

Open Source Ecologies:

A Talk in Three Chapters

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Chapter 1

- Open source grows up and goes to work

A Revolution? No, An OS to Play With

Date: Sat, 5 Oct 1991 05:41:06 GMT
From: Linus Benedict Torvalds <torvalds@KLAAVA.HELSEINKI.FI>
Subject: Free minix-like kernel sources for 386-AT

Do you pine for the nice days of minix-1.1, when men were men and wrote their own device drivers? Are you without a nice project and just dying to cut your teeth on a OS you can try to modify for your needs? Are you finding it frustrating when everything works on minix? No more all-nighters to get a nifty program working? Then this post might be just for you :-)

...

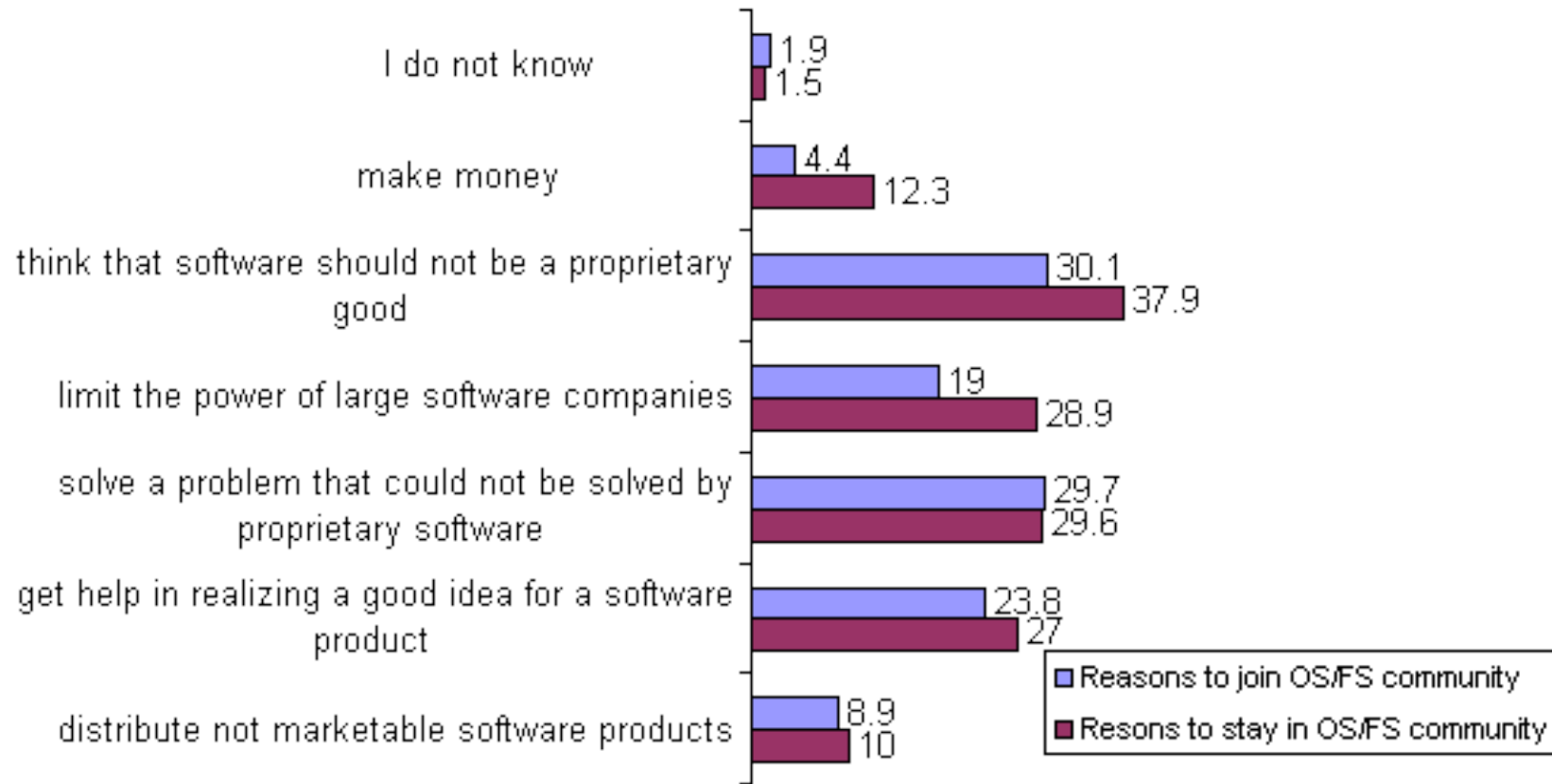
I can (well, almost) hear you asking yourselves "why?". Hurd will be out in a year (or two, or next month, who knows), and I've already got minix. This is a program for hackers by a hacker. I've enjoyed doing it, and somebody might enjoy looking at it and even modifying it for their own needs. It is still small enough to understand, use and modify, and I'm looking forward to any comments you might have.

