BSCW Version 3 Help

This document describes Version 3.0.1 (June 1997) of the BSCW Shared Workspace Server.

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Abstract:

BSCW supports group work over the internet by providing shared workspaces. A workspace allows storage and retrieval of documents and sharing information within a group of persons. Some basic awareness functionality is provided. The system is designed primarily to support self–organizing groups.

A workspace can be accessed via the World–Wide Web, which makes it very useful for cooperation in groups that are geographically distributed and/or work on different platforms.

If you have questions that are not addressed in this manual, please feel free to contact us at bscw@gmd.de.

Different versions of this manual exist and may be downloaded from the bscw server:

- on–line as a series of HTML pages (http://bscw.gmd.de/Help
- printable postscript and PDF version (http://bscw.gmd.de/Help/download.html)

The HTML pages and the printable versions should be identical. Please refer to Appendix A of the on–line version to see if your copy is out of date.

This document does not contain an index. There is a full text search available for the on–line version.

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1 Executive Summary

The following pages give an overview of the current version of the BSCW system. You will find information about:

- Why should I use BSCW?
- What do I need to use BSCW?
- Where can I get more information about the system and the developers?
- BSCW for the impatient

1.1 Why should I use BSCW?

BSCW is a **shared workspace**,
a general tool that can be used, for example, to store documents (or other objects) that relate to some particular project or working group.

The important **benefits** are:

- You can use the workspace **to share documents accross different platforms** (Windows, Macintosh or Unix).
- You can access a workspace, browse through folders and retrieve objects **just like ordinary WWW pages**.
- You can upload documents **via a WWW–Browser**.
- The workspace **keeps you aware** of all events (e.g. creating, reading, changing of objects)
- You **do not need to install any software** if you use the BSCW–server at GMD. You only need an ordinary Web–Browser. (But you can install your own server if you want, and you may download additional software for uploading to ease the use of the workspace. See http://bscw.gmd.de/Download.html).

1.2 What do I need to use BSCW?

In order to use BSCW, your system must fulfill some **minimal requirements**:

- You must have an **e–mail address** if you want to register yourself as a user with our public server.
- For **accessing a workspace** and retrieving documents, the only thing you need is a WWW browser that supports forms and basic authentication. Most browsers (Netscape Navigator, Internet Explorer, ...) do so. We recommend to use Netscape 3.0 or later.
- There are two possible ways of **adding documents** to a workspace. The easiest way is using a browser with built–in file–uploading (such as Netscape 3.x). For all other browsers you need to download a *'helper' program* (cf. section 5 of the on–line help) and install it locally. (There are different helpers for different platforms; currently we support UNIX in various forms (including Solaris 2.3, SunOS 4.1.3, HPUX, AIX), Macintosh (MacOS 7.5), and Windows (3.1, NT, and 95).

1.3 More Information About BSCW

The following BSCW pages provide additional information about BSCW and the developers group at GMD:

- The BSCW Home page (http://bscw.gmd.de).
- A list of frequently asked questions (FAQ). (http://bscw.gmd.de/faq.html)
- A guest workspace with anonymous access for new visitors. (http://bscw.gmd.de/pub/english.cgi)
- What's new? (http://bscw.gmd.de/WhatsNew.html)
- An Overview page with further entry points. (http://bscw.gmd.de/Overview.html)
- A list of selected BSCW publications . (http://bscw.gmd.de/Papers/index.html)

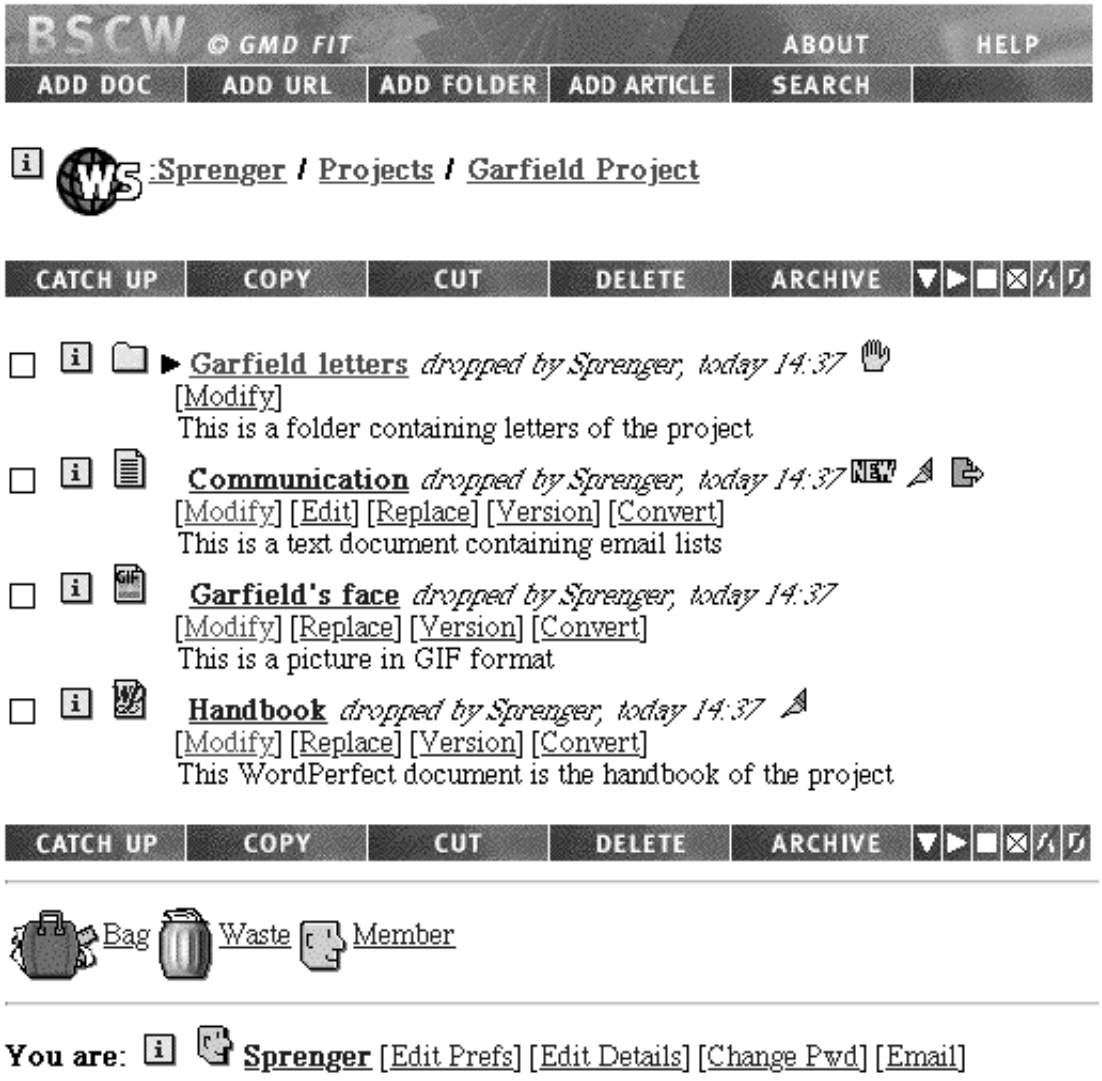
1.4 BSCW for the Impatient

BSCW offers **shared workspaces** for exchanging documents of any kind. The main advantages of the system, compared to exchange via email or ftp, are:

- you can download and upload documents **via a Web–Browser**
- the workspace **keeps you aware** of all events (e.g., creating, reading, changing of objects)

This short introduction doesn't inform you about all features. For further details, please, have a closer look at the on–line help pages or download a printable version of the complete help pages.

A Workspace is usually set up as a hierarchy of directories and objects, or, to speak in a 'Windows' or 'Macintosh' style, a **hierarchy of folders and documents**. A workspace looks like the following:



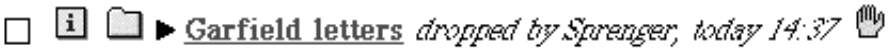
1.4.1 Basic features

Before you start using the workspace, you have to understand some basic features. These are explained below referring to the picture above (for any detailed information, please look at the help pages or use the full text search).

Click these buttons for **adding objects** to the workspace. The **Search** enables you to look for folders or files in the workspace or to search the Web.

This is the **current location**: In this case, the user ’Sprenger’ views objects of the folder ’Garfield Project’ inside the ’Projects’ workspace.

The five large buttons provide actions to be performed on a **set of selected objects** (see below). Just click the other icons to find out what they will do.



This is a folder named **Garfield letters**. To open the folder just click the name.

This icon characterizes the type of object, in our case it’s a folder.

There are other icons, e.g., for postscript files, for pictures in GIF format, or for a zipped document (see Appendix C of the help pages for a complete list of icons).

Clicking this icon
will fold out the contents of the folder.

Click this checkbox to **select** the object.

You can perform actions (e.g., DELETE) simultaneously on a set of selected objects (in contrast to actions for a single object; cf. below)

Clicking this icon
will bring up detailed information about the object.

There may appear some icons indicating events that have happened. Clicking on those icons will provide you with more detail:

: This object is new (i.e. has been created after your last ’Catch up’).

: Someone has modified this document.

: Someone has read the document.

: Something has changed inside this folder.

[Modify] [Edit] [Replace] [Version] [Convert]

This line describes actions which can be performed on a single object (in contrast to actions for a set of selected objects)

You can ’cut’ every object or a selection of objects, which means that the object is put into a clipboard (called **bag**). When you ’copy’ an object, the copy is put into the bag. Wherever you

go in the workspace you can 'drop' the objects that were last cut to the current location. You can also enter the bag, by clicking on the icon at the bottom of the page.

Every user has a personal **wastebasket**. When an object is deleted it is moved to the wastebasket of the owner of the object. Only the owner is able to irreversibly 'destroy' it. You can enter the wastebasket by clicking **waste** at the bottom of each page.

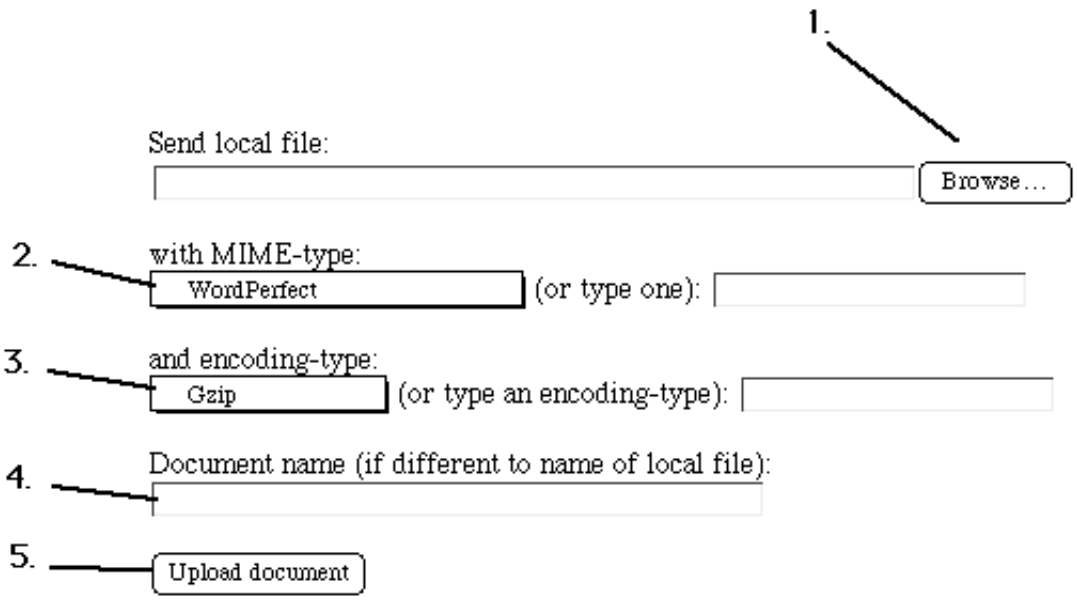
You can access information about the workspace members by clicking the **members** icon

You are: **Sprenger** [Edit Prefs] [Edit Details] [Change Pwd] [Email]

Look at the help pages (or just try out) for details about personal information and preferences.

1.4.2 An Example: Uploading a Document

(for Netscape 3 users) Click ADD DOC at the top of the page. A page consisting of the following form will come up:



1. Click the 'Browse...'–button to select a document from your local file system.
2. Select the MIME–type of the document.
3. If necessary, you can specify an encoding type.
4. Type in a name for the document on the workspace (if different to the name of the local file).
5. Click 'upload document' to start uploading.

Finally, you should see the folder view including the new document.

2 Before you start

You are encouraged to explore the workspace. If you don’t understand something, you find a help link on every page refering to this manual.

However, there are **a few things you should know before you start**.

In order to use BSCW, your system must fulfill some minimal requirements:

- You must have an e–mail address if you want to register yourself as a user with our public server.
- For accessing a workspace and retrieving documents, the only thing you need is a WWW browser that supports forms and basic authentication. Most browsers (Netscape, Internet Explorer, ...) do so. We recommend to use Netscape 3.0 or later.
- There are two possible ways of adding documents to a workspace. The easiest way is using a browser with built–in file–uploading (such as Netscape 3.x). For all other browsers you need to download a *’helper’ program* (cf. section 5) and install it locally. (There are different helpers for different platforms; currently we support UNIX in various forms (including Solaris 2.3, SunOS 4.1.3, HPUX, AIX), Macintosh (MacOS 7.5), and Windows (3.1, NT, and 95).

Some other practical hints:

- Do not use your normal password as a password for the workspace. Password transmission over the Internet is currently unprotected.
- You can browse through a workspace by following the links offered on each page. It is also possible, however, to use the *Back* and *Forward* buttons of your WWW browser.
- If you don’t have a user name yet, you may use a "guest login" to look around in a demonstration workspace. You can get a user name by filling out a registration form. For more details, see our Information Pages.

User registration: New users can register themselves on a public server or may be invited by workspace members to register for a specific workspace. A valid email address is necessary to complete a registration form.

A workspace is organized as a hierarchical structure of folders. When you access a workspace folder, its contents is displayed in form of a WWW page. The next sections guides you through the various bits and pieces that you find on such a page.

3 Basic concepts

The following pages give an overview of the basic concepts and will enable you to explore the workspace. More advanced features are explained in section 4.

