GEFÖRDERT VOM
Bundesministerium
für Bildung
und Forschung

HappyFace as a meta monitoring tool for the ATLAS experiment

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Outline

- Introduction
- Interface
- Project developers
- Basic workflow
- Database structure
- Developed modules
- Non ATLAS modules
- ATLAS modules
- Web-services
- Installation
- Ongoing development
- Smart monitoring
- Conclusion

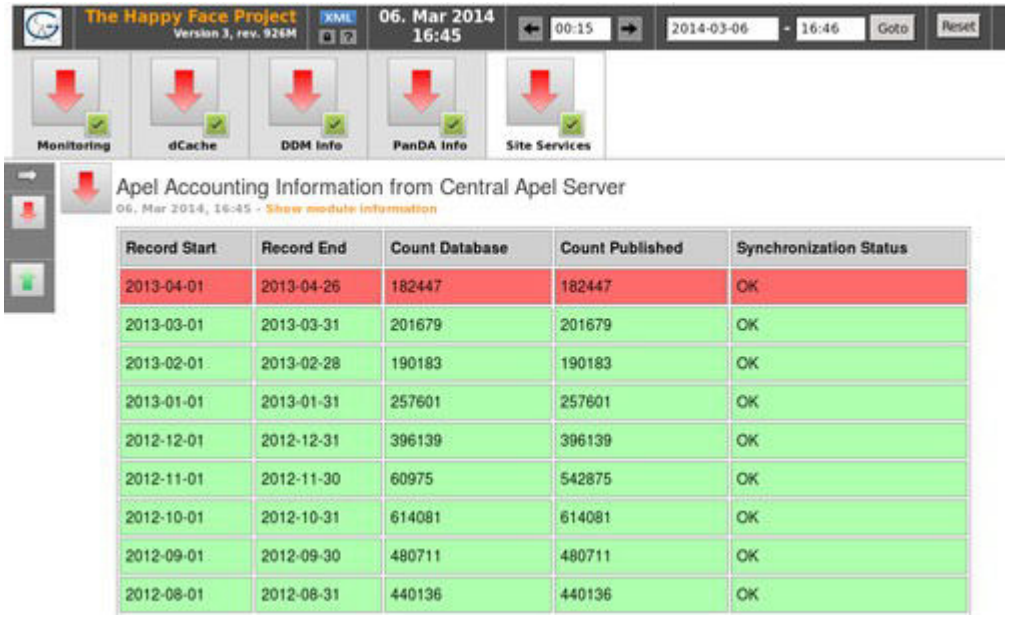
Introduction

HappyFace project is a meta monitoring tool to monitor grid sites.

- Aggregates, processes and stores information from different monitoring sources

Requirements

- Single access point
- History functionality
- Fast accessibility
- Comfortable usage
- Modular structure
- Up-to-date monitoring information

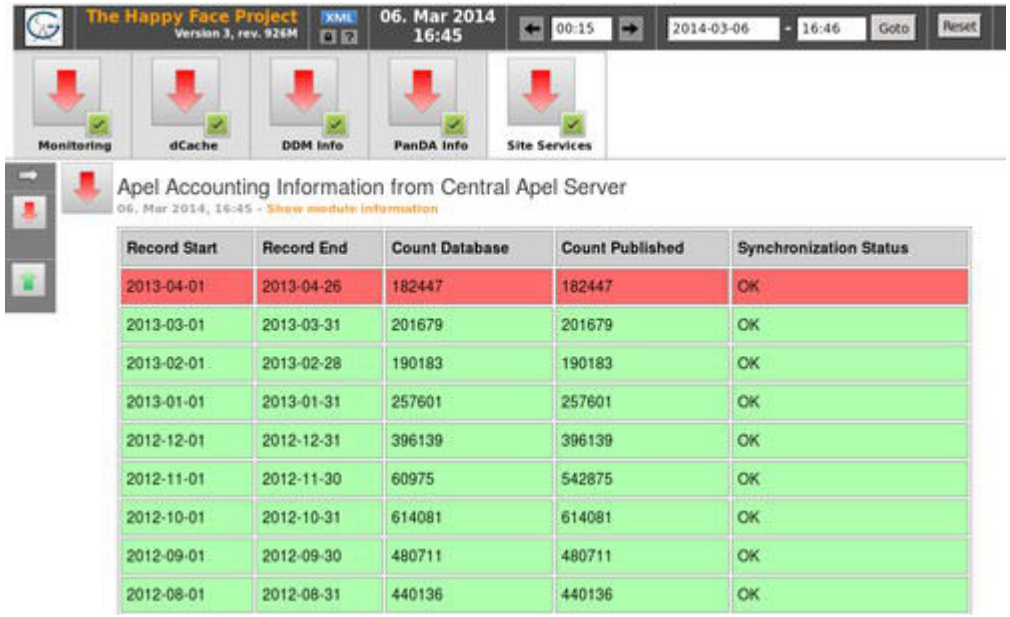


Record Start	Record End	Count Database	Count Published	Synchronization Status
2013-04-01	2013-04-26	182447	182447	OK
2013-03-01	2013-03-31	201679	201679	OK
2013-02-01	2013-02-28	190183	190183	OK
2013-01-01	2013-01-31	257601	257601	OK
2012-12-01	2012-12-31	396139	396139	OK
2012-11-01	2012-11-30	60975	542875	OK
2012-10-01	2012-10-31	614081	614081	OK
2012-09-01	2012-09-30	480711	480711	OK
2012-08-01	2012-08-31	440136	440136	OK

Project developers

HappyFace project is a joint collaboration within the DE cloud in terms of the module development.

