Input Methods in Plasma 5

— Modern and global text input —

Eike Hein · 2017

Introduction

About me

- KDE user since ~1999
- KDE developer since ~2005
- Core Plasma Desktop developer
  - Taskbar, desktop icons, folder widgets, launcher menus, ...
- Apps shenanigans: Konversation, Yakuake, ...
- Based in Seoul, South Korea

Talk outline

- Intro to Input Methods
- Demos
- Technology
- Plasma Desktop
- Plasma Mobile
- Q & A

Input Methods

What are Input Methods?

- Conversion of input events into text
  - Input events: Key presses, screen taps, gestures, more complex interactions
  - Divorcing output from input
- Stateful: Composing output in multiple steps
- Rich UI feedback

Who uses Input Methods?

- Use cases: Essential to communication vs. assistive / enhancing
- >20% of the world's population require an IM to write their native language: Chinese, Japanese, Korean, ...
  - Increasing % of IM users among computer users as more come online
  - Underrepresented among users of open systems: Growth opportunity
- Completions, word suggestions, emoji palettes are IMs
  - So far few users on the desktop
- It's a chicken and egg thing on both accounts

Demos

Writing Korean

- Alphabet, but grouping letters into character-wide syllabic blocks
- Stateful multi-step composition of output
- Complex interaction between client application and IM
  - Replacing existing text with each keypress: ㅎ (h) → 하 (ha) → 한 (han)
  - Formatting hints provided by IM

INTERACTIVE DEMO

Writing Chinese

- Logographic writing means thousands of characters
  - Problem becomes tractable with IM
- Output candidate seletion
  - Interactive UI provided to applications externally, system service
- The many ways to write Chinese
  - Alternatives to Pinyin; handwriting

INTERACTIVE DEMO

Typing Emoji

- Language-agnostic
  - Seem familiar? Logographic writing, too

INTERACTIVE DEMO

Word completions & spell-checking

- Language-agnostic
- Learns with use
- Staple of mobile
  - Overcoming a handicap through IM

INTERACTIVE DEMO

Technology

Input Method architecture (Desktop)

- Common case: Many actors, lots of IPC
  - Hardware -> Kernel → Windowing System → Application
  - Application -> IM daemon -> IM plugin
  - IM plugin <-> UI frontend ("panel")
  - IM -> Application -> UI control
- IM daemon: Manages IM plugins, provides config & marshalling infra
- IM panel: Provided by desktop environment (e.g. Plasma)

Naming the players (Desktop)

- IM daemons: ibus, fcitx, scim
  - Plasma supports all of them
- Qt: Input Context plugins
  - Interface with IM daemon vs. in-process IM
  - In-tree vs. out of tree
  - QInputMethodEvent
- Mobile is its own party

Input Method community

- Wide problem domain
  - Many writing systems to cover, some not yet or poorly supported
  - Existing Input Methods are not "done" yet
- Manpower shortages
  - Few developers, in some cases we rely on single experts
  - Yet we make them duplicate their efforts
  - Community onboarding: Language barrier can be a big problem
- KDE.org is part of the community: Qt, fcitx

Plasma Desktop

Input Method Panel widget

Korean (ibus-hangul)

Chinese (ibus-pinyin)

