



Introduction

Urbancode developed Anthill to make it easier to automate the build process among a group of developers using Apache Ant.

Anthill allows multiple users to work together and consistently access only the latest build, complete with changes from all programmers working on a project. This eliminates messy conflicts that arise when multiple users are working with the same source code!

We decided the best way to unlock the source code assets within a company was to dedicate a portion of an intranet to a project library. This library would contain home pages for every project within the organization.

Anthill creates a central project library that is updated manually and kept current, allowing the sharing of source code and compiled libraries within an organization.

Anthill performs a checkout from the source repository of the latest version of a project before every build and tags the repository with a unique build number. Anthill then updates a project intranet site with artifacts from the latest build.

It's a model developed from Open Source projects. Basically, Anthill instantly internalizes Open Source within an organization.

Anthill is compatible with version 1.3 and 1.4 of Apache Ant. Unlike other Apache Ant build tools, Anthill is designed to be as non-intrusive as possible and does not require cumbersome build additions. Anthill is Open Source and released under a Mozilla-like license.



System Requirements

Anthill Server Requirements

- Anthill uses Apache Ant, which is packaged with the program.
- Anthill requires Java 1.2 or later.
- Besides having Java, all you will need is Tomcat and a CVS server to run Anthill.

Servlet Containers

- Anthill may be configured for any Java servlet container 2.2+ compatible web container, but has only been tested with Tomcat, (versions 3.2.2 and 4.0.2)

Anthill Client Browser Requirements

- For the administration of the system, you can use a regular web browser. Microsoft Internet Explorer 4+ or Netscape 4+ are recommended, but Mozilla and Opera will also work.



Downloading Anthill

You may download the most recent version of Anthill by visiting the Download Directory at <http://www.urbancode.com/projects/anthill/download/>. Urbancode makes Anthill available with and without the source for each public build.

View the date in the right column to select the version you want. Scroll down for the newest version (Latest date will be the newest public version.)



Installing Anthill and Running Example Projects

1. Decide where to install Anthill.
 - Ideally, you should have a central Anthill server that is used to build and publish all your projects.
 - If you have more than one CVS server, then you may want one Anthill installation per CVS server.
 - Future releases of Anthill will lock the CVS project while performing a checkout to minimize the possibility of data corruption.
 - A CVS repository can only be locked locally by a process running on the same machine. So it makes sense to install Anthill on the same machine as your CVS server.
2. Unpack the Anthill distribution into a directory of your choice.
 - For Windows, we recommend installing all Java applications in a Programs directory on your hard drive. The default Windows location for applications (the 'Program Files' folder) contains a space character that may cause unforeseen problems in Java applications.
 - If you choose to install Anthill in your 'C:\programs' directory and unpackage the Anthill distribution into that directory, the 'C:\programs\anthill\' directory will be the Anthill root directory.
 - For Unix, we recommend creating a directory first called Anthill in 'usr/local/' directory.
3. Make sure a CVS client - and CVS itself - is installed on the same machine as Anthill, and the CVS client executable is in the path.
4. Make sure the CVS user whose account Anthill will use has logged in to CVS from the machine on which Anthill is installed
5. Make sure Apache Tomcat or another Servlet container is installed on the same machine as Anthill.
6. Copy the anthill.war file located in the '/dist/' folder of the Anthill distribution to the webapps folder under Tomcat (if you are using another servlet container then follow the steps required by that container to deploy a WAR file.)

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7. Start the Tomcat servlet engine and point to the a URL that consists of your server location and the anthill directory. (*Example: `http://localhost:8080/anthill`*)
 - The first time you access this page you will be asked for the Anthill home directory (this is simply the absolute path to the directory where Anthill is installed.
 - In the above examples the root directories were 'C:\programs\anthill\' and '/usr/local/anthill/'.)
8. Modify the default Anthill properties.
 - From the main Anthill Build System page follow the link entitled Anthill Properties. On the form that appears modify the anthill.repository.cvs.root property and the anthill.mail.host and anthill.mail.from properties.
9. Configure a project to use Anthill. You may create a new project or run one of the example projects. (See directions about example projects on next page.)



