

Request #: HUTRR42 revision c.
Title: Consumer Page Keyboard Assist Controls
Spec Release: 1.12
Received: 5 April 2013
Requester: Rouella Mendonca
Company: Microsoft Corporation
Phone: +1 425 882 8080
FAX: +1 425 936 7329
email: roumen@microsoft.com

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Required Voter: Logitech – Mark Lavelle
Required Voter: Intel – Steve McGowan
Required Voter: Microsoft – Rouella Mendonca

Summary:

This review request adds support for a set of controls intended for Feature Reports to give additional capability and physical description for keyboards so that a HID Host can adjust software assistance for modified or limited keyboard implementations.

Background:

Today's keyboards provide little to no information to the HID Host about their size, key type, physical layout or legend set. While there is a bCountryCode, it is little used and does not provide enough granularity to define a legend set nor the physical form factor of the keyboard. This Review Request addresses these limitations in a lightweight manner. It does not provide a mechanism of fully describing a complete layout, but does provide basic information about keyboards that implement the de-facto standard layouts that is usable by a HID Host for most scenarios.

Proposal:

The proposed mechanism is to provide descriptive controls that are usable in a Feature Report to describe capabilities of a keyboard collection. Other controls may coexist in the Feature Report, and not all controls are required. Furthermore, the controls may be constant or variable, depending on whether the keyboard is a fixed (eg, wired) implementation, or are reported from a wireless adapter that supports possibly dynamically-changing physical keyboards.

The proposal also provides usages for controls allowing users to offer specialized input for navigating and selecting from lists of proposed insertions, as is currently done in common Input Method Editors. The controls are not limited to text insertions, but could be used by HID Host software to select and insert any type of object into the current editing context.

The HID Host can then use the descriptive controls to determine the level and type of insertion lists to provide, if any.

The Feature Report should be described in a keyboard Top-Level Application Collection, and the Input Report should be described in a Consumer (Remote Control) Top-Level Application Collection, in the same or similar field that reports other hotkeys such as Mute or Volume controls.

If implemented, all controls are optional. However, the HID Host software determines the descriptive information that is required to provide any particular level of functionality, so implementers are encouraged to use as many of the controls as possible.

Document Changes:

Add the following usages to the **Consumer Page (0x0C)** Section 15, Table 17:

Usage	Name	Type
0x2C0	Extended Keyboard Attributes Collection	CL
0x2C1	Keyboard Form Factor	SV
0x2C2	Keyboard Key Type	SV
0x2C3	Keyboard Physical Layout	SV
0x2C4	Vendor-Specific Keyboard Physical Layout	SV
0x2C5	Keyboard IETF Language Tag Index	SV
0x2C6	Implemented Keyboard Input Assist Controls	SV
0x2C7	Keyboard Input Assist Previous	Sel
0x2C8	Keyboard Input Assist Next	Sel
0x2C9	Keyboard Input Assist Previous Group	Sel
0x2CA	Keyboard Input Assist Next Group	Sel
0x2CB	Keyboard Input Assist Accept	Sel
0x2CC	Keyboard Input Assist Cancel	Sel
0x2CB-0x2DF	(Reserved for Future Extended Keyboard Attributes)	N/A

Descriptive Controls

Extended Keyboard Attributes Collection

Declares a Logical Collection containing extended attributes for a keyboard. The controls 0x2C1-0x2C6 must be enclosed within a Logical Collection tagged with this usage, within a Generic Desktop(Keyboard) Top-Level Application Collection.

Keyboard Form Factor

- 0: Unknown Form Factor
- 1: Full-Size keyboard
- 2: Compact keyboard. Such keyboards are less than 13" wide.

Keyboard Key Type

- 0: Unknown Key Type
- 1: Full-travel keys
- 2: Low-travel keys such as those on laptop keyboards.
- 3: Zero-travel or virtual keys

Keyboard Physical Layout:

- 0: Unknown Layout
- 1: 101 (e.g., US)
- 2: 103 (Korea)
- 3: 102 (e.g., German)
- 4: 104 (e.g., ABNT Brazil)
- 5: 106 (DOS/V Japan)
- 6: Vendor-specific – If specified, 0x02C4 must also be specified.

The usage does not refer to the legend set printed on the keys, but only to the physical keyset layout, defined by the relative location and shape of the textual keys in relation to each other. This usage indicates which of the *de facto* standard physical layouts to which the keyboard conforms. These layouts are commonly understood.

