SEVENTH FRAMEWORK PROGRAMME

D03.1 – Electronic Communication Tools Specification

FP7-ICT-216863/UNIBO-UPC/R/PU/D03.1

Project Number: FP7-ICT-2007-1 216863

Project Title: Building the Future Optical Network in Europe (BONE)

Contractual Date of Deliverable: 31/03/08

Actual Date of Delivery: 03/08/08

Workpackage contributing to the Deliverable: WP03 : Electronic Communication Tools

Nature of the Deliverable R

Dissemination level of Deliverable PU

Editors: UNIBO – Walter Cerroni, Aldo Campi
UPC – Dàmaris Coll
PoliTO – Enrica Conrotto, Maurizio Munafò

Abstract:

This deliverable provides the technical specification of the different electronic communication tools available to the BONE consortium that will be used throughout the project duration, such as a web server, a mailing lists service, a directory service, an on-line reporting system, a shared workspace for on-line document exchange, an on-line publications and meetings/events reporting system, an on-line mobility actions management system, a VoIP and teleconference system. Most of these tools are already available to the consortium, while the deployment of the others is in progress.

Keyword list:
Communication tools, website, directory service, on-line reporting, mailing lists, VoIP, teleconference, shared workspace.

Clarification:

Nature of the Deliverable

R Report
P Prototype
D Demonstrator
O Other

Dissemination level of Deliverable:

PU Public
PP Restricted to other programme participants (including the Commission Services)
RE Restricted to a group specified by the consortium (including the Commission Services)
CO Confidential, only for members of the consortium (including the Commission Services)

Disclaimer

The information, documentation and figures available in this deliverable, is written by the BONE ("Building the Future Optical Network in Europe*) – project consortium under EC co-financing contract FP7-ICT-216863 and does not necessarily reflect the views of the European Commission*

Table of Contents

1. Executive Summary

This deliverable provides the technical specification of the different electronic communication tools that have been or are currently being deployed within the BONE consortium.

The size of the consortium and its peculiar technical organization result in a complex management structure and require a set of useful electronic tools whose main purpose is to improve and promote the interaction among the partners and to ease the consortium management process.

The electronic communication tools that are being deployed within the NoE include:

- a website
- an electronic directory service
- an on-line reporting submission system
- a mailing list system
- a VoIP and teleconference system
- a shared electronic workspace

The use of this set of electronic tools, specifically tailored to fit the BONE consortium peculiar requirements, is proving to be a key factor for a successful progress of the project.

2. Introduction

The main objective of WP03 is to provide the BONE Network of Excellence with a set of electronic communication tools implementing different functionalities. The size of the consortium (49 partners from 17 different countries), its peculiar technical organization (6 Virtual Centres of Excellence, 7 Topical Projects, 3 Workpackages for centralised activities) and the resulting complex management structure are among the factors that justify the adoption of a number of useful electronic tools whose main purpose is to improve and promote the interaction of the partners and to ease the consortium management process.

In particular, the electronic communication tools that are being deployed within the NoE include

- a website, to promote the dissemination of the NoE knowledge-base;
- an electronic directory service, to provide an efficient way of managing and accounting for the large NoE community;
- an on-line reporting submission system, to ease the NoE reporting process and to improve its efficiency and timeliness;
- a mailing list system, to implement an effective and reliable written communication service reflecting the organisational structure of the consortium;
- a VoIP and teleconference system, to implement an inexpensive, real-time communication service for promoting partner interaction;
- a shared electronic workspace, to be used for on-line discussions and efficient document sharing.

This deliverable provides the technical specification of the different tools that have been or are currently being deployed for the BONE consortium.

3. Website

After analyzing the peculiar characteristics of the BONE Network of Excellence, and specifically the requirements in terms of electronic communication, a platform based on web 2.0 tools was found to be the most suitable solution. It had to comprise dissemination information, which will be the role of the website, and a place for sharing information and having on-line discussions, provided by the shared workspace as detailed in Section 8.

