Ubiquitous Linux: The Future of Computing

Jim Zemlin, Executive Director, Linux Foundation

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Linux Powers the One Laptop Per Child Project

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Linux Runs Air Traffic Control

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Linux Runs Nuclear Submarines

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Linux Powers the $10 Billion Dollar CERN Super Collider

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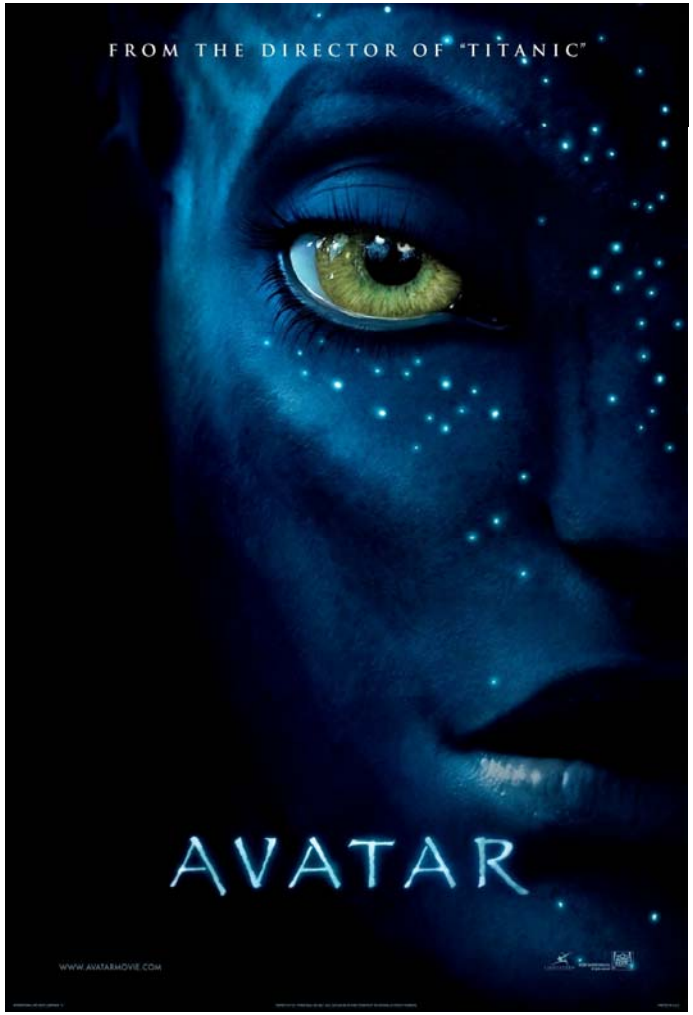
Linux Created the Effects in Avatar



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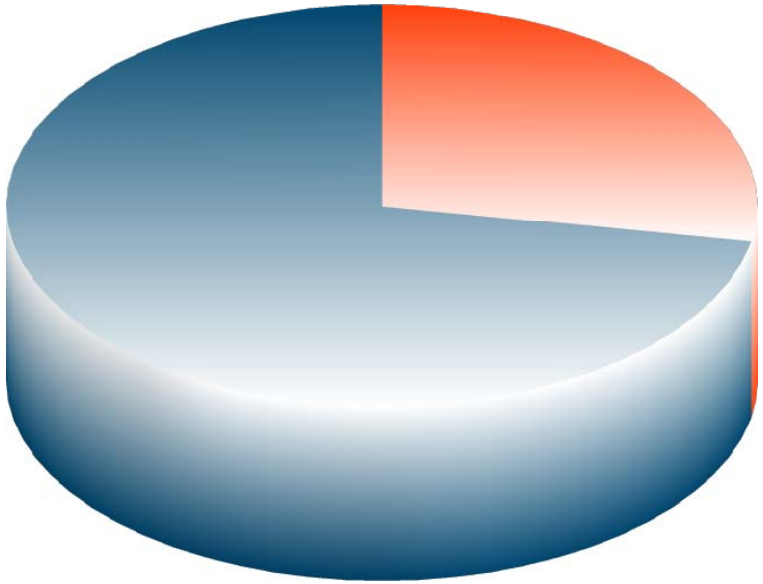
Linux enables the majority of the world's equity trading systems



- **In 2010, over 72% of the world's equity trades occurred on exchanges running Linux.**
- **This number will grow in 2011 as the world's largest exchanges license their Linux-based technology.**

72%

Percentage of 2010 equity trading volumes on exchanges that have publicly announced their trading systems run Linux

Source: World Federation of Exchanges data, annual reports, and press releases

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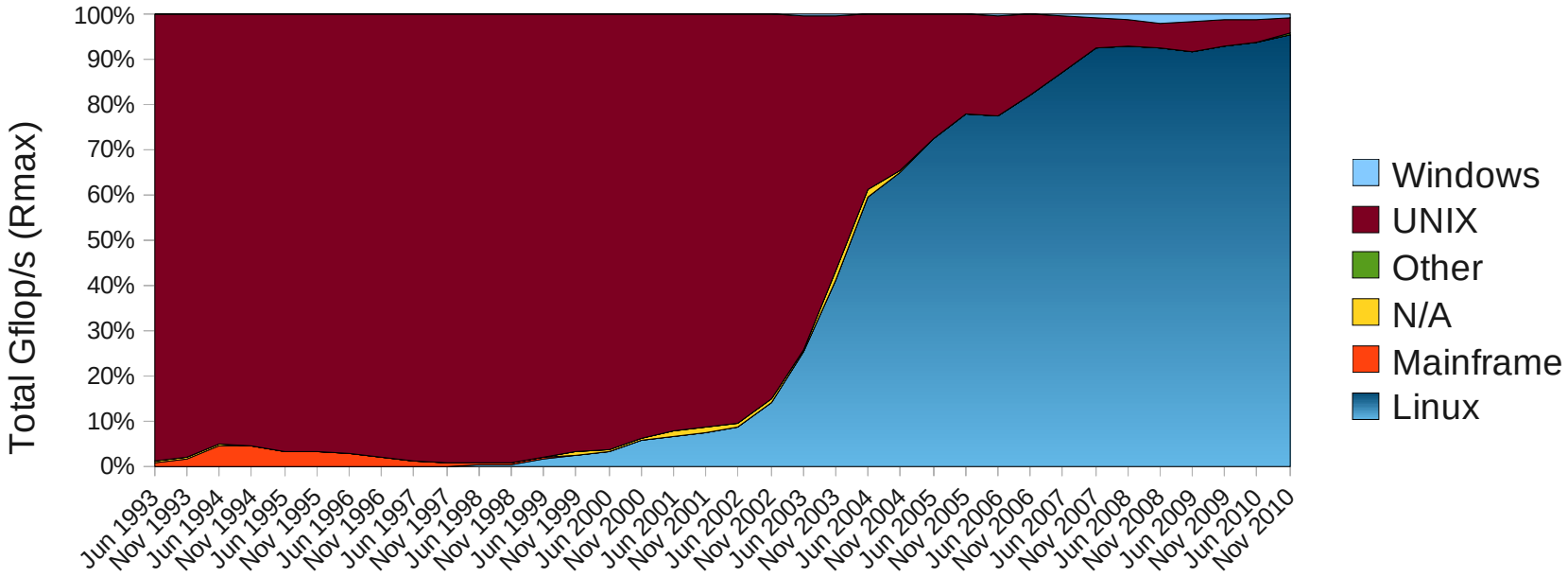
In 12 years, Linux has completely dominated supercomputing

