

What's New In PC² Version 9.0

1. “.ini” files

The use of “.ini” files has been streamlined in Version 9 (“V9”). The “sitelist.ini” and “reject.ini” files of PC² Version 8 (V8) are no longer necessary (the values formerly specified via these files are now configurable interactively). There is now just one single file used to pre-configure the system: “**pc2v9.ini**”. As with the old “pc2v8.ini” file, this file contains [client] and [server] sections. A minimal configuration includes a

```
server=xxx.xxx.xxx.xxx:portNum
```

line in the [client] section (specifying the IP and port number where the client should contact its server) and a

```
remoteServer=xxx.xxx.xxx.xxx:portNum
```

line in the [server] section specifying where each server *other than the first server* in a multi-site contest should contact a remote server to join the contest. If the “:portNum” argument is omitted on either line, a default value of 50002 is used.

2. Enhanced Network Configuration

Each PC² server in a multi-site contest must have a publicly accessible IP address which can accept inbound connections on a single port. Each client must have network access to its server. Network operation behind NAT boxes is also now supported provided the above two requirements are met. It is no longer necessary to open a large range of firewall ports to use the system.

3. Single-point Contest Administration

In Version 9 it is possible to manage an entire multi-site contest from one site using a single Administrator. All contest details, including generation of PC² accounts for all sites, can be done from a single Admin client; this is described in more detail below.

4. Enhanced Security

Information transmitted over the network in V9, both between clients and servers and between different servers in a multi-site contest, is now fully encrypted. In addition, information stored on disk is also automatically encrypted.

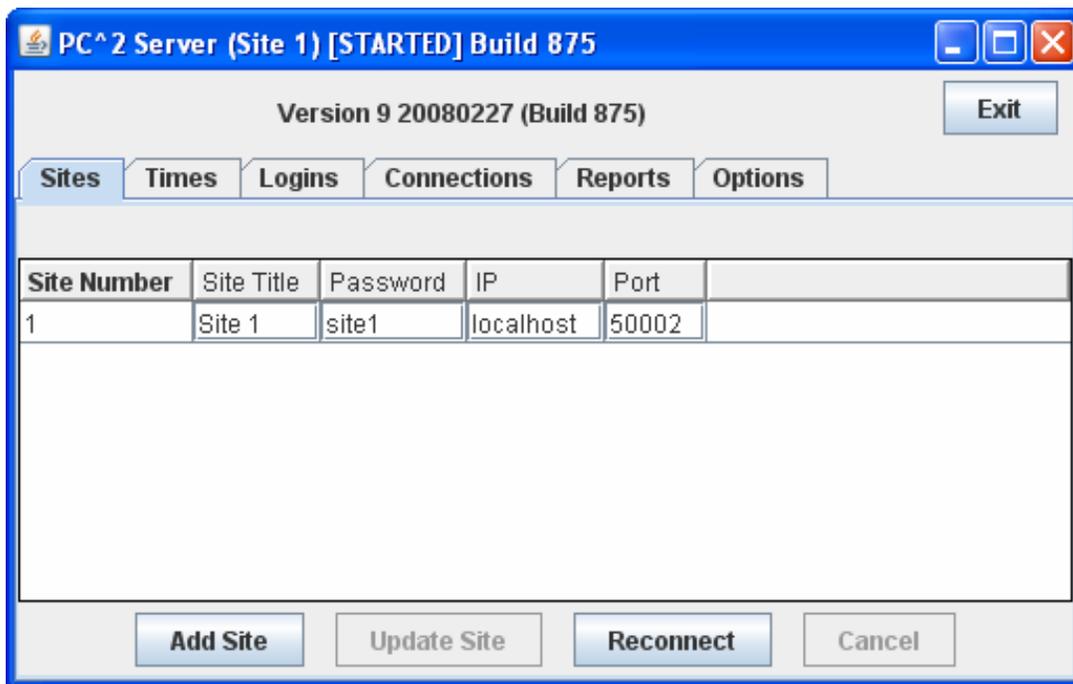
5. Server Control

When a PC² V9 server is started (using the command “**pc2server**”, as in V8), the server now displays a “login GUI” similar to that of the clients. The login account name for the first server in a contest is always “**site1**”, with a default password of “**site1**”.

Following login the server prompts for a *contest password*. At this point the contest administrator must choose and enter a password which will then be used to perform disk file encryption. If a contest is shut down and restarted it will then be necessary to reenter the same contest password when the server is restarted. (Note that the *contest password* is unrelated to the *site login/password*.)

