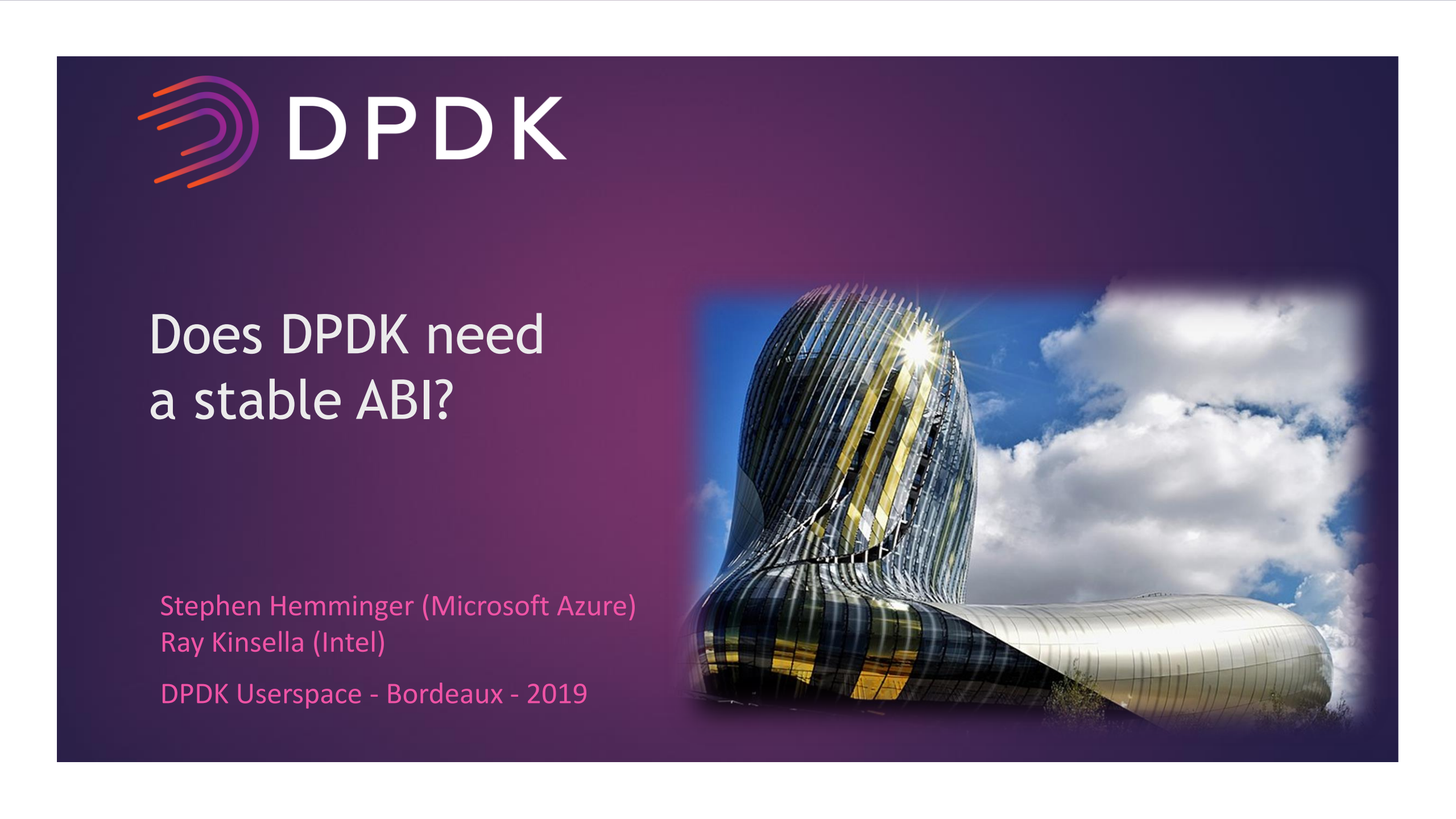

Does DPDK need a stable ABI?

Stephen Hemminger (Microsoft Azure)
Ray Kinsella (Intel)

DPDK Userspace - Bordeaux - 2019

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Adapting to change?

