SUSE® Linux Enterprise Kernel

Back to the Future

Olaf Kirch
Director Server Engineering
okir@suse.com

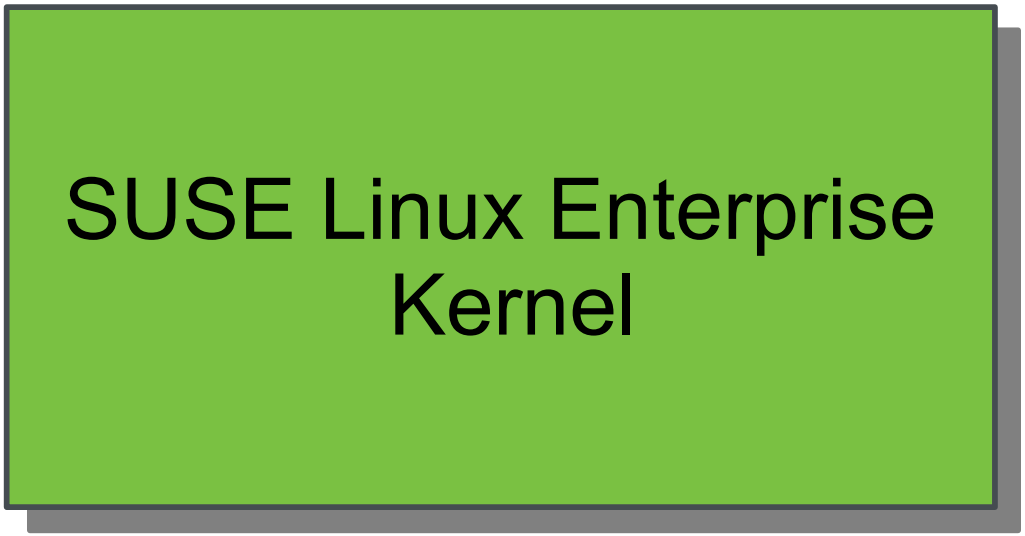
Agenda

- SUSE Linux Enterprise Service Packs
  - What makes a SUSE Linux Enterprise kernel an enterprise kernel?
  - Bringing you enterprise stability *and* more innovation
- What this Means for You

SUSE Linux Enterprise Kernel

Development Model

Four Forces of a Service Pack Kernel



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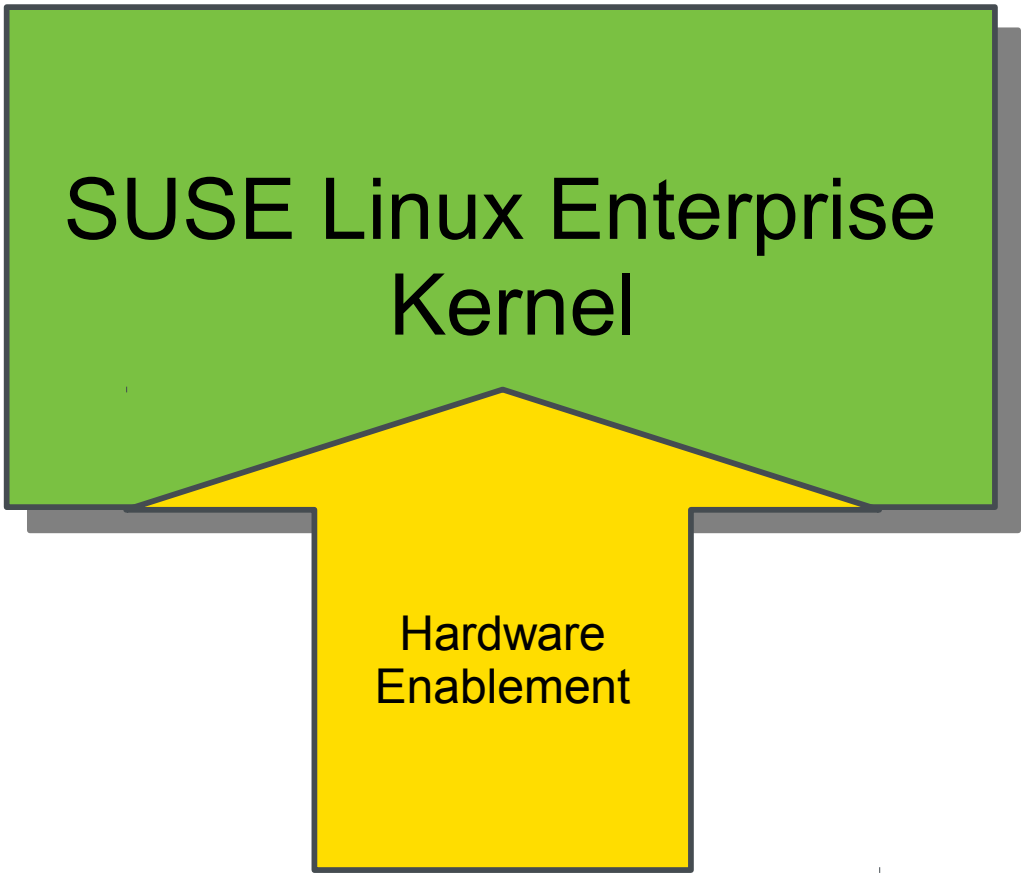

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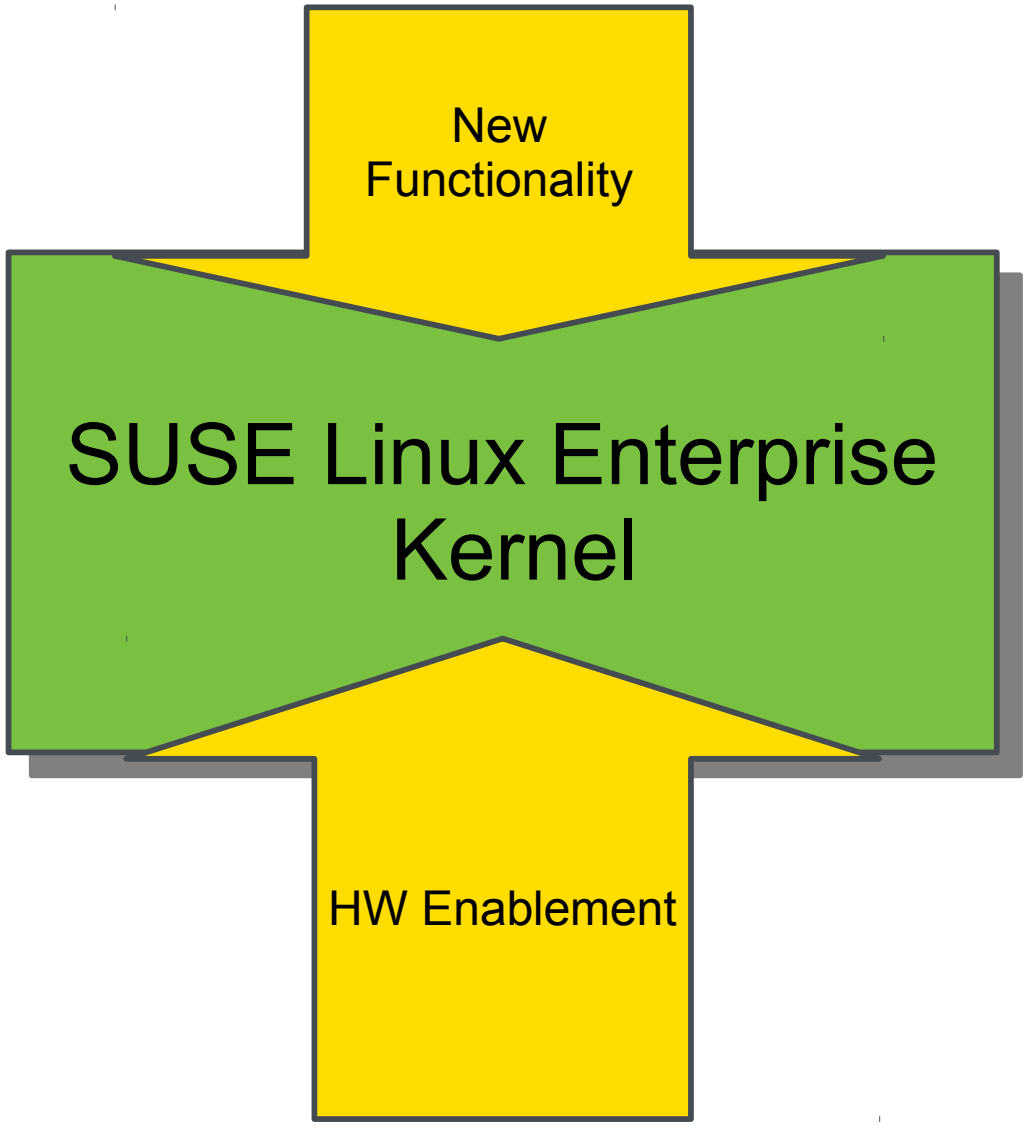

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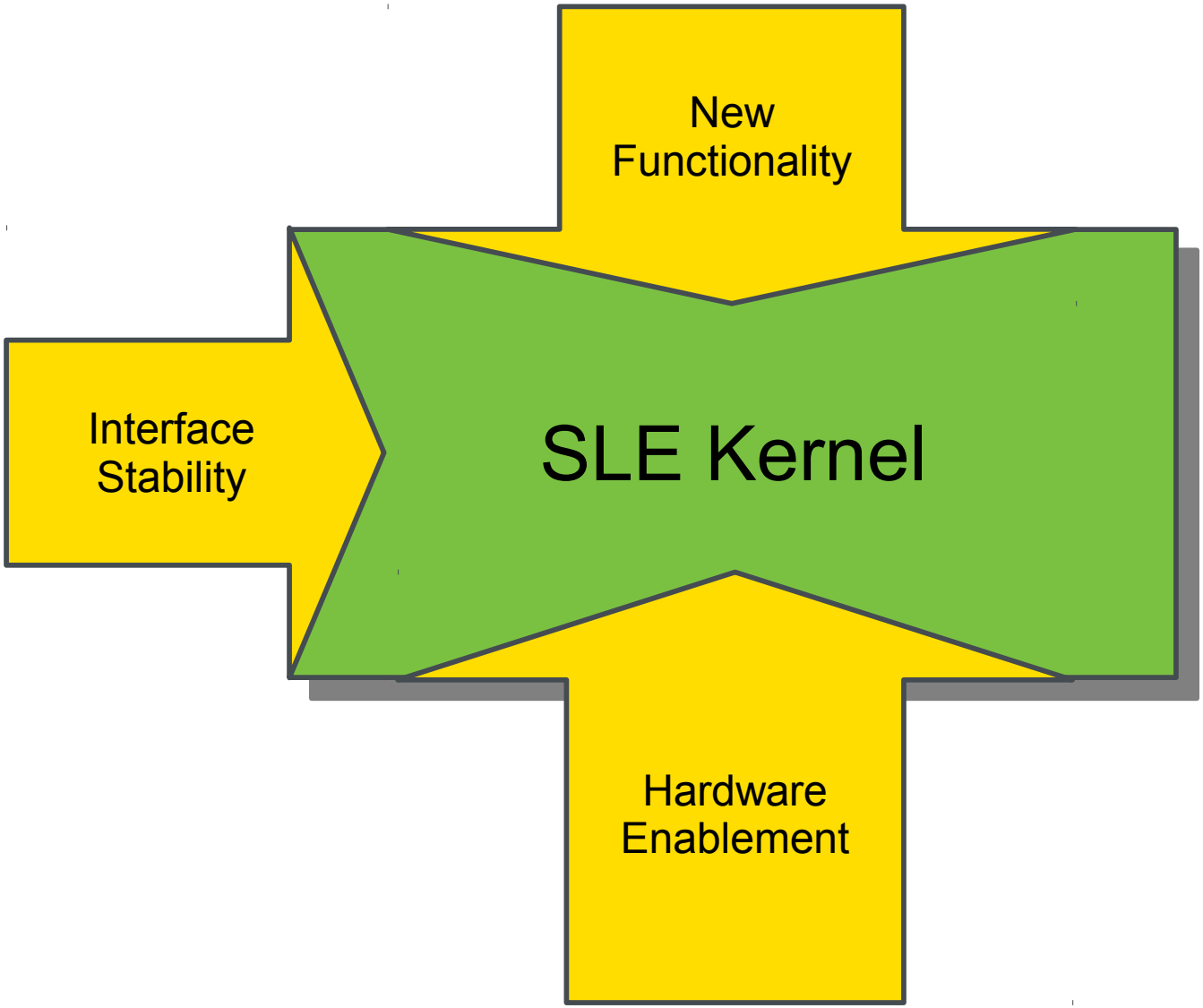

