



CMS Online Web-Based Monitoring and Remote Operations

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Introduction and Outline



❖ CMS Online Web-Based Monitoring

➤ Remote Operations

- ✓ Justification
- ✓ Physical installation, use of web services

➤ Online Web Services

- ✓ Database as source; need for meta-data descriptors
- ✓ Browsing, plotting, & dynamic time correlation plots
- ✓ CMS RunSummary example servlet
- ✓ Screen Snapshot Service S^3 desktop image display
- ✓ Environmental trends over time & real time status
- ✓ Web-Based *Root* browser; data quality monitoring

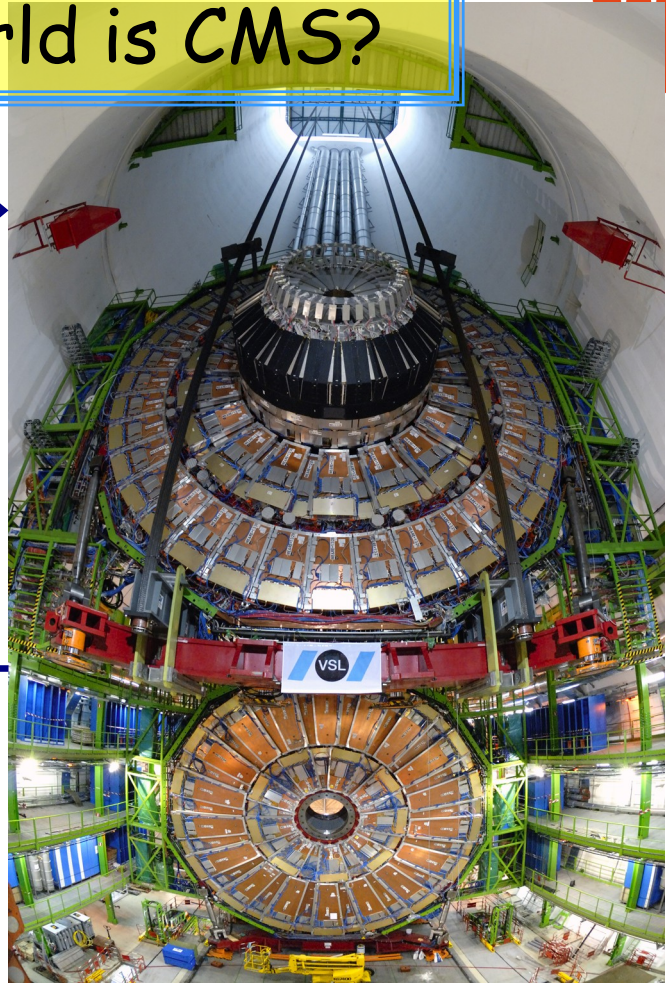
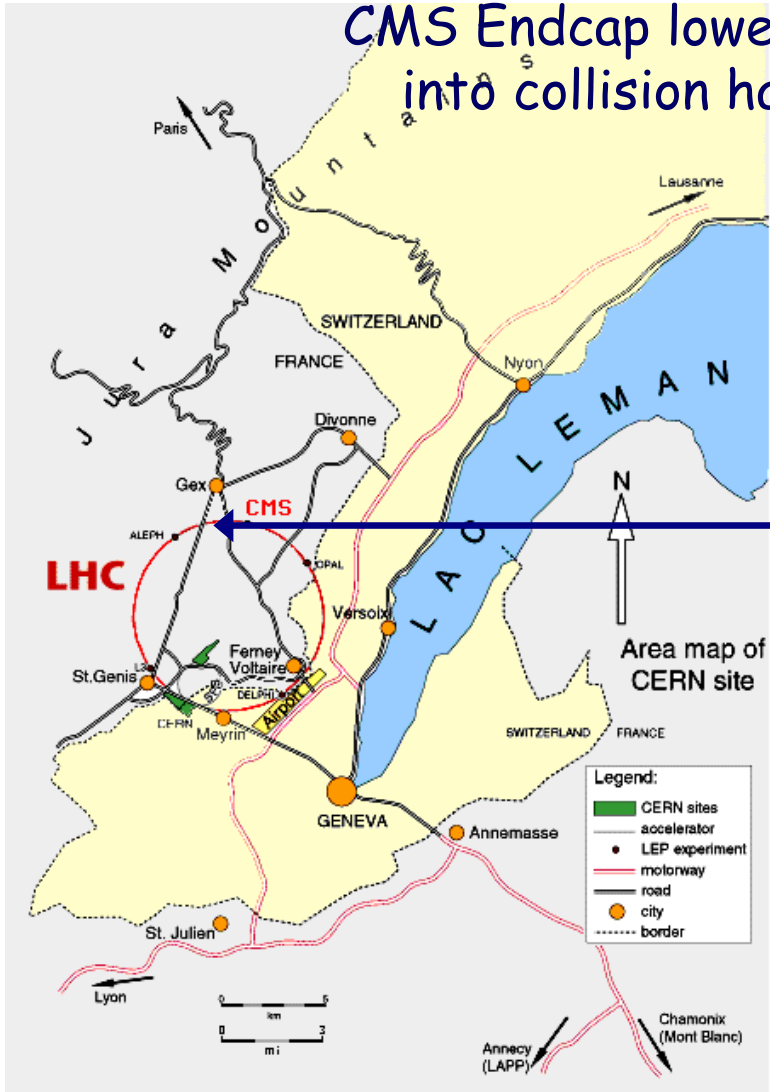
➤ Demonstrate experience during data taking

