# MARK SCHEME for the May/June 2013 series

## 0417 INFORMATION AND COMMUNICATION TECHNOLOGY

**0417/22**       Paper 2 (Practical Test A), maximum raw mark 80

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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Name, candidate number, Centre number

Full file path and candidates file name

Header: Candidate details          1 mark
Filename and path                 1 mark

# Building a *Crazy but Cool* Computer

Spelling correct, 26 point serif font          1 mark
Text italicised, centre aligned                1 mark

Spelling correct, 18 point serif font          1 mark
Underscored, right aligned                     1 mark

## Choosing your storage by: name

This is the third of our articles on building your "Crazy but Cool" computer. It may only _____ ____ _____ articles we explored choosing a mo_____ ____ _____ in speed gaming machine. Then we looked at cases and power supplies. This week we consider storage devices.

Page layout     changes here

You will like the SATA connections as each drive has its own cable and your motherboard will have plenty of connectors. No need any more for those ribbon connectors and daisy chaining your devices! There is another choice you will have to make. SATA2 is being replaced by SATA3 – twice as fast data transfer! So, will you look for a SATA3 drive as your _____ ___ his?

Spellings corrected          1 mark

### Get lots of storage

You have already, perha___ ____ good size hard disk, b__ __on examining it you see that its connection is a parallel ATA system and your new motherboard only supports serial ATA connections. You "only" had a 500gb drive and now you think that as this was getting pretty full you will need at least a tera____te of storage. If you are seriously gaming or streaming video you may ____ __en this gets full soon. This may seem incredible, but whenever we ____ ___led what seems to be an excessively huge amo_____ ____ _____ ome applications that will ____ _____

### Use an SSD for the OS

For your main storage you will prob___ use a mechanical hard drive which writes data to a series of "_____" and has a moving read/write head. There is nothing wrong ____ _____ devices, but for speed you might be thinking ____ _____ ____ have no moving parts, so are more robust in moving environments such as laptops or tablets. They are also very fast as they use flash memory. The disadvantage of them is that they are much more expensive than mechanical hard disk drives.

Subheads body text plus 14 pt and centred          1 mark

One choice you mi___ _____ ___ operating system a___ ____ your data storage. ____ ____ much quicker and ____

Appropriate image found          1 mark
Placed here and aligned to top of text and
aligned to left margin          1 mark
with text wrapped               1 mark
Resized to half column width
with aspect ratio maintained          1 mark

Body text:
2 columns                                          1 mark
with 1 cm spacing                                  1 mark
12 point sans-serif font                           1 mark
Single line spacing, left aligned                  1 mark
Applied to all paragraphs with
consistent one line spacing between                1 mark

Name, candidate number, Centre number                                                      Full file path and candidates file name

So, why not go all out for solid state storage? One reason is that even in this fantasy world of building a crazy but cool machine there are limits to finance and two 512gb SSD drives will probably cost more than the rest of the project together. Another reason is that currently SSDs are said to slow down rapidly when they have made a lot of writes to the disk. Controllers are being developed to "level" the wear and they are now said to be better at keeping to their original incredible speed. Hence the plan to use a small SSD for the operating system and programs, and a mechanical hard disk drive for data storage.
Here are examples of the cheapest storage devices per GB in our list.

the loss of data on both disks. You will need to make sure you have regular backups of your data.

RAID1 configuration mirrors the data on two discs. This gives the security of automatic backup as all data is recorded on both discs and if one disc fails, the other can take over.

For speed and security, RAID10 combines both striped and mirrored data using four disks. This now sounds a bit excessive for our gaming machine, but you might consider a pair of SSDs in RAID0 for your operating system.

| Drives you might consider | | | | |
|---|---|---|---|---|
| Type of drive | Model | Capacity | Price | Price_Per_GB |
| HDD | Samsung Spinpoint | 2000 | €129.99 | €0.06 |
| SSD | Corsair Force | 120 | €122.98 | €1.02 |

You will find other combinations of hard disk and solid state technology. Some disk drives include a solid state cache to improve hard disk drive

Here is a RAID configuration. You might combine disks for speed or security or both. In RAID0, the data is written across two disks as though they were one. This is called "striping". This gives extra speed writing to disk, but has the disadvantage that the

