開放環境技術發展趨勢

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History – Major milestones

- 1993 GNU project (Richard Stallman - MIT AI Lab)
- 1985 Free Software Foundation
    - Copyleft (vs. copyright)
- 1992 Linux kernel (Linus Torvalds)
    - GNU General Public License
- 1995 Apache HTTP Server
    - Apache License
- 1998 Mozilla Firefox (Netscape)
    - Mozilla Public License
- 1998 Open Source Initiative (Eric Raymond etc)

Notable OSS

- Linux / Android

- Apache HTTP server

- Mozilla Firefox, Chromium

- LibreOffice, Open Office

- MySQL, Postgres

- Java, PHP, Python

- …

Free Software vs. Open Source Software

- Free Software
  - Freedom to run, study, modify and redistribute
  - Can be free of charge, or for a price
- Open Source Software
  - Free distribution
  - Inclusion of source code
  - Allowing modification and derived work
  - No discrimination against fields of endeavor
  - ...

Trends

- Maturity
  - Quality
  - performance
- Speed of advance
  - Tens of thousands of quality contributors
  - Widely used/tested
- Variety

Maturity

- Linux
  - 6 of the top 10 most reliable internet hosting companies (2010)
  - 97% of 500 fastest supercomputers (2014)
  - 96.5% of top 1 million Alexa domains web servers
- Most popular databases
  - Oracle (1), MS SQL (3), DB2 (5)
  - MySql (2), Postgres (4), MongoDB (6)

Speed of Advance

☐ Much faster than any single commercial entity

☐ Linux

    □ 12000 developers from 1200 companies

    □ 5000 active developers

    □ ~US$3 billions development cost

Variety

- Development
  - Android Studio, Eclipse, NetBeans, Jenkins, Git, Subversion, …
- Application Server
  - Geronimo, Tomcat, GlassFish
- Virtualization
  - Xen (Amazon), KVM (Google), VirtualBox
- Cloud Computing
  - OpenStack (IaaS), Cloud Foundry (Paas)
- Big Data
  - Hadoop
- Search
  - Lucene, Nutch
- …