Running the Example Anthill Project

Anthill is packaged with example projects, groups, and schedules to allow you to play around and familiarize yourself with the interface.

Anthill has the following example projects:

- -Example
- -Example2
- -Example3

Anthill has the following example dependency group:

- -ExampleGroup

Anthill also has the following example schedules

- -default
- -stoppedSchedule (The Example projects are set to the stoppedSchedule. You can change that so that Anthill will build the Example project according to the schedule you set.)

1. Make sure you are logged on to CVS
2. Identify the CVS repository to use and import the project into the CVS repository
3. Drop Anthill .war file into Tomcat's webapps directory.
4. Start Tomcat.
5. Set home directory to where you installed Anthill.
6. Set the Main Anthill Properties
7. Click on the project name to set the project properties.
8. To do an example build, select the "build" link and click force build. See build directions for further info.
9. After build is complete, you will receive an email.
10. Click "site" to view artifacts of publishDir from the Ant build script.



Starting Anthill

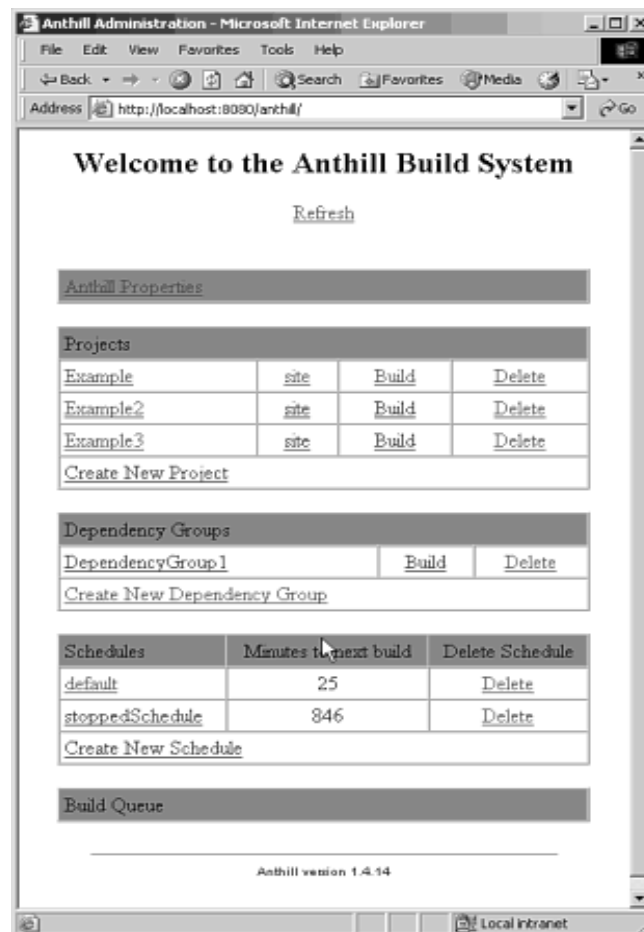
Once Anthill is installed on your computer and it's started up in Tomcat, you can open it from a browser directed to the address you specified as the anthill.server in the main Anthill properties.

footnote: This should actually be pointed to the URL determined in the Tomcat configuration file: "server.xml" Any change in this configuration file has to be duplicated in the Anthill configuration so that the URL links work correctly in Anthill email notification. How this is listed in the configuration file should be duplicated in the anthill.server property in the Anthill properties.

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Navigating Anthill

Pull up Anthill in a browser to view the main screen.



Anthill is broken into 5 sections where you can navigate Projects, and the attributes Anthill uses to control your builds. :

- Main Anthill Properties
- Projects
- Dependency Groups
- Schedules
- Build Queue

Create a new Project, Dependency Group, or Schedule

To create a new Project, Dependency Group, or Schedule, click on the “Create New Project” link at the bottom of the corresponding list.

This link will open a new properties screen. Enter the requested properties to create the new project. See the section on Projects, Dependency Groups, or Schedules for more information about requested properties.

Delete a Project, Dependency Group, or Schedule

To delete a project, click “Delete” beside the Project, Dependency Group, or Schedule to be deleted.

