

# **Pylot / Co-Pylot / eCo-Pylot: Software For Collecting, Storing, and Analyzing Supercomputer Performance Data into Databases**

**Daniel W. Barnette (1422)  
Sandia National Laboratories  
Albuquerque, New Mexico**

**Application to Review and Approval  
for open-sourcing Pylot, Co-Pylot, and eCo-Pylot  
to the public**



# Pylot Main Screen

**74 PYLOT - Sandia Job Submission and Database Analysis Tool**

HOST INFO | CVS/SVN ACCESS | COMPILER | SETUP | RUN | STATUS | POST-PROCESS | MySQL ACCESS

-- MySQL ACCESS TAB --

Reset Form | Help | **Quit PYLOT**

Email problems, comments, or suggestions to [pylot-help@sandia.gov](mailto:pylot-help@sandia.gov)

**PYLOT**  
Sandia Job Submission and Database Analysis Tool  
Version: 0.1  
Username: dwbarne  
Hostname: S930567 (Windows)  
Working Directory:  
Python - Pylot Job Submission and Analysis Tool

Save-state file: test2.sav | **SAVE state**

Restore-state file: | **RESTORE state**

**PYLOT home page**

**CONNECT TO MySQL SERVER**

Username: root  
Password:   
Server: localhost  
Port: 3306  
**Reset**

Not connected  
 Attempting to connect  
 Connected

**Connect** | **Disconnect from server**

**DATABASES (select to show Tables)**

- tests
- demo
- information\_schema
- mantevo
- mysql
- sc10\_poster\_data
- temp
- template\_co\_pylot
- templates\_usage\_stats
- tests
- usage\_stats

Databases: 12

**TABLES IN DATABASE (select to show Fields)**

- tlcc\_temp
- copy\_tlcc\_temp
- my\_copy\_delete\_this
- orig\_tlcc\_temp
- rename\_copy\_tlcc\_tem
- tlcc\_temp

Tables: 5

**FIELDS IN TABLE (listed in column order)**

- 1. date
- 2. machine
- 3. test\_name
- 4. mpi\_tasks
- 5. cpu\_time
- 6. cpu\_time\_2
- 7. auto\_index

Fields: 7

**Create** **Delete** **Create** **Delete** **Add** **Delete**

**Rename database** **Table functions** **Edit field name**

**Backup & Restore Databases and Tables**



# Pylot Filter

7x Table: ticc\_temp, Database: tests

SELECT & DISPLAY ORDERED FIELDS  
FOR TABLE "ticc\_temp"  
IN DATABASE "tests"

Drop-down menus use data from displayed table,  
but "Display" accesses data from database server, not the displayed table

**SELECT**

All columns  
 Y-Select columns

**WHERE**

Fields	Operators	string or numbers (do NOT use quotes)
	<input checked="" type="radio"/> NOT	<input type="button" value="Deselect"/>
1. <input checked="" type="radio"/> (		
2. machine	=	Unity
	<input type="radio"/> OR <input checked="" type="radio"/> AND <input type="radio"/> AND NOT <input type="radio"/> XOR	<input type="button" value="Deselect"/>
2. <input checked="" type="radio"/> (		
3. test_name	=	Sierra/Presto
	<input checked="" type="radio"/> OR <input type="radio"/> AND <input type="radio"/> AND NOT <input type="radio"/> XOR	<input type="button" value="Deselect"/>
3.		
3. test_name	=	miniFE
		<input checked="" type="radio"/> )

**ORDER BY**

Fields	Sort Order
1. 3. test_name	<input checked="" type="radio"/> Ascending <input type="radio"/> Descending
then by	
2. 7. auto_index	<input type="radio"/> Ascending <input checked="" type="radio"/> Descending
then by	
3. 5. cpu_time	<input checked="" type="radio"/> Ascending <input type="radio"/> Descending



# Pylot Bar and Pie Charts

VALUES FOR TABLE "my\_copy\_delete\_this"

mpi_tasks	cpu_time	cpu_time_2	auto_index
4	5	6	7
2	4.37	1.457	1
4	5.37	1.79	2
8	5.77	1.923	3
16	6.28	2.09	4
32	7.93	2.643	5
64	9.88	3.293	6
128	13.25	4.417	7
256	16.08	5.36	8
512	23.02	7.67	9
1024	38.75	12.9167	10
25	11.6	3.86667	11
275	10.7	3.56667	12
7	2.88	0.96	13
40	60.88	16.27	14

Sorted summary and statistics  
Field: "mpi\_tasks"

No.	Count	Field_Value
1	1	2
2	1	4
3	1	7
4	1	8
5	1	16
6	1	25
7	1	32
8	1	40
9	5	60
10	1	64
11	13	90
12	1	128
13	1	256
14	1	275
15	1	512

Statistics for Field\_Value (assumes data are normally distributed)

Total entries: 32

Minimum: 2      Maximum: 1024

Mean: 120.719      Median: 90.00

Sample Std Dev'n: 191.173      Std Error: 33.75

95% Confidence Interval: 54.481 to 186.9

Statistics help from web: [Ref 1 - Streiner](#) [Ref 2](#)

