



Dart

One language to rule them all ...

Sébastien Deleuze - [@sdeleuze](https://twitter.com/sdeleuze)

Disclaimer

Cette présentation comporte de nombreuses hypothèses non confirmées officiellement par

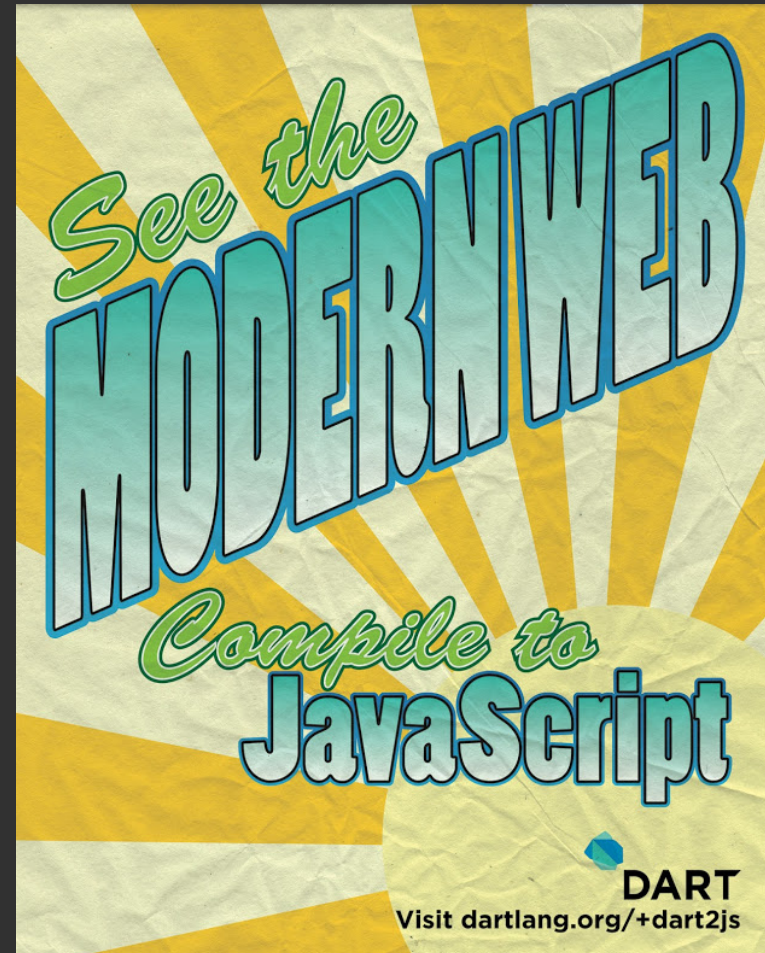
The Google logo is displayed in its characteristic multi-colored font (blue, red, yellow, blue, green, red) with a slight 3D effect and shadow.

Dart, c'est quoi exactement ?

Un langage structuré et flexible
pour les développements Web
(mais pas que)

Destiné aux navigateurs modernes

Pour améliorer la
maintenabilité et l'efficacité de nos
développements



Une plateforme

Langage

Documentation

Outillage

Bibliothèques

Machines
virtuelles

IHM à base de
composants

Compilateur
Dart / Javascript

Dépôt de paquets



Remplacer Javascript ?

Non, Google suit 2 pistes en parallèle ...



Peu de prise de risque
Gains potentiels faibles



Grosse prise de risque
Gains potentiels importants

Qui contribue ?

ager@google.com
ahe@google.com
ajohnsen@google.com
alanknight@google.com
alexeif@google.com
amouravski@google.com
amshali@google.com
antonm@google.com
aprelev@gmail.com
arv@google.com
asiva@google.com
bak@google.com
benl@google.com
benwells@google.com
blois@google.com
brianwilkerson@google.com
codefu@google.com
cshapiro@google.com
danrubel@google.com
dcarlson@google.com
devoncarew@google.com
dgrove@google.com

100 contributeurs



16 contributeurs
externes

Très nombreux échanges
avec la communauté

Maitrise technologique et gestion du risque

ORACLE®

Google



Microsoft

Unifier le développement d'applications



Web



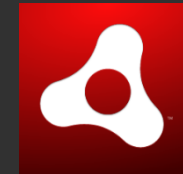
Serveur



Mobile



Script



Desktop

Langage

Orienté objet et typage optionnel

```
import 'dart:math';

class Point {
  num x, y;

  Point(this.x, this.y);

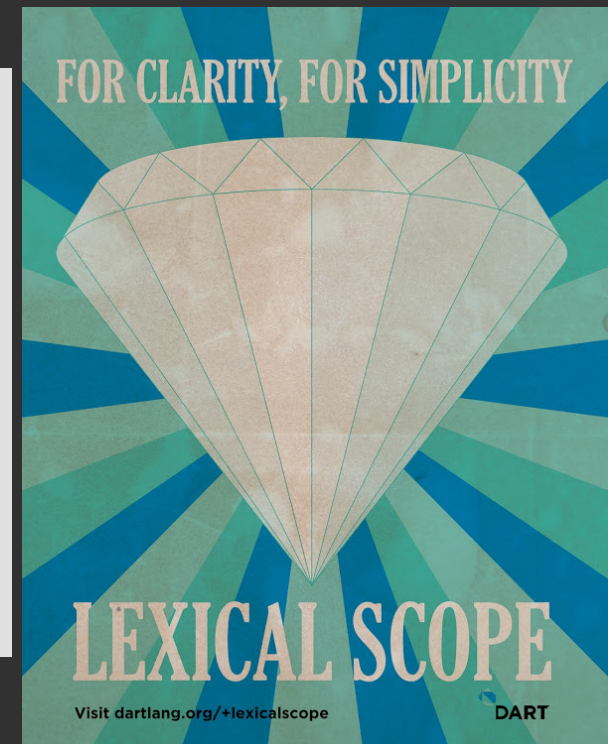
  num distanceTo(Point other) {
    var dx = x - other.x;
    var dy = y - other.y;
    return sqrt(dx * dx + dy * dy);
  }
}

main() {
  var a = new Point(2, 3);
  var b = new Point(3, 4);
  print('distance from a to b = ${a.distanceTo(b)}');
}
```

Language

This version Javascript

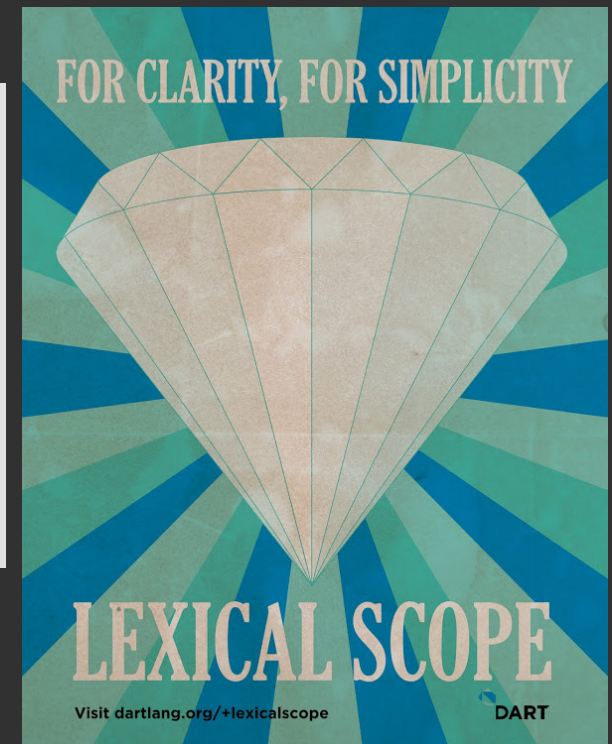
```
function Awesome() { }
Awesome.prototype.cool = function() {
  alert("inside awesome");
}
Awesome.prototype.init = function(button) {
  button.addEventListener("click", function() {
    this.cool(); // this won't work!
  });
}
var button = document.getElementById("b");
var a = new Awesome(); a.init(button);
```



