ORM Zen

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cf.Objective() 2011

http://bit.ly/cformzen

Announcements

- Get this presentation and all code at **http://bit.ly/cformzen**
- There's a short Appendix at the end
  - SQL Logging
  - ORMReload
- Lots of links at the end, too

ORM

ME

http://simpsons.wikia.com/wiki/The_Itchy_%26_Scratchy_Show

http://www.flickr.com/photos/50235987@N00/3386446442

http://www.visualparadox.com/wallpapers/zen.htm

I’m an ORM King! Eaassssyyy!

http://severity1.wordpress.com/2009/11/01/my-first-zen-wallpaper/strength_zen_naturallaw-2/

OKOKOK… W. T. F.?

Say Hello to my Leetle Friends

- “Why won’t you save relationships?”
- “Why won’t you delete relationships?”
- “Why DID you save anything at all?”
- “Why did you insert into MyTable …
  And then update MyTable ?”

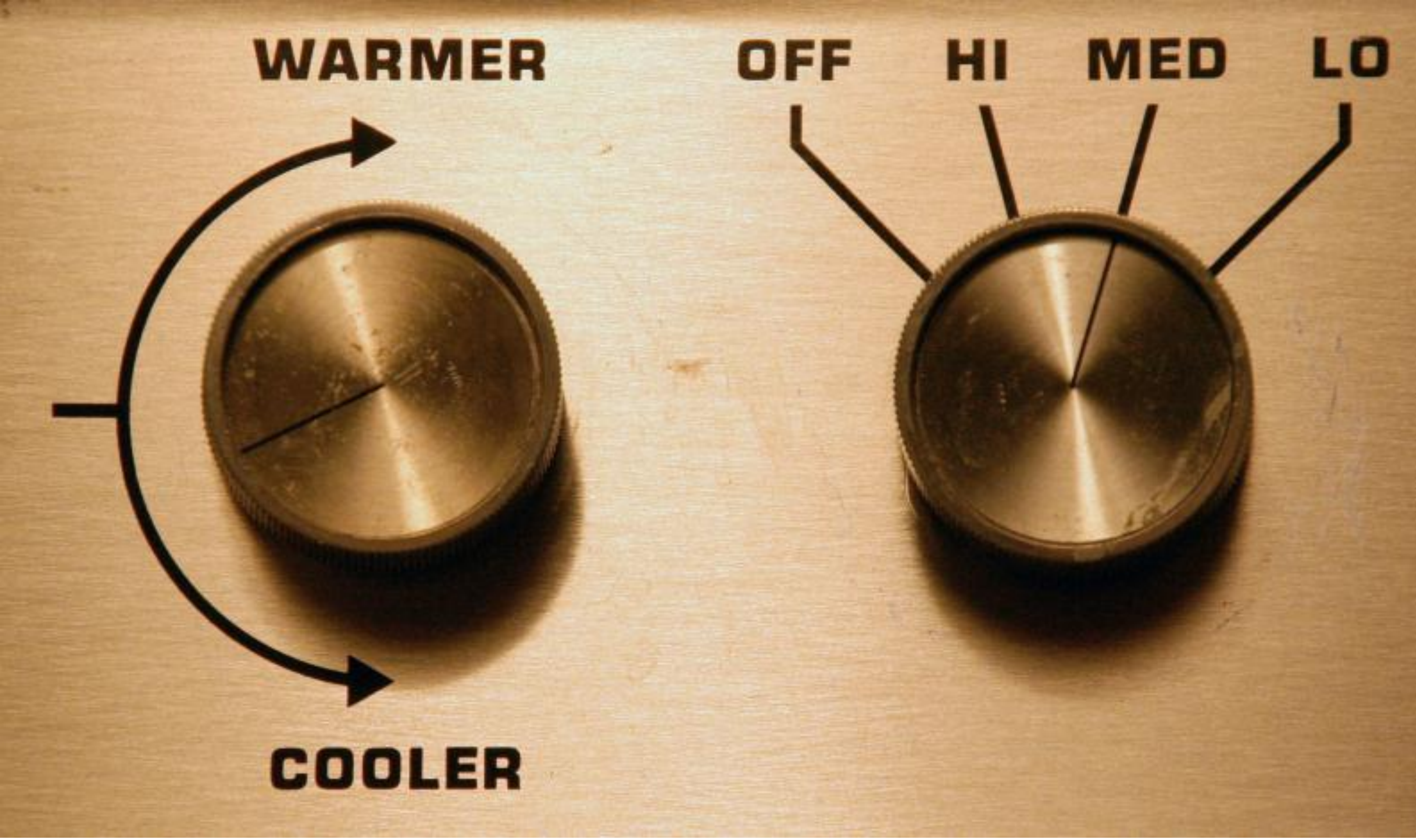
And their less-attractive cousins…

- “object references an unsaved transient instance - save the transient instance before flushing”
- “Cannot insert null into <SomePrimaryKey>… ”
- “java.util.ConcurrentModificationException”
- “*failed to lazily initialize a collection of role: xxx, no session or session was closed* ”
- “*a different object with the same identifier value was already associated with the session*”

ORM

(In Marc's "ORM is the Devil" mindset)

http://www.akomic.net/mechanical.html



http://just-a-blip.blogspot.com/2009/07/modern-bed-warmer.html

This is my story

From **Suffering**

This is my story

From **Suffering**

Toward

Enlightenment

