



On the road: To provide the Long-Term Stable Linux for the Industry

15 Feb, 2012

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CE WG, The Linux Foundation

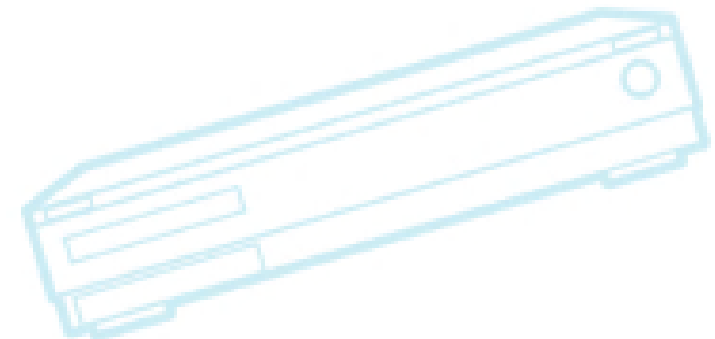
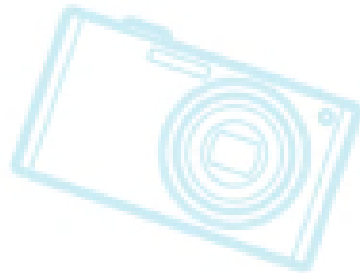
CONTENTS

- Background
- LTSI Project Overview
 - Long-Term Stable kernel
 - LTSI Kernel tree details
 - Definition
 - Development process
 - Upstream support for the industry engineers
- How industry can use LTSI
- How to participate
- Future plan

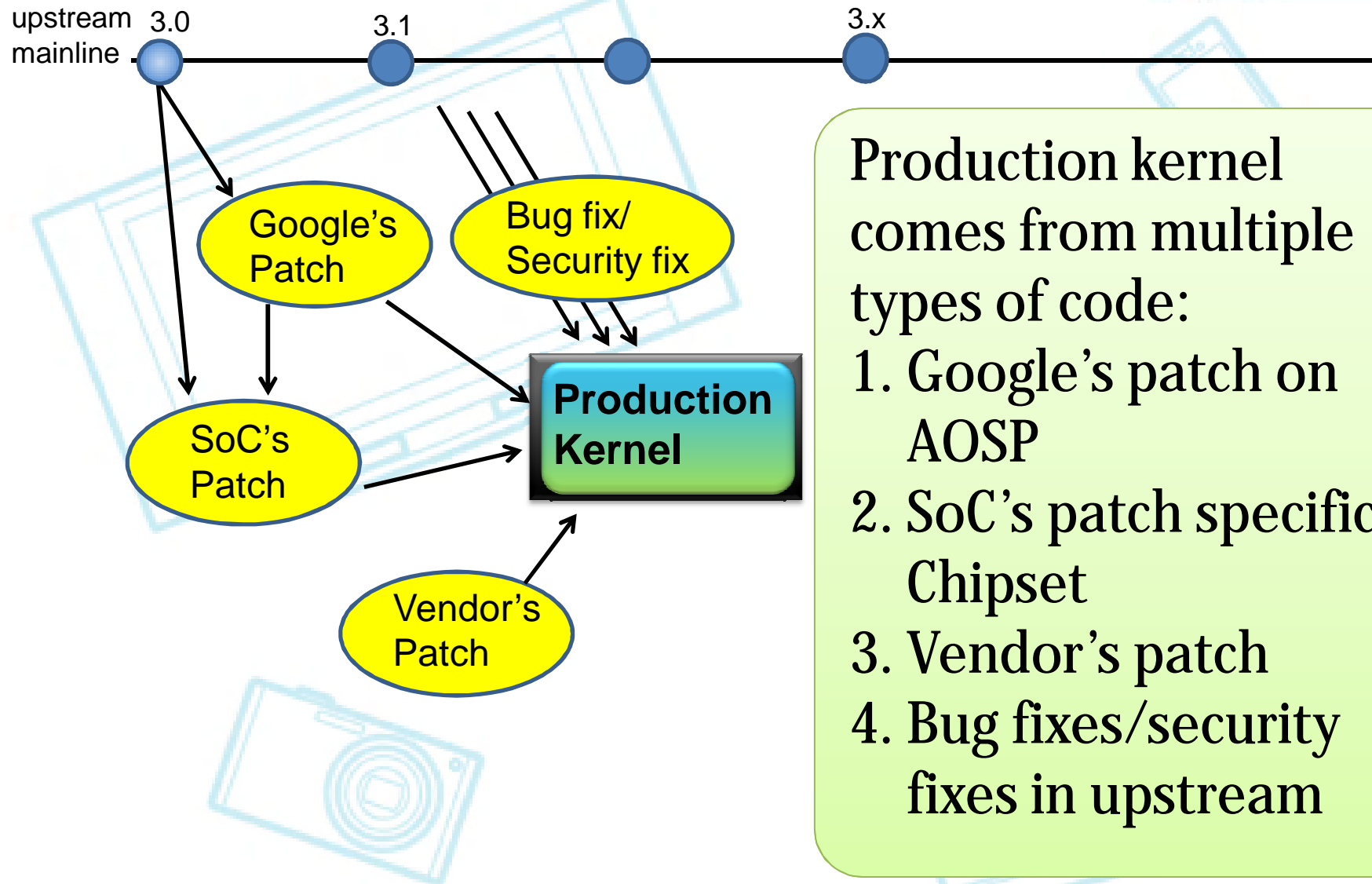
Background



- Building a embedded/Consumer electronics products are really complicated process
 - Lots of source in different place
 - No common ground to share knowledge
 - Upstream patch submission is inactive
 - ...



Case of Building an android product



Production kernel comes from multiple types of code:

1. Google's patch on AOSP
2. SoC's patch specific to Chipset
3. Vendor's patch
4. Bug fixes/security fixes in upstream

4 way merging process is really hard for manufacturers

Case of Android release cycle

- Android is releasing about every 6 month
- Every time using latest kernel version

Android Version	Code Name	Kernel version	Release Date
1.6	Donut	2.6.29	15,Sep, 2009
2.0	Éclair	2.6.29	26,Oct. 2009
2.2	Froyo	2.6.32	20,May. 2010
2.3	Ginger Bread	2.6.35	6,Dec. 2010
3.0	Honey Comb	2.6.36	22,Feb.2011
4.0	Ice Cream Sandwich	3.0	14,Nov.2011