Langage

This version Dart

```
class Awesome {  
  cool() =>  
    window.alert("inside cool");  
  init(button) =>  
    button.onClick.listen((e) => cool());  
}  
void main() {  
  new Awesome().init(document.query("#b"));  
}
```



Langage

Fonctions

```
[0, 1, 2, 3].where((n) => n.isEven).forEach(print);
```

Langage

Interfaces implicites

```
class Person {  
  final _name;  
  Person(this._name);  
  String greet(who) => 'Hello, $who. I am $_name.';  
}
```

// Same implicit interface than

```
class Person2 {  
  String greet(who);  
}
```

```
class Bro implements Person {  
  String greet(who) => 'Hi $who. What's up?';  
}
```

Langage

Paramètres optionnels et valeurs par défaut

```
String say(String from, String msg, [String channel='email']) {  
    // ...  
}  
  
main() {  
    say('Bob', 'Howdy');  
    say('Bob', 'Howdy', 'smoke signal');  
}
```

Paramètres nommés et valeurs par défaut

```
enableFlags({bool bold: false, bool hidden: false}) {  
    // ...  
}  
  
main() {  
    enableFlags();  
    enableFlags(bold: true);  
    enableFlags(bold: true, hidden: false);  
}
```

Language

Mixins

```
import 'dart:async';
```


```
class Person {  
  String name;  
  Person(this.name);  
}
```

```
class Womanizer {  
  pickUpTheseWomen() => print("Challenge Accepted!");  
}
```

```
class Bro {  
  legendary() {  
    print("This is gonna be, wait for it ...");  
    new Timer(new Duration(seconds:5), () => print("legendary!"));  
  }  
}
```

```
class BarneyStinson extends Person with Bro, Womanizer {  
  BarneyStinson(name): super(name);  
}
```

Un langage facile à apprendre



Scala

I am watching you !



API

dart:async

dart:chrome

dart:collection

dart:core

dart:crypto

dart:html

dart:indexed_db

dart:io

dart:isolate

dart:json

dart:math

dart:mirrors

dart:svg

dart:typeddata

dart:uri

dart:utf

dart:web_audio

dart:web_gl

dart:web_sql

args

fixnum

intl

logging

matcher

meta

mock

serialization

source_maps

unittest

API

dart:html

```
import 'dart:html';

main() {

  var message = query('#msg');

  var b = new ButtonElement()
    ..classes.add('important')
    ..text = 'Bro Code'
    ..onClick.listen((e) => message.text = "A bro does not dare/challenge
another bro to do anything they wouldn't try them self");

  document.body.children.add(b);

}
```

API

dart:io

```
import 'dart:io';

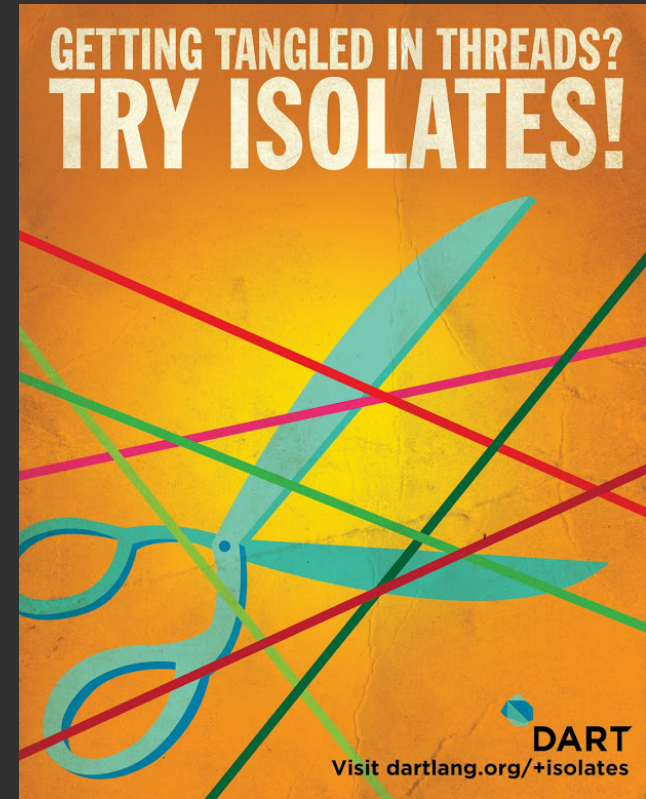
main() {
  HttpServer.bind('127.0.0.1', 8080).then((server) {
    server.listen((HttpRequest request) {
      request.response
        ..write('A bro cannot give another bro a Teddy bear')
        ..close();
    });
    print('web server started !');
  });
}
```

API

dart:isolate

```
import 'dart:isolate';

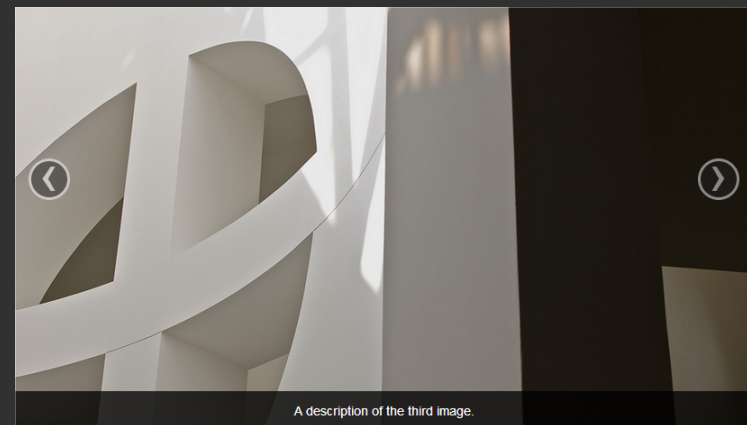
main() {
  var sendPort = spawnUri('plugin.dart');
  sendPort.call('getPluginMetadata').then(
    (reply) {
      print(reply);
    });
}
```



Web UI

```
<element name="x-carousel" extends="div" constructor="Carousel">
  <template>
    <style type='text/css'> ... </style>
    <div class='carousel'>
      <x-swap>
        <content></content>
      </x-swap>
      <a class="left" on-click='previous()'>&lsaquo;</a>
      <a class="right" on-click='next()'>&rsaquo;</a>
    </div>
  </template>
</element>
```

```
<x-carousel>
  <figure>
    
    <figcaption>Description 1</figcaption>
  </figure>
  <figure class="active">
    
    <figcaption>Description 2</figcaption>
  </figure>
</x-carousel>
```

