

STRUCTURED COAUTHORING

BACKGROUND

5 [0001] In multi-user environments, it may be desirable for multiple users be able to edit the same document at the same time. Often, when multiple users are editing the document, confusion can exist as to how the various edits are added to the document. For example, sometimes multiple versions of the document are edited, making it difficult to merge the edits into a single, complete document.

10 [0002] Even in systems that support multi-user editing of a document, users typically cannot control when the users' edits are shown to others editing the document. Further, it can be difficult to define which user is working on which particular part of the document, thereby resulting in possible conflicts in the changes made to the document.

SUMMARY

15 [0003] The present disclosure relates to systems and methods for structured coauthoring of a document.

[0004] According to one aspect, a system for structured coauthoring of a document
20 comprises a server including one or more documents, each document being organized into sections, a document permissions module that stores user access permissions for each section of a document, a document update processing module that processes requests from a user to share document updates with other users and that processes requests from a user to receive document updates from other users and a document rendering module that
25 renders a document for display on a client, the document being rendered so that sections of the document are updated with shared document updates made by users, the shared document updates being requested by the user on the client. The user access permissions determine the extent to which a user can modify each section of the document, permitting different user access permissions to be stored for one or more sections of the document.
30 The system permits two or more users to coauthor one or more of the sections of the document so that each user has specific access rights to one or more of the sections of the document, so that the user can specify whether updates made by the user to the one or more sections of the document can be displayed to other users, and so that the user can

view the names of other users accessing the one or more sections of the document and can selectively obtain updates to the document from those users.

[0005] According to another aspect, a method for structured coauthoring of a document comprises: opening a document on a client by a user, the document organized into sections, each section representing a part of the document, the document displaying user access permissions for one or more sections of the document and the document displaying the names of users who are editing one or more of the sections of the document; performing operations on one or more sections of the document, the operations being consistent with the user access permissions granted for the one or more sections of the document; identifying updates to the document that can be shared with other users so that the updates to the document are shared with other users; and identifying one or more users from which document updates to one or more of the sections of the document are to be obtained, the one or more users selected from the names displayed on the document, so that the document updates are obtained from the document server and displayed in the appropriate sections of the document.

[0006] According to yet another aspect, a method for coordinating the structured coauthoring of a document at a document server comprises: dividing a document into a plurality of sections, each of the sections including a paragraph of the document; storing user access permissions to each of the sections of the document for a plurality of users of the document, the user access permissions defining an extent to which each of the plurality of users can view, edit and comment on the sections of the document; storing the names of users who are accessing each of the sections of the document; rendering an instance of the document to the users of the document, the rendered document including access controls that indicate user access permissions for each of the sections of the document, the rendered document including the names of the users who are editing each of the sections of the document, the rendered document including action controls providing actions including requesting updates to the sections from the users and designating that updates a user made to the sections are made available to users; storing updates to the document made by the users of the document; receiving a request from a first user to share updates to the document made by the first user with other users; in response to the request from the first user, enabling the document updates made by the first user to be shared with other users; receiving a request from a second user to receive updates to the sections of the document

made by other users; and in response to the request from the second user, rendering an instance of the document for the second user that includes the shared updates to the sections requested by the second user, the shared updates being rendered in new document sections located directly above the requested document sections.

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[0007] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

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DESCRIPTION OF THE DRAWINGS

[0008] The accompanying drawings incorporated in and forming a part of the specification illustrate several aspects of the present disclosure, and together with the description serve to explain the principles of the disclosure.

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[0009] Figure 1 shows an example system for coauthoring documents.

[0010] Figure 2 shows a structure of an example document used for coauthoring.

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[0011] Figure 3 shows a portion of an example document for coauthoring.

[0012] Figure 4 shows an example of displaying document updates from another user for a portion of the example document shown in Figure 3.

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[0013] Figure 5 shows example modules of an example document server.

[0014] Figure 6 shows a flowchart for an example method for coauthoring a document.

[0015] Figure 7 shows a flowchart for an example method for coordinating the coauthoring of documents at a document server.

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DETAILED DESCRIPTION

[0016] The present application is directed to systems and methods for structured coauthoring of a document.