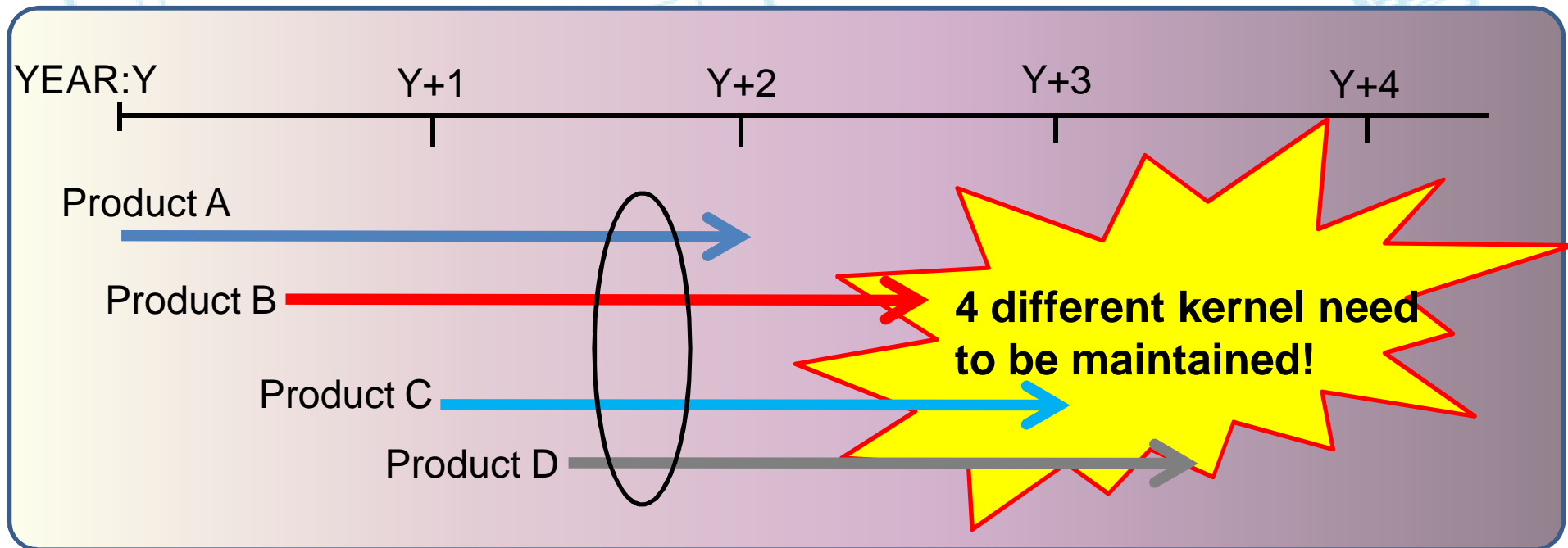
Days
41
206
200
78
265

Stay same kernel at least a year could be great!

Manufacturer's product timeline



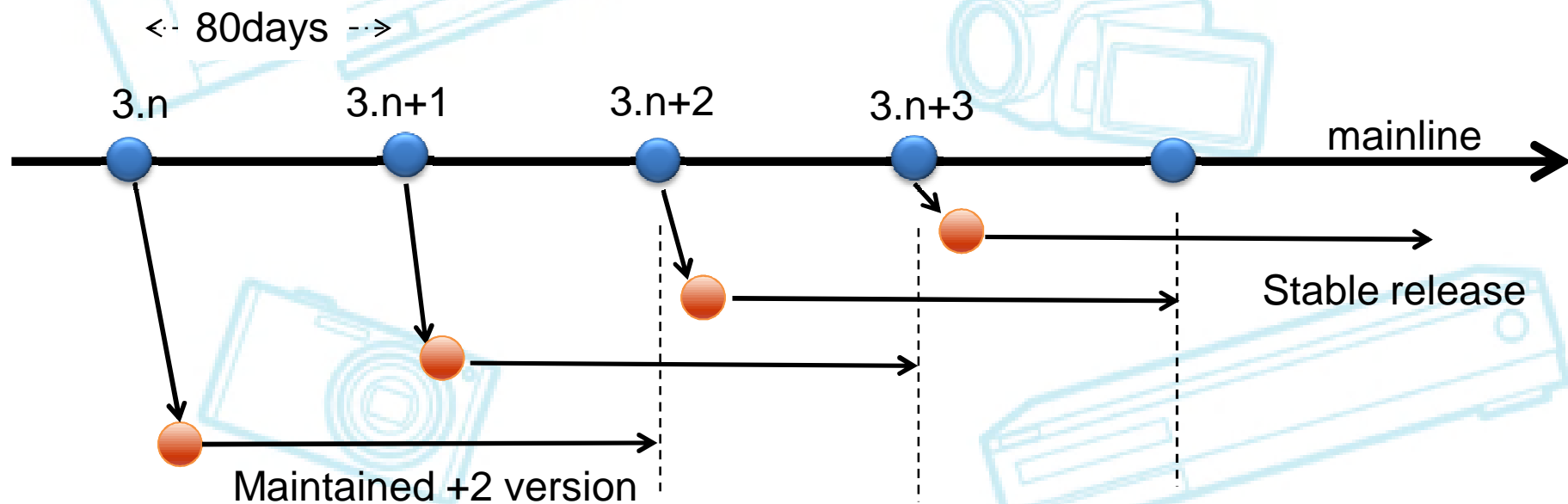
- A product life time is about 2 years
- Should provide bug fixes/security fixes for a production kernel within lifetime
- 4 of different kernels need to be maintained in Android



Industry would like to use same kernel with reasonable lifecycle as a common ground of industry

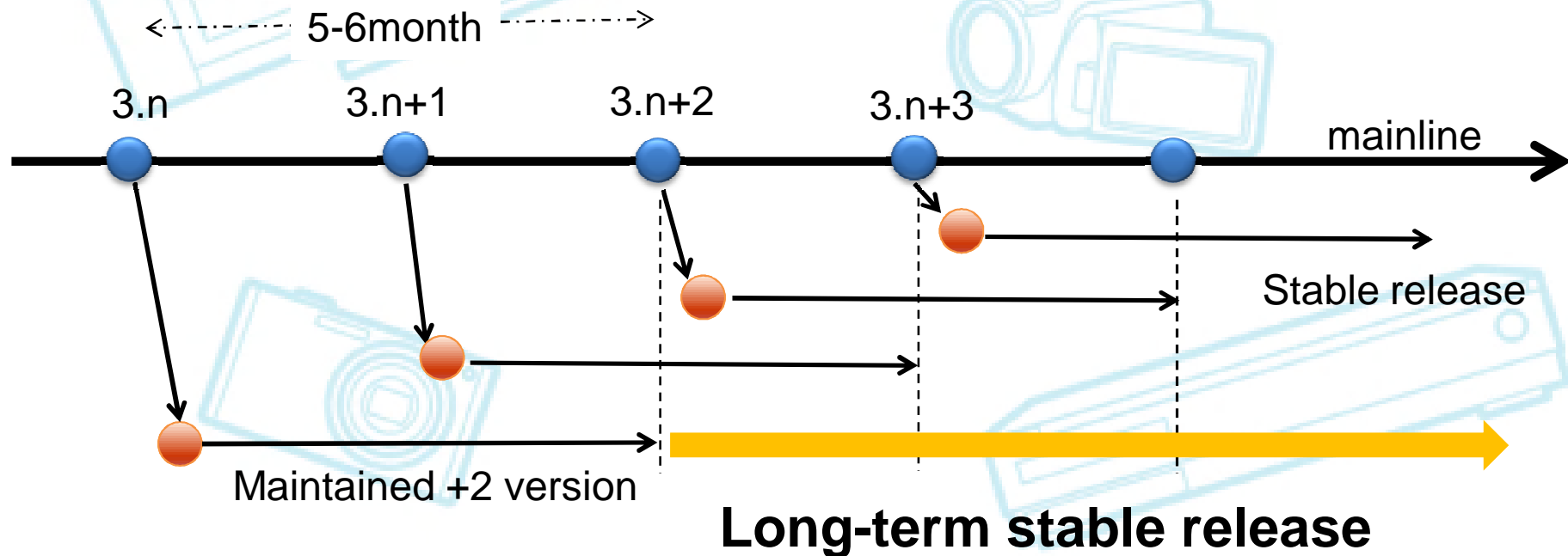
Stable kernel by the community

- After release of a kernel, stable release branch will start to maintain until $n+2$ version released
- Stable release will only include bug/security fixes found in latest version



Stable kernel by the community

- Some specific versions are maintained as “long-term stable” release
- For Enterprise use, there are Long-term stable release
 - 2.6.32 is used by Red Hat and SUSE for more than 4 years



Upstream patch submission

- Share the code, problem and fixes are valuable for the industry. Why it's inactive?

It's Open source.