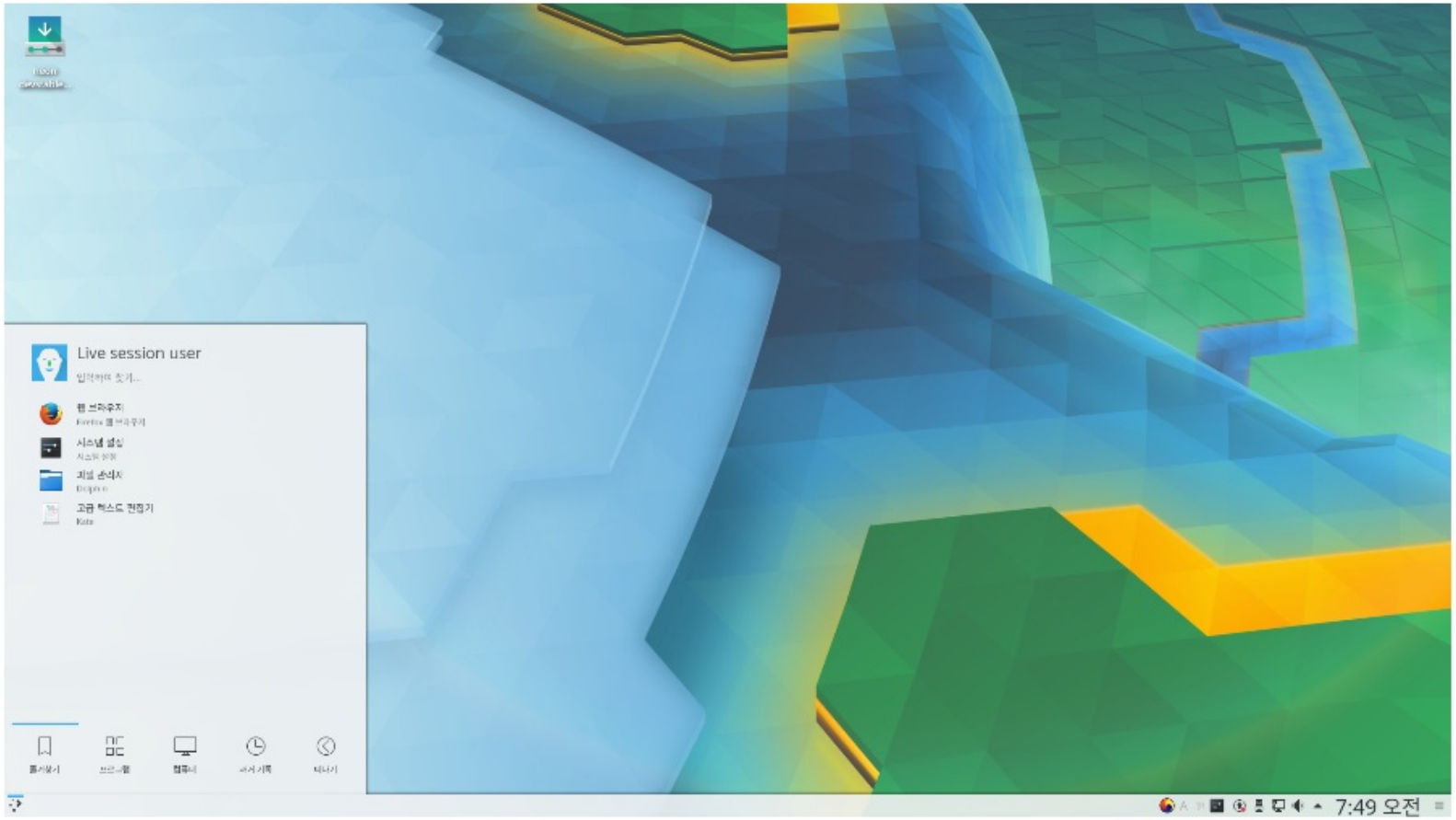
Input Method Panel widget

- Provides access to Input Method configuration
  - Both daemon and active plugin
- Displays active Input Method controls
- Provides plugins with host UI (popups)
- Multi-backend: Supports ibus, fcitx and scim

Recent work

- Moved Input Method Panel from addons to core (Plasma 5.6)
  - Allowed us to start auto-adding it to the panel by locale on first logon
- Improved ibus support (Plasma 5.10)
  - Auto-starting panel after daemon launches
- KDE Neon Korean Developer Edition (Fall 2016)
  - Made to coincide with KDE's 20th birthday party in Seoul, South Korea
  - Serves as integration test case, based on Dev Edition git stable