The registry file associated with Project, Dependency Group, or Schedule will be deleted from the system. You will be asked if you are sure, before Anthill performs the delete.

Warning: Deleted Projects, Dependency Groups, or Schedules will not be retrievable after delete.

Open a Project’s website or artifact Directory

Beside each project is a link to a project’s website.

This link will be to the address specified in the Project Properties as the `anthill.publish.url`. If this property is left empty, the site link will default to the address specified in main Anthill property: `anthill.publish.dir.default`. The site link will allow the project artifacts to be viewed.

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Edit Properties, Projects, Dependency Groups, or Schedules

Click on the name of the Project, Dependency Group, or Schedule to edit its properties. This will bring up the properties page. Most fields may be edited at any time.

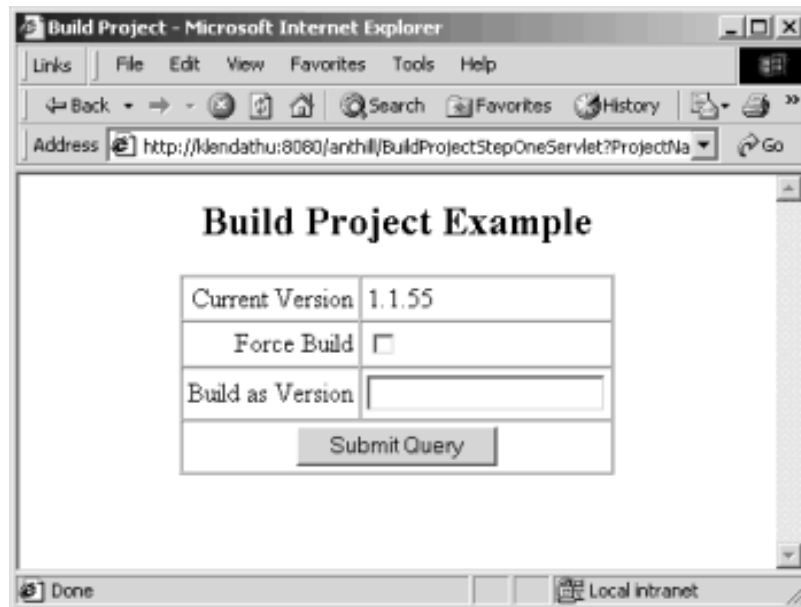
The delete checkbox

Some fields have a delete checkbox to remove previously entered data. To use these, click the checkbox and hit the submit button at the bottom of the page. This will delete selected lines.

anthill.users.	blair = blg@urbancode.com	delete <input type="checkbox"/>
anthill.users	<input type="text"/>	<input type="text"/>

Do an Unscheduled Build

Click “Build” in the far right column of the project category to force an unscheduled build for a project. This can be done at any time, and will run Ant’s build script.



The screenshot shows a web browser window titled "Build Project - Microsoft Internet Explorer". The address bar displays "http://kendathu:8080/anthill/BuildProjectStepOneServlet?ProjectNa". The main content area is titled "Build Project Example" and contains a form with the following fields:

Current Version	1.1.55
Force Build	<input type="checkbox"/>
Build as Version	<input type="text"/>
<input type="button" value="Submit Query"/>	

The status bar at the bottom shows "Done" and "Local intranet".

When the next scheduled build time arrives, Anthill will check to see if modifications have been made since the last build (good or failed.) If changes have not occurred, Anthill will not do another build unless Force Build is checked.

FORCE BUILD CHECKBOX

If no changes have been made since the previous build, and you still wish to do another build, you must use this checkbox to do the build.

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BUILD AS VERSION

Use the build as version box to specify a build number.



Note: This should be in the proper format as defined by the `anthill.version.adapter`.

Refresh Main Screen

To refresh the main screen, click the “Refresh” link at the top of the main screen beneath the “Welcome to the Anthill Build System” greeting.

This will refresh the page without reposting form data from the user’s last action, and show projects currently in build queue.

Build Queue

The Build Queue is at the bottom of the main screen. When a project goes into a scheduled build or a forced build, it will appear in the build queue.

