THE FOLLOWING PRESENTATION HAS BEEN APPROVED FOR ALL AUDIENCES
BY ME

www.filmratings.com    www.mpaa.org
DISCLAIMER

HOW TO ILLUSTRATE SUCH AN ABSTRACT CONCEPT AS DATA STORAGE AND TRANSFER?

WE NEED TO USE METAPHORS AND PICTURING.

WE APOLOGIZE FOR THE INCONVENIENCE.
HUGE DATA SET STORAGE AND TRANSFER
1 - THE PROBLEMATIC.
(END-USER SIDE)
USUAL IMAGING WORKFLOW
(THE THEORY)
USUAL IMAGING WORKFLOW
(THE FACTS)

1- Nice data, I will store them...eh...somewhere.

2- Oh no no, I need to analyse this first!

3- Now where to put all those movies? Ah yes on my USB key! Or maybe a DVD?

4- What’s this? Nevermind, let’s leave it on the server.

5- Damn referee, where did I put all these data?

6- Bah, let’s acquire some more...
USUAL IMAGING WORKFLOW

EFFICIENCY?
USUAL IMAGING WORKFLOW

10-100 Mb

Everything’s OK
USUAL IMAGING WORKFLOW

100 Mb - 1 Gb

USB, CD and DVD SLOW

Mobile HD and Ethernet quite OK
USUAL IMAGING WORKFLOW

> 1 Gb

USB, CD and DVD: Forget it

Mobile HD and Ethernet SLOW
## MEDIA CAPACITY, COST AND TIME CONSUMPTION COMPARISON

<table>
<thead>
<tr>
<th>Type of Media</th>
<th>Capacity</th>
<th>Price (CHF/Gb)</th>
<th>Time to write (minutes/Gb)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD-ROM</td>
<td>640-700 Mb</td>
<td>SFr. 0.25</td>
<td>7</td>
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<tr>
<td>HD-DVD</td>
<td>15-90 Gb (planned)</td>
<td>SFr. 1.00</td>
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<tr>
<td>DVD-ROM</td>
<td>4.7-9 Gb</td>
<td>SFr. 0.50</td>
<td>3</td>
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<tr>
<td>BD-ROM (Blue-Ray)</td>
<td>25-50 Gb</td>
<td>SFr. 1.00</td>
<td>3</td>
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<tr>
<td><strong>Flash Drives</strong></td>
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<tr>
<td>Flash Memory Card</td>
<td>8 Gb</td>
<td>SFr. 22.50</td>
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<tr>
<td>USB 2.0 Flash Key</td>
<td>16 Gb</td>
<td>SFr. 15.00</td>
<td>1.25</td>
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<tr>
<td><strong>Hard Drives</strong></td>
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<tr>
<td>PATA</td>
<td>500 Gb</td>
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<tr>
<td>SATA</td>
<td>750 Gb</td>
<td>SFr. 0.50</td>
<td>0.25</td>
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<tr>
<td>SATA II</td>
<td>1 Tb</td>
<td>SFr. 0.50</td>
<td>0.24</td>
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<tr>
<td>SAS</td>
<td>150 Gb</td>
<td>SFr. 7.00</td>
<td>0.24</td>
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<tr>
<td>SCSI</td>
<td>150 Gb</td>
<td>SFr. 3.00</td>
<td>0.18</td>
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## INTERFACE TRANSFER RATE COMPARISON

<table>
<thead>
<tr>
<th>Interface (Mobile devices)</th>
<th>Transfer rate MB/s (theoretical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluetooth</td>
<td>0.13</td>
</tr>
<tr>
<td>USB 1.0</td>
<td>1.50</td>
</tr>
<tr>
<td>Wifi G</td>
<td>6.75</td>
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<tr>
<td>Ethernet 100</td>
<td>12.50</td>
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<tr>
<td>Fire Wire 400</td>
<td>50.00</td>
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<tr>
<td>USB 2.0</td>
<td>60.00</td>
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<tr>
<td>Fire Wire 800</td>
<td>100.00</td>
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<tr>
<td>Ethernet Gigabit</td>
<td>125.00</td>
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<tr>
<td>e-SATA</td>
<td>300.00</td>
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</tbody>
</table>

Wireless prohibited
IF WE SUM THIS UP, WHAT YOU NEED IS A MOBILE HARD DRIVE

BUT BEFORE...
2 - A FEW QUESTIONS YOU NEED TO ASK YOURSELF.
USUAL IMAGING WORKFLOW

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2- Oh no no, I need to analyse this first!