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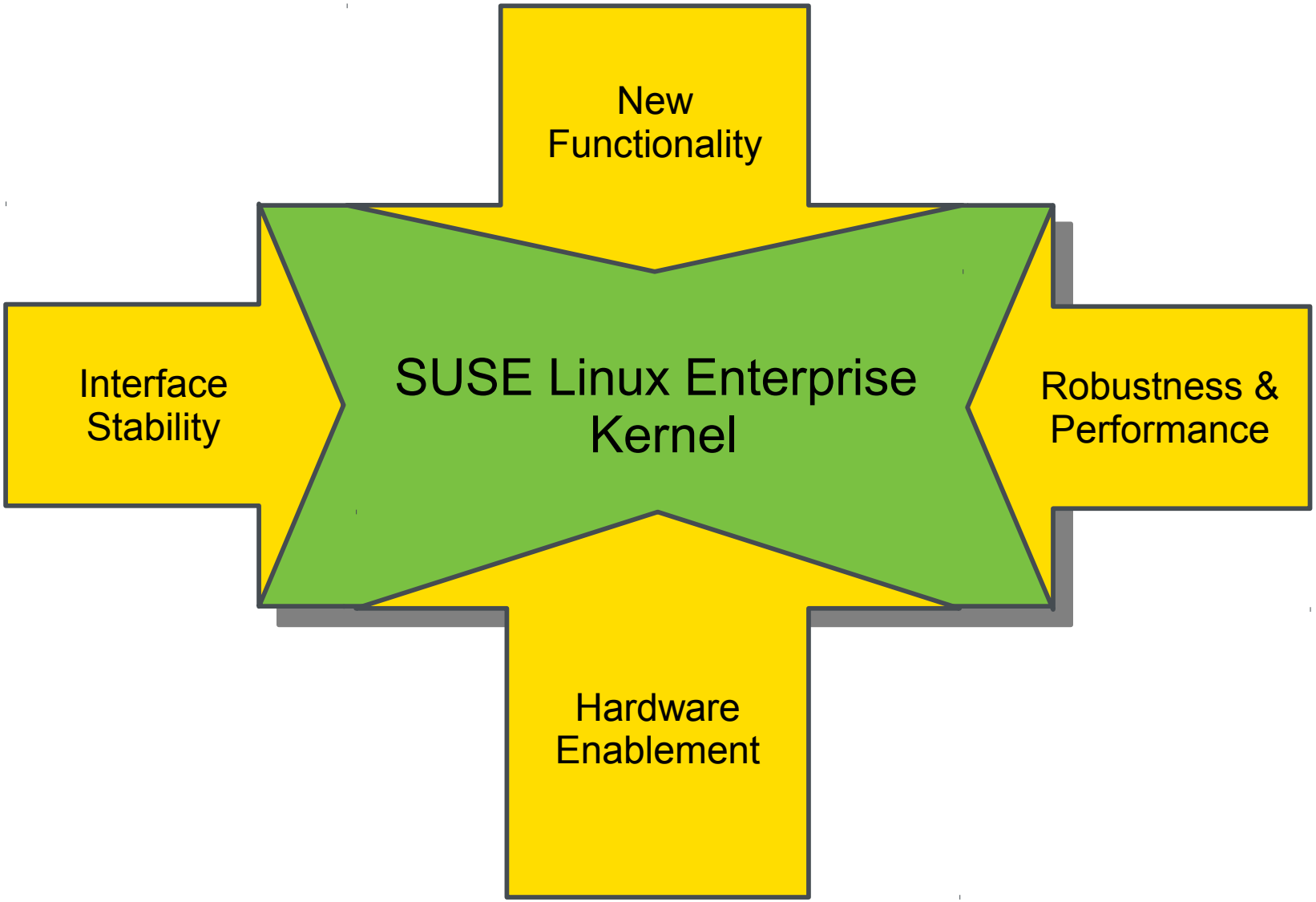
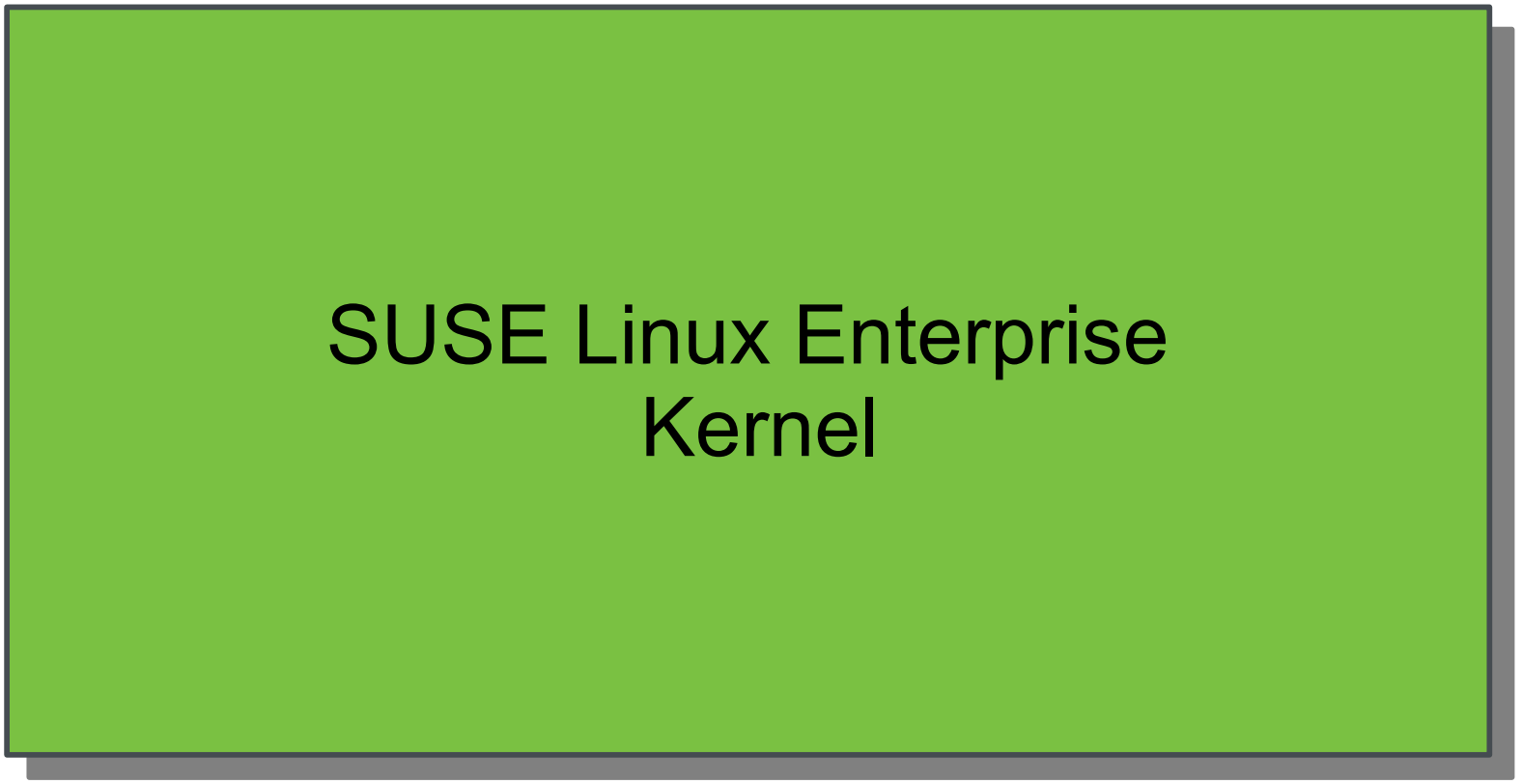


What Drives Kernel Changes in a Service Pack

- We make changes to the kernel based on
  - customer requests
  - requirements of upcoming hardware
    - new CPUs, chipsets, peripherals, and entire subsystems like USB 3.0
  - innovative changes in upstream kernel
    - btrfs, FCoE, ...
  - anticipated market needs
- These are plentiful and often massive and/or intrusive

