ChronoAgent™ for macOS

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Chapter 1 - Benefits and Explanation

ChronoAgent is a transparent piece of software that, when installed on a computer, allows ChronoSync, located on another computer, or InterConneX, located on an iPad, to access all of the files on the ChronoAgent machine as if it was a locally attached hard drive.

The agent is configured and controlled via a System Preferences pane. It is installed as its own application, separate from ChronoSync. It has its own installer included in the download. It can be installed on any Mac running Mac OS 10.8 or newer.

An agent is simply a faceless program that runs external to ChronoSync or InterConneX. It can be installed on the same machine as ChronoSync or on another computer and accessed via a network connection. The advantages of synchronizing via agents are numerous:

- Full administrative access to all files regardless of the privileges of the logged in user who is running ChronoSync or InterConneX.

- The ability to communicate with remote machines.

- Transferred data between ChronoSync or InterConneX and an Agent can be encrypted.

- Users don't need to be locally logged into remote machines.

- User/group ID mapping between machines.

- Limitations of a file server connection are circumvented.

- Restrict connections to specific volumes.

- Increased performance.

Chapter 2 - Configuring ChronoAgent

You can find ChronoAgent in the System Preferences, under "Other". The system preference pane has 4 tabs: General, Advanced, License and Status. ChronoAgent settings are protected and can only be modified with admin access. The padlock icon needs to be clicked to allow such changes to be made.

General Panel

The "General" tab contains all of the controls for configuring the agent. All settings need to be established before the agent can be turned ON. Otherwise, starting the agent will not be allowed. The required settings are Name, Port number, Username, and Password.

To configure a ChronoAgent on a remote Mac, follow these steps:

1. Give a name to the agent.

The "Identify agent with name" field allows you to provide a name that will be broadcast on the local network. Other computers running ChronoSync or devices running InterConneX will identify this particular agent by the name provided. The default is "ChronoAgent@computername", but it should probably be changed to something more descriptive such as "Receptionist", "Bob's Laptop" or "Central Server." A unique name must be chosen, i.e. two ChronoAgents cannot have the same name.
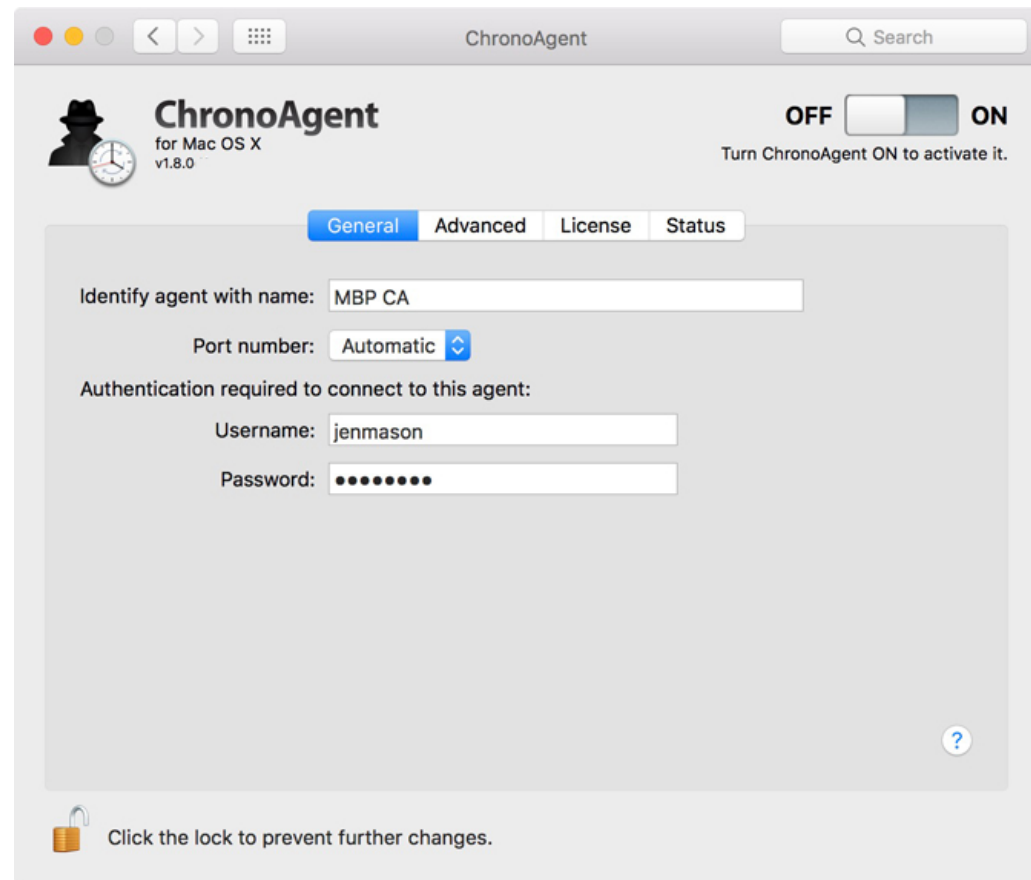
2. Provide a port number.

