



Krakatau Essential PM (KEPM)

***ADA, Assembly, ASP, C#, C/C++, CSS,
Fortran, IDL, HTML, Java, JavaScript, JSP,
Perl, PHP, PL/SQL, Python, Ruby,
ShellScript, Textfiles, VB6 / VB.NET /
VBScript, VHDL, Windows Batch and XML***

User Guide

1.12.3.0

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Document

Purpose

This document is an Installation and User Guide for the Krakatau Essential PM graphical source code metrics tool. It describes how to use KEPM to generate metrics results. It does not describe in detail how to use the command-line backend – Essential Project Manager (EPM) – this detail is covered in a separate EPM User Guide.

Readership

This User Guide is intended for end-users, system administrators. Management and non-technical users should refer to our website – <http://www.powersoftware.com/kepm/>

Version History

1.00.006	24-Jan-2006	179 : Readonly Project Filename box, limit Project Title to 30 non-space characters
1.01.001	14-Feb-2006	185 : Saved Project List request
1.01.002	13-Mar-2006	199 : Ensure Ada files are compared correctly
1.01.003	15-Mar-2006	202 : Correct summed/calculated Halstead project metrics
1.01.004	18-Mar-2006	210 : Added Deselect to right-click menu
1.02.000	26-Mar-2006	213 : Retrieve EPM Analysis options from project.txt.epm.cmd file
1.02.001	10-Apr-2006	230 : Ensure Ada parsing is case-insensitive
1.02.002	02-Jun-2006	252 : Released including EPM 1.10.003.
1.02.003	06-Jun-2006	255 : Released including EPM 1.10.003.
1.02.005	08-Jun-2006	243 : Correctly remembers the file types chosen for the project when it was created.
1.02.006	14-Jun-2006	268 : Better error handling during project creation.
1.02.007	15-Jun-2006	258 : Development of Metric Sets in KEPM.
1.02.008	08-Jul-2006	258 : Completion of Metric Sets in KEPM.
1.02.009	12-Jul-2006	282 : Cancel button frozen on Metric Sets.
1.03.000	18-Jul-2006	272 : Added Changed Logical Lines of Code to EPM.
1.03.001	22-Jul-2006	291 : Added tooltips to Metric Sets buttons and Reporting options.
1.04.000	02-Nov-2006	117 : Added ASP language support.
1.05.000	10-Nov-2006	301 : Added PHP language support.
1.06.000	16-Jul-2007	314 : Added IDL language support.
1.07.000	26-Jul-2007	316 : Added VHDL language support.
1.07.001	28-Jul-2007	317 : Changed default VHDL extension to *.vdh
1.07.002	26-Oct-2007	319 : Remove duplicate files in projects before analysing
1.07.003	01-Nov-2007	321 : Ensure Logical Lines are calculated corrected in Ada, ASP & C/C++/Java.
1.07.004	28-Nov-2007	323 : Resolved issues with missing PHP metrics.
1.08.000	11-Dec-2007	324 : Added JSP Parsing 325 : Added XML Parsing 327 : Ensure MySQL Databasename contains only valid characters.
1.08.001	14-Dec-2007	
1.08.002	04-Jan-2008	338 : Added MetricsDefinitions.pdf to Help menu
1.08.003	24-Apr-2008	359 : LLOC whitespace causing erroneous Diff values 355 : LLOC mismatch – C++-Style comments within C-style comments