Contents of this section

3.1 Logging in to the workspace server

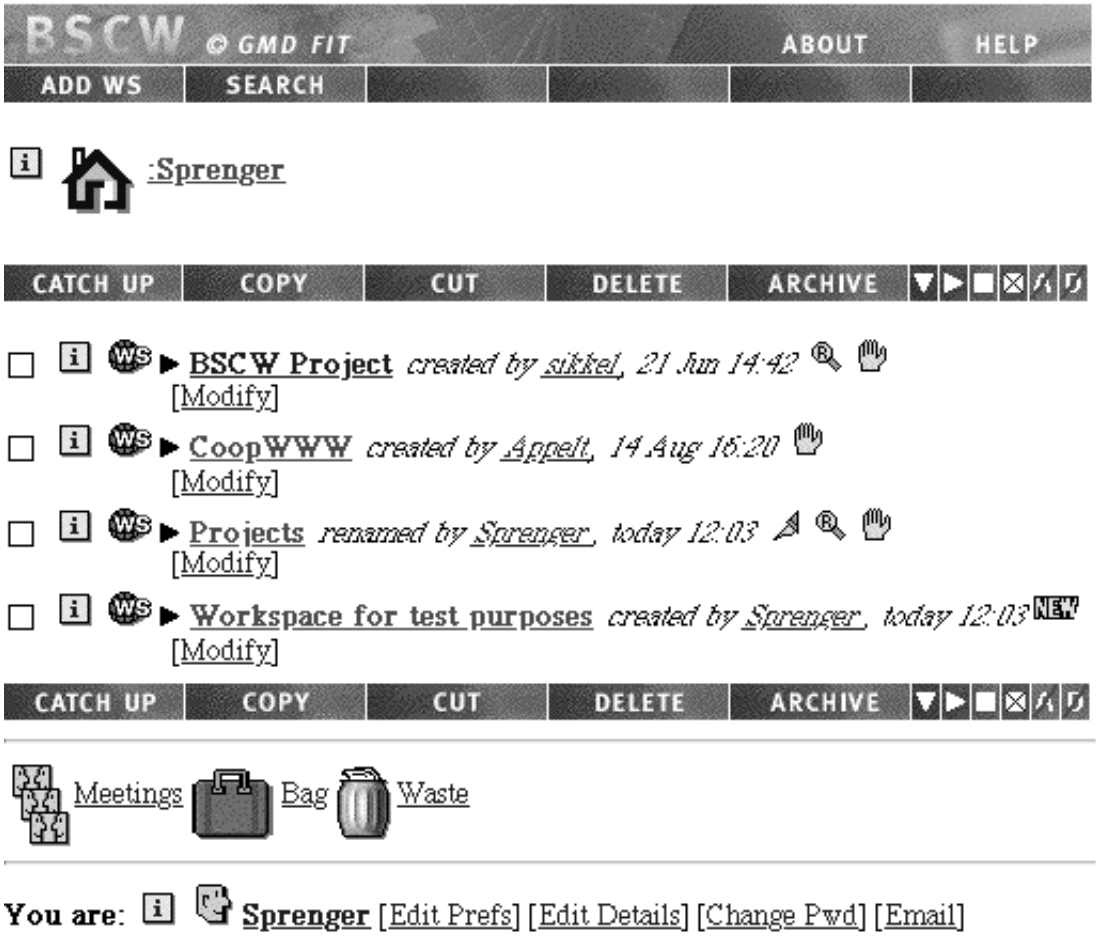
From the BSCW Start Page you can go to the public Shared Workspace server. You will be asked to authenticate yourself with user name and password. This will be remembered until the end of the session, i.e., until you quit the WWW browser.

Each registered user has an *index of workspaces* which presents the shared workspaces he or she can access. Each workspace has its own group of associated members.

Changing your password is possible by clicking **[Change pwd]** at the bottom of each page.

If you first want to look around in a demonstration workspace, you can visit our guest workspace (http://bscw.gmd.de/Overview.html).

The following figure will give you an impression of what an index of workspaces may look like:



3.2 Page headers and footers

Each page that displays a folder within a workspace has a header that precedes the contents of the folder. This header comprises the following sections.

The **top line,**

which provides links to the home page of BSCW (*ABOUT*) and the on–line user manual (*HELP*).

The **button bar** under the top line indicate the possible actions of adding folders and documents and editing a banner (if you are on top level, there is only the *ADD WS* button, enabling you to create a new workspace):

The different *Add* buttons are described in section 3.5.

It is possible to edit a banner which is then placed between the two button lines. See section 4.11 for details.

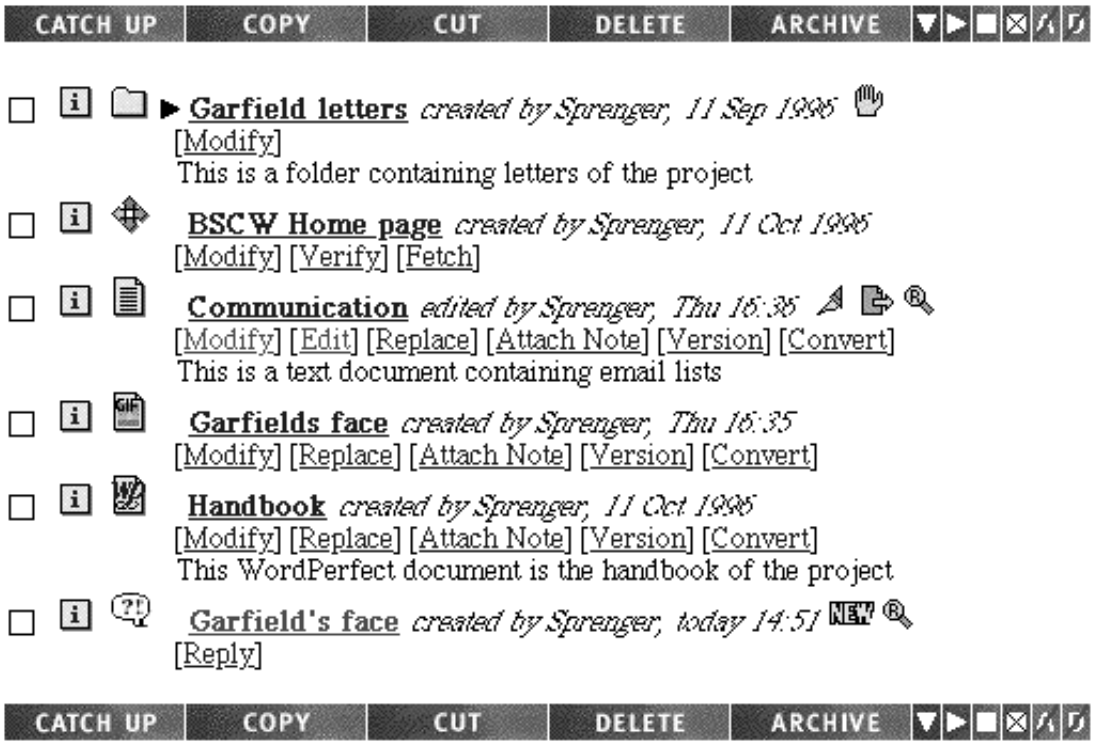
Location of the current folder.
Beneath the button bar, the location and name of the current folder is displayed. For example, if the user `Sprenger` has access to the workspace `Projects` which contains a folder `Garfield project`, the location will be shown as

Page footers. The first line at the bottom of each page contains a bag  , a wastebasket  , and a members icon  . The members–icon (cf. section 4.6) will provide information about users with access to the workspace, the waste (cf. section 3.7) contains deleted documents. The bag (cf. section 4.2) is used for 'cut and paste' actions.

The last line provides user–specific actions like editing preferences (cf. section 4.8), changing the password and editing details of the user–description.

3.3 Objects

The contents of a workspace or a folder inside can be displayed with different kinds of information about the objects in folders. Directly above and below the folder contents are button bars for viewing and handling objects in folders. Basic operations on objects are described in section 3.5 The following picture gives an impression of a possible presentation of a folder:



The name of each object is represented as a link, that can be clicked to access the object. The icon in front of an object name gives an indication of its type (cf. Appendix C for a complete list of icons).

The objects in a folder come in different categories: documents, links, folders, articles and meetings.

3.3.1 Documents

There is a variety of different kinds of documents: text, images, sound, video, all in different formats. All documents in the workspace carry an explicit type. These so–called *Mime types* are further discussed in Appendix B.

When you click on a document, various things can happen, depending on the type of the document and the configuration of your local browser.

- the browser interprets the document and displays it as a WWW page;
- a local application is started that can handle the document;
- a dialog box comes up, for storing the document as a local file;
- the browser is not sure what to do and offers you a choice from the above alternatives.

3.3.2 Links

 in front of an object indicates a URL (also called: a link), rather than a document. This is a *Universal Resource Locator*, i.e., the address of a WWW page that can be located anywhere.

Links can be used to include pages that are relevant to your work, but not maintained in your group. You can also include links to workspaces located at other servers.

3.3.3 Folders

A folder may contain other folders. As would be expected, clicking on the folder name will bring you into the folder. Your location in the folder hierarchy is indicated at the top of the page (cf. section 3.2)

3.3.4 Articles

It is possible to post articles and have threaded discussions in a workspace. One can reply to an article, reply to a reply and so on. Articles in a workspace folder are indicated by the article icon . The contents of an article can be made visible by clicking its name as usual. See section 4.4 for details.

3.3.5 Meetings

in front of an object indicates a meeting. A meeting object is used to schedule an event, invite participants, and as a container of information related to the meeting. Also, the meeting object serves as an access point for joining the meeting itself, in those cases where this is possible (i.e. for online events).

Clicking on the meeting name will bring you into the meeting. A meeting, in turn, can contain any number of other objects, such as documents, folders, URLs, and even other meetings.

All participants of a meeting will have an entry in their respective list of meetings ("Meetings"), which is a short–cut to the actual meeting object in a workspace.

3.4 Events

The icons that follow the object name indicate recent events in the workspace. (’Recent’ means: after you did the last **Catch up** action on the object. See section 3.4.3.)

3.4.1 Seeing the events

There are two ways to see these recent events:

- The **info page** of an object (accessible via in front of an object) contains a list of all recent events related to the object.
- Following the name of an object, up to 5 different event icons can appear (, , , ,). These indicate different categories of events.
  Clicking an event icon will show you a list of events of that category.

Events related to your personal index of workspaces (3.1), your wastebasket (3.7), your bag (4.2), and the members page of a workspace (4.6) can only be viewed from their info pages, accessible via the  in the upper left corner of these pages.

3.4.2 Event categories

The event icons summarize the following categories of events.

Creation.
This is a new object.

Change.
Something has changed: the contents (if it is a document), the URL (if it is a URL link), or the object description, etc.

Location.
The object has been moved from one folder to another.

Read.
The object was read, downloaded, etc.
A workspace object only remembers the last read event of each user.

Touch.
This only appears with folders, and is somewhat different from the other event icons. It lists the *Creation, Change,Read* and *Location* events *anywhere within* the folder, one of its sub–folders, etc.

3.4.3 Catching up

The event icons and listings of events of an object disappear if you **catch up** on that object. (Catching up a folder recursively catches up on it's contents.) This can be done in several ways:

- click **[Catch up]** in the action list of an object;
- select one or more objects (cf. section 3.5.2) and click 

;
- go to the info page and click the 'Catch Up' button there.

Note: Catching up affects your personal view, not that of other workspace members. They have to catch up for themselves.

3.5 Actions

All operations on objects are performed by clicking appropriate buttons.

3.5.1. Adding objects to a folder

ADD URL

allows you to add a *link to* an arbitrary WWW page (or ftp:// or gopher:// etc.) as an object into a workspace folder. When you push this button, you receive a form where you can fill in a URL. The WWW page is not copied, only its URL (i.e. WWW address) is stored in the workspace folder.

ADD FOLDER

asks you for the name of a new folder and adds this within the current folder.

ADD DOC

You get a form that allows you to select a local file and transmit it to the workspace. If you use a seperate helper, you may have to click the **Reload** button of your WWW browser to see the changes on your screen.
Adding a document to the workspace is possible if you use a **browser with built–in file–uploading** (such as Netscape 3.0) or you have **installed a special helper application** for file–uploading. **So read section 5 before you try this.**

ADD ARTICLE

You can post articles for threaded discussions in your workspace. See section 4.4 for details.

ADD WS

Adding a workspace is only possible in your ’home folder’, not inside another workspace.

ADD MEETING

allows you to schedule new meetings. When you click this button you will be asked to provide details of the meeting, such as date & time, location, and meeting participants.
All participants will automatically get a new entry in their respective list of meetings ("Meetings").

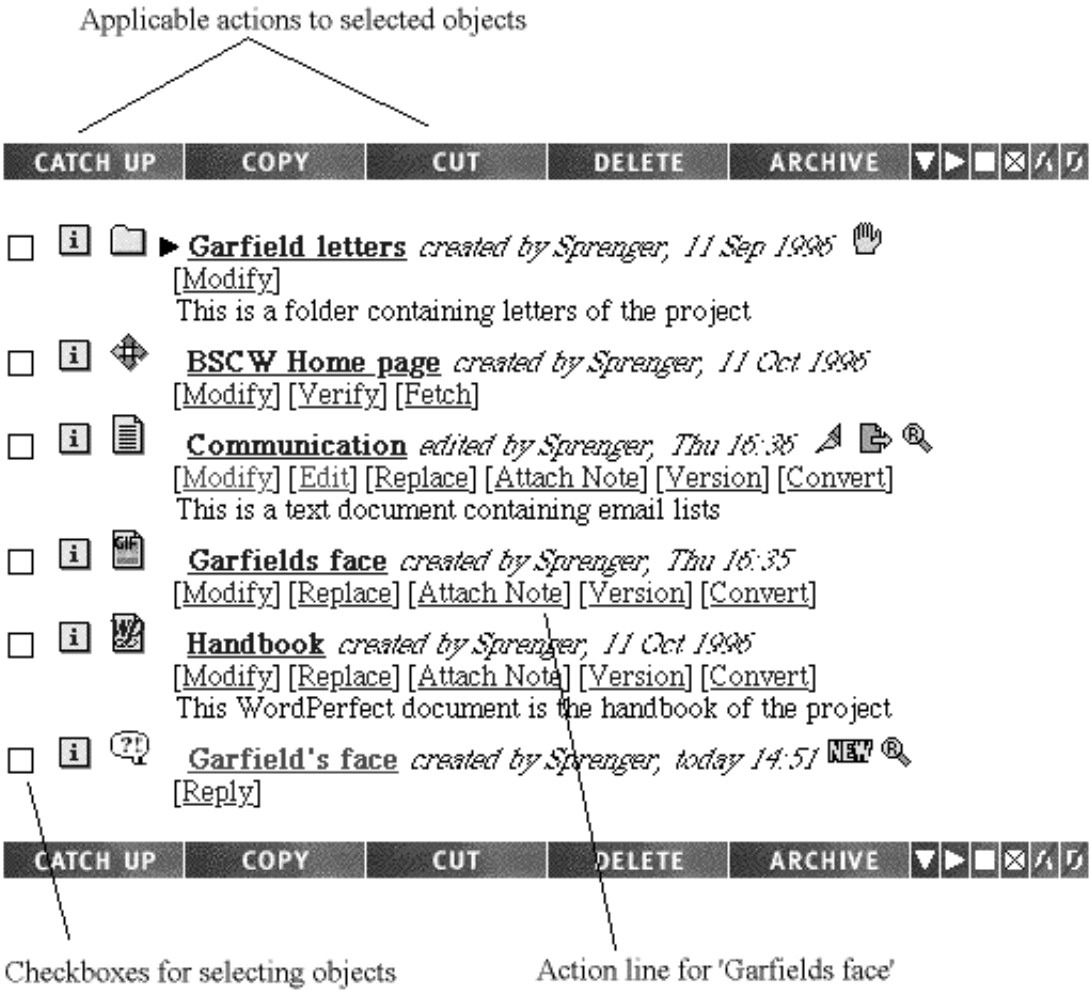
The workspace is protected against *overwriting* of documents. You may add a document under the same name as an already existing document. If you want to create a new version of an existing document, you should create a *versioned document* (cf. section 4.3 for details).

