



mod

# Creating iOS and Android Apps in Lisp, with mocl

Wes Henderson

Wukix

No Service

8:10 AM

## 2nd Contacts



Joe Johnson



John Doe



Leonard Lee



Martin Martinez



Mike Michaels



Roger Roberts

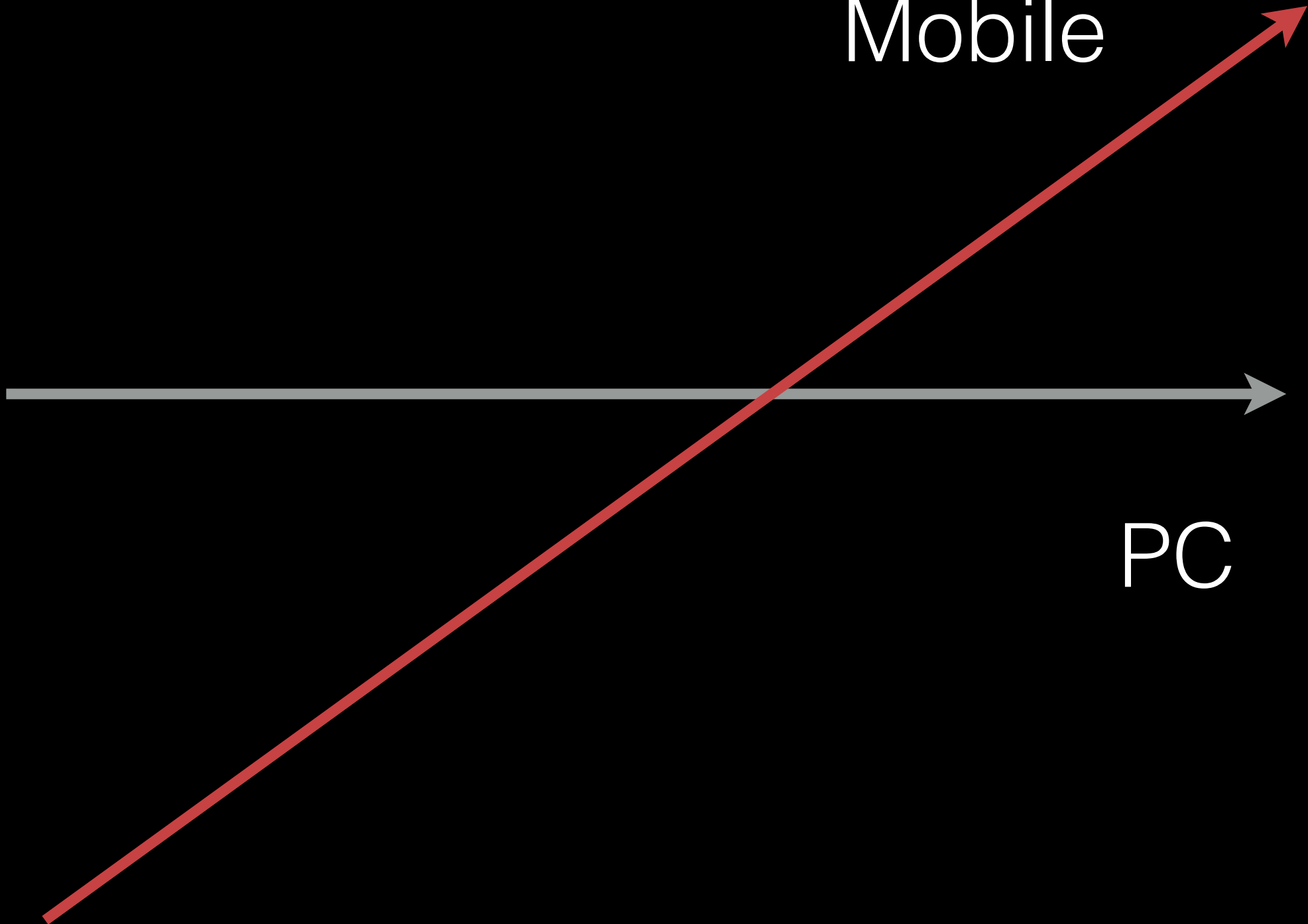


Sam Smith



Mobile

PC





# Challenges

- Touch input
- Screen sizes, form factors
- Slow CPU, GPU
- Multiple technology platforms
- App store distribution model