Kernel Components Changed in a Service Pack



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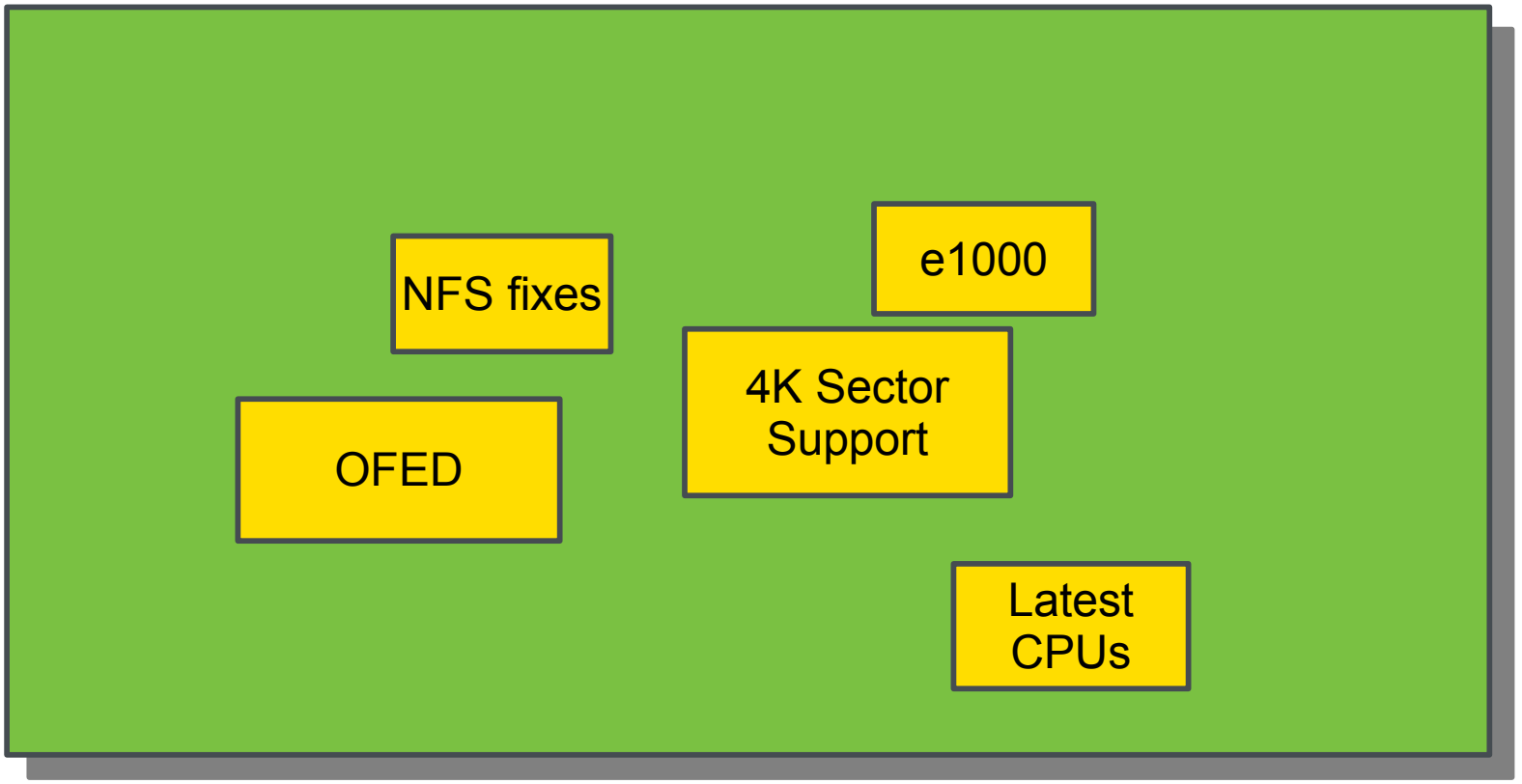

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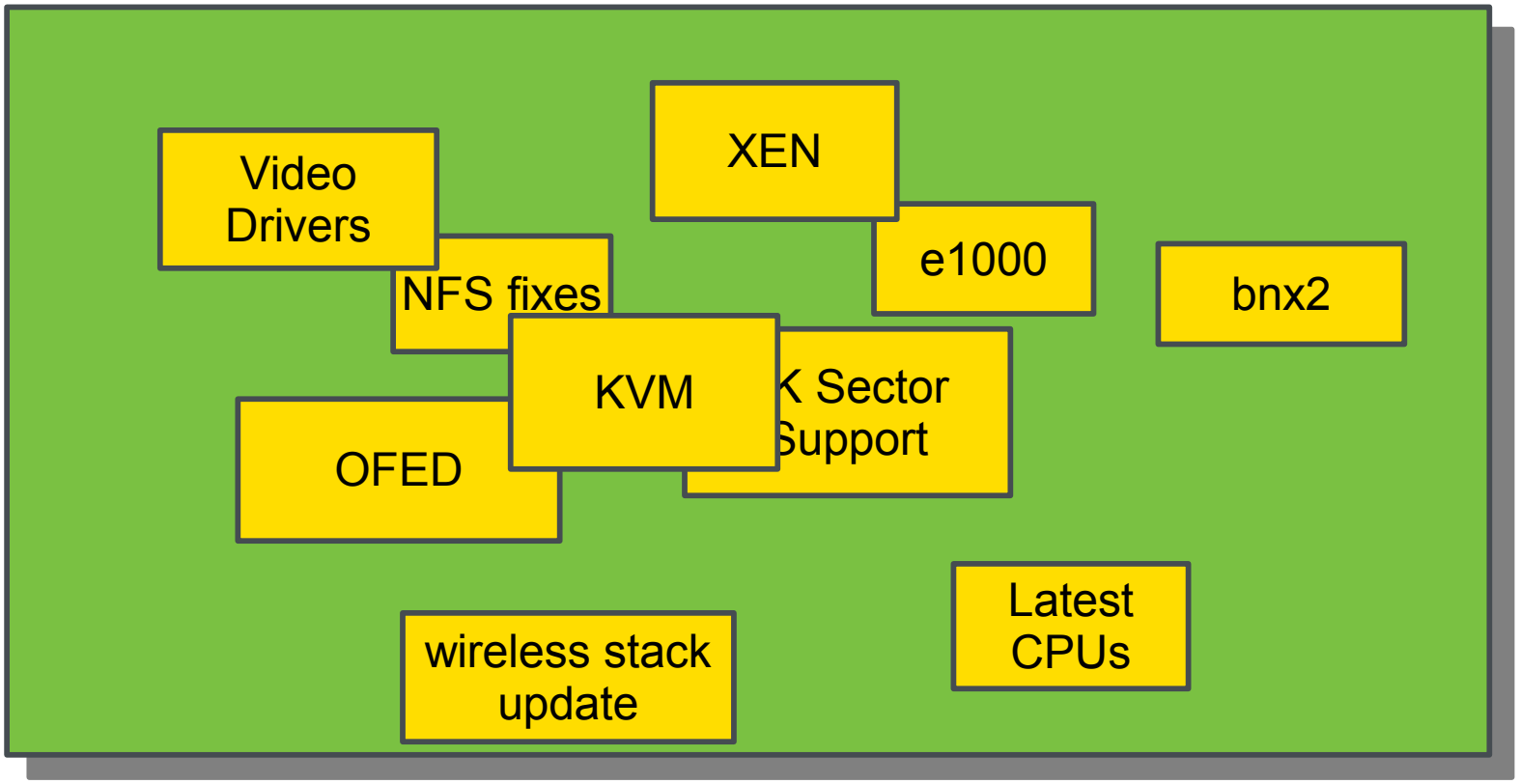

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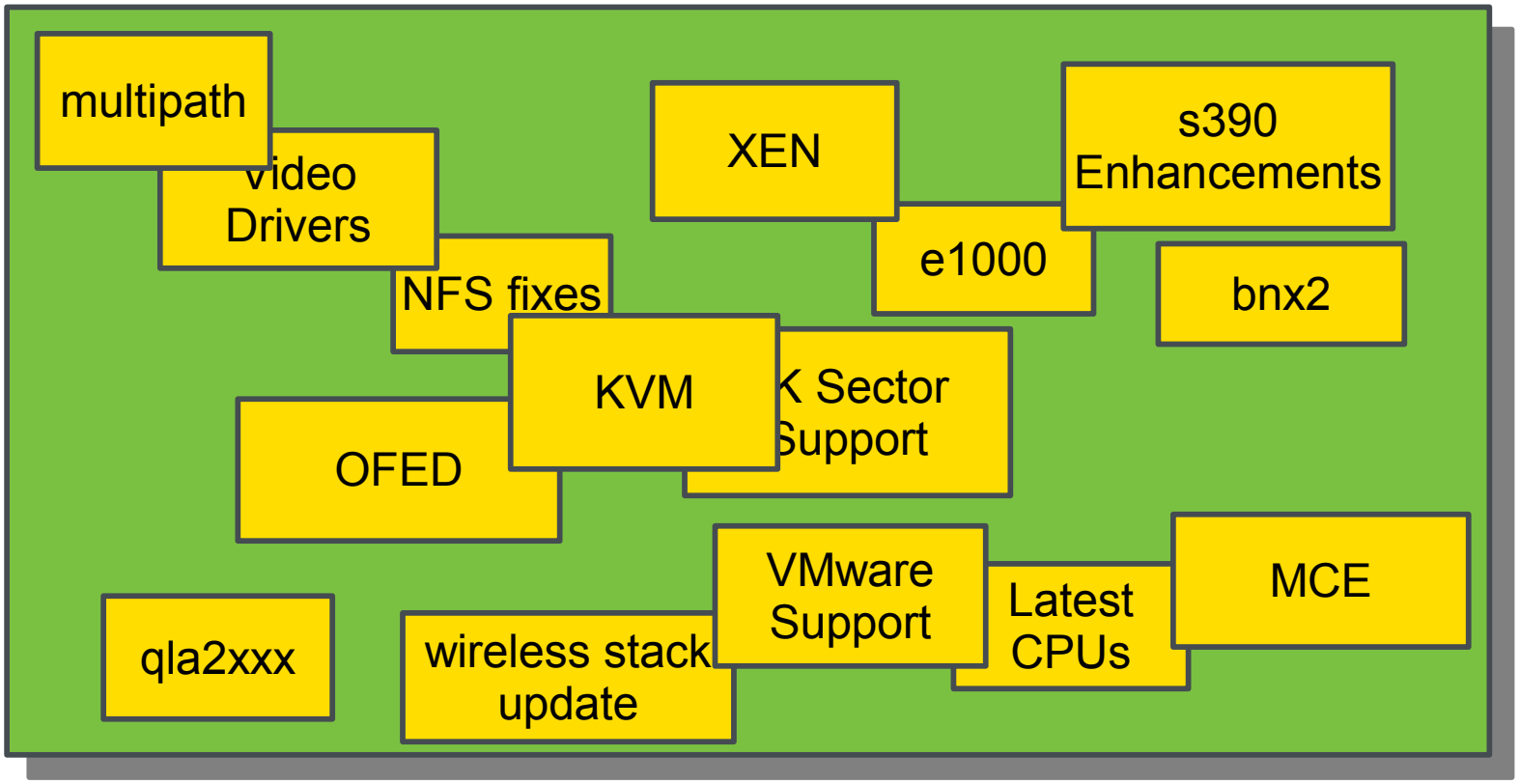

