

The 9th NEA OSS Promotion Forum

Statistic Analysis of The Linux Kernel Development

Tsugikazu SHIBATA
4, November 2010

Empowered by Innovation

NEC



\$ who am i

- ✓ Tsugikazu Shibata
- ✓ OSS Promotion center, NEC
- ✓ Member of the Board of The Linux Foundation and CE Linux Forum
- ✓ Fostering industry's developer
- ✓ Maintaining a Japanese version of HOWTO at Documentation/ja_JP/HOWTO

Agenda

- Background
- Status of latest kernel
- Status of series of kernel development
- Status of distributions

Background

- Now, Linux and OSS is used by broad industries:
 - Internet services
 - Mission Critical enterprise system
 - Carrier infrastructure
 - Consumer Electronics/Embedded
 - Smart phone
 - In Vehicle Infotainment
- Linux and OSS is developing in the communities by developers from industries
- This talk is try to look at upstream community's development



Status of Latest Kernel

- Latest release: 2.6.36

Released: 20, Oct. 2010

| | | |
|------------------|--------|--------------|
| Size of tar.bz2: | 70.3MB | (70,277,083) |
| # of Lines: | 13.5ML | (13,419,556) |
| # of Files: | 34,297 | |

- Latest stable release:

2.6.35.7

2.6.34.7

- Long-term stable release

2.6.27.54

2.6.32.24

Comparison with other software

- Linux is now really large sized software compared with other OSS

| Software | Source code size of tar.bz2 | # of Lines | # of Files |
|----------------|-----------------------------|------------|------------|
| Linux-2.6.36 | 70.3MB | 13.5Mlines | 34,297 |
| Firefox-3.5.12 | 23.9MB | 4.2Mlines | 8,346 |
| GCC-4.5.1 | 86.1MB | 11.4Mlines | 65,841 |

% of 2nd directories

```
$ ls -F ./linux-2.6.35
```

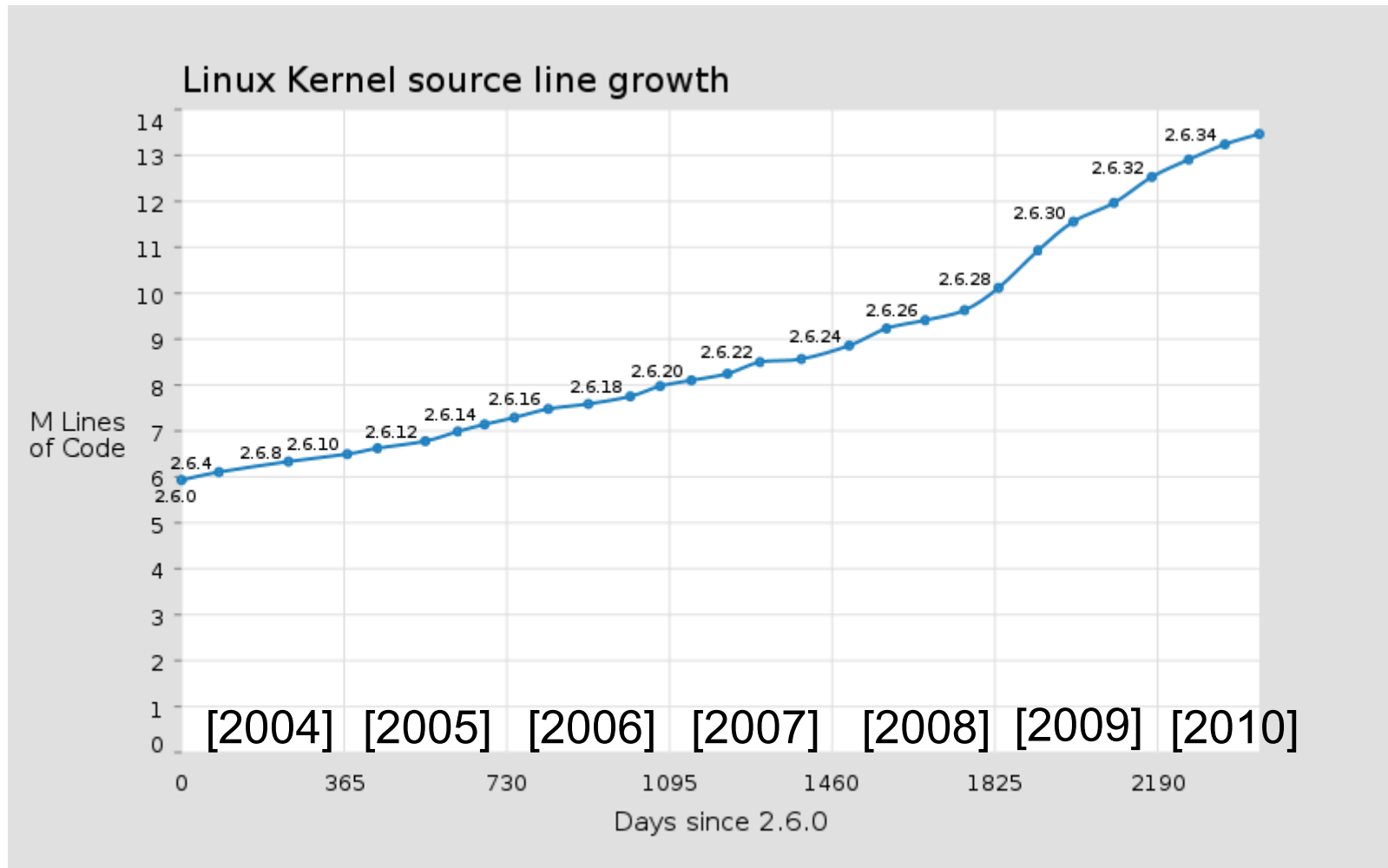
```
COPYING          REPORTING-BUGS  include/        samples/  
CREDITS          arch/           init/           scripts/  
Documentation/   block/         ipc/            security/  
Kbuild          crypto/        kernel/        sound/  
MAINTAINERS      drivers/       lib/           tools/  
Makefile        firmware/     mm/            usr/  
README          fs/           net/           virt/
```