# CL + Mobile

- High performance
- Platform portability
- Reduced FFI dependence

High-level **and** fast

portability => flexibility

Pure CL => Reduced FFI  
dependence =>  
**Fewer headaches**

The logo symbol is a stylized orange shape composed of several rectangular blocks. It features a central vertical rectangle, with horizontal bars extending from its top and bottom. To the left of the central bar is another horizontal bar, and to the right is a third, creating a symmetrical, stepped appearance.

**mod**

# What is mocl?

- CL to C compiler
- Fully native code, no interpreters
- Implements most of ANSI (and more)
- Sophisticated: type inference, tail calls, ...



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# iOS Security

- Code signing => strict no-execute policy
- Strict no-execute => no JIT, no run-time compilation
- Code signing => ~~interpreters banned~~  
interpretation allowed, but only for pre-defined code within the app
- Upshot: mocl design AOT, ensuring compliance

# Red Tape vs. Red Tape

- Security and anti-infringement red tape
- "Share and be nice" red tape

# Goal: "It just works"

- Most of ANSI
- Unicode strings (automatic)
- Gray streams
- Networking (usocket TCP/IP)
- Many CL libraries tested



# Compiler Tech

- Type inference and type declaration handling
- Type-optimized arithmetic
- Typed arrays
- Tail call optimization
- Dead code elimination

# FAQ

- Why not clojure?
- Why not an existing CL?
- Why not something easier to implement, like scheme?





```
(defun hello (name)
  (format t "Hello, ~A~%" name))
```

```
(declaim (call-in hello))  
(defun hello (name)  
  (format t "Hello, ~A~%" name))
```

```
mocl --ios ~/apps/hello/ hello.lisp
```

```
cl_init();
```

```
hello(name)
```

```
hello(name)
```