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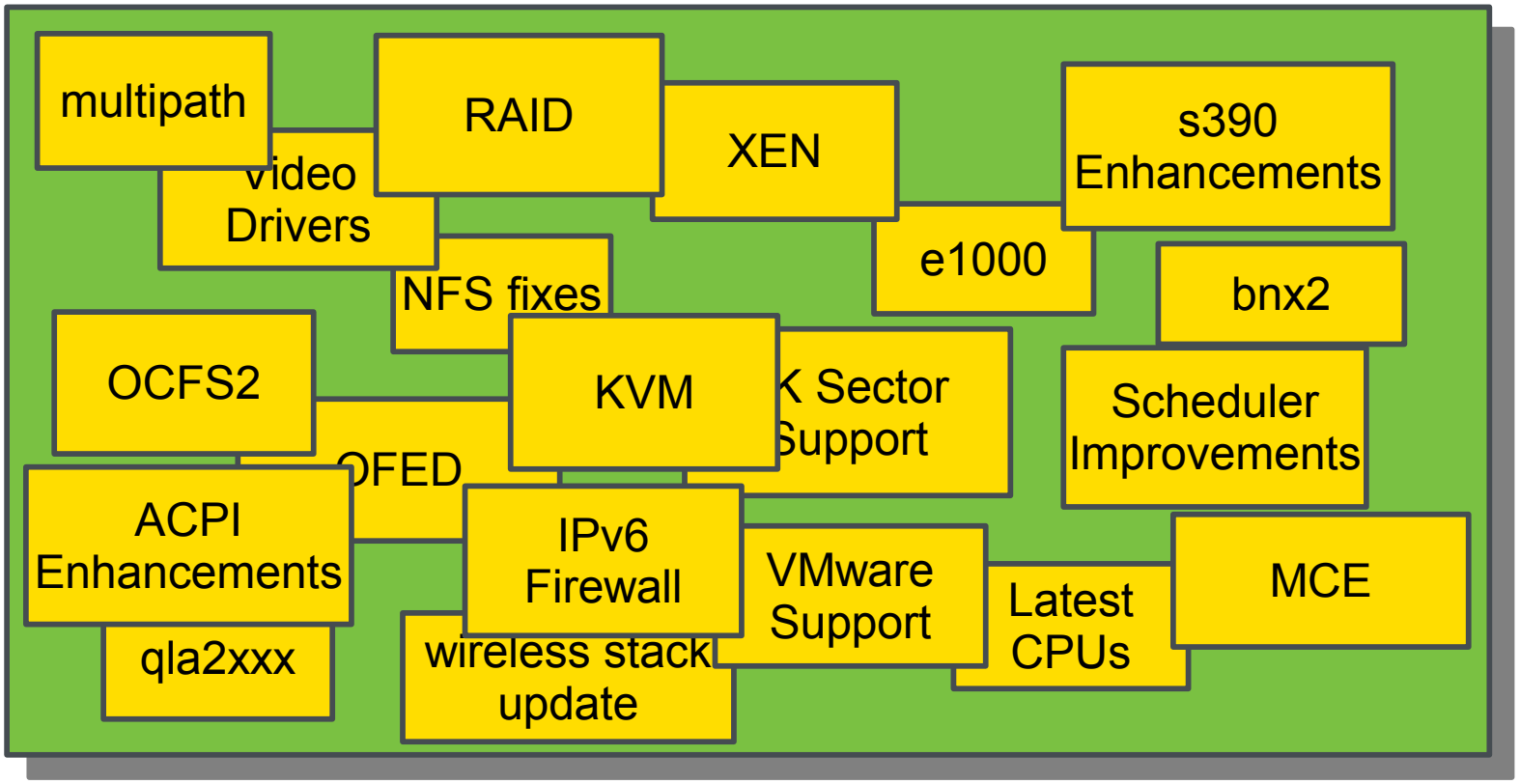

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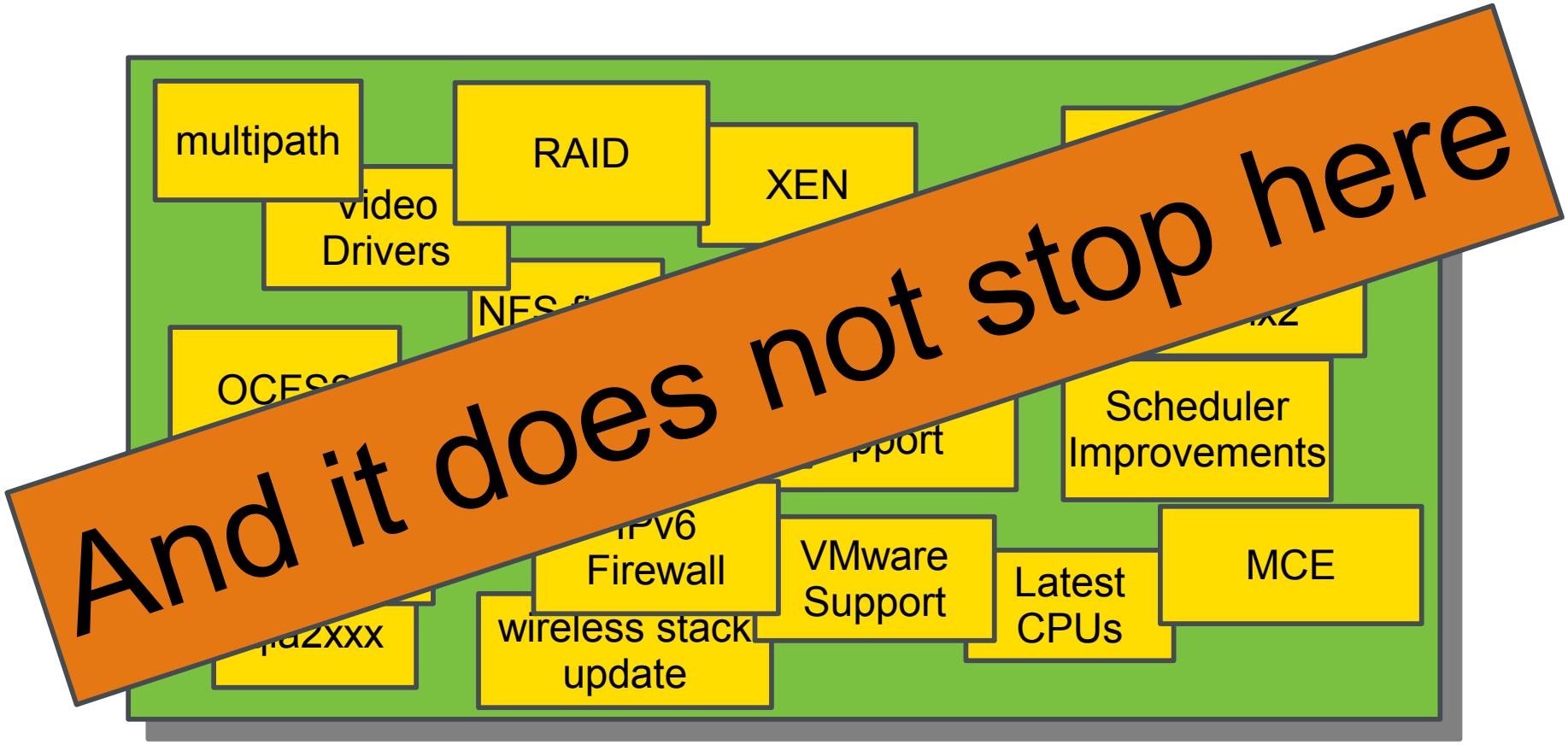

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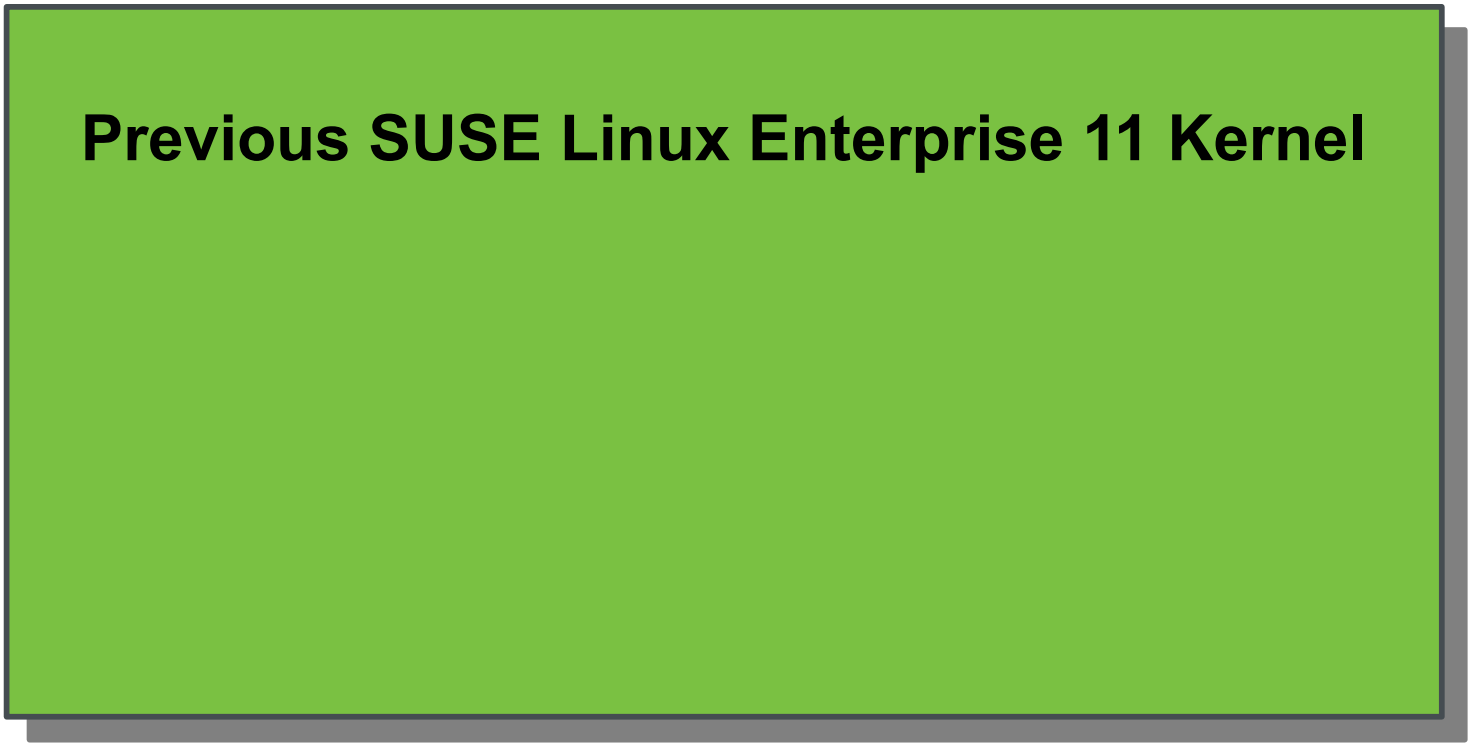

