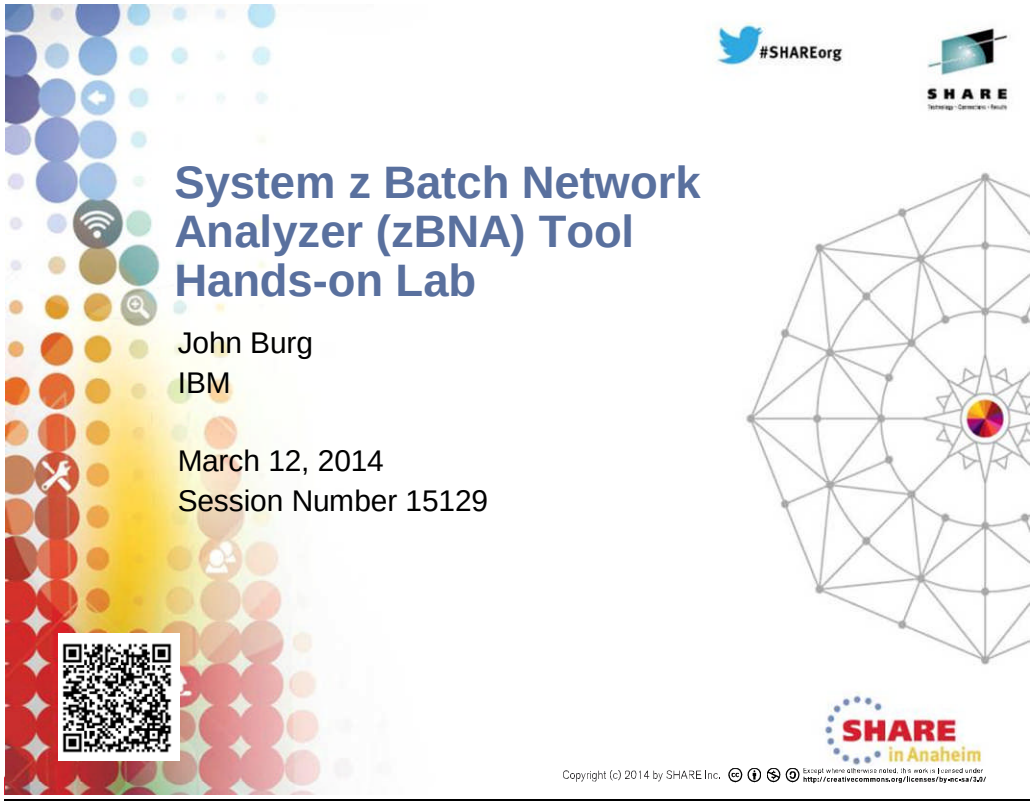
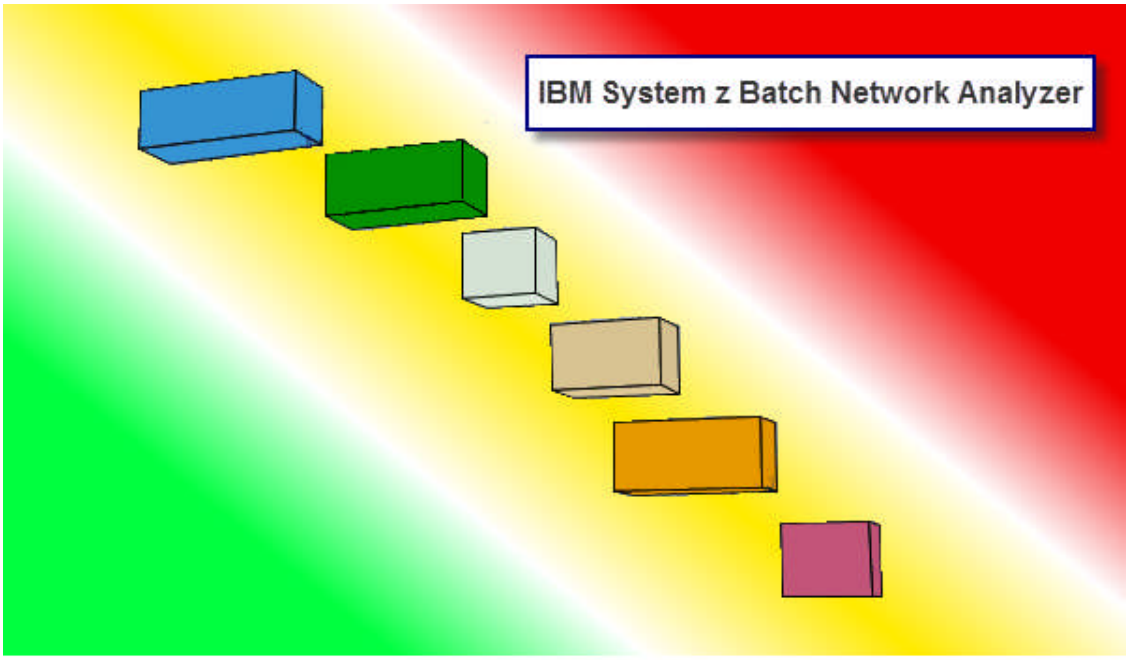

#SHAREorg
SHARE
System z Batch Network Analyzer (zBNA) Tool Hands-on Lab
John Burg
IBM
March 12, 2014
Session Number 15129
SHARE in Anaheim
Copyright (c) 2014 by SHARE Inc.



IBM System z Batch Network Analyzer © Copyright IBM Corporation 2013. All rights reserved.
Contains graphics software from
JFree Chart © 2005-2011 Object Refinery Limited

zBNA Lab Guide

zpcr@us.ibm.com
John Burg
Valerie Spencer

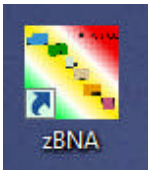
The purpose of this zBNA Lab is to provide an exercise in running the zBNA tool; utilizing its functions to successfully complete a simple Batch analysis.

In this exercise you will complete the following tasks:

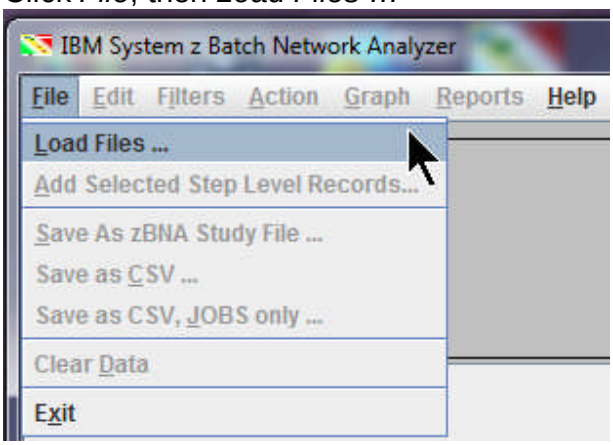
1) Explore the Main Screen
   Start zBNA and load in two data files
2) Filter Data
   - Use the job filtering capabilities (CPU time, Service classes, exclude jobs, key jobs and job masking) to select a subset of candidate Batch jobs
   - Save as zBNA File
   - Filter Top Program Pct
   - Load Step level records, and drill down into the Step details
3) Display a Graph and Create Reports
   Display the job subset created with the filters
4) Display SMF 42(6) DASD Dataset Analysis
   - Job/Dataset Report
   - Top 10 Dataset Report
5) Perform Alternate Processor Analysis
   Assess the impact of an alternate CPU technology
6) Explore zEDC Compression
   Identify data sets that will benefit from moving to zEDC cards
7) Save the final zBNA file

Task 1 - **Exploring the Main Screen**

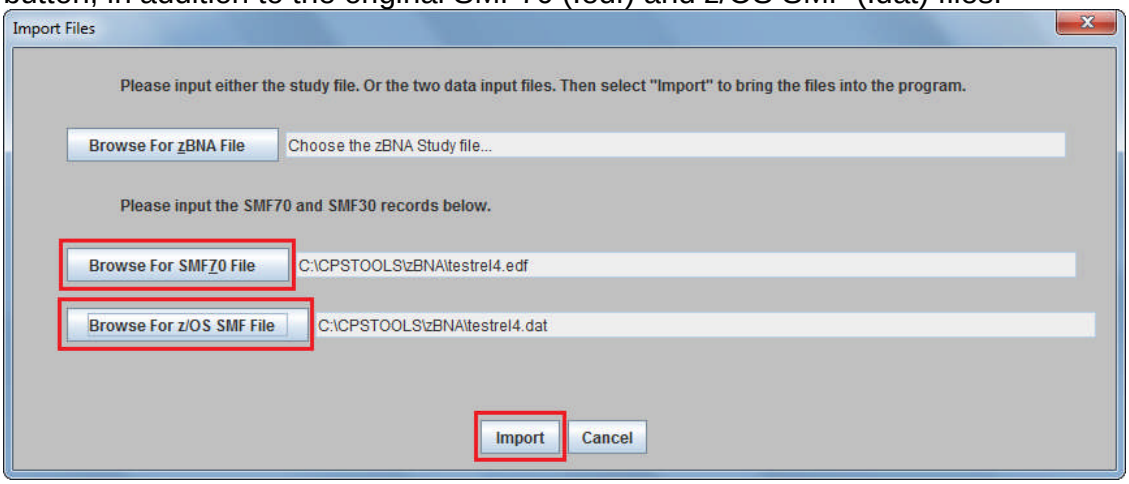
1. To start the System z Batch Network Analyzer (zBNA), first double-click the icon.



2. Click *File*, then *Load Files …*

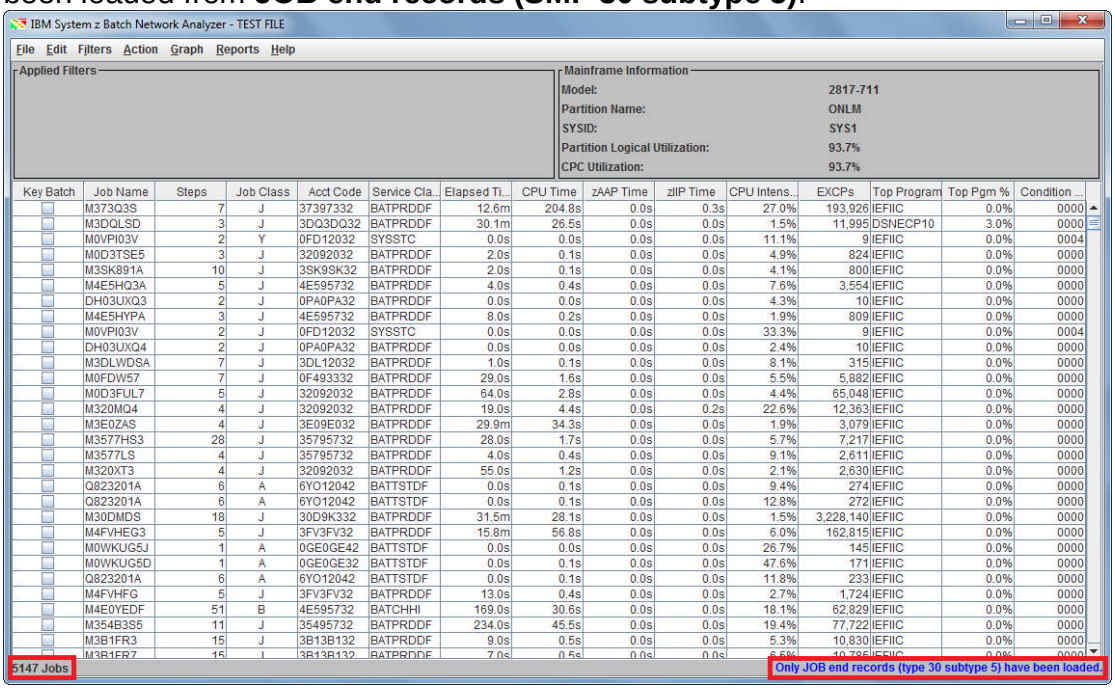


3. If this is your first time using the zBNA tool, select the SMF70 (.edf) and z/OS SMF (.dat) files by clicking the appropriate *Browse* buttons. Navigate to **C:\CPSTOOLS\zBNA.** Both files are required to be loaded together. Note that a previously saved study file (.zBNA) is required to use the *Browse For zBNA File* button, in addition to the original SMF70 (.edf) and z/OS SMF (.dat) files.



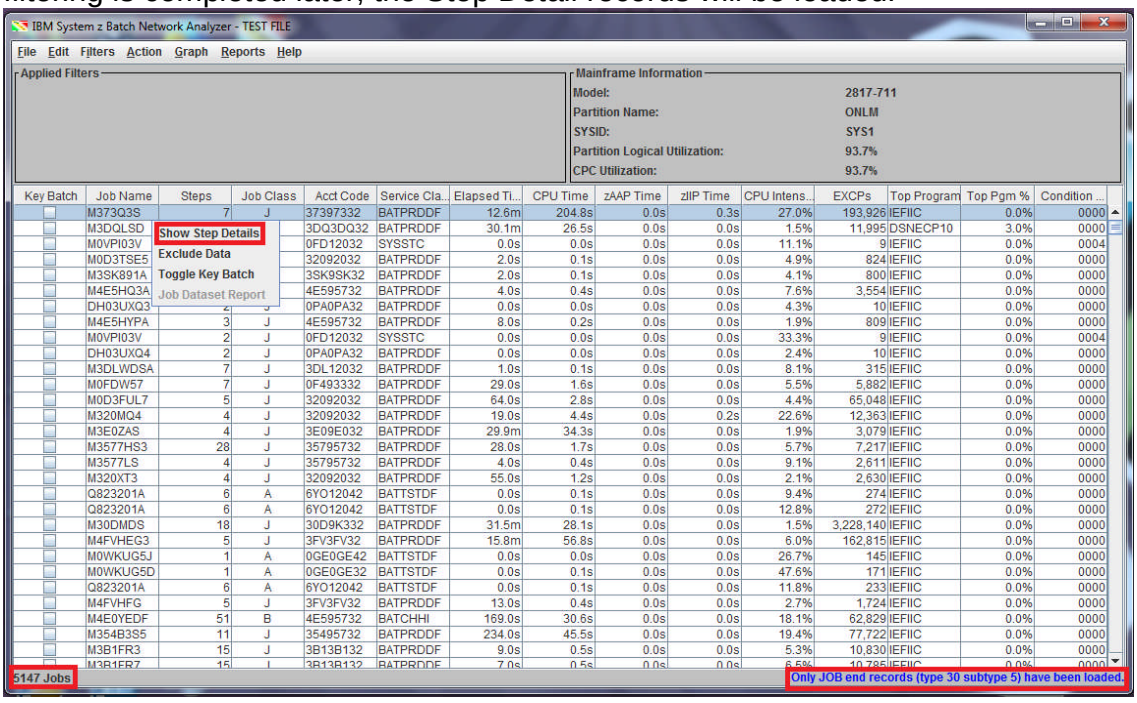
The SMF70 file name is **testrel4.edf** and **testrel4.dat** for the z/OS SMF one. Click ***Import***.

4. The zBNA tool will load the desired data in tabular format with job information displayed. At the bottom of the panel the messages indicate that **5147 jobs** have been loaded from **JOB end records (SMF 30 subtype 5)**.



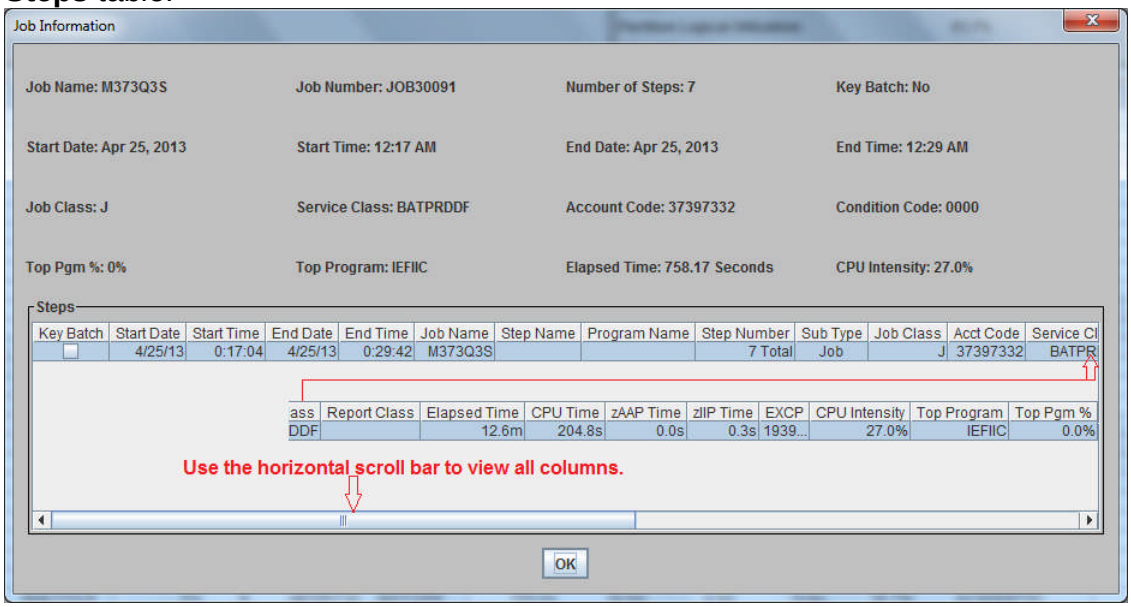
Key Batch	Job Name	Steps	Job Class	Acct Code	Service Cla...	Elapsed Ti...	CPU Time	zAAP Time	zIIP Time	CPU Intens...	EXCPs	Top Program	Top Pgm %	Condition ...
	M373Q3S	7	J	37397332	BATPRDDF	12.6m	204.8s	0.0s	0.3s	27.0%	193,926	IEFIIC	0.0%	0000
	M3DQLSD	3	J	3DQ3DQ32	BATPRDDF	30.1m	26.5s	0.0s	0.0s	1.5%	11,995	DSNECP10	3.0%	0000
	M0VPI03V	2	Y	0FD12032	SYSSTC	0.0s	0.0s	0.0s	0.0s	11.1%	9	IEFIIC	0.0%	0004
	M0D3TSE5	3	J	32092032	BATPRDDF	2.0s	0.1s	0.0s	0.0s	4.9%	824	IEFIIC	0.0%	0000
	M3SK891A	10	J	3SK9SK32	BATPRDDF	2.0s	0.1s	0.0s	0.0s	4.1%	800	IEFIIC	0.0%	0000
	M4E5HQ3A	5	J	4E595732	BATPRDDF	4.0s	0.4s	0.0s	0.0s	7.6%	3,554	IEFIIC	0.0%	0000
	DH03UXQ3	2	J	0PA0PA32	BATPRDDF	0.0s	0.0s	0.0s	0.0s	4.3%	10	IEFIIC	0.0%	0000
	M4E5HYPA	3	J	4E595732	BATPRDDF	8.0s	0.2s	0.0s	0.0s	1.9%	809	IEFIIC	0.0%	0000
	M0VPI03V	2	J	0FD12032	SYSSTC	0.0s	0.0s	0.0s	0.0s	33.3%	9	IEFIIC	0.0%	0004
	DH03UXQ4	2	J	0PA0PA32	BATPRDDF	0.0s	0.0s	0.0s	0.0s	2.4%	10	IEFIIC	0.0%	0000
	M3DLWDSA	7	J	3DL12032	BATPRDDF	1.0s	0.1s	0.0s	0.0s	8.1%	315	IEFIIC	0.0%	0000
	M0FDW57	7	J	0F493332	BATPRDDF	29.0s	1.6s	0.0s	0.0s	5.5%	5,882	IEFIIC	0.0%	0000
	M0D3FUL7	5	J	32092032	BATPRDDF	64.0s	2.8s	0.0s	0.0s	4.4%	65,048	IEFIIC	0.0%	0000
	M320MQ4	4	J	32092032	BATPRDDF	19.0s	4.4s	0.0s	0.2s	22.6%	12,363	IEFIIC	0.0%	0000
	M3E0ZAS	4	J	3E09E032	BATPRDDF	29.9m	34.3s	0.0s	0.0s	1.9%	3,079	IEFIIC	0.0%	0000
	M3577HS3	28	J	35795732	BATPRDDF	28.0s	1.7s	0.0s	0.0s	5.7%	7,217	IEFIIC	0.0%	0000
	M3577LS	4	J	35795732	BATPRDDF	4.0s	0.4s	0.0s	0.0s	9.1%	2,611	IEFIIC	0.0%	0000
	M320XT3	4	J	32092032	BATPRDDF	55.0s	1.2s	0.0s	0.0s	2.1%	2,630	IEFIIC	0.0%	0000
	Q823201A	6	A	6YO12042	BATTSTDF	0.0s	0.1s	0.0s	0.0s	9.4%	274	IEFIIC	0.0%	0000
	Q823201A	6	A	6YO12042	BATTSTDF	0.0s	0.1s	0.0s	0.0s	12.8%	272	IEFIIC	0.0%	0000
	M30DMDS	18	J	30D9K332	BATPRDDF	31.5m	28.1s	0.0s	0.0s	1.5%	3,228,140	IEFIIC	0.0%	0000
	M4FVHEG3	5	J	3FV3FV32	BATPRDDF	15.8m	56.8s	0.0s	0.0s	6.0%	162,815	IEFIIC	0.0%	0000
	M0WKUG5J	1	A	0GE0GE42	BATTSTDF	0.0s	0.0s	0.0s	0.0s	26.7%	145	IEFIIC	0.0%	0000
	M0WKUG5D	1	A	0GE0GE32	BATTSTDF	0.0s	0.1s	0.0s	0.0s	47.6%	171	IEFIIC	0.0%	0000
	Q823201A	6	A	6YO12042	BATTSTDF	0.0s	0.1s	0.0s	0.0s	11.8%	233	IEFIIC	0.0%	0000
	M4FVHFG	5	J	3FV3FV32	BATPRDDF	13.0s	0.4s	0.0s	0.0s	2.7%	1,724	IEFIIC	0.0%	0000
	M4E0YEDF	51	B	4E595732	BATCHHI	169.0s	30.6s	0.0s	0.0s	18.1%	62,829	IEFIIC	0.0%	0000
	M354B3S5	11	J	35495732	BATPRDDF	234.0s	45.5s	0.0s	0.0s	19.4%	77,722	IEFIIC	0.0%	0000
	M3B1FR3	15	J	3B13B132	BATPRDDF	9.0s	0.5s	0.0s	0.0s	5.3%	10,830	IEFIIC	0.0%	0000
	M3B1FR7	15	J	3B13B132	BATPRDDF	7.0s	0.5s	0.0s	0.0s	6.5%	10,785	IEFIIC	0.0%	0000

5. Individual jobs may be selected with a single click. Right-clicking the first job, **M373Q3S**, displays a menu. Select ***Show Details*** to display the Step details. However, at this point, zBNA will only display Job End record information (not Step Detail) because the SMF 30 subtype 4 data has not been loaded. Once filtering is completed later, the Step Detail records will be loaded.



