



World Community Grid –Mass Install with the BOINC agent

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1 Overview

The purpose of this document is to provide an overview of items that should be considered when considering a mass install of the BOINC agent. Because there are many techniques for deploying software to workstations, providing a comprehensive review of these techniques is out of the scope of this document. This document will thus focus on the two most common ways that mass installations are performed. It also will provide details on the features of the BOINC agent that support mass install, and the files and directories that need to be protected from being erased or overwritten. This document is targeted at technical users who are familiar with the mass deployment tool that their organization uses.

2 Installation Scenarios

The following are the two most common ways that mass installations are performed that will be covered in this document.

2.1 Scenario #1 - Automated deployment using a software distribution system

This scenario is likely to be used by a business or corporation that has an existing software distribution system such as Microsoft SMS or Microsoft Group Policy. This document discusses how to prepare the files and executables so that they can be loaded into a distribution package. It also describes how to customize some of the settings on the agent and have it automatically attach to World Community Grid with a specific member name.

2.2 Scenario #2 - Protected systems where the disk is re-imaged frequently (such as using Deep Freeze where files can be saved between re-imaging)

This scenario is likely to be used by a university computer lab or other environment where the computers' hard drives are frequently re-imaged. This document describes what needs to be created and placed in a section of the hard drive that is protected (thawed) from the re-imaging software. It also describes what configuration files need to be present in the BOINC installation directory to ensure that the agent uses the files stored in the protected (thawed) section of the hard drive.

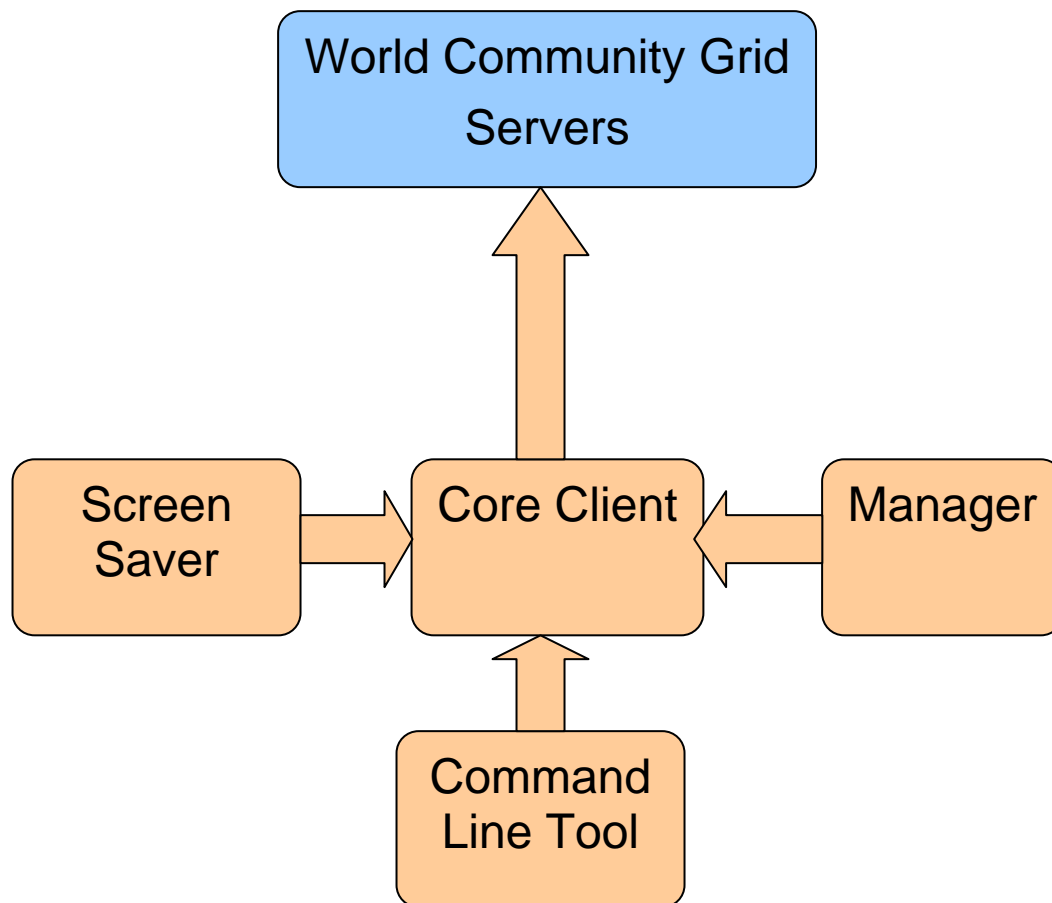
2.3 Scenario #3 - Protected systems where the disk is re-imaged frequently (such as using ghost – where the entire computer hard drive is replaced and no files can be saved)