		356 : DEL_LLOC not being output to CSV file 357 : CHG_SLOC not being output to reports when using Metric Sets.
1.08.004	26-Apr-2008	360 : Build issues caused by compilation of EPM under VS2008 (upgraded from VC++6).
1.09.000	30-May-2008	366 : Bundle EPM 1.16.005.
1.10.000	18-Apr-2009	10433 : Incorporate latest language additions to EPM: 10400 : Added JavaScript Language (JT) 10401 : Added HTML Language (HT) 10402 : Added Assembler Language (AY) 10403 : Added Python Language (PY) 10415 : Perl parser optimisation 10416 : C# parser optimisation 10418 : XML parser optimisation 10420 : Ada parser optimisation 10421 : ASP parser optimisation 10422 : C/C++ parser optimisation 10424 : Java parser optimisation 10426 : PHP parser optimisation 10428 : VB parser optimisation 10430 : Add Churn metrics (CRN_SLOC, CRN_LLOC & CRN_FILE)
1.10.1.0	30-Apr-2009	10437 : Allow use of empty file extension using space (" ") and exclude directories in filelist
1.10.2.0	05-May-2009	10441 : Ensure free text within HTML is counted as SLOC.
1.10.3.0	12-May-2009	10445 : Ensure commas in filenames do not disrupt CSV reports.
1.10.3.1	18-Jun-2009	10447 : Enabled installation on any drive other than C:.
1.11.0.0	27-Jul-2009	10454 : Add Text files (TX) Language to EPM 10453 : Add Shell Script (SH) Language to EPM 10457 : Investigate Intel Issue: EPM crash parsing 'MKL sources' 10451 : Add Fortran (FT) Language to EPM
1.12.0.0	22-Aug-2009	10450 : Added CSS Stylesheet (SS) Language to EPM 10452 : Added Ruby (RB) Language to EPM 10455 : Added Windows Batch File (WB) Language to EPM 10456 : Corrected issue with Halstead Bug Prediction (B) rounding to 0 or 1. 10461 : Added Check/Uncheck All to New Project Wizard
1.12.2.0	15-Sep-2009	10479 : Add PLOC (Preprocessor LOC) for Preprocessor Directives to C/C++ and Assembly 10483 : Add logging to EPM 10484 : Add logging to KEPM 10488 : File extensions that do not exist in EPM.XML are excluded
1.12.3.0	27-Oct-2009	10496 : Ensure integrity of build (following missing files in 1.19.2.0).

Installation

Installing Krakatau Essential PM

Unzip the downloaded file and double-click on setup.exe. Follow the installation prompts, clicking Next through the wizard as normal.

If you accept the defaults, Krakatau Essential PM will be installed in:

C:\Program Files\Power Software\Krakatau EPM

Installing MySQL (optional)

If you wish to use an existing MySQL server in the organisation, you can do so using the `-s` (and `-u/-p` if required) parameter.

Otherwise, a local MySQL database will be started implicitly as Essential Metrics runs.

Installing Krakatau Essential PM on Microsoft Windows Vista

Vista's User Account Control prevents EPM from installing and starting the MySQL service. A simple solution to this problem is to install MySQL separately, and reference accordingly within KEPM or to the command-line of EPM.

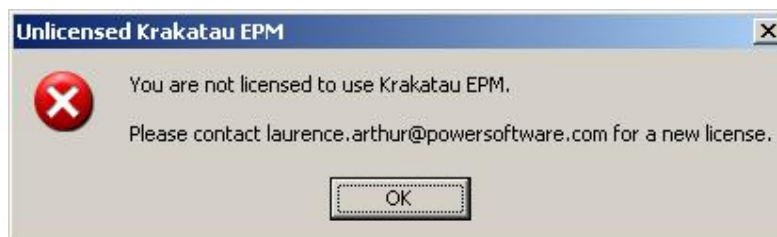
Please follow the instructions in the **KEPM_Vista_MySQL** User Guide – which accompanies the KEPM installation.

Now follow the instructions in section **Setting Preferences** in this document to configure your default MySQL Connection properties.

Installing a License

You must obtain either a time-locked (for testing) or node-locked/floating (following purchase) license from Power Software. The recommended way to install the license is to place it where you installed Essential Metrics (see default directory above) and then simply launch Krakatau EPM from Start – Programs – Power Software – Krakatau EPM. This will prompt for you to Browse to the license.dat file.