3.5.2 Basic actions

Actions can be applied to a single object as well as to a selection of objects.

Operations on selected objects are performed by using checkboxes; actions to be applied to currently selected objects are triggered from a button bar which is located directly above and below the contents of a folder. If it is not possible to apply the operation to one or more of the selected objects, the whole operation fails and no objects are modified. All objects are selected in the button bar by clicking ☒

Operations on a single object can be triggered by the actions listed directly below the object.



If you like, you can hide the action lines of all objects by clicking in the button bar of the folder content. To view them again, click

In the following list, the more basic actions are found. A complete list is found in section 4.15.

CATCH UP

will delete all event icons for the selected object(s). Catching up a folder recursively catches up on its contents.

COPY

produces a copy of the document and put it into the bag, from where you can [Drop] it to another location (see section 3.6).

CUT

simply puts the document into the bag, from where you can [Drop] it to another location (see section 3.6).

DELETE

moves the object to your wastebasket. Inside the wastebasket you can [Destroy] the objekt (see section 3.7 for details).

ARCHIVE

offers you to archive (e.g., create a tar archive) and compress a document or several documents and folders. This is especially useful, if you want to download multiple files (for details see section 4.9).

[Attach note]
write a note, that will be displayed to other users when they try to access this object

[Convert]
converts a document into another format. A form comes up where you can chose a new document format (for details see section 4.9).

[Edit]
allows you to edit a text document.

[Modify]
allows you to change the name and the description of the object. If the object is a document, you can also change the document type. If it is a folder you can specify a banner (cf. section 4.11 for details). of the document.

[Replace]
replaces a document. You get a form that allows you to select the local file that should replace the document.

3.6 Cut and drop

You can ’cut’ every object or a selection of objects, which means that the object is put into a clipboard (called *bag*). If you ’copy’ an object, the copy is also put into the bag. Wherever you go in the workspace you can ’drop’ the objects that were last cut or copied to the current location. You can also enter the bag, indicated by  or  (for an empty/non–empty bag respectively) at the bottom of the page. See section 4.2 for details.

3.7 Wastebasket

 The wastebasket appears at the bottom of every folder. An empty wastebasket is indicated by  , a wastebasket which contains one or more objects by  . You can enter the wastebasket by clicking the waste icon.

Every user has a personal wastebasket. When an object is deleted it is moved to the user's wastebasket. While objects may be deleted by any workspace member, they can irreversibly destroyed only by the owner of that object.

DESTROY

If you are the owner of the object, this will irreversibly destroy the object. Else, the object is moved to the wastebasket of the owner.

UNDELETE

This will restore the object to its previous position (if the location still exists. Otherwise you have to use 'cut' and 'drop' to move it to another location).

4 Advanced features

4.1 Information on objects

Objects can be displayed with various kinds of information. You might find at least a document icon, which characterizes the type of the object (e.g., a Microsoft Word document, a URL, a gif picture; a complete list of document format icons can be found in Appendix C). In front of the object you find an information button and a check box for multiple selection of objects. After the object icon you find the object’s name (as a link), the last significant action performed on the object (e.g., ’created by xyz’) and a list of event icons.

4.1.1 Custom–tailoring the workspace view

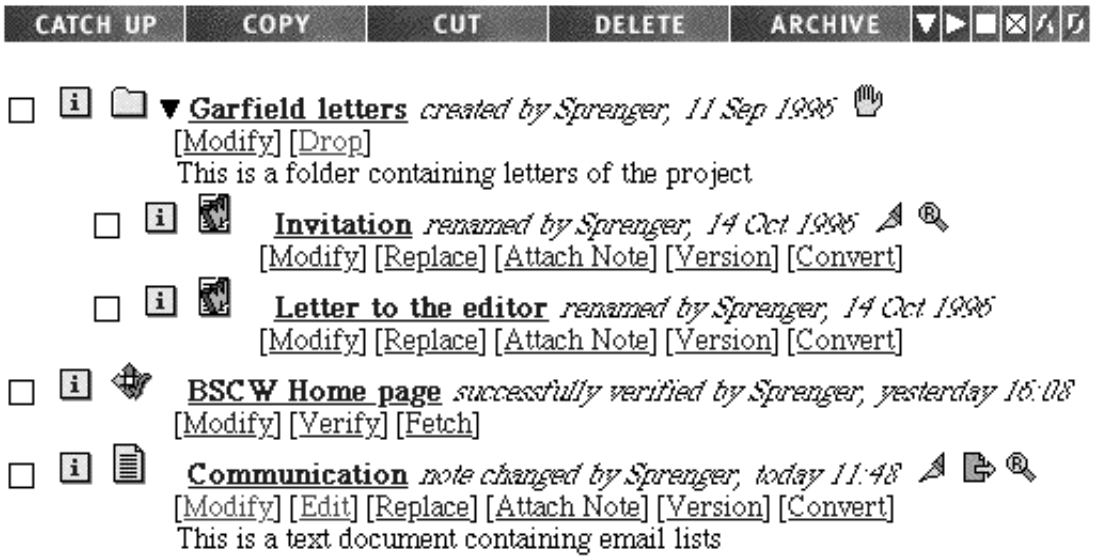
When clicking on the button  a line of actions applicable to the object appears. You can also view the descriptions of all the objects by clicking  . You can hide the view again by clicking  to hide the actions and  to hide the descriptions. In this way, you can compose the view of the content of a folder depending on your own preferences.

It is possible to ’fold out’ the contents of a folder. This can be done in two ways:

- clicking  in front of a single folder.
- selecting one or more folders by clicking their checkboxes and then clicking 

Folding in is done by clicking  on a single folder or  for a set of selected folders.

The following figure shows the folder ’Garfield letters’ folded out.



4.1.2 The information page

To obtain detailed information about an object, click the information button . An information page is shown, giving details about the object, changes since the last [Catch up] and the access rights. On this page you can also change the Mime type of the object by clicking the CHANGE TYPE button. Different access rights can be defined for different user groups and for different types of actions. For details see section 4.7. The following figure gives you an impression of what you might find on the information page:

Invitation

Document details

Document name	:	**Invitation**
Size	:	**3 K (3235 bytes)**
Added by	:	**Sprenger**
Added at	:	**11 Sep 1996**
Contained in	:	**:Sprenger**
Mime-type	:	**application/msword**
Encoding method	:	**None**
Last modification	:	**renamed by Sprenger, 14 Oct 1996**

Access details

Owners:

Sprenger

Members:

Duesentrieb **Mustermann** **Sprenger**

Access rights

	Owners	*Members*	*Others*	*Anonymous*
Archive	yes	yes	no	no
Attach Note	yes	yes	no	no
Branch	yes	yes	no	no
Change Type	yes	yes	no	no
Convert	yes	yes	no	no
Copy	yes	yes	no	no
Cut	yes	yes	no	no
Delete Versions	yes	yes	no	no
Edit	yes	yes	no	no
Edit Desc.	yes	yes	no	no
Get	yes	yes	no	no
More info	yes	yes	no	no
Rename	yes	yes	no	no
Replace	yes	yes	no	no
Revise	yes	yes	no	no
Update Note	yes	yes	no	no
Version	yes	yes	no	no
Version Info	yes	yes	no	no
Version Number	yes	yes	no	no

Number of times read: *2*

Each user last looked at Invitation:

read by Sprenger, today 11:40

Changes since 17 Apr 13:30

changed attributes by Sprenger, today 11:39

4.2 Bag


Every user has a *bag* which is a clipboard that can be used to move objects around inside a workspace and across workspaces. The bag icon, shown at the bottom of every workspace folder listing, indicates whether the bag is empty or not.

In principle there are two ways in which you can interact with your bag.

- Using '**cut**', **copy**', and '**drop**' (as explained in Section 3.6).
  One can cut or copy objects from some folder and drop them into another one.
- Entering your bag.
  It is possible to *go into* your bag – clicking the **bag** icon or the link next to it – where you have access to several other operations.
  What can be done inside a bag is described in the remainder of this section.

The bag, in a way, is your private workspace and differs little from regular workspaces. It can contain folder hierarchies and all kinds of objects; you can even upload documents or add articles and have discussions with yourself.

The following picture gives an impression of a possible presentation of a bag.

Current selection
The bag has a notion of 'current selection', indicated by selected check boxes before each object. The selected objects (if any) are the ones that were added to the bag with the last 'cut' or 'copy'.

It is possible to change the current selection by clicking the appropriate check boxes. The workspace server will remember changes in the current selection if you do a 'cut' *within* the bag by selecting the appropriate check boxes and then clicking the 

button.

If your bag contains folders, then it is possible to drop the current selection into a folder inside the bag.

Return to workspace
To return to the regular workspace hierarchy from the bag, select a workspace (folder) next to the

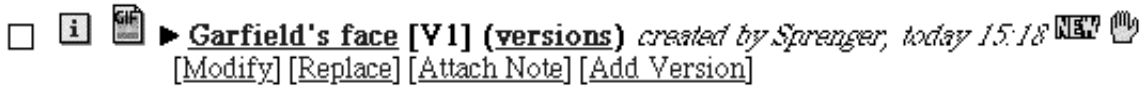

icon at the bottom of the page.

4.3 Versions of documents

When uploading a document you cannot overwrite an already existing document with the same name (unless this is explicitly wanted, in which case one should use the [Replace] button). Instead, you will have two seperate documents with the same name. Different versions of a single document can be maintained in a *versioned document*. Versions are numbered consecutively, and stored in a special folder.

4.3.1 Creating a versioned document

An ordinary document can be transformed into a versioned document by clicking [Version] in the action line of the document.
[Version] brings you to a form that allows you to select a name (by default the existing name) and write a description of the versioned document. When you confirm that the document is to be put under version control, the workspace listing will show something like



Clicking on **Garfields's face [V<No>]** will give you the latest version; clicking **(versions)** brings you into the folder where all versions are kept.

4.3.2 Adding, replacing and removing versions

There are various ways to add a new version:

- The action [Add version] lets you upload a new version from your local system.
- When you have *cut* (and not yet dropped) a document somewhere in the workspace, the action

line will also include [Drop]. Selecting [Drop] will drop the document from the bag as the new version.

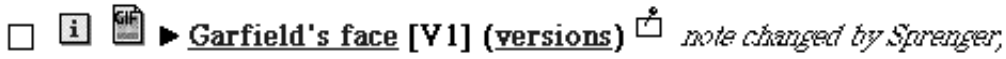
- If you go into the folder with versions, you can upload a document as with any other folder. It will automatically get the next version number.

As an alternative to *adding* a version, it is possible to *replace* the current version. It often happens that after you add a version, read it, and then still want to make some minor changes. [Replace] lets you overwrite the current version. The existing document is destroyed and the newly uploaded document takes its place and its version number.
When the document is a *text* document (e.g. HTML or ASCII), an action [Edit] allows you to directly edit the document on the server, rather than replace it by uploading a corrected version.

Removing a version can only be done by [Cut] or [Delete] *from within the folder with versions*. **[Cut] or [Delete] on the versioned document will remove the document with all its versions.**

4.3.3 Notes

To avoid different members editing the same object simultaneously you can attach a *note* to the versioned document, using the [Attach note] action. The versioned document will now look like



All users (except the one who put up the note) who try to get the document will get a page that displays the note and provides another link to really get the document – if they still want it after having read the note.

Clicking the  icon will also display the note, and give authorized persons the option to change or remove the note.

The idea behind the notes mechanism is that workspaces are used for working together in a cooperative atmosphere. Rather then locking objects, which prevents other users from getting the object, in most cases it is sufficient to give them a warning e.g. "I am currently editing a new version". Unanticipated situations can occur, in which group members may have good reasons to override your warning, and then it is very useful that the document was not really locked.

If you really want to have a 100 % guarantee that other users do not peform certain actions on an object, you can change the access rights (provided you are the owner of the latest version) – see the section 4.7 on access control.

4.4 Articles and Discussions

It is possible to post articles and have threaded discussions in a workspace. One can reply to an article, reply to a reply and so on.

Articles in a workspace folder are indicated by the article icon  . The contents of an article can be

made visible by clicking its name as usual. The article page will also show you whether there are replies and, if so, provide links to them.

4.4.1 Creating a new article

ADD ARTICLE in the button bar of a workspace folder brings up a form in which you can type an article. The text entered into the *Subject* field is the name under which the article will appear in the current folder.
The contents of the article goes in the *Message* field. When an article contains a URL (i.e. the address of a WWW page) then a link to this page is automatically inserted.

4.4.2 Replying to an article

In order to reply to an article, select REPLY button from within the article or the [reply] action in the workspace. The subject and context of the article will be quoted in a form that allows you to submit a reply.

If you can summarize the essence of the reply in a few words, it is advisable to change the *Subject* field accordingly ("Re: `article`" is not very informative, because from the context it is clear that your text is a reply to `article`).
As in Usenet news, it is good style to quote only those parts of the article that you actually reply to.

4.4.3 Browsing through a discussion

Articles form a hierarchical structure, much the same way as folders (in fact they are implemented as a special kind of folder). One article can have several replies, replies can also have replies, but it is not possible to reply to more than one article at the time.
There are two ways to browse through an article hierarchy:

From article to article

- The top of the article page gives links (if any) to the article that was replied to, and so on.
- The bottom of an article page gives links to responses to this article (if any).
- The button bar in an article page may contain the buttons PREVIOUS and/or NEXT These indicate that the current article is one of a series of replies to some article. The ’next’ and ’previous’ buttons lead to the next resp. previous sibling reply.

Folding out the article hierarchy

- If an article carries responses, there is an icon ▶ in front of the article name. Clicking this icon will fold out the responses. Folding in can be done by clicking the icon ▼.

4.4.4 Removing articles

Cutting or deleting an article removes the article – as well as the replies to it – from its current location. Undeleting an article from one's wastebasket will restore it to its previous position. Note, however, that when an article has been cut, it can only be dropped as a 'top–level' article, not as a reply to another article.