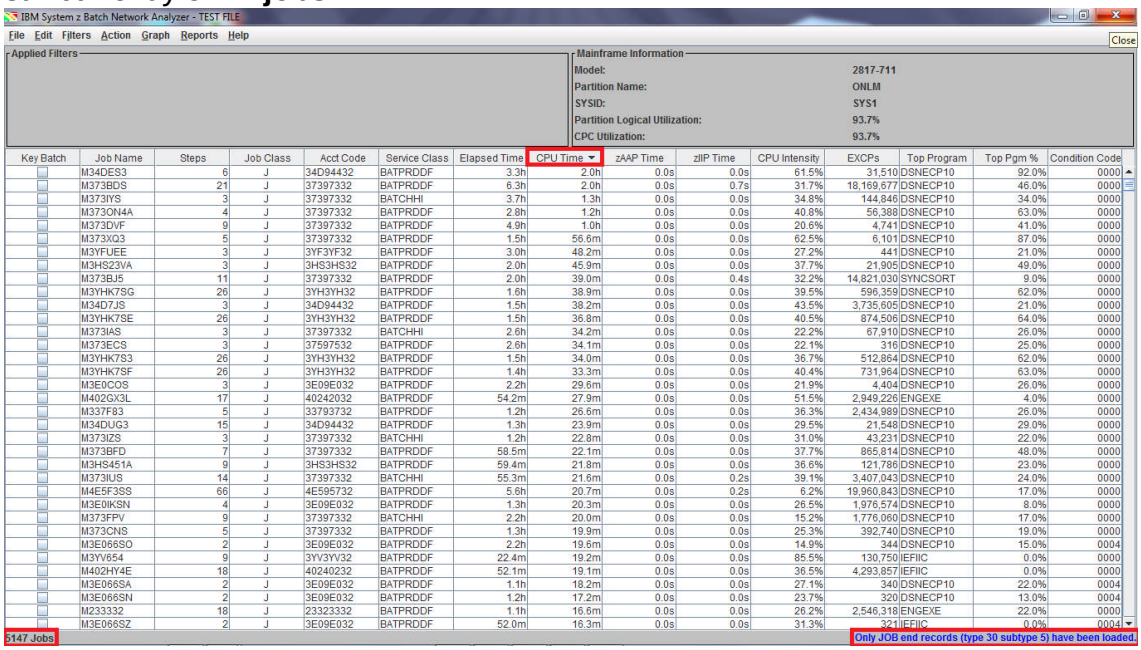
Key Batch	Job Name	Steps	Job Class	Acct Code	Service Cla...	Elapsed Ti...	CPU Time	zAAP Time	zIIP Time	CPU Intens...	EXCPs	Top Program	Top Pgm %	Condition ...
	M373Q3S	7	J	37397332	BATPRDDF	12.6m	204.8s	0.0s	0.3s	27.0%	193,926	IEFIIC	0.0%	0000
	M3DQLSD			3DQ3DQ32	BATPRDDF	30.1m	26.5s	0.0s	0.0s	1.5%	11,995	DSNECP10	3.0%	0000
	M0VPI03V			0FD12032	SYSSTC	0.0s	0.0s	0.0s	0.0s	11.1%	9	IEFIIC	0.0%	0004
	M0D3TSE5			32092032	BATPRDDF	2.0s	0.1s	0.0s	0.0s	4.9%	824	IEFIIC	0.0%	0000
	M3SK891A			3SK9SK32	BATPRDDF	2.0s	0.1s	0.0s	0.0s	4.1%	800	IEFIIC	0.0%	0000
	M4E5HQ3A			4E595732	BATPRDDF	4.0s	0.4s	0.0s	0.0s	7.6%	3,554	IEFIIC	0.0%	0000
	DH03UXQ3			0PA0PA32	BATPRDDF	0.0s	0.0s	0.0s	0.0s	4.3%	10	IEFIIC	0.0%	0000
	M4E5HYPA	3	J	4E595732	BATPRDDF	8.0s	0.2s	0.0s	0.0s	1.9%	809	IEFIIC	0.0%	0000
	M0VPI03V	2	J	0FD12032	SYSSTC	0.0s	0.0s	0.0s	0.0s	33.3%	9	IEFIIC	0.0%	0004
	DH03UXQ4	2	J	0PA0PA32	BATPRDDF	0.0s	0.0s	0.0s	0.0s	2.4%	10	IEFIIC	0.0%	0000
	M3DLWDSA	7	J	3DL12032	BATPRDDF	1.0s	0.1s	0.0s	0.0s	8.1%	315	IEFIIC	0.0%	0000
	M0FDW57	7	J	0F493332	BATPRDDF	29.0s	1.6s	0.0s	0.0s	5.5%	5,882	IEFIIC	0.0%	0000
	M0D3FUL7	5	J	32092032	BATPRDDF	64.0s	2.8s	0.0s	0.0s	4.4%	65,048	IEFIIC	0.0%	0000
	M320MQ4	4	J	32092032	BATPRDDF	19.0s	4.4s	0.0s	0.2s	22.6%	12,363	IEFIIC	0.0%	0000
	M3E0ZAS	4	J	3E09E032	BATPRDDF	29.9m	34.3s	0.0s	0.0s	1.9%	3,079	IEFIIC	0.0%	0000
	M3577HS3	28	J	35795732	BATPRDDF	28.0s	1.7s	0.0s	0.0s	5.7%	7,217	IEFIIC	0.0%	0000
	M3577LS	4	J	35795732	BATPRDDF	4.0s	0.4s	0.0s	0.0s	9.1%	2,611	IEFIIC	0.0%	0000
	M320XT3	4	J	32092032	BATPRDDF	55.0s	1.2s	0.0s	0.0s	2.1%	2,630	IEFIIC	0.0%	0000
	Q823201A	6	A	6YO12042	BATTSTDF	0.0s	0.1s	0.0s	0.0s	9.4%	274	IEFIIC	0.0%	0000
	Q823201A	6	A	6YO12042	BATTSTDF	0.0s	0.1s	0.0s	0.0s	12.8%	272	IEFIIC	0.0%	0000
	M30DMDS	18	J	30D9K332	BATPRDDF	31.5m	28.1s	0.0s	0.0s	1.5%	3,228,140	IEFIIC	0.0%	0000
	M4FVHEG3	5	J	3FV3FV32	BATPRDDF	15.8m	56.8s	0.0s	0.0s	6.0%	162,815	IEFIIC	0.0%	0000
	M0WKUG5J	1	A	0GE0GE42	BATTSTDF	0.0s	0.0s	0.0s	0.0s	26.7%	145	IEFIIC	0.0%	0000
	M0WKUG5D	1	A	0GE0GE32	BATTSTDF	0.0s	0.1s	0.0s	0.0s	47.6%	171	IEFIIC	0.0%	0000
	Q823201A	6	A	6YO12042	BATTSTDF	0.0s	0.1s	0.0s	0.0s	11.8%	233	IEFIIC	0.0%	0000
	M4FVHFG	5	J	3FV3FV32	BATPRDDF	13.0s	0.4s	0.0s	0.0s	2.7%	1,724	IEFIIC	0.0%	0000
	M4E0YEDF	51	B	4E595732	BATCHHI	169.0s	30.6s	0.0s	0.0s	18.1%	62,829	IEFIIC	0.0%	0000
	M354B3S5	11	J	35495732	BATPRDDF	234.0s	45.5s	0.0s	0.0s	19.4%	77,722	IEFIIC	0.0%	0000
	M3B1FR3	15	J	3B13B132	BATPRDDF	9.0s	0.5s	0.0s	0.0s	5.3%	10,830	IEFIIC	0.0%	0000
	M3B1FR7	15	J	3B13B132	BATPRDDF	7.0s	0.5s	0.0s	0.0s	6.5%	10,785	IEFIIC	0.0%	0000

6. The Job Information panel displays the specific job information at the top of the **Steps** table.



Note: The job details will be displayed once you have performed **File**, **Add Selected Step Level Records** (performed after the **Filtering** process is complete) on the zBNA main panel.
In the display above**,** "**7 Total**" shown in the **Step Number** column refers to the total number of steps in this job, **M373Q3S**. Also, notice that there is a scroll bar so that all of the various fields can be seen. Click ***Ok*** to return to the main panel.

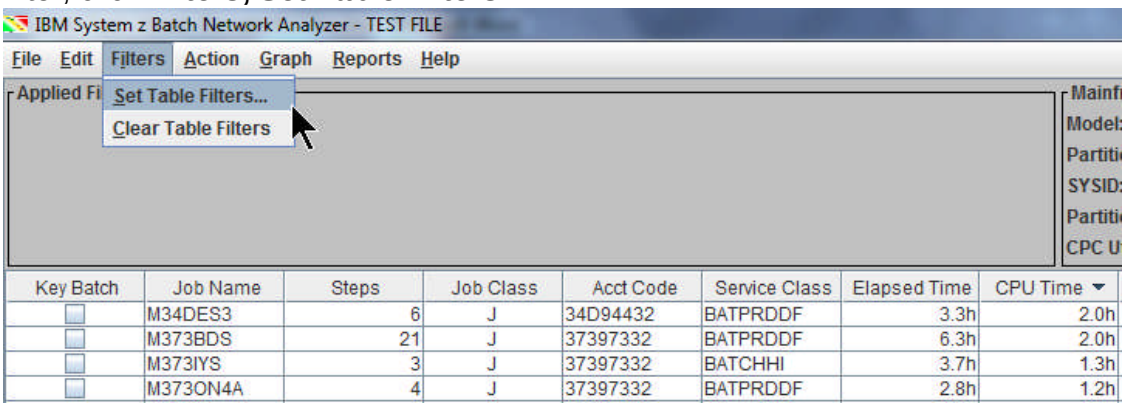
7. Jobs may be sorted by any parameter on the screen in both ascending and descending order, simply by clicking on the corresponding column header. Click the ***CPU Time*** column twice to sort from the largest to smallest values. Also note that the number of jobs in the screen, displayed in the bottom left-hand corner, is still currently **5147 jobs**.



Key Batch	Job Name	Steps	Job Class	Acct Code	Service Class	Elapsed Time	CPU Time	zAAP Time	zIIP Time	CPU Intensity	EXCPs	Top Program	Top Pgm %	Condition Code
	M34DES3	6	J	34D94432	BATPRDDF	3.3h	2.0h	0.0s	0.0s	61.5%	31,510	DSNECP10	92.0%	0000
	M373BDS	21	J	37397332	BATPRDDF	6.3h	2.0h	0.0s	0.7s	31.7%	18,169,677	DSNECP10	46.0%	0000
	M373IYS	3	J	37397332	BATCHHI	3.7h	1.3h	0.0s	0.0s	34.8%	144,846	DSNECP10	34.0%	0000
	M373ON4A	4	J	37397332	BATPRDDF	2.8h	1.2h	0.0s	0.0s	40.8%	56,388	DSNECP10	63.0%	0000
	M373DVF	9	J	37397332	BATPRDDF	4.9h	1.0h	0.0s	0.0s	20.6%	4,741	DSNECP10	41.0%	0000
	M373XQ3	5	J	37397332	BATPRDDF	1.5h	56.6m	0.0s	0.0s	62.5%	6,101	DSNECP10	87.0%	0000
	M3YFUEE	3	J	3YF3YF32	BATPRDDF	3.0h	48.2m	0.0s	0.0s	27.2%	441	DSNECP10	21.0%	0000
	M3HS23VA	3	J	3HS3HS32	BATPRDDF	2.0h	45.9m	0.0s	0.0s	37.7%	21,905	DSNECP10	49.0%	0000
	M373BJ5	11	J	37397332	BATPRDDF	2.0h	39.0m	0.0s	0.4s	32.2%	14,821,030	SYNCSORT	9.0%	0000
	M3YHK7SG	26	J	3YH3YH32	BATPRDDF	1.6h	38.9m	0.0s	0.0s	39.5%	596,359	DSNECP10	62.0%	0000
	M34D7JS	3	J	34D94432	BATPRDDF	1.5h	38.2m	0.0s	0.0s	43.5%	3,735,605	DSNECP10	21.0%	0000
	M3YHK7SE	26	J	3YH3YH32	BATPRDDF	1.5h	36.8m	0.0s	0.0s	40.5%	874,506	DSNECP10	64.0%	0000
	M373IAS	3	J	37397332	BATCHHI	2.6h	34.2m	0.0s	0.0s	22.2%	67,910	DSNECP10	26.0%	0000
	M373ECS	3	J	37597532	BATPRDDF	2.6h	34.1m	0.0s	0.0s	22.1%	316	DSNECP10	25.0%	0000
	M3YHK7S3	26	J	3YH3YH32	BATPRDDF	1.5h	34.0m	0.0s	0.0s	36.7%	512,864	DSNECP10	62.0%	0000
	M3YHK7SF	26	J	3YH3YH32	BATPRDDF	1.4h	33.3m	0.0s	0.0s	40.4%	731,964	DSNECP10	63.0%	0000
	M3E0COS	3	J	3E09E032	BATPRDDF	2.2h	29.6m	0.0s	0.0s	21.9%	4,404	DSNECP10	26.0%	0000
	M402GX3L	17	J	40242032	BATPRDDF	54.2m	27.9m	0.0s	0.0s	51.5%	2,949,226	ENGEXE	4.0%	0000
	M337F83	5	J	33793732	BATPRDDF	1.2h	26.6m	0.0s	0.0s	36.3%	2,434,989	DSNECP10	26.0%	0000
	M34DUG3	15	J	34D94432	BATPRDDF	1.3h	23.9m	0.0s	0.0s	29.5%	21,548	DSNECP10	29.0%	0000
	M373IZS	3	J	37397332	BATCHHI	1.2h	22.8m	0.0s	0.0s	31.0%	43,231	DSNECP10	22.0%	0000
	M373BFD	7	J	37397332	BATPRDDF	58.5m	22.1m	0.0s	0.0s	37.7%	865,814	DSNECP10	48.0%	0000
	M3HS451A	9	J	3HS3HS32	BATPRDDF	59.4m	21.8m	0.0s	0.0s	36.6%	121,786	DSNECP10	23.0%	0000
	M373IUS	14	J	37397332	BATCHHI	55.3m	21.6m	0.0s	0.2s	39.1%	3,407,043	DSNECP10	24.0%	0000
	M4E5F3SS	66	J	4E595732	BATPRDDF	5.6h	20.7m	0.0s	0.2s	6.2%	19,960,843	DSNECP10	17.0%	0000
	M3E0IKSN	4	J	3E09E032	BATPRDDF	1.3h	20.3m	0.0s	0.0s	26.5%	1,976,574	DSNECP10	8.0%	0000
	M373FPV	9	J	37397332	BATCHHI	2.2h	20.0m	0.0s	0.0s	15.2%	1,776,060	DSNECP10	17.0%	0000
	M373CNS	5	J	37397332	BATPRDDF	1.3h	19.9m	0.0s	0.0s	25.3%	392,740	DSNECP10	19.0%	0000
	M3E066SO	2	J	3E09E032	BATPRDDF	2.2h	19.6m	0.0s	0.0s	14.9%	344	DSNECP10	15.0%	0004
	M3YV654	9	J	3YV3YV32	BATPRDDF	22.4m	19.2m	0.0s	0.0s	85.5%	130,750	IEFIIC	0.0%	0000
	M402HY4E	18	J	40240232	BATPRDDF	52.1m	19.1m	0.0s	0.0s	36.5%	4,293,857	IEFIIC	0.0%	0000
	M3E066SA	2	J	3E09E032	BATPRDDF	1.1h	18.2m	0.0s	0.0s	27.1%	340	DSNECP10	22.0%	0004
	M3E066SN	2	J	3E09E032	BATPRDDF	1.2h	17.2m	0.0s	0.0s	23.7%	320	DSNECP10	13.0%	0004
	M233332	18	J	23323332	BATPRDDF	1.1h	16.6m	0.0s	0.0s	26.2%	2,546,318	ENGEXE	22.0%	0000
	M3E066SZ	2	J	3E09E032	BATPRDDF	52.0m	16.3m	0.0s	0.0s	31.3%	321	IEFIIC	0.0%	0004

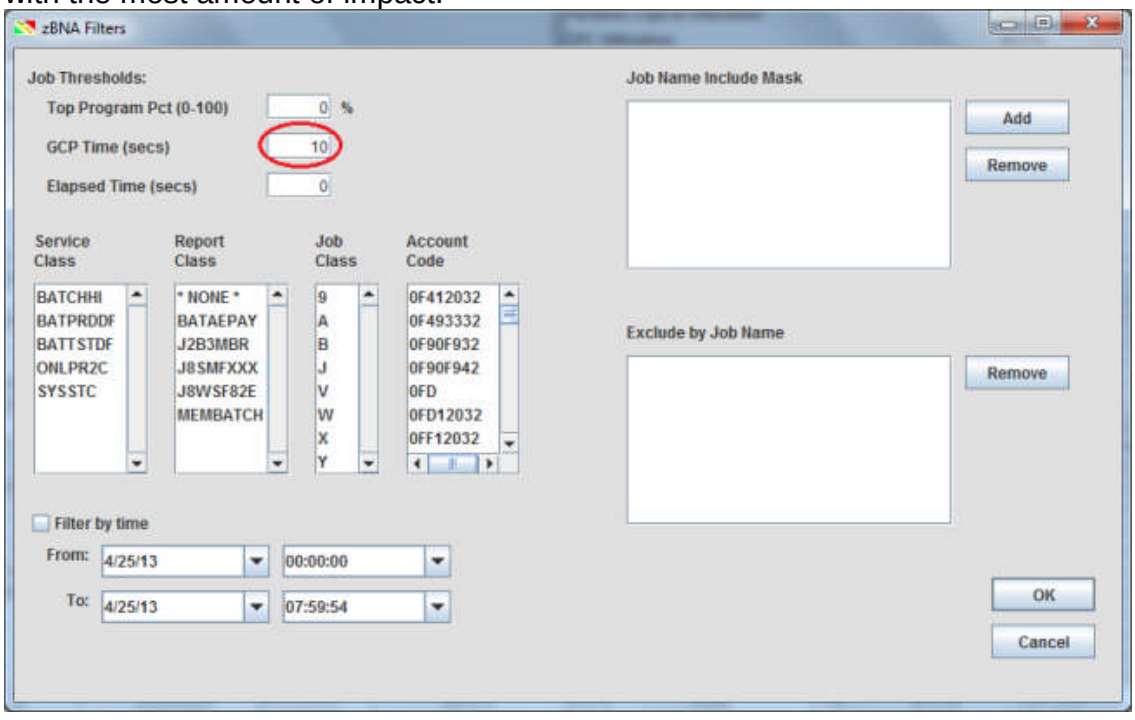
Task 2 - **Filtering Data**

1. There can be data from hundreds or thousands of jobs. It is often necessary to filter the jobs based on some criteria to reduce the number to be more manageable for the analysis, and Filters can help reduce the number. To apply a filter, click ***Filters***, ***Set Table Filters***…



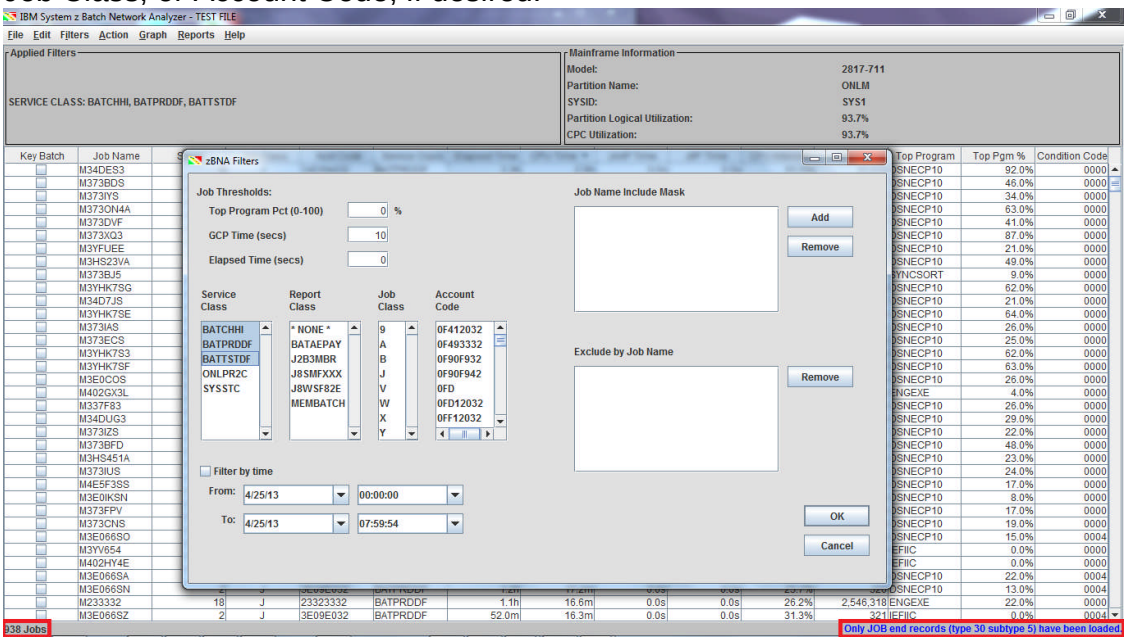
Key Batch	Job Name	Steps	Job Class	Acct Code	Service Class	Elapsed Time	CPU Time
	M34DES3	6	J	34D94432	BATPRDDF	3.3h	2.0h
	M373BDS	21	J	37397332	BATPRDDF	6.3h	2.0h
	M373IYS	3	J	37397332	BATCHHI	3.7h	1.3h
	M373ON4A	4	J	37397332	BATPRDDF	2.8h	1.2h

2. Start by setting the ***GCP Time*** to **10 seconds**, which will filter out jobs that took less than 10 seconds of CPU during the job's elapsed time. Clicking on another option or pressing Tab will allow the changes to take effect. The purpose of setting the filter is to remove a number of jobs that took an extremely small amount of CPU resource, so that the focus on the analysis can be on the jobs with the most amount of impact.