Development Processes

Waterfall → Agile → DevOps

Application Architecture

Monolithic → Multi-tiered → Micro-Services

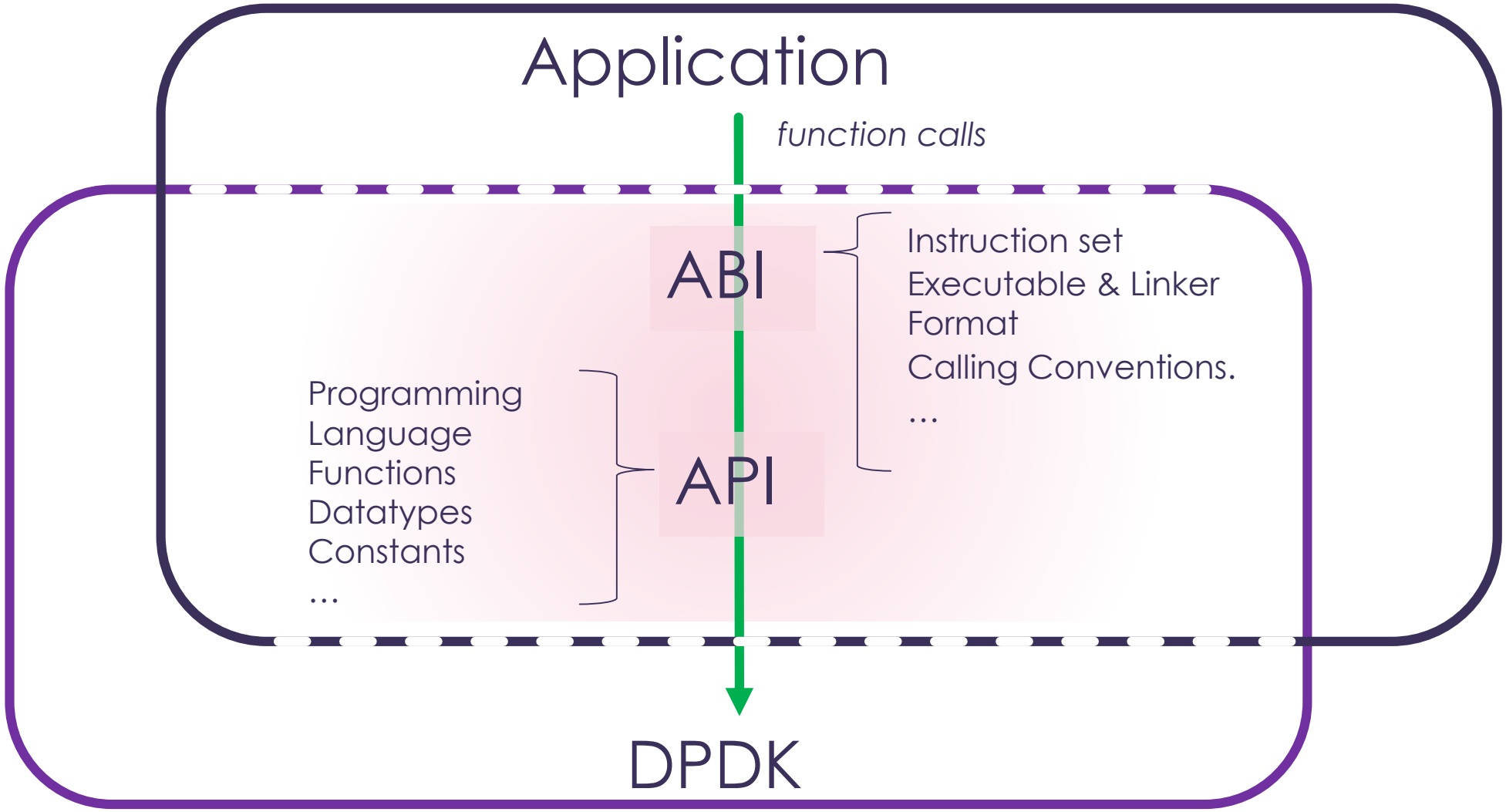
Deployments

Appliances → Virtual Machines → Containers

Data-Plane Development Kit

Proof of Concept → Open Source Project → Product

What is an ABI?



Why ABI Stability?

Maintaining a stable ABI for this change is impossible!