[0017] In examples described herein, a document is organized into sections, and users are assigned specific access permissions to one or more sections of the document. The access permissions define the extent to which a user can view, edit, or comment on a section of the document. Structured coauthoring also permits users to share document updates. A user can make changes to the document and decide which, if any, of these changes are shared with other users. In addition, a user can request to see shared updates to the document made by one or more other users.

[0018] Figure 1 shows an example system 100 that supports structured coauthoring of documents. The system 100 includes clients 101, 102 and one or more document servers 104. More or fewer clients and document servers can be used.

[0019] In example embodiments, the clients 101, 102 are computing devices, such as desktop computers, laptop computers, personal data assistants, or cellular devices. The clients 101, 102 can include input/output devices, a central processing unit ("CPU"), a data storage device, and a network device.

[0020] Typical input/output devices include keyboards, mice, displays, microphones, speakers, disk drives, CD-ROM drives, and flash drives. Other types of input/output devices can also be used.

[0021] Computer readable media, such as the data storage device, provides for data retention. By way of example, computer readable media can include computer storage media and communication media. Computer storage media includes physical volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer readable instructions, data structures, program modules or other data. Communication media typically embodies computer readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal.

[0022] Among the plurality of information stored on the data storage device is a client operating system (“OS”) and client applications. The client OS is a program that manages the hardware and software resources of the client system. The client applications utilize the resources of the clients 101, 102 to directly perform tasks specified by the user. For example, the clients 101, 102 include one or more software applications, such as word processing programs, that are used to create and edit document files. One example of such an application is Microsoft Word from Microsoft Corporation of Redmond, Washington. Other examples of such applications are also applicable.

[0023] The network device enables the clients 101, 102 to send and receive data to/from the server 104 through a network such as a LAN or the Internet. Other configurations for the clients 101, 102 are possible.

[0024] The document server 104 is a file server that is accessible through a network. The document server 104 stores a plurality of files. These files can include both software applications and documents, as described further herein. The document server 104 controls access to the documents stored by the server 104.

[0025] In example embodiments, the document server 104 can be located within an organization or can be part of an Internet-based shared document system. An example Internet-based shared document system is a SHAREPOINT® team services portal server services provided by Microsoft Corporation. An example shared document server is Microsoft Office SharePoint Server 2007 provided by Microsoft Corporation. Other configurations can be used.

[0026] Figure 2 shows an example document 200 that is rendered by a word processing application 201 on example client 101.

[0027] In the example shown, the document 200 is organized into a plurality of sections, designated as sections 202 through 212, respectively. A section corresponds to an editable piece of a document. Typically, a section can be any subpart of a document, for example paragraphs, headings, drawings, tables, etc. A document may contain only one section, for example a table or a single paragraph or sentence.

[0028] Alongside each section of the example document 200 are example user controls 222-232 that display the names of users who are currently coauthoring the section. The example document 200 also includes example access controls 242-252 that display the access permissions of each user for the document section and example action controls 282-292 that permit the user to take one or more specific actions for the document section. The specific actions may include assigning the document section to another user, marking the document section reviewed, marking the document section completed, etc. In addition, the example document 200 also includes example dynamic controls 262-272 that define rules for dynamically changing the access permissions for a section of the document. Other functionality for the controls is possible. The controls may include text boxes, list boxes, pull-down list boxes, icons or any other user interface control types that may be appropriate.

[0029] In the example shown, the user controls 222-232 list the names of the user or users who are currently editing the note section 202-212 of the documents. For example, if user A and user B are currently editing section 202 of the document, the names of user A and user B are listed in the user control 222 so that everyone that has the document 200 open can see that user A and user B are currently editing the section 202. A user is considered to be editing a document section when the user makes changes to the document section, for example by typing in the document section.

[0030] The access permissions of the access controls 242-252 indicate the extent to which a user may edit a section of the document 200. Example user access permissions include full control, read/write, review only, comment only, read only and no access. Other user access permissions may be possible.

[0031] In example embodiments, the names of all users with any level of access permission to the document section are displayed via user controls 222-232. In example embodiments, the names of users with read only access may not be displayed, for example if the list of such users is long.

