Open Source
from Legend, Business, to Ecosystem

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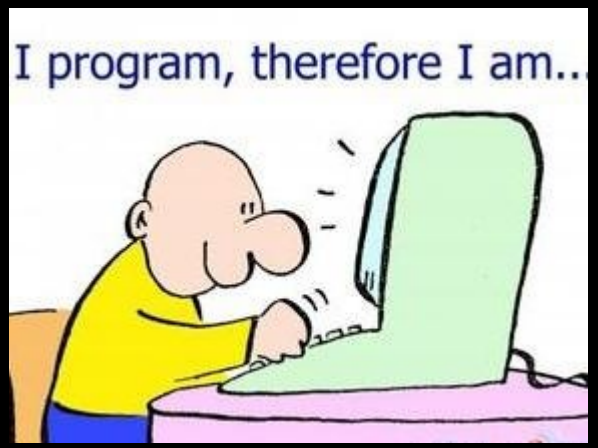
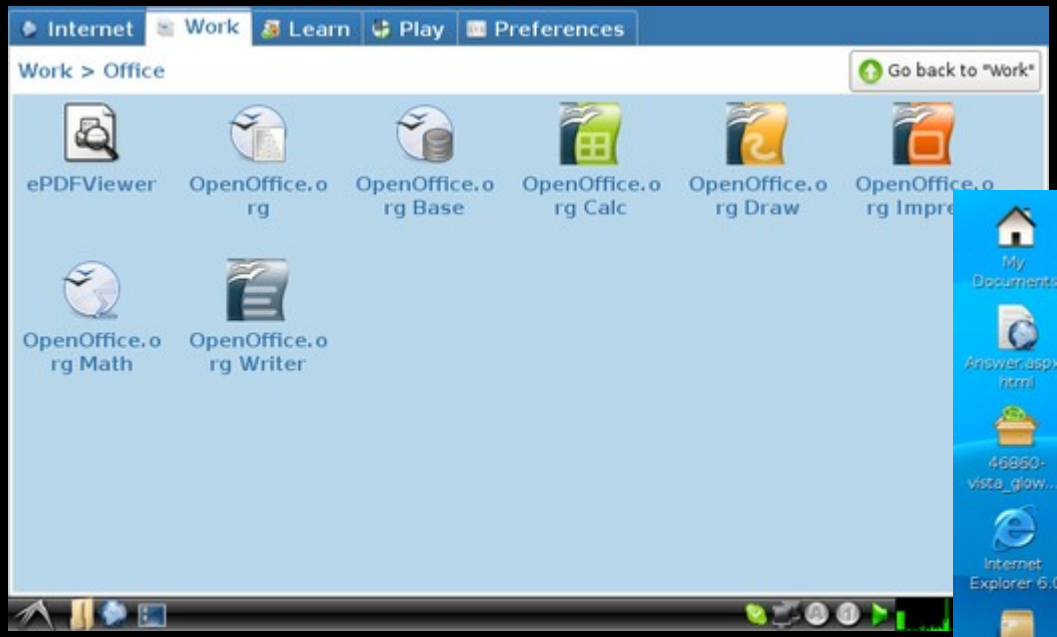
首先，我不是什麼專家，充其量只是個常提交代碼的碼農，看倌們就當這是我的耕作心得吧



從一個笑話說起 ...

可是萬一你真的想要有堪用的 Win98 界面的桌面環境時，該怎麼辦?


Internet
Work
Learn
Play
Preferences
Work > Office
Go back to "Work"
ePDFViewer
OpenOffice.org
OpenOffice.org Base
OpenOffice.org Calc
OpenOffice.org Draw
OpenOffice.org Impre
OpenOffice.org Math
OpenOffice.org Writer


My Documents
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Adobe Reader 8
bookmarks.sh
41090-LiNsta-Pack...
cai_hong.gp3
lxde_screenshots
tuning.mid
LiNsta-Pack
Temp
LXDE
LIGHTWEIGHT X11 DESKTOP ENVIRONMENT
05:33


Let's speed up your desktop!

自己打造！
LXDE

除了 LXDE，也可以在你的 Android 手機中找到我 . . .

我知道，你現在就想問：

「Open Source 怎麼獲利呢？」

回答這問題之前，我們先問另一個問題:
「誠品書店怎麼獲利?」

「從 1989 年誠品書店創立以來，靠著獨特設計感和閱讀氛圍，打造出小型獨立書店和連鎖書店外的第三種經營趨勢，成為台灣獨特文化地標」

Source: http://www.managertoday.com.tw/?p=14607

誠品書店在都市叢林中，打造良好的開放閱讀環境，品牌氛圍擺第一、成為亞洲唯一 24 小時不打烊書店 ...

