iPhone “Companion” Apps

“File > New Project” to App Store in two months*

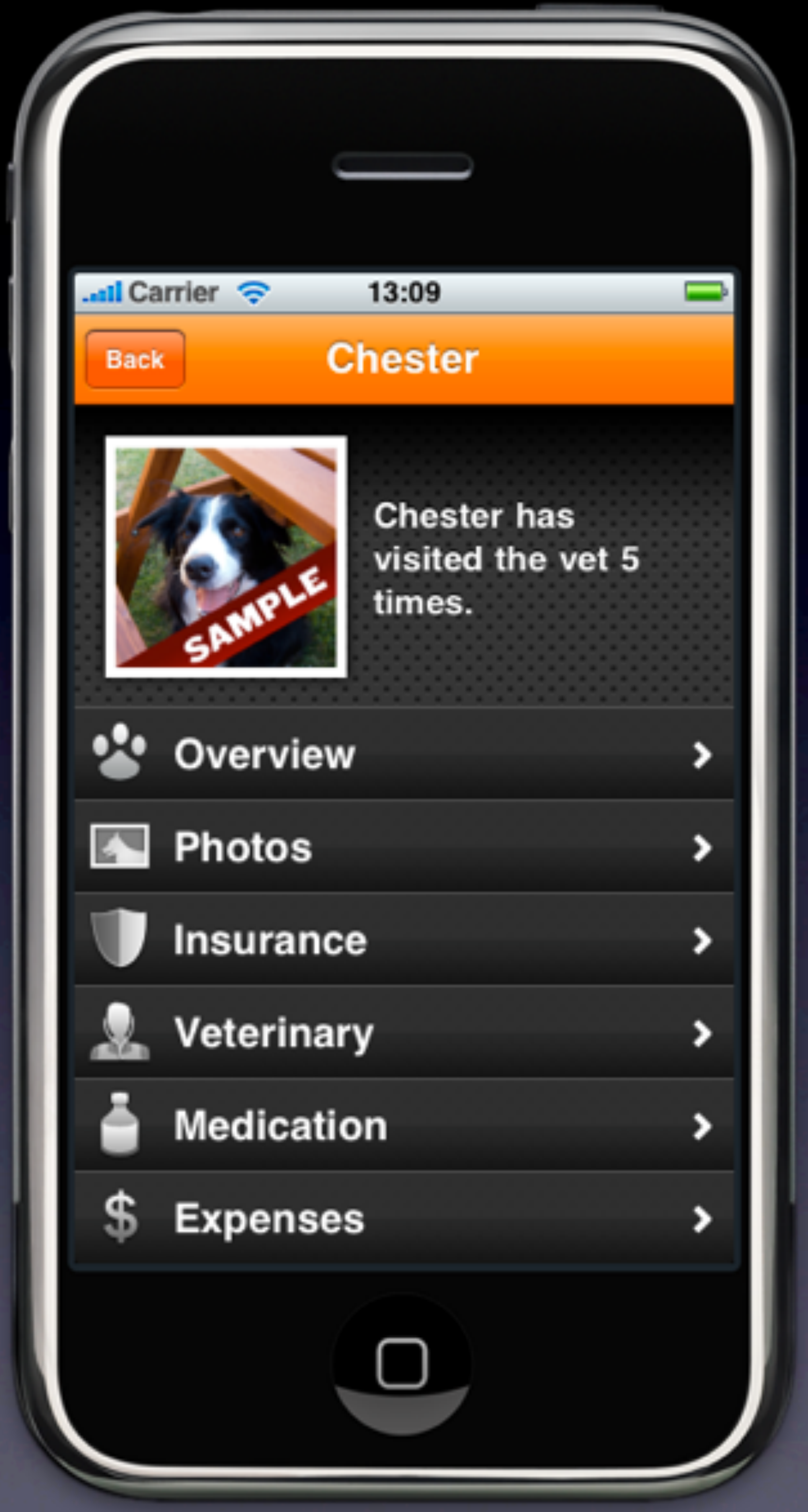
Daniel Kennett

** Approval time may vary*

Clarus

Yo

'Sup

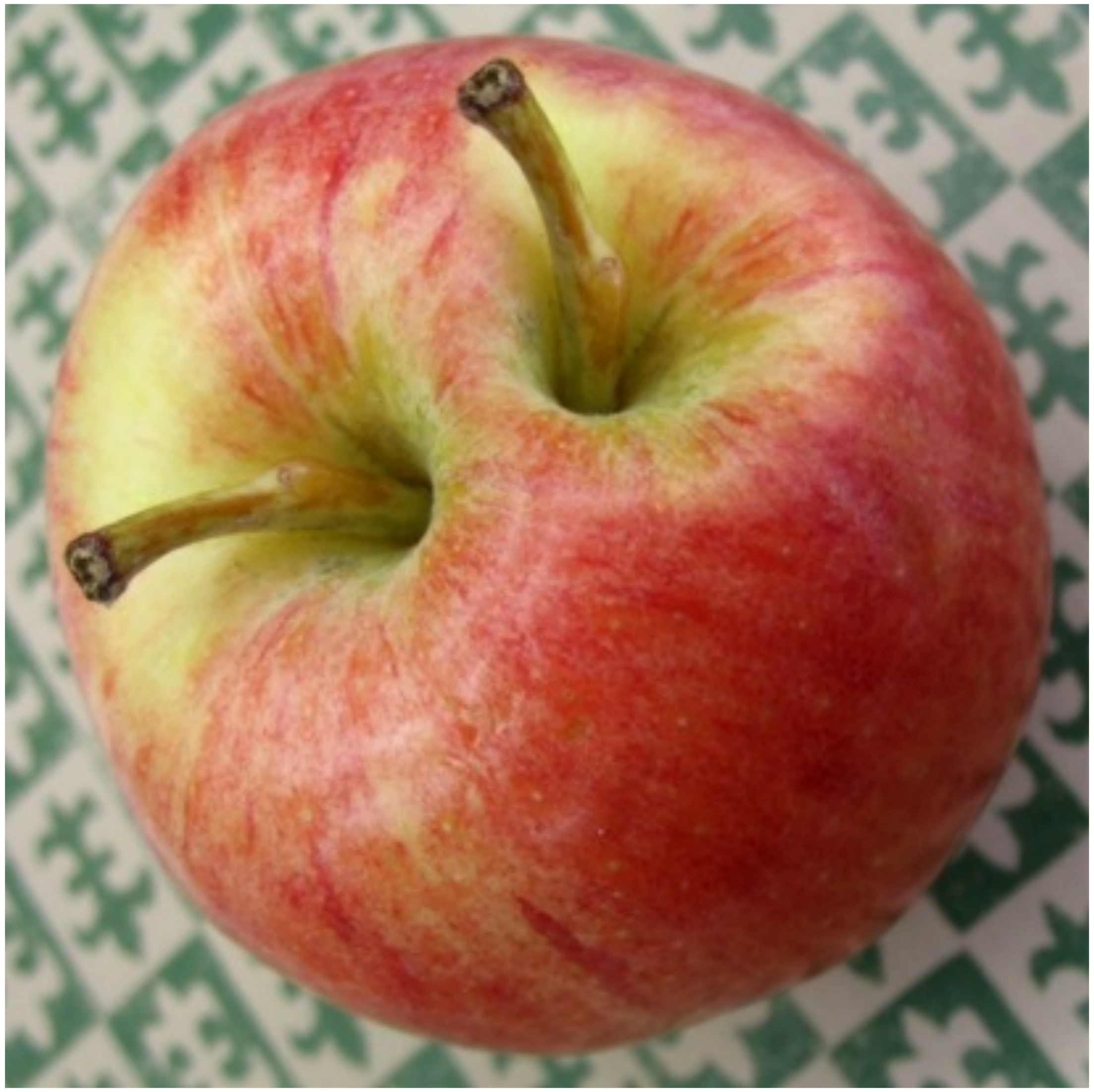


Chester has visited the vet 5 times.