Contributors

There is too much DPDK ABI churn, keeping up to date is impossible!

Application Developers

These network apps are just broken and it is impossible to update them!

NetOps Engineers

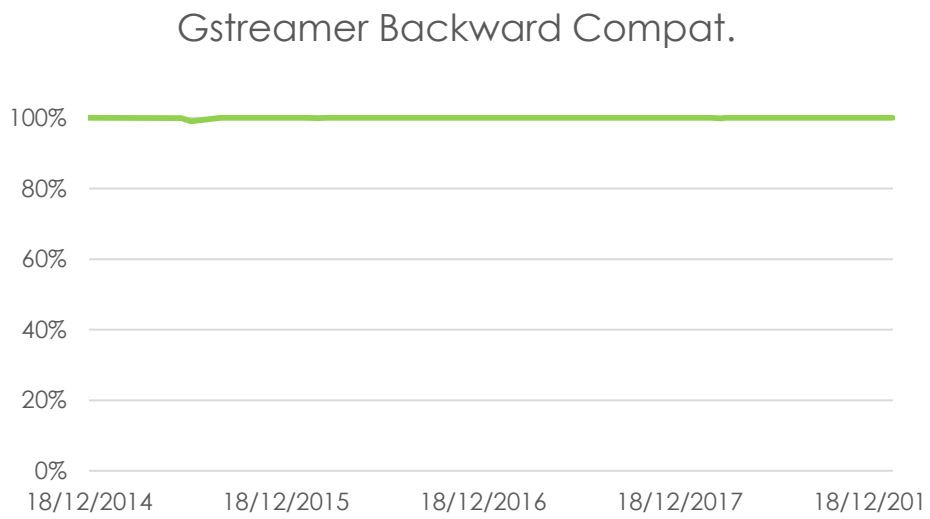
Linux Kernel ABI Stability

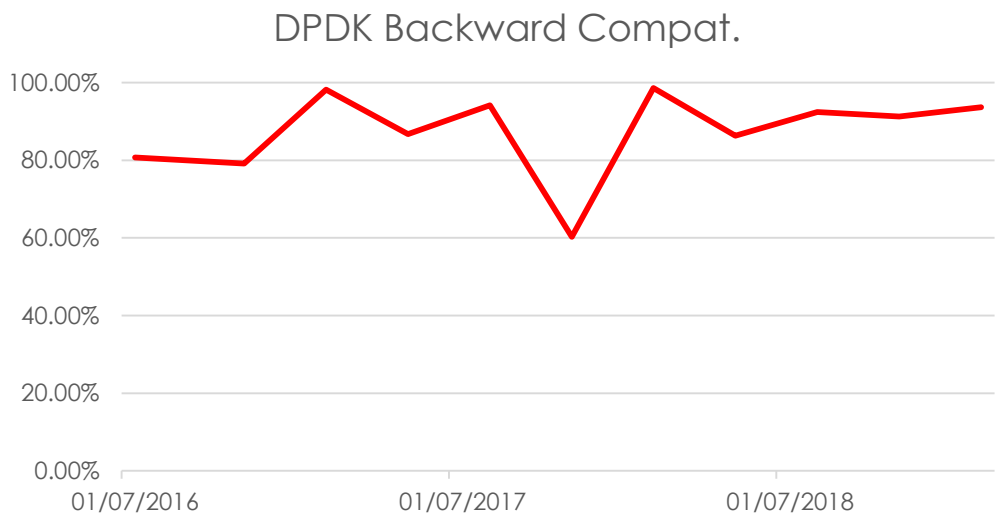
We care about user-space interfaces to an insane degree. We go to extreme lengths to maintain even badly designed or unintentional interfaces. Breaking user programs simply isn't acceptable.

Linus Torvalds, 2005

Linux Tux, by Larry Ewing 1996.
Public Domain

Comparative ABI Churn





GStreamer Application Binary Interface

- 100% backward compatible within Major Versions (1.x).
- Stable since 1.4.5, typically < 1% change between Major Versions.

https://abi-laboratory.pro/index.php?view=timeline&l=gstreamer

DPDK Application Binary Interface

- 8.7% median ABI churn between quarterly releases.
- LTS release ***is*** API stable for 2 years, however limited backporting of new features or HW.

https://abi-laboratory.pro/index.php?view=timeline&l=dpdk

Thanks to ABI Laboratory for providing the ABI analysis tools.