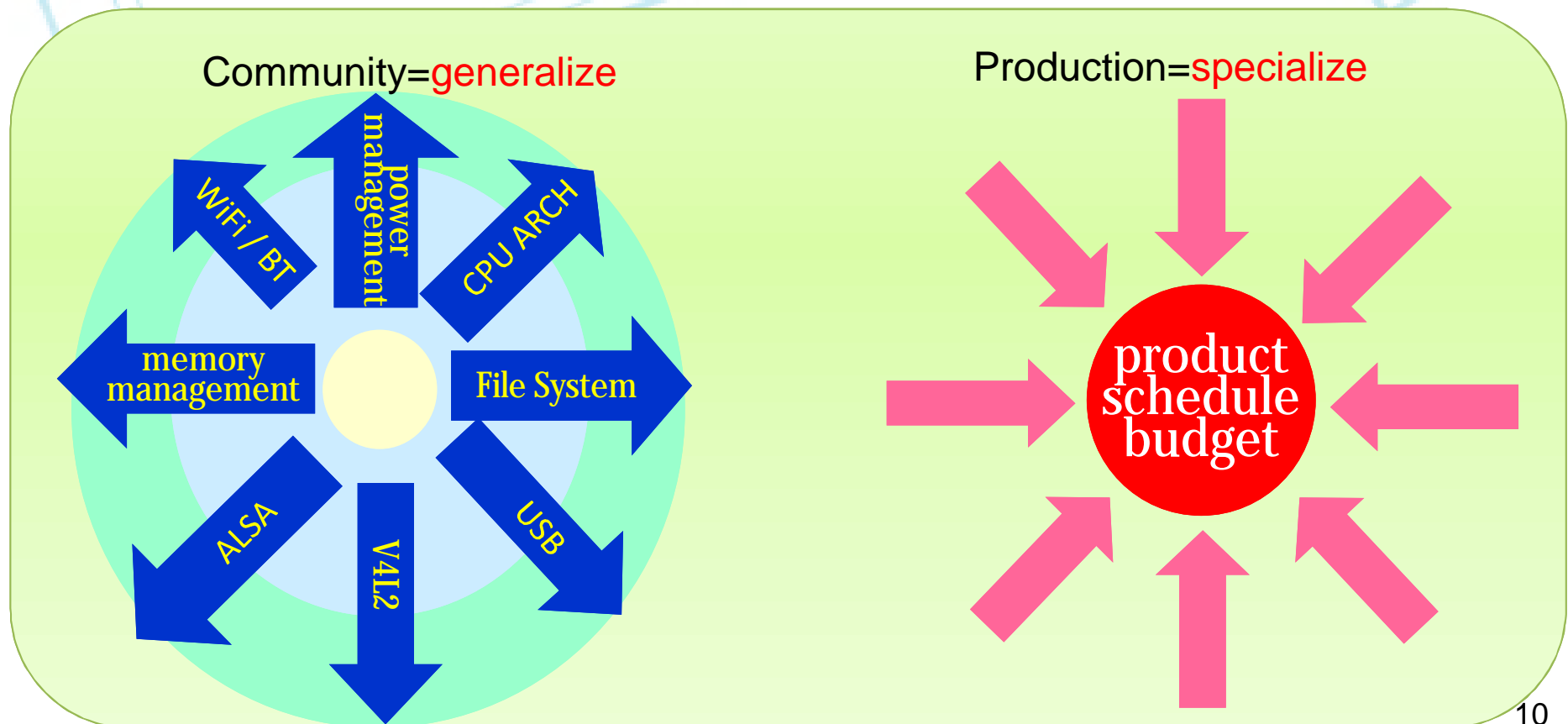
Non differentiation part could be shared among the community

Is Linux differentiator?

All the source code of Linux will be opened to public

Upstream patch submission

- Community and Industry have different direction and view
 - Such difference makes industry engineer hard to submit their code to the community

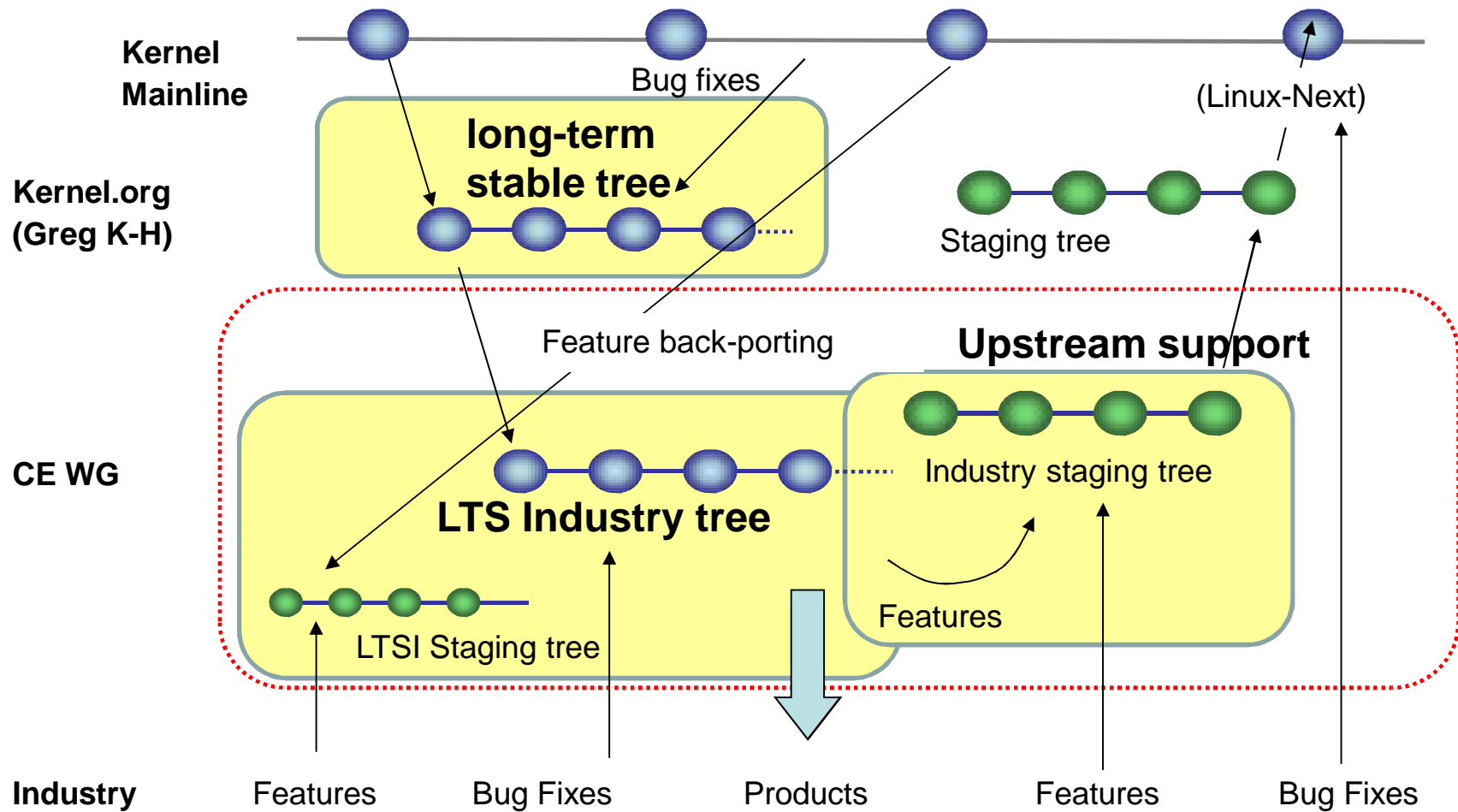


Project requirements

- We need Long-term community based Linux kernel to cover embedded life cycle
- We need Industry managed kernel as a common ground for Embedded industry
- We need some mechanism to support the upstream activities for Embedded engineers

LTSI project overview

1. Long term stable kernel by the community
2. LTSI kernel
3. Upstream support



1. Long term Stable kernel by the community



- Discussed with community already
 - Pick a version every year, with 2 years term
- Greg already stated 3.0 as long-term kernel
 - Android 4.0 is using 3.0 kernel as one of user
 - We guess many others can easy to decide to use 3.0
- We proposed LF to establish the Industry Advisory Board (IAB) to be discussed and decided for further versions

From: Greg KH <greg-AT-kroah.com>
To: linux-kernel-AT-vger.kernel.org
Subject: Latest kernel stable/longterm status
Date: Mon, 9 Jan 2012 16:37:05 -0800
Message-ID: <20120110003705.GA9482@kroah.com>
Cc: stable-AT-vger.kernel.org

As 3.2 is now out, here's a note as to the current status of the different stable/longterm kernel trees.