In the case of a multi-site contest, only the *first* server prompts for a contest password; subsequent servers (that is, those with **remoteServer** entries in their **pc2v9.ini** files as described above) obtain the contest password via their secure connection to the remote server.

Once the server login sequence is completed the server displays a main GUI similar to the one shown below:



The configuration for a site (title, password, IP address, and port) can be changed by editing the fields in the corresponding row in the grid. Once a site's configuration has been specified, click the "Update Site" button to commit the changes. Note that **changes do not take effect until and unless the "Update Site" button is clicked.**

For a multi-site contest, the operator of the first server must identify the other sites expected to join the contest. Click the "Add Site" button once for each site to be added, then update the IP address and port number for each site. NOTE that the default values for these entries may not be correct; be sure to configure each site carefully with that site's IP address and port number, and also to **click the "Update Site" button when done.**

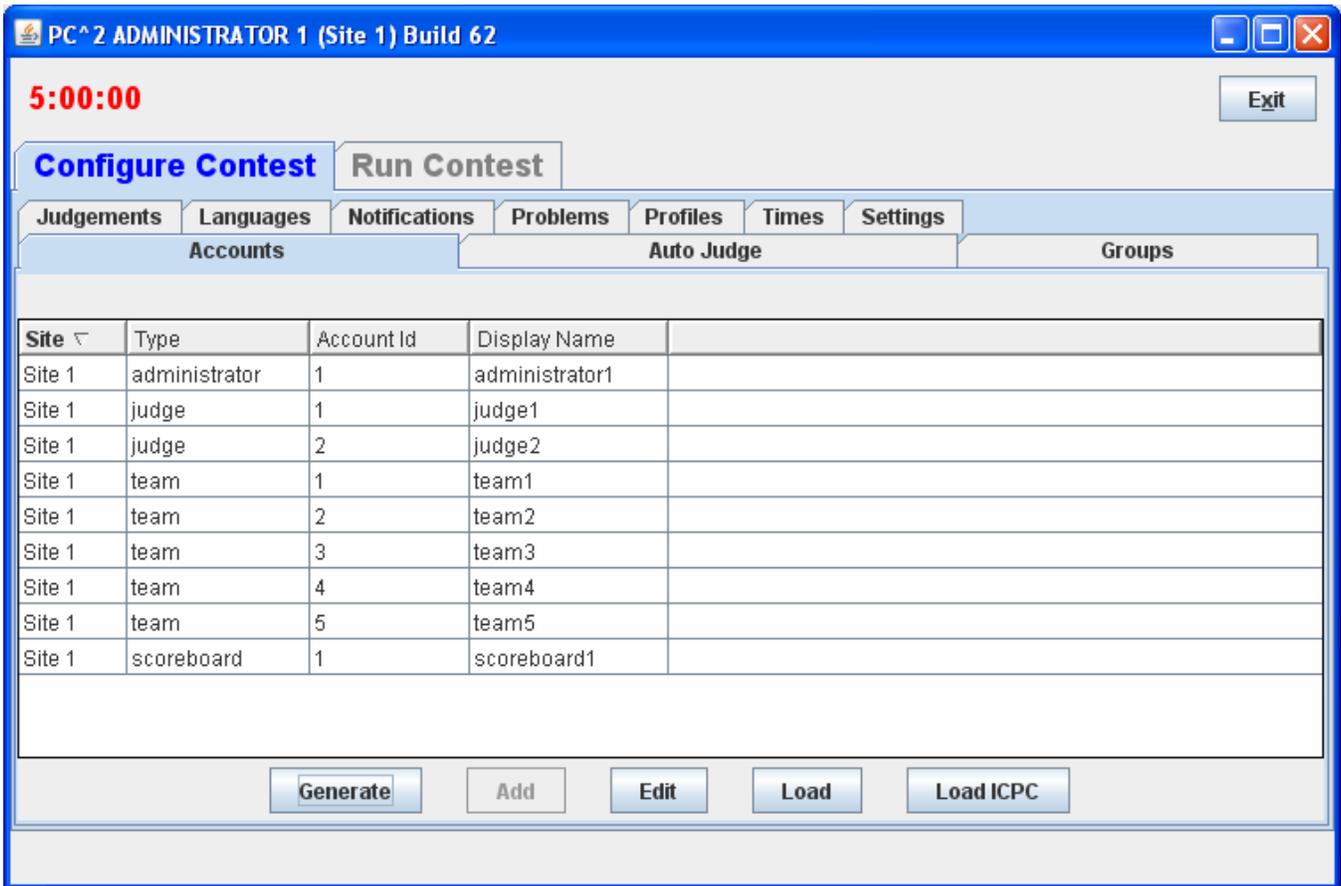
Once other sites have been added to the contest configuration in the first server, servers at those other sites can be started using the **pc2server** command. Each secondary server will prompt asking for a login account and password. The login account for a server is always **siteN** where **N** is the site number; the default password is the same ("**siteN**", where **N** is the site number).