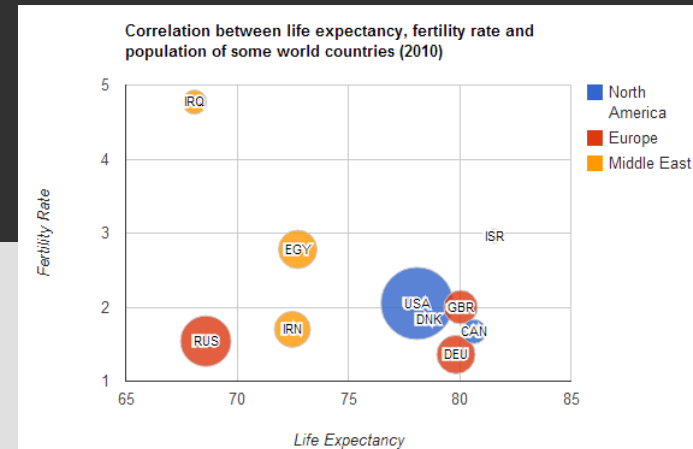


JS Interop

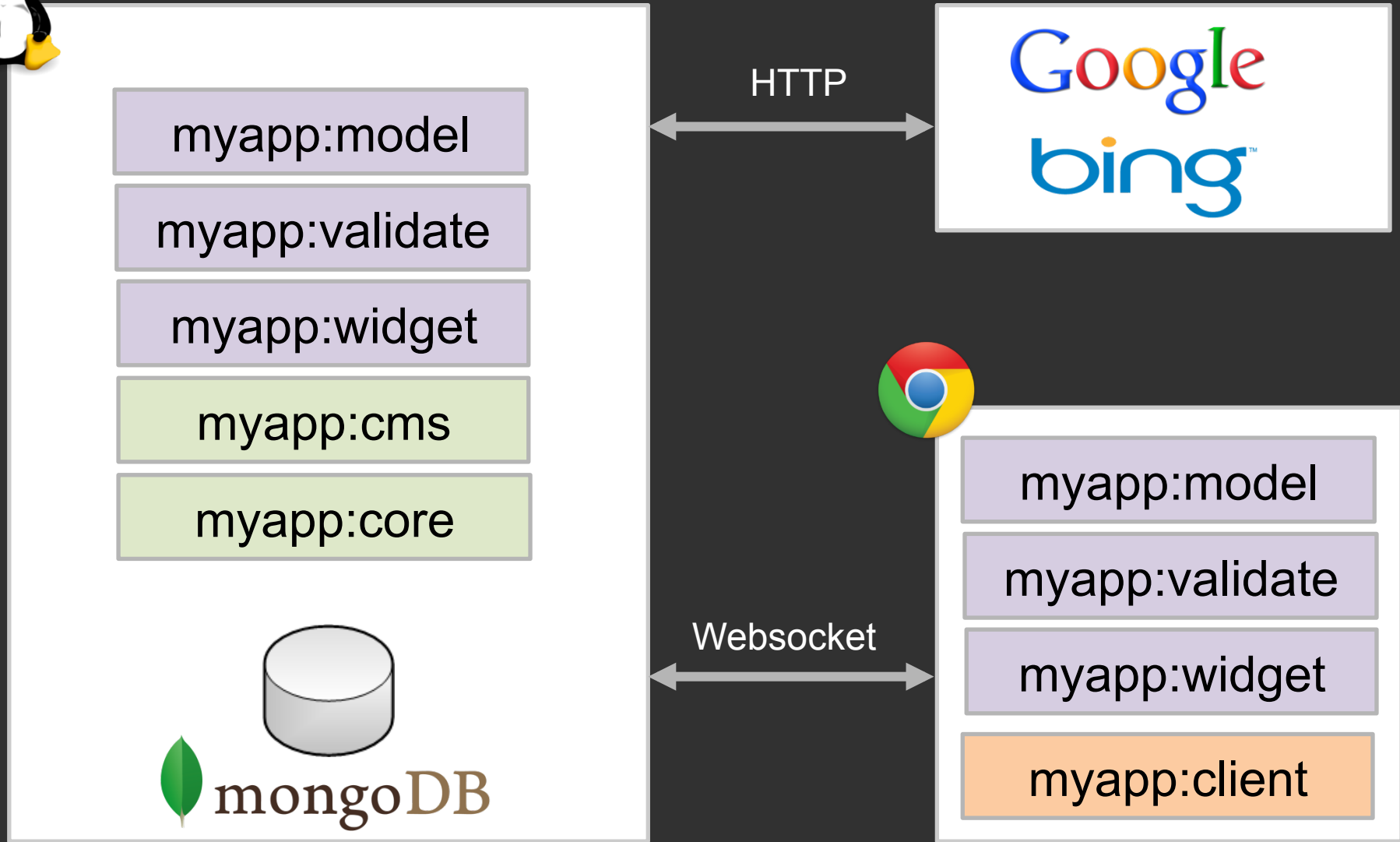
```
import 'dart:html';
import 'package:js/js.dart' as js;

void draw() {
  var gviz = js.context.google.visualization;
  var listData = [ ... ];
  var arrayData = js.array(listData);
  var tableData = gviz.arrayToDataTable(arrayData);
  var options = js.map({ 'title': 'Correlation' });
  var chart = new js.Proxy(gviz.BubbleChart, query('#viz'));
  chart.draw(tableData, options);
}

main() {
  js.context.google.load('visualization', '1',
    js.map( { 'packages': ['corechart'],
              'callback': new js.Callback.once(draw) }));
}
```

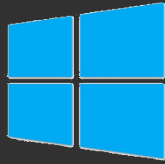


Exemple d'architecture



Environnements d'exécution

Aujourd'hui



VM Serveur



VM navigateur



Cloud



dart2js

Environnements d'exécution

Domain



VM Serveur



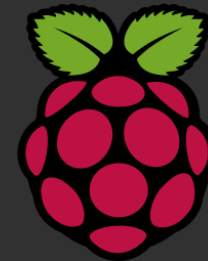
VM navigateur



Cloud



dart2js










ARM / Android











#dartlang #mixin13

Environnements d'exécution

Android

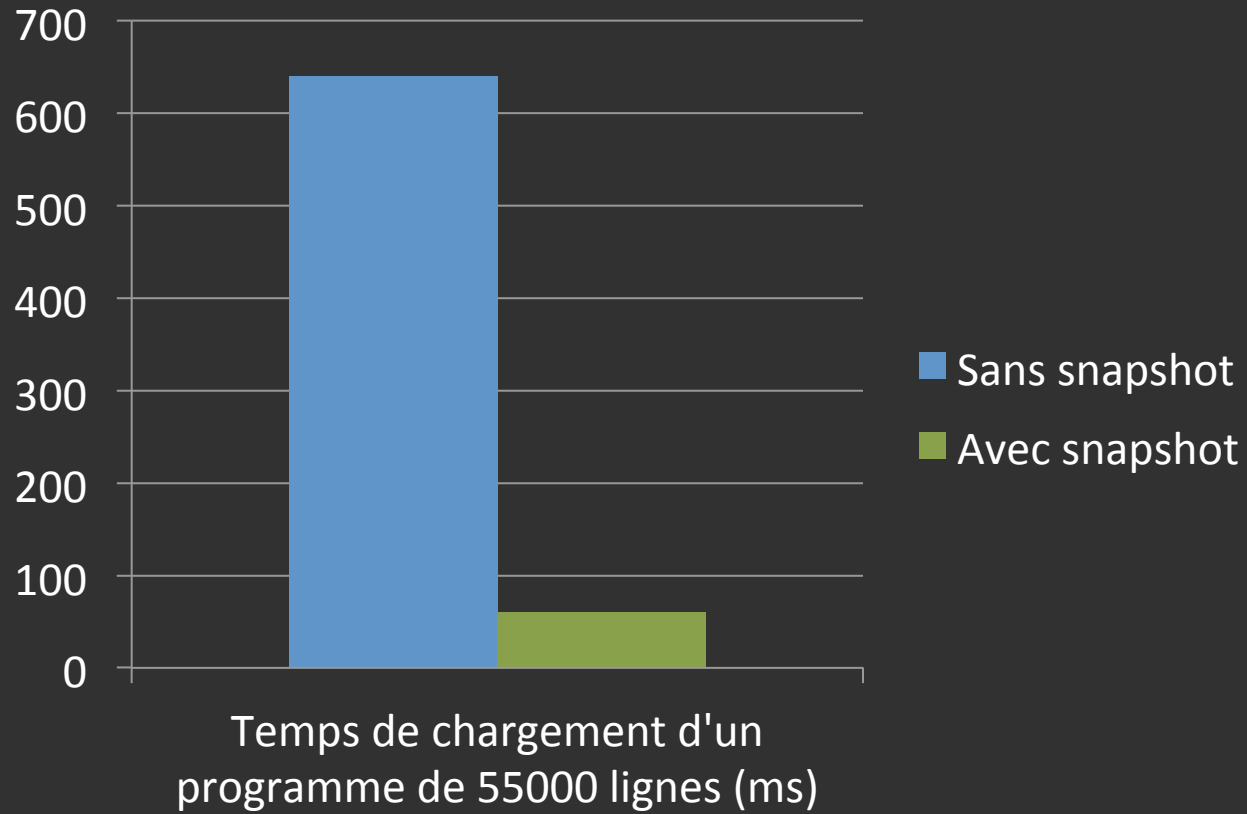
 object_x64_test.cc	10 months ago	Ensure objects emitted in code are allocated in old space. [cshapiro@google.com]
 os.h	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
 os_android.cc	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
 os_linux.cc	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
 os_macos.cc	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
 os_test.cc	3 months ago	Increase timeout jitter [sgjesse@google.com]
 os_win.cc	8 days ago	Fix dartbug.com/10415: [iposva@google.com]