- Linux first appeared on the top500 Supercomputer List in 1998.
- In 2004, Linux accounted for over half of the raw computing power.
- Complete inversion from 96% UNIX to 96% Linux took just 10 years.



Source: top500.org results from June 1993 to November 2010

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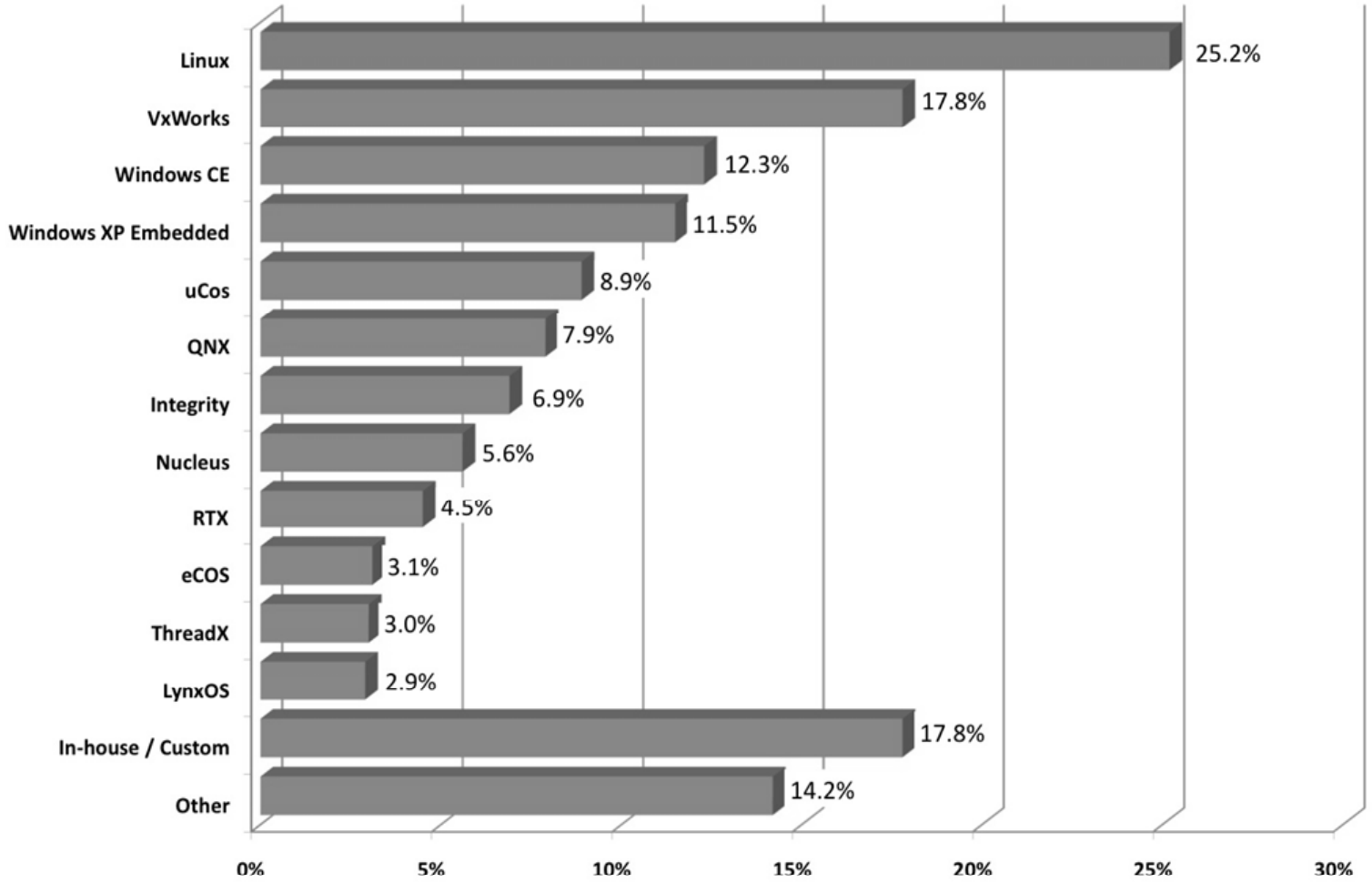
Linux is dominating Embedded OS Market Shares



Source: Embedded.com 2009

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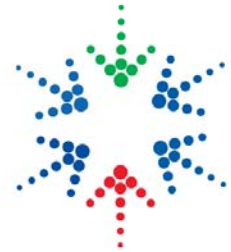
Linux is dominating the mobile device market



