



Sign in with your CERN account

Username or Email Address:

Password:

Reminder: you have agreed to comply with the CERN computing rules

Remember Username or Email Address

Sign in using your current Windows/Kerberos credentials [autologon] 

Sign in using your Certificate [autologon] 

Sign into CERN: CERN IT Services for You!

Sebastian Łopieński
CERN Deputy Computer Security Officer
(slides by Stefan Lueders)



Academic Freedom

Sebastian.Lopienski@cern.ch — “Sign into CERN: CERN IT Services for You!”

Welcome to CERN!!!

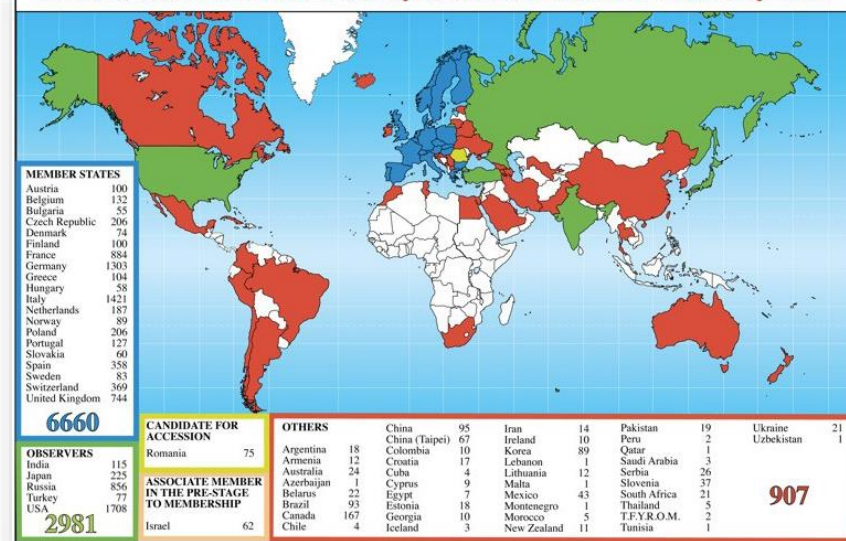
You are now +1 user at CERN:

- ▶ ...from 100s of universities worldwide
- ▶ Pupils, students, post-docs, professors, technicians, engineers, physicists, ...
- ▶ High turn-over (~12k per year)

Academic Freedom in Research:

- ▶ Open campus attitude (**consider CERN as an ISP**):
No boundaries if possible: **free communication & freedom to publish**
- ▶ **Cacophony of O/S**, programming languages, applications
- ▶ Merger of professional & private life incl. mobile revolution
- ▶ The trial of the new & all-time prototypes

Distribution of All CERN Users by Nation of Institute on 9 January 2012



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Welcome to CERN!!!

You are now +1 user at CERN:

- ▶ ...from 100s of universities worldwide
- ▶ Pupils, students, post-docs, professors, technicians, engineers, physicists, ...
- ▶ High turn-over (~10k per year)

“Academic Freedom” means “Responsibility”:
Computer Security at CERN is delegated to YOU
as user, developer, administrator, expert, ...!



- ▶ “Academic Freedom” in research:
No proprietary attitude (consider CERN as an ISP):
as much as possible: free communication & freedom to publish
as user, developer, administrator, expert, ...!
- ▶ Safety of O/S, programming languages, applications
- ▶ Merge of professional & private life incl. mobile revolution

Academic Freedom vs. Security

Sebastian.Lopienski@cern.ch — “Sign into CERN: CERN IT Services for You!”

CERN is under permanent attack... even now:

- ▶ ...attackers trying to **brute-force passwords**;
- ▶ ...attackers trying to **break Web applications**;
- ▶ ...attackers trying to **break-in servers** and obtain administrator rights.
- ▶ ...attackers trying to **harvest credentials**.