4.5 Using HTML documents

It is possible to upload or create a series of HTML documents containing links to each other.

From the "Location" field of your browser you may have noticed that URLs of workspace objects do not regularly contain the usual folder hierarchy. It is possible, however, to use such path names to address objects in sub–folders, sub–sub–folders, etc. The system will resolve the path names to appropriate object names. This allows local hierarchies of HTML documents with links back and forth to be maintained within a workspace.

4.5.1 Links to pages within the same folder

As a typical example, consider a document **article.html** that contains a figure **figure.gif** and refers to a second document **doc2.html**. The HTML source of the article will contain links such as

```
<IMG SRC="figure.gif">
...
See <A HREF="doc2.html">this document</A>.
```

When the three documents **article.html**, **figure.gif** and **doc2.html** are put into the same folder, the included image and the link to second document will function appropriately in the workspace.

4.5.2 Links to pages in sub–folders

Documents in sub–folders can be addressed by name in the usual way. If you put the figure in a folder **images** and the second document in a folder **documents** within a folder **more**, then the links

```
<IMG SRC="images/figure.gif">
...
See <A HREF="more/documents/doc2.html">
this document</A>.
```

are properly resolved by the BSCW system.

If the document **doc2.html** contains a link

```
<A HREF="../../article.html">
previous document</A>.
```

this does not always work. (To be precise: It does work if **doc2.html** was accessed under a URL that contains a path of at least two folder names preceding the object name – as from **article.html**. In this

case the `../..` context can be resolved. – It does not work if **doc.html** was accessed directly from the workspace folder in which it resides)

4.5.3 Links to pages at arbitrary workspace locations

The "real" URL of an HTML page in a workspace can be obtained by entering the page and copy the URL from the "Location" field of your browser. The link in the previous example could be replace by something like

```
<A HREF="http://bscw.gmd.de/bscw/bscw.cgi/f3014/article.html">
previous document</A>.
```

(When the reference is on the same server, as is the case here, this can be abbreviated to

```
<A HREF="/bscw/bscw.cgi/f3014/article.html">
previous document</A>
```

as usual.)

In the same fashion, one can link to documents in other workspaces and on other servers. Note, however, that access control may prevent the users in your workspace to actually get the document.

If you want to refer to an HTML document (or any other workspace object) in *another workspace* than the one in which it resides, it is probably appropriate to allow 'Get' right to all registered users on the server.
If you want to refer to an HTML document (or any other workspace object) from *outside the workspace server*, it is probably appropriate to allow 'Get' right to anonymous users, see Section 4.7.

4.6 Workspace membership and registration

Each workspace has a *Members* page, where you can see who is a member and invite other persons to join the workspace. Another possible method for registration is that users register themselves as new members at the workspace server.

4.6.1 Workspace members 

Each workspace has its own group of members. To find out which members are registered for the current workspace, you need to click the 'members'–link (next to the group icon as shown above) at the bottom of a page.

This page displays the members of a workspace, in two possible fashions:

- By *user name* (and affiliation, if they have cared to fill out their page of personal details)
- by *email address*. Such members are "pending", i.e., they have been invited to participate but have not yet registered themselves.

More details about the registered members are shown by clicking on their name. **[Mail]** lets you send mail to this member, **[Remove]** removes him from the workspace. You can change your own details via **[Edit details]** (on the member page or on the bottom line of any workspace listing).

removes selected members from the workspace.

lets you send mail to all members of the workspace.

4.6.2 Background of the registration scheme

Authentication of new users has to start somewhere (and we can't ask every user to come along with an identity card). We have chosen email addresses as the basis of authentication. This is as a compromise, weighting general availability and ease of use somewhat higher than security.

The registration mechanism is based on the following assumptions.

- A (potential) BSCW user has at least one and possibly several different personal email addresses.
- **Mail to somebody's personal email address is not readable to third persons without the user's consent.** The risk of email being intercepted by malevolent third parties, during transmission over the internet or on the local system of the user, is negligible.

The second assumption is questionable in general, but should do for our public BSCW server (for private BSCW server installations, the registration procedures can be adapted as appropriate). This allows for registration scheme that combines flexibility (users can do everything themselves) with traceability (the administrator can trace and contact users in case of problems).

4.6.3 Inviting other member to your workspace

on the members' page brings up a page that allows you to add members. This page contains two forms.

The upper section diplays your "*address book*": user names (if known) and email addresses of persons that you have inserted into the address book sometime in the past. These persons can be selected (by clicking) and invited to join the workspace.

If you want to invite users who you cannot find in your address book, the lower section allows you to add them. Typing the email addresses of one or more users in the input field and clicking "Add users to the address book" yields an enlarged address book with these users selected.

Your address book automatically keeps track of the mapping of email addresses to user names. When you invite an existing user (annotated with email address), this user will see your workspace the next time she goes to her workspace index page. When you invite an email address, a mail will be sent to this address, containing a request to register at the server.

If a user, invited by email address, does not register within the time span that you would expect (e.g. the mail got lost), **[Re–invite]** will send her another copy of the same mail.

4.6.4 Self–registration

New users can register themselves on our public server using the registration form. People who register themselves can start their own workspaces and invite others, but it is not possible to add yourself to an existing workspace. In order to become a new member of an existing workspace, you have to be invited and introduced by a member of that workspace.

4.6.5 Accepting an invitation

An email with an invitation to register with the server contains two options:

- register as a new user at this BSCW server,
- register for this workspace with an (on this server) existing User ID.

If you are **not** already registered at the BSCW server, open the first URL with your WWW browser and fill out the form.

Why the second URL? It is quite common to have more than one valid email address which all correspond to the same user. It could be that a registered user is 're–invited', because the email address specified by the invitor was not recognised by the system as a valid email address for that user. By opening the second URL, the user can tell the system that the given address is in fact a 'mail alias', which the system then records as a valid email address for the user. In future when this address is used to invite the user as a member of a workspace, the system can then detect that the user is already registered with the server.

4.6.6 Changing user name and password

Changing your user name is not possible in the current version of the system.

Changing your password, normally, is done by **[Change pwd]** which you find at the bottom of a workspace page.

If you forget your password you can no longer get to these pages – but there is a way around. Using the registration form (see the BSCW Info page: http://bscw.gmd.de/Overview.html) you can invite yourself once more. If you register with an email address already known to the system, this time the mail will contain the URL of a form that lets you change the password – without having to give the old one.

4.7 Access control

BSCW offers some facilities for access control. On the one hand, it is possible to restrict the various kinds of access to an object to subgroups of the workspace members. On the other hand, it is possible

to make objects in a workspace accessible to persons who are not members of the workspace.

Although it is intended that the support for access control will be enhanced in future versions, the current system offers enough functionality for most purposes. In fact one may do a lot of work with shared workspaces without ever bothering to set access rights explicitly. A coherent set of default access rights should support 'normal' work by 'normal' users.

NOTE:

> While it is possible to restrict access to certain users, the authentication of the users is not up to professional security standards. Authentication is by means of UID and password, which are transmitted unencrypted over the internet.

4.7.1 Default access rights

The following default access rights policy applies to all objects unless explicitly changed by the owner.

- All types of access to an object are granted to all members of a workspace
- No access to an object is granted to persons who are not members of a workspace

Only the right to destroy objects, i.e., remove them from the workspace server, is organized differently. See section 3.7 about the Wastebasket.

The access rights of any object can be set individually. As a consequence, a folder may contain objects which are accessible for a user group who is not allowed to access the folder in general. The user then has to know the correct URL, because he cannot browse through the folder contents.

4.7.2 Visibility of rights

When the actions to the objects are folded out, each object only shows those actions that can currently be applied. If some actions are absent that would normally be present, this means that the owner of the object denied you these actions. The precise settings of action rights can be seen on the **info page** (under the  button in front of the object name) – if you have the right to see this info.

When one or more rights to an object are granted to persons outside the workspace (i.e. other registered users of the same server or anonymous users), the info button  for this object is replaced by an inverted info button  . This shows the workspace members that the object can be accessed by non–members.

4.7.3 Anonymous access to workspace objects

When an object has granted 'Get' (and/or other rights) to *anonymous* this does not mean that anonymous users know how to find it. The object can be accessed via a regular URL, but – in order to remove the need for 'anonymous' users to give a password – this URL has to be slightly different

from the one that the workspace member sees. In order to link to this object, one has to

- determine the URL under which the object is available to workspace members;
- adapt this to a URL that is accessible to anybody in the Internet.

This is best explained by an example.

Suppose you have a document **text.html** somewhere in the workspace, and you have allowed 'Get' access to anonymous users (Note the icon  turning to ). How this is done is explained later in this section.

Determine the URL of this document (E.g., if you enter the document your browser may show the URL in the 'location' field). It will read something like

```
http://bscw.gmd.de/bscw/bscw.cgi/f18147/text.html
                  ==== ========
```

By replacing the underlined parts as follows:

```
http://bscw.gmd.de/pub/english.cgi/f18147/text.html
                  === ===========
```

one obtains the URL that is anonymously accessible. This URL can be used, for example, to create a link from a regular WWW page to a publicly available document in a workspace.

This `pub`
: path gives access to the same data, bypassing the authentication procedure that would normally be started if an unauthenticated person accesses the server. (Note, however, that the system will return an error if 'anonymous' does not have the appropriate right for this object).

`english.cgi`
: defines the language in which the anonymous user interacts with the system. For a single document this is in fact irrelevant. If, however, the object to be accessed is a *folder*, the anonymous user gets the usual BSCW folder listing – with the buttons and actions displayed in the language indicated. You can provide the anonymous user a different interface language, e.g. German, as far as the BSCW server provides such an interface. Just replace `english` with the language you want. For example, change `english.cgi` to `german.cgi`. To find out which interface languages are currently supported look at your user preferences ('Display all user interface messages in: ...').

4.7.4 Groups

The info page of an object (found under the  button) tells you more about the access rights to the object. Access to an object is granted to certain groups. The following four standard groups exist

- **Owner of the object**.
  By default, the creator of an object is the sole owner.

It is possible to add other members of the workspace to the group of owners. It is possible to delete owners one has added (and owners added by these owners, and so on). If the owner group contains two or more persons, it is possible to delete oneself.

- **Members of the workspace**
  as discussed in the previous section. These are the members of the workspace in which the object currently resides. If it is moved to a different workspace, then the rights are transferred to the members of the new workspace accordingly.

- **Other users**
  i.e., users registered at the server on which the workspace resides.

- **Anonymous access**
  circumventing authentication to the BSCW server.

For future releases the possibility to define additional groups of users is envisaged. This feature has not been implemented in Version 2.1.

Currently, the **Owners** group is the only group that can be directly modified by the user (if she is an owner). At the bottom of the access page (see next paragraph) one finds forms to add/delete owners.

4.7.5 Assigning rights to groups

An owner of an object finds a button 

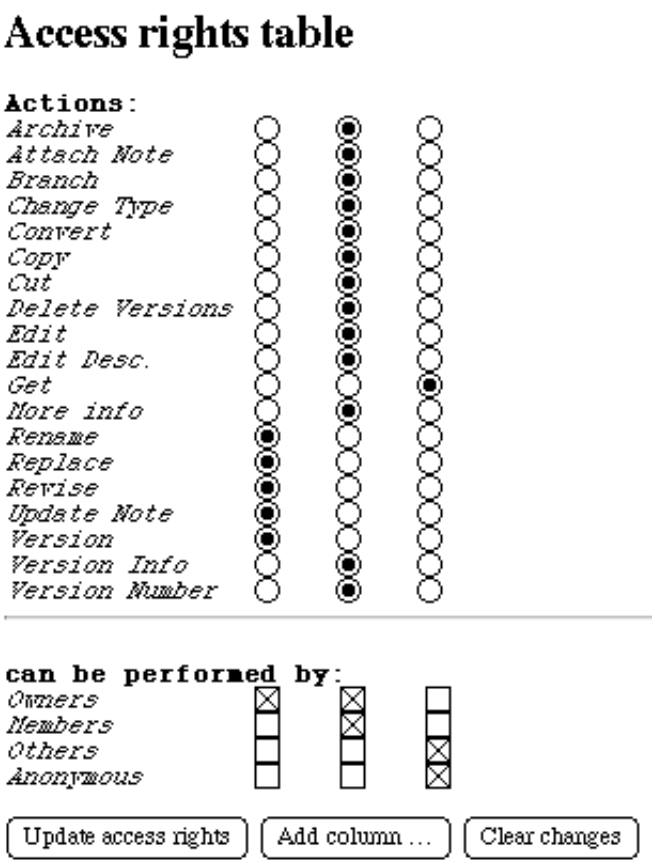
in the button bar on the **info page** of the object. This brings one to the access control page.

An object can be accessed in a variety of ways, depending on the type of the object. Under the heading **Access rights table**, all the actions that operate on this particular object are listed.
The actions are divided into *action groups*. Each column in the table represents an action group.

The **top half** of this table defines the distribution of actions over action groups. Every action belongs to exactly one group. By pushing radio buttons, actions can be moved to another group.

The **bottom half** of the table defines which user groups have access to which action groups. By clicking check boxes, rights can be granted to or withdrawn from user groups.
Modified settings of action rights have to be ’submitted’ in order to become effective.

A user can perform an action if she is a member of *at least one* group with the appropriate right. In the following example, the ’Get’ right is granted to ’Others’, i.e., all registered users of the server, and ’anonymous’ users. Owners and workspace members are registered users, hence they do have the ’Get’ right as well.



4.7.6 The different types of access

The following types of access exist.

Add article (*Folder*)
Add document (*Folder*)
Add folder (*Folder*)
Add URL (*Folder*)
: Create (for documents: upload) new objects of the respective type in this folder or drop them from one's bag.

Add versions (*Folder*)
: Change a document contained folder into a versioned document; drop a versioned document into this folder.

Add version (*Versioned document*)
: Upload or drop a document as a new version.

Attach note (*Versioned document*)
: Create a note *see section 'Versions of documents'*.

Change type (*Document*)
: Change the MIME type of a document.

Cut (*all objects*)
: Move the object to one's personal bag.

Delete (*Folder, Versioned document*)

Delete objects from this folder. *See note below.*

Delete (*Article*)
Delete replies to this article (not the article itself – see note below).

Edit (*Document or versioned document of type* `text`)
Editing a text file (e.g. HTML, ASCII) directly on the server, rather than download–edit–upload.

Edit URL (*URL*)
Change the URL of a URL link.

Edit banner (*Folder*)
Create or change the banner of a workspace folder.

Edit desc. (*all objects except Article*)
Edit the description of an article (visible in a folder listing when descriptions are folded out)

Get (*Document, Article*)
Read, Download the document, the article.