- ✓ Cosmic Ray runs, Global test runs

➤ Conclusions



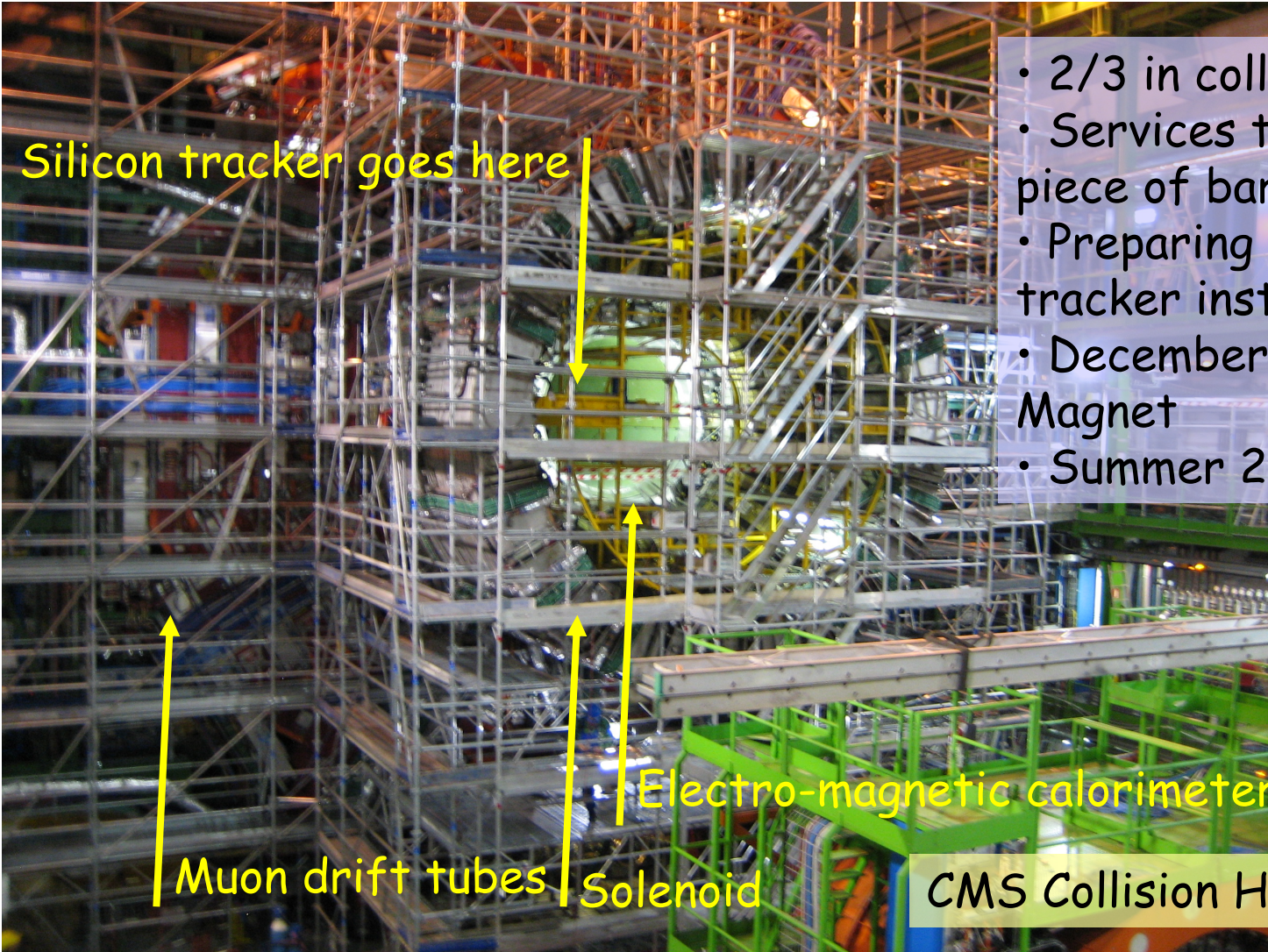
Where in the World is CMS?



100m below Cessy, France
 Large Hadron Collider (LHC) $\sqrt{s}=14\text{TeV}$
 Detects proton-proton collisions



The Really Big CMS



Silicon tracker goes here

Electro-magnetic calorimeter

Muon drift tubes Solenoid

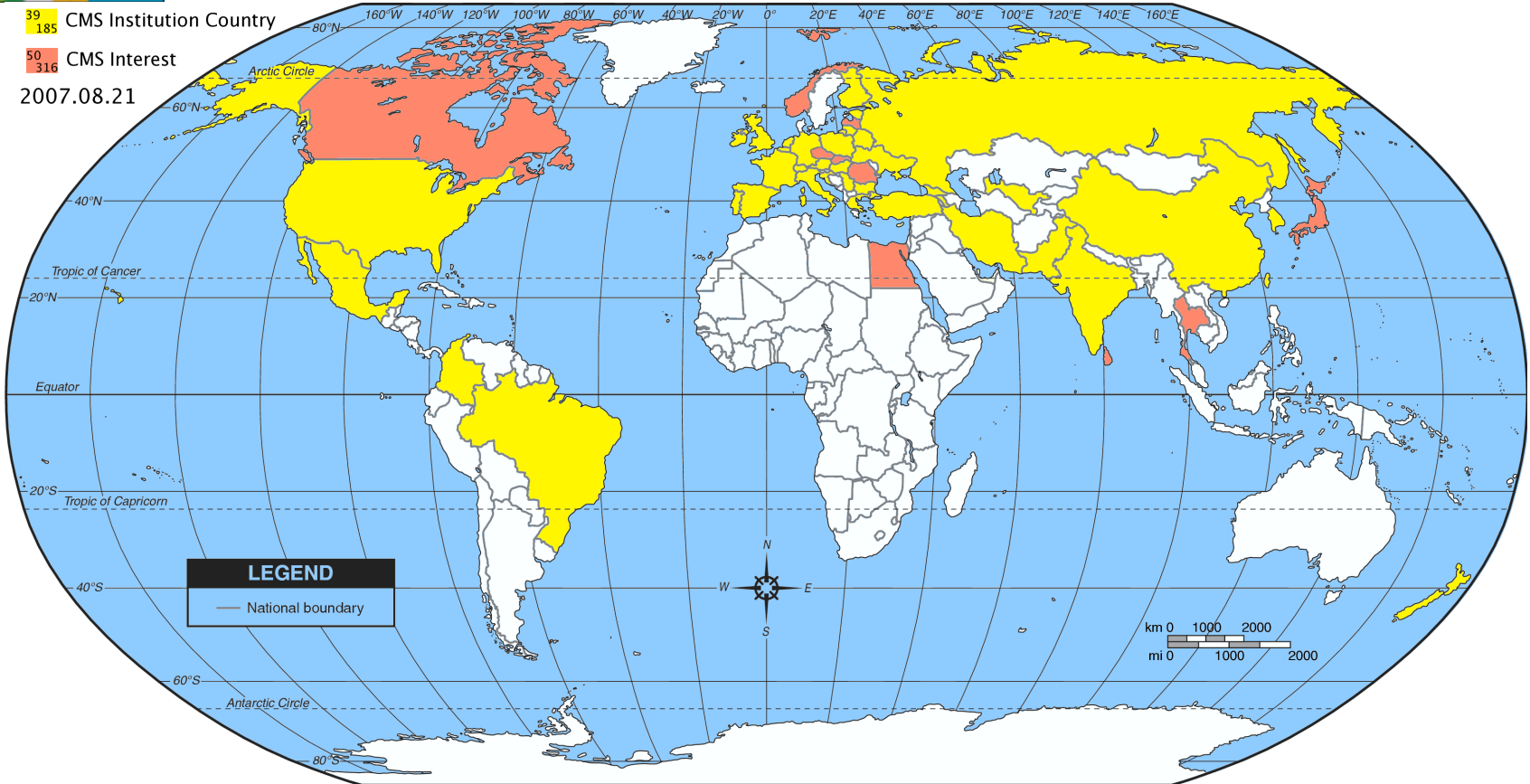
- 2/3 in collision hall
- Services to central piece of barrel
- Preparing for silicon tracker install
- December Cosmics with Magnet
- Summer 2008 collisions

CMS Collision Hall 2007.08.30



The Really Big CMS World

39
185 CMS Institution Country
50
316 CMS Interest
2007.08.21



Don't you remember the original purpose of the WorldWideWeb?