... some lines removed

Here's the different active kernel versions that I am maintaining at the moment:

3.2.y - this will be maintained until 3.3 comes out

3.1.y - there will be only one, maybe two, more releases of this tree

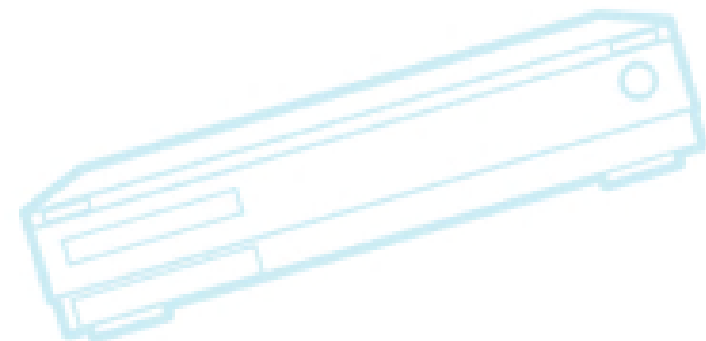
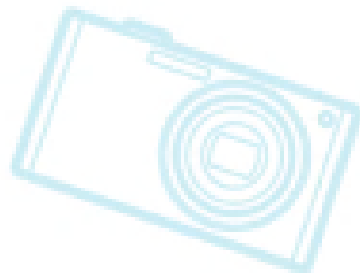
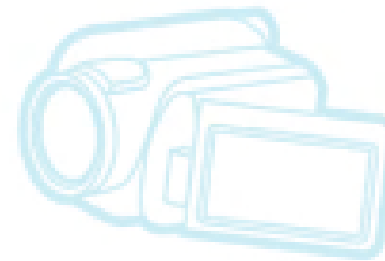
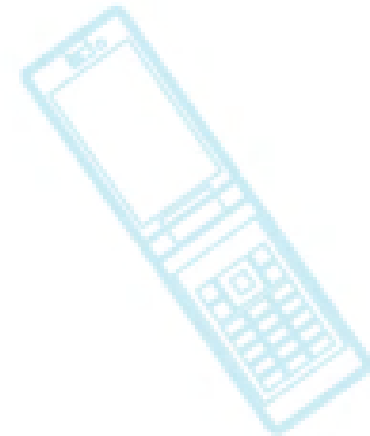
3.0.y - this is the new "longterm" kernel release, it will be maintained for 2 years at the minimum by me.

2.6.32.y - this is the previous "longterm" kernel release. It is approaching it's end-of-life, and I think I only have another month or so doing releases of this. After I am finished with it, it might be picked up by someone else, but I'm not going to promise anything.

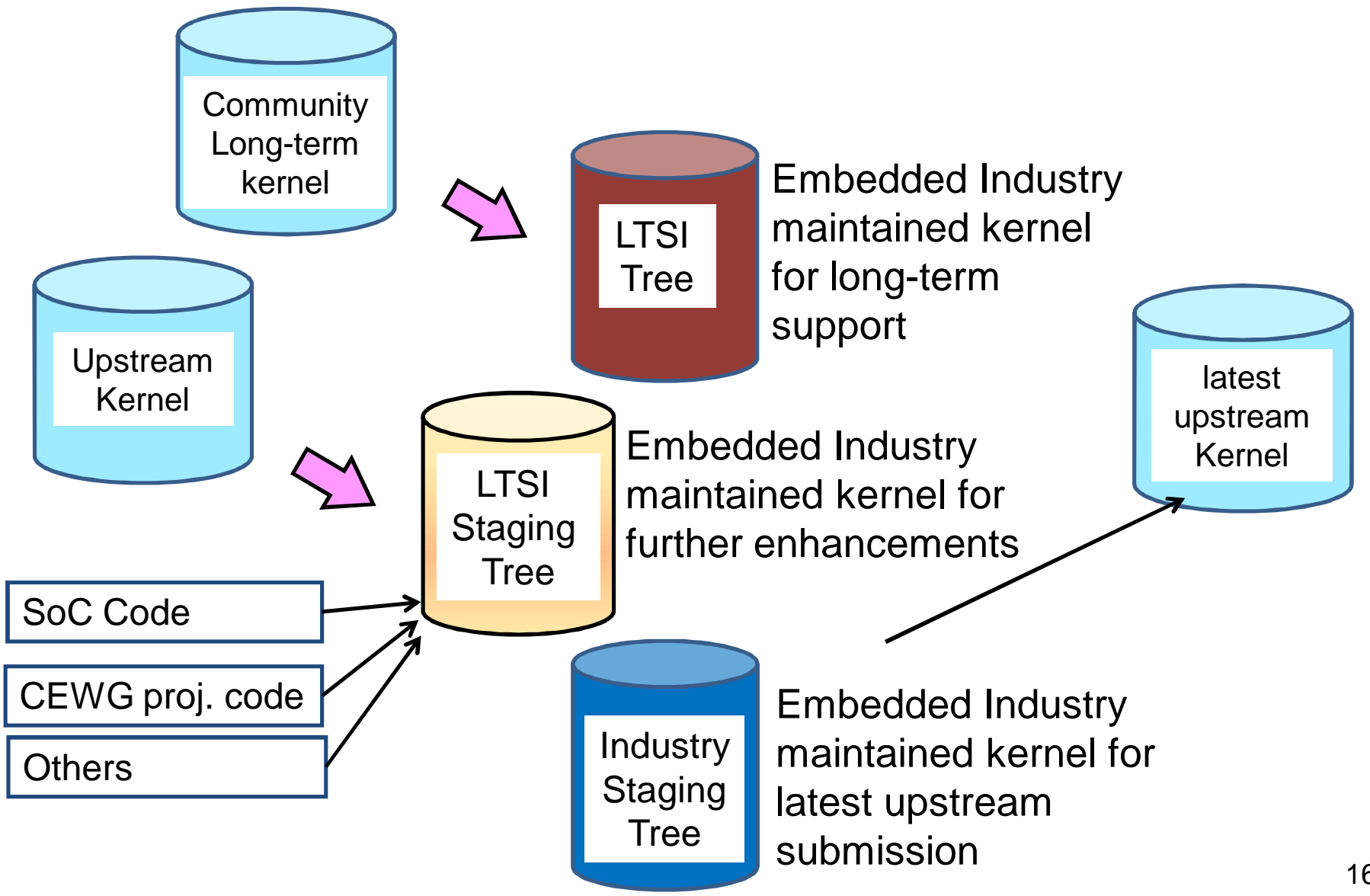
thanks,
greg k-h

2. LTSI kernel

- LTSI kernel definitions
- LTSI kernel development process
 - LTS Industry tree
 - LTSI staging tree
 - LTS industry staging tree