Choosing "Automatic", and thus having ChronoAgent choose one, is perfectly acceptable for the majority of people. If you are running a port-level firewall you will need to specify a port.

Advanced User Tip: If you want to assign a fixed port number to ChronoAgent, pick somewhere in the middle of the Private/Dynamic Port Number Ranges to prevent conflicting with other services that may be picking from this range. If the network firewall is enabled, you will have to choose a port number that isn't blocked or, more likely, open that port up in the firewall settings. Using port numbers within the range of 49,152 - 65,535 is recommended, as they are not considered reserved numbers.

3. Supply a username and password.

The username and password fields simply define a unique username/password that needs to be specified when ChronoSync or InterConneX attempt to connect to this agent. You should choose something reasonably secure and protect its confidentiality because an agent connection provides full access to all files on the computer.

4. Start the Agent

Now that the agent's required settings have been specified, the agent can be turned ON. Slide the "ON/OFF" switch to "ON" to activate the ChronoAgent.

Advanced Panel

Once done with the "General" panel, move on to the "Advanced" panel. Here you'll find a handful of options in the "Settings" popup menu that you can browse through to customize to your liking. If you desire to set any of these options, you'll need to slide the "ON/OFF" switch to the "OFF" position.

Security

"Encryption strength" determines how strong of an encryption key will be used. Note that the higher setting ensures more security but may slow performance.

"Require all connections to be secure" requires all connections between copies of ChronoSync and this agent to have all transferred data encrypted. With this setting OFF (unchecked), secure connections can still be established but they are at the discretion of the ChronoSync user when they enter their agent connection settings. Turning this setting ON will require all connections to be secure. This is true even if the ChronoSync user establishes a connection to this agent without enabling the "Use secure connections" setting in ChronoSync. Also worth noting is that secure connections perform slower than non-secure connections, so if ChronoSync and ChronoAgent are running on the same local network, and that network is considered closed, secure and trusted, this setting does not need to be enabled.

ChronoAgent uses TLS for security but it requires ChronoSync 4.6.6 or later. Earlier versions of ChronoSync can still securely connect by using the "Backwards compatible with older versions of ChronoSync" option which uses a less sophisticated security protocol. It is recommended that you update ChronoSync.