Two correct records identified                    2 marks
Text inserted into table and style matches body text
                                                          1 mark
Top row cells merged and centred                  1 mark
Second row only underlined                         1 mark
Outside lines only thick                           1 mark

Footer:
Date                                               1 mark
Automated page number                             1 mark

Name, candidate number, Centre number                                                    Full file path and candidates file name

Here are some fast solid state disk drives that you might consider for the
system:

| Model | Type | Gb_s | Capacity | Price |
|---|---|---|---|---|
| Samsung 830 | SSD | 6.0 | 128 | €164.98 |
| OCZ Agility | SSD | 6.0 | 120 | €129.99 |
| Corsair Force | SSD | 6.0 | 120 | €122.98 |
| OCZ Vertex | SSD | 6.0 | 120 | €144.98 |
| Kingston HyperX | SSD | 6.0 | 120 | €149.98 |
| Samsung 830 | SSD | 6.0 | 64 | €89.99 |
| OCZ Vertex | SSD | 6.0 | 60 | €83.99 |

Happy building! Next week we wi          options for a graphic card.

| DB extract: | Placed here | 1 mark |
|---|---|---|
| | SSD <=128 | 1 mark |
| | 5 specified fields: | |
| | All visible within margins | 1 mark |
| | Sorted descending on capacity | 1 mark |

| Document layout: | | |
|---|---|---|
| Page size A4, orientation landscape | | 1 mark |
| Margins: | top, bottom 2 cms | 1 mark |
| | left 2.5, right 1 cm | 1 mark |
| No widows, orphans, split lists, blank pages | | 1 mark |
| Document complete, paras intact | | 1 mark |

01/08/2013

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# Internal SATA storage devices

Report title     1 mark

| Type | Code | Model | Connection | RPM | Interface | Gb_s | Capacity | Size | Price | Stock_item | Price_per_GB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HDD | 973001 | Seagate Barracuda | Internal | 7200 | SATA | 6.0 | 500 | 3.5 | €79.99 | Yes | €0.16 |
| HDD | 973002 | Hitachi Deskstar | Internal | 7200 | SATA | 3.0 | 1000 | 3.5 | €89.98 | Yes | €0.09 |
| HDD | 973003 | Samsung Spinpoint | | | SATA | 3.0 | 1000 | 2.5 | €99.99 | Yes | €0.10 |
| HDD | 973004 | Samsung Spinpoint | | | SATA | 3.0 | 2000 | 3.5 | €129.99 | Yes | €0.06 |
| HDD | 973006 | Samsung Spinpoint | Internal | 7200 | SATA | 3.0 | 1000 | 3.5 | €99.99 | Yes | €0.10 |
| HDD | 973007 | Samsung Spinpoint | Internal | 5400 | SATA | 3.0 | 250 | 2.5 | €54.99 | Yes | €0.22 |
| HDD | 973008 | Samsung Spinpoint | Internal | | SATA | 3.0 | 160 | 2.5 | €49.99 | Yes | €0.31 |
| HDD | 973009 | Hitachi DeskS... | | 7200 | SATA | 6.0 | 200 | | | | 0.08 |
| HDD | 973010 | Hitachi TravelStar | Internal | 5400 | SATA | 3.0 | 500 | 2.5 | €69.99 | Yes | 0.14 |
| HDD | 973063 | Hitachi UltraStar | Internal | 10000 | SATA | 6.0 | 850 | 3.5 | €459.99 | Yes | €0.54 |
| SSD | 973022 | Kingston HyperX | Internal | N/A | SATA | 6.0 | 120 | 2.5 | €149.98 | Yes | €1.25 |
| SSD | 973023 | OCZ Vertex | Internal | N/A | SATA | 6.0 | 120 | 2.5 | €144.98 | Yes | €1.21 |
| SSD | 973024 | Corsair Force | Internal | N/A | SATA | 6.0 | 120 | 2.5 | €122.98 | Yes | €1.02 |
| SSD | 973025 | OCZ Agility | Internal | N/A | SATA | 6.0 | 120 | 2.5 | €129.99 | Yes | €1.08 |
| SSD | 973026 | Samsung 830 | Internal | | | | 128 | 2.5 | €164.98 | Yes | €1.29 |
| SSD | 973027 | Samsung 830 | Internal | | | | 64 | 2.5 | €89.99 | Yes | €1.41 |
| SSD | 973028 | OCZ Vertex | Internal | | | | 60 | 2.5 | €83.99 | Yes | €1.40 |
| SSD | 973029 | Samsung 830 | Internal | N/A | SATA | 6.0 | 256 | 2.5 | €319.99 | Yes | €1.25 |
| SSD | 973030 | Kingston SSDNow | Internal | N/A | SATA | 6. | | | | | 1.42 |
| SSD | 973031 | OCZ Octane | Internal | N/A | SATA | 6. | | | | | 1.31 |
| SSD | 973032 | Crucial m4 | Internal | N/A | SATA | 6. | | | | | 1.27 |

