





# A Year of Clutter



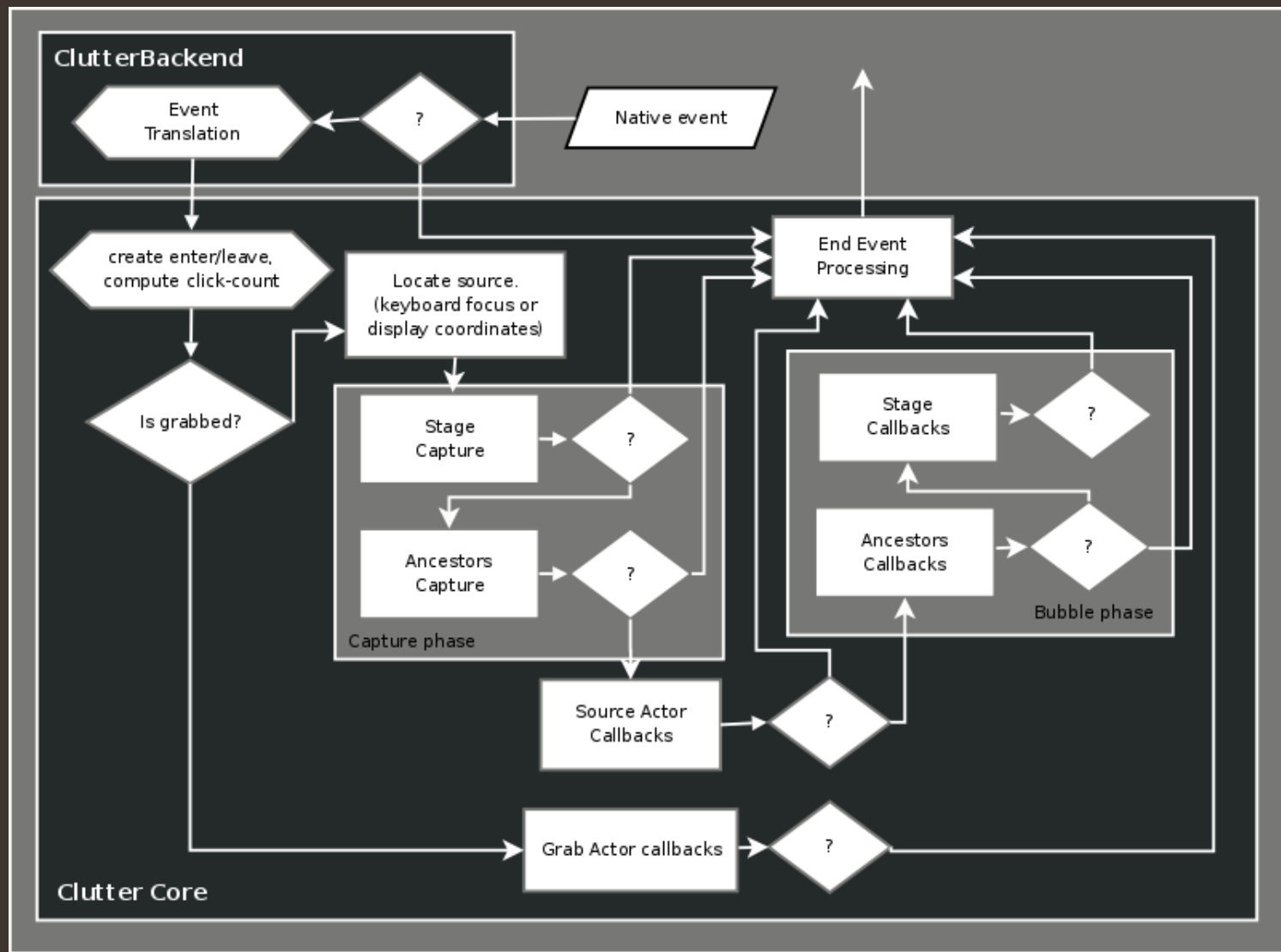
# Introduction

**I hate talking**

One

Or Two

```
clutter_actor_animate (actor, 500,  
    CLUTTER_EASE_OUT_BOUNCE,  
    "x", 100.0, "y", 100.0,  
    "anchor-x", 150.0,  
    "opacity", 128,  
    "fixed::text", "Hello, World!",  
    "fixed::font-name", "Sans 48px",  
    "signal-after::completed",  
        G_CALLBACK (on_animation_complete),  
        NULL,  
    NULL);
```





Laugh. Now.



Kitten and chicks, jackhynes, CC by-sa-2.0



# Clutter 1.0: An Overview

Where were we **last year?**



A small palace from Istanbul, gonzalemario, cc-by 2.0





Unnamed, John (J5) Palmieri, cc-by-sa 2.0



Unnamed, John (J5) Palmieri, cc-by-sa 2.0

**Clutter 0.8 @ GUADEC 2008**



**DUN DUN DUUN!**

OpenedHand  $\subset$  **Intel**

January

January  
February

~~January~~  
~~February~~  
March

January  
~~February~~  
March  
April

January  
~~February~~  
March  
April  
May

January  
February  
March  
April  
May  
June



January  
February  
March  
April  
May  
June  
**July**

**WIN!**

**Moblin 2.0**

**What changed?**

**Performance**

# API consolidation

# New **animation** framework

What 1.0 means?