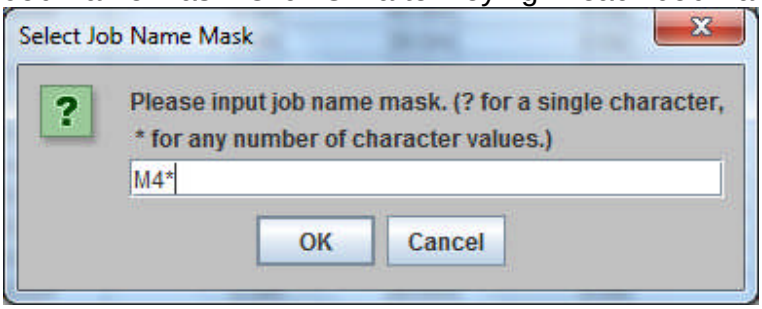


3. Next, filter by the Service Class name. This allows one to filter on the WLM construct that is already aligned to business importance and classification. Multiple Service Classes may be selected by holding the Control key while clicking the desired service class names. Select ***BATCHHI***, ***BATPRDDF***, and

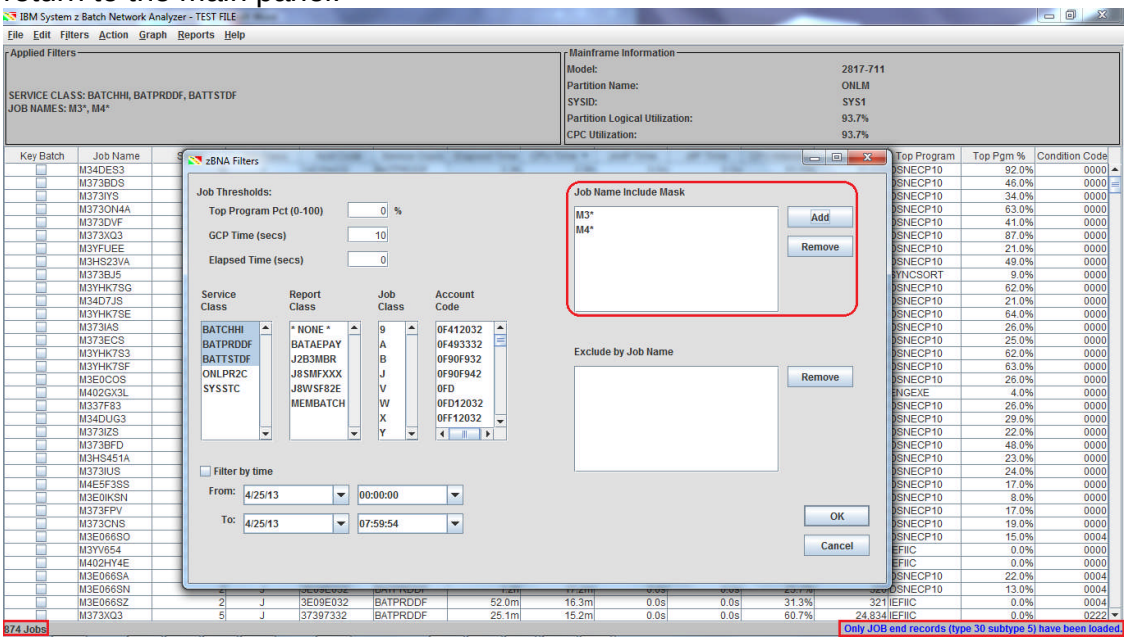
BATTSTDF. Note that there are now **938** jobs in the table. To remove a selection, hold Control and click it again. Similarly, one can filter by Report Class, Job Class, or Account Code, if desired.



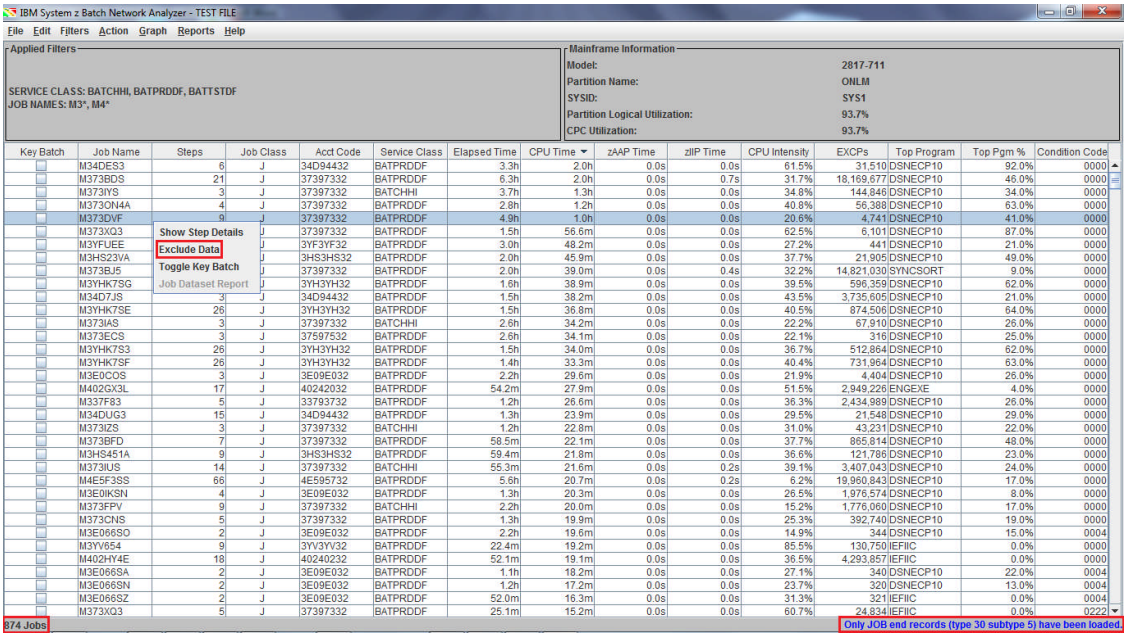
4. Job names may also be filtered by clicking ***Add***. Specific jobs can be named, or only parts of the name may be used, followed by an asterisk, which will match any number of characters. Please add **M4*** and **M3***, as separate entries, to the Job Name Mask. Click **OK** after keying in each Job Name Mask.



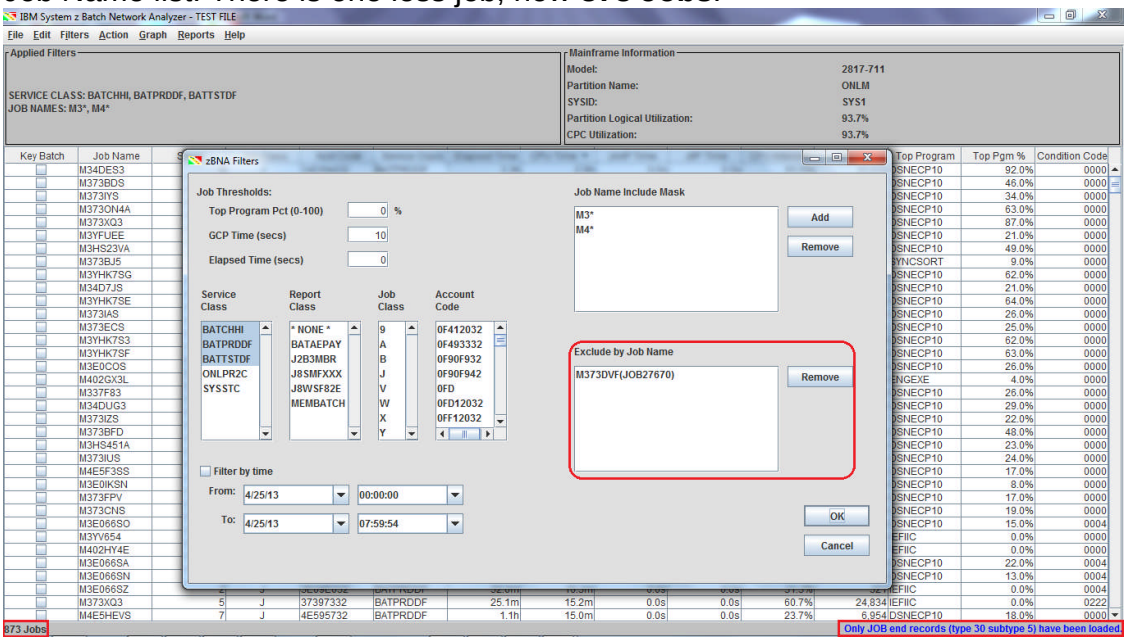
5. As shown below, **M4*** will find all jobs starting with M4, and **M3*** will find all jobs starting with M3. Note that there are now **874** jobs on the main panel. Click *Ok* to return to the main panel.



6. Even with a filtered list there may be jobs that should not be included. These can be excluded from the analysis. Select the line for job **M373DVF** and right-click; select ***Exclude Data*** to remove it from the table.

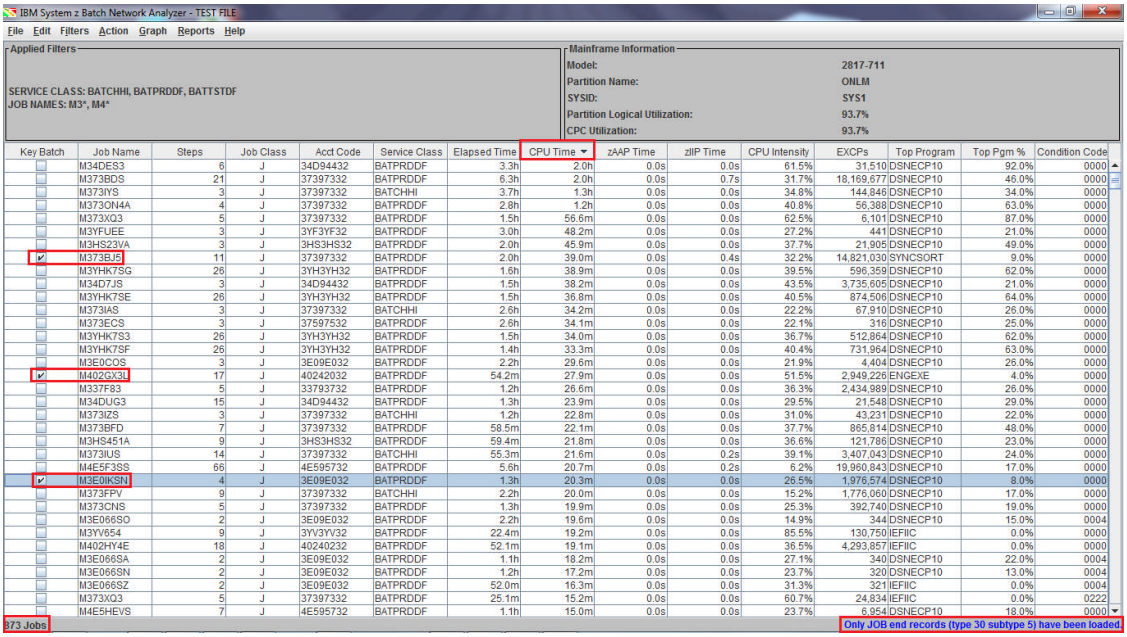


7. Note that returning to the zBNA Filters panel shows that job in the Exclude by Job Name list. There is one less job, now **873 Jobs**.

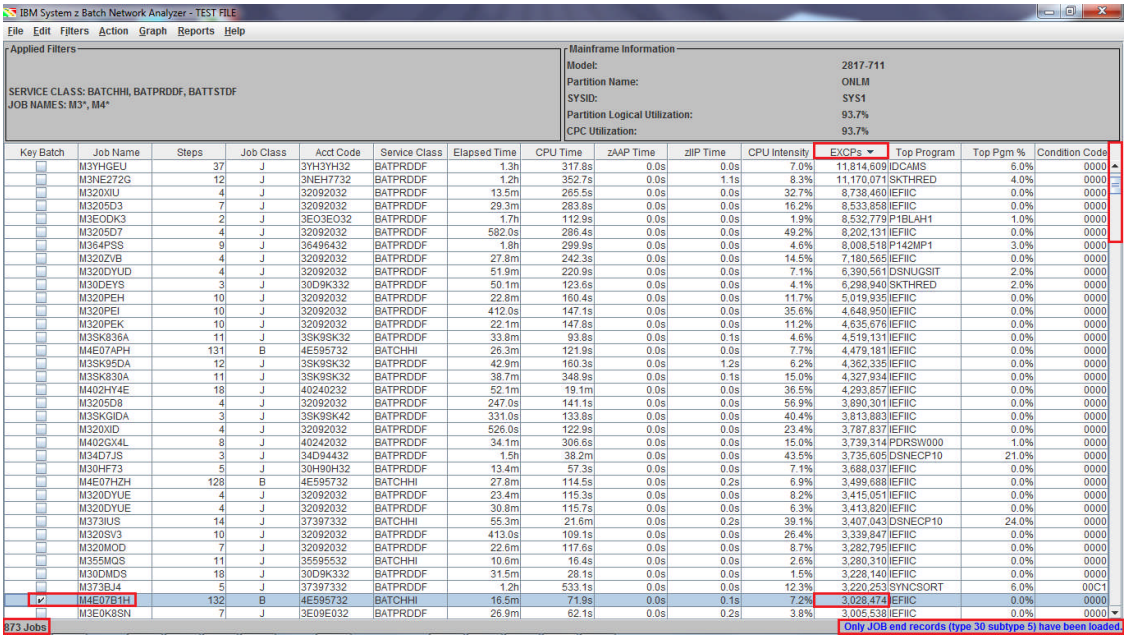


Click ***Ok***.

8. If there are key jobs that you would like to focus on, select those in the **Key Batch** column. These will **always** be included in the analysis regardless of the job filter definitions. Select the following jobs as key: **M373BJ5**, **M402GX3L**, and **M3E0IKSN**.



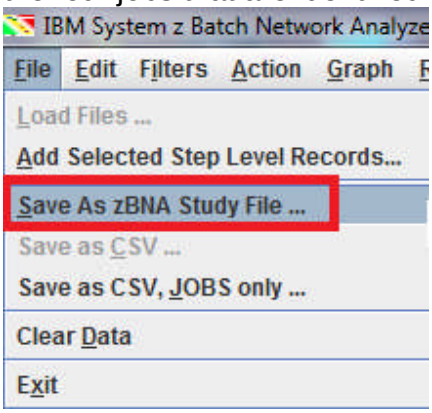
Now sort the ***EXCPs*** column in descending order to view the values from largest to smallest.



Let's find job **M4E07B1H**, which has **3,028,474 EXCPs,** in the table. You can either slowly scroll down the table to job **M4E07B1H** or use the **Edit**, **Find** (Ctrl+F) function. Click the **Key Batch** checkbox. Note that the other three *Key Batch* jobs are still selected, however, they just are not in this view since we performed the sort by EXCPs.

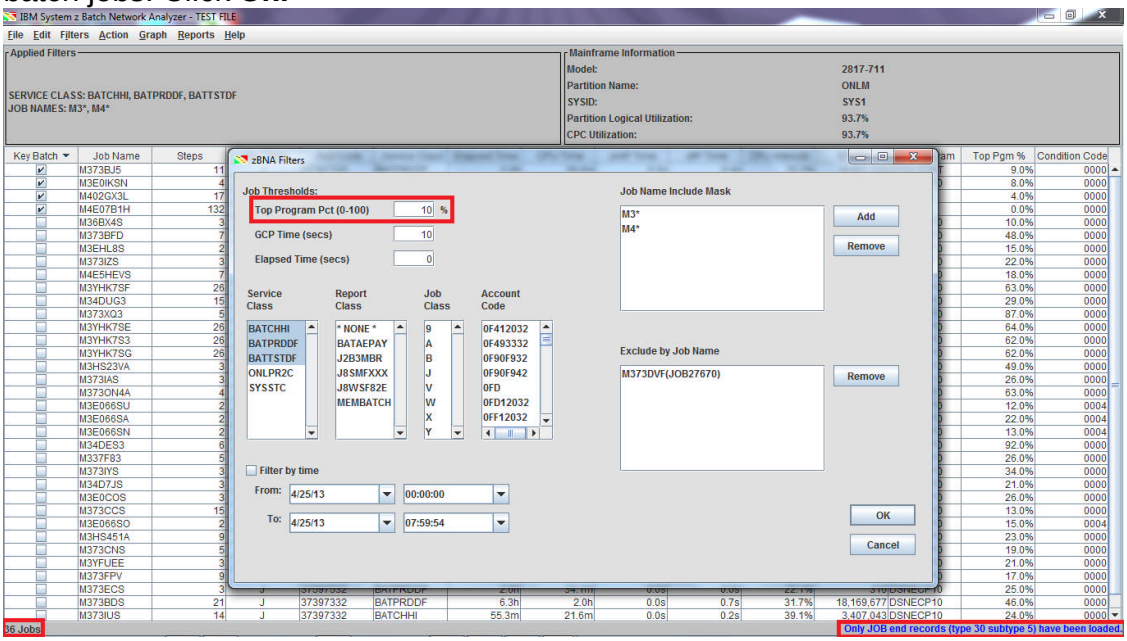
NOTE: This technique of identifying jobs as *Key Batch* can be used to keep known jobs always in the analysis (e.g. critical path jobs, high importance, etc.) so that other filtering techniques do not inadvertently remove them. There is also the ability to separately report on these "Key" jobs.

At this point, let's stop and save the current filters that have been set along with the four jobs that are identified as key in a zBNA study file.

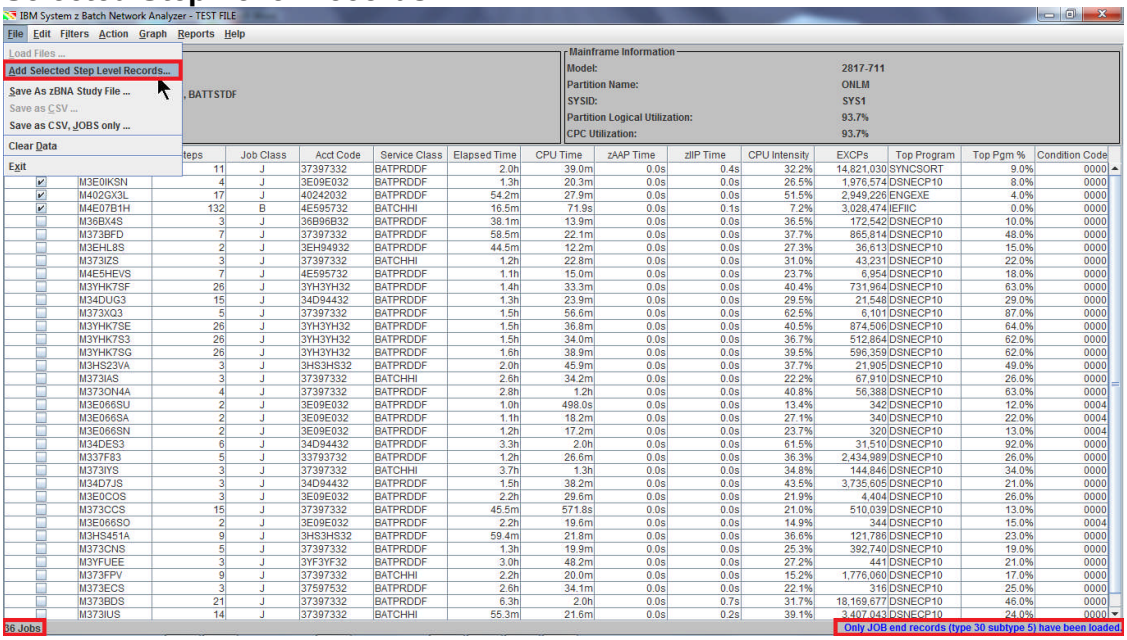


Name the file **testrel4** (".zBNA" will automatically be appended to the file name), and click **Save**.