 constants_x64.h	12 days ago	Introduce architecture specific headers describing Dart stack frames. [regis@google.com]
 cpu.h	11 months ago	Fix issue 1968, replace usage of inline 'asm' constructs in 'stack al... [asiva@google.com]
 cpu_arm.cc	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
 cpu_ia32.cc	11 months ago	Fix issue 1968, replace usage of inline 'asm' constructs in 'stack al... [asiva@google.com]
 cpu_mips.cc	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
 cpu_test.cc	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
 cpu_x64.cc	11 months ago	Fix issue 1968, replace usage of inline 'asm' constructs in 'stack al... [asiva@google.com]
 custom_isolate_test.cc	23 days ago	Implements context allocation stub for MIPS. [zra@google.com]



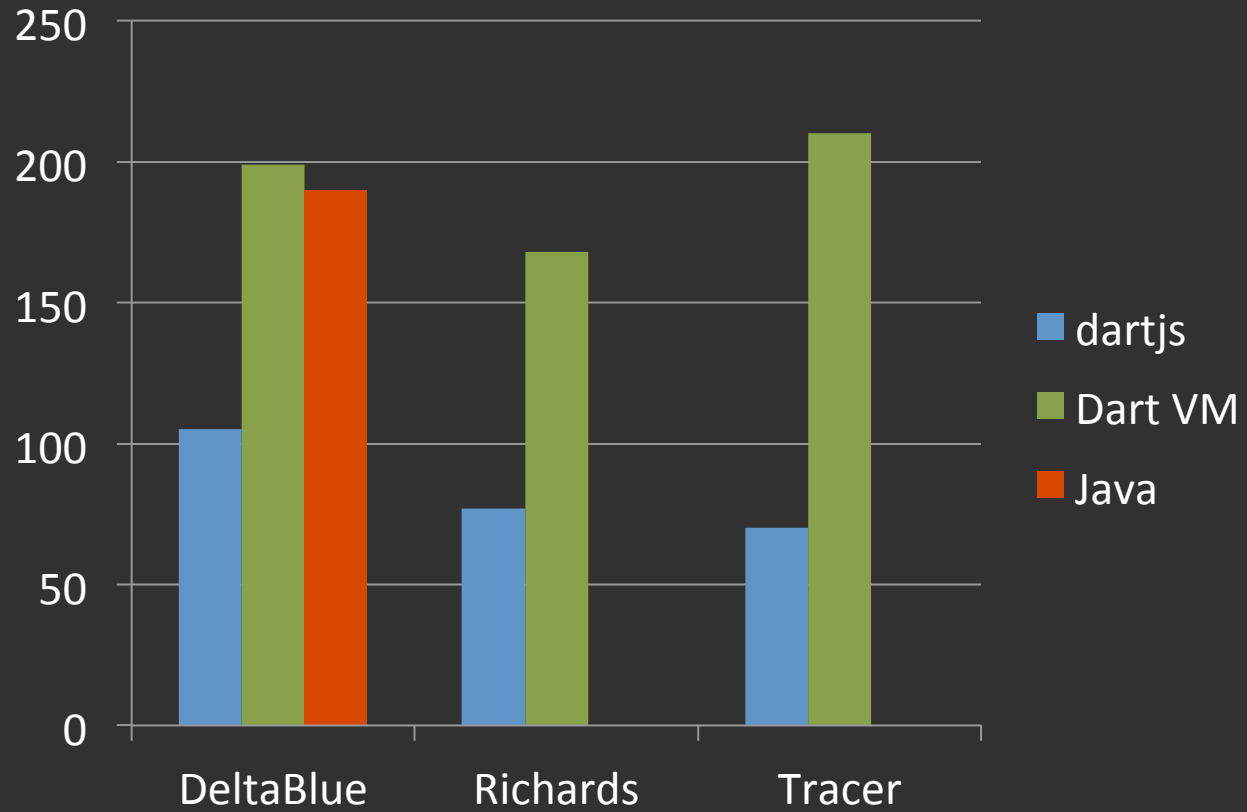
Performance

Démarrage



Performance

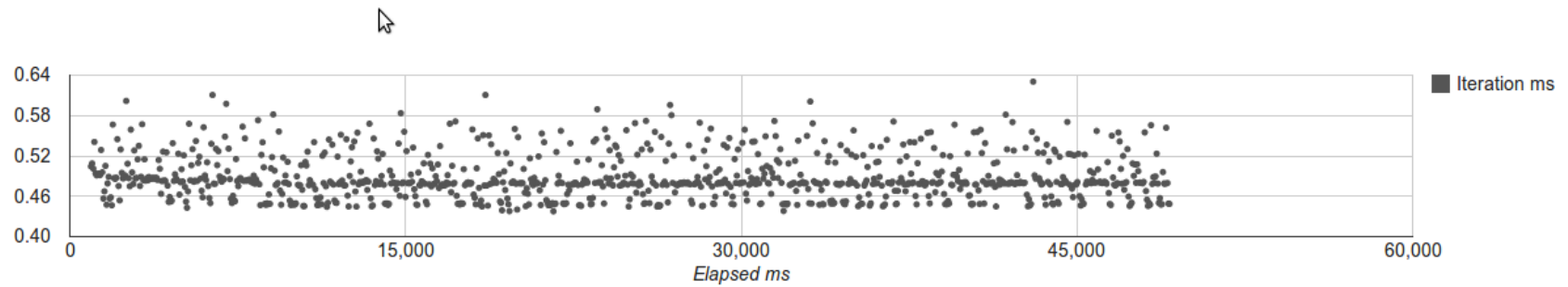
Exécution



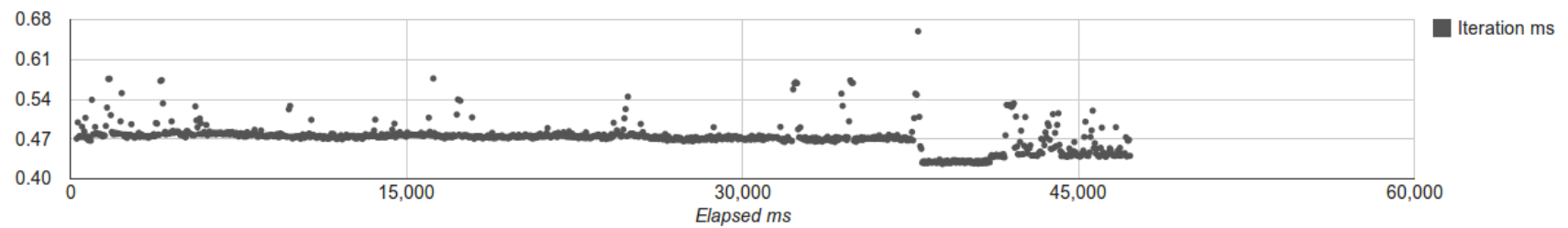
Performance

Exécution

JVM



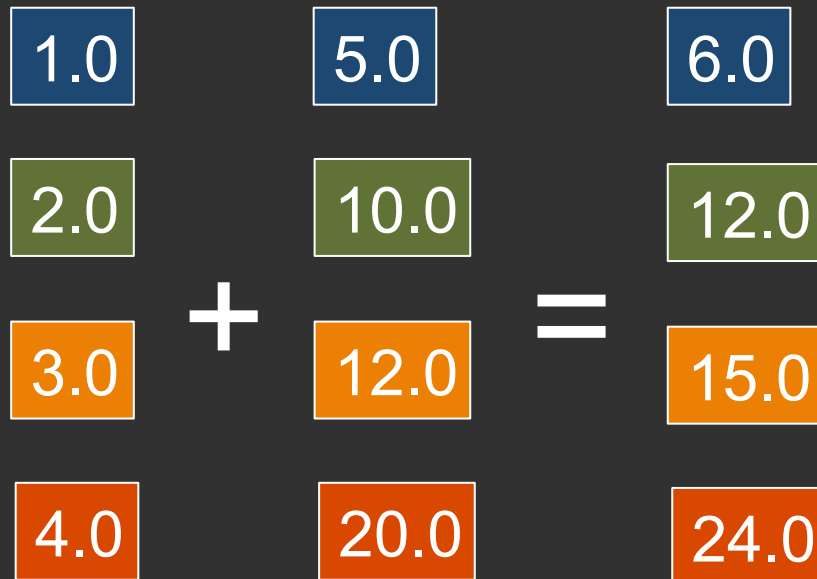
DartVM



Performance

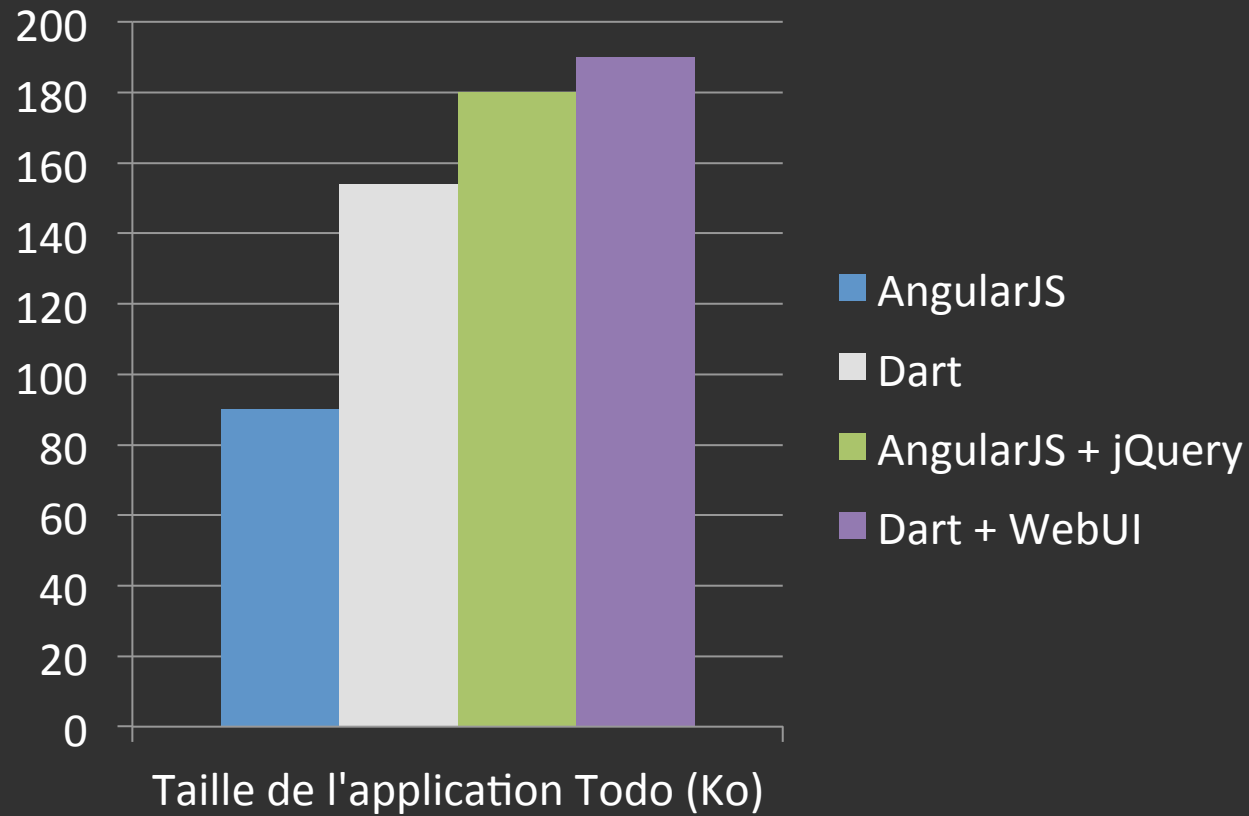
Single instruction, multiple data (SIMD)

```
var a = new Float32x4(1.0, 2.0, 3.0, 4.0);  
var b = new Float32x4(5.0, 10.0, 15.0, 20.0);  
var c = a + b;
```