Stat-o-rama

- Date started: 19th June, 2009
- Date submitted to App Store: 4th September, 2009
- Date approved: 17th September, 2009
- Date officially launched: 30th October, 2009
  - Over a month between approval and launch. That's a *good* problem.
  - The "Release" date isn't so important for companion apps.

If I had seen this presentation before I started, this would’ve taken me less than two months.

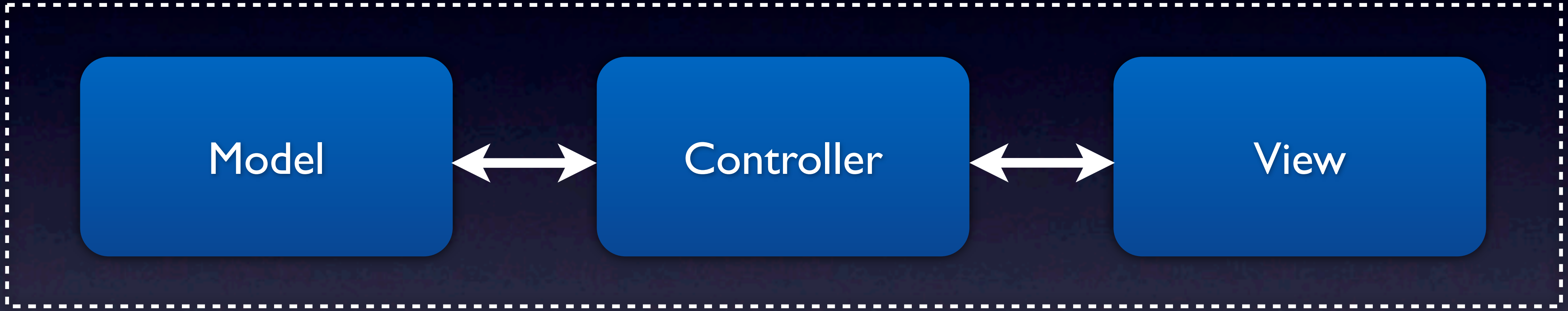


“Apple Core Duo”

Part 1: Core Design

MVC

Clarus

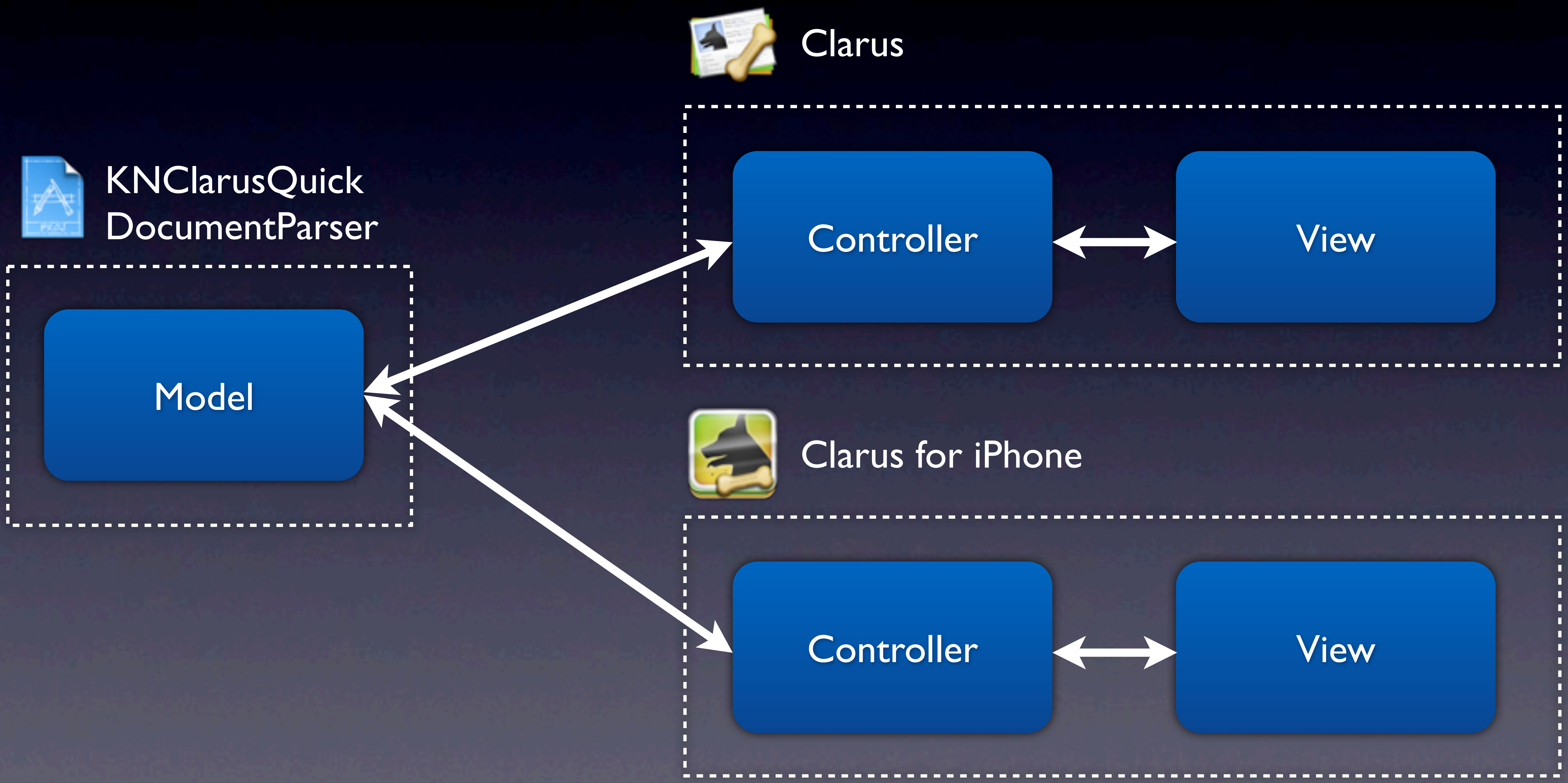


Model

Controller

View

MVC Xtreme



KNClarusQuick
DocumentParser

Model

Clarus

Controller

View

Clarus for iPhone

Controller

View

Document Format

- Use Core Data.
- …or don’t.
- Since you have a shared model, who the hell cares?
- Bundled document formats are fine.
- DON’T EXPORT. Just copy. Seriously.