The need to disseminate HEP data world-wide grows even more important with huge collaborations spanning the globe



Why Remote Operations?



- Thousands of collaborators located all over the world
- Most of them not resident at CERN
- Collider H.E.P. has never before been so concentrated in one location
- Need to disperse and disseminate



R.I.P.

- HERA June 2007
- CESR 2008
- PEP II 2008
- Tevatron October 2009...

Future

- ILC - 2020? 2120? Ever?
- Are we the last HEP collider experiment?
- Must be clever to survive

Remote Operations


LHC @ FNAL Remote Operations Center



Fermilab Remote Operations Center
LHC@FNAL



CMS Underground Control Room
2007.08.30 Global Integration Run

- 
- Tools needed for remote status display
 - Must be easy to use, flexible, drillable
 - Coöperative with firewall, security
 - Must survive trans-Atlantic crossing
 - Also see Lucas Taylor's talk,
"CMS Centers for Control, Monitoring, Offline Operations and Analysis"
Thursday, 14:00, DD-6, contribution 260



Web-Based Monitoring



• Wealth of information in database

- Trigger rates, event rates, cross sections, beam conditions, temperatures, voltages, environmental conditions, etc. ...
- Database is preferred locale for configuration and monitoring data persistency
- Oracle 10 located at CMS site; replicated to offline world
- Has current and historical status data
 - ✓ Latency ~ < 1 second to ~1 minute
 - ✓ Behind firewall for security reasons

• Need a portal to gain access

- Provide display of contents
- And provide access control

• Typical data present, "Value vs. Time"

- Needs tools to access, plot, download, correlate

• Complex, heterogeneous database

- Many schemas, many designers
- Already have 140 schemas just in the online database & not nearly done

• Central description needed

- Correlate across subsystems
- Typical monitoring is "Value vs. Time"
 - ✓ *Global meta-data descriptive tables*



Meta Data Tables



- Consider "value, time" pairs (x, t_x)
 - Time: Timestamp, Run Number, Luminosity Subsection
 - Entries in meta-data tables specify value, time, units, type of data, subchannels, ...
 - Allows general purpose retrieval from central tables
- Conversion: HTML, Text, XML, Root formats
 - Root TTree n-tuple object with multiple values per time (x, y, z, t)
 - Optional caching of results
 - ?FORMAT=TEXT|XML|HTML|Root|GRAPHICS
 - Dynamic inline embedding of graphics
 - ✓ Other pages can access plots automatically
 - Available via HTML display page links or via direct download with *curl* or *wget*:
 - ✓ `curl "http://cmsmon.cern.ch/cmsdb/servlet/GenericQuery?..."`



DatabaseBrowser and GenericQuery

DatabaseBrowser - Microsoft Internet Explorer

Address: http://cmsmon.cern.ch/cmsdb/serve

JavaScript Tree Menu

- DatabaseBrowser omds 2007.08.13 22:21:37
 - AD_PORTAL_TEST
 - CDAQ_MONITOR
 - INDEX
 - TABLE
 - BU_EVENT_NUMBER_DATABASE**
 - BU_OCCUPANCY_DATABASE
 - BU_PERFORMANCE_DATABASE
 - BU_STATUS_DATABASE
 - EVM_EVENT_NUMBER_DATABASE
 - EVM_OCCUPANCY_DATABASE
 - EVM_PERFORMANCE_DATABASE
 - EVM_STATUS_DATABASE
 - FBO_DATABASE
 - FMMCONTROLLER_FMMINPUT
 - FMMCONTROLLER_STATUS_DATABASE
 - FRLCONTROLLER_CARD_DATABASE
 - FRLCONTROLLER_LINK_DATABASE
 - FRLCONTROLLER_STATUS_DATABASE
 - FU_PERFORMANCE_DATABASE
 - FU_RATE_DATABASE
 - FU_STATUS_DATABASE
 - LTCCONTROL_DATABASE
 - ITC_CONTROL

TABLE CDAQ_MONITOR.BU_EVENT_NUMBER_DATABASE contents

Columns for table CDAQ_MONITOR.BU_EVENT_NUMBER_DATABASE

Set Clear

ColumnName	DataType	Select	Plot	Order	Not Null	Equals	LowBound	HighBound
CLASS	VARCHAR2(1000)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
EVENTNUMBERFROMEVM	NUMBER(22,10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
EVENTNUMBERFROMRUS	NUMBER(22,10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
EVENTNUMBERTOFUS	NUMBER(22,10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
HOSTNAME	VARCHAR2(1000)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
INSTANCE	NUMBER(22,10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
RUNNUMBER	NUMBER(22,10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIMESTAMP	VARCHAR2(1000)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

SubmitQuery

Detailed information for TABLE CDAQ_MONITOR.BU_EVENT_NUMBER_DATABASE

OWNER	CDAQ_MONITOR
TABLE_NAME	BU_EVENT_NUMBER_DATABASE
TABLESPACE NAME	CMSOMDS_DQA

- Peruse database definitions
- Dynamic query definition
 - ✓ Data download, plots

DatabaseBrowser and GenericQuery Java/Tomcat servlets are focal point and parents of tools

- Primarily expert starting point
- General user pages inherit (Java) from browser
 - ✓ Specific use cases, easier to use



RunSummary query



CMS RunSummary

File Edit View History Bookmarks Window Help

http://cmsmon.cern.ch/cmsdb/servlet/RunSummary

CMS Web ...nitoring Apple Amazon eBay Yahoo! News (80)

CMS RunSummary Information

All times are in UTC

RunSummary for Specific Runs

Enter a RunNumber or LHC Fill and press **return**; [All LHC Fills](#) | [Range of LHC Fills](#) | [SlowControl by Date](#)

CMS RunNumber: LHC Fill:

or Search over a range of runs

All times are in UTC

Enter range of RunNumbers or range of dates and press or click here for the last 24 hours

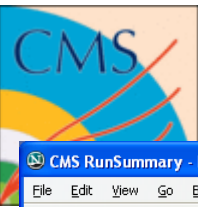
Begin RunNumber:	<input type="text"/>	End RunNumber:	<input type="text"/>
Begin date YYYY.MM.DD:	<input type="text" value="2007.09.01 18:21:27"/>	End date YYYY.MM.DD:	<input type="text" value="2007.09.02 18:21:27"/>
Minimum Triggers:	<input type="text"/>	Minimum Events:	<input type="text"/>
Run Duration, minutes:	<input type="text"/>	Magnet Current, amps:	<input type="text"/>
Sequence:	<input type="text" value="AUG-GLOBAL-RUN"/>		

Components Online Status:

EFED TRG TRACKER ECAL HCAL DT RPC CSC

RunSummary query page an example of these monitoring and browsing tools

- Select by:
- Run range
 - Time range
 - Component status
 - Run duration, event
 - Trigger type
 - ... more to come