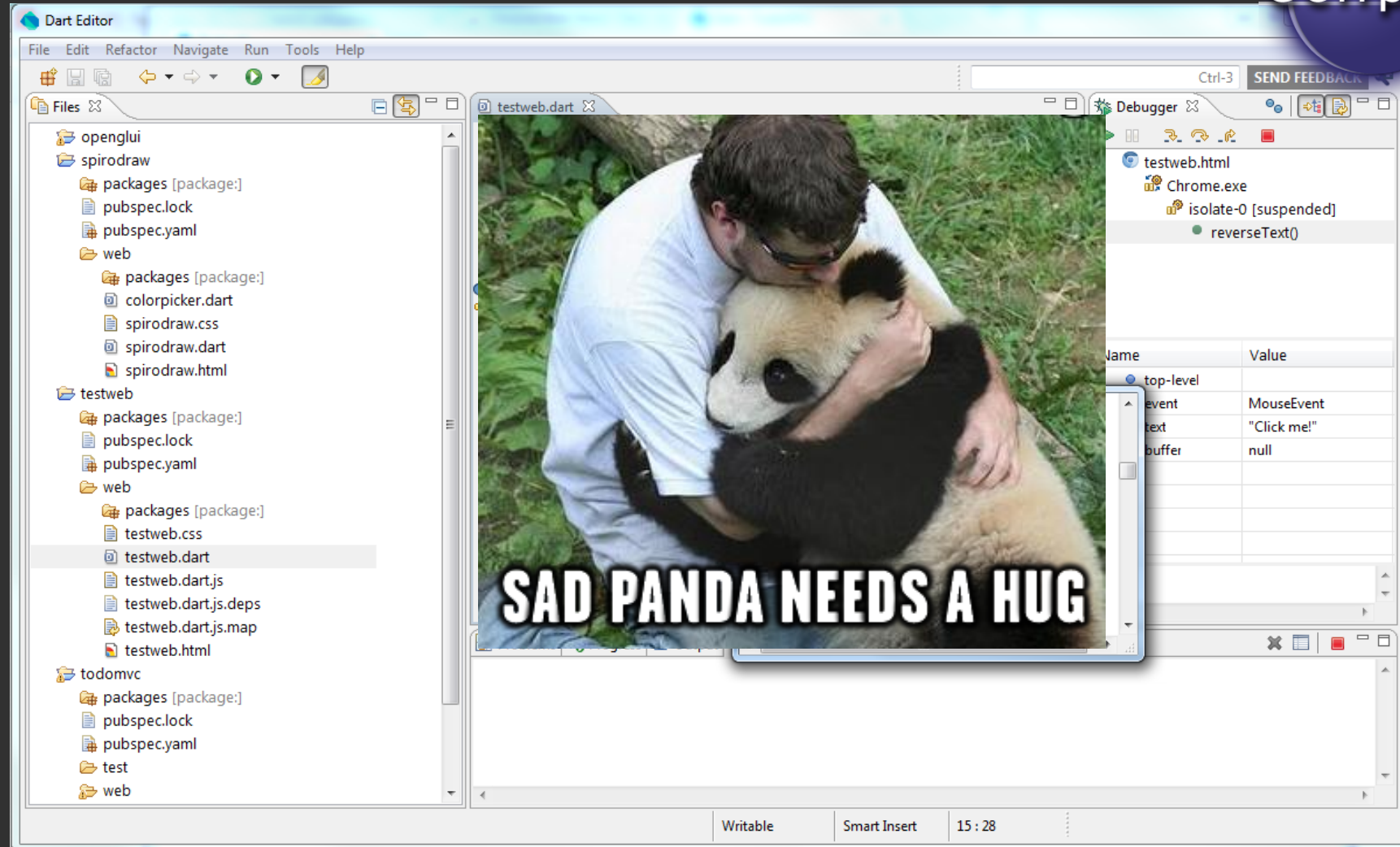
Performance

Taille javascript généré



Outillage

IDE : Dart Editor



Outillage

IDE : pas obligé d'utiliser Eclipse



```
D:\Workspaces\testdart\src\Mixins.dart - Sublime Text 2
File Edit Selection Find View Goto Tools Project Preferences Help

Mixins.dart
1  import 'dart:async';
2
3  class Person {
4    String name;
5    Person(this.name);
6  }
7
8  abstract class Womanizer {
9    pickupThisWomen() => print("Challenge Accepted!");
10 }
11
12 abstract class Bro {
13   legendary() {
14     print("This gonna be, wait for it ...");
15     new Timer(new Duration(seconds:5), () => print("legendary!"));
16   }
17 }
18
19 class BarneyStinson extends Person with Bro, Womanizer {
20   BarneyStinson(name): super(name);
21 }
```

Line 16, Column 4 Tab Size: 4 Dart

```
testdart - [D:\Workspaces\testdart] - [testdart] - Luc\Mixins.dart - IntelliJ IDEA 12.1.1
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

testdart
Project
  testdart (D:\Workspaces\testdart)
  classes
  exportForTML
  src
    File.dart
    Mixins.dart
    Person.dart
    Point.dart
    testdart.dart
  External Libraries

Point.dart
import 'dart:async';

class Person {
  String name;
  Person(this.name);

  abstract class Womanizer {
    pickupThisWomen() => print("Challenge Accepted!");
  }

  abstract class Bro {
    legendary() {
      print("This gonna be, wait for it ...");
      new Timer(new Duration(seconds:5), () => print("legendary!"));
    }
  }

  class BarneyStinson extends Person with Bro, Womanizer {
    BarneyStinson(name): super(name);
  }
}
```

Support de Dart dans Idea IntelliJ
et WebStorm

Externalisation du moteur
d'auto-complétion

Outillage

Source maps



Paused in debugger



Timeline Profiles Audits Console

html_dart2js.dart spirodraw.dart x

```
70 frontCanvas..height = height
71     ..width = width;
72 backCanvas..height = height
73     ..width = width;
74 clear();
75 }
76
77 void initControlPanel() {
78     inOrOut.onChange.listen((_) => refresh());
79     fixedRadiusSlider.onChange.listen((_) => refresh());
80     wheelRadiusSlider.onChange.listen((_) => refresh());
81     speedSlider.onChange.listen(onSpeedChange);
82     penRadiusSlider.onChange.listen((_) => refresh());
83     penWidthSlider.onChange.listen(onPenWidthChange);
84
85     colorPicker = new ColorPicker(paletteElement);
86     colorPicker.addListener((String color) => onColorChange(color));
87 }
```

samples/spirodraw/web
samples/spirodraw/web/packa...
/implementation/lib

R: null
RUnits: null
animationEnabled: true
▶ back: CanvasRenderingContext2D
▶ backCanvas: canvas
colorPicker: null
d: null
dUnits: null
▶ doc: document
▶ fixedRadiusSlider: input#fixed_radius
▶ front: CanvasRenderingContext2D
▶ frontCanvas: canvas#canvas
height: null
▼ inOrOut: select#in_out.full
▶ 0: option
▶ 1: option
accessKey: ""
▶ attributes: NamedNodeMap

Outillage

pub

```
name: myproject  
version: 1.1.0  
description: Sample application  
author: Sébastien Deleuze  
homepage: http://jyuro.org  
documentation: http://jyuro.org/doc  
dependencies:  
  route: 0.4.5  
  mustache : '>=0.1.5'  
  mylib:  
    git: git://github.com/jyuro/mylib.git  
dev_dependencies:  
  unittest: any
```

IT'S ON THE HOUSE
AT THE PUB!



 **DART**
Visit dartlang.org/+pub

Outillage

pub.dartlang.org

The screenshot shows the package page for 'mustache' on pub.dartlang.org. The page includes a navigation bar with 'Getting Started', 'Docs', and 'Packages' links, and a search bar. The main content area features the package name 'mustache' and version '0.1.4', with tabs for 'README.md', 'Installing', and 'Versions'. A description states it is a Dart library for parsing and rendering mustache templates. A 'Passing drone.io' badge is present. An 'Example' section contains a Dart code snippet demonstrating the library's usage. On the right side, there are sections for 'About' (Mustache template library), 'Author' (Greg Lowe), 'Homepage' (https://github.com/xxgreg/mustache), 'Uploader' (greg.lowe), and 'Share' (Google+1 and Tweet buttons). An 'API' section at the bottom shows the signature for the 'parse' method.

pub.dartlang.org Getting Started Docs Packages Search

mustache 0.1.4

README.md Installing Versions

Mustache templates

A Dart library to parse and render [mustache templates](#).

Passing drone.io

Example

```
import 'package:mustache/mustache.dart' as mustache;

main() {
  var source = '{{#names}}<div>{{lastname}}, {{firstname}}</div>{{/names}}';
  var template = mustache.parse(source);
  var output = template.renderString({'names': [
    {'firstname': 'Greg', 'lastname': 'Lowe'},
    {'firstname': 'Bob', 'lastname': 'Johnson'}
  ]});
  print(output);
}
```

About

Mustache template library

Author

✉ Greg Lowe

Homepage

<https://github.com/xxgreg/mustache>

Uploader

greg.lowe

Share

API

```
Template parse(String source, {bool lenient : false});
```

Outillage

dartdoc



Dart API Reference > dart:core > Collection<E>

Search API

args

dart:async

dart:chrome

dart:collection

dart:core

BidirectionalIterator<T>

bool

Collection<E>

Comparable<T>

Comparator<T>

DateTime

double

Duration

Expando<T>

Expect

Function

int

InvocationMirror

Iterable<E>

Iterator<E>

List<E>

Map<K, V>

Match

num

Object

Pattern

RegExp

Collection<E> abstract class

A collection of individual elements.

Hide inherited

A [Collection](#) contains some elements in a structure optimized for certain operations. Different collections are optimized for different uses.

A collection can be updated by adding or removing elements.

Collections are [Iterable](#). The order of iteration is defined by each type of collection.

Deprecated: This class is deprecated and will be removed soon.