Licenses

- GPL (GNU General Public License)
- LGPL (GNU Lesser General Public License)
- Apache License
- BSD license
- MIT license
- Eclipse Public License
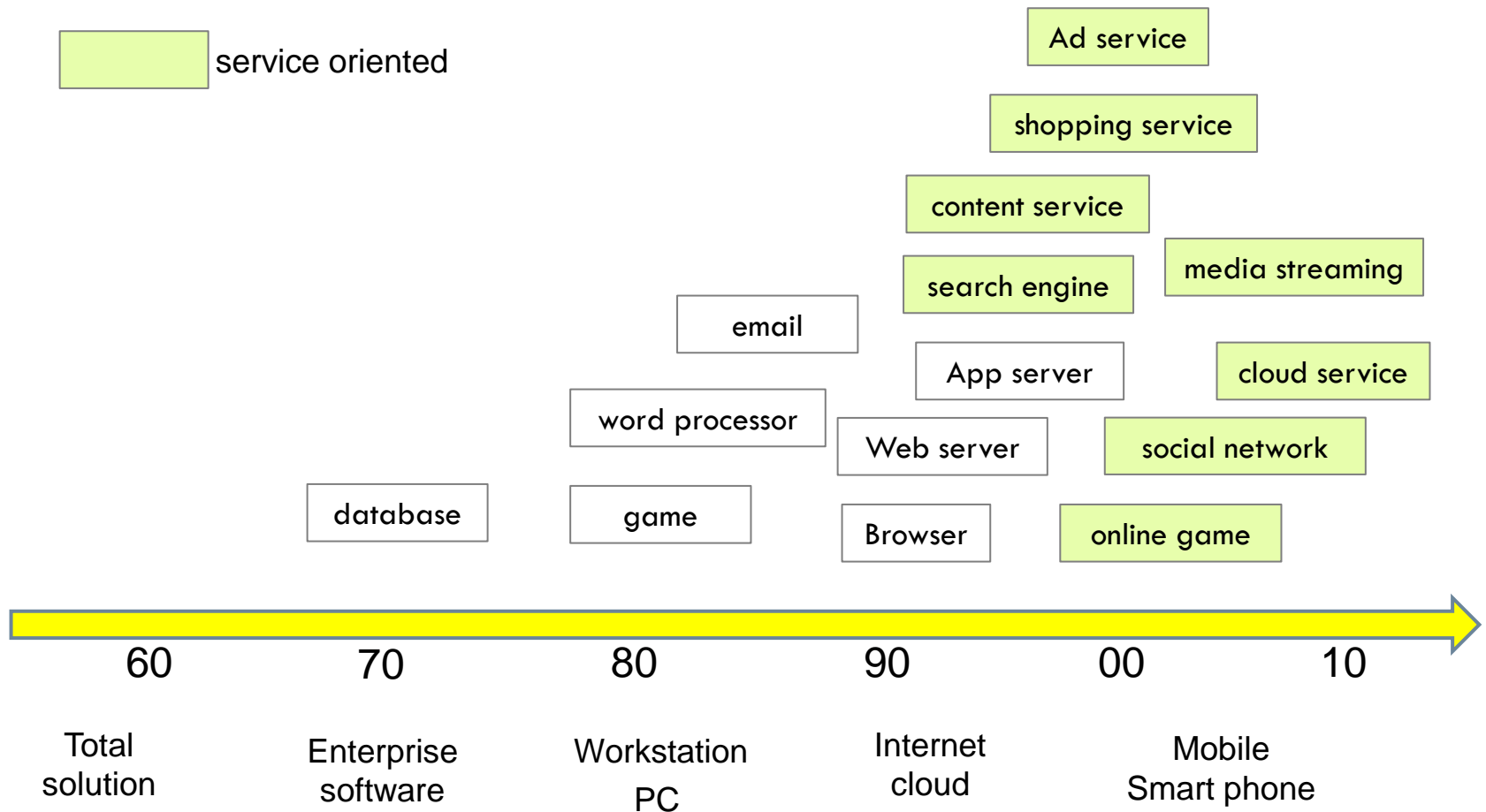- Mozilla Public License
- …