[0032] When a user is assigned full control, the user has full read/write access to the section of the document and, in addition, the user can use any aspect of the user interface. For example, with full control, the user can change the formatting of the document. When

a user has read/write control, the user has read-write permission to a section of the document, but cannot make formatting changes. With review only permission, a user can make changes to the document that are tracked via a technology like Track Changes in Microsoft Word. With comment only permission, the user can insert comments to a
5 section of the document but cannot alter the text within the section of the document. With read only permission, the user can view the section of the document but cannot make any changes to it and cannot insert any comments.

[0033] With no access permission, certain sections of a document may not be viewable to
10 users. For example, there may be confidential information in a document that one or more users are not permitted to view. Therefore, when presented to a user, one or more sections of a document may be redacted to prevent a user from viewing it. This is illustrated by shaded sections 206 and 208 in Figure 2, which have been defined as no access for some of the users. In some embodiments, confidential sections may not be displayed at all to a
15 user that is not permitted to view them. In example embodiments, sections of a document may be redacted if a user is not permitted to edit them. For example, in a document that includes both engineering and financial sections, the financial sections may be redacted when an engineer is viewing the document and the engineering sections may be redacted when a financial person is viewing the document.

[0034] In example embodiments, user access permissions and rules may be assigned and edited by an owner of the document (i.e. the person or persons having ownership
20 permission for the document). This may be done on a section by section basis or globally for the entire document. The user access permissions and rules are stored on a document
25 server.

[0035] The user access permissions described can also be enforced without network connectivity. Assigned user permissions to sections of a document can be cached in the client's software application or stored within the document. In this way, the access
30 permissions can be used if the client is disconnected from the network or working on the document from a different computer.

[0036] The action controls 282-292 permit the user to take a specific action regarding the document section. For example, the user may wish to obtain updates to the document

section from one or more other users that may be editing the document section or the user may wish to share updates that the user made to the document section with one or more other users. Other example actions that the user may make include sending an email to a user or instant messaging a user to find out status. Other actions are possible.

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[0037] The dynamic controls 262-272 are used to define rules that permit the access permissions for a section of the document to dynamically change when a user completes a task. For example, one or more users may be designated reviewers, but a user may not want the document to be reviewed until it is completed. In an example embodiment, when a user marks a section of a document as complete, the access permission for a reviewer dynamically changes from read/only to review only.

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[0038] When a user opens and begins editing the document 200, the user can view the corresponding example coauthoring control 222-232 to determine who else is currently editing the various sections of the document. Typically, the user may know one or more other users and may want to see any changes that the other users have made before the user makes any additional changes. The user can indicate via example action controls 282-292 that the user wants to view the changes of one or more other users, and if those users have designated that their changes can be shared, the changes made by the one or more other users will be displayed on the document shown to the user.

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[0039] In example embodiments, the user also has the flexibility to decide when to share edits with other users. When editing a document, the user may not want to share changes until those changes are in a state with which the user feels comfortable. In one example embodiment as discussed above, the user selects an example action control 282-292 to specify a user with which changes can be shared. In another example embodiment, when the user wishes to share changes with other users, the first user highlights the section of the document to be shared and clicks example Share button 205 on the user interface. This notifies the document server 104 that changes to the document section document are to be shared. In example embodiments, clicking the example Share button 205 may bring up a list of users with which the document section changes may be shared. Other implementations are possible.

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[0040] In addition to example Share button 205, the example user interface also includes an example Save button 203 and an example Assign button 207. The example Save button 203 operates as a standard save button, allowing the user to save changes into client or server memory. However, the save operation does not result in sharing updates with others. The example Assign button 207 permits the owner of the document to assign access permissions to other users.

[0041] Figure 3 shows an example embodiment of a document 300 for structured coauthoring of an example document section 306. To the left of the example document section 306 are example user controls 312, 318 displaying the names of two users currently coauthoring the document section. In this example, the two users are Heidi Craig and Tom Anderson. Associated with the users are example access controls 314, 320 and example action controls 308, 316. For user Heidi Craig, the example access control 314 is shaded to indicate full access. For user Tom Anderson, the example access control 320 has a different shading to indicate write access. In other embodiments color, shape of icon, text, etc. may be used to indicate access status.

