Collaborative Editing, Status & Future ...

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*"Stand at the crossroads and look; ask for
the ancient paths, ask where the good way
is, and walk in it, and you will find rest for
your souls..." - Jeremiah 6:16*

Overview

- Collaboration on Documents
  - CMIS, red-lining, document compare
  - other mechanisms ...
- Interactive document editing
  - a design overview
  - some nuts & bolts
  - current status / demo
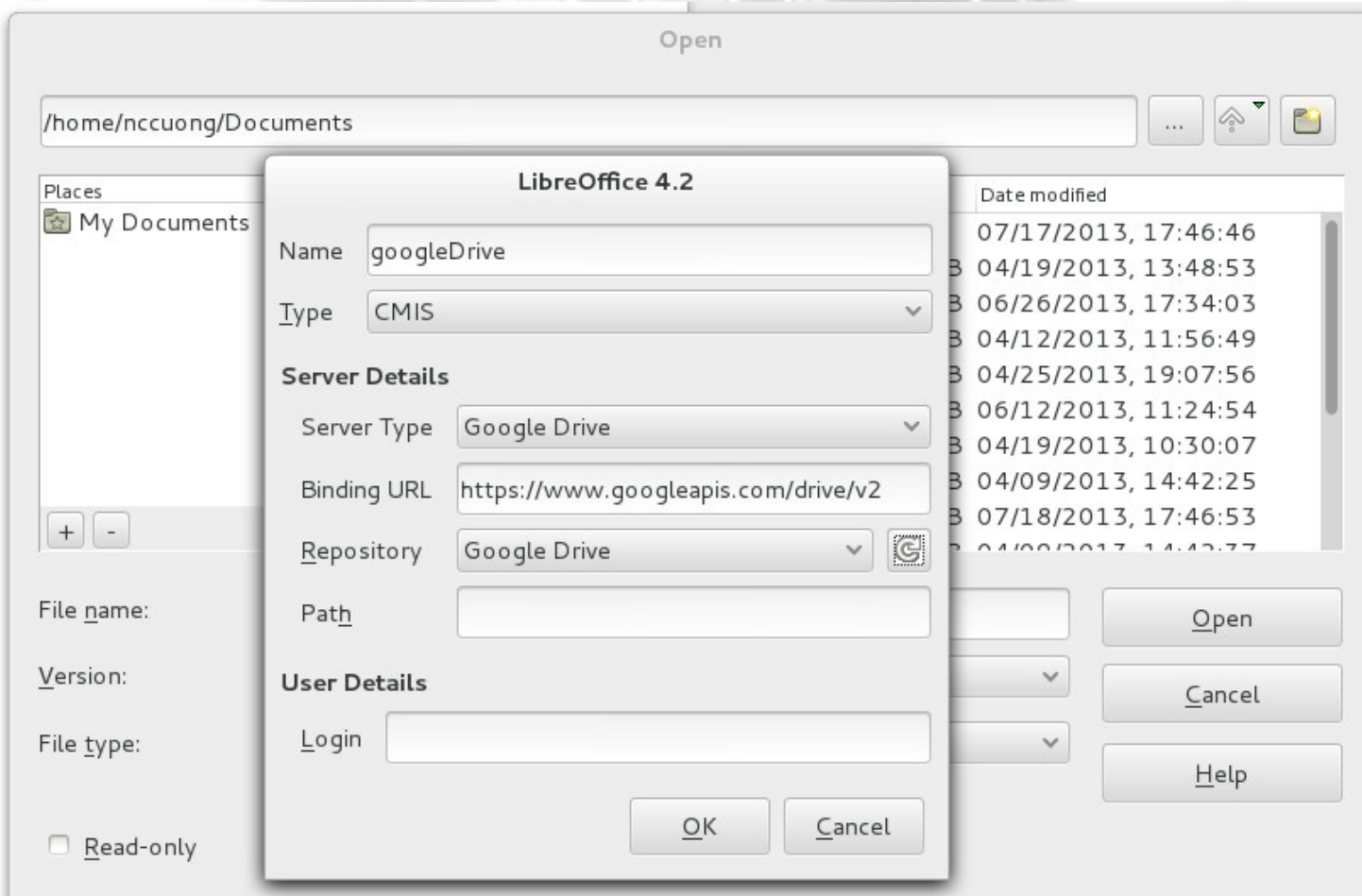- Conclusions