某些角度來說，跟 Open Source Software 片面的印象有點接近：你是享受閱讀之後，才真的消費，而後者非必要

吳清友體認到只賣書無法生存，便提出「複合式通路」的創新經營方式，將生活百貨、商場元素導入誠品，創立了以書店為核心的百貨商場新型態。

藉由原本與其他書局差異化的價值，吸引人潮進入誠品，再由商場獲利，如今誠品集團商場的營收占了總營收的六成，是最主要的收入來源。

Source: http://www.managertoday.com.tw/?p=14607

誠品非書部份已是整個誠品集團的重要支柱，營收佔比 70％，是主要獲利來源，書店只佔 30％。其中，商場的餐飲佔比 20％到 25％，其他包括設計、配件、家具等

— 彭博商業週刊

Source: http://tw.bbwc.cn/qrlsrj.html

白馬非馬

誠品書店非書店

Free Software 非 Software
Open Source Software 非 Software

後者是本質，但前者不受後者形式所拘束

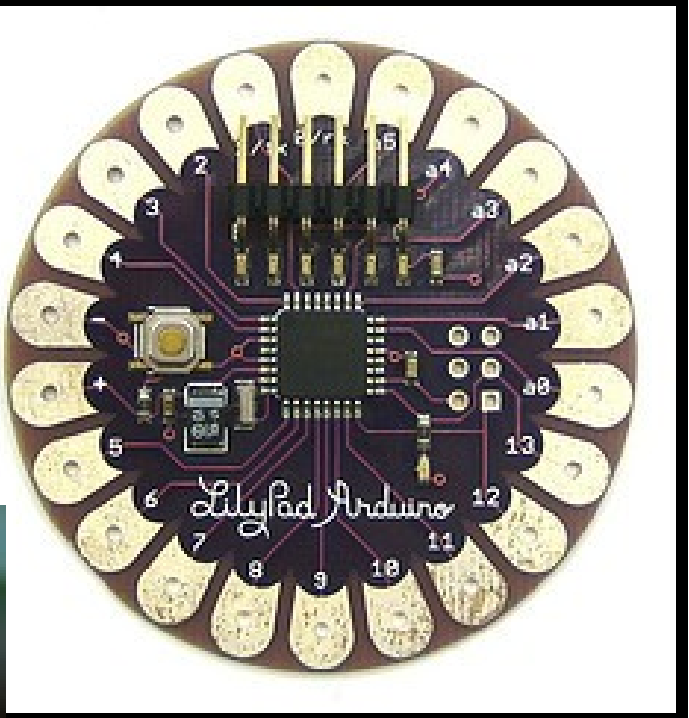
事實上硬體發展也採用 Open Source 模式

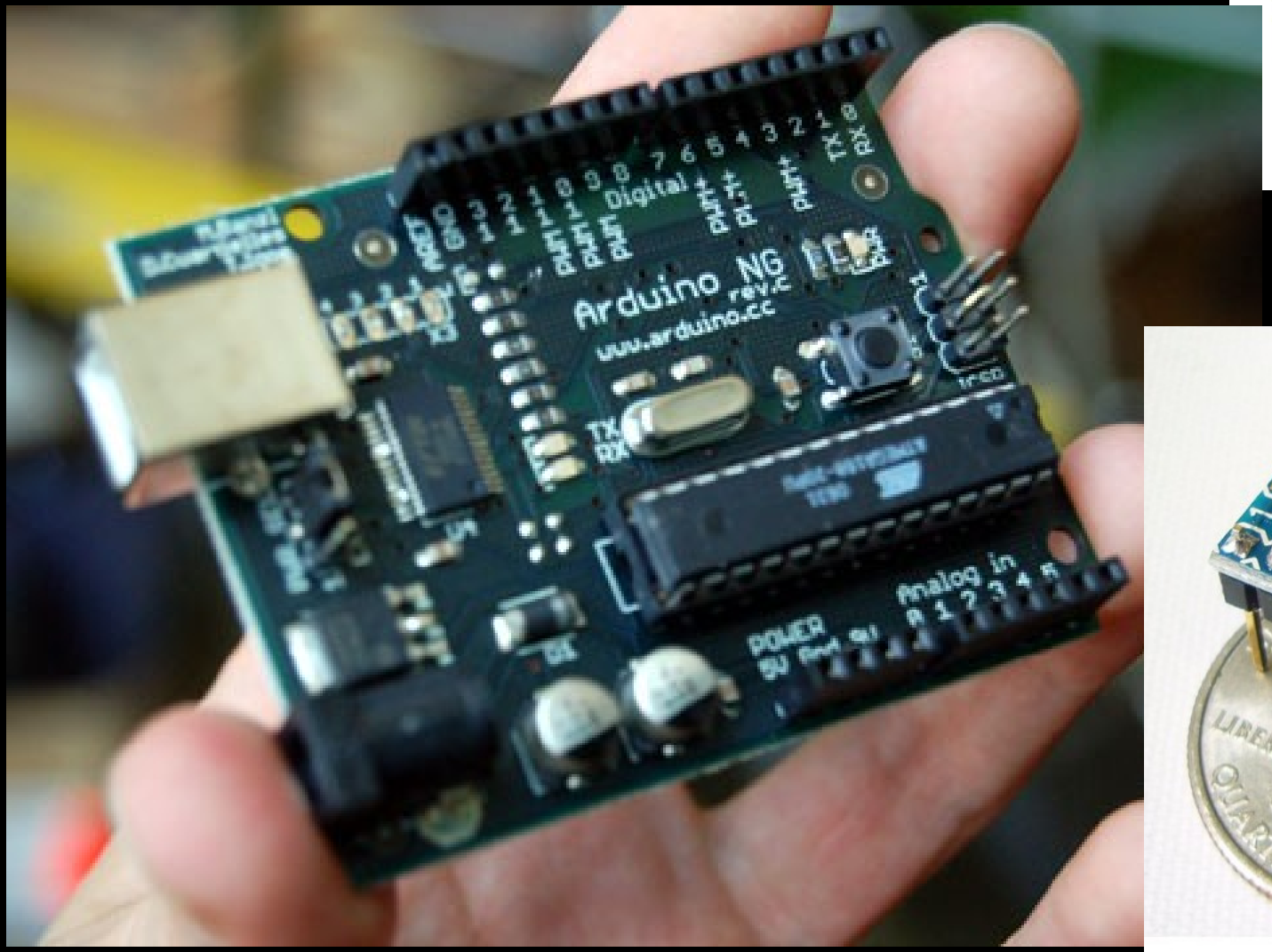
Raspberry Pi

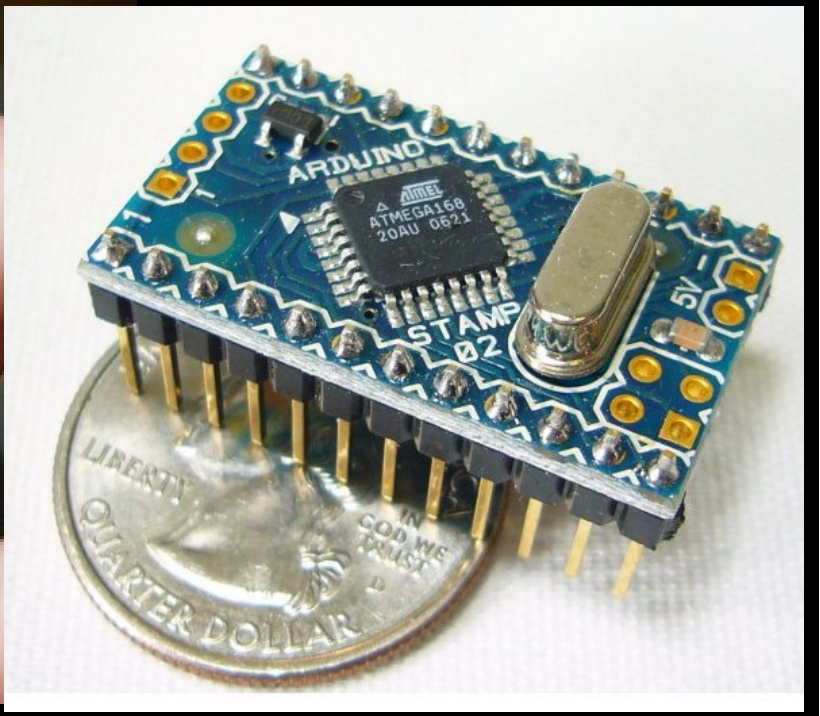
USD $35

- 「我們當時真的認為我們或許會賣出約 1000 台，頂多到 10000 台而已。我們當時也沒想到要大量生產，只想著生產幾台，到時就發給那些劍橋大學電腦科學系的學生。」
- 超過 200 萬台 Raspberry Pi 廣為愛好者改造為機器人、無人機械、家庭自動化設備

Arduino


LilyPad Arduino


Arduino NG
rev.c
www.arduino.cc
Digital
Analog In
POWER


ARDUINO
ATMEGA168
20AU 0621
STAMP
02
LIBERTY
IN GOD WE TRUST
QUARTER DOLLAR

軟體 / 硬體 / 演化

- 世界前幾大的軟體公司都積極從事硬體
  → Google, Microsoft, Amazon, Facebook, Oracle

  → 這幾家「軟體」公司的出貨量甚至超越頗多號稱「硬體大國」台灣的廠商

- 實際上不是大量銷售，而是軟體創造了附加價值，進而推動了整個生態鍊 (ecosystem)
- 為何你該在資訊工程系學習硬體設計、在電機工程系學習軟體開發呢?
  → 適應演化

  → 持續跨領域創新才能刺激生態鍊

軟體 / 硬體 / 演化

- 麗魚的演化見證了高度競爭環境的影響：，單一物種在十餘萬年間演化出了 500 多種麗魚，伴隨得以適應多種奇特的生態特徵 （東非的維多利亞湖）

  → 五百多種全部都來自同一個祖先

  → 不同種類的麗魚不僅外觀不同，就連顏色也有著顯著的差異，而且連獵食的對象也不同

  → 說明了達爾文天擇論的「適者生存」的食物鏈循環：生物必須透過不斷改變自己的基因來增加自己生存的機會

- 華人星光大道 / 中國好聲音 → 有挑戰、攤在陽光下的發展，甚至比原唱者更有韻味並獨樹一格

軟體觀點

