



Enabling Grids for E-scienceE

SA3

Markus Schulz

CERN-IT-GD

Markus.schulz@cern.ch

Thanks for all the contributions

www.eu-egee.org



- **MSA3.2 Software Process**
- **MSA3.5 Test Plan**
- **Recommendations from the last review**
- **Status**
 - Execution Plan
 - All-Hands-Meeting
- **Future Plans**
- **Issues**
- **Full execution plan**

- **Software Process**
- **Milestone document is used as a live document**
- **Close to the old gLite process**
 - gLite process: optimized for development
 - New process: targeted at maintenance and bug fixes
 - Some modifications to Savannah to allow better tracking
 - Started to look into access to data in savannah
- **In practice:**
 - Stick to the process
 - Handle special cases outside the process
 - WMS tests in production with CMS

- **The Software Process**
 - How we should be working
 - The different roles with defined responsibilities
 - The interaction between the different roles
- **Creates a primary information source**
 - The reference for all knowledge on problems and solutions
 - Implemented in Savannah
 - Traceability of the problems and the solutions
- **Not written in stone**
 - If we find a problem with the process
 - Analyze the problem and improve the process
 - Must follow the process correctly

- **Component**
 - The smallest self-contained package (e.g. one rpm)
- **Subsystem**
 - A logical group of components (e.g. R-GMA, WMS)
 - Globus, Condor etc considered to be subsystems.
- **Baseline**
 - The full list of components that make up a release.
- **Two distinct entities, Problems and Solutions** 😊
 - Problems = Bugs
 - Solutions = Bug Fixes = Patches
 - New features are tracked as “Enhancement”
 - Missing feature = Problem

Operating System

Externals
Packages

External
Middleware

Internal
Middleware

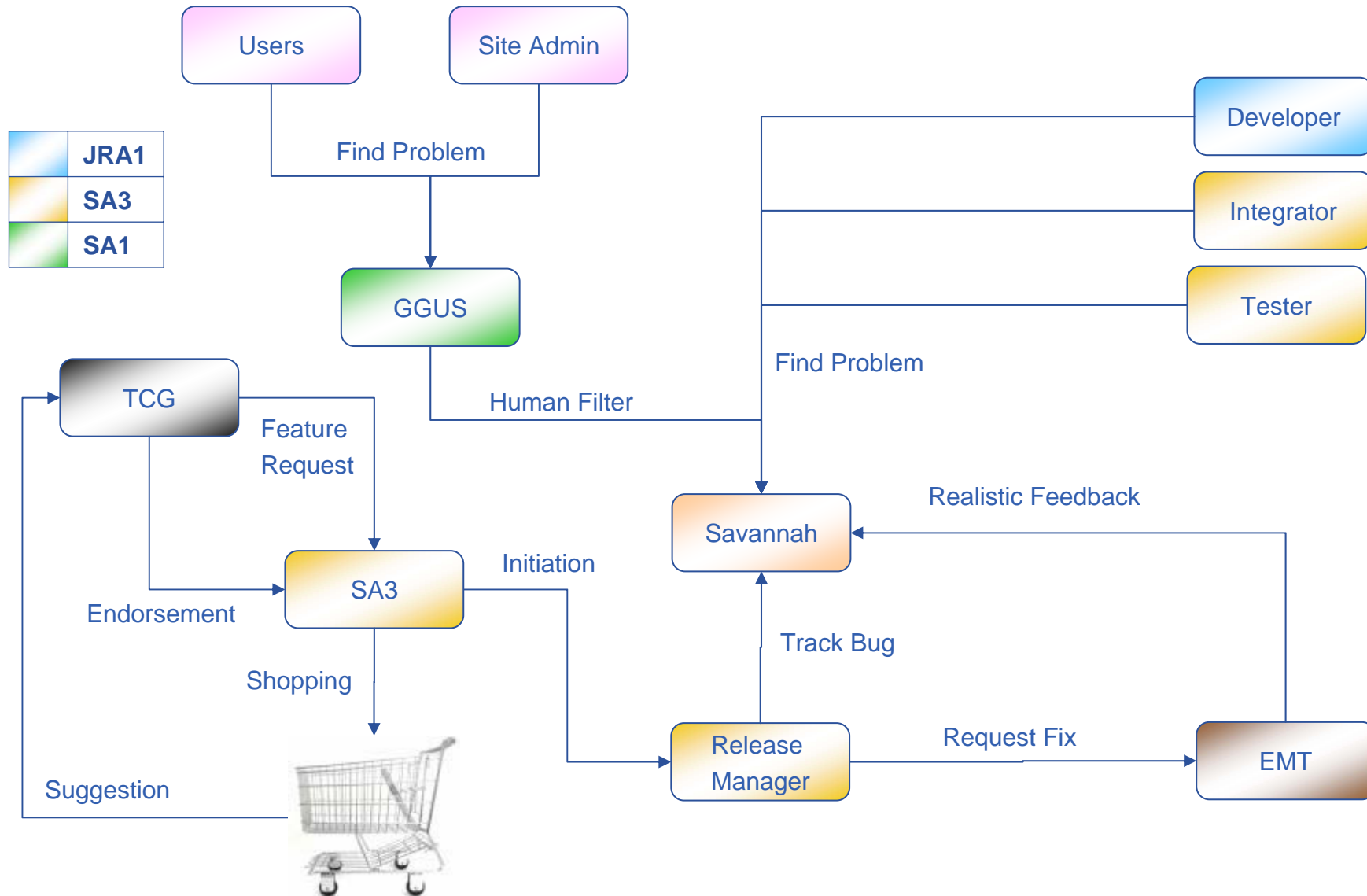
- **Most software is provided as a package**
 - Packages found in project repositories and from web pages
 - Only internal middleware needs to be built from CVS
 - Require mapping rule from package name to CVS tag
 - *Package version x_y_z = CVS release tag R_x_y_z*
 - “Grey areas” between categories, hence spectrum
- **Need to integrate at the package level**
 - View every thing as an external component
 - The build for internal components is decoupled
- **Defined configurations (meta packages) for**
 - Service Types
 - Nodes Types