WAN Access

Accessing ChronoAgent over the internet became easier with the advent of WAN Accessibility and Service Discovery. The "Router" section controls the configuration of the port-mapping functionality using UPnP or NAT-PMP. "Allow agent to automatically configure router to accept incoming connections" will allow ChronoAgent to configure your router using the "WAN port" you specify. If you want ChronoAgent to choose a port for you, just leave this field blank. "Test Router" to see if your router is compatible and able to be located.
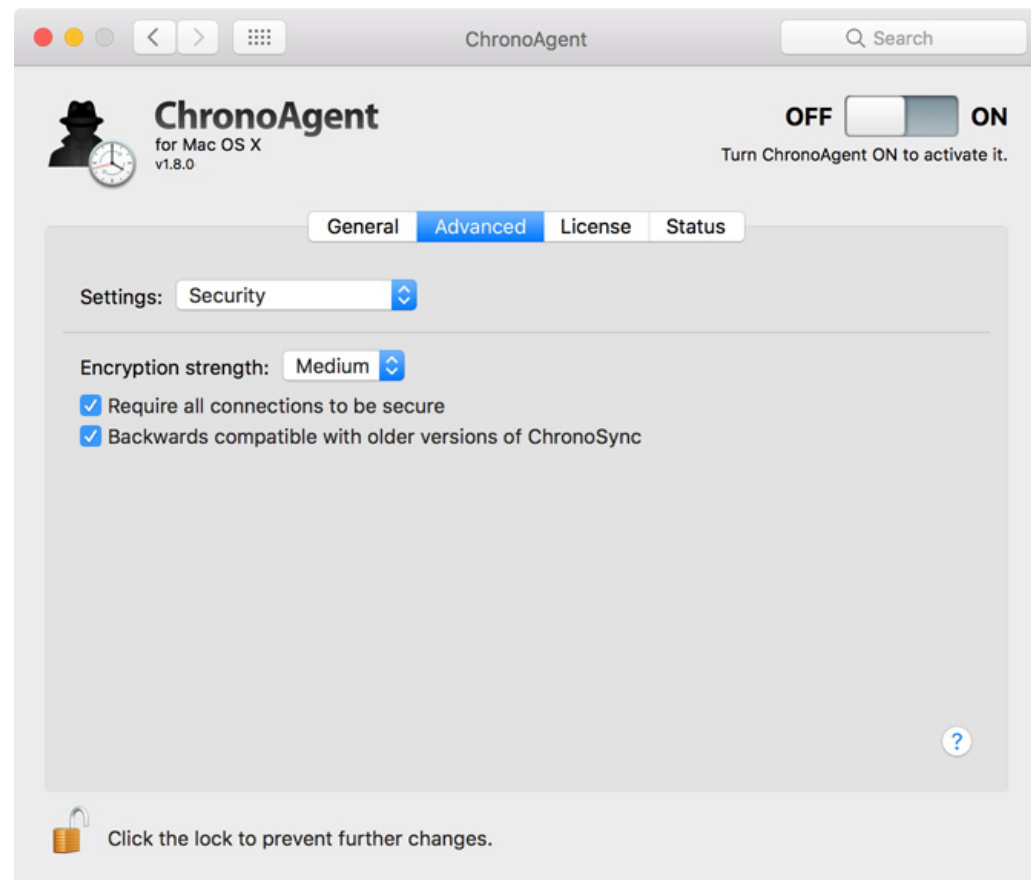
In the "Service Discovery" section, you can set up a Dynamic DNS service. ChronoAgent performs the task of informing the Dynamic DNS server of the current WAN IP address. ChronoAgent supports only a few services, provided to you in the "Dynamic DNS service" popup menu. Whichever you choose, you must set up an account through that service. Once this is done, you can provide ChronoAgent your "Username", "Password", and "Host name." Of course, after all this is set up, you should "Test DDNS". This will check your Dynamic DNS account and report any errors if ChronoAgent comes across any.

User Paths

ChronoAgent will only be able to access the volumes that you select in the "Limit client path selection to specific volumes" list. If you wish to allow users access to ONLY the external drive connected to your ChronoAgent Mac, you can add the external drive to this list. This would prevent access to any other drives.

When using InterConneX, sharespaces that connect to this agent will only have access to the selected directory chosen in "Default user path for InterConneX clients."

User/Group Mapping

If you wish for ChronoAgent to obtain its list of users & groups from Directory Services, be sure to check "Use directory services" and then select the domains that you wish to limit access to.

Miscellaneous

In this panel, you'll find options for ChronoAgent Monitor. With ChronoAgent Monitor, you can quickly and easily monitor the status of ChronoAgent from the system menu bar. ChronoAgent Monitor will report the current connections, recent connections and any errors that were encountered. From the ChronoAgent Monitor menu, you can also update ChronoAgent, if an update is available. This can all be done without having to open ChronoAgent. Detailed information on ChronoAgent Monitor can be found in the application Help.

The "Miscellaneous" panel also contains the "Client timeout" setting. This is the number of seconds ChronoAgent waits for a response from the client before declaring the connection dead or stalled.

License Panel

The License panel displays your licensing information. Here you can request a trial key, register, unregister and purchase ChronoAgent.