When the build is complete, the project will disappear from the build queue. If no projects are currently being built, this list will be empty.



You will need to hit refresh for page to update and view precisely whether or not a project is currently being built.

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Setting the Main Anthill Properties

At the top of the main screen is the link to the main Anthill properties. These settings control where the system accesses Anthill, and where the CVS repository is located.

The screenshot shows a web browser window titled "Anthill Properties - Microsoft Internet Explorer". The address bar shows the URL: `http://blondethu:8080/anthill/AnthillPropertiesViewServlet`. The main content area is titled "Anthill Properties" and contains a form with various configuration fields. The fields are organized into sections with descriptive text above them. The fields include text inputs for paths, URLs, and hostnames, a dropdown menu for a boolean setting, and a button at the bottom labeled "Submit Query".

Property Name	Value
anthill.ant.home	lib/ant1.4
anthill.version.adapter	com.urbancode.anthill.adapter.UrbanCodeVersionAdapter
anthill.repository.adapter	com.urbancode.anthill.adapter.CVSRepositoryAdapter
anthill.repository.cvs.root	pserver:mbz@192.168.2.204:/usr/local/cvs
anthill.work.dir	work
anthill.publish.dir.default	publishDir
anthill.mail.host	192.168.2.203
anthill.mail.from	anthill@cvs.urbancode.com
The url that you access anthill from	
anthill.server	http://localhost:8080/anthill/
Turn off cvs locking of version file.	
anthill.lock.version.file	on
The ant target to execute when building dependencies.	
anthill.dependency.target	null
The property name to be passed when executing a dependency target whose value is the directory of the build artifacts.	
anthill.dependency.artifact.property	null

Submit Query



anthill.ant.home

Enter location of Ant .jar file

anthill.version.adapter

Enter class of CVS version adapter.

Currently, the UrbanCode Version Adapter is implemented, and the default value should not be changed. The option to change it is there should someone have a desire to develop their own adapter.

This controls the format of the version number Anthill uses during scheduled builds.

This value defaults to:

- major.minor.build (for example 4.5.234)

Anthill only increases the build number during scheduled builds. To increase major or minor build numbers a build must be forced. Refer to section on unscheduled builds for information on how to force a build.

When building with branches with the default `anthill.repository.adapter`, the format of the version number will be different. There will be only one number, usually prefaced by the branch name.

Example: Pluto_Branch-36

anthill.repository.adapter

Enter the class name of the CVS repository adapter.

The repository adapter is responsible for interaction with the source control repository.

Currently, only the `CVSRepositoryAdapter` is supported, but the option is there to change it should someone have a desire to develop their own adapter.

This might be useful if someone wished to use Anthill with other source repositories such as Perforce, Merant PVCS, or Microsoft Visual SourceSafe.



anthill.repository.cvs.root

Enter the CVS ROOT used to log in to CVS.

This is the CVS connection information with the following information:

the authentication method
user name @ CVS server
directory of CVS server

Note: Please keep in mind that if you are using pserver authentication, then the user must log into CVS on the machine running Anthill. (Logging in manually will allow the CVS client to store the CVS password for future use.)

anthill.publish.dir.default

Specify the location to place build artifacts after a build is completed. Each project starts with a default value of publishDir.

anthill.mail.host

Specify the mail server IP address or DNS name.

anthill.mail.from

Specify the name that will show up on automatic emails sent by Anthill after builds.

anthill.mail.from property determines the address that'll show up on notification emails Anthill sends out after a build is complete

anthill.server

Specify the URL address where Anthill will be accessed on server.¹

Note: This should actually be pointed to the URL determined in the Tomcat configuration file: "server.xml." Any change in this configuration file has to be duplicated in the Anthill configura-

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tion so that the URL links work correctly in Anthill email notification. How this is listed in the configuration file should be duplicated in the anthill.server property in the main Anthill properties

This will be the address you use to access Anthill with your browser.

Note: context name in the URL has to be the same as the name of the .war file.

anthill.lock.version.file

This drop-down box allows the user to select to turn off or on the option to lock a CVS version file.

anthill.dependency.target

Enter the Ant target to execute when building dependencies.