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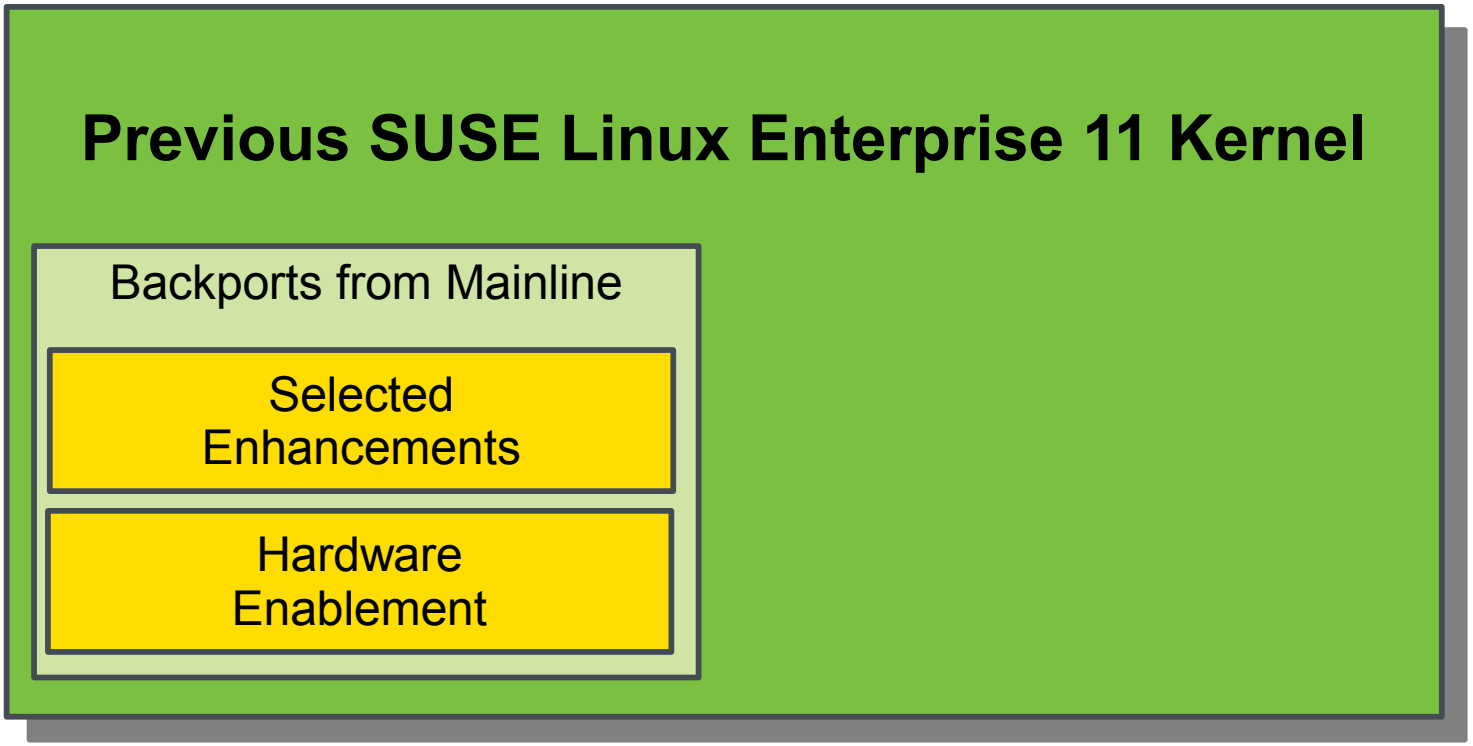

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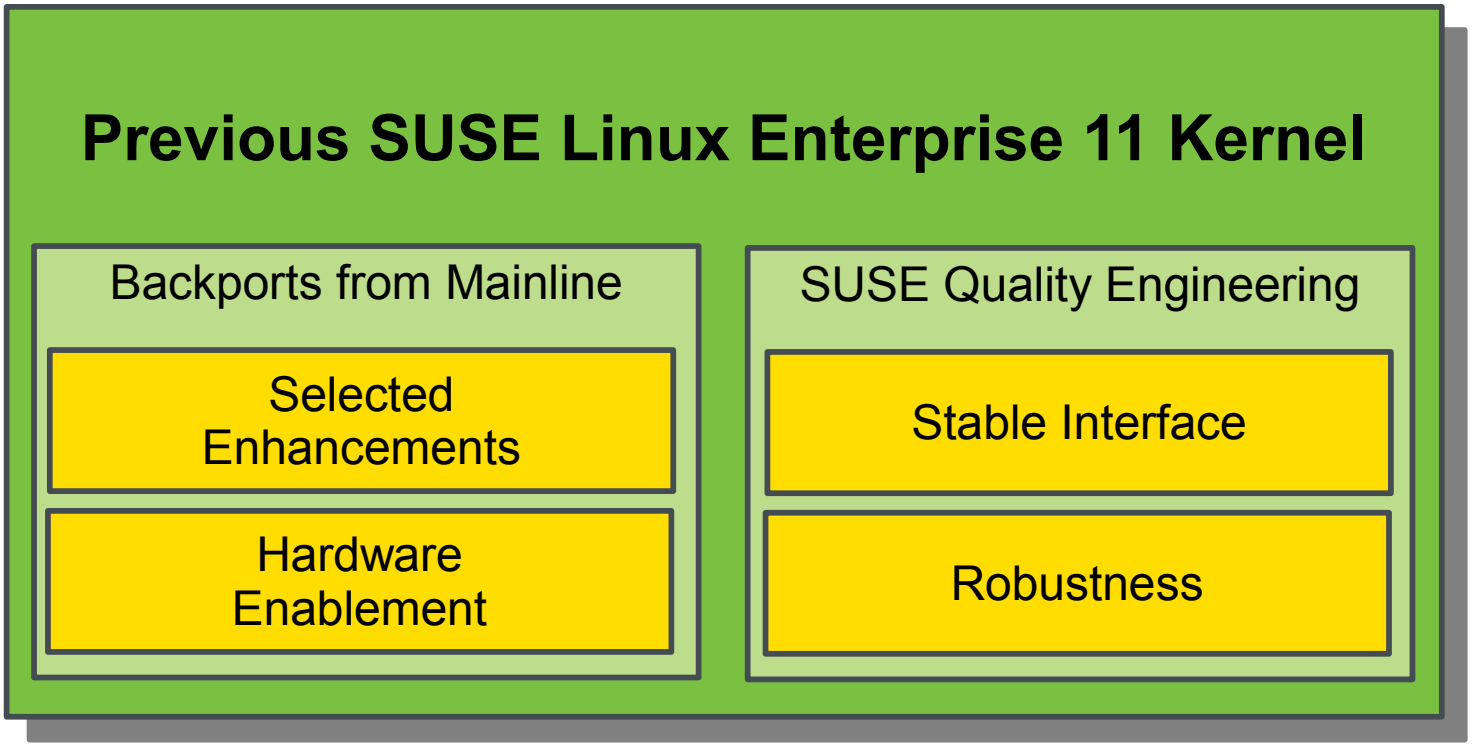

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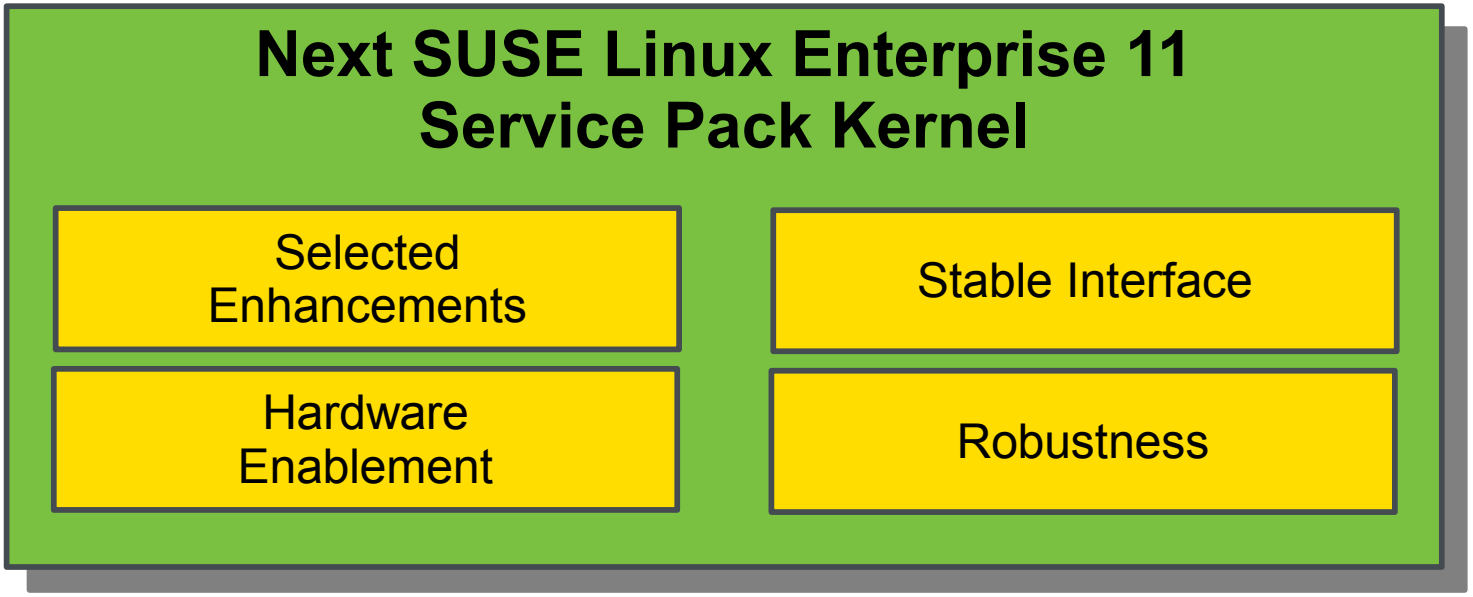


SUSE Linux Enterprise 11 SP2

A Sneak Peek into the SUSE Labs

SUSE Linux Enterprise 11 SP2

- We received about 8,000 individual Feature Requests
  - The majority of which was in the kernel area
- The changes were almost all across the map
  - Scheduler
  - Block I/O layer (including FCoE and iSCSI)
  - Virtual memory management
  - USB stack
  - Introduce btrfs as supported file system
- Still, we decided to backport to 2.6.32

SUSE Linux Enterprise 11 SP2 Beta 4

- This was a tough challenge
  - We were almost done with incorporating all feature changes
  - We worked hard on stabilizing this kernel and bring its performance up to the expected level
- The result was up to par with our Enterprise quality standards
  - Again, we proved that the approach of backporting works
  - A kernel that we could have been proud of