If running in demo or trial mode, you will be informed of this in the License panel. If this is the case, you haven't purchased the program and/or entered a valid license. When in demo mode, a copy of ChronoSync or InterConneX can connect to this agent but it's limited in what it will synchronize. With trial mode, you receive a full working version of ChronoAgent but for a limited time.
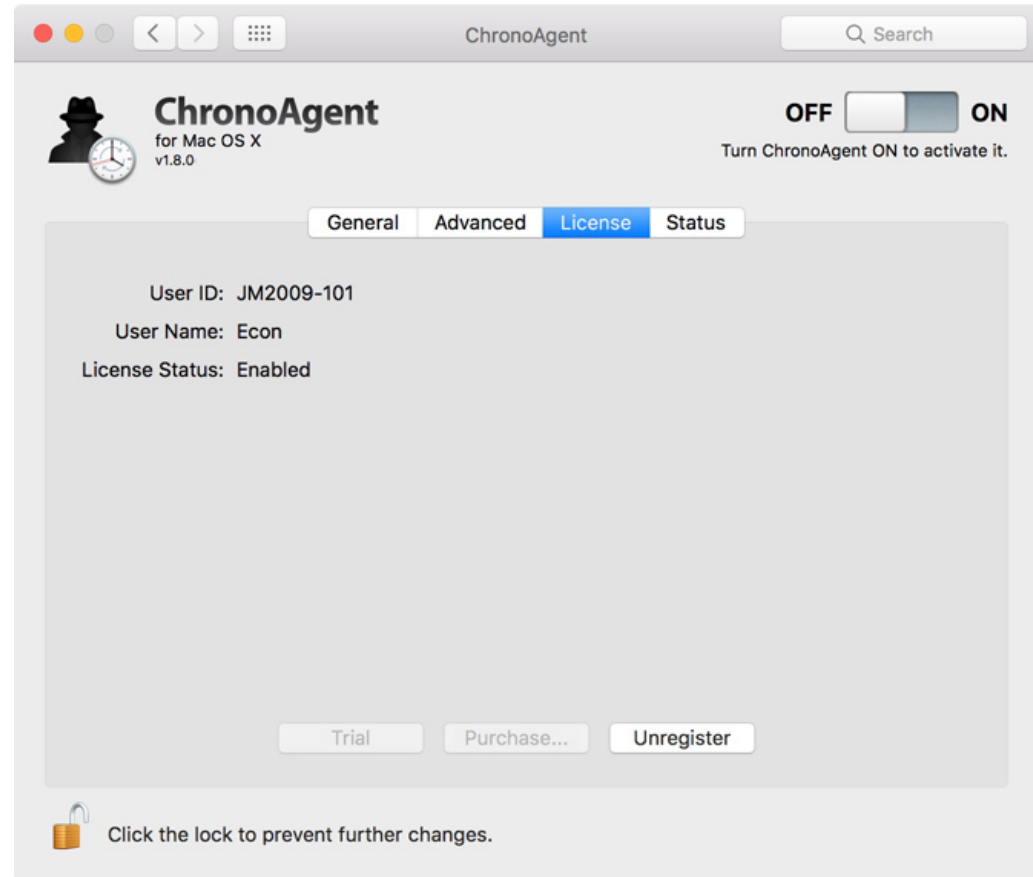
Requesting a Trial Key

When you launch ChronoAgent for the first time, it is in Demo mode. Demo mode has limitations and may not give you the best idea of all that ChronoAgent can do. To get a full working version without limitations, request a trial key. A trial key is good for about 15 days. First, on the License panel, click on the 'Trial' button.

ChronoAgent will contact the licensing server and then activate your trial period. You'll receive an on-screen confirmation of this.