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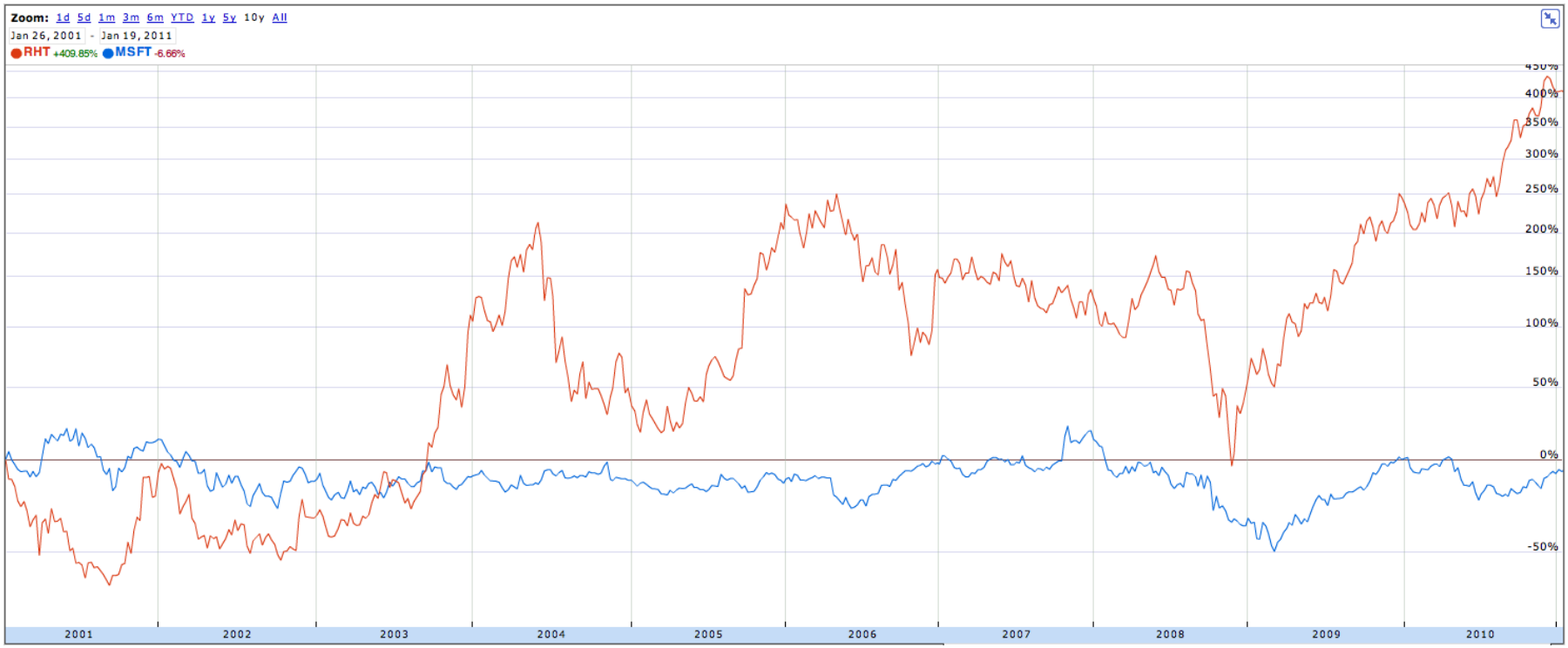

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Why is the world turning to Linux and open source?

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Reason One: The Internet is Changing

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The Internet of connected devices…

- Cars
- Appliances
- Roadways
- Pipelines
- Livestock

…is headed to 1 trillion.

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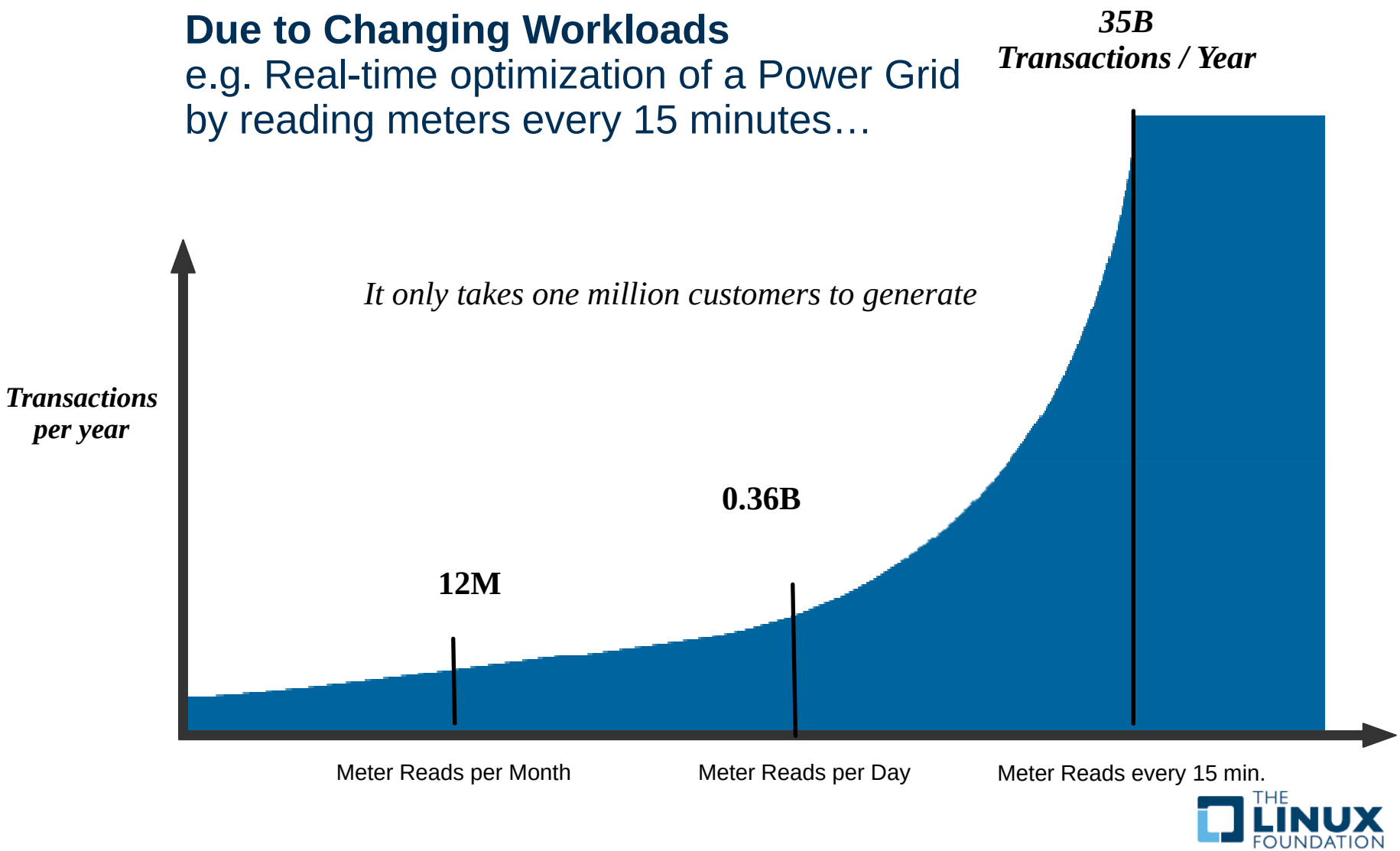
Requirements are changing for a more instrumented, interconnected, intelligent world

Due to Changing Workloads
e.g. Real-time optimization of a Power Grid by reading meters every 15 minutes…



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What do you need to deal with this future?