*The core has been developed at **KIT (CMS)** and the **Georg-August-Universtität Göttingen (ATLAS)***



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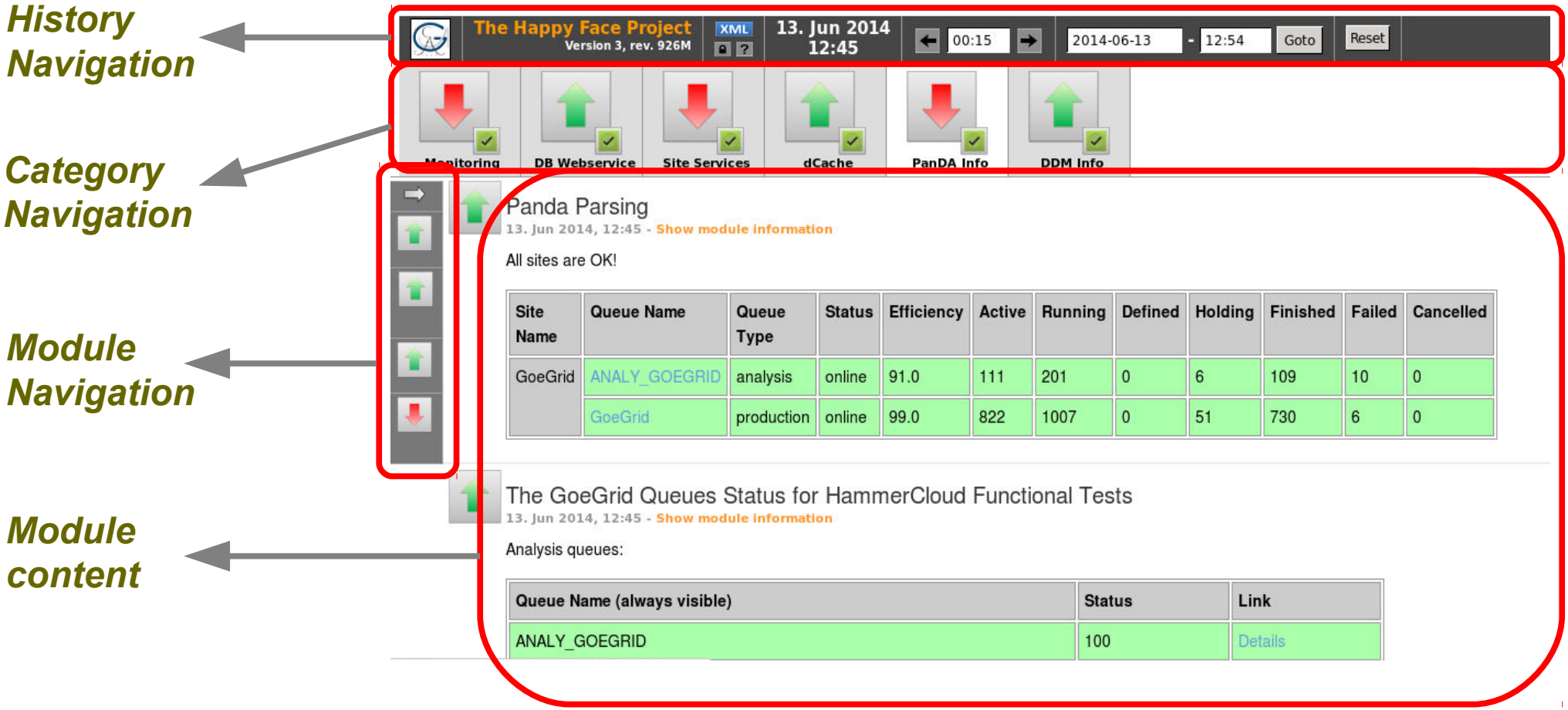
2012-12-01	2012-12-31	396139	396139	OK
2012-11-01	2012-11-30	60975	542875	OK
2012-10-01	2012-10-31	614081	614081	OK
2012-09-01	2012-09-30	480711	480711	OK
2012-08-01	2012-08-31	440136	440136	OK