Change the World? I Need This for My Job

“Development of NCSA httpd stalled . . . and **many webmasters had developed their own extensions and bug fixes** that were in need of a common distribution. A small group of these Web masters gathered together via private e-mail for the purpose of coordinating their changes (in the form of ‘patches’).”

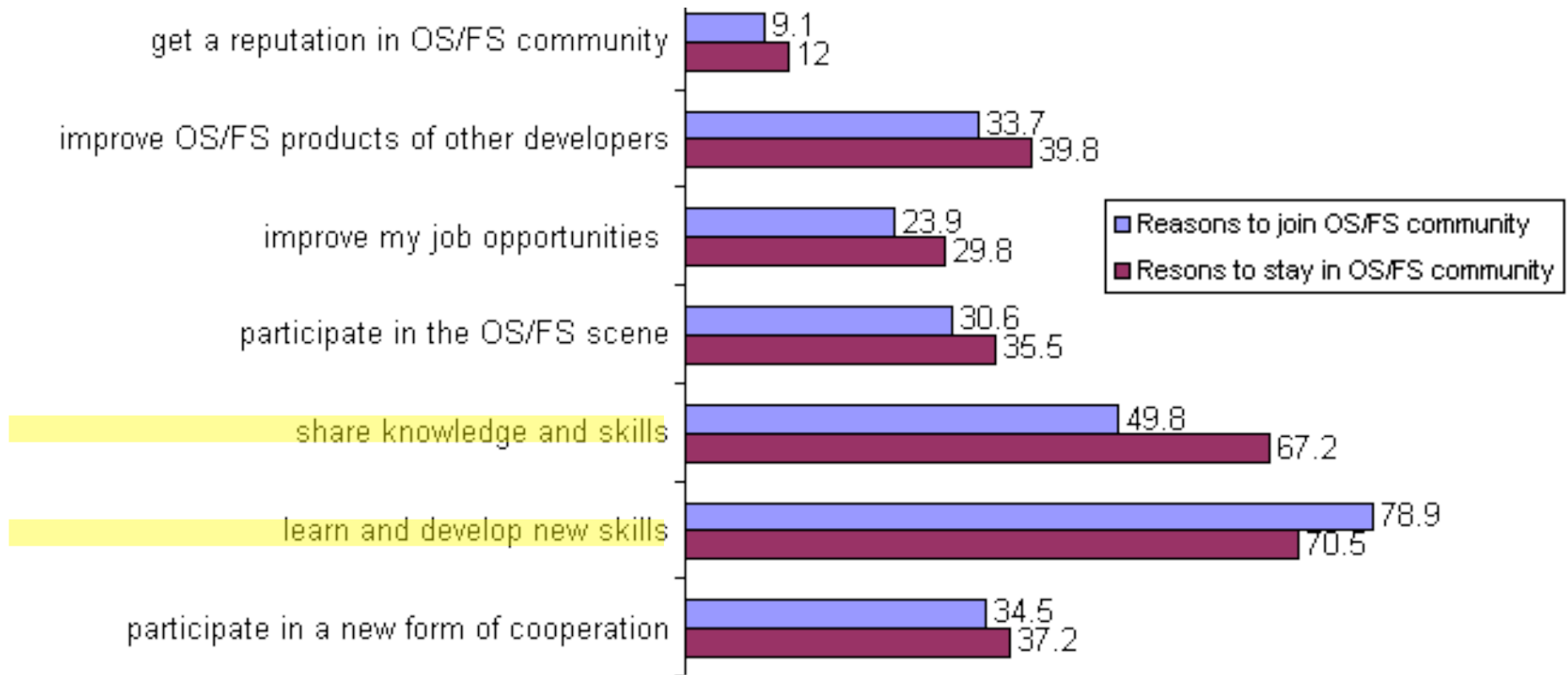
“A flurry of interest was generated when the **IBM Corporation joined the Apache project** and began contributing code fixes and features back to the open source base. IBM is treated the same as any other member of the Apache Group, albeit one with deeper pockets . . . **IBM deserves credit for joining the project on Apache’s terms**, based upon their merit as a contributor, and in continuing to promote both the spirit and the actions of open-source development.”