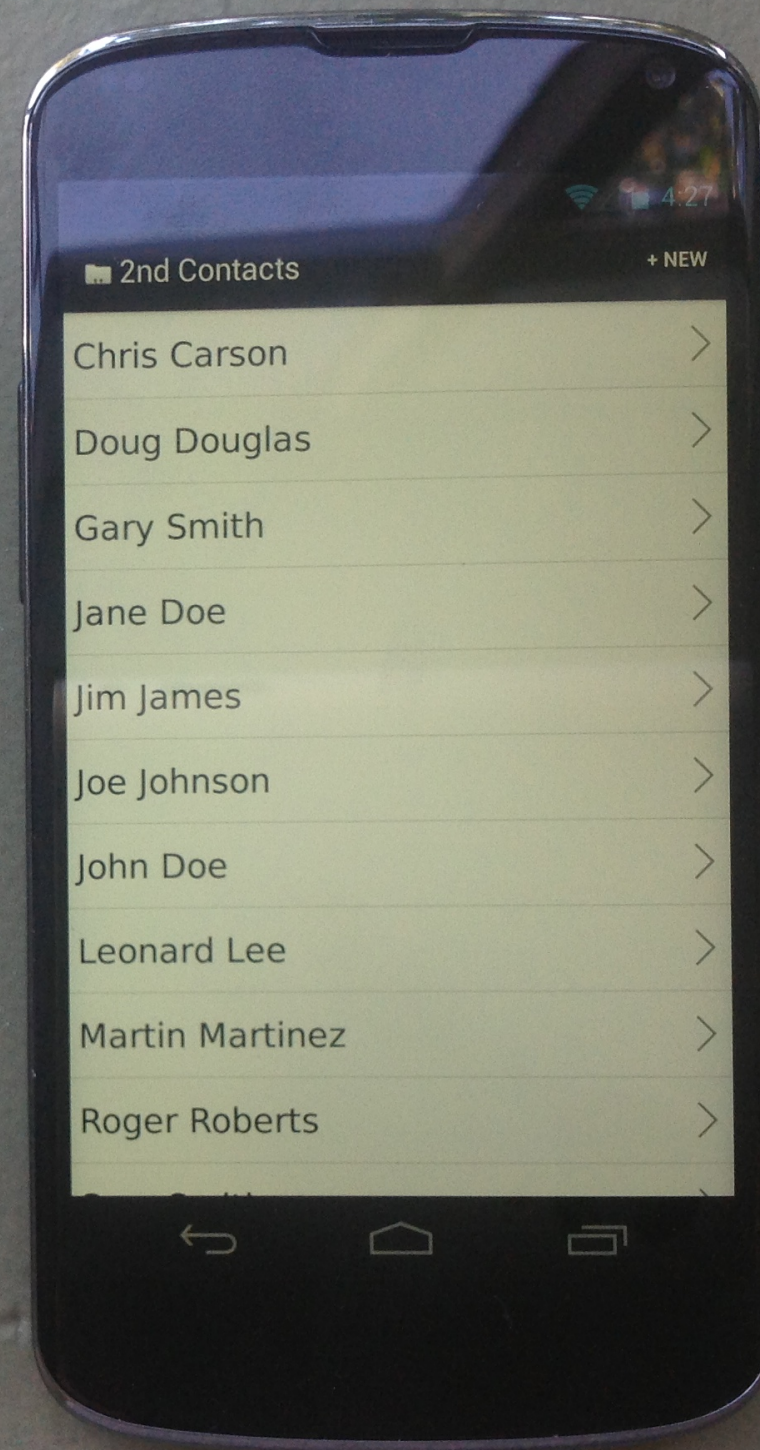
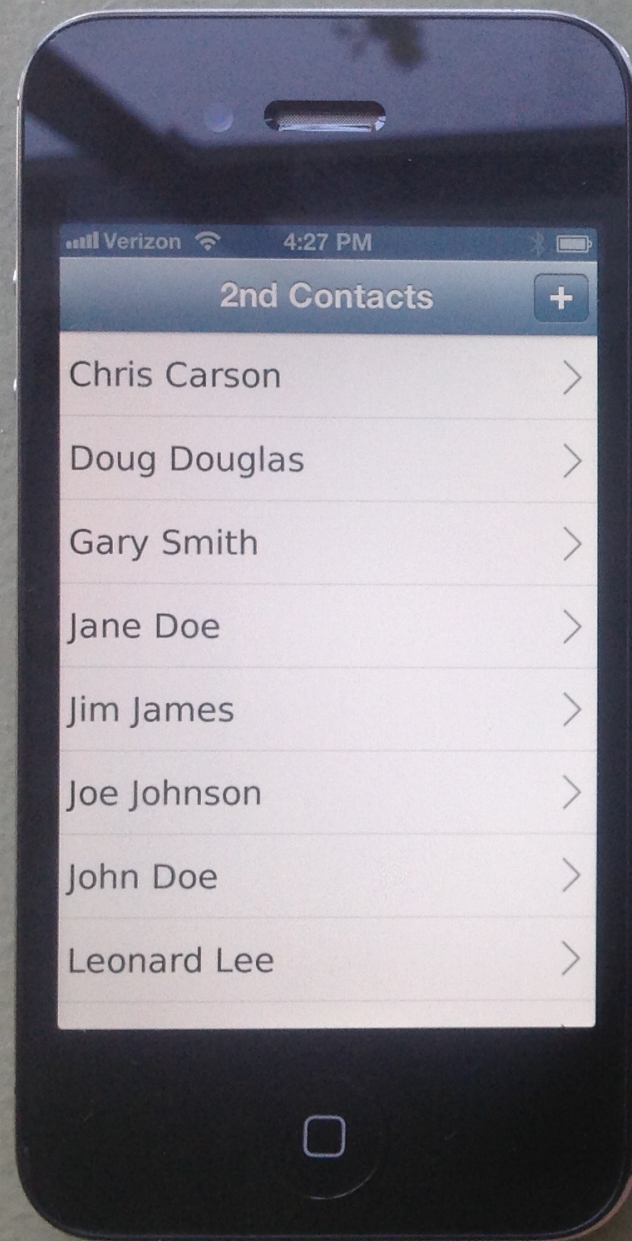
```
info hello__callinfo
```

```
{
```

