

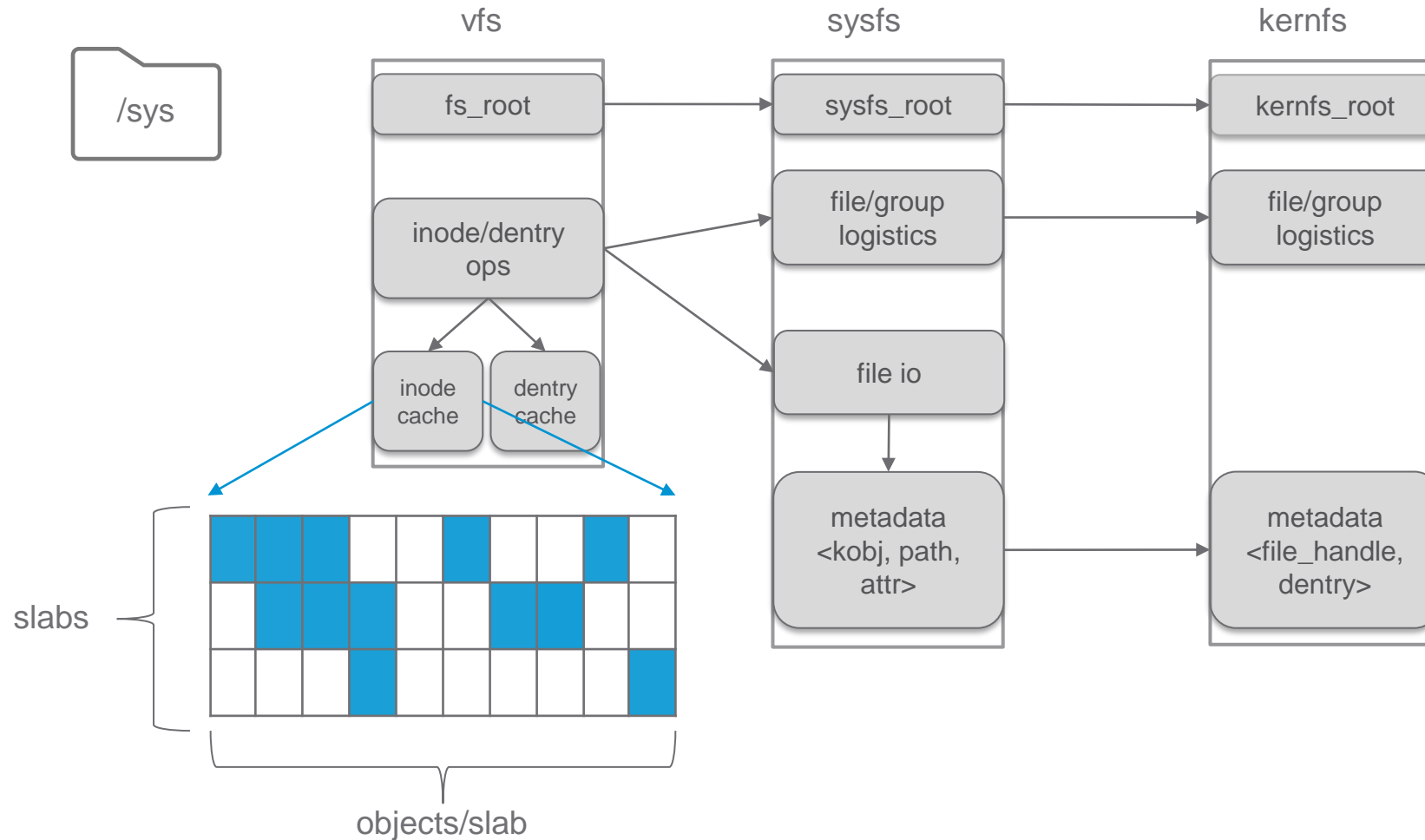
## Improve memory usage for sysfs/procfs

