D-Bus in the Kernel

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Who?

Greg Kroah-Hartman,
David Herrmann,
Daniel Mack,
Lennart Poettering,
Kay Sievers

with help from Tejun Heo

Most newer OS designs started around powerful IPC

Mach, QNX, Hurd, ...

Linux only had IPC primitives (sockets, fifos, shared memory)

D-Bus is powerful IPC

Method Call Transactions,

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Used in init system (regardless if systemd or Upstart), the desktops, embedded, ...

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Overview

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Receiver buffers

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Single copy to destination(s)

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Method call windows

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Method call windows

Name registry

memfds

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File descriptors for memory regions

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File descriptors for memory regions

Zero Copy!

memfds

File descriptors for memory regions

Zero Copy!

Sealing

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At 512K zero copy is faster than single copy

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Zero Copy!

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At 512K zero copy is faster than single copy

(a bit like Android ashmem)

Signal Broadcasting

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Bloom Filters

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Every broadcast message includes bloom filter (calculated by sender) that contains all supported matches, kernel will then simply check receiver bloom filter mask (calculated by receiver) against it.

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Bloom filter uses SipHash, but kernel doesn't care

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New libsystemd-bus client library: waaaaay nicer to use – but not portable to non-Linux

Proxy: provides compatibility with dbus1 sockets

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Synthesizes obsolete AcquiredName, LostName, Hello messages

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Remarshals gvariant/dbus1

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Activation: new .busname unit type in systemd

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Identical to .socket unit types for socket activation

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dbus1 bus activation files still supported, but only for clients connecting via the proxy

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It's probably what you want to use when you hack on system level software, and up

Android binder

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Some similar technical concepts, different semantics

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No name registry, no broadcasts, no ordering

When?

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Google for git repos!

Outlook

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Sandboxing

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Yielding CPU time to destination

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Priority inheritance

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That's all, folks!