Get (*Versioned document*)
Get the listing of all versions.
Note: in order to get the current (last) version, one needs the 'Get' right to that version.

Get (*Folder*)
Display the contents of the folder.

Get (*URL*)
The link is clickable.

Info (*all objects*)
Display history information and access rights to this object.

Rename (*all objects except Article*)
Change the name of this object.

Replace (*Document, Versioned document*)
Change (the last version of) the contents by uploading a new document.

Reply (*Article*)
Provide an answer to discussion article.

Update note (*Versioned document*)
Change the note on a versioned document; includes the right to remove the note.

Version (*Document*)
Change a document into a versioned document. The document will appear as Version 1.

View note (*Versioned document*)
See the note on a versioned document, if present.

The right to change access rights is granted to the owner (group) of an object. There is no way to grant/deny this right to other users, other than including/removing them from the owner group. There are a few other rights, that cannot be modified: create new workspaces in one's personal 'home folder'; destroy objects in one's wastbasket.

A note on deletion of objects
In order to delete an object, one needs the 'Delete' right on the *folder* that contains the object. No delete right to the object itself can be granted (or denied). This has the following effect

- The owner of a folder (and other users with 'Delete' right) can tidy up folders and remove objects that should no longer be there.
- The owner of an object who finds the object deleted without her consent can recover it from her wastebasket.

- The owner of an object (or anybody with 'Cut' right) can always remove objects – also without 'Delete' right to the folder – by *Cut*ting it to her personal bag.

4.8 User preferences

Personal preferences can be tailored for a number of aspects of the user interface.

Actions and descriptions of objects

You can decide, whether you want to view the object descriptions and the actions applicable to single objects by default.

BSCW helper

You can decide to use the BSCW helper for uploading documents instead of built–in features of your browser. See section 5.

External editor

If you decide to use an external editor for editing HTML documents (instead of the built–in editor), you have to perfom the following steps:

- Change your personal preferences by clicking **Use external editor for HTML documents**.
- Configure the helper of your browser: Select an editor for **application/x–html**.
- Click on [edit] for the document you want to edit. It will be downloaded and opened by the external editor.
- After editing, you have to upload the document again.

If using Netscape Gold, it is much easier to edit an HTML document: Just click *edit document* in the browser's main menu, and upload after editing directly (look at your Netscape Gold manual for details).

Use Javascript–enhanced interface

Use of JavaScript to allow select–all/none and folding of actions and descriptions without re–computing the page. This improvement will be most noticable for users accessing a BSCW server over a slow link or over the Internet when the net is heavily loaded. **Note:** You also have to enable Java Script in the options menu of your Netscape browser!

Use ActiveX–enhanced interface

If you are using Microsoft Internet Explorer, enabling ActiveX interface will display an ActiveX control in all folders with the text 'Drop Here'. You can use this to upload (multiple) files to the workspace, simply by drag and drop. Thus, this eliminates the need to install a separate upload helper application.

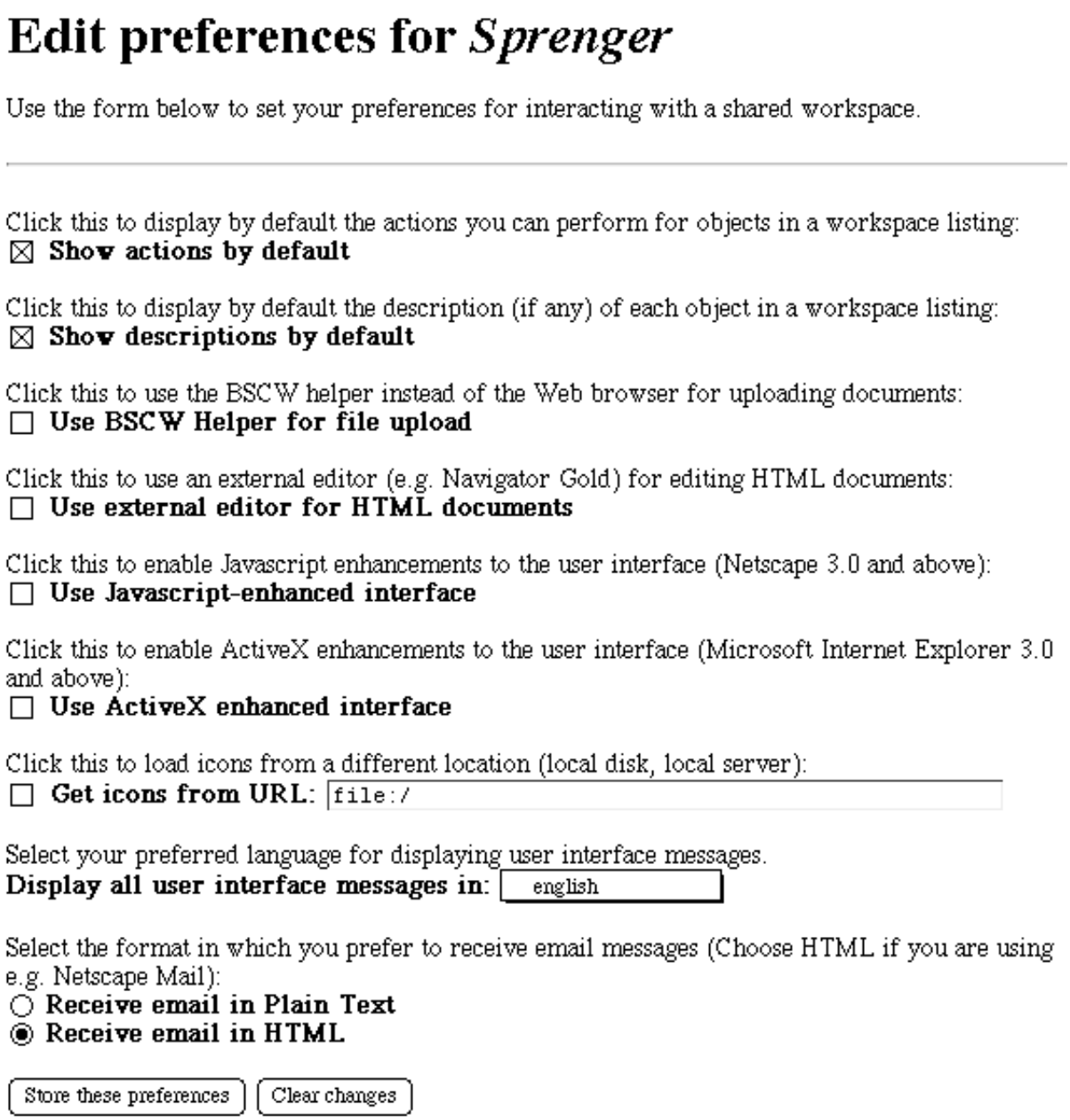
Local icons

Users can download the BSCW icons from our download page and save them locally. These can then be served from the local disk or from a local Web server (useful if more than one person uses BSCW at a site, or if you use more than one machine). For more information look at the BSCW FAQ.

Interaction language

It is possibility to select the language for interacting with the system. Find out in the preferences which languages are currently supported.

Below you see an example of a user's 'Edit preferences' page.



Edit preferences for *Sprenger*

Use the form below to set your preferences for interacting with a shared workspace.

Click this to display by default the actions you can perform for objects in a workspace listing:
☒ **Show actions by default**

Click this to display by default the description (if any) of each object in a workspace listing:
☒ **Show descriptions by default**

Click this to use the BSCW helper instead of the Web browser for uploading documents:
☐ **Use BSCW Helper for file upload**

Click this to use an external editor (e.g. Navigator Gold) for editing HTML documents:
☐ **Use external editor for HTML documents**

Click this to enable Javascript enhancements to the user interface (Netscape 3.0 and above):
☐ **Use Javascript-enhanced interface**

Click this to enable ActiveX enhancements to the user interface (Microsoft Internet Explorer 3.0 and above):
☐ **Use ActiveX enhanced interface**

Click this to load icons from a different location (local disk, local server):
☐ **Get icons from URL:** file:/

Select your preferred language for displaying user interface messages.
Display all user interface messages in: english

Select the format in which you prefer to receive email messages (Choose HTML if you are using e.g. Netscape Mail):
○ **Receive email in Plain Text**
◉ **Receive email in HTML**

Store these preferences | Clear changes

4.9 Archive and convert

You can archive selected documents or folders, e.g. for downloading. Documents may also be converted to other formats, e.g., you can convert an MS Word document into an HTML or postscript file.

4.9.1 Archive

You first have to select all objects you want to archive. Click then on the ARCHIVE .

Choose between a *tar* and a *zip* archive. You can compress (*Gzip* or *Compress*) the archive or encode it (*UUE*). After you click on 'create archive', the archive is put into your bag and a new page will come up from where you can directly download it.

4.9.2 Convert

BSCW 3 offers a converter for converting documents from one format to another. To convert a document click on [Convert]. Choose the format and, if you want, a compression or encoding type. After you click on 'Convert ...', a copy of the document with the new format is created and put into your bag. A new page will come up from where you can directly download the converted document.

The list of conversion formats presented may vary dependend on the format of the document to convert. You see only those conversion formats for which converters are installed.

Note: Some kind of information may be lost during conversion. There is a note at each converter, if this is the case.

4.10 Search

BSCW 3 provides two search facilities:

- You can search the Web using common search engines (e.g., Lycos or AltaVista) and put the results back into the workspace.
- You can also search the workspace for specific objects (documents, folders, ...)

Click on SEARCH to start your search. You can switch between BSCW Search and Web search with the BSCW SEARCH and WWW SEARCH buttons on top of the page.

4.10.1 Web Search

Just type in your key words at the field 'Enter your search query'. In the pop–up menu below you can limit the number of pages to be shown as a result. Click on 'Do Search' to start. BSCW passes your query to the selected search engine and stores the search result as a search object in the workspace.

You can chosse between AltaVista, Excite, Infoseek, and Lycos as search engines. To find out more about the search engines and how to use them for advanced search, just click on 'Query Help' to get the help pages of the respective search engine.

The search result is presented as a list of URLs as BSCW objects. Just click the name to see the respective web page. You can sort them by clicking on [By rank] (the default), [By name], or [By

location]. The following operations can be performed on the query result:

will save selected URLs in your bag. The same can be done with [save] for a single URL.

will verify selected URLs, i.e. find out wether the URL still refers to an existing page. The same is done with [verify] for a single URL.

will save a search object – similar to a folder – that contains the results of your search inside your bag.

will show more relevant URLs, if there are more than just presented.

will redo the search with the same query.

allows you to edit, e.g. to refine, your last query.

Directly below the search engine's logo, you find your query as a link, which leads you to the query result pages of the search engine.

4.10.2 BSCW Search

You can search your workspaces for specific objects. The simplest way to do this is

- specify the location in the 'Search in' pop–up menu (e.g., your bag or 'Home: <user name>', which is your complete set of workspaces)
- type in a key word in the 'Name' field and click on 'Do search'. The result presented as a list of BSCW objects, which can again be sorted [By rank] (the default), [By name], or [By location].

You can refine your search in several ways:

Restrict the object type:
In the menu 'for objects of type' at the top of the form you can restrict the object type to search for.

Using search terms:
The default search term is **Name**, i.e. the name of the object to search for. There are two sections: a text field where you type in key words to search for, and a pop–up menu, where you can specify how the Name should match the keword ('contain', 'start with', 'end with', ...)

You can add more search terms:

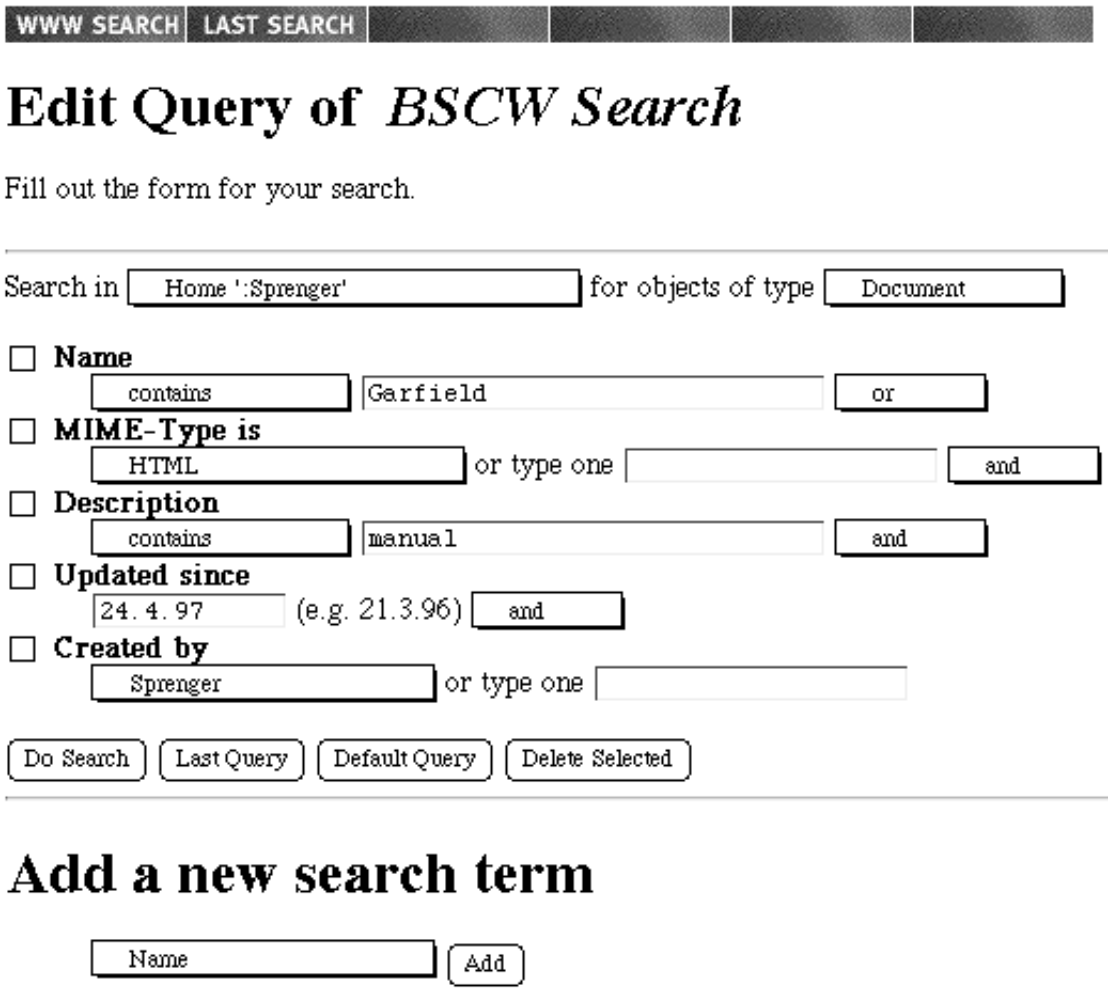
At the bottom of the search form you find a pop–up menu where you can choose and add more search terms. You can, for example, want to search inside a *document* (if it is a simple text or HTML document) or inside the *description* of objects. You can further restrict the search by specifying that only those objects are of interest which have been *created*, *read*, *updated* or *moved* in a specific time period or by a specific person.