# Agenda

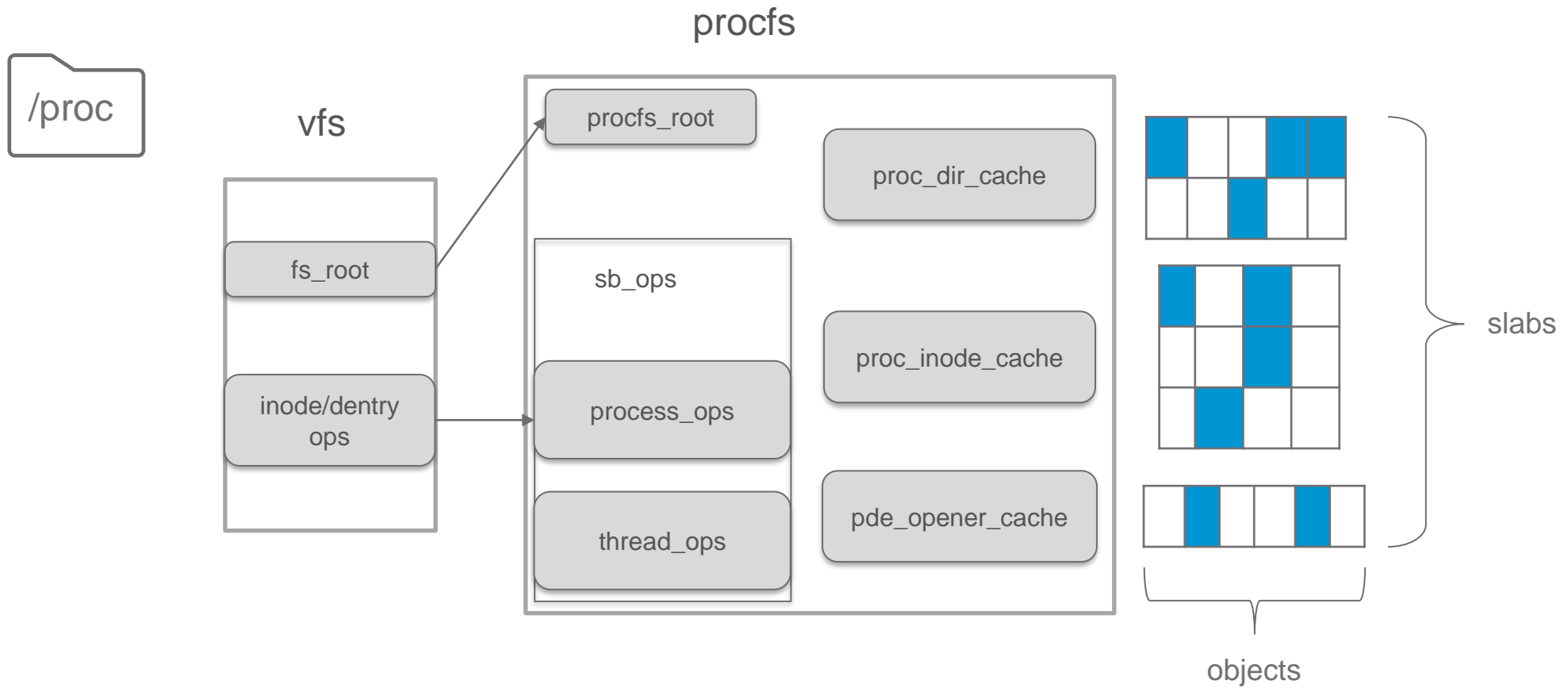
- Architecture of sysfs/procfs
- Access walkthrough
- Problem Statement
- Proposed solution