- Instrumentation: in embedded systems to collect data
- Network Servers: to gather and store data
- Super computers: to analyze this data explosion
- Devices: to display, communicate and interact with that data

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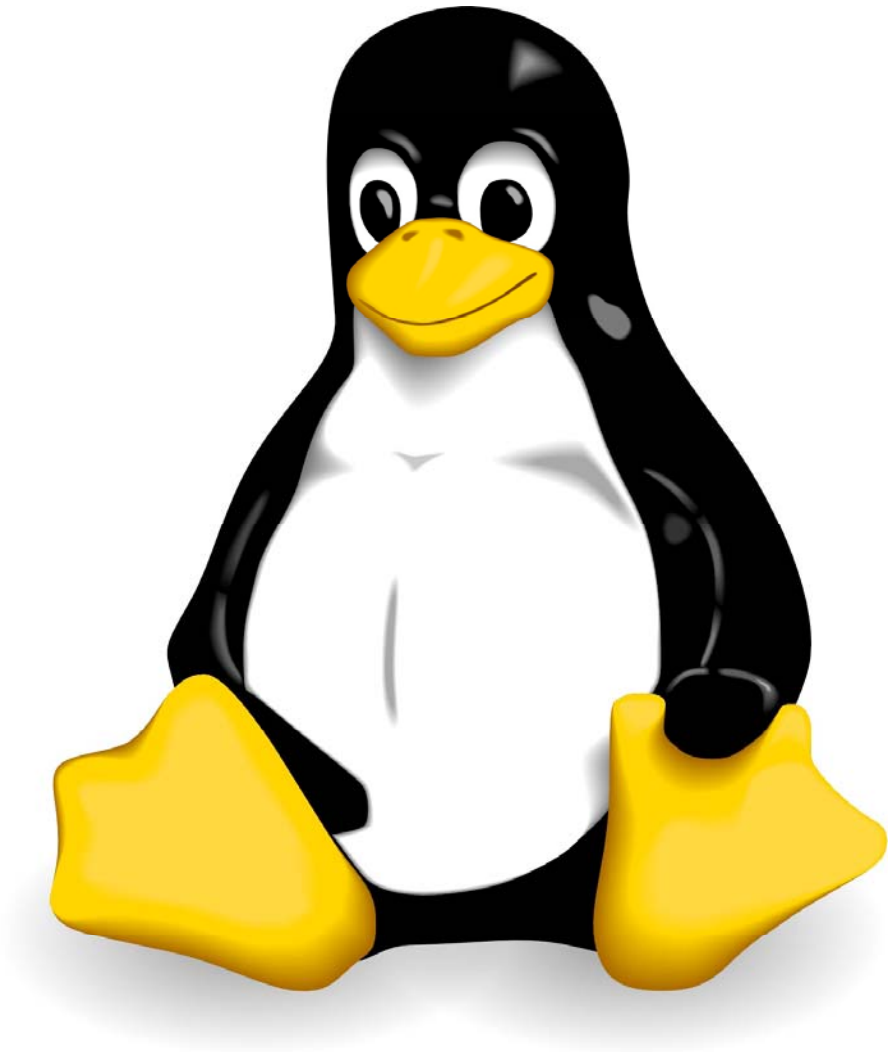
Sound familiar?



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Reason Two: It’s saves money