Why Do Volunteers Participate?



From: Ghosh, Glott, Krieger, & Robles (2002). *Free/Libre and Open Source Software: Survey and Study Part IV: Survey of Developers*
http://flossproject.org/report/Final4.htm#_Toc13908324

Why Do Volunteers Participate? (ctd.)



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Firms Jump In: Open Source Business Models

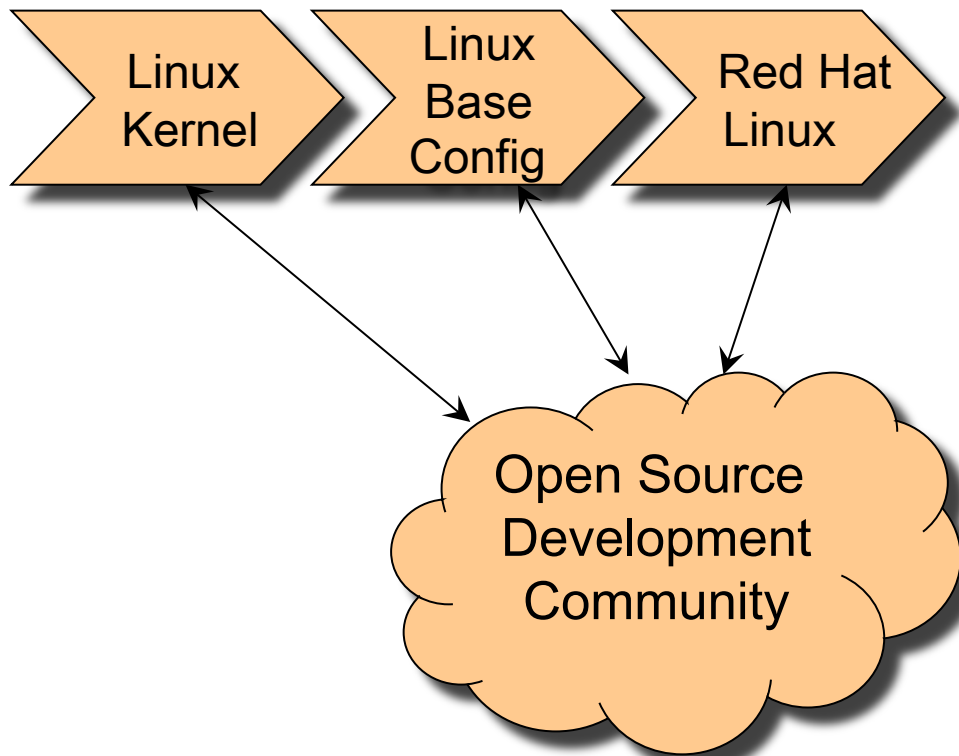
- Red Hat and Linux: market creation
- Netscape and Mozilla: rescue dying product
- IBM Websphere and Apache: use free commodity technology
- Eclipse: strategic ecology creation