# Sysfs - Architecture

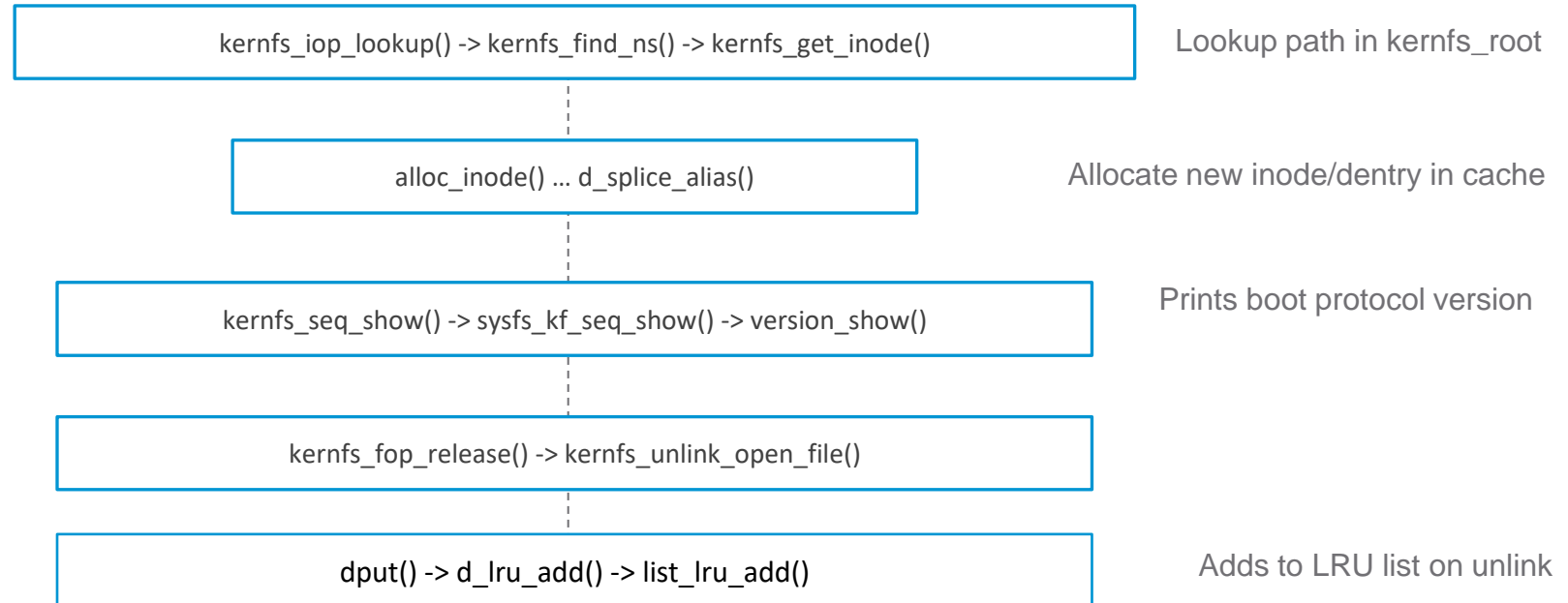
- Sysfs is a pseudo file system based on kernfs
- Allows kernel objects to be exported as files for user space for tuning.



