Testing Experiment Services - SAM tests

Patricia Méndez Lorenzo (CERN, IT-GS/EIS)

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- SAM is covering the LHC VO needs to have a full picture of the Grid status
  - In terms of Grid Services
  - In terms of VO specific services
- A flexible SAM environment is required and provided to each VO
  - To establish the list of sites to tests (and possible relations between sites)
  - To define their own test suite associated to each critical service
- In this talk we will cover the following aspects:
  - SAM implementation and test suites for each VO
  - Calculation of the site availability: **Gridview**

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- We proposed a general questionnaire to each VO to have a general picture of the SAM use
  - Sent and discussed with EIS members
  - Following the mechanism we established (Sep 2007) to check the T0 level of services
    - *Implementation and Execution of the specific test suite*
    - *Creation of the list of sites to test*
    - *Sensors included in the test setup*
    - *Definition of critical and non-critical tests per sensor*
    - *Extension of each specific test suite to the rest of VOs*
    - *Use of FCR*
    - *Alarm system*
    - *Site and expert actions in case of failures in the services*
   - *Future plans*
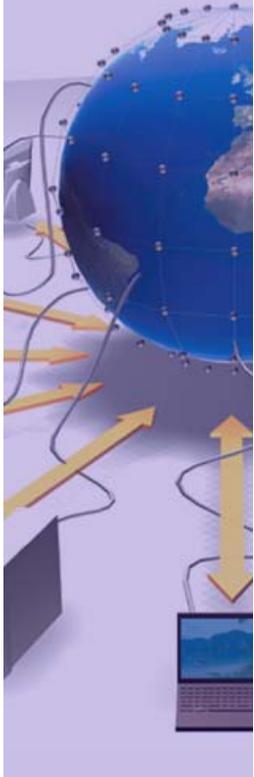
- ALICE is using one of the SAM UIs placed at CERN (monb002)
  - **Trigger** the specific test suite, **collect** the results from each site and **publish** the results
- Definition of the list of sites based in a procedure developed by the SAM experts
  - A local (ALICE) file containing the list of sites to test is accessed by SAM each 1h
    - File under ALICE access
  - Those sites which have been lately included in the list will be registered into the SAM DB
    - The test suite will be automatically triggered to this new site(s) and the results published into the SAM web page
      - Procedure applied to WLCG sites only

ALICE view (II)

- ALICE sensors and tests
  - Tests executed with ALICE credentials and defined to test (exclusive) the service and its functionality
    - No tests related to the ALICE services or the specific experiment software (covered by MonaLisa)
    - **The specific test suite contains 9 tests (high modularity) and can be easily adapted to the rest of experiments**
  - **VOBOX** at each site: Specific test suite executed at each Tx each 2h
    - Status of the proxy renewal mechanism (critical tests)
      - Proxy renewal service, user proxy registration, registration of the machine within myproxy server at CERN, status of the proxy machine, duration of the user delegated proxy
    - Access to the software area (critical test)
    - Status of the ALICE job agents (NOT critical)
    - Status of the local RB (critical test)
  - **CE:** standard "ops" test suite
    - Job submission procedure, CA versions and software area (all declared as critical)
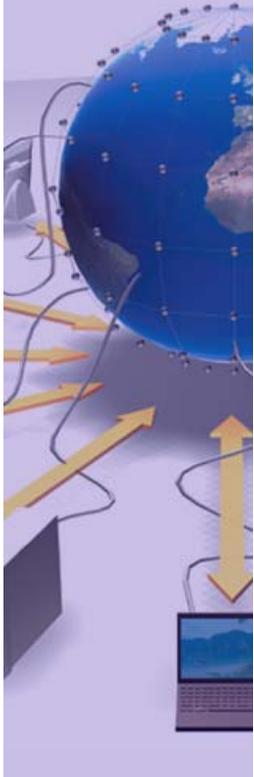
- Use of FCR
  - Definition of Critical Tests only
  - Site exclusion system included in the experiment framework
- Alarm and notification system
  - Created by SAM developers and based on an email notification system once a critical test fails
    - SAM results are interfaced with MonaLisa
      - MonaLisa also triggers a notification including higher verbosity
  - ALICE is ready to stop this system for those sites providing their own alarm procedures in case of failures
    - Nagios sensors, etc
- Site and expert actions are expected in case of errors
- Future plans
  - Test suite modifications for the gLite.3.1 VOBOX
  - FTS and WMS specific tests are foreseen