Bolean operators:

If you use more then one search term, you have to specify how these terms are logically correlated. You can combine the single terms with logical 'and' and 'or'.

Note: The checkboxes are only to delete search terms by clicking on 'Delete selected'. They are not relevant for the search itself. With 'Do search' all terms in the form are evaluated.

The following figure gives an example of how a search form may look like.



4.11 Edit banner

Each page that displays the contents of a workspace or a folder has a header that precedes the contents. This header comprises a **top line** and a **button bar** (cf. section 3.2). For the contents of a workspace it usually looks like:

For each workspace or folder any user may create a banner, which is then displayed between the top line and the button bar. Creating and editing can be done by using the button EDIT BANNER on the info page of the workspace or folder. You are then asked to specify the banner using HTML.

Your banner might then look like:

4.12 Meeting objects

in front of an object indicates a meeting. A meeting object is used to schedule an event, invite participants, and as a container of information related to the meeting.

Clicking on the meeting name will bring you into the meeting. A meeting, in turn, can contain any number of other objects, such as documents, folders, URLs, and even other meetings.

All participants of a meeting will have an entry in their respective list of meetings (’Meetings’), which is a short–cut to the actual meeting object in a workspace.

A meeting object ( ) in BSCW is the access point to information about the details of a particular meeting, such as date and time, location, participants, type of meeting, etc. A Meeting can be thought of as a special kind of folder, which may contain documents and other objects relevant to the meeting. It is also the access point to join the meeting itself (if it is to take place over the network).

4.12.1 Creating a new meeting

A new meeting is created by clicking the "ADD MEETING" button (ADD MEETING) at the top of the page. This will return a form for specifying the meeting characteristics.

The following meeting information can be specified:

- **Date & Time –** The date, time, and timezone of the meeting.
- **Location –** The type of meeting (e.g. face–to–face, group video conference, etc). If the meeting is specified as some other sort of internet conference, a host address or IP address is required (depending on the software).
- **Participants** – Here you can specify the meeting participants, who can be chosen from a list of registered workspace members. External people can be invited by specifying their email addresses (separated by comma). Here you can also choose whether to send out email notifications to participants.
- **Notes –** a short description of the meeting.

4.12.2 Changing the details of a meeting

The details and characteristics of an existing meeting can be changed or updated by clicking the [Modify] command directly on a meeting object. This will return a similar form as the one used to create the meeting, and the meeting characteristics can be modified as wished.

4.12.3 Joining a meeting

A meeting can be joined simply by clicking the "JOIN" button () from the meeting page or the [Join] command directly on a meeting object. This will return a MIME–type to launch the particular client application used for the meeting and automatically connect to the right address. For this to work, your Web browser has to be properly configured to launch the right application when receiving the specific MIME–type.

4.12.4 Supported third–party conferencing programs

Most of the conferencing applications supported by BSCW are either completely free or can be bought in the price range of $50 – $200. A majority of the applications can be downloaded for evaluation.

Download conferencing applications:

- WhitePine Enhanced CU–SeeMe (http://www.cu–seeme.com)
- Microsoft Netmeeting (http://www.microsoft.com/netmeeting)
- VDOnet VDOPhone (http://www.vdo.net)
- Connectix Videophone (http://www.connectix.com)
- Intel Internet Video Phone (http://connectedpc.com)

4.13 The ’Meetings’ view

The ’Meetings’ icon () at the bottom of the page takes you to a list of the meetings to which you are invited. Only meetings where you are specified as a participant will be displayed. Not that the

workspace may contain several other meetings which you are not scheduled to participate in, and thus these meetings will not be displayed in the 'Meetings' listing.

4.13.1 Four different viewing modes

The meeting list can be displayed in four different modes:

- viewing all meetings (past and future)
- viewing only future meetings
- viewing only the current month's meetings
- viewing only the current year's meetings.

Use the buttons on the top of the page to switch between these four modes

4.13.2 Confirming and declinging meeting attendance

In the meeting–list you will see the confirmation status of the meetings, i.e. if you have confirmed or declined (or neither) your meeting attendance.

By checking one or more meetings and then clicking the 'CONFIRM' button will confirm your attendance to these meetings. Similarly, clicking the 'DECLINE' button will decline your attendance. The meeting–list will be updated immediately to reflect these changes.

To see who else has confirmed or declined their attendance, click the info button left of the meeting.

4.13.3 vCalendar object

The  icon beside the meeting icons can be clicked, which will return a vCalendar representation of the meeting with the MIME type application/x–vcalendar. vCalendar is a standardized format for exchange of calendar events between different applications. For example, if you have Netscape Calendar, you can use this feature to easily copy the meetings to your calndar.

4.13.4 Other operations in 'Meetings'

Other operations available in the meeting–list are e.g. [Modify] to modify the meeting details, [Join] to join meetings (where possible).

Unwanted entries in your meeting–list can be removed by checking the meeting and then clicking the 'REMOVE' button. Note that this will only remove the entry from your meeting–list, and not the meeting object itself.

4.14 User details

Your personal information can be changed by clicking [Edit details] on the bottom of the page.

4.14.1 Changing your personal information

You can change such informations as:

- **Full name**
- **Organisation**
- **Phone**
- **Postal address**
- **Primary mail address**. Here you can also add several mail alias if you have any.
- **Face URL**. The URL address to a GIF or JPEG picture of yourself
- **Home page URL**
- **Directory Information**. Here you can specify in which online directories (white pages) you can be found, and by which email address. Currently, the directories supported are Four11 and WhoWhere?.
- **Communication Capabilities** Here you can specify whether you are connecting using a fixed or a dynamic **IP address**. BSCW will automatically detect what IP address you have on your computer, but if you are connecting through a fire–wall or a proxy, the IP address detected by BSCW may not actually be correct. If you are sitting on a Windows95 system, you can easily check what IP address you have by following these steps:
  1. From Windows Desktop, click Start/Run.
  2. In the Run dialog, type "winipcfg" then press "Enter." You'll see your IP address listed in the dialog.

  Here you can also configure what communication accessories (conferencing programs) you have on your computer.
- **Other information**. Any information about yourself that you want to provide, but that does not fit into any of the categories above.

4.14.2 View another member's personal information

A member's information page can be viewed by clicking on the user name in the list of workspace members, or on a username anywhere it appears in the workspace.

A user's info page will display all the information available on a particular user, such as real name, telephone numbers, address, etc.

If the user has specified that he/she can be found in any online directories there will be links to take you directly to the user's page in those directories.

If the user has specified any conferencing programs by which he/she can be reached, there will be a list of those programs. If you, yourself, have any of the programs listed you can call the user directly be clicking the call–button (

) by the specific program. This will launch the application on your computer (assuming you have configured your browser correctly) and automatically connect you to

the specified user.

4.15 Complete list of actions

This page lists alphabetically all actions that can be performed upon objects in a workspace.

In addition to actions, a workspace page contains a series of **clickable icons** that lead you to further information pages. These are not listed here, you find them in **Appendix C: Glossary of Icons**.

(*on the info page of an object or via [Modify] action, only visible to object owners*)
Change access rights and/or ownership of this object.

Post a discussion article in the folder in which you are currently located.

Upload one or more documents to the folder in which you are currently located.

Create a new folder within the folder in which you are currently located.

Schedule a new meeting within the folder in which you are currently located.

(*on the members page of a workspace*)
Invite another person to participate in this workspace.

Add a URL link (to any WWW page) to the folder in which you are currently located.

[Add Version] (*for versioned documents*)
Upload the next version of this document.

(*in your personal workspace index*)
Create a new workspace.

Will create an archive of selected folders and documents. You can choose between tar and zip archives and several compression formats.

, **[Attach note]** (*for versioned documents*)
Write a note, that will be displayed to other users when they try to access this object (cf.

Section 4.3).

CATCH UP , **[Catch up]**

Delete the event icons (and the events on the info page) related to this obects.
On a folder, this will recursively catch up on all contained objects.

CHANGE PWD. , **[Change pwd]**

Change your password to the BSCW server.

CHANGE TYPE (*on the info page of an object*)

Change the Mime–type of an object. (cf. Appendix B).

COPY

Creates a copy of selected documents and puts the copies into the bag.

CONFIRM , **[Confirm]**

Confirms your attendance to a meeting.

[convert]

Will convert a document into another format. A copy of the document with the new format is put into the bag.

CUT , **[Cut]**

Remove an object (or a selection of objects) from the current location and put it (them) into your personal bag.

DECLINE , **[Decline]**

Declines your attendance to a meeting.

DELETE , **[Delete]**

Remove an object (or a selection of objects) from the current location and put it (them) into the wastebasket of the owner of the object(s).

DESTROY , **[Destroy]** (*in one's personal wastebasket*)

Remove an object from the system.

DROP , **[Drop]** Put the current selection in your bag (i.e. the result of the last **cut**) into this folder.

EDIT , **[Edit]** (*for text files (including HTML)*)

Edit the text of this document directly in your WWW browser or use an external editor.

EDIT DESC. , **[Edit desc.]** (*on the info page of an object or via [Modify] action*)
Edit the description of this object.

EDIT DETAILS , **[Edit details]**
Edit the page with information about yourself (name, address, communication accessories, ...)

[Edit Prefs]
Edit some personal preferences (uploading documents, user interface language).

EDIT URL , **[Edit URL]**
Change the URL of this link.

FUTURE (*in 'Meetings'*)
View only future meetings.

JOIN , **[Join]** (*for meetings*)
Join a meeting that is linked to an online conference. Your browser will automatically launch the proper conference software and connect to the address specified in the meeting object.

MAIL , **[Mail]**
Send a mail to this person.

MODIFY , **[Modify]**
allows you to modify several features of an object. You can change the name and the description. For documents you can further change the type of the document, for folders you can edit a folder banner, for a meeting you can modify date & time, location, participants, etc.

NEXT (*in discussion articles which are replies to other articles*)
Go to the next reply to the same article.

PREVIOUS (*in discussion articles which are replies to other articles*)
Go to the previous reply to the same article.

[Re–invite] (*in the members' page with users who have not yet registered*)
Re–send the mail message to the user inviting him/her to register with the server at a specific URL.

REMOVE , **[Remove]**
Remove a meeting.

RENAME , **[Rename]** (*on the info page of an object or via [Modify] action*)
Change the name of this object.

REPLACE , **[Replace]**

Replace this object by uploading a new version of it.

THIS MONTH (*in 'Meetings'*)

View only this month's meetings.

THIS YEAR (*in 'Meetings*)

View only this year's meetings.

REPLY , **[Reply]** (*with discussion articles*)

Post a reply to this article.

SEARCH

Allows you to search the workspace for specific documents, or to use some of the internet search engines to search the Web and put the results into the workspace.

UNDELETE , **[Undelete]** (*within one's personal wastebasket*)

Move the object to its previous locations from where it was deleted (if the location still exists. Otherwise you have to use 'cut' and 'drop' to move it to another location).

VERSION , **[Version]** (*only for documents*)

Change this document into a versioned document (cf. Section 4.3), with the current contents being version 1.

VIEW ALL (*in 'Meetings'*)

View all meetings.

5 Uploading of documents

Uploading documents can be done in different ways, depending on the hardware and software that is available to you.
Basically, there are two possiblities

Some browsers provide **built–in file uploading** (e.g., Netscape 3.0)

Advantages:
– no installation of special software required
Disdvantages:
– not offered by all browsers (Netscape supports this from Version 2 onwards).
– only one file at the time, no multiple file upload
– does not provide Mime type resolution (i.e. selecting the right document type for you)

The alternative is to use a special **helper program** that can be downloaded from the public BSCW server.

Advantages:
– supports (in most cases) multiple file upload and Mime type resolution and gives progress report (lets you know what it's doing and whether it has finished)
Disdvantages:
– some requirements for hardware and/or software, depending on the operating system.
– helper software needs to be installed.

Note:
If your browser does support built–in file upload, this is set to the default option. When using a helper program you have to change this option in your **user preferences** page (see section 4.8). Using built–in file upload is described in section 5.1

The following section 5.1 describes uploading with built–in file upload. Section 5.2 provides information on different helpers for file–uploading depending on your hardware platform.

5.1 Uploading documents with built–in file uploading

Built–in file uploading is possible with Netscape 3. If you use Internet Explorer you have to install a helper program.

Go to the workspace folder to which you would like to add a document.

brings up a dialog box for selecting the file that you want to transfer. You can select a document and transfer it as follows:

1. The *Browse* button brings up a file selection window. Select a file and the respective field of the dialog box will be filled automatically.

2. The default of the field *MIME–type* is 'from browser', which in most cases will determine the right MIME–type automatically. To determine the MIME–type manually just click in the field to get a pop–up menu listing with various MIME–types. See Appendix B for detailed information about MIME–types.

3. If the document name should be different from the local file name, then type the name in the field *Document name*.

4. To send the file to the workspace click on *Upload document*. You will return to the workspace when the uploading has finished.

5.2 Overview on hardware dependend helpers

To get more information about the helpers or to download and install them, please look at our information pages (http://bscw.gmd.de/Download.html)

Do not forget to **set your workspace preferences** (available via [Edit Prefs] at the bottom of each page in a workspace) by selecting **Use BSCW Helper for file upload**. You also have to add the Mime type `application/x-bscw-helper` in your browser. For details look at the documentation which is downloaded with the respective helper.

5.2.1 Helper for PC

Native helper

Before you install the native helper, make sure you can't run the drag and drop helper (cf. below) first!

Features:

- progress reporting
- automatic document type detection

Requirements:

- Windows 3.1x, with approximately 160k of disk space
- Windows 95, with approximately 50k of disk space
- Windows NT, with approximately 50k of disk space

Drag and drop uploader

Features

- Automatic document type detection using the Windows Registry.
- Progress reporting on the status of document transmission.
- Support for command–line execution for calling from other applications.

Requirements

- Windows 95, with approximately 50k of disk space
- Windows NT, with approximately 50k of disk space

5.2.2 Helper for Unix

Native helper

Features:

- progress reporting
- automatic document type detection

Requirements:

The BSCW native unix transmitter requires the **X windows Motif widget set** to be compiled. Statically built versions on the transmitter exist for SunOS and Solaris machines without X–Motif.

The Unix transmitter v2.0 should work on a variety of Unix variants but has currently only been tested on machines running SunOS 4.1.x and Solaris 2.x. The source code release should compile on Irix, HP (etc.) and we would appreciate any feedback regarding the success (with changes required) or failure of the transmitter on such systems.