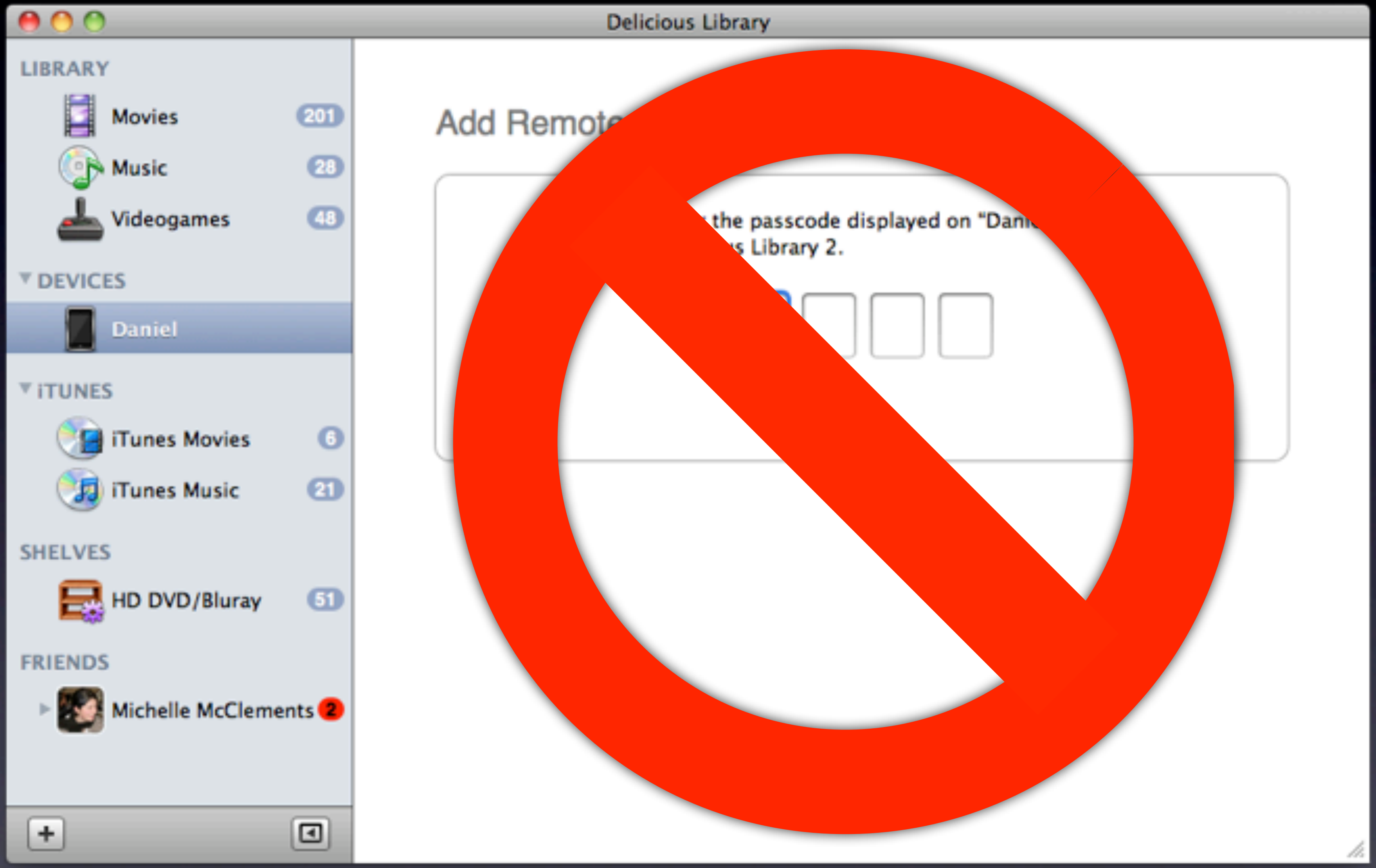
“Sunk Boat”

Part 2: Syncing

Disclaimer

“Syncing” is probably too advanced to describe what I’m doing.

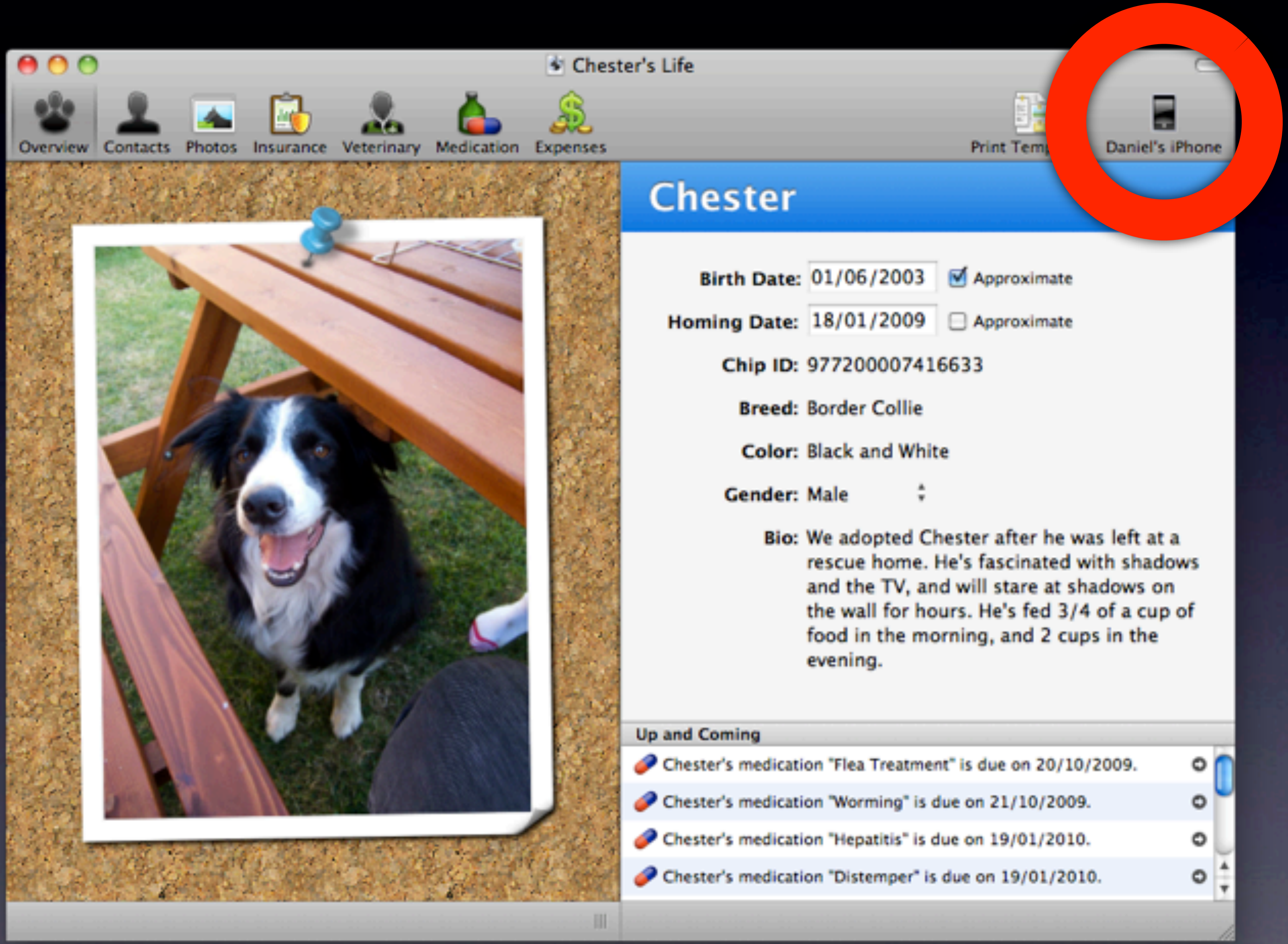
K.I.S.S



the passcode displayed on "Dani
s Library 2.

