laos, Cambodia, Vietnam, Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden (models)	41R3209	1
Power cord - Denmark (models)	41R3212	1
Power cord - Denmark (models)	41R3213	1
Power cord - Switzerland (models)	41R3228	1
Power cord - Switzerland (models)	41R3229	1
Power cord - Israel (models)	41R3236	1
Power cord - Israel (models)	41R3237	1
Power cord - South Africa (models)	41R3220	1
Power cord - South Africa (models)	41R3221	1
Power cord - India (models)	41R3341	1
Power cord - India (models)	41R3175	1
Power cord - Japan and Japanese English (models)	43N9057	1
Power cord - Japan and Japanese English (models)	43N9058	1
Power cord - US (for use on 2P systems only) (models)	45J9502	1
Power cord - Taiwan (for use on 2P systems only) (models)	45J9503	1

4218 Windows XP Pro Recovery DVDs	FRU#	CRU
US English/UK/Asia Pacific (models)	64Y5658	1
French/French Canadian (models)	64Y3591	1
German (models)	64Y3592	1
Italy (models)	64Y3595	1
Brazil (models)	64Y3594	1
Spanish/LA Spanish (models)	64Y3593	1
Danish (models)	64Y3599	1
Dutch (models)	64Y3600	1
Arabic English (models)	64Y3605	1

4218 Windows XP Pro Recovery DVDs	FRU#	CRU
SV (Swedish) (models)	64Y3598	1
Hebrew (models)	64Y3603	1
Finland (models)	64Y3602	1
Norwegian (models)	64Y3597	1
Polish (models)	64Y3604	1
Portuguese (models)	64Y3611	1
Russian (models)	64Y3606	1
Russian English (models)	64Y3607	1
Hungarian (models)	64Y3609	1
Czech (models)	64Y3601	1
Turkish (models)	64Y3608	1
Greek (models)	64Y3610	1
Slovakian (models)	64Y3612	1
Japanese (models)	64Y5659	1
Simplified Chinese (models)	64Y5660	1
Traditional Chinese Taiwan (models)	64Y3614	1
Traditional Chinese Hong Kong (models)	64Y3615	1
Korean (models)	64Y3616	1

4218 Vista Business 32 Recovery DVDs	FRU#	CRU
English (models)	64Y5661	1
Russian English (models)	64Y3672	1
French (models)	64Y3673	1
German (models)	64Y3674	1
Spanish (models)	64Y3675	1
Brazilian (models)	64Y3676	1
Italian (models)	64Y3677	1
Japanese (models)	64Y5662	1
Norwegian (models)	64Y3699	1
Swedish (models)	64Y3700	1
Danish (models)	64Y3697	1
Dutch (models)	64Y3691	1
Czech (models)	64Y3678	1
Finnish (models)	64Y3698	1
Polish (models)	64Y3679	1
Russian (models)	64Y3680	1
Turkish (models)	64Y3681	1
Hungarian (models)	64Y3682	1
Greek (models)	64Y3683	1
Simplified Chinese (models)	64Y5663	1
Trad Chinese-TC (models)	64Y3686	1

4218 Vista Business 32 Recovery DVDs	FRU#	CRU
Trad Chinese-HK (models)	64Y3687	1
Korean (models)	64Y3688	1
Slovenian (models)	64Y3689	1
Romanian (models)	64Y3693	1
Portuguese (models)	64Y3694	1
Sebian-Latin (models)	64Y3695	1
Slovakian (models)	64Y3696	1
Arabic Localized (models)	64Y3690	1
Hebrew (models)	64Y3692	1
MUL DVD P/Ns VB32 C&L1 Nordics (EN DK FI NO SV) (models)	64Y3701	1
MUL DVD P/Ns VB32 C&L 2 Switzerland (EN FR GR IT) (models)	64Y3702	1
MUL DVD P/Ns VB32 C&L 3 Bel Lux (EN FR GR NL) (models)	64Y3703	1

4218 Vista Business 64 Recovery DVDs	FRU#	CRU
English (models)	64Y5664	1
Russian English (models)	64Y3771	1
French (models)	64Y3772	1
German (models)	64Y3773	1
Spanish (models)	64Y3774	1
Brazilian (models)	64Y3775	1
Italian (models)	64Y3776	1
Japanese (models)	64Y5665	1
Norwegian (models)	64Y3796	1
Swedish (models)	64Y3797	1
Danish (models)	64Y3794	1
Dutch (models)	64Y3790	1
Czech (models)	64Y3777	1
Finnish (models)	64Y3795	1
Polish (models)	64Y3778	1
Russian (models)	64Y3779	1
Turkish (models)	64Y3780	1
Hungarian (models)	64Y3781	1
Greek (models)	64Y3782	1
Simplified Chinese (models)	64Y5662	1
Trad Chinese (models)	64Y3785	1
Trad Chinese (models)	64Y3786	1
Korean (models)	64Y3787	1
Slovenian (models)	64Y3788	1
Portuguese (models)	64Y3792	1
Slovakian (models)	64Y3793	1
Arabic Localized (models)	64Y3789	1

