



Visual prototype and report of the ACGT portal

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ABSTRACT:

The present deliverable is a report on the first prototype of the ACGT Portal. The ACGT Portal is intended to represent to main access gate to the ACGT grid platform. The development of the ACGT Portal is going to be made in spiral, based on prototypes out of which the first one is described in this document.

Part 1 of this document presents the objectives of prototyping the ACGT Portal. **Part 2** of the document describes the features of the ACGT Portal that were selected for prototyping and the portlets through which these features were implemented in the first prototype. **Part 3** presents conclusions on the development, the expectations and further work regarding the ACGT Portal prototype.

KEYWORD LIST: Web Portal, Grid Portal, Biomedical Portal

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Executive Summary

ACGT is an Integrated Project (IP) funded in the 6th Framework Program of the European Commission under the Action Line "*Integrated biomedical information for better health*". The high level objective of the Action Line is the development of methods and systems for improved medical knowledge discovery and understanding through integration of biomedical information (e.g. using modelling, visualization, data mining and grid technologies). Biomedical data and information to be considered include not only clinical information relating to tissues, organs or personal health-related information but also information at the level of molecules and cells, such as that acquired from genomics and proteomics research.

The ultimate objective of the ACGT project is the development of European Knowledge Grid infrastructure offering high-level tools and techniques for the distributed mining and extraction of knowledge from data repositories available on the Grid, leveraging semantic descriptions of components and data and offering knowledge discovery services in the domain of Cancer research.

In the architecture of the ACGT Grid infrastructure, the portal is the gate to the services. Structured on several layers of access rights, the ACGT Portal is offering information to all the actors playing in the ACGT project and more general in the domain of Cancer research.

The present document is a report on the first prototype of the ACGT Portal. The document is structured in four parts.

Part 1 of this document presents the objectives of prototyping the ACGT Portal. The development of the ACGT Portal is planned to undergo in spiral, based on several prototypes, out of which the first one is described in this document.

The specific objectives of the first ACGT Portal prototype are to:

- Allow for an early deployment of the ACGT Portal in order to:
 - Familiarize the users with the portal
 - Gather feedback from specific users and improve the initial specifications of the portal
- Provide a base for the integration of ACGT services into the portal.

Part 2 of this document describes the features of the ACGT Portal that were selected for prototyping and the portlets through which these features were implemented in the first prototype.

The ACGT Portal prototype presents basic functions of the ACGT portal:

- Integration in the general GRID architecture
- Partial implementation of the system of privileges and roles
- Credential-based user authentication
- General and private content
- Partial customization of the content

- Uploading, viewing, modification and deletion of the content based on the roles scheme
- Job creation, execution and tracking.

The portlets implemented in the ACGT Portal prototype are:

- Login portlet
- Homepage
- Role request portlet
- Change password portlet
- Layout manager portlet
- Profile manager portlet
- Credential manager portlet
- File browser portlet
- Workflow upload, search and execute portlet
- Administration page
- Group manager portlet
- Role manager portlet
- Messaging portlet

Part 3 presents conclusions on the development, the expectations and further work regarding the ACGT Portal prototype.

PART 1

Prototype Objectives

1 Introduction

1.1 Project Background

Recent and forthcoming developments in genomics and the increased importance of genetics in healthcare are already changing clinical care. Research on the molecular mechanisms of cell growth, apoptosis and differentiation has resulted in a better understanding of the nature of cancer cells. The genotypic knowledge of a cancer cell helps to identify the predisposition of the disease and develops therapies adapted to the genotype of a cancer patient. Medicine is getting more individualized.

The information from genetic and protein studies, clinical trials, and other research is growing rapidly. On the other hand there is no unifying infrastructure or common standard for the technologies that cancer researchers use. There are for example no mechanisms for easily sharing and joining data. In responding to these challenges, Biomedical Informatics is quickly evolving into a research field that encompasses the use of all kinds of biomedical information, from genetic and proteomic data to image and clinical data associated with various levels of the human body. This kind of integration and exploitation of the data and information requires a new synergetic approach that enables a bi-directional dialogue between these scientific disciplines and integration in terms of data, methods, technologies, tools and applications. While the goal is clear, the path is difficult to go, fraught with technical, scientific, clinical, legal and ethical challenges. Many new tools for today's biomedical researcher have been developed to find the mechanism behind cancer, whereas legal and ethical issues are lagging behind.

The main objective of ACGT is the fight against cancer. To achieve this goal ACGT has the following objectives

- The ACGT project sees its mission to develop a GRID platform to support and stimulate further exchanges of both clinic and genetic information.
- ACGT intends to trigger the emergence of latent **clinico-genomic synergies** to ensure **faster diagnosis** and more **efficient therapy**
- ACGT targets two major cancer diseases namely, **breast cancer (BRCA)** and **paediatric neuroblastoma (PN)** presented by three (running) clinical trials.
- In addition, **in-silico** oncology trial scenarios will be run to assess the utility of **tumour-growth simulation** on both BRCA and PN.

1.2 The ACGT Environment

ACGT was set up to respond to the challenges arising from three global factors as mentioned above:

- Changing environment comprising a number of issues in all areas of life science
- Changes in healthcare delivery comprising the move towards a more individualised medicine and

- Technology push in conjunction with Biomedical Informatics

ACGT focuses on clinical trials on Cancer (Wilms tumour, Breast) and is based on the principles of open access (among trusted partners) developing open source products.

ACGT will provide a unified technological infrastructure to facilitate

- Integrated access to multi-level biomedical data;
- The development or re-use of open source analytical tools, accompanied with the appropriate meta-data allowing their discovery and orchestration into complex workflows.

ACGT brings together internationally recognised leaders in their respective fields, with the aim to deliver to the cancer research community an integrated clinico-genomic ICT environment enabled by a powerful GRID infrastructure. In achieving this objective ACGT has formulated a coherent, integrated workplan for the design, development, integration and validation of all technologically challenging areas of work. Namely:

- Grid: delivery of a European Biomedical Grid infrastructure offering seamless mediation services for sharing data and data-processing methods and tools, and advanced security;
- Integration: semantic, ontology based integration of clinical and genomic/proteomic data - taking into account standard clinical and genomic ontologies and metadata;
- Knowledge Discovery: delivery of data-mining GRID services in order to support and improve complex knowledge discovery processes;
- Legal and ethical issues: development and integration of technical solutions regarding data protection and secure personal data management in a European context.

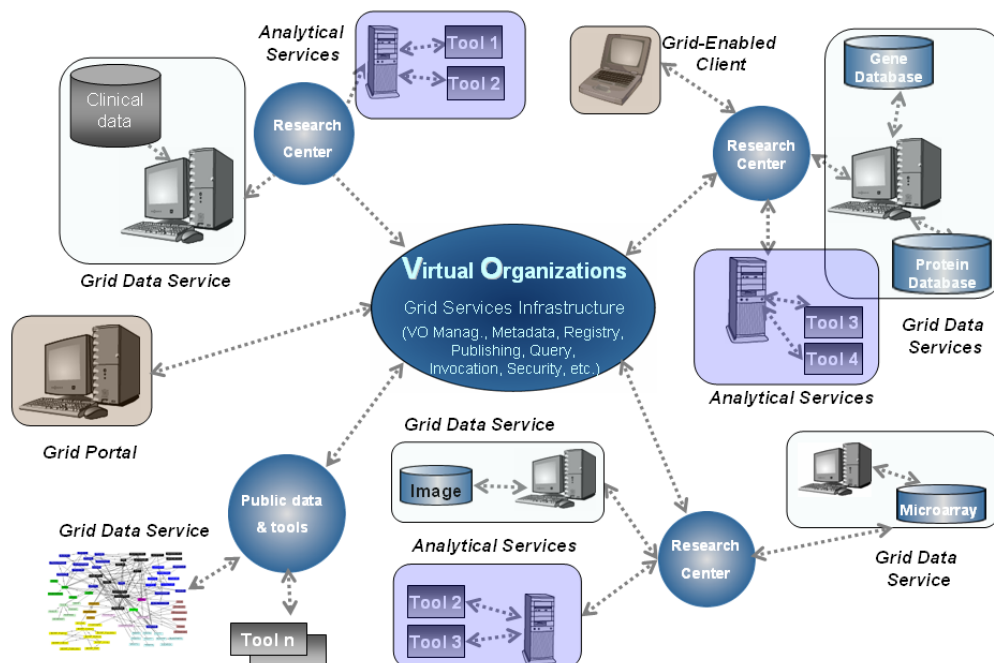


Figure 1: The ACGT Virtual Organizations

The technological platform of ACGT will be validated in concrete setting of advanced clinical trials on Cancer. Pilot trials have been selected based on the presence of clear research objectives, raising the need to integrate data at all levels of the human being.

For further details on the specification of the ACGT infrastructure see *D2.1 - User requirements and specification of the ACGT internal clinical trial*.

1.3 The ACGT Portal

The ACGT Portal is the interface of the ACGT environment, which attempts to provide an integrated easy-to-use and up-to-date gateway to the ACGT tools and services.

The main roles of the ACGT Portal are:

- It provides a unique access point for the ACGT Grid
- It provides a customizable client for ACGT services
- It integrates the usage of ACGT internal and external services
- It provides a channel for ACGT dissemination and exploitation.

In many respects the ACGT Portal gives access to the services of the Business Process Layer and it is the main point of entry in the ACGT environment

The ACGT Portal is built on the Gridsphere portal framework. GridSphere is an open-source JSR-168 compliant portal framework that is ready to run with a suite of tutorial and example modular web components, called portlets. A portlet is a module of a dynamic web page created using Java. For creating dynamic web pages, JSP (Java Servlet Pages) was developed, which combines html with java - a JSP web server to run such applications is needed. As only some parts of the dynamic page actually needs to be modified while doing a set of actions, web page content was redesigned as a set of integrated dynamic JSP modules and a static html content.