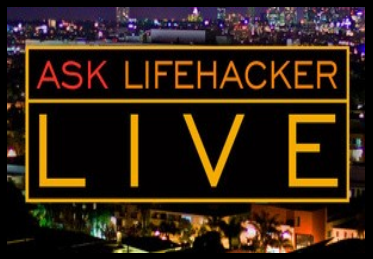
- 以軟體作為加值的模式
- 「看不見的電腦」
- 預先評估、預先整合、預先驗證、預先銷售
- 高效率的供應鍊與回饋模式
- 硬體升級的期望則是挑戰

OaaS (Open-source as a Strategy)

- Many impossible business model
  → possible now
  → scaling, fundamental changes
- 淘寶案例 → 不再受 IOE 控制
  不用再買 **I**BM (很貴 server): PC is enough
  不用再買 **O**racle (很貴 software): open-source
  不用再買 **E**MC (很貴 storage): No RAID. Just HD
- 但過程中，許多過去優秀的公司消失了 ...

回頭看看 DIY...

DIY life



Make: Projects
build, hack, tweak, share, discover

今日的雲端，瀰漫著 DIY 的風氣

毛主席：「自己動手，豐衣足食」

Agenda

- Legend
- Business
- Ecosystem

Open Source Legend

"Views of Free Software History"

by Paul Elliott

Business

與其探討 open source 的獲利模式，不如先檢視整體環境的變化

另一個笑話 ...

1 + 1 = ?

1 + 1 = ?

普通人回答２

1 + 1 = ?

物理學會詢問「單位」

1 + 1 = ?

數學家會證明 1+1=2

1 + 1 = ?

會計師會反問你:

「你想要等於多少？」

這笑話說明現實考量:

open source business 絶非僅「販售軟體本身」，讓 1+1 的結果成為你我期望的值，實際上就是說對 software infrastructure 的控制和 community 的影響

現實環境之移動終端的發展

- 1980 年，麥肯錫預估 2000 年電話市場為 **90 萬台**
  → 現在每天售出超過 **90 萬台**手機
- 1990 年， AT&T 預估 2000 年手機市場為 **100 萬台**
  → 2000 年手機數量已達到上述數字的 100 倍
  → 現在 **100 萬台**的銷售額連零頭都排不上
- 從通訊基礎建設的一部分 (Motorola, AT&T, Qualcomm) 到與人們緊密的關聯

Black Duck Top 20 licenses: http://www.blackducksoftware.com/osrc/data/licenses/

Microsoft

- 2001: Shared Source,
  - "Cancer"
- 2007: MS-RL and MS-PL
  - "It's a trick, don't do it!"
  - License proliferation
- Contributes to Linux Kernel in 2009.
- Top 10 Linux contributor in 2011.
- Contributes to Samba in 2011.