Non-Interactive collaboration

Or: getting the easier stuff right ...
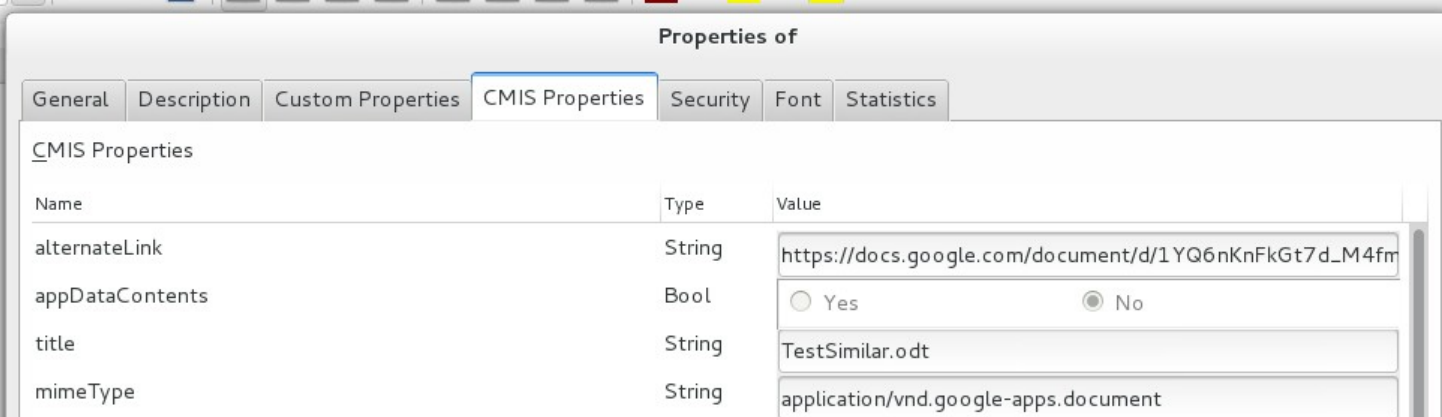
CMIS: Sharepoint / Alfresco / Nuxeo ...

� Using the CMIS protocol – load / save / checkout to your favourite content / document management system:
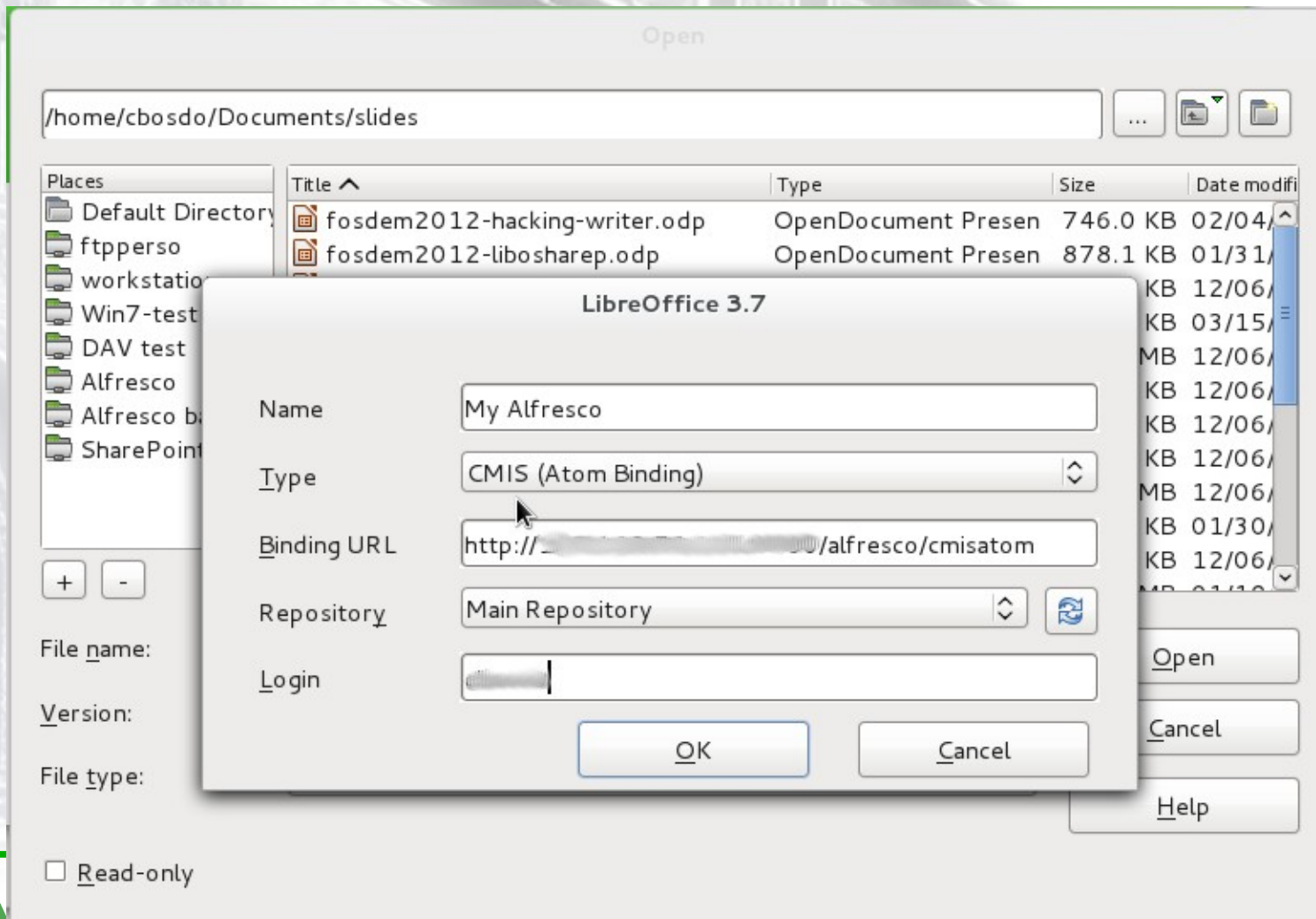
GDrive integration (via libcmis)