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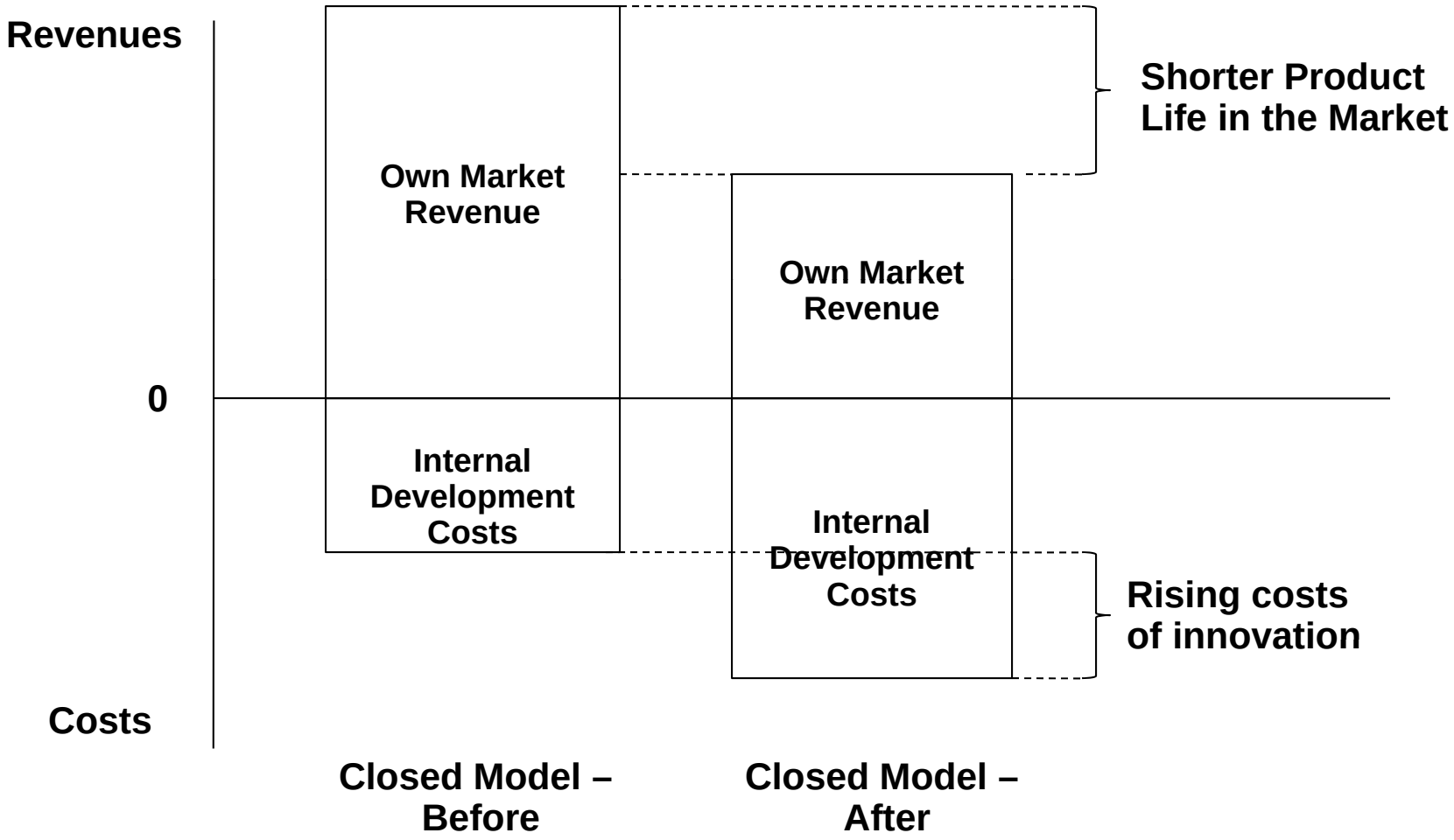
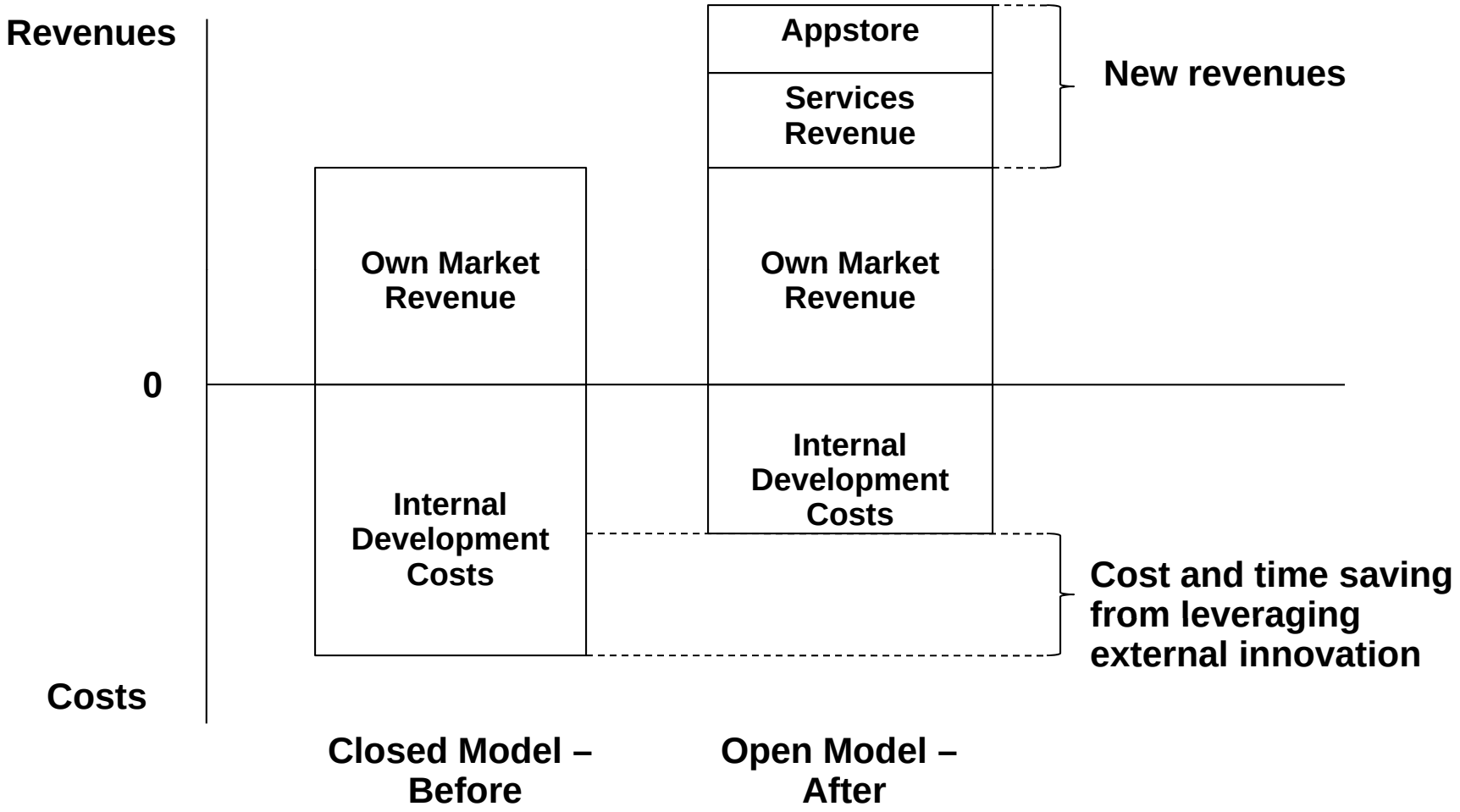
The price pressure of innovation



Source: Henry Chesbrough – Open Business Models

Open innovation enables new revenue streams, faster time to market, and lower costs