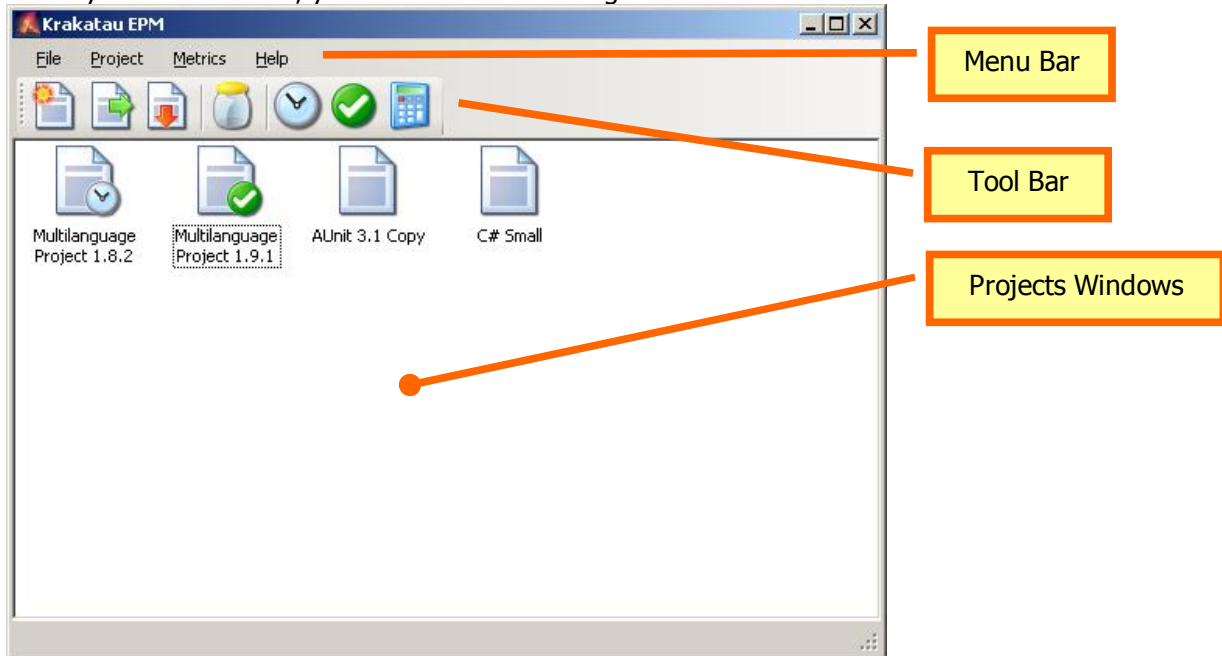
If you do not have a valid license, you will see the following dialog on startup:









Using Krakatau Essential PM

Startup

When you launch KEPM, you will see the following window:

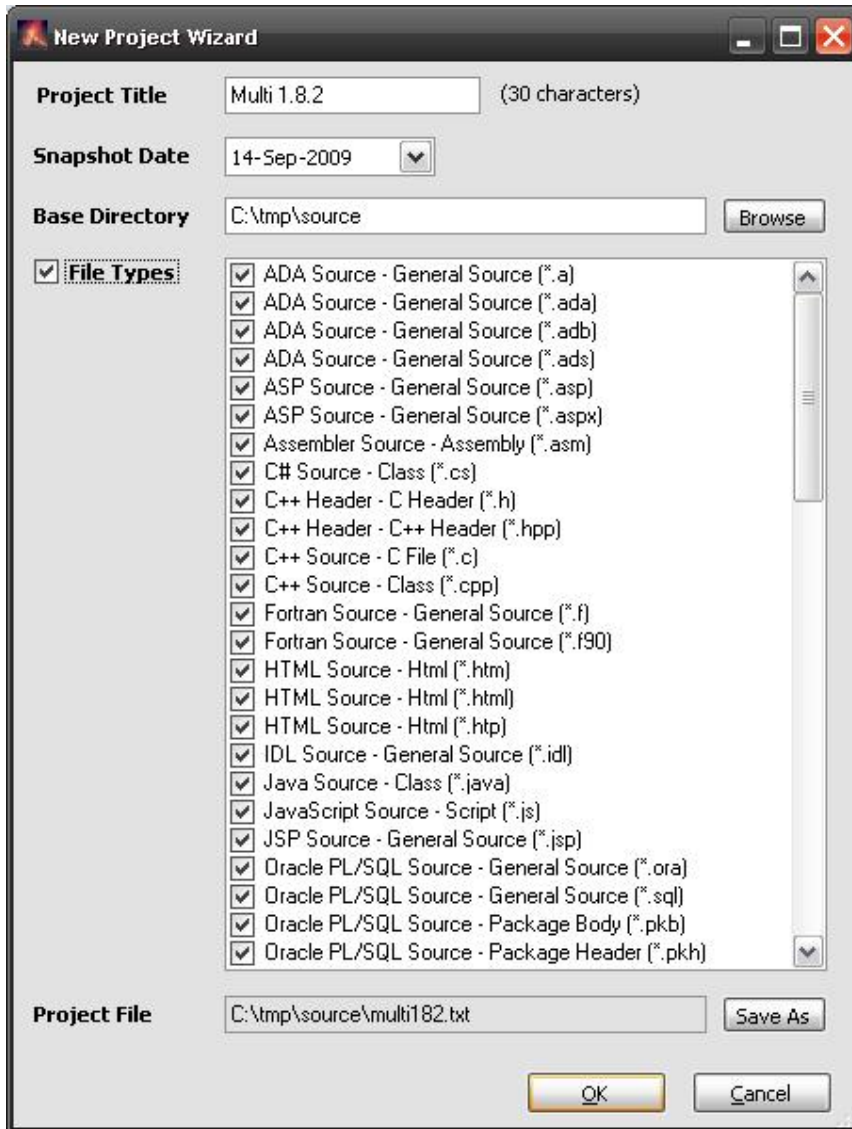


As with other applications, there is more than one way to carry out an operation. We will describe operations using the application Tool Bar:

-  New Project wizard – allows you to create new project files containing a Project Title, Snapshot date, Base directory and actual source files in the project.
-  Open an existing Project file.
-  Remove a Project from the Projects windows.
-  Open the Metric Sets dialog and add, edit and delete Metric Sets.
-  Set the currently selected Project as the Old Project.
-  Set the currently selected Project as the New Project.
-  Analyse. If Old and New Projects are selected, perform a Project comparison, otherwise a Single Project analysis.

Creating a Project

To create a new Project, click the New Project Wizard toolbar button.



Enter **Project Title** (a name for the Project, representing the software and possibly a version number)

Choose the **Snapshot Date** – the date the source was extracted or labelled.

Browse to the **Base Directory** for the source code – the top-level directory where the source may be found.

If required, select the file types you require in the Project.

You may use the checkbox beside **File Types** to Check/Uncheck All.

Finally, click **Save As** to save the Project file.

When you click OK, the Base directory will be examined (and all subdirectories below it) for the types of files you have selected. These files, along with the Project Title and Snapshot date are then stored in the Krakatau EPM Project file you chose.

Note: as well as the Project file (in the example above 'mn105a.txt'), a Windows command file with the extension .cmd will also be created (e.g., 'mn105a.txt.cmd'). Experienced users can use these sample command files to create their own Project files. They may be deleted, if not required. Each time you create a New Project, KEPM creates a command file for it.

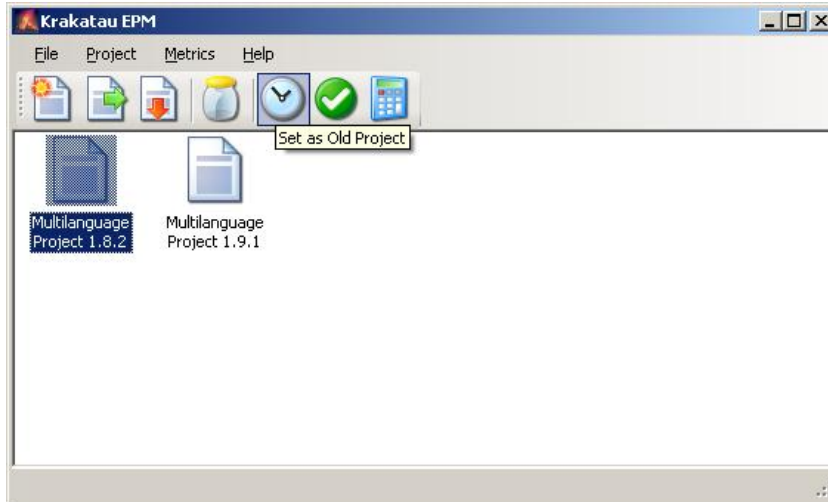
Once the Project file has been created it will appear in the Project window.

Opening an Existing Project file

If you have previously created a Project file, you may open it in Krakatau EPM using the Open Project toolbar button. This loads the file into the Projects Window.