With thanks to *Cuong Cao Ngo* and *Cedric Bosdonnat*

Interactive document editing

Some thoughts on architecture ...

Interactive Document Editing ...

- Everyone wants more than E-mail

- No-one wants to setup yet-another server

- Everyone has IM working already

- The Telepathy framework

  - A pleasant IM abstraction / API

  - Messages for edits, file transfer for bulk.

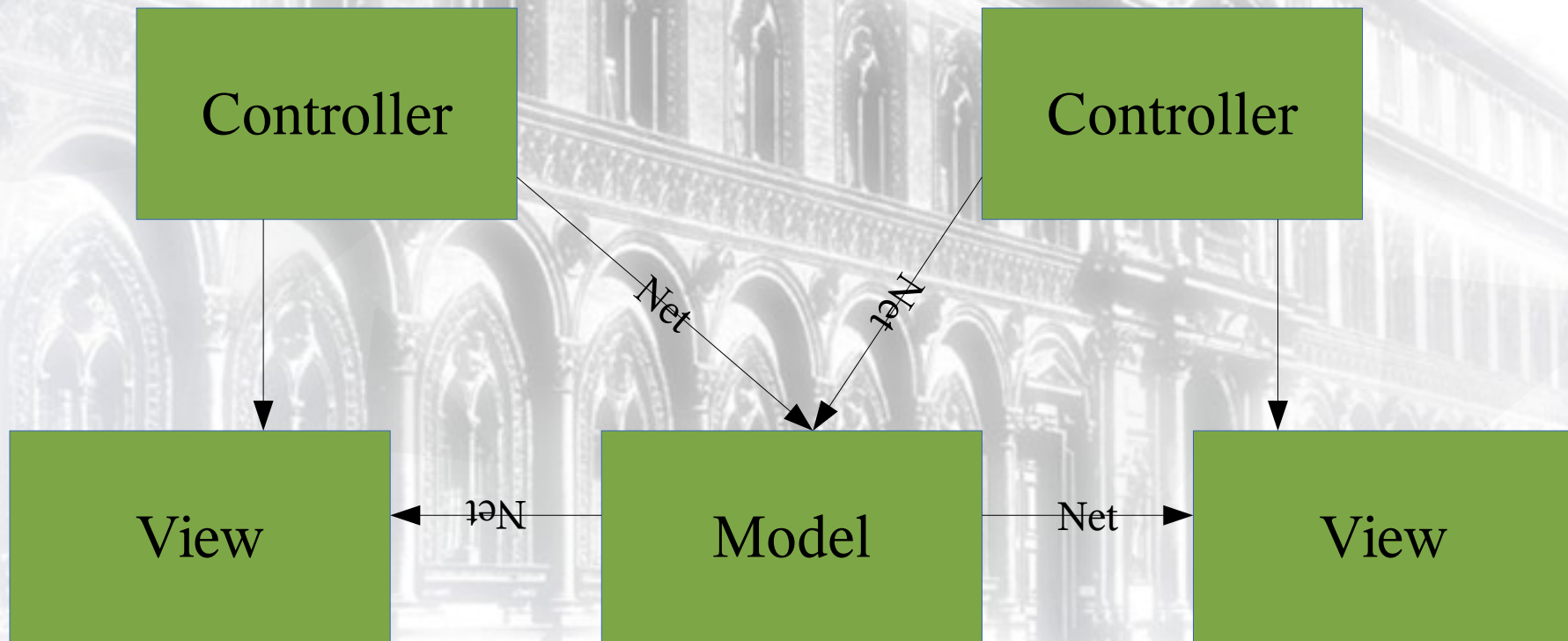- So – use I/M to bootstrap communication