Proposals on ABI Stability

- Major ABI versions are declared every **year** and are then supported for one year, typically aligned with the LTS release.
- The ABI version is managed at a project level in DPDK, with the ABI version reflected in all library's soname.
- The ABI should be preserved and not changed lightly. ABI changes must follow the outlined deprecation process.
- The addition of symbols is generally not problematic. The modification of symbols is managed with ABI Versioning.
- The removal of symbols is considered an ABI breakage, once approved these will form part of the next ABI version.
- Libraries or APIs marked as Experimental are not considered part of an ABI version and may change without constraint.
- Updates to the minimum hardware requirements, which drop support for hardware which was previously supported, should be treated as an ABI change.

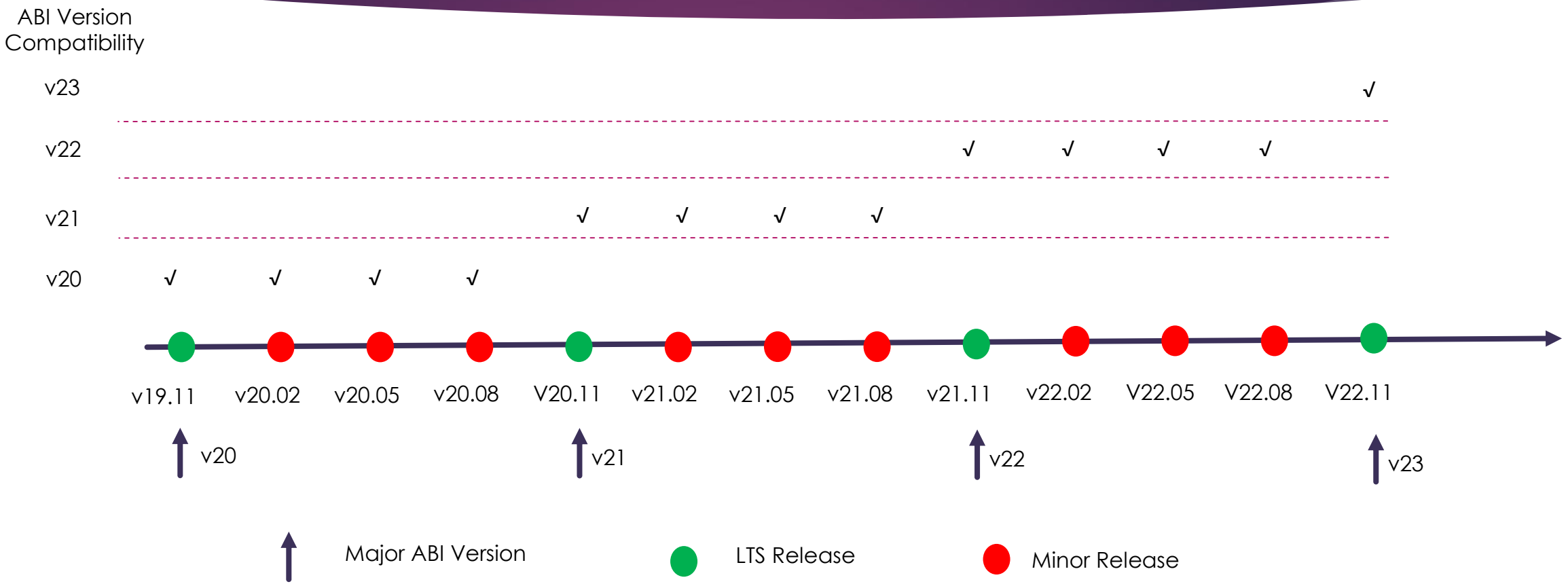
ABI / API remains stable for one year

New platform, features & improvement continue to be released.

Experimental libraries or APIs may change without restriction.