Bar Chart      Pie Chart

adjust bar chart      adjust pie chart      close 'ac

Cancel

Figure 1000  
from table 'my\_copy\_delete\_this' (total item count = 32)

Field Value	Number of Occurrences
2	1
4	1
7	1
8	1
16	1
25	1
32	1
40	1
60	5
64	1
90	13
128	1
256	1
512	1
1024	1

from table "my\_copy\_delete\_this" (total item count = 32)

Field Value	Percentage
2	3.1%
4	3.1%
7	3.1%
8	3.1%
16	3.1%
25	3.1%
32	3.1%
40	3.1%
60	15.6%
64	3.1%
90	40.6%
128	3.1%
256	3.1%
512	3.1%
1024	3.1%
275	3.1%
7	3.1%

# Pylot Storage Buffer

7x Storage buffer X

**STORAGE BUFFER**  
 (stores select data for X-Y and Kiviati plots)

Field width:  Field height:  Field font:  Reset

Refresh display

Show user fields

Pickle select rows to file

unPickle file to buffer

Save select rows to CSV file

Read/append CSV file to buffer

Purge duplicates from buffer

Auto-Sort on selected column

Move selected row

Delete select rows

Clear buffer

x_header	y_header	first (x,y) pair	last (x,y) pair	database	table
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	7	8	9	10	11
mpi_tasks	cpu_time	(2, 4.37)	(90, 112.0)	tests	tlcc_temp
mpi_tasks	cpu_time_2	(2, 1.457)	(90, 37.3)	tests	tlcc_temp

1  
 2

^  
Clear/Select all

Total rows:  Total cols:

FORM A NEW ROW

-----

Using 4 or less selected rows, form a new buffer row by math combinations of row elements.

FORM new row

UPDATE X-Y PLOTS

-----

Using selected rows, update number of buffer plots in X-Y Plotting Specs window.

UPDATE x-y plots

Cancel

# Pylot Storage Buffer – Row Generator

**7%** Storage buffer
✕

**STORAGE BUFFER**  
(stores select data for X-Y and Kiviat plots)

Field width:  Field height:  Field font:

x_header	y_header	first (x,y) pair	last (x,y) pair	database	table
6	7	8	9	10	11
mpi_tasks	cpu_time	(2, 4.37)	(90, 112.0)	tests	tlcc_temp
mpi_tasks	cpu_time_2	(2, 1.457)	(90, 37.3)	tests	tlcc_temp

X-Header	Y-Header	Row # (select)	Functions	Keypad
<input type="text" value="mpi_tasks"/>	<input type="text" value="cpu_time"/>	<input type="text" value="1"/>	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/>
<input type="text" value="mpi_tasks"/>	<input type="text" value="cpu_time_2"/>	<input type="text" value="2"/>	<input type="button" value="*"/> <input type="button" value="/"/>	<input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="**"/>	<input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value("(""=""/> <input type="button" value=")"/>	<input type="button" value="0"/> <input type="button" value="."/>

New row =

Insert into "Y-Header" field below, using Y-Header labels above:

---

FIELDS FOR NEW ROW  
(User changeable, except for Database and Table entries)

X-Header:  Y-Header:

Database(s):  Table(s):

user comment:

user\_field 1:

user\_field 2:

user\_field 3:

user\_field 4:

**7%** Form New Row
✕

**STORAGE-BUFFER ROW GENERATOR**

Row Selection

**7%** Storage buffer
✕

1

2

Tot row

# Co-Pylot: For transferring user info and files to a database

**Co-Pylot: Transfer user file/data to MySQL database table**

Co-PYLOT: Send Name and Contents of Test Files to a MySQL Database Table  
(all user fields optional except OUTPUT file)

User:  Current directory:  Local hostname:  Date:  Time of last send:

INPUT file (sample)    OUTPUT file (REQUIRED INPUT)     just this file  MAKE file (sample)    SOURCE file (sample)

INPUT file dir  OUTPUT file dir   all 00/00 files with extension   all 00/00 files that begin with  MAKE file dir  SOURCE file dir

all 00/00 files that contain the phrase   all 0 files in this directory

EXECUTABLE file (sample)    Machine on which executable was run   Tester's name first:  last:   QSUB file (sample)

EXECUTABLE file directory  QSUB file dir

Copy/Paste compile line (sample)   Copy/Paste execute line (sample)

User comments (approx 8,000 characters max)

**CONNECT TO MySQL SERVER**  
(skip if saving to file)


Username:   
Password:   
Server:   
Port:

Not connected  
 Attempting to connect  
 Connected

STATUS

DATABASES (select to show Tables ->):   
TABLES IN DATABASE (select target table):

Databases: 0 Tables: 0



# **eCo-Pylot: an Email Parsing Script**

---

**Goal: to allow the user to easily and quickly insert performance data into a database using a familiar work-flow model: email**

**eCo-Pylot is a Python script that performs the following functions:**

- Intercepts emails sent to a specially designated email account**
- Parses email to extract attachments (performance-data files) and user info (like username, date, time, etc.)**
- Automatically inserts parsed information into a pre-formatted database, to be analyzed using Pylot**