The interface of HappyFace is the following

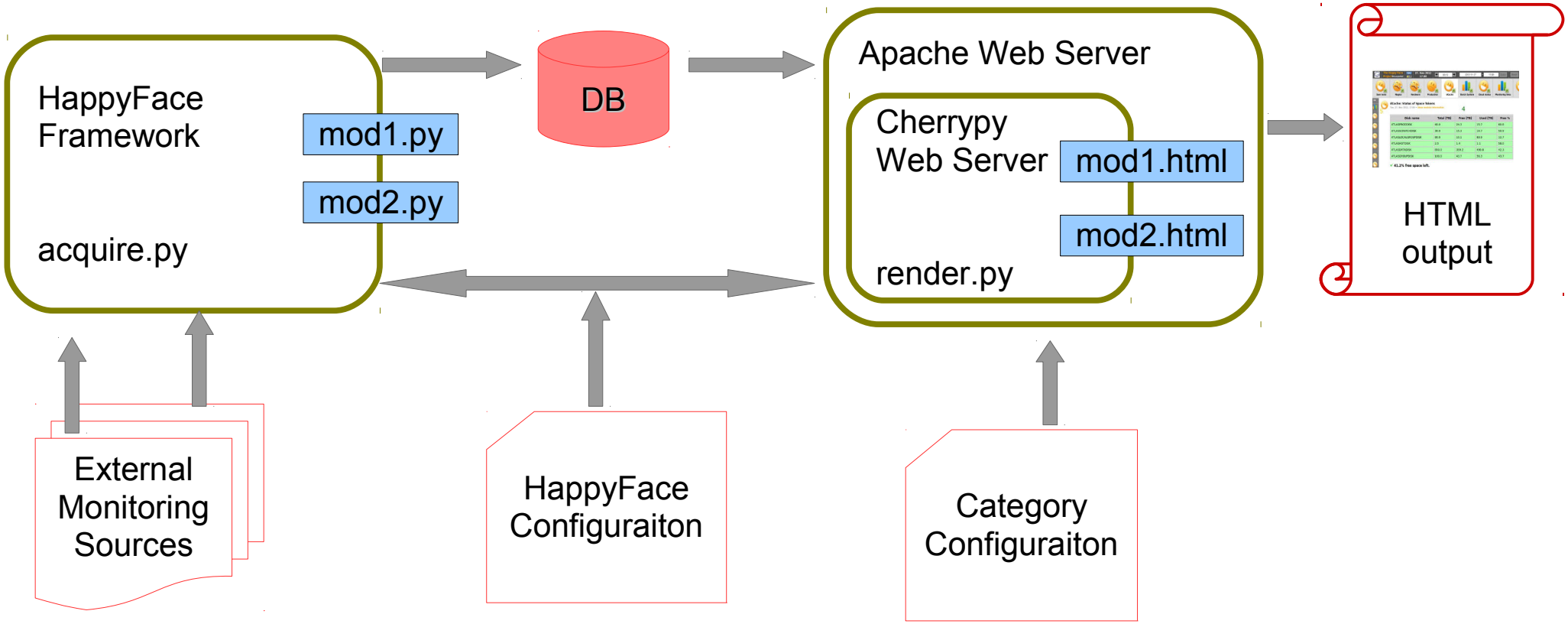


HappyFace has a simple module and category rating system.

Basic workflow

Basic workflow of HappyFace

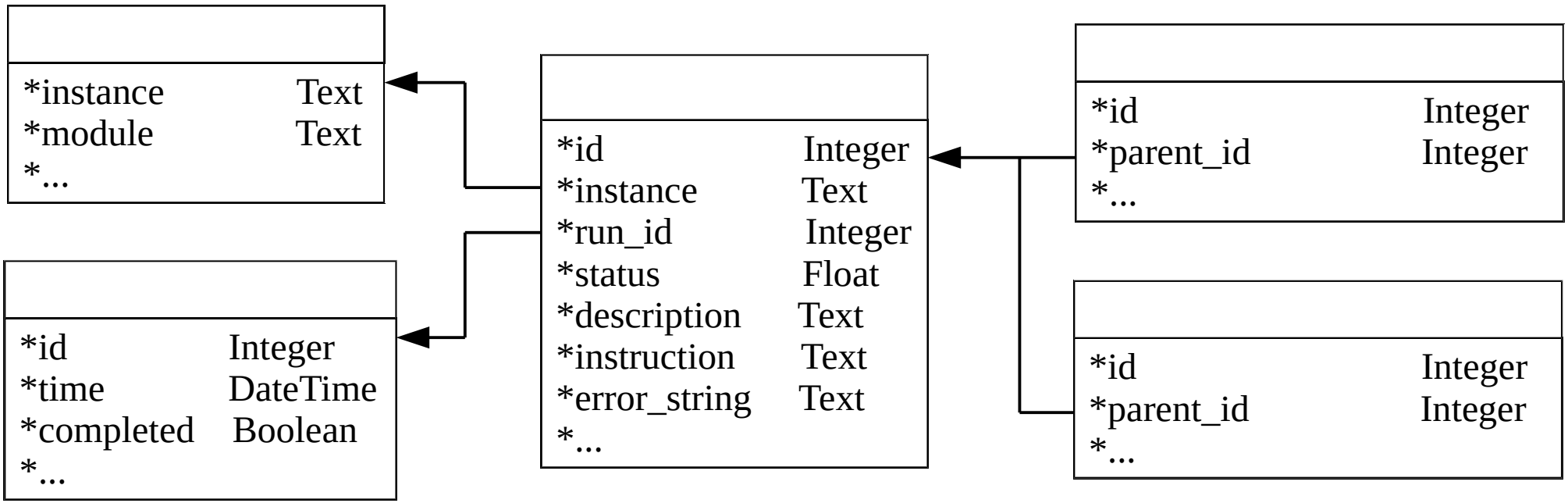
- Retrive data from external sources
- Information is stored in SQLite database
- Output is processed by the **HappyCore** as a HTML file



Database structure

Database structure of HappyFace

- Each module has exactly ONE module table and can have several subtables
- Only a minimal set of information is stored: name, id, status, etc.



Developed modules

The list of developed modules

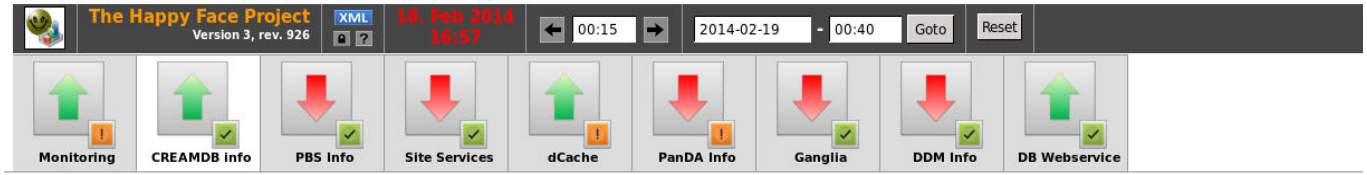
Non ATLAS modules

- Ganglia
- GStat
- SAM tests
- HammerCloud Functional Tests
- Compute Node Information
- Nagios
- dCache Dataset Restore Monitor
- dCache Pool Information
- CreamCE
- PBS

ATLAS modules

- Apel Accounting
- Panda
- Analysis Ganga Jobs
- DDM Dashboard
- DDM Deletion

Non ATLAS module 1



CREAMCE

18. Feb 2014, 16:57 - Show module information

Queue	REGISTERED	PENDING	IDLE	RUNNING	REALLY_RUNNING	CANCELLED	HELD	DONE_OK	DONE_FAILED	PURGED	ABORTED	Total
atlas	0	0	7	0	0	0	0	0	0	0	0	7
atlasL	0	0	5	0	0	0	0	0	0	0	0	5
atlasS	0	0	4	0	0	0	0	0	0	0	0	4
atlasXL	0	0	507	3	940	0	0	0	0	0	0	1450
ops	0	0	43	0	0	0	0	0	0	0	0	43
opsL	0	0	2	0	0	0	0	0	0	0	0	2
opsS	0	0	1	0	0	0	0	0	0	0	0	1
opsXL	0	0	3	0	0	0	0	0	0	0	0	3
Total	0	0	572	3	940	0	0	0	0	0	0	1515

