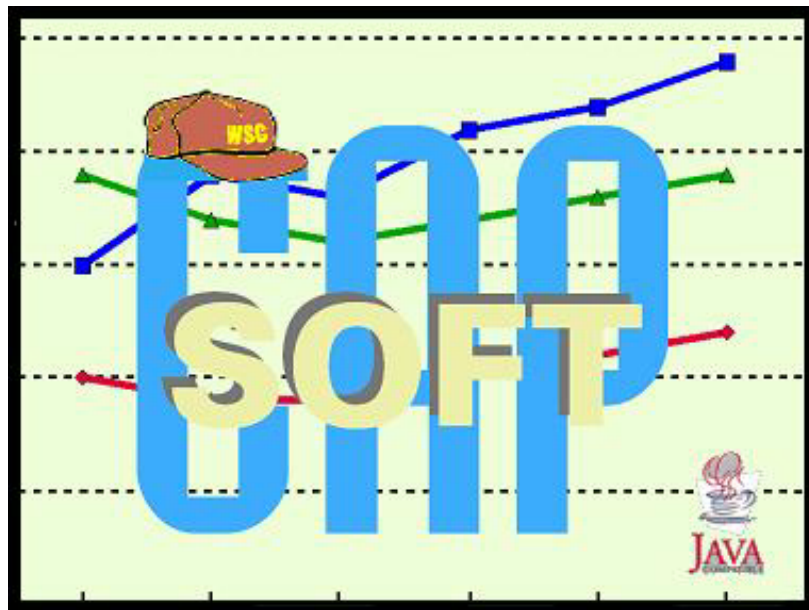


Software Migration Capacity Planning Aid User's Guide



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September 22, 2004

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Introduction

Software Migration Capacity Planning

SoftCap is a PC-based productivity tool designed to assess the effect on capacity for an IBM z/Architecture or System/390 processor, when migrating to more current releases of the operating system or major subsystems. **SoftCap** assumes that hardware remains constant while software releases change.

Software Migration

For the z/OS and OS/390, input required by **SoftCap** includes the current version with the utilization for each of the following components being exploited: Batch, TSO, CICS, DB2, IMS, and System. The target operating system version and migration from "Compatibility Mode" or "Goal Mode" must also be specified.

For both CICS and IMS, the current and planned release, and a high-level description of the subsystem's implementation is required. Results are shown for each software component, showing the net change in capacity and the effective change in processor utilization that can be expected. If migrating multiple components, results are also shown for the components combined.

Changing from 31-bit to 64-bit Addressing Mode

If the host is a z/Architecture processor currently running OS/390 V2.10 or later, and the target operating system is either z/OS or OS/390 V2.10, **SoftCap** can also assess the effect on capacity when changing from 31-bit to 64-bit addressing. This projection is based on current 31-bit storage contention metrics that you provide.

Getting Started

The Software Migration Capacity Planning Aid (SoftCap) is a PC-based productivity tool, developed and maintained by IBM's Capacity Planning Support (CPS) team.

The intent of SoftCap is to evaluate the effect on processor capacity when migrating to different software releases. It includes support for various release levels of z/OS, OS/390, CICS, and IMS.

OS/390 V2.10 and z/OS V1.1 introduce 64-bit addressing for the z/Architecture processors. When this release of OS/390 or any z/OS is selected as the new operating system, SoftCap provides the ability to estimate the effect on capacity due to such a conversion. This estimate is based on current 31-bit storage contention metrics specified by the user.

Input requirements for SoftCap include the current OS/390 version and the utilization for each of the components (Batch, TSO, CICS, DB2, IMS, System) that apply. Output is presented in table format.

Environmental

Hardware and Software Requirements

SoftCap utilizes the Graphic User Interface (GUI) of the Microsoft Windows™ operating system and can be run on any IBM compatible PC running Microsoft's Windows™ XP/2000. A Pentium II class or faster processor is required. An SVGA display 800x600 or better is required.

SoftCap has been written in Java and **requires** the IBM Java Runtime Environment 1.4.1 or higher to execute successfully. Instructions for obtaining this software are available both in the **Installation** section of this guide and on the IBM web site where SoftCap is located.

Approximately 35MB of hard-disk space is required for the SoftCap application, IBM Java runtime environment, and the PDF format of this user's guide.

Obtaining SoftCap

SoftCap is available at <http://www-1.ibm.com/support/techdocs>.

1. Click on **Presentations & Tools**.
2. In the box under **Search Presentations & Tools for the following word(s): input softcap**, and press **Search**.
3. Click on **PRS268**.

Installing SoftCap

NOTE: The IBM Java Runtime Environment version 1.4.1 is now required. Please use the **SoftCapJ.exe** file in order to update your system to this level. **After your system has been updated to the IBM Java Runtime Environment version 1.4.1 or higher**, IBM employees will only need to obtain the **SoftCapC.exe** file when there are updates to the tool itself.