- ATLAS triggers the test suite from SAM UI placed at CERN together with some external machines

  – External results recorded at CERN for publication purposes

- List of sites to test provided by the BDII together with a specific list of sites (TierOfATLAS python dictionary)

  – For the CE sensor: BDII

  – For the SE sensor: BDII + list of sites including the srm endpoints

ATLAS view (II)
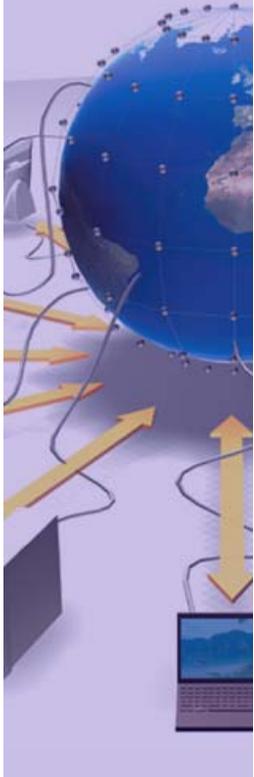
- **ATLAS sensors and tests**
  - Executed with ATLAS credentials
  - **CE:** Specific test suite including one critical test
    - Ganga-robot test: Analysis job checking the behavior of LFC, lists a data set, locates a file and access it via Ganga
  - **SE**: Specific test suite oriented to srm checking
    - Valid for both srm.v1 and srm.v2 (declared as critical)
      - Copy and registration of a file using the full srm endpoint and with the LFC at the T1
      - Copy of a file using the full srm endpoint
      - Deletion of the file
  - **FTS:** Including 1 "ops" test defined as critical
    - List of FTS channels
  - **LFC**: Including 2 "ops" tests defined as critical
    - Creation and list of a file for ATLAS VO

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- FCR not used to black list any site
  - Use for the definition of CT only
- The alarm system and operation procedures still under discussion in the experiment
- Future plans
  - Increase the granularity of the *ganga-robot* test (CE sensor)
  - CE test based on the information from Panda
  - **New GUI creation based on the CMS setup included in Dashboard**
  - Modification of the VO-tag (CE sensor)
  - Installing the set of tests for srmv.2 (SE sensor)
    - Test suite defined to test each srm endpoint **for each space token**
      - Copy and registration of a file including the full srm endpoint and specific token using the T1 LFC
      - Copy of a file of a file including the full srm endpoint and specific token
      - Deletion of files

- Test suites executed from one SAM UI placed at CERN
- The list of sites are generated using a CMS DB containing the information about all the sites
  - cross-checks with the SAM-DB before execution
- CMS sensors declared for the CE and SRM
  - Critical tests created based on the "ops" standard tests
  - Specific VO tests are no declared as critical
   - Their failures mean a degradation of the site performance

CMS view (II)

- ## CMS tests

  - Executed with CMS credentials
  - **CE:** VO specific test suite including two critical tests copied from the "ops" standard test suite (job submission and CA version)
    - Basic: checks correct CMS environment and software area configuration
    - Squid, Frontier: Verification of the access to the local CMS calibration DB
    - Swinst: CMS software version installed and available at the site
    - MC (runs with production group credentials): verifies that the output of Monte Carlo production may be copied from the WN to the local Storage Element

- **SRM:** VO specific test suite including one critical test (v1-put: store file to srm.v1 using srmcp)
  - Decoupled as much as possible from other Grid services as LFC and FTS
  - The VO-specific part has been made as similar as possible to CMS (PhEDEx) operations activity
    - advisory-delete: Removal of the file previously copied using v1-put
    - get: retrieval of the file previously copied with v1-put
    - get-metadata: verification of the metadata for the file copied via v1-put
    - pfn-from-tfc: check of the Trivial File Catalogue availability and uses it to translate a LFC into a PFN with the srm protocol.