CreamCE

- Queue information
- User information

User	Local User	REGISTERED	PENDING	IDLE	RUNNING	REALLY_RUNNING	CANCELLED	HELD	DONE_OK	_FAILED	PURGED	ABORTED	Total
CN_Maarten_Litmaath_CN_410032_CN_litmaath_OU_Users	sgmops01	0	0	4	0	0	0	0	0		0	0	4
CN_Pavlos_Daoglou_OU_auth_gr_O_HellasGrid_C_GR_ops	ops039	0	0	4	0	0	0	0	0		0	0	4
CN_Robot__ATLAS_Data_Management_CN_531497_CN_ddmad	atlas014	0	0	4	0	0	0	0	0		0	0	4
CN_Robot__ATLAS_Data_Management_CN_531497_CN_ddmad	sgmatl44	0	0	4	0	0	0	0	0		0	0	4
CN_Robot__ATLAS_Data_Management_CN_531497_CN_ddmad	atplt006	0	0	15	0	0	0	0	0		0	0	15
CN_Robot__ATLAS_Pilot1_CN_614260_CN_atlpilo1_OU_Us	atplt001	0	0	333	0	311	0	0	0		0	0	644
CN_Robot__ATLAS_Pilot2_CN_531497_CN_atlpilo2_OU_Us	prdatl46	0	0	167	3	629	0	0	0		0	0	799
CN_Robot__grid_client___Dimitri_Nilsen_OU_KIT_O_Ge	ops009	0	0	41	0	0	0	0	0		0	0	41
Total		0	0	572	3	940	0	0	0		0	0	1515