An analysis of the state of the art in web 2.0 platforms resulted in the possibility to use the ECAT platform. This platform, developed by UPC, had just been released as Free Software and is able to satisfy most requirements from BONE in terms of electronic communication.

Although the ECAT platform was quite complete and was the logical next step of evolution needed by BONE's electronic communication system, it was necessary a preliminary study of the assimilations and adaptations in order to become the future website and workspace for BONE.

The definitive proposal is to use ECAT to support the Intranet, as well as the public part, and offer a different perspective to the website. Not only it offers a private part to share information with all the members of the consortium, but it also gives the opportunity to have a proactive behaviour. The platform supplies a big range of tools to allow the members to communicate and work together.

By accessing to the website (http://www.ict-bone.eu), BONE members can see the private information of their Workpackages, the shared workspace and the public information. For anonymous access only public information is shown in the website.

To show the public content the ECAT platform offers a bunch of tools to display different types of information. Therefore tools act as containers of information that process the data and make it appear in the most convenient format.

The public part of the website will have a static structure and from the website main page all public content will be accessible through a general menu.

Technical specifications of the BONE website are included in Annex 1.

3.1 Installation

The first step was the installation and configuration of ECAT platform in one of UPC servers, making it accessible through the URI http://www.ict-bone.eu. The server runs a recent release of virtualization software where a package of the ECAT platform was installed.

Altogether with the Installation, with the help of the platform functionalities, the website and the public content structure were created.

3.2 Public content

Each section in the public area of the website was created using the type of container that fitted better the type of information that was to be displayed. These containers are called Web 2.0 tools. Web 2.0 is a term describing the trend in the use of World Wide Web technology and design that aims to enhance creativity, information sharing, and, most notably, collaboration among users. The characteristics of Web 2.0 comprise rich user experience, user participation, dynamic content, metadata, web standards and scalability. Three further

characteristics could be openness, freedom, and collective intelligence by way of user participation – all should be viewed as essential attributes of Web 2.0. The concept of web-as-participation-platform captures many of these characteristics. This concept fits perfectly with BONE needs and with what BONE should head to in communication systems.

The containers or tools used (or that could be used for future sections) for the content in the public area are:

- A tool created to store and organise files into folders, i.e. a repository of files. Each file has some information such as a title, description and keywords (to improve searches for documents). Also a file can be marked as draft to warn other users before they proceed to download it. The tool also allows comments for each file in order to provide some form of feedback mechanism. The BONE website will use it to store public deliverables, milestones and other documents that can be shared in the public area.
- A tool created to host information that should be articulated as news or announcements, and in chronological order. It also allows comments for each post. The BONE website will use it to publish new information that should reach the members or news that should be shared with BONE website visitors.
- A tool created to display event information that should be sorted chronologically based on a date or a range of dates. This tool allows users to join certain events published in the calendar or comment the information of those events. The BONE website will use this tool to publish general meetings and workshops in the calendar and encourage members to join the event (registry) through the same tool.
- A tool created to introduce information that can be formatted with HTML. This information can also be introduced collaboratively. The BONE website will use this tool to display general information about BONE, partner information, teaching and dissemination information details among other contents.
- A tool created to be a place of discussion on different topics.
- A tool created for the type of content that can be best visualized in a picture viewer. BONE could use it to show pictures from meetings and other events.
- A tool created to automate processes such as joining meetings or making surveys.

It is remarkable that also two automatic lists are created for dissemination proposals in the public area. One of them can be used as a newsletter since it only allows one way of communication, from the newsletter administrator to all BONE members. The other list is open for each BONE member to send and receive emails. An archive of all mails sent through the list is stored and is managed through a friendly interface. Since this service partly overlaps with the existing mailing list service managed by POLITO, the project management bodies will decide whether to switch to the distribution list system provided by the ECAT platform or to keep using the current system described in Section 6.