Command line uploader

Features:

Primarily for developers, allows upload to a BSCW server from the Unix command line (or other programs ...).

Requirements:

The Unix command line uploader should work on a variety of Unix variants and has been tested on machines running SunOS 4.1.x and Solaris 2.x. and NextStep. The source code release should compile on Irix, HP (etc.) and we would appreciate any feedback regarding the success (with changes required) or failure of the transmitter on such systems.

5.2.3 Helper for Macintosh

Native helper

Features:

- multiple file–upload
- drag and drop upload
- full progress reporting

Requirements:

- PowerPC or 680x0 Macintosh
- System 7 or greater (7.5 for drag and drop to the upload window)

A What’s new?

A.1 Changes in BSCW Version 3.0

In our introduction pages you find

- Changes from BSCW 2.1 to 3.0

describing what’s new, for people who are familiar with one of the previous versions.

A.2 What’s new in this manual?

This manual is updated from time to time. This page lists changes to the manual

2 Sep 1997
: Several minor corrections. Most screendumps are new. New section 3.7 (wastebasket)

B About Mime types

When you share documents a in workspace with people working on different systems, then sooner or later (but probably sooner) you will face the problem that computer systems and WWW–browsers do not always agree on data formats.

There is a bewildering variety of systems, applications, and document types. It is impossible to give a simple recipe for how to configure this for your group and the particular task you want to use the workspace for. It is possible, however, to give some background knowledge about what the problem is and how it is generally solvable.

If you have read Sections B.1, B.2, and B.3, and you cannot get things working as they should, you should be 'Mime type literate' enough to discuss the problem with your colleagues or your local guru. So, if you are having problems with document types, we suggest the following approach:

1. Read this section and try to understand the problem.
2. Ask a local guru or a colleague who is more experienced in such things.
3. Reconfigure your browser according to their advice.
4. If the problem remains, study further reference material as necessary, starting with the documentation of your WWW browser.
5. If that doesn't help either, drop us a line.

B.1 Document, types and applications

Mime (Multipurpose Internet Mail Extensions) is a standard for identifying different file formats. It is used in the *http* protocol underlying the World–Wide Web to distinguish between files of different types. Mime is defined by RFC 1521 (http://ds.internic.net/rfc/rfc1521.txt). A list of official Mime types (ftp://venera.isi.edu/in–notes/iana/assignments/media–types) and (pointers to) specifications is maintained by the *Internet Assigned Numbers Authority* (IANA).

B.1.1. Mime types and WWW

Workspace documents (and Web pages, in general) come in a variety of different formats. A file can contain data that are processable by some program, or it may be an executable binary itself. There is no general way to tell from the contents of a file what you can do with it. On some platforms, the file name –– or, to be precise, its *extension* –– gives an indication of its type. But these conventions do not hold across different types of computer systems. Moreover, on some systems (e.g. Macintosh) it is not common practice to use extensions.

When your browser gets some WWW page, the server always adds a Mime type for that page. This Mime type determines how the data should be processed. The browser can pursue different courses of action:

- It displays the document as an ordinary Web page.
  (Typical examples: HTML files, plain text files.)
- It launches an application program on your local system –– a 'helper' in WWW terminology –– that can handle the document.
  (Typical examples: MS–Word documents, PostScript files.)
- The browser neither knows how to display the document nor which application to start. So it will store the document as a local file (and ask you for a file name).
  (Typical example: executable binaries.)
  If the browser is confronted with a new Mime type, it may ask you whether to store it or to display it (and in the latter case: how to display it).
- If the document is compressed, the browser may decompress it (if it knows how) and carry out one of the above actions with the decompressed document.

Which alternative is chosen depends on the capabilities and the configuration of your browser. Netscape, for example, can display a *gif* image file directly, while Mosaic calls an external application to display the image. How to configure your browser for handling Mime types is discussed at the end of this appendix.

An interesting example of the use of Mime types is found in the BSCW system itself: for the document upload helper applications (that provide more support than the upload facilities built into some browsers). This is organized as follows:
If you push the *Add document* button in some workspace folder, the server sends your browser some data (details about the location of the folder). These data come with a special Mime type. Your browser has been configured to launch the BSCW helper application when it receives a document of this particular Mime type. So it starts the helper, which lets you select a document from your local file system and transmits it to the workspace folder.
This will only work, obviously, if you have downloaded the helper from the workspace server and configured your browser accordingly.

Some examples of Mime types are

`text/html` for HTML–formatted text (the standard WWW data format),
`text/plain` for plain (ASCII) text,
`image/gif` for *gif*–encoded images,
`image/tiff` for *tiff*–encoded images,
`video/mpeg` for *mpeg*–encoded video,
`audio/basic` for basic audio,
`application/msword` for MS–Word documents,
`application/mac-binhex40` for binhex–encoded documents
`application/x-dvi` for *dvi* (formatted TeX) files,
`application/x-bscw-helper` for the **BSCW helper application**.

and so on.

A Mime type consists of a type and a subtype as indicated. Subtypes starting with `x-` are unofficial, experimental Mime types.

B.1.2. Compression (Encoding)

Web browsers like Netscape and Mosaic support transmission and viewing of *compressed* documents. For large documents a large percentage of disk space and bandwidth can be saved by storing (and, consequently, transmitting) these documents in compressed form, using, for example, `gzip` on your PC or `compress` on a UNIX workstation. In Mime terminology this is called *encoding*. (This is actually a confusing term, because there are various encoding mechanisms like *tar*, *shar*, *binhex*, etc., that classify as an application in Mime.)

Decompression (‘‘uncompression’’ in Newspeak) is handled automatically by *some* Web browsers. Compression techniques differ across platforms. If you share a workspace with people working in different environments, a number of practical problems may come up when you store compressed documents in a workspace. In general, it is advisable not to use this, unless you work with really large documents and you (and the other group members) know what you’re doing.

B.2 Mime types and BSCW

The BSCW server explicitly stores a Mime type for each document in a workspace folder (in contrast to standard WWW servers, which determine the Mime type of a document from the extension of the file name). It is impossible to add a document without giving it a Mime type. You can inspect the Mime type of a document by clicking the small information button in front of it.

If *A* writes a document into a folder and *B* has difficulties viewing it, there are two possible sources of confusion:

- The document was given the wrong Mime type when *A* wrote it into the folder;
- *B*’s browser is not properly configured to handle this type of document.

The latter problem, how to make your browser understand some Mime type, is a common one. Every (decent) WWW browser will give instructions for this in its reference manual, reachable via its *Help* button or menu. A very brief overview is given in section B.5.

The former problem, how to assign the right Mime type to a document, is rather different. The browser’s manual cannot assist you here, because it is the BSCW helper, rather than the browser, that makes the server store the document. The BSCW system has its own particular way of handling this –– or, even worse, different helpers have different ways of handling this – see B.4. The helper will suggest a Mime type based on the extension of the file name.
If you use the built–in upload function, there is **no** support for Mime types and you have to select the right mime type by hand.

If, for some reason, you want to *change* the Mime type of an already uploaded document, you find the **change type** operation on the info page of the document.

B.3 Exchanging documents across platforms

Reading documents that originate from another type of computer system (in the sequel referred to as 'alien' documents) may give rise to various kinds of problems. This is caused by incompatibilities of data formats across platforms and beyond our control.

Plain text. A very old and simple problem is the tiny difference in the ASCII plain text format on different platforms. In UNIX files, the internal representation of end–of–line is the *linefeed* character; Macintosh denotes this by *carriage return*; the DOS file format uses *carriage return* + *linefeed*. Document formats that make use of end–of–line, therefore, may cause confusion.
`Note: it is envisaged that documents of type text/... will be converted to MS-DOS format (which is usable on all platforms) when uploaded to the server. This has not yet been implemented.`

There are two Mime types for plain text: `text/plain` and `text/ascii`. All WWW browsers interpret `text/plain` and show documents in this format as a Web page. Some browsers fall into the end–of–line trap. For example, *Mosaic* under UNIX shows a Macintosh ASCII text as a single line. *Netscape* identifies alien end–of–lines and handles them correctly.

A different issue is the fact that word processors typically use paragraphs, rather than lines, as text units. For example, if you save an MS–Word document as plain text without line breaks and then add it to the workspace, each paragraph will be displayed as a single line.

Most browsers do not interpret `text/ascii` (unless you modify the configuration). So it would be possible to use this type for documents in a workspace that should be saved to disk, when downloaded, rather than displayed to the user.

Microsoft Word documents have the type `application/msword`. If you are using different versions of MS–Word on different platforms it may take some experimenting to find out how portable it is. Word 6 seems to have solved most of the problems, but some types of images are not portable between PC and Macintosh.

Note that Windows expects the MS–Word document to have an extension `.doc`. Macintosh users who share documents with PC users are advised to adopt this as a naming convention.

For documents in RTF exchange format, the type `application/rtf` can be used and configured to start MS–Word on your system.

Microsoft Excel documents have the type `application/x-excel`. When using different versions of Excel, problems may occur that are similar to those with MS–Word.

TeX and LaTeX. There is a type `application/x-latex`, but is does not really make sense to feed a WWW page straight into latex. If you use this for latex files, it is probably most convenient to configure the browser so that it saves latex documents to the local disk. When you produce a joint document with a distributed group, you may just as well use `text/ascii`, because that's what Latex source files really are.

PostScript. By and large, PostScript documents should be portable. Nevertheless, when a PostScript

document is processed correctly by one PostScript viewer or printer, it may cause problems with other viewers or printers.

B.4 Configuring Mime types for uploading documents

When you upload a document to a workspace it should get the right Mime type, so that WWW browsers know what to do with the document when somebody accesses it. This has been discussed in Sections B1–B3. The helper applications for uploading documents make an educated guess of the type of your document – based on the extension of the file name – and fill in the Mime type field accordingly.

In your Web browser you have to add the Mime type `application/x-bscw-helper` and attach the transmission program to it. For the *Netscape* browser this works as follows (for other browsers, consult the browser manual pages):

- From the *Options* menu select *Preferences*.
  There are various pages with preferences. Choose *Helper Applications*.
- Pop up a window with the button *New*. Give `application` as type and `x-bscw-helper` as subtype and create this type.
- The bottom of the window displays a series of radio buttons for *Action*. Select *Launch application*.
- With *Browse* you can select the application to be launched.
- Leave the *Preferences* dialog box.

For built–in document upload there is no support for Mime types. The default is `text/plain` for any document. It is not possible to edit the Mime type configuration file (because it is on the server). If a standard Mime type that you need is missing, please notify the administrator of your BSCW server. You can change the Mime type defaults and add new Mime types by editing the configuration file of your helper application. Where to find these **configuration files** differs according to platform and type of helper:

Native helper for PC:
: `bscw.ini` (probably in `C:\WINDOWS`)

Drag and drop for PC:
: Select 'Mime types' in the uploader preferences box to edit or add mime types.

Native helper for Unix:
: `.transmitter.mimes` (in your home directory)

Command line uploader for Unix:
: `.transmitter.mimes` (in your home directory)

Macintosh:
: `bscw-s.config` in the BSCW Helper folder.

For details look at the respective documentation ('read–me') which is downloaded with the helper application, or look at our download–page

B.5 Configuring Mime types for reading documents

We only give a brief overview for the Netscape browser. See you browser's manual page for more information.

B.5.1 UNIX

What your browser does when it receives a document of some Mime type depends on the `mailcap` configuration files. Your browser has a default `mailcap` file, typically `/usr/local/lib/mosaic/mailcap` for Mosaic and `/usr/local/lib/netscape/mailcap` for Netscape –– see these for an example of what a mailcap file looks like.
A personal mailcap file, typically `.mailcap` in your home directory, can be used to define helper applications for additional Mime types or to override the defaults.

If you open a local file, the Mime type is derived from the file name extension by an *extension map*.

B.5.2 Macintosh

From the *Options* menu, select *Preferences*. In a pop–up menu you can select various kinds of preferences. *Helper Applications* is the one that lets you configure Mime types.

The Mime type table displays four fields: *Mime Type*, *Application*, *Action* and *Extensions*. This table is used to determine what to do with a file of some given Mime type.

The *Action* field indicates what should happen with an object of a given type: display it as a Web page (restricted to those types that the browser is able to display), launch a specific 'helper' application, save it to disk, or prompt the user for further action. The *Application* field, showing which helper to start, is relevant only if the action to be performed is 'Launch'. The window on preferences for helper applications allows you to define new Mime types and change the application and action fields of existing Mime types.

The *Extensions* field is only used to determine the Mime type when you use the browser to open a local file.

B.5.3 Windows (3.1, NT, '95)

From the *Options* menu, select *Preferences*. In a pop–up menu you can select various kinds of preferences. *Helper Applications* is the one that lets you configure Mime types.

The Mime type table displays three fields: *File Type* (i.e. Mime type), *Action*, and *Extensions*.

The *Action* field indicates what should happen with an object of a given type: display it as a Web page, (restricted to those types that the browser is able to display), call another application to display the object, save it to disk, or prompt the user for further instructions. The window for helper applications under "preferences" in the option menu allows you to define new Mime types and change

the action fields of existing Mime types.

The *Extensions* field is only used to determine the Mime type when you use the browser to open a local file.

B.6 Configuring Mime types for conferencing applications

We only give a brief overview for the two most popular browsers, Netscape Navigator and Microsoft Internet Explorer. See you browser's manual page for more information.

B.6.1 Netscape Navigator

In Netscape, the easiest method, by far, is to configure your browser when first trying to join a meeting or calling a person using a particular program.

Clicking the Join– or the Call–button in BSCW will return a specific MIME–type to launch the appropriate conferencing application.

If your browser has already been configured, the application will start and automatically connect to the called Internet address. If your browser has not yet been configured, it will respond with a message saying it does not recognize the particilar MIME type. You then choose to pick an application, and select your conferencing program. The next time you click the join button for a meeting of the same kind, the right application will be launched automatically.

Alternatively, you could add the MIME–type and the action to carry out upon receiving the particular MIME–type by hand. This is done under the "Helpers" tab in the "General Preferences" menu under "Options". You don not have to associate any file extensions with the MIME types.

B.6.2 Microsoft Internet Explorer

MSIE is slighly more complicated to configure than other browsers. Follow these steps:

1. In the "View" menu, select "Options" – an "Options" dialog will pop up
2. Click on the "Programs" tab, and in "Viewers", click on the "File types" button. A new "File types" dialog will appear
3. Click "New type", a new dialog "Add new file type" will pop up.
4. Enter the following information into the relevant fields in the dialog: Description of type : "e.g Enhanced CU–SeeMe" Associated extension : "e.g. .csm for CU–SeeMe" Content Type : "The MIME type"
5. De–select any of the options which may be set at the bottom, such as "Confirm open after download
6. Click on the "New" button, a "New action" dialog will appear
7. In the dialog, enter the action name "open"
8. Use the "Browse" button to locate the conferencing program
9. Click on "OK" in the "New Action" dialog
10. Click on "OK" in the "Add new file type" dialog

11. Click on "OK" in the "File types" dialog
12. Click on "OK" in the Explorer "Options" dialog

C Glossary of icons

BSCW uses a large variety of icons. One can distinguish icons for the following purposes:

- Action buttons to trigger actions of all sorts.
- Manipulating the workspace view.
- Information on objects
- Event notification icons
- Some special kinds of objects
- Workspace objects that can be found in the listing of a folder.

