

Dumpsys Input Diagnostics

The `dumpsys input` command dumps the state of the system’s input devices, such as keyboards and touchscreens, and the processing of input events.

Input

To dump the input system’s state, run the following command:

```
$ adb shell dumpsys input
```

Output

The set of information reported varies depending on the version of Android but consists of three sections:

- Event Hub State
- Input Reader State
- Input Dispatcher State

Event Hub State

INPUT MANAGER (dumpsys input)

```
Event Hub State:
BuiltInKeyboardId: -2
Devices:
-1: Virtual
  Classes: 0x40000023
  Path:
  Descriptor: a718a782d34bc767f4689c232d64d527998ea7fd
  Location:
  ControllerNumber: 0
  UniqueId:
  Identifier: bus=0x0000, vendor=0x0000, product=0x0000, version=0x0000
  KeyLayoutFile: /system/usr/keylayout/Generic.kl
  KeyCharacterMapFile: /system/usr/keychars/Virtual.kcm
  ConfigurationFile:
  HaveKeyboardLayoutOverlay: false
1: msm8974-taiko-mtp-snd-card Headset Jack
  Classes: 0x00000080
  Path: /dev/input/event5
  Descriptor: c8e3782483b4837ead6602e20483c46ff801112c
  Location: ALSA
  ControllerNumber: 0
  UniqueId:
  Identifier: bus=0x0000, vendor=0x0000, product=0x0000, version=0x0000
  KeyLayoutFile:
  KeyCharacterMapFile:
  ConfigurationFile:
  HaveKeyboardLayoutOverlay: false
2: msm8974-taiko-mtp-snd-card Button Jack
  Classes: 0x00000001
  Path: /dev/input/event4
  Descriptor: 96fe62b244c555351ec576b282232e787fb42bab
  Location: ALSA
  ControllerNumber: 0
  UniqueId:
  Identifier: bus=0x0000, vendor=0x0000, product=0x0000, version=0x0000
  KeyLayoutFile: /system/usr/keylayout/msm8974-taiko-mtp-snd-card_Button_Jack.kl
  KeyCharacterMapFile: /system/usr/keychars/msm8974-taiko-mtp-snd-card_Button_Jack.kcm
```

```

    ConfigurationFile:
    HaveKeyboardLayoutOverlay: false
3: hs_detect
    Classes: 0x00000081
    Path: /dev/input/event3
    Descriptor: 485d69228e24f5e46da1598745890b214130dbc4
    Location:
    ControllerNumber: 0
    UniqueId:
    Identifier: bus=0x0000, vendor=0x0001, product=0x0001, version=0x0001
    KeyLayoutFile: /system/usr/keylayout/hs_detect.kl
    KeyCharacterMapFile: /system/usr/keychars/hs_detect.kcm
    ConfigurationFile:
    HaveKeyboardLayoutOverlay: false
4: touch_dev
    Classes: 0x00000014
    Path: /dev/input/event1
    Descriptor: 4e2720e99bd2b59adae8529881343531fff7c98e
    Location:
    ControllerNumber: 0
    UniqueId:
    Identifier: bus=0x0000, vendor=0x0000, product=0x0000, version=0x0000
    KeyLayoutFile:
    KeyCharacterMapFile:
    ConfigurationFile: /system/usr/idc/touch_dev.idc
    HaveKeyboardLayoutOverlay: false
5: qnpn_pon
    Classes: 0x00000001
    Path: /dev/input/event0
    Descriptor: fb60d4f4370f5dbe8267b63d38dea852987571ab
    Location: qnpn_pon/input0
    ControllerNumber: 0
    UniqueId:
    Identifier: bus=0x0000, vendor=0x0000, product=0x0000, version=0x0000
    KeyLayoutFile: /system/usr/keylayout/qnpn_pon.kl
    KeyCharacterMapFile: /system/usr/keychars/qnpn_pon.kcm
    ConfigurationFile:
    HaveKeyboardLayoutOverlay: false
6: gpio-keys
    Classes: 0x00000081
    Path: /dev/input/event2
    Descriptor: d2c52ff0f656fac4cd7b7a118d575e0109a9fe1c
    Location: gpio-keys/input0
    ControllerNumber: 0
    UniqueId:
    Identifier: bus=0x0019, vendor=0x0001, product=0x0001, version=0x0100
    KeyLayoutFile: /system/usr/keylayout/gpio-keys.kl
    KeyCharacterMapFile: /system/usr/keychars/gpio-keys.kcm
    ConfigurationFile:
    HaveKeyboardLayoutOverlay: false