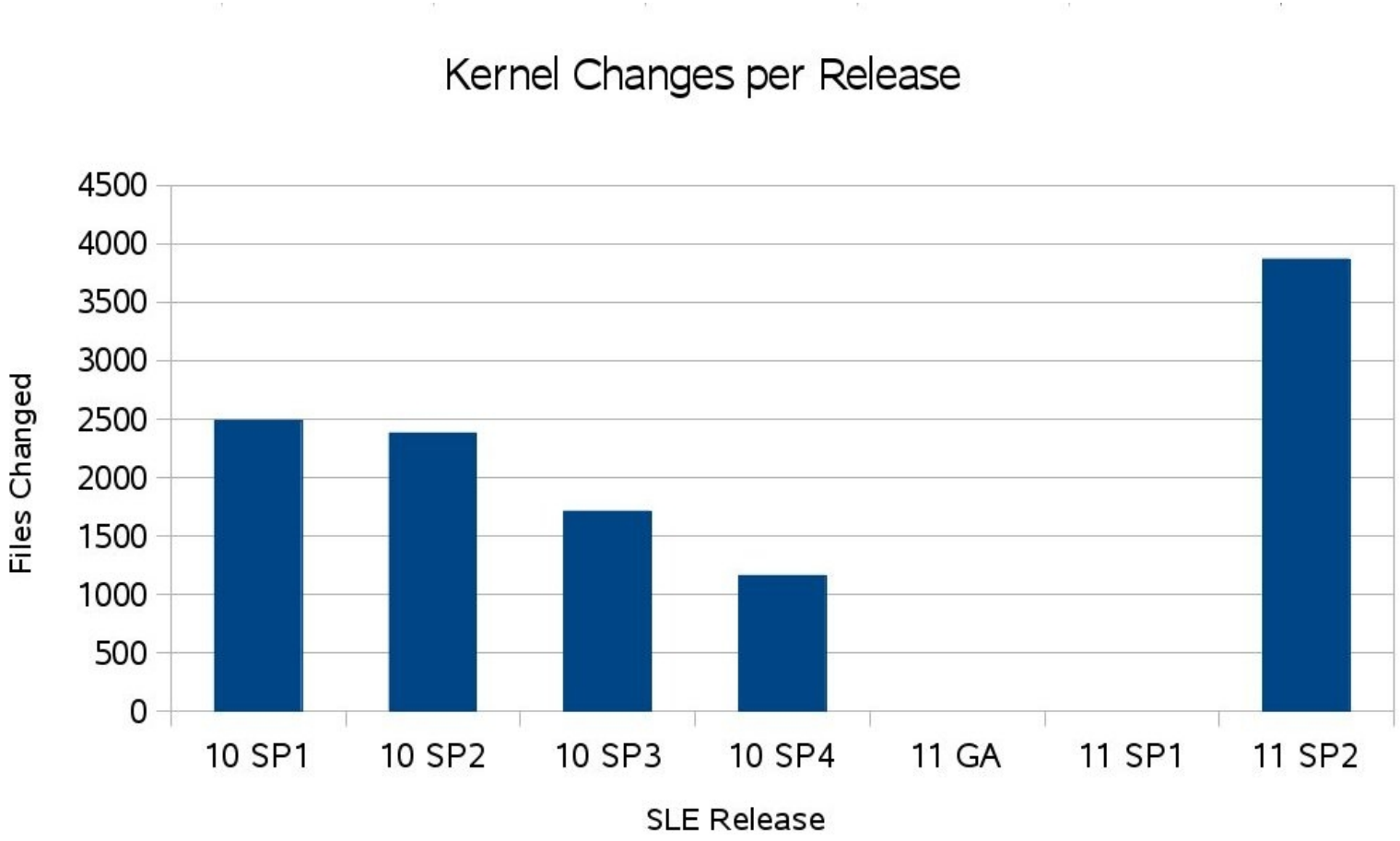
SUSE Linux Enterprise 11 SP2

- The pace of innovation has picked up further
  - As of Beta 4, the SP2 kernel carried 12,500 patches. Details:

    1142872 insertions(+), 330837 deletions(-)
  - More than twice the number of code lines changed than usual. From 2.6.32 to SLE 11 SP1 we did:

    516135 insertions(+), 114429 deletions(-)

Statistics: Scope of Kernel Changes



Is This the Best We Can Give You?

- Sadly, this Frankenkernel had no future
  - Future backports would have been anything but straightforward
  - Hardware enablement would have been almost impossible for some subsystems
  - Future service packs would have had to be be rather limited
- We did not incorporate some major features
  - pNFS would have meant another 700 patches
  - A number of virtualization improvements we missing
  - Forget about things like RADOS
- We certainly can do better!

Why Did We Stick to One Stable Kernel?

- When SUSE did the first Enterprise Linux distribution, the kernel development model was quite different
  - There was a “stable kernel” branch (2.2, 2.4) ...
  - ... and a development branch (2.3, 2.5)
- All the exciting stuff happened in the development branch
  - But it was broken more often than not

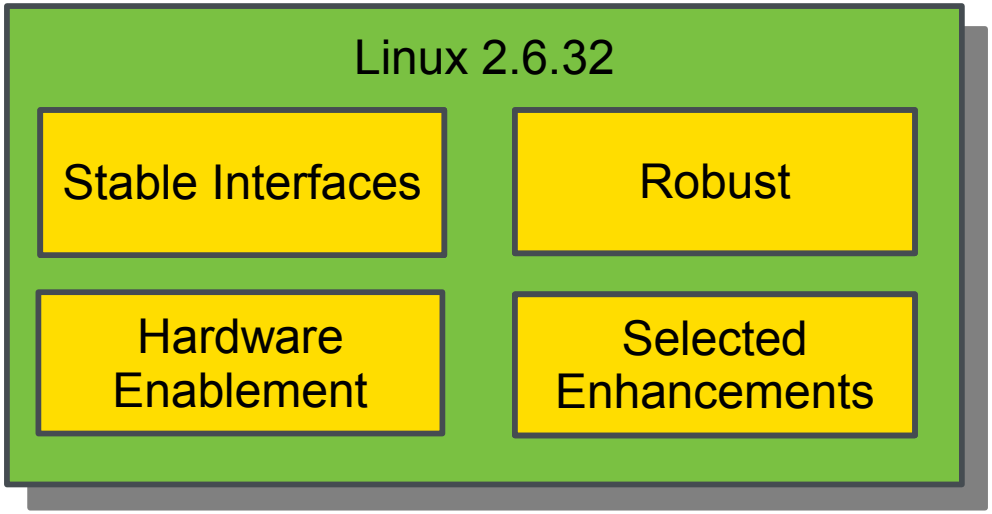
That Model has Changed!

- With the release of 2.6, the community moved to a different development model
  - No separate kernel series for development
  - Much more focus on stability of new features
- Turning an upstream kernel into a platform for an Enterprise product is still considerable work
  - But it's feasible, and actually not much different from the backporting patch-o-la we've been used to
- Linus decided that he wanted a birthday present for 20 years of Linux

For SUSE Linux Enterprise 11 SP2, we're proud to present

Linux 3.0

What Does this Change Mean?



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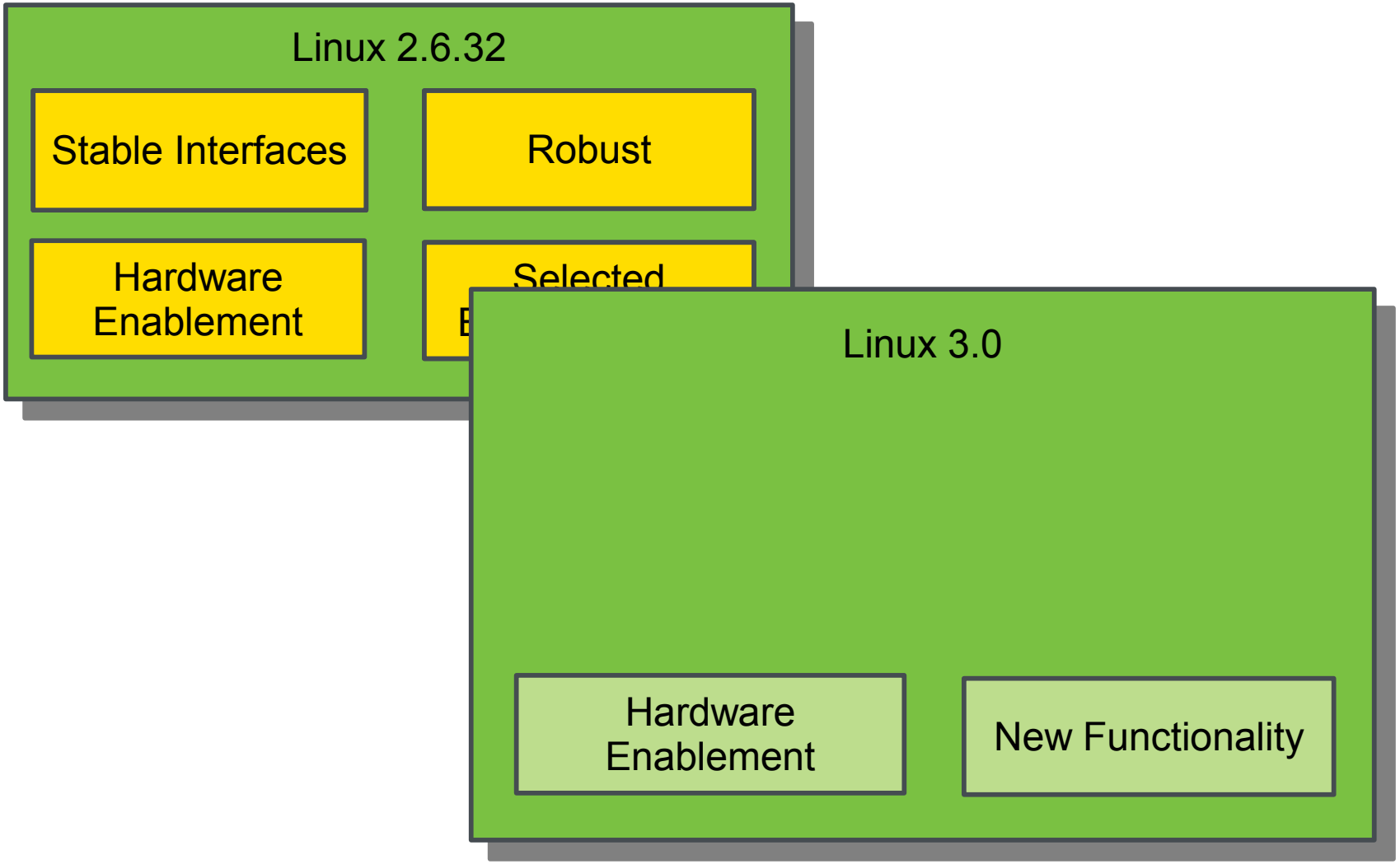

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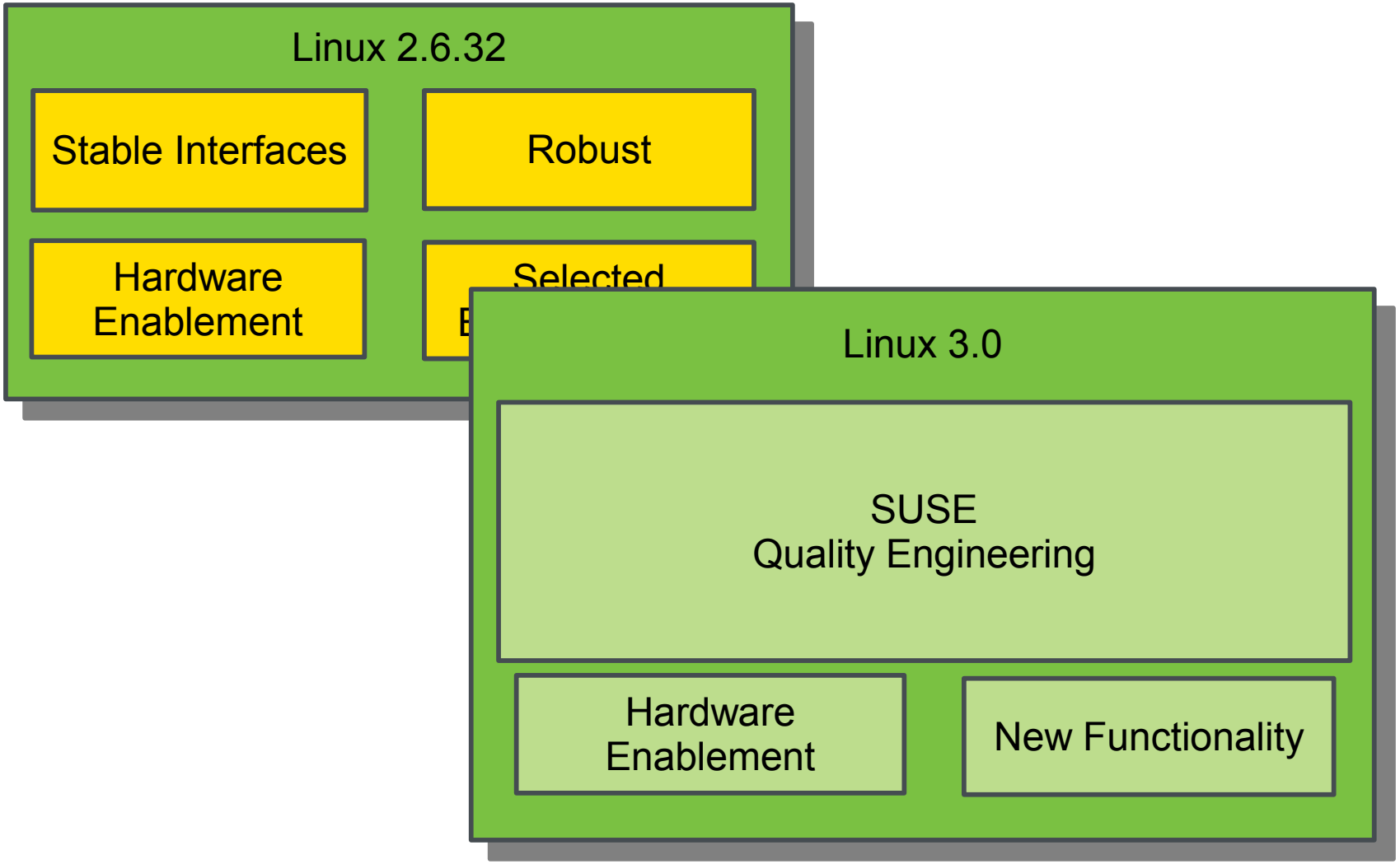