JSR (Java Portlet Specification) 168 is one of the main standards in portal development. JSR 168 is a standard API for integrating portlets in portlet containers. JSR-168 defines a contract between the portlet container and portlets and provides a convenient programming model for portlet developers. The Java Portlet Specification V1.0 was developed under the Java Community Process (having as members experts from leading industry companies) as JSR 168, and released in October 2003. Right now, the second version of the standard, Java Portlet Specification V2.0 or JSR286, is under development.

The Java Portlet Specification V1.0 introduces the basic portlet programming model with:

- Two phases of action processing and rendering in order to support the Model-View-Controller pattern.
- Portlet modes, enabling the portal to advise the portlet what task it should perform and what content it should generate
- Window states, indicating the amount of portal page space that will be assigned to the content generated by the portlet
- Portlet data model, allowing the portlet to store view information in the render parameters, session related information in the portlet session and per user persistent data in the portlet preferences

- A packaging format in order to group different portlets and other J2EE artefacts needed by these portlets into one portlet application which can be deployed on the portal server.

The Gridsphere portal framework provides a standard based platform for the easy development of portlets. Portlets are defined by a standard API and provide a model for developing new portal components that can be shared and exchanged by various portlet containers. Gridsphere provides a portlet container, a collection of core portlets and an advanced user interface library that makes developing new portlets easier for application developers.

For further details on the ACGT Portal see *D14.1 - Functional & technical specification of the ACGT portal*.

1.4 Purpose and Structure of this Document

The present deliverable D14.2: “Visual prototype and report of the ACGT Portal” is a report on the first prototype of the ACGT Portal.

The purpose of the work done and reported here is to present the objectives targeted by the 1st ACGT Portal Prototype and the features through which these objectives are implemented in the prototype.

The present deliverable is articulated as follows:

Part 1 of this document presents the objectives of prototyping the ACGT Portal. The development of the ACGT Portal is planned to undergo in spiral, based on several prototypes, out of which the first one is described in this document.

The specific objectives of the first ACGT Portal prototype are to:

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The ACGT Portal prototype presents basic functions of the ACGT portal:

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The portlets implemented in the ACGT Portal prototype are:

- Login portlet
- Homepage
- Role request portlet
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- Layout manager portlet
- Profile manager portlet
- Credential manager portlet
- File browser portlet
- Workflow upload, search and execute portlet
- Administration page
- Group manager portlet
- Role manager portlet
- Messaging portlet

Part 3 presents conclusions on the development, the expectations and further work regarding the ACGT Portal prototype.

2 Objectives of the ACGT Portal Prototype

2.1 Using prototypes

A prototype is an initial version of a system, which may be used for experimentation. Prototypes are valuable for requirements elicitation because users can experiment with the system and point out its strengths and weaknesses. The prototype allows users to experiment and discover what they really need to support their work, but more importantly forces a detailed study of the requirements, which reveals inconsistencies and omissions.

Rapid development of prototypes is essential so that they are available early in the elicitation process. Establishes feasibility and usefulness before high development costs are incurred.

Prototypes are also essential for developing the 'look and feel' of a user interface and they can be used for system testing and the development of documentation.

A prototype of a proposed system is presented to workers for critical comments. Revisions are made to the original prototype, producing a second version that is again presented to users for critical analysis. The process of revising and submitting to users continues until some criterion for acceptability is reached.

For further details on the requirements engineering within the ACGT project see *D2.1 - User requirements and specification of the ACGT internal clinical trial*.

2.2 Using the ACGT Portal prototype

The specific objectives of the first ACGT Portal prototype are to:

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 - Gather feedback from specific users and improve the initial specifications of the portal
- Provide a base for the integration of ACGT services into the portal.

2.2.1 Early deployment

The ACGT Portal is on the top layer of the ACGT architecture. Even if the development of the portal is independent from the rest of the system, the ACGT portal is highly influenced by the evolution of the rest of the components. For further details on the integration of ACGT Portal in the general ACGT architecture see *D3.1 – The ACGT Initial Architecture*.

There is a need for an early deployment of the portal, but the portal is not developed in one step, based only on the initial analysis. Instead of that, several prototypes of the portal are going to be developed. At each stage more complexity will be added to the portal both in terms of functionalities and technical integration.

The highest risk of the portal development is a reduced rate of usage. In order to eliminate this risk, all the specific features are integrated in the portal along with the development of the ACGT infrastructure. Thus, not all features of the portal are implemented from the first prototype.

The gradual implementation of the portal functionalities will keep the complexity of the portal in reasonable limits and will allow users to get familiar with the portal while this is growing in complexity.

In the same time, the gradual implementation of the technical features of the portal into the grid system will allow the early testing of the ACGT tools and services, even before their complete integration in the system. At the moment of the implementation in the portal prototype, some functionalities belonging to the grid layer may not be in a stable and mature state. For this reason some of the portal features may be implemented in a transitory form at the portal level, rather than at the grid level.

2.2.2 Base for service interface integration

For service integration, the ACGT Portal represents the Business Process Layer, in which services should be primarily described from the user/usage point of view.

Different types of services will be possible accommodated in the ACGT Portal, reflecting different stages in the integration of these services in the ACGT system. Basically, we might refer to:

- ACGT integrated services
- ACGT external services
- Third-party services.

The goal is to have as many of the services integrated in the ACGT Grid. However, it is presumable that not all the useful/necessary services will be easily and immediately

Service registry is a component responsible for storing information about services available in ACGT environment. It should provide enough information for enabling the execution of at least the following operations:

- Service registering
- Service unregistering
- Service updating
- Service search and discovery
- Service availability
- Service access
- Service monitoring

From the integration point of view, the leading idea is that as much as possible from these service tools should be defined under the grid. However, in some cases, some of these tools might be defined in the ACGT Portal, as described below.

ACGT integrated services are those services accessible through the ACGT Portal that are fully compliant with the ACGT standards and quality requirements. It is planned that ACGT integrated services are going to be registered and executed as sequences of Grid jobs and consequently no additional service registry would be necessary. However, even for ACGT integrated it is possible that some information on the service, like metadata or semantic information, used for example for service search or discovery, is kept in a separate registry and the corresponding tool will be treated as a portal tool, rather than as a grid tool.

ACGT external services are those services, provided by ACGT partners that are in a transitory phase, in the sense that they do not fulfil all the requirements (technical, regarding security, etc) for being fully integrated in the ACGT infrastructure. Normally, for these services all the tools will be available, but some of them might be defined in the portal. Once these services are fully integrated, they become ACGT integrated services.

Third-party services are those services registered by providers that are not ACGT partners. These services will not interfere with the core of the ACGT infrastructure, services and data. These services will be published under the responsibility of each provider and used under the responsibility of each ACGT user. Third-party services may become in time ACGT external or even integrated services, after the fulfilment of all necessary conditions.

Further details on service and tools integration within ACGT can be found in *D9.1 – Integration Requirements and Guidelines*.

PART 2

Prototype Report

3 ACGT Portal Prototype Functionalities

3.1 Scenario-driven approach

In developing the ACGT portal prototype, several user scenarios have been taken into account.

These scenarios have been developed by other partners for demonstrating different components of the ACGT.

Scenarios are stories, which explain how a system might be used. Telling stories about systems helps to ensure that project stakeholders share a sufficiently wide view to avoid missing vital aspects of problems. Scenarios vary from brief stories to richly structured analyses, but are almost always based on the idea of a sequence of actions carried out by intelligent agents.

For further details on scenario-driven approach within the ACGT project see *D2.1 - User requirements and specification of the ACGT internal clinical trial*.

Using a scenario-driven approach for the development of the ACGT portal we avoid a massive development of the portal in a wrong direction. Following the development directions established by *D14.1 - Functional and technical specification of the ACGT portal*, new features are added to the portal only when specific user scenarios require them.

Currently, the list of the scenarios used for the development of the ACGT portal prototype:

- Account management scenario

This scenario describes how a visitor may become a user of the ACGT portal and how he/she may receive a new role in the portal

- Service and workflow registration (proposed by UMA for WP9)

This scenario describes how a service provider may register a new service and how the service is approved and becomes part of the ACGT infrastructure

- Job execution scenario applied for the execution of an analytical tool deployed under the grid system (proposed by FhG for WP5)

This scenario describes how an ACGT service is executed as a job under the grid system

- Workflow execution scenario (proposed by Forth for WP9)

This scenario describes how a complex workflow is loaded and executed into the ACGT portal.

Other scenarios are under work (like the oncosimulator scenario proposed by WP6), as the implementation of different user scenarios in the ACGT portal will be done on a continuous base.

3.2 Specific tailoring

The ACGT portal prototype is a standard JSR168 compliant Java application, based on Gridsphere platform. Gridsphere was chosen as the basis for the ACGT portal because of its standard compliance, already shown abilities in other biomedical portals and because of its license (open source).

Although Gridsphere framework allows standard JSR 168 applications to run unmodified on it, it predates the adoption of the standard. So the majority of the latest release of the framework is not JSR 168 compliant. The ACGT portal aims to be a JSR standard compliant application.

Building the portal prototype, some portlets of the core Gridsphere were tailored to cover specific ACGT portal needs. Customization of such portlets has implied mapping of some portlets from GS – Gridsphere pre JSR 168 API's based on IBM WebSphere API – to JSR 168.

The ACGT Portal prototype presents basic functions of the ACGT portal:

- Integration in the general GRID architecture
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- Job creation, execution and tracking.