2.LTSI kernel trees



LTSI tree definition

- Linux kernel maintained by Industry Initiative: LTSI
 - not a part of upstream community
- Keep maintained in 2 years
- Defined a version yearly (initially 3.0)
- Use community long-term stable [LTS] version as base kernel
 - bug and security-fix will be provided timely fashion
- Useful for Industry
 - No experimental features will be integrated
 - Stable and Replaceable
 - Industry engineers can be shared the problem and fix it
- Add some additional stuff to obtain industry requirement
 - new kernel feature support (e.g. Android patch set , device drivers)
 - SoC/manufacturer in-house code (after sanity check)
 - CEWG funded open source project result

LTSI staging tree definition

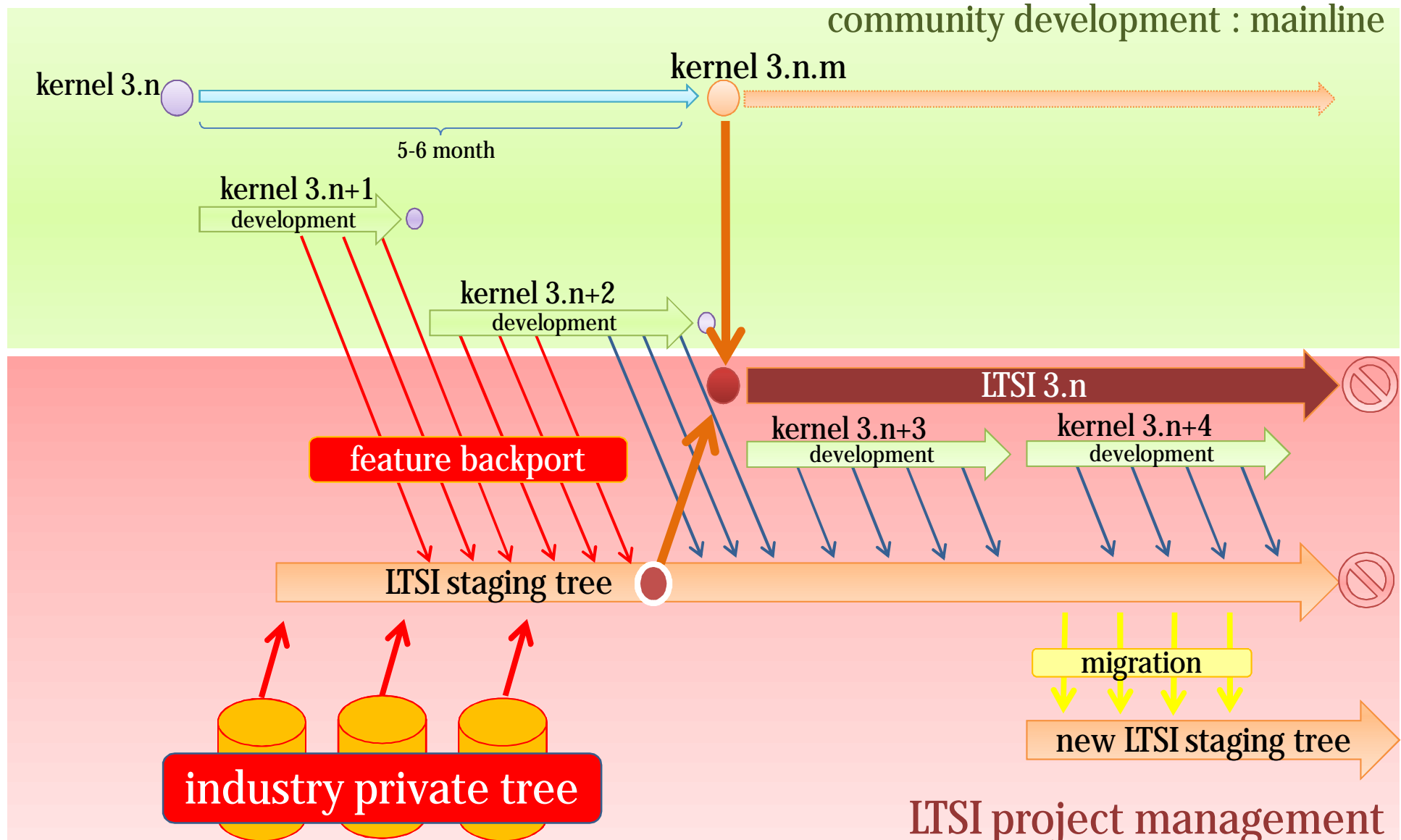
- Tree for the feature enhancements for LTSI
 - Same version as LTSI tree
- All code flow into LTSI kernel must be merged through this staging tree
 - Newly mainlined kernel code (back ported device driver, others).
 - CEWG funded project result
 - SoC Vendor code (SoC vendor can send merge request)
- Before feature freeze of LTSI tree, this is the place to collect the patch
- After feature freeze, proposed patch can be merged in this tree
 - Industry engineer can get latest back ported code from this tree
 - Experimental patch can be discussed here and can get help to be mainlined

LTSI staging tree definition



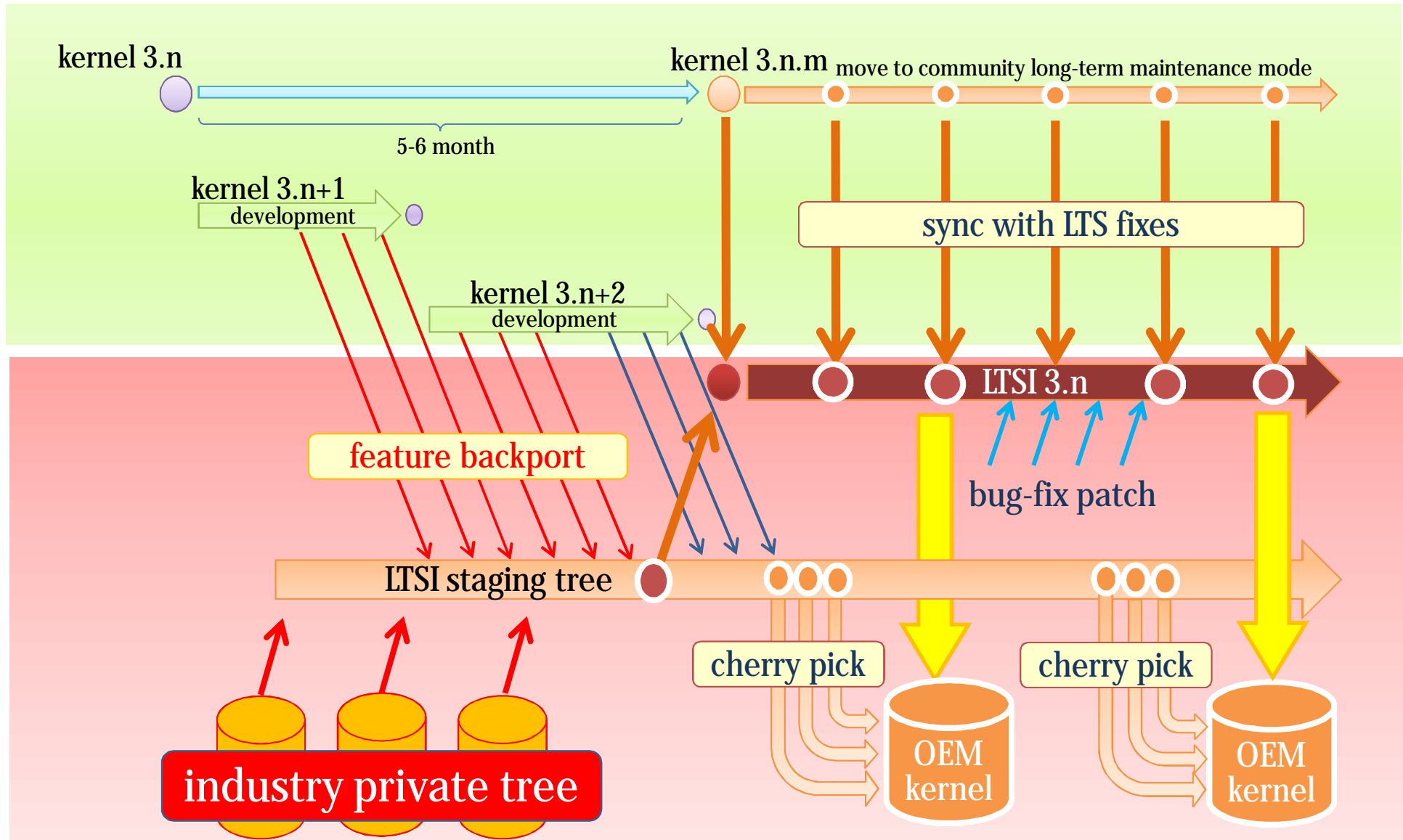
- Tree for the feature enhancements for upstream submission
 - Keep latest version of upstream
 - Provide consultation and review patches for industry engineers
 - Be able to share opinion with industry engineers
 - Be able to get consultation and review from LTSI staff