Chapter 2

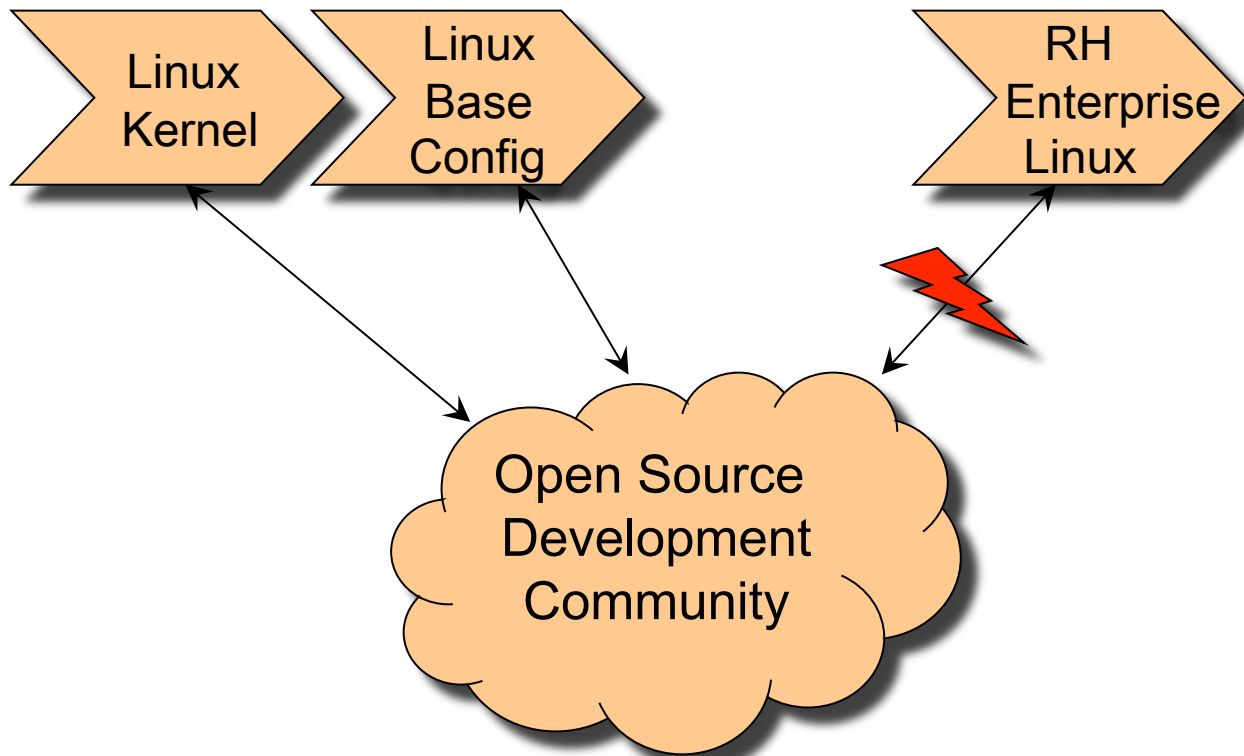
- Business learns to play nice – or else!