4 ACGT Portal Prototype Portlets

4.1 Login portlet

The *Login Portlet* – **Figure 2:** ACGT Portal Prototype – Login page – is publicly exposed and allows the authentication of users in the portal. For security reasons and for analytical purposes, the access to the portal is allowed only after authentication. In the first page of the portal, only the *Login Portlet* and news on the portal are presented and this is just what the public can see from the portal without using a valid account.

The *Login Portlet* has two areas:

- One area is dedicated to the publication of news from the ACGT community
- The second area is the login area, which is presenting the usual functions for:
 - Input account name and password
 - Create a new account
 - Retrieve the password

There are two types of users: portal users and grid users.

Portal users are hosted in the portal and they are practically guest users. A guest user has the right to access the information contained by the portal, which is publicly available. However, the most important facility of a guest user is to require for a new role in the portal, as described in the section on the *Role Request Portlet*.

Once, the user gets the approval for changing the role in the portal, his/her account becomes a grid account.

For the layout of the ACGT Portal prototype, the graphical concept of the ACGT website was used (<http://www.eu-acgt.org/>). In this way, the visual identity of the ACGT project is kept through the migration from the website to the webportal.

For further details on the ACGT website see *D15.1 - Project Websites (Internal & External)*.

For the next period, the website will focus on presenting information about the ACGT *project*, while the webportal will aggregate information about the ACGT *infrastructure*.

In time, the portal will replace the website, becoming the main gateway to ACGT.

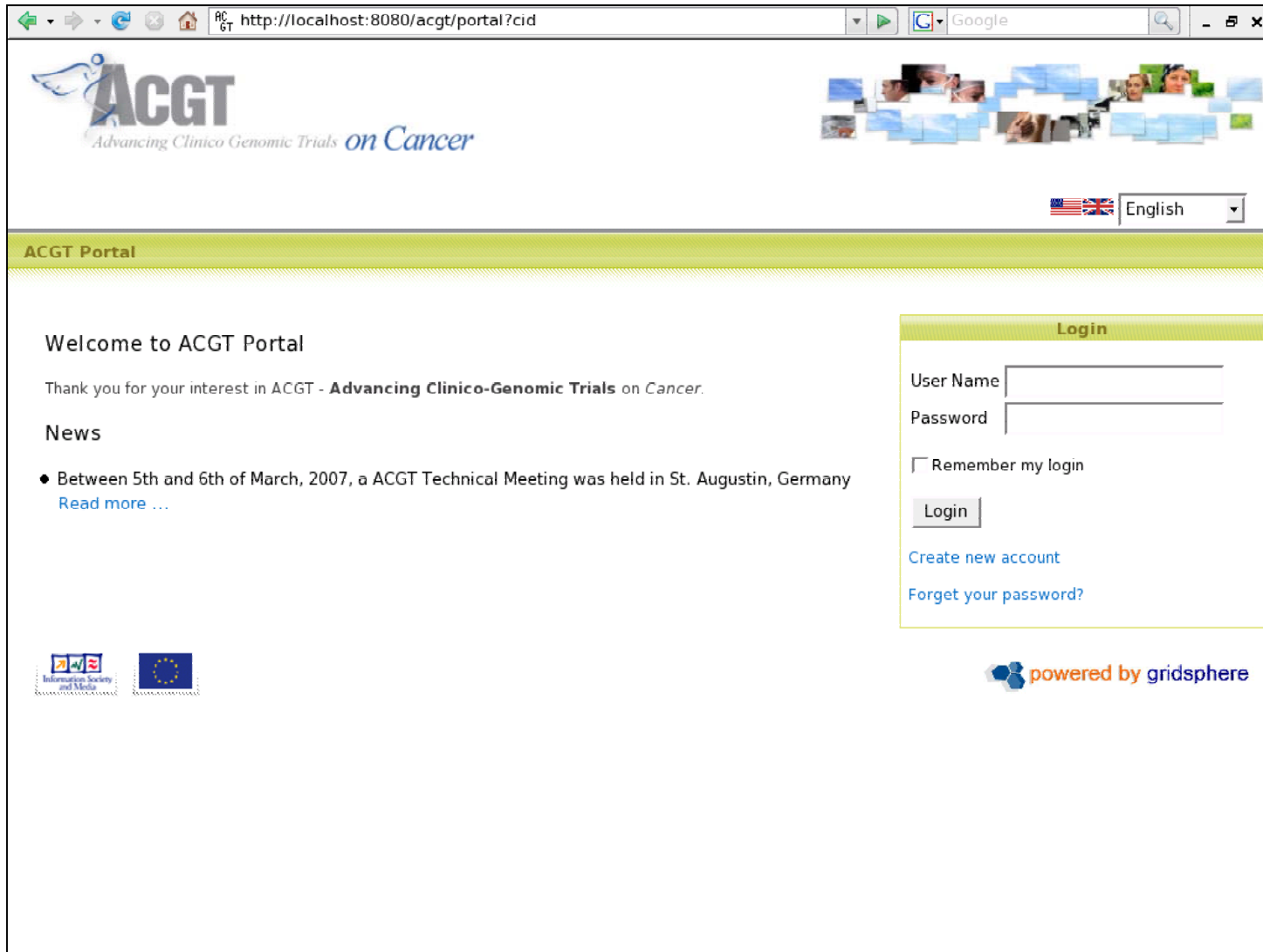


Figure 2: ACGT Portal Prototype – Login page

4.2 Homepage

Different homepages are established for different categories of users (roles) in the ACGT portal

The homepage – **Figure 3: ACGT Portal Prototype – Home page** – presents a tabular menu on two levels, which contains the portlets that are available to a specific role.

4.3 Layout manager portlet

The user may modify the general layout, by choosing one of the offered themes – green being the default one. Also, individual portlets can be added or removed by user – portlets are accessible to a user according to the roles that user acquired.

The layout can be modified using the *Layout Manager Portlet* – **Figure 4: ACGT Portal Prototype – Change layout page**. The default theme is adapted from the graphical identity of the ACGT website. Alternative themes can be chosen.

The user can choose also individual portlets that he/she wants to display in some view. However the access to the portlets is in the first row restricted by the role played by the user. This means that the user can choose portlets only from the set of portlets that he/she is entitled to access according to the specific privileges given by the role played in the portal.

A portal layout is represented per-user as a PortletPage. A PortletPage can contain any number of portlet components. Generally, portal layout components inherit functionality from a PortletContainer that includes attributes for width, height, a CSS theme and optionally a required role. Other layout components listed below may be used in creating a layout descriptor.

4.4 Profile manager portlet

The *Profile Manager Portlet* – **Figure 5: ACGT Portal Prototype – Change profile page** – allows the user the set basic profile information, like:

- Name
- Organization
- Email
- Time zone
- Others.