- notification system based on Savannah ticket submission
  - Manual visualization of the results once per day

- Future Plans:
  - Suite of tests for srmv.2 in production (in collaboration with ATLAS): **IMPORTANT TO DEFINE SITE STATUS**
 - Specific tests for analysis ongoing

- Test suite implemented into the Dirac infrastructure and running into a dedicated node placed at CERN
  - Dirac submits pilot jobs which execute the SAM tests suite into the WN
  - The SAM results publication is performed from the WN
  - Caching of the SAM jobs failures into specific Dirac logfiles
- List of production sites taken from the SAM DB
- LHCb has defined an specific test suite for the CE and the SRM sensors
- FCR: Own experiment mechanism to black list the sites
- The experiment does not consider the SE/SRM as separated sensors
  - Only for the site availability calculation

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- **LHCb tests**
  - All tests executed with LHCb credentials
  - **CE:** VO specific tests all considered critical (executed each 8h)
    - Check the compatibility between the length of the queue published in the IS and the OS available at the site and the experiment requirements
    - Specific software installation operations: install and delete
    - LHCb events specific tests: generation and simulation, digitization, reconstruction and analysis
    - Some basic srm function
  - **SRM**: (applied to srm.v1) VO specific tests defined as critical
   - Storage and access of files and retrieval of metadata

- **FTS**: VO specific tests defined as critical and performed at T0 and T1 sites
  - Control of the channels, FTS endpoint publication and behavior of basic transfer commands
- **LFC:** VO specific tests defined as critical and performed at T0 and T1 sites
  - LFC is a central service mirrored at T1
    - Stream procedures implemented by 3D
  - Location of replicas at T0 and (mirrored) T1 sites
  - Registration of a file at T0 and stream behavior at the T1 sites
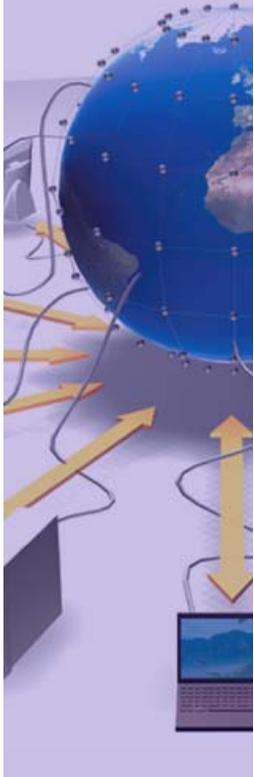
- Alarm and operation procedures still to be discussed in the experiment
- Future Plans:
  - Adaptation of the current srm tests for srm.v2
  - Inclusion of tests for gLite WMS and VOMS
 - T1-T1 matrix sensors
  - T0-T1 matrix sensors
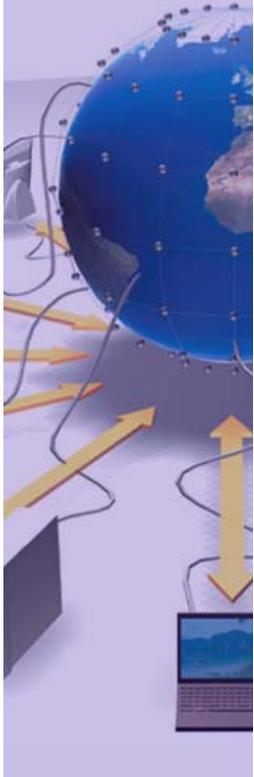
- Gridview (gridview.cern.ch) calculates the site availability per VO based on the CT results published by SAM