Sort Type ascending and Code ascending     1 mark

Record added  1 mark

Price_per_GB calculated          2 marks

Select Connection is Internal     1 mark
Interface is SATA                     1 mark
Stock_item is Yes                     1 mark

Required data and labels all visible     1 mark
Landscape                                   1 mark
One page wide                               1 mark

| Type | Code | Model | Connection | RPM | Interface | Gb_s | Capacity | Size | Price | Stock_item | Price_per_GB |
|------|------|-------|-----------|-----|-----------|------|----------|------|-------|-----------|-------------|
| SSD | 973033 | Samsung 830 | Internal | N/A | SATA | 6.0 | 512 | 2.5 | €629.98 | Yes | €1.23 |
| SSD | 973037 | OCZ Agility | Internal | N/A | SATA | 6.0 | 480 | 2.5 | €559.99 | Yes | €1.17 |
| SSD | 973038 | Crucial m4 | Internal | N/A | SATA | 6.0 | 512 | 2.5 | €559.99 | Yes | €1.09 |
| SSD | 973040 | Intel 320 | Internal | N/A | SATA | 6.0 | 300 | 2.5 | €392.98 | Yes | €1.31 |
| SSD | 973041 | Kingston HyperX | Internal | N/A | SATA | 6.0 | 240 | 2.5 | €384.99 | Yes | €1.60 |
| SSD | 973062 | Samsung 830 | Internal | N/A | SATA | 6.0 | 256 | 2.5 | €389.99 | Yes | €1.52 |
| SSD | 973064 | Intel 320 | Internal | N/A | SATA | 6.0 | 512 | 2.5 | €639.99 | Yes | €1.25 |

Name, candidate number, centre number    Average price per GB for all drives    €0.89

Record added  1 mark

Record added    1 mark

Label correct   1 mark

Candidate details on left        1 mark

Calculated average price        1 mark

Currency fields all euro and 2dp    1 mark

Title    1 mark

Candidate details at top    1 mark

## Some of the fastest SSD drives

| Model | Connection | Type | Interface | Gb_s | Capacity | Price | Stock_item |
|-------|-----------|------|-----------|------|----------|-------|-----------|
| Kingston SSDNow | Internal | SSD | SATA | 6.0 | 480 | €679.96 | Yes |
| OCZ Octane | Internal | SSD | SATA | 6.0 | 512 | €669.99 | Yes |
| Crucial m4 | Internal | SSD | SATA | 6.0 | 512 | €649.99 | Yes |
| Intel 320 | Internal | SSD | SATA | 6.0 | 512 | €639.99 | Yes |
| Samsung 830 | Internal | SSD | SATA | 6.0 | 512 | €629.98 | Yes |
| Crucial m4 | Internal | SSD | SATA | 6.0 | 512 | €559.99 | Yes |
| OCZ Agility | Internal | SSD | SATA | 6.0 | 480 | €559.99 | Yes |
| Intel 320 | Internal | SSD | SATA | 6.0 | 300 | €392.98 | Yes |
| Samsung 830 | Internal | SSD | SATA | 6.0 | 256 | €389.99 | Yes |
| Kingston HyperX | Internal | SSD | SATA | 6.0 | 240 | €384.99 | Yes |
| Samsung 830 | Internal | SSD | SATA | 6.0 | 256 | €319.99 | Yes |
| Samsung 830 | Internal | SSD | SATA | 6.0 | 128 | €164.98 | Yes |
| Kingston HyperX | Internal | SSD | SATA | 6.0 | 120 | €149.98 | Yes |
| OCZ Vertex | Internal | SSD | SATA | 6.0 | 120 | €144.98 | Yes |
| OCZ Agility | Internal | SSD | SATA | 6.0 | 120 | €129.99 | Yes |
| Corsair Force | Internal | SSD | SATA | 6.0 | 120 | €122.98 | Yes |
| Samsung 830 | Internal | SSD | SATA | 6.0 | 64 | €89.99 | Yes |
| OCZ Vertex | Internal | SSD | SATA | 6.0 | 60 | €83.99 | Yes |