An idealized view of perfect S/W

If anyone finds an ideal instance of a large app with this model, let me know.

Controller

Model

View

LibreOffice
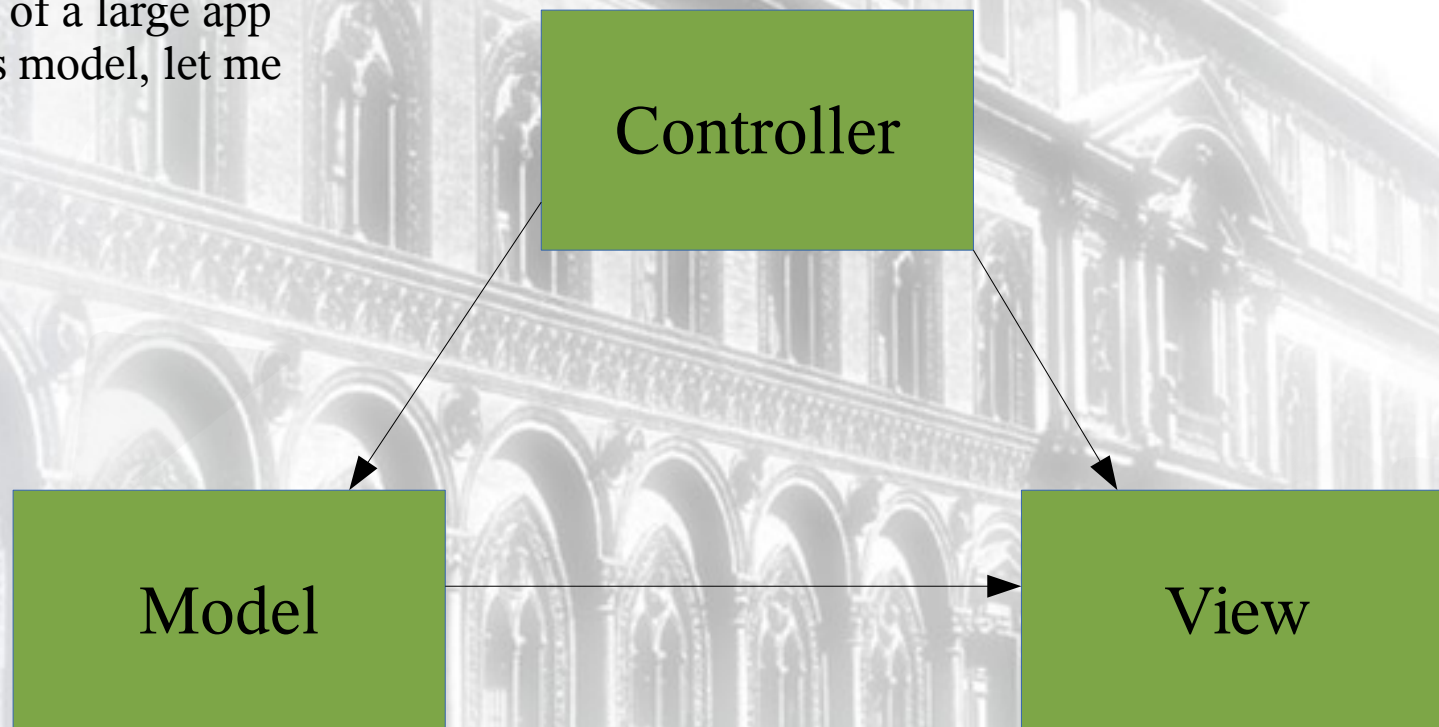
One idealized view of perfect S/W