RunSummary pages



CMS RunSummary - Netscape Browser

File Edit View Go Bookmarks Tools Help

http://cmsdaq.cern.ch/cmsmon/cmsdb/servlet/RunSummary

ROWS: 1 Data: [root](#) | [text](#) | [xml](#) | [query](#)

RUNNUMBER	USERNAME	SEQUENCE	BOOKINGTIME	RUN_MODE	START_TIME	STOP_TIME	TRIGGERS	EVENTS
2241	toppro	CESSY_DAQ	2006.08.10 13:40:46	null	2006.08.10 15:40:46	2006.08.10 16:25:15	50222	50222

ROWS: 3 Data: [root](#) | [text](#) | [xml](#) | [query](#)

COMPONENT	AVERAGE_RATE_HZ	AVERAGE_SIZE	AVERAGE_SIZE_RMS	N
BU_PERFORMANCE	8.559	262492.814		127.999 96
EVM_PERFORMANCE	19.201	72.000		0E0 43
RU_PERFORMANCE	18.756	87469.880		31.728 129

LTC_CONTROL Configuration			LTC_CONTROL Rates, n=44		MagnetStatus	
Trigger	Name	Enable	AVERAGEEFFICIENCY	1.000	Temperature, °K	5.034 n=243 2006.08.10 16:25:13
0	DT	1	AVERAGEDL1ARATE	19.131	Current, A	566.056 n=178 2006.08.10 16:25:13
1	CSC	0	AVERAGEDRAWL1ARATE	19.131	MAGNET_CURRENT, A	588.172 n=100 2006.08.10 16:25:14
2	RBC1	0	BLOCKEDTRIGGERS	0E0	VACUUM, bar	1.665118E-6 n=0 * 2006.08.10 15:09:09
3	RBC2	0	EFFICIENCY	0.977	* no values during run; last value before run is shown	
4	RPCTB	0	L1ARATE	18.523		
5	na	0	RAWL1ARATE	18.523		

FED Enable Masks			
Component	Id	Status	OK?
ECAL	818	0x1b	Good
HCAL	700	0x3	Good
HCAL	701	0x3	Good
HCAL	702	0x3	Good

Done Spyware Protection Not Effective

CMS RunSummary - Netscape Browser

File Edit View Go Bookmarks Tools Help

ROWS: 1 Data: [root](#) | [text](#) | [xml](#) | [query](#)

Column	min	max	clear
CHANGE_DATE	2006.08.10_15:40:46	2006.08.10_16:25:15	<input type="checkbox"/>
MAGNET_CURRENT	178.6	1251.6	<input type="checkbox"/>

Submit

DCS_ENVIRONMENT.CMSFWMAGNET2DCS Entries: 290

[eps]

ROWS: 290 Data: [root](#) | [text](#) | [xml](#) | [query](#)

CHANGE_DATE	MAGNET_CURRENT
2006.08.10 15:40:49	196.000
2006.08.10 15:40:52	202.000

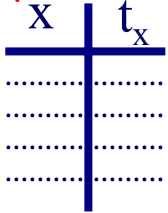
http://cmsdaq.cern.ch/cmsmon/cmsdb/servlet/GenericQu... Spyware Protection Not Effective

- Clickable measurements
 - Drill-down capability
- Plot creation
 - Provides Root TTree and histogram object in file
 - Resizeable on resubmit



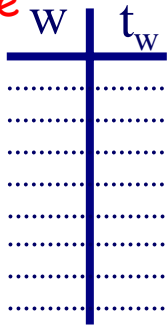
Time Correlation Plots

ntuple

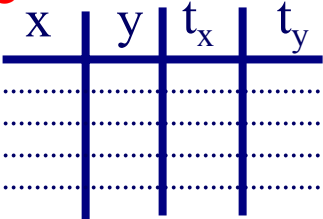


Must choose independent variable as basis for correlation

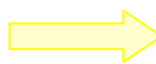
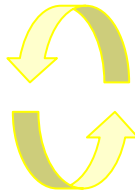
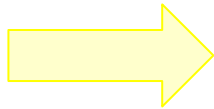
ntuple



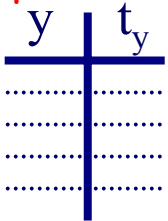
ntuple



$(x, t_x) \times (y, t_y)$



ntuple

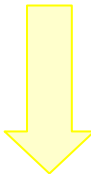


collate

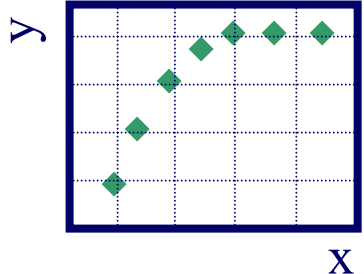
$w = x, y$
 $t_w = t_x, t_y$

sort and pair
nearest neighbors
by time
TTreeIndex

plot



TH2D



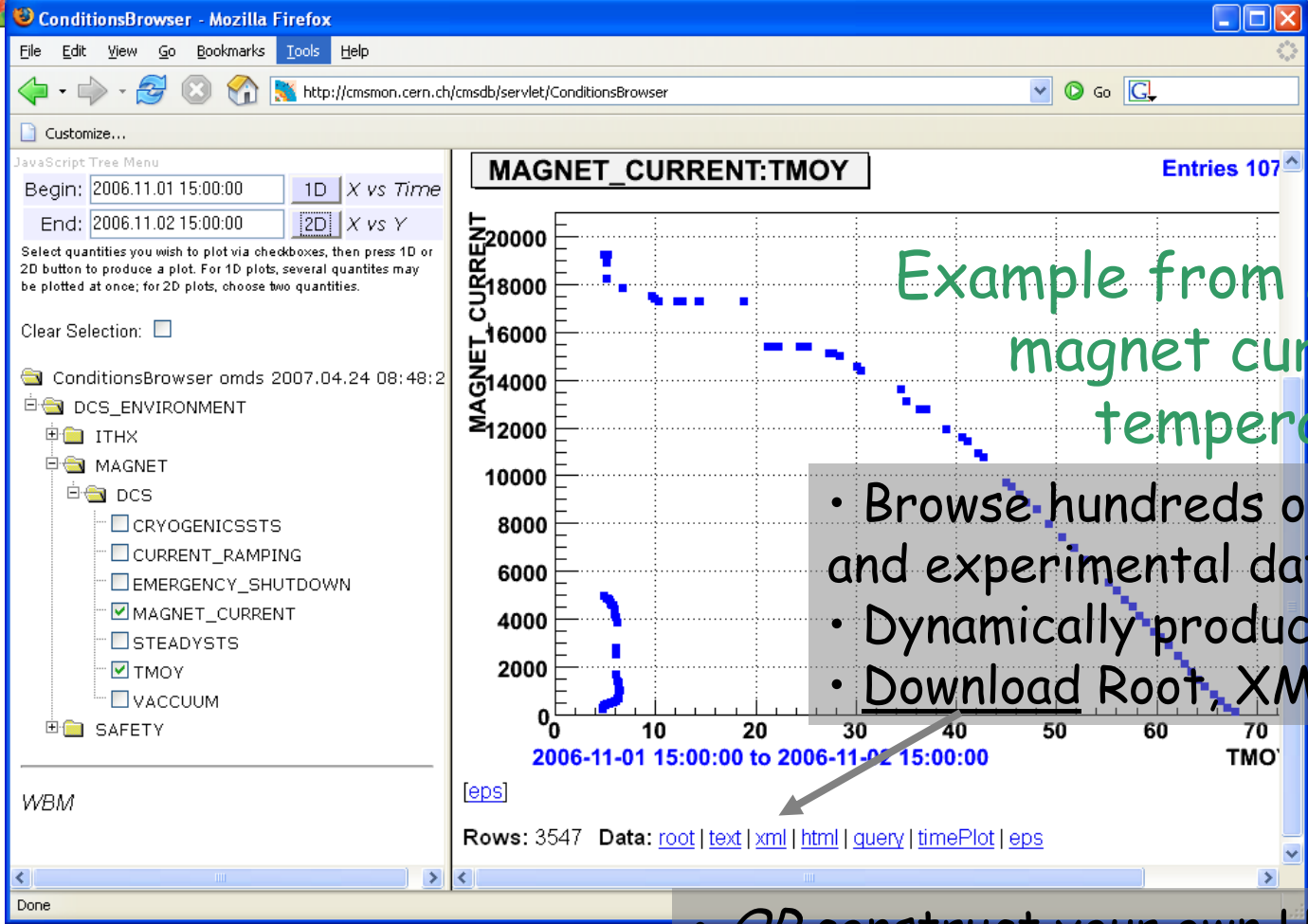
Time range must be identical: $\Delta T_x = \Delta T_y$