This scenario is likely to be used in environments such as a university computer lab where the entire hard drive of the computer is frequently re-imaged. The description below will inform the user

3 The BOINC agent

3.1 Applications

The BOINC agent actually consists of four separate but interacting applications. They are represented in the diagram below:



The **core client** (**boinc.exe**) is the central controller for the BOINC agent. It handles communication with World Community Grid's servers, downloads workunits, returns results and manages the starting and stopping of the science applications to comply with the preferences set for the agent.

The **manager** (**boincmgr.exe**) is a graphical user interface that allows the user to view the current state of the core client, the workunits that have been downloaded, the applications that are running and the graphics for running the application. It also provides the ability to change preferences locally and temporarily suspend the running of the application. All communications between the manager and the core client occur over TCP/IP. (See the security section of this document for additional information.)

The **command line tool** (**boinccmd.exe**) does the same thing as the manager, except that it does it via the command line and only displays information as text. This is most useful if the agent has been installed on a Linux machine that is being accessed remotely. All communications between the command line tool and the core client occur over TCP/IP. (See the security section of this document for additional information.)



The **screen saver** renders the application graphics as a screen saver. In the event that the application graphics are not available, it will display World Community Grid's logo and text describing the application running and the progress of the current workunit.

3.2 Versions

At the time that this document was written, World Community Grid was using version 5.10.22 of the BOINC agent. There are two versions of the agent. The standard version which is downloaded and used by most people is available here: http://boincdl.ssl.berkeley.edu/dl/wcg_boinc_5.10.22_windows_intelx86.exe

The second version is called the 'mass install' version. It is not intended to be used directly, but rather to be used to create a custom deployment package for a software distribution system. It is available at http://boincdl.ssl.berkeley.edu/dl/wcg_mass_boinc_5.10.22_windows_intelx86.exe.

More detail on the proper version to use in each scenario is contained further in this document.

World Community Grid will periodically update the version of the BOINC agent as new features are added to the software.

4 Deployment using software distribution system

The instructions below provide details on how to do prepare World Community Grid's BOINC agent so that it can be deployed silently from the command line. After performing these modifications, the command line will install the agent and automatically attach to World Community Grid using the specified member.

4.1 Prepare World Community Grid's BOINC Agent

1. Download the 'mass install' version of World Community Grid's BOINC agent from http://boinc.berkeley.edu/dl/wcg_mass_boinc_5.10.21_windows_intelx86.exe and put it into `c:\temp\wgc_mass_install`.
2. Open a command prompt and go to `c:\temp\ wgc_mass_install`.
3. Run `wgc_mass_boinc_5.10.21_windows_intelx86.exe /a`.
4. In the window that opens, hit 'next'.
5. Select a file location to store the files. Use `c:\temp\wgc_mass_install\files`. (You will need to create the files directory.)
6. Click 'install'.
7. On the final screen, deselect the 'launch' checkbox. Make sure that you are not going to launch the agent. Then click finish.
8. Go to directory: `C:\temp\wgc_mass_install\files\program files\BOINC`.
9. Go to <http://boinc.berkeley.edu/trac/wiki/ClientMessages#Behavioralparameters> and read the section on 'Behavioral Parameters'. Decide if you want to use any of these settings. If you want customize any of these, please follow the next two steps
 - a. Open `cc_config.xml` and add the additional flags you wish to use.
 - b. Save the `cc_config.xml` file.
10. Obtain the BOINC account key for the member name that you want the computers to register under by visiting <https://secure.worldcommunitygrid.org/ms/viewMyProfile.do>. (You will find it near the bottom of the page next to the text that says BOINC account key.)



11. Open `account_www.worldcommunitygrid.org.xml` and place the BOINC account key between the `<authenticator>` tags. It should look something like the following:

```
<account>
  <master_url>http://www.worldcommunitygrid.org/</master_url>
  <authenticator>abcdef0123456789abcdef0123456789</authenticator>
  <project_name>World Community Grid</project_name>
</account>
```

12. Save `account_www.worldcommunitygrid.org.xml`.

4.2 Obtain the correct version of the install shield script files

World Community Grid's BOINC agent installer was built using InstallShield. Installers built with InstallShield require that the appropriate InstallShield engine be available on the machine(s) where the software is being installed. Unfortunately, the check and installation of the correct InstallShield engine is done within the 'exe'. Since we have extracted the MSI and will be deploying it on many machines, this step is not being done. As a result the following steps need to be taken to obtain the correct InstallShield engine:

1. Download the 10.1 InstallShield engine from <http://support.installshield.com/kb/files/Q108322/ISScript101.zip> (md5sum = b695842997ab74122518fc740bdce55b).
2. Extract the file 'ISScript10.Msi' file within the zip file that you downloaded.