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4- What's this? Nevermind, let's leave it on the server.

5- Damn referee, where did I put all these data?

6- Bah, let's acquire some more...
Nice data, I will store them somehow.

Oh no no, I need to analyse this first!

Now where to put all those movies?

Ah yes on my USB Key!

Or maybe a DVD?

What’s this? Nevermind, let’s leave it on the server.

Bah, let’s acquire these data?

USUAL IMAGING WORKFLOW

Data too dispersed

Too many files

Data too heavy

Too many files
What kind of data do I want to backup?

How many files have I to store?

Speed of the storage device
What kind of data do I want to backup?

Overall size of the data?

Space on the storage device
What kind of data do I want to backup?

Keep track of daily changes, evolution of data?

Backup Frequency
Backup Type
Types of Backup

**Full Backup**: an archive comprised of all files on a system, usually including system state, registry data, and other information necessary to restore a system completely.

**Selective Backup**: an archive composed of only some files on a computer, for example all Word and Excel files.

**Differential Backup**: an archive comprised of all files that have changed since the last full backup.

**Incremental Backup**: an archive comprised of all files that were modified since the last backup was made, whether it was a full or incremental backup.
How do I want to access my data?

- Direct access
- Archive reconstruction

How long do I want/need to keep my data?

- Archive retention time

Time needed to recover the data

Direct access or Archive reconstruction?
What about data safety?

- Protection against natural disasters (fire, flood, …) ?
- Protection against theft ?
- Protection against media aging ?

Choose the right place for the storage device
What about data safety?

Protection against hacking?

Need to crypt the data?

Consider the opportunity of redundant backup

Backup bug tracking?
Synthetic view

- Local HD
- Local HD + Compression
- Removable storage
- Network storage
- Tape backup
3 - SOME EXAMPLE DEVICES FOR THE END-USER.
Western Digital Passport II 250 Go 5400 RPM 2 Mo (USB 2.0) SFr. 280.-

Light weighted USB Port USB Powered Cheap

Low capacity Relatively slow
EXEMPLE END-USER HARDWARE

Seagate Externe 300 Go 7200 RPM 16 Mo (eSATA)  
SF. 280.-

Fast  
Cheap

Medium capacity  
Heavy  
eSATA rare
LaCie d2 Quadra Hard Drive 1 To
(USB 2.0, FireWire 400, FireWire 800 and eSATA)
SFr. 850.-

Capacity !
Connectivity !
Speed !

Weights a ton
Expensive
IN THE FUTURE…

Already available, but wait! Because…

Prices will decrease
Capacity will increase
We still don’t know which one will win (remember Betamax?)…
…but hybrid burners are on the way ;}
4 - THE PROBLEMATIC.
(FACILITY SIDE)
WHAT WE WOULD NEED:

This looks quite simple…
(Closed environment like in a private firm)

We have this (but only 1 To)

This is nice to increase safely the storage capacity

This is mandatory for long term storage

YOU ARE HERE
...BUT THIS IS WHAT WE HAVE...
...which is much more complicated because of:

**HETEROGENEOUS ENVIRONMENT**

You need a cross platform backup and storage system
...which is much more complicated because of:

HETEROGENEOUS FILE TYPES

You need a software capable of handling these files
…which is much more complicated because of:

HETEROGENEOUS NETWORKS

You need a secure but still accessible network
5 – FINAL WORDS.
THE DATA STORAGE AND TRANSFER PROBLEMATIC HAS TO BE SOLVED BY FINDING THE RIGHT BALANCE BETWEEN:

- The **time** you can spend doing backups
- The **duration** of the storage
- The total **space** occupied by your data
- The **money** you want to invest
- The **security** level you want
Thank you for your attention !