- The algorithm uses for the moment the status of the CE, SE, SRM and BDII

  – Five possible status are provided per service/site/VO

    • SCHEDULED DOWN: The service has been marked as under scheduled downtime. Tests results ignored

    • DONTCARE: no critical tests defined for this service

    • UP: All critical tests have passed

    • DOWN: at least one critical test has failed

    • UNKNOWN: no critical test is failed and the result of at least one critical test is not available

Gridview (II)
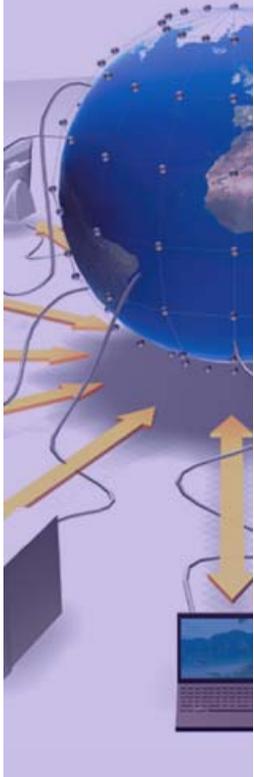
- The full availability of the site forces the good behavior of all sensors
  - Before the DONTCARE status, VOs had to define fake tests for those sensors which were not critical for them
    - Otherwise the status of the service would be set to UNKNOWN and the total availability of the site would be false
  - At this moment the DONTCARE and UP status are marked with the same color
    - Procedure valid for the availability algorithm but not for the service visualization in the gridview page
    - Savannah ticket required
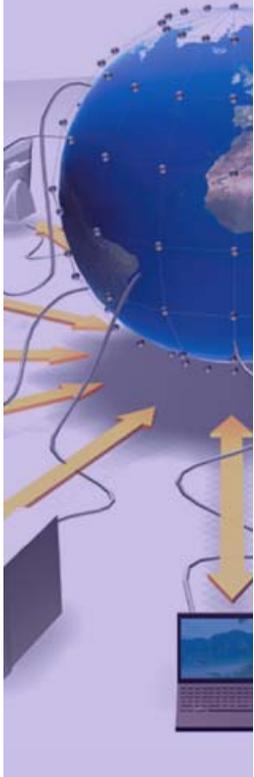
- The inclusions of sensors into the availability calculation based on VO decision could be a good procedure to ensure more real results

  - For example, ALICE would like to include the VOBOX results into the availability calculations and exclude the SRM

  - The inclusion of sensors is not a VO decision now

    - This means; if we include the VOBOX for ALICE into the algorithm, we include it for all experiments

    - A "small" change on the DB schema?

    - Simpler solution based on the non definition of critical tests for those sensors which are not required into the algorithm
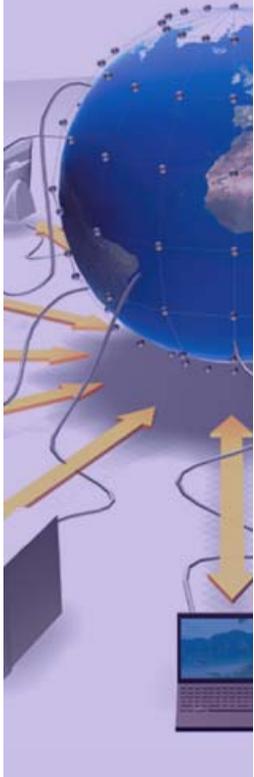
- **The four LHC experiments are using the SAM Monitoring system to visualize the status of the Grid services**

  - In general all experiments are defining their own test suites for the critical services
    - srm.v2 test suite ongoing for ATLAS, CMS and LHCb
  - High flexibility is a common requirement for all the VOs
  - The alarm and notification procedure in case of errors are still opened issues in the experiments

- **Several aspects of Gridview to discuss with the experts**