Security Events happen

- ▶ Web sites & web servers, data-bases, computing nodes, mail accounts, ...
- ▶ The office network is very liberal: free connection policy and lots of visitors. Thus, there are always **devices being infected/compromised**.

Security is as good as the weakest link:

- ▶ Attacker chooses the time, place, method
- ▶ Defender needs to protect against all possible attacks (currently known, and those yet to be discovered)

The screenshot shows a news article on the Telegraph.co.uk website. The article title is "Hackers infiltrate Large Hadron Collider systems and mock IT security" by Roger Highfield, Science Editor. The article is dated 12/09/2008. Below the article, there is a section titled "SICHERHEITSLÜCKE" (Security Breach) with the headline "Hacker knacken Teilchenbeschleuniger LHC" (Hackers crack particle accelerator LHC). Below that, there is a section titled "Le site du Cern piraté" (The CERN website hacked). The source is listed as AP, dated 13/09/2008, with 6 comments.



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Security Events happen

- ▶ Web sites & web servers, data-bases, computing nodes, mail accounts,
- ▶ The office network is very liberal free connection policy and lots of visitors.

Thus, there are always devices being infected or compromised

- ▶ **YOU are responsible for securing your accounts/computers/data/...**
- ▶ **Security is as good as the weakest link:**
- ▶ Attacker chooses the time, place, method
- ▶ Defender needs to protect against all possible attacks (currently known, and those yet to be discovered)



Go central!!!

Sebastian.Lopienski@cern.ch — “Sign into CERN: CERN IT Services for You!”

Take advantage of central CERN IT services:

- ▶ Let them take care of security
- ▶ Don't worry about maintenance
- ▶ Focus on your core work

CERN IT offers many services:

- ▶ Computing infrastructures for office computing, experiments and accelerators
- ▶ Administrative computing
- ▶ Physics data processing
- ▶ Cluster/Grid computing

Note:

Personal usage of CERN computing facilities is tolerated.

The screenshot shows the 'All IT Services' page with a navigation bar (Home, Search, KPIs, Tags, Admin, Documentation) and a date stamp (6 Jun 2011 Mon). The main content is organized into several columns:

- Administrative applications:** EDH, AIS Common Login, AISMEDIA, Warehouse (BAAN), CET, Contracts (CFU), Recruitment (ERT), Foundation application, Human Resources (HR), HRT, PPT system, PPT for LHC, WOS system, XOTHER.
- Windows Services:** Active Directory, Distributed File System, Antivirus / Windows Security, Terminal Services, Printing Service.
- Mail and Web Services:** MMM (Mail Services), Mail gateways, Web.
- Documents and collaborative services:** CDS, Directorate Archive, Aleph, Bulletin, Conversion Server, Indico.
- Services for physics:** CASTOR Service, CASTOR SRM services, Batch service, LXPLUS, LXBUILD, FTS Service, WMS Service.
- Infrastructure services:** CERN Authentication, Kerberos, AFS, Backup, Linux Repository and Installat, CDB, Sindes, Lemon, Remedy, Service Database, Service Level Status, CERNVM Project.
- Worldwide LHC Computing Grid:** CERN-PROD - OPS, Grid Tier-1 sites, VOMS Service, Grid LFC, ATLAS Storage Space, LHCb Storage Space.
- EU-funded projects:** ETICS, OpenAIRE.
- For developers and engineers:** EDMS Service, Savannah, HyperNews, Central CVS Service, CVS Service for LCG, Central SVN Service, SVNWEB, J2EE Public Service, TWiki, Licence Servers, LicMon.
- Databases:** Accelerator databases, AIS databases, EDMS databases, General purpose databases, IT infrastructure databases, CASTOR and SRM databases, DB Virtualization, ALICE databases, ATLAS databases, CMS databases, LHCb databases, WLCG databases, Other experiments databases.
- Networking:** General Network, External Connectivity, LCG Network, Technical Network, Network Services.
- Computer Center:** CCBYNUM.