Rank	License	%
1.	GNU General Public License (GPL) 2.0	38.88%
2.	MIT License	12.22%
3.	GNU General Public License (GPL) 3.0	8.58%
4.	Artistic License (Perl)	7.37%
5.	Apache License 2.0	7.34%
6.	BSD License 2.0	7.07%
7.	GNU Lesser General Public License (LGPL) 2.1	6.12%
8.	Code Project Open 1.02 License	1.78%
9.	GNU Lesser General Public License (LGPL) 3.0	1.75%
10.	Microsoft Public License (Ms-PL)	1.67%
11.	Mozilla Public License (MPL) 1.1	1.09%
12.	Eclipse Public License (EPL)	0.98%
13.	BSD Two Clause License	0.37%
14.	Common Public License (CPL)	0.35%
15.	zlib/libpng License	0.31%
16.	Common Development and Distribution License (CDDL)	0.29%
17.	Academic Free License	0.26%
18.	Open Software License (OSL)	0.18%
19.	Microsoft Reciprocal License (Ms-RL)	0.18%
20.	Ruby License	0.17%

OSS **Business Tactics** in One Slide

OSS Development Projects (Technology "Buckets")

1. Distributed communities with good SW process develop technology packages that satisfy well defined need – the technology grows into new usage scenarios
2. Loosely coupled component architecture with well defined interfaces makes it easy to assemble larger solutions from components (e.g. LAMP)
3. Quality is a measure of community (i.e. developer customer) activity – *good software is developed by good developers regardless of license schemes*
4. Contributions reflect the individual economic considerations of the contributor and are based on selfish asymmetric value propositions ("Get more than you give")

We don't compete with Open Source – it's not a product

Applied OSS: Customers, Integrators, Competitors

1. Fast and easy for new developer customers and IT Pros to experiment with these technology buckets because of low cost of acquisition as they assemble component solutions
2. Easy for Integrators to develop mixed OSS/non-OSS products from component base.
3. **Fast and easy for OEM/ISV/SI to bootstrap products that complement their core product/service value proposition to customers from these technology buckets – they polish the rough technology to product readiness – This is a normal well understood tactic: commoditize your complements to drive demand for your Core businesses**
4. Enables aggressive (salt the fields) intellectual asset strategy of publishing to prevent patents, and a patent licensing filter

OSS Becomes Big Business (*Big Business is contributing for similar economic gain as individuals*)

1. There are many "small" company examples using OSS (Sendmail Inc., ActiveState, SleepyCat, Red Hat and SuSE, etc.) but this is not necessarily the interesting action for scalable business
2. IBM on it's third Big Play: Joined the Apache community 6 years ago, borrowing a web server while selling Websphere; joined the Linux community 3 years ago while managing the commodity curve on UNIX servers w 250 kernel engineers; began their own project (share out) around Eclipse IDE last year (and bought Rational)
3. SAP released a complete modern relational database for free to drive their core business into mid-tier (Aug 02). Released under the GPL to salt the IP fields around their 100 person x 2 year investment. Now partnering with MySQL AB to integrate MySQL and SAPDB and evolve the community development model. June 03 MySQL AB announces $19.5M venture capital round from Benchmark Capital.
4. Sun working in the Gnome desktop community (GPL) to develop and contribute the accessibility features they need for US government procurement to complement their Linux workstation offerings. Sun also working OpenOffice community under the SISSL
5. Viral licensing is an EXCELLENT competitive tactic to ensure your competition does not perturb your community or monetize your assets: BSD-style licensing doesn't protect your customer relationships in community nor your asset investment

The Effect on Our Businesses

1. Microsoft is gaining no experience with community development for complement technologies which have value with our IT Pro customers and OEM/SI/ISV partners: **Commercial Software vs. Non-Commercial Software positioning is IRRELEVENT**
2. Microsoft is gaining no traction with our MLORG IT Pro and OEM/ISV/SI development customers as they explore and validate OSS technology components in their IT environments and begin replacing, constraining, or shutting out our technology stack
   - IBM Eclipse already has 175 committed partners to our 161 in the VSIP program
   - MySQL moved from 20% to 30% of the share of the dev market from Q102 to Q103 to our increase in 10% to 15% for MSDE
   - Apache remains the dominant web server at 63% vs. Msft technologies at 27% (May 2003)
3. Product groups are not considering the use of community development as a customer engagement mechanism, part of a GTM strategy (provide complements at reduced Msft investment), nor as part of their IP strategy (publish versus patent)

Actual MSFT internal slide. 2003
http://stephesblog.blogs.com/my_weblog/2009/09/open-source-business-tactics-in-one-slide.html

對我們的啓發

- Web/Mobile（與一系列快速成長的市場）公司採用 open source 的動機：較低的授權金和可估的研發成本
- Open source 提供一個高度可見的協作框架，吸引原本一方霸主的關注 (Amazon, Microsoft, Google)
- Open source 作為公共財的形式，刺激了基礎軟體設設（如作業系統核心、資料庫管理系統、網路伺服器等等）的開放發展，並不會被封閉的廠商所牽制，長期來說，引導新創事業專注於更高獲利價值
- 專利和法律訴訟跳脫單一廠商，而廣泛成為生態系統的共通議題 (如 Android），從而加速資訊法律的發展和健全化
  -> 相較 199x 年加州柏克萊大學和 AT&T 曠日廢時的訴訟