Setting Old and New

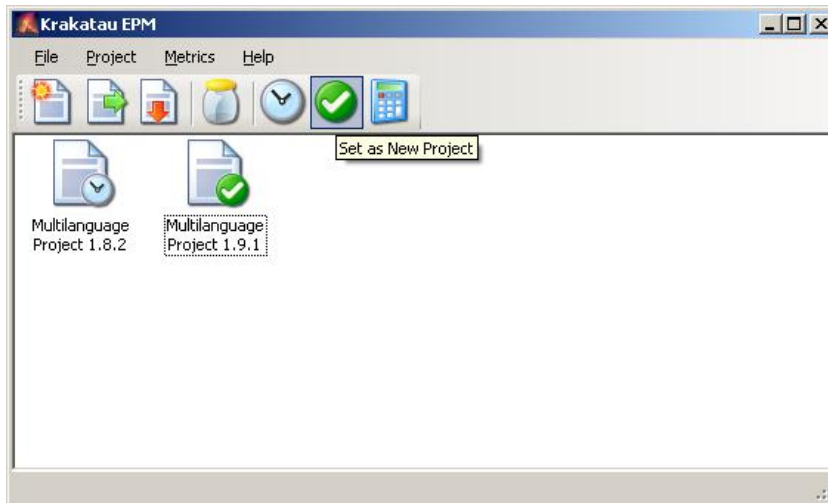
When you have a Project open, you can click on it then choose either Old or New toolbar buttons:



The **Multilanguage 1.8.2** Project has been selected. By then clicking the Old button, it will get a clock icon.

If we then click the **Multilanguage 1.9.1** Project and click the New button, it is highlighted in green, as below.

You may also right-click on a Project and choose Set as Old or Set as New from the popup menu.



We are telling Krakatau EPM that **Multilanguage 1.8.2** is the Old Snapshot of the source, and that **Multilanguage 1.9.1** is the New Snapshot.

When comparing these projects, **Multilanguage 1.9.1** will be examined with reference to **Multilanguage 1.8.2**.

For instance, a file that existed in **Multilanguage 1.8.3** but no longer exists in **Multilanguage 1.9.1** is considered to have been deleted. Source Lines that exist in a file in the new Project but not in the old are New Source Lines.

If you only set a New Project, Krakatau EPM will perform a Single Project analysis, with no changed information.

Setting Preferences

Krakatau EPM preferences allow you to configure the default MySQL connection properties. This is especially useful for Microsoft Windows Vista users, who will have opted to install MySQL separately from Krakatau EPM.

To set Preferences, select **Project – Preferences...**

If you have followed the Vista MySQL User Guide, you will need to set:

Server to **localhost**
 Username to **root**

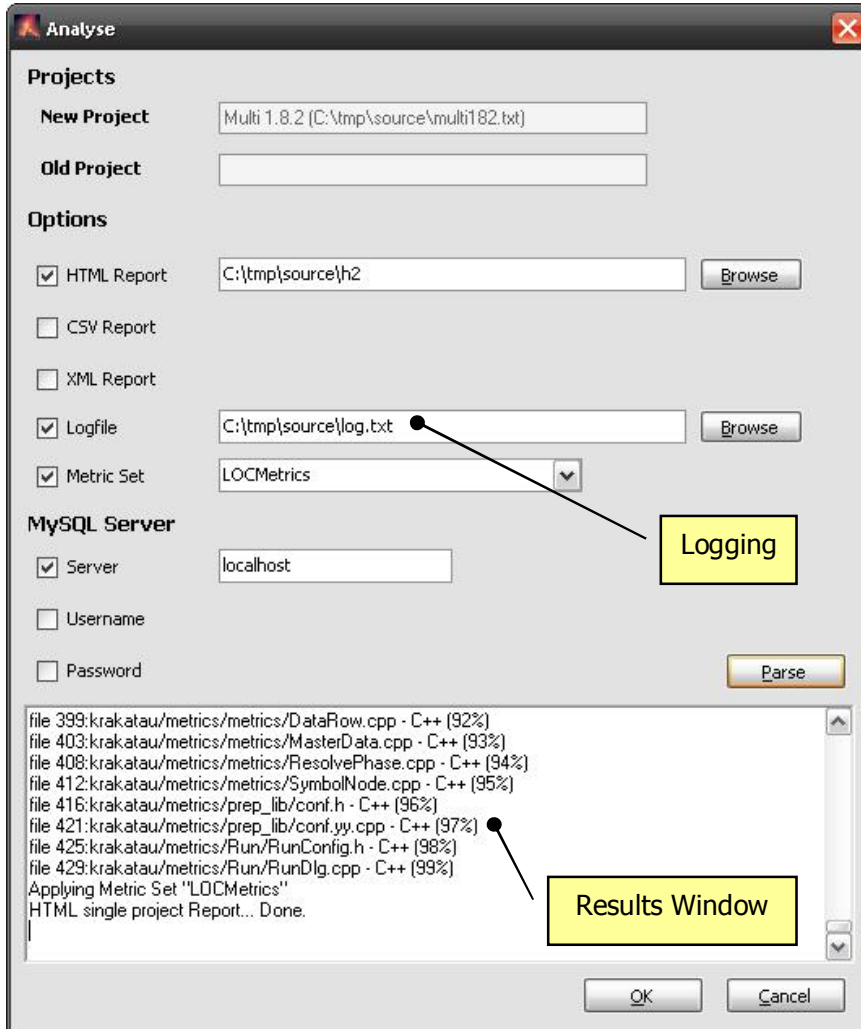
The password will be as you configured during MySQL Installation.