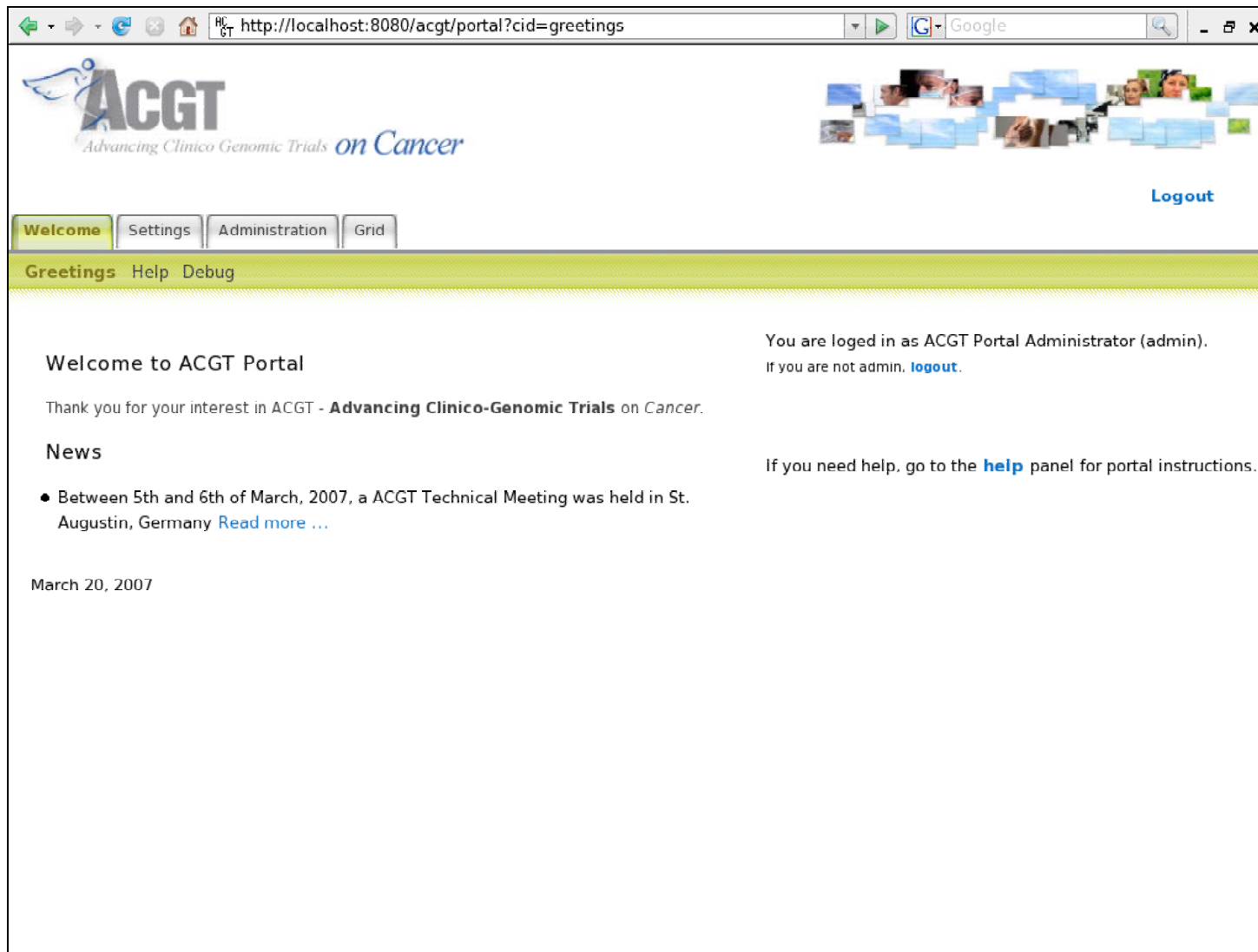


Figure 3: ACGT Portal Prototype – Home page

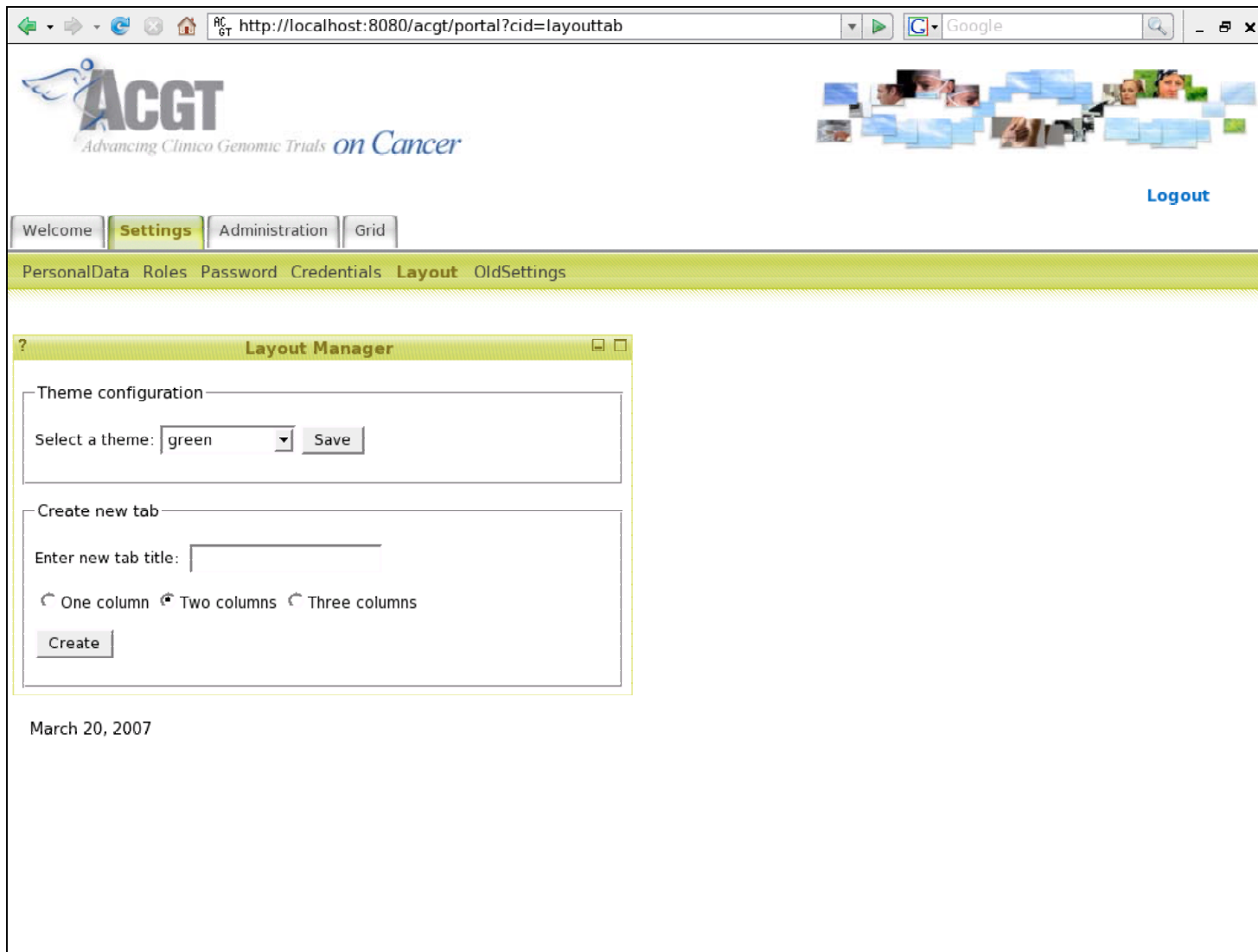


Figure 4: ACGT Portal Prototype – Change layout page

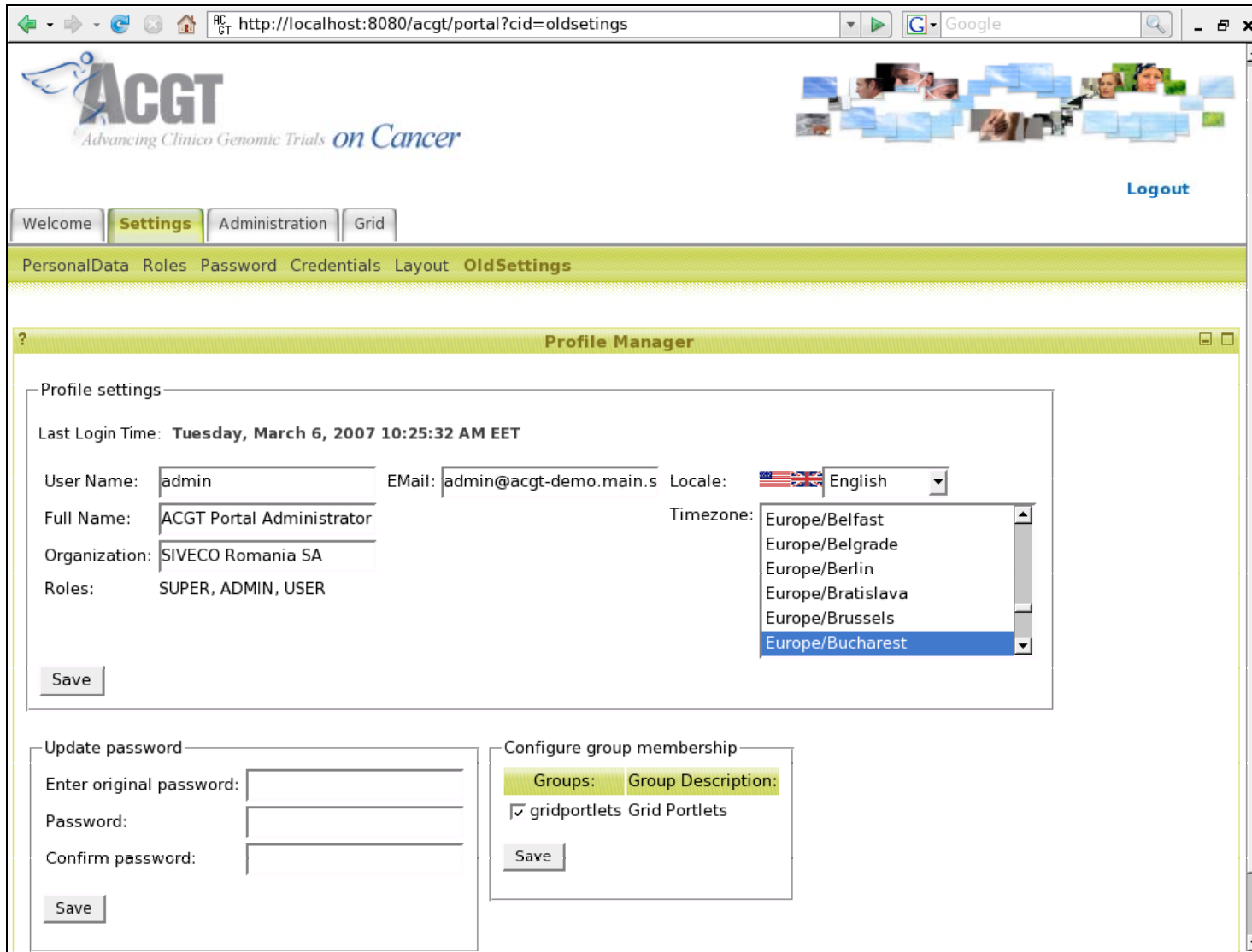


Figure 5: ACGT Portal Prototype – Change profile page

4.5 Role request portlet

A new user registers in the ACGT Portal with a portal account. A portal account is a guest or a transitory account that allows the user to browse the information that is publicly available through the portal, but also to apply for another role in the ACGT Portal.

Roles are defined in *D14.1 - Functional and technical specification of the ACGT portal*. Out of the ten roles defined there – *Administrator, Editor, Reviewer, Cancer organization representative, Researcher, Clinician, Auditor* (member of a regulatory agency), *Technology supplier, Standard bodies representative, Patient*, the most relevant roles of *Administrator, Editor, Researcher, Clinician* and *Patient* were implemented in the ACGT Portal prototype.

The *Role Request Portlet* – **Figure 6: ACGT Portal Prototype – Role request page** – provides an interface through which a user may apply for a new role. The procedure is conformant with the security requirements established by *D10.2 – The ACGT ethical and legal requirements* and consists of the following steps:

- The user sends the request through the portal
- The user receives an automatic email with further instructions, like filling-in, printing and sending by surface email a formal signed contract to the principles and rules of the ACGT system
- The ethical committee approves the user to receive a new role in the portal.
- The grid administrator and the user are informed about the decision of the ethical committee.