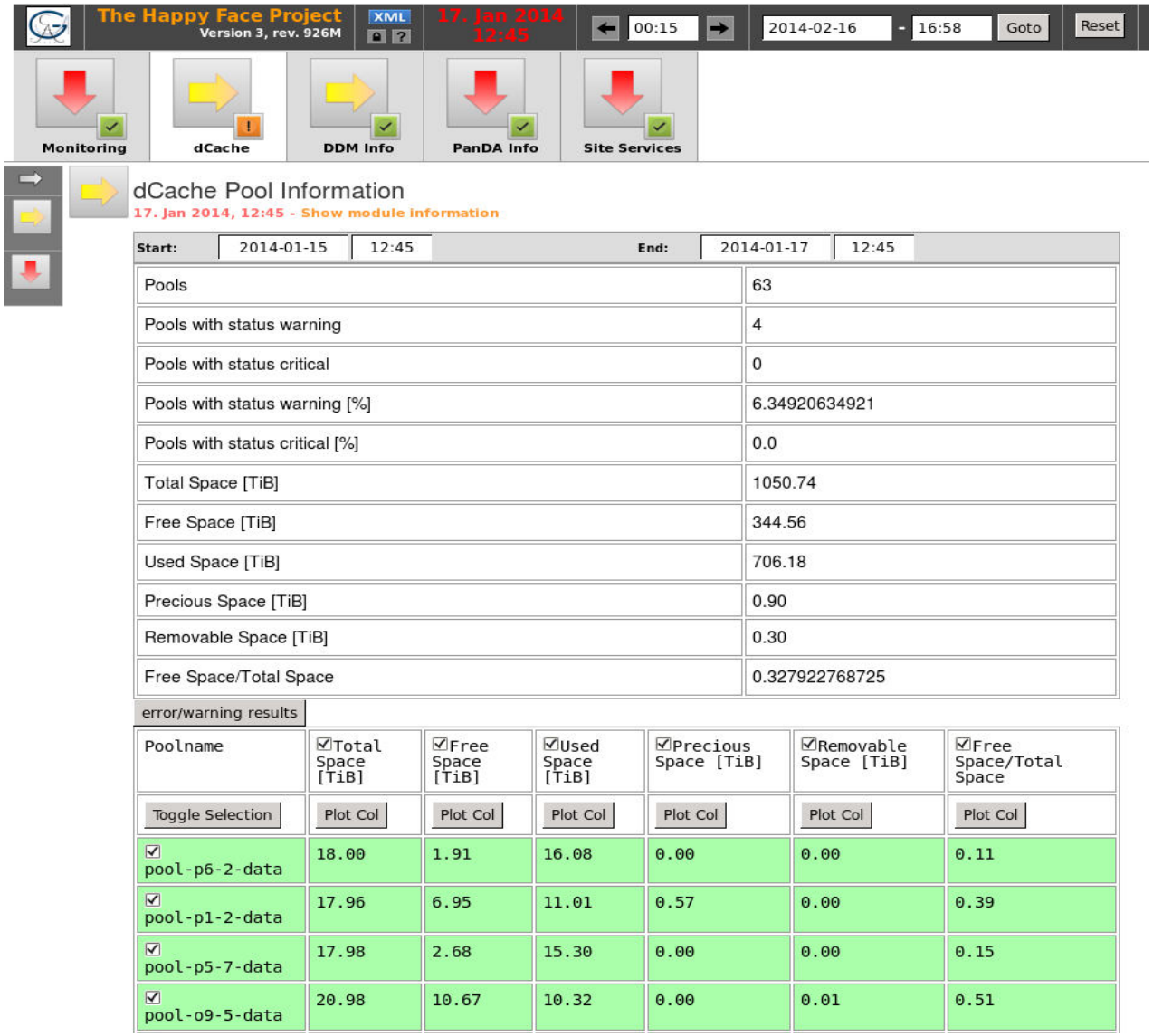
Non ATLAS module 2

Node	REGISTERED	PENDING	IDLE	RUNNING	REALLY_RUNNING	CANCELLED	HELD	DONE_OK	DONE_FAILED	PURGED	ABORTED	Total
N/A	0	0	233	0	55	0	0	0	0	0	0	288
compute-0-10	0	0	6	0	0	0	0	0	0	0	0	6
compute-0-13	0	0	9	0	0	0	0	0	0	0	0	9
compute-0-15	0	0	9	0	0	0	0	0	0	0	0	9
compute-0-17	0	0	11	0	0	0	0	0	0	0	0	11
compute-0-19	0	0	14	0	0	0	0	0	0	0	0	14
compute-0-2	0	0	5	0	0	0	0	0	0	0	0	5
compute-0-21	0	0	25	0	0	0	0	0	0	0	0	25
compute-9-4.local	0	0	0	0	4	0	0	0	0	0	0	4
compute-9-5.local	0	0	0	0	12	0	0	0	0	0	0	12
compute-9-6.local	0	0	0	0	7	0	0	0	0	0	0	7
compute-9-7.local	0	0	0	0	6	0	0	0	0	0	0	6
compute-9-8.local	0	0	0	0	7	0	0	0	0	0	0	7
compute-9-9.local	0	0	0	0	19	0	0	0	0	0	0	19
Total	0	0	572	3	940	0	0	0	0	0	0	1515