This allows the user to use a different build process for stand-alone projects and projects that are part of a dependency group.

anthill.dependency.artifact.property

Enter the property name to be passed to the Ant script when executing a dependency target whose value will be the directory containing the build artifacts

For example, if you used the default property of "dependency.artifact.property" then you would refer to the build artifact directory from your Ant script as: `${dependency.artifact.dir}`

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Setting Project Properties

The second section of the main screen allows users to access, add, and edit properties of all projects. Each project will appear in the left column. User may click the project name to view the project's properties, "site" to view the project's website or build artifacts, or "build" to force a build before scheduled or build with a specified build number. (*Note: A project's properties can not be changed while the project is being built.*)

Project Properties - Microsoft Internet Explorer

Address: <http://localhost:8080/Anthill/ProjectPropertiesNewServlet?ProjectName=Example>

Example Properties

The name of this project.

anthill project name:

The class name of the version adapter. Right now only the UrbanCodeVersionAdapter is implemented so do not change this value.

anthill version adapter:

The path of the version file relative to the project root. The version file must be in CVS. The version file is a text file that contains the version of the project. For example, a text file that contains the string "1.0.5".

anthill version file:

The class name of the repository adapter. The repository adapter is responsible for interaction with the source control repository. Currently only the CVSRepositoryAdapter is implemented so do not change this value.

anthill repository adapter:

The name of the CVS module that stores this project. The path of the version file, build script, and publish script, are all relative to the CVS module. For example, if the CVS module is Anthill and the build script is Anthill/build/build.xml, then the location of the build script is build/build.xml.

anthill repository cvs module:

The CVS ROOT used to log in to CVS. Please keep in mind that if you are using pserver authentication, then the user must log in manually from the machine running Anthill into the CVS. (Logging in manually will allow the CVS client to store the CVS password for future use).

anthill repository cvs root:

The name of the CVS branch that Anthill is to build. (Most of the time this will be blank.)

anthill repository cvs branch:

The path to the build script relative to the project root directory.

anthill build script:

The path to the publish script relative to the project root directory. (In the near future, we are going to get rid of the publish script. Publishing of the projects will still be possible but will need to take place in the main build script.)

anthill publish script:

The path to which the build artifacts are to be moved. Most of the time you can leave this empty. Anthill will then place all publish artifacts in the publishDir/(project name) directory under the Anthill root. This will by default allow Anthill to make the project artifacts available via a browser at the url: <anthill server>/anthill/projects/%(project name).

anthill publish dir:

The url at which the build artifacts are available. Most of the time you can leave this empty. See description of anthill publish dir.

anthill publish url:

The email address(es) to send build logs to. The first input field is the user's name and the second is their email address.

anthill users:

anthill users:

Additional build parameters to be referenced in ant build scripts. The first input field is for the property name, the second is its associated value. These are passed as system properties to the JVM.

anthill build params:

Parameters to be passed to Ant during the build process.

anthill build ant params:

Additional publish parameters to be referenced in ant build scripts. The first input field is for the property name, the second is its associated value. These are passed as system properties to the JVM.

anthill publish params:

Parameters to be passed to Ant during the publish process.

anthill publish ant params:

anthill schedule:

Done Local Internet

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anthill.project.name

Enter the name of the new Anthill project.

When naming a project, it is advisable not to use spaces. This is known to cause problems on some platforms.

anthill.version.adapter

View `anthill.version.adapter` in the Main Anthill Settings for more information.

The `anthill.version.adapter` in the Project settings is configured slightly differently than the adapter in the Main Anthill properties, to allow the user more control should they wish to use a custom version adapter.

version.file

Enter the path of the version file relative to the project root.

The version file must be in CVS. The version file is a text file that contains the version of the project.

version.lock.file

This allows you to turn off CVS locking of version file.

Type “off” to disable CVS locking of version file. Under normal situations, there would be no reason to do this. This feature was merely added to

anthill.repository.adapter

See `anthill.repository.adapter` in main Anthill settings.

repository.cvs.work.dir

Enter the name of the directory to which CVS will check out the project.

This directory should be relative to the current working directory. This is the location Anthill will use to temporarily copy files to as it checks out the CVS project source during a build.