For further details on security and privileges policy within the ACGT infrastructure see *D10.2 – The ACGT ethical and legal requirements*.

Once receiving a new role the user gets the corresponding privileges in the portal and the possibility to join other sub-roles existent in the ACGT virtual organization. For example, a user receiving the clinician role may further apply to join specific ACGT trial on different form of cancer.

The management of the roles and privileges over the grid system is implemented through the GAS (Grid Authentication Service), which is developed over the grid.

Until the full configurations of roles in the GAS, the prototyping roles are implemented in the portal. The roles will move to the GAS as soon as the virtual organizations through the grid will be established.



Figure 6: ACGT Portal Prototype – Role request page

4.6 Change password portlet

The *Change Password Portlet* – **Figure 7: ACGT Portal Prototype – Change password page** – is a simple portlet that allows a user to modify his/her password

4.7 Credential manager portlet

GridSphere provides a pluggable way to specify "authentication modules" used for authenticating users to the portal. The model is very similar to the PAM (Pluggable Authentication Modules) approach used in Unix in that modules may be "stackable" such that each module that is selected as active also has a priority associated with it. This makes it possible for instance to default to the GridSphere password based authentication module if some other module with a higher priority fails at first.

The following major design parameters were used:

- An authentication module is described by an XML descriptor file called `authmodules.xml` located in `WEB-INF` directory of web application. As a proprietary extension, GridSphere will load in authentication modules specified in a third-party portlet application if one exists
- All authentication modules conform to a common interface, such that a new authentication module implementation can be supported if it implements the `LoginAuthModule` interface
- A key method of the `LoginAuthModule` interface throws an `AuthenticationException` which assumes that any authentication decision may be made based upon a user object (which contains profile information i.e. name, email, organization) and a password value
- Authentication modules that are `ACTIVE` will be executed upon attempted login. Modules can be set active either in the descriptor, or via the `Login Configuration` portlet at run-time. By default, the password authentication module which uses the password stored in the gridsphere database is active
- A module has a priority number associated with it. All active modules are executed until authentication is successful starting with the module with the highest priority.
- Generic configuration attributes may be associated with an authentication module.

In the ACGT Portal prototype, two authentication modules are implemented, one which is based only on user account and password, the other one using credentials and MyProxy. The management of credentials is realised through the *Credential Management Portlet* – **Figure 8: ACGT Portal Prototype – Credential manager portlet page**.

For interacting with the grid from the portal, a user has to receive a credential – the portal uses MyProxy for certificate delegation. Afterwards it has to define the credential from the Credentials panel.

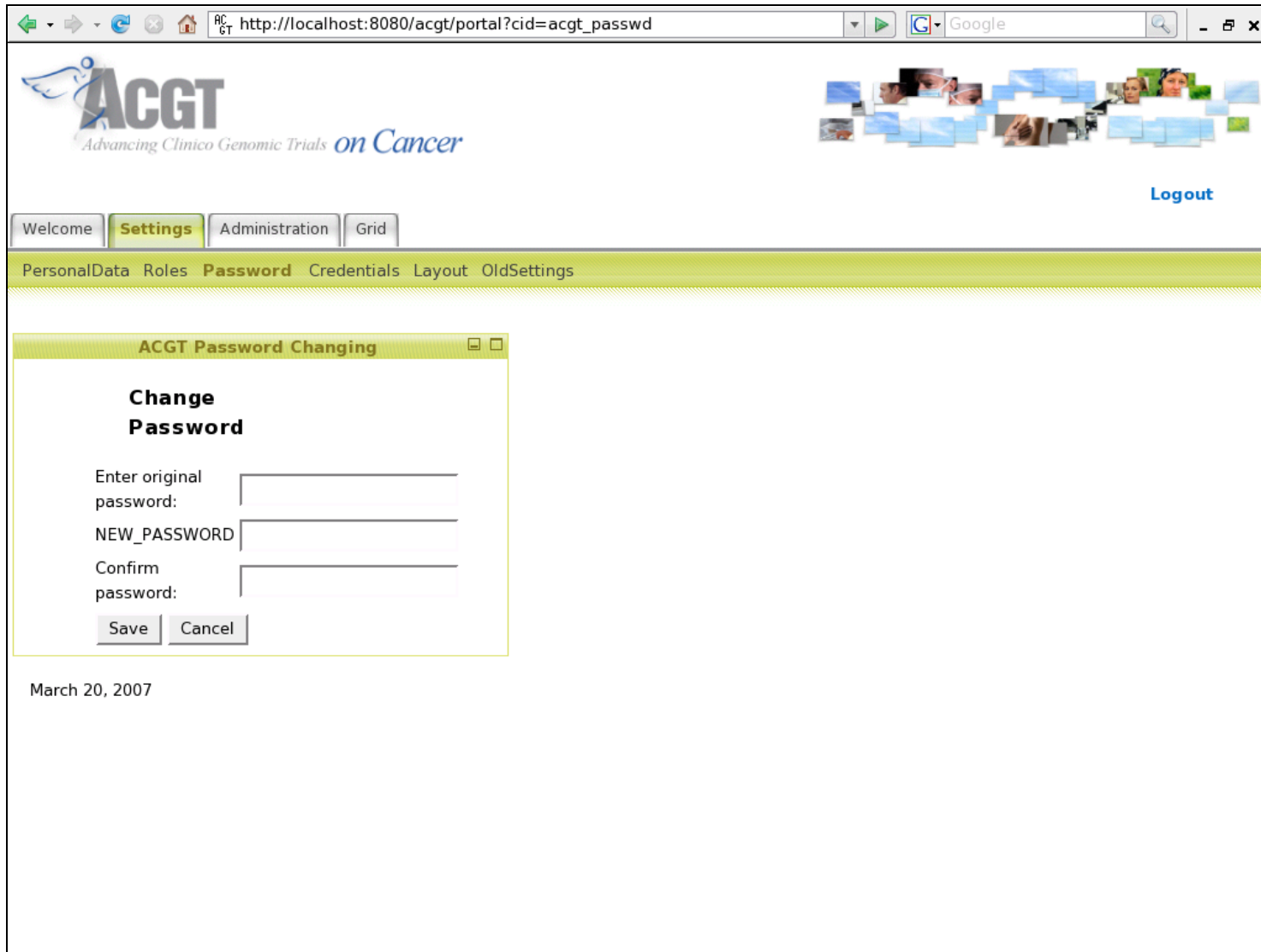


Figure 7: ACGT Portal Prototype – Change password page

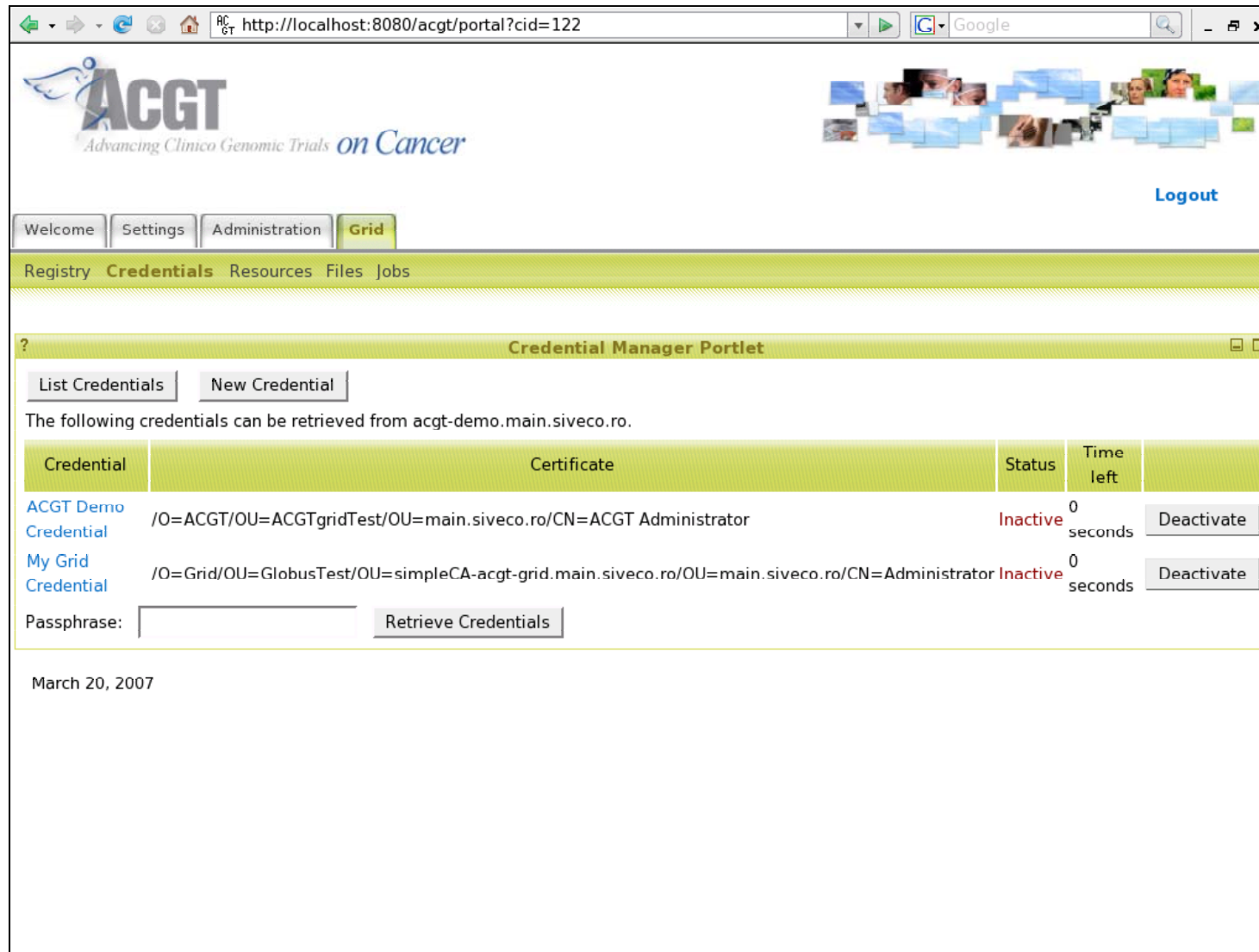


Figure 8: ACGT Portal Prototype – Credential manager portlet page

4.8 File browser portlet

The *File Browser Portlet* – **Figure 9:** ACGT Portal Prototype – File browser portlet page – provides a complete way for browsing files and moving files from one location to another.