Delicious Library 2

K.I.S.S



Chester

Birth Date: 01/06/2003 ☑ Approximate

Homing Date: 18/01/2009 □ Approximate

Chip ID: 977200007416633

Breed: Border Collie

Color: Black and White

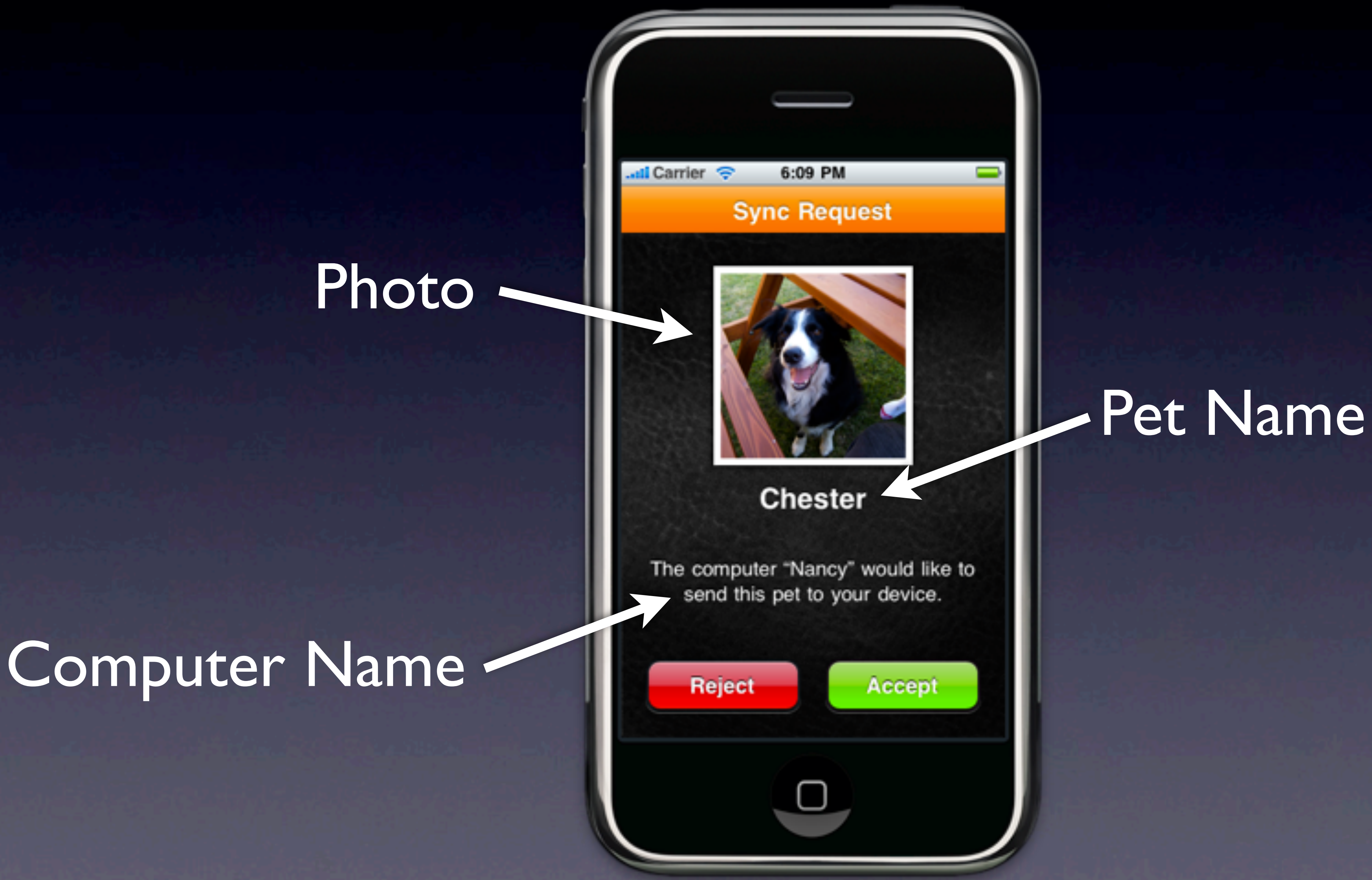
Gender: Male

Bio: We adopted Chester after he was left at a rescue home. He's fascinated with shadows and the TV, and will stare at shadows on the wall for hours. He's fed 3/4 of a cup of food in the morning, and 2 cups in the evening.

Up and Coming

- Chester's medication "Flea Treatment" is due on 20/10/2009.
- Chester's medication "Worming" is due on 21/10/2009.
- Chester's medication "Hepatitis" is due on 19/01/2010.
- Chester's medication "Distemper" is due on 19/01/2010.

Establishing Trust



Photo

Pet Name

Computer Name

Sync Request

Chester

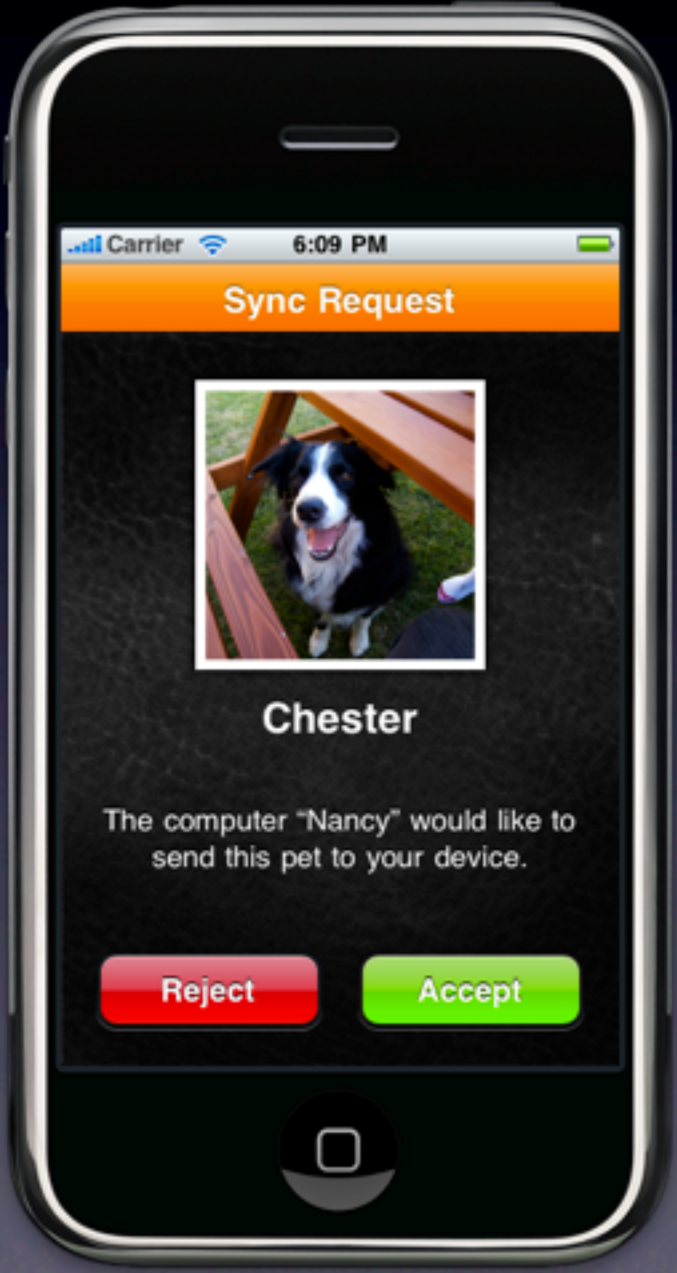
The computer “Nancy” would like to send this pet to your device.

