Lessons from Ion

Laura Abbott

labbott@redhat.com
labbott@fedoraproject.org
laura@labbott.name

April 6, 2016
Which Ion?

- Not the tiling window manager
- Not the cell phone
- Not the latest framework Google released
- Yes, the framework in drivers/staging/android/ion
Who Am I?

- Not the original Ion author
- Used to crash cell phones
- Currently crash Fedora
- ”Maintainer” of Ion
Why am I talking about this?
Ion introduction

- Need a way to manage memory pools
- Everyone has a pet framework
- Ion is consolidated framework
- Sharing, allocation, mapping
- Lesson: consolidation is good
Ion concepts: Heap

- Single type of memory
- Specific carveout region, buddy pages, CMA region etc.
- bitmask of IDs for allocation
- allows for fallback depending on system configuration
- Lesson: Think about your ABIs
Ion concept: Client

- Notion of 'ownership'
- `open("/dev/ion")` and kernel APIs
- Lesson: existing models are there for a reason
Sharing

- fds for sharing
- dma_buf is the generic version
- Lesson: Take what works!
So

Do we still need Ion? Does anyone care?
Yes and...

- Android?
- Userspace allocation seems popular
- Generic allocation framework?
- Devicetree?
- Lesson: mainlining takes work. Why are you doing it?
The kernel has missing pieces, writing new things is okay
Consolodate!
ABIs are hard
Think twice before creating your own model
Do you care about getting it in mainline?
Factor out the parts that other people want
Ask who wants this in mainline
Questions?