Eight fields only    1 mark

List is refined    1 mark
SSD and 6 Gb_s    1 mark
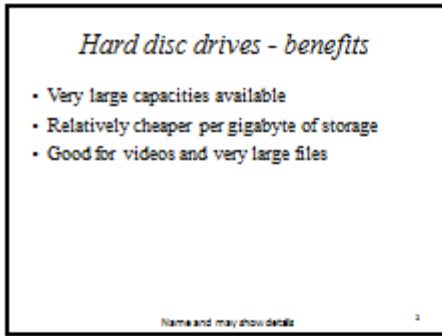
Sort Price descending    1 mark

Portrait    1 mark
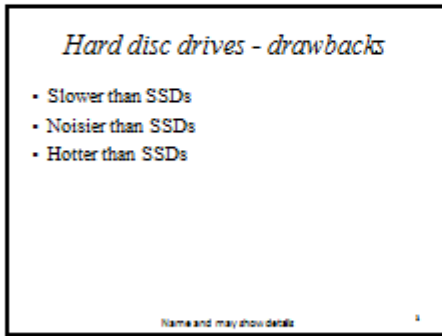All data and labels visible    1 mark

Presentation evidence

13/05/2013

### Storage Devices

Hard disc drives
Solid state drives

Name and may show details
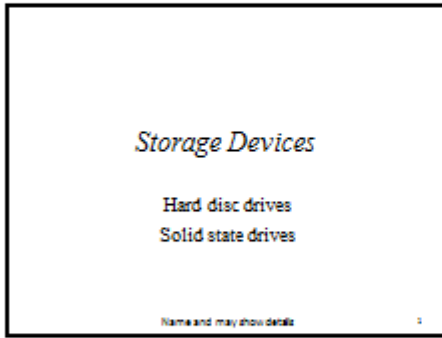
First slide layout changed to
title and subtitle                1 mark

### Hard disc drives - benefits

- Very large capacities available
- Relatively cheaper per gigabyte of storage
- Good for videos and very large files

Name and may show details

Slides created from source file
as headings and bulleted text        1 mark
Name and slide number on all slides   1 mark
Blank slide(s) deleted                1 mark

### Hard disc drives - drawbacks

- Slower than SSDs
- Noisier than SSDs
- Hotter than SSDs

Name and may show details

1

13/05/2013

Solid state drives - benefits

· Very fast operating system start up
· Very fast read and write speeds
· Silent in operation
· Cool running
· No moving parts, so resistant to shocks

Name and may show details

Bullet point added to slide     1 mark

Solid state drives - drawbacks

· Very large capacities not available
· More expensive per gigabyte than HDDs

Name and may show details

Handout **layout** 3 slides per page     1 mark

2

EVIDENCE DOCUMENT

Contacts added to address book

**Jane Jones**

Contact     Work

Display Name: Jane Jones     Editor
Email: J.Jones@cie.org.uk

**Rajinder Ghee**

Contact     Work

Display Name: Rajinder Ghee     Print Manager
Email: R.Ghee@cie.org.uk

Three contacts added to address book   1 mark
(Names addresses and job titles all correct)

**Alice Nie**

Contact     Work

Display Name: Alice Nie     Manager
Email: A.Nie@cie.org.uk

Evidence of group defined in address book

**Mailing List**

List Name:    Editorial team
List Nickname:
Description:

Type email addresses to add them to the mailing list:

- Jane Jones <J.Jones@cie.org.uk>
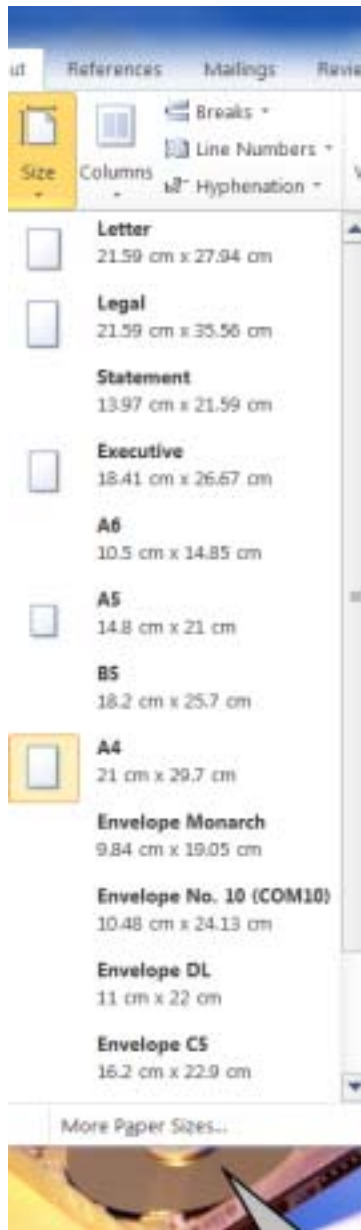- Alice Nie <A.Nie@cie.org.uk>
- Rajinder Ghee <R.Ghee@cie.org.uk>

Group formed and named
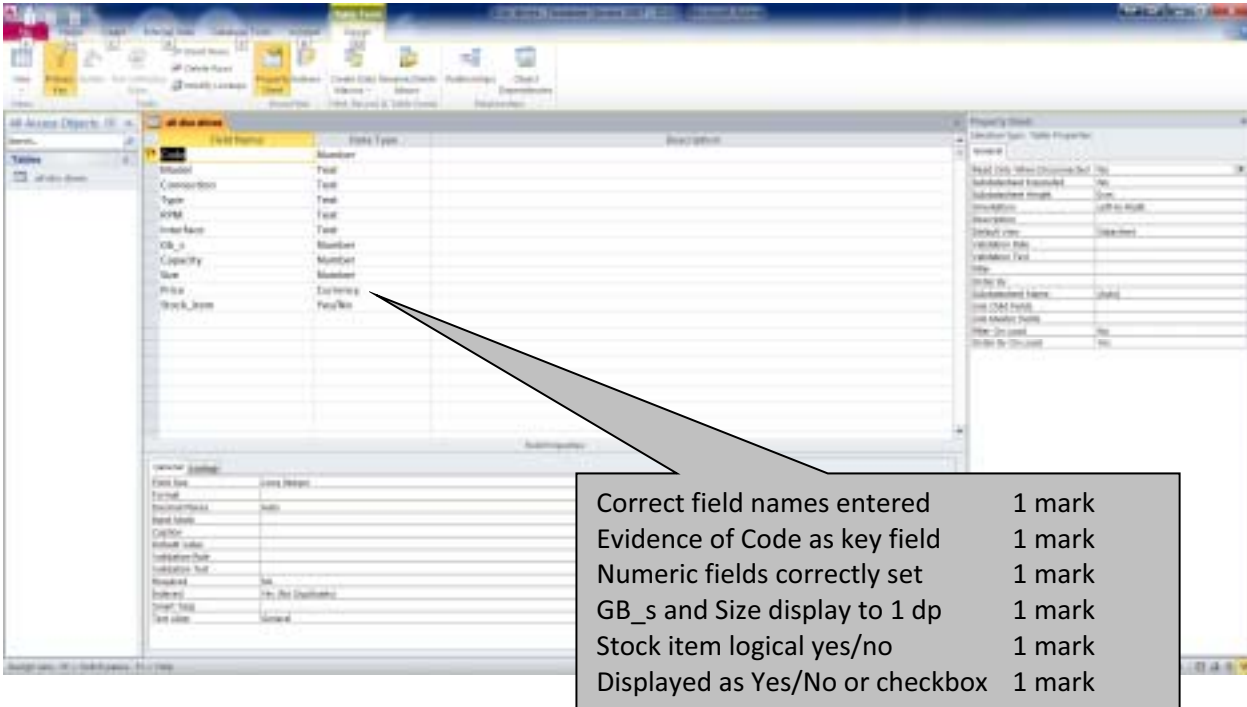with correct contacts      1 mark