Once activated, you can view the time remaining in your trial on the 'License' panel.
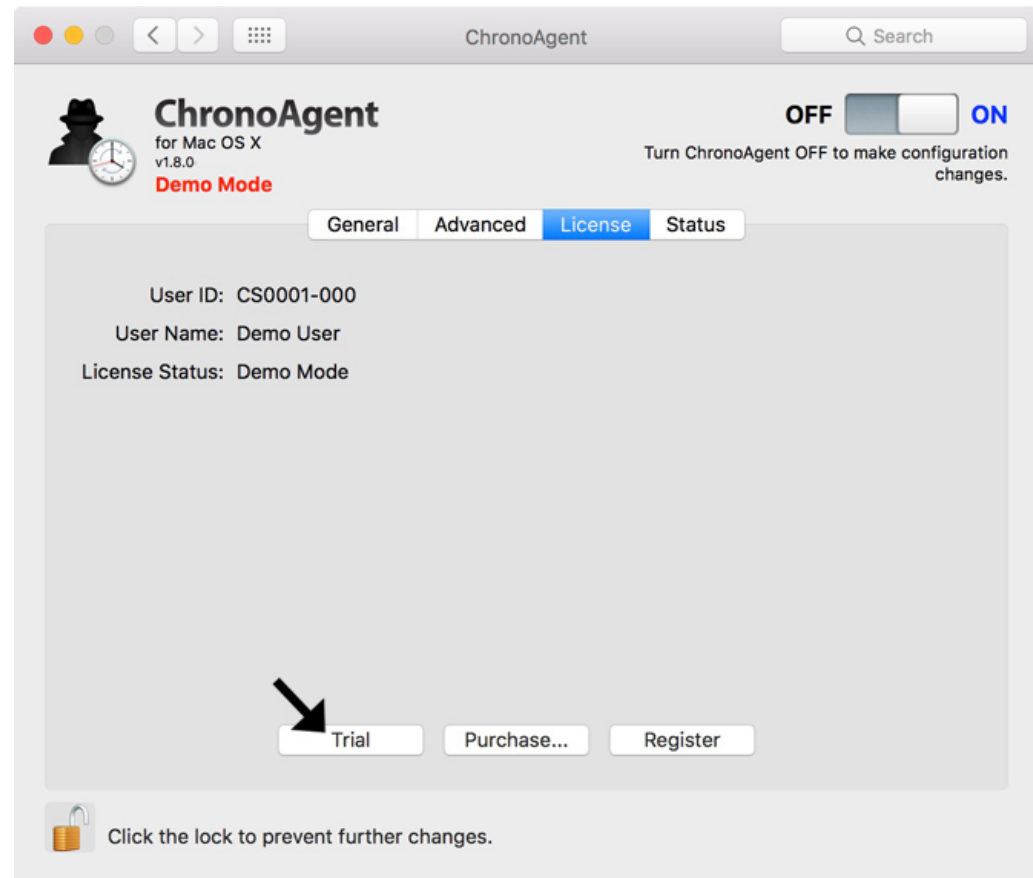
Status Panel

The Status panel displays information about ChronoAgent and useful information about the agent you have configured. Here you can find the version number and whether or not your agent is running. If your agent is running, the port number that will be used for all agent communications and IP address(es) associated with the agent are listed. You can use this panel to see how many ChronoSync Macs or InterConneX sharespaces are currently connected to the ChronoAgent Mac. You can also "Check for Updates" in this panel.
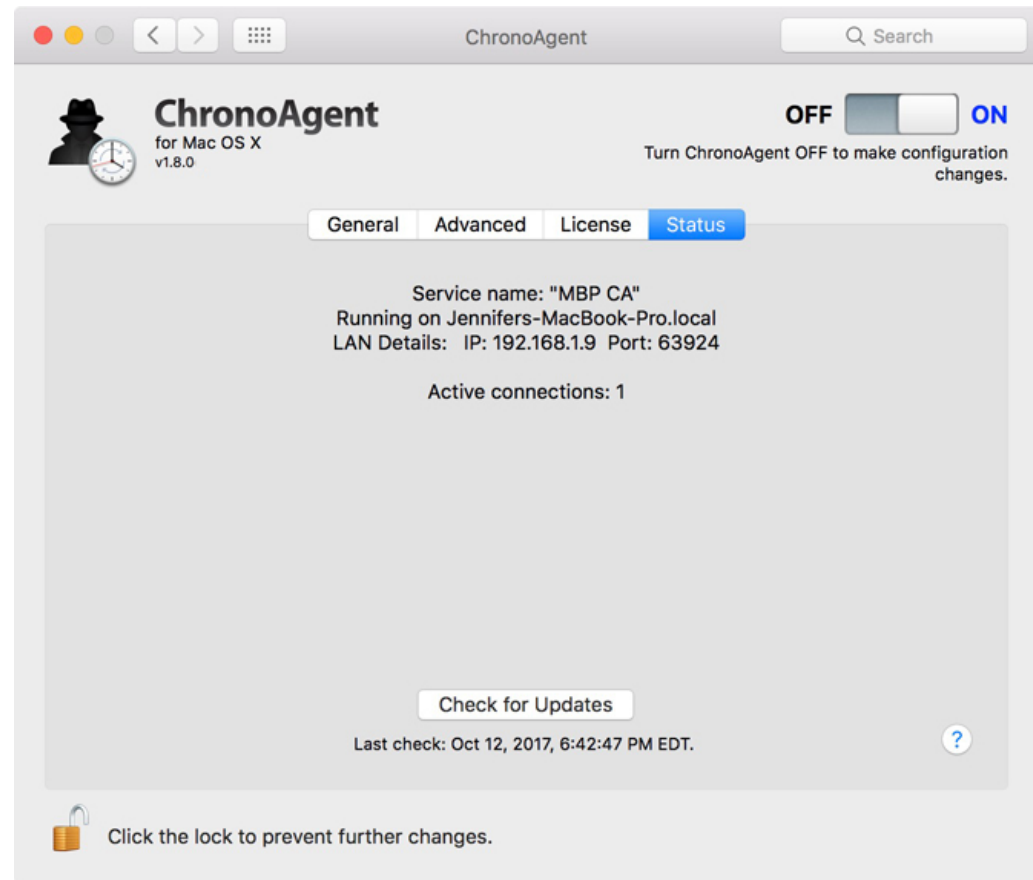
Chapter 3 - Firewall Configuration