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- ▶ Don't worry about maintenance
- ▶ Focus on your core work

CERN IT offers many services:

- ▶ Computing infrastructures for office computing, experiments and accelerators
- ▶ Administrative computing
- ▶ Physics data processing
- ▶ Master/and computing

Pass the responsibility to the IT Department.
Use central services!!
Open your mind: Learn to work “securely” 😊

Note:

Personal usage of CERN computing facilities is tolerated.

The image shows a screenshot of the CERN IT Services for You! portal. The page is titled "All IT Services" and lists various services under different categories. A red diagonal banner is overlaid on the screenshot, containing the text: "Pass the responsibility to the IT Department. Use central services!! Open your mind: Learn to work 'securely' 😊". In the top right corner of the screenshot, there is a photo of four students walking outdoors, with the text "THINKSTOCK" visible in the bottom right corner of the photo.

Category	Service	Status
Administration	AIS Common Login	OK
	AISMEDIA	OK
	Warehouse (BAAN)	OK
	CET	OK
	Contracts (CPI)	OK
	Recruitment (MRT)	OK
	Formal Applications	OK
	Human Resources (HR)	OK
	Windows Services	OK
	Printing Service	OK
Mail and Web Services	MMM (Mail Services)	OK
	Mail gateways	OK
	Web	OK
	Indico	OK
Documents and collaborative services	CDS	OK
	Directorate Archive	OK
	Aleph	OK
	Bulletin	OK
Conversion Server	OK	
Infrastructure services	Kerberos	OK
	AFS	OK
	Backup	OK
	Linux Repository and Install	OK
	CDB	OK
	Sindes	OK
	Lemon	OK
	Remedy	OK
	Service Database	OK
	Service Level Status	OK
Worldwide LHC Computing Grid	CERN-PROD - OPS	OK
	Grid Tier-1 sites	OK
	VOMS Service	OK
	Grid LFC	OK
EU-funded projects	ATLAS Storage Space	OK
	LHCb Storage Space	OK
Databases	Accelerator databases	OK
	AIS databases	OK
	EDMS databases	OK
	General purpose databases	OK
	IT infrastructure databases	OK
	CAS/STOR and SRM databases	OK
	DB Virtualization	OK
	ALICE databases	OK
	ATLAS databases	OK
	CMS databases	OK
LHCb databases	OK	
WLCCG databases	OK	
Other experiments databases	OK	
Networking	General Network	OK
	External Connectivity	OK
	LCG Network	OK
	Technical Network	OK
Computer Center	Network Services	OK
	CCBYNUM	OK



Enter CERN: Your Account

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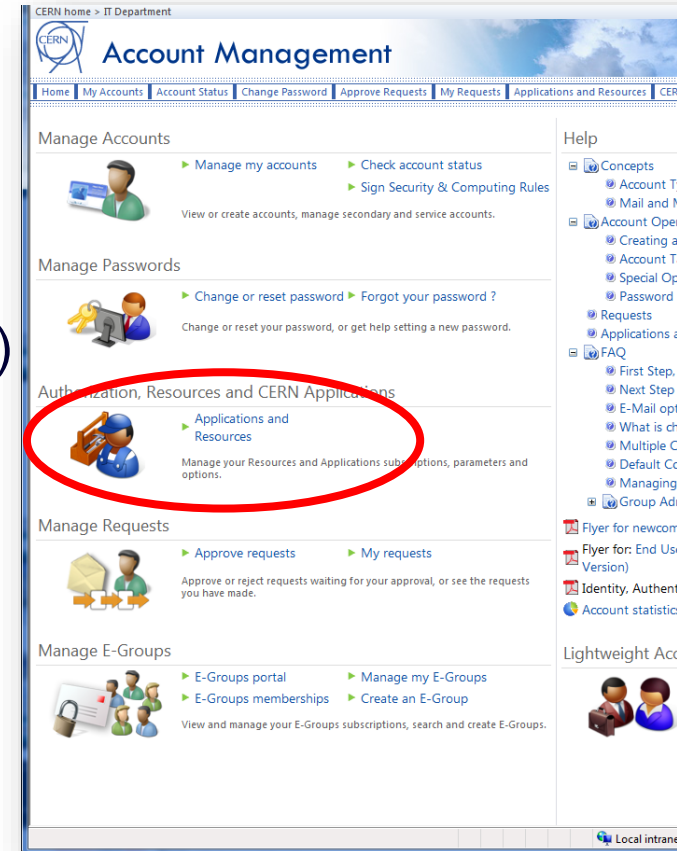
CERN has ~44k active accounts...