Forming a Conversation

Pre-Sync Data →

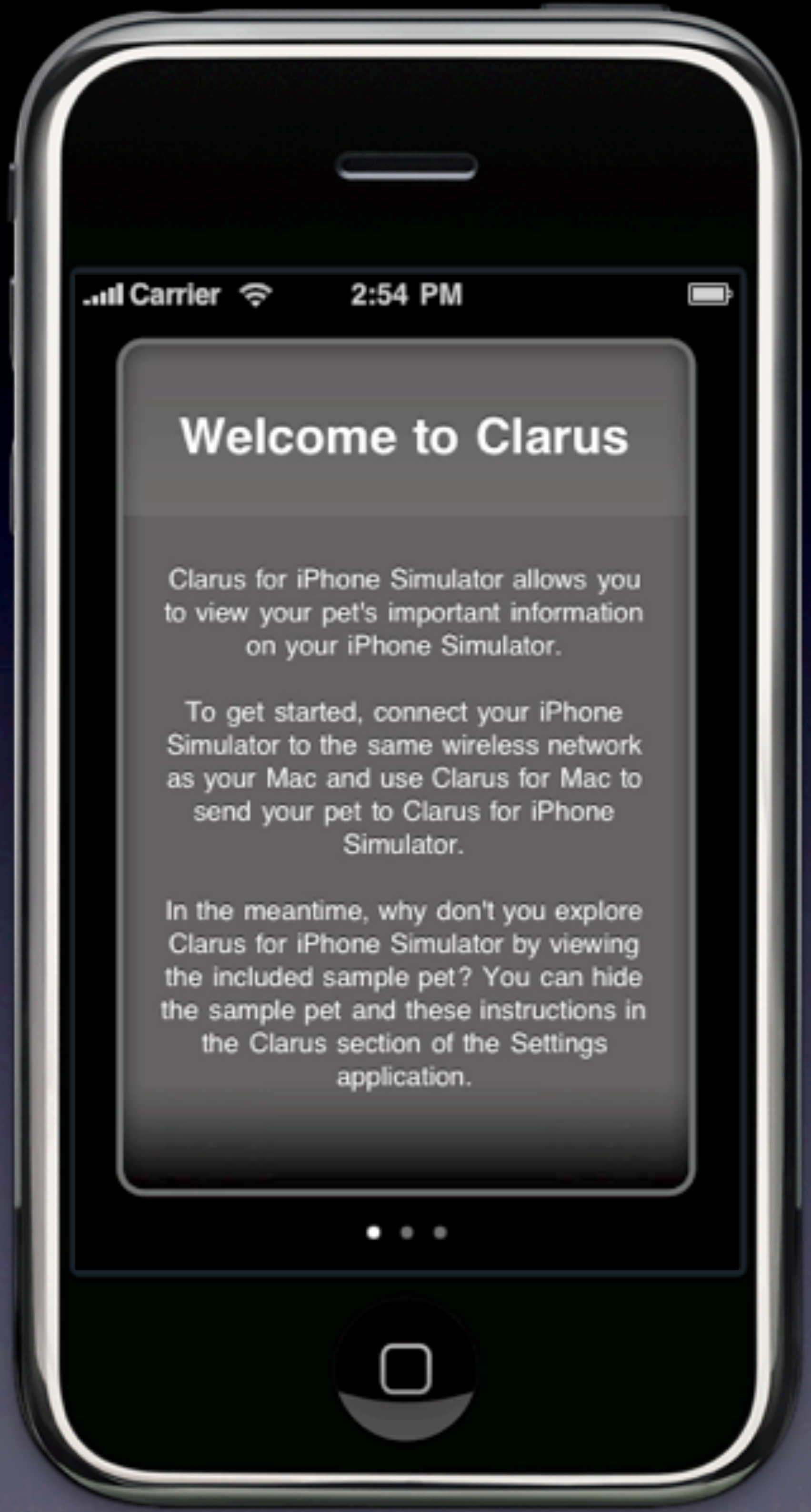
← Confirm or Deny?

Document & Resources →



Chester

The computer "Nancy" would like to send this pet to your device.



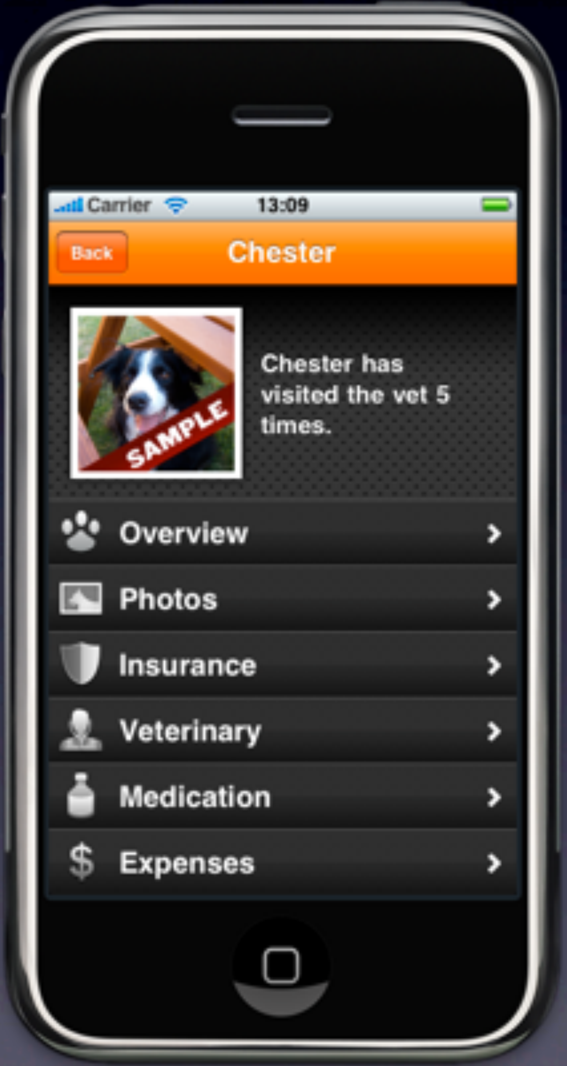
Welcome to Clarus

Clarus for iPhone Simulator allows you to view your pet's important information on your iPhone Simulator.

To get started, connect your iPhone Simulator to the same wireless network as your Mac and use Clarus for Mac to send your pet to Clarus for iPhone Simulator.

In the meantime, why don't you explore Clarus for iPhone Simulator by viewing the included sample pet? You can hide the sample pet and these instructions in the Clarus section of the Settings application.

Ça va, et toi?

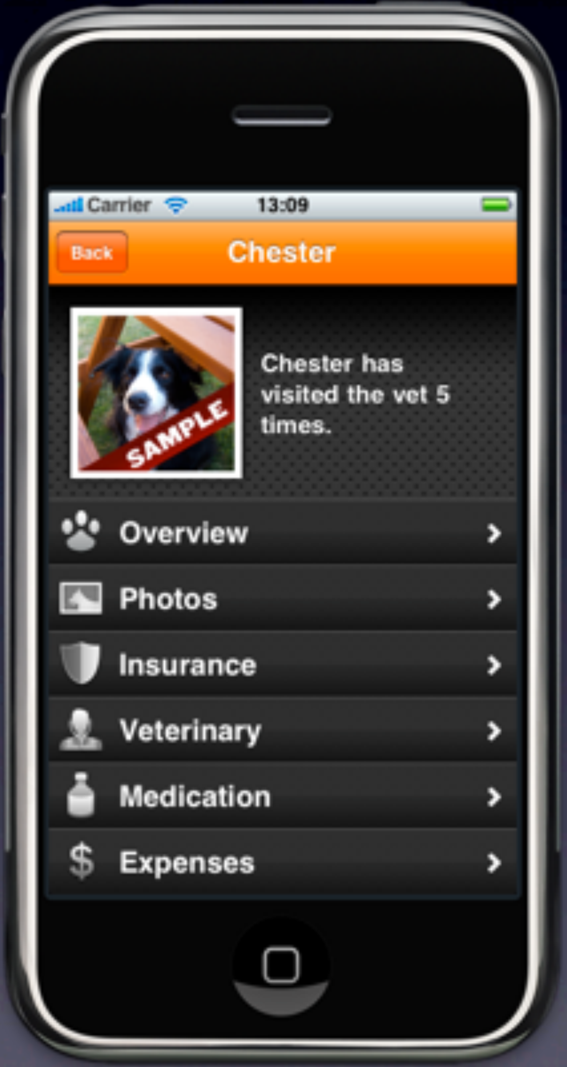


Chester has visited the vet 5 times.