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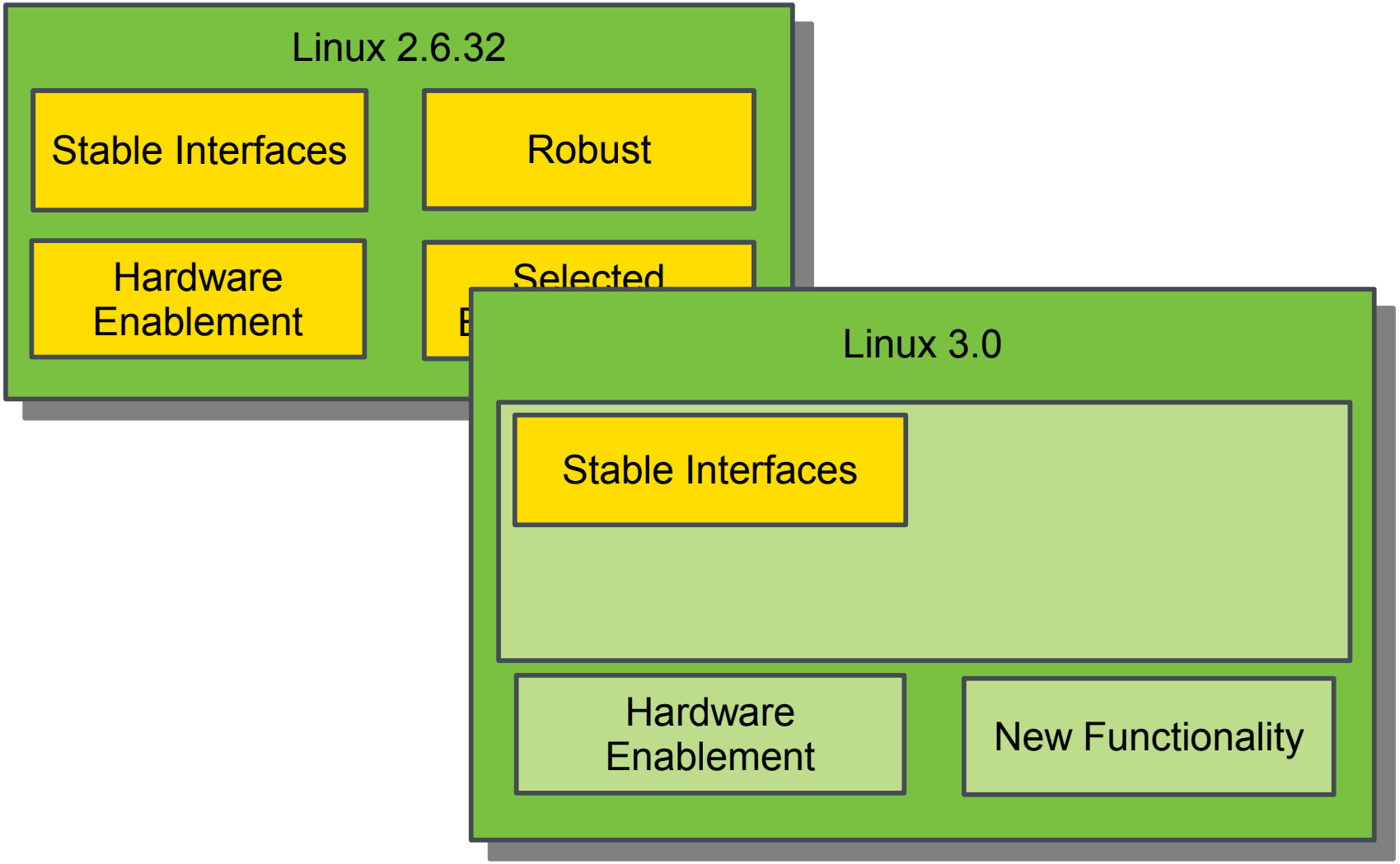

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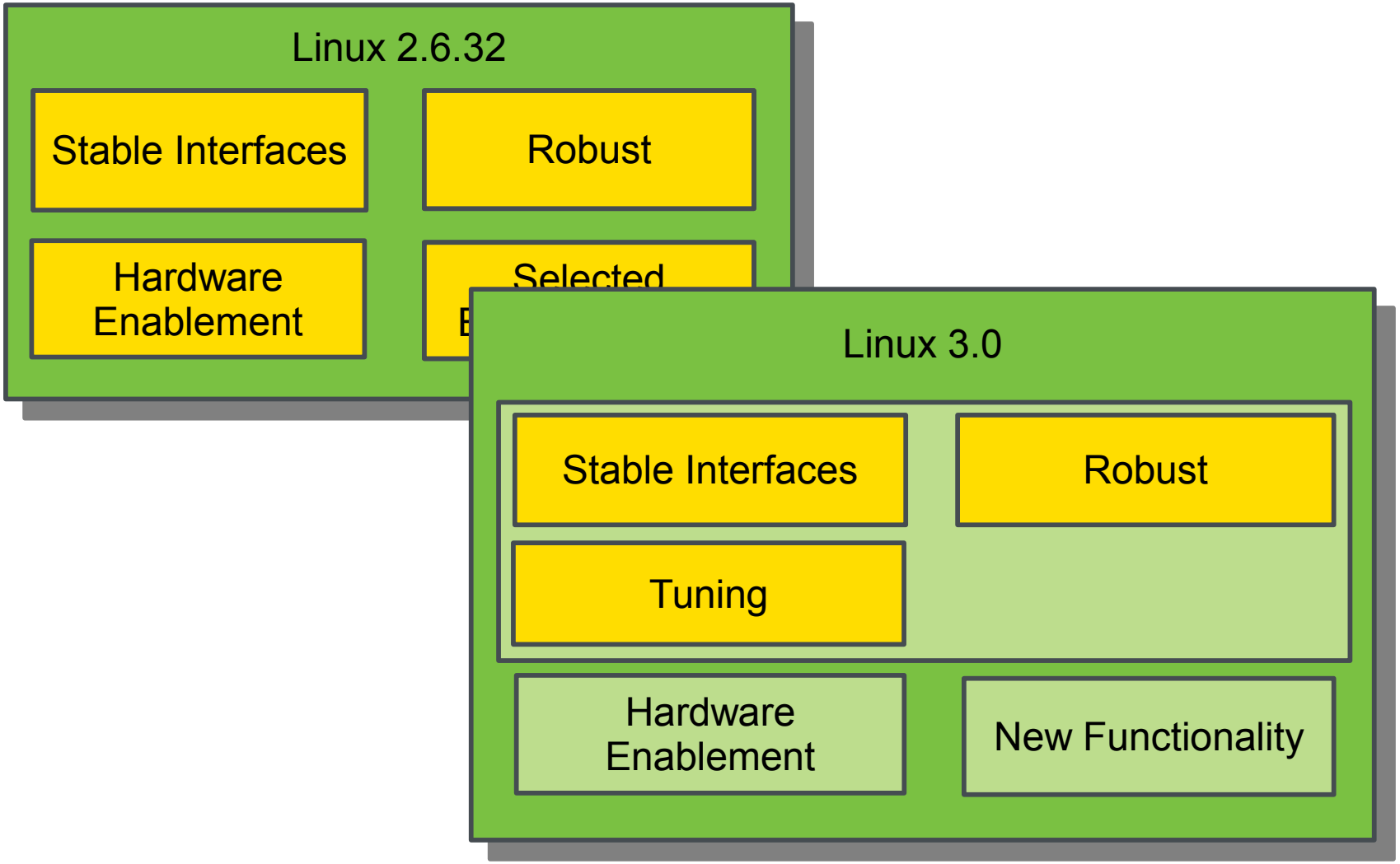