- **Repository structure**
 - currently being reworked to reflect component based updates
 - OS -> OS dist rep
 - Baseline
 - Updates
 - Security-updates
 - CA
- **A software release is a set of packages (baseline)**
 - These packages are continuously updated to fix bugs
- **The baseline contains a core.**
 - Analogous to the kernel and gcc for linux distribution
 - Changes to the core make the release non-backwards compatible
 - At the software level rather than the service level
- **Changes of the core will require a new release**
 - New apt repository
- **Minimal functionality changes**
 - Not an open invitation to put everything
 - Updates included into the baseline
- **“Developers Playground”**
 - Preview access to next release (core)

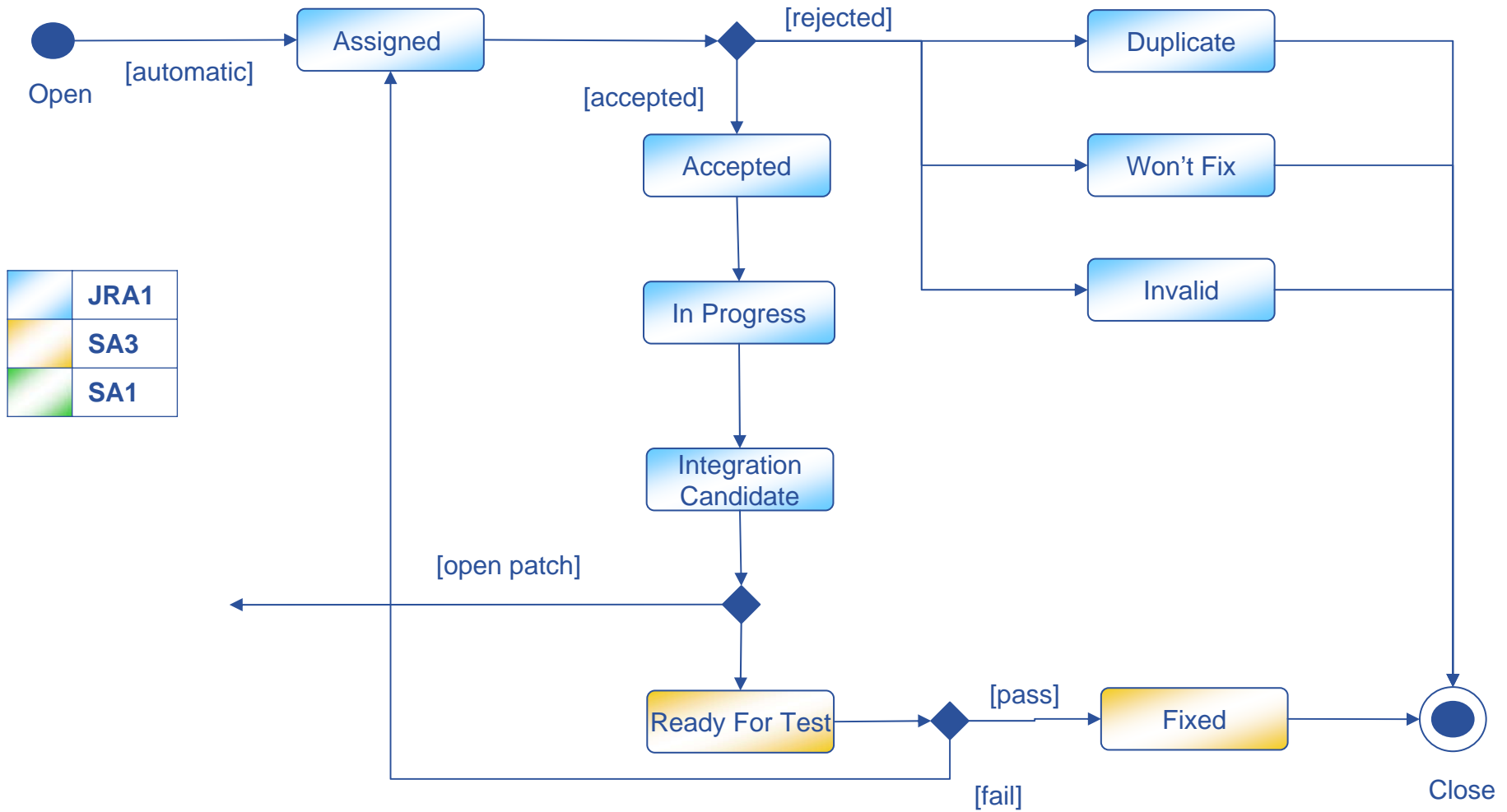
Subsystem Bug Manager	Manages bugs in the subsystem
Developer	Investigating bugs and provides a solution
Subsystem Integrator	Releasing components and subsystems
Integration Manager	Responsible for the software repositories
Certification Manager	Responsible for certification
Pre-production Manager	Responsible for the pre production
Production Manager	Responsible for the production system
EMT	Sets priorities for developers and the release process
TCG	Sets priorities for new features
Release Manager	<ul style="list-style-type: none"> • Responsible for overall coordination. • Tracking priority bugs • Pulling patches into the certification • Ensuring that software has been tested • Releasing software to the pre production and production.