Time sampling period similar: $\Delta t_x \sim \Delta t_y$

Heterogeneous environment, with no a priori correlation necessary



Time Correlation Example



Example from MTCC* data magnet current vs. temperature

- Browse hundreds of environmental and experimental data samples
- Dynamically produce plot
- Download Root, XML, text, HTML

• OR construct your own URL for in-line linking or non-interactive "wget" access

*Magnet Test Cosmic Challenge, November 2006



Trend over Time Plots



- Search for performance anomalies
- Interactive, historical, downloadable
- Selection of type of data
- Zoom in on problems

The screenshot displays the CMS Online Web-Based Monitoring interface. On the left, a tree view shows a hierarchy of data points under 'H4_SM02'. In the center, a table lists selected data points with columns for 'SELECT', 'RUN_TYPE', 'ID2', and 'COUNT'. On the right, a trend plot shows 'DQM_Blue_Laser_APD_over_PN' over time from 06.15 to 07.06. The plot includes a legend for 'LEGEND RUN_TYPE ID2' with color-coded markers for LASER 1 (red), LASER 2 (blue), LASER 3 (magenta), and LASER 5 (cyan).

COLUMN	MIN	MAX
RUN_START	2004.08.24 20:35:03	2007.08.25 20:35:03
APD_OVER_PN_MEAN		

EM Calorimeter (ECAL) Test Beam



Environmental - Slow Control



- Access to current "right-now" conditions
- ...and historical settings and trends...

Address http://cmsmon.cern.ch/cmsdb/servlet/DcsLastValue?SNAPSHOT_TIME=2007.07.03_00:00:00 Go File

DcsLastValue

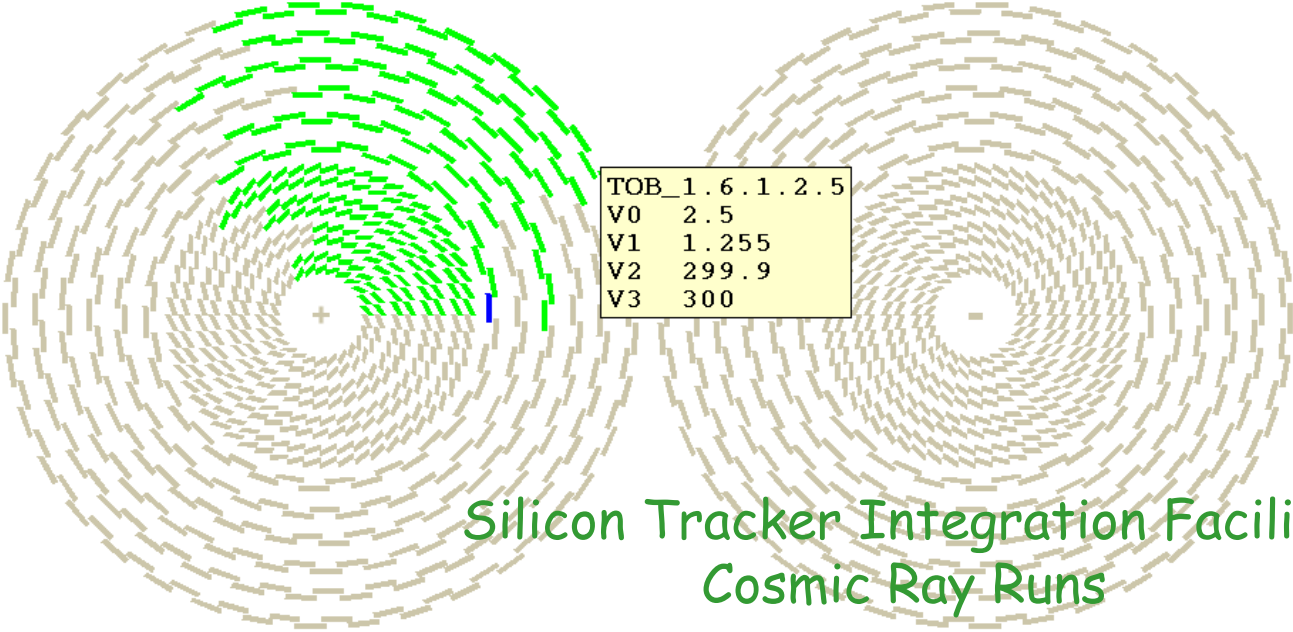
- Tk_Barrel
 - Voltage
 - Current
 - Temperature
- Tk_Disc
 - Voltage
 - Current
 - Temperature
- HCal
 - Geometry
- Preshower
 - Temperature
 - Humidity
- Documentation



Tk_Barrel Voltage

SNAPSHOT TIME 2007.07.03_00:00:00

-Select Source- V 2007.07.02 23:59:25 UTC ON PARTIALLY ON OFF NO HEARTBEAT



Silicon Tracker Integration Facility
Cosmic Ray Runs

(Zongrun Wan)