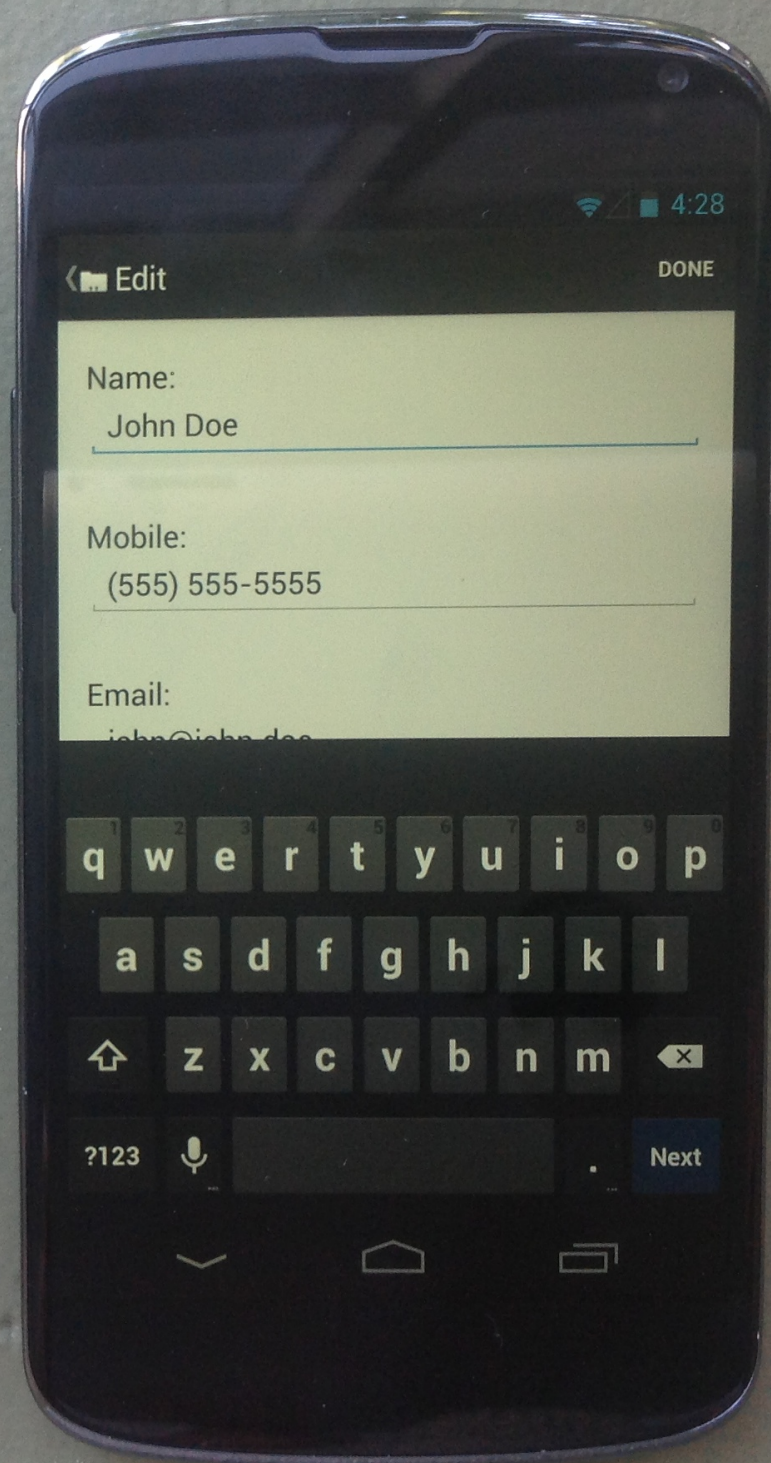
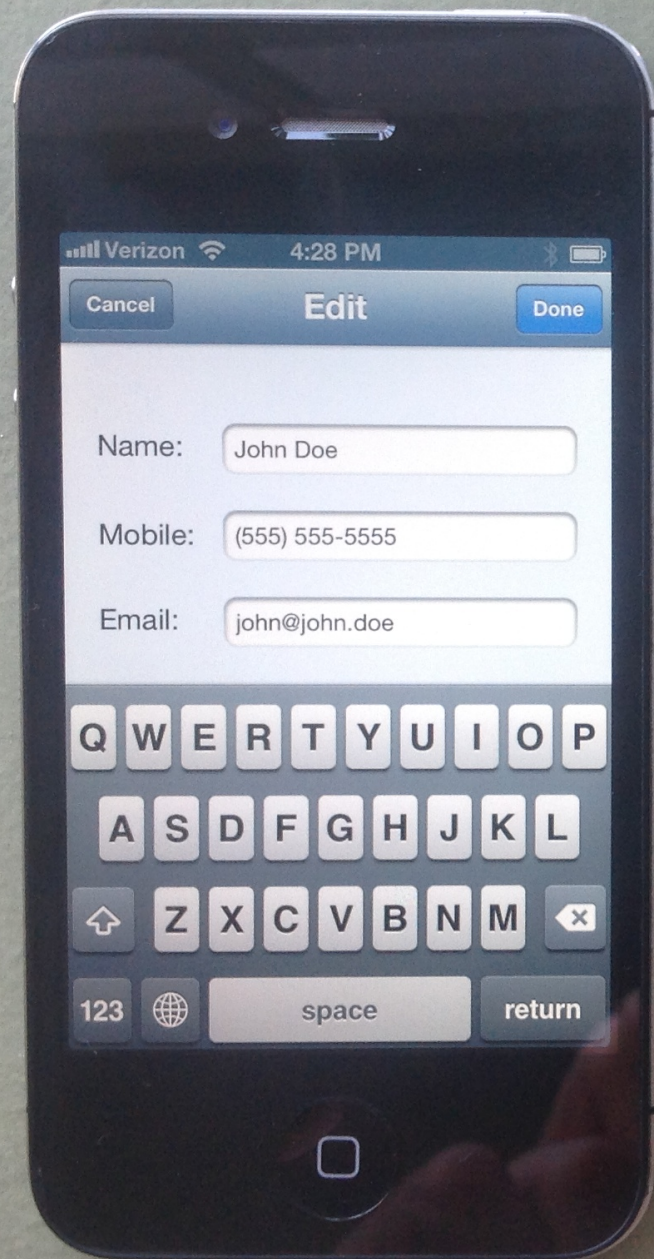
All Output ↕