The default password for sites is obviously not very secure. The operator of the *first* server should configure new passwords for each remote site and then provide those passwords via external secure means to the remote server operator. Again, be sure to click the "Update Site" button once secure passwords have been entered on the first server.

6. Administrator Options

The Admin client has been substantially reorganized in V9, and has a number of new functions. When an administrator logs in (using login account "**administrator1**", password "**administrator1**" as in Version 8), the Admin client displays the new GUI shown below. The

main window contains two primary tabs: **Configure Contest**, which holds functions related to pre-contest setup, and **Run Contest**, which holds function primarily used while the contest is running. The picture shows the GUI with the **Configure Contest** tab selected.



The administrator configures the contest in a manner similar to V8, using the tabs on the **Configure Contest** screen to:

- generate accounts (for teams, judges, etc.);
- update account details such as team names, passwords, and ICPC Registration information;
- define languages and problems for the contest;
- configure balloon notifications;
- start the contest clock at the appropriate time.

Differences in these configuration functions from V8, as well as descriptions of new functions, are given below.

6.1. Accounts Tab

This tab is used to generate and configure accounts. One significant enhancement in V9 is that the Administrator at one site can generate and configure accounts for *all* sites in the contest sites (in Version 8, each site had to have its own accounts generated separately by an Admin client connected to that site's server). Note however that a site must be "logged in" – that is, its server must be running and connected to the contest – in order for an Admin to generate/configure accounts for that site.

Clicking the **Generate** button displays a dialog which allows selection of the accounts to be generated (including selecting the site for the accounts). The picture above shows the contest configuration after several accounts have been generated.

Each site can have account numbers that are the same (for example, it is permissible to have a "team1" account at both Site1 and Site2). Also, V9 allows account generation to begin at an arbitrary "base" at each site (so, for example, Site1's team accounts could start with "team101", "team102", etc., while Site2's team accounts could start with "team201", "team202", etc.

Once accounts have been generated, clicking on an account (row) in the Accounts grid and then clicking "Edit" invokes an Account Edit dialog which allows modification of the properties of the account.

A significant new feature of V9 is the association of *permission properties* with accounts; the Account Edit dialog allows the administrator to select (or remove) a variety of permissions on the account.

The Accounts tab also supports loading of account properties from an external file, similar to the way V8 did – although the format of the input file describing accounts is considerable more flexible in V9 (see the PC² Wiki page referenced below for details on the "Load Accounts" file format).

The Accounts tab also supports loading of ICPC Registration file information (for contests associated with the ICPC and using the Registration system hosted at Baylor University), similar to V8. Note: if the administrator invokes the LoadICPC function after the Load function, the "Display Names" from the ICPC Registration file will overwrite any specified in the external "Load" file. Note also: in order to associate PC² team accounts with ICPC accounts, it is necessary to "preprocess" the ICPC data file by adding a new leftmost column containing the PC² team number as described in the Version 8.5 Contest Administrator's Guide, page 67.

Note that the "Add" button on this tab does not work (see "Known Features", below).

6.2. Groups Tabs

The Groups tab is a new feature of Version 9; it allows associating a collection of accounts together in a "group". For example, your contest might have several "divisions": lower-division students, upper-division students, and graduate students. Each of these groups can be defined on the Groups tab, and then the "Edit" function on the Accounts tab can be used to associate each account with its Group. Group definitions can also be defined by loading an ICPC Registration file using the "LoadICPC" button on the Groups tab (each team in such a file has a group corresponding to its ICPC Regional Contest site). The PC² scoreboard can also be instructed to separate different accounts by Group on the standings display.

6.3. Languages and Problems Tabs

These tabs work the same as in Version 8, although the Problems tab provides a more flexible mechanism for configuring "Validators" into a contest (specifically, it is now possible to

list an arbitrary external program to be invoked at the ‘validation’ stage of team run execution on the Judge).