4. Directory service

Besides the information publicly available on the website for dissemination purposes, the BONE NoE is expected to produce a number of technical documents that, due to intellectual property issues, must be accessible by members of the consortium only. Information about people involved in the project activities and their role in the consortium organization is also required by the project management. In addition, the electronic communication tools adopted by the NoE require some form of authentication, e.g. in order to restrict access to shared workspace, mailing lists, on-line reporting and VoIP system.

Due to the large size and the dynamic nature of the BONE community, a non-trivial user management system is necessary in order to provide an effective solution to the aforementioned information gathering and distribution issues. It was therefore decided to adopt the same approach as in e-Photon/ONe+ and a BONE directory service has been set up. This service is based on the latest standard Lightweight Directory Access Protocol (LDAP – RFC 4510), an Internet protocol targeted to access structured and distributed electronic information about users and resources, enabling effective user management, authentication and accounting services.

The directory service is provided by UNIBO through a Linux-based server running OpenLDAP (http://www.openldap.org), an open-source implementation of the LDAP protocol. The logical tree structure of the BONE directory is shown in Annex 2. All people involved in the NoE activities must be registered to the directory, as the electronic services are accessible only through authentication via the LDAP server. User management is performed with a hierarchical approach:

- the Project Coordinator, the Project Office and the LDAP server administrators have complete control of the directory and are allowed to add/modify/remove and assign any role to any user;
- every participating institution designates one or a few Local Directory Managers, which are in charge of managing users from their respective institution and are responsible for keeping the list of involved people up to date; the Project Office is in charge to assign the Local Directory Manager role to a registered used based on the partner's designation;
- WP leaders are allowed to add/remove users to their WP and to designate new WP leaders;
- each user is allowed to update her/his personal information and to select the WPs to be involved to.

The interaction with the BONE directory is performed through an ad-hoc, web-based user interface, available at https://ict-bone.unibo.it. The interface is running on an Apache web server and interacts directly with the LDAP server. After a successful login using the LDAP credentials, each user is provided with a menu of choices allowing to change personal information, manage WP memberships, browse the user directory and access to other on-line tools such as mailing lists, publications and meetings database, mobility application submission form, technical report submission page and manpower and budget tables. WP leaders have an additional menu to access their WP user management and report submission pages, while Local Directory Managers have access to a partner management menu where they can manage local users and partner information. An additional administration menu is

available to the Project Coordinator, the Project Office and the LDAP server administrators to perform their coordination tasks.

5. On-line reporting

The web-based reporting system is another useful on-line tool available to the BONE consortium, implementing an efficient and handy way for collecting the required quarterly reports describing technical activities both at the partner and Workpackage level. It is also used to collect and manage additional key information for the project management and evaluation processes, such as manpower and budget figures declared by participants, publications from partners, meetings and events attended and relevant to the NoE, mobility actions. This tool is integrated with the BONE directory service and is accessible through the same web interface: https://ict-bone.unibo.it. The user interface represents the front end section of the whole reporting information system, which is based on a MySQL database backend.

The user interaction with the reporting system follows a hierarchical approach:

- all NoE users are allowed to contribute to the quarterly activity report of their respective participating institution by filling a set of forms with the description of the work carried on within each Workpackage;
- users are also allowed to update manpower and budget figures in the relevant tables and to report about project-related publications or attended meetings/events; they are also allowed to submit mobility applications, which are subject to approval from relevant WP leaders;
- for each participating institution, General Assembly members and Local Directory Managers are in charge of submitting the quarterly report forms to the Project Office; submission is performed on-line;
- Workpackage leaders have access to the activities reported by partners within their respective WPs, so they can use this information to compile their quarterly WP report and submit it to the Project Office; WP report compilation and submission is performed on-line;
- WP leaders are also in charge of updating the status of milestones and deliverables and of approving mobility applications relevant to their respective WPs;
- the Project Coordinator, the Project Office and the LDAP server administrators have complete control of the reporting system and are allowed to modify any part of it;
- the Project Coordinator and the Project Office collect all the information included in the different sections of the on-line report system and use it to submit the required quarterly project report to the European Commission and to monitor the progress of the consortium.

