

“What’s New” In PC²

This is a list of upgrades and bug fixes in PC². The list is cumulative, starting with the most recently released version at the top.

What’s new in Version 8.7

1. Documentation and Support

- 1.1. Bugzilla Support.** The Bugzilla system (<http://www.bugzilla.org>) is now being used as the software development tracking system for PC². A new web public web page (<http://pc2.ecs.csus.edu/bugzilla>) allows users to submit bug reports, check the status of bug fixes, and make requests for system enhancements.
- 1.2. Wiki Support.** The MediaWiki system (<http://www.mediawiki.org>) is now being used as the basis for a community-supported effort to document aspects of using PC² in programming contests. A new web page (<http://pc2.ecs.csus.edu/wiki>) allows users to enter and edit information related to configuring and running contests using PC², to document obscure features of PC², and to provide hints and insights into other PC²-related issues.
- 1.3. Continuous What’sNew.** This “What’s New In PC²” document is now cumulative; rather than creating a new document for each release, a single document will show the incremental changes in each release, with the most recent at the top.

2. Team Module

No Changes. (However, see General Enhancements, below.)

3. Judge Module

- 3.1. MyJudgements Tab.** Each Judge screen now includes a grid showing all the runs which have previously been judged by that Judge.
- 3.2. View Output Button.** The judge now has a button to display the output of the most recently executed team submission. This allows the judge to re-examine the output without having to re-execute the run.
- 3.3. Display Validator Output.** If a problem definition includes a Validator, the team output window displayed to a judge now includes a tab containing the Validator output (if any).

4. Admin Module / Contest Configuration

- 4.1. Language Autofill.** The Add/Edit Language screen contains a new drop-down list containing a wide variety of languages that PC² knows about. Selecting one of the specified languages will automatically populate the language definition fields with predefined values for the selected

language. (Note that since computer system configurations vary, it is still the Contest Administrator's responsibility to check that the language definition matches the system configuration.)

- 4.2. Multi-Select Give/Take Run.** Multiple runs may now be selected for returning to (or taking from) the Judges' screens (previously, each run had to be selected and returned individually).
- 4.3. Give Clarifications.** Clarifications which have already been answered may now be given back to the Judges for further processing.
- 4.4. Multi-Select Runs For Extraction.** Multiple runs may now be selected for extraction (previously, the only options were to extract a single run or to extract all runs). Extracted runs are stored in separate directories beneath the **extract** directory.
- 4.5. Suppress Team Output Window on Judge.** A configuration checkbox has been added to allow suppression of the window which displays the output of a team's program (run) on the Judge. This can be useful when using a Validator which is already automatically displaying the team output (previously, when the judge finished using the Validator to examine the output, a subsequent output window was always generated).
- 4.6. Edit "Default Answer" For Clarifications.** The Contest Administrator can now set the text of the "Default Clarification Response" sent to a team when a Judge selects "Default Answer" for the response to a clarification request.
- 4.7. Confirm New Account Data Loading.** The "Load PC² Data" function which loads new account configuration information now presents a display of the data to be loaded and asks for confirmation prior to accepting the data.
- 4.8. New "Account Data" Report.** The "Reports" tab contains a new option to generate a report describing the current PC² account configuration. This report can subsequently be used with the Admin "Load PC² Data" function to load (restore) contest account information.
- 4.9. Complete Language Definitions Are Displayed.** The Languages display screen now shows, for each defined language, the "executable file name" and "execution command" templates for the language in addition to the previously displayed values.
- 4.10. Judgment Strings Can Be Edited.** The Admin Client has a new "Judgments" tab that allows editing of the judgment strings returned to teams and also allows adding new judgment strings. Editing existing strings can only be done when no problems have yet been configured in the contest. New judgment strings can be added to the list at any time. Changes to judgment strings are propagated to all sites.
- 4.11. New Substitution Variables.** Several new substitution variables are now supported. These variables can be used in various places during contest configuration; the runtime value of the variable will be substituted as appropriate. New substitution variables include:

- { :timelimit }** This represents the value entered (per problem) in the “Run Timeout limit (Secs)” field when a problem is defined; it may be entered in the “Compile Cmd Line” and/or “Program Execution Command Line” fields when a Language is defined, and in the “Validator Command Line” field when a Validator is specified during Problem definition.
- { :executetime }** This represents the amount of time a run took to execute on the Judge; it may be entered in the “Validator Command Line” field when a Validator is specified during Problem definition.
- { :exename }** This represents the full name of the executable file generated by the compiler when a team submission is compiled (for example, **hello.exe** for a Windows C program; **hello.class** for a Java program, or **hello** for a Unix C program). It may be substituted (specified) on any language or problem definition text field.

4.12. Postscript Printer Support. The Admin now supports the ability to specify PostScript printers for balloon printing.

4.13. Display Team and School Name. When the Admin IMPORT function is used to import team identification information, the default is now to instruct the scoreboard to display both Team and School names in the standings display (the previous default was to display only the Team name). The default display can be overridden by specifying the desired option in the **pc2v8.ini** file on the Admin machine; see the commented-out options in the sample **pc2v8.ini** file, or the PC² Version 8.5 Contest Administrator’s Guide, for details.

5. Scoreboard Module

5.1. Standings Screen. The Scoreboard module now contains an enhanced graphical user interface which includes a “Main” tab showing the current contest standings (the old scoreboard generated HTML files giving the standings but did not actually display them directly).

5.2. Balloon Color Display. The Scoreboard now contains a tab showing, for each site, the “balloon colors” assigned to each problem at that site (contest sites may use different balloon colors for problems). The Scoreboard also generates a file named “color.html” in the “html” directory containing the same information. This file can be used for example by runners to verify what colors should be delivered to teams at their site for each problem.

5.3. Email/Printing Test Function. The Scoreboard now contains a facility for initiating a test of emailing and/or printing of balloon messages. Selecting the desired test(s) on the Scoreboard “Test” screen and then pushing the “Test” button will cause a test message to be sent to the selected locations.

5.4. Contest Remaining Time Display. The Scoreboard now displays the time remaining in the contest, like the other client modules.

5.5. Balloon History. Balloon notification messages (emails and printouts) now show a list of the balloons the team should have, both by problem and by color. This should allow runners delivering new balloons to confirm that each team has the correct balloons at their workstation.

5.6. Display Team and School Name. The Scoreboard now defaults to displaying both the “Team Name” and the “School Name” in the standings display (this setting is controlled by the Admin IMPORT function; see the Admin section above for further details).

6. Server Module

6.1. Server Respects `java.rmi.server.hostname`. The PC² Server now uses the current value of the Java System Property `java.rmi.server.hostname` if that property is set. The property can be set on the command line used to start the Server using the `-D` option:

```
java -Djava.rmi.server.hostname=foo pc2.server.Server
```

The RMI Server hostname can also be specified using an entry in the [client] and/or [server] section of the pc2v8.ini file:

```
[client]
hostname=foo

[server]
hostname=foo
```

The precedence for picking hostname (from highest to lowest) is:

1. Use the hostname from the pc2v8.ini file (client.hostname or server.hostname)
2. Use `java.rmi.server.hostname` if set
3. Use the value returned by the Java method `InetAddress.getLocalHost()` (this was the default in previous versions).

6.2. Judgment String Initialization. When a judge assigns a “No” judgment to a run, the team receives a specific “judgment string” identifying the reason the run was rejected (for example, “No – Runtime Error”). The values for the judgment strings are specified in the file `reject.ini` which is read by the server at startup. In previous versions of PC², each new server joining a contest would override (replace) previously defined judgment strings, which could cause problems if the `reject.ini` file contents on different servers were different. Now, when a new server joins a contest it obtains its judgment strings from the remote server, insuring that judgment strings are identical across a contest.