KDE Neon Korean Edition

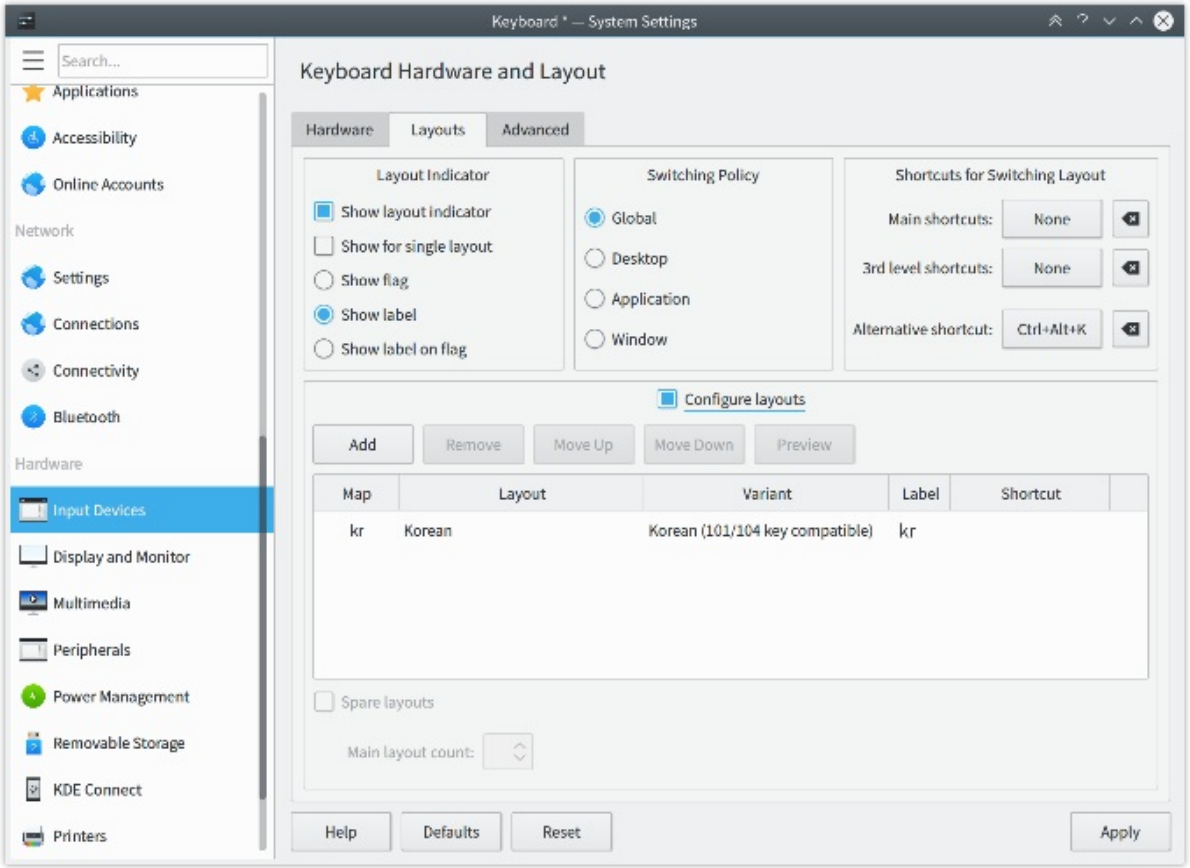


KDE's 20th Birthday in Seoul

Pain points

- Expert knowledge required for initial setup
  - For both installation and configuration
- Config UI is hard to discover and not where users expect to find it
  - And it's not ours
- System Settings both incomplete and redundant
  - Keyboard layouts are but a part of the whole
  - Settings stop working correctly when IM is used
- Input Method Panel competes with System Tray