To ensure these settings are set as the defaults for new projects, check the appropriate box.

Click OK to save.

Analysis

To perform an analysis of your selected Project(s), click the Analyse:



The dialog tells you what the New and Old Projects are.

You can then select the reporting options you require – ticking a checkbox to force an option, and specifying files/folders in the textbox that appears. Use the Browse button if you wish.

Choose a Metric Set if you wish to filter the metrics that are output on the report.

If you have a MySQL server on your network that you wish to use, specify the hostname (Server) and user/password details as required.

When ready, click the Parse button.

The **Parse** button creates another Windows command file (e.g., called 'mn105a.txt.epm.cmd'). This is then executed and the results are shown in the Results Window. As the Projects are parsed you will see the analysis and differences, and finally the reports you have selected.

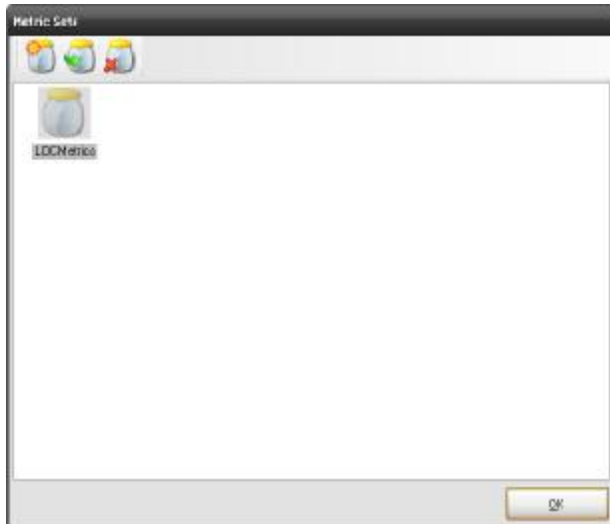
Each time you press **OK** or **Parse**, the .epm.cmd file is recreated, and this file is also used to retrieve your Analysis options when you reopen the project. The checkboxes you have ticked, and the values entered, will be retrieved from the .epm.cmd file and populated in this dialog the next time you Analyse, in the same KEPM session or at a later date.

If you select an HTML report, it will be launched in your default browser once parsing is complete.

Metric Sets

If you wish to limit the metrics that are output in your reports, you can define a Metric Set with only those metrics you wish to see. For example, your Project Manager is only interested in LOC, SLOC, the changed SLOC and the new changed LLOC.