So – just get two controllers and two views – right ? Easy …

```
  Controller                         Controller

       │         ╲ Net      Net ╱        │
       │           ╲        ╱            │
       ▼             ▼    ▼              ▼
    View  ◄── Net ──  Model  ── Net ──►  View
```
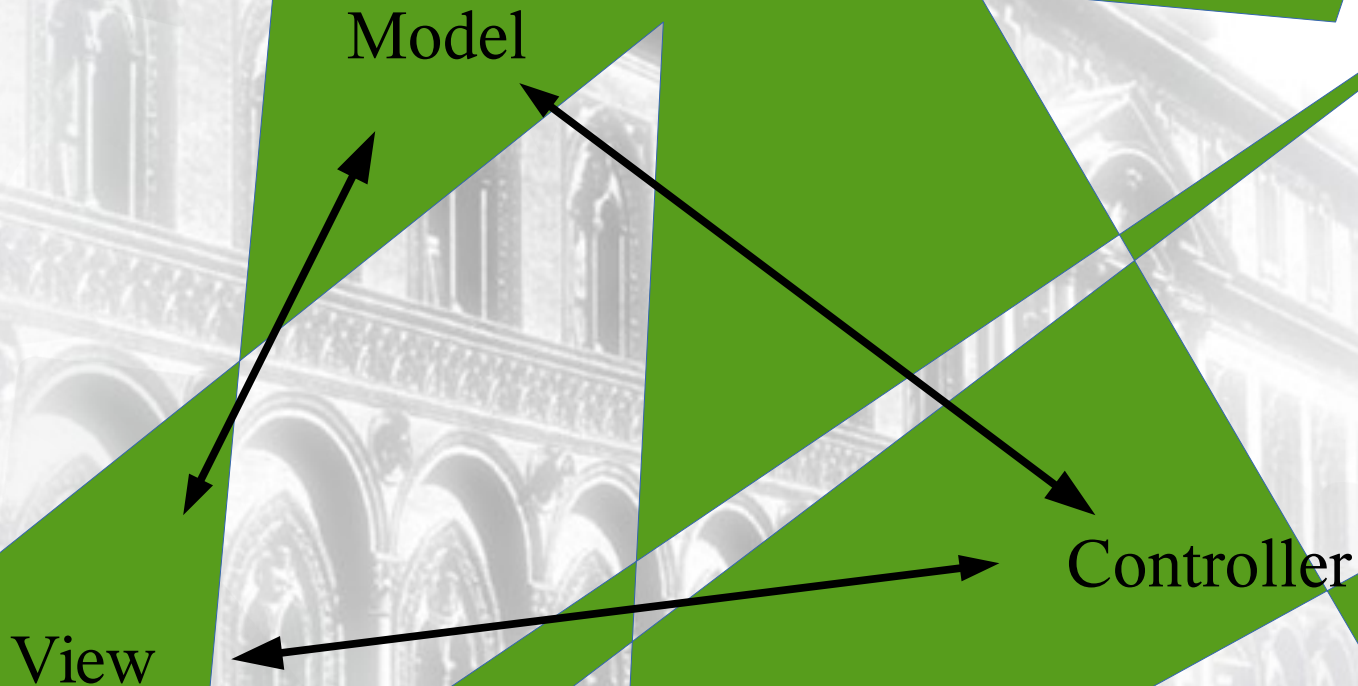
LibreOffice

Another idealized view ...

Or synchronize the models, reconciling conflicting edits, or adapting their representations ...

Controller		Controller

Bang ...