4218 Vista Business 64 Recovery DVDs	FRU#	CRU
Hebrew (models)	64Y3791	1
MUL DVD P/Ns VB64 C&L1 Nordics (EN DK FI NO SV) (models)	64Y3798	1
MUL DVD P/Ns VB64 C&L 2 Switzerland (EN FR GR IT) (models)	64Y3799	1
MUL DVD P/Ns VB64 C&L3 Bel Lux (EN FR GR NL) (models)	64Y3800	1

4218 Windows XP 64 Recovery DVDs	FRU#	CRU
English (models)	64Y6595	1
Japanese (models)	64Y6596	1

Chapter 13. Additional Service Information

This chapter provides additional information that the service representative might find helpful.

Security features

Security features in this section include the following:

- Passwords
- Vital Product Data
- Management Information Format (MIF)

Hardware controlled Passwords

Hardware controlled passwords are set using the Setup Utility program. For more information about passwords, see “Using passwords” on page 51.

Operating system password

An operating system password is very similar to a power-on password and denies access to the computer by an unauthorized user when the password is activated. The computer is unusable until the password is entered and recognized by the computer.

Vital product data

Each computer has a unique Vital Product Data (VPD) code stored in the nonvolatile memory on the system board. After you replace the system board, the VPD must be updated. To update the VPD, see “Flash update procedures.”

BIOS levels

An incorrect level of BIOS can cause false errors and unnecessary FRU replacement. Use the following information to determine the current level of BIOS installed in the computer, the latest BIOS available for the computer, and where to obtain the latest level of BIOS.

- To determine the current Level of BIOS:
 - Start the Setup Utility.
 - Select Standard CMOS Features.
- Sources for obtaining the latest level BIOS available
 1. Lenovo support web site:
<http://www.lenovo.com/support/>
 2. Lenovo Customer Support Center
 3. Levels 1 and 2 Support

To update (flash) the BIOS, see “Flash update procedures.”

Flash update procedures

This section details how to flash (update) the BIOS.

Updating (flashing) BIOS from a disc

This section provides instructions on how to update (flash) BIOS from a disc.

System program updates are available at:

<http://www.lenovo.com/support> on the World Wide Web.

1. Make sure the optical drive you want to use is set as the first boot device in the startup device sequence.
2. Make sure the computer is turned on. Insert the disc into the optical drive.
3. Turn off the computer and back on again. The update begins.
4. When prompted to change the serial number, press N.

Note: If you want to change the serial number, press Y when prompted. Type in the serial number and then press Enter.

5. When prompted to change the machine type/model, press N.

Note: If you want to change the machine type/model, press Y when prompted. Type in the machine type/model and then press Enter.

6. Follow the instructions on the screen to complete the update.

Updating (flashing) BIOS from the operating system

Note: Because Lenovo makes constant improvements to the Web site, the Web page contents are subject to change without notice, including the contents referenced in the following procedure.

To update (flash) BIOS from your operating system:

1. Go to <http://www.lenovo.com/support>.
2. Do the following to locate the downloadable files for your machine type:
 - a. In the **Enter a product number** field, type your machine type and click Go.
 - b. Click **Downloads and drivers**.
 - c. Select **BIOS** in the **Refine results** field to easily locate all the BIOS related links.
 - d. Click the BIOS update link.
 - e. Click the TXT file that contains the instructions for updating (flashing) BIOS from your operating system.
3. Print these instructions. This is very important because they are not on the screen after the download begins.
4. Follow the printed instructions to download, extract, and install the update.

Recovering from a POST/BIOS update failure

If power to your computer is interrupted while POST/BIOS is being updated (flash update), your computer might not restart correctly. If this happens, perform the following procedure commonly called Boot-block Recovery.

1. Turn off the computer and any attached devices, such as printers, monitors, and external drives.
2. Unplug all power cords from electrical outlets, and open the computer cover. See "Removing the cover" on page 96.
3. Access the system board.
4. Locate the Clear CMOS/Recovery jumper on the system board. See "Locating parts on the system board" on page 137.