<http://cmsmon.cern.ch/cmsdb/servlet/DcsLastValue>



RootBrowser



- Need light-weight method to browse plethora of Root output - e.g. data quality monitoring (DQM)
 - Some DQM > 100,000 histograms CSC (!)
 - Display Root Folder tree dynamically
 - Selective display of objects implementing the Draw() method
- Implement browser for Root files
 - Latency ~ 30 seconds to 5 minutes
 - Transfer minimal data needed for display
 - ✓ Dynamic TFolder opening and dynamic TObject display
 - ✓ Optional single object download
 - No dependency on data structure of Root objects
 - No special web client software needed
 - Javascript on display (client) side, Java/Tomcat plus Root on server
 - ✓ A la Ajax
- Also developing sophisticated detector-specific display
 - User-defined markups and arrangement, with tools
 - Network protocol data transfer - latency < 1 s
 - Lassi Tuura



DQM / RootBrowser



Dynamic JavaScript displays with Tomcat/Java backend

DQMBrowser - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://cmsmon.cern.ch/cmsdb/servlet> Go

Run 8022

- RootFileTree
 - SiStripOffline_run8022.root
 - DQMData
 - SiStrip
 - TH1F: ChargeOfEachCluster
 - MechanicalView
 - Track
 - SiStripWebInterface_8022.root
 - SiStripWebInterface_8022.root

WBM

RootDisplay

TH1F: ChargeOfEachCluster; 1

Title: ChargeOfEachCluster

Path: /DQMData/SiStrip

File: /cms/mon/data/dqm/online/000/008/022/SiStripOffline_run8022.root

ChargeOfEachCluster

ChargeOfEachCluster	
Entries	386688
Mean	135.1
RMS	84.29

Silicon Tracker Integration Facility
Cosmic Ray Run

Internet

This is pre-release version. Please file any feature requests and any bugs you find in Savannah.

Action: [Subscribe](#), [Unsubscribe](#), [Reload](#)

Layouts: +21 Collector, +21 LiveDQM, Playback, Playback2

DT: +21 RealMonitor, +21 L1TMonitor

DataFormatMonitor, DigMonitor, LEDMonitor, BEAM ENERGY, DUT LOGIC

HF: +21 HF, +21 HF Digi, +21 HF Digi, +21 HF Digi, +21 HF Digi, +21 HF Digi

Select: All, None, Alarms, Non-alarms Size: XS - S - M - L - XL

Hadron Calorimeter (HCAL)
Global Integration / Cosmic Ray Run
New DQM GUI with user markup

(Lassi Tuura)



Screen Snapshot Service S^3



- Remote Operations need Remote Knowledge
 - Operations screens, e.g. RunControl, HV Control, EventDisplay valuable for remote users to know what is going on
 - But normally have tight restrictions on access to nodes
- What is the Screen Snapshot Service?
 - A way to provide periodic, read-only copies of display images (snapshots) for remote viewing
 - Similar to products like VNC, pcAnywhere, and VGA2WEB but without the cost or danger of accidental remote control
 - Can be used to make private-network displays viewable on the public internet (useful for remote monitoring)
 - Uses commonly available technologies for portability and ease of use: Java, JSP, Tomcat

(Kurt Biery)



Screen Snapshot Service Mechanism

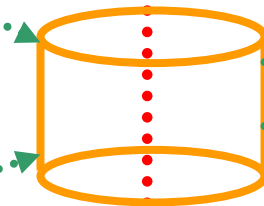


Provides real time images of monitor displays to remote sites

Snapshot Producer 1
Java web start app

⋮

Snapshot Producer *n*



Web Service
Disk Cache

Web Client 1
Remote Ops

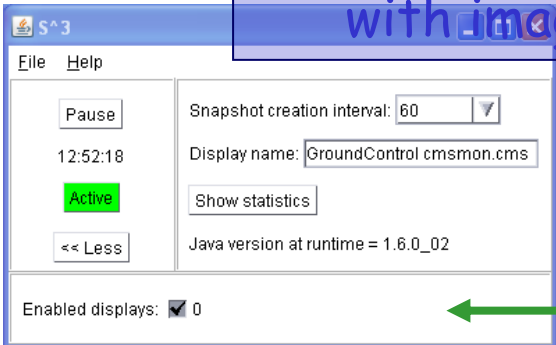
Web Client 2

⋮

Web Client *m*

Periodic HTTP Web POST
with image payload

Normal HTTP Request
Web page, no special config



Private net
Firewall

Public net

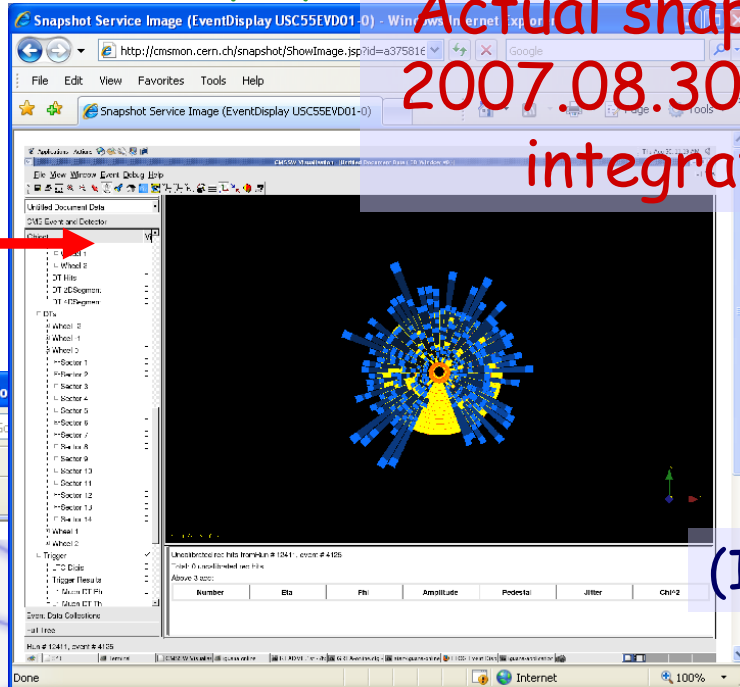
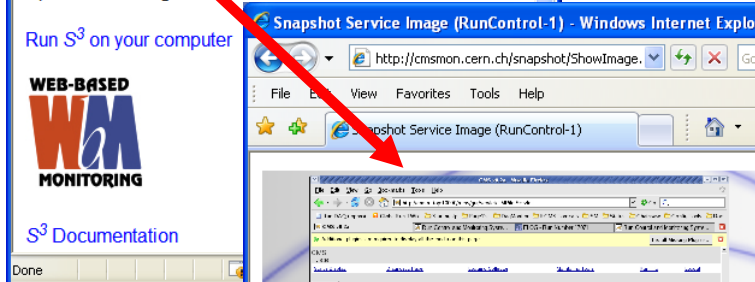
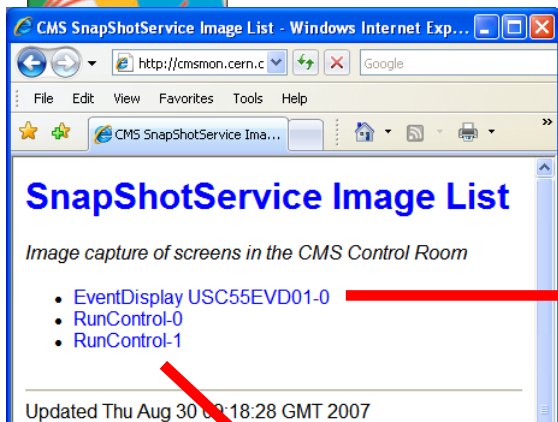
← control widget