```

Things to check

- All of the expected input devices are present.
- Each input device has an appropriate key layout file, key character map file and input device configuration file. If the files are missing or contain syntax errors, then they will not be loaded.
- Each input device is being classified correctly. The bits in the `Classes` field correspond to flags in `EventHub.h` such as `INPUT_DEVICE_CLASS_TOUCH_MT`.
- The `BuiltInKeyboardId` is correct. If the device does not have a built-in keyboard, then the id must be `-2`, otherwise it should be the id of the built-in keyboard.
- If you observe that the `BuiltInKeyboardId` is not `-2` but it should be, then you are missing a key character map file for a special function keypad somewhere. Special function keypad devices should have key character map files that contain just the line `type SPECIAL_FUNCTION` (that's what in the `tuna-gpio-keykad.kcm` file we see mentioned above).

Input Reader State

The `InputReader` is responsible for decoding input events from the kernel. Its state dump shows information about how each input device is configured and recent state changes that have occurred, such as key presses or touches on the touch screen.

As an example, this is what a special function keypad looks like:

Input Reader State

```
...
Device 3: tuna-gpio-keypad
IsExternal: false
Sources: 0x00000101
KeyboardType: 1
Keyboard Input Mapper:
Parameters:
  AssociatedDisplayId: -1
  OrientationAware: false
KeyboardType: 1
Orientation: 0
KeyDowns: 0 keys currently down
MetaState: 0x0
DownTime: 75816923828000
```

Here is a touch screen. Notice all of the information about the resolution of the device and the calibration parameters that were used.

Input Reader State

```
...
Device 6: Melfas MMSxxx Touchscreen
IsExternal: false
Sources: 0x00001002
KeyboardType: 0
Motion Ranges:
X: source=0x00001002, min=0.000, max=719.001, flat=0.000, fuzz=0.999
Y: source=0x00001002, min=0.000, max=1279.001, flat=0.000, fuzz=0.999
PRESSURE: source=0x00001002, min=0.000, max=1.000, flat=0.000, fuzz=0.000
SIZE: source=0x00001002, min=0.000, max=1.000, flat=0.000, fuzz=0.000
TOUCH_MAJOR: source=0x00001002, min=0.000, max=1468.605, flat=0.000, fuzz=0.000
TOUCH_MINOR: source=0x00001002, min=0.000, max=1468.605, flat=0.000, fuzz=0.000
TOOL_MAJOR: source=0x00001002, min=0.000, max=1468.605, flat=0.000, fuzz=0.000
TOOL_MINOR: source=0x00001002, min=0.000, max=1468.605, flat=0.000, fuzz=0.000
Touch Input Mapper:
Parameters:
  GestureMode: spots
  DeviceType: touchScreen
  AssociatedDisplay: id=0, isExternal=false
  OrientationAware: true
Raw Touch Axes:
X: min=0, max=720, flat=0, fuzz=0, resolution=0
Y: min=0, max=1280, flat=0, fuzz=0, resolution=0
Pressure: min=0, max=255, flat=0, fuzz=0, resolution=0
TouchMajor: min=0, max=30, flat=0, fuzz=0, resolution=0
TouchMinor: unknown range
ToolMajor: unknown range
ToolMinor: unknown range
Orientation: unknown range
Distance: unknown range
TiltX: unknown range
TiltY: unknown range
TrackingId: min=0, max=65535, flat=0, fuzz=0, resolution=0
Slot: min=0, max=9, flat=0, fuzz=0, resolution=0
Calibration:
  touch.size.calibration: diameter
  touch.size.scale: 10.000
  touch.size.bias: 0.000
  touch.size.isSummed: false
  touch.pressure.calibration: amplitude
  touch.pressure.scale: 0.005
  touch.orientation.calibration: none
  touch.distance.calibration: none
SurfaceWidth: 720px
SurfaceHeight: 1280px
SurfaceOrientation: 0
```

Translation and Scaling Factors:
XScale: 0.999
YScale: 0.999
XPrecision: 1.001
YPrecision: 1.001
GeometricScale: 0.999
PressureScale: 0.005
SizeScale: 0.033
OrientationCenter: 0.000
OrientationScale: 0.000
DistanceScale: 0.000
HaveTilt: false
TiltXCenter: 0.000
TiltXScale: 0.000
TiltYCenter: 0.000
TiltYScale: 0.000
Last Button State: 0x00000000
Last Raw Touch: pointerCount=0
Last Cooked Touch: pointerCount=0

Here is an external keyboard / mouse combo HID device. (This device doesn't actually have a mouse but its HID descriptor says it does.)