Download the **SoftCapJ.exe** file to a temporary location on your PC. Execute **SoftCapJ.exe** using RUN under the Windows START button, or by executing it from a MS-DOS prompt. The installation files will be extracted and SETUP will be automatically invoked. Simply respond to the InstallShield prompts. Upon completion, the extracted install materials are automatically purged. The IBM Java 1.4.1 runtime environment will automatically be installed along with this SoftCap package. **As a reminder**, if you already have the IBM 1.4.1 Java runtime environment installed, please use either the **SoftCapC.exe** file, instead.

Note: The IBM Java™ Runtime Environment provided herewith shall only be used with the SoftCap tool.

Executing SoftCap

SoftCap execution can be initiated from the program icon. Alternatively, SoftCap can be started from an MS-DOS command prompt by accessing the drive/directory where the tool is installed and typing **softcap**.

The SoftCap application is controlled through a variety of standard GUI controls, including menu bar, tool bar, push buttons, entry fields, check boxes, and radio buttons. Each of the specific controls is covered in the section where each application window is discussed.

Help Facility

An online help facility has been implemented in SoftCap. It can be accessed by clicking on **Help** on the menu bar, the **Help (?)** Icon on the tool bar, or pressing F1.

Output

SoftCap results are displayed in table format showing each software component, the net change in capacity, and the expected effective change in processor utilization. The contents can be copied to the Windows Clipboard/Clipbook Viewer or your preferred Word Processor. If the latter is used, select a uniform font (Courier New) so the data will align properly. When using the Clipboard/Clipbook Viewer, depending on the Windows platform you are using, select either the **Display** or **View** menu bar and **OEM Text** so the data will align properly.

Exiting SoftCap

Exiting from SoftCap is available from the *Migrate Operating Systems Environment* window only. Clicking on **FILE** on the menu-bar and **EXIT**. Alternatively, you can click on the **EXIT** icon on the tool bar.

Documentation

This user's guide is in Adobe™ PDF format. During the installation process, it is loaded in your SoftCap installation directory, and an ICON to display it is created in the SoftCap program folder. The document can be printed while it is being displayed.

Note: The online help implemented in SoftCap is basically the same information that is contained in this user's guide, without the figures.

Using SoftCap

Logo Window

When SoftCap is initiated, the logo window appears displaying the **Version** and technical support contact information.