(Kurt Biery)

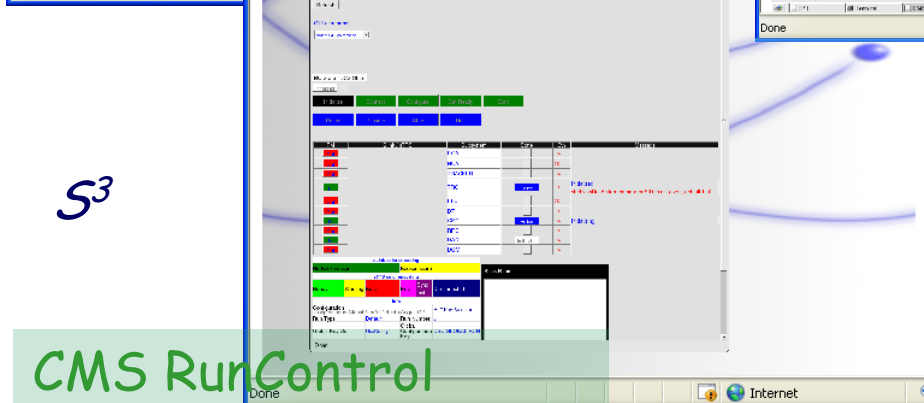
Screen Snapshot Service Example

CMS EventDisplay

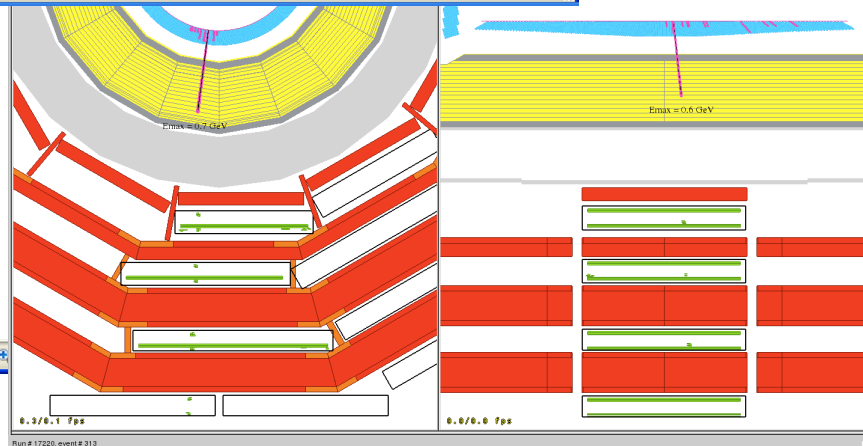
Actual snapshots from
2007.08.30 CMS global
integration run



(Ianna Osborne)



CMS RunControl
(see Alex Oh, CHEP'07 279)





More Run Monitor Tools



CMS Page 1 - Microsoft Internet Explorer

Page refreshed at: 2007/08/13 22:44:17 CET 20:44:17 UTC
All other times given in UTC

CMS Page 1

Run Information

Booking time	2007/07/27 17:19:01
L1 trigger rate	N/A
Run number	14920
Start time	2007/07/27 17:20:03
Stop time	2007/07/30 16:02:13

DCS Environment

DAQ cluster dew point	8.4 C
DAQ cluster relative humidity	39.6 %
DAQ cluster temperature	21.9 C

DSS

DAQ room temperature	24.8 C
Magnet room temperature	20.8 C
FED room temperature	21.8 C
SX5 temperature	16.6 C

RC States

CMS.LVL0:RC_STATE	Destroyed
CMS.LVL0:DAQ_STATE	Running
CMS.LVL0:TRG_STATE	Running

FERMILAB MTCC File Lists
yumiceva@mail.gov

WBM: Zongru Wan, William Badgett & Steven Murray
Comments: Steven.Murray@cern.ch

CMS "Page 1" top level status display, simplicity for even the most naive user (Oracle Portal)
(S.Murray)

CMS Fermilab Data File Process Summary Page
Files copied to FNAL Tier 1 site and status of processing (jsp)

FERMILAB PROCESS SUMMARY PAGE

List of data files [txt], List of root files [txt], Runs being (or not) converted [txt].
green=files converted, orange=being transferred/converted, red=no files available.

Run	dat Files @CERN	Total events	dat Files @FNAL	root Files @FNAL	Total Size	Stop Time	Magnet (KA / BJT)	DOM			
								TRG	TRK	HCAL	CSC
2600	A1180	776956	A1180180	A1180180	187 GB	2006.08.27 16:59:42	18.2 KA/3.7995 T	In	In	In	In
2599	A1181	766532	A1181181	A1181181	184 GB	2006.08.27 15:37:05	18.2 KA/3.7995 T	In	In	In	In
2598	A1182	null	A1182182	A1182182	0.00 bytes	2006.08.27 14:22:39	18.2 KA/3.8001 T	In	In	In	In
2596	A1183	759550	A1183183	A1183183	116 GB	2006.08.27 14:13:11	18.2 KA/3.7995 T	In	In	Out	In
2595	A1184	null	A1184184	A1184184	0.00 bytes	2006.08.27 13:06:24	18.2 KA/3.8001 T	In	In	Out	In
2594	A1129	622258	A1129129	A1130129	150 GB	2006.08.27 12:56:41	18.2 KA/3.7996 T	In	In	In	In
2593	A1129	608938	A1129129	A1127125	145 GB	2006.08.27 11:38:23	18.2 KA/3.7995 T	In	In	In	In
2591	A1171	30313	A1171171	A1171171	0.00 bytes	2006.08.27 09:53:34	18.2 KA/3.8001 T	In	Out	Out	Out
2590	A1171	15829	A1171171	A1171171	7.05 GB	2006.08.27 09:49:57	18.2 KA/3.7995 T	In	In	In	Out
2590	A1171	15829	A1171171	A1171171	4.32 GB	2006.08.27 09:22:19	18.2 KA/3.7999 T	In	In	In	Out
2589	A1171	221165	A1171171	A1171171	51.6 GB	2006.08.27 08:49:07	18.2 KA/3.8 T	In	In	In	Out
2588	A1171	null	A1171171	A1171171	0.00 bytes	2006.08.27 07:45:47	18.2 KA/3.8005 T	In	In	In	Out
2587	A1171	863688	A1171171	A1171171	206 GB	2006.08.27 07:41:42	18.2 KA/3.7998 T	In	In	In	In
2586	A1171	null	A1171171	A1171171	0.00 bytes	2006.08.27 05:32:20	18.2 KA/3.8001 T	In	In	In	In