A Different Kind of Business:

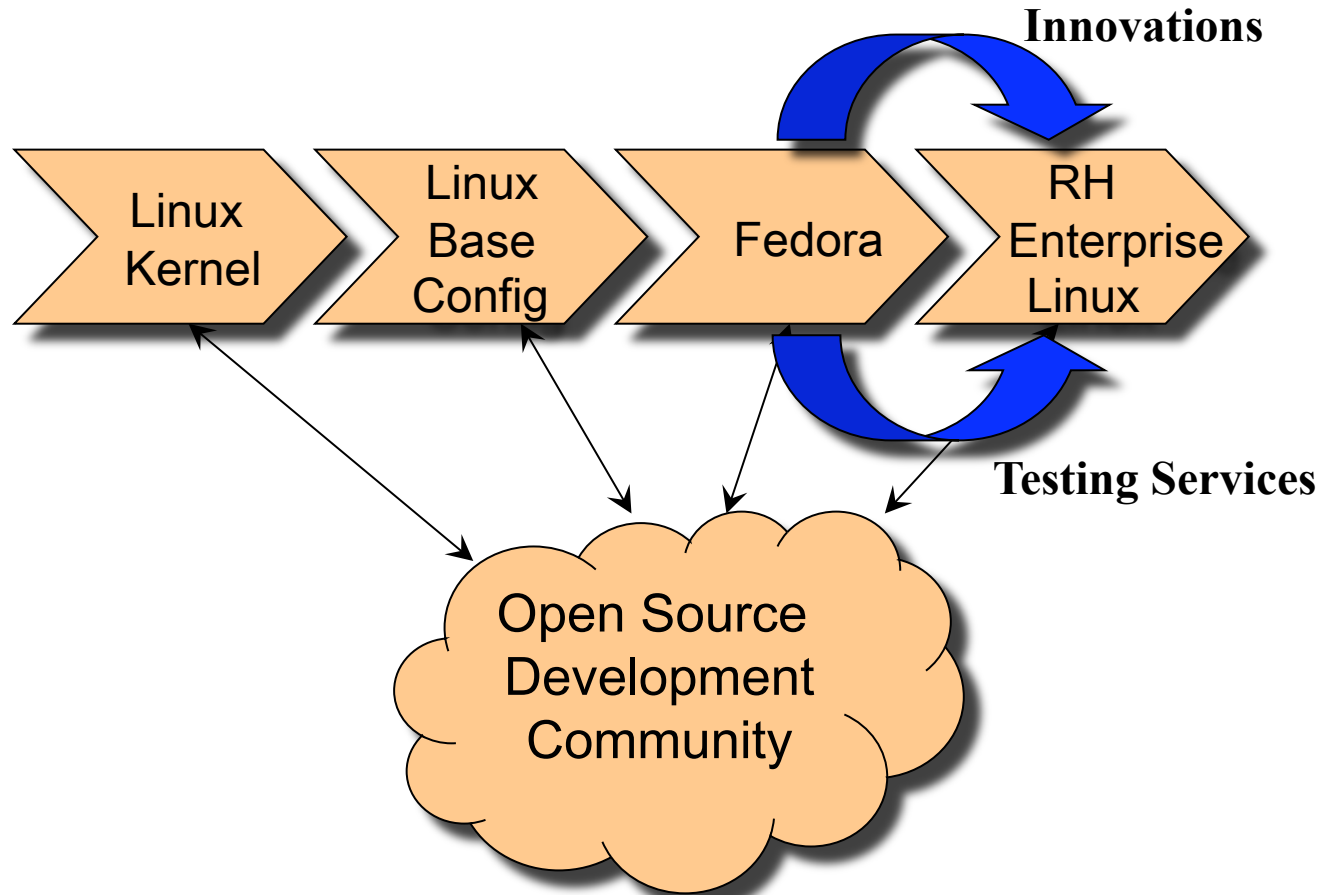
Early Red Hat Value Chain



Red Hat Enterprise Linux



Current Red Hat Value Chain



What Happens When Firms Jump In?

- **SWAG1:**
 - Volunteers don't want to work for free while someone else makes a profit.
- **SWAG2:**
 - Volunteers won't be able to keep up with pace of change, will drop out.
- **SWAG3:**
 - Volunteers will sense that project is more popular, cool, valuable, will also jump in.