Users can browse files on remote computing resources in a manner similar to how they might browse files on their desktop. It is relatively simple to create new directories, transfer and delete files using simple HTML interfaces.

Any file stored in a directory is available to a number of users according to their role. Besides common files, any user has its own private area, like the home directory, where he/she can store private files.

The operations available through this portlet are:

- Make a new directory
- Rename a directory/file
- Delete a directory/file
- View a file
- Upload a file
- Download a file
- Copy/Move a file to another directory

Files can be moved to different locations over the grid.

Files can be stored in a directories structure, but also in a database. There are two manners in which a user can store files in a database, either using a database in the portal, or using a database under the grid system.

The *File Browser Manager Portlet* will be used also to store input and output data from services or workflows executed in the ACGT portal.

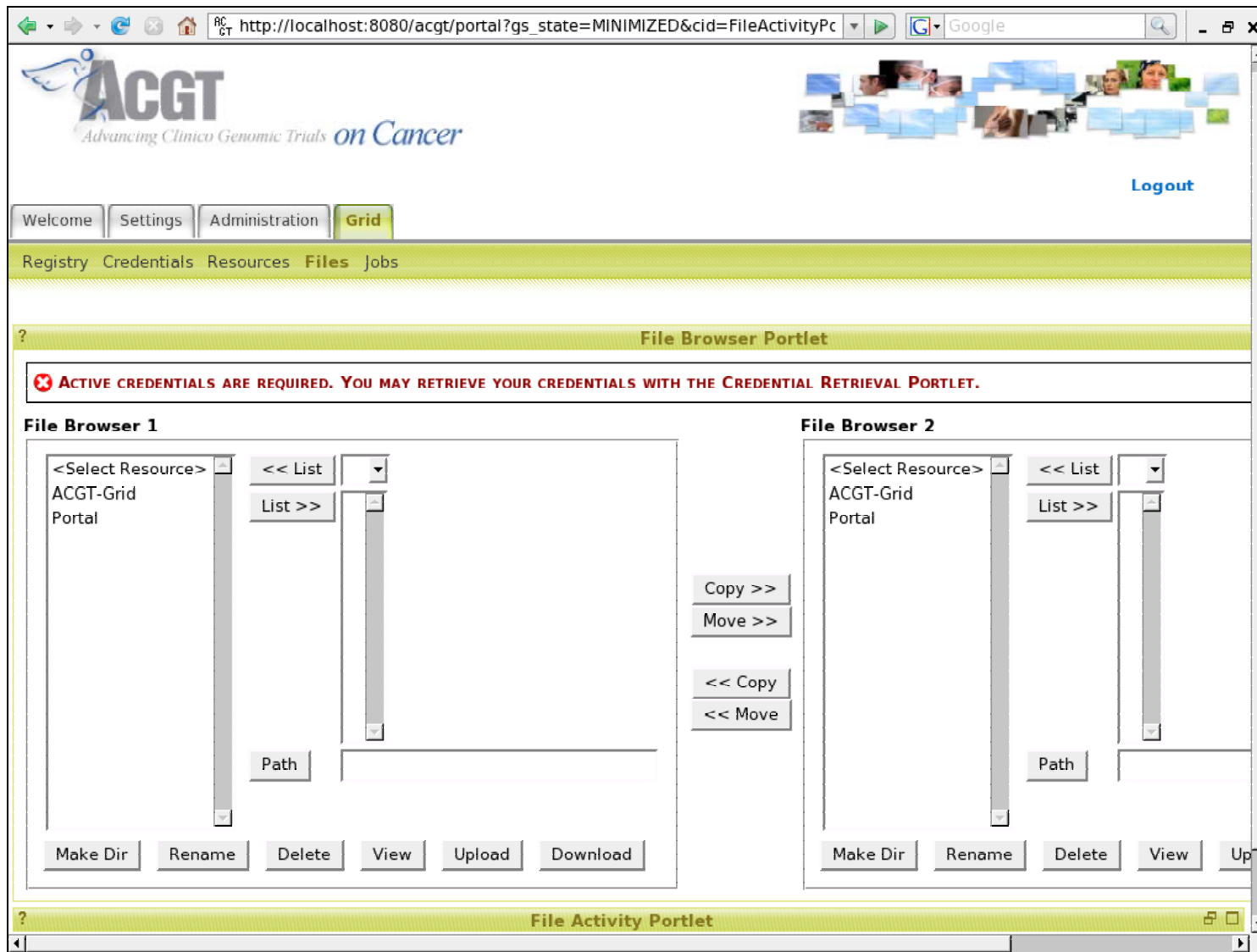


Figure 9: ACGT Portal Prototype – File browser portlet page

4.9 Workflow upload, search and execute portlet

The *Workflow Manager Portlet* – **Figure 10: ACGT Portal Prototype – Workflow upload portlet page** – is a complex portlet that manages the usage of complex workflows in the ACGT Portal.

The fields and actions available to the user within this portlet are presented in the following table:

Name	View	Field	Actions
UploadWorkflow	Upload	*Name	language=GRMS -> GRMS_Upload
		*Description	language!=GRMS -> dbSave
		*Author	
		*Version	
		*LanguageType	
		*WorkflowFile	
	GRMS_Upload	*ParametrizableList	back
			dbSave
SearchWorkflow	SearchInit	*SearchFields	
		*SearchExpression	
	SearchResults	*ResultsList	modifySearch
			removeWorkflow
			downloadWorkflowFile
			detailedView on list member
	DetailedView	*Metadata	change
		*User/date upload	remove
			download
//if lang==GRMS		*ParametersList	execute

The above table displays the options that are available for managing simple workflows defined as GRMS jobs over the grid. A similar scheme can be written for managing more complex workflows stored in the *Service&Workflows Repository*.

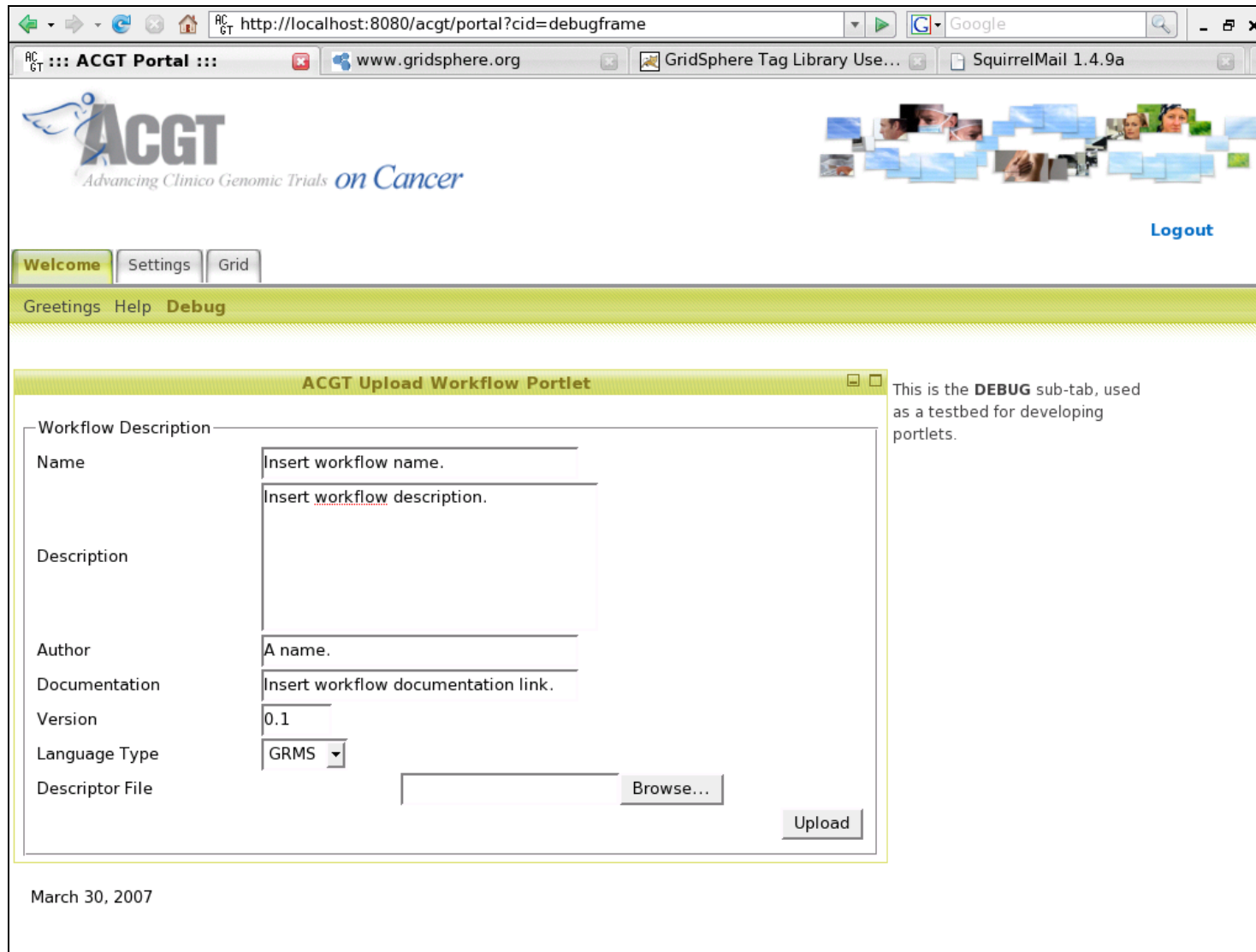


Figure 10: ACGT Portal Prototype – Workflow upload portlet page

4.10 Administration page

The *Administration page* – **Figure 11: ACGT Portal Prototype – Administration page** – is a general purpose page, which is available to the administrators of the portal.