Note: Some of the roles may be carried out by the same person

- **All bugs are tracked in Savannah**
 - Including feature requests, “Enhancements”
- **New bugs are reported from many places**
 - User and sys admin bugs are filtering via GGUS
- **TCG requests new features**
 - SA3 shops around for solutions
 - Proposal given to TCG to endorse
 - Request given to the release manager
- **EMT**
 - Gives realistic feedback on bugs
 - Priorities discussed
 - Criticality of update vs development schedule
 - Timelines assed
- **Release Manager coordinates everything**

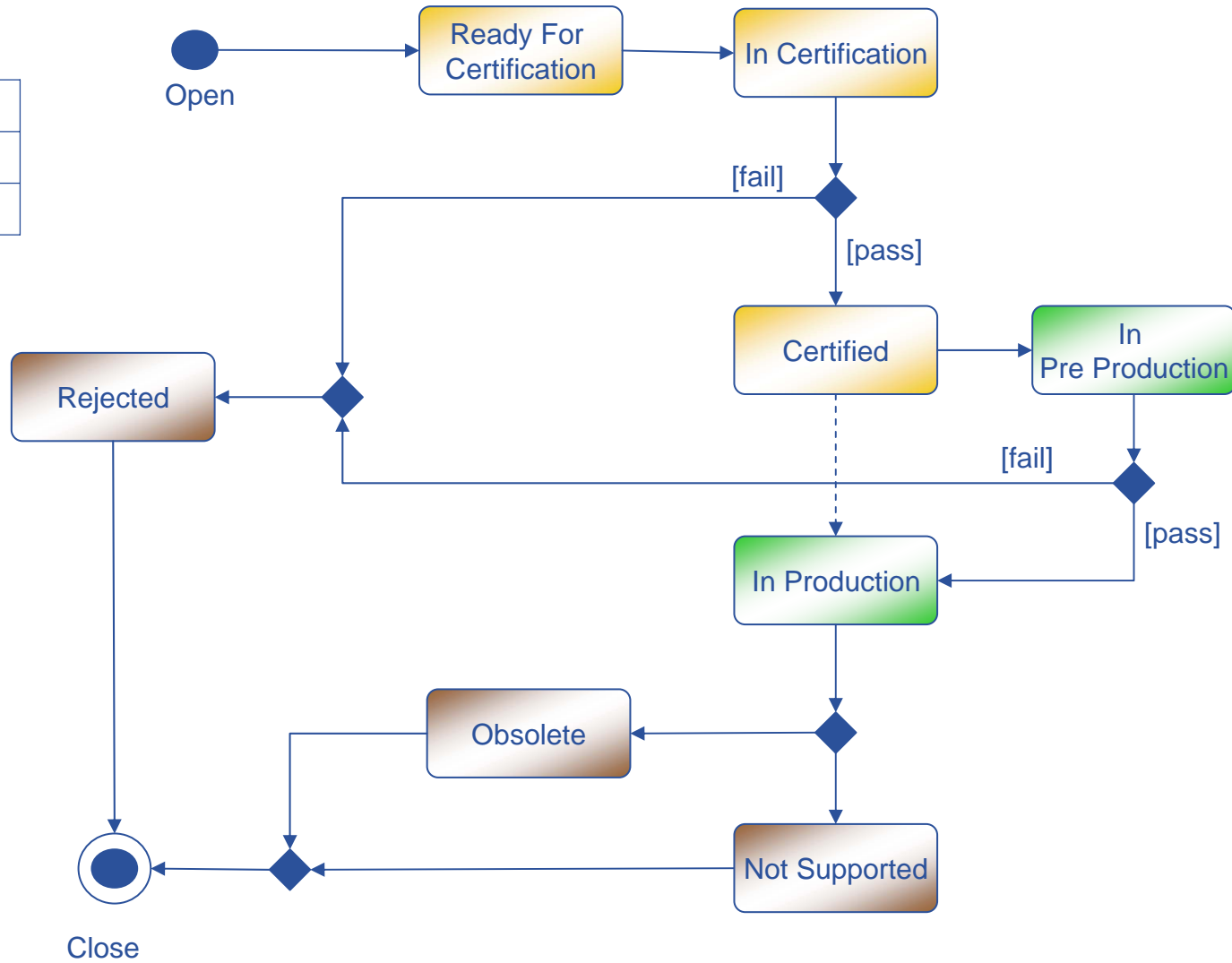


- **Bugs automatically assigned to subsystem bug mangers**
 - Subsystem manager assigns bug to a developer
- **Developer investigates and checks fix into CVS**
 - Developer assigns bug to subsystem integrator
- **Subsystem integrator releases subsystem/component**
 - Tags CVS with a release tag (component_R_x_y_z)
 - Creates a Patch.
 - Adds all required information to the patch
 - Links all the bugs to the patch.
 - Puts Bug into state “Ready for Test”.
- **Testers Monitor “Ready for Test” State**
 - See linked patch for state of fix in the process.
 - Close bug when verified
 - Or put into “Ready for Review” for user bugs
- **Only for Certification, Pre Production and Production Bugs**
 - Development bugs can be closed by the developer



- **Integration team receives new patch.**
 - With all required information
 - Linked bugs
 - Check provided information against the checklist
 - Obtain software
 - Ensure that packages have been created
 - Or locate the packages from another repository.
 - Do any prerequisite steps
 - Update configuration
 - Update tests
 - Move patch to “Ready for Certification”
- **Release manager pulls patches.**
 - Patch moves to “In Certification”
- **Patch is certified or rejected**
- **Patches can go to straight Production or via PPS.**
 - Production updates must go to PPS in parallel

	JRA1
	SA3
	SA1



- **Patch progression depends on**
 - Actions (build, etc.)
 - Tests (automatic, manually, etc.)
 - Meeting criteria
 - Expressed by check lists
 - Currently only 'soft' defined
 - *Has to be agreed between SA3, SA1, NA4, and JRA1*
- **First lists from the document:**

- ✓ **Functional description of the service**
- ✓ **User documentation (man style quality) to allow testers to start**
- ✓ **List of "sub services" and their role, this includes location and description of log files.**
- ✓ **List of processes that are expected to run, giving a typical load of the service.**
- ✓ **A description on how state information is managed. Examples are: file xxx contains the state of active transfers, DB table YYY is used to maintain the state of all jobs ever run.**
- ✓ **A statement on whether the state be rebuilt from other sources.**
- ✓ **Description of how to follow audit trails**
- ✓ **Description of configuration, no detailed document, but a (simple "do this, do that")**
- ✓ **Port list, including which services are expected to connect to the specified ports or port ranges.**
- ✓ **Description on how to start, stop and inquire service state.**
- ✓ **Each service and client has to publish its version.**