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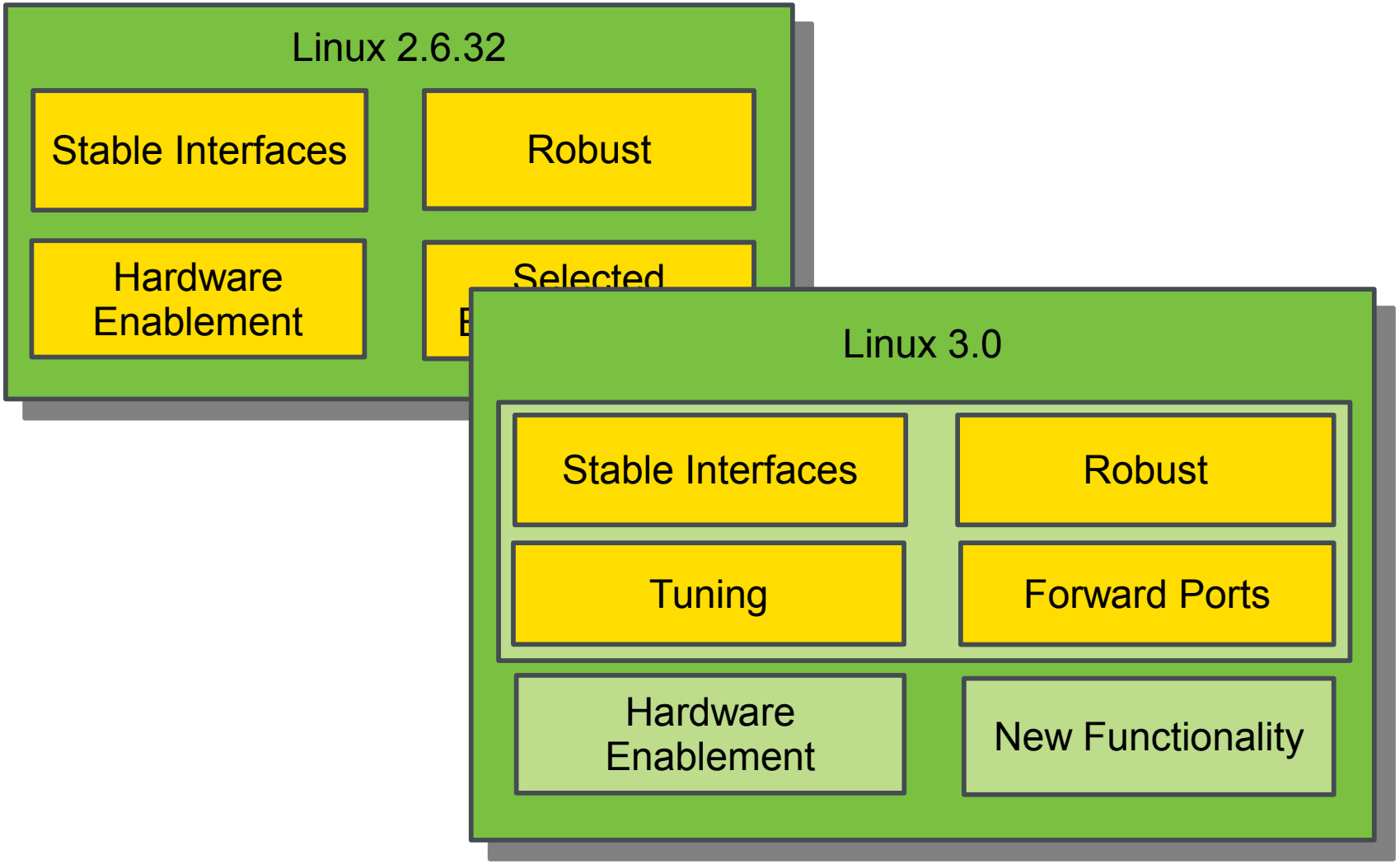
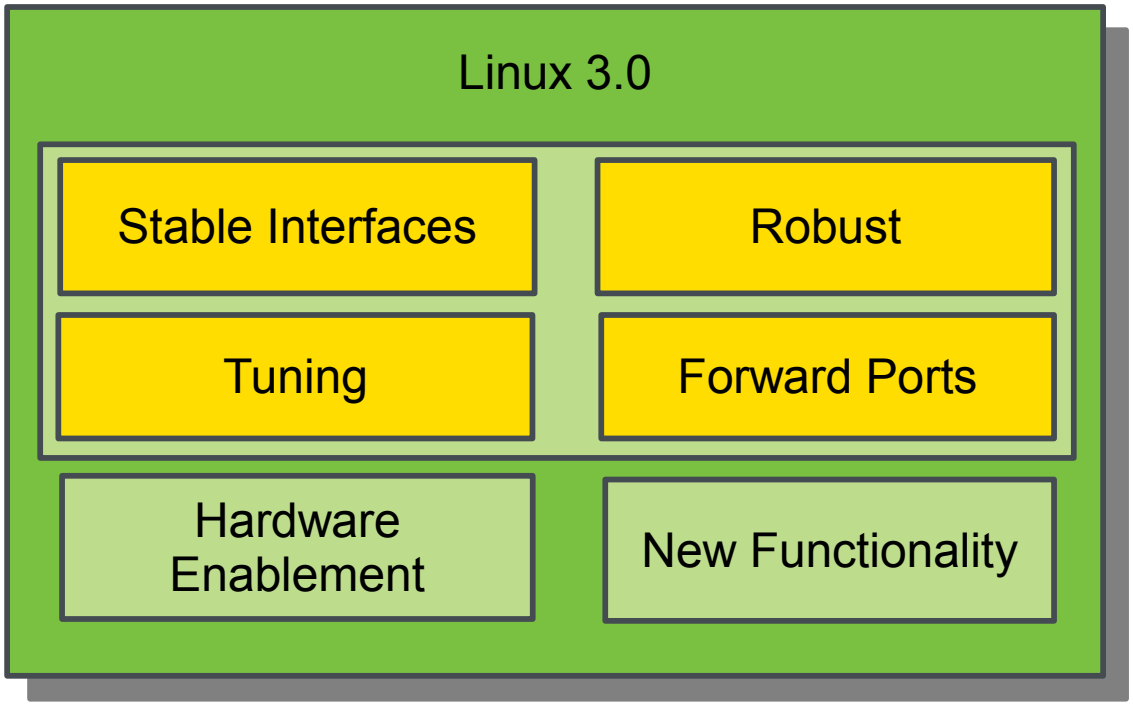


SUSE Linux Enterprise 11 SP2



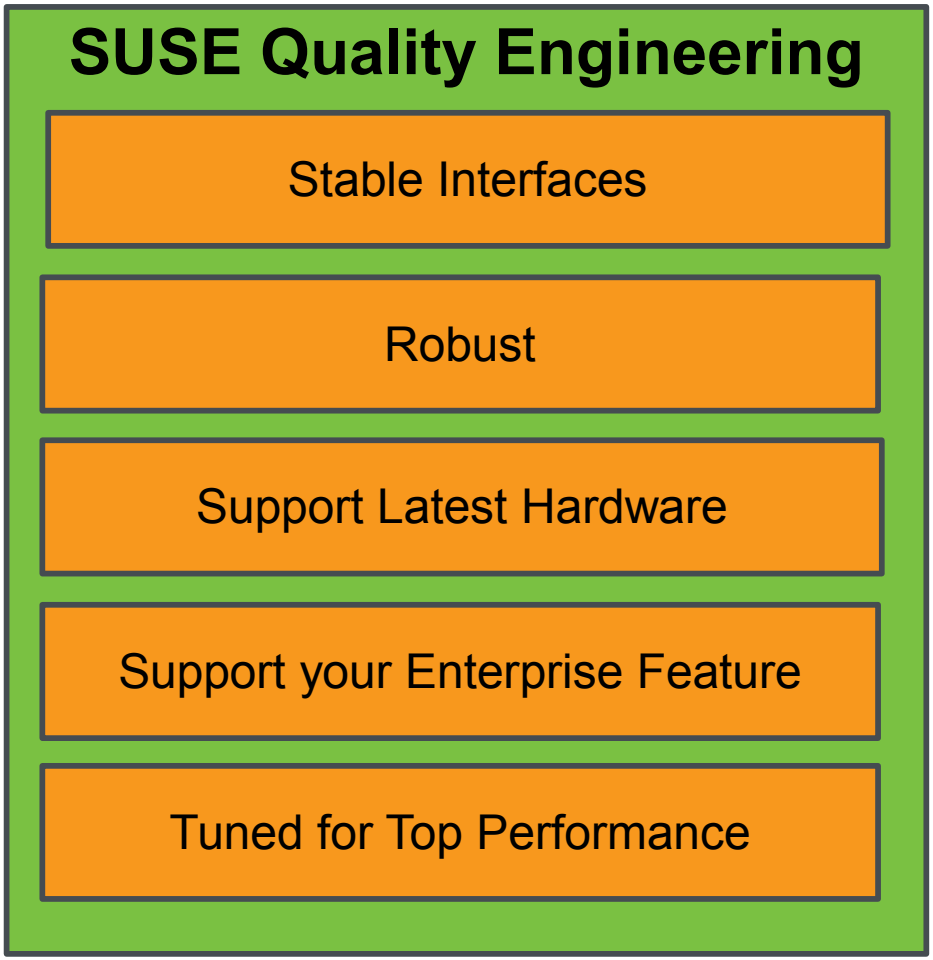
What this Means for You!

We deliver the quality you are used to

and

we give you more innovation

Yesterday, Today, Tomorrow



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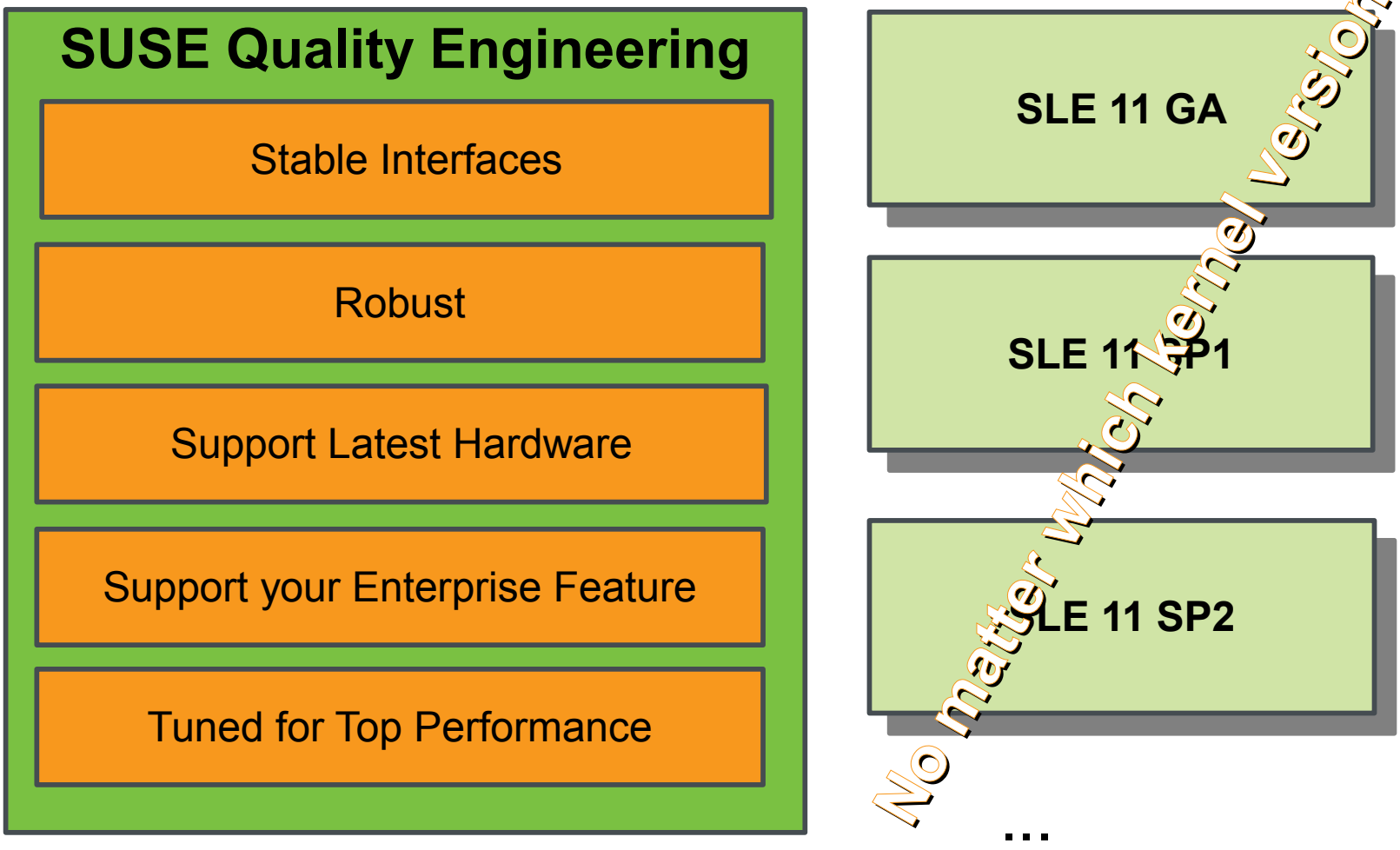

We are looking forward to your questions and feedback!

Thank you.

Corporate Headquarters
Maxfeldstrasse 5
90409 Nuremberg
Germany

+49 911 740 53 0 (Worldwide)
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