GNOME

- Interviews:
 - Variety of views on corporate participation
 - Seemed to be different attitudes toward different corporate players: manufacturer versus distributor
- What are the effects, at time $t + 1$, of an increase in corporate involvement at t ?

GNOME Data



GNOME

- 7+ years of data
- 800+ distinct projects
- 1,200+ developers
- 200,000+ bugs
- 280,000+ files
- 2,400,000+ file modifications
- 3,000,000+ email messages

Predicting New Volunteers Joining

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Parameter Estimates

Variable	Estimate	Std Err	DF	t Value	Pr > t
Intercept	0.3748	0.1043	13.0	3.59	0.0033
L Vol Users	0.0135	0.0168	763.0	0.80	0.4217
L Man Users	-0.0075	0.0127	763.0	-0.59	0.5547
L Dist Users	0.1993	0.0323	763.0	6.17	<.0001
L New Vol Users	0.1332	0.0360	763.0	3.70	0.0002

Dependent Variable = Number of New Volunteer Users in this project
L: value of variable at $t-1$

Work with Patrick Wagstrom and Bob Kraut, CMU

Fixing and Helping Out With Bugs

Variable	Manufacturer	Distributor	Δ	T	P
Bug Reports	122.63	154.82	32.19	0.84	0.4007
Bug Attachments	53.95	95.88	41.93	1.79	0.0758
Bug Patches	42.54	75.15	32.61	1.61	0.1083
Bug Comments	1039.4	1769.9	730.5	1.4	0.1649
Bugs Fixed	28.51	101.15	72.64	3.38	0.0009
Bug Projects	17.16	27.46	10.3	2.66	0.0087
Extra Bug Projects	9.77	11.36	1.59	0.59	0.5557

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Provide Information, Bonding

- Information seeking and direction
 - Distributors provide 85% more email addresses
 - Distributors provide 140% more web addresses
- Bonding by knowing different interests
 - Volunteers speak of leisure 50% more than commercial
 - Distributors speak of leisure 30% more than manufacturers

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- **SWAG4:**
 - **Different firms will have different effects depending on how well they behave themselves.**

Chapter 3

- Can this marriage really work?

Potential OSS Issues for Commercial Firms

- Pace mismatch
- Interdependent roadmaps
- Mixed motivations, cultures
- Transparency, openness
- Techno-organizational interfaces
- Marketing strategies

Wisdom of Crowds:

Better Decision-Making?

- ***Memoirs of Extraordinary Popular Delusions and the Madness of Crowds, Charles Mackay (1841)***
- Can crowds be wise?
- Yes, if . . .
 - Diversity
 - Independence
 - Decentralization
 - Aggregation

James Surowiecki (2004). *The Wisdom of Crowds*.

Decision-Making in OSS Ecologies

Compared to Corporate Decision-Making Processes

- **Diversity**
 - Many more points of view represented
 - A variety of positions in a related set of markets
 - Variety of technical expertise
- **Independence**
 - Each company looking after its own interest
 - Each company using its own private information
- **Decentralization**
 - Foundation mostly coordinates
 - Firms decide how to invest own resources
- **Aggregation**
 - Voting, governing board
 - Common code base

Research Questions

- Managing the free/proprietary frontier
 - What to open up? When?
 - Spur innovation?
 - Increase competition to benefit of users?
- Investing in public goods
 - Under many conditions, underinvestment is the norm
 - Tragedy of the commons
 - Free riding
 - Example: Will anyone pick up translation for Eclipse now that IBM is not doing it?

Conclusion

- "Communities can often be compared to an Australian Rules Football match where 30,000 people who need the exercise watch 36 players who don't."
(Peter Kenyon)
- "In times of change it is the learners who inherit the future. Those who have finished learning find themselves equipped to live in a world that no longer exists."
(Eric Hoffer)
- "The only way to predict the future is to invent it."
(Alan Kay)