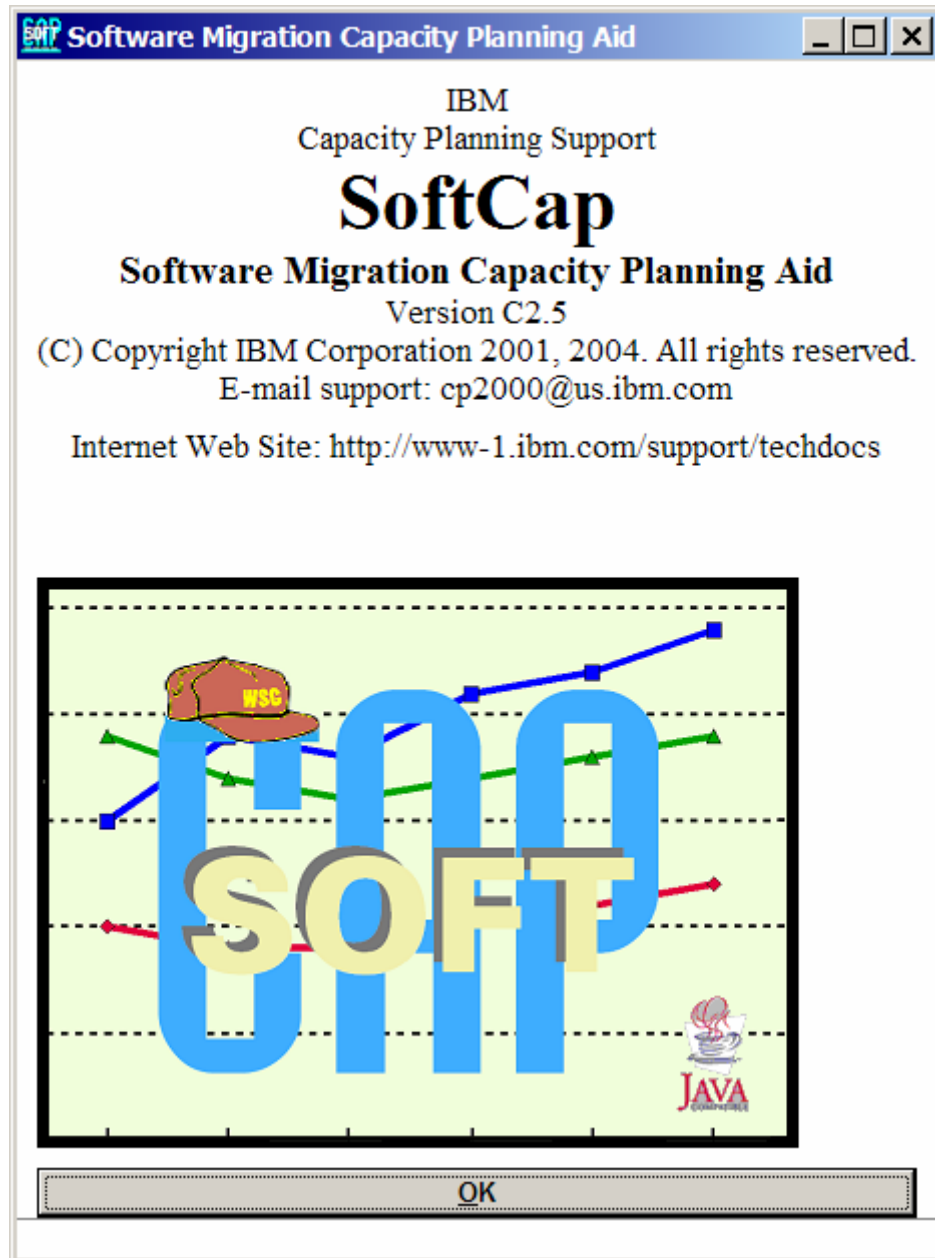


Figure 1. Logo window

Click **OK** to access SoftCap.

Migrate Operating System Environment Window

Current Software Environment

OS/390 V2.10 SCP Host is z/Architecture

WLM Mode: Compatibility Goal

Addressing Mode: 31-bit 64-bit

Future Software Environment

z/OS V1.1 SCP

WLM Mode: Compatibility Goal

Addressing Mode: 31-bit 64-bit

Processor Utilization by Component

Migrate Cl...	CICS	25.0 %
Migrate IMS	IMS	12.0 %
	Batch	22.0 %
	DB2	12.0 %
	TSO	10.0 %
	System	18.0 %
	Total Processor	99.0 %

Projection Metrics for 64-bit Addressing

31-bit Demand Paging to / from ES
Rate per second = 500

RSM Services Intensity = Medium

Note: 64-bit addressing mode requires z/Architecture Processors. Refer to WSC flash 10086 for further information. Projection results are dependent on workload mix.

View Projections

To migrate to newer CICS or IMS levels please press the "Migrate.." buttons above

Figure 2. Migrate Operating System Environment window

This window is the initial screen for your software migration study. From this window new studies are started or SoftCap can be terminated. You can access the help menu from this screen by selecting Help on the menu bar or clicking on the Help icon on the tool bar.

This window allows selection of the current operating system. Releases of OS/390 and z/OS are available for selection.

The selection of the future operating system **must be** a release that is newer than the current OS specified **except** when migrating from Compatibility to Goal Mode or when migrating **OS/390 V2.10 or higher** from 31-bit to 64-bit mode.

The workload manager for both the current and future OS can be set by radio buttons to either Compatibility Mode or Goal Mode. Goal Mode is the default setting. When the current OS is set to Compatibility Mode, the future OS can be set to Goal Mode, to project the effect on capacity due to such a change. For the current operating system, 31-bit addressing mode is assumed **unless** it is **OS/390 V2.10 or higher**, or **z/OS** and the **Host is z/Architecture processor** check box is selected, then 64-bit Addressing Mode is supported. The **View Flash** pushbutton is available for immediate access to information on this support.

Current

SCP

The following inputs are required in defining the current environment.

1. SCP.

Select one of the various releases of OS/390 or z/OS available in the drop-down list.

2. Identify whether the current processor is z/Architecture.

This check box can be enabled when the SCP is **OS/390 V2.6 and higher or z/OS**.

3. Hardware Addressing Mode.

Select either the 31-Bit Addressing (default) or 64-Bit Addressing radio button. The latter is available only when the SCP is **OS/390 V2.10 or z/OS**, and the **Host is z/Architecture processor** check box is enabled.

4. Workload Manager (WLM).

Select either the **Compatibility** or **Goal Mode** (default) radio button. If the SCP is z/OS 1.3 or higher, the WLM **must** be Goal Mode.

NOTES:

1. SoftCap allows the current and future SCPs to be the same in order to show the effect of migrating from Compatibility to Goal Mode and 31-bit to 64-bit addressing mode (OS/390 V2R10 and z/OS).
2. SoftCap assumes that the processor is the same for both the current and future operating system.
3. SoftCap will automatically disable the **Host is z/Architecture processor** check box when an SCP prior to OS/390 V2.6 is selected, as these releases are not supported on the z/Architecture family of processors.
4. SoftCap will automatically disable the **Compatibility Mode** radio button when the SCP is z/OS V1.3 or higher.
5. If you have an MQSeries workload, enter it in the associated transaction processor field. For example, if MQSeries is used with CICS, then enter the % of MQSeries in the CICS field along with the amount of CICS work.

