



A compiler providing incremental scalability for web applications

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A compiler providing incremental scalability for web application

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To develop a **web application**, one have to **choose**

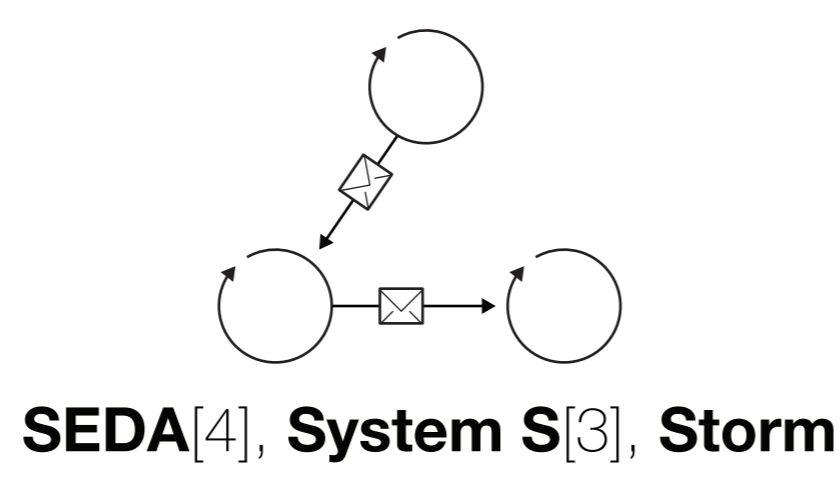
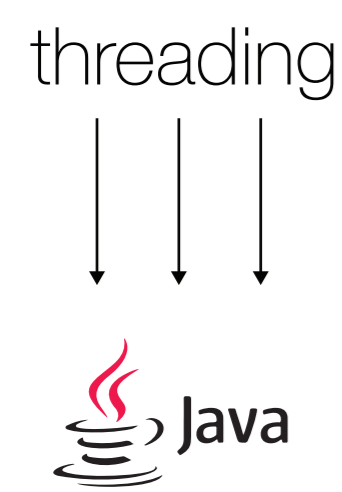
features
scalability

performance
scalability

Monolithic models

Or

Distributed models



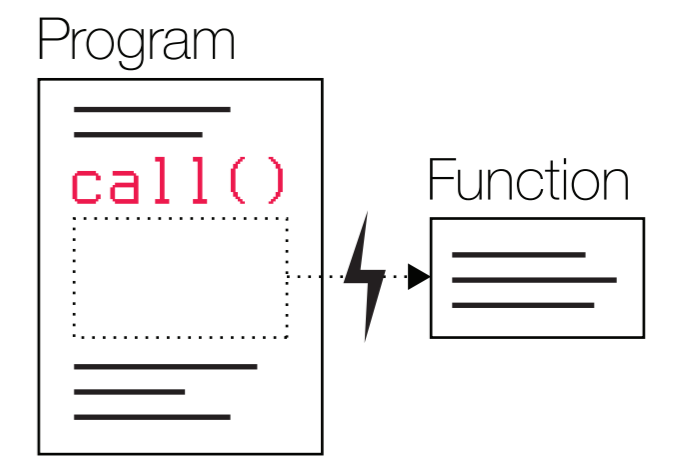
We want to **compile** into

The compiler extracts **autonomous parts** by searching for **rupture points** marking them out

A **Rupture point** is a call of a loosely coupled function

In **node**, an **asynchronous call** is a **rupture point**.

