Linux Kernel Configurations

```bash
# CONFIG VFIO is not set
# CONFIG VFIO DRIVERS is not set
CONFIG VFIO=y
# CONFIG VFIO_PCI is not set
# CONFIG VFIO_MMIO is not set
#
# Microsoft Hyper-V guest support
#
# CONFIG STAGING is not set

3456 CONFIG X86 PLATFORM_DEVICES=y
3457 CONFIG ACER WMI=m
3458 CONFIG ACER WIRELESS=m
3459 CONFIG ACERHDF=m
3460 CONFIG ALTECH WMI=m
3461 CONFIG ASUS LAPTOP=m
3462 CONFIG DELL SMBIOS=m
3463 CONFIG DELL SMBIOS WMI=y
3464 CONFIG DELL LAPTOP=m
3465 CONFIG DELL WMI=m
3466 CONFIG DELL WMI_DESCRIPTOR=m
3467 CONFIG DELL WMI AIO=m
3468 CONFIG DELL WMI LED=m
3469 CONFIG DELL S088B=m
3470 CONFIG DELL B810=m
3471 CONFIG FUJITSU LAPTOP=m
3472 CONFIG FUJITSU TABLET=m
3473 CONFIG AMDLAPTOP=m
3474 CONFIG GPD POCKET FAN=m
3475 CONFIG HP ACCEL=m
3476 CONFIG HP WIRELESS=m
3477 CONFIG HP WMI=m
3478 CONFIG MSI LAPTOP=m
3479 CONFIG PANASONIC LAPTOP=m
```
CONFIG Count

17,209
CONFIG Count
3.0 to 4.18

17,209
CONFIG Count
3.0 to 4.18
Defconfig CONFIG Count

3.0 to 4.18

CONFIG Options by Version

Defconfig

4,368
Defconfig Diff
3.0 to 4.18

~500
Defconfig Diff
3.0 to 4.18

Defconfig Diff by Version

Line Count

Context
Changes

Defconfig Diff

3.0 to 4.18

~100
That only maintains the default, you haven’t even made any changes!
Kconfig Language Overview

type: bool | tristate | string | hex | int

prompt: user visible description [if <expr>]

default: y | m | n

depends: on SYMBOL [if <expr>]

select: SYMBOL [if <expr>]

For excruciating detail, see Documentation/kbuild/kconfig-language.txt
CONFIG Revision Control
A Good Commit Contains...

1. Problem description
2. Developer intent
3. Changes address the problem and match intent
4. Nothing else
Enable DELL SMBIOS Driver