[0042] The example action controls 308, 316 permit the user to select one or more actions to be taken regarding the document section. In an example embodiment, when the user moves a mouse over an action control (for example the action control 308 for Heidi Craig), a list of available actions 307 is presented. In this example embodiment, if the user selects the example action 309 for obtaining updates, the user will obtain updates to the document section from Heidi Craig that Heidi has designated for sharing. If the user selects the example action 311 to share updates, the changes the user made to the document section will be shared with Heidi Craig. If the user selects example action 313, the user can send an email to Heidi Craig. Moving the mouse over the example action control 316 for user Tom Anderson provides the same set of action options for Tom Anderson.

[0043] In another embodiment, the action control 308, 316 is a pull-down list box that provides a list of choices for the user. Other embodiments for action controls are possible.

[0044] Also shown in Figure 3 is an example dynamic control 322. The example dynamic control 322 allows the user to dynamically change access permissions to the

document section and to specify conditional access permissions. In this example, the dynamic control 322 is a pull-down list box. When expanded, the example dynamic control displays an example list of users 324 that have access permissions for the example document section 306. When one of the example users 324 is selected, the access permission for that user is shown. For example, if example user Sara White 326 is selected, the dynamic control 322 is further expanded to shown example access permission list 328. In example access permission list 328, example access permission 330 (No Access) is shaded, indicating that Sara White currently has no access to this document section. For this example, if access permission 330 is clicked, the dynamic control 322 is further expanded to provide a means to dynamically change access permissions. A list of Until options 332 is displayed, providing the option of maintaining the current access permission until a specific action occurs. For example, the user may select the Section Shared option 334 to specify that the current No Access permission for Sara White is to be maintained until the document section is designated for sharing by the user. When the example Section Shared option 334 is clicked, the dynamic control 332 is further expanded to provide an example list of Then options 336, indicating access permissions that can be set once the Section Shared action occurs. In the example, the Comment Only option 338 is selected, indicating that the access permission for user Sara White will dynamically change from No Access to Comment Only when the document section is designated for sharing.

[0045] Referring now to Figure 4, in an example embodiment, changes may be displayed above the document section so the user may see them before making any additional edits, as shown in the example document 300. In the example document 300, the user, via action control 316, makes a request to receive updates to document section 306 from Tom Anderson. The updates 406 are displayed above document section 306. The user may observe that Tom Anderson changed the last sentence in document section 306 and may make additional changes to the document section as a result.

[0046] Other example embodiments for the selection and display of coauthoring changes are possible. For example, the coauthoring changes may be displayed adjacent to the current section, below the current section or simply incorporated into the current section.

In example embodiments, deletions and additions may be shown by strikethroughs and underlining.

5 [0047] In example embodiments, the user can select the one or more other users for which changes are to be displayed. The user may also globally select changes from all other users. In example embodiments, the changes can be received on a per section basis or for the entire document.

10 [0048] Figure 5 shows the example document server 104 in more detail. The example document server 104 includes one or more documents 502, a document permissions module 504, a document update processing module 506, and a document rendering module 508. An example document 502 is rendered to a user when a request is received from an application program on a client to open the document.

15 [0049] The example document permissions module 504 stores the access permissions for each section of each document for each user. In some embodiments, the access permissions are stored within each document. In other embodiments, the access permissions are stored separately from each document (for example on a server or in a database) and are linked to the document. As noted above, different user access
20 permissions can include full control, read/write, review only, comment only, read only and no access. Other user access permissions are possible.

[0050] The example document permissions module 504 also enforces access permissions without network connectivity. The document permissions module 504 achieves this
25 enforcement by caching the access permissions on the client. The access permissions are cached for the user and for all other users who have accessed the document. The document permissions module 504 updates the client cache dynamically when the access permissions change. When the user goes offline, the client cache is checked to determine the extent to which the user can edit sections of the document.

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[0051] The example document update processing module 506 keeps track of all changes saved to a document by users. The document update processing module 506 also keeps track of which of these changes are designated by a user to be shared with other users. Typically, a user saves changes made to a document by clicking a button on the user

interface representing saving. However, these saved changes are not made available to other users until a user designates the changes to be shared. In example embodiments, a user can make such a designation by highlighting one or more sections of a document and clicking a button on the user interface representing sharing. In other example

5 embodiments, the user may designate that a document section is to be shared via an action control button adjacent to the document section. The user may also designate that the entire document is to be shared. The use of buttons representing saving and sharing are examples only. Other implementations are possible.