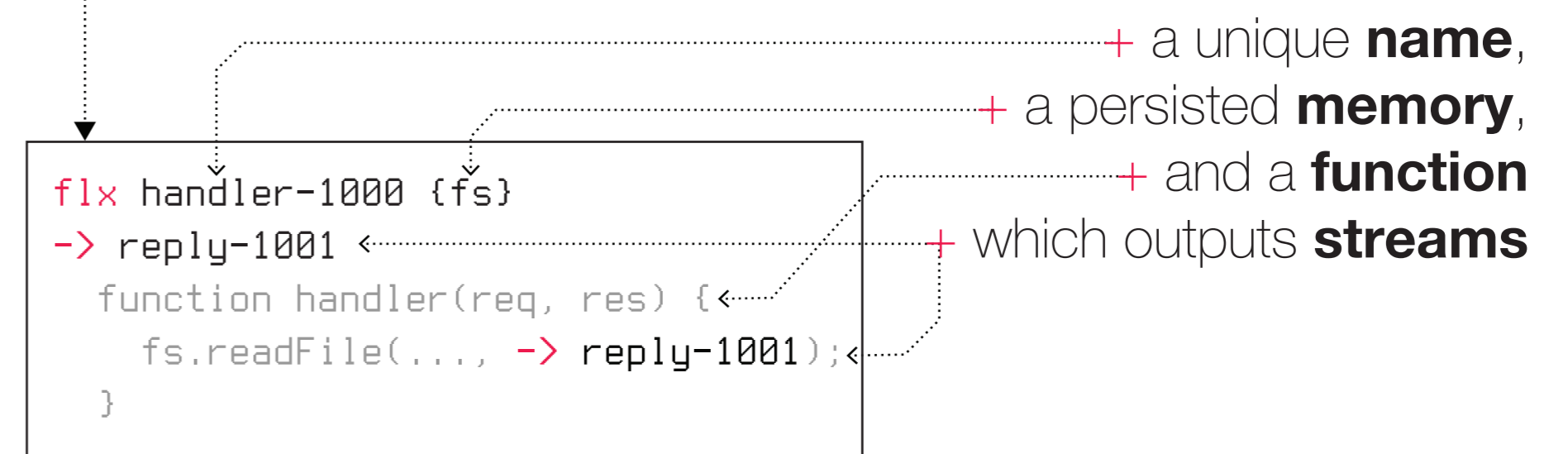
I/O Operation like **fs** and **express**.



```
var app = require('express')();
app.get('/', function handler(req, res){
  fs.readFile(__filename, reply);
});
```

Application parts are enveloped into **fluxions**.

A **fluxion** is an autonomous with :



..... compilation>

source[1]

target[1]

```
var app = require('express')(),
    fs = require('fs'),
    count = 0;

app.get('/', function handler(req, res){
  fs.readFile(__filename, function reply(err, data){
    count += 1;
    var code = (' + data)
      .replace(/\n/g, '<br>')
      .replace(/ /g, '&nbsp;');

    res.send(err
      || 'downloaded ' + count +
        ' times<br><br><code>' +
          code + '</code>');
  });
});

app.listen(8080);
console.log('>> listening 8080');
```

```
f1x source.js {}
>> handler-1000 [res]
var app = require('express')(),
    fs = require('fs'),
    count = 0;
app.get('/', >> handler-1000);
app.listen(8080);
console.log('>> listening 8080');
```

```
f1x handler-1000 {fs}
-> reply-1001 [res]
function handler(req, res) {
  fs.readFile(__filename, -> reply-1001);
}
```

```
f1x reply-1001 {count}
-> null
function reply(err, data) {
  count += 1;
  var code = (' + data)
    .replace(/\n/g, '<br>')
    .replace(/ /g, '&nbsp;');

  res.send(err
    || 'downloaded ' + count +
      ' times<br><br><code>' +
        code + '</code>');
}
```

[1] fx-example: <https://github.com/etnbrd/fx-example/tree/1.0>. Accessed: 2014-08-22.

[2] Fox, A. et al. 1997. Cluster-based scalable network services.

[3] Jain, N. et al. 2006. Design, implementation, and evaluation of the linear road benchmark on the stream processing core. SIGMOD '06 Proceedings of the 2006 ACM SIGMOD international conference on Management of data.

[4] Welsh, M. et al. 2000. A design framework for highly concurrent systems.