7. General Enhancements, Bug Fixes, and Internal Changes

7.1. Client Quick-Start. All clients (Admin, Judge, Team, and Board) now support the ability to be started with command line arguments that automatically initiate a login sequence. For example, the command

```
java pc2.team.Team --id 3
```

will start a Team client and attempt to login using account “team3” and default password “team3”. This facility is useful during testing and setup since it can reduce the tedium of having to enter repeated login values. The general form of the command line arguments for this facility is

```
[ ( --id <num> | --user <acctName> ) [ --password <string> ] ]
```

where **<num>** is a PC² account number (e.g. 3 for Team3 or Judge3), **<acctName>** is a complete PC² account name (e.g. **team3** or **judge3**), and **<string>** is the password for the specified account. The default password (which is the account name) is used if no password string is specified.

7.2. New pc2zip Command. The PC² distribution now contains commands **pc2zip.bat** (for Windows) and **pc2zip** (for Unix). When typed at a command prompt in the PC² installation directory, these commands create a complete .zip file of the current contest (the entire PC² state on the current machine) and store it in the “./archive” directory. The current date/time is used as a component of the generated filename. PC² does not have to be running in order to use this command (in fact, it shouldn’t be). Note that when someone seeks help from us regarding an issue with PC² in their contest, the very first thing we usually do is ask them to send us this .zip file from their PC² Server. Note also that to create a complete archive of a contest, the **pc2zip** command must be run on each machine in the contest.

7.3. URL for pc2v8.ini. All modules (the Server and all Clients) now recognize a startup command line argument of the form

```
--ini <url>
```

If this argument is present when a module is started then the local **pc2v8.ini** file is ignored and the one specified by the given URL is used instead. This allows, for example, creating a contest configuration CD to be used by two different sites which need different **pc2v8.ini** files because of local variations. The same command line argument is also recognized by the stand-alone **pc2zip** command (above).

7.4. .ini Entries Documented. Several previously-undocumented property values are now listed as examples in the **pc2v8.ini** file in the **samps** directory distributed with the system.

7.5. Security Policy File Renamed. The file which specifies the security policy for the JVM has been renamed to “policy.ini” for consistency with other PC² initialization files (the old name was “all.policy”).

7.6. Scoreboard XML Output. Fixes were added to insure the XML output of the Scoreboard is well-formed.

7.7. Efficiency Enhancements. The operation of the multi-column list-boxes used to display run grids was modified to speed up loading of information.

7.8. Logging Enhancements. A number of additional logging messages, both error logging and status logging, were added.

What's new in Version 8.6^{1,2}

1. Team Module

The team (contestant) user interface in V8.6 remains identical to previous versions. However, there are internal operational differences, some of which can be seen by a contestant under certain circumstances.

- 1.1. **Change-Password Control.** The Contest Administrator now has the ability to disable the contestant “change password” function (see the Admin section, below). If a team tries to change their password when this function has been disabled, a warning message will be displayed on the Team screen.
- 1.2. **Team “Standard Input”.** If a contest problem specifies that team programs are to read input data from “standard input”, then when the program is executed on a Judge’s machine PC² automatically associates the judge’s data file with “standard input”. When a contestant uses the “TEST RUN” function on their own machine, “standard input” likewise must come from a file; in this case one created by the contestants. Previously the contestant was required to place their input data in a file whose name was predetermined. Now, the system prompts for the name of an arbitrary data file to be used as “standard input”. It is still the contestant’s responsibility to provide a data file containing the desired test input data.

2. Judge Module

- 2.1. **Fully Automated Judging.** The Judge now provides support for fully automated judging. That is, if the Contest Administrator provides a “validator” for a problem, the result from the validator can now be *automatically* accepted with no human intervention. A choice can also be specified as to whether only *new* runs are to be “auto-judged”, or rather whether any runs which are “re-judged” at some point in the contest should also be auto-judged (this allows judging to proceed automatically for new runs, but gives the option at the same time to have a human judge perform “rejudging”).