Action buttons

,

etcetera.

Each action button is labelled with a keyword describing the action. For a comprehensive list of actions and their explanation, see Section 4.10.

Manipulating the workspace view

The following buttons change something in your view of the current workspace folder. Some of these, like the action buttons in the same button bar, operate on **Selected** objects. Objects are selected by clicking the check boxes at the very left of the workspace folder listing. If no objects have been selected, an operation on selected objects does not do anything (other than reloading the page).

Fold in *selected* folders and articles

Fold out *selected* folders and articles.

Unselect all objects displayed in the current page.

Select all objects displayed in the current page.

Show an action line with each object in the current page.

Show descriptions (if any) of objects in the current page.

Hide the action lines of the objects.

Hide the descriptions of objects.

(at folder or article:) Fold in.

(at folder or article:) Fold out.

Information on objects

Provide more information (and, where applicable, more actions) on this object.

The same as  . This blue button is used to signal that this object is accessible to persons who are not a member of this workspace.

(on a versioned document:) A *Note* is attached to the versioned document. Click the document or the note icon to see the note.

A successfully verified URL.

An unvalid URL, i.e. the location could not be verified.

CONFIRMED

(for meeting objects:) The user has confirmed his attendance

DECLINED

(for meeting objects:) The user has declined his attendance.

Event notification icons

The following icons indicate events (after the laste ’catch up’) in the listing of a workspace. See Section 3.4.

Creation.

Change of some kind.

Location (or name) has changed.

Read.

Touch: events within the contents of this objects.

In addition, event lists obtained by clicking these icons and events displayed on the info page, display the following icons.

Cut.

Drop.

Delete.

Undelete.

Destroy.

Join.

Call.

Some special kinds of objects

(in your index page:) Workspaces you are a member of.

The (current) workspace.

Your personal bag (currently empty).

Your personal bag (currently not empty).

Your personal wastebasket (currently empty).

Your personal wastebasket (currently not empty).

The members page of this workspace (which has two or more members)

The members page of this workspace (which has a single member: yourself).

Your personal list of meetings.

Workspace objects

The following icons appear in a workspace listing in front of the object name.

Folder.

Discussion article.

URL (link to a WWW page).

Documents and versioned documents are preceded by an icon that indicates the type of document (if such an icon is available). The following list contains **some examples** of document type icons. There are many more.

Meeting.

vCalendar representation of a meeting.

A document of type `text/...` (HTML, ASCII, ...).

A document of type `application/msword` (MS Word)

A document of type `application/x-latex` (LaTeX)

A document of type `application/postscript` (Postscript)

A document of type `application/macbin` (Macintosh binary)

A document of type `application/x-tar` (UNIX tar file)

A document of type `image/gif` (GIF image)

A document of type `audio/basic` (sound)

A document encoded with `compress` or `x-compress`.

A document encoded with `gzip` or `x-gzip`.

A document type for which no icon is available.
(**Note:** The question mark signals merely that no icon for the document type could be found, *not* that there is something wrong with the type or the document. It probably has a legitimate mime type, perhaps a special type for some private application.)

How to Organize a Workspace

General Recommendations

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D.1 Motivation

While using your personal computer, you may organize your personal file system according to your individual needs and preferences. Similarly, when sharing a multi–user system, e.g. a Unix system, any user may organize his personal home directory individually.

Workspaces are different from personal file systems in that they are shared among multiple users. Workspace usage must not happen according to individual preferences, since this would commonly lead to a situation that requires a reorganization of the already established workspace structure. Then, one or few users reorganize the workspace, while others will have problems in comprehending the new structure. This increases the potential of confusion and even conflicts but restrains collaboration.

In essence, we may state the following, general principle of workspace organization:

Principles for organizing a workspace have to be explicitely stated a priori!

The principles should enable any user of the workspace to answer the following questions:

- Where do I have to place this document?
- Where can I find an answer to this organizational question?
- Which kinds of (manually triggered) notifications are necessary for this kind of event?

This document contains recommendations for organizing workspaces. To some extend, these recommendations are comparable to the organizational principles the Unix community has agreed upon: Major parts of the Unix file system are structured according to general rules supporting the actual operating system, ease of administration and portability of software. For instance, individual home directories are located in ’/home and general commands in ’/bin’ (cf., e.g., Frisch 1995).

Additionally, the Unix file system is relatively static. System modifications (installation of new software) rarely happen. Workspaces, in contrast, are by definition dynamic and subject to changes. For shared workspaces, however, you cannot predefine detailed organizational rules in general, because the specific requirements of a workspace user group cannot be predicted. Thus, each user group sharing a workspace has to agree upon the respective needs and organizational rules appropriate to their specific project.

Nevertheless, some general recommendations can be made, and that is what this document is about:

- Static aspects characterize the structure of a workspace.
- Dynamic aspects concern the actual collaboration processes. Statics and dynamics in combination actually define the overall style of cooperation.
- An Example is finally used for illustrating the more abstract principles, presented before.

The recommendations presented here may appear intuitive and trivial. However, even well experienced BSCW users tend to forget some important aspects while structuring a new workspace. Hence, these recommendations should be considered a check–list.

D.2 Static aspects of a workspace

Strictly speaking, there is only one single, general rule for organizing the structure of a workspace:

**The structure of a workspace should reflect the
different types of processes it supports and
the different types of objects it contains.**

In practice, this general rule has to be appropriately instantiated according to the actual circumstances of a specific project. As already explained, you cannot predict the specific instantiation in general. However, there are some common types of objects and processes occuring in virtually any collaboration context.

In this section, we present 3 common types of objects, i.e. evolving documents, archived documents and organizational documents. Common patterns of processes are explained in the section 3.

D.2.1 Evolving Objects

Evolving objects constitute the ’real workspace’. They are the subjects the project group jointly works upon. Below, we call these type of documents ’**@work**’.

D.2.1.1 Documents of General Interest

Typical instances of evolving objects are project reports or deliverables still under work or under review. The eventual release versions of these documents, however, are considered "fixed" (cf., below). Documents falling into this class are to some extend matured, therefore of general interest to all group members. Early versions are usually considered of personal respectively subgroup interest, as explained under the next items.

D.2.1.2 Subgroup Folders

Commonly, only a subset of a project group is responsible for creating a specific document. Therefore, each of these subgroups should locate their working material within a subgroup specific folder.

When a draft version is ready for discussion or evaluation within the whole project group, the document is of general interest and will therefore be moved to a place of general attention. A release version of the document is finally put into the archive.

D.2.1.3 Personal Folders

The points made for subgroup folders may analogously be made for personal folders. Very often, you have to implement some kind of workflow: you want to deliver a document to a specific group member for further processing. In such a case, a preferred location for this document is the personal folder of the responsible member.

D.2.2 Fixed Documents

A second type of document can be characterized in that they are fixed, i.e. they are no longer subject to change. Examples are release versions of documents, reports on meetings, or forms and style sheets used by all members of the working group. These documents constitute the project's **archive**.

D.2.2.1 Templates

Progress reports, costs statements, and any other type of documents produced by the project should be of uniform structure and layout. This can be most easily accomplished by providing an appropriate set of templates, i.e. forms and style sheets.

D.2.2.2 Administrative Documents

These documents typically do not reflect the work of the group but refer to the legal or administrative background of the project. Examples are contracts and further preparatory project documents.

D.2.2.3 Supporting Documents

Documentations of different kinds of meetings, e.g. project meetings, conferences, or externally provided material of general interest to the project group.

D.2.2.4 Project Results

Project results can be classified into products (e.g., software tools) and documents. Objects located here are allways release version and no longer subject to changes. They may also be classified with respect to distribution policy.

D.2.3 Organizational documents

There is some "meta" information about the organization of the project and the shared workspace. Examples are information about members of the project group, the rationales for the actual structure of the workspace as well as for the agreements made about the dynamics of collaboration, e.g. the different responsibilities and rights of members.

We distinguish organizational information from the archived documents for two reasons. Firstly, although these organizational documents are intended to be fixed, they have to be periodically adapted to the actual progress or delay of the project. Secondly, there is a significant difference of the importance of changes to the overall project group: if an organizational document has changed, instantenous reading of the new version is strongly recommended to any member of the project.

D.2.3.1 Workspace Organization

Organizational documents include information about the structure of the workspace. Most notably, this information should enable any project member to decide where to locate different kinds of documents.

Rules about the dynamics of collaboration are also stored here. Agreements about means for communication and notification within the project group typically refer to mailing lists and additional information for further communication channels like telephone numbers for video conferencing.

D.2.3.2 News Deposit

Here, present information relevant to the overall project group is located. Examples are agendas for project meetings or externally provided material of general interest. Periodically, this material should either be destroyed or moved into the workspace archive.

The rational for installing a news deposit is twofold: Firstly, present information of general interest has a definite location. Secondly, the event notification built into BSCW resembles some automatic receipt of acknowledgement that enables any project member to realize who has (not) yet been effectively informed.

Consider the example of announcing a project meeting. Instead of mailing the agenda to all members, just a notification mail and the URL of the agenda is sent. BSCW's notification on read events keeps you aware of who has already obtained the agenda.

D.2.3.3 Time Table

Deadlines for deliverables and dates of project meetings are documented in the time table.

D.3 Dynamic Aspects of a Workspace

Collaboration is a process, hence inherently dynamic. Thus, a project group has to agree upon the joint maintainance and evolution of the shared workspace.

Here, we point out 3 different dynamic aspects of the collaboration process, namely (1) how to support the flow of work, (2) how to notify project members about events, and (3) means for coping with present deficiencies of collaboration support within BSCW.

D.3.1 Supporting Workflow within a Shared Workspace

Joint production of documents is usally done in a sequential manner, and different roles are assigned to different members of the project group.

For example, let person A be the actual writer of a document, and person B the major reviewer. Hence, when he has finished an intermediate version of his document, A has to inform B about the event of storing the new version in the workspace. To some extent, A may rely on the built–in notification mechanisms of BSCW, but he has to know where to locate the document. A simple structural means for 'personal' notification are personal input folders (cf., section D.2.1.3, above). So, A might store his document within B's personal input folder.

Personal input folders combined with subgroup folders significantly reduce the load of event watching for any member of the project group. You do not have to check all events within the whole workspace but you may narrow your attentention to a very limited number of locations:

- Events in your *personal folder* should usually be considered as personal mail announcing personal obligations.
- The importance of events in the *subgroup folders* you're working with depends on the actual state of the respective work and the role you have been assigned.
- Folders and *documents of general interest* should be observed by any member of the project team.

Unfortunateley, production lines are not the only way of collaboration. Consider a slight extension of our example: suppose, person C is additionally involved in that C is responsible for coordinating different concurrent tasks including our example. In this case, A has to additionally inform C about the ongoing work.

D.3.2 Notification

In general, notification is a means for assuring, that group members are aware of a specific event occured in the workspace. Notification can be carried out by built–in mechanisms of BSCW or manually, e.g. by email, telephone–call or fax.

There is only one general rule for notification:

If a document is stored according to the project plan,
use built–in notification, else, email–notificaton is recommended.

Take for example reports or deliveries: An email–notification is recommended only in case of delay.

D.3.3 Coping with Current Deficiencies

The World–Wide Web is rapidly growing due to its independence of hardware and software platforms. However, in shared workspaces document exchange between different tools and platfoms is necessary. The project has to agree upon common data formats for all applications and platfoms in use.

Unfortunateley, different application programs do not agree on a specific exchange format, e.g. RTF. This might even be the case for different versions of one and the same application: for example, we had problems when exchanging RTF format with a Word 6.0 Version (PC) and Word 5.1 (Mac). One version is not able to correctly interpret the RTF format of the other! HTML is the only format for text production, which is really platform independend. In most cases, the highly sophisticated features of text processing systems are not needed for documents. People who wish to use their own favorite text processing system, can easily transform HTML documents into their system. For example, with Microsoft's "Internet Assistant" you can produce a Word version of any HTML document. Therefore, you are save when using HTML as format for workspace documents.

D.4. Example

The following example illustrate a possible structure of workspaces. The example is directly derived from sections above. It describes the workspace structure for the CoopWWW project.

D.4.1 The Structure of the workspace

Archive

Here, 'fixed' documents are found, i.e. final versions of papers, forms, etc. The Archive contains the following four folders:

- Contracts
  This corresponds to section D.2.2.2 'administrative documents'.
- Forms
  This corresponds to section D.2.2.1 'templates'.
- Meetings
  This is a part of the 'supporting documents' described in section D.2.2.3
- Workpackages
  Here final versions of documents of the various workpackages are found. This corresponds to the 'project results' in section D.2.2.4. For the structure of each workpackage, the respective coordinator should be responsible. In each workpackage folder an **info page** should be included describing the structure of the respective workpackage.

General Information

Information of general interest, e.g. schedules, workshop announcements (cf. section D.2.3.2 'news deposit').

General Interest

Documents of general interest for all workspace members, e.g., draft documents (or respective links) for discussion (cf. section D.2.1.1).

Partners

Partners' folders contain documents in work, the '@work' part of the workspace in contrast to final versions which are located in the archive. This folder corresponds to the 'subgroup' folder in section D.2.1.2. The folders located here may also be useful in supporting working lines by moving documents for further work (e.g. peer review of a document) to the input folder of the respective project partner. Instead of the document itself, a link can also be created. The partners' folders may also contain personal folders of group members.

- GMD
  - INPUT
    Input folders indicate, that the group should further process the respective documents (peer review, give feedback on drafts, ...)
- horz informatik
  - INPUT
- ...

Communication

Here you can find information about mailing lists.

 **READ ME**

This document informs about the workspace organization (cf. section D.2.3.1).

D.4.2 Proposed rules for using the workspace

- **General**: When you store a document, keep in mind the structure of the workspace as explained above.
- All **evolving documents** are stored in the **partners** folders (cf. D.2.1.2). Drafts for general discussion are located in **general interest**. **Release versions** are shifted to the workpackage folders in the archive.
- **Notification**: If a document is stored according to the project plan, use built–in notification. Else an email–notificaton is recommended.
- **Workflow**:
    - Documents for further processing should be moved to the input folder of the respective 'partners' folder.
    - There should be a predefined location (e.g., in the workpackage folder) where a folder contains the different versions of a document.

D.5 References

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