Clarus: Daniel’s iPhone

```
NSUInteger port = …; // From CFNetwork

NSNetService *bonjourService =
  [[NSNetService alloc]
   initWithDomain:@"local."
            type:@"_clarussync._tcp."
            name:[[UIDevice
       currentDevice] name]
            port:port];

[bonjourService setDelegate:self];
[bonjourService publish];
```

Ça va, et toi?



Chester has visited the vet 5 times.

Clarus: Daniel's iPhone

App. Version: 1.0
Sync Version: 1
Device Model: iPhone
Device UID: 645cfd…
Capacity: 524288000
Free: 82010112

```
NSDictionary *txtDict = …;

txtDict setValue:kSyncVersion
         forKey:kSyncVersionKey];

NSData *data = [NSNetService
dataFromTXTRecordDictionary:txtDict];

[bonjourService setTXTRecordData:data];
[bonjourService publish];
```

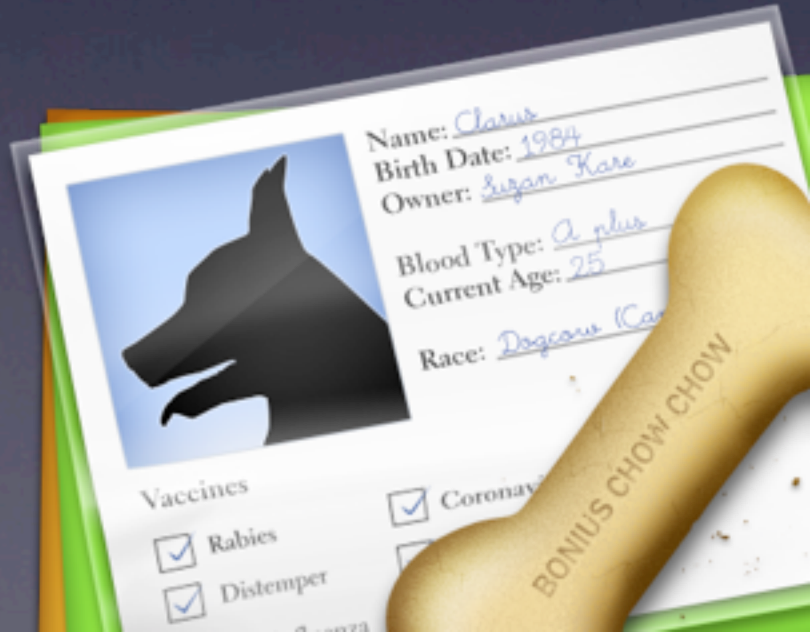
Ça va, et toi?

Clarus: Daniel’s iPhone

App. Version: 1.0
Sync Version: 1
Device Model: iPhone
Device UID: 645cfd…
Capacity: 524288000
Free: 82010112

“Could not sync to “Daniel’s iPhone” because there is not enough free space.”

“Could not sync to “Daniel’s iPhone” because the application on the iPhone is too old. Please check for updates in the App Store.”



Resolving Services

- Use NSNetServiceBrowser.
- Different versions of OS X resolve services differently.
  - You’d think the service resolves before the service’s TXT data…
  - Not necessarily.
  - Make sure you have *both* before displaying any UI.

Dear God, Error Check

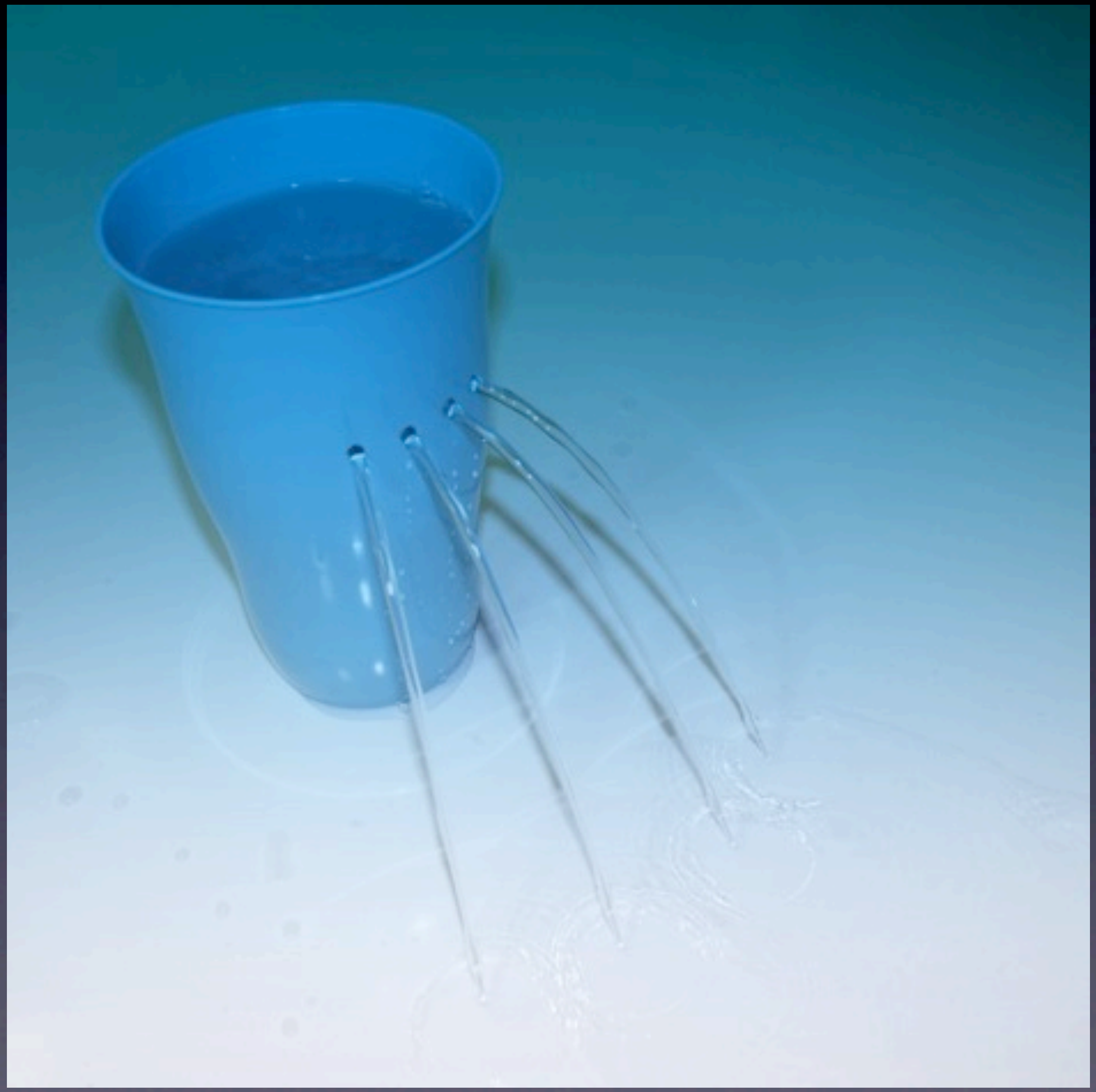
- Bonjour names need to be short — less than 63 octets (bytes).
  - If you go longer, it’ll just not work.
- IPV6 simply doesn’t work on iPhone.
- Setting up a service before you get WiFi doesn’t work.
- There’s *millions** of potential failure points for setting up services.

