Open Source Development

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What is meant by Open Source ?

- Model of development in which the design/blueprint/code is made available to users for free.
- Free -> Freedom to modify, look at and redistribute the design/blueprint/code.
- Free does not always mean free of cost always.

Difference between Open Source and Closed Source

- Open Source development lets you see the code or design and modify it to your needs.
- Open Source development makes you independent of the developer of the product once you buy it.
- Open Source products are typically developed by a large set of diverse developers from across the globe not belonging to any one organization.
- Open Source Products are protected by GPL license or a similar license.

- Closed Source development does not let you see the code or design. Hence you are not empowered to modify it to your needs.
- Closed source development makes you heavily dependent on the developer of the product for minor issues in the product too.
- Closed source product is typically developed by a small set of developers of a particular organization.
- Closed source products are protected by copyrights, patents or organization specific license.

Popularity of Open Source products

- Web Servers run on Linux – an open source operating system.
- Yahoo uses FreeBSD to run its directory services. FreeBSD is another open source operating system.
- Titanic and Lord of the Rings rendered their graphics on Linux machines running at companies like Disney, Pixar, Dreamworks.
- Enterprise applications from Amazon, Reuters and Merill Lynch run on Linux.
- US government including the Defense Department, Department of Energy, NSA are increasingly using open source software.
- Companies from Germany to Peru to China are mandating the use of Open source software.
- IBM made a commitment of 1billion dollars in 2001 to developing open source technology and recasting central parts of its business models around Linux and other open source software.
- Companies like Intel, HP, Dell, RedHat, Samsung, ARM feature among the major contributors of Open Source software.

History of Open Source

- Open Source has gained popularity only over the last decade.

  - Why was this concept not present before?

  - What is so outstanding about this model of development that it has gained such wide spread use?

History of Open Source

- The concept of Open Source was present in the days as early as the development of the first computers.
- In the first computers programmers had to punch in binary data on Punch Cards or Magnetic tapes to create programs. These cards and tapes would be fed into the computers.
- It would take hours to days to get one program executed. They needed a compiler which could translate their code into binary. To do this programmers from different organizations were brought together to build such a compiler.
- Programmers from each organization could share the modification that they make with those from another organization. Together they built the compiler.

History of Open Source

- Soon there was a need for an operating system which could do multi-tasking and allow multiple users at the same time.
- Thus Unix was built by Ken Thompson and Dennis Ritchie. Unix became so popular that the source code was shipped on magnetic tapes from one place to another.
- Users of Unix began modifying it for their purpose and needs. Thus Unix grew from a modest operating system to one that was strong enough to accommodate inclusion of support for diverse needs

  Example: -To enable distribution of Unix and to take advantage of the growth of internet, the TCP/IP protocol support was built into it.

  - Students from University of California at Berkeley developed tools like the very popular vi editor and ported it to Unix.
- By 1980 students from many universities and people from research organizations had begun contributing to the development of Unix.
- Such massive development was possible just because everyone could view the source code of Unix and were empowered to modify it.

History of Open Source

- How Internet spurred the growth of open source:

  - Before the days of the internet if people from different parts of the globe had to share code they had to physically travel from one place to another with code on tapes, cards or disks.

  - Internet grew from the days of the ARPANET where it was available only for the defense personnel to a common place technology ever since the 1990s.

  - As a result many open source products gained pace in the last decade.

  - Example of such a popular product is Linux started by Linux Torvalds, then a student from the University of Helsinki who built Linux with the base of another open source operating system at that time called Minix.

  - Linux became popular, with developers from across the globe contributing. They were enabled to do so majorly due to the spur of internet. Today Linux is the most widely used operating system.

Characteristics of Open Source development

- How is open source development different from closed source?
- What is so special about this kind of development that it is motivating large organizations to adapt it?

Characteristics of Open Source development

- Does open source refer to “free” as in free of cost?

  No. Open source does not mean free of cost. It means anybody is free to take look at the source code, modify it and redistribute it. There are organizations which benefit monetarily from contributing to open source.

- So how does the author benefit monetarily by doing this, if anyone can redistribute it?

  The author can get a distribution fee when he distributes it. But most importantly many developers make open source software more for the love of it rather than for money.

Characteristics of Open Source development

- There are some developers who make contributing to open source projects their hobby. Why would he spend his precious time on making open source software besides his regular job ?

  - The motivation to develop open source software comes from an intellectual joy in doing so.

  - In big companies a developer has to code what he is asked to code by his manager, his freedom to innovate is restricted.

  - However in open source development, any feature that the developer thinks is worthy of going into the product, he is free to contribute. There is no limitation to the amount he can innovate.

  - Besides, a true programmer is more of an artist and the code is his art piece. He thoroughly enjoys programming as long as he is free to innovate.

Characteristics of Open source development

- How is it that open source development has a faster development pace than closed source?

  - The beauty of open source development is that you and me can contribute to it when we find it lacks some features.

  - Imagine thousands of developers across the world doing this. Why would it not grow?

  - But in closed source development the users have to wait till the developers of the product take a look at the defect before they can fix it. This frustrates them.

  - Besides in the development of closed source products, the developer may not be able to understand the needs of the users very well due to the usual problems of communication gap. This could potentially slow or hinder development.

Characteristics of Open source development

- Why are big companies who are profit driven, adapting to open source development?

  - Their development cost comes down. The whole world is contributing and they don't need to pay them. Yet they can get the benefit of the open source product.

  - They might employ a small set of developers who will contribute to the product to accommodate the company's needs. But paying this small set is surely cheaper than paying a large number of people to build a product from scratch.

  - Overall the price/value for the company comes down. One gets a huge value at a lesser cost.

Challenges of Open Source development

- How about clashes among developers? What about if one person wants to have the most number of contributions and plays spoilsport ?

  - This is surely possible but unlikely. The reason is that majority of open source contributors have the welfare of the product close to their heart. Any such trouble makers will be pushed out of the community.

- With so many people contributing how do you manage the software development? Will it not be a case of “too many cooks spoil the broth” ?

  - It is true that open source development has astounded everyone alike about how it can survive and compete against its enterprise counterparts with such a diverse and large set of developer community.

  - In the next lecture I shall introduce you to the way Linux Kernel development, one of the most popular and successful open source products that exist today works. That will give you a fair idea on how open source development is structured and managed.

References

- “The Success of Open Source” by Steven Weber
- Wikipedia

QUESTIONS ?

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