LTSI creation process



LTSI project management

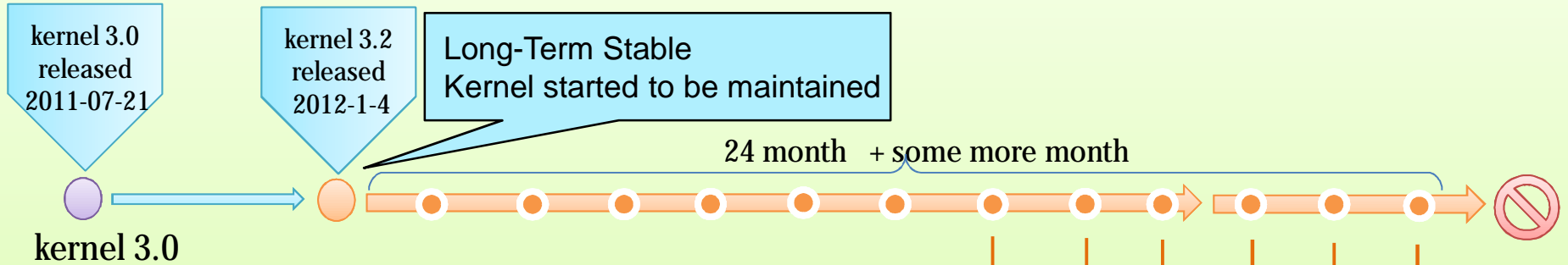
LTSI maintenance process



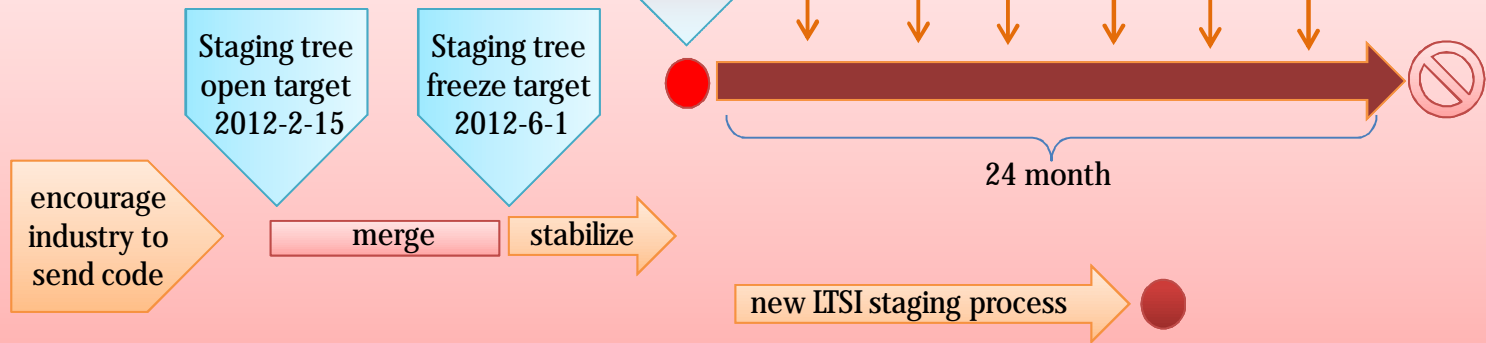
LTSI 3.0 release plan



community development : mainline

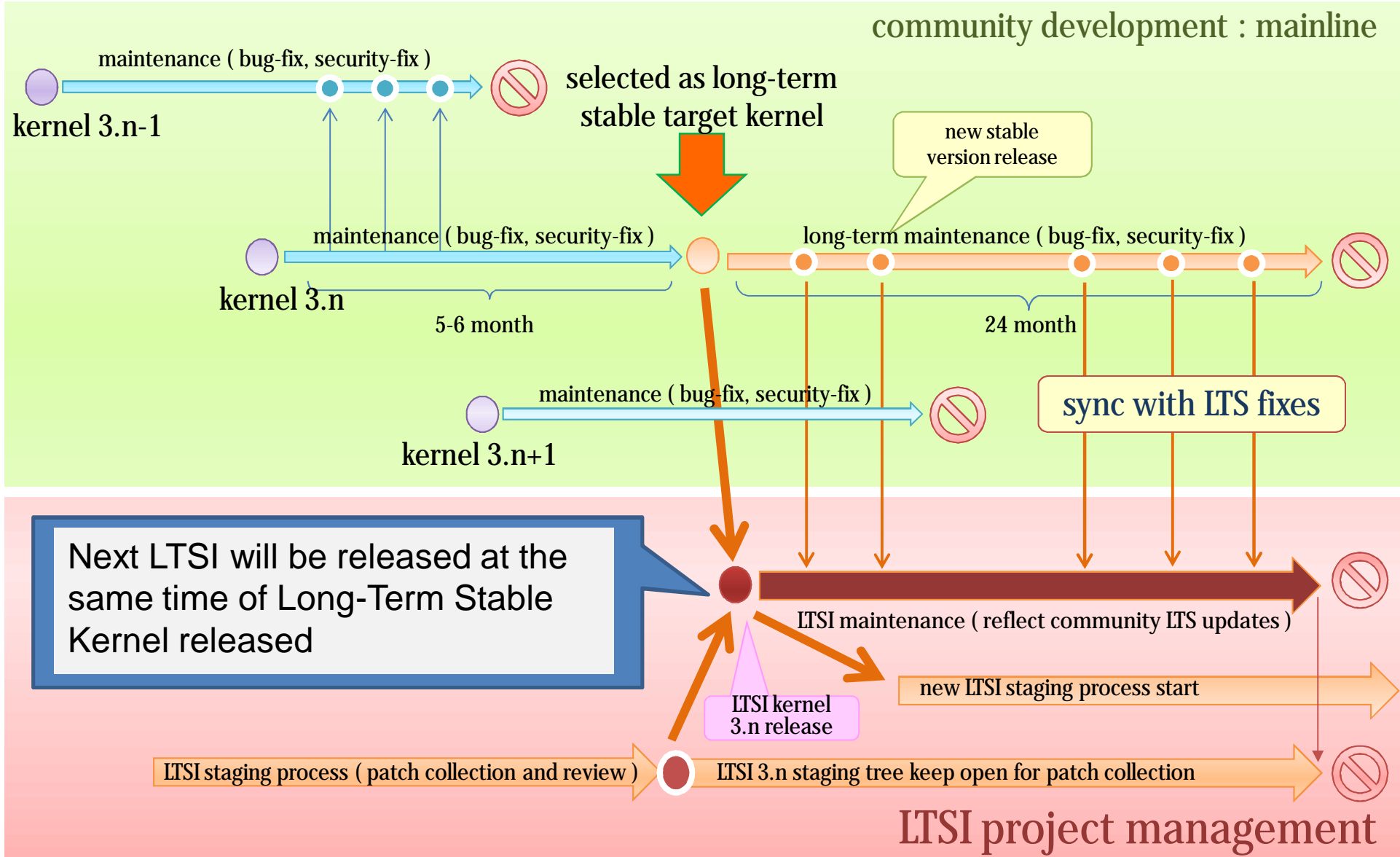


- LTSI release target date is set to the end of June 2012
- LTSI staging tree will be closed end of May
- LTSI will be tested one month before release
- LTS 3.0 will be maintained while LTSI 3.0 is alive.