4.3 Execute the two MSI installers

Now that all the files have been prepared for installation, the following commands can be used to install both the InstallShield engine and World Community Grid's BOINC agent:

1. Install the InstallShieldEngine:

```
msiexec /i ISScript10.Msi /qn /l c:\isscript.log
```

2. Install the World Community Grid – BOINC Agent

```
msiexec /i BOINC.msi /qn /l c:\boincsetup.log SETUPTYPE=Shared ALLUSERS=1 ENABLESCREENSAVER=0  
ENABLELAUNCHATLOGON=1
```

Please note that there are several installation types and additional installation options available for World Community Grid's BOINC agent. Please view this page to see them: <http://boinc.berkeley.edu/trac/wiki/WinDeploy>.

If using any of these other options, please test them to make sure that they work correctly.

4.4 Start the agent

You can start the BOINC manager (which will then start the core client as well) by running the following command:

```
"c:\Program Files\BOINC\boincmgr.exe" /s
```

If you wish to just start the BOINC core client, then you can simply run the following command:

```
"c:\Program Files\BOINC\boinc.exe" --detach
```

5 Deployment on protected systems where the disk is re-imaged frequently (such as using Deep Freeze)

5.1 Install World Community Grid's BOINC agent onto the disk image

1. Download the 'mass install' version of World Community Grid's BOINC agent from http://boinc.berkeley.edu/dl/wcg_mass_boinc_5.10.21_windows_intelx86.exe.
2. Run `wcg_mass_boinc_5.10.21_windows_intelx86.exe` to install World Community Grid's BOINC agent onto the image. Select the options you wish, but you make sure that the 'Launch' box is not checked on the last installation screen.
3. If you want to allow users to use the BOINC Manager on the computers where this image is deployed, you need to create a file called 'gui_rpc_auth.cfg' in the installation directory. Read the security section of this document for information about this file.
4. Remove the `account_www.worldcommunitygrid.org.xml` file, but first save a copy of it for the steps below. While this is not strictly required, it does not need exist, and it could cause some confusion when trying to track down problems if this file is present.
5. Open the `cc_config.xml` file. Add the tag `<data_dir>path_to_dir</data_dir>` to the file. Please replace the text 'path_to_dir' with the actual path to the data directory. The contents of the file should look something like this when you are done:

```
<cc_config>
  <log_flags>
</log_flags>
  <options>
    <data_dir>path_to_dir</data_dir>
    <dont_contact_ref_site>1</dont_contact_ref_site>
  </options>
</cc_config>
```

6. Save the `cc_config.xml` file.
7. At this point you should have successfully installed World Community Grid's BOINC agent onto the image.

5.2 Prepare the directory that will be preserved (thawed)

1. You need to create a directory on each machine where the above image will be deployed. This new directory must be preserved and not overwritten each time the image is re-installed on the machine. The location of this directory also must match what you used to replace the 'path_to_dir'.
2. Obtain the BOINC account key for the member name that you want the computers to register under by visiting <https://secure.worldcommunitygrid.org/ms/viewMyProfile.do>. (You will find it near the bottom of the page next to the text that says BOINC account key.)
3. Open `account_www.worldcommunitygrid.org.xml` and place the BOINC account key between the `<authenticator>` tags. It should look something like the following:

```
<account>
  <master_url>http://www.worldcommunitygrid.org/</master_url>
  <authenticator>abcdef0123456789abcdef0123456789</authenticator>
  <project_name>World Community Grid</project_name>
</account>
```



4. Save `account_www.worldcommunitygrid.org.xml` and make sure that when the protected directory is created, this file is placed within that directory. This only needs to be done once, but if it is repeatedly placed into that directory, no harm is done.
5. Go into the installation directory from step 5.1 above and copy the file `ca-bundle.crt`. This file also needs to be placed into the protected directory when it is first created. Similar to the account file, this step only needs to be done once, but if it is done repeatedly, there is no harm.
6. Finally, if you created a specific version of the `gui_rpc_auth.cfg` in the installation directory, you need to make sure that it is also placed into the protected directory. Again, this step only needs to be done once, but if it is done repeatedly, there is no harm.
7. Please note that the `account_www.worldcommunitygrid.org.xml`, `ca-bundle.crt` and `gui_rpc_auth.cfg` files must be placed into the protected directory before the BOINC core client starts. They are read on startup, and if not present, various problems will result.