+1:

- ▶ You've got now a “primary account”
- ▶ Just go to <http://cern.ch/account>
- ▶ This grants you access to CERN facilities (Check “Applications and Resources” for details)
- ▶ For dedicated purposes, you can obtain a secondary account (“me_admin”) or a service account (“my_cool_service”)

Once you leave again, make sure that

- ▶ All your important emails are backed up
- ▶ All your important documents/data/programs are transferred
- ▶ Service accounts are transferred, too
- ▶ We will delete everything after 6 months



Enter CERN: Your Account

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- ▶ Just go to <http://cern.ch/account>
- ▶ This grants you access to CERN facilities (Check “Applications and Resources”)
- ▶ For dedicated purposes, you can obtain a secondary account (“you admin”) or a service account (“cool service”).

Your password is your toothbrush!
Do NOT share it and change it regularly.
Nobody legitimate will ever ask you for it.
Make it complex: $a^{**2+sqr(b)}==c^2$

- ▶ All your important emails are backed up
- ▶ Save your important documents/data/programs
- ▶ Some accounts are transferred, too
- ▶ We will delete everything after 6 months



First Contact: Your Mail Address

Sebastian.Lopienski@cern.ch — “Sign into CERN: CERN IT Services for You!”

**CERN receives ~2M emails/day.
90% are Spam.**

CERN Mail:

- ▶ Do not run your own SMTP server.
- ▶ Your client is your choice: Outlook, Thunderbird, Pine...
- ▶ ...or forward to an external mailbox
- ▶ Check on <http://cern.ch/mail>

Personal usage is tolerated:

- ▶ ...but this activity must not be illegal, political, commercial, inappropriate, offensive, or detrimental to official duties

The screenshot shows the CERN Mail Services web interface. At the top, it says "CERN home > IT Department" and "Mail Services". Below this is a navigation bar with "Home", "Help", "Services", and "Other". The main content area is divided into several sections:

- Help Contents:** A search box with the text "[Search for help]" and a green arrow button. Below it is a list of help topics: Getting Started, Accessing Your Mailbox, Managing your Mailbox, Fax Services, Instant Messaging, RSS, Phonebook & SMS, and Search.
- MMM Companion book:** A list of links to PDF documents: MMM Book PDF (English version), Outlook 2003 update PDF (English version), MMM Book PDF (French version), and Outlook Hands-on Session.
- Mail Services:** A section with a green icon and the text "Outlook Web Access (Webmail)". Below it are links for E-Groups (Mailing lists), Office Communicator Web Access, Fax Service, and CERN Market.
- Mail Accounts:** A section with an information icon and links for Mailbox Information, Change your password, and Connection parameters.
- CERN Mail Tools:** A section with a folder icon and links for Vacation message (out of office), Mailbox settings (spam, sharing, quot), Email addresses and forwarding, Fax Settings, and Instant messenger.
- Address book:** A section with a folder icon and links for Import your Pine address book to mail, CERN Phonebook (Xwho), and Mail Address book (Ldap).

First Contact: Your Mail Address

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90% are Spam.

CERN Mail:

- ▶ Do not run your own SMTP server
- ▶ Your client is your choice:
Outlook, Thunderbird, Pine,
- ▶ ...or forward to an external mailbox
- ▶ Check on <http://cern.ch/mail>

Beware of Phishing emails!!!!
Nobody legitimate will ever ask for your password. Never!!