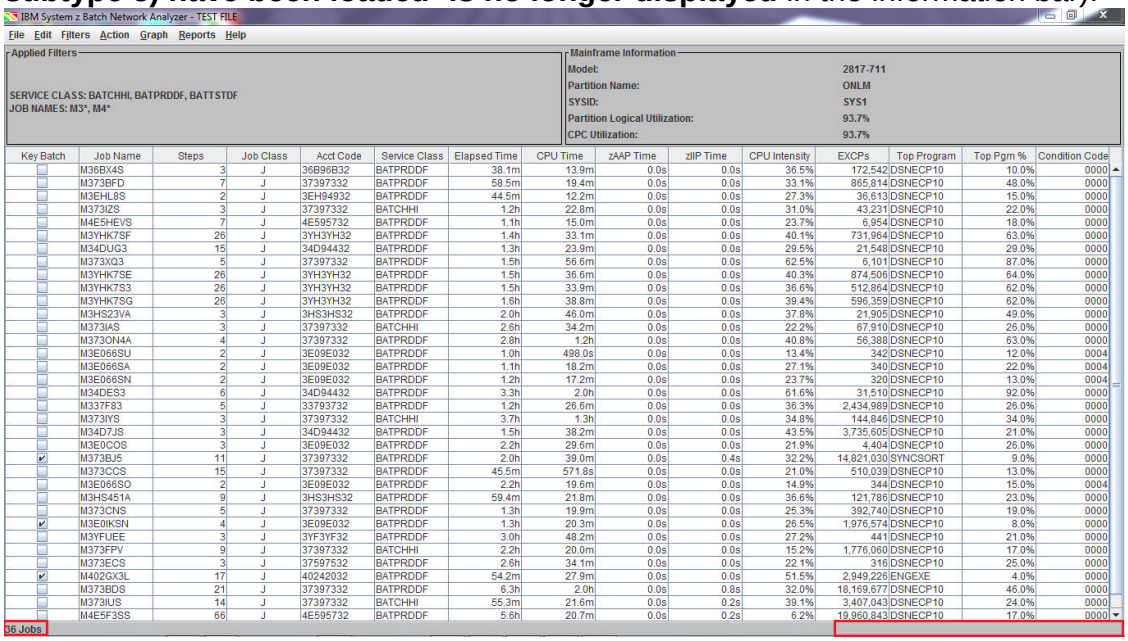
9. Return to the zBNA Filters panel and set the ***Top Program Pct*** to **10%**, which will only include jobs where a Top Program is greater than 10%. Note that there are now only **36 jobs** in the table, including the four that we selected as key batch jobs. Click ***Ok*.**



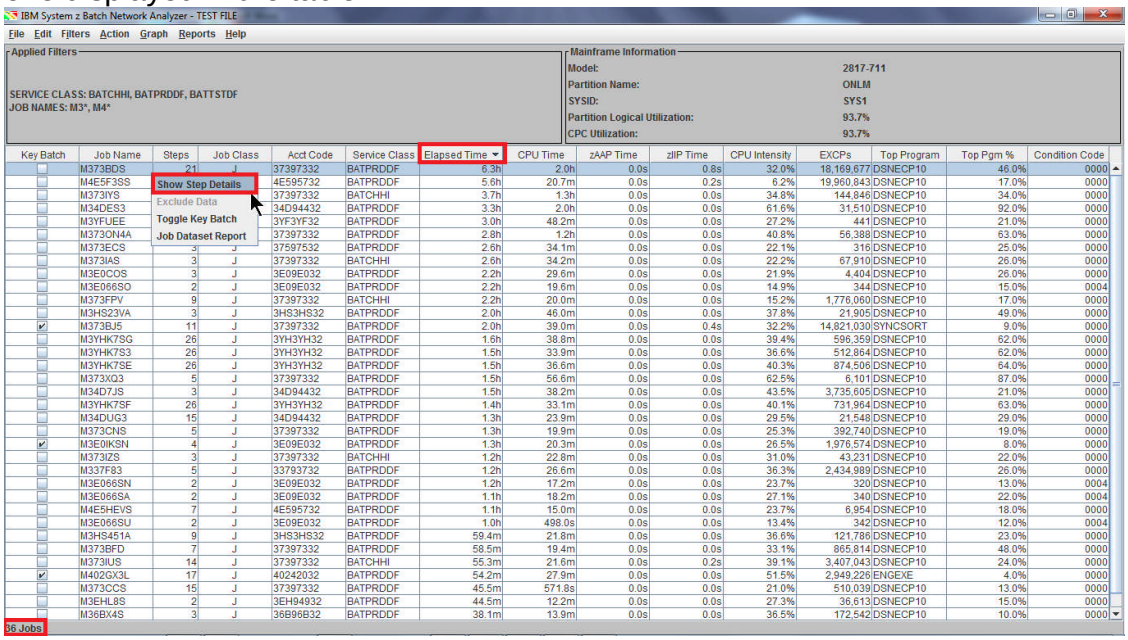
10. Let's add the job step data (SMF Type 30 subtype 4 records). Click **File**, **Add Selected Step Level Records**.



11. The main zBNA panel is redisplayed. Now a job can be drilled down to show the step level details. (Note that the message "**Only JOB end records (type 30 subtype 5) have been loaded**" **is no longer displayed** in the information bar).

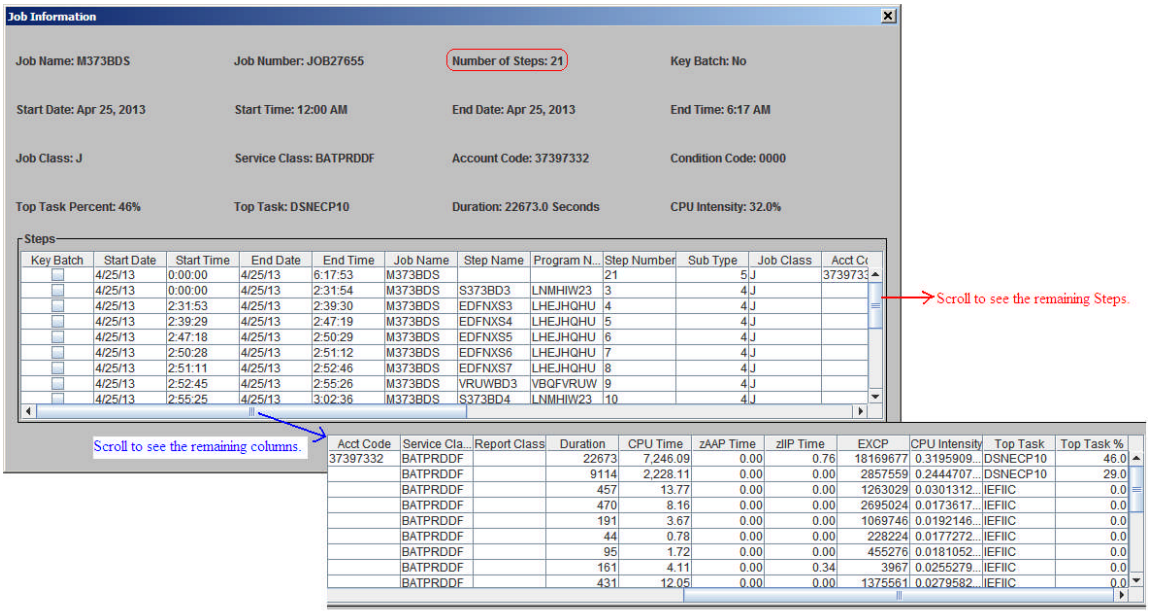


Let's sort on the **Elapsed Time** column so that the longest running job is the first one displayed in the table.



Job **M373BDS** is the longest running job in this filtered set. You can see that the elapsed time is **6.3 hours** and had **21 Steps**. Right click on that job, and select **Show Step Details**. **Note**: Double clicking in the job row will perform the same task.

12. The details on the steps are displayed. One row per each Step is provided, and all the columns for the Job level are provided for each Step. Remember to use both the vertical and horizontal scroll bars to view all of the information.



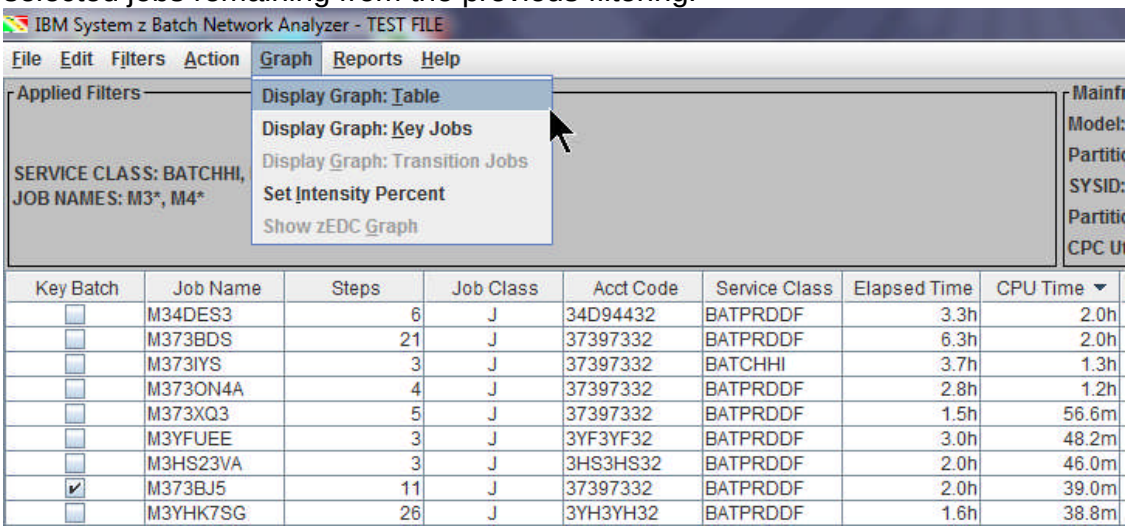
The detailed information on each step of the job includes:

- start/end time and date
- step name
- program name
- step number
- sub type
- job class
- account code
- service class
- report class
- elapsed time
- CPU time
- zAAP time
- zIIP time
- EXCPs
- CPU intensity
- Top Program
- Top PGM %

These step level fields may be useful once you've identified a job that you want to reduce the elapsed time, because you'll be able to identify the step and program level resources to know where to focus tuning or alternative technology. Click ***OK*** to return to the zBNA main panel.

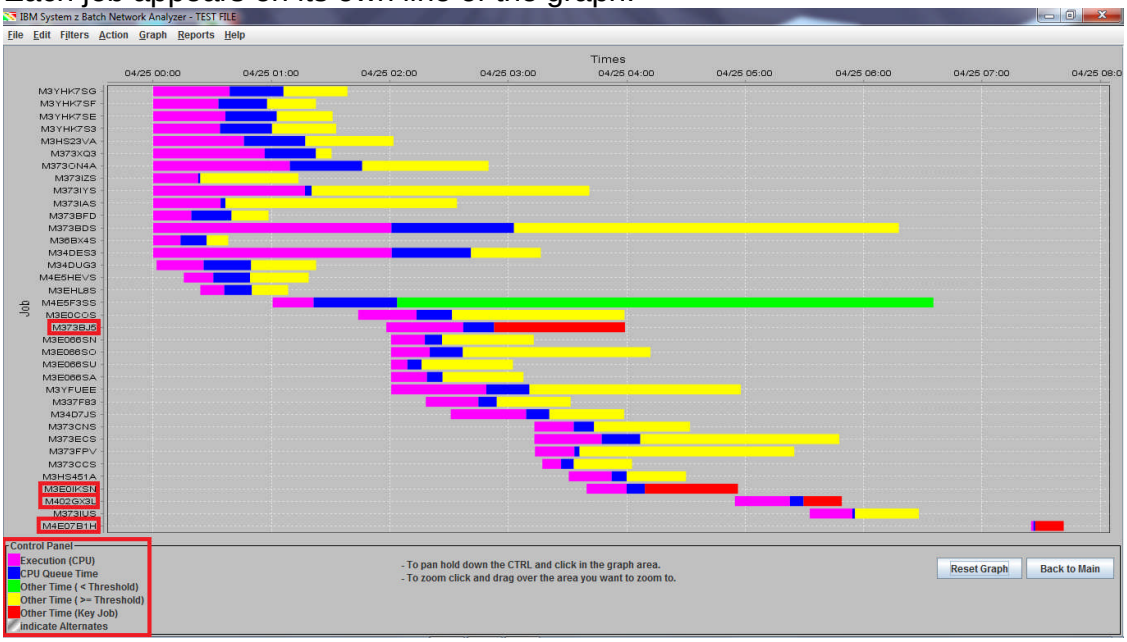
Task 3 - **Displaying a Graph**

1. The data in the table on the main zBNA panel may also be displayed in a graph format by selecting ***Graph*** then ***Display Graph: Table***. This will graph the selected jobs remaining from the previous filtering.



Key Batch	Job Name	Steps	Job Class	Acct Code	Service Class	Elapsed Time	CPU Time
☐	M34DES3	6	J	34D94432	BATPRDDF	3.3h	2.0h
☐	M373BDS	21	J	37397332	BATPRDDF	6.3h	2.0h
☐	M373IYS	3	J	37397332	BATCHHI	3.7h	1.3h
☐	M373ON4A	4	J	37397332	BATPRDDF	2.8h	1.2h
☐	M373XQ3	5	J	37397332	BATPRDDF	1.5h	56.6m
☐	M3YFUEE	3	J	3YF3YF32	BATPRDDF	3.0h	48.2m
☐	M3HS23VA	3	J	3HS3HS32	BATPRDDF	2.0h	46.0m
☑	M373BJ5	11	J	37397332	BATPRDDF	2.0h	39.0m
☐	M3YHK7SG	26	J	3YH3YH32	BATPRDDF	1.6h	38.8m

2. Each job appears on its own line of the graph.



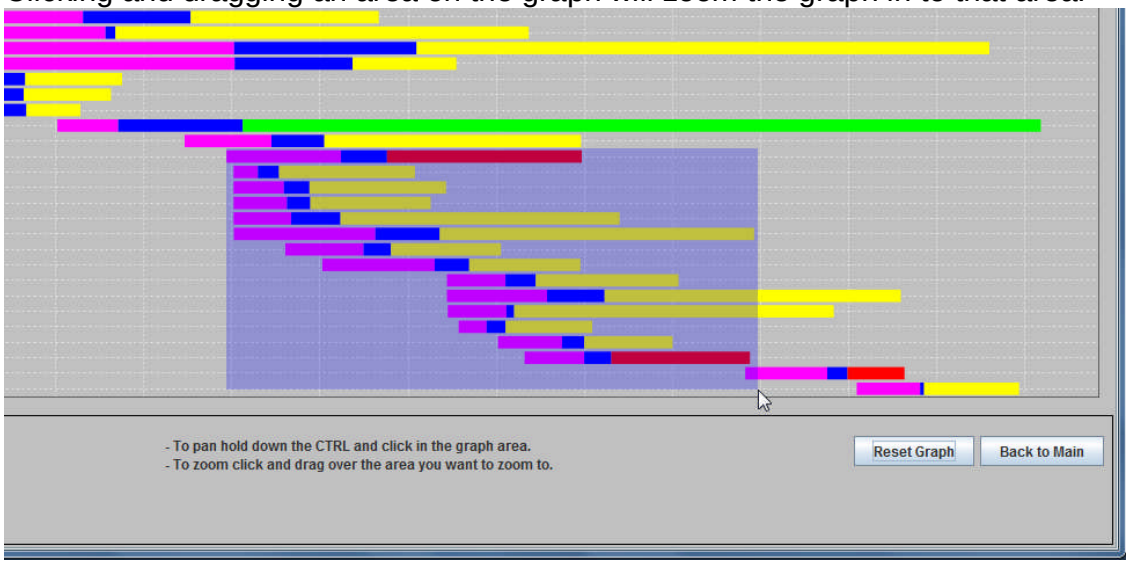
The Elapsed Time for a job is the sum of **CPU Time + CPU Queue Time + Other Time**. Other time is all other time, and is typically comprised of I/O time. The sum of the 3 components is placed on the X axis when the Job's Elapsed Time occurred in the interval, but they represent the % of time spent in each component (e.g. the actual CPU Time does not all occur at the beginning of the job).

The legend for the graph appears in the bottom left corner.

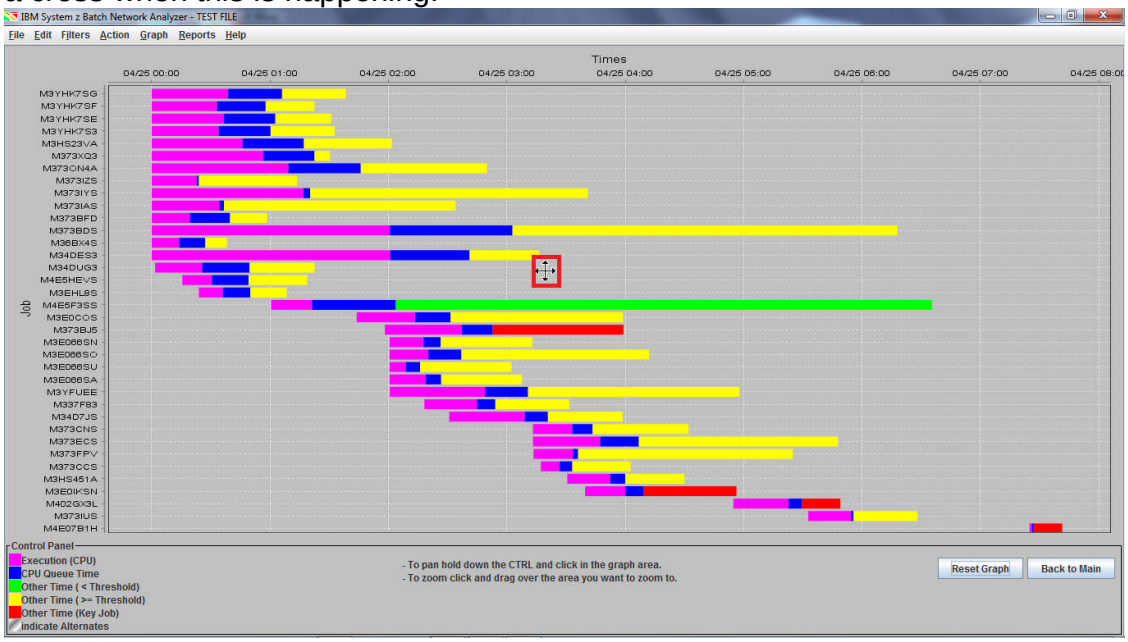
- Pink, **Execution (CPU Time**, shows the measured CPU time for a job.

- Blue, **CPU Queue Time**, represents the estimated CPU wait time for a job, which is calculated from the *RMF Service class waiting for dispatch* field.
- **Other Time**, a green bar signifies that the job's CPU execution time is less than 10% (default value for **Set Intensity Percent**) of the job's duration.
- **Other Time**, a yellow bar signifies that the CPU execution time is more than 10% (default value for **Set Intensity Percent**) of the duration.
- **Other Time**, a red bar signifies *Key batch* jobs.