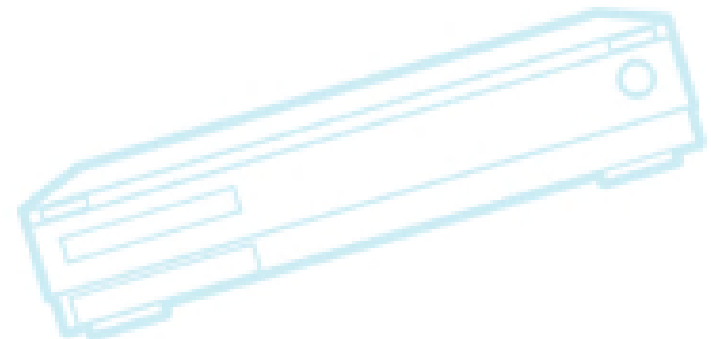
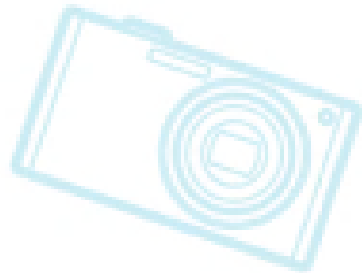
LTSI project management

LTSI development (after 2nd release)

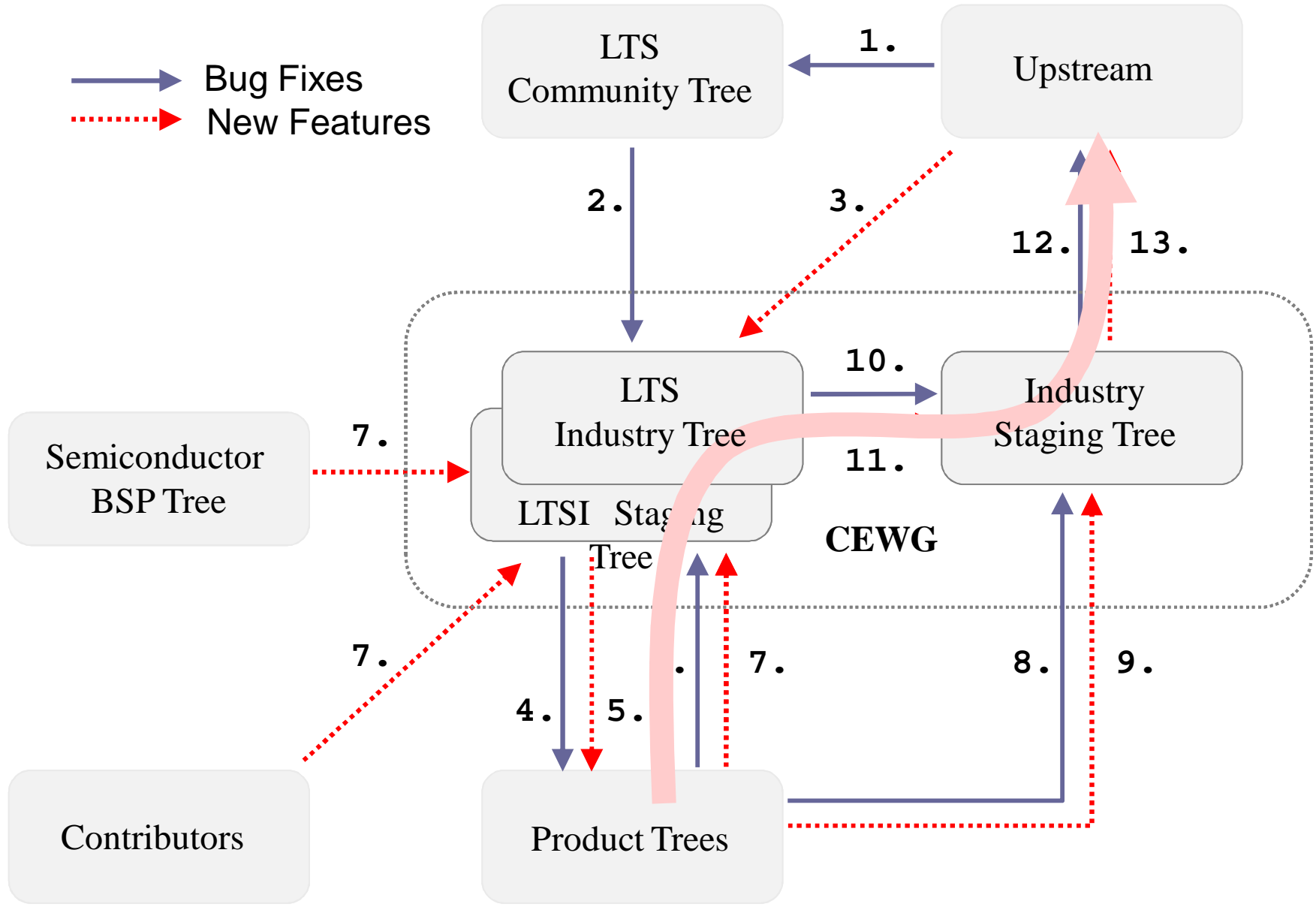


3. Upstream support

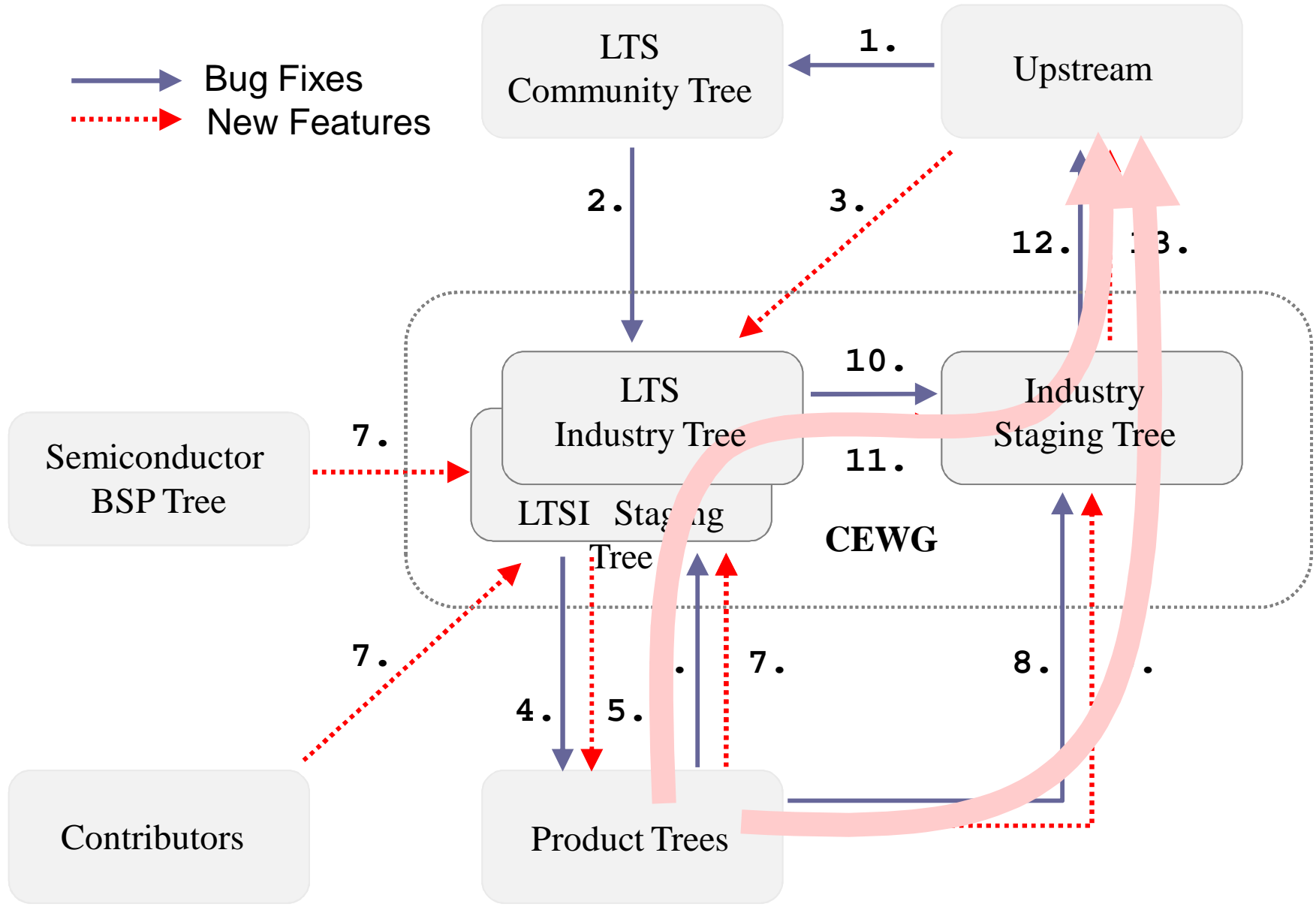
- Submitting patch into upstream. What's difficult?
 - Porting to latest kernel is not easy
 - Industry Engineer have No guidance, No consultation, No review
 - Communication with outside of company is always not easy



Upstream support in LTSI: Accept Patches for LTSI version and port it



Upstream support in LTSI: Accept Patches for LTSI version and port it



Industry Contact : What?

- Industry Contact is:
 - Contact person for the company to communicate with LTSI and community
 - LTST team staff provide help to company's engineer though Industry Contact
- LTSI help Industry Contact:
 - Engineers in the company can successfully talk with the community
 - LTSI provide the place to share information among Industry Contacts
 - Industry Contact Meeting
- CEWG member company can use this

How to use LTSI for the products



- Use LTSI as an alternative of upstream and/or Soc code
 - Keep maintained about 2 years
- If you need features in upstream, try to find back ported patches in the staging tree
 - This is the same version of your products
- LTSI is the place to share the code among embedded industry, you can find bug fixes, experience and opinion from other vendors.
- You can submit your patch to LTSI
 - LTSI accept patches for current LTSI version
 - You can get review and recommendation by LTSI team to your patch
 - Upstream your patch will greatly reduce your porting cost

How you can participate LTSI



- Follow on Twitter account:
@LinuxLTSI



LinuxLTSI

@LinuxLTSI

LTSI stands for Long-Term Support Initiative. A group of OS Working Group of the Linux Foundation to provide Long-Term and stable Linux for Industry.

- Join mailing list:

<https://lists.linuxfoundation.org/mailman/listinfo/ltsi-dev>

Or send email with word 'help' as subject to:

ltsi-dev-request@lists.linuxfoundation.org

LTSI-dev — A list to discuss patches, development, and other things related to the LTSI project

About LTSI-dev

English (USA)

To see the collection of prior postings to the list, visit the [LTSI-dev Archives](#).

Using LTSI-dev

To post a message to all the list members, send email to ltsi-dev@lists.linuxfoundation.org.

How you can participate LTSI



- Git tree can found:

- <http://git.linuxfoundation.org/?p=ltsi-kernel.git;a=summary> and can be cloned by doing:

- `git clone git://git.linuxfoundation.org/ltsi-kernel`

- README in top directory is document that explains what is needed in a patch

- Tree contains: the Android patches, and the LTTng patches, and is based on the latest 3.0.20 stable kernel releases.

- Greg is working with the Renesas developers to add some more stuff

git://git.linuxfoundation.org / [ltsi-kernel.git](http://git.linuxfoundation.org/?p=ltsi-kernel.git) / [summary](http://git.linuxfoundation.org/?p=ltsi-kernel.git;a=summary)



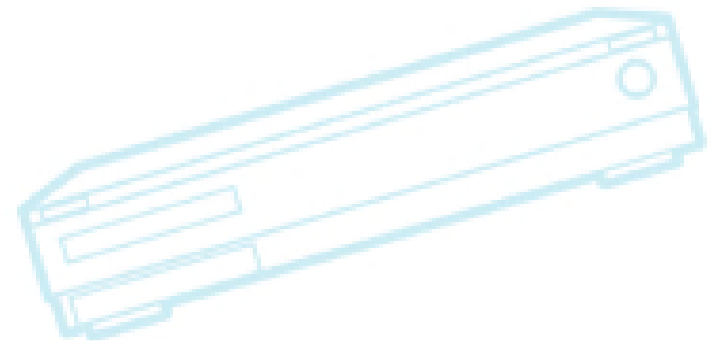
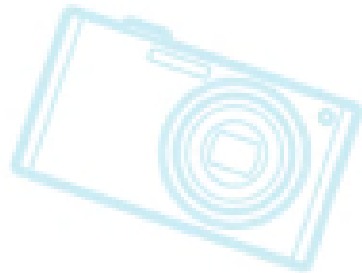
[summary](#) | [shortlog](#) | [log](#) | [commits](#) | [commitdiff](#) | [tree](#)

commit search: re

description LTSI kernel patches
owner Linux Foundation public git account
last change Wed, 16 Feb 2011 06:03:02 +0000

How you can participate LTSI

- Watch the web: *will be in public soon*
<http://ltsi.linuxfoundation.org/>
- Join CE Working group
 - CE Working Group is the place to discuss the feature to be included in the initial staging tree
 - LF corporate member can participate CEWG
 - Register Industry Contact for the company



Future plan



- Staging tree is already in public, Merge window is opened today
- Feature freeze is about End of May
- In about End of June, 1st LTSI3.0 tree will be released
 - Please consider to use LTSI for your product and send your code to LTSI
- IC (industry contact) meeting
 - 2012-6 @LinuxCon Japan
 - 2012-8 @LinuxCon North America
 - 2012-11 @Embedded Linux Conference Europe

SUMMARY

- LTSI provides stable kernel.
 - Define a version in every year, maintain about 2 years
 - During 2 years, bug/security fixes are back ported from upstream
- LTSI kernel is for Industry, it includes ;
 - back ported features from upstream, important features for embedded, SoC code and industry changes
- LTSI is provide place to share the code, experiences and fixes
 - That can reduce your development cost
- LTSI supports mainlining industry's patch
 - Accept patches same as LTSI version with providing review and recommendations
 - Provide opportunity to share/learn upstream activities by the Industry Contact Meeting

THANK YOU



Q&A

- What is the relationship with Yocto and LTSI
 - LTSTI will be able to be a source for Yocto project
 - We hope LTSI will be good source to create stable distribution
- What is the relationship with Tizen
 - Tizen is some kind of distribution and LTSI will provide industry usable kernel. So, If Tizen would pick LTSI kernel, it will be really stable and useful platform