| Directory name | # of Lines in dir | % |
|----------------|-------------------|------|
| driver | 6,883,548 | 51.2 |
| arch | 2,932,985 | 21.8 |
| fs | 971,067 | 7.2 |
| net | 629,148 | 4.7 |
| Sound | 614,601 | 4.6 |

Status of series of Kernel development

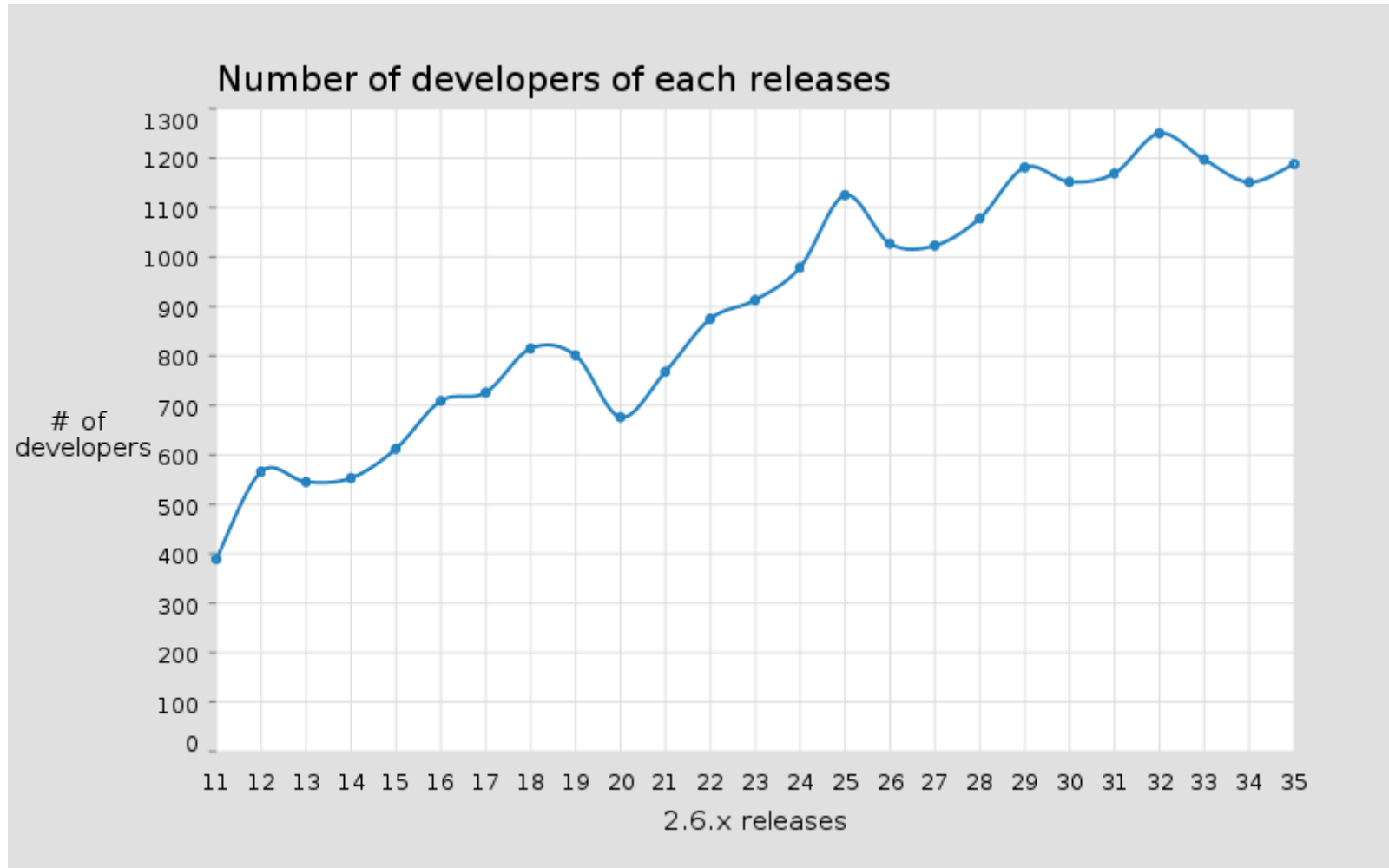
Source code growth

- 2.4ML grew in 2009, about 1ML in this year



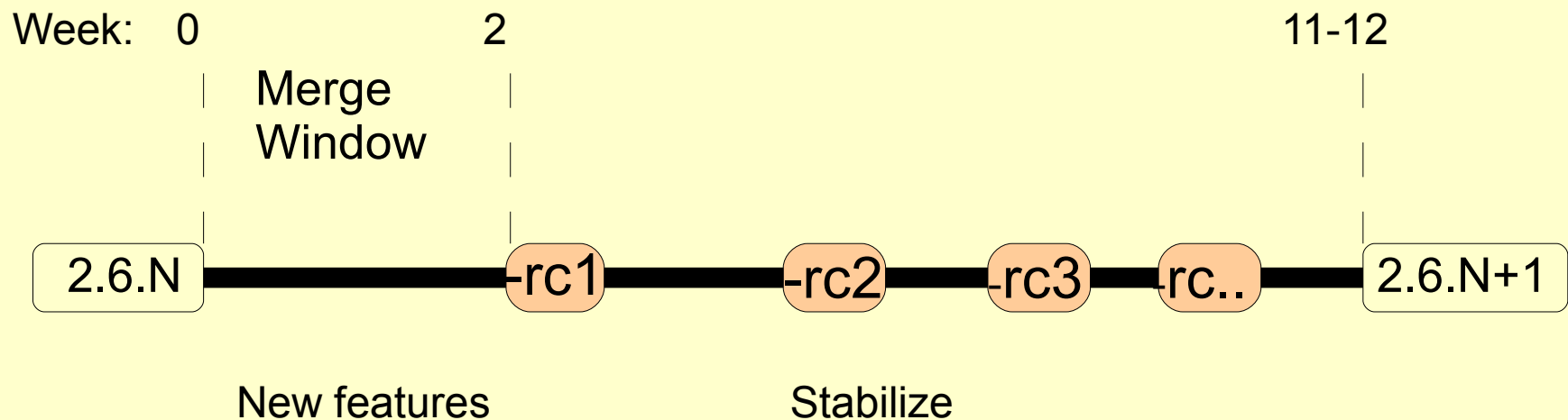
Number of developers sent patches

- More than 1000 of developers patch are merged since 2.6.25



