ACPI CA Debug Output

The ACPI CA can generate debug output. This document describes how to use this facility.

Compile-time configuration

The ACPI CA debug output is globally enabled by CONFIG_ACPI_DEBUG. If this config option is not set, the debug messages are not even built into the kernel.

Boot- and run-time configuration

When CONFIG_ACPI_DEBUG=y, you can select the component and level of messages you're interested in. At boot-time, use the acpi.debug_layer and acpi.debug_level kernel command line options. After boot, you can use the debug_layer and debug_level files in /sys/module/acpi/parameters/ to control the debug messages.

debug_layer (component)

The "debug_layer" is a mask that selects components of interest, e.g., a specific part of the ACPI interpreter. To build the debug_layer bitmask, look for the "#define _COMPONENT" in an ACPI source file.

You can set the debug_layer mask at boot-time using the acpi.debug_layer command line argument, and you can change it after boot by writing values to /sys/module/acpi/parameters/debug_layer.

The possible components are defined in include/acpi/acoutput.h.

Reading /sys/module/acpi/parameters/debug_layer shows the supported mask values:

```
ACPI_UTILITIES              0x00000001
ACPI_HARDWARE               0x00000002
ACPI_EVENTS                 0x00000004
ACPI_TABLES                 0x00000008
ACPI_NAMESPACE              0x00000010
ACPI_PARSER                 0x00000020
ACPI_DISPATCHER             0x00000040
ACPI_EXECUTER               0x00000080
ACPI_RESOURCES              0x00000100
ACPI_CA_DEBUGGER            0x00000200
ACPI_OS_SERVICES            0x00000400
ACPI_CA_DISASSEMBLER        0x00000800
ACPI_COMPILER               0x00001000
ACPI_TOOLS                  0x00002000
```

debug_level

The "debug_level" is a mask that selects different types of messages, e.g., those related to initialization, method execution, informational messages, etc. To build debug_level, look at the level specified in an ACPI_DEBUG_PRINT() statement.

The ACPI interpreter uses several different levels, but the Linux ACPI core and ACPI drivers generally only use ACPI_LV_INFO.

You can set the debug_level mask at boot-time using the acpi.debug_level command line argument, and you can change it after boot by writing values to /sys/module/acpi/parameters/debug_level.

The possible levels are defined in include/acpi/acoutput.h. Reading /sys/module/acpi/parameters/debug_level shows the supported mask values, currently these:

```
ACPI_LV_INIT                0x00000001
ACPI_LV_DEBUG_OBJECT        0x00000002
ACPI_LV_INFO                0x00000004
ACPI_LV_INIT_NAMES          0x00000020
ACPI_LV_PARSE               0x00000040
ACPI_LV_LOAD                0x00000080
ACPI_LV_DISPATCH            0x00000100
ACPI_LV_EXEC                0x00000200
ACPI_LV_NAMES               0x00000400
ACPI_LV_OPREGION            0x00000800
ACPI_LV_BFIELD              0x00001000
ACPI_LV_TABLES              0x00002000
ACPI_LV_VALUES              0x00004000
ACPI_LV_OBJECTS             0x00008000
ACPI_LV_RESOURCES           0x00010000
ACPI_LV_USER_REQUESTS       0x00020000
ACPI_LV_PACKAGE             0x00040000
ACPI_LV_ALLOCATIONS         0x00100000
```

```
ACPI_LV_FUNCTIONS               0x00200000
ACPI_LV_OPTIMIZATIONS           0x00400000
ACPI_LV_MUTEX                   0x01000000
ACPI_LV_THREADS                 0x02000000
ACPI_LV_IO                      0x04000000
ACPI_LV_INTERRUPTS              0x08000000
ACPI_LV_AML_DISASSEMBLE         0x10000000
ACPI_LV_VERBOSE_INFO            0x20000000
ACPI_LV_FULL_TABLES             0x40000000
ACPI_LV_EVENTS                  0x80000000
```

Examples

For example, drivers/acpi/acpica/evxfevnt.c contains this:

```
#define _COMPONENT          ACPI_EVENTS
...
ACPI_DEBUG_PRINT((ACPI_DB_INIT, "ACPI mode disabled\n"));
```

To turn on this message, set the ACPI_EVENTS bit in acpi.debug_layer and the ACPI_LV_INIT bit in acpi.debug_level. (The ACPI_DEBUG_PRINT statement uses ACPI_DB_INIT, which is a macro based on the ACPI_LV_INIT definition.)

Enable all AML "Debug" output (stores to the Debug object while interpreting AML) during boot:

```
acpi.debug_layer=0xffffffff acpi.debug_level=0x2
```

Enable all ACPI hardware-related messages:

```
acpi.debug_layer=0x2 acpi.debug_level=0xffffffff
```

Enable all ACPI_DB_INFO messages after boot:

```
# echo 0x4 > /sys/module/acpi/parameters/debug_level
```

Show all valid component values:

```
# cat /sys/module/acpi/parameters/debug_layer
```