Device 7: Motorola Bluetooth Wireless Keyboard
IsExternal: true
Sources: 0x00002103
KeyboardType: 2
Motion Ranges:
X: source=0x00002002, min=0.000, max=719.000, flat=0.000, fuzz=0.000
Y: source=0x00002002, min=0.000, max=1279.000, flat=0.000, fuzz=0.000
PRESSURE: source=0x00002002, min=0.000, max=1.000, flat=0.000, fuzz=0.000
VSCROLL: source=0x00002002, min=-1.000, max=1.000, flat=0.000, fuzz=0.000
Keyboard Input Mapper:
Parameters:
AssociatedDisplayId: -1
OrientationAware: false
KeyboardType: 2
Orientation: 0
KeyDowns: 0 keys currently down
MetaState: 0x0
DownTime: 75868832946000
Cursor Input Mapper:
Parameters:
AssociatedDisplayId: 0
Mode: pointer
OrientationAware: false
XScale: 1.000
YScale: 1.000
XPrecision: 1.000
YPrecision: 1.000
HaveVWheel: true
HaveHWheel: false
VWheelScale: 1.000
HWheelScale: 1.000
Orientation: 0
ButtonState: 0x00000000
Down: false
DownTime: 0

Here is a joystick. Notice how all of the axes have been scaled to a normalized range. The axis mapping can be configured using key layout files.

Device 18: Logitech Logitech Cordless RumblePad 2
IsExternal: true
Sources: 0x01000511
KeyboardType: 1
Motion Ranges:
X: source=0x01000010, min=-1.000, max=1.000, flat=0.118, fuzz=0.000
Y: source=0x01000010, min=-1.000, max=1.000, flat=0.118, fuzz=0.000
Z: source=0x01000010, min=-1.000, max=1.000, flat=0.118, fuzz=0.000
RZ: source=0x01000010, min=-1.000, max=1.000, flat=0.118, fuzz=0.000

```
HAT_X: source=0x01000010, min=-1.000, max=1.000, flat=0.000, fuzz=0.000
HAT_Y: source=0x01000010, min=-1.000, max=1.000, flat=0.000, fuzz=0.000
Keyboard Input Mapper:
Parameters:
  AssociatedDisplayId: -1
  OrientationAware: false
KeyboardType: 1
Orientation: 0
KeyDowns: 0 keys currently down
MetaState: 0x0
DownTime: 675270841000
Joystick Input Mapper:
Axes:
  X: min=-1.00000, max=1.00000, flat=0.11765, fuzz=0.00000
    scale=0.00784, offset=-1.00000, highScale=0.00784, highOffset=-1.00000
    rawAxis=0, rawMin=0, rawMax=255, rawFlat=15, rawFuzz=0, rawResolution=0
  Y: min=-1.00000, max=1.00000, flat=0.11765, fuzz=0.00000
    scale=0.00784, offset=-1.00000, highScale=0.00784, highOffset=-1.00000
    rawAxis=1, rawMin=0, rawMax=255, rawFlat=15, rawFuzz=0, rawResolution=0
  Z: min=-1.00000, max=1.00000, flat=0.11765, fuzz=0.00000
    scale=0.00784, offset=-1.00000, highScale=0.00784, highOffset=-1.00000
    rawAxis=2, rawMin=0, rawMax=255, rawFlat=15, rawFuzz=0, rawResolution=0
  RZ: min=-1.00000, max=1.00000, flat=0.11765, fuzz=0.00000
    scale=0.00784, offset=-1.00000, highScale=0.00784, highOffset=-1.00000
    rawAxis=5, rawMin=0, rawMax=255, rawFlat=15, rawFuzz=0, rawResolution=0
HAT_X: min=-1.00000, max=1.00000, flat=0.00000, fuzz=0.00000
    scale=1.00000, offset=0.00000, highScale=1.00000, highOffset=0.00000
    rawAxis=16, rawMin=-1, rawMax=1, rawFlat=0, rawFuzz=0, rawResolution=0
HAT_Y: min=-1.00000, max=1.00000, flat=0.00000, fuzz=0.00000
    scale=1.00000, offset=0.00000, highScale=1.00000, highOffset=0.00000
    rawAxis=17, rawMin=-1, rawMax=1, rawFlat=0, rawFuzz=0, rawResolution=0
```