View	Model	Model	View
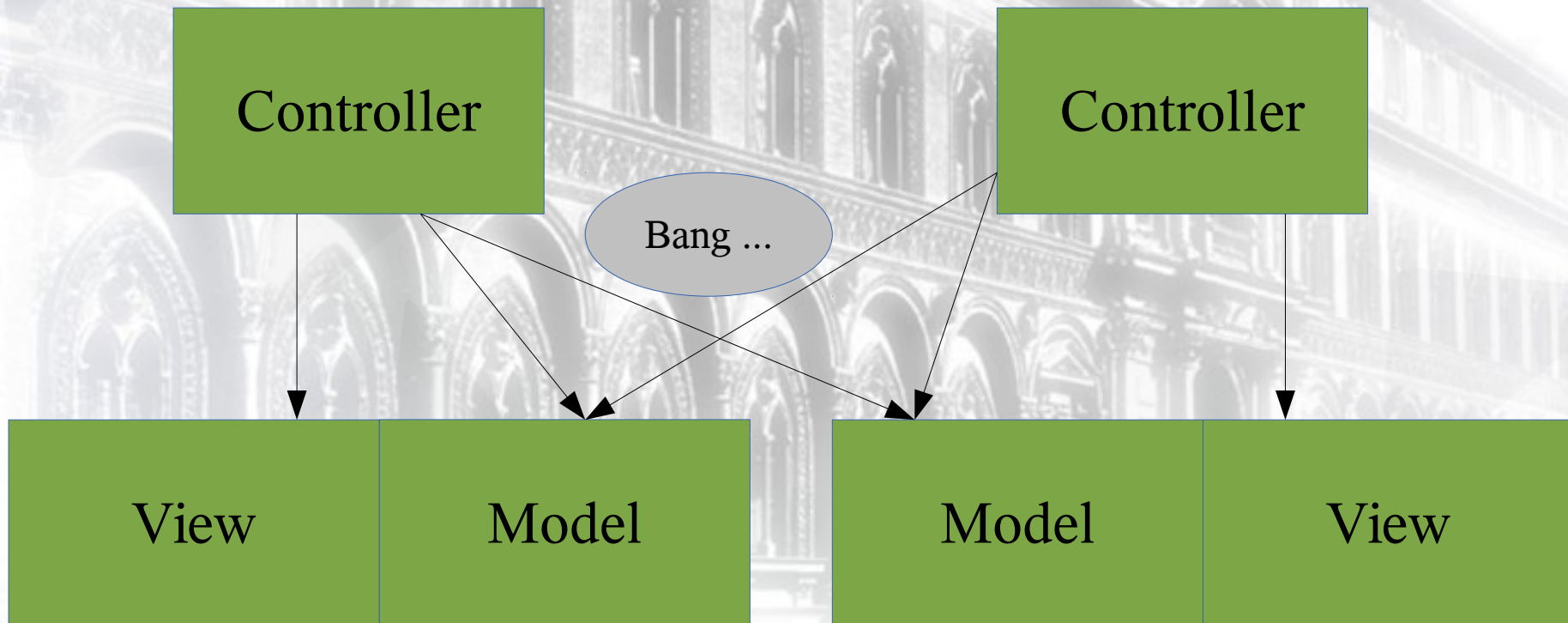
Actual simplified (inherited) view

Not quite the amusing:
class ModelViewController { … };

Model

View

Controller

So what can we do ?

- Make some hard up-front design decisions:
    - Ordering is King
        - It doesn't matter what you do **but**
        - **always** do everything, everywhere in the <u>same order</u>, on <u>every client</u> – and we will have consistent documents.
    - Interactive conflicts can be dealt with by users as they occur: both edit the same cell, and see who wins ...

Adapted, collaboration design:

By no means perfect but functional.