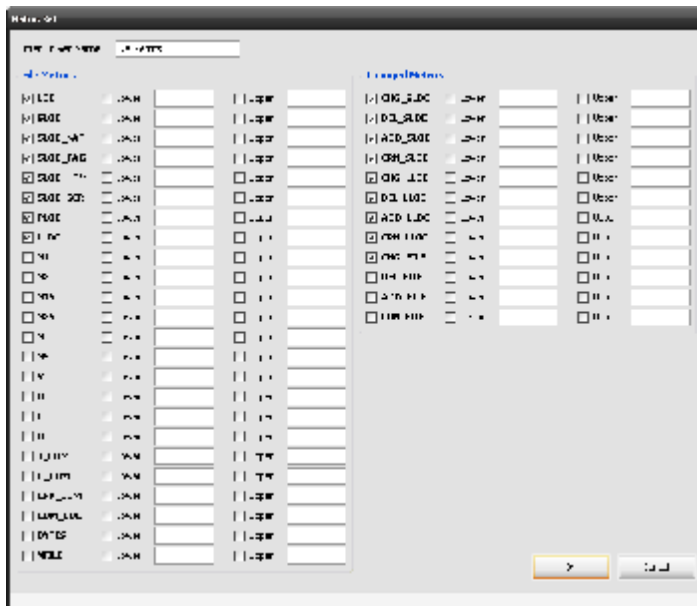
From the main application, click the Metric Sets jar icon, or choose "Metrics – Sets...":



In this example, we already have an existing set called "LinesComments". This set, and any we create, are stored in the epm.xml configuration file.

Let's create a new one for our particular metric interests.

Click the New icon (the first one) on the toolbar.



Enter a name for the metric set. Spaces are not allowed, and will be removed.

Check the box beside each metric code you wish to include in the set. The lower and upper bounds settings can also be set although they are not yet used by any EPM reports.

Click OK.

You can specify a metric set when you Analyse (see previous section).

FAQ

How does Krakatau Essential PM know which parser to use?

Krakatau EPM is supplied with a default XML Configuration file that instructs the tool to apply different languages parsers to the files based on the following file extensions:

Language	Extensions	Parser Code
ADA	.a .ada .adb .ads	AD
ASP	.asp .aspx	AS
Assembly	.asm	AY
C++	.cpp .c .hpp .h	CP
C#	.cs	CS
CSS	.css	SS
Fortran	.f .f90	FT
IDL	.idl	ID
HTML	.htm .html .htp	HT
Java	.java	JV
JavaScript	.js	JT
JSP	.jsp	JS
PHP	.php	PH
Perl	.pl	PL
PL/SQL	.sql .ora	S1
Python	.py	PY
Ruby	.rb	RB
Shell Script	.ash .bash .bsh .csh .sh .tcsh .tsh .zsh	SH
Textfile	.cvs .install .readme .tsv .txt	TX
VB.NET	.vb	VB
VB6	.frm .bas .cls	VB
VBScript	.vbs	VB
VHDL	.vhd	VH
Windows Batch	.bat .cmd	WB
XML	.xml .xsd .xsl .xslt .wsml	XM

All other files are treated as C/C++ files.

You cannot simply add a language of your own. EPM only understands the **Parser Codes** listed above. Should you need a new language not listed here, please contact us to discuss.

If you need to modify this configuration, you may edit the EPM.XML configuration file supplied with the tool, **but please take a backup before you start** and if you experience any errors and you report these, please **include your EPM.XML file** and state what you were trying to achieve.

The default file looks like:

<pre> <?xml version="1.0" encoding="UTF-8"?> <epm> <lang name="C++" parser="CP"> <filetype name="Source"> <ext name="Class" value="cpp" /> <ext name="C File" value="c" /> </filetype> <filetype name="Header"> <ext name="C++ Header" value="hpp" /> <ext name="C Header" value="h" /> </filetype> </lang> <lang name="C#" parser="CS"> <filetype name="Source"> <ext name="Class" value="cs" /> </filetype> </lang> ... </epm> </pre>	<p>This extract from the file shows the definitions for two Languages: C++ and C#.</p> <p>Within each lang entity there are filetype entities. The C++ Language has two filetypes: Source and Header. Each filetype then has one or more ext entities representing the file extensions that comprise the filetype.</p> <p>C# only has one filetype – Source – and a single extension – cs.</p> <p><i>Extensions are the characters after the last period (.) in the filename.</i></p>
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To add new `filetype` or `ext` entities, simply edit the file using a text editor, copy/paste an existing block and modify the name and value attributes accordingly.

The values in the **name** attributes are free-text. In a future version of EPM it will be possible to report on these values, including viewing files/metrics grouped by the same filetype (e.g. Source) across several languages.

If you have files that have no extension, you may use a value of " " (single space). This means that **all** files with no extension will be parsed using the language parser you have selected.

```
<ext name="MyFileType" value=" " />
```

The **parser** attribute of the **lang** entity must be one of the Parser Codes listed in the first table.