(F.Yumiceva, D.Mason)



Conclusions



- LHC plans first collisions in 2008
- Remote Operation will be an important part of CMS data taking
- Tools have been developed for remote operations
 - Actively used in Cosmic Runs, Test Beam, Global Integration Runs, late 2006 through 2007
 - Remote Operations Center or Individual Users and Experts
 - Continued development in preparation for collisions
 - Accessible at <http://cmsmon.cern.ch>



More



Backup Slides



HomePage





CMS Web Based Monitoring

File Edit View History Bookmarks Window Help

http://cmsmon.cern.ch/ Google

CMS Web ...nitoring Apple Amazon eBay Yahoo! News (106) ▾

CMS Web Based Monitoring

LHC	CMS	code
Customized Slides Beam Status - Luminosity (simulated HF)	CMS Page 1 RunSummary (global, in development) - Online DQM GUI Display (live during data taking or test) [SM] - SnapshotService S ³ <i>new!</i> - RunSummary MTCC Phase I (frozen) RunSummary MTCC Phase II (frozen) RunSummary TIF - DcsLastValue HCalibViewer PixelConfigViewer MagnetHistory MTCC Files Magnet MTCC Shift eLog MTCC DAQ Expert Summary EventProxy EventProxyTIF Trigger Rate DAQ Status Shifts Fills ConditionsBrowser DatabaseBrowser devdb10 cms_hcl cms_pvss_tk cmscald ecalh4db ConfigureDescriptors cms_hcl cms_pvss_tk cmscald ecalh4db CustomizedSlides cms_hcl cms_pvss_tk cmscald ecalh4db ecalcondb	How to Construct a Command Line RunSummary Query - How to Construct a Command Line RunSummaryTIF Query - How to Construct a Database Query Plot URL - Using the RunNotification Service <i>new!</i> for asynchronous begin and end run messages - Documentation for CustomizedSlides <i>new!</i> for multi-channel plot - Meta Data - Tomcat Java Root PL/SQL

Proposal for Web Based Monitoring and Database Browsing, 2006.11.05: [text](#) | [pdf](#) (CMS IN-2006-044)
 CMS WBM at the LHC@FNAL meeting, 2006.08.10: [ppt](#) | [pdf](#)

Steven Murray, William Badgett & Zongru Wan; last modified on 2006.10.09

- cmsmon home page
- <http://cmsmon.cern.ch>
- Links to servlets and documentation
- Visit me



cmsmon Activity



Usage Statistics for cmsmon.cern.ch - Last 12 Months

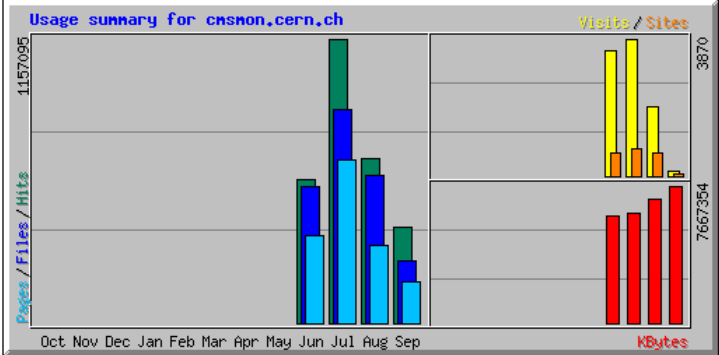
File Edit View History Bookmarks Window Help

http://cmsmon.cern.ch/log/webalizer/log/

CMS Web ...nitoring Apple Amazon eBay Yahoo! News (106)

Usage Statistics for cmsmon.cern.ch

Summary Period: Last 12 Months
Generated 03-Sep-2007 17:30 GMT



cmsmon.cern.ch server access rate >36,000 hits July 2007 ...before experiment has begun

Summary by Month										
Month	Daily Avg					Monthly Totals				
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
Sep 2007	130609	84841	55104	51	63	7667354	155	165314	254525	391828
Aug 2007	21523	19432	10242	62	665	6888814	1945	317531	602421	667227
Jul 2007	37325	28063	21494	124	785	6124828	3870	666316	869957	1157095
Jun 2007	36390	34566	22152	221	642	5973835	3545	354446	553062	582248
Totals						26654831	9515	1503607	2279965	2798398

Generated by [Webalizer Version 2.01](#)



Example URL Plot Query

<IMG SRC= <http://cmsmon.cern.ch/cmsdb/servlet/GenericQuery>

?DB=omds

&OWNER=DCS_ENVIRONMENT

&TABLE=FWMAGNETCMS

&SELECT_MAGNET_CURRENT=1

&PLOT_MAGNET_CURRENT=1

&NOTNULL_MAGNET_CURRENT=1

&SELECT_CHANGE_DATE=1

&TIME_CHANGE_DATE=1

&PLOT_CHANGE_DATE=1

&LOW_CHANGE_DATE=2006.11.01_13:40:40

&HIGH_CHANGE_DATE=2006.11.02_13:40:40

&MIN_CHANGE_DATE=2006.11.01_13:40:40

&MAX_CHANGE_DATE=2006.11.02_13:40:40

&FORMAT=GRAPHICS>

Location of Data in DB

Which columns to plot,
which column is time

Time and plot ranges
or
LAST_CHANGE_DATE=*seconds*

Payload returned will be
purely PNG graphics



Example Multiple Time Plot

ConditionsBrowser - Windows Internet Explorer

http://cmsmon.cern.ch/cmsdb/servlet/ConditionsBrowser

Begin: 2006.11.01 15:00:00 1D X vs Time
End: 2006.11.02 15:00:00 2D X vs Y

Select quantities you wish to plot via checkboxes, then press 1D or 2D button to produce a plot. For 1D plots, several quantities may be plotted at once; for 2D plots, choose two quantities.

Clear Selection:

- ConditionsBrowser omds 2007.09.04 17:16:00
 - CMS_PRESHOWER_PVSS
 - DCS_ENVIRONMENT
 - ITHX
 - MAGNET
 - DCS
 - CRYOGENICSSTS
 - CURRENT_RAMPING
 - EMERGENCY_SHUTDOWN
 - MAGNET_CURRENT
 - STEADYSTS
 - TMOY
 - VACCUUM
 - SAFETY

VACCUUM 0.0000003090392326 0.0000491593513289

Submit

DCS_ENVIRONMENT.FWMAGNETCMS.TMOY

Entries		
71.42	TMOY	116
20090.11	MAGNET_CURRENT	3431
4.92e-05	VACCUUM	136

3.09e-07
0.00e+00
4.60

15:00 18:00 21:00 00:00 03:00 06:00 09:00 12:00 15:00

2006-11-01 15:00:00 to 2006-11-02 15:00:00

[eps]

Rows: 3683 Data: root | text | xml | html | query | correlation | eps

Plotting current, temperature and magnet current from November 2006

Downloadable Root file contains composite TTree ntuple for all three