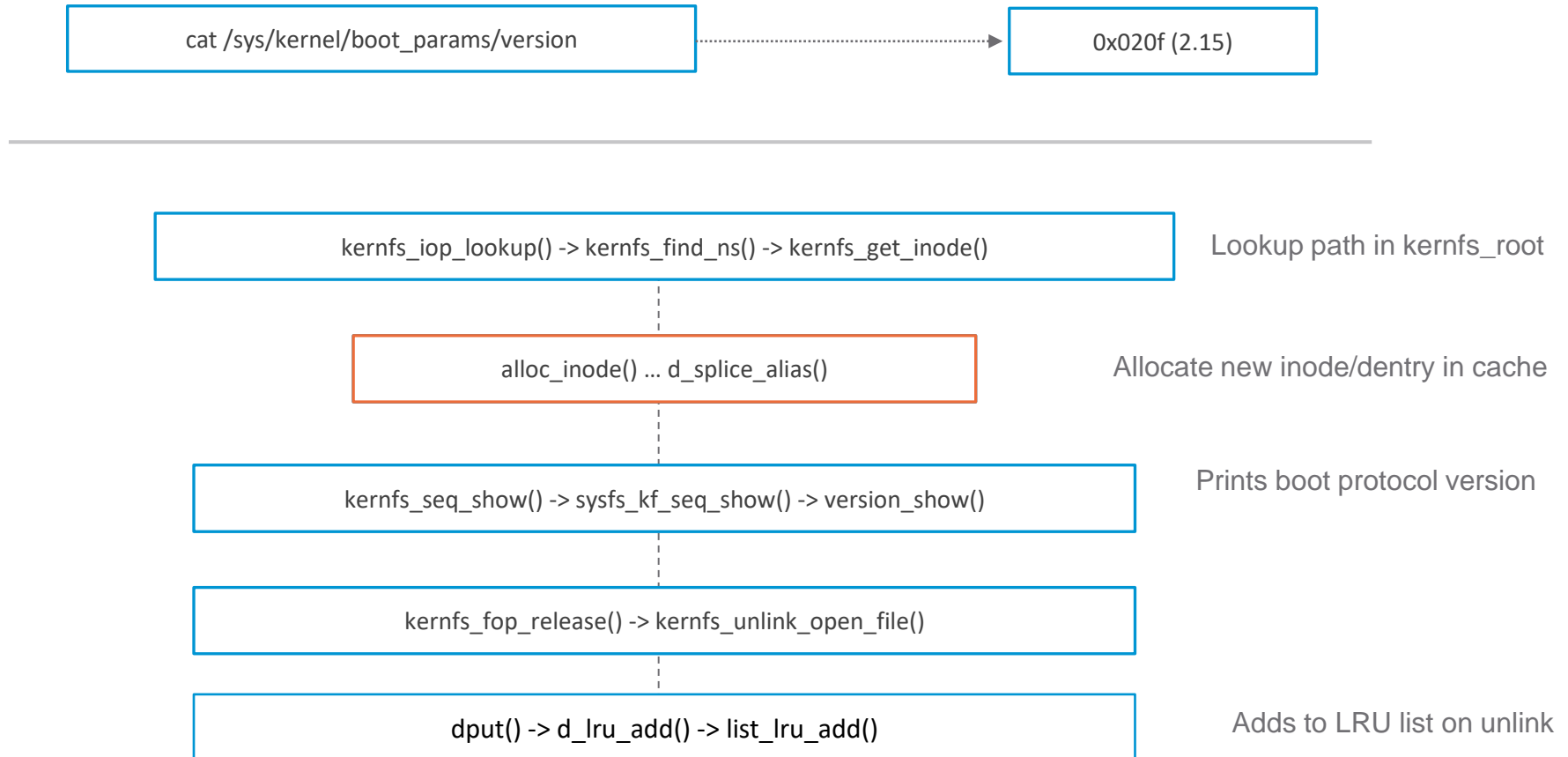
# Procs - Architecture



# Access walkthrough of sysfs

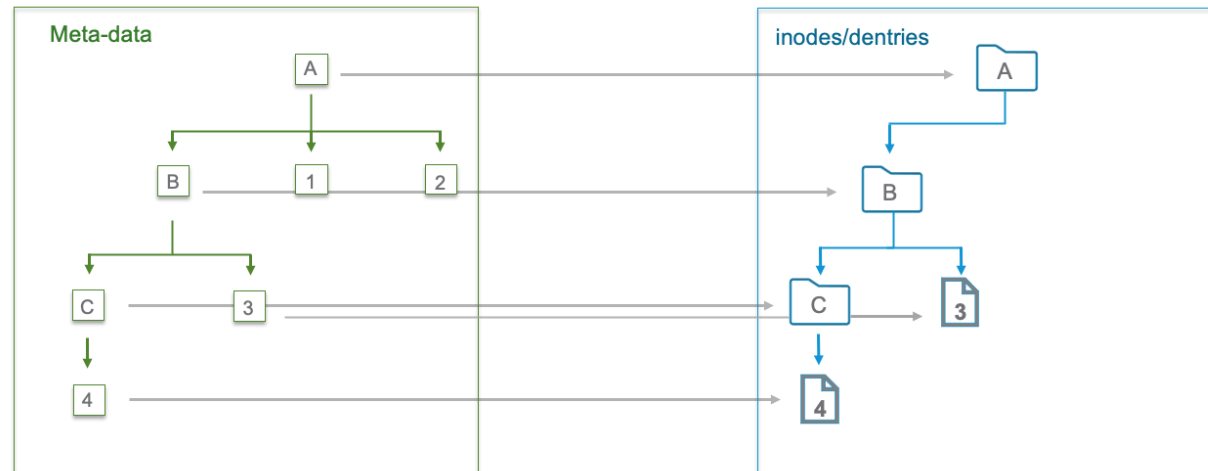


# Access walkthrough of sysfs



# Problem Statement

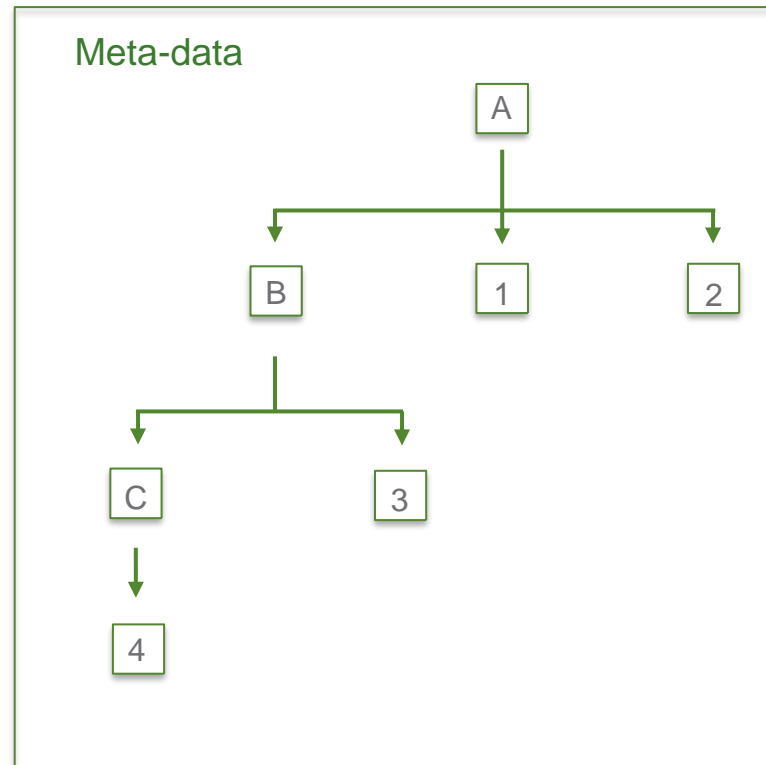
Retaining inode and dentry objects of sysfs and procfs entries causes higher than required memory page allocations.