4.11 Group manager portlet

The *Group Manager Portlet* – **Figure 12: ACGT Portal Prototype – Group manager portlet page** – allows an administrator or another user with privileges of managing groups to:

- Create a new group
- Edit a default group
- Delete a group.

For example, a clinician, who is conducting a clinical trial, has the possibility to establish a group for this clinical trial and add or delete members in this group.

Based on the group membership, users will be allowed to share data, services and workflows in the portal.

4.12 Role manager portlet

The Role Manager Portlet – **Figure 13: ACGT Portal Prototype – Role manager portlet page** – is a portlet available to the administrator of the portal. This portlet allows the administrator to create new roles in the portal.

4.13 Messaging portlet

The Messaging Portlet – **Figure 14: ACGT Portal Prototype – Messaging service portlet page** – is a portlet that allows the administrator to set-up an email service for the users of the portal.

Through this email service, all notifications to the users will be sent. Because of the implications related to the ethical and security aspects, the email service should be 100% safe and reliable. This email service can be established in the portal or in other location.

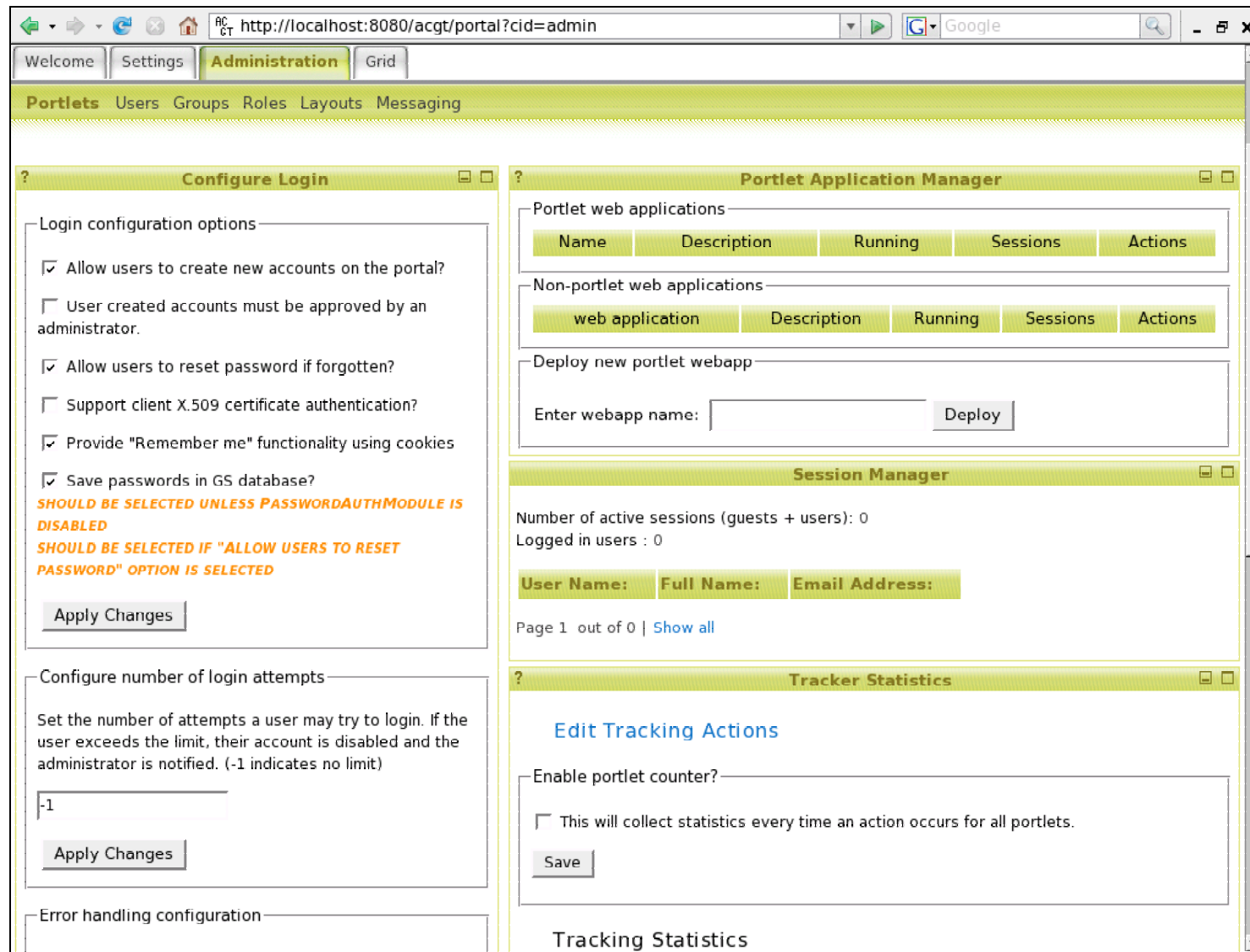


Figure 11: ACGT Portal Prototype – Administration page

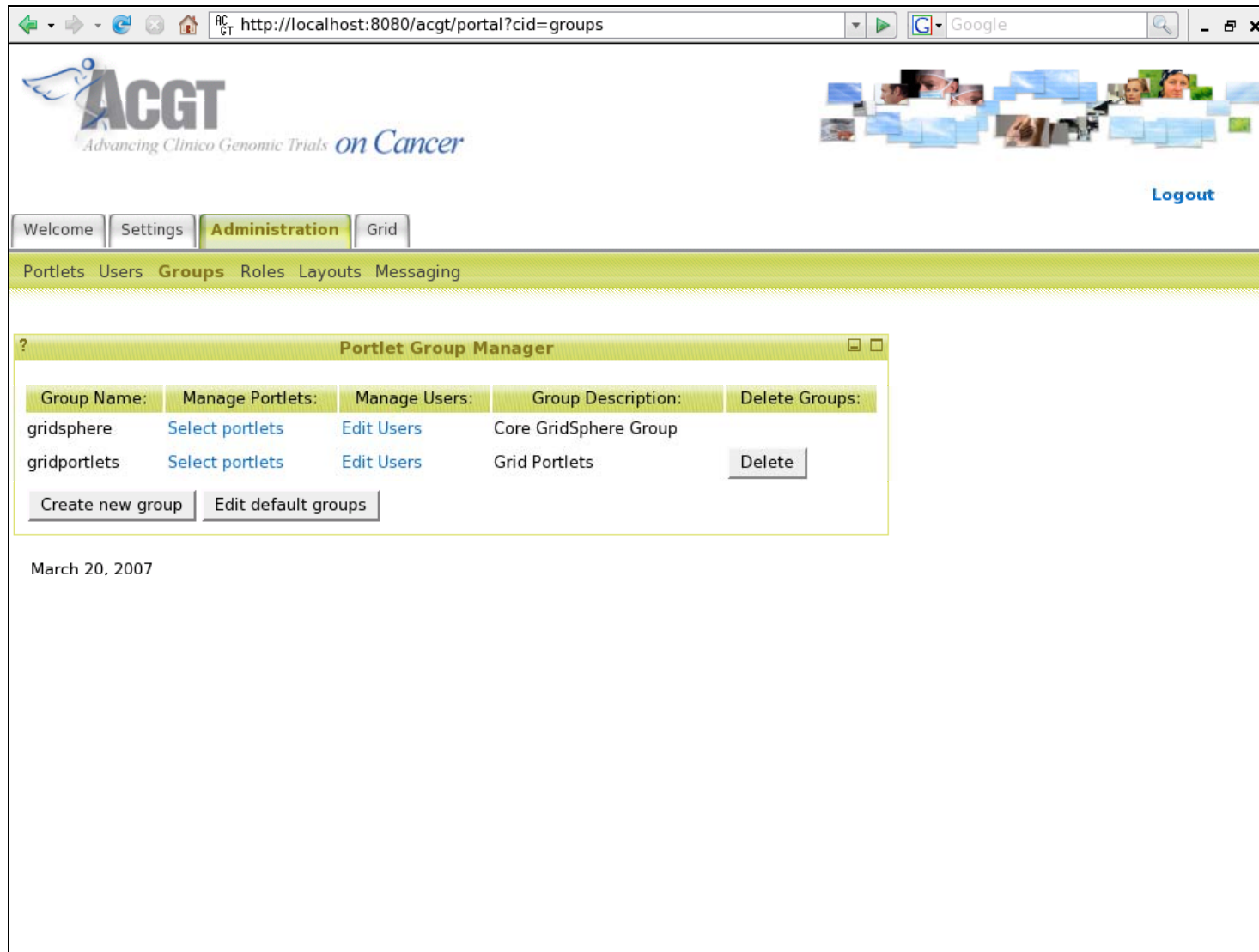


Figure 12: ACGT Portal Prototype – Group manager portlet page

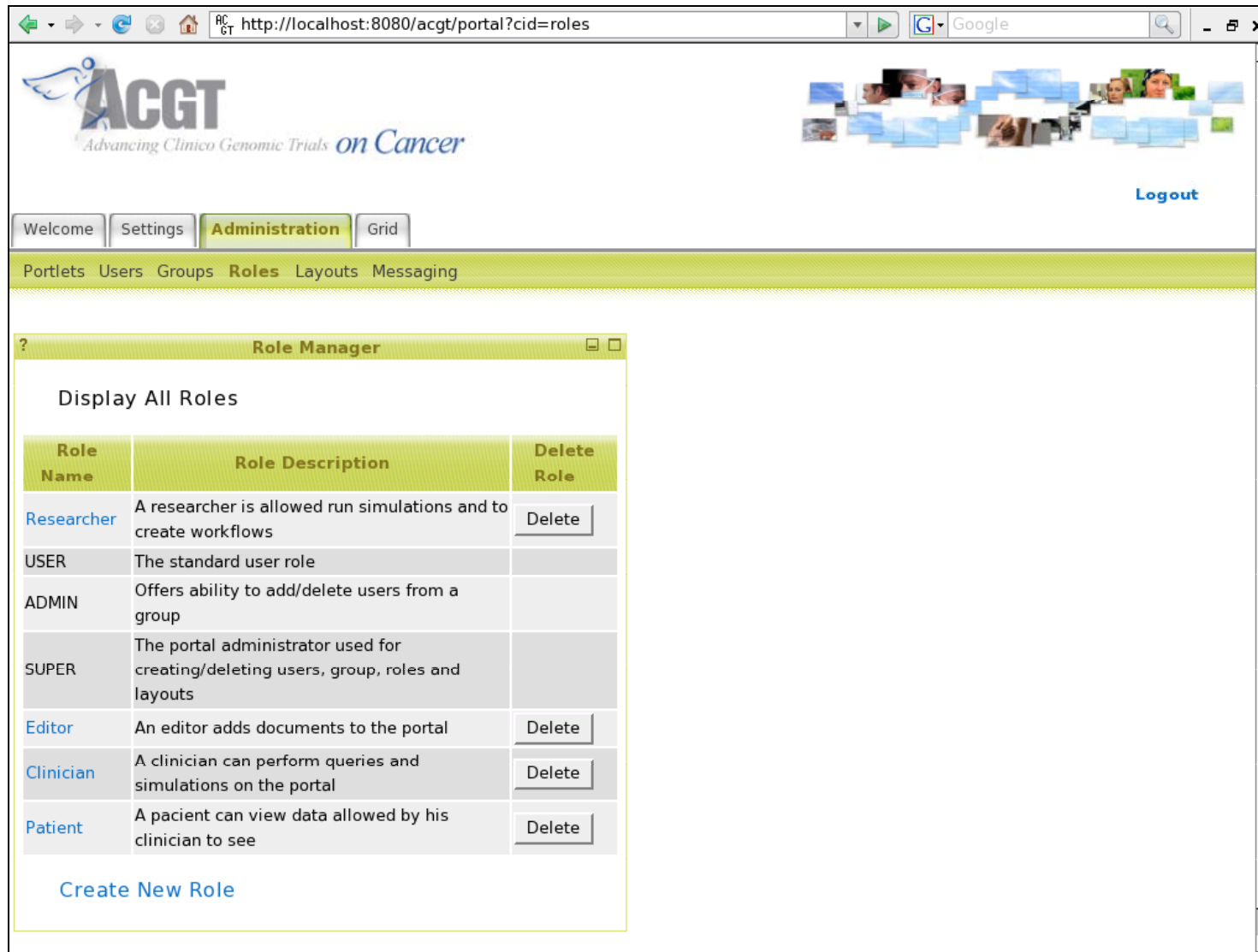


Figure 13: ACGT Portal Prototype – Role manager portlet page

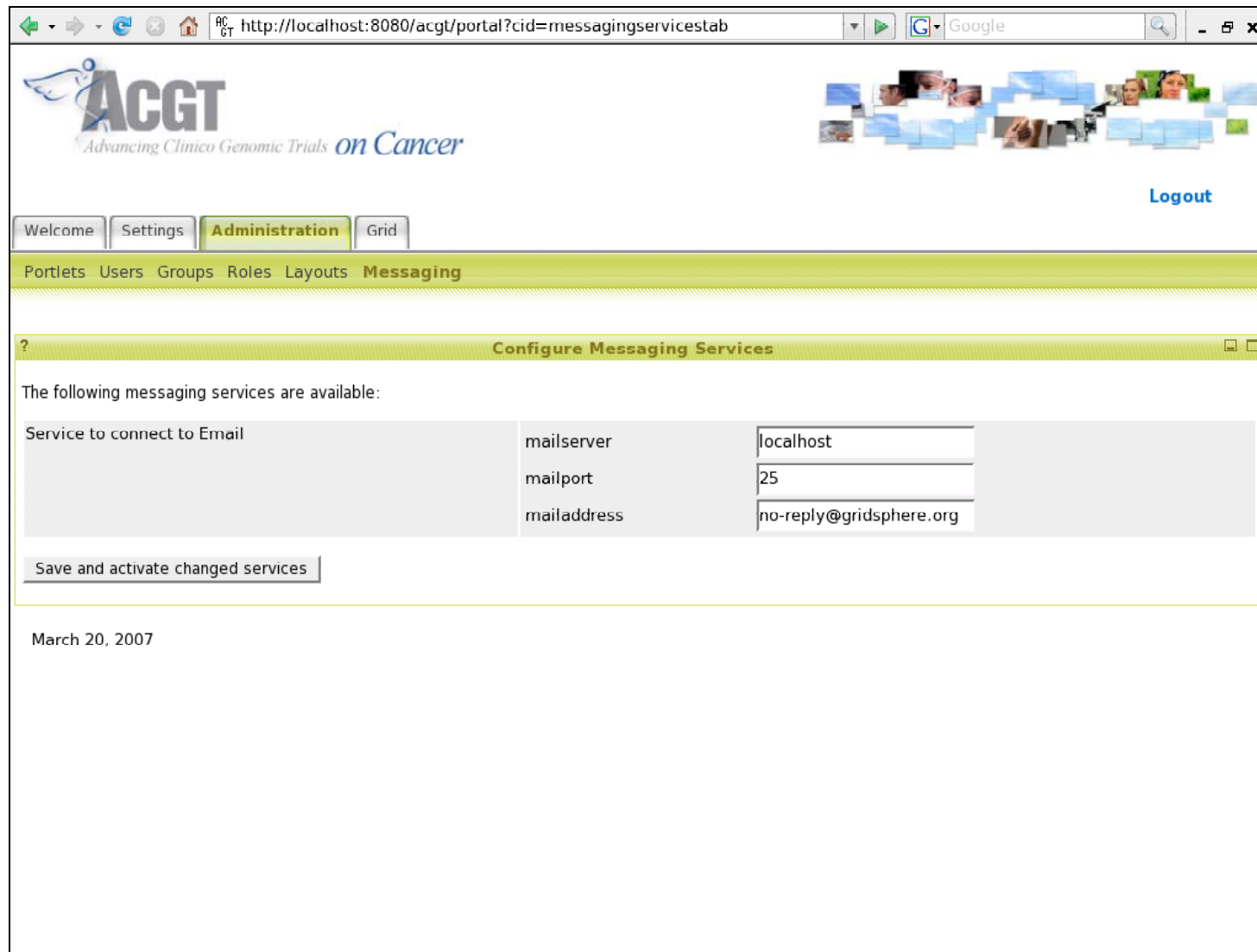


Figure 14: ACGT Portal Prototype – Messaging service portlet page

PART 3

Conclusions and Further Work

5 Conclusions

The ACGT Portal prototype was developed on the Gridsphere framework as a grid interface layer. The functionalities provided by the Gridsphere framework were adapted and developed to the specific needs of the ACGT infrastructure.

A series of user-driven scenarios were considered for the development of the prototype. Based on these scenarios, a subset of functionalities of the ACGT Portal has been implemented in the prototype. In this way, the portal grows in complexity, as it is required by practical implementation of the ACGT services and tools. This gradual development guarantees that no useless parts of the portal will be developed and maintained.