Configuring a firewall is only necessary if you are running a firewall. The firewall defaults to OFF, so it's typical to not even use one.

Configuring a firewall

To open a firewall port, follow these steps to ensure it's properly set up:

1. Open your System Preferences and click on the "Security & Privacy" icon. Choose the "Firewall" tab.

2. If you do nothing, by default, all incoming connections will be allowed since the Firewall is turned "Off". If you wish to have control over what programs are allowed incoming connections, you need to "Start" the Firewall by clicking on the "Turn On Firewall" button. You will likely have to authenticate to gain access to this panel. Click on the padlock at the bottom of the panel to do this.

3. Once the Firewall is turned "On", you'll notice that the "Firewall Options..." button becomes enabled. Click on this to modify the settings.

4. There are 4 options: "Block all incoming connections", "Automatically allow built-in software to receive incoming connections", "Automatically allow downloaded signed software to receive incoming connections" and "Enable stealth mode." Explanations of each are documented on the panel and in the Help page associated with this panel.

5. Choose "Automatically allow downloaded signed software to receive incoming connections." Choosing this option will ensure that only trusted applications allow incoming connections.

Chapter 4 - Connection Profiles

Once ChronoAgent has been configured, a ChronoSync connection can be established by defining connection profiles. This is done in ChronoSync's "Connections" preference pane. Once a connection profile has been defined, its name will appear in the "Connect to:" popup menu in the left and right target areas of ChronoSync's Setup panel. ChronoSync can be configured to connect to any number of ChronoAgents.

In InterConneX, a connection to a ChronoAgent can be defined when creating a new sharespace.

To set up a connection profile, follow these steps:

NOTE: A ChronoAgent must first be installed and configured before setting up any connections to it.

1. From the Connections panel, within ChronoSync's Preferences, click on the plus (+) button.

2. Give the connection a unique profile name and choose the connection type "ChronoAgent" from the popup menu. The profile name is what will appear in the "Connect to:" popup menu on the synchronizer task document's Setup panel. Thus, it's a good idea to be descriptive with the profile name so that you know which one it is when you have multiple agents listed.

3. The General panel appears where you can select an agent and provide the necessary information to connect to it. The username and password of the agent is required here. If these are unknown, ChronoSync will be unable to connect to that particular agent.

4. "Test" the connection.

If the connection is valid, move on to the Advanced panel.

5. Here you have connection options, security options, and custom timeout settings. Enable the settings you'd like for your agent to have. Detailed descriptions can be found in the application help.