3. Clicking and dragging an area on the graph will zoom the graph in to that area.

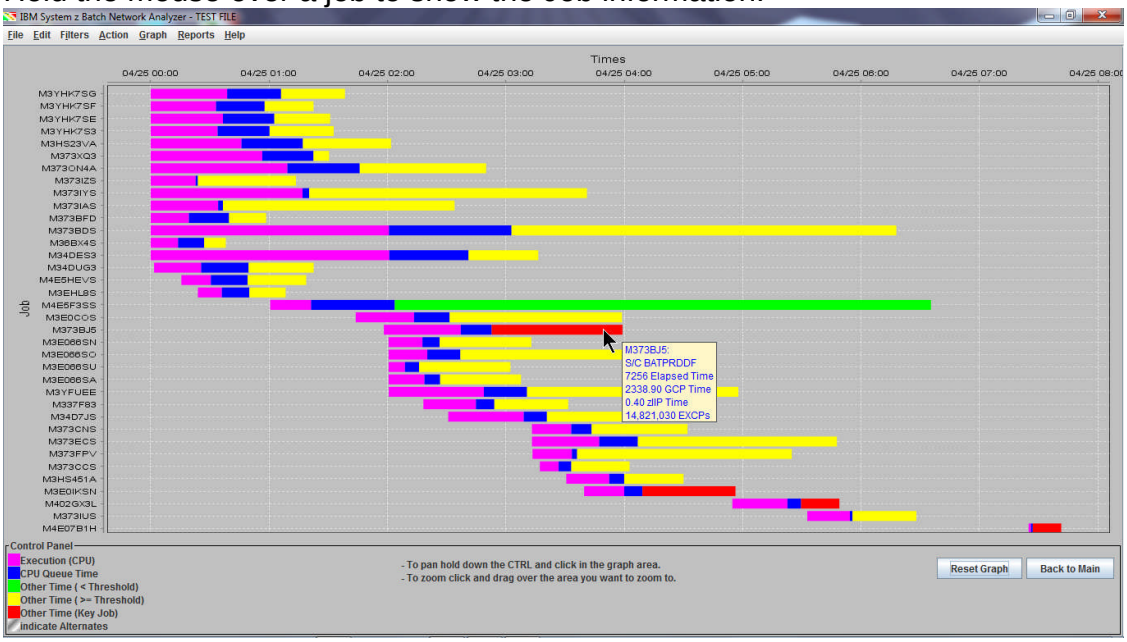


4. Holding Control allows the user to pan across the graph. The cursor will become a cross when this is happening.

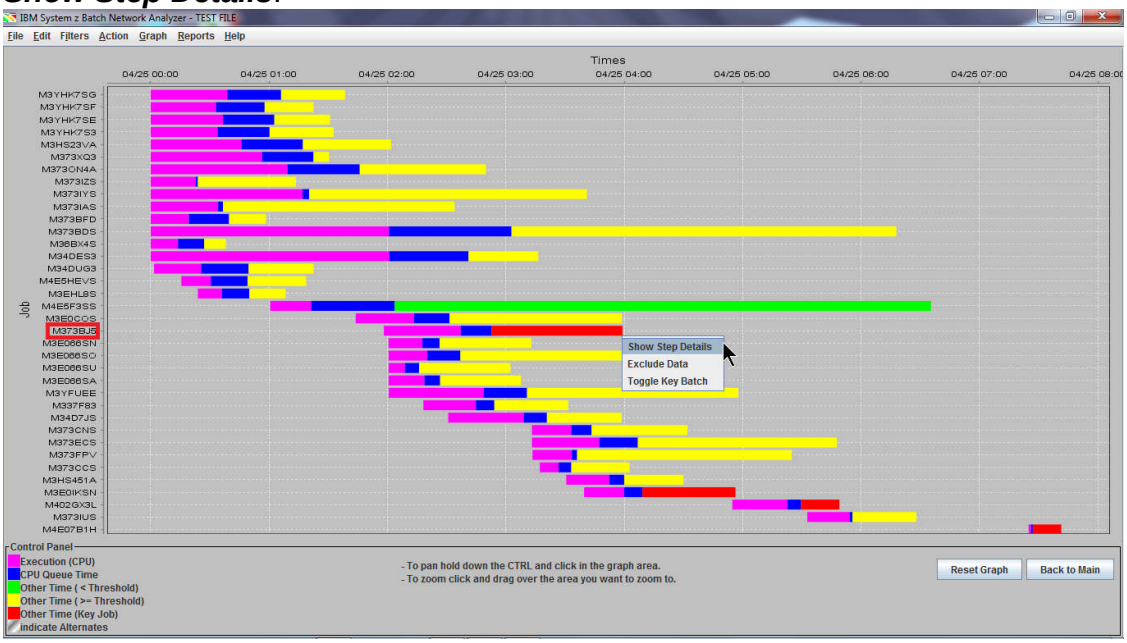


Click ***Reset Graph*** to show the original graph.

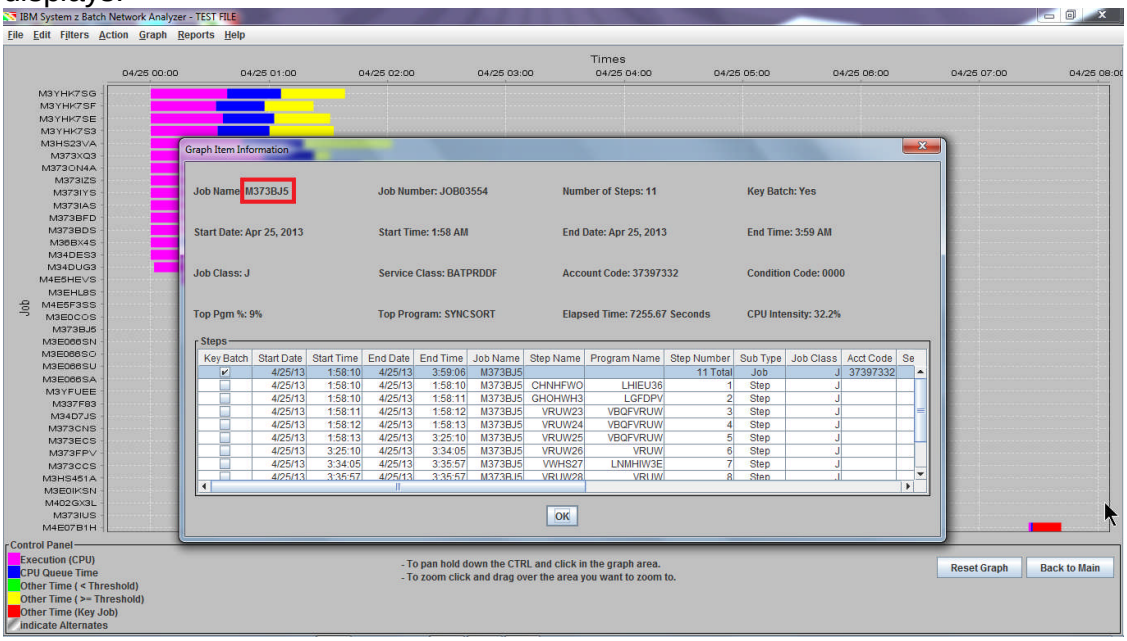
5. Hold the mouse over a job to show the Job information.



Further detail is available for each job by right-clicking and selecting *Show Step Details*. Right-click **M373BJ5** (the first Key job with Red Other time) and click ***Show Step Details***.

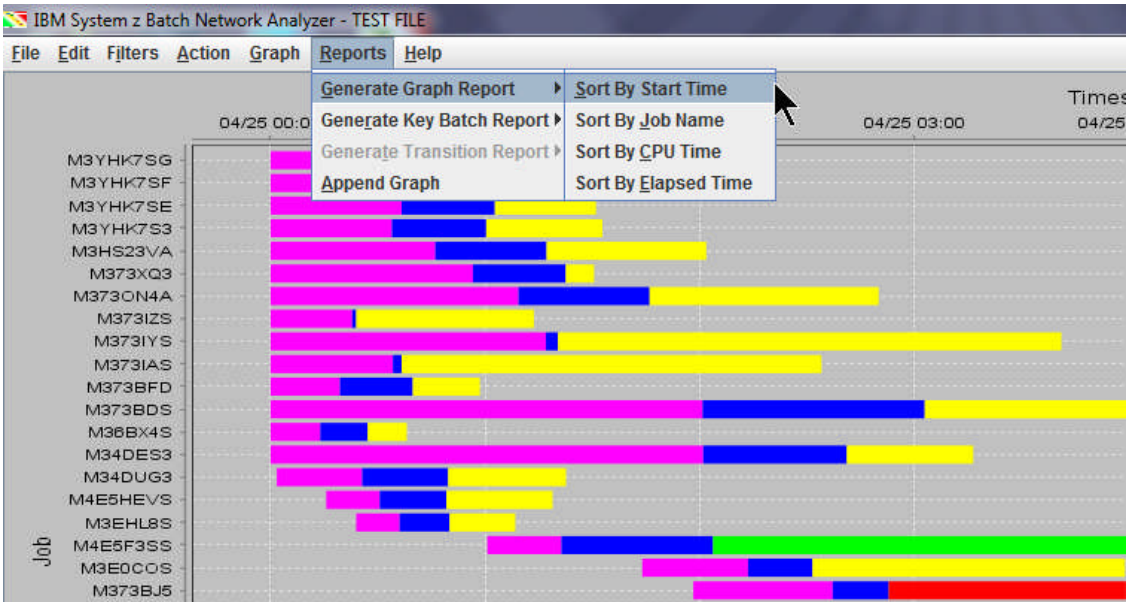


6. The same Job Step panel that is accessible from the main panel displays.



Click ***OK*** to return to the graph.

7. A graph report can automatically be created by using the ***Reports*** menu while displaying the graph. Click ***Generate Graph Report*** then select what job attribute (Start Time, Job Name, CPU Time, Elapsed Time) you would like the data sorted in the table that is included in the report. Select "**Sort By Start Time**".



This will prompt you to save the report as an HTML file. Key in a file name, e.g. "**TEST_Report**.htm" and click ***Save***.

8. Open the file (**TEST_Report.htm**) in an internet browser. After a legal disclaimer, the report will show the filters that were used and the resulting table. Key batch jobs are in bold. There is one line for each job, and at the very bottom there is a "Total" job line that is the sum of the resources used for all the Filtered jobs.

Filters

Type	Filter
Top Percent	Greater than 10%
CPU Time	Greater than 10.0
Service Class	Must be BATCHHI, BATPRDDF or BATTSTDF
Job Names	Must match M4* or M3*
Exclude	Excluded from analysis: M373DVF(JOB27670)

Data

There are 36 jobs in the following table.

Line	Key	Job Name	Program Name	Start	End	Steps	Job Class	Acct Code	Serv Class	Elapsed Time	CPU Time	Top Program	Top Pgm %
1		M3YHK7SG		4/25/13 12:00 AM	4/25/13 1:38 AM	26	J	3YH3YH32	BATPRDDF	5,908	2,327	DSNECP10	62
2		M3YHK7SF		4/25/13 12:00 AM	4/25/13 1:22 AM	26	J	3YH3YH32	BATPRDDF	4,950	1,988	DSNECP10	63
3		M3YHK7SE		4/25/13 12:00 AM	4/25/13 1:30 AM	26	J	3YH3YH32	BATPRDDF	5,458	2,198	DSNECP10	64
4		M3YHK7S3		4/25/13 12:00 AM	4/25/13 1:32 AM	26	J	3YH3YH32	BATPRDDF	5,565	2,035	DSNECP10	62
5		M3HS23VA	LNMHIW3D	4/25/13 12:00	4/25/13 2:01	3	J	3HS3HS32	BATPRDDF	7,308	2,763	DSNECP10	49
36	**X**	**M4E07B1H**		**4/25/13 7:24 AM**	**4/25/13 7:41 AM**	**132**	**B**	**4E595732**	**BATCHHI**	**991**	**72**	**IEFIIC**	**0**
		Total								**239,325**	**72,959**		

Note: A report may also be generated solely for key batch jobs by selecting ***Generate Key Batch Report*** on the **Reports** menu. The following is included in the report.

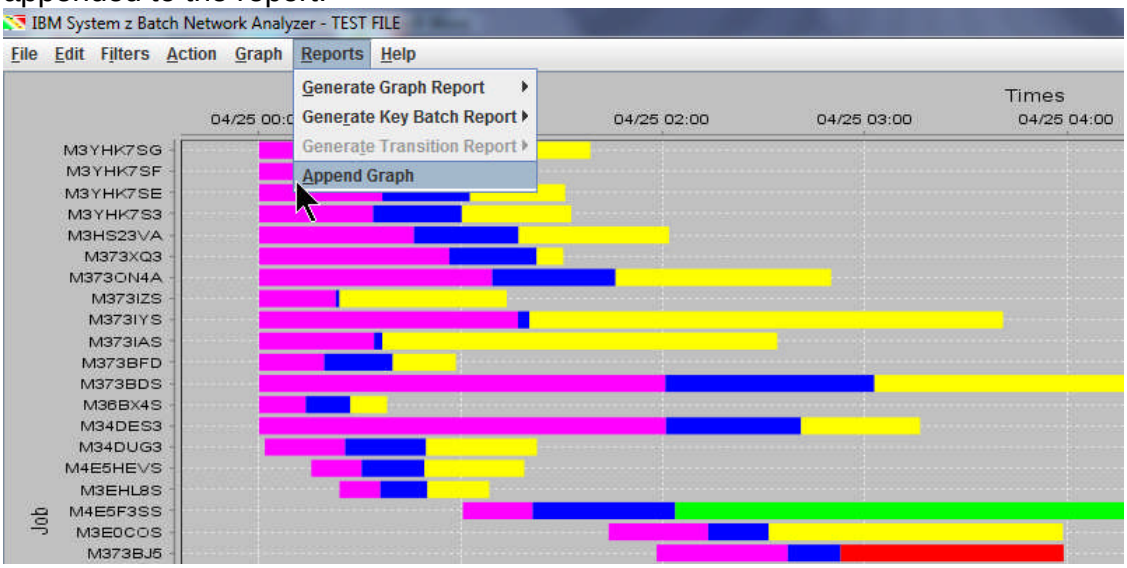
Key Batch Jobs

These are jobs that the user specifically selected for display.

There are 4 jobs in the following table.

Line	Key	Job Name	Program Name	Start	End	Steps	Job Class	Acct Code	Serv Class	Elapsed Time	CPU Time	Top Program	Top Pgm %
1	X	M373BJ5		4/25/13 1:58 AM	4/25/13 3:59 AM	11	J	37397332	BATPRDDF	7,255	2,339	SYNCSORT	9
2	X	M3E0IKSN		4/25/13 3:39 AM	4/25/13 4:56 AM	4	J	3E09E032	BATPRDDF	4,601	1,218	DSNECP10	8
3	X	M402GX3L		4/25/13 4:54 AM	4/25/13 5:49 AM	17	J	40242032	BATPRDDF	3,252	1,674	ENGEXE	4
4	X	M4E07B1H		4/25/13 7:24 AM	4/25/13 7:41 AM	132	B	4E595732	BATCHHI	991	72	IEFIIC	0
		Total								16,099	5,301		

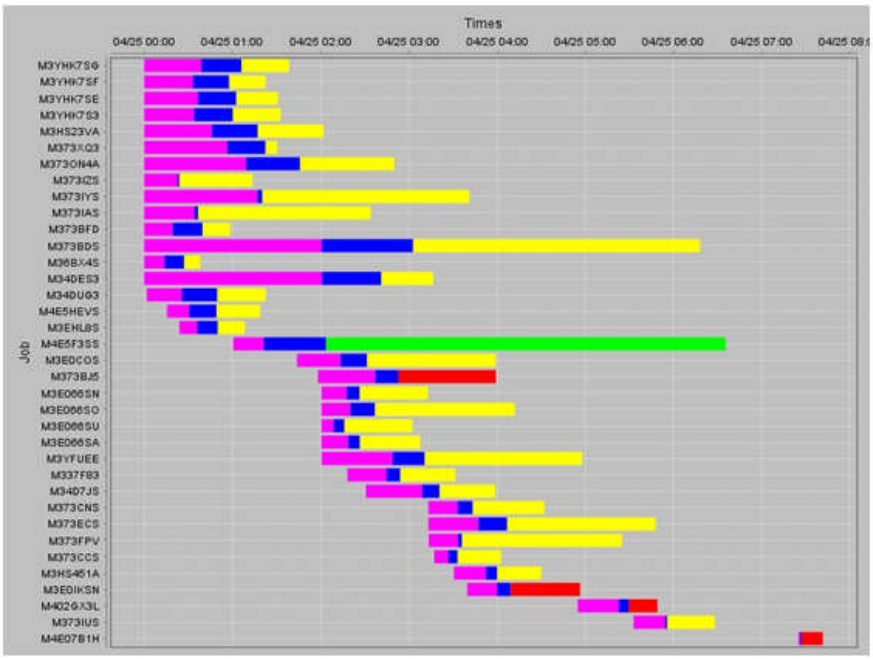
9. When the graph report is initially generated, the graph is not present. *To include the graph in the report, click* ***Reports***, ***Append Graph***. You will be prompted to select the previously saved report file. Then click ***Save***, and the graph will be appended to the report.



Click ***Back to Main*** to return to the zBNA main panel.

10. Reload (or Refresh via F5) the report, which will now include the graph positioned below the job table.

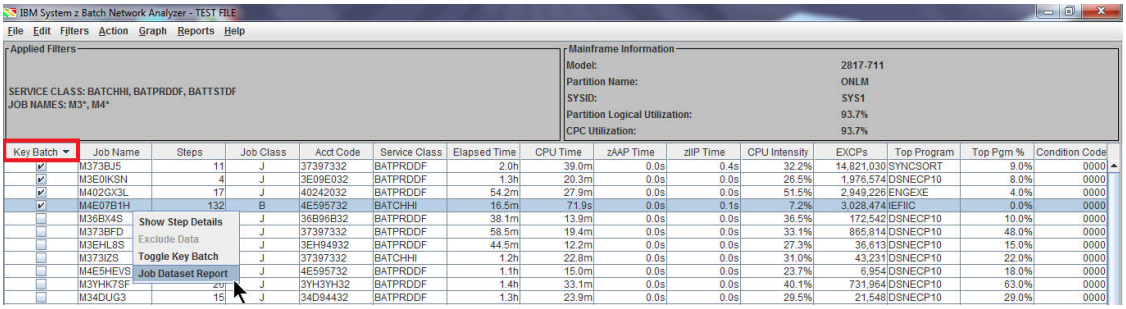
33	**X**	**M3E0IKSN**	**4/25/13 3:39 AM**	**4/25/13 4:56 AM**	**4**	**J**	**3E09E032**	**BATPRDDF**	**4,601**	**1,218**	**DSNECP10**	**8**
34	**X**	**M402GX3L**	**4/25/13 4:54 AM**	**4/25/13 5:49 AM**	**17**	**J**	**40242032**	**BATPRDDF**	**3,252**	**1,674**	**ENGEXE**	**4**
35		M373IUS	4/25/13 5:32 AM	4/25/13 6:28 AM	14	J	37397332	BATCHHI	3,315	1,296	DSNECP10	24
36	**X**	**M4E07B1H**	**4/25/13 7:24 AM**	**4/25/13 7:41 AM**	**132**	**B**	**4E595732**	**BATCHHI**	**991**	**72**	**IEFIIC**	**0**
		Total							**239,325**	**72,959**		



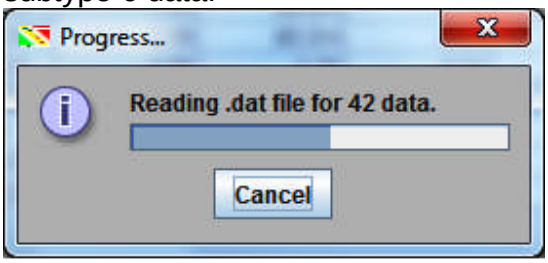
	Execution
	Wait for Execution
	Other Time (< Threshold)
	Other Time (>= Threshold)
	Other Time (Key Job)
	indicate Alternates

Task 4 – **Reviewing DASD Data Set Information**

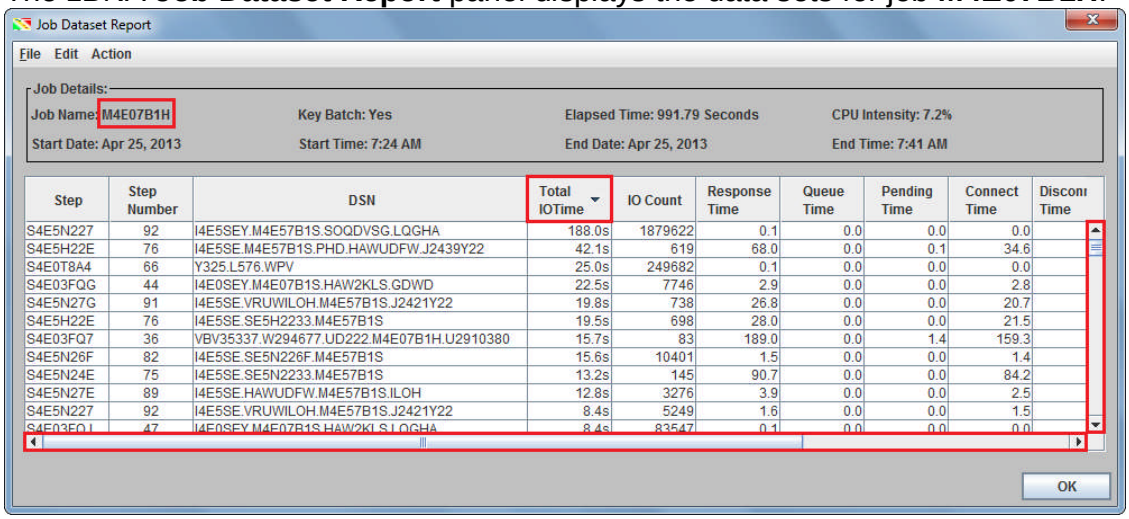
1. The SMF Type 42 subtype 6 records are required to view the DASD data set I/O information. They are loaded into zBNA via the .dat file when the job step level data is added.



A job must be selected to display the data set information. Let's focus on one of the jobs identified as key batch. Double click on the **Key Batch** header to sort that column. Right click on the job, **M4E07B1H**, and select **Job Dataset Report** (this option is also available on the **Action** menu). zBNA reads the SMF Type 42 subtype 6 data.