**Hello, ECLM!**











2nd Contacts



Chris Carson



Doug Douglas



Gary Smith



Jane Doe



Jim James



Joe Johnson



John Doe



Leonard Lee





Verizon

4:43 PM

## 2nd Contacts



Chris Carson



Doug Douglas



Gary Smith



Jane Doe



Jim James



Joe Johnson



John Doe



Leonard Lee



# Contacts App

- Vectometry/vecto renders list
- Lisp for data handling (e.g. sorting, reader and printer for data persistence)
- iOS/Android stock UI components for navigation, form fields, scrolling
- Future: Drakma for server communication

```
(defun foo (a) (aref #(1 2 3) a))
```

```
(declare (call-in bar))
```

```
(defun bar (b) (foo b))
```

```
24  
25      // 9 is out of bounds  
26      bar(9);  
27  }
```

All Output ↕

Clear

```
Error: The index 9 is not in the range [0, 3)  
      in row-major-aref (array.lisp:580)  
      in foo (hello.lisp:5)  
      in bar (hello.lisp:9)
```

Text

```
time FATAL EXCEPTION: main
time mocl.Condition: Error: The index 9 is not in the range [0, 3)
time     in row-major-aref
time     in foo (hello.lisp:5)
time     at mocl.CL.bar__native(Native Method)
time     at mocl.CL.bar(CL.java:18)
time     at com.example.hello.MainActivity.onCreate(MainActivity.java:18)
time     at android.app.Activity.performCreate(Activity.java:5104)
time     at android.app.Instrumentation.callActivityOnCreate(Instrumentation.java:105)
```

When will mocl be  
available?



**Lisp universal time**

**3581000000**

**(3 weeks from today)**



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subject: ECLM