Hardware options 2013

Matt Edwards
matt.edwards@rm.com

Agenda

Introduction
Hardware in the modern world
Traditional computing
What’s new?
Caring for the old
Summary

Introduction
Hardware options 2013

Why a session on hardware options?

Hardware options 2013

Hardware in the modern world
Hardware in the modern world

The basics of all computing

The basics of all computing
Traditional computing

Desktop computers
Local servers
Mobile computers

Traditional requirements in education
What's new in the world of traditional computing?

What's new in the world of... Desktops

80 PLUS power supplies
80 PLUS power supplies

Introduced in 2004

Energy efficiency rating for desktop PSU's

How is efficiency measured?

30% of power lost as heat
80 PLUS certifications

<table>
<thead>
<tr>
<th></th>
<th>20% load</th>
<th>50% load</th>
<th>100% load</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 PLUS</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>80 PLUS Bronze</td>
<td>82%</td>
<td>85%</td>
<td>82%</td>
</tr>
<tr>
<td>80 PLUS Silver</td>
<td>85%</td>
<td>88%</td>
<td>85%</td>
</tr>
<tr>
<td>80 PLUS Gold</td>
<td>87%</td>
<td>90%</td>
<td>87%</td>
</tr>
<tr>
<td>80 PLUS Platinum</td>
<td>90%</td>
<td>92%</td>
<td>89%</td>
</tr>
</tbody>
</table>

80 PLUS certifications

<table>
<thead>
<tr>
<th>PSU that meets minimum ATX efficiency requirements</th>
<th>DC Output</th>
<th>AC Input</th>
<th>Efficiency</th>
<th>Watts Lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical low cost PSU</td>
<td>210W</td>
<td>410W</td>
<td>60%</td>
<td>160V</td>
</tr>
<tr>
<td>80 PLUS PSU</td>
<td>250W</td>
<td>512W</td>
<td>80%</td>
<td>82.5W</td>
</tr>
<tr>
<td>80 PLUS Bronze PSU</td>
<td>250W</td>
<td>512W</td>
<td>80%</td>
<td>82.5W</td>
</tr>
<tr>
<td>80 PLUS Silver PSU</td>
<td>250W</td>
<td>512W</td>
<td>80%</td>
<td>82.5W</td>
</tr>
<tr>
<td>80 PLUS Gold PSU</td>
<td>250W</td>
<td>512W</td>
<td>80%</td>
<td>82.5W</td>
</tr>
<tr>
<td>80 PLUS Platinum</td>
<td>250W</td>
<td>512W</td>
<td>80%</td>
<td>82.5W</td>
</tr>
</tbody>
</table>

80 PLUS summary

Look for the sweet spot--Cost/NoEfficiency
RM offers 80 Plus Silver PSU's for the Ecoquest range.
Solid State

What is Solid State?

Why do I want Solid State?

- Lower power usage
- Performance
- Reliability
SSD boot times

<table>
<thead>
<tr>
<th>System</th>
<th>Boot Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 PC w/100 GB HDD</td>
<td>38.4</td>
</tr>
<tr>
<td>2009 PC w/250 GB Samsung 470 SSD</td>
<td>16.5</td>
</tr>
<tr>
<td>2006 PC w/400 GB HDD</td>
<td>26.3</td>
</tr>
<tr>
<td>2006 PC w/250 GB Samsung 470 SSD</td>
<td>17.3</td>
</tr>
<tr>
<td>2009 PC w/1TB HDD</td>
<td>18.9</td>
</tr>
<tr>
<td>2009 PC w/100GB HDD</td>
<td>19.5</td>
</tr>
<tr>
<td>2010 PC w/250 GB Samsung 470 SSD</td>
<td>16.0</td>
</tr>
</tbody>
</table>

Solid State considerations

- 3.5 inch / 2.5 inch drives
- Capacity
- Life span
- Catastrophic failure
- Cost
Solid State summary

Great where performance more important than storage size
3.5 inch / 2.5 inch drives
Reliability
Performance
Cost— but this will reduce

What's new in the world of Desktop products

RM Profile
What's new in the world of... Servers

Intel S2600CP

Server mainboard—Intel S2600CP

CPU support—2 CPU’s supporting up to 4 cores each (8 cores total)

Memory support—Currently up to 128GB RAM (increasing to 256GB with improved thermals in 2013). Across 16 memory slots.

Storage—RAID storage

Network—4 Ethernet ports

Intel S2600CP – Remote Management Module
Intel S2600CP - RMM

Intel Remote Management Module

- View, control, manage servers remotely
- Share media devices
- Remote power actions
- System health monitoring
- Dedicated management access
- Hardware level

Intel Remote Management Module summary

- Remote management access to your servers via a dedicated management port
- Remote console access to servers in the BIOS and operating system
- Connect devices from your local computer for remote use on the server
- Processor temperature monitoring on every sensor in the server
- Remote access to all system information including BIOS version, detailed motherboard/CPU/memory specifications

What's new in the world of mobile computers
What's new in the world of notebooks

More RAM, faster CPU, port connectivity, storage

Products over technology

Requirements and usage

---

What's new in the world of notebooks

Will the laptops be carried around school by the students?
Do applications need to be installed on the laptop?
Are the laptops going to be used on the internet alone?
Will the laptops be used for whole lessons in some cases?
What type of applications/computing are the laptops being used for?
Do the laptops need to work for longer periods of time disconnected from the mains?

---

What's new in the world of notebook products

---
Summarising the new

- The future of traditional computing
- Intel Remote Management Module
- 80 PLUS and solid state
- RM Profile
- Microsoft Assessment Toolkit

Caring for the old

Extending computer life
Extending computer life

- Replace filters
- Replace oil
- Replace brake pads/disk
- Replace tyres
- Check electrics

Ouch!

Environment and computer life
Temperature

Between 10°C (50°F) to 28°C (82°F)
Multiple components at risk
Fan limitations
Damage can be permanent

Air quality

Free access to intake and exhaust fans
Filters and ionizers
A very common cause of failures
Cleaning

The most common cause of failures
The most common fix for ‘faulty’ computers
Think of your car service
Setup regular checks: once a term/year?
Compressed air/air dusters

- Always turn off and unplug a computer from the mains
- Take computers outside
- Spray compressed air onto intake and exhaust fans, heatsinks, motherboard, hard drives, optical drives or any other internal electrical devices
- Clean out laptops and mobile devices

Cleaning

Prevention better than a cure!

Mobile battery care
Mobile battery care

- The battery used to last a lot longer than it used to
- Laptops are rubbish
- Batteries are rubbish
- Lithium-ion technology

---

Lithium ion

- Positive electrode
- Negative electrode
- Charge
- Discharge
- LiCoO2
- Specialty Carbon

---

Advantages of Lithium ion

- Wide variety of shapes and sizes efficiently fitting the devices they power
- Much lighter than other energy-equivalent secondary batteries
- No memory effect
Disadvantages of Lithium ion

Expected life period of cells
20% per year?
Limited number of charge cycles

Lithium ion charging advice

Storing batteries: 40-60%
Total discharge: 20%-80%
Longer charges cause more heat
Temperature and airflow
Lithium ion does not forget its limits
Full charge/discharge every 3 months

Hardware maintenance summary

Computer servicing
Computer environment
Air quality and access
Cleaning
Battery care for mobile devices
Session summary
Traditional computing still plays an important role.
New computers offer efficiency and performance.
Mobile devices should be selected based on requirement alone.
Computer servicing is a must.
Cleaning practices:
Mobile battery care: get the most out of your mobile batteries.

Hardware options 2013
Matt Edwards
matt.edwards@rm.com