Personal use is prohibited:
illegal, political, commercial,
inappropriate, offensive, or
detrimental to official duties

The screenshot shows a webmail interface for CERN. At the top, it says "CERN home > IT Department" and "Mail Service". A red box highlights a phishing email with the following content:

Date: Fri, 5 Sep 2008 15:53:42 -0700
From: Webmail IT Service <sandraward@charterinternet.com>
Reply-To: webITServices@live.com
To: Staff/Student
Subject: Important: Email Account Verification Update

Dear Staff/Student

This message is from the Webmail IT Service messaging center to mail center due to an unusual activities identified in our ems verify your webmail account by confirming your Webmail identity.

In order to confirm you Web-Mail identity, you are to provide

Full Name:
Username/ID:
Password:
Domain Name:
Important


Please provide all these information completely and correctly

The interface also includes a "Help Contents" section with links to "Getting Started", "Accessing Your Mailbox", "Managing your Mailbox", "Fax Services", "Instant Messaging", "RSS, Phonebook & SMS", and "Search". There is also a "MMM Companion book" section with links to PDFs and a session. On the right, there are sections for "Mail Accounts" (Mailbox Information, Change your password, Connection parameters) and "CERN Mail Tools" (Vacation message, Mailbox settings, Email addresses and forwarding, Fax Settings, Instant messenger). At the bottom, there is an "Address book" section with links to import address books and phonebooks.

Central Win/Linux/Mac Support

Sebastian.Lopienski@cern.ch — “Sign into CERN: CERN IT Services for You!”

Windows PCs (~10k active):

- ▶ Use CMF (<http://cern.ch/cmfi>)
or click  “All Programs” “Windows Update”
- ▶ Run up-to-date anti-virus software
- ▶ This applies also to control PCs and oscilloscopes

Linux PCs (>13k active):

- ▶ Use Yum (`/usr/bin/yum`)

Macs (>2k active):

- ▶ Click  “Software Update...”
- ▶ Consider running up-to-date anti-virus software

```
220-<<<<<<>=< Haxed by A|0n3 >=<>>>>>>
220- ,,øñ°°^°°ñø,,,øñ°°^°°ñø,,,øñ°°^°°ñø,,,øñ°°^°°ñø,,
220-/
220|      Welcome to this fine str0
220|      Today is: Thursday 12 January, 2006
220|
220|      Current througput: 0.000 Kb/sec
220|      Space For Rent: 5858.57 Mb
220|
220|      Running: 0 days, 10 hours, 31 min. a
220|      Users Connected : 1 Total : 15
220|
220^°°ñø,,,øñ°°^°°ñø,,,øñ°°^°°ñø,,,øñ°°^°°ñø
```




- ▶ The Win/Mac antivirus software is also free for home usage!!!!
- ▶ There is also community support for Android and iOS:
Check also on [http://cern.ch/\[win|linux|mac|android|ios\]](http://cern.ch/[win|linux|mac|android|ios])

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Macs (>2k active):

- ▶ Click  “Software Update...”
- ▶ Consider running up-to-date anti-virus software

- ▶ The Win/Mac antivirus software is also free for home usage!!!!
- ▶ ...or you risk that you will be disconnected.
- ▶ There is also community support for Android and iOS:
Check also on [http://cern.ch/\[win|linux|mac|android|ios\]](http://cern.ch/[win|linux|mac|android|ios])



Stop-Think-Click

Sebastian.Lopienski@cern.ch — “Sign into CERN: CERN IT Services for You!”

Take care when surfing the web.

- ▶ Not everything is what it seems to be
- ▶ Do not click on random links
- ▶ Do not install software you do not really need or not know



following page as we try to verify your identity.