The quarterly activity reporting system was already available at the end of the first project quarter (M03). During the second quarter the publication reporting tool has been added. Additional tools for mobility actions and meetings/events reporting are currently ongoing and will be available at the end of the third quarter.

6. Mailing lists

A set of mailing lists was created (domain: @tlc.polito.it) to circumscribe discussions and messages inside the different groups and Workpackages of the BONE consortium. These mailing lists are managed through Mailman (http://www.list.org), a widely used open-source software tool for list management, on a mail server located at Politecnico di Torino (POLITO). Among its features, Mailman supports the message archives, so that previous messages can be retrieved through a Web interface. The mailing lists are also protected (as far as possible) from commercial spam and viruses by the MailScanner software and the explicit filtering of positively identified spam messages.

To integrate the mailing list management as far as possible with the BONE directory service so that users do not need to interact directly with the Mailman subscription system, the lists are automatically and dynamically populated starting from the information available in the directory server. Twice a day the directory server is queried to retrieve the lists of participants to the various user groups described below: using the Mailman command line scripts, any change to the groups on the directory service is propagated to the Mailman subscription lists with a maximum delay of 12 hours. Suitable safety checks are implemented to avoid wiping the subscription lists in case of a communication failure between the mail server and the directory server.

Every user registered to the directory is automatically subscribed to the general BONE mailing list BONE@tlc.polito.it. Technical lists for specific Workpackages have been created as BONE-WPxx@tlc.polito.it. Subscriptions to WP lists are managed by the users themselves through the WP membership on the directory server.

The management mailing lists, reflecting the organisational structure of the consortium, are the following:

- BONE-office@tlc.polito.it: Project Office list
- BONE-GA@tlc.polito.it: General Assembly members
- BONE-MB@tlc.polito.it: Management Board members (appointed at the kick-off meeting)
- BONE-EAB@tlc.polito.it: External Advisory Board members

Additional mailing lists have been defined for other administrative and technical issues:

- BONE-adm-contact@tlc.polito.it: Administrative contacts
- BONE-legal@tlc.polito.it: Legal contacts
- BONE-web@tlc.polito.it: Website Taskforce, for all queries related to the BONE website
- BONE-dir@tlc.polito.it: Local Directory Managers (appointed by each partner)

7. VoIP and teleconference system

The VoIP and teleconference system that is under development for the BONE consortium is based on the SIP standard signalling protocol. The choice of SIP is driven by the intention of developing a fully standard platform for interaction and collaboration. Both server and client tools will be provided in order to produce a fully manageable and configurable Virtual Communicator Centre. The system will be based on open source software and will be customized and integrated with the BONE directory and website.

The services that will be provided by the VoIP system are described in the following.

- Point-to-point audio and video call: this service allows BONE members to make inexpensive long-distance and international calls using the data network.
- Text messaging; this service provides point-to-point real-time text messages.
- Presence service; this service gives the capability to check the status of the users: on-line, busy, away, etc…
- Teleconference; this service is based on virtual teleconferencing rooms.

The VoIP and teleconference system will adopt a client-server approach. On the sever side the following software will be installed and configured on a Linux platform.

- Openser (http://www.openser.org), an open source software implementing SIP Proxy, Registrar and Presence server. Openser will be integrated with the BONE directory allowing the use of the same credentials for web and VoIP services.
- Asterisk PBX software (http://www.asterisk.org) will be used to develop the teleconference system.
- A web-based interface will provide integration between the BONE directory server and the VoIP and teleconference service.

Because the VoIP implementation is based on the standard SIP protocol, any SIP client can be used to join the VoIP and teleconference system. However, in order to provide a full VoIP implementation, the customization of a SIP client for the BONE community is currently in progress.