Source: Henry Chesbrough – Open Business Models

Reason Three: We are redefining personal computing

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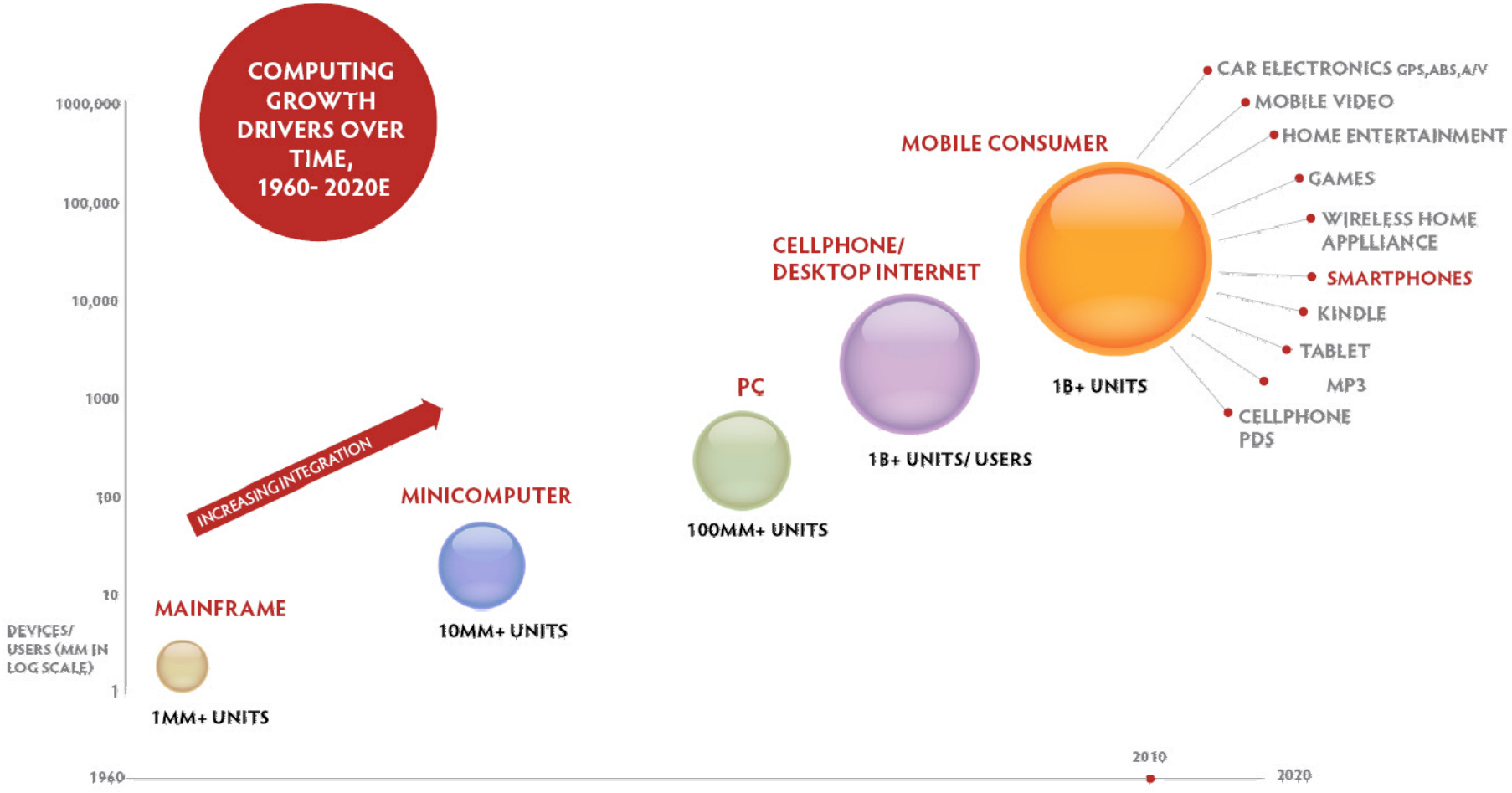
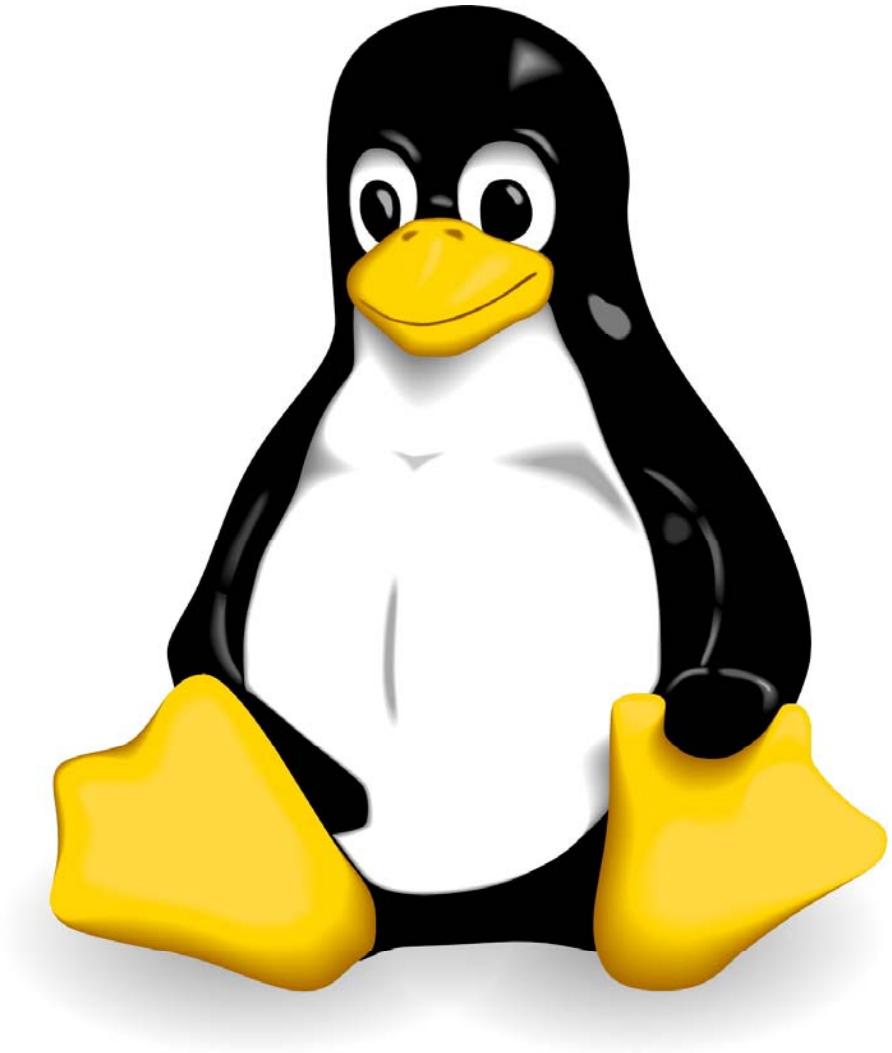
We are moving beyond the PC era



Morgan Stanley Research 2010

Fortunately most new forms of computing have one thing in common



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Reason Four: The move to services

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FREE

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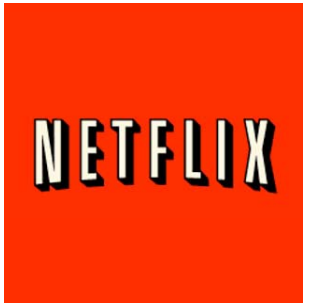
The move towards a services economy for consumers



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The move towards a services economy for enterprise

Linux is de facto winner as a services platform

Could Google, Amazon or Facebook be the companies they are today if they were written on Microsoft .NET?