The **parser** attribute of the **lang** entity must be one of the Parser Codes listed in the first table.

What does line_type in CSV reports mean?

Line Type	Description	Meaning
C	Changed	The File/Project has Changed. This line gives details of the New File/Project and the original metrics can be found on a corresponding Old (O) line.
O	Old	Where a File/Project has Changed, the Old line will also be output to the CSV file.
X	Diff	Where a File/Project has Changed, the Diff line will also be output to the CSV file, showing the difference between Changed (C) and Old (O) lines.
U	Unchanged	The File/Project has not changed.
N	New	The File is New, it has been added to the Project.

Deleted files are not shown in CSV reports.

Why do I get ‘You do not have a valid license’?

If you have not requested a license from laurence.arthur@powersoftware.com, please do so. Once you have received this file (supplied as an attachment called 'license.dat'), please detach this to the folder in which you installed Krakatau EPM.

If there is an existing license.dat, overwrite it. Then try re-executing Krakatau EPM. If you continue to experience problems, send an email support@powersoftware.com with the License [Code] value you see on starting up KEPM.

What does the error stating the MySQL cannot start mean?

If you are relying on Krakatau EPM to start a MySQL database for you, please ensure that you wait a few seconds between running successive KEPM sessions. MySQL takes a moment or so to start and stop the service at the beginning and end of a KEPM session.

What do the Metric IDs and Codes mean?

We use a unique numeric code for each metric, as well as an alpha code which is more descriptive.

For efficiency reasons, these numeric codes may change between releases, when a new metric is inserted into the list. We upgrading, be sure to check your Metric Sets and any other interfaces that rely upon the Metric ID.

ID	Code	Description	Project	File
100	LOC	Lines of Code	✓	✓
101	SLOC	Source Lines of Code	✓	✓
102	SLOC_NAT	Source Native Lines of Code	✓	✓
103	SLOC_TAG	Source Tag Lines of Code	✓	✓
104	SLOC_HTM	Source HTML Lines of Code	✓	✓
105	SLOC_SCR	Source Script Lines of Code	✓	✓
106	PLOC	Preprocessor Directive Lines of Code	✓	✓
107	LLOC	Logical Lines of Code (semi-colon count – formerly NSC)	✓	✓
108	N1	Total No. of Operators		✓
109	N2	Total No. of Operands		✓
110	n1	No. of unique or distinct Operators		✓
111	n2	No. of unique or distinct Operands		✓
112	N	Halstead program Length (calculated as N1 + N2)		✓
113	n	Halstead program Vocabulary (calculated as n1 + n2)		✓
114	V	Halstead Volume (calculated as V = Nlog2n)		✓
115	D	Halstead program Difficulty		✓
116	E	Halstead program Effort (calculated as D * V)		✓
117	B	Halstead Bug Prediction		✓
118	J_COM	Java-style Comment Lines	✓	✓
119	C_COM	C-style Comment Lines	✓	✓
120	EOL_COM	To End of Line Comment Lines	✓	✓
121	COM_LOC	Total Comment Lines	✓	✓
122	BYTES	File size in bytes	✓	✓
123	NFILE	Number of Files	✓	
124	CHG_SLOC	Changed Source Lines of Code	✓	✓
125	DEL_SLOC	Deleted Source Lines of Code	✓	✓
126	ADD_SLOC	Added Source Lines of Code	✓	✓
127	CRN_SLOC	Churn Source Lines of Code (CHG_SLOC + DEL_SLOC + ADD_SLOC)	✓	✓
128	CHG_LLOC	Changed Logical Lines of Code	✓	✓
129	DEL_LLOC	Deleted Logical Lines of Code	✓	✓
130	ADD_LLOC	Added Logical Lines of Code	✓	✓
131	CRN_LLOC	Churn Logical Lines of Code (CHG_LLOC + DEL_LLOC + ADD_LLOC)	✓	✓
132	CHG_FILE	Changed Files	✓	
133	DEL_FILE	Deleted Files	✓	
134	ADD_FILE	Added Files	✓	
135	CRN_FILE	Churn Files (CHG_FILE + DEL_FILE + ADD_FILE)	✓	