



GBL + Dynamic Partitions 2.0

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Android Generic Bootloader

Since Last Year

- GBL 17 shipped with frozen 1.0 protocols
- GBL 18 mandatory on mobile
- Migrated Cuttlefish to boot off GBL
- Passed security review + added Post-Quantum Cryptography support
- Added boot performance tracing and telemetry

Our Focus

- X86_64 boot support.
- Kernel UEFI stub adoption
- Resizable super partition in GBL



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Resizable Super Partition

Problem Statement

- Super Partition is fixed in size and running out of space
- Ecodesign mandates 7 years of OS updates
- New AI models consume large amounts of space
- Oversized super leads to wasted space

Solution

- Allow super to dynamically grow in size when necessary during OTA.
- Two proposed solutions. Device Aliasing and Dynamic Data Partition



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PARTITION MAP EXAMPLE



Device Aliasing

HOW IT WORKS

- Up to 7 extra "**expansion**" partitions can be added to GPT. These can be of any size.
- If an OTA requires more space than is available in **super**, data is migrated off "shared" expansion partitions as needed via F2FS ioctl
- Expansion partitions are dynamically added to **super** during install time

REQUIREMENTS & CONSTRAINTS

- **Launch Devices Only.**
- Requires **F2FS** and **android17-6.18** or higher.
- Requires **GBL** to properly implement erase/flashing logic.

Shared
Expansion Partitions

super (12GB)

userdata (200GB)

userdata_exp.shared1 (1G)

userdata_exp.shared2 (1G)

userdata_exp.shared3 (1G)

userdata_exp.shared4 (1G)

PARTITION MAP EXAMPLE



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Dynamic Data Partition

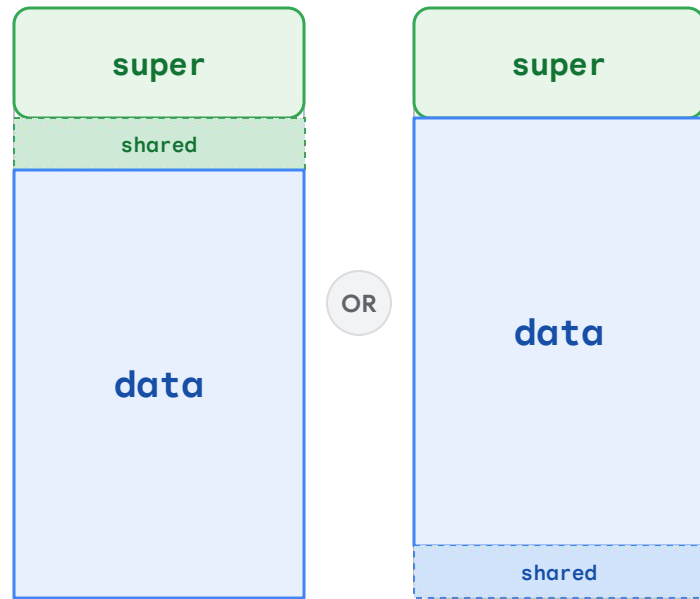
HOW IT WORKS

- Overprovision **super**; /data can store blocks at the end of super.
- Alternately, super can be sized normally and acquire blocks from the end of /data (retrofit path for < Android 18).
- On OTA, if those blocks in super are needed, /data is migrated off and shrunk.
- F2FS online resize is invoked to shrink partition as needed

REQUIREMENTS & CONSTRAINTS

- Shared size must be decided at factory time (cannot store pinned files).
- **F2FS** only; planned for android17-6.18. **GBL** required for proper flash and wipe support.

LAYOUT CONFIGURATION OPTIONS



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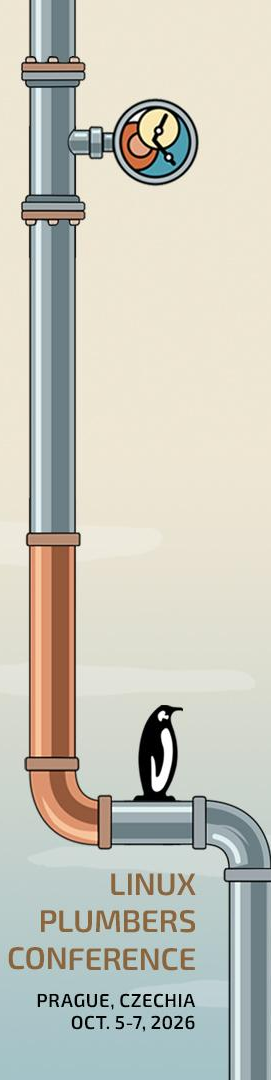
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Provisioning still requires some work

- **01. Shared Space Limits**
 - Not a panacea to provisioning issues. Updates must still fit within the set-aside shared space.
- **02. Retrofitting Timeline**
 - Retrofitting not guaranteed for Android 18 launch; more info will be available in android source. There are some technical challenges.
- **03. Slack Space Reserve**
 - Recommended to always keep some slack space free in "super" after each update, so security updates and bug fix releases do not rely on resizing.
- **04. Sideloading & Flashing**
 - Sideloading and flashing are affected. If a device on Android 18 can't boot, and wants to update to Android 22, the new OS may be too big to flash or sideload without a wipe or step-by-step updates.



Discussion?

A vertical pipe with a gauge and a penguin on a horizontal section. The pipe is grey with orange-brown joints. A circular gauge with a yellow face and blue needle is attached to the upper part. A penguin is perched on a horizontal section of the pipe that turns downwards.

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