Porting openSUSE to MIPS platform

--- Gdium as target platform

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Before the Talk

- This is a Google Summer of Code 2009 project for openSUSE project.
- Most of the work gets done by Eryu Guan, my role was GSoC mentor.
- We port a basic openSUSE 11.1 installation on Gdium netbook.

Motivation

- A Chinese designed MIPS 64el compatible processor.
- More distribution choices for MIPS net-book users.
- Support from OLPH (One Laptop Per Hacker) project.

Opportunity

- Many students showed their interest on this idea.
- OpenSUSE accepts this idea as a GSoC 2009 proposal candidate.
- Eryu Guan from BUPT (Beijing University of Posts and Telecommunications) got highest rate and won the project.
- Google sponsored this project.

Challenge

- Didn't have KNOW-HOW on Linux distribution porting.
- Packages dependence were very complexed.
- Almost no on-hand document.
- Needed real hardware for target platform.

Approaches

- OLPH project sponsors hardware
  - Gdium netbook
  - Loongson2f processor
  - MIPS 64el compatible
  - A real working and product-quality hardware platform

Approaches (Cont.)

- Divided the job into 3 steps
  - Booting system
    - boot on target hardware
  - Build system
    - build other RPM packages
  - Basic system
    - an basic openSUSE installation for MIPS hardware, with YaST.

Approaches (Cont.)

- Eryu Guan does a great homework to analyze packages dependence.
  - 71 source packages for booting

    https://docs.google.com/Doc?docid=dtp9h3z_5fb3jzpfm&hl=en
  - 150 source packages for building rpm

    https://docs.google.com/Doc?docid=dtp9h3z_7czk4zddr&hl=en
  - 76 source packages for running YaST and FVWM.

    https://docs.google.com/Doc?docid=dtp9h3z_9g6kwwbgq&hl=en

Approaches (Cont.)

- Start porting on QEMU firstly, then real hardware.
  - Use vanilla Kernel firstly.
  - Learn more knowledge from practice.
  - When booting system worked, ported openSUSE kernel to MIPS 64el and Gdium.

Approaches (Cont.)

- Kernel porting is simple
  - All the target processor (loongson2f) support is in upstream kernel.
  - Gdium specific kernel support is maintained in philv's (Philippe Vachon) git tree.
  - Very little merge works onto openSUSE 11.1 kernel tree.

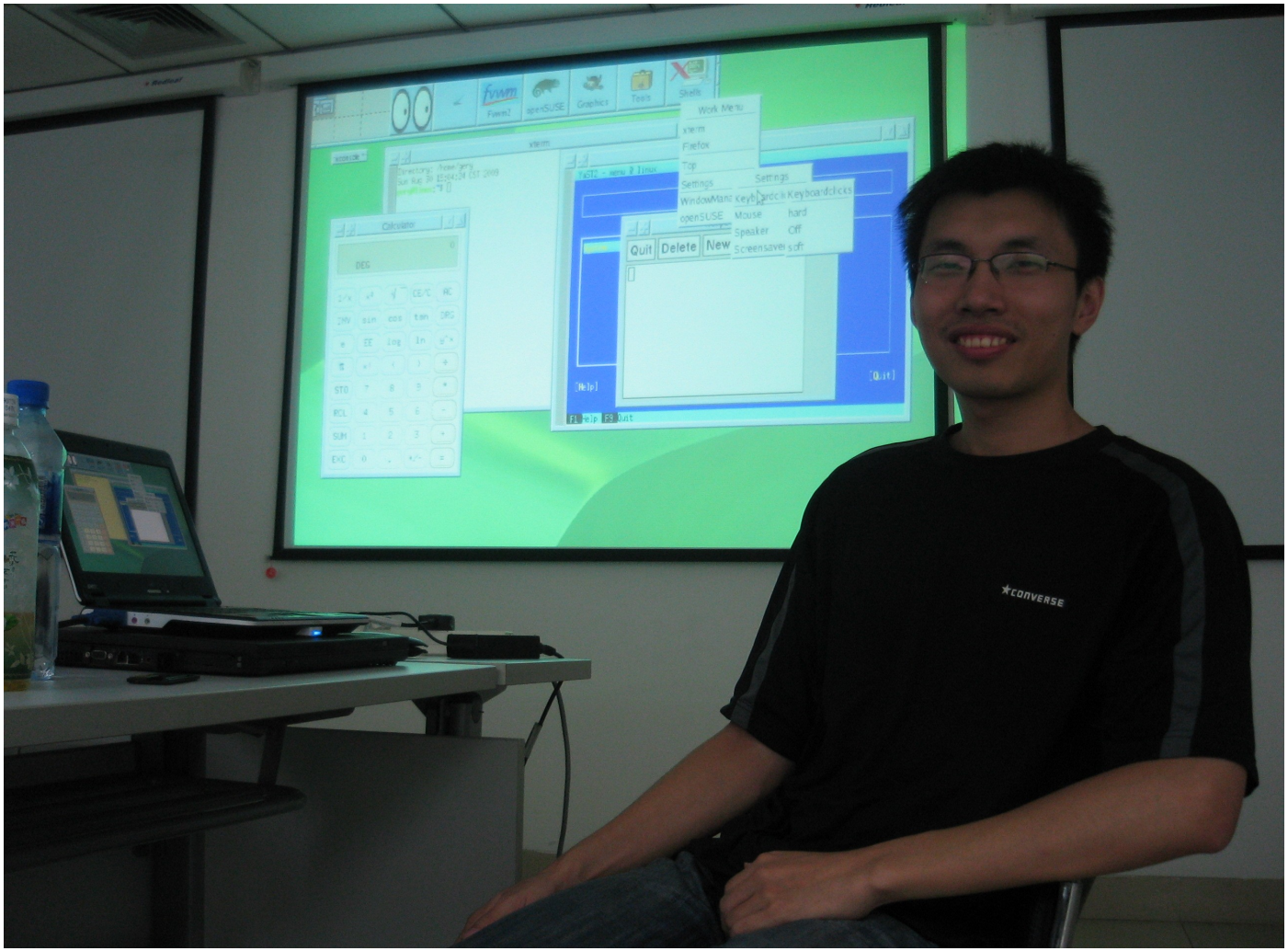
Approaches (Cont.)

- Compiled all RPM packages on QEMU system-emulator, installed and ran on Gdium.
  - System mode QEMU is very slow
  - Fortunately we were able to run multiple QEMU executions

Approaches (Cont.)

- Great help from openSUSE community
  - In time response to the questions
  - Correct answers in the feed back
  - Well organized source code

Achievement



Achievement (Cont.)

- A very basic openSUSE porting.
  - Kernel + 297 source RPM
- A good start for future improvement.

Future

- User mode QEMU hacking on MIPS.
  - Compiling glibc from 5 days to 3 hours
- Integrate into openSUSE Build Service.
  - Power tool to build more packages
- Installation server for openSUSE MIPS users

Credit

- Sponsorship from
  - OLPH program
  - Google Summer of Code program
  - OpenSUSE project
- OpenSUSE community support
- Gdium community support

Credit (Cont.)

- Eryu Guan's hard work.
- Philv's help on kernel porting.
- Suggestion from Jan-Simon Möller and Martin Mohring for user mode QEMU and Build Service integration.
- All other members' encouragement from http://www.linuxfb.org

Credit (Cont.)

- Thank you for coming.
- Q & A

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