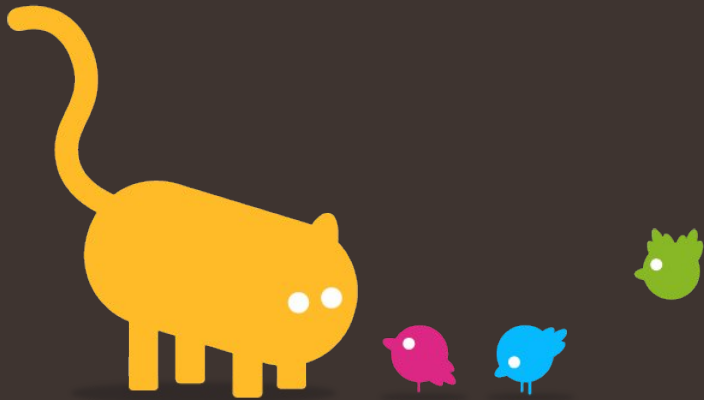
# API and ABI **stability**

Minimal amount of  
**reliable API**

**Full documentation**

**Some metrics**

- ~70 kSLOC codebase, **+20 kSLOC since 0.8**
  - 12+ kSLOC **test suite**
- 1600+ symbols in Clutter (99% **documented**)
- ~300 symbols in COGL (90% **documented**)
  - 1200+ **single** commits
  - 29 single authors, 14 **non-Intel**



# Implicit Animations

**Independent initial and  
final states**

**Behaviours**



Final state **dependent**  
on initial state

# Animation

**Binds intervals to  
object properties**

# **Timeline + Alpha**

Create an Animation



Get the state of the actor



Bind properties



Manage the Animation

```
clutter_actor_animate()
```



# The Master Clock



Halo 3: master chief, commorancy, cc-by 2.0





**Master Clock**

Sync to **Vblank**

Something changes



Advance animations



Process events



Layout



Paint



Wait for the vblank

**Something changes**



Advance animations



Process events



Layout



Paint



Wait for the vblank

Something changes



**Advance animations**



Process events



Layout



Paint



Wait for the vblank

Something changes



Advance animations



**Process events**



Layout



Paint



Wait for the vblank

Something changes



Advance animations



Process events



**Layout**



Paint



Wait for the vblank



Something changes



Advance animations



Process events



Layout



**Paint**



Wait for the vblank

Something changes



Advance animations



Process events



Layout



Paint

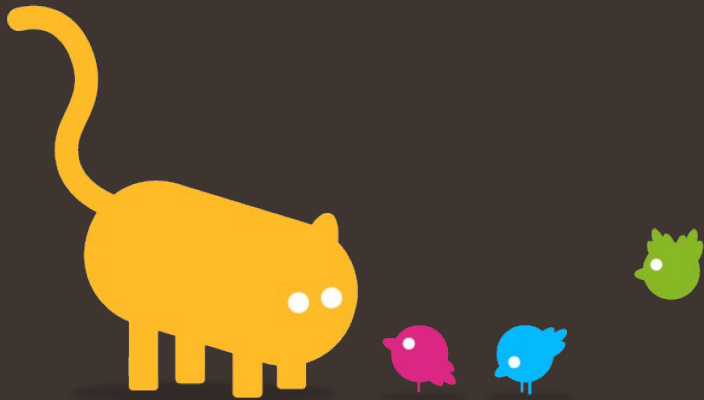


**Wait for the vblank**



Linus on the sofa, nedrichards, cc-by-sa 2.0

# GLib MainLoop



# COGL, The Clutter OpenGL Abstraction Library

**Integrated with Clutter**

# Materials

# Vertex Buffer Objects



**Journal**

# **State Caching And Batching**

Break **out** into OpenGL



# The Future of Clutter

The **FUTURE**



Star Trek Motorcycle.2, Timm Williams, cc-by 2.0

6 months **cycles**

1.x is API and ABI **stable**



**COGL**

=

GPU programming  
library

2.0 starts **now**



Pony 47, treehouse1977, cc-by-sa 2.0

Sorry, no ponies



flying, kmgsquidoo, cc-by-sa 2.0

Have fun

# Special Thanks

Robert Bragg

Neil Roberts

Owen Taylor

Øyvind Kolås

Damien Lespiau

Havoc Pennington

Thomas Wood

Bastian Winkler

Colin Walters

Chris Lord

Johan Bilien

Raymon Liu

Garry Bodsworth

Rob Bradford

Tomas Frydrych

Jonas Bonn

Robert Staudinger

Christian Persch

Dan Winship

Geoff Gustafson

Gordon Williams

Jonathan Matthew

Marc-André Lureau

Matthew Allum

Ole André Vadla Ravnås

Shane Bryan

Tim Horton

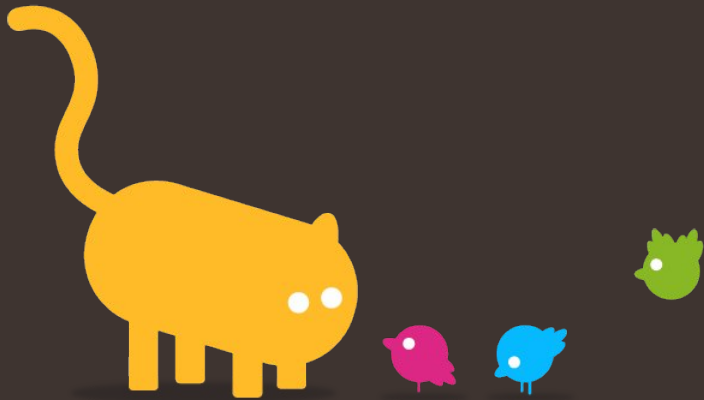
Tommi Komulainen



Questions?



# Thank you



## A Year of Clutter

