Project Origins

- http://techuman.wordpress.com/
- http://deliriotecnologico.blogspot.it/
- http://powerpc-notebook.org/

Ready to switch to gnu/linux PowerPC notebooks.

The game has changed, now gnu/linux is everywhere running on every cpu architectures and devices. It’s the right time to make new choices, a new PowerPC Notebook designed around Gnu/Linux, make it happen!

Join
Join and strengthen the PowerPC Notebook Team. Subscribe to the newsletter.

How To
Our passion on innovation and for this project have already motivated a producer to start to design the mobo of this PowerPC Notebook. Your participation make the difference to produce and design an ideal device.

Develop
We are searching software developers able to run PowerPC console games (Wii / WiiU, p3, xbox360). Fine tune gnu/linux on this PowerPC notebook.
## Creation dates of CPU architectures

<table>
<thead>
<tr>
<th>Instruction set</th>
<th>Bits</th>
<th>Introduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>64</td>
<td>1992</td>
</tr>
<tr>
<td>ARM</td>
<td>32</td>
<td>1983</td>
</tr>
<tr>
<td>ARMv8-A</td>
<td>64/32</td>
<td>2011[2]</td>
</tr>
<tr>
<td>AVR32</td>
<td>32</td>
<td>2006</td>
</tr>
<tr>
<td>Blackfin</td>
<td>32</td>
<td>2000</td>
</tr>
<tr>
<td>DLX</td>
<td>32</td>
<td>1990</td>
</tr>
<tr>
<td>eSi-RISC</td>
<td>16/32</td>
<td>2009</td>
</tr>
<tr>
<td>Itanium (IA)</td>
<td>64</td>
<td>2001</td>
</tr>
<tr>
<td>M32R</td>
<td>32</td>
<td>1997</td>
</tr>
<tr>
<td>Motorola 6</td>
<td>32</td>
<td>1979</td>
</tr>
<tr>
<td>Mico32</td>
<td>32</td>
<td>2006</td>
</tr>
<tr>
<td>MIPS</td>
<td>64 (32→64)</td>
<td>1981</td>
</tr>
<tr>
<td>MMIX</td>
<td>64</td>
<td>1999</td>
</tr>
<tr>
<td>6502</td>
<td>8</td>
<td>1975</td>
</tr>
<tr>
<td>65k</td>
<td>64 (8→64)[8]</td>
<td>2006?</td>
</tr>
<tr>
<td>NS320xx</td>
<td>32</td>
<td>1982</td>
</tr>
<tr>
<td>PA-RISC (H64 (32→64))</td>
<td>1986</td>
<td></td>
</tr>
<tr>
<td>PowerPC</td>
<td>32/64 (32→64)</td>
<td>1991</td>
</tr>
<tr>
<td>S+core</td>
<td>16/32</td>
<td>2005</td>
</tr>
<tr>
<td>SPARC</td>
<td>64 (32→64)</td>
<td>1985</td>
</tr>
<tr>
<td>SuperH (SH)</td>
<td>32</td>
<td>1990s</td>
</tr>
<tr>
<td>System/3664 (32→64)</td>
<td>1964</td>
<td></td>
</tr>
<tr>
<td>VAX</td>
<td>32</td>
<td>1977</td>
</tr>
<tr>
<td>x86</td>
<td>32 (16→32)</td>
<td>1978</td>
</tr>
<tr>
<td>x86-64</td>
<td>64 (32→64)</td>
<td>2003</td>
</tr>
</tbody>
</table>
Mainstream processor families

Current mainstream:
• ARM
• MIPS
• x86
• Power Architecture (Power - PowerPC)
• Sparc

CPU with many (proprietary) applications force to keep compatibility into new CPUs.

Windows was born and grown on x86. Used by everyone, it also forced to keep compatibility when going to new CPUs.
PowerPC History

- 1991 Created by AIM (Apple IBM Motorola) (mix some drawn back compatibility between IBM Power e Motorola 88000)
- 1993 PowerPC 601
- 1997 Freescale/IBM G3, Gekko (IBM) Nintendo GameCube
- 1999 Freescale G4
- 2004 MPC 7447A (Freescale G4 variant)
- 2003 G5 64 bits (IBM)
- 2006 BroadWay IBM (64 bits) Nintendo Wii
- 2006 Cell (64 bits) Sony Playstation 3
- 2007 PWRficient PA6T (64 bits)
- 2010 e5500 core (64 bits) Freescale
- 2012 Expresso (64 bits) IBM Nintendo Wii U
- 2012 e6500 core (64 bits) Freescale
- 2014 Axxia AXE3500
x86 vs PowerPC

- 1993 Windows 25 million licenses
- 1993 PowerPC 601 released
- 1994 first Apple computer with PowerPC

*PowerPC is released without software compiled for it*: OS and previous applications was running on 386 or Motorola 68000.