** May or may not be a lie.*

Dear God, Error Check

- You may get the same service resolving more than once.
  - NSNetService's -isEqual: doesn't catch them.
  - Compare TXT data - especially if you're broadcasting a device UID.
  - This seems to be sporadic.
- When syncing, don't ever replace data in-situ. Ever ever ever.
  - Sync to someplace new, move new data into place, remove old data.

NSFileHandle: A Summary



NSFileHandle: A Summary

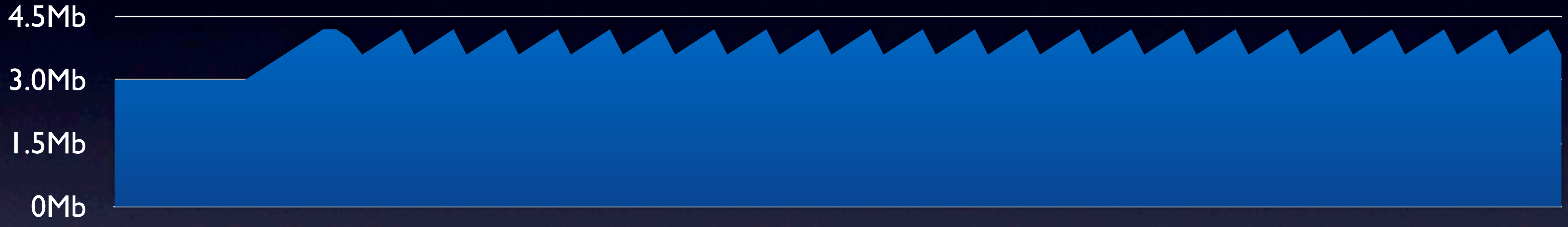
- Easy to use!
- Seems to randomly lose bytes.
- Randomly `malloc`'s 16/32/64Mb chunks.

CFNetwork

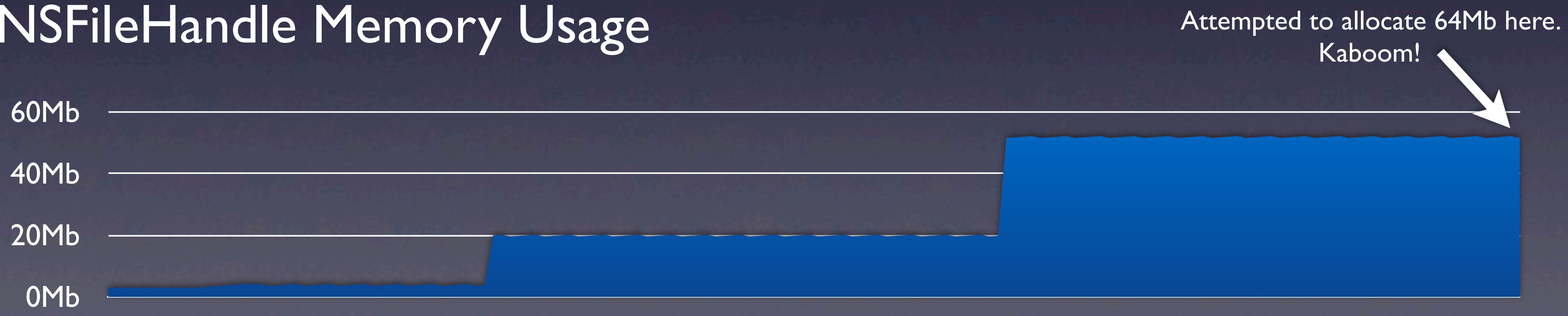
- Looks scary: `CFSocketCreateRunLoopSource(kCFAllocatorDefault, sock, 0);`
- But, it works. Really well. And you only have to use it a little bit.
- See the CocoaEcho sample code…
  - …but remove the IPv6 stuff - it'll fail on iPhone OS.
- In the connection callback, use `CFStreamCreatePairWithSocket()` to get NSInput/OutputStreams.

NSFileHandle vs. NSIn/OutputStream

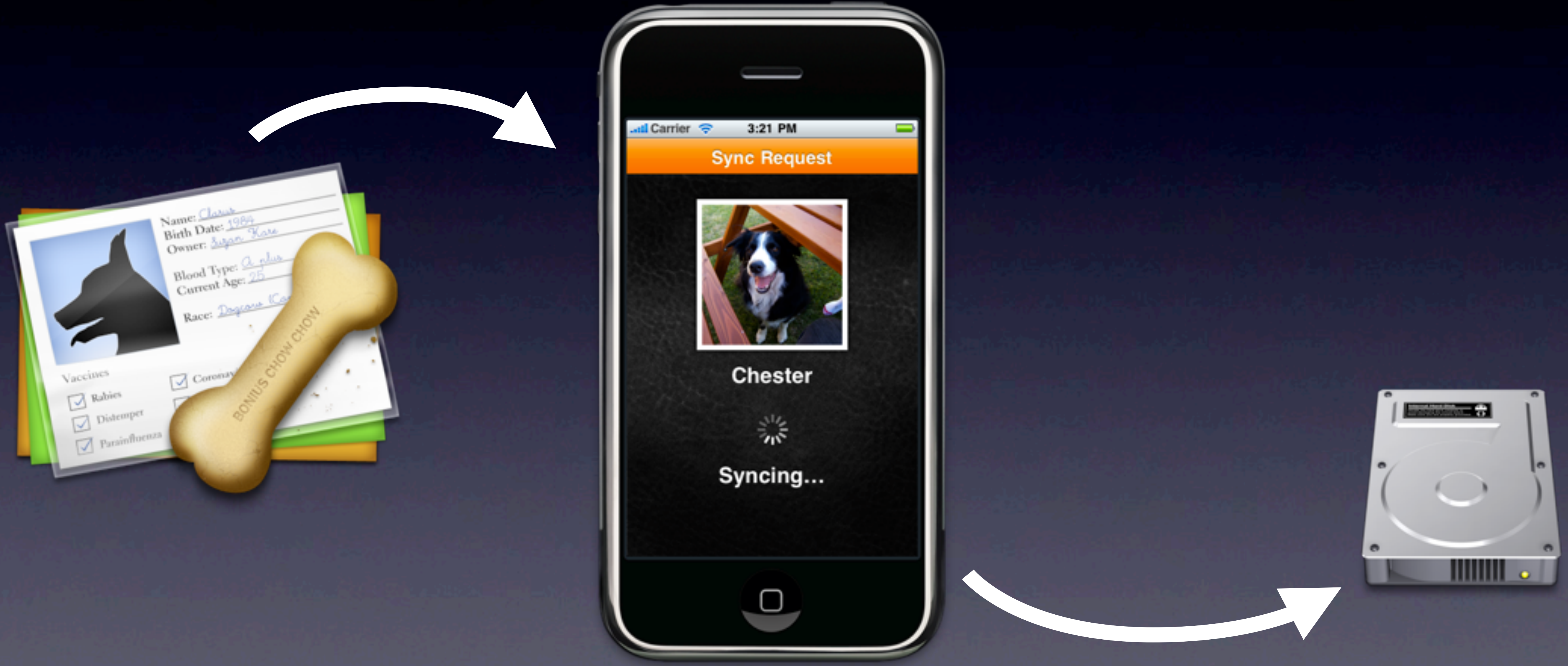
NSIn/OutputStream (via CFNetwork) Memory Usage



NSFileHandle Memory Usage


Attempted to allocate 64Mb here.
Kaboom!

