SECTION III - Support Features

CHAPTER 6

Soft-ICE Initialization Options

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6.1 Introduction

The Soft-ICE program file (S-ICE.EXE) can be loaded as a loadable device driver in CONFIG.SYS or as a program from the DOS command line. To get the full power of Soft-ICE, it must be initially loaded as a device driver in CONFIG.SYS. However, there may be circumstances when you might want to run Soft-ICE from the DOS prompt or a batch file, such as:

 * You do not have extended memory in your system
    Soft-ICE can only load as a loadable device driver
    if you have extended memory.
 * You want to take up ZERO bytes of conventional
    memory. When loaded as a device driver,
    Soft-ICE occupies approximately 2K of
    conventional memory.
 * You only need to use Soft-ICE occasionally and
    there are no other programs using extended
    memory.

In some cases you may need some of the features that require Soft-ICE to be loaded in CONFIG.SYS but do not want Soft-ICE to be resident all of the time. In this case Soft-ICE can be loaded in CONFIG.SYS to reserve extended memory, and then disabled, by using the /UN switch, until Soft-ICE is required. See section 6.3.1 for more information about the /UN switch.

6.2 Loading Soft-ICE from the DOS Prompt

You can NOT enable all of Soft-ICE's features when loading from the DOS prompt. If you will be using Soft-ICE as a stand-alone debugger, it is recommended you load Soft-ICE in the CONFIG.SYS file.

To load Soft-ICE from the DOS prompt type:

    S-ICE

In systems with no extended memory present, Soft-ICE loads itself at the highest memory location possible. The memory used by Soft-ICE is then 'mapped out', making it invisible to DOS programs. Since the total memory visible to DOS and its programs is less after Soft-ICE loads, it is recommended that you load Soft-ICE before any TSR's control programs.

In systems with extended memory, you should only load Soft-ICE from the DOS prompt if you are not using extended memory for anything else (e.g., VDISK, CACHE, HIMEM...). When you initially load Soft-ICE from the command line or from a batch file, Soft-ICE will prompt you with a warning message. This warning message is just to remind you that Soft-ICE will overwrite the highest portion of extended memory when it loads. You can suppress this warning prompt with the EXTENDED option in the Soft-ICE configuration file S-ICE.DAT. For more information about the EXTENDED option, see section 6.4.1.

6.3 Loading Soft-ICE as a Loadable Device Driver

In order to use all of the Soft-ICE features, you must first load Soft-ICE as a loadable device driver in your CONFIG.SYS file. The features this makes possible are:

  * Coexisting with other software that uses extended
     memory.
     Loading as a device driver allows Soft-ICE to
     manage extended memory so you can run Soft-ICE
     with programs that use extended memory, such
     VDISK, CACHE and HIMEM.

  * Symbolic and source level debugging
     Loading as a device driver allows Soft-ICE to
     allocate an extended memory buffer for symbols
     and source information.
  * Back trace ranges and the SNAP command
     Loading as a device driver allows Soft-ICE to
     allocate an extended memory buffer for a back
     trace buffer. This buffer is also used for the
     Soft-ICE SNAP command.
  * Enabling Soft-ICE's EMM 4.0 capability
  * Running Soft-ICE with MagicCV or MagicCVW

Note :
When loaded as a device driver in CONFIG.SYS, Soft-ICE allocates the highest portion of extended memory for itself and its associated components, so there can be no memory conflicts. S-ICE.EXE must be loaded in CONFIG.SYS before any other driver that allocates extended memory loaded (e.g., VDISK.SYS, RAMDRIVE.SYS). Generally Soft-ICE works best if it is the first loadable device driver installed in CONFIG.SYS.