5.3 Starting the client

During installation, you will have specified the startup option. If you wish to start World Community Grid's BOINC agent in some other fashion, you can use the following commands to start the agent:

You can start the BOINC manager and send it to the system tray (which will then start the core client as well) by running the following command:

```
"c:\Program Files\BOINC\boincmgr.exe" /s
```

If you wish to just start the BOINC core client, then you can simply run the following command:

```
"c:\Program Files\BOINC\boinc.exe" --detach
```

6 Managing the behavior

Several items that can be configured in the BOINC agent can be used to minimize and eliminate the impact of the BOINC agent running. These options can be controlled from the website on this page: <http://www.worldcommunitygrid.org/ms/device/viewProfiles.do>. Each computer is initially assigned to the 'Default' profile. This profile can be customized to give the desired behavior. You also can create additional profiles, assign some computers to one profile and other computers to another profile. This allows you to customize the behavior of your computers according to your needs.

The most important features that can be controlled from these profiles are:

- **CPU Throttle:** This causes the BOINC client to only use a certain percentage of the computers' cpu time.
- **Memory Throttle:** This causes the BOINC client to only use a certain percentage of the computers' memory.
- **Do work while computer in use:** This can limit processing to only when the user of the computer has not done anything on it for more than X minutes.
- **Do work only between the hours of X and Y:** This allows you to limit the time of day when computers run.
- **Connect to the internet only between X and Y:** This lets you set the time of day that the agent is allowed to communicate with the project servers.



7 Firewalls and Proxies

There are two firewall rules that need to be allowed:

1. The binary boinc.exe needs to be allowed to communicate with ip address 129.33.89.133 on ports 80 and 443. This is communication to World Community Grid's servers.
2. The binaries boinc.exe, boinc.scr, boincmgr.exe and boinccmd.exe need to be able to communicate to 127.0.0.1 on port 31416 (some firewalls restrict ip traffic to the localhost).

The BOINC agent also can be configured to communicate through Proxies. This is done by performing the following steps:

1. Open the BOINC Manager.
2. Click on the 'Advanced' button to go to the advanced view.
3. Select the 'Advanced' menu and select 'Options'.
4. In the popup, select either the HTTP or SOCKS proxies as appropriate.

In certain circumstances, you may be prompted for the proxy information while you are attaching to World Community Grid.

8 Security

The BOINC agent was designed by the University of California under a National Foundation of Science grant. One of the design goals of the BOINC technology was to allow volunteers to contribute to multiple projects. As a result, a single computer can be attached to multiple BOINC projects such as World Community Grid.

When the BOINC core client is started, a file called `gui_rpc_auth.cfg` is created. This file contains a password. This password is checked by the core client any time that the BOINC manager requests information from the core client or sends it a message directing it to do something (such as suspend a workunit or attach to an additional project). In order to prevent the user of the computer from attaching to unauthorized projects, this file must be protected so that the end user cannot read or access this file. Additionally, the `cc_config` file can be modified to include a tag called `<disallow_attach>`. This will prevent users from attaching to other BOINC projects. . More information about this is available at <http://boinc.berkeley.edu/trac/wiki/ClientMessages#Behavioralparameters>



Appendix I: Additional Detail on the BOINC client components:

The Core Client: <http://boinc.berkeley.edu/trac/wiki/UnixClient>

The Manager: <http://boinc.berkeley.edu/trac/wiki/ManagerAdvanced>

The Command Tool: <http://boinc.berkeley.edu/trac/wiki/BoincCmd>

Client Files and configuration: <http://boinc.berkeley.edu/trac/wiki/UnixClient>

Appendix II: Other BOINC references:

The links below are for websites external to World Community Grid and BOINC. These are the pages and tools created by people as a way to contribute to the BOINC community. You are welcome to examine these as sources of information, but we neither endorse nor recommend these tools.

The Unofficial BOINC WIKI

This is a WIKI dedicated to providing information to users of BOINC:

http://boinc-wiki.ath.cx/index.php?title=Main_Page

BOINCView

This is a tool that will allow you to monitor the status of multiple BOINC agents at one time.

<http://boincview.amanheis.de/>