OK     Cancel

01/08/

Evidence of page formats
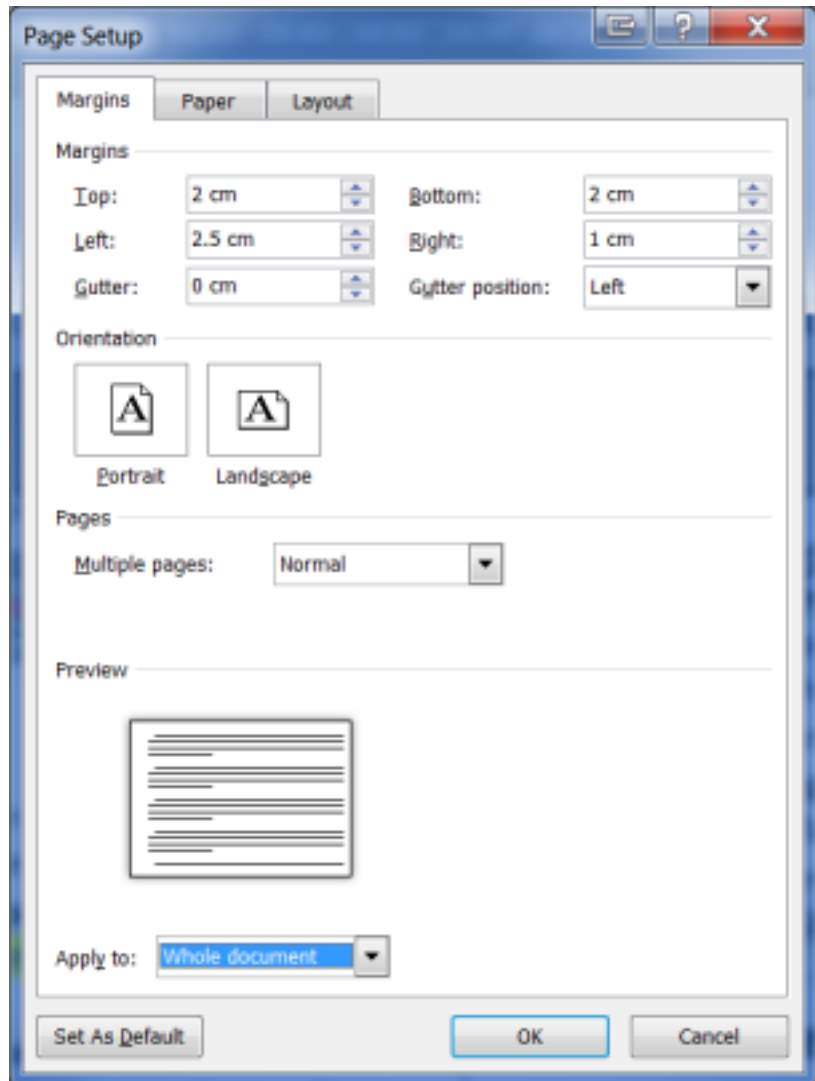


Page size set as A4 landscape
Margins all set as specified

Database structure



Correct field names entered        1 mark
Evidence of Code as key field        1 mark
Numeric fields correctly set        1 mark
GB_s and Size display to 1 dp        1 mark
Stock item logical yes/no        1 mark
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Evidence of transitions



Evidence of Transitions        1 mark

Evidence of animation of bullets



Evidence of Animations        1 mark

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Evidence of email



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| Subject **Draft for storage article** | 1 mark |
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| Name | |
| Centre number | |
| candidate number | |
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