ASRockRack Technical Document (NOVEMBER/2024)

Q: How to check CPU identification and feature information in Linux

Preparation

1. Linux Environment
   The example below is run under Ubuntu 24.04
2. Please use **x86info** to probe the CPU registers to find out more information
   It can help discover the contents of model-specific registers
   The following steps would give you the instruction.

Step

1.

We run **#sudo apt-get update**
to download the package lists from the repositories and "updates" them to get information on the newest versions of packages and their dependencies

2.

To install x86info, please input the commands
#sudo apt-get install x86info

```
:~$ sudo apt-get install x86info
```

```
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
x86info is already the newest version (1.31~pre0.8052aabdd159bc9050e7dc264f33782c5acce05f-2).
0 upgraded, 0 newly installed, 0 to remove and 30 not upgraded.
```

3.

To get the information on the CPU cache configuration, speed and supported features,
We can see the whole structure by ***x86 Instruction Set Reference***
(https://c9x.me/x86/html/file_module_x86_id_45.html)

For example, we want to get the **Processor Serial Number Information,** we can find the column

INPUT EAX = 1: Returns Feature Information in ECX and EDX

Feature Information Returned in the EDX Register

Bit #	Mnemonic	Description
15	CMOV	Conditional Move Instructions. The conditional move instruction CMOV is supported. In addition, if x87 FPU is present as indicated by the CPUID.FPU feature bit, then the FCOMI and FCMOV instructions are supported
16	PAT	Page Attribute Table. Page Attribute Table is supported. This feature augments the Memory Type Range Registers (MTRRs), allowing an operating system to specify attributes of memory on a 4K granularity through a linear address.
17	PSE-36	36-Bit Page Size Extension. Extended 4-MByte pages that are capable of addressing physical memory beyond 4 GBytes are supported. This feature indicates that the upper four bits of the physical address of the 4-MByte page is encoded by bits 13-16 of the page directory entry.
18	PSN	Processor Serial Number. The processor supports the 96-bit processor identification number feature and the feature is enabled.
19	CLFSH	CLFLUSH Instruction. CLFLUSH Instruction is supported. 20 Reserved Reserved

By the information,

we have to check the Bit 18 of the EDX Register

Please run Linux command below

#x86info –a

```
:~$ x86info -a
x86info v1.31pre  Dave Jones 2001-2011
Feedback to <davej@redhat.com>.

Found 16 identical CPUs
Extended Family: 0 Extended Model: 8 Family: 6 Model: 143 Stepping: 7
Type: 0 (Original OEM)
CPU Model (x86info's best guess): Unknown model.

eax in: 0x00000000, eax = 00000020 ebx = 756e6547 ecx = 6c65746e edx = 49656e69
eax in: 0x00000001, eax = 000806f7 ebx = 00800800 ecx = 7ffefbff edx = bfebfbff
eax in: 0x00000002, eax = 00feff01 ebx = 000000f0 ecx = 00000000 edx = 00000000
eax in: 0x00000003, eax = 00000000 ebx = 00000000 ecx = 00000000 edx = 00000000
eax in: 0x00000004, eax = fc004121 ebx = 02c0003f ecx = 0000003f edx = 00000000
eax in: 0x00000005, eax = 00000040 ebx = 00000040 ecx = 00000003 edx = 00001020
eax in: 0x00000006, eax = 00080077 ebx = 00000002 ecx = 00000009 edx = 00000001
eax in: 0x00000007, eax = 00000000 ebx = 00000000 ecx = 00000000 edx = 00000000
eax in: 0x00000008, eax = 00000000 ebx = 00000000 ecx = 00000000 edx = 00000000
```

Input Value EAX = 1 => EDX= BFEBFBFF

To get **Serial Number Feature** Information, we have to check Bit 18 of EDX

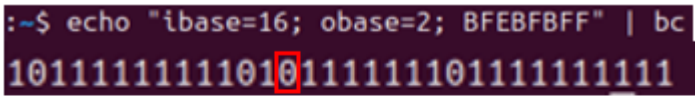
Due to Linux command shows **Hex value**, to check the bit, we have to transfer from **Hex value to Binary value**

4.

Transfer the EDX Value from **Hex value to Binary value**

Input command:

#echo “ibase=16; obase=2; BFEBFBFF” | bc



Check bit 18

if 0: Non Support Serial Number

if 1: Support Serial Number

We can know if the Model supports Serial Number.

Done