System Settings: Keyboard Layouts



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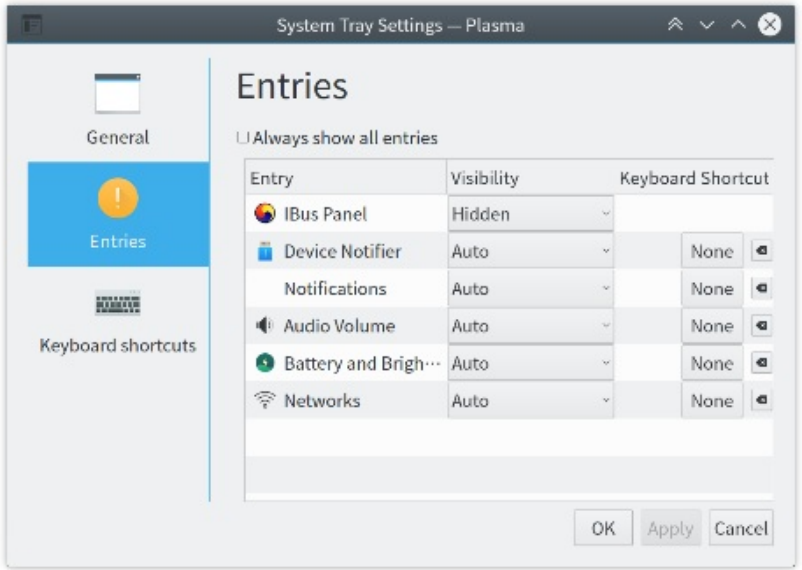
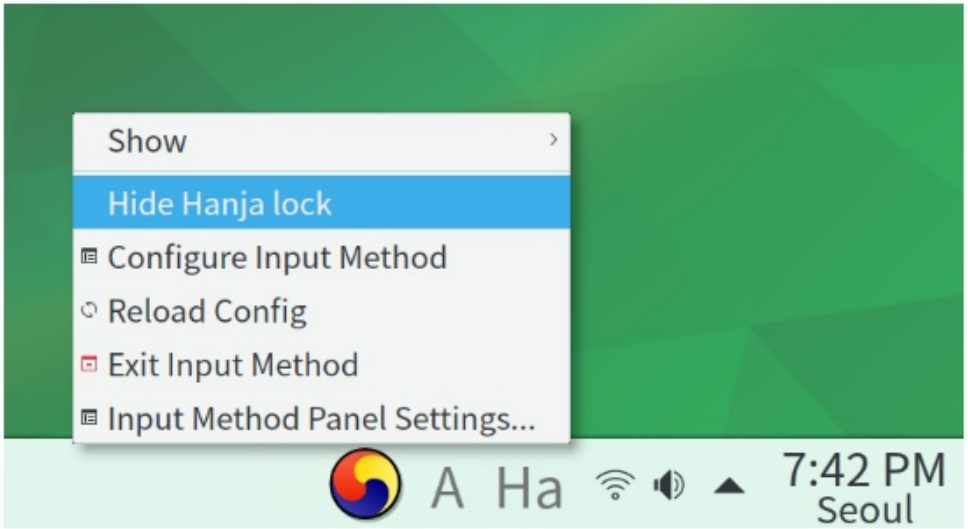
System Tray vs. Input Method Panel



System Tray

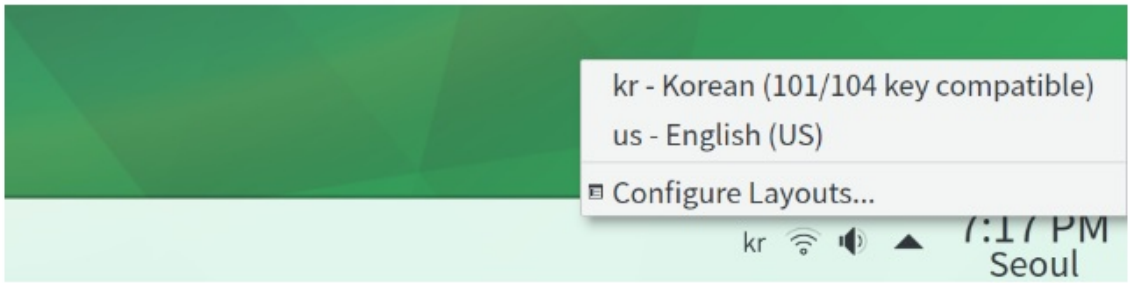


Input Method Panel

Solutions (read: todos)