CreamCE

- Node information

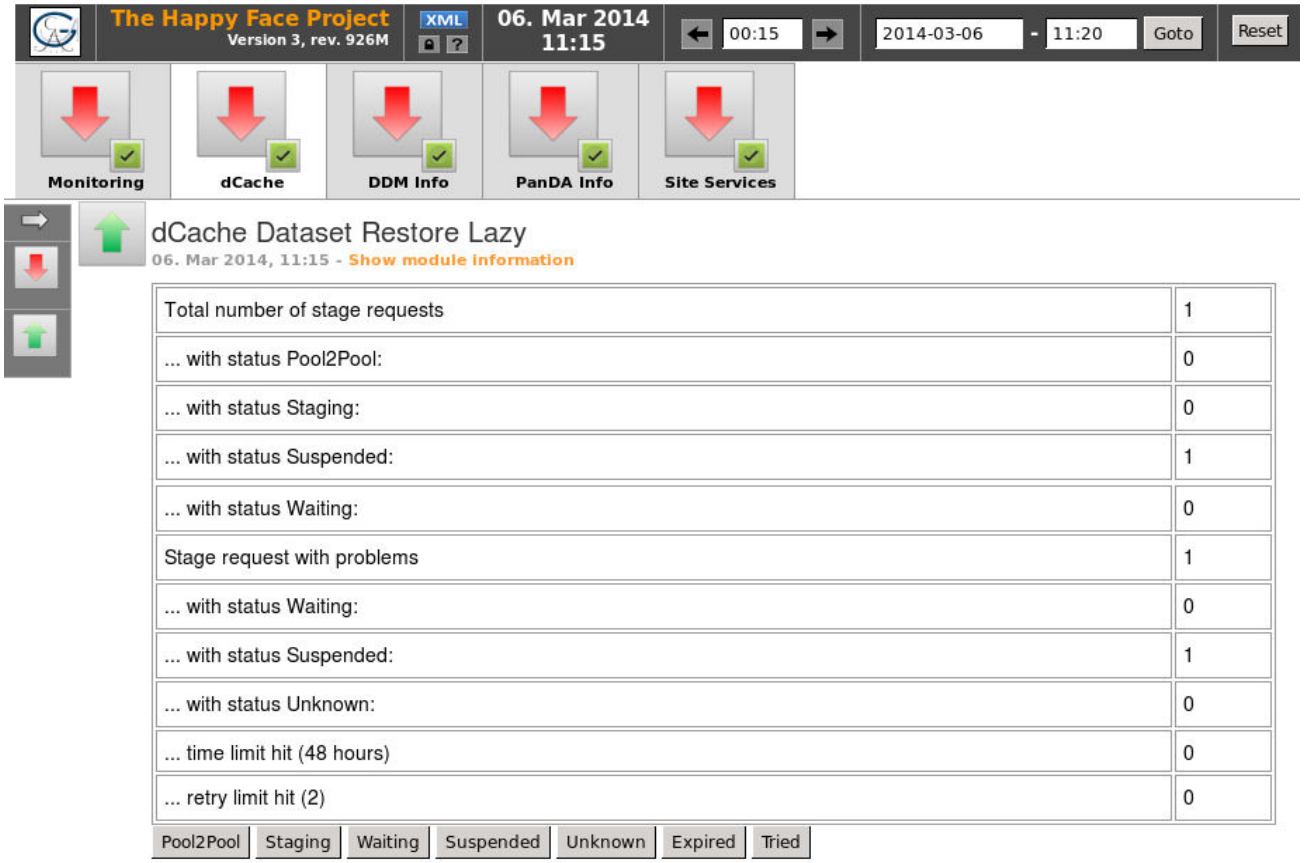
Non ATLAS module 3



dCache Pool Information contains

- Pools status
- Space usage

Non ATLAS module 4



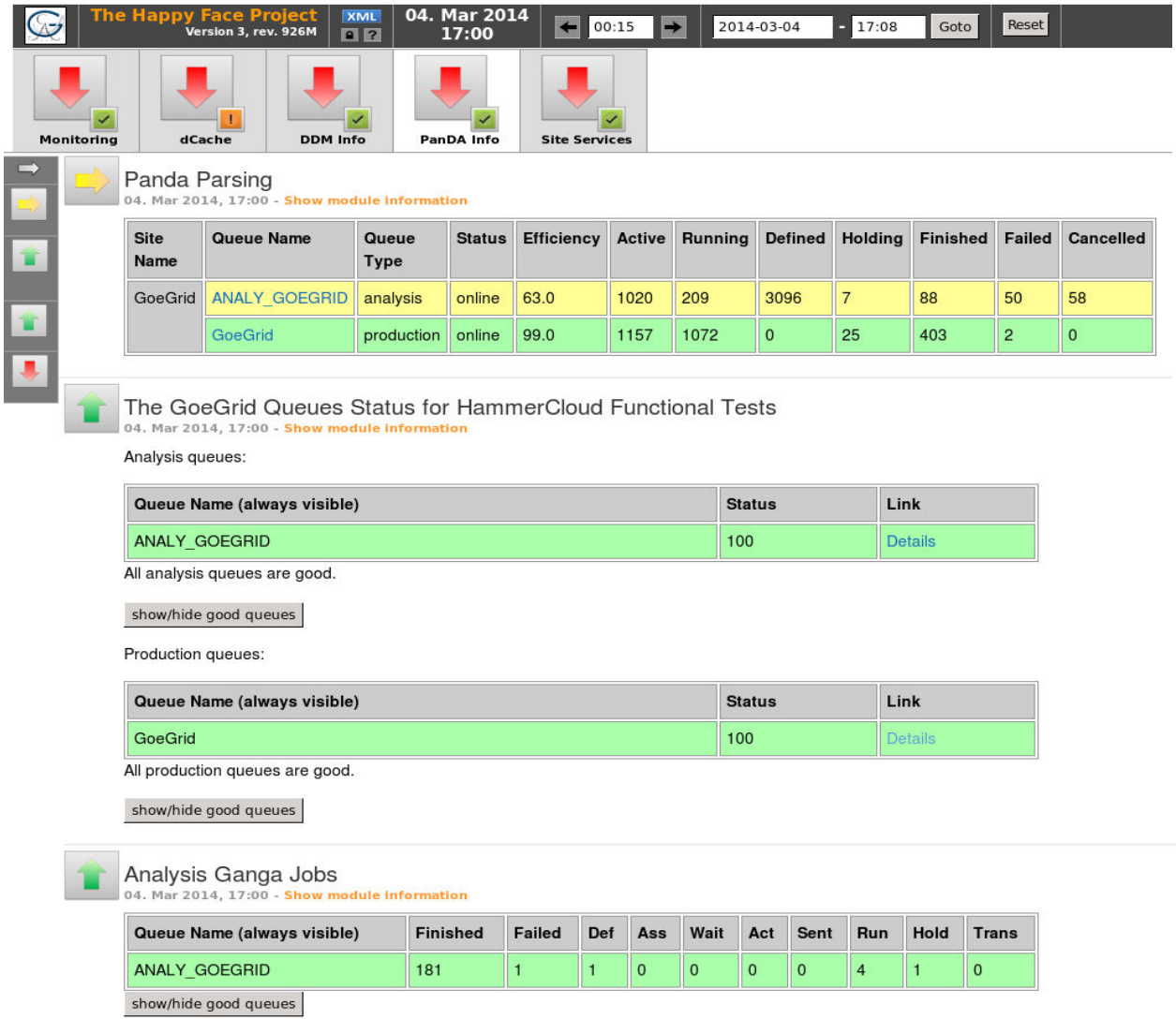
dCache Dataset Restore Lazy contains

- Total stage requests
- Problematic stage requests

ATLAS module 1

Panda module contains

- Analysis queue status
- Production queue status
- Queue status for the HammerCloud Functional Tests
- Analysis for the Ganga jobs



The Happy Face Project Version 3, rev. 926M | XML | 04. Mar 2014 17:00 | 00:15 | 2014-03-04 - 17:08 | Goto | Reset

Monitoring | dCache | DDM Info | PanDA Info | Site Services

Panda Parsing

04. Mar 2014, 17:00 - Show module information

Site Name	Queue Name	Queue Type	Status	Efficiency	Active	Running	Defined	Holding	Finished	Failed	Cancelled
GoeGrid	ANALY_GOEGRID	analysis	online	63.0	1020	209	3096	7	88	50	58
	GoeGrid	production	online	99.0	1157	1072	0	25	403	2	0

The GoeGrid Queues Status for HammerCloud Functional Tests

04. Mar 2014, 17:00 - Show module information

Analysis queues:

Queue Name (always visible)	Status	Link
ANALY_GOEGRID	100	Details

All analysis queues are good.

show/hide good queues

Production queues:

Queue Name (always visible)	Status	Link
GoeGrid	100	Details

All production queues are good.

show/hide good queues

Analysis Ganga Jobs

04. Mar 2014, 17:00 - Show module information

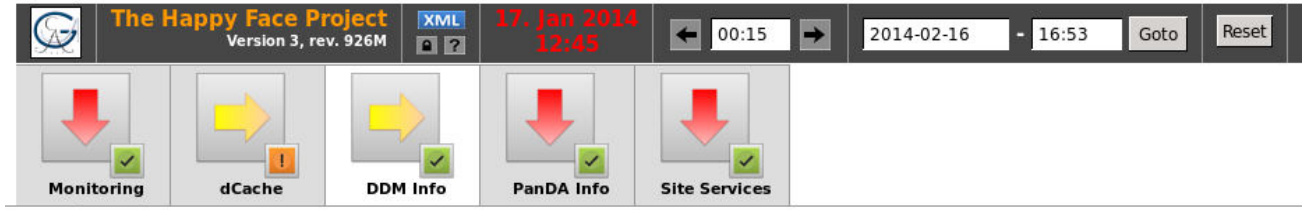
Queue Name (always visible)	Finished	Failed	Def	Ass	Wait	Act	Sent	Run	Hold	Trans
ANALY_GOEGRID	181	1	1	0	0	0	0	4	1	0

show/hide good queues

ATLAS module 2

DDM Dashboard contains

- Transfers to GoeGrid within 120 minutes
- Transfers from GoeGrid within 120 minutes
- Dataset deletion efficiency



ATLAS Data Management Information for GoeGrid

17. Jan 2014, 12:45 - Show module information

Transfers for destination site GOEGRID in interval 120 minutes.

Space Token	Throughput [MB]	Successful	Failed	Failed (site related)	Efficiency	Efficiency (site related)
LOCALGROUPDISK	390.0	47	1	1	0.98	0.98
PRODDISK	89605.0	208	0	0	1.0	1.0
SCRATCHDISK	34.0	15	0	0	1.0	1.0
PHYS-EXOTICS	172564.0	1070	0	0	1.0	1.0
DATADISK	324865.0	106	1	0	0.99	1.0
All tokens	587461.0	1446	2	1	1.0	0.999

Transfers from site GOEGRID in interval 120 minutes.