- ✓ Configuration tools and detailed description of the config parameters
- ✓ If not build via gLite ETICS instance a finalized list of dependencies
- ✓ Statement on 32/64 bit compliance
- ✓ Statement of functionality that will be supported including an estimated scale. This can be a subset of the functionality expressed via the API.
- ✓ Tests for supported subset functionality in a form that can be adopted by SAM.
- ✓ Co-hosting matrix, this doesn't need to be complete, it is assumed that none, but the stated services can be co-hosted.
- ✓ Statement on whether the component can be installed and configured from user level
- ✓ An initial operations guide containing information such as:
 - ✓ how to drain a service
 - ✓ effects of restarting services
 - ✓ what actions are needed that configuration changes become active
 - ✓ effects of services being stopped abruptly, what cleanup process is needed in this case
 - ✓ effect of service unavailability on other services, a good example is the MyProxy service whose absence will make all long running jobs fail.

- ✓ **A statement on accounting and resource partitioning between different VOs**
- ✓ **End user documentation, covering common use cases**
- ✓ **Expanded operations manual including information on:**
- ✓ **Load balanced deployment (which not always might be possible, required)**
- ✓ **High availability deployment scenarios, if available and required**
- ✓ **A description of common operations problems and the recommended solutions**
- ✓ **Migration of services between nodes.**
- ✓ **Reference to a statement by the TCG that endorses the deployment of the service**
- ✓ **Tests integrated in to SAME**
- ✓ **Description of deployment scenarios that allow sites and regions to plan**
- ✓ **Installation and configuration documentation covering common deployment scenarios**
- ✓ **Statement on support provisioning for the component.**
- ✓ **Note on known incompatibilities with former components and migration plan.**
- ✓ **A statement by a system operator on services related to the memory consumption and other resource requirements under pre-production load.**

- **Subsystem Bug Manager**
 - Manages all the bugs assigned to the subsystem
 - Has overall responsibility for all bugs
 - Assigns bugs to developers
 - And informs them of the priorities
 - *Requires EMT interaction*
- **Developer**
 - Respond in a timely manner to bugs assigned
 - In order of priority given by the bug manager
 - Check the fix into CVS
 - Assign the bug to the Subsystem integrator
 - Ensure the knowledge is transferred
 - *Use the details field in the bug*

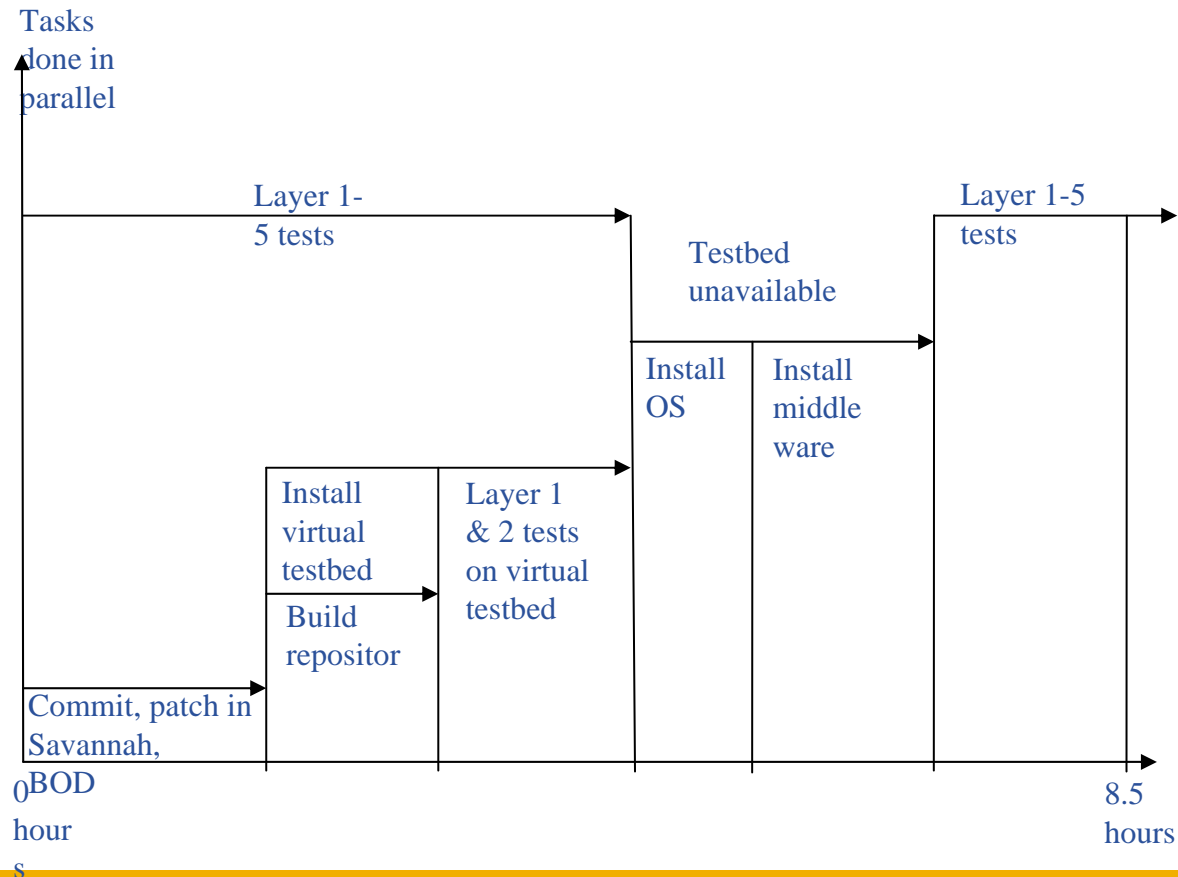
- **Subsystem Integrator**
 - Responsible for releasing subsystems and components.
 - Decides when and what to release.
 - Creates a patch
 - Inserts all information required
 - *Should ensure that all information is available*
 - And links all bugs fixed to the patch
 - Moves the bug state to “Ready for Test”
 - Must have the knowledge to carry out the above tasks.
- **SA3**
 - Putting it all together and releasing quality software to SA1
- **SA1**
 - Operating the Pre Production and Production System