6.3.1 Soft-ICE Loading Switches

One or more loading switches can follow S-ICE.EXE in CONFIG.SYS. These switches allow you to customize the way extended memory will be reserved by Soft-ICE. The switches all must begin with a / character. The loading switches are:

  * /EXT XXXX -- Informs S-ICE.EXE to reserve
     XXXX Kilobytes of extended memory for other
     DOS programs that use extended memory (e.g.,
     VDISK, CACHE, HIMEM,...). If the /EXT

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switch is not present, then any extended memory not used by Soft-ICE and its associated components will be left as standard extended memory, but the amount can not be guaranteed. The /EXT switch is useful because it is sometimes difficult to determine exactly how much memory being used by Soft-ICE and its associated components. Using the /EXT switch will guarantee a specified amount is available for other programs that use extended memory.

  * /SYM XXXX -- Informs S-ICE.EXE to reserve
    XXXX Kilobytes of extended memory for symbols
    and source usage. If XXXX is not specified, then
    all remaining extended memory is used for
    symbols. Enough memory must be allocated for
    your .SYM file and all source files. For more
    information about using symbols and source, see
    chapter 7.
  * /TRA XXXX -- Informs S-ICE.EXE to reserve
    XXXX Kilobytes of extended memory for a back
    trace history buffer. This buffer is used for back
    trace ranges and for the SNAP command. If
    XXXX is not specified, then 10K of extended
    memory is automatically reserved for the buffer. If
    you do not want any memory reserved for a back
    trace buffer, use /TRA 0. For more information
    about using back trace ranges, see chapter 9.
  * /MCV XXX -- Informs S-ICE.EXE to reserve
    XXX Kilobytes of extended memory for MagicCV
    or MagicCVW. The minimum amount of extended

memory you can specify is 280K and the maximum
is 620K. If XXX is not specified, S-ICE.EXE will
reserve the remaining memory, between 280K and
620K. See chapter 10 for more information about
running Soft-ICE with MagicCV or MagicCVW.
*/EMM XXXX -- Informs S-ICE.EXE to turn
XXXX Kilobytes of extended memory into EMM

4.0 conforming expanded memory. If XXXX is
specified, then all remaining memory is used as
expanded. See chapter 8 for more information
about expanded memory support.
* /UN -- Informs S-ICE.EXE to enter protected
mode, reserve any needed extended memory, then
exit protected mode and unload itself. This switch
should be used when you are loading S-ICE.EXE
as a loadable device driver, but you don't want
your system to remain in protected mode. This
switch will reserve memory for Soft-ICE, and you
must execute S-ICE.EXE from the DOS prompt
when you are ready to use Soft-ICE.

Soft-ICE reserves extended memory in the following order, regardless of the order the switches are
specified:

Reserve approximately 120K for S-ICE.EXE.
Reserve memory for the /EXT switch if present.
Reserve memory for the /SYM switch if present.
Reserve memory for the /TRA switch if present.
    if it is not present, default to reserve 10K for
    the back trace buffer.
Reserve memory for the /MCV switch if present.
Reserve memory for the /EMM switch if present.

If available memory runs out while trying to reserve memory for a switch in the above sequence,
then S-ICE.EXE does the following:

1. The remaining extended memory is allocated to
   switch being processed when memory runs out.
2. No memory will be reserved for the remaining
   switches.

Note:
If the /MCV or /EMM switch is present, a additional 64K of extended memory is reserved for a DMA holding buffer.

The switches can be placed in any order following DEVICE = S-ICE.EXE. example is:

DEVICE = S-ICE.EXE /TRA50 /EMM 500 /SYM 2048

If four megabytes of extended memory are available, this example will reserve approximately 120K for Soft-ICE, 2 megabytes for symbols, 50K for a back trace history buffer, 500K for expanded memory and leave approximately 1.3 megabytes for other extended memory programs. Note that Soft-ICE will load into the highest portion of extended memory, leaving the remaining memory starting at 100000H (one megabyte mark).

6.4 The Soft-ICE Initialization File S-ICE.DAT

Soft-ICE has several load options. These options are specified by placing special commands in an initialization file named S-ICE.DAT.
S-ICE.DAT is an ASCII text file that Soft-ICE parses at load time. This file can contain function key assignment an auto-start string and various configuration options. The file can be created and edited with any DOS text editor. When loading Soft-ICE from the command line, S-ICE.DAT must be placed in the current directory or in a directory that is accessible through your current PATH. When Soft-ICE is loaded as a device driver in CONFIG.SYS, S-ICE.DAT must be in the same directory where S-ICE.EXE is located.