Space Token	Throughput [MB]	Successful	Failed	Failed (site related)	Efficiency	Efficiency (site related)
PRODDISK	40217.0	553	0	0	1.0	1.0
SCRATCHDISK	81638.0	309	93	0	0.77	1.0
DATADISK	27513.0	20	4	0	0.83	1.0
All tokens	149369.0	882	97	0	0.9	1.0

DDM Dashboard contains

- Transfers to GoeGrid within 120 minutes
- Transfers from GoeGrid within 120 minutes
- Dataset deletion efficiency

Dataset Deletion Efficiency for GoeGrid

17. Jan 2014, 12:45 - Show module information

DDM Deletion for site GOEGRID

	Datasets					Files		Volumes [GB]		
Space Token	**To delete**	**Waiting**	**Resolved**	**Queued**	**Deleted**	**To delete**	**Deleted**	**To delete**	**Deleted**	**Errors**
GOEGRID_DATADISK	1	0	1	0	1	0	5	0.0	0.03	0
GOEGRID_DET-INDET	0	0	0	0	0	0	0	0.0	0.0	0
GOEGRID_LOCALGROUPDISK	0	0	0	0	0	0	0	0.0	0.0	0
GOEGRID_PHYS-EXOTICS	0	0	0	0	0	0	0	0.0	0.0	0
GOEGRID_PRODDISK	47	0	39	8	57	296	560	38.11	97.49	0
GOEGRID_SCRATCHDISK	11	0	10	1	7	1	99	0.0	0.29	0
Summary	59	0	50	9	65	297	664	38.11	97.81	0

Web-services

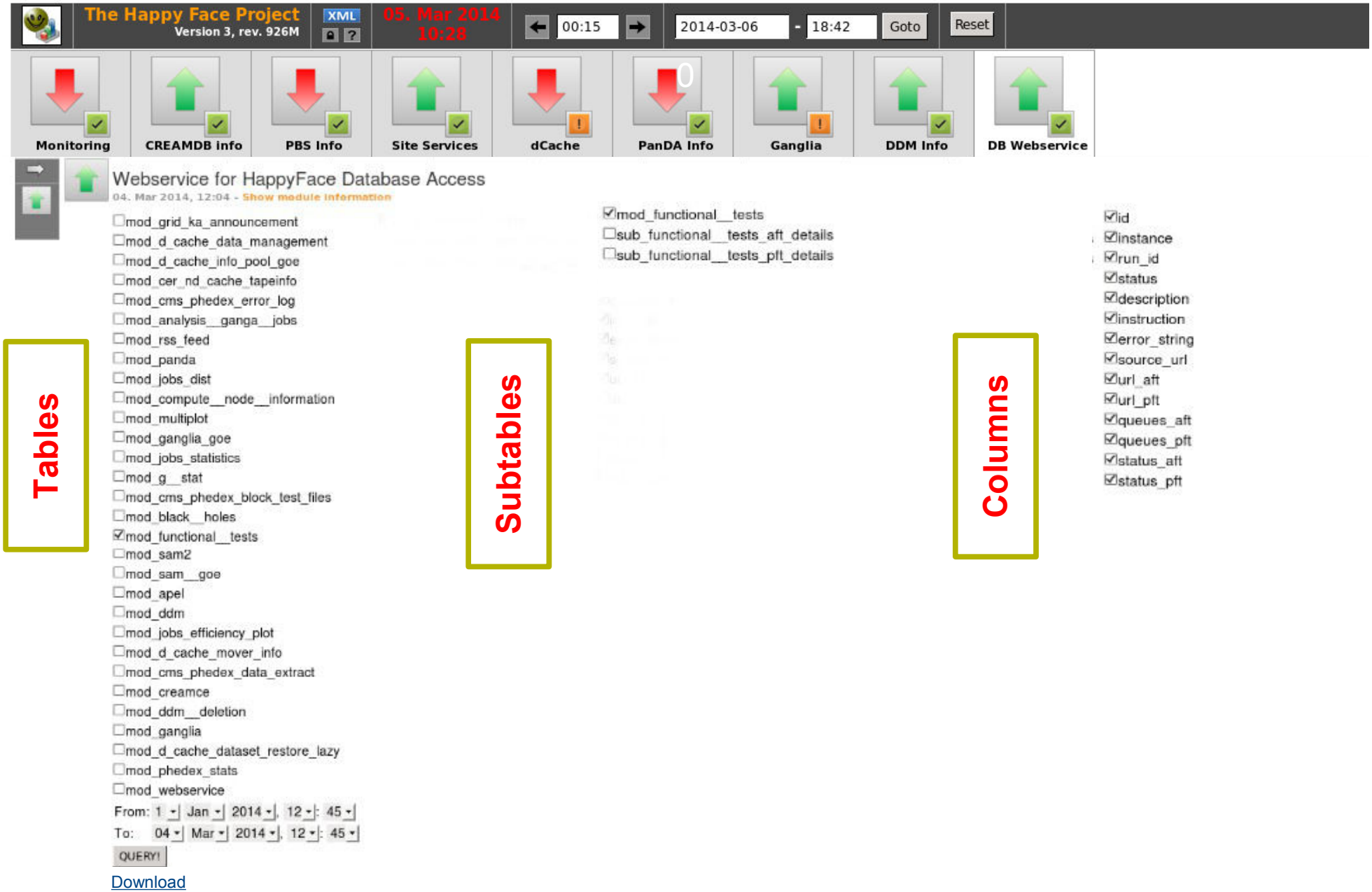
HappyFace web-services provide an easy access to the