Vendor-specific Keyboard Physical Layout

A numeric identifier of the particular Vendor-specific Keyboard Physical Layout. Values for this field are defined by the hardware vendor but 0x00 is defined to not specify a Vendor-specific Keyboard Physical Layout. If non-zero, 0x2C3 must have value 0x06. If this identifier is 0x00, 0x2C3 must not have the value 0x06. If 0x2C3 is omitted, 0x2C4 must also be omitted.

Keyboard IETF Language Tag:

String index of a String Descriptor having an IETF Language Tag. This Language Tag specifies the intended primary locale of the keyboard legend set, conformant to IETF BCP 47 at <http://www.rfc-editor.org/rfc/bcp/bcp47.txt> or its successor. Operating systems may use this information to help select a layout that maps keyboard usages to textual glyphs.

This specification does not specify the exact glyph sets, as small variances may apply in particular implementations. If an appropriate IETF Language Tag is not available, such as for custom, adaptive or new layouts, the control should be omitted or set to 0x00.

Implemented Keyboard Input Assist Controls

Bitmap for physically implemented controls. The input report field for Keyboard Input Assist controls may be declared as an array using Usage Min and Usage Max tags, but the keyboard is not required to implement every control in that range. However, host software may need to know which controls are actually implemented in order to present an appropriate user interface.

All 0: No Keyboard Input Assist controls are implemented.

Bit 0: Previous Suggestion

Bit 1: Next Suggestion

Bit 2: Previous Suggestion Group

Bit 3: Next Suggestion Group

Bit 4: Accept Suggestion

Bit 5: Cancel Suggestion

All other bits reserved.

Input Assist Selectors:

Keyboard Input Assist is any system that presents a list of potential elements to be inserted in the current input stream. Types of elements could be graphical substitutions, word suggestions or script translations such as Rōmaji-to-Kanji in Japanese or Hangeul-to-Hanja in Korean. User interfaces may only present a subset of all possible candidate elements, and a provision is made to page through groups of candidates with the Group navigation controls below.

Keyboard Input Assist Previous – Selects the previous Keyboard Assist element, if any.

Keyboard Input Assist Next – Selects the next Keyboard Input Assist element, if any.

Keyboard Input Assist Previous Group – Highlights the previous Keyboard Input Assist element group, if any.

Keyboard Input Assist Next Group - Highlights the previous Keyboard Input Assist element group, if any.

Keyboard Input Assist Accept – Commits the selected Keyboard Input Assist element.

Keyboard Input Assist Cancel – Cancels Keyboard Input Assist for the current input element boundary

Sample Report Descriptors and Reports

Example Generic Desktop Keyboard Application Report Descriptor and Report

```

0x05, 0x01,           // USAGE_PAGE(Generic Desktop)
0x09, 0x06,           // USAGE(Keyboard)
0xA1, 0x01,           // COLLECTION(Application)
0x85, REPORT_ID_KEYBOARD, // REPORT_ID(REPORT_ID_KEYBOARD)
0x15, 0x00,           // LOGICAL_MINIMUM(0)
0x25, 0x01,           // LOGICAL_MAXIMUM(1)
0x75, 0x01,           // REPORT_SIZE(1)
0x95, 0x08,           // REPORT_COUNT(8)
0x05, 0x07,           // USAGE_PAGE(Keyboard)
0x19, 0xE0,           // USAGE_MINIMUM(KEYBOARD_USAGE_LEFT_CONTROL)
0x29, 0xE7,           // USAGE_MAXIMUM(KEYBOARD_USAGE_RIGHT_GUI)
0x81, 0x02,           // INPUT(Data_Var_Abs)
0x75, 0x08,           // REPORT_SIZE(8)
0x95, 0x06,           // REPORT_COUNT(6)
0x19, 0x00,           // USAGE_MINIMUM(KEYBOARD_USAGE_NOEVENT)
0x29, 0x91,           // USAGE_MAXIMUM(KEYBOARD_USAGE_KEYBOARD_LANG2)
0x26, 0xFF, 0x00,    // LOGICAL_MAXIMUM(0xFF)
0x81, 0x00,           // INPUT(Data_Arr_Ab)
0x05, 0x0C,           // USAGE_PAGE(CONSUMER_DEVICES)
0x0A, 0xC0, 0x02,    // USAGE(EXTENDED_KEYBOARD_ATTRIBUTES)
0xA1, 0x02,           // COLLECTION(Logical)
0x1A, 0xC1, 0x02,    // USAGE_MINIMUM(KEYBOARD_FORM_FACTOR)
0x2A, 0xC6, 0x02,    // USAGE_MAXIMUM(KBD_IMPLEMENTED_ASSIST_CONTROLS)
0x95, 0x06,           // REPORT_COUNT(6)
0x75, 0x08,           // FEATURE(Const_Var_Abs)
0xC0,                 // END_COLLECTION
0x05, 0x08           // USAGE_PAGE (LEDs)
0x19, 0x01           // USAGE_MINIMUM (Num Lock)
0x29, 0x03           // USAGE_MAXIMUM (Scr Lock)
0x25, 0x01           // LOGICAL_MAXIMUM (1)
0x75, 0x01           // REPORT_SIZE (1)
0x95, 0x03           // REPORT_COUNT (3)
0x91, 0x02           // OUTPUT (Data_Var_Abs)
0x95, 0x05           // REPORT_COUNT (5)
0x91, 0x01           // OUTPUT (Const_Arr_Abs)
0xC0                 // END_COLLECTION