Organizations

- Apache Software Foundation (2000+ volunteers)
- Linux Foundation (180 corporate members)
- Eclipse Foundation
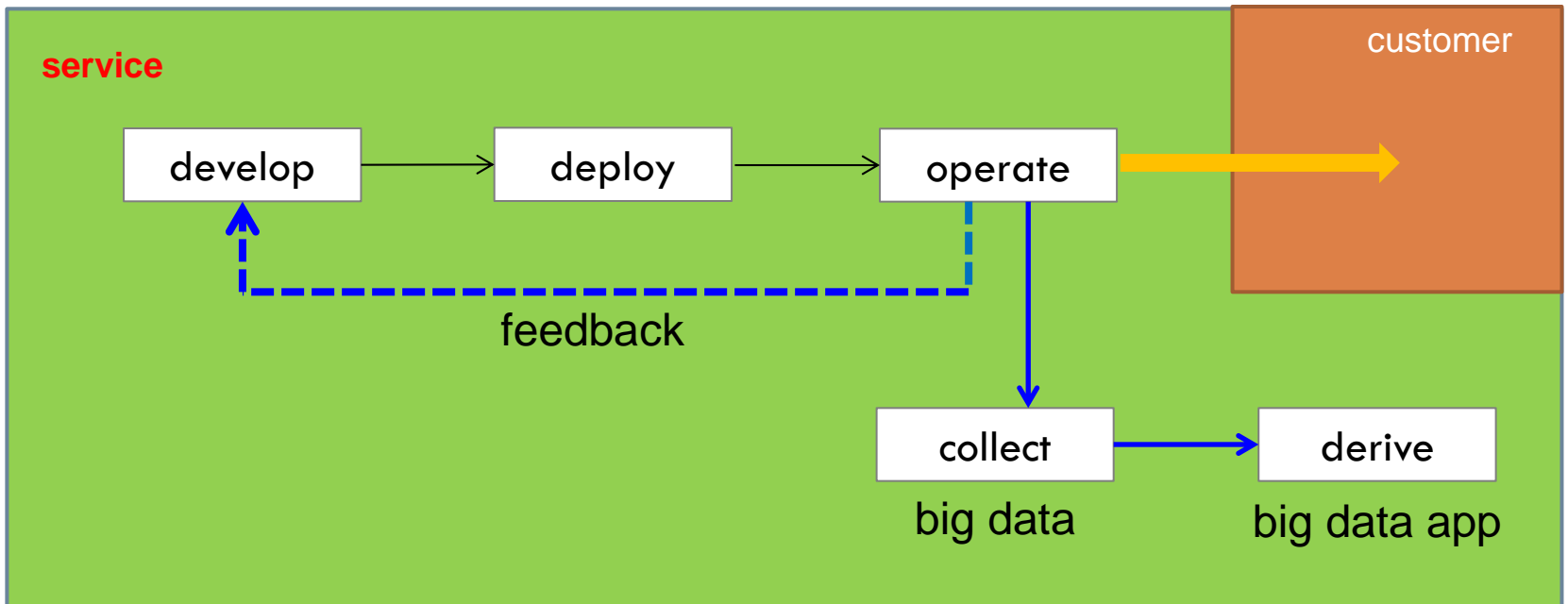- Mozilla Foundation
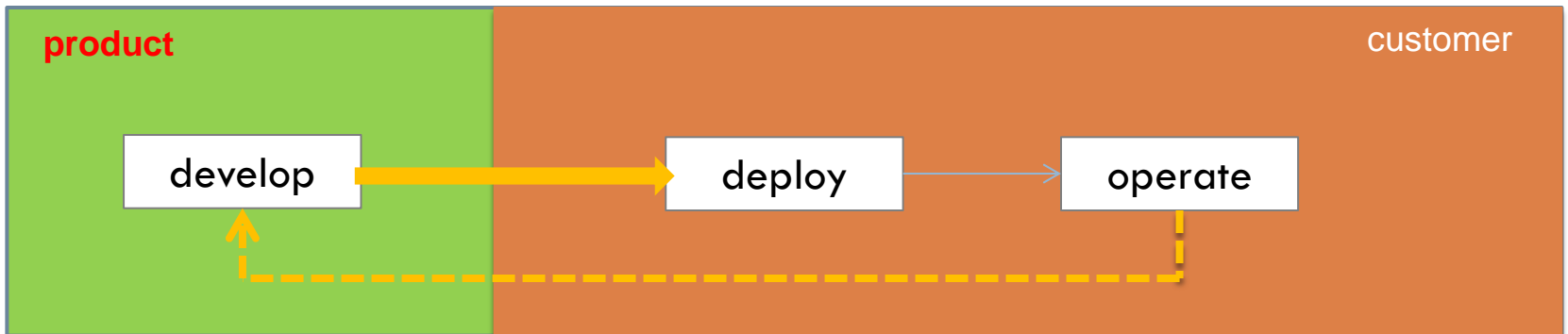- OW2 (Europe)
- …

New Growing Battle Ground

- Internet-based services
  - New business model
  - Fast idea to market
  - High traffic
- Notable internet services
  - Google (search, email, map, …)
  - Facebook (social media)
  - Tweeter
  - Netflix
  - Amazon
  - Uber
  - Airbnb
  - Salesforce.com