If the host is a **z/Architecture processor** running **OS/390 V2R10 or later**, and the **future operating system is OS/390 V2R10 or later**, SoftCap can also assess the effect on capacity when changing from 31-bit to 64-bit addressing. This estimate is based on current 31-bit storage contention metrics specified by the user. To see these results, click in the **Host is z/Architecture processor** check box in the **Current** window and **64-bit Addressing** radio button in the **Addressing Mode** group box in the **Future** window.

Processor Utilization by Component

The current processor utilization for each of the following components **CICS**, **IMS**, **Batch**, **DB2**, **TSO** and **System** are to be entered in the respective fields. The total processor utilization cannot exceed 100%.

To input, position the cursor in a field and input the utilization percentage. Press the tab key to advance the cursor to the next field. This information will appear on subsequent windows that estimate the impact on capacity due to migrating to the new software specified, and/or changing to Goal Mode or converting to 64-bit addressing mode.

Future

SCP

The following inputs are required in defining the future environment.

1. SCP.

Select one of the various releases of OS/390 or z/OS available in the drop-down list. If the release of the selected SCP is earlier than the one selected as the current SCP, SoftCap will issue an error message.

2. Hardware Addressing Mode.

Select either the 31-bit Addressing or 64-bit Addressing radio button. The latter is automatically enabled if 64-bit Addressing was defined in the current environment and automatically disabled if the **Host is z/Architecture processor** check box is not enabled.

3. Workload Manager (WLM).

Select either the **Compatibility** or **Goal Mode** (default) radio button.

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With the release of the z900 processors and OS/390 v2.10, support for 64-bit Addressing Mode environments was introduced. When this release is selected as the future SCP, the **Host is z/Architecture processor** check box and 31-bit Addressing are selected in the Current window, SoftCap provides the ability to estimate the affect on capacity due to such a conversion.

In z/OS V1.4, the z/OS Bimodal Migration Accommodation software is available when migrating from OS/390 to z/OS on a z/Architecture processor. The intention is to provide fallback support to 31-bit addressing mode in the event that is required. Therefore, SoftCap allows you to change the addressing mode back to 31-bit, and the 64-bit calculations are removed. For more details on this support, please refer to Software Announcement 202-190, which was made available on August 13, 2002.

For more information on Migrating to 64-bit mode, please refer to **Flash 10086**, which is available at <http://www-1.ibm.com/support/techdocs>. While in SoftCap, press the **View Flash** button on the *Migrate Operating System Environment* window for immediate access to this information.

Metrics for projecting 64-bit Addressing Mode

When migrating from 31-bit to 64-bit Addressing, two metrics in the **Metrics for projecting 64-bit Addressing Mode** box are enabled.

- 31-bit Demand Paging Rate to/from ES

This control is a drop-down list that specifies a page rate (pages per second, or pps) of any value from zero to 60,000, in increments of 500 pps. The default setting is 500 pps.

- RSM Services Intensity

This control is a drop-down list with three possible settings:

- Low

Time spent in RSM is less than average for this workload.

- Medium (**default setting**)

Time spent in RSM is average for this workload. In the absence of an in-depth understanding about how storage is used in your environment, **Medium** should be selected.

- High

Time spent in RSM is greater than average for this workload.

The information on processor utilization is available from postprocessing SMF records or by running RMF (or equivalent product) Workload Activity Report.

NOTE: The results are dependent on workload selection.

To view the migration results for OS/390, click on **View Results**. If you are only interested in results for a CICS or IMS software migration, click on either **Migrate CICS** or **Migrate IMS**.

Controls

Menu Bar

- **File** - displays the following drop-down menu
 - **New** - Initiates a new SoftCap session. **Any existing data will be lost!**
 - **Exit** - Terminates the SoftCap application.
- **Help** - displays the following drop-down menu.
 - **General Help** (invokes online help for the displayed window)
 - **Using Help**
 - **Keyboard Actions**
 - **Product Information**

Push Buttons

- **View Results**
Displays the results of the **Capacity Summary**, **Capacity by Component**, and **Storage Impact** calculated from the input data.
- **Migrate CICS**
Displays the window to further define CICS activity.
- **Migrate IMS**
Displays the window to further define IMS activity.

