Lessons from Ion

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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!

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?

Summary

- 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?