OaaS 對我們的啓發

- 現今企業之間的競爭，早已非「產品或服務」層級的競爭，而是生態體系的競爭了
  → 繼續談單一產品或單一服務的獲利能力已無太大的意義
- 企業的內部創新障礙已是個被普遍承認的事實，而企業處理永續經營與持續獲利的唯一有效方式，即是持續進行外部創新與購併
  → open source 在這點兼顧戰略和創新效率意義

  → 小型創新者或早期投資者，以爭取戰略位置，尋求快速賣掉，是比持續經營更佳的選擇，從中孕育出的 open source 不隨併購而消失，反而奠定戰略價值

更深入 open source 對產業的刺激

- 大公司採用 open source 作為打擊其他公司的武器，但過程中卻在基礎項目中合作

  → 在移動市場中， Apple 和 Google 是直接的競爭對手，卻相互在 WebKit（網頁瀏覽器引擎）和 LLVM（動態編譯器架構）保持緊密的合作

  → 雲端運算的重要軟體框架 OpenStack 背後的廠商，往往有競爭關係，但為了加速基礎建設的發展，卻競相貢獻程式碼，以追求更多的主導權

- **Designed to prosper from engagement!**

Cloud: the real software + hardware

超大規模

高度可擴展

虛擬化

租賃服務

高可靠度

破壞性價格

通用性

過往的預測再次成真

「我認為全世界大概只需要五台電腦」

Thomas Watson,
IBM

Google 谷歌

amazon web services™

?

IBM

Microsoft

Bill Gates,
Microsoft

「 640KB 記憶體對任何人應該都夠用了」

Innovation + Open Source = Virtuous Cycle

Open Source Innovation

600,000+ OSS projects

100+ billion lines of code

10 million person-years of work

Source: Blackduck

- Open source is leading, not following, in important areas including **cloud, big data, mobile apps and enterprise mobility.**
- More than 50 percent of software acquired in the next five years will be open source software.
- **Innovation, flexibility, cost, quality** of open source are some of the top reasons that make it attractive for use
- Companies most likely to be impacted by OSS have these characteristics: **Business drivers to invest in IT, software development is an essential strategic process, technology centric**
- When asked about revenue generating strategies likely to create value for vendors, 52 percent of respondents said an annual, repeatable support and service agreement was the most likely value strategy
- http://northbridge.com/2012-open-source-survey

Ecosystem

Case Study:

OpenStack

What is OpenStack?

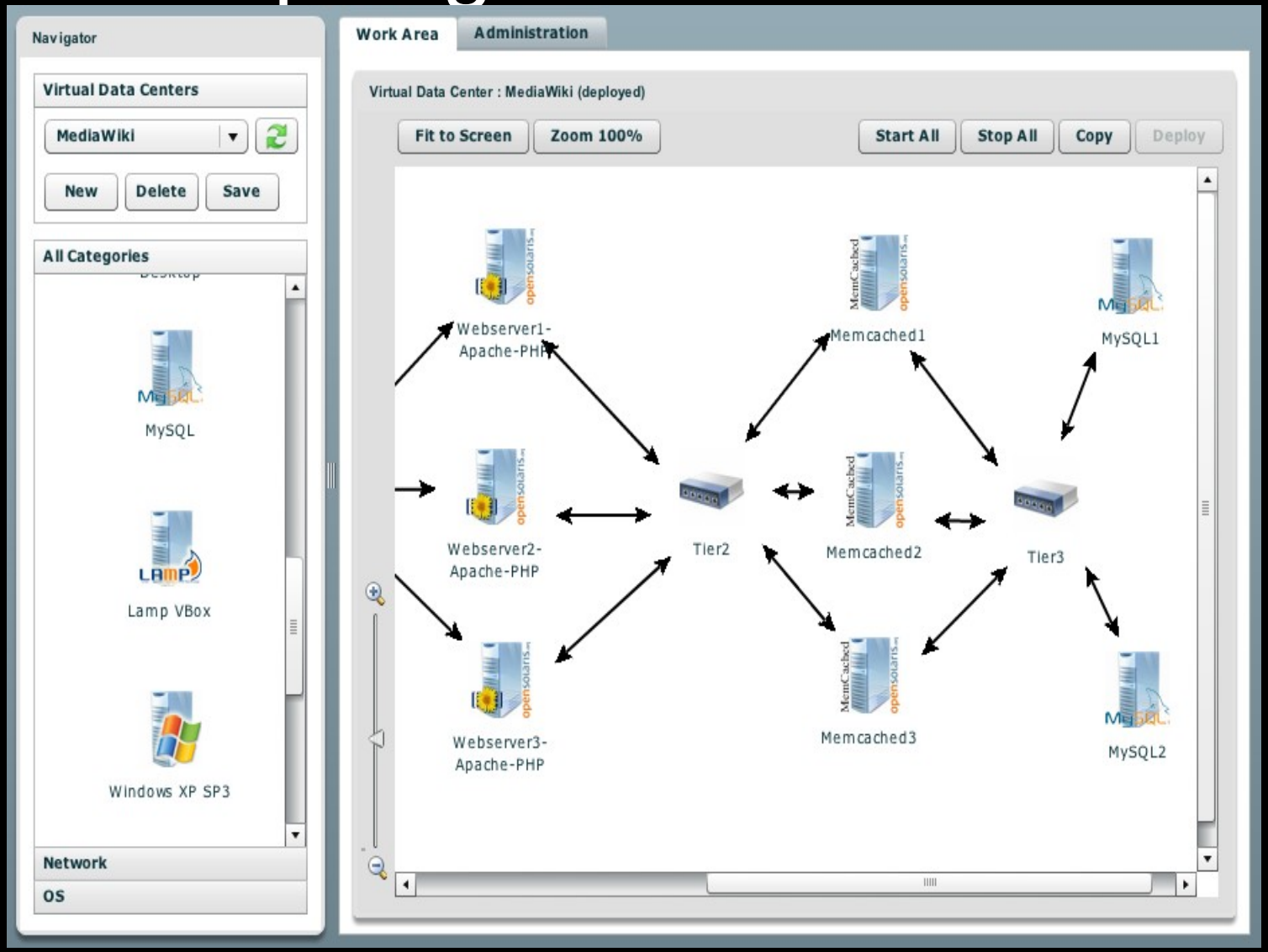
- Originated at NASA, with Rackspace
- Driven by an open community process
- Three existing projects:
  - OpenStack Compute
  - OpenStack Image Service
  - Open Object Storage
  - Multiple hypervisors: Xen, KVM, ESXi, Hyper-V