Projecting 64-bit Addressing Mode Capacity

Current Software Environment

OS/390 V2.10 SCP Host is z/Architecture

WLM Mode: Compatibility Goal

Addressing Mode: 31-bit 64-bit

Future Software Environment

z/OS V1.1 SCP

WLM Mode: Compatibility Goal

Addressing Mode: 31-bit 64-bit

Processor Utilization by Component

Migrate CICS	CICS	25.0 %
Migrate IMS	IMS	12.0 %
	Batch	22.0 %
	DB2	12.0 %
	TSO	10.0 %
	System	18.0 %
	Total Processor	99.0 %

Projection Metrics for 64-bit Addressing

31-bit Demand Paging to / from ES
Rate per second = 500

RSM Services Intensity = Medium

Note: 64-bit addressing mode requires z/Architecture Processors. Refer to WSC flash 10086 for further information. Projection results are dependent on workload mix.

To migrate to newer CICS or IMS levels please press the "Migrate.." buttons above

Figure 3. 64-bit Addressing Mode

The 31-bit Demand Paging Rate is based on the information that you obtain from your current RMF reports. This entry field is enabled when either OS/390 V2.10 or z/OS is the selected SCP, the **Host is z/Architecture processor** check box and 31-bit Addressing are selected in the Current window and **64-bit Addressing** radio button in the Future window.

64-bit addressing mode requires a z/Architecture processor and either z/OS or OS/390 v2.10 as the operating system.

To display the migration results for the operating system, click on **View Results**.

NOTE: If you are only interested in results for a CICS or IMS software migration, click on either **Migrate CICS** or **Migrate IMS**.

Results Window

Current Software ...	Future Software L...	64-bit Addressing	Cost(-)/Benefit(+)	Current Utilization	Projected Utilization
OS/390 V2.10	z/OS V1.1	<input checked="" type="checkbox"/>	-3.1 %	99.0 %	102.1 %

Figure 4. Results window

The **Capacity by Component** tab is active and displays the summary for each component of this software migration. SoftCap calculated the Cost or Benefit of Overall Capacity in percentage format. The **Current** and **Projected** processor utilization are also displayed.

If a CICS or IMS migration or both were performed, then the **Capacity Summary** tab will also be displayed.

Click on the **Storage Impact** tab to see the impact on storage as a result of this migration.

Migrate CICS Environment Window

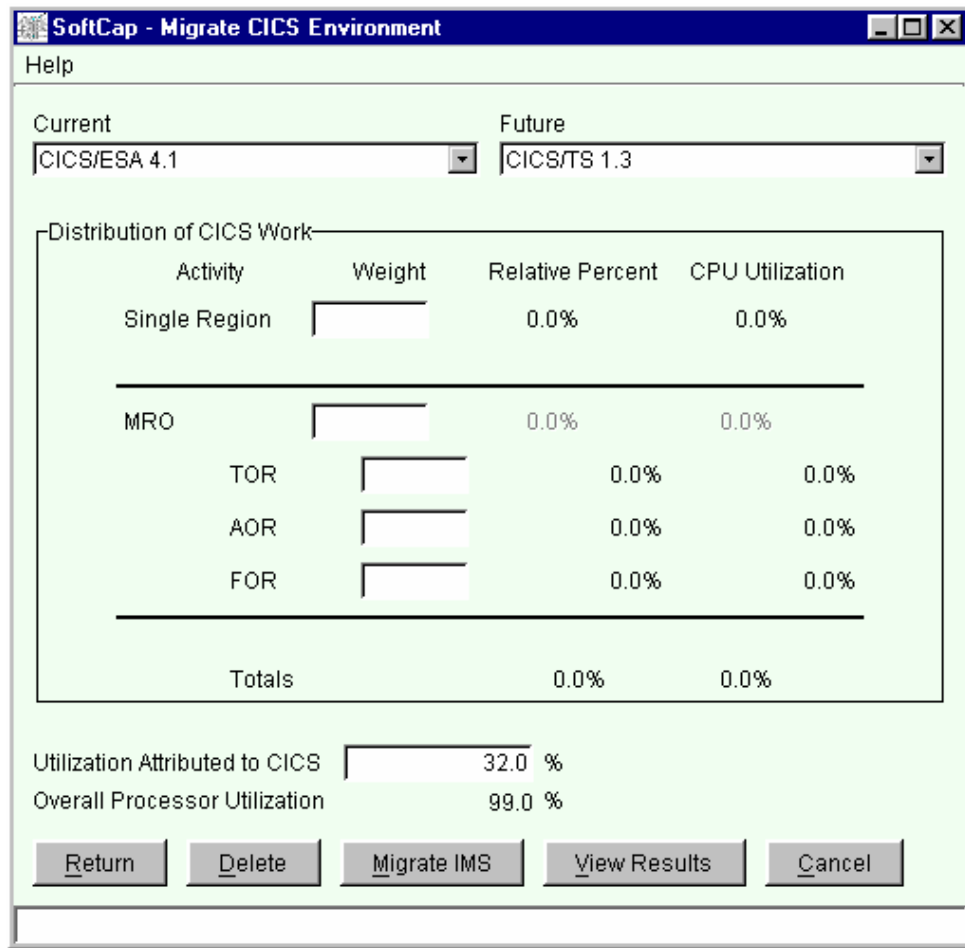


Figure 5. Migrate CICS Environment window

This window is accessible from the *Migrate Operating Systems Environment* window by clicking on **Migrate CICS**. It describes the current and future CICS releases along with the distribution of the CICS work, which is found in the SMF record type 110.