Extends

[Iterable<E>](#) > [Collection<E>](#)

Subclasses

[DoubleLinkedQueue<E>](#), [HashSet<E>](#), [LinkedHashSet<E>](#), [List<E>](#), [ListQueue<E>](#), [Queue<E>](#), [Set<E>](#)

Constructors

const [Collection\(\)](#)

Properties

final [E](#) [first](#)

inherited from [Iterable](#)

Returns the first element.

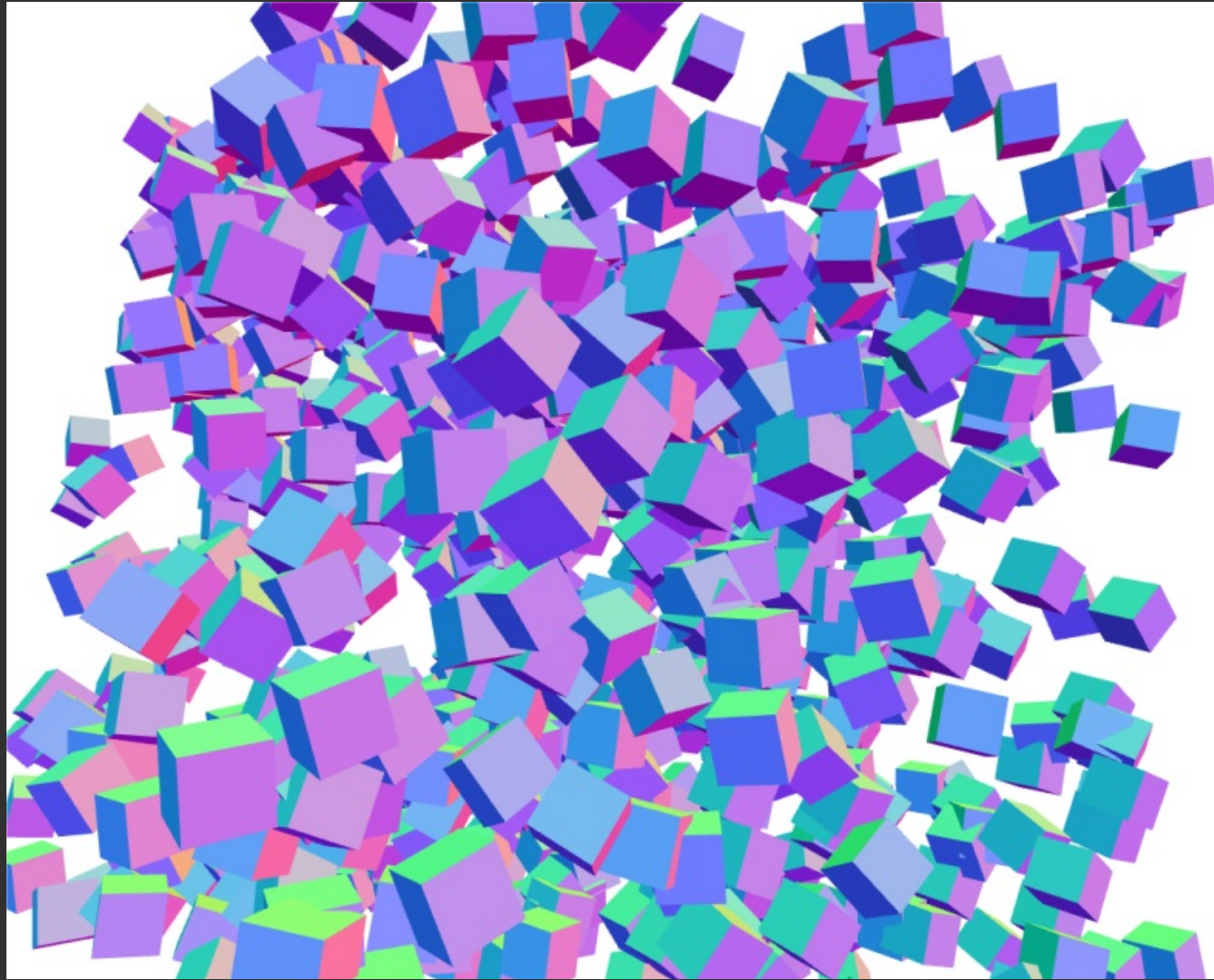
If `this` is empty throws a [StateError](#). Otherwise this method is equivalent to

```
this.elementAt(0)
```

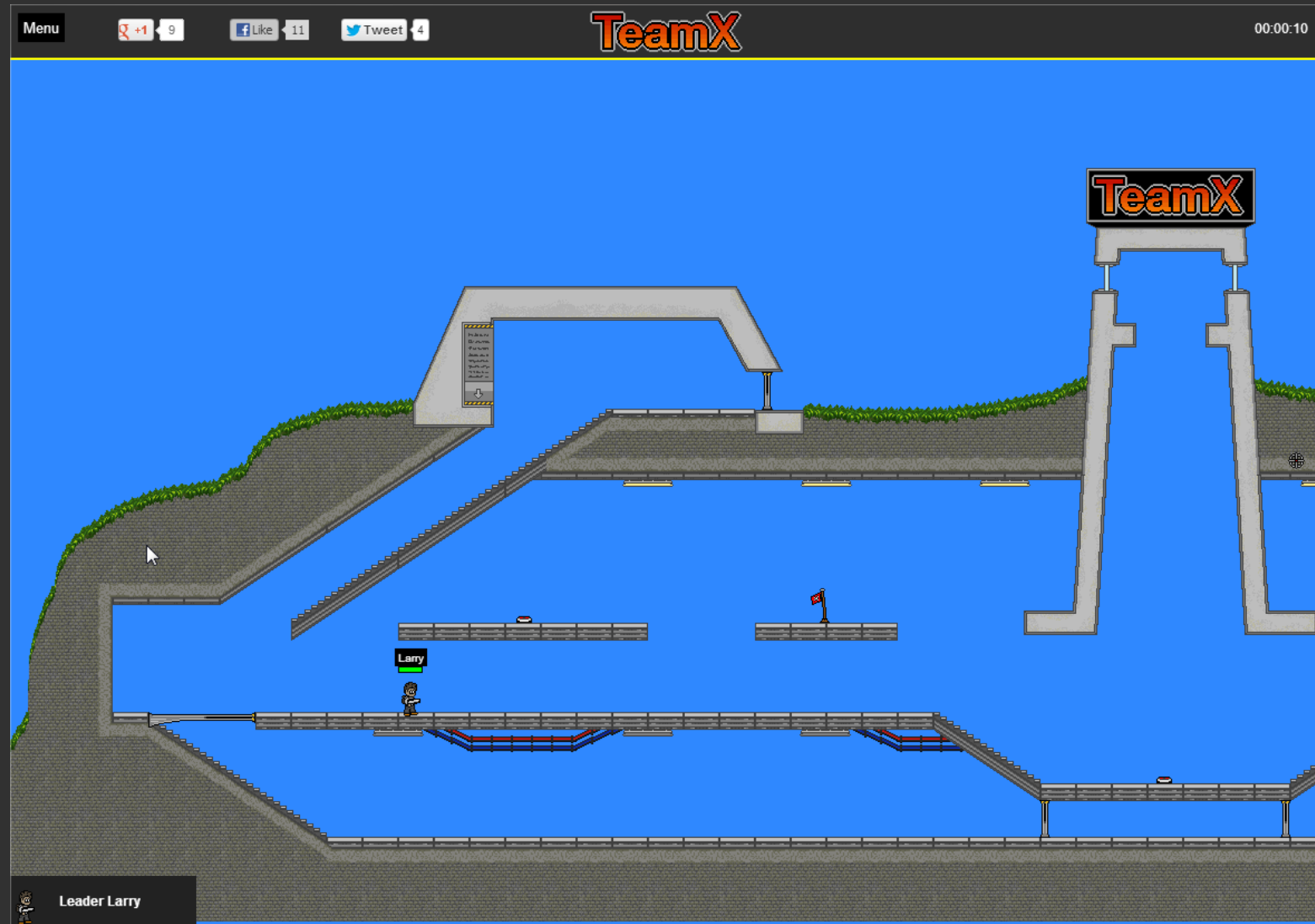
Applications

The image displays a software interface for a drawing application on the left and its resulting output on the right. The interface includes a dropdown menu set to "Wheel inside", five sliders for "Fixed radius", "Wheel radius", "Pen radius", "Pen thickness", and a "Smoother" to "Faster" range. It also features a color palette, a "Start" button, "Stop" and "Clear" buttons, and a "I'm feeling lucky!" button. The output is a complex geometric drawing consisting of several overlapping circles and arcs in various colors (purple, blue, green, orange, grey) within a large grey circle.