History - Software Industry

service oriented

Ad service

shopping service

content service

search engine

media streaming

email

App server

cloud service

word processor

Web server

social network

database

game

Browser

online game

60   70   80   90   00   10

Total
solution

Enterprise
software

Workstation
PC

Internet
cloud

Mobile
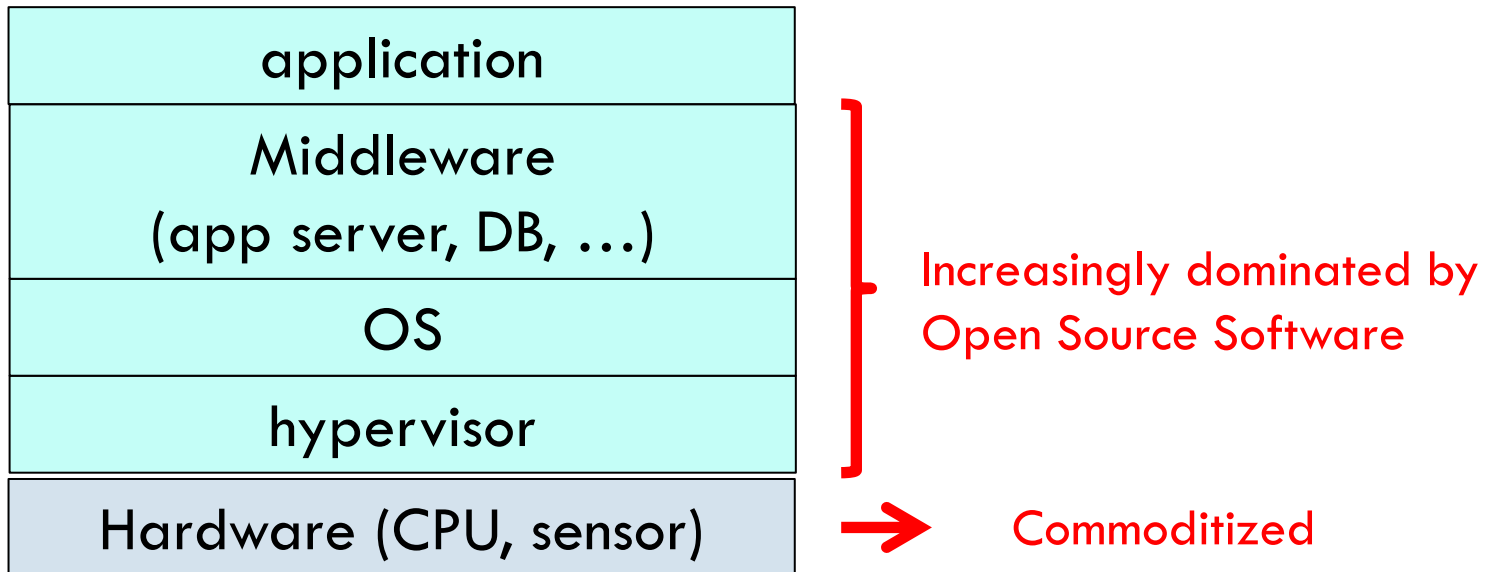Smart phone

Services – more value

Application vs. Service

- CRM (Customer Relationship Management)
  - Saleforce.com (service)
  - Oracle (application $\rightarrow$ service)
  - SAP (application $\rightarrow$ service)

Solution Stack

application
Middleware (app server, DB, …)
OS
hypervisor
Hardware (CPU, sensor)

Increasingly dominated by Open Source Software

Commoditized

Direction for Taiwan

- ☐ Move to software

- ☐ Move to application

- ☐ Move to service

- ☐ Use OSS aggressively

Open Source Advantage

☐ lower cost

☐ More advanced technology (usually)

☐ Easy to adapt/modify

☐ Rich offering

☐ Easier to get answer (usually)

Open Source Disadvantage

- Lack of support (relatively)
- Less Backward compatibility
- lower usability (usually)
  - Not as easy to use and integrate
- Fast changing

Conclusion

- OSS has become the main driving force in advancing software technology

- OSS has gaining popularity worldwide

- OSS reduce cost and time to market

- OSS is critical for the success of future software (service) industry