- Input Methods always-on
  - Force distros' hands, guarantee availability
  - Can take different forms (build time deps vs. runtime deps)
- Revamp config UI
  - From managing keyboard layouts to managing input languages
- Unify keyboard layout indicator and Input Method Panel
- Integrate Input Method Panel with System Tray
  - Fix theming (icons)

Keyboard Layout Indicator



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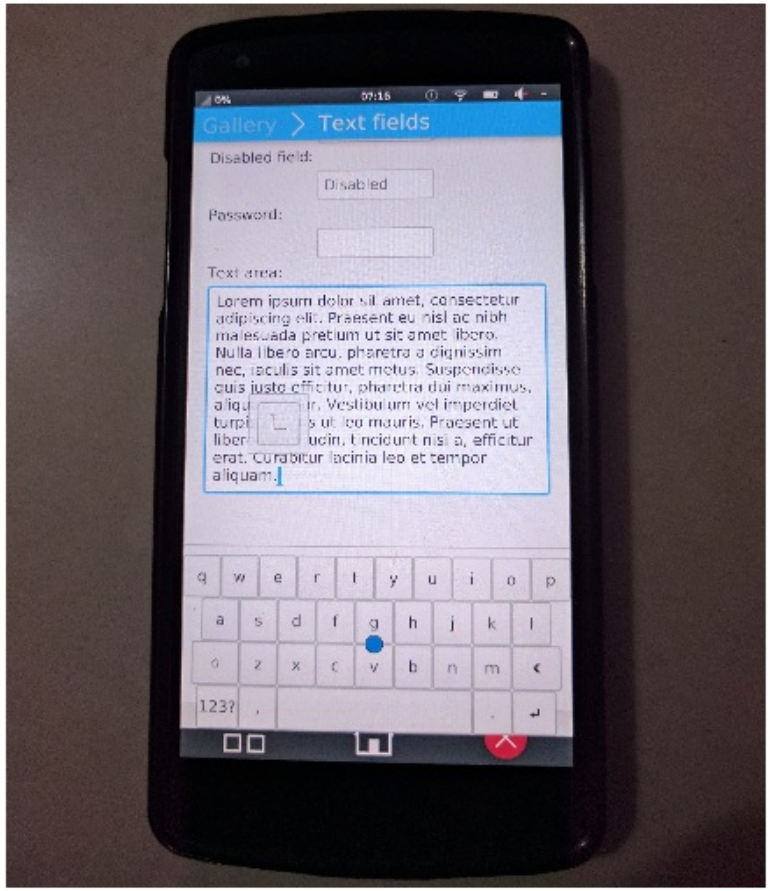
Plasma Mobile

Mobile stacks

- The screen as the keyboard
  - Additional interaction patterns: Swipe gestures, etc.
- Oldschool: On-screen keyboards as key event generators
- Maliit
- Qt Virtual Keyboard
  - In-process: Input context plugin