Transferring Big-Ass Files



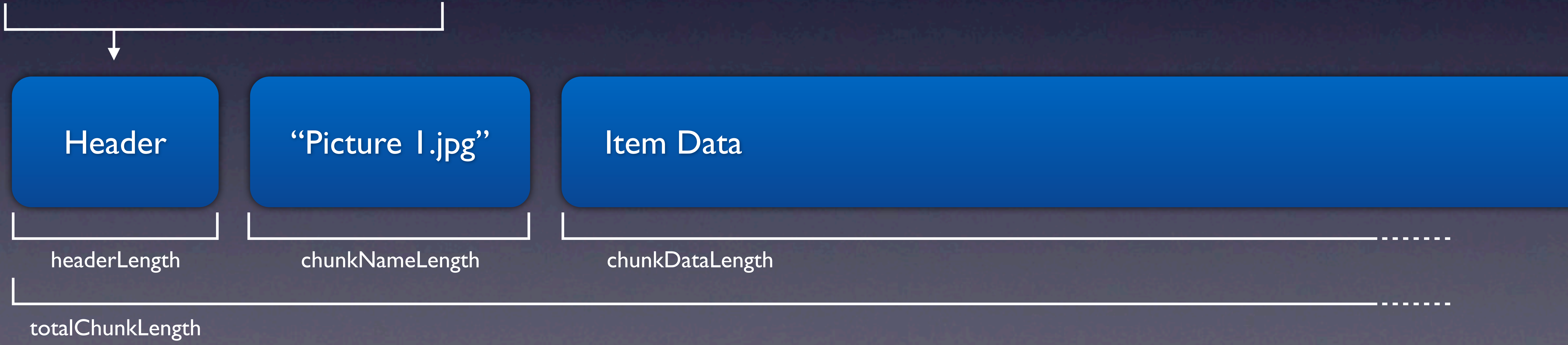
Transferring Big-Ass Files

- You can’t hold the data in memory…
- …so we stream it right to the disk as it comes in.
- This rules out anything that requires a footer (like XML).
- We can check integrity when we’re done.
- Test with desktop-sized data!
    - … you can optimise later.

Transferring Big-Ass Files

```
struct ClarusPetChunkHeader {

    UInt32 headerLength;
    UInt32 totalChunkLength;
    ChunkType chunkType;
    UInt32 chunkNameLength;
    UInt32 chunkDataLength;

} __attribute__ ((packed));
```

```
typedef enum {

    kChunkTypePreSyncInfoDictionary = 0,
    kChunkTypeDataFile = 1,
    kChunkTypeResource = 2,
    kChunkTypeEndOfData = 3, // Signals the natural end
    kChunkTypeSyncCancelled = 4

} ChunkType;
```



Header

“Picture 1.jpg”

Item Data

headerLength

chunkNameLength

chunkDataLength

totalChunkLength

Performance

- iPhone’s WiFi is sloooooooooooooooooooooooooooooooooooooooooooooooooo
- You have plenty of time to optimise your data as you’re copying it.
  - For example, making iPhone-sized images.
  - Which means no justification for using blocks :-(
- Advantage: If the user cancels, you haven’t spent five minutes creating 300 image files for nothing.

Part 3: Strategy

Think Small

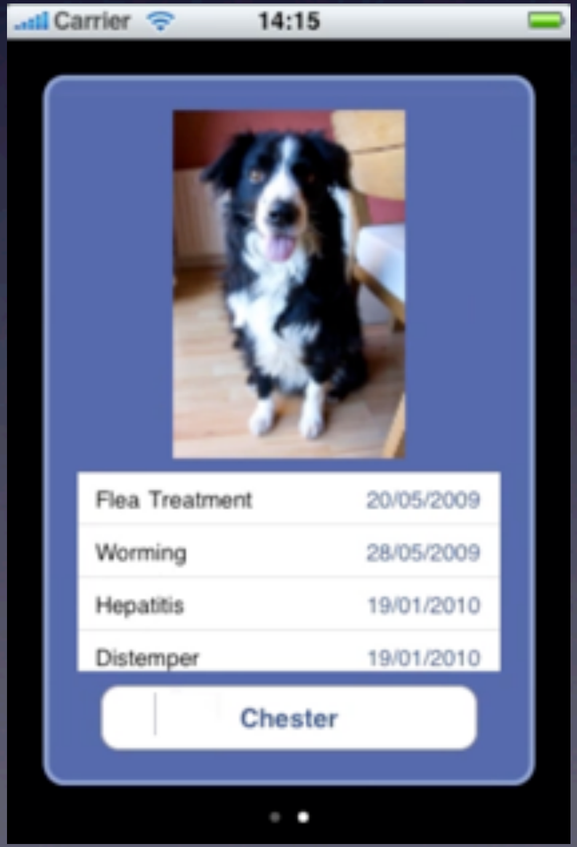
- You should already have your model layer.
- If your model is good, you'll already have an implied view hierarchy.
- Aim to be able to implement a no-frills viewer in less than a week.
- If you take longer, implementing cool UI and syncing will kill you.

No, Even Smaller Than That

- Clarus for iPhone does *nothing*. It's just a viewer.
- In the future, it might do something.
  - Allow you to take photos and sync them back?
  - Add expenses?
- It'll *never* be a full editor for a Clarus document.

Know Your Limits

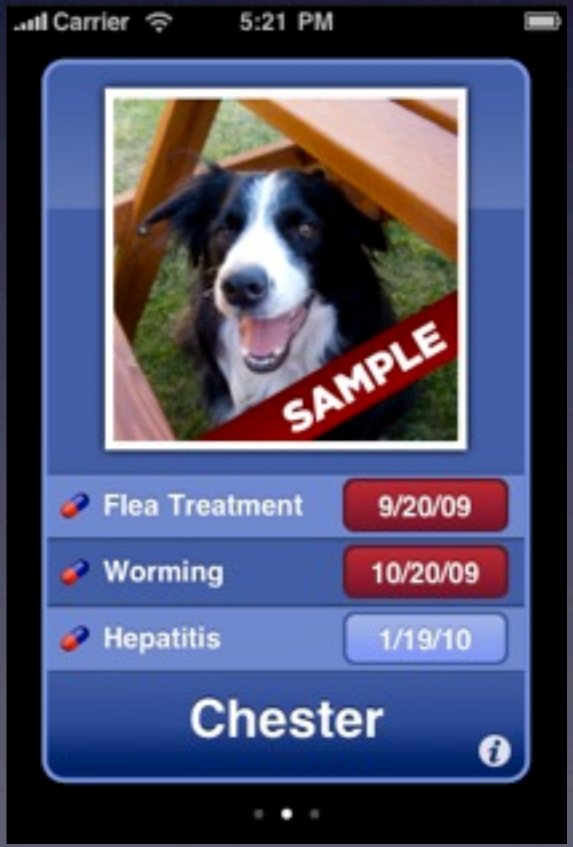
- You're not a designer.
- Employ a designer and suddenly two things are being done at once.



Flea Treatment	20/05/2009
Worming	28/05/2009
Hepatitis	19/01/2010
Distemper	19/01/2010

← Me

Me + You Know Who Design →



Flea Treatment	9/20/09
Worming	10/20/09
Hepatitis	1/19/10

Mo Money, Mo Problems

- *Not* including time, Clarus for iPhone cost nearly £1,000 to develop.
  - This isn’t a good idea if you can’t survive never seeing that £1,000 (and the lost time) again.
  - That said, it’s *totally* worth it.
- If you do it, do it *well.*
  - In the current App Store, you need quality to overcome quantity.

Fin

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