10 **[0052]** The example document update processing module 506 also processes requests from a user to obtain changes made to the document from other users. The user requests may be made for each document section via an action control or they may be made for the entire document. The example document update processing module 506 determines which sections of the document can be updated and provides the updated changes to the example
15 document rendering module 508. The user requests are manually generated so that the user can be in control of when the document is updated. This prevents the situation where a document section is updated while a user is editing it, possibly overriding changes the user made.

20 **[0053]** The example document rendering module 508 renders the document for display to a user on a client. The document rendering module may use standard user interface controls such as text boxes, list boxes and pull-down list boxes to display user access permissions for each section of the document and to display the names of users accessing sections of the document. In alternate embodiments custom designed controls may be
25 used. User interface controls may also be used to define rules for each section of the document that are used to dynamically change access permissions depending on the user operation being performed.

[0054] The example document rendering module 508 also incorporates any shared
30 updates from users into the document. These are updates made by users that were saved at the document server 104 and designated to be shared with other users. The updates may include edited changes to sections of the document, tracked review changes or comments. The example document rendering module 508 typically renders text edits above the section of the document in which the edits were made so that the current user can easily

see them. Comments are typically rendered adjacent to sections of the document. However, in example embodiments, the updates may be positioned differently.

[0055] Figure 6 shows an example flowchart for a method 600 for coauthoring a document. At operation 602, a user opens a document on a client. The document, obtained from a document server, is organized into sections. Access permissions for the user are displayed on one or more sections of the document. In addition, the names of other users are displayed on the document, typically adjacent to the sections of the document they are accessing.

[0056] At operation 604, the user performs operations consistent with the access permissions for a section. For example, if the user has full control for a section, the user can make full edits to a section of a document, including changing formatting for the section. By contrast, if a the user has comment only access, the user can only insert comments for a section of the document but can not edit any text in the section.

[0057] When the user has completed the operation appropriate to the access permission for a section, the user may wish to share the changes made to one or more sections of the document with other users. At operation 606, the user identifies the updates to the document that can be shared. For example, the user may highlight the sections that can be shared. In another example, the user can choose to share all updates.

[0058] At operation 608, the user notifies the document server that the identified updates are available for sharing. This can be done, for example, by clicking a button on the user interface representing sharing. As another example, the user may click a button indicating that all changes made to the document are to be shared. Other ways to designate sections to be shared and to notify the document server are possible.

[0059] As the user is editing the document, the names of other users who are also editing the document are displayed for each section of the document. If the user wishes to view the edits from one or more other users, the user identifies the one or more other users at operation 610. For example, the user may highlight the name of another user or double click on the name of another user. Other implementation methods are possible.

[0060] At operation 612, the updates from the identified other users are obtained and displayed on the document. The updates are typically displayed above the section the user is editing along with the name of the other user. Other implementations are possible.

5 [0061] Figure 7 shows an example flowchart for a method 700 for coordinating the coauthoring of a document at a document server. At operation 702, the user access permissions for each section of a document that are stored in the document server. At operation 704, the names of users currently coauthoring the document are stored at the document server.

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[0062] At operation 706, the contents of the document, the user access permissions for each section of the document and the names of users coauthoring sections of the document are used to render the document for display to a user on a client. The user access permissions and the names of users coauthoring sections of the document are typically
15 displayed using standard user interface controls such as text boxes, list boxes or pull-down list boxes. Other implementations are possible.

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[0063] As users make changes to the document, those changes are stored in the document server at operation 708. However, the changes are not available for sharing until designated as such by a user who made the changes.

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[0064] When a user determines that changes to the document are available for sharing, at operation 710 the document server receives a notification from the client that identifies the updates to be shared and to make those updates available to other users who may request them.

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[0065] At operation 712, the document server receives a request from a user for updates to the document made by one or more other users. The document is then rendered at operation 714 to incorporate the shared changes requested.