Goal: Reduce the memory footprint of sysfs and procfs

# Proposal: Use DCACHE\_DONTCACHE

inode used = 0  
dentry used = 0

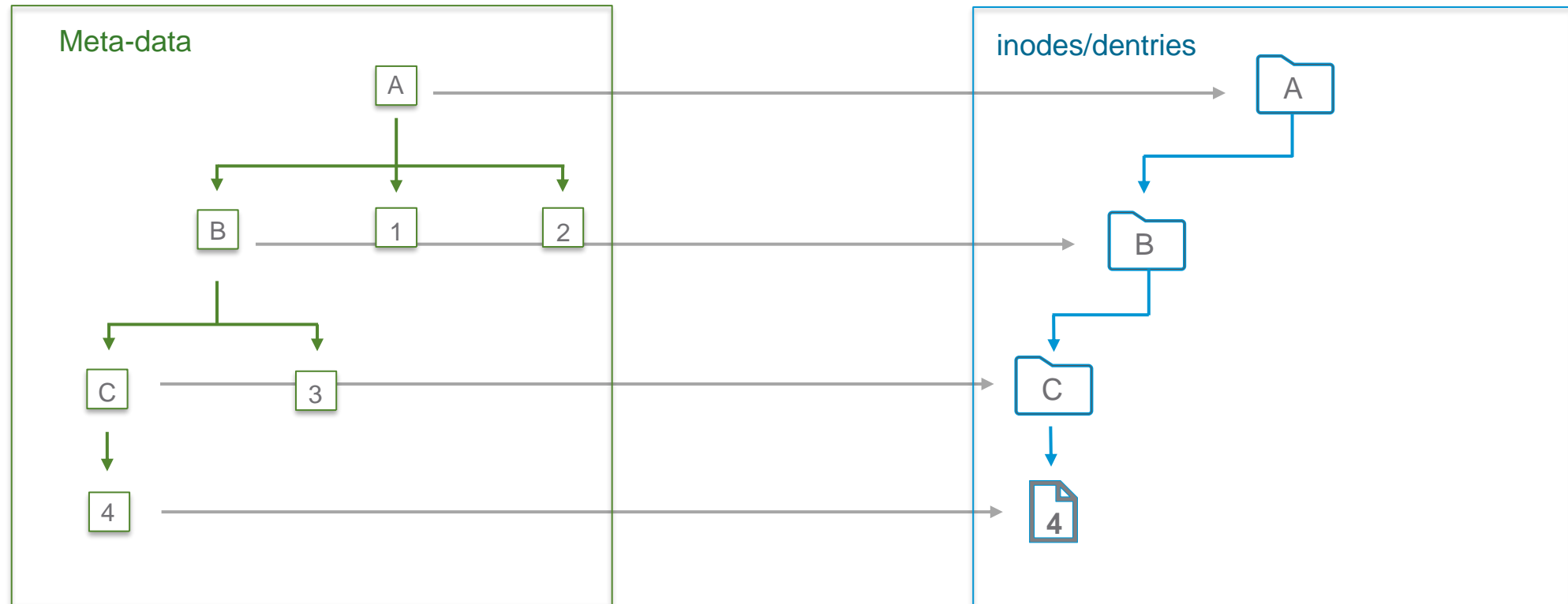


inodes/dentries



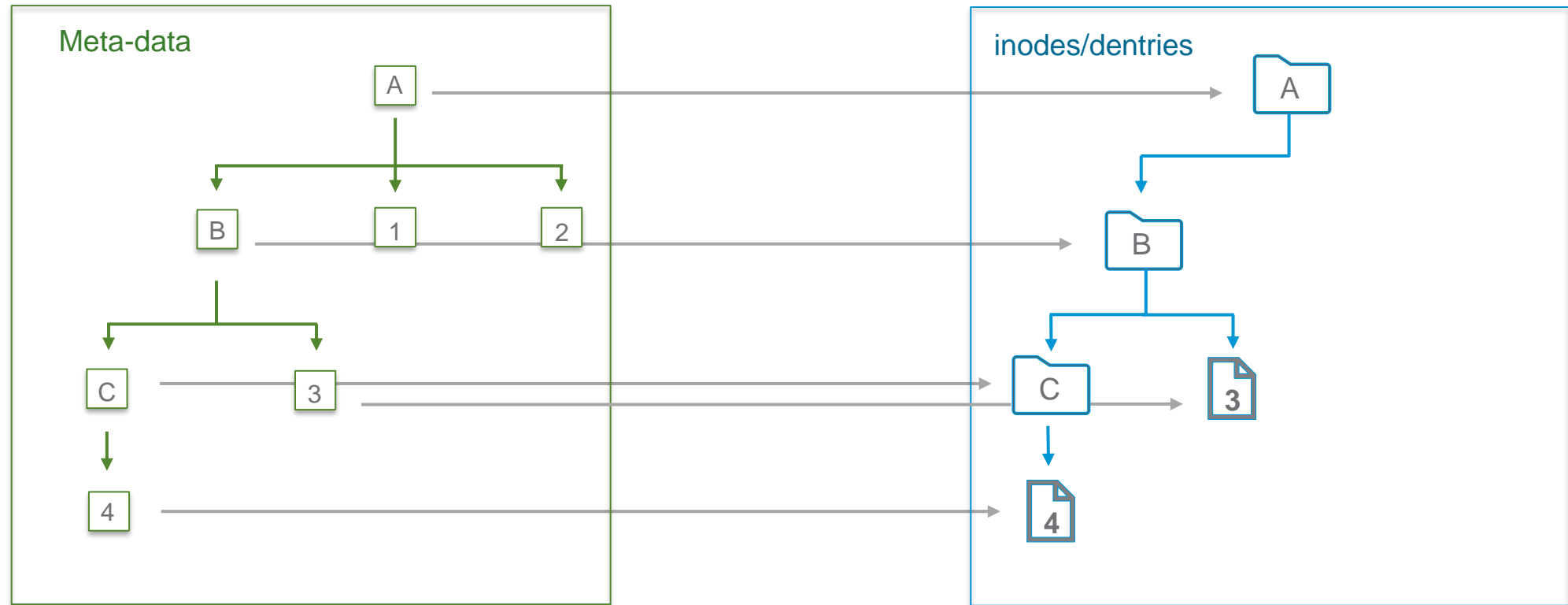
# Proposal: Use DCACHE\_DONTCACHE

inode used = 4  
dentry used = 4



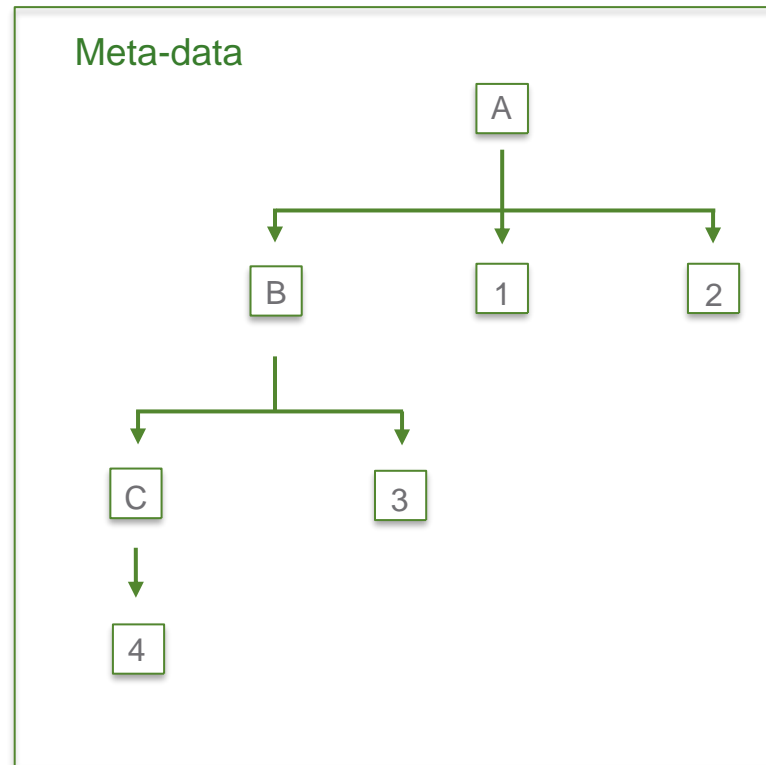