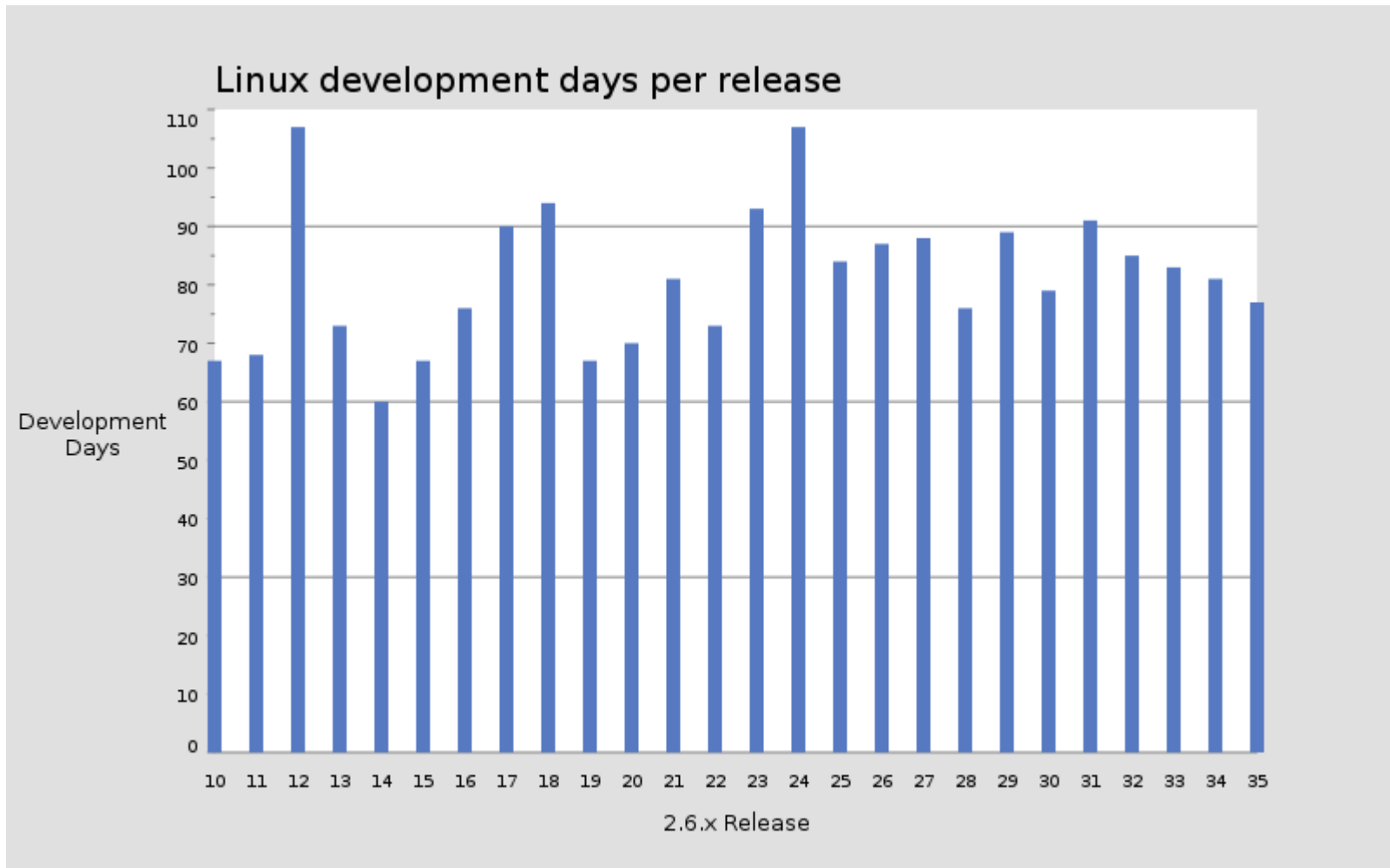
Development Process

- Merge window and Release candidates
 - 2 weeks of merge window just after kernel released
 - Each RC takes a week or 10 days, continue 8-9 times