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There are three categories of commands that can be included in the S-ICE.DAT initialization file:

   * Special configuration options
   * Function key assignments
   * Initialization command sequence

6.4.1 Special Configuration Options

Any of the following configuration options that are needed should each be placed on a separate line in the S-ICE.DAT file.
  * COMPAQ -- Compaq 386 and 386SX computer
      and some Compaq compatible computers
      (including computers containing Micronix
      motherboards) have 384K of non-contiguous
      extended memory. The COMPAQ option is
      necessary if you want Soft-ICE to use this memory.
      Note that the COMPAQ option is the same as the
      /C command line parameter in Soft-ICE 1.X.
  * NOLEDS -- The NOLEDS option tells Soft-ICE

not to set and clear the keyboard LEDs while the Soft-ICE window is up. On some keyboards the are timing problems that will cause Soft-ICE to lose synchronization with the keyboard. If Soft-ICE hangs when you are in the Soft-ICE window use this option. Note that the NOLEDS option is the same as the /L command line parameter in Soft-ICE 1.X.

 * NOTVGA -- The NOTVGA option allows Soft-ICE to run on BIOS compatible VGA cards. Many VGA cards are not compatible with IBM VGA at the hardware level. These cards support VGA at the BIOS level only. Use this switch if you have one of those video adapters. Note that the

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NOTVGA option is the same as the /V command line parameter in Soft-ICE 1.X.

 * EXTENDED -- The EXTENDED option causes Soft-ICE to load directly into extended memory without prompting the user with a warning message. It should be used if you are loading Soft-ICE initially from the DOS prompt and do want to be prompted, and you know nothing else using extended memory. Note that the EXTENDED option is the same as the /E command line parameter in Soft-ICE 1.X.

6.4.2 Function Key Assignments

One or more Soft-ICE commands can be assigned to any function key at load time. See the description of the FKEY command in section 5.8 (Debugger Customization Commands) for a description of assigning function keys from the Soft-ICE command line.

The syntax for assigning a function key name in S-ICE.DAT is :

  function-key-name = "string"
  function-key-name -- F1, F2... F12.
  string -- The string may consist of any valid
            Soft-ICE commands and the special
            characters ^ and ;. A ^ is placed in
            the string to make a command
            invisible. A ; is placed in the string
            denote a carriage return. The string
            must be enclosed in double quotes.

An example function key assignment in S-ICE.DAT is:
    F12 = "D 100;"

This will assign the Soft-ICE dump command to function key 12. When F12 is pressed Soft-ICE will dump at offset 100H in the current data segment. The semi-colon following the 100 represents the ENTER key.

6.4.3 Initialization Command Sequence

A sequence of commands can be automatically executed when Soft-ICE loads. This is useful for customizing Soft-ICE to meet your needs. For example, you might set up windows and change the default hot key sequence.
The syntax for setting up an initialization command sequence in S-ICE.DAT is:

  INIT = "assignment-string"
  assignment string -- The string consists of any valid
                Soft-ICE commands and the special
                characters ^ and ;. A ^ is placed in
                the string to make a command
                invisible. A; is placed in the string
                denote a carriage return. The string
                must be enclosed in double quotes.

An example initialization command sequence in S-ICE.DAT is:

  INIT = "WIN; WR; WD 1; WC 12; ALTKEY CTRL X;"

This example will put the Soft-ICE window in full screen mode, create a register window, create a data window one line long, create a code window 12 lines long, and change the hot key sequence to CTRL X.

Sample S-ICE.DAT

A sample S-ICE.DAT initialization file is included on the distribution diskette. This sample assigns the function keys

so they are used in a similar manner as the function keys in Microsoft's CodeView debugger. This sample S-ICE.DAT should also be used as is for the tutorial in chapter 3.

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