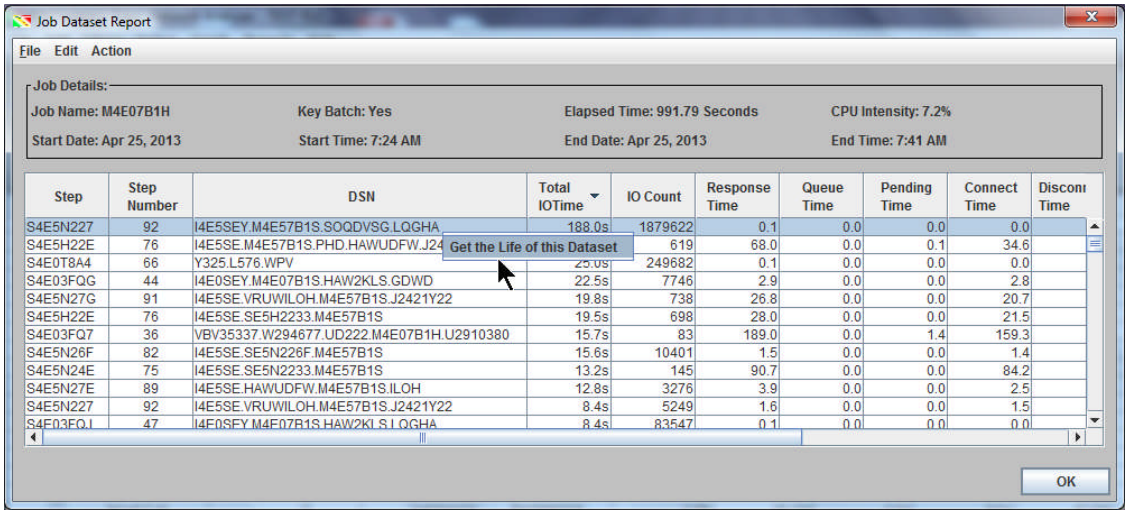


2. The zBNA **Job Dataset Report** panel displays the data sets for job **M4E07B1H**.

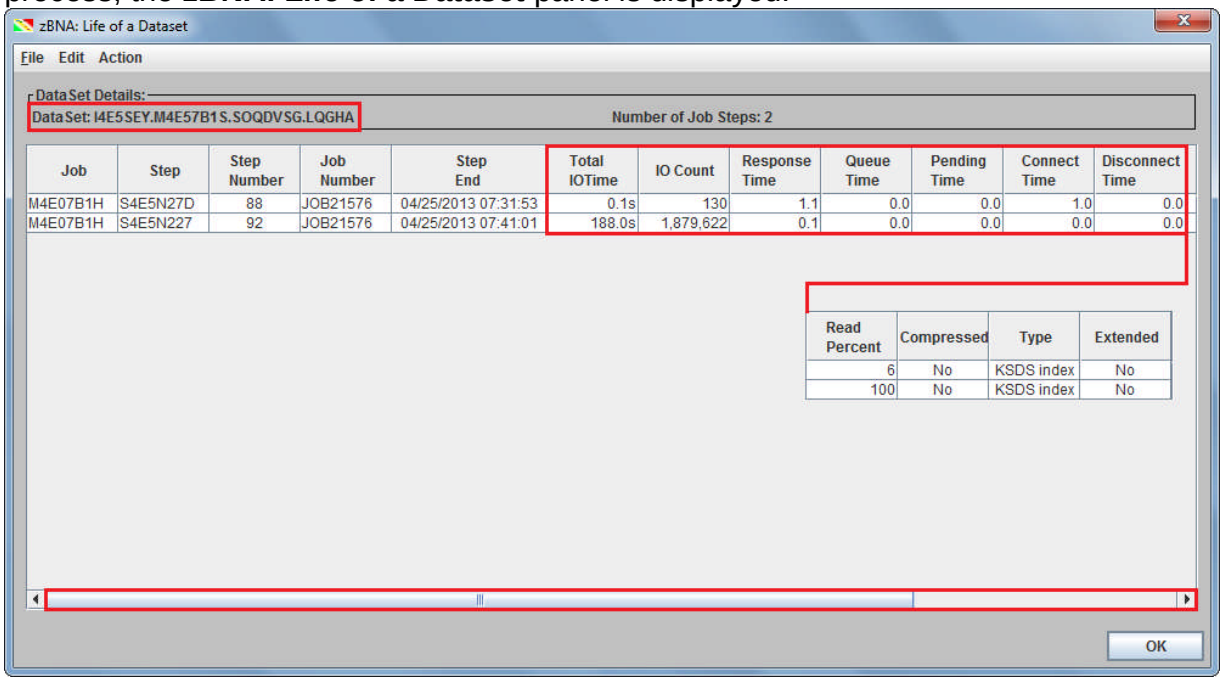


Be sure to use the scroll bars to get a complete view of the job details. Sort the **Total IO Time** column in descending order so that the data set with the most IO time is positioned in the first row.

3. Right click on **I4E5SEY.M4E57B1S.SOQDVSG.LQGHA**, and select **Get the Life of this Dataset**.



4. zBNA reads the .dat file that is loaded for the SMF 42 then the SMF 30 data. It searches through **all Jobs (5147)**, not just the Filtered Jobs. When it finishes the process, the **zBNA: Life of a Dataset** panel is displayed.

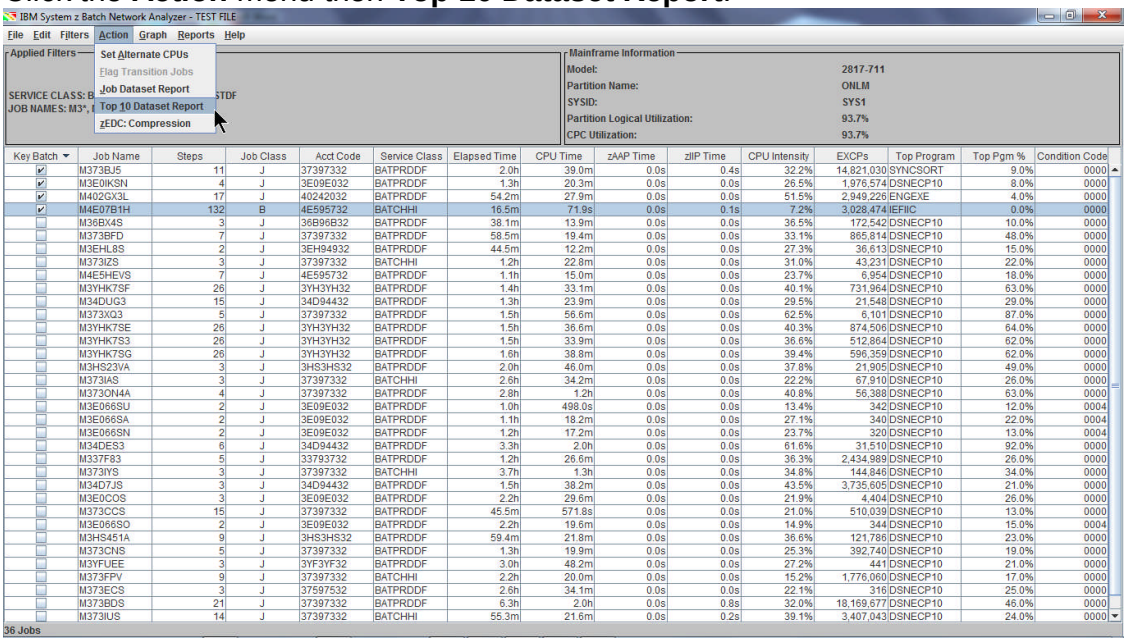


The job names using this data set are shown. Use the scroll bar to view all of the data, and the columns can be sorted.

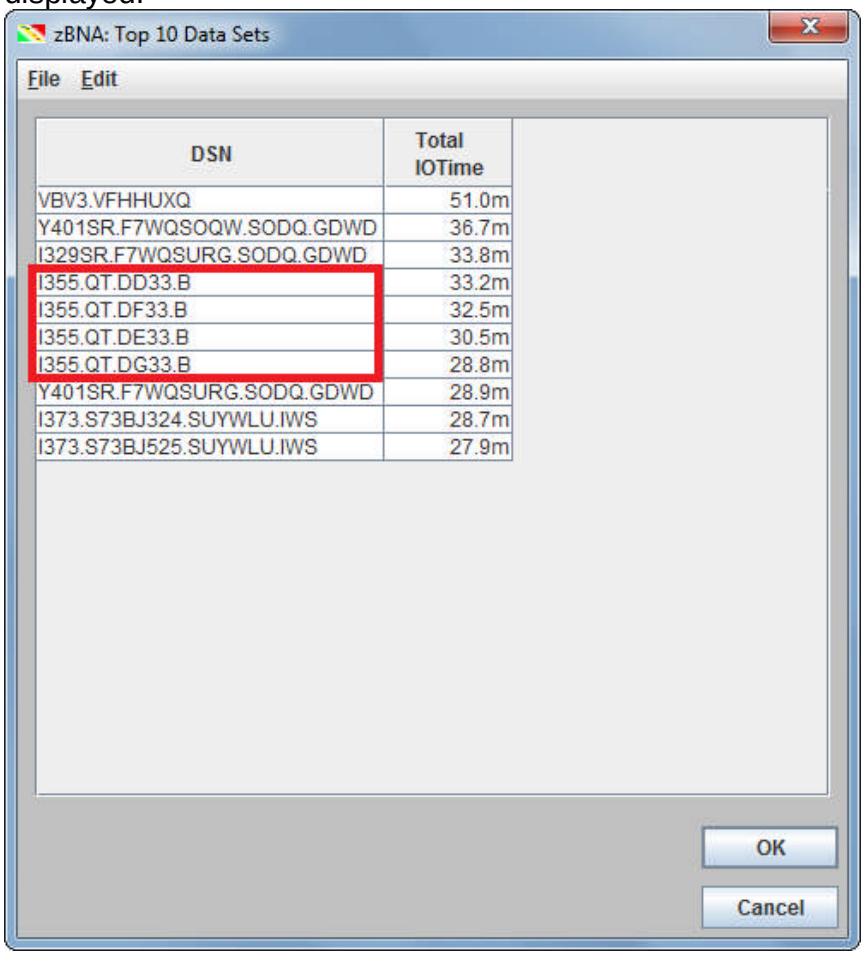
In this case, **Job M4E07B1H** is the only job that accessed the data set; in Steps 88 and 92. Step 92 has the most **Total IO Time**, 188 seconds. The response time is very low. If you scroll to the right, in the column **Type**, you'll see it is a "**KSDS Index"**. While not currently provided in zBNA, one could investigate SMF 64s and consider increasing LSR / NSR buffers to hold Index Set and potentially eliminate ~3 Minutes of I/O time, which would be approximately 18% of the Job's elapsed time (16.5 minutes).

Click ***OK*** until the zBNA main panel is displayed.

5. Click the **Action** menu then **Top 10 Dataset Report**.

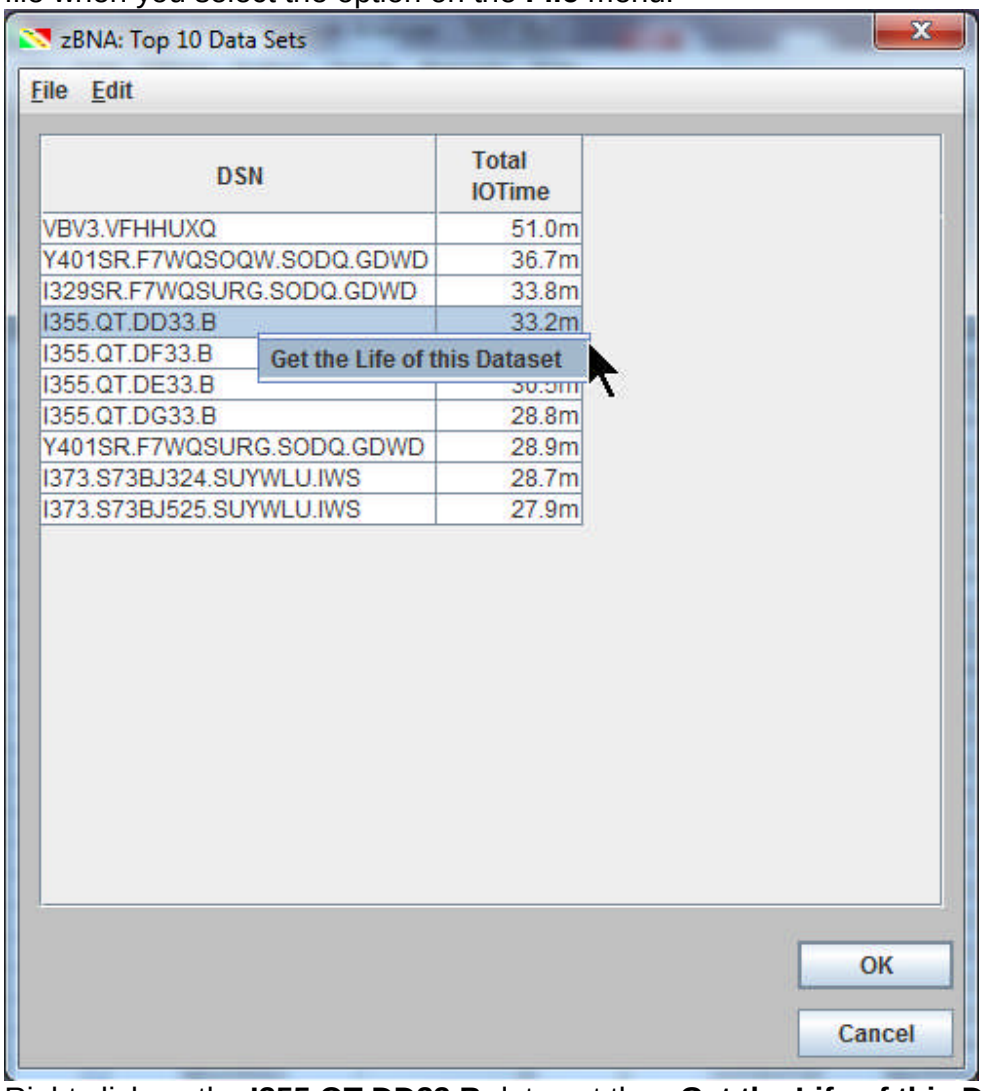


zBNA displays an information panel showing that it is reading the SMF 42 (6) then SMF 30 data from the loaded .dat file. The **zBNA Top 10 Data Sets** panel is displayed.



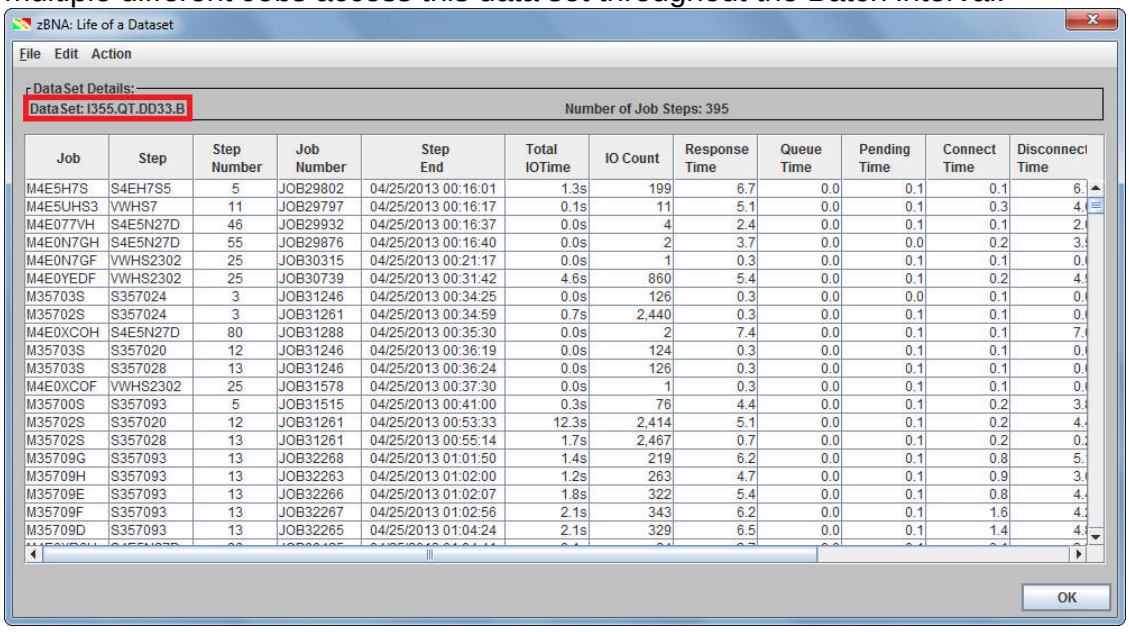
The purpose is to show where the most I/O time is, over the entire interval and regardless of who is accessing the dataset. Then looking at the characteristics, technology options can be evaluated to improve the response time, and thus the elapsed times of the jobs/online applications that are accessing it. In this case, it appears that 4 data sets starting with **I335.QT.** are the 4th through 7th Top data sets. Perhaps they are clones that we enabled for parallel processing? We'll investigate one of these files.

6. The Top 10 data sets are displayed, and the information can be written to a CSV file when you select the option on the **File** menu.



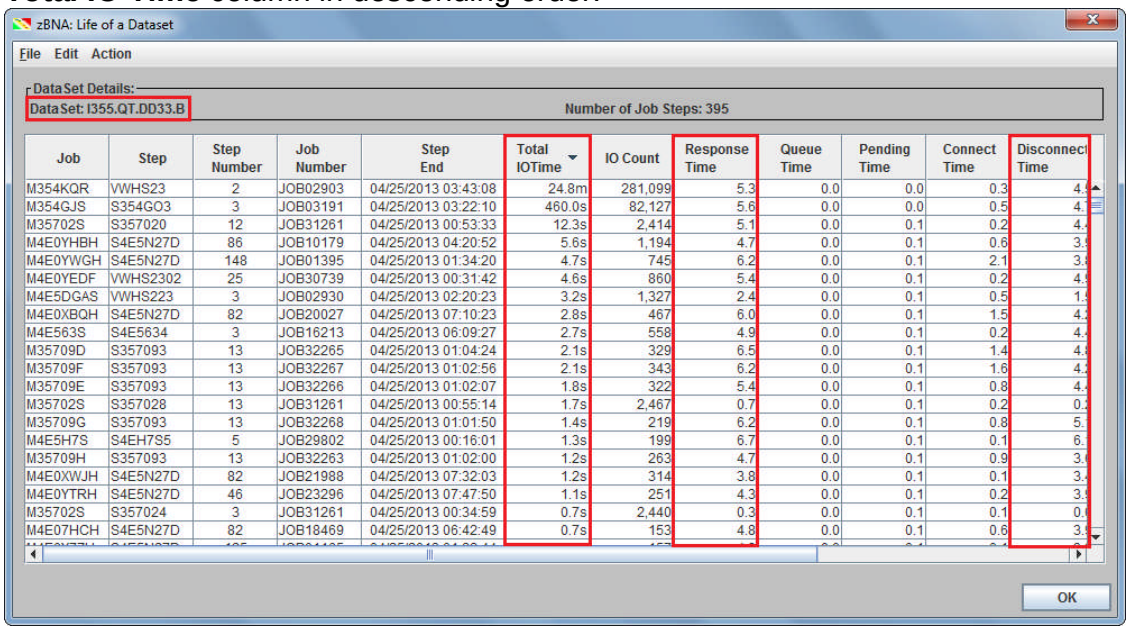
Right click on the **I355.QT.DD33.B** data set then **Get the Life of this Dataset**. After zBNA reads the SMF 42 and 30 data in the .dat file, the **zBNA: Life of a Dataset** panel is displayed.

7. The job details are shown for the **I355.QT.DD33.B** data set. You can see that multiple different Jobs access this data set throughout the Batch interval.