CONFIG_ACPI_WMI

CONFIG_DELL_SMBIOS
CONFIG Diff
Enable DELL_SMBIOS_WMI

+++ .config 2018-10-20 21:47:33.44244208 -0700
@@ -3382,10 +3382,18 @@
 CONFIG_VIRTIO_MENU=y
 #
 # CONFIG_STAGING is not set
-CONFIG_X86_PLATFORM_DEVICES=y
 +# CONFIG_ACER_WMI is not set
-# CONFIG_ACER_WIRELESS is not set
-# CONFIG_ACERHDF is not set
+# CONFIG_ALIENWARE_WMI is not set
-# CONFIG_DELL_SMBIOS is not set
+CONFIG_DELL_SMBIOS=m
 # CONFIG_DELL_SMBIOS_WMI is not set
+# CONFIG_DELL_LAPTOP is not set
-# CONFIG_DELL_SMBIOS is not set
+CONFIG_DELL_SMBIOS=y
 +CONFIG_DELL_SMBIOS_WMI=y
 +# CONFIG_DELL_LAPTOP is not set
 +# CONFIG_DELL_WMI is not set
 +CONFIG_DELL_WMI_DESCRIPTOR=m
 +# CONFIG_DELL_WMI_AIO is not set
 +# CONFIG_DELL_WMI_LED is not set
-# CONFIG_DELL_SMO8800 is not set
-# CONFIG_DELL_RBTN is not set
-# CONFIG_FUJITSU_LAPTOP is not set
@@ -3394,6 +3402,7 @@
 CONFIG_X86_PLATFORM_DEVICES=y
 # CONFIG_GPD_POCKET_FAN is not set
 # CONFIG_HP_ACCEL is not set
+CONFIG_HP_WIRELESS is not set
 +# CONFIG_HP_WMI is not set
 # CONFIG_MSI_LAPTOP is not set
 # CONFIG_PANASONIC_LAPTOP is not set
 # CONFIG_COMPAL_LAPTOP is not set
@@ -3403,11 +3412,17 @@
 CONFIG_X86_PLATFORM_DEVICES=y
 # CONFIG_SENSORS_HDAPS is not set
 # CONFIG_INTEL_MENLOW is not set
-# CONFIG_ACPI_WMI is not set
+CONFIG_ACPI_WMI=m
 +CONFIG_WMI_BMOF=m
+CONFIG_INTEL_WMI_THUNDERBOLT is not set
-# CONFIG_MSI_WMI is not set
 +# CONFIG_MSI_WMI_DESCRIPTOR=m
-# CONFIG_PEAQ_WMI is not set
+CONFIG_PEAQ_WMI=m
-# CONFIG_TOPSTAR_LAPTOP is not set
-# CONFIG_TOSHIBA_BT_RFKILL is not set
-# CONFIG_TOSHIBA_HAPS is not set
+# CONFIG_TOSHIBA_WMI is not set
 # CONFIG_ACPI_CMPC is not set
 # CONFIG_INTEL_HID_EVENT is not set
 # CONFIG_INTEL_VBTN is not set
@@ -3415,6 +3430,7 @@
 CONFIG_EEEPC_LAPTOP=y
 # CONFIG_INTEL_PMC_CORE is not set
 # CONFIG_IBM_RTL is not set
-# CONFIG_SAMSUNG_LAPTOP is not set
 +# CONFIG_MXM_WMI is not set
 # CONFIG_INTEL_OAKTRAIL is not set
 # CONFIG_SAMSUNG_Q10 is not set
-# CONFIG_APPLE_GMUX is not set
+CONFIG_APPLE_GMUX=m