6. Once you have set your Advanced preferences, click "Next" to go to the Mappings panel.

Macintosh users have the ability to control who can access, modify, and see their personal files and folders. Every Mac uses a User/Group model to control file security. Every file is owned by a User and associated with a Group. Groups contain multiple users and are an easy way to grant multiple users access to files which they do not own.

Users and groups simply map to numeric IDs. Each computer can have their own unique set of user/group names and numeric IDs associated with them so that when you copy a file from one computer to another it may lose its identity because the exact same users with the exact same IDs do not exist on each machine. This panel allows you to map different users and groups on each machine to each other.

When mapping is disabled, ChronoSync will maintain the numeric ID for user/group membership, e.g. if a file has a user ownership that translates to an ID of 502 on one machine, it will get copied with an ID of 502 to the other, regardless of whether or not a user with an ID of 502 exists on the destination machine.

To set up mappings, follow these steps:

7. Determine which "Mapping Mode" you'd like to use. If synchronizing between two computers that have single or very few users, consider "Basic". If synchronizing between two computers having many users, "Advanced" mapping is your best bet. We recommend that you not choose "None". In doing so, user and group ID's will not be mapped.

8. Once you've set up your mappings, choose Save to close the window..

9. You have now successfully set up a connection profile.

Advanced Mappings

"Local-to-remote mappings" refers to the mapping that is performed when copying a file from the local machine TO the remote machine. "Remote-to-local" is the opposite. In some instances, one side of the user/group mapping may be irrelevant. For example, if you use this connection profile only for left-to-right synchronizations and the right target is your agent, you only need to define local-to-remote mappings since you will never be copying files FROM the remote target back to the local machine. It doesn't hurt to map both sides, though.

By default, ChronoSync tries to establish the most meaningful user/group mapping it can. For example, if the user "jdoe" exists on the local machine, it looks for another user named "jdoe" on the remote machine. If it finds it, the mapping will automatically be established. "jdoe" on each machine can be associated to different numeric IDs and ChronoSync will automatically handle the translation. If another user by the same name doesn't exist, ChronoSync then looks for a matching ID. For example, if the local user named "jdoe" has an ID of 503, ChronoSync will look for a remote user whose ID is 503. If it finds it, the mapping will be established. If that fails, the user "jdoe" will be "Not Mapped".

Entries that are not mapped are displayed in red. A summary is displayed at the bottom of each mapping list to call attention to the fact that one or more entries may not be mapped. In some cases, it is perfectly acceptable to leave certain users/groups as "Not Mapped". An example would be various "System" user accounts, such as "xgridcontroller", that may exist on one computer but not the other. This mismatch would be irrelevant if all that is being synchronized are user-level files such as those in a user's Home folder.

There is value of mapping to the "unknown" user. In macOS, "unknown" is a special user that is accessible to all user accounts. In situations where you want to backup files from one machine to another and you simply want to make those files accessible to all users on the destination machine, just map the relevant users on the source machine to "unknown" on the destination.

Chapter 5 - Examples

This chapter presents some real-world scenarios for using ChronoAgent. The examples are outlined in a stepwise fashion for simplicity and better understanding. ChronoAgent's uses are varied and can be quite advanced. These examples illustrate the more common uses.

Example One - Single user, two computers.

This is a typical scenario where the Home folders of a desktop and a laptop are kept in sync. To do this:

1. Pick which machine will run ChronoSync and which will have the ChronoAgent. It doesn't really matter, but you would typically choose the machine that is used more often to be the one running ChronoSync. Another factor is whether or not ChronoSync will be used for more than just synchronizing the two machines, e.g. a backup. If one machine has external drives connected to it for backup, then that should be the one running ChronoSync.

2. For the sake of this example, assume the user's name is Dave. Dave puts ChronoSync on his iMac and ChronoAgent on his MacBook Pro. He configures the ChronoAgent with the name "Dave's MacBook Pro Agent" and supplies "automatic" as his "Port Number" and supplies a username and password.

3. On the iMac, Dave installs ChronoSync and then creates a connection profile. He names the profile "My MacBook Pro" and supplies the necessary info. He chooses "Dave's MacBook Pro Agent" from the popup menu and tests the connection. Note: An error on the test usually means the wrong username/password was typed.