```

FEATURE	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Report ID (REPORT_ID_KEYBOARD)							
Byte1	Keyboard Form Factor							
Byte 2	Keyboard Key Type							
Byte 3	Keyboard Physical Layout							
Byte 4	Keyboard Vendor-Specific Physical Layout							
Byte 5	Keyboard IETF Language Tag String Index							
Byte 6	Implemented Keyboard Assist Controls							

Example Consumer Remote Control Report Descriptor and Report

```

0x05, 0x0C,           // USAGE_PAGE(CONSUMER_DEVICES)
0x09, 0x01,           // USAGE(REMOTE_CONTROL)
0xA1, 0x01,           // COLLECTION(Application)
0x85, REPORT_ID_HOTKEY, // REPORT_ID(REPORT_ID_HOTKEY)
0x95, 0x01,           // REPORT_COUNT(1)
0x75, 0x10,           // REPORT_SIZE(16)
0x15, 0x00,           // LOGICAL_MINIMUM(0)
0x26, 0xFF, 0x03,     // LOGICAL_MAXIMUM(0x3FF)
0x19, 0x00,           // USAGE_MINIMUM(0)
0x2A, 0xFF, 0x03,     // USAGE_MAXIMUM(0x3FF)
0x81, 0x00,           // INPUT(Data_Arr_Ab)
0xC0                  // END_COLLECTION

```

INPUT	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Report ID (REPORT_ID_HOTKEY)							
Byte1	Consumer Page Hotkey Selector – Any of the selectors on this page can be sent here (up to 0x3FF as defined), including the new 0x02C7-0x2CC codes.							
Byte 2								

*The REPORT_ID_HOTKEY label is only a placeholder, the vendor may select this value.

(End Consumer page addition)

Response:

Notes on Approval Procedure:

HID WG On Line Voting Procedures

1. Votes are on a per company basis.
2. Each Review Request shall have attached a Required Voter List that is the result of recruiting by the HID Chair and submitter of members of the USB IF. Required Voter List must include the HID Chair plus 2 companies (other than the submitter) plus any others designated by the HID Chair at the Chair's discretion. The Required Voter List ensures that a quorum is available to approve the Request.
3. Impose a 7-calendar-day posting time limit for new Review Requests. HID Chair or designate must post the RR within 7 calendar days. HID Chair or designate must work with the submitter to make sure the request is valid prior to posting. Valid review request must include all fields marked as required in the template. A new template will be adopted that requires at least the following fields: Change Text, Required Voter List, Review Period End Date and Voting End Date, Submittal Date, Submitter, Review Request Title and RR Number.
4. If a RR approval process stalls, the HID Chair may call a face-to-face meeting or conference call to decide the issue. Submitter may request that this take place.
5. Impose a minimum 15-calendar-day review period on a posted RR prior to the voting period. At HID Chair discretion, changes to the RR may require this review period to restart.
6. The Chair will accept votes via documentable means such as mail or e-mail during the 7 calendar days after the close of the review period. If a Required Voter does not vote during the period, then there is no quorum and the Chair may pursue the absent required voter and extend the voting period. The Chair may designate a substitute for the absent voter and extend the voting period if necessary.