Current

Select the **Current** CICS release from the drop down list.

Distribution of CICS Work

- **Single Region**
Specify the weight that represents this activity.
- **MRO**
Specify the weight that represents this activity. Additionally, a weight **must** be specified for at least one of its components; **TOR, AOR, FOR**.
Note: A weight value **must** be specified for either Single Region, MRO **or** both.

SoftCap will calculate the **Relative Percent** for Single Region and MRO from the specified weight values for each activity. The total relative percent will always equal 100%.

The **CICS Utilization** field will already contain a value, if input was provided on the *Migrate Operating System Environment* window. However, it can be modified on this window.

The total **Overall Processor Utilization** cannot exceed 100%. If it does, SoftCap will issue an error message.

More detailed information on CICS is available in *IBM CICS Family: General Information, GC33-0155*.

Future

Select a future version from the drop-down list. However, only the versions of the product that are a later release than the one selected as the current version will be accepted.

Controls

Menu Bar

- **Help** - displays the following drop-down menu.
 - **General Help** (invokes online help for the displayed window)
 - **Using Help**
 - **Keyboard Actions**
 - **Product Information**

Push Buttons

- **Return**

Displays the previous window.
- **Delete**

Deletes the input currently displayed on the window **only after** viewing the results of the migration. SoftCap will prompt you prior to performing the action.
- **Migrate IMS**

Displays the window to further define IMS activity. **Note:** This push button is only active when the *Migrate IMS Environment* window was displayed from the *Migrate Operating System Environment* window.
- **View Results**

Displays the results of the **Capacity Summary**, **Capacity by Component**, and **Storage Impact** calculated from the input data.
- **Cancel**

Discards any input that was entered on the window during this session. SoftCap will prompt you prior to performing the action.

Migrate IMS Environment Window

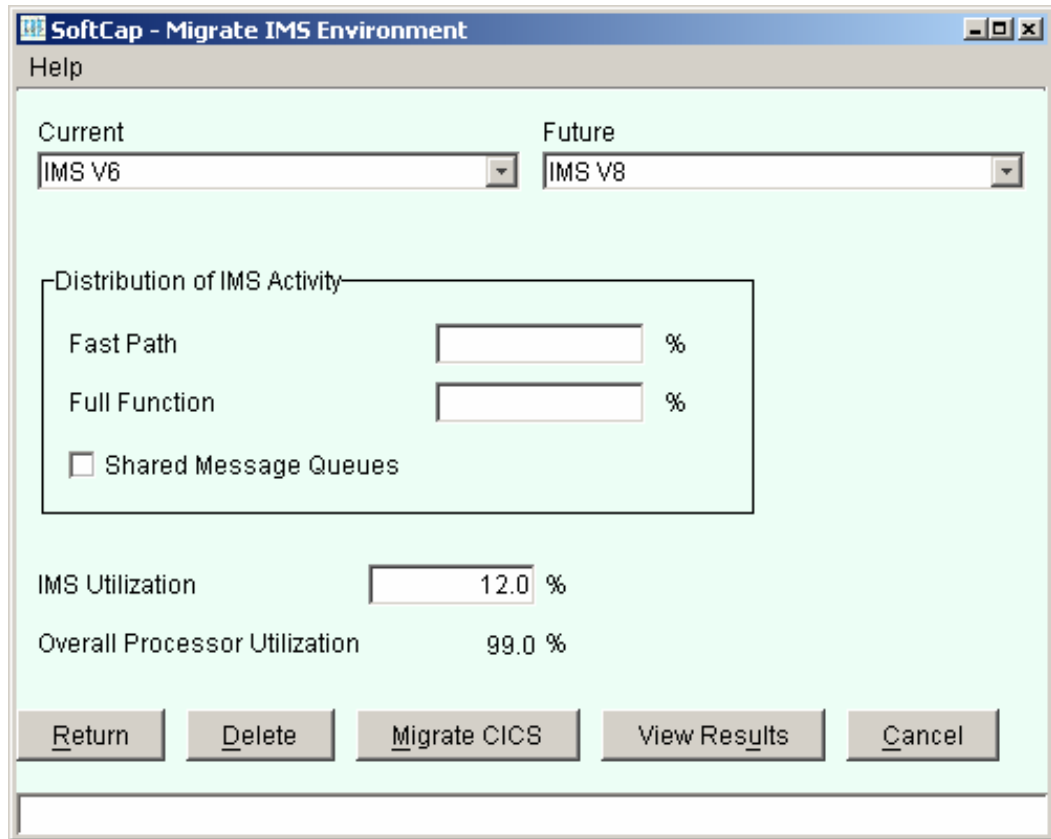


Figure 6. Migrate IMS Environment window

This window is accessible from the *Migrate Operating Systems Environment* window by clicking on **Migrate IMS**. It describes the current and future IMS releases along with the distribution of IMS activity.