The client will be probably based on the sip-communicator user agent (http://www.sip-communicator.org), written in java and fully portable to any operating system and platform. However other options are under evaluation, as OpenWengo (http://www.openwengo.org/).

The client will provide the following features:

- It will be branded with the BONE logo.
- The buddy list will be automatically filled with the SIP address of all BONE partners.
- It will show customized buttons to easily join the teleconference system.

8. Shared workspace

As anticipated in Section 3, the BONE shared workspace and website have been created to be a whole. Once a BONE member is logged in, he/she is offered all the information available to him/her, that included in his/her private groups of work (Virtual Centres of Excellence, Topical Projects or other Workpackages) but also the public information. The shared workspace relies on the same information containers as described for the website. It is important that these 2.0 tools are especially conceived to allow a shared and communicative workspace. Technical specifications of the BONE shared workspace are included in Annex 1.

8.1 Authentication

One of the challenges was to make the authentication system of ECAT platform compatible with the BONE directory service. An effort was made towards the adaptation of the platform to the LDAP-based authentication used by BONE in order to avoid two different authentication systems for the same users. Moreover, it was also not advisable to force users to introduce their information and WP memberships twice, since this was already available on the directory server.

All the necessary information to add users to the platform with no need of an extra registration was extracted from the BONE directory. The users are able to access using the same username and password as in the directory server, since the platform authenticates accesses through the same directory. Once the LDAP server at UNIBO validates the user, the platform at UPC retrieves the information necessary to connect the user with his/her profile.

8.2 Private content

A private group was created for each Workpackage, Virtual Centre of Excellence and Topical Project. For each one of them some basic content was created using the type of container that best fitted the type of information that was to be displayed. The containers or tools are the same ones used to host public information, as described in Section 3.2.

Each private group will have the following sections:

- Announcements, which will use a tool for posting news. The WP leader will be able to publish news related to the Workpackage and the rest of members can insert comments.
- Deliverables and Milestones and Working Area, that both will use a file repository tool.
- Meetings and Workshops, that will be created with a calendar tool where the WP leader would be able advertise new events in the Workpackage and encourage WP members to comment or to join these events.