Fully-automated judging is configured using the “AutoJudging” button on the Judge’s “**Settings**” screen, and enabled by clicking on the “Enable AutoJudging” button on the Judge’s “**Unjudged Runs**” screen. Note that the use of this functionality is optional; the previous modes of either having no validator or having a validator which provides a “recommendation” are still fully supported.

As before, the server reads a file named “**reject.ini**” at startup; the contents of that file specify the “reject messages” which will be displayed for the Judge. Previously there were no requirements regarding what reject messages are defined for a contest. With the addition of AutoJudging capability, it is necessary to insure that messages for certain reject conditions are

¹ Some of the upgrades/fixes listed may actually have been included in versions prior to V8.6, but were never fully documented; they are listed here for purposes of bringing the documentation up to date.

² Note that except for items listed here, the PC² V8.5 Contest Administrator’s Guide and the PC² Team Guide documents also apply to PC² Version 8.6.

defined, either by the user or by the system. As a result, PC² now automatically checks to see that the `reject.ini` file defines at least the following three “judgement messages” (reject messages):

“**Compilation Error**”,
“**Time-limit Exceeded**”, and
“**Other - Contact Staff**”.

If these reject messages are not defined in the `reject.ini` file then PC² automatically adds them to the list of reject messages strings defined in the `reject.ini` file.

This change has two ramifications. First, it means that the contest administrator does not need to define reject messages for compilation error, time limit exceeded, and “other – contact staff” conditions; they are now predefined and will automatically be displayed for the judge. Second, a validator wanting to return a specific result string may return any one of these strings in addition to any string defined in the `reject.ini` file. See the complete manual (V8.5) for information on how to write a validator which returns responses (judgements) to PC².

- 2.2. **Beep On New Run.** The Judge now “beeps” whenever a new run arrives and the Judge’s grid was empty (this was one of our most-requested enhancements ☺). The beeping can be disabled via the Judge’s “**Settings**” screen.
- 2.3. **Uniform Output File Viewing.** The formatting of the output windows comparing team program output to the “answer file” has been improved; specifically, issues such as variable-width fonts which were causing difficulty in making line-by-line comparisons between output windows have been fixed.
- 2.4. **Execution Runtime Error Detection.** The Judge’s ability to detect certain types of runtime errors which occur during contestant program execution has been significantly improved. It now checks the “return code” from each run and, if the return code is not zero, it displays the error code value. Note that error code values and their corresponding meanings vary among different platforms; nevertheless, showing the error code value provides at least an indication that some kind of runtime error occurred (previously there was no provision for displaying this if the underlying language runtime system did not explicitly provide it).
- 2.5. **Confirm Dialog When Answering a Clarification.** The judge now displays a confirmation dialog showing the answer and who is receiving the clarification (the specific team or all teams).
- 2.6. **Previous Judgment Visible.** When re-judging a run the previous judgment is now shown in red underneath the Judgment combo-box.

3. Admin Module / Contest Configuration

- 3.1. **Change-Password Control.** The Admin can disable the Team’s ability to change their password (see the Team section, above).
- 3.2. **Default Contest Length.** The default value for the time (in minutes) when teams can no longer view Judge’s responses to runs was changed from 240 (4 hours) to 300 (5 hours). This makes

the default value consistent with the length of the ICPC World Finals as well as the majority of ICPC Regional Contests. The value can still be changed by the Admin.