- **The Software Process defines how we should work**
 - Roles, Responsibilities and Interactions
- **Describes the workflow between JRA1, SA3 and SA1**
 - Defined jointly by representatives from each activity
- **Implemented using Savannah**
 - Bug tracker for problems
 - Patch tracker for the solutions
- **A Check List has been introduced**
 - To ensure software is delivered with everything required
 - Not just the software but also good documentation etc
- **The goal is to produce good quality software**
 - In an efficient and traceable way
- **Full details will be in the gLite developers guide**

- **MSA3.5 Test Plan**
- **First round of review**
 - We need to add more details ▪
 - Currently most information is in wiki page
 - A quick link to the "Missing tests": <https://twiki.cern.ch/twiki/bin/view/LCG/LCGgliteTestMissing>
 - A quick link to the existing tests: <https://twiki.cern.ch/twiki/bin/view/LCG/LCGgliteTestInventory>
- **For us this is a live document ▪**

- **The plan covers:**
- **List of existing tests**
 - Maintained on wiki
- **List of missing tests**
 - Maintained on wiki
- **Development of new tests**
 - Development guide
 - Describes multi level approach
 - Tests should be frame work neutral
 - Functional
 - Stability
 - Performance
 - Interoperations tests

- **Test strategy and workflow**
 - Upgrade/install
 - Virtualization
 - Local/ External testbeds.....



- **Integration of tests is discussed**
- **We need**
 - Framework to submit tests
 - Framework for archival and browsing of test results
- **We have tests from various sources**
 - Some integrated in test frameworks (monolithic)
 - All tests have to be as atomic as possible
- **We invested into ETICS integration**
 - Maybe too early, will retry later
- **SAM as a backend will be looked at**
- **Decision needed when we have tests in atomic form**

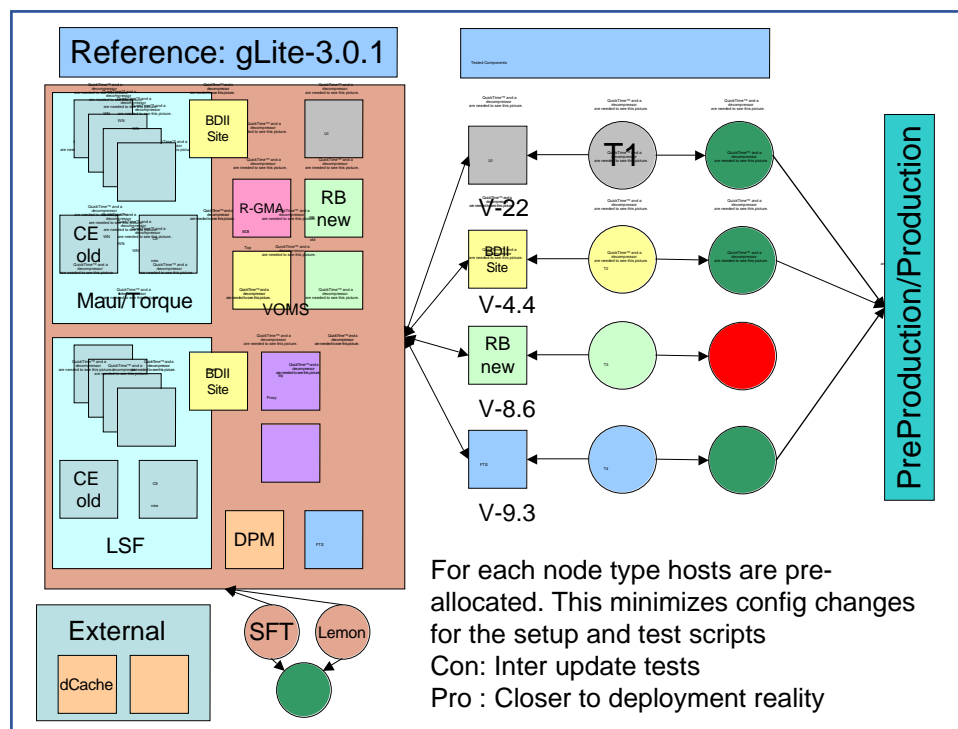
- **Partners signed up for:**
 - Providing tests
 - Providing hardware for testbeds
 - Operating specific test beds/ test services
 - Conducting specific tests
- **Lists in the document, will be updated**

Edg-tests	Gilbert Grosdidier (will resign), Domenico Vicinanza (currently CERN)
WMS	Hui-Min Lin (currently CERN), Mario Reale (CERN), Alvaro Fernandez (CSIC/IFIC)
VOMS	Maria Allandes Pradillo (CERN)
R-GMA	TCD, Maria Alandes Pradillo (CERN)
FTS	Radoslava Goranova (currently CERN), Gergely Debrezzeni (CERN)
DPM/LFC	Mario Reale (CERN)
Information System	Laura Perini (INFN)
Proxy Renewal	Goes to security
AMGA	Birger Koblitz (CERN), Viktor Pose (CERN)
LB	Othmane Bouhali, Shkelzen Rugovac (University of Bruxelles), Ales Krenek
BLAH	Laura Perini (INFN), also covered by batch system tests
APEL	Laura Perini (INFN)
DGAS	Laura Perini (INFN)
HYDRA	Akos Frohner (CERN)
Batch systems: LSF	Marc Rodrigues (PIC), Carlos Borregos (PIC)
Batch Systems: Sun Grid Engine	IMPERIAL
Batch systems: Condor	Kai Neuffer (PIC)
Interoperability: OSG	Laurence Field (CERN)
Interoperability: ARC	Denmark
Interoperability: UNICORE	FZJ
Interoperability: NAREGI	Laurence Field (CERN)