Maliit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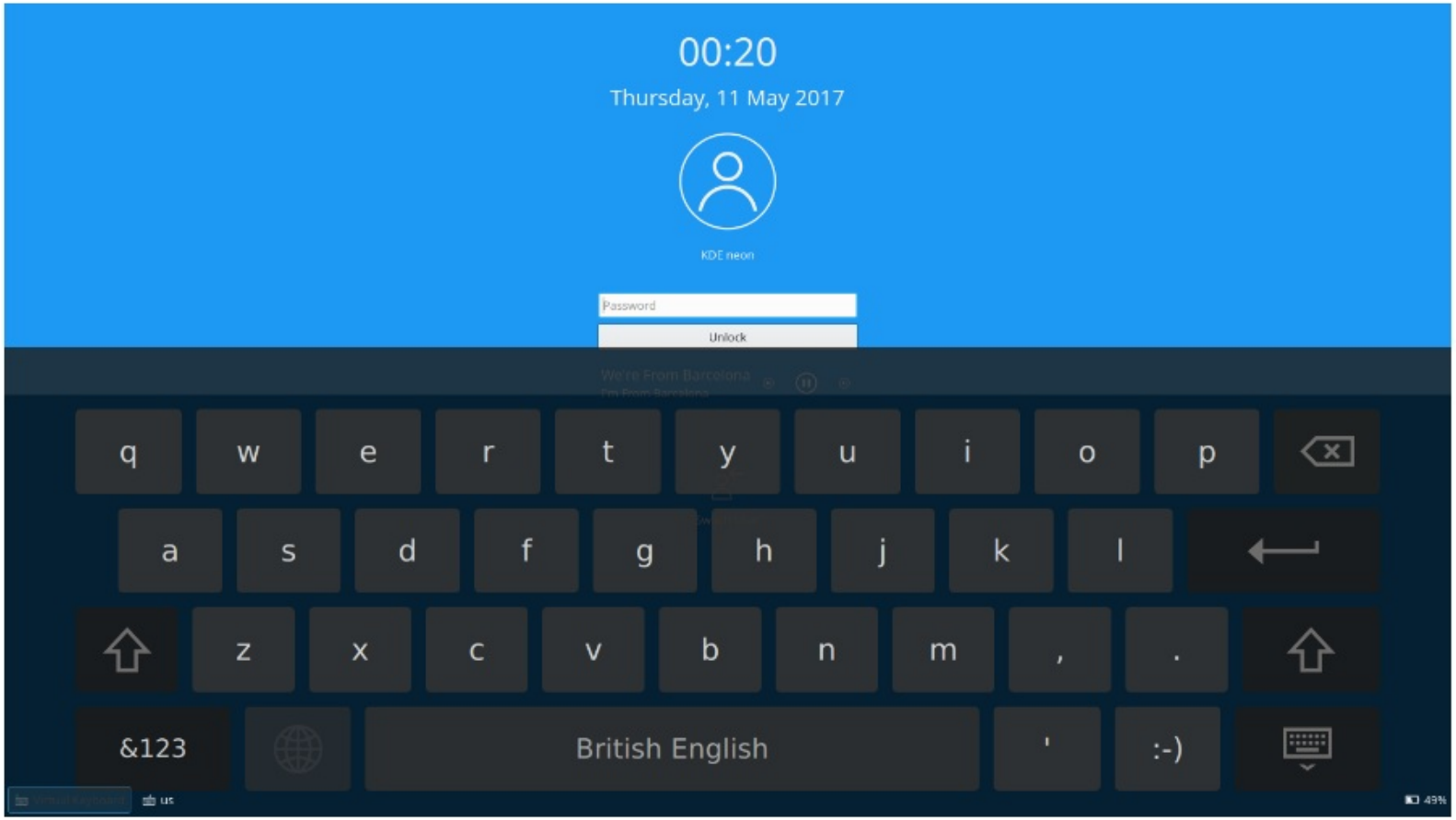
Qt Virtual Keyboard



Pain points

- Duplication of effort vs. desktop stacks
  - Not achieving feature parity (both ways)
  - API explosion: Spreading the community even thinner
  - Bad reasons we don't share: Licensing, ...
- Challenges to convergence
  - Jarring behavior differences between input devices
  - No state synchronization
  - Poor UI integration and no consistency

Solutions (more todos)

- Extend Qt Virtual Keyboard?
  - Wrap existing IM system
  - Maybe fcixt
- Reuse Input Method Panel widget in keyboard tray

And finally ...

Why we should care

- Inclusivity is one of our core values
  - Says https://manifesto.kde.org
- Expanding our reach helps us achieve our goals
- Engineering is about facilitating culture and building civilization
  - Communication is essential to culture and civilization
  - Language is essential to communication