Days to develop each releases

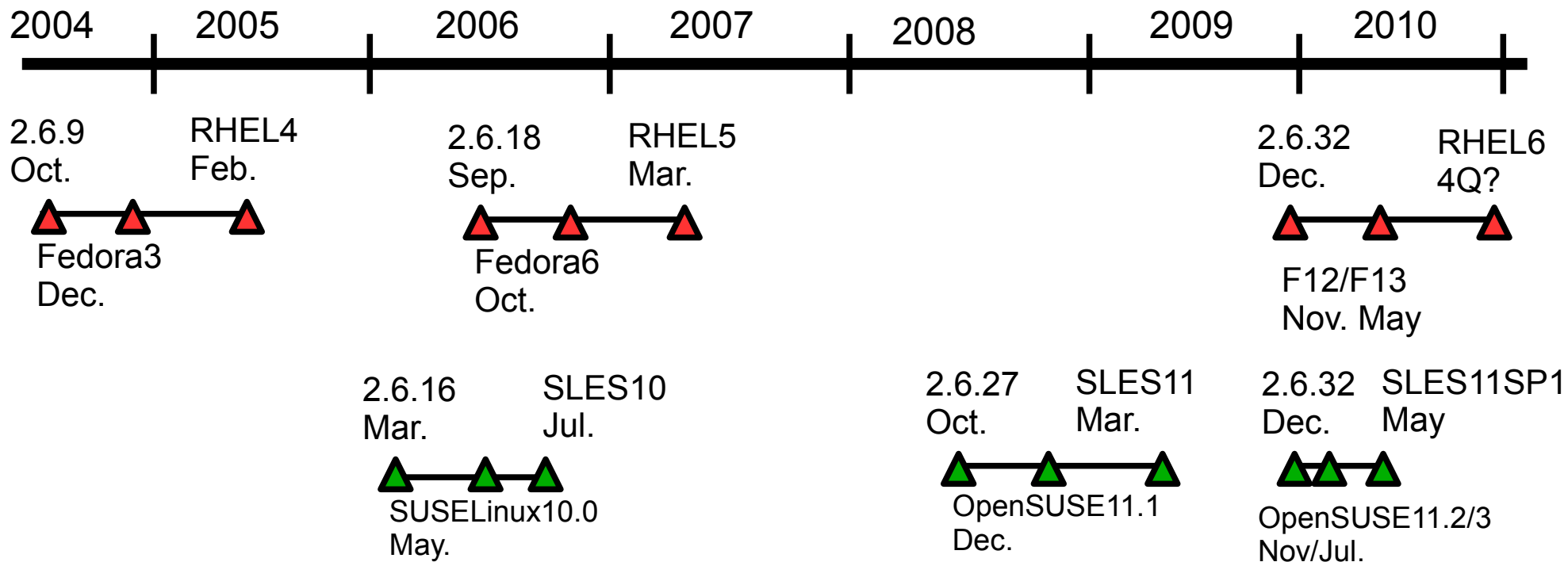
- Average 81 days in last 4 releases
- Average 84 days in last 10 releases



Status of Distributions

Linux upstream and distros

- Distros take 9-12 months from upstream Kernel release to provide commercial products for it's integration and testing
- New versions will be released every 3-4 years



Android and Linux kernel

- Android is using relatively new kernel
- Took 5-7 month after kernel released



| Android version | Code name | Released date | Kernel version | Kernel release date |
|-----------------|--------------|---------------|----------------|------------------------|
| 1.1 | | 9, Feb 2009 | | |
| 1.5 | Cupcake | 30, Apr 2009 | 2.6.27 | 9, Oct 2008 |
| 1.6 | Donut | 15, Sept 2009 | 2.6.29 | 23, Mar 2009 |
| 2.0, 2.1 | Eclair | 26, Oct 2009 | 2.6.29 | 23, Mar 2009 |
| 2.2 | Froyo | 20, May 2010 | 2.6.32 | 6, Jan 2010 |
| ? | Ginger Bread | 4Q, 2010 | 2.6.33 or 34 | Feb, 2010 May, 2010 |

Conclusion

- Now, Linux is indispensable to create innovative products, social infrastructure and global internet services
- Linux is enough large and rapidly growing. Any single entity cannot be able to compete or own the Linux community
- Developers join the community from Korea, China and Japan is growing in these years
- This is the result of our activities of NEA OSS Promotion forum. We would continue to support the upstream development

THANK YOU

Empowered by Innovation

NEC