TARUJWN	Andrea Interlinder (CERN)
Performance tests on catalogs	
Tests verifying user guides	Ioannis Liabotis (GRNET)
dCache	Owain Syng (RAL, DES), Craig Cowan
Sensible error messages	
Security	Jaroslav Sisko, Tomasz Nowocien, Blazej Miga (PSNC)
Deployment, Installation and localization	
Robustness of services against reboot and restarts	
gliteCE	Laura Perini (INFN)

- Test table is not complete!
- Need to find more resources

- **Some tests not easy to formalize**
 - Security testing, check lists, ...
- **Component based updates require adjustments**
 - Repositories, packaging, configuration tools
 - Testbed structures
 - Test configuration
 - First concepts



- **Document needs a bit of more work to be useful**
- **We know now who will do what**
- **We still don't know when the partners will deliver**
 - Follow up needed
 - We have to provide more details
- **Sections on frameworks are weak**
 - But should not keep us from writing tests

- pursue recommendation 18 from 2nd review
- **remove dependency on Linux, port to other OS including supercomputers**
- **Porting activities by various SA3 partners to different UNIX flavors and linux distributions**
 - However not a ‘standalone’ task in SA3
 - Partially covered by integration and operation of testbeds
 - Eamonn Kenny from TCD maintains a status page:
 - <http://cagraidsvr06.cs.tcd.ie/porting/>

- **Current state**
 - Many independent activities
 - Patches given back to developers
 - But not always make it to the main branch
 - We still release for Scientific Linux only
 - Ports follow releases
 - Not a sustainable situation
 - ETICS is now in a state that it can be used for:
 - Decentralized multi platform builds

- **Near term goal**
 - Release software for multiple linux distributions
 - Debian & SL3 & SL4

- **Supercomputers**
 - Very strict security requirements
 - No readily available test systems
 - Small pool of experts to work with
- **No activity to port core software to supercomputers**
 - Applications for commodity clusters
 - not tuned for architecture
 - Many users, many dynamic applications
 - Total throughput matters
 - Applications for supercomputers
 - Tuned to achieve peak performance for a machine
 - Few applications, based on large packages
 - Few, very experienced users + expert support

- **Maybe interoperability and partial port is the solution...**
 - I can't see a BDII or a WMS running on a supercomputer..
 - Front ends are often Linux systems
 - Grid gateways could stay on Linux/Unix too.

- **MSA3.3 Interoperability Plan for Unicore**
 - 2 days intense exchange at FZJ with developers
 - Interoperability and interoperation (DEISA)
 - Updated, detailed plan within the next 3 weeks

- **Almost all tasks have names assigned to them.**
- **Exceptions:**
- **TSA3.2.1 Functional and Stress Testing**
 - IMPERIAL 12PM
 - WLMS performance testing
- **TSA3.2.3 Operate Certification and Testing Testbeds**
 - IMPERIAL 12PM
 - Testbed with 30 machines, dynamic allocation of machines between performance testing of WLMS and providing a CE with SUN Grid Engine local resource manager for extended cert. testbed
 - CSIC 12PM
 - Testbed and test suite for testing the C++ APIs of WLMS. Testbed based on Maui/Torque with special emphasis on resource sharing policies and the implementation of the recommendations of the priorities work group
 - CESGA 12PM
 - SGE testbed, including information provider, job manager and accounting tests. Cooperation with LIP and IMPERIAL

- **Exceptions:**
- **TSA3.3 Debugging, Analysis, Support**
 - INFN 12PM
 - In depth debugging of problems related to Bla, DGAS and other components related to the WLMS and the CE. Especially related to the interface to LSF.
- **Problems with the execution plan:**
 - No resources for SA3 coordination
 - Partners have signed up, but are starting slowly

- **Mid June (21st/22nd)**
- **40+ participants**
- **Very collaborative atmosphere**

- **Main focus:**
 - Execution plan
 - Assigning responsibilities and tasks to individual teams
 - Clarification of scope and goals

- **Permanent release, test, debug, emergency work**
- **gLite-3.0 , 3.0.1, and 3.0.2 releases**
 - Required lots of support (bumpy road to seamless integration)
- **Process**
 - Implemented MSA3.2
 - Refinement of implementation
 - To handle latency and delays
 - ‘Formalize’ exceptional work

- **Testing**
 - Inventory on wiki
 - Gap lists + assignment to partners on wiki
 - Test development guide (a bit simplistic)
 - Test strategy defined and documented
 - Decomposition of old test suite advanced
 - First evaluation of ETICS as test framework
 - First virtualized XEN based testbeds
 - Includes work on management tools
 - Cooperation with openlab
 - New architecture for testbeds to reflect new process
 - Under development
 - SAM (SA1 product) under evaluation as a potential backend

- **Integration, build system, and packaging**
 - LCG + gLite-1.5 integration
 - Moved all components to same CVS
 - Refined repository to reflect certification, PPS, production, experimental
 - Made components more independent
 - February: first evaluation of ETICS as a build service
 - Fast feedback loop with developers
 - September start of move to ETICS for all components
 - *All?*
 - *No, only non legacy components*
 - Started the move of long term components to common build system
 - Target to do SL4 and vdt-1.3 move with ETICS
 - ETICS will support multiple platforms and porting locally and distributed
 - Eamonn Kenny from TCD (non funded work)

- **Config Management**
 - Started with monolithic YAIM
 - No independent versioning of component configuration
 - Wrappers and some full config scripts for gLite components in gLite-3
 - Wrappers turned out to be problematic
 - Proposal for config. harmonization
 - Document circulated, available on wiki
 - Started implementation
 - Expected to switch to restructured YAIM in 3 months
 - *Testing starts in 6 weeks*
 - External maintainers for some of the scripts have been identified (DESY, dCache)