Applications



Applications



Applications

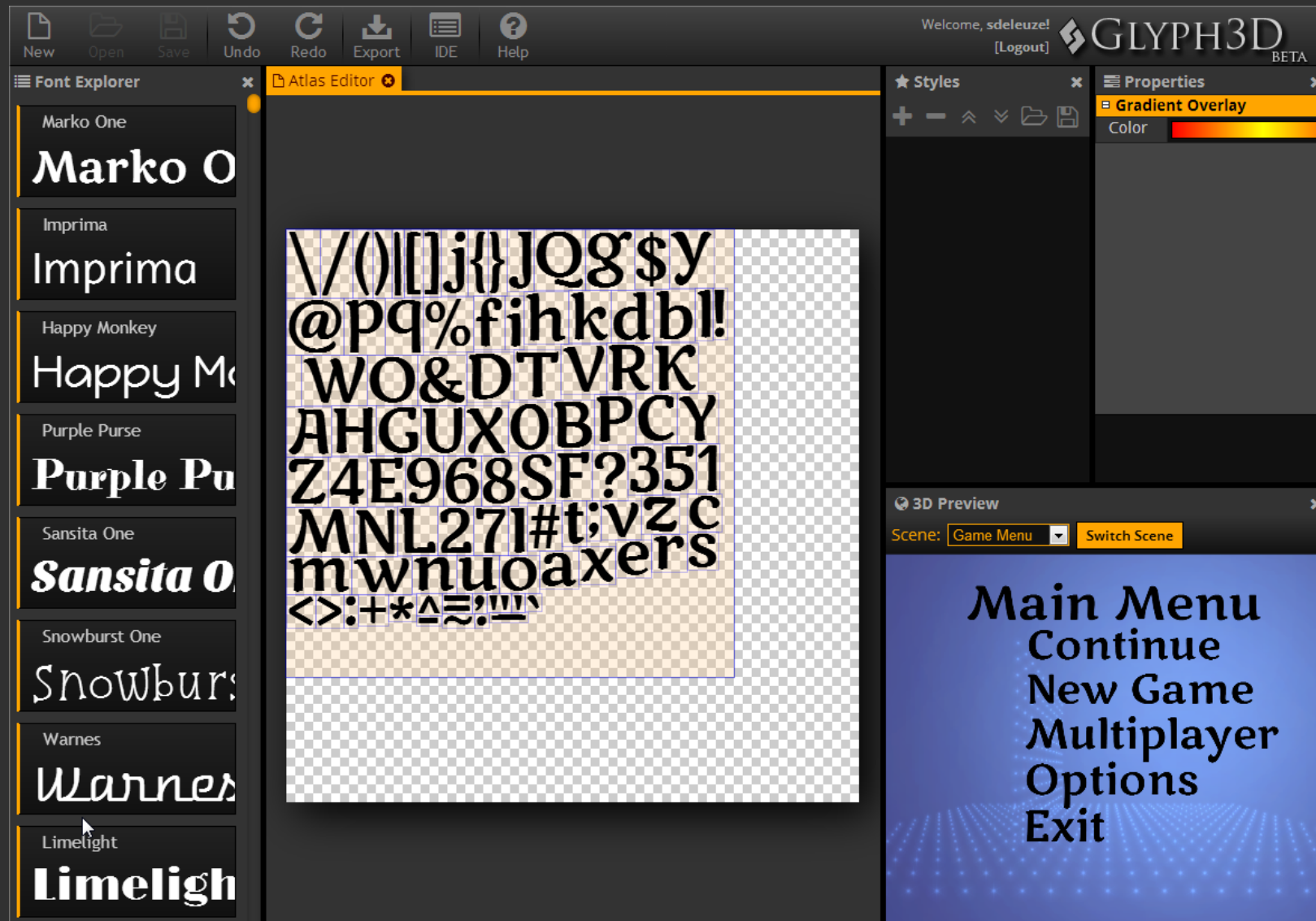
Dock Spawn IDE Demo Pull a panel out from it's title bar and dock it elsewhere

The screenshot displays the Dock Spawn IDE interface. The main window is titled "Dock Spawn IDE Demo" and contains a subtitle "Pull a panel out from it's title bar and dock it elsewhere". The interface is divided into several panels:

- Solution Explorer:** Located on the left, it shows a project structure with "Test Project" containing "Source File 1", "Header File 1", and "My Project 2".
- Code Editor:** The central area displays C++ code for "Steering.h" and "Steering.cpp". The code includes methods like `SteeringBehaviours()`, `GetSteeringForce`, `Seek`, `IsSeekEnabled`, and `SetSeekEnabled`. The `Seek` method is currently selected and highlighted.
- Toolbox:** Located on the right, it contains five tool icons labeled "Tool 1" through "Tool 5".
- Outline:** A small panel below the Solution Explorer.
- Properties:** A panel below the Outline.
- Output:** Located at the bottom left, it shows the message "[info] program exited with code 0".
- Problems:** Located at the bottom right, it is currently empty.

```
12
13 syntheticarc::SteeringBehaviours::SteeringBehaviours()
14 : seek(true), bounce(false), timeSinceLastBound(0)
15 {
16 }
17
18 respawn::math::Vector3 syntheticarc::SteeringBehaviours::GetSteeringForce(const GameEntity& h
19                                     const GameEntity& t
20 {
21     // Get the steering force
22     Vector3 steeringForce = Vector3(0, 0, 0);
23     if (seek) {
24         steeringForce = steeringForce + Seek(host, target);
25     }
26     if (bounce) {
27         steeringForce = direction * host.GetMaxSpeed();
28     }
29     return steeringForce;
30 }
31
32 respawn::math::Vector3 syntheticarc::SteeringBehaviours::Seek( const GameEntity& host, const
33 {
34     Vector3 desired = target.GetPosition() - host.GetPosition();
35
36     // If desired velocity's speed component is greater than maxSpeed then truncate it
37     const float maxSpeed = target.GetMaxSpeed();
38     const float distance = length(desired);
39     if (distance < 0.000001f) {
40         return Vector3(0, 0, 0);
41     }
42     desired = desired * (maxSpeed / distance);
43
44     return desired - host.GetVelocity();
45 }
46
47 bool syntheticarc::SteeringBehaviours::IsSeekEnabled() const
48 {
49     return seek;
50 }
51
52 void syntheticarc::SteeringBehaviours::SetSeekEnabled( bool flag )
53 {
```

Applications



Conclusion

Dart a le potentiel pour changer notre façon de développer

Version 1.0 prévue pour cet été

Un concurrent sérieux pour « Javascript as a language », Java, Groovy, Scala, Ruby et Python

Rejoignez la communauté Dart et participez à la création de son écosystème



Questions / Réponses

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