4. Dave then clicks "Next" to go to the "Advanced" panel. There he decides he wants all of his data to be securely copied. He turns the "Force all data to be encrypted" setting ON.

5. Dave then goes to set up Mappings. Since Dave is the only user on his iMac, he chooses "Basic" mapping mode which intelligently maps his iMac user to his MacBook Pro user.

6. In the synchronizer task document, Dave chooses his left target to be the local machine and specifies "Connect to: Mounted Volumes". He then clicks "Choose" to select his Home folder.

Note: Dave does not need to choose "Mounted Volumes (Admin access)" because he will simply be copying files that he already owns. However, there's no harm in choosing the admin access option, if he really wants to.

7. On the right target, Dave chooses "Connect to: My MacBook Pro". He then uses the "Choose" button to navigate to "Macintosh HD->Users" and then selects "webmaster", which is the Home folder of the MacBook Pro. Be aware that there is no "Home" icon like there is on the local machine.

8. Lastly, Dave proceeds to configure the rest of the synchronizer task document as he desires and saves it with a meaningful name. He can then synchronize as normal.

Example Two - Two users, two computers.

In this example, we have a two computer household, say a husband and wife. We'll call them Dave and Jen Smith. Dave has an iMac and has set up his account with the name "Dave Smith" and short name "Dave." He added a second user account for his wife and chose to use his pet name for her, "Honey Bunny", with a short name "honeyb." On Jen's iMac, she set it up using the name "Jen Smith", short name "Jen." She, too, set up an account for her husband and chose his formal name, "David Smith" with a short name of "dsmith."

1. Decide what computer will run ChronoSync and which one will run ChronoAgent. It doesn't really matter, but you would typically choose the machine that is used more often to be the one running ChronoSync. Another factor is whether or not ChronoSync will be used for more than just synchronizing the two machines, e.g. a backup. If one machine has external drives connected to it for backup, then that should be the one running ChronoSync. In this case, there's no factor favoring one machine over the other. Feeling a need to be "in control", Dave decides to put ChronoSync on his computer and ChronoAgent on his wife's.

2. Dave configures the ChronoAgent with the name "Jen's iMac Agent" and supplies a username and password. Since a port-level firewall is run, he assigns the agent to use port 54000 and opens that port up using his firewall software.

3. On his iMac, Dave installs ChronoSync and then creates a connection profile. He names the profile "Dave's iMac" and supplies the necessary info. He chooses "Jen's iMac Agent" from the popup menu and tests the connection. Note: An error on the test usually means the wrong username/password was typed.

4. Dave now needs to specify "Basic" mappings of "Dave" <-> "dsmith" and "honeyb" <-> "Jen."

5. Once the profile set up is out of the way, Dave can now set up the synchronizer task document. He specifies "Mounted Volumes (Admin access)" on one target and the agent's connection profile on the other. This is because ChronoSync needs to be able to have full access to all the files on his computer in order to access files in Jen's account. When specifying targets, he selects the "Macintosh HD->Users" folder of both machines.

Example Three - Setting up a backup server: Pushing backups to a ChronoAgent.

In this example, you put one ChronoAgent on a central machine and multiple copies of ChronoSync on several "satellite" machines. The advantage of "pushing" backups to a central agent are that each user is responsible for his own data. They can synchronize at will and they can simply open a synchronizer task document to recover files from its archive as well as countless other changes that they personally desire (rules, etc.). To set this up, follow these steps:

1. On the central machine - the server - a folder should be created for each user.

2. Each "satellite" machine needs a connection profile defined that connects to the central machine.

3. Set up a synchronizer task document that targets the appropriate user's folder on the central machine.

One consideration that needs to be made is the issue of user ownership of files on the central machine. One approach is to set up the central machine with a single account, say "Backup Master", short name "bmaster". Each user's connection profile would map their own local user name to "bmaster" and vice-versa. As long as each user is placing files in their own respective folder on the backup computer's hard drive, and there is no desire to exchange data between multiple users, then this method is fine.

If, however, you want to retain the identity of files placed up on the server, you should add accounts on the central computer for each user. Then each user would map their local name to their corresponding name on the central server.

A disadvantage is that each user has full access to all the files on the central server via the agent connection, so there is no security model in place.