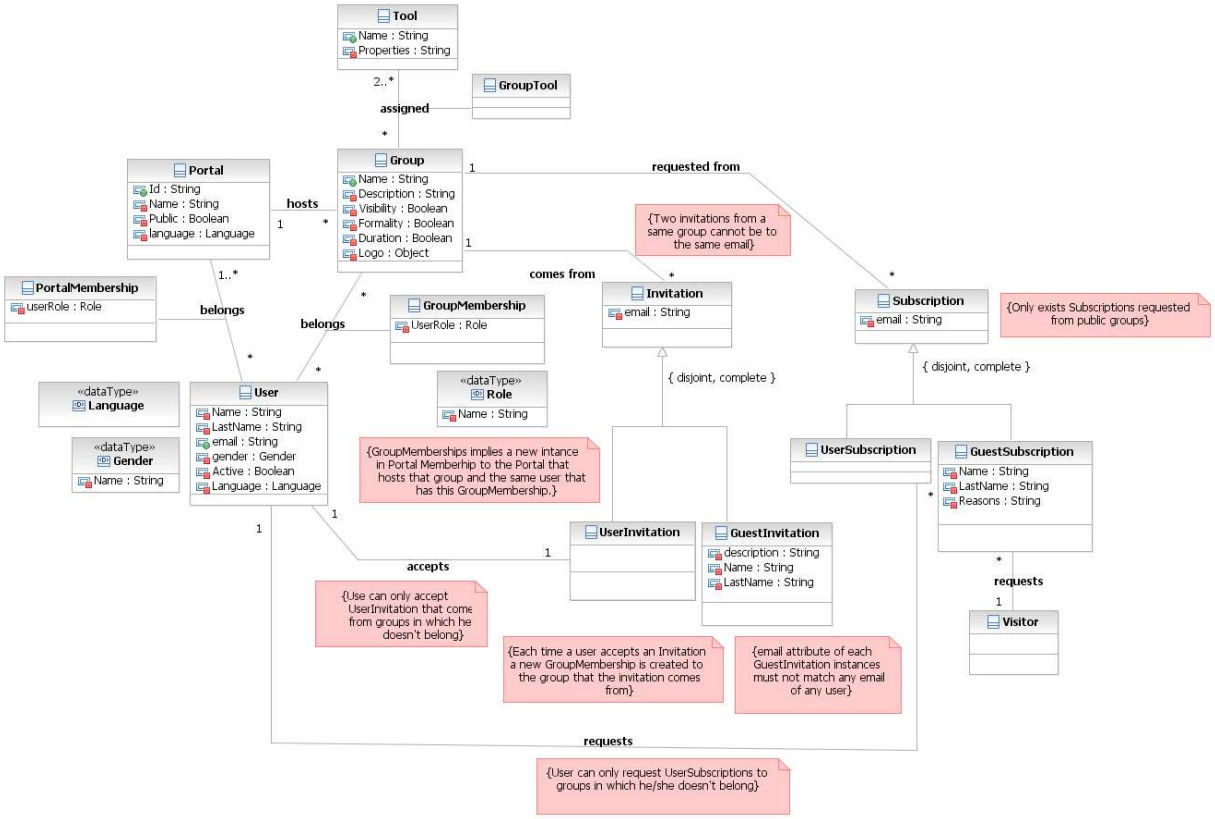
9. Conclusions

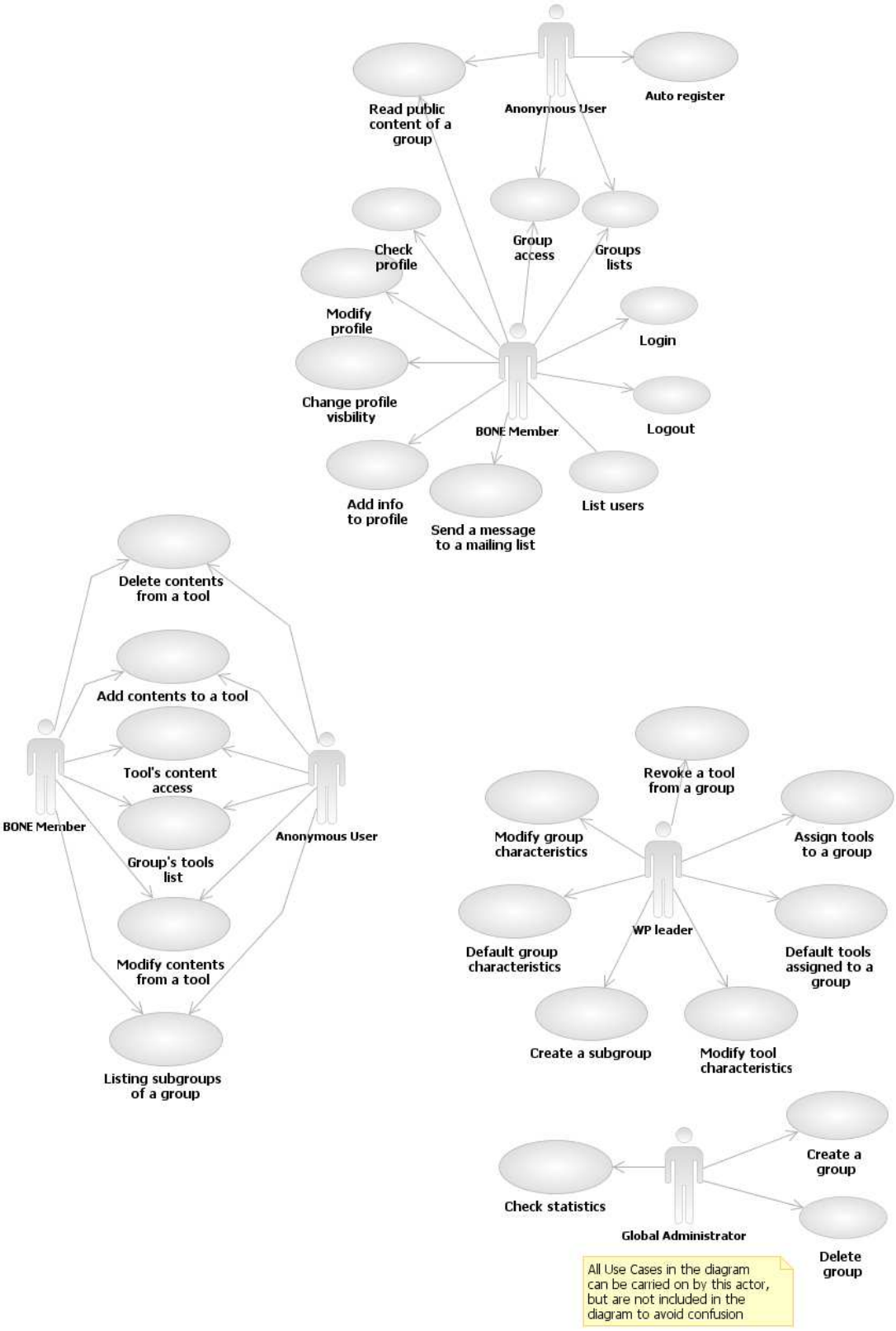
This deliverable has provided the technical specification of the different electronic communication tools available to the BONE consortium that will be used throughout the project duration. The most important and critical communication tools (web server, mailing lists, directory server, quarterly activity reporting system) have already been deployed and are currently used by partners and governing bodies. Additional tools (shared workspace, publications and meetings/events reporting, mobility applications submission and evaluation, VoIP and teleconference system) are either already available or will be available soon.