- 3.3. **Configurable Penalty Points.** The number of penalty points assigned to incorrect runs is now configurable (instead of being hard-coded at 20 as it was before). This item is configured by using the Admin→Options→General→Scoreboard screen.
- 3.4. **Configurable Judge’s View of Team Identification.** The Admin now has more control over what identifying data about a Team is visible to a Judge. Specifically, the Admin can specify that the Judge can see either the Team Name, the Team Number (ID), both of these, or neither of these. This configuration item is found on the Admin→Options→General→Judge screen.
- 3.5. **Data File Format Conversion.** A warning message is generated if the Admin attempts to load a problem data file whose format appears to be inconsistent with the current operating system (for example, loading a text file created in DOS format – i.e., with lines terminated by CR/LF – into a Unix system). If this happens, the Admin is given the option to either load the file as-is, or to have PC² automatically convert the file to the host operating system format.
- 3.6. **Configurable Output Limit.** The upper limit, in kilobytes, for output produced by a Team’s program is now configurable. Any output produced by a Team program in excess of the configured value is discarded and a notification is added to the end of the output listing. The default value is 512 (KB).
- 3.7. **Reports.** The Report Generation tab (“Reports”) contains a new option (#9) to generate a report showing, for each problem, the team which was the fastest to solve that problem and what language was used. Also, all reports which display lists of runs now include a field (“JBy”) identifying which judge rendered the judgment on the run.
- 3.8. **Improved Handling Of Input Changes.** When the contest administrator edits a contest problem configuration and hits “Update”, the system now automatically checks to see whether the original data file for the problem has been changed. If so, it asks if the new data file should be loaded into the system. (This fixes a ‘gotcha’ where users were both changing a data file and making other changes to the problem configuration; previously it was necessary to explicitly re-select the data file in order for the updated version to be loaded.) A similar issue related to specification of an external validator was also fixed.
- 3.9. **Configurable Compare Option.** Contest problems can be configured so that displaying a “compare window” to the Judge is optional (previously, every execution of a run on the Judge would automatically pop up a “compare window”).
- 3.10. **Flexible Contest Reset.** The “reset contest” function now includes the ability to optionally remove problem and/or language definitions as well as clearing all runs and clarifications from the system. This is useful for switching between contests (for example, from a practice session to a real contest) where it might be desired to retain some configuration data will removing other data.
- 3.11. **Flexible Execution Command Line.** When configuring a language, the execution command line (the command used to invoke a compiled team submission) is now allowed to contain arguments to be passed to the command.

- 3.12. **Information Added to Exit Confirmation Dialog.** If there are un-judged runs in the contest and the contest is currently stopped, the exit dialog top line will show a warning with a count of un-judged runs.

4. Scoreboard Module

- 4.1. **Honorable Mention Computation.** The algorithm used to compute the values for determining the formatting of the scoreboard output screen “final.html” was changed. This screen displays standings according to the format specified for the ICPC World Finals, where only the teams qualifying for medals have their individual ranks and scores displayed; teams below the medal teams are assigned a rank that is equal to that of all teams solving the same number of problems (with no individual scores displayed), and teams solving less than the median number of problems solved are listed together in an “Honorable Mention” category. Previously, teams solving less than the average (mean) number of problems solved were listed in “Honorable Mention”; the median is now used instead as the breakpoint for this category.

Note that this change affects *only* the computation of the break-point between teams in the “Honorable Mention” category and those which have their ranking displayed; it does *not* affect the scoring algorithms which are used in the scoreboard to compute rankings, nor does it affect any other display except the “finals.html” display.

- 4.2. **Default Display Names.** “UseTeamAndSchoolName” is now the default for scoreboard displays (instead of “UseSchoolName”). Entries in the `pc2v8.ini` file [admin] section can still be used to select any desired display choice, as shown in the complete manual.
- 4.3. **XML friendly.** The static portions of the generated html now conform to XML syntax.
- 4.4. **Miscellaneous.** Various changes were made to improve the readability of the information displayed on the scoreboard.

5. Server Module

- 5.1. **Version Consistency Enforced.** Because of internal differences between PC² Version 8.6 and previous versions, a V8.6 server in a multi-site contest will not accept connections to servers running previous versions of the code. In other words, if any server in a multi-site contest is running V8.6, then all servers must be running V8.6; the server enforces this constraint.
- 5.2. **Command Line Option Format.** When specifying server options on the command line while starting a server, the preferred form for options whose name is more than a single character is to precede the option name with a “double dash”, for example

```
pc2server --first --site CSUS
```

The old format (single dash for multi-character options) is now deprecated.