The directory will always be relative to the directory Tomcat is started from.

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repository.cvs.module

Enter this project's CVS module.

The paths of the version file, build script, and publish script, are all relative to the CVS module. For example, if the CVS module is Anthill and the build script is Anthill/build/build.xml, the location of the build script is build/build.xml.

repository.cvs.root

See anthill.repository.cvs.root in the main Anthill properties.

repository.cvs.anthill.user

Enter the name of the CVS user account used by Anthill.

All revisions committed by this user will be filtered out when determining whether a build is required.

repository.cvs.branch

Enter the name of the CVS branch that Anthill is to build.

Most of the time this will be blank.

anthill.build.script

Enter the path to the build script in the project root directory.

anthill.publish.script (optional)

Enter the path to the publish script in the project root directory. If the user doesn't specify a publish script, they should do the publishing in their build script.

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anthill.publish.dir

Enter the path to which the build artifacts are to be moved.

Most of the time this can be left empty. By default, Anthill will place all publish artifacts in the publishDir/\${project.name} directory under the Anthill root. Project artifacts will then be available via browser at the url:

- /anthill/projects/\${project.name}

anthill.publish.url

Enter the url where the build artifacts are available.

Most of the time this can be left empty. By default, Anthill will place all publish artifacts in the publishDir/\${project.name} directory under the Anthill root. Project artifacts will then be available via browser at the url:

- /anthill/projects/\${project.name}

anthill.users

Enter users that should receive build logs each time this project is built. Enter the user's name in the first box, and the user's email address in the second box.

anthill.build.ant.params

Enter parameters to be passed to Ant during the build process. These are passed in three types of command line parameters to Ant as in the following example paramaters:

- flag

Example: verbose

- DPropName=PropValue

Example: Dant.home=..\lib\ant1.4

- PropName PropValue

Example: logfile logFileName

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anthill.publish.ant.params

Enter parameters to be passed to Ant during the publish process. These are passed in three types of command line parameters to Ant as in the following example paramaters:

- flag

Example: verbose

- DPropName=PropValue

Example: Dant.home=..\lib\ant1.4

- PropName PropValue

- *Example:* logfile logFileName

anthill.schedule

This dropdown box specifies which build schedule will be used for this project. If a new schedule is needed, refer to the instructions for the Schedules.



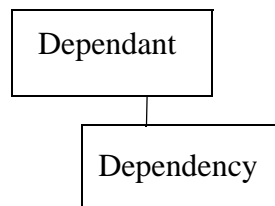
Dependency Groups

Anthill allows users to specify different projects as dependencies of other projects.

Doing builds of dependent projects often becomes cumbersome because a dependant needs the artifacts from its dependency builds to successfully build. When there is more than a one-to-one relationship, it simply becomes unmanageable to do it manually.

Anthill allows users to set up dependency groups to coordinate the build order of related projects and eliminate the need to manually manipulate the build artifacts of related projects.

Dependency group establishes a "dependant" (project) and a "dependency" (sub-project) relationship between projects.



Anthill automatically builds all dependencies first and makes the build artifacts available to the dependant.

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Create a new dependency group

Click on the "Create New Dependency Group" link at the bottom of the screen. This will open a new properties screen for dependency groups.

_temp Properties	
The name of this Dependency Group.	
Group name	<input type="text" value="_temp"/>
To add a new project to this dependency group select one from the list below. A new Member of this group will be created for the selected project.	
New Member:	<input type="text" value="- Select Project -"/>
Schedule	<input type="text" value="default"/>
<input type="button" value="Update"/>	

Group Name

Name your group in this text box. This is how your group will show up on the dependency group list on the main screen.

New Member

Select the first project to be a member of your dependency group from this dropdown box. All projects currently created will be in the drop-down menu. Click update to add the member.

Reopen the group and select the second member from the drop-down list.

Repeat this process for as many members as you need for each group.

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Dependency Drop-Down

After the members of a group have been specified, you may then choose the relationships of each member. Once a project is assigned as a dependency of another project, it will disappear from the drop-down list.