Model

View

Controller

Instant Messaging
ordered bus

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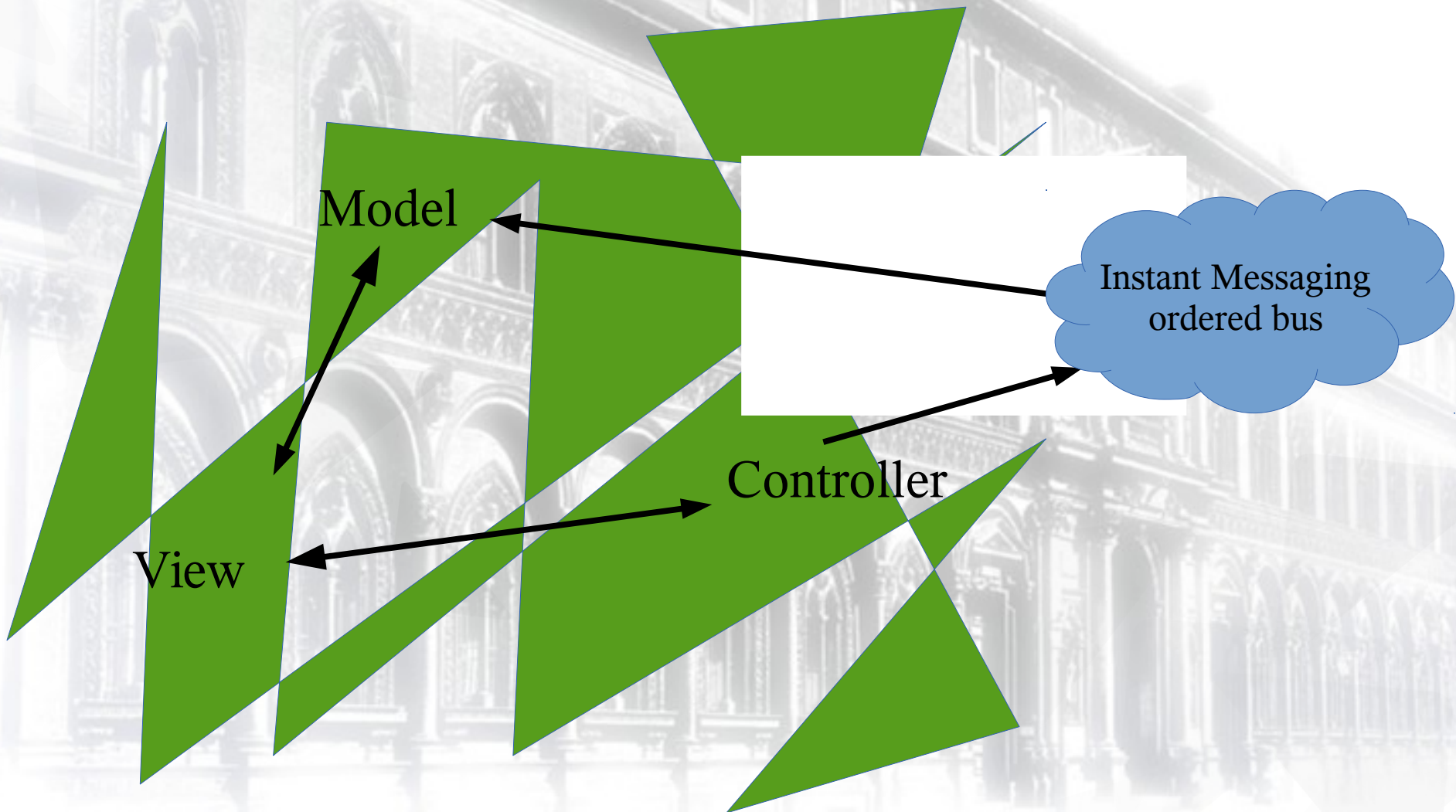
What does that mean ?

And/or why do that crazy thing ?

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Some consequences ….

- Constraints:
  - cell editing is applied asynchronously …
    - eg. enter "foo" in A1
      - edit sent to the IM bus
  - user moves to another cell
    - apply all messages from IM bus in order
    - "foo" entered into A1 …
  - Potential latency issue
- But:
  - Implementable is feasible in linear time
  - No blue-sky monster re-work necessary …

Demo ...