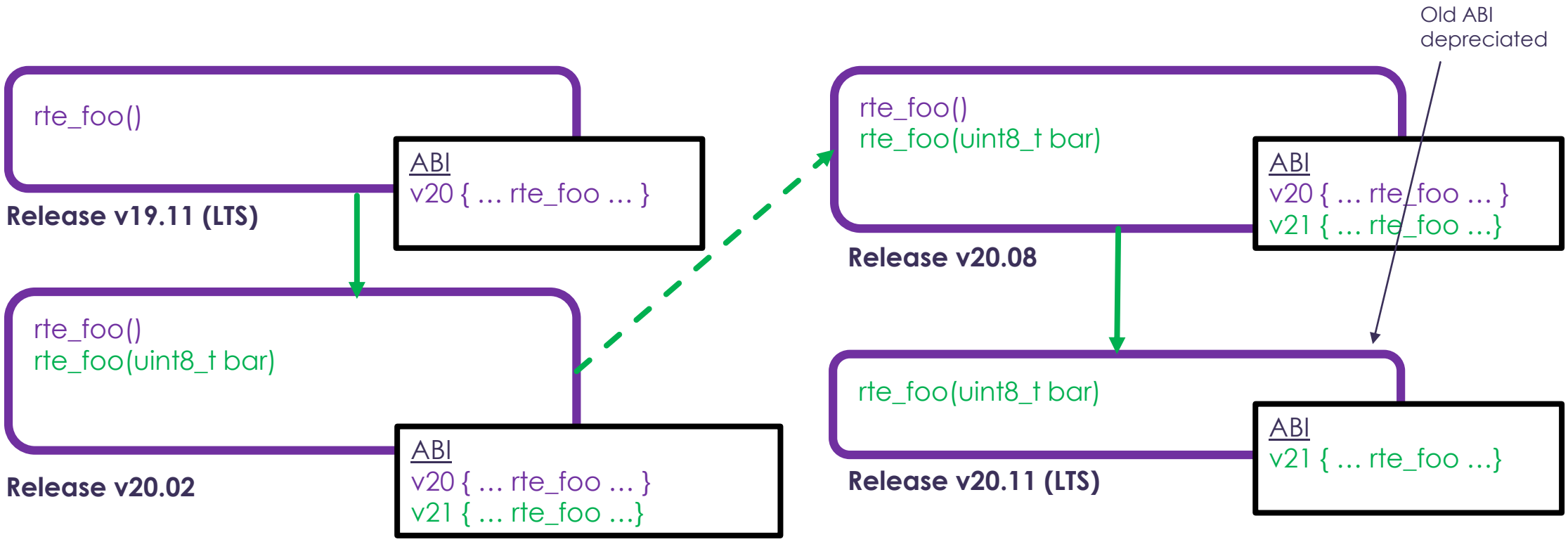
[dpdk-dev] [PATCH v3 0/4] doc: changes to abi policy introducing major abi versions

ABI Stability: major ABI versions



- Major ABI versions are declared every year aligned with the LTS release.
- ABI / API remains stable for one year, from the LTS.

ABI Stability: addition and modification



- The addition of symbols is generally not problematic. The modification of symbols should be managed with ABI versioning.
- New platform, features & improvements continue to be released.

Where the ABI policy applies

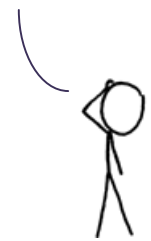
In Scope	Out of Scope
• lib • drivers (with public API's)	• lib (experimental) • api (annotated experimental) • examples • usertools • devtools • doc

Our choices …

	Best Case	Worst Case
What if we do not make this change?	Application developers are slow to adopt new versions.	Application developers start looking for an alternative.
What if we do make this change?	Contributors adding new features, need to take care of ABI compatibility	Changes breaking the ABI, get pushed to the next major ABI version

Integrating new DPDK versions is soooooooo painful ….

Gonna take some extra time, need to ensure ABI compatibility….



Next Steps

- Tentative agreement at the DPDK Technical Board.
- Supporting work - preparation for ABI stability
  - Review of exposed data structures and inline functions.
  - Supporting infrastructure to test ABI stability in the UNH lab.
  - Ensure testing of ABI Compatibility as part of the RC Test Cycle.
  - Removal of old ABI Versioning code.

Pending today's feedback, now is the opportunity to voice how this change affects you!

Questions?

Stephen Hemminger

stephen@networkplumber.org