57 Line Diff
CONFIG Diff
Enable DELL_SMBIOS_WMI

--- config-data.qZ4A/v4.18.15-defconfig.config  
+++ .config 2018-10-20 21:47:33.442444208 -  
0700  
@@ -3382,10 +3382,18 @@  
CONFIG_VIRTIO_MENU=y  
    #  
    # CONFIG_STAGING is not set  
CONFIG_X86_PLATFORM_DEVICES=y  
+# CONFIG_ACER_WMI is not set  
 # CONFIG_ACER_WIRELESS is not set  
 # CONFIG_ACERHDF is not set  
+# CONFIG_ALIENWARE_WMI is not set  
 # CONFIG_ASUS_LAPTOP is not set  
-# CONFIG_DELL_SMBIOS is not set  
+CONFIG_DELL_SMBIOS=m  
+CONFIG_DELL_SMBIOS_WMI=y  
+# CONFIG_DELL_LAPTOP is not set  
+# CONFIG_DELL_WMI is not set  
+CONFIG_DELL_WMI_DESCRIPTOR=m  
+CONFIG_DELL_WMI_AIO is not set  
+# CONFIG_DELL_WMI_LED is not set  
 # CONFIG_DELL_SMO8800 is not set  
 # CONFIG_DELL_RBTN is not set  
 # CONFIG FUJITSU_LAPTOP is not set  
@@ -3394,6 +3402,7 @@  
 CONFIG_X86_PLATFORM_DEVICES=y  
 # CONFIG_GPD_POCKET_FAN is not set  
 # CONFIG_HP_ACCEL is not set  
 # CONFIG_HP_WIRELESS is not set  
+# CONFIG_HP_WMI is not set  
 # CONFIG_MSI_LAPTOP is not set  
 # CONFIG_PANASONIC_LAPTOP is not set  
 # CONFIG_COMPAL_LAPTOP is not set  
@@ -3403,11 +3412,17 @@  
 CONFIG_X86_PLATFORM_DEVICES=y  
 # CONFIG_SENSORS_HDAPS is not set  
 # CONFIG_INTEL_MENLOW is not set  
 CONFIg_EEEPC_LAPTOP=y  
+# CONFIG_ASUS_WMI is not set  
 # CONFIG_ASUS_WIRELESS is not set  
-# CONFIG_ACPI_WMI is not set  
+CONFIG_ACPI_WMI=m  
+CONFIG_WMI_BMOF=m  
+# CONFIG_INTEL_WMI_THUNDERBOLT is not set  
 set  
+# CONFIG_MSI_WMI is not set  
+# CONFIG_PEAQ_WMI is not set  
 # CONFIG_INTEL_PMC_CORE is not set  
 # CONFIG_INTEL_RTL is not set  
 # CONFIG_SAMSUNG_LAPTOP is not set  
+# CONFIG_MXM_WMI is not set  
 # CONFIG_INTEL_OAKTRAIL is not set  
 # CONFIG_SAMSUNG_Q10 is not set  
 # CONFIG_APPLE_GMUX is not set  
57 Line Diff  
# CONFIG_TOSHIBA_HAPS is not set  
+# CONFIG_TOSHIBA_WMI is not set  
 # CONFIG_ACPI_CMPC is not set  
 # CONFIG_INTEL_HID_EVENT is not set  
 # CONFIG_INTEL_VBTN is not set  
@@ -3415,6 +3430,7 @@  
 CONFIG_EEEPC_LAPTOP=y  
 # CONFIG_INTEL_PMC_CORE is not set  
 # CONFIG_INTEL_RTL is not set  
 # CONFIG_SAMSUNG_LAPTOP is not set  
+# CONFIG_MXM_WMI is not set  
 # CONFIG_INTEL_OAKTRAIL is not set  
 # CONFIG_SAMSUNG_Q10 is not set  
 # CONFIG_APPLE_GMUX is not set  

Enable DELL_SMBIOS_WMI

dell-smbios-wmi.config -> arch/x86/configs/

CONFIG_ACPI_WMI=m
CONFIG_DELL_SMBIOS=m
CONFIG_DELL_SMBIOS_WMI=y
CONFIG Fragment Processing

$ make defconfig dell-smbios-wmi.config | grep -ve "^ "
*** Default configuration is based on 'x86_64_defconfig'
#
# configuration written to .config
#
Using .config as base
Merging ./arch/x86/configs/dell-smbios-wmi.config
Value of CONFIG ACPI WMI is redefined by fragment ./arch/x86/configs/dell-smbios-wmi.config:
Previous value: # CONFIG ACPI WMI is not set
New value: CONFIG ACPI WMI=m

Value of CONFIG DELL SMBIOS is redefined by fragment ./arch/x86/configs/dell-smbios-wmi.config:
Previous value: # CONFIG DELL SMBIOS is not set
New value: CONFIG DELL SMBIOS=m

#
# merged configuration written to .config (needs make)
#
scripts/kconfig/conf --oldconfig Kconfig
#
* Restart config...

* X86 Platform Specific Device Drivers

X86 Platform Specific Device Drivers (X86_PLATFORM_DEVICES) [Y/n/?] y
#
# configuration written to .config
#
$
merge_config.sh

dvhart@fedora:~/source/linux/linux-stable-config [(v4.18.15)]
$ scripts/kconfig/merge_config.sh -h
Usage: scripts/kconfig/merge_config.sh [OPTIONS] [CONFIG [...]]
 -h display this help text
 -m only merge the fragments, do not execute the make command
 -n use allnoconfig instead of alldfconfig
 -r list redundant entries when merging fragments
 -0 dir to put generated output files. Consider setting $KCONFIG_CONFIG instead.

dvhart@fedora:~/source/linux/linux-stable-config [(v4.18.15)]
$
CONFIG Fragment Organization

- Distro policy
- Machine architecture
- Platform enabling
- Generic drivers
Looking Forward...

- Menuconfig could generate fragments
- Avoid silent errors
- Final config audit
Thank You

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