6.4. Notifications Tab

This tab is used to tell PC² how and where to send “balloon notifications” for correct runs. It allows configuration of an email notification (by specifying an email address and an SMTP server) and/or a printed notification (by specifying a print device). Each configured contest problem can have an associated balloon color, and each contest site can have a separate balloon notification configuration (with a distinct set of email, printer, and balloon colors). Note: if a contest is configured to use balloon notifications, there should be only a *single* instance of the PC2 “Board” class running for the entire contest; otherwise, multiple notifications for each correct run will be issued.

6.5. Times Tab

This tab, like its equivalent function in V8, allows the Admin to start or stop the Contest Clock either on one specific site or on all sites at once. It also provides the ability to edit the Contest Clock on any site. Note that the “clock time” shown in the rows corresponding to each site on this tab does *not* dynamically update; click the “Refresh” button to update the display.

6.6. Judgements Tab

The possible “Judge Responses” to team runs are listed on this tab. However, the “Add” button does not work (see “Known Features”, below, for information on alternative configurations for judgement responses).

6.7. Additional Tabs

The following additional **Configure Contest** tabs have functions similar to those in Version 8, or provide additional contest status information.

- **AutoJudge:** shows which judge accounts (if any) have the “AutoJudge” feature enabled (see “Known Features”, below, for additional information about the AutoJudge feature).
- **Settings:** allows specification of the official “Contest Title” (displayed on the scoreboard; also allows setting the type of information which the Judges will see regarding the teams whose runs they are judging as well as the text of the “default answer” which judges send back to teams in reply to clarification requests.
- **Profiles:** provides support for creation of different “contest profiles” (for example, “Practice” vs. “Real” contest configurations) and for automatically switching between profiles. Note that this feature is not yet implemented (we just wanted to let you know we’re working on it).

6.8. Run Contest Screen

Clicking the **Run Contest** tab on the Admin displays a screen containing functions typically used during the actual running of a contest, including display of **Runs** and **Clarification Requests**. The various tabs on this screen conform for the most part to equivalent tabs in V8, although there are several additions including **Connections** and **Logins** showing the status of client communication, a **Sites** tab allowing editing of site information using the same interface as provided on the server GUI, **Standings** and **StandingsHTML** showing different versions of the

current contest standings, and an **Options** tab allowing display of various logs and other contest state information.

7. Known Features (OK, Bugs; we're working on them)

7.1. Unique Accounts

The system does not correctly prohibit multiple logins for the same client account (in other words, for example, it is possible for multiple people to login as “judge3” if they simply both have the password for “judge3”). If such a login situation occurs, bad things can happen. It is therefore important that the Contest Administrator take steps to insure that every team, every judge, etc. has (and *uses*) a *different* account/password combination.

7.2. AutoJudge

The “AutoJudge” feature does not work in V9.0. Current plans call for this to be fixed by Release 9.1. Note that “AutoJudge” is the facility to send responses to teams without human intervention; this is different from the “Validator” capability – which does work (that is, a contest problem can be configured with a Validator just as in V8, and the Validator result will be displayed for the Judge).

7.3. Add Accounts

The “Add” button on the “Accounts” tab, intended to allow dynamic addition of accounts, does not work. Use the “Generate” button to create new accounts (generating new accounts does not affect existing accounts).

7.4. Edit Multiple Accounts

There is currently no mechanism to select multiple accounts for editing using the Accounts tab “Edit” function. Note however that multiple account property changes can be made using an external file and the “Load” function.

7.5. Add Judgements

The “Add” button on the “Judgements” tab, intended to allow dynamic addition of “judgement messages”, does not work. If your contest wishes to use a set of judgement messages other than the default ones, your messages can be installed by listing them in a file named “**reject.ini**” in the first server’s startup directory (as in Version 8). However, this file (as in Version 8) is only read when the server is first started; to change the messages after the start of a contest it is still necessary to shut down and restart the server.

8. Additional Information

We have begun creating a “Wiki” describing how PC² is organized, how it is configured for running a contest, and how it is structured internally. Our plan is to eventually have a complete, comprehensive description of all aspects of the system available online; we already have a good start and we invite people in the PC² user community to visit our Wiki page to find additional information about the system and to help contribute to this effort. Please visit <http://pc2.ecs.csus.edu/wiki> for further details.