Job	Step	Step Number	Job Number	Step End	Total IOTime	IO Count	Response Time	Queue Time	Pending Time	Connect Time	Disconnect Time
M4E5H7S	S4EH7S5	5	JOB29802	04/25/2013 00:16:01	1.3s	199	6.7	0.0	0.1	0.1	6.
M4E5UHS3	VWHS7	11	JOB29797	04/25/2013 00:16:17	0.1s	11	5.1	0.0	0.1	0.3	4.
M4E077VH	S4E5N27D	46	JOB29932	04/25/2013 00:16:37	0.0s	4	2.4	0.0	0.1	0.1	2.
M4E0N7GH	S4E5N27D	55	JOB29876	04/25/2013 00:16:40	0.0s	2	3.7	0.0	0.0	0.2	3.
M4E0N7GF	VWHS2302	25	JOB30315	04/25/2013 00:21:17	0.0s	1	0.3	0.0	0.1	0.1	0.
M4E0YEDF	VWHS2302	25	JOB30739	04/25/2013 00:31:42	4.6s	860	5.4	0.0	0.1	0.2	4.
M35703S	S357024	3	JOB31246	04/25/2013 00:34:25	0.0s	126	0.3	0.0	0.0	0.1	0.
M35702S	S357024	3	JOB31261	04/25/2013 00:34:59	0.7s	2,440	0.3	0.0	0.1	0.1	0.
M4E0XCOH	S4E5N27D	80	JOB31288	04/25/2013 00:35:30	0.0s	2	7.4	0.0	0.1	0.1	7.
M35703S	S357020	12	JOB31246	04/25/2013 00:36:19	0.0s	124	0.3	0.0	0.1	0.1	0.
M35703S	S357028	13	JOB31246	04/25/2013 00:36:24	0.0s	126	0.3	0.0	0.1	0.1	0.
M4E0XCOF	VWHS2302	25	JOB31578	04/25/2013 00:37:30	0.0s	1	0.3	0.0	0.1	0.1	0.
M35700S	S357093	5	JOB31515	04/25/2013 00:41:00	0.3s	76	4.4	0.0	0.1	0.2	3.
M35702S	S357020	12	JOB31261	04/25/2013 00:53:33	12.3s	2,414	5.1	0.0	0.1	0.2	4.
M35702S	S357028	13	JOB31261	04/25/2013 00:55:14	1.7s	2,467	0.7	0.0	0.1	0.2	0.
M35709G	S357093	13	JOB32268	04/25/2013 01:01:50	1.4s	219	6.2	0.0	0.1	0.8	5.
M35709H	S357093	13	JOB32263	04/25/2013 01:02:00	1.2s	263	4.7	0.0	0.1	0.9	3.
M35709E	S357093	13	JOB32266	04/25/2013 01:02:07	1.8s	322	5.4	0.0	0.1	0.8	4.
M35709F	S357093	13	JOB32267	04/25/2013 01:02:56	2.1s	343	6.2	0.0	0.1	1.6	4.
M35709D	S357093	13	JOB32265	04/25/2013 01:04:24	2.1s	329	6.5	0.0	0.1	1.4	4.

Now we want to see which Jobs have the most IO Time. Perform a sort on the **Total IO Time** column in descending order.



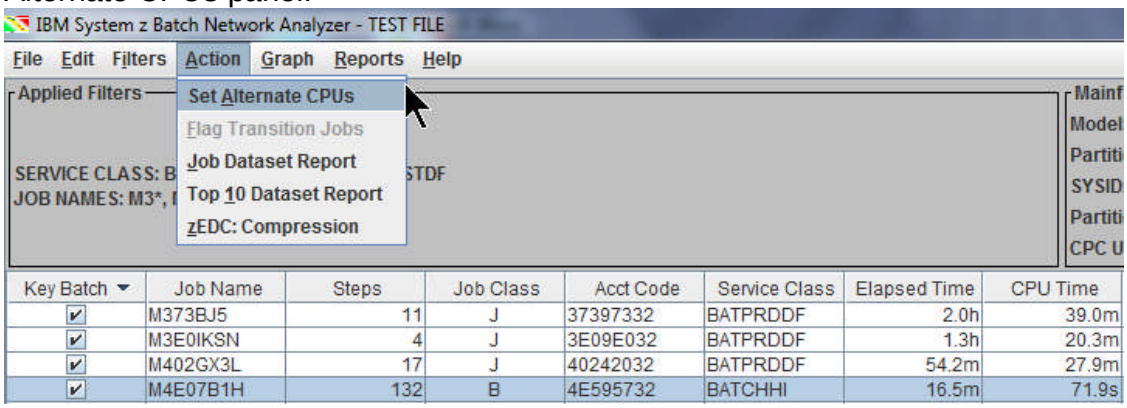
Job	Step	Step Number	Job Number	Step End	Total IOTime	IO Count	Response Time	Queue Time	Pending Time	Connect Time	Disconnect Time
M354KQR	VWHS23	2	JOB02903	04/25/2013 03:43:08	24.8m	281,099	5.3	0.0	0.0	0.3	4.
M354GJS	S354GO3	3	JOB03191	04/25/2013 03:22:10	460.0s	82,127	5.6	0.0	0.0	0.5	4.
M35702S	S357020	12	JOB31261	04/25/2013 00:53:33	12.3s	2,414	5.1	0.0	0.1	0.2	4.
M4E0YHBH	S4E5N27D	86	JOB10179	04/25/2013 04:20:52	5.6s	1,194	4.7	0.0	0.1	0.6	3.
M4E0YWGH	S4E5N27D	148	JOB01395	04/25/2013 01:34:20	4.7s	745	6.2	0.0	0.1	2.1	3.
M4E0YEDF	VWHS2302	25	JOB30739	04/25/2013 00:31:42	4.6s	860	5.4	0.0	0.1	0.2	4.
M4E5DGAS	VWHS223	3	JOB02930	04/25/2013 02:20:23	3.2s	1,327	2.4	0.0	0.1	0.5	1.
M4E0XBQH	S4E5N27D	82	JOB20027	04/25/2013 07:10:23	2.8s	467	6.0	0.0	0.1	1.5	4.
M4E563S	S4E5634	3	JOB16213	04/25/2013 06:09:27	2.7s	558	4.9	0.0	0.1	0.2	4.
M35709D	S357093	13	JOB32265	04/25/2013 01:04:24	2.1s	329	6.5	0.0	0.1	1.4	4.
M35709F	S357093	13	JOB32267	04/25/2013 01:02:56	2.1s	343	6.2	0.0	0.1	1.6	4.
M35709E	S357093	13	JOB32266	04/25/2013 01:02:07	1.8s	322	5.4	0.0	0.1	0.8	4.
M35702S	S357028	13	JOB31261	04/25/2013 00:55:14	1.7s	2,467	0.7	0.0	0.1	0.2	0.
M35709G	S357093	13	JOB32268	04/25/2013 01:01:50	1.4s	219	6.2	0.0	0.1	0.8	5.
M4E5H7S	S4EH7S5	5	JOB29802	04/25/2013 00:16:01	1.3s	199	6.7	0.0	0.1	0.1	6.
M35709H	S357093	13	JOB32263	04/25/2013 01:02:00	1.2s	263	4.7	0.0	0.1	0.9	3.
M4E0XWJH	S4E5N27D	82	JOB21988	04/25/2013 07:32:03	1.2s	314	3.8	0.0	0.1	0.1	3.
M4E0YTRH	S4E5N27D	46	JOB23296	04/25/2013 07:47:50	1.1s	251	4.3	0.0	0.1	0.2	3.
M35702S	S357024	3	JOB31261	04/25/2013 00:34:59	0.7s	2,440	0.3	0.0	0.1	0.1	0.
M4E07HCH	S4E5N27D	82	JOB18469	04/25/2013 06:42:49	0.7s	153	4.8	0.0	0.1	0.6	3.

We can see that many of the Jobs have Response times in the 2 - 6 MS range. Based on this, perhaps an investigation of I/O technology to reduce I/O response times should be a follow-on action.

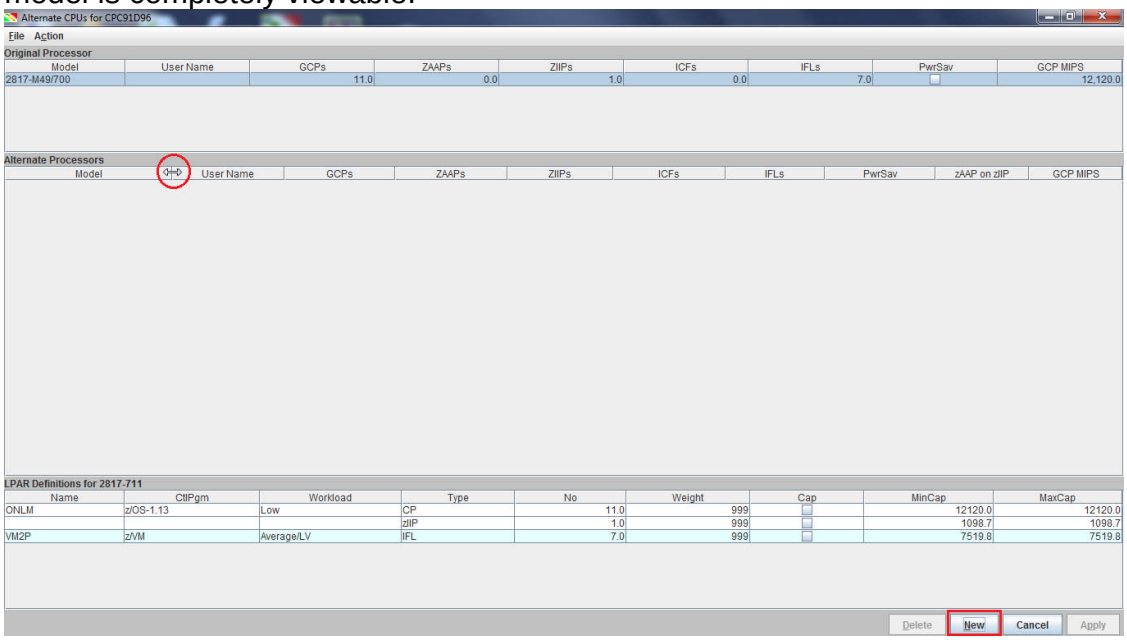
Click ***Ok*** to return to the zBNA main panel.

Task 5 – **Performing an Alternate Processor Analysis**

1. Now we will view a “what-if” scenario by selecting an alternate processor to “execute” the same batch jobs. **Click *Action*, *Set Alternate CPUs*** to load the Alternate CPUs panel.



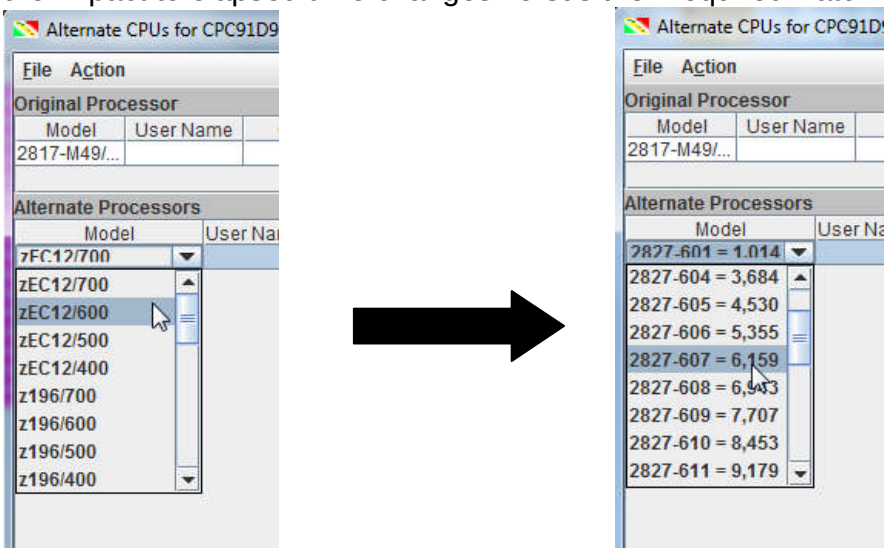
2. Maximize the **Alternate CPUs** window to show all of the columns. Then expand the **Model** column in the **Alternate Processors** table so that the name of each model is completely viewable.

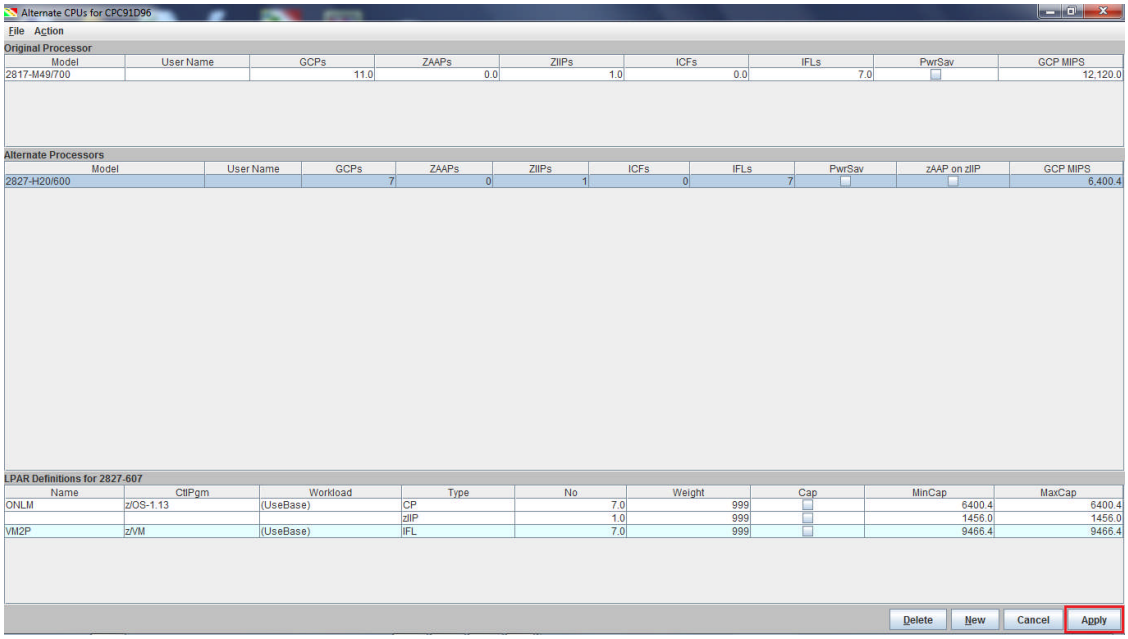


Click ***New***.

3. A drop-down menu will appear that allows you to select the new processor. In this example we are going to select a processor with less total capacity and also less capacity per engine. Select the **zEC12/600** family, and then the **2827-607**.

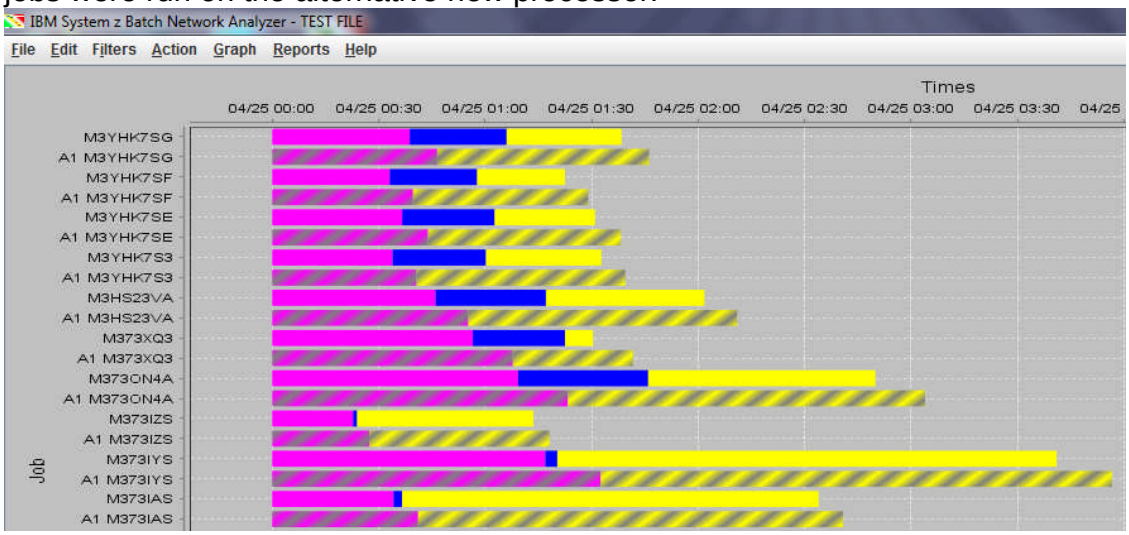
   In this example, we are selecting a zEC12 607 subcapacity model versus the current z196 711 full capacity model. (Perhaps they have a zEC12 607 and are considering migrating these jobs to that processor, and they want to understand the impact to elapsed time changes versus their required Batch completion time.



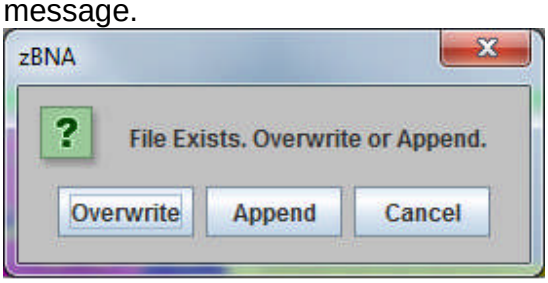


Click **Apply** to view the hypothetical scenario with this new processor.

4. From the main zBNA panel, use ***Graph, Display Graph Table*** to display the graph to see that each row now contains a gray striped one below it. This second row shows the same jobs, however, the total times are estimated as if the jobs were run on the alternative new processor.



5. We can generate a new report that includes the alternate processor details or we can append to the one previously saved in **Task 3**. To do this, click on the **Reports** menu, then select **Generate Graph Report**, **Sort By Start Time**. This will prompt you to save the report as an HTML file. Since we have already created a report, you can select that file. zBNA will display the following message.



Click **Append** to add to the end of the previously generated file.
Note: Click **Overwrite** to replace the file. Click **Cancel** to return to the graph.

6. The report will now include the alternate processor, as well as the estimated run-time in the table for this new processor.

The processors considered in this analysis are the following:
Note: There is no effort to determine if the alternate processor has the total capacity to run this workload. The analysis is simply comparing the single engine speed of base versus the alternate processor.

Name	Processor	Single GCP Mips	Ratio
Base (B)	2817-711	1,102	
Alternate 1 (A1)	2827-607	914	-17.0%

The analysis follows:

Data

There are 36 jobs in the following table.

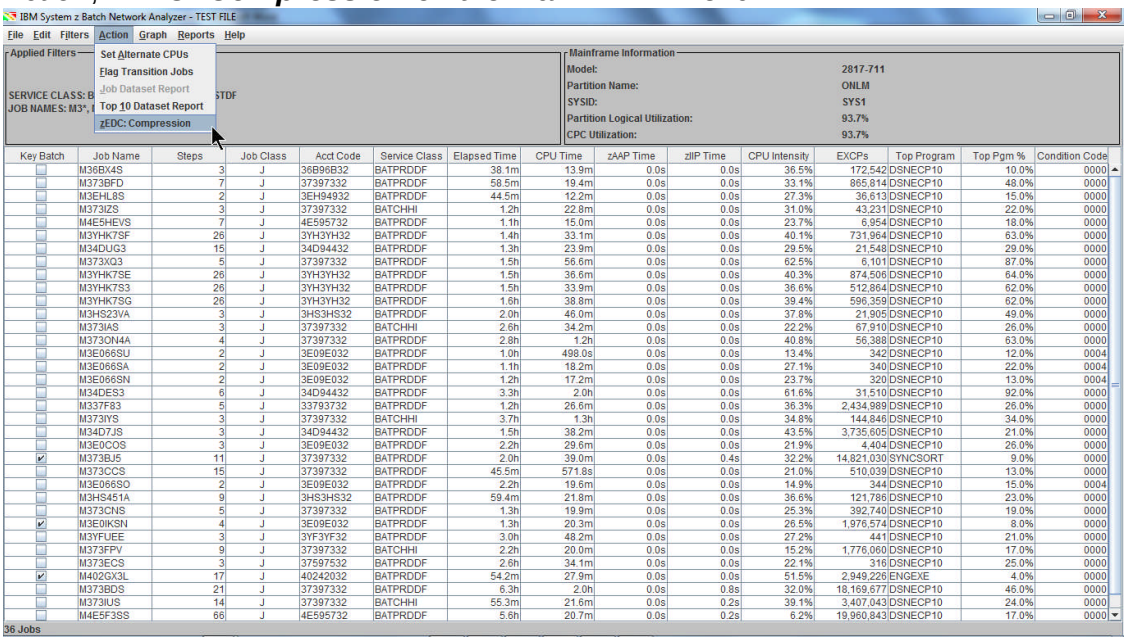
Name	Line	Key	Job Name	Program Name	Start	End	Steps	Job Class	Acct Code	Serv Class	Elapsed Time	CPU Time	Top Program	Top Pgm %
B	33	X	M3E0IKSN		4/25/13 3:39 AM	4/25/13 4:56 AM	4	J	3E09E032	BATPRDDF	4,601	1,218	DSNECP10	8
A1	33	X	M3E0IKSN		4/25/13 3:39 AM	4/25/13 5:00 AM	4	J	3E09E032	BATPRDDF	4,851(5.4%)	1,468		
B	34	X	M402GX3L		4/25/13 4:54 AM	4/25/13 5:49 AM	17	J	40242032	BATPRDDF	3,252	1,674	ENGEXE	4
A1	34	X	M402GX3L		4/25/13 4:54 AM	4/25/13 5:54 AM	17	J	40242032	BATPRDDF	3,595(10.5%)	2,018		
B	35		M373IUS		4/25/13 5:32 AM	4/25/13 6:28 AM	14	J	37397332	BATCHHI	3,315	1,296	DSNECP10	24
A1	35		M373IUS		4/25/13 5:32 AM	4/25/13 6:32 AM	14	J	37397332	BATCHHI	3,581(8.0%)	1,561		
B	36	X	M4E07B1H		4/25/13 7:24 AM	4/25/13 7:41 AM	132	B	4E595732	BATCHHI	991	72	IEFIIC	0
A1	36	X	M4E07B1H		4/25/13 7:24 AM	4/25/13 7:41 AM	132	B	4E595732	BATCHHI	1,006(1.5%)	87		
B			Total								239,325	72,959		
A01			Total								254,106(6.2%)	87,740		

In this case we can see that the Alternate Processor had a **Ratio** of **-17%** **Single GCP MIPS**, resulting in slightly increased CPU and Elapsed times compared to the current processor for each job.