[Click here to verify your account](#)

http://211.248.156.177/.PayPal/cgi-bin/webscr/cmd_login.php

Please do not reply to this e-mail. Mail sent to this address cannot be answered. For assistance, [log in](#) to your PayPal account and choose the "Help" link in the footer of any page.

To receive email notifications in plain text instead of HTML, update your preferences [here](#).

PayPal Email ID PP697

You should never give your PayPal password to anyone, including PayPal employees.

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- ▶ Do not install software you do not really need or not know



Don't consult pornographic or other illicit material
(e.g. inciting to violence, racism, discrimination).
Respect copyrights!
Do not download or share music or videos.



Publish or Perish

Sebastian.Lopienski@cern.ch — “Sign into CERN: CERN IT Services for You!”

**CERN hosts ~11k web sites
with ~100k web pages on
~500 different web servers**

Set up your own site:

- ▶ “Official”, “Personal” or “Test” sites
- ▶ Program in Python/Perl/PHP/...
- ▶ Use Twiki, Sharepoint, Drupal, J2EE

You are responsible!!!

- ▶ **Avoid common mistakes:**
Sanitize & validate input values
- ▶ **Know what you publish!**
Avoid leaking sensitive documents...

CERN home > IT Department

WEB Services

Home Help Services Site Tools

Our Phone Book Form (xwho service). - Windows Internet Explorer

em.ch/xwho/people?-x<script>alert("This_is_prone_to_cross_site_scripting_(XSS)")</script> Google

samfox site:cern.ch - Google Search - Windows Internet Explorer provided by CERN

http://www.google.com/search?q=samfox+site%3Acern.ch&rls=com.microsoft:*&ie=UTF-8&oe=UTF-8

samfox site:cern.ch - Google Search

Web Images Maps News Shopping Gmail more

Google samfox site:cern.ch Search Advanced Search Preferences

Web

[doc] [WHAT AND WHEN TO UPLOAD IN MTF](#)
File Format: Microsoft Word - [View as HTML](#)
... icon of <http://sm18-operation.web.cern.ch/sm18-operation> (sm18 operation page); When MTF page gets open, enter login 'sm18op' and password 'samfox'. ...
www.cern.ch/sm18-public/sss/procedure/WHAT,%20WHEN%20&%20HOW%20TO%20UPLOAD%20IN%20MTF%20for%20SSS.doc - [Similar pages](#)

[ppt] [Slide 1](#)
File Format: Microsoft Powerpoint - [View as HTML](#)
"samfox". if some people. Have forgot. MTF my custom report. My custom reports. MTF my custom report. For dipole. For SSS. MTF my custom report. Magnet Name ...
www.cern.ch/sm18-public/presentation/Presentation%20Starting%20Up.ppt - [Similar pages](#)

[xls] [Sheet1](#)
File Format: Microsoft Excel - [View as HTML](#)
70, sm18op, password - **samfox**. Click access equip data. Type hcl% magnet no. in identifier and select assemblies only in type. Now click search, ...
www.cern.ch/sm18-public/dipole/procedure/SM18%20made%20easy%20in%20details%20for%20Dipole.xls - [Similar pages](#)

In order to show you the most relevant results, we have omitted some entries very similar to yours. If you like, you can [repeat the search with the omitted results included](#).

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- ▶ “Official”, “Personal” or “Test” sites
- ▶ Program in Python/Perl/PHP/...
- ▶ Use Twiki, Sharepoint, Drupal, J2EE

You are responsible!
▶ This is the place to screw up.
▶ If you don't know what you're doing, don't do it.
▶ Ask an expert, read a book, get some training (<http://cta.cern.ch>), or forget it.
▶ Know what you're publishing!
▶ Avoid leaking sensitive documents...



Space — plenty of space

Sebastian.Lopienski@cern.ch — “Sign into CERN: CERN IT Services for You!”