OpenStack Compute
(VMs & VM Networks)

OpenStack Image Service
(Image Library & Management)

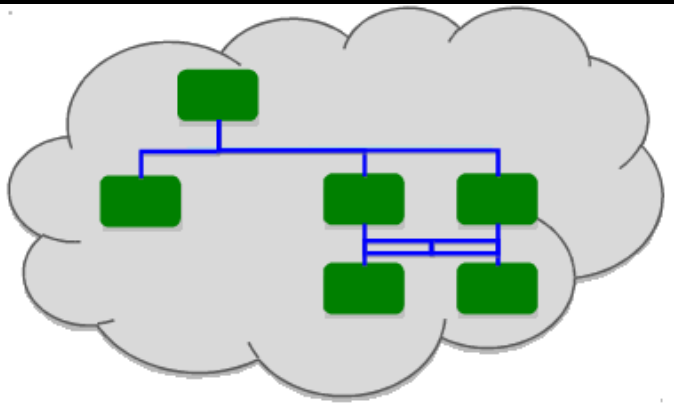
OpenStack Object Store
(Storage)

Time To Let Developers Design Virtual Network Topologies



Former SunCloud user screen

Network Service as a peer to Compute and Storage



Developer API

Compute Service
(VMs, Memory, Local Disk)
Servers

Network APIs
Network Services
(Subnets, Network Svcs, Security)
Networks

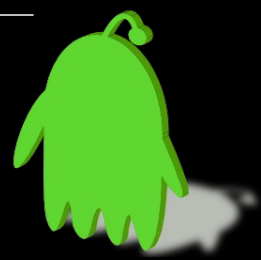
Storage Services
(Block, Massive Key-value store)
Disks

User and System Admin

Observations #1

OpenStack is replacing the legacy infrastructure software stack

Self-developed VM Management Platform	Nova
Cloud Storage Platform	Swift, Cinder
Networking/Security Tools	Neutron
Database DBA Operation System	Trove
SSO System	Keystone
Dev/Testing Environment	Devstack/TripleO
Hadoop Management Platfrom	Savana
Physical Resources Provisioning System	Ironic



Source: China Cloud Reality, Hui Cheng

Observation #2

OpenStack restructures the infrastructure team

Network Team

Security Team

Operation Team

Development Team

→ OpenStack Team

Observation #3

OpenStack leads to converged infrastructure

KVM,XEN,

Hypervisors

VMware, Hyper-V

MySQL MongoDB

Database

LevelDB

OpenStack

Nexenta

Ceph Storage

Gluster

Open Contrail

Networking

NVP OpenvSwitch

Types of OpenStack Players

Type	Description	Example
Hardware Vendor	Selling hardware that integrates or supports OpenStack	Juniper, NetApp, Cisco, EMC
Component Vendor	Point solution, usually software, that provides subset of OpenStack functionality or supports it	Midokura, Nexenta
Distribution / Packager	Basic packaging, some installation/setup, etc.	RedHat, SUSE, Canonical
Turn-key System	Complete, integrated, OpenStack solution, with value adds	Cloudscaling, Nebula, Piston
Service Companies	Professional or managed services to customize or operate OpenStack	Mirantis, Metacloud, Rackspace Private
Public Clouds	Public IaaS	HP, Rackspace Public
PaaS / ISVs	Value add on top of OpenStack deployments	Scalr, ActiveState (Stackato), CloudFoundry
Private Clouds	Users	Wikimedia, AT&T, Yahoo!

Case Study:

Android

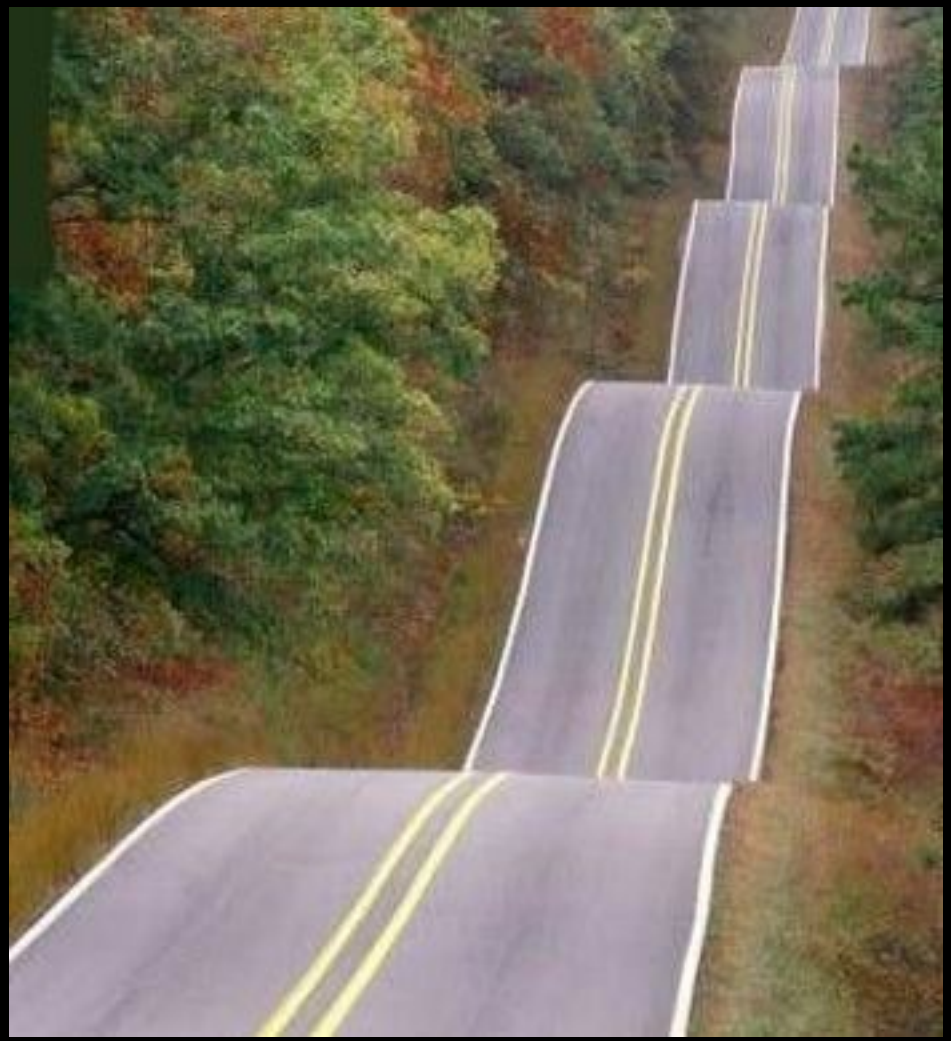
(實際上是談 Google 以外的生態)

