

Branch Prediction Patch Management Guideline

This guideline provides more information about using the branch prediction logic patch contained in T9070AAJ and T9070AAK and later versions of the T9070 SPRs.

Activating the branch prediction logic patch might impact performance; please read HOTSTUFF HS02774 (HS02774C as of 2003-APR-23) before you decide to activate the patch.

NOTE:

If the branch prediction logic patch is already active on the system:

The branch prediction logic patch must be inactive before a new version of the patch is installed and activated. See instructions under the heading “**To disable patch persistence**”.

To activate the patch, you must first install the DIAG2 utility and its OBEY files.

Installing DIAG2 and Its OBEY Files

If you download the SPR files from Scout:

1. Delete local copies of DIAG2.
2. Download all of the SPR files, including the OBEY files INSTBPM, CHECKALL, APPALL, and DISALL.
3. Copy DIAG2 into \$SYSTEM.*sysnn*.

If you use DSM/SCM to install the SPR:

1. DIAG2 is placed in \$SYSTEM.*sysnn* automatically.
2. Select the branch prediction utility SPR from the product list in DSM/SCM.
3. Double-click the SPR to view its list of files.
4. Select **INSTBPM**, **CHECKALL**, **APPALL**, and **DISALL**.
5. Click **Export** on the DSM/SCM screen.
6. When DSM/SCM requests the destination volume, click **OK** if the default volume is preferred, or enter a volume name and click **OK**.

Making Patch Activation Persistent

To activate the branch prediction logic patch persistently across cold loads, you must add a statement to the current (default) configuration file used by most customers. If you use multiple configuration files for cold loads (not a common practice), you should make the change to each configuration file for which you want the patch to apply. The active configuration file is changed as follows.

To make the branch prediction patch active in all processors, use the super ID (255,255) to run the SCF OBEY command file INSTBPM. INSTBPM configures and runs the patch utility DIAG2. This process, with the symbolic name \$ZBR, uses the terminal interface defined for \$ZHOME. \$ZBR is added to the current kernel subsystem configuration for the persistence monitor, \$ZZKRN. This action allows the active state of the patch to be persistent across subsequent processor reloads or coldstarts until a different configuration file that does not contain an entry for \$ZBR is used. You must run INSTBPM each time the configuration file is replaced with one that does not contain an entry for \$ZBR.

To run INSTBPM:

1. Go to the subvolume where INSTBPM was installed
2. At the TACL prompt, enter:

OBEY INSTBPM

To verify that the patch is active:

1. Go to the subvolume where the CHECKALL file was installed
2. Enter the following from the TACL prompt:

CHECKALL

CHECKALL displays the current state of the patch (active, not active, or not applicable) for all processors.

To verify the status of the persistent processes:

1. At the TACL prompt, enter either:

SCF INFO PROCESS \$ZZKRN.#ZBR

or

SCF STATUS PROCESS \$ZZKRN.#ZBR

Either command should report the state of \$ZBR in the kernel subsystem configuration. For example, a 16-processor system would have a display that shows copies of \$ZBR as \$ZBR00 through \$ZBR15. If a copy of the process named "\$ZBRxx" (where xx = cpu number) has state of "STARTED" , then the \$ZBR process is persistent on that CPU.

To disable patch persistence:

When you no longer want the patch to be active after a processor reload or cold start, you must remove \$ZBR from the kernel subsystem configuration so that DIAG2 does not run again.

1. \$ZBR must be in a stopped state to be removed. To stop \$ZBR, at the TACL prompt, enter this command as the super ID:

SCF ABORT PROCESS \$ZZKRN.#ZBR

Note: The ABORT command does not make the patch inactive.

2. To remove DIAG2 from the kernel subsystem configuration after \$ZBR stops, at the TACL prompt, enter this command as the super ID:

SCF DELETE PROCESS \$ZZKRN.#ZBR

The DELETE command does not make the patch inactive or remove DIAG2 from the system. To make the patch inactive, you must run DIAG2 manually or use an OBEY command file such as DISALL (please refer to the “Using the DIAG2 OBEY Files” section of this guideline).

3. To verify that DIAG2 was correctly removed from the kernel subsystem configuration, at the TACL prompt, enter:

SCF INFO PROCEESS \$ZZKRN.#ZBR

or

SCF STATUS PROCESS \$ZZKRN.#ZBR

Neither command you enter should find the process in the kernel subsystem configuration. An output message should indicate that the object is not found.

You can use the OBEY command file INSTBPM to reconfigure DIAG2 as \$ZBR after an SCF DELETE command has been processed.

Manually Managing the Patch

When you need additional control over the patch, you can:

- Run DIAG2 manually for a single processor in either an interactive or non-interactive mode.
- Use a set of OBEY command files to automate the use of DIAG2 from TACL for all processors.

Running DIAG2 Interactively

To run the DIAG2 program in interactive mode, at the TACL prompt, enter this command as the super ID:

DIAG2 / CPU *number* /

CPU number

is the number of the processor to which the command applies. The processor in which DIAG2 runs is the processor affected by the command.

From the menu displayed, enter the number for one of these options:

Option 1:

Display the current state of the patch (active, not active, or not needed by the processor).

Option 2:

Display the version of the Boot Millicode product, T7892, running in the selected processor. (This option is available only on systems running release version update (RVU) G06.09 or later versions of the NonStop Kernel.)

Option 3:

Make the patch active and display the state of the patch to verify that the patch is active.

Option 4:

Make the patch inactive and display the state of the patch to verify that the patch is inactive.

Running DIAG2 Without Interaction

To run DIAG2 in non-interactive mode, at the TACL prompt, enter this command as the super ID:

DIAG2 / CPU *number* / *param*

CPU number

is the number of the processor to which the command applies. The processor in which DIAG2 runs is the processor affected by the command.

param

is one of these options:

NOPROMPT

Display the current state of the patch (active, not active, or not needed by the processor).

APPLYPATCH

Make the patch active and display the state of the patch to verify that the patch is active.

DISABLEPATCH

Make the patch inactive and display the state of the patch to verify that the patch is inactive.

Using the DIAG2 OBEY Files

The OBEY command files CHECKALL, APPALL, and DISALL provide a way to check the state of the patch, or to make the patch active or not active, on all processors in the system. Enter the commands shown at the TACL prompt as the super ID, within the subvolume that contains the corresponding file:

CHECKALL

Display the current state of the patch (active, not active, or not needed by the processor) for all processors.

APPALL

Make the patch active for all processors and display the state of the patch to verify that the patch is active.

DISALL

Make the patch inactive for all processors and display the state of the patch to verify that the patch is inactive.