- **Release management**
 - EMT now tracking short term priorities for gLite-3
 - 2 times a week
 - 1 time with Condor participation
 - *Overlap with VDT*
 - All issues tracked via Savannah
 - Follow-up of progress with developers
 - PPS representing SA1
 - TCG defines medium term goals and priorities

- **Interoperation**

- OSG

- Achieved
 - Used transparently by some experiments

- NDGF (ARC middleware)

- Started 1 year ago
 - Defined and documented a plan (MSA3.4)
 - Funded work progressing on WMS modifications (Christian Soettrup UKBH)

- UNICORE (with DEISA as an exiting infrastructure)

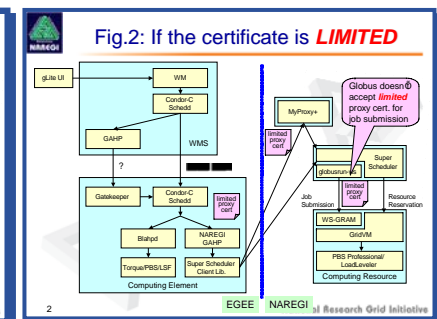
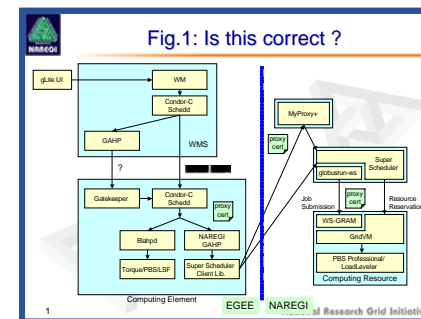
- 2 days brain storming (this week)
 - Some ideas, but will need much more thinking before a valid plan can be drawn

- NAREGI

- Initial meeting at CERN (3 days event)
 - Documented plan on wiki
 - *No time scales, no funding, but willingness*
 - Information system link
 - *In process, quite far advanced*
 - Translation table
 - BDII with Naregi information

- GIN (grid interoperability now (GGF))

- Participated in several meetings
 - Very active in the GIN info group
 - *Additional information system interoperability work with terragrid and pragma*



- **Other activities**
- **GLUE 1.3**
 - Evolution of schema
 - Ready by mid October (target)
- **CIM (Common Information Model)**
 - Evaluation of CIM as the basis to define future schemas
 - Pilot project to extend CIM with the GLUE-1.3 schema
 - Report expected in 3 months
- **Ensuring scalability of the EGEE information system**
 - Exploration of different deployment scenarios
 - Additional caching
 - Tuning of timeouts etc.
 - Improved GIP and specific information providers

- **Other activities**
- **DPM, LFC, gfal,.....**
 - Move to full VOMS support
 - Continuous improvements (performance, reliability)
 - XROOTD integration with DPM and gfal started
 - LFC replication
 - Proof of concept, evaluation of 3D tools
 - Move all DM components to SRM-2.2
 - Progressing, but large effort
 - Medical data management
 - Plan to remove dependency on fireman and gLite I/O
 - Crypt libs under test
 - Hydra key store split ongoing

- **Parallel to the day to day work:**
- **Integration (build and packaging)**
 - Move to SL4 and VDT-1.3 before the end of the year
 - Move all components to the ETICS build system
 - All that have a long term future
- **Work on completion of plans**
 - We don't see in the near future large scale structural changes
 - All have been started in the first half year
- **Testing and Process**
 - Finish the implementation of the 'independent component' update process
 - Adjust build system and repository
 - Adjust test workflow
 - Adjust testbed layout
 - *Include external test bed resources*

- **SA3 activity coordination**
 - Lack of resources at CERN (not in the execution plan)
 - Some of the milestones have been documented too late
 - Web pages only rudimental in wiki
 - Has to be brought up to speed
 - **Lack of follow-up with external partners**
- **People leaving**
 - To find suitable candidates for the remaining time is not easy
 - We loose experienced staff
 - Experienced staff is currently not keen on < 2 year long contracts
 - Will affect not only SA3

- **Sticking to the process is not always acceptable**
 - Process was designed for mature software with deep bugs
 - Software still has many shallow bugs
 - We handle this via 'experimental' instances (see CMS instance for WMS)
 - Very costly in terms of human resources

- **Some partners are a bit passive**
 - Requests for participation in concrete work show minimal results
 - Testbed expansion request is a good examples
 - *Initial result was 2 sites responding*
 - YAIM testing request
 - *No responds*
 - Testing coordinator checks status of partners activities frequently
 - *This shows good results*

- *TSA3.1 Integration and Packaging*
 - **Partners: CERN , INFN**
 - **CERN 120PM**
 - *Integration and build of releases, assembling distribution kits including documentation, installation, configuration, and verification tools. Coordination of contributions of different partners and coordination with software providers and the TCG.*
 - *FLAMMER Joachim 24PM*
 - *HARAKALY Robert 24PM*
 - *KEEBLE Oliver 24PM*
 - *SCHULZ Markus 24PM*
 - *DI MEGLIO Alberto 12PM*
 - *ZUREK Marian Jozef 12PM*
 - **INFN 24PM**
 - *Packaging and documenting the support for CEs using LSF. Including guides on info system configuration and configuration of the scheduler. Support packaging of the high availability solutions for the WLMS and CEs.*
 - *Molinari Elisabetta (Milano) 24PM*

- *TSA3.2.1 Functional and Stress Testing*
 - **Partners: CERN, TCD, IMPERIAL**
 - **CERN 48PMs**
 - *Maintaining certification test suite and running certification tests on new release candidates. Maintain list of existing tests.*
 - QING Di 12PM
 - ALANDES PRADILLO Maria 12PM
 - REALE Mario left 12PM
 - DEBRECZENI Gergely 12PM
 - **TCD 6PM**
 - *Running certification tests on additional platforms*
 - Walsh John 6PM
 - **IMPERIAL 12PM**
 - *WLMS performance testing*
 - *Name to be confirmed*