CERN hosts ~1B files / ~150TB for your home directories

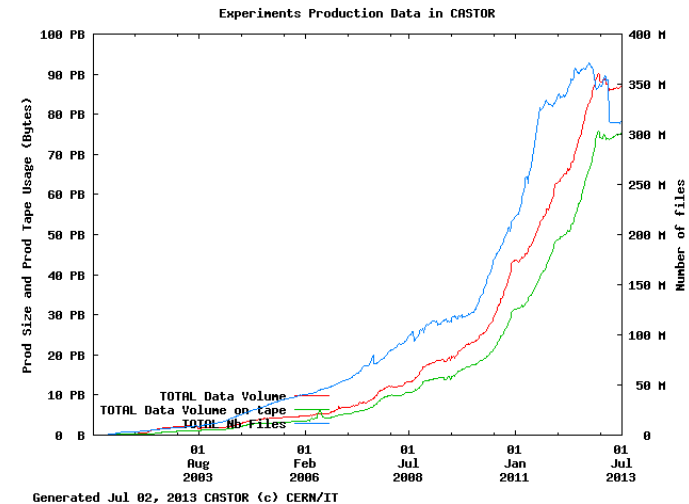
- ▶ For Windows: use DFS (\\cern.ch\dfs; see <http://cern.ch/dfs>)
- ▶ For Linux: use AFS (/afs/cern.ch; see <http://cern.ch/afs>)

Plus 1800 disk servers with >90PB capacity for the Grid

- ▶ Redundant disk configuration
- ▶ ~30% growth rate
- ▶ 2-3 disk failures per day

There is more:

- ▶ For sharing, Dropbox a la CERN: <http://cernbox.cern.ch>
- ▶ For publications, documents, etc. use CDS (<http://cern.ch/cds>)
- ▶ For meetings, use INDICO (<http://indico.cern.ch>)
- ▶ For technical stuff, use EDMS (<http://edms.cern.ch>)
- ▶ For back-ups, there are CASTOR (<http://cern.ch/castor>) and TSM
...but recall that AFS and DFS are backed-up, too!



Space — plenty of space

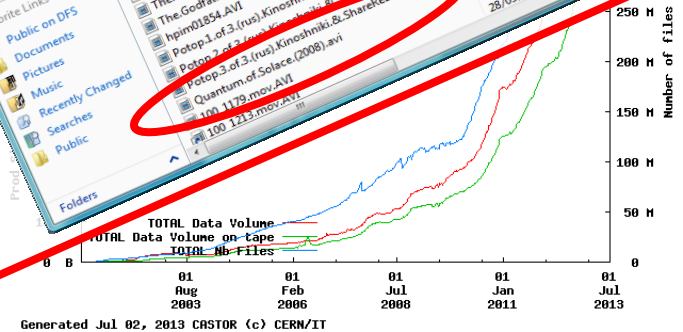
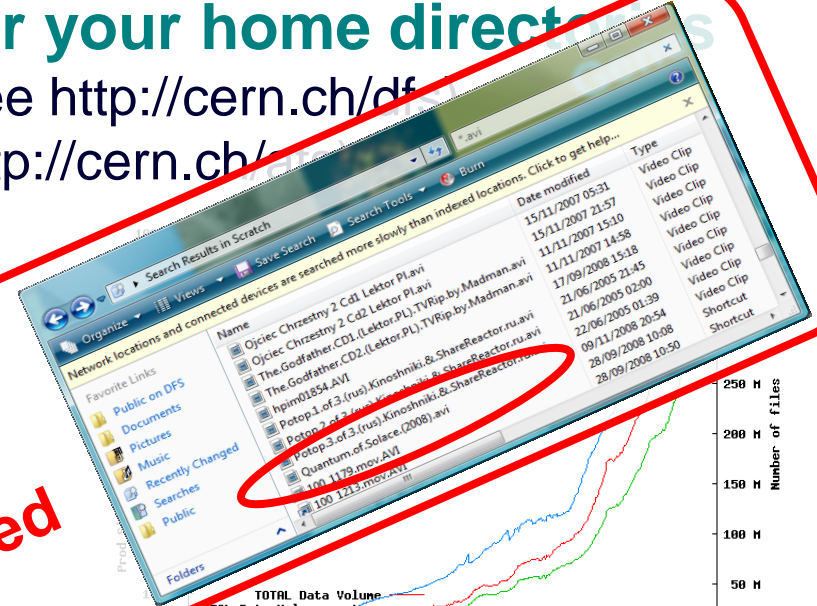
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There is more:

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Programming and Development

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CERN Git for programming:

- ▶ Strongly recommended for all software developers
- ▶ Check out at <http://gitlab.cern.ch>
- ▶ Static code checkers available at: http://cern.ch/security/recommendations/en/code_tools.shtml (and watch your compiler outputs!!!)

```
// If same day then simple querie
if (($StartDay == $EndDay) && ($StartMonth == $EndMonth))
  $DateClause = " WHERE PROCESSINGDAY = TO_DATE(':$StartDay-$StartMonth-$StartYear')
else {
  $DateClause = " WHERE PROCESSINGDAY BETWEEN TO_DATE(':$StartDay-$StartMonth-$StartYear')
  $DateClause .= " AND TO_DATE(':$EndDay-$EndMonth-$EndYear')
}

// do the query and show tables
Suser = 
Spass = 
#Sdb = 
Sdb = "

Sdb_conn = ocilogon(Suser, Spass, Sdb);

Sqlstring = "Select sum(NROFRECORDS), exelcluster, jobstat
Sqlstring .= $DateClause;
```

Tools for development:

- ▶ Calculus tools: Mathematica, Mathcad, Octave, ...
- ▶ Electronic EDA tools: CADENCE, Altium Designer, FPGA synthesis, ...
- ▶ Mechanical CAD tools: CATIA, AutoCAD, Inventor, Ansys, Opera/Tosca,...
- ▶ Have a valid license! Check <http://cern.ch/engineering-software>

Databases on demand:

- ▶ Check <https://cern.ch/DBOnDemand/>

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Databases on demand:

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```
// If same day then simple querie
if (($StartDate == $EndDate) && ($StartDate < $EndDate))
$DateClause = " WHERE PROCESSED_DATE = $StartDate"
)
else {
$DateClause = " WHERE FROM_DATE = $StartDate AND TO_DATE = $EndDate"
}

// do the query
Suspension = $db->query($DateClause);
Sdb = $db->query($DateClause);
Sdb_conn = $db->query($DateClause);

Select * from (NROFRECORDS), execluster, jobstat
where JobID = $DateClause;
```



**The second best place to screw up.
If you don't know what your doing, don't do.
Ask an expert, read a book,
get some training (<http://cta.cern.ch>), or forget it.**

Let IT help you!

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Make use of central services

- ▶ Do not reinvent the wheel
- ▶ Focus on your core work
- ▶ Don't worry about maintenance
- ▶ Let IT take care on security

If you have questions:

- ▶ Contact the ServiceDesk:
<http://cern.ch/servicedesk>
- ▶ They deal with any question related with IT (and other stuff)

For security questions/training/help:

- ▶ Check <http://cern.ch/security>
- ▶ Or contact:
Computer.Security@cern.ch



The screenshot shows the CERN Computer Security website. The browser address bar displays <https://cern.ch/security>. The page header includes the CERN logo and the text "CERN Computer Security". A navigation menu at the top contains links for Home, Computing Rules, Recommendations, Training, Services, and Reports. The main content area features a section titled "CERN Computer Security Announcements" with a sub-link for "Security needs you". Below this, there is a quote: "Academic freedom is a valuable thing, but like any kind of freedom, it comes with responsibility... It is the responsibility of all of us, not just the experts in our IT infrastructure while striking the right balance between freedom and the unfettered operation of our facilities complete without you." The page also includes a sidebar with sections for "Emergency Response", "Contact", and "About CERN Computer Security".