The use of this set of electronic tools, specifically tailored to fit the BONE consortium peculiar requirements, is proving to be a key factor for promoting partner interaction and improving the consortium management process.

Annex 1: BONE Website and Shared Workspace Conceptual Model and Use Cases Diagrams

The following Conceptual model and Use Cases Diagrams were created using UML (Unified Modelling Language).




Read public content of a group
Anonymous User
Auto register
Check profile
Group access
Groups lists
Modify profile
Login
Change profile visbility
BONE Member
Logout
Add info to profile
Send a message to a mailing list
List users
Delete contents from a tool
Add contents to a tool
Tool's content access
BONE Member
Anonymous User
Group's tools list
Modify contents from a tool
Listing subgroups of a group
Revoke a tool from a group
Modify group characteristics
Assign tools to a group
WP leader
Default group characteristics
Default tools assigned to a group
Create a subgroup
Modify tool characteristics
Create a group
Check statistics
Global Administrator
Delete group
All Use Cases in the diagram can be carried on by this actor, but are not included in the diagram to avoid confusion

Annex 2: BONE Directory Structure

The BONE directory service is built on the logical tree structure shown below. The root node has two branches, “ou = personnel”, where all the users are stored, and “ou = administration”, where users are assigned their respective roles in the NoE. Apart from the project officer, on the personnel branch users are classified by country and then by participating institution. The administration branch has two sub-branches: “ou = JPA” stores the user roles related to the technical activities based on the different workpackages, while “ou = management” stores the user roles related to the NoE governing bodies and other responsibilities.

dc = ict-bone.eu
- ou = personnel
  - ou = project officer
    - uid = <project officer>
  - c = <country>
    - o = <participant>
      - uid = <user>
- ou = administration
  - ou = JPA
    - ou = WPxx
      - cn = WPxx leader
      - cn = WPxx members
  - ou = management
    - cn = administrative contacts
    - cn = external advisory board
    - cn = general assembly
    - cn = LDAP server administrators
    - cn = legal contacts
    - cn = local directory managers
    - cn = management board
    - cn = website taskforce
    - ou = coordination
      - cn = project coordinator
      - cn = project office