At the end of the input reader dump there is some information about global configuration parameters such as the mouse pointer speed.

```
Configuration:
ExcludedDeviceNames: []
VirtualKeyQuietTime: 0.0ms
PointerVelocityControlParameters: scale=1.000, lowThreshold=500.000, highThreshold=3000.000, acceleration=3.000
WheelVelocityControlParameters: scale=1.000, lowThreshold=15.000, highThreshold=50.000, acceleration=4.000
PointerGesture:
  Enabled: true
  QuietInterval: 100.0ms
  DragMinSwitchSpeed: 50.0px/s
  TapInterval: 150.0ms
  TapDragInterval: 300.0ms
  TapSlop: 20.0px
  MultitouchSettleInterval: 100.0ms
  MultitouchMinDistance: 15.0px
  SwipeTransitionAngleCosine: 0.3
  SwipeMaxWidthRatio: 0.2
  MovementSpeedRatio: 0.8
  ZoomSpeedRatio: 0.3
```

Things To Look For

- 1. All of the expected input devices are present.
- 2. Each input device has been configured appropriately. Especially check the touch screen and joystick axes.

Input Dispatcher State

The `InputDispatcher` is responsible for sending input events to applications. Its state dump shows information about which window is being touched, the state of the input queue, whether an ANR is in progress, and so on.

```
Input Dispatcher State:
DispatchEnabled: 1
DispatchFrozen: 0
FocusedApplication: <null>
```

```

FocusedWindow: name='Window{3fb06dc3 u0 StatusBar}'
TouchStates: <no displays touched>
Windows:
  0: name='Window{357bbbfe u0 SearchPanel}', displayId=0, paused=false, hasFocus=false, hasWallpaper=false, visible
  1: name='Window{3b14c0ca u0 NavigationBar}', displayId=0, paused=false, hasFocus=false, hasWallpaper=false, visib
  2: name='Window{2c7e849c u0 com.vito.lux}', displayId=0, paused=false, hasFocus=false, hasWallpaper=false, visibl
  3: name='Window{31c9f22 u0 Heads Up}', displayId=0, paused=false, hasFocus=false, hasWallpaper=false, visible=fal
  4: name='Window{3fb06dc3 u0 StatusBar}', displayId=0, paused=false, hasFocus=true, hasWallpaper=false, visible=tr
  5: name='Window{278c1d65 u0 KeyguardScrim}', displayId=0, paused=false, hasFocus=false, hasWallpaper=false, visib
  6: name='Window{869f213 u0 com.android.systemui.ImageWallpaper}', displayId=0, paused=false, hasFocus=false, hasW
  7: name='Window{16ab6320 u0 InputMethod}', displayId=0, paused=false, hasFocus=false, hasWallpaper=false, visible
  8: name='Window{cf4ff0b u0 com.google.android.googlequicksearchbox/com.google.android.launcher.GEL}', displayId=0
  9: name='Window{1a7be08a u0 com.android.systemui/com.android.systemui.recents.RecentsActivity EXITING}', displayI
  10: name='Window{2280455f u0 com.google.android.gm/com.google.android.gm.ConversationListActivityGmail}', display
  11: name='Window{657fee5 u0 com.mobilityware.freecell/com.mobilityware.freecell.FreeCell}', displayId=0, paused=f
MonitoringChannels:
  0: 'WindowManager (server)'
RecentQueue: length=10
  MotionEvent(deviceId=4, source=0x00001002, action=2, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=1, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=0, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=2, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=2, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=2, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=2, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=2, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=2, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
  MotionEvent(deviceId=4, source=0x00001002, action=1, flags=0x00000000, metaState=0x00000000, buttonState=0x000000
PendingEvent: <none>
InboundQueue: <empty>
ReplacedKeys: <empty>
Connections:
  0: channelName='WindowManager (server)', windowName='monitor', status=NORMAL, monitor=true, inputPublisherBlocked
    OutboundQueue: <empty>
    WaitQueue: <empty>
  1: channelName='278c1d65 KeyguardScrim (server)', windowName='Window{278c1d65 u0 KeyguardScrim}', status=NORMAL,
    OutboundQueue: <empty>
    WaitQueue: <empty>
  2: channelName='357bbbfe SearchPanel (server)', windowName='Window{357bbbfe u0 SearchPanel}', status=NORMAL, moni
    OutboundQueue: <empty>
    WaitQueue: <empty>
  3: channelName='869f213 com.android.systemui.ImageWallpaper (server)', windowName='Window{869f213 u0 com.android.
    OutboundQueue: <empty>
    WaitQueue: <empty>
  4: channelName='3fb06dc3 StatusBar (server)', windowName='Window{3fb06dc3 u0 StatusBar}', status=NORMAL, monitor=
    OutboundQueue: <empty>
    WaitQueue: <empty>
  5: channelName='2c7e849c (server)', windowName='Window{2c7e849c u0 com.vito.lux}', status=NORMAL, monitor=false,
    OutboundQueue: <empty>
    WaitQueue: <empty>
  6: channelName='cf4ff0b com.google.android.googlequicksearchbox/com.google.android.launcher.GEL (server)', window
u0 com.google.android.googlequicksearchbox/com.google.android.launcher.GEL}', status=NORMAL, monitor=false, inputPubl
    OutboundQueue: <empty>
    WaitQueue: <empty>
  7: channelName='2280455f com.google.android.gm/com.google.android.gm.ConversationListActivityGmail (server)', win
    OutboundQueue: <empty>
    WaitQueue: <empty>
  8: channelName='1a7be08a com.android.systemui/com.android.systemui.recents.RecentsActivity (server)', windowName=
    OutboundQueue: <empty>
    WaitQueue: <empty>
  9: channelName='3b14c0ca NavigationBar (server)', windowName='Window{3b14c0ca u0 NavigationBar}', status=NORMAL,
    OutboundQueue: <empty>
    WaitQueue: <empty>
  10: channelName='16ab6320 InputMethod (server)', windowName='Window{16ab6320 u0 InputMethod}', status=NORMAL, mon
    OutboundQueue: <empty>
    WaitQueue: <empty>
  11: channelName='657fee5 com.mobilityware.freecell/com.mobilityware.freecell.FreeCell (server)', windowName='Wind
    OutboundQueue: <empty>
    WaitQueue: <empty>
  12: channelName='31c9f22 Heads Up (server)', windowName='Window{31c9f22 u0 Heads Up}', status=NORMAL, monitor=fal
    OutboundQueue: <empty>
    WaitQueue: <empty>

```

```
AppSwitch: not pending
7: channelName='2280455f com.google.android.gm/com.google.android.gm.ConversationListActivityGmail (server)', win
  OutboundQueue: <empty>
  WaitQueue: <empty>
8: channelName='1a7be08a com.android.systemui/com.android.systemui.recents.RecentsActivity (server)', windowName=
  OutboundQueue: <empty>
  WaitQueue: <empty>
9: channelName='3b14c0ca NavigationBar (server)', windowName='Window{3b14c0ca u0 NavigationBar}', status=NORMAL,
  OutboundQueue: <empty>
  WaitQueue: <empty>
10: channelName='16ab6320 InputMethod (server)', windowName='Window{16ab6320 u0 InputMethod}', status=NORMAL, mon
  OutboundQueue: <empty>
  WaitQueue: <empty>
11: channelName='657fee5 com.mobilityware.freecell/com.mobilityware.freecell.FreeCell (server)', windowName='Wind
  OutboundQueue: <empty>
  WaitQueue: <empty>
12: channelName='31c9f22 Heads Up (server)', windowName='Window{31c9f22 u0 Heads Up}', status=NORMAL, monitor=fal
  OutboundQueue: <empty>
  WaitQueue: <empty>
AppSwitch: not pending
Configuration:
  KeyRepeatDelay: 50.0ms
  KeyRepeatTimeout: 500.0ms
```

Things To Look For

1. In general, all input events are being processed as expected.
2. If you touch the touch screen and run dumsys at the same time, then the TouchStates line should show the window that you are touching.

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