My interpretation of Android:

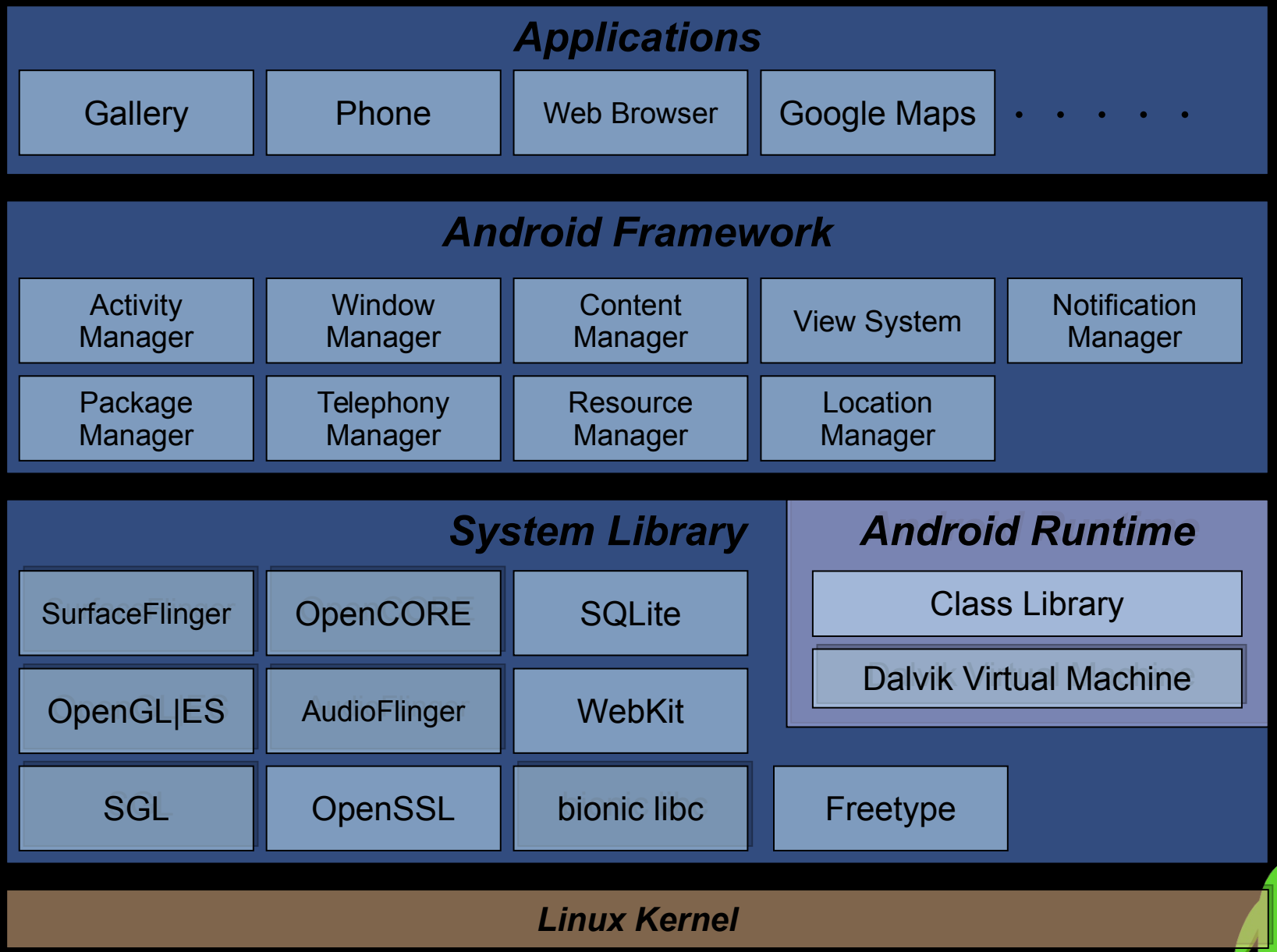
Hardware is Revolution;

Software is basically Evolution;