- *TSA3.2.2 Security, Vulnerability Testing*
 - **Partners: PSNC, TCD**
 - **PSNC 12PM**
 - *Code reviews, unit and integrated tests to check for the absents of previous vulnerabilities, penetration testing of deployed infrastructure*
 - *Frankowski Gerard 3PM*
 - *Nowocien Tomasz 3PM*
 - *Miga Blazej 3PM*
 - *Sajko Jaroslaw 3PM*
 - **TCD 6PM**
 - *Work in close collaboration with the vulnerability group, verify that usage can be traced trough all services*
 - *WALSH John 6PM*

- *TSA3.2.3 Operate Certification and Testing Test Beds*
 - **Partner: CERN, INFN, IMPERIAL, TCD, GRNET, CSIC, CESGA, PIC, UCY**
 - **CERN 72PM**
 - *Central certification testbed >50 nodes, multiple sites, virtual testbeds (at the time of writing 4 nodes hosting 16 virtual machines), 30 machines for individual testing*
 - *Daily upgrades/re-installations needed*
 - *PONCET Louis 24PM*
 - *QING Di 12PM*
 - *DEBRECZENI Gergely 12PM*
 - *LEMAITRE Sophie 12PM*
 - *REALE Mario left 12PM*
 - **INFN 24PM**
 - *Running testbeds for LSF CEs suitable to run stress tests on these CEs. Test hardware for the high availability WLMS and CEs*
 - *Gianelle Alessio (Padova) 24PM*

- **IMPERIAL 12PMs**

- *Testbed with 30 machines, dynamic allocation of machines between performance testing of the WLMS and providing a CE with a Sun Grid Engine (SGE) local resource manager for the extended (central) certification testbed*
- *Name to be confirmed*

- **TCD 7PM**

- *Testbeds for verifying ports to different platforms and OSs. 16 physical machines, 6 of them are used to host 22 virtual machines, 8 different setups*
- *Kenny Eamonn* *7PM*

- **GRNET 24PM**

- *Certification site with 13 nodes. Will be used for tests to verify the User Guide. Initially covering the base services.*
- *Liabotis Ioannis* *12PM*
- *Person to be hired* *12PM*

- **CSIC 12PM**

- *Testbed and test suite for testing the C++ APIs of WLMS. Testbed based on Maui/Torque with special emphasis on resource sharing policies and the implementation of the recommendations of the priorities work group*
- *Expect to receive notification via e-mail*

- **CESGA 12PM**

- ***SGE testbed, including information provider, job manager and accounting tests. Cooperation with LIP and IMPERIAL***
- *Expect to receive notification via e-mail from Francisco Jose Bernabe Pellicier*

- **PIC 24PM**

- ***Testbed for verification of the automatic installation. Specialized testbed with Condor batch system linked to the central certification testbed***
- ***Potentially extended to include a site with LSF.***
- *Borrego Carlos 12PM*
- *Rodriguez Marc 6PM*
- *Neuffer Kai 6PM*

- **UCY 24PM**

- ***Testbed for grid performance benchmarking (using GridBench). Details have to be specified. The testbed will be relative small in size (4-5 machine).***
- *Lambrinos Lambros 8PM*
- *Tsouloupas George 8PM*
- *Gjermundrod Harald 8PM*

- *TSA3.2.4 Project Testing Coordination*
 - **Partner: CERN**
 - **CERN 24PM**
 - *The number of teams in and outside CERN involved in testing and operation of testbeds require significant coordination to avoid duplication and achieving with the given resources the best coverage possible. This includes maintaining an inventory of existing and missing tests and steering the development of frameworks.*
 - *UNTERKIRCHER Andreas* *24PM*

- *TSA3.3 Debugging, Analysis, Support*
 - **Partner: CERN, INFN**
 - **CERN 120PM**
 - *Support for components that are not supported by JRA1, examples of these components are: BDII, GIP, LFC, DPM, HYDRA, LCG-UTILS*
 - *In depth analysis of complex problems emerging on the production service.*
 - *KHALID Omer* *12PM*
 - *ABADIE Lana (soon to come)* *24PM*
 - *ALANDES PRADILLO Maria* *12PM*
 - *LEMAITRE Sophie* *12PM*
 - *MCCANCE Gavin John* *24PM*
 - *SOBREIRA DE ALMEIDA Antonio Pedro* *24PM*
 - *ROCHA DA CUNHA RODRIGUES Daniel Filipe* *24PM*
 - **INFN 12PM**
 - *In depth debugging of problems related to Bla, DGAS and other components related to the WLMS and the CE. Especially related to the interface to LSF.*
 - *To be communicated by INFN 12PM*

- *TSA3.4 Interoperation*
 - **Partner CERN, FZJ, UKBH**
 - **CERN 24PM**
 - *Coordination of interoperations activity, ensuring that a consistent approach is used. Maintaining the interoperation between EGEE and OSG as far as the EGEE components are affected.*
 - *FIELD Laurence 24PM*
 - **FZJ 36PM**
 - *Achieving interoperation with UNICOE. This includes identification of what is needed to be changed, added on both stacks.*
 - *MALLMANN Daniel 18 PM*
 - *RIEDEL Morris 18 PM*
 - **UKBH 12PM**
 - *Working on interoperation with the ARC middleware stack. This includes contributing to the milestone on planning.*
 - *Christian Søttrup 12 PM*

- *TSA3.5 Requirements Capture*
 - **Partner CERN**
 - **CERN 24PMs**
 - *Maintenance of prioritized requirement list used by the TCG to decide on short term planning, Gathering requirements related to deployment. Coordinating this with SA1 and JRA1.*
 - *FROHNER Akos 24PM*
- Not funded activities
 - **Examples for additional activities:**
 - **TSA3.4 Interoperation**
 - **IMPERIAL working on GIN**
 - **Brussels working on Logging and Bookkeeping testing**
 - **LIP SGE tools**
 - **TCD Eammonn Kenney porting**