# Proposal: Use DCACHE\_DONTCACHE

inode used = 5  
dentry used = 5



# Proposal: Use DCACHE\_DONTCACHE

inode used = 0  
dentry used = 0



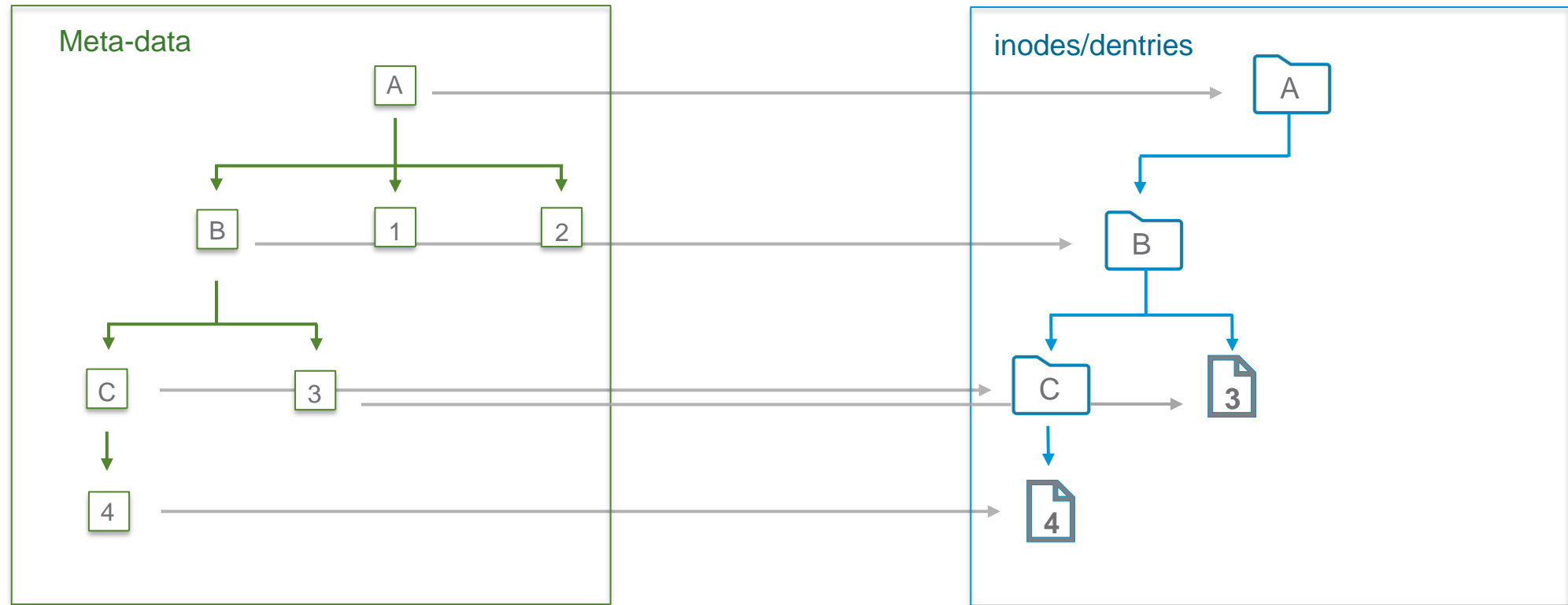
inodes/dentries

# Proposal: Use DCACHE\_DONTCACHE

	Current implementation	DONTCACHE Files and Folders
Boot Time	1.531s (kernel) + 862ms (initrd) + 5.749s (userspace) = 8.143	1.617s (kernel) + 883ms (initrd) + 6.239s (userspace) = 8.739
sysfs, procfs lookup() called during Boot	~10K	~45K
inode, dentry	11542, 11688	2812, 2858
MemFree	1799.244 MB	1811.380 MB
echo 3 > /proc/sys/vm/drop_caches		
inode, dentry	1814, 1843	1837, 1864
MemFree	1859.328 MB	1852.776 MB
find /sys/ -iname "*"   wc		
inode, dentry	4771, 4820	2247, 2262
MemFree	1853.684 MB	1864.576 MB