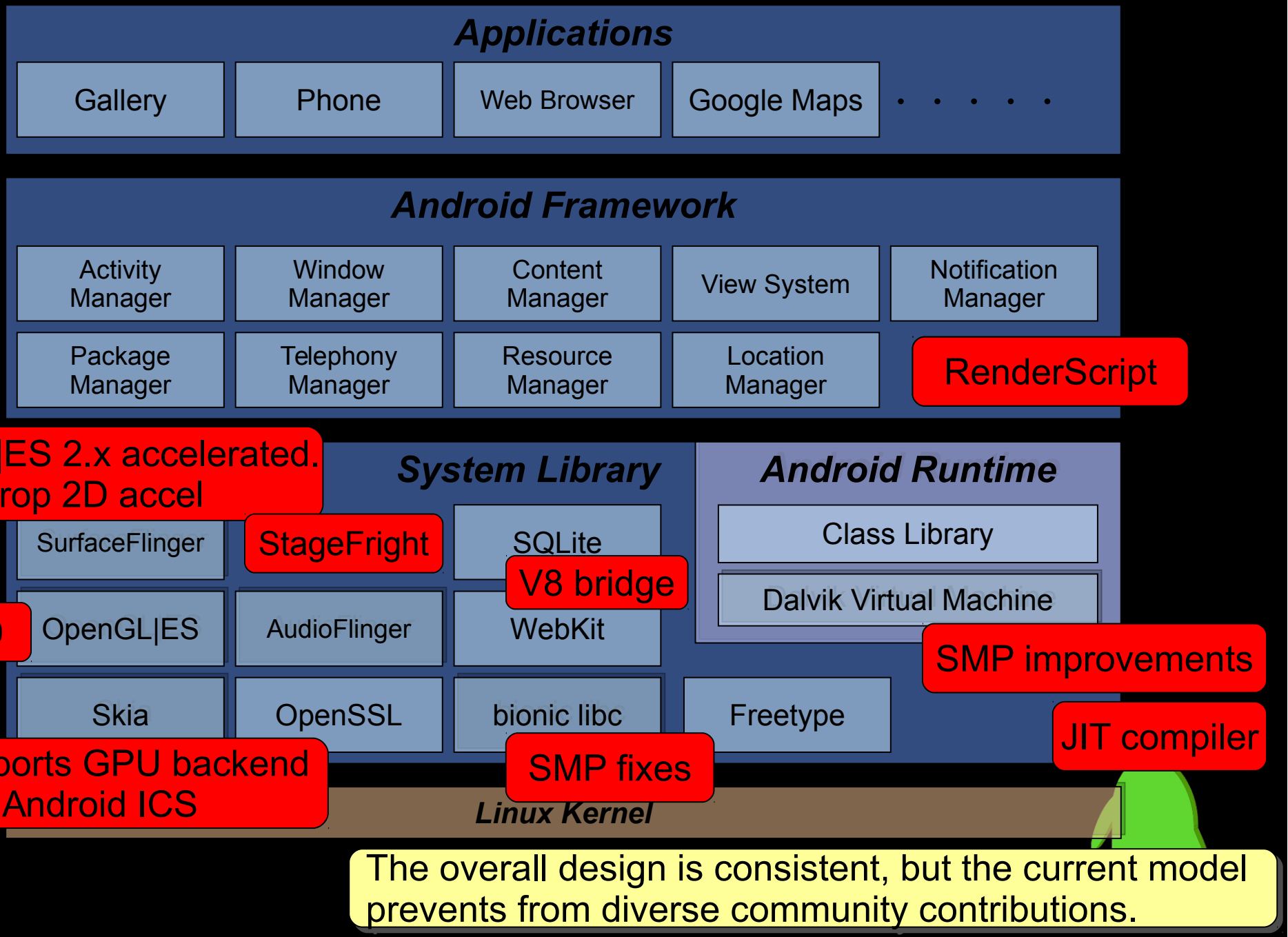
Android is Hardware-driven Software Revolution



Functional View (Android 1.5)



Functional View (Android 2.3)



AOSP 刺激廠商正面貢獻 open source

- AOSP = Android Open Source Project，為內建 Android 系統的裝置的基礎，可說扣除高產值應用程式和特定廠商的專屬元件外，其他均 open source!
- 許多傳統的 SoC 在商業上與 Google 公司交手後，不得不改變產品策略，並且主動貢獻原始碼，如 HTC(爭取和 Google 的合作) 和 MediaTek (MTK; 聯發科技)
- 甚至 MediaTek 為此貢獻了 MCLinker(一個高效能又輕巧的連結器，為 AOSP 收錄)，扮演異質性運算 (主要是 multicore 和 GPU 運算需求) 的基礎建設，不僅為了和 Google 更深入的合作，同時也對其他 SoC 公司設下競爭門檻
  --> HSA (Heterogeneous System Architecture) Foundation 亦採取類似的遊戲規則

最後分享幾句話

電腦科學家 Alan Kay 的名言：

「預測未來的最佳方式就是去創造它」

你只要對 AOSP 貢獻那怕一行程式碼，都表示你的創作在全球九億台內建 Android 的電子裝置上運作，若你還能持續貢獻，那就勾勒了未來的面貌！

「人生就是這樣：和陽光的人在一起，心裡就不會晦暗；和快樂的人在一起，嘴角就常帶微笑；和進取的人在一起，行動就不會落後；和大方的人在一起，做事就不小氣；和睿智的人在一起，遇事就不迷茫；和聰明的人在一起，做事就變機敏。借人之智，完善自己。學最好的別人，做最好的自己。」

— 國學大師南懷瑾

該如何與符合這些特質者共事？參與 Open Source 專案的開發，就是一個很好的切入點，拋開國籍、忘卻身份背景，人們有共通的語言，就是藉由創作，以軟體作為相互聯繫的機制，在不斷完善軟體系統的同時，我們也在這過程中蛻變。

「船停在港灣裡是最安全的，
但是那不是船存在的目的」

— Grace Hopper

咱們電機資訊科系的學生，不能解決實際工程問題、為人們尋求福祉，而只在教室「停泊」，是不是該反省呢?

來吧，一起在踏著 open source 的基礎而出航！