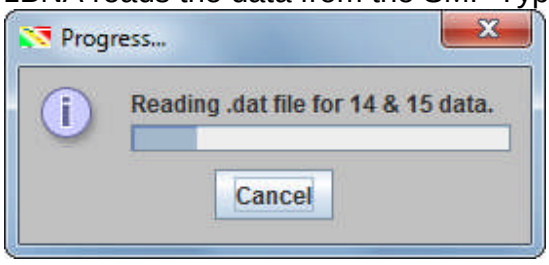
7. Let's save the study as a zBNA file, click ***File***, ***Save As zBNA Study File***. This saves a .zBNA file containing the current filters and settings including the key batch jobs. However, when you load the .zBNA file, the original SMF70 and SMF30 files will still be needed.

Task 6 – **Exploring zEDC Compression**

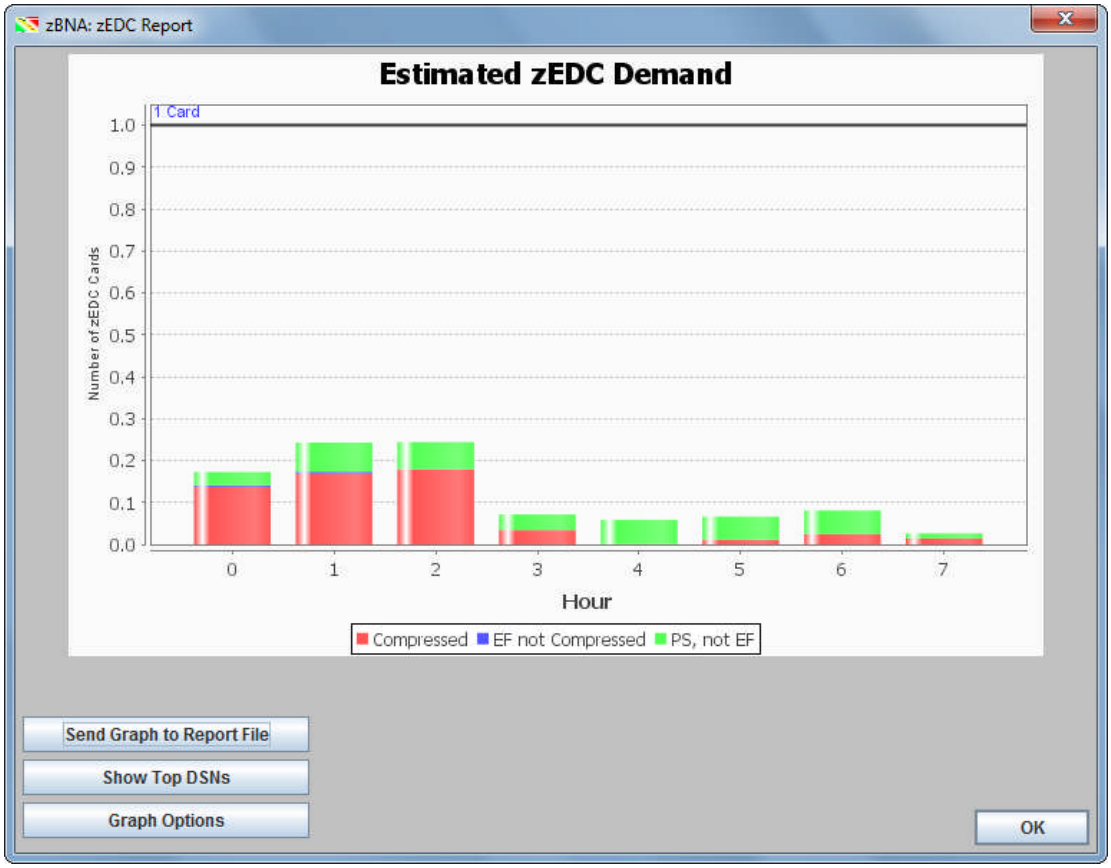
1. To use the zBNA zEDC Compression function, SMF Type 14 and 15 (Input/Output Data Set Close) Records must be included in the "**.dat**" file. Click *Action*, ***zEDC: Compression*** on the main zBNA menu.



zBNA reads the data from the SMF Type 14 and 15 records.

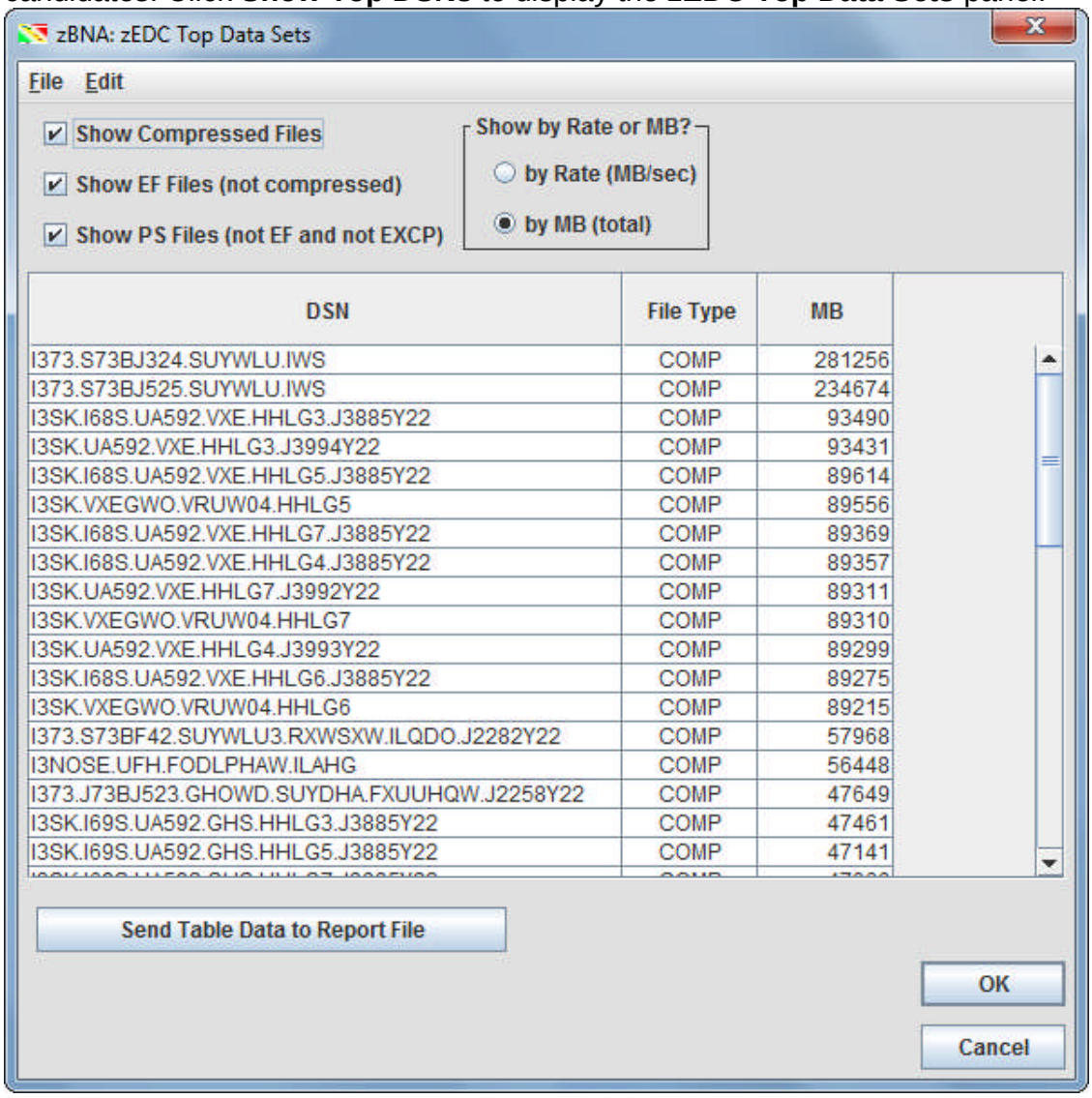


2. The **zEDC Report** panel displays after the SMF Type 14 and 15 records have been loaded.



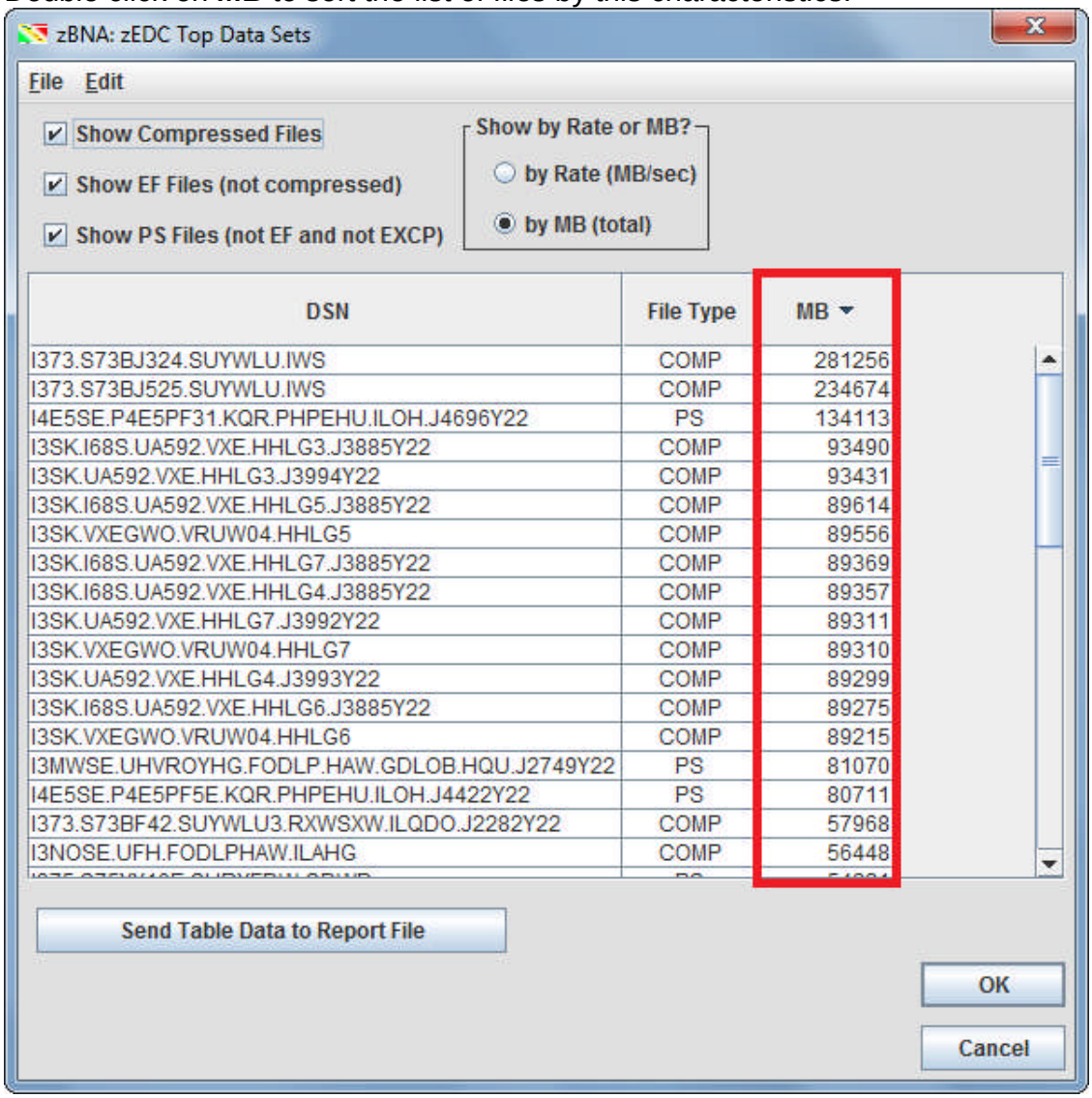
This graph shows the estimated number of zEDC cards by hour needed to support the workload for all data sets that met the criteria in the interval. With this graph you can see the peak time and how many cards are required from a capacity perspective. Save this data and graphic image to a zBNA report file by clicking **Send Graph to Report File**. Input "**zEDCgraph**" for the file name, and click **Save**. Both the ".htm" and ".jpg" files are generated.

3. Let's view the data sets that zBNA has calculated are the top zEDC Compression candidates. Click **Show Top DSNs** to display the **zEDC Top Data Sets** panel.



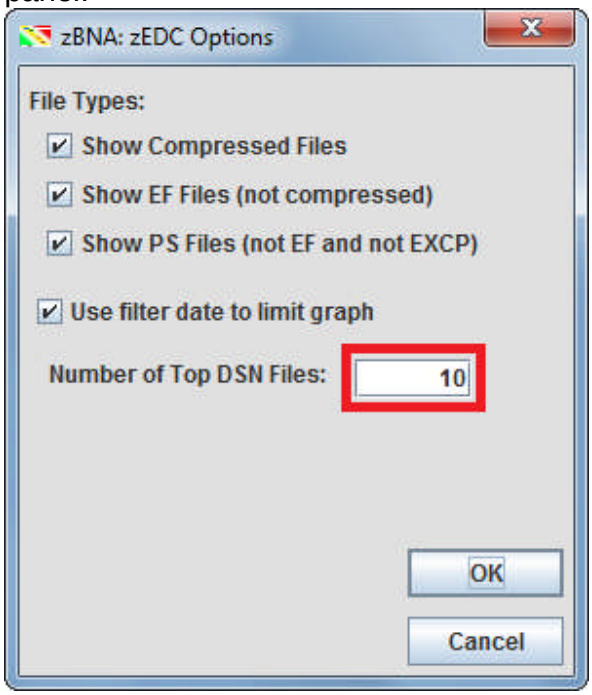
By default, the list is ordered by the top data sets, according to MB, in each of the compression categories.

4. Double click on **MB** to sort the list of files by this characteristics.

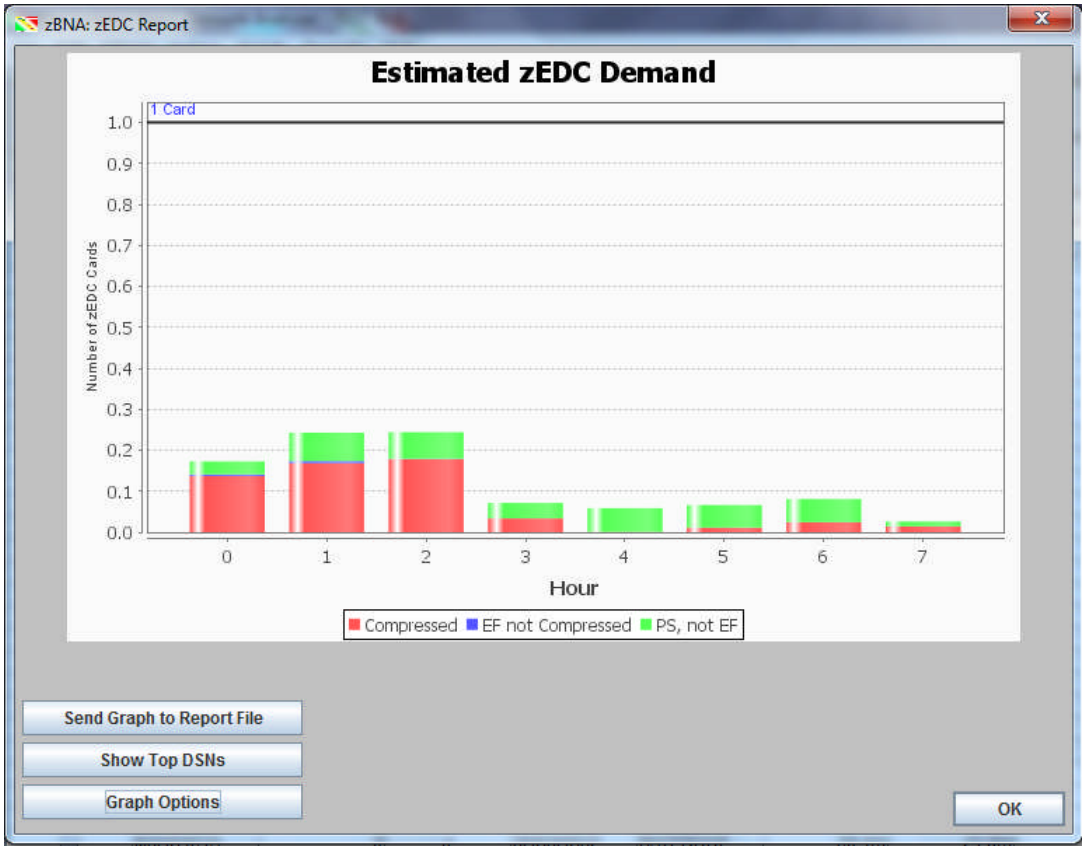


Now the top data sets are listed by MB no matter which compression category they are in. Click **OK**.

5. On the **zEDC Report** panel, click **Graph Options** to display the **zEDC Options** panel.

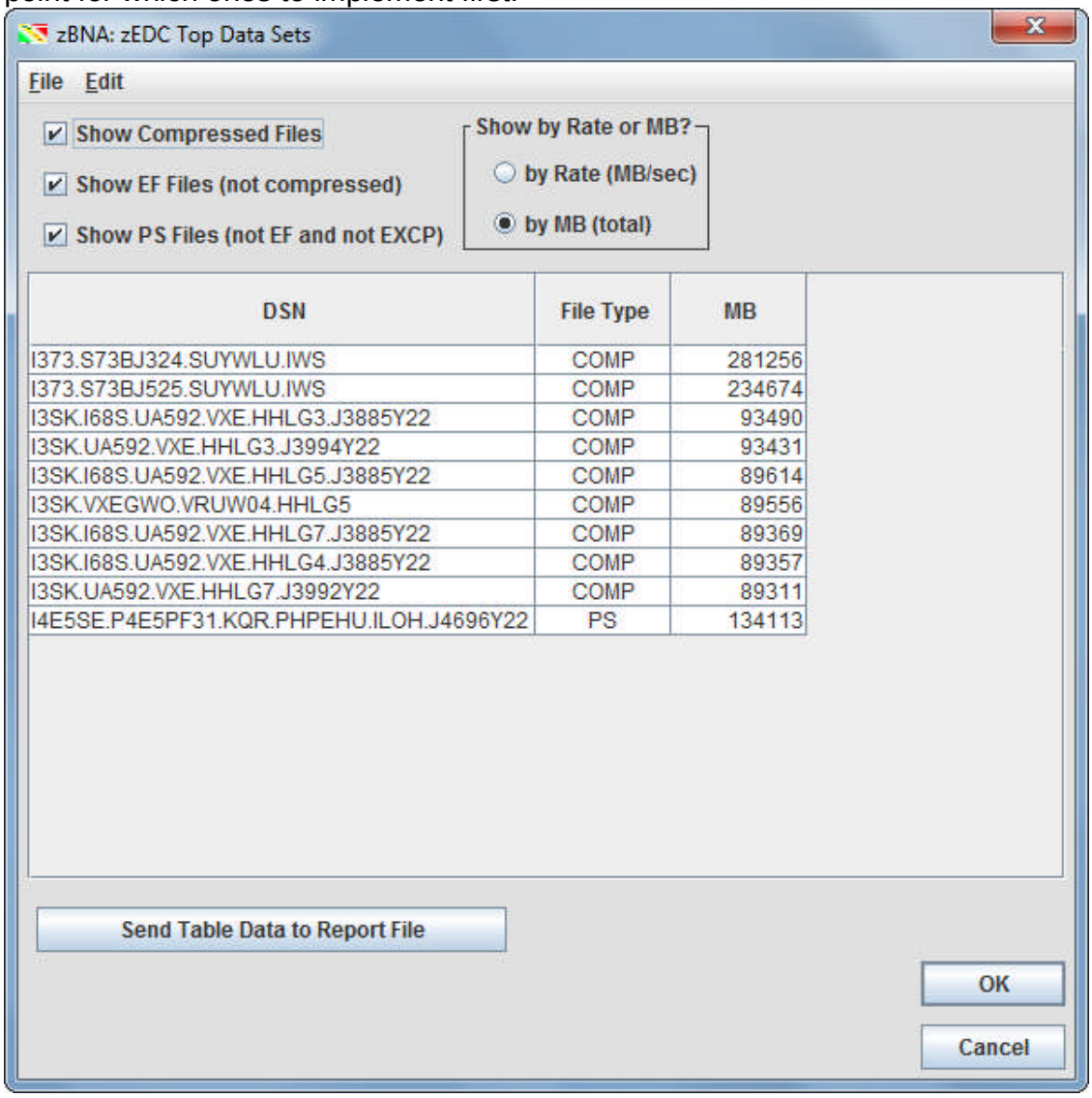


Change the "**Number of Top DSN Files**" from the default value of 50 to **10**. Click **OK**.



Click **Show Top DSNs** to redisplay the **zEDC Top Data Sets** panel.

The purpose of providing the Top Data Sets is to identify which ones will provide the most impact/benefit from zEDC compression, and may provide a starting point for which ones to implement first.



Also, you can drill down further on a data set by right clicking on its name and selecting **Get the Life of this Dataset**.

You have successfully completed all the tasks in running the zBNA Lab.