When Apple created PowerPC they were running parts of Mac OS written for 68k, under emulation on the PowerPC.
PowerPC OS appeared and disappeared

- 1995
  Windows NT 3.51 and NT 4.0 for PowerPC dropped in 1996
- December 1995
  Os/2 Warp, PowerPC edition
- 1995
  Solaris 2.51 for PowerPC
Windows NT 4.0 PowerPC
OS/2 PowerPC
## PowerPC game consoles

<table>
<thead>
<tr>
<th>Name</th>
<th>Image</th>
<th>Producer</th>
<th>CPU</th>
<th>Clock</th>
<th>On the market</th>
<th>No. sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pippin</td>
<td><img src="image1.png" alt="Image" /></td>
<td>Apple Bandai Katz Media</td>
<td>PowerPC 603</td>
<td>66 MHz</td>
<td>1995 - 1997</td>
<td>42,000</td>
</tr>
<tr>
<td>GameCube</td>
<td><img src="image2.png" alt="Image" /></td>
<td>Nintendo</td>
<td>Gekko</td>
<td>486 MHz</td>
<td>2001 - 2007</td>
<td>21.74 million</td>
</tr>
<tr>
<td>Xbox 360</td>
<td><img src="image3.png" alt="Image" /></td>
<td>Microsoft</td>
<td>XCPU (Xbox 360)</td>
<td>3.2 GHz</td>
<td>2005 - present</td>
<td>77.2 million March 2013</td>
</tr>
<tr>
<td>Wii</td>
<td><img src="image4.png" alt="Image" /></td>
<td>Nintendo</td>
<td>Broadway</td>
<td>729 MHz</td>
<td>2006 - present</td>
<td>99.8 million March 2013</td>
</tr>
<tr>
<td>PlayStation 3</td>
<td><img src="image5.png" alt="Image" /></td>
<td>Sony</td>
<td>Cell B.E.</td>
<td>3.2 GHz</td>
<td>2006 - present</td>
<td>78.4 million May 2013</td>
</tr>
</tbody>
</table>
Game consoles processors

- PS2 MIPS
- PS3 PowerPC
- PS4 x86_64
- Nintendo N64 MIPS
- Nintendo GameCube PowerPC
- Nintendo Wii/WiiU PowerPC
- MS Xbox x86
- MS Xbox 360 PowerPC
- MS Xbox One x86_64
- PSP MIPS
- PSP VITA ARM

Consoles have a tiny OS with few embedded applications. Games are written from scratch or are developed on cross-architecture engines. CPU change affects them less.
PowerPC is an active architecture

- Since 2013 there is OpenPower Foundation with around 50 companies taking part on an open technical community. They created an open ecosystem, using the POWER Architecture.
- Freescale have an active Roadmap based on Power architecture
- LSI have a new processor AXE3500 476FB PowerPC 6 core
Free Software on any CPU

• "Free software" means software that respects users' freedom and community.

• Users have the freedom to run, copy, distribute, study, change and improve the software. Thus, "free software" means liberty, not "software at no price".

• Gnu/Linux is free software → you can view, change and recompile the sources for many different CPUs

• It is possible to run the same programs recompiled for different CPUs.

• You can easily change the CPU architecture
Free Software Video card and devices

- Open Source Video drivers now are partially supported by ATI and even by NVIDIA.
- Support for old devices is much longer in the open source world than with proprietary software.
- Less product obsolescence.
Today PowerPC computers

- A few desktop PowerPC computers exists
- There is no PowerPC notebook
PowerPC Desktop/embedded

- AmigaOne X1000, (beta test x5000) A-eon
- AmigaOne 500 ACube Systems
PowerPC Notebook tech specs

- CPU: 64 bit PowerPC, multi-thread - AltiVec
- video card: MXM (upgradable)
- USB
- SATA
- RAM: DDR3, upgradable
- HD/SSD 2.5", upgradable
- Standard notebook case 15,6"
PowerPC notebook project steps

• Notebook without motherboard
• Design a PowerPC board
• Board prototype + fit inside notebook
• Board production + notebooks assembling
How to participate

- Spread the word (physical presentation, videos, web and digital diffusion, translations, video production, etc)
- OS optimizing for the motherboard
- PowerPC Applications optimization (test gnu/linux application package, and feedback or fix the errors)
- Virtualization PS3/WiiU/Wii/Xbox360
- Power server virtualization
- Hardware wishes list
- Participate in a group buying
Solidal Group Buying

• People already make group buying with little producers in the food. Example: they buy organic milk from a farm and define together with the farmer a fair price in a middle between the producer and buyer willing.

• We want to do the same in hardware and software: to help and promote little producers of hardware and software that really want to do something for innovation and find together a fair price for each other,
Port to PowerPC Dolphin Wii emulator

- https://it.dolphin-emu.org/?cr=it
Game Console Emulator projects

- The Wii/WiiU, PS3 and Xbox360 emulator are compiled for x86 and they need to emulate the PowerPC processor.
- Porting them to PowerPC means that we don't need the PowerPC emulation but we need only virtualization because they will run on the same Power architecture.
- Virtualizing we speed up many times these game console “emulators”.
Port to PowerPC
Xbox360, PS3 emulators

- Xbox360 https://github.com/benvanik/xenia
- PS3 https://github.com/DHRpcs3/rpcs3
Roadmap

- Build a multi-disciplinary project team
- Actions to spread the idea
- Crowd-funding/Group buying
- Beta tester program for software optimization
- To go into production before the end of 2015