The development of the ACGT Portal is closely related to the development and integration of the ACGT services and tools. However, the portal goes with one step in front of the services integration by providing ad-hoc solution of integration in the portal before the services are fully integrated in the grid system.

This gradual implementation of services in the ACGT services, using the portal as a transitory environment will allow for an early testing of the services and for an early adoption of the ACGT infrastructure by other service providers.

6 Further work

The work to the ACGT Portal will continue with the implementation of other features as planned in the document *D14.1 – Functional & technical specification of the ACGT portal*.

These features will be implemented in a series of prototypes, using user-driven scenarios, as the scenarios are defined and completed by other partners.

In the same time, based on the scenarios already implemented, the activity in the ACGT Portal will be analysed through different types of reports. These reports will provide a feedback not only on the usage of the portal itself, but also on the usage of the entire ACGT infrastructure.

The portal activity reports will be made available through the portal to the stakeholders and will serve to the adaptation of the initial specification of the system or to the modification of scenarios.

Based on the new specifications and scenarios, a new prototype will be published at the end of the month 30 of the project.

Another part of the work will go to the improvement of the portal in the direction of make it easier to use. Much of the technical part will continue to be hidden and other features of the portal will be developed, like online training modules that will make the portal an easy-to-use tool.

A special attention will be paid to the methodological basis of the integration of services into the portal. A specific document will be written in this respect.

Along with all these improvements, the portal will begin to be used as a dissemination and exploitation channel within the ACGT project.