[0066] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described

above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A system for coauthoring a document, the system comprising:
a server including:

5 one or more documents, each document being organized into sections;
a document permissions module that stores user access permissions for each
section of a document, the user access permissions defining an extent to which a
user can modify each section of the document, the document permissions module
permitting different user access permissions to be stored for the sections of the
10 document;

 a document update processing module that processes requests from a user
to share document updates with other users and that processes requests from a user
to receive document updates from other users; and

 a document rendering module that renders a document for display on a
15 client, the document being rendered so that sections of the document are updated
with shared document updates made by users, the shared document updates being
requested by the user on the client;

 wherein the system permits two or more users to coauthor one or more of the
sections of the document so that each user has specific access rights to one or more of the
20 sections of the document, so that the user can specify whether updates made by the user to
the one or more sections of the document can be displayed to other users, and so that the
user can view the names of other users accessing the one or more sections of the document
and can selectively obtain updates to the document from those users.

- 25 2. The system of claim 1, wherein user access permissions are selected from the
group consisting of full control, read/write, review only, comment only and read only.

3. The system of claim 1, wherein the document rendering module provides user
interface controls for the sections of the document.

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4. The system of claim 3, wherein the user interface controls provide indicators of
users accessing the sections of the document.

5. The system of claim 3, wherein the user interface controls provide the user access permissions for each section of the document.

6. The system of claim 3, wherein the user interface controls permit the user to select from a group of actions, the actions including making updates to one of the sections available to other users and requesting updates to one or more of the sections from other users.

7. The system of claim 3, wherein the user interface controls are provided adjacent to each of the sections of the document.

8. The system of claim 1, wherein the document rendering module redacts portions of a document.

9. The system of claim 1, wherein the document permissions module processes rules for dynamically changing the user access permissions.

10. A method for coauthoring a document, the method comprising:

opening a document that is organized into sections, each section representing a part of the document, the document displaying user access permissions for one or more of the sections of the document, and the document displaying names of users who are editing one or more of the sections of the document;

performing operations on one or more of the sections of the document, the operations being consistent with user access permissions granted for the sections of the document;

identifying updates to the document that can be shared with other users so that the updates to the document are shared with other users; and

identifying one or more users from which document updates to one or more of the sections of the document are to be obtained, the one or more users selected from the names displayed on the document, so that the document updates are obtained from the document server and displayed in appropriate sections of the document.

11. The method of claim 10, wherein user access permissions are selected from the group consisting of full control, read/write, review only, comment only and read only.

12. The method of claim 10, further comprising displaying the user access permissions and the names of the one or more users via user interface controls displayed adjacent to sections of the document.

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13. The method of claim 10, further comprising enforcing user access permissions when the client is disconnected from a network.

14. The method of claim 10, further comprising defining rules on the document for
10 dynamically updating the user access permissions.

15. The method of claim 14, wherein the rules are defined via user interface controls located adjacent to sections of the document.

15 16. A method for coordinating the coauthoring of a document at a document server, the method comprising:

dividing a document into a plurality of sections, each of the sections including a paragraph of the document;

20 storing user access permissions to each of the sections of the document for a plurality of users of the document, the user access permissions defining an extent to which each of the plurality of users can view, edit and comment on the sections of the document;

storing the names of users who are accessing each of the sections of the document;

25 rendering an instance of the document to the users of the document, the rendered document including access controls that indicate user access permissions for each of the sections of the document, the rendered document including the names of the users who are editing each of the sections of the document, the rendered document including action controls providing actions including requesting updates to the sections from the users and designating that updates a user made to the sections are made available to other users;

storing updates to the document made by the users of the document;

30 receiving a request from a first user to share updates to the document made by the first user with other users;

in response to the request from the first user, enabling the document updates made by the first user to be shared with other users;

receiving a request from a second user to receive updates to the sections of the document made by other users; and

in response to the request from the second user, rendering an instance of the document for the second user that includes the shared updates to the sections requested by the second user, the shared updates being rendered in new document sections located directly above the requested document sections.

17. The method of claim 16, wherein the user access permissions are selected from the group consisting of full control, read/write, review only, comment only and read only.

18. The method of claim 16, further comprising dynamically updating the user access permissions for users of the sections of the document when the first user indicates that edits to a section of the document are completed.

19. The method of claim 18, further comprising updating the user access permissions using a set of rules stored on the document server.

20. The method of claim 19, further comprising redacting certain of the sections of the document that the second user does not have permission to view.