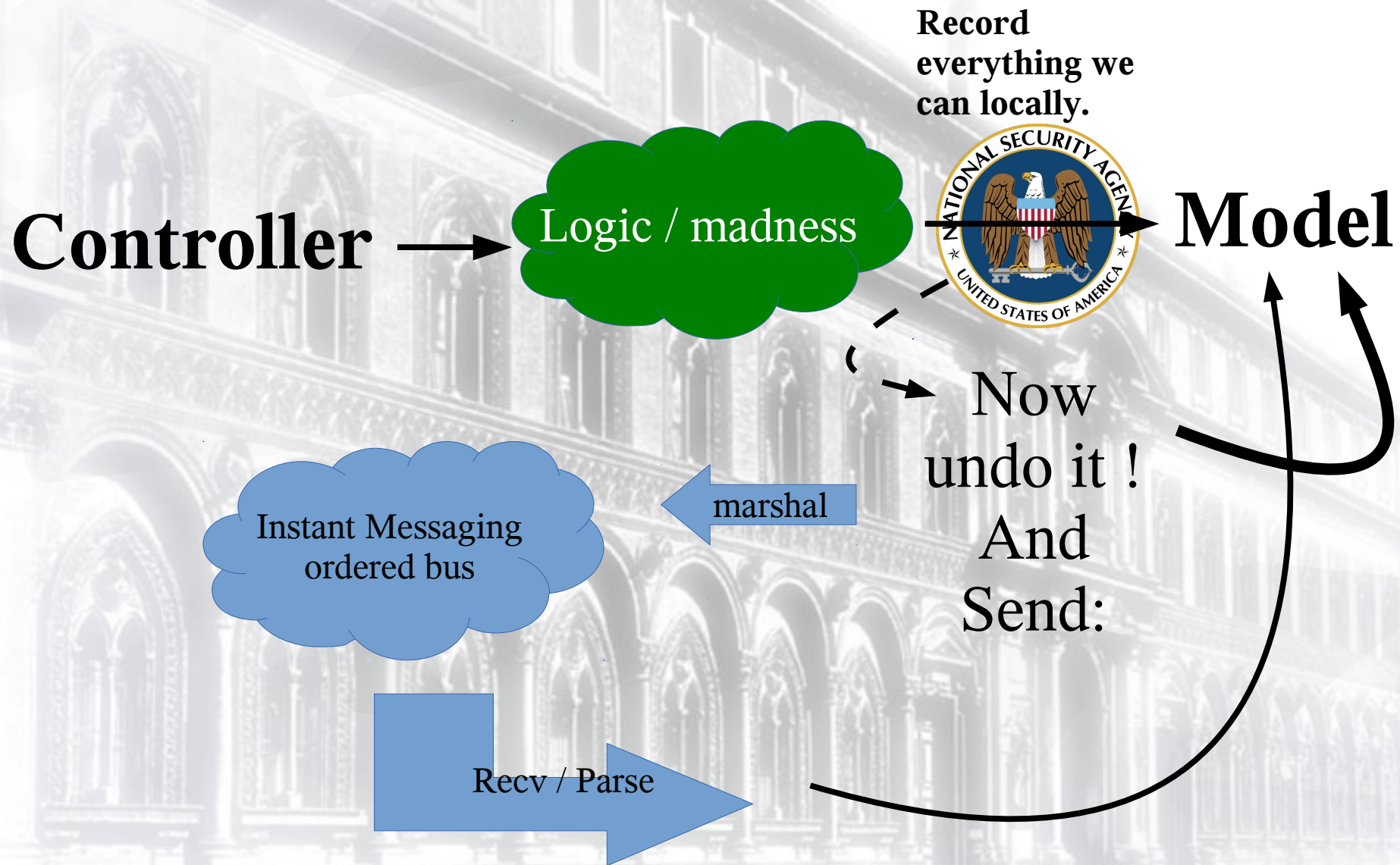Which is -very- demo-like ...

Incremental reality bites ...

Model

Controller

The problem !

Instant Messaging
ordered bus

**All or nothing is a
big issue.**

A more incremental model ...

Controller → Logic / madness

Record everything we can locally.

Model

Now undo it ! And Send:

marshal

Instant Messaging ordered bus

Recv / Parse

The Star Trek future ...

- Autosave/recover is a user-experience nightmare
- Save is not much better …
  - serialize state & fsync to disk as you type
  - cleverly journal inside .zip, replay state on load
  - requires intercepting some view state changes too
- Use these operations for UI behaviors
- Re-use them for undo / redo …
- *<smoke something whacky here>*
  - standardization ...
    - also use for change tracking !!?!>!? :-)
  - revision control systems & full history in file … etc.

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Conclusions:

- **Interactive Collaboration is fun**
  - Lots more work needed teasing apart the core
  - This is something you can get involved in git: feature/tubes2
  - checkout the backing blog / details
  - This is a *prototype* – you can't buy it in a (web) store
- **LibreOffice is improving rapidly**
  - It's a fun place to hack with others to make a big difference ...
  - strike a dis-proportionate blow for freedom here
- **See me to get involved** and help us ...

Oh, that my words were recorded, that they were written on a scroll, that they were inscribed with an iron tool on lead, or engraved in rock for ever! I know that my Redeemer lives, and that in the end he will stand upon the earth. And though this body has been destroyed yet in my flesh I will see God, I myself will see him, with my own eyes - I and not another. How my heart yearns within me. - Job 19: 23-27