Current

Select the current IMS environment from the drop-down list.

Distribution of IMS Activity

- **Fast Path**

IMS functions for applications that require good response characteristics and that may have large transaction volumes. Programs have rapid access to main-storage databases (to the field level), and to direct-access data entry databases.

Input the utilization percentage for this IMS activity. Press the tab key to advance to the next input field.

- **Full Function**

Hierarchic databases that are accessed through Data Language I (DL/I) call language and can be processed by all four types of application programs: IFP, MPPs, BMPs, and batch. Full-function databases include HDAM, HIDAM, HSAM, HISAM, SHSAM, and SHISAM.

Input the utilization percentage for this IMS activity. Press the tab key to advance to the next input field.

- **Shared Message Queues**

IMS V6 introduced shared message queues. With shared queues, the message queues are moved to list structures in the coupling facilities where they are available to any IMS in the shared queues group. A terminal is connected to one IMS system. Then input messages from the terminal are placed in the shared queues. They are accessible from any IMS using those queues. This means that another IMS, not the one to which the terminal is connected, may process the input message.

Additional information is available in the “*IMS in a Parallel Sysplex*” presentation, which is available at:

<http://www-3.ibm.com/software/data/ims/presentations/three/imsp/.>

The total utilization for both the **Fast Path** and **Full Function** activity combined **must** total 100%. If it doesn't, SoftCap will issue an error message after **View Results** is pressed.

The **IMS Utilization** field will already contain a value, if input was provided on the ***Migrate Operating System Environment*** window. However, it can be modified on this window.

The total **Overall Processor Utilization** cannot exceed 100%. If it does, SoftCap will issue an error message.

Future

Select the future IMS environment from the drop-down list. However, only the versions of the product that are a later release than the one selected as the current version will be accepted.

Controls

Menu Bar

- **Help** - displays the following drop-down menu.
 - **General Help** (invokes online help for the displayed window)
 - **Using Help**
 - **Keyboard Actions**
 - **Product Information**

Push Buttons

- **Return**
Displays the previous window.
- **Delete**
Deletes the input currently displayed on the window **only after** viewing the results of the migration. SoftCap will prompt you prior to performing the action.
- **Migrate CICS**
Displays the window to further define CICS activity. **Note:** This push button is only active when the *Migrate IMS Environment* window was displayed from the *Migrate Operating System Environment* window.
- **View Results**
Displays the results of the **Capacity Summary**, **Capacity by Component**, and **Storage Impact** calculated from the input data.
- **Cancel**
Discards any input that was entered on the window during this session. SoftCap will prompt you prior to performing the action.

Displaying Migration Results

To display the *Results* windows, press **View Results** on either the *Migrate Operating System Environment*, *Define CICS Environment*, or *Migrate IMS Environment* window. The following details are displayed in tabular format.

- Capacity summary,
- benefit(+) or cost(-) of the software migration on capacity,
- current processor utilization,
- processor utilization after migration,
- capacity by component, and
- storage impact.

The *Results* window contains the **Capacity Summary**, **Capacity by Component**, and **Storage Impact** tabs.