- 5.3. **Additional Command Line Options.** The server now accepts a wider variety of command line parameters to control its operation. Use the commands

```
pc2server -h  
or  
pc2server --help
```

to obtain a listing of accepted command line parameters.

6. Bug Fixes and Internal Changes

- 6.1. If an ICPC team database has previously been loaded and subsequently a “Load PC² Data” operation is performed, the Load operation will prompt asking whether you wish to retain the Team names previously defined from the ICPC data import operation. (Previously, the Load function simply overwrote the ICPC data.) Note that it is still the case that using the “Load ICPC Data” function will overwrite any previously loaded team names.
- 6.2. Improved system handling of team runs which generate runtime errors. It is the case that the occurrence of certain runtime errors during the execution of a team’s program can cause the team program to produce no output (for example, due to operating system buffering issues). Previously, PC² simply displayed the message “No Output” for the results of such runs, which could be misinterpreted as meaning that the program successfully ran to completion but produced no output (as opposed to the program having generated a runtime error). Now, the system displays a more detailed message explaining what happened.
- 6.3. Fixed an error which caused the system to incorrectly reject certain valid forms of XML result files returned by validators.
- 6.4. Disabled the functionality to “reset all sites” from a single administrator console. This mechanism was causing subtle synchronization issues in control between sites. Hopefully a way will be found to reintroduce this functionality in a future version.
- 6.5. Fixed an issue which under certain conditions allowed the “Timer” window showing the run time of a team program to be dismissed before the run had completed execution or been properly terminated.
- 6.6. Fixed an issue which could cause the system to fail to locate the built-in PC² validator program under certain conditions.
- 6.7. Fixed a problem which under certain conditions could cause team programs reading from “stdin” to hang indefinitely.
- 6.8. Improved the output of several reports generated via the Admin “Reports” tab.
- 6.9. Fixed a Unix-specific issue which could cause inability to execute an external validator program under certain conditions.
- 6.10. Fixed a bug in the scoreboard related to improper handling of team accounts marked as “disabled”.
- 6.11. Corrected an error in the “head” section of the HTML generated by the scoreboard.

- 6.12. Modified the Judge so that multiple occurrences of the built-in “file viewer” are no longer displayed when switching between different team runs.
- 6.13. Fixed a bug which kept the user from viewing the “Answer File” for a problem if the problem had been configured without a data file.
- 6.14. Fixed a bug which caused “Additional Files” selected on the Team interface to not be properly transmitted to the Judge during program execution.
- 6.15. Communication between multiple servers was modified to fix a potential hang.
- 6.16. Communication between servers and team clients was modified to improve the efficiency and security of the system.
- 6.17. Fixed a bug where servers which disconnect correctly were not showing as disconnected.
- 6.18. Fixed a bug in the Admin “Team Status” screen which was causing multiple invocations of status updates (the data was previously being displayed correctly, but in an incredibly inefficient way).
- 6.19. Improved several “error display” messages to clarify to the user what kind of error has occurred and what possible options are available.
- 6.20. Changed the handling for numerous error conditions so that in addition to simply logging the error in the log file, an error message dialog is displayed for the user.
- 6.21. Fixed an error in the Admin “Import ICPC Data” operation which was causing the Contest Title from the imported data to not be loaded into PC² correctly.
- 6.22. Fixed various issues related to screen formatting differences between Windows and Linux.
- 6.23. Fixed several timing issues related to starting and stopping of external processes in both the team and judge modules.
- 6.24. Modified the operation of the Admin→Time/Reset→ContestTimes screen to eliminate a possible scenario where the user could edit the contest time data in a way that was not self-consistent.
- 6.25. Made various rearrangements in a number of GUI screens for improved readability.
- 6.26. Judge GUIs showing Clarifications now obey the “Team Info Displayed to Judges”.
- 6.27. Judge windows no longer pile up, compare/answer file/data file windows are now disposed of properly.
- 6.28. Improved I/O Error handling on server.