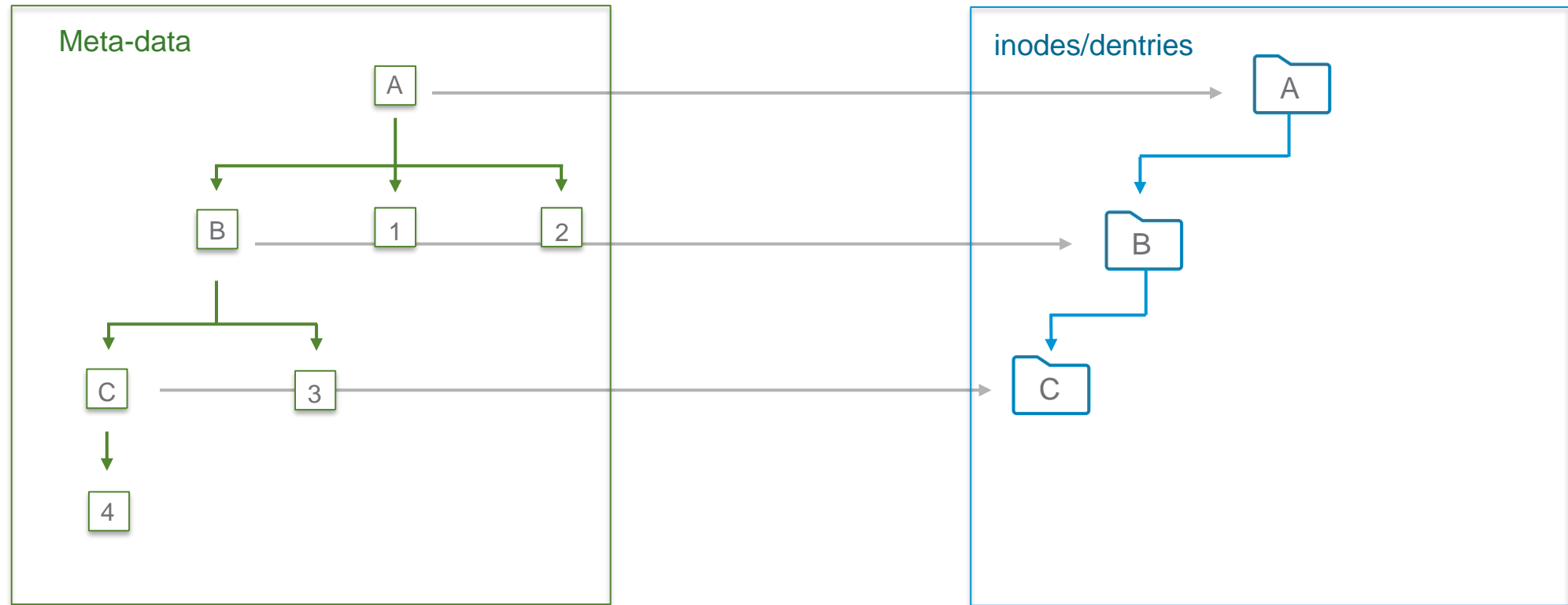
# Proposal: Use DCACHE\_DONTCACHE only for files

inode used = 5  
dentry used = 5



# Proposal: Use DCACHE\_DONTCACHE only for files

inode used = 3  
dentry used = 3



# Proposal: Use DCACHE\_DONTCACHE only for files

	Current implementation	DONTCACHE Files and Folders	DONTCACHE Files
Boot Time	1.531s (kernel) + 862ms (initrd) + 5.749s (userspace) = 8.143	1.617s (kernel) + 883ms (initrd) + 6.239s (userspace) = 8.739	1.516s (kernel) + 897ms (initrd) + 5.746s (userspace) = 8.160s
sysfs's procfs lookup() called during Boot	~10K	~45K	~19K
inode, dentry	11542, 11688	2812, 2858	6012, 6154
MemFree	1799.244 MB	1811.380 MB	1805.204 MB
echo 3 > /proc/sys/vm/drop_caches			
inode, dentry	1814, 1843	1837, 1864	1831, 1856
MemFree	1859.328 MB	1852.776 MB	1861.704 MB
find /sys/ -iname "*"   wc			
inode, dentry	4771, 4820	2247, 2262	4153, 4169
MemFree	1853.684 MB	1864.576 MB	1860.000 MB

## Q & A



**Thanks**