ExampleGroup Properties		
The name of this Dependency Group.		
Group name	<input type="text" value="ExampleGroup"/>	
Group Member: Example		delete <input type="checkbox"/>
	Dependency: Example2	delete <input type="checkbox"/>
	Dependency: <input type="text" value="- Add Dependency -"/>	
Group Member: Example2		delete <input type="checkbox"/>
	Dependency: Example3	delete <input type="checkbox"/>
	Dependency: <input type="text" value="- Add Dependency -"/>	
Group Member: Example3		delete <input type="checkbox"/>
	Dependency: <input type="text" value="- Add Dependency -"/>	
To add a new project to this dependency group select one from the list below. A new Member of this group will be created for the selected project.		
New Member:	<input type="text" value="- Select Project -"/>	
Schedule	<input type="text" value="stoppedSchedule"/>	
<input type="button" value="Update"/>		

Schedule

Select the schedule to use for builds of your dependency group. All schedules currently created will be in the drop-down menu.

Anthill will build each project in the group on this schedule. This will not affect the pre-existing build schedules for each project.

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Schedules

The Schedules box keeps track of the schedules that Anthill uses to automatically conduct builds of Ant projects.

Users may create customized schedules for each project, or use the same schedules for many projects.

Upon install, Anthill will have two default schedules:

- stoppedSchedule,
- and default.

Create a new schedule

To create a new schedule, click the "Create New Schedule" link at the bottom of the schedule box. This will open a properties screen that will allow you to name your schedule and specify the start time and the interval at which projects using this build schedule will use.

Schedule	
Schedule Name	<input type="text" value="_temp"/>
minutes between builds	
build interval	<input type="text" value="0"/>
The time this schedule initially starts (hh:mm)	
start time	<input type="text" value="12:00"/>
<input type="button" value="Submit Query"/>	

Projects using Schedule

Schedule Name

Name your schedule in this box. Do not use spaces.

Build Interval

Enter the number of minutes between each build.

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Start Time

Enter the time to begin this build schedule.

This will be the start time when Anthill is started, or restarted. After the initial time, Schedules will only run at the specified build interval.

The exact start time will be the time of the computer Tomcat is running on.

stoppedSchedule

Anthill is equipped with a stoppedSchedule to be used if you need to stop builds for a period of time. Because Anthill's very purpose is to perform builds on a regular basis, all projects must select a schedule for builds. This schedule was created as a workaround for situations where it might be wise to delay builds temporarily.



Anthill Public License

Anthill is a product of Urbancode Software Development and falls under the protection of the Urbancode Public License Version 1.0 , which incorporates the base public license

URBANCODE PUBLIC LICENSE
version 1.0

1. Incorporation of Base Public License

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5. Exhibit A

1. Initial Developer

The Initial Developer is Urbancode Software Development Inc.

2. Original Code

"Original Code" shall include, but is not limited to, all the files in the Java packages in covered-code.txt.

3. Source Code Notice

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Appendices

Appendix A: Troubleshooting

Permission Problems:

INSTALLING TOMCAT THROUGH RPM

If you are installing Tomcat through via RPM, make sure the owner of Tomcat can write to Tomcat home directory.

The user running Tomcat needs to have write permission to its own home directory, because it needs to write the anthill.properties file.

View the bug log for further information.

Configuration issues:

MORE ROBUST LOGGING OUTPUT

To view more of the CVS commands in your logging output, you can change the logging level in the log4j.properties file in the conf directory.

If you set the log4j.configuration in the Anthill conf directory to "log4j.root.category=DEBUG" you will get the output of the CVS commands among other commands.

There is one caveat with the DEBUG log level -- the work directory to which Anthill checks out the project does not get deleted after the build. So it's probably not a good idea to keep logging at the DEBUG level in the long run.

Appendix B: Technical Support

Anthill Newsgroup and Mailing List

Urbancode encourages our users to contribute their thoughts on Anthill with the rest of our community of users with our Anthill newsgroup

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For updates on Anthill, you may also join the Anthill mailing list

Contacting Urbancode

Feel free to contact the developers of Anthill at Urbancode Software development for more information about Anthill, or to voice your opinion.

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