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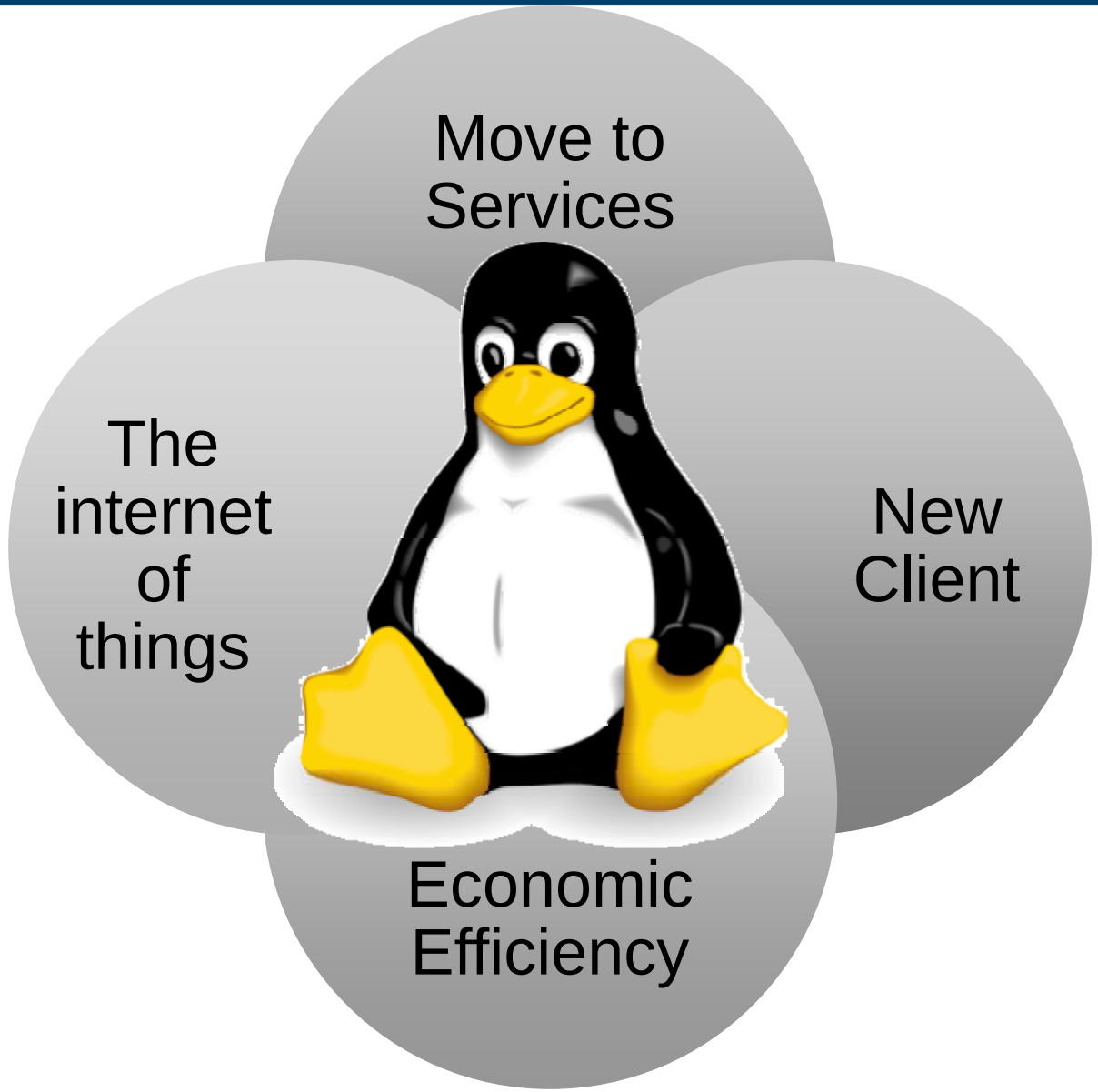
Linux is the center of all major computing trends



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Big problems that still need solving:

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A universal app and media “warehouse”

- Open source is being used to create automotive systems, tablets, white label smart phones and more
- Currently each OEM, carrier, or supplier is creating their own app store or tapping into one of the majors
- There exists an opportunity for a white label app “warehouse” to fill this market need

License compliance continues to be messy for no good reason

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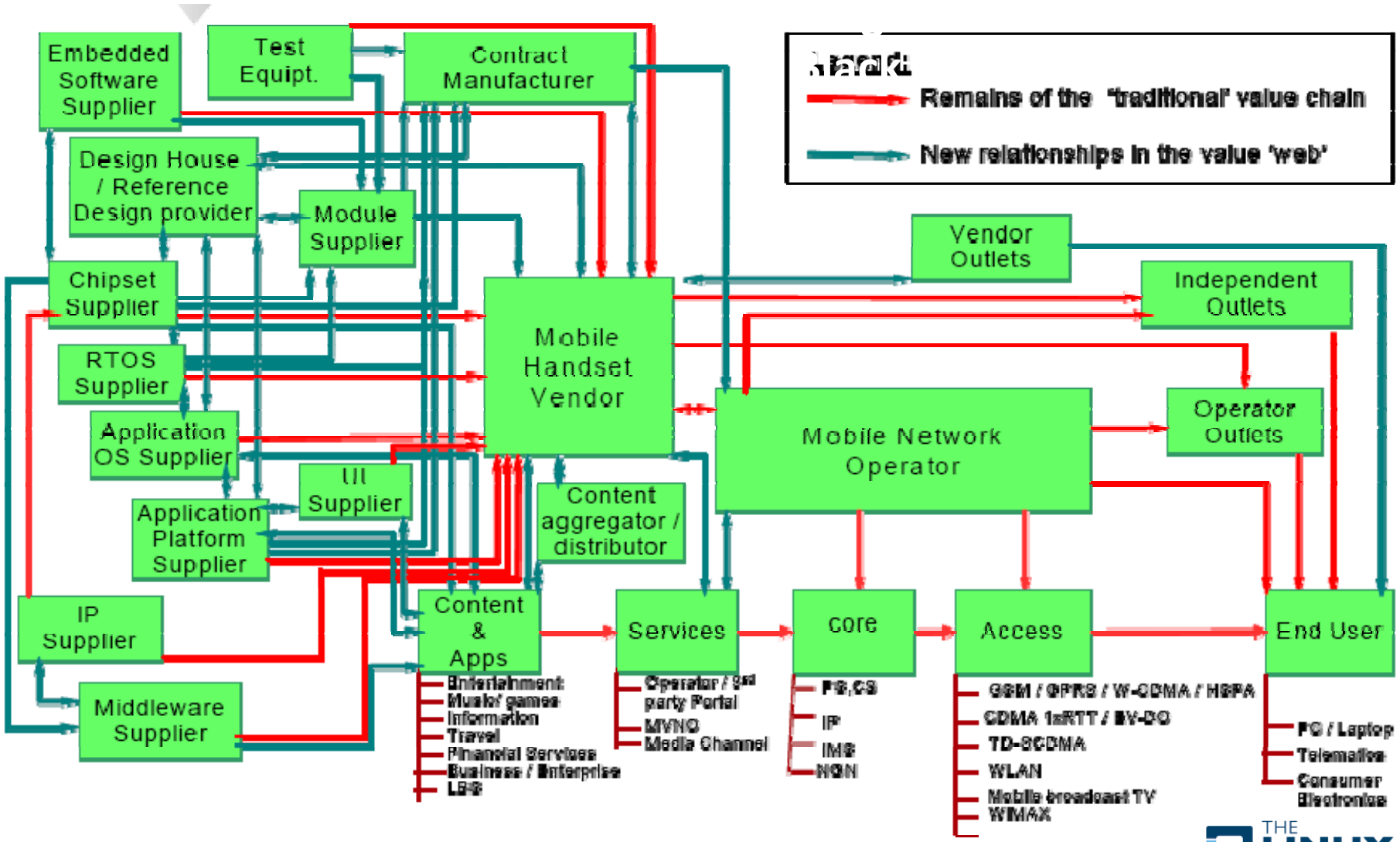
Products today are composed of mixed source code originating from many different sources