- Database structure
- Data, stored in the database

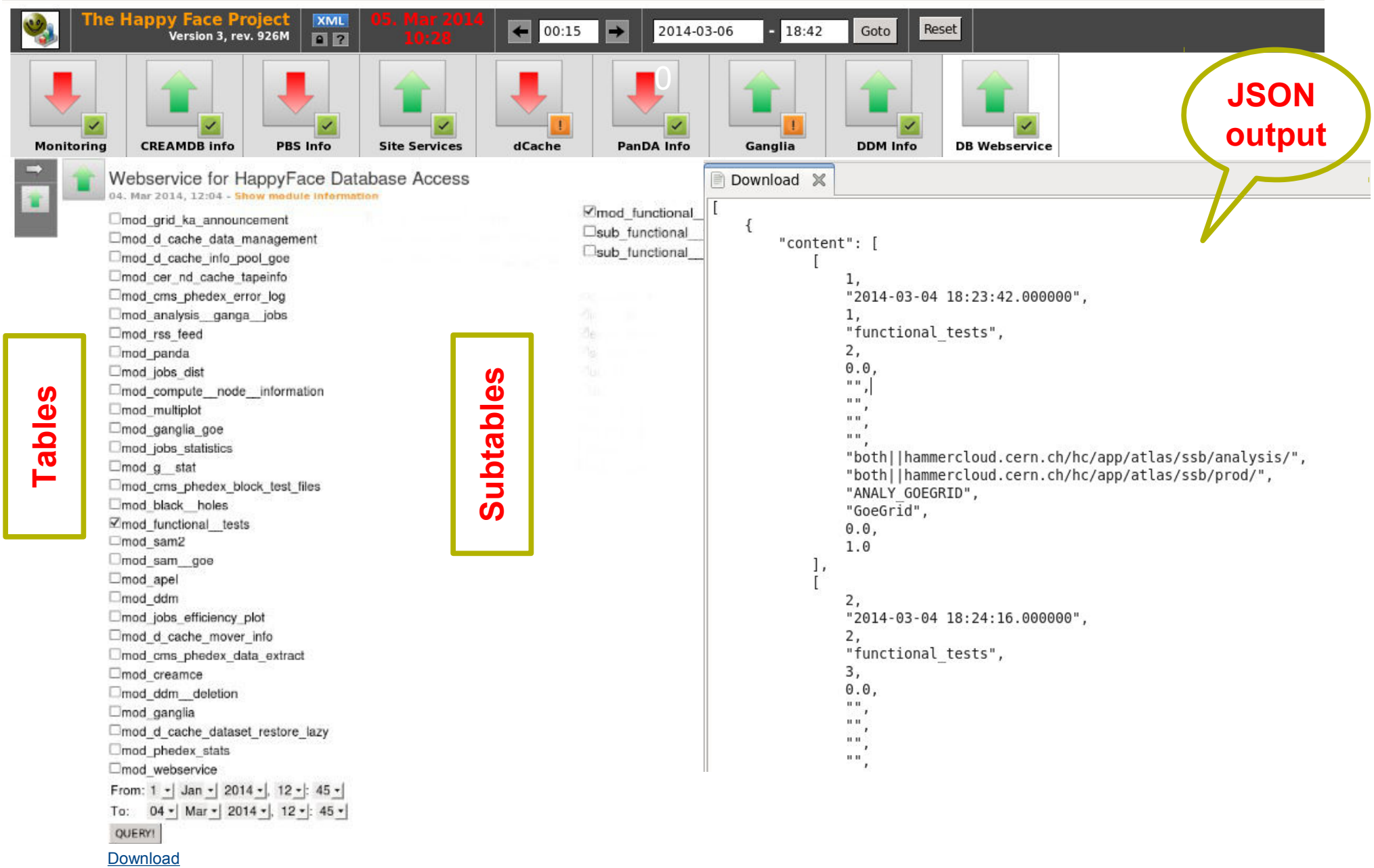
Two kinds of web-service are provided for the database access

- REST-ful web-service with the JSON output
  - Tuning phase
- W3C-compliant WSDL/SOAP-based web-service with the XML output
  - Tuning phase

REST-ful web-service



REST-ful web-service



Installation of HappyFace is simple

- New RPM packages are available
  - HappyFace-3.0.0-1.x86_64.rpm
  - HappyFace-ATLAS-3.0.0-20140304.x86_64.rpm
  - HappyFace-ATLAS-internal-resource-3.0.0-20140304.x86_64.rpm
  - HappyFace-ATLAS-webservice-3.0.0-20140304.x86_64.rpm
- yum testing repository exists

Ongoing development

- Grid-enabled command wrapper implementation is still ongoing

  -This will provide an access to the protected information.

- Mobile/smartphone application developement is in final stage

  -The application is be available for both major smartphone OS Android and iOS.

- Smart Monitoring System (independent project)

  -This will provide analitical information for the site services.

Smart monitoring system

Motivation

- It is possible to use monitoring information for more than only show the current status of the observation object

Outcome of analytics

- Make a service degradation forecast due to the load
- Perform the service failure Root Cause Analysis (RCA)
- Define the critical level dynamically

Smart monitoring system

This information can be usefull for

- Users

  -If it is known 1 hour in advance that a certain service might fail on a site nobody will submit additional jobs there

- Site Administrators

  -Service failure Root Cause Analysis would be helpful in bottleneck identification in the infrastructure

- Site Administrators,Cloud support and Central Services Managers

  -It will be possible to tune the Resource Management Systems and load balancers automatically to find out a certain load thresholds for different sites. If site will increase the hardware power or tune the systems threshold will be changed automatically.

This work currently doing our PhD student Erekle Magradze (email: erekle.magradze@cern.ch.).

For more details, please contact him directly.

Conclusion

- HF is a robust framework working for various experiments CMS/ATLAS/Belle in different sites.
- HF has modular structure and supplies a web-service in a different format and time frames.
- HF mobile application soon will be available to use
- As a next step of HF project Smart monitoring system can be taken into account
- The goal is to make HF used by the ATLAS community.

Thanks for the attention