5. Remove any cables that impede access to the Clear CMOS/Recovery jumper.
6. Move the jumper from the standard position (pins 1 and 2) to pins 2 and 3.
7. Reinstall the adapter cards (some models).
8. Close the computer cover and reconnect any cables that were disconnected.
9. Reconnect the power cords for the computer and monitor to electrical outlets.
10. Insert the POST/BIOS update (flash) diskette into drive A, and turn on the computer and the monitor.
11. The recovery session will take two to three minutes. During this time you will hear a series of beeps. After the update session is completed, there will be no video, the series of beeps will end, and the system will automatically turn off. Remove the diskette from the diskette drive.
12. Repeat steps 2 through 5.
13. Replace the Clear CMOS/Recovery jumper to its original position.
14. Reinstall the adapter cards (some models) if removed.
15. Close the computer cover and reconnect any cables that were disconnected.
16. Turn on the computer to restart the operating system.

Power management

Power management reduces the power consumption of certain components of the computer such as the system power supply, processor, hard disk drives, and some monitors.

Automatic configuration and power interface (ACPI) BIOS

Being an ACPI BIOS system, the operating system is allowed to control the power management features of the computer and the setting for Advanced Power Management (APM) BIOS mode is ignored. Not all operating systems support ACPI BIOS mode.

Automatic Power-On features

The Automatic Power-On features within the Power Management menu allow you to enable and disable features that turn on the computer automatically.

- **Serial Port A Ring Detect:** With this feature set to **Enabled** and an external modem connected to serial port (COM1), the computer will turn on automatically when a ring is detected on the modem.
- **PCI Modem Ring Detect:** With this feature set to **Enabled**, the computer will turn on automatically when a ring is detected on the internal modem.
- **PCI Wake Up:** This feature allows PCI cards that support this capability to wake the system.
- **Wake Up on Alarm:** You can specify a date and time at which the computer will be turned on automatically. This can be either a single event or a daily event.
- **Wake on LAN:** If the computer has a properly configured token-ring or Ethernet LAN adapter card that is Wake on LAN-enabled and there is remote network management software, you can use the Wake on LAN feature. When you set Wake on LAN to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN).

Appendix A. Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service.

Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*Lenovo (United States), Inc.
1009 Think Place - Building One
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing*

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary.

Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk.

Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may

vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Television output notice

The following notice applies to models that have the factory-installed television-output feature.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Trademarks

The following terms are trademarks of Lenovo in the United States, other countries, or both:

- Lenovo
- The Lenovo logo
- ThinkStation
- PS/2
- Rescue and Recovery

Wake on LAN is a trademarks of International Business Machines Corporation in the United States, other countries, or both.

Intel and Pentium are trademarks of Intel Corporation in the United States, other countries, or both.

Microsoft, Windows, and Windows Vista are trademarks of the Microsoft group of companies.

Other company, product, or service names may be trademarks or service marks of others.

Appendix B. System memory speed

The Intel Xeon microprocessor families compatible with this ThinkStation computer feature an integrated memory controller, which provides the microprocessor with direct access to the system memory. Because of this design, the system memory speed will be determined by a number of factors, including the microprocessor model and the type, speed, size (capacity), and number of DIMMs installed. Refer to the following table for the information on the supported system memory speed for your own computer model.

Table 1. System memory speed

DIMM Type and Speed		PC3-10600U		PC3-8500U
DIMM Size (Capacity)		1 GB, 2 GB, 4GB		1 GB, 2 GB, 4GB
Number of DIMMs Installed		1 to 3	4 to 6	1 to 6
Microprocessor Model	Intel Xeon E5502	800 MHz	800 MHz	800 MHz
	Intel Xeon E5503	800 MHz	800 MHz	800 MHz
	Intel Xeon E5504	800 MHz	800 MHz	800 MHz
	Intel Xeon E5506	800 MHz	800 MHz	800 MHz
	Intel Xeon E5507	800 MHz	800 MHz	800 MHz
	Intel Xeon E5520	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5530	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5540	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5620	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5630	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5640	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon X5550	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon X5560	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon X5570	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon X5650	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5660	1333 MHz	1333 MHz	1066 MHz

Table 1. System memory speed (continued)

	Intel Xeon X5667	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5670	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5677	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5680	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon W3503	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3505	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3520	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3530	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3540	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3550	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3565	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3570	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon W3580	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon W3680	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon W5580	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon W5590	1333 MHz	1066 MHz	1066 MHz



Part Number: 53Y4348

Printed in USA

(1P) P/N: 53Y4348