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Nobody likes their names in these kind of headlines

PALOS VERDES PENINSULA NEWS — SATURDAY, MARCH 13, 2004 — 7

SFLC LAW SUIT

Best Buy, Samsung, Westinghouse, And Eleven Other Brands Named in Suit

Norris Center for the Performing Arts, 27570 Crossfield Drive in RHE, on Saturday, March 20 at 2 and 4 p.m. Tickets are $8 for adults and $19 for students for the evening performance and $10 for adults and $15 for students at the matinée performance. For reservations, call 544-0403.

• UPCOMING — The Palos Verdes Peninsula Unified School District and Friends of School Music host the 15th Palos Verdes Elementary Choral Festival on March 23, 24 and 25 at the Norris Center for the Performing Arts, 27570 Crossfield Drive in RHE. All shows begin at 7:30 p.m. For tickets, call the Norris box office at 544-0403.

• ONGOING — The Distinctive Edge, 29050 S. Western Ave., Suite 113 in RPV, continues "Third Time's a Charm," an exhibit of 3-D collages by artist Steve Jacobsen, through March 30. For gallery hours, call 833-3613.

• ONGOING — "Natural Treasures" exhibition contin-

Two years ago, U.S. Navy personnel and their families assigned to the Atsugi Navy base, home of the U.S.S. Kitty Hawk, were treated to a rare experience when Terry Fleming and his local Irish/American band, Innisfree, traveled to the base to entertain them on St. Patrick's Day. Fleming and the other five members of Innisfree were delighted and honored to be able to go to Japan and lift the spirits, if only for a few hours, of the Navy personnel and their families.

For the third year in a row, Fleming — a local insurance broker in Rolling Hills by day and an entertainer by night — and the band travel to entertain the Navy men, women and families at various bases throughout Japan.

Fleming, the leader of the band on accordion and harmonica, actually is the only member of the band from Ireland. Other members include lead singer Julie Delaney, a civil engineer in Newport Beach; Terry Doyle, guitar, a news director with CBS news; Denis Doyle, Celtic harpist, a professor at Glendale College; Kevin Ward, keyboards and bagpipes, music teacher and assistant director of the Orange County Symphony; and Mike Tiffany, bass, a computer engineer. The band has been playing the length and breath of California for the past 25 years. They have played at pubs, wakes, weddings, birthdays and on occasions where there was little excuse for throwing a party.

Fleming says it was by coincidence the band got the opportunity to travel to Japan. Another band was unable to travel at the last minute and so he and his band were offered the opportunity to go in their place.

With some trepidation they made their first trip and with the overwhelming response they received at Atsugi, any fears they had were quickly allayed. On a damp St. Patrick's Day, hundreds of families, clad in many shades of green, whooped it up, sang their hearts out and danced up a storm. As the evening wore on, many in the audience were emboldened to try their hand or foot at the Irish gig, with much encouragement from the band.

Even though far from home, the Atsugi base — situated a few hours south of Tokyo — felt like home away from home, with its lush green rolling landscape and its multitude of cherry blossom trees. "Yet," Fleming says, "one was struck by the commitment and dedication of our men and women in uniform as they played their part in protecting and serving in an ever challenging and hostile world."

A couple of the families even took time out from their busy schedule to host Terry and the band members. They treated them to a guided tour of the base and accompanied them on a few exciting trips off the base, visiting beautiful ancient temples, monuments and revered giant Buddas.

On a visit to downtown Tokyo, the band came across what they assumed was a very rare sight, a place called "Scruffy Murphy," an Irish pub located in the heart of a bustling downtown. Upon checking the establishment out, they discovered a real authentic Irish Pub with excellent Guinness and good pub grub. It also happened to be open mic night, so the band members took over the stage and entertained the locals for a few fun filled hours. It turned out that it was just one of many establishments in the city.

A special bond developed between the band members and these families and already exchange visits have occurred when the same families were on leave in the United States.

For more information about the band, log on to www.innisfreemusic.com.

thebridge

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Open source compliance is still misunderstood and a problem for the Software industry

- Most license violations are unintentional and result from carelessness or ignorance
- Compliance is not without cost, but copyright infringement (by breaking license obligations) is significantly more costly
- There are a host of tools and training available at the Linux Foundation and elsewhere

Patents continue to suck resources away from innovation (from both proprietary and open source software): we need better tools and reform

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The Linux and Open Source Defense Network

openinventionnetwork℠

frdm
Software Freedom Law Center

DEFENSIVE PUBLICATIONS

LINUX DEFENDERS

PEERTOPATENT
in cooperation with USPTO

Patent Commons PROJECT
PRESERVE
COLLABORATE
INNOVATE

open source™

OSAPA

POST ISSUE PEER TO PATENT

Linux Legal Defense Fund

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Rapid build tools for embedded systems need improvement

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Yocto Project Release 1.0 Released

- First major release since introduction in October
- Improvements to build system and developer interface
- Yocto is a set of common open source software tools helps companies make custom Linux-based systems for embedded products, regardless of hardware architecture.

We need more talent

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Thank you.

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