Capacity Summary

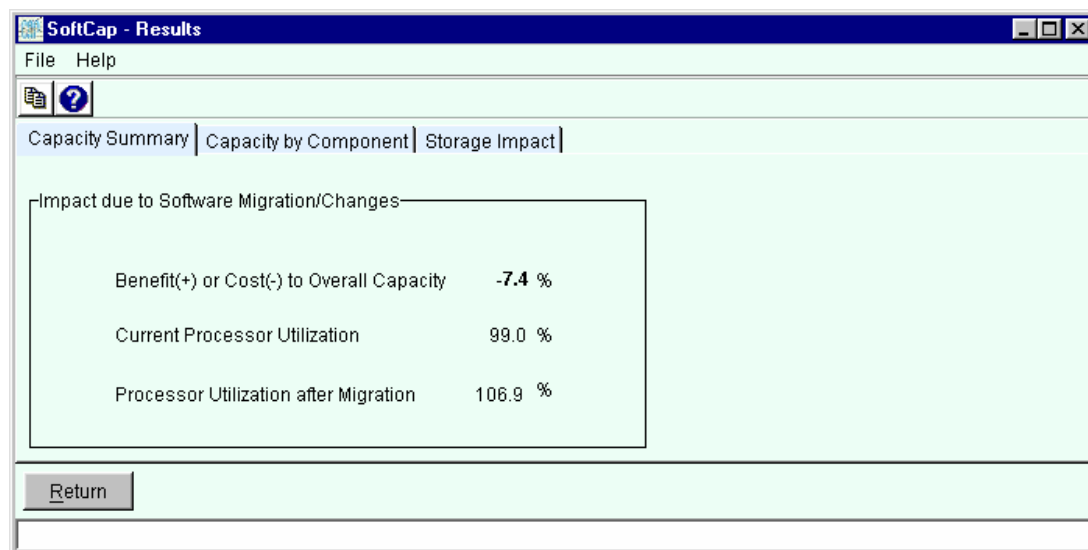


Figure 7. Results window - Capacity Summary tab

The **Capacity Summary** tab is displayed on the *Results* window **only** after a migration has been done for two components.

Capacity by Component

Current Software ...	Future Software L...	64-bit Addressing	Cost(-)/Benefit(+)	Current Utilization	Projected Utilization
OS/390 V2.10	z/OS V1.1	<input checked="" type="checkbox"/>	-3.1 %	99.0 %	102.1 %
CICS/ESA 4.1	CICS/TS 1.3	<input type="checkbox"/>	-9.5 %	32.0 %	35.4 %
IMS/ESA 6.1	IMS/ESA 7.1	<input type="checkbox"/>	-4.9 %	23.0 %	24.2 %

Figure 8. Results window - Capacity by Component tab

Storage Impact

	64-bit Addressing Mode
MBs required to IPL z/OS V1.1	35.0 MB
Additional KBs for each non-TSO-Address Space	0.0 KB
Additional KBs for each TSO Address Space	0.0 KB

Figure 9. Results window - Storage Impact tab

Saving Migration Results

The results of the migration that are displayed can be copied to the clipboard by either:

- selecting **File** and **Copy to the Clipboard** or
- pressing the **Copy to the Clipboard** icon on the tool bar.

The contents can be pasted in either the Windows Clipboard/Clipbook Viewer or your preferred Word Processor. If the latter is used, select a uniform font (Courier New) so the data will align properly. When using the Clipboard/Clipbook Viewer, depending on the Windows platform you are using, select either the **Display** or **View** menu bar and **OEM Text** so that the data will align properly.

NOTE: SoftCap **does not** have the capability to save the input in a file to be used in a future study.

Support

Problems and Suggestions

Efforts have been made to make SoftCap a useful and intuitive application. Should you detect problems or want to make suggestions, please e-mail cp2000@us.ibm.com.

Specify "SoftCap" as the subject. Describe the problem or suggestion as thoroughly as possible. Please include your name, your location, and telephone number should additional information is needed.

All comments and suggestions are welcomed and will be considered.

Maintaining Currency

As capacity information for new software releases becomes available, SoftCap will be updated. It is your responsibility to verify that you are always working with the most current version of the tool. Please check the IBM web site frequently for updates.

SoftCap Terms and Definitions

31-bit Addressing Mode – 2 gigabyte addressability for central storage and virtual storage.

Demand Paging Rate – The rate at which Real Storage Manager (RSM) finds real storage frames that haven't been referenced for the longest period and moves (page) this to expanded storage.

64-bit Addressing Mode – The ability to support up to 2 exabytes of central storage, thereby eliminating the overhead of paging between central and expanded storage.

Compatibility Mode – A mode of processing, in which the IEAIPSxx and IEAICSxx parmlib members determine system resource management.

Goal Mode – A mode of processing where the active service policy determines system resource management.

RSM Services Intensity - This metric provides an indication of how much Real Storage Management (RSM) activity is representative for the workload. Such activity includes services such as GETMAIN, FREEMAIN, PAGE FAULT, PAGE FIX, and FREE. In 64-bit addressing mode, this metric is used to project the additional RSM processing time due to invoking 64-bit addressing mode. There are three settings: low, medium (default), and high.

When the demand page rate is set to zero, the zSeries processor 64-bit capacity projections will reflect only the path length increases in RSM. As the page rate metric increases, the path length cost is offset. At some point, the advantage will overcome the additional RSM cost, and the benefit of running in 64-bit mode to eliminate paging becomes apparent.

Appendix A. Related Publications

The publications listed contain detailed information about the subjects covered in this user's guide.

<http://www.redbooks.ibm.com>

- **SG24-5352**
IMS Primer
- **SG24-5976**
OS/390 Version 2 Release 10 Implementation

<http://www.ibm.com/support/techdocs>

- **Flash 10086**
Software Capacity Planning: Migration to 64 bit Mode

<http://www.ibm.com/software/ts/cics>

- **GC33-0155**
IBM CICS Family: General Information

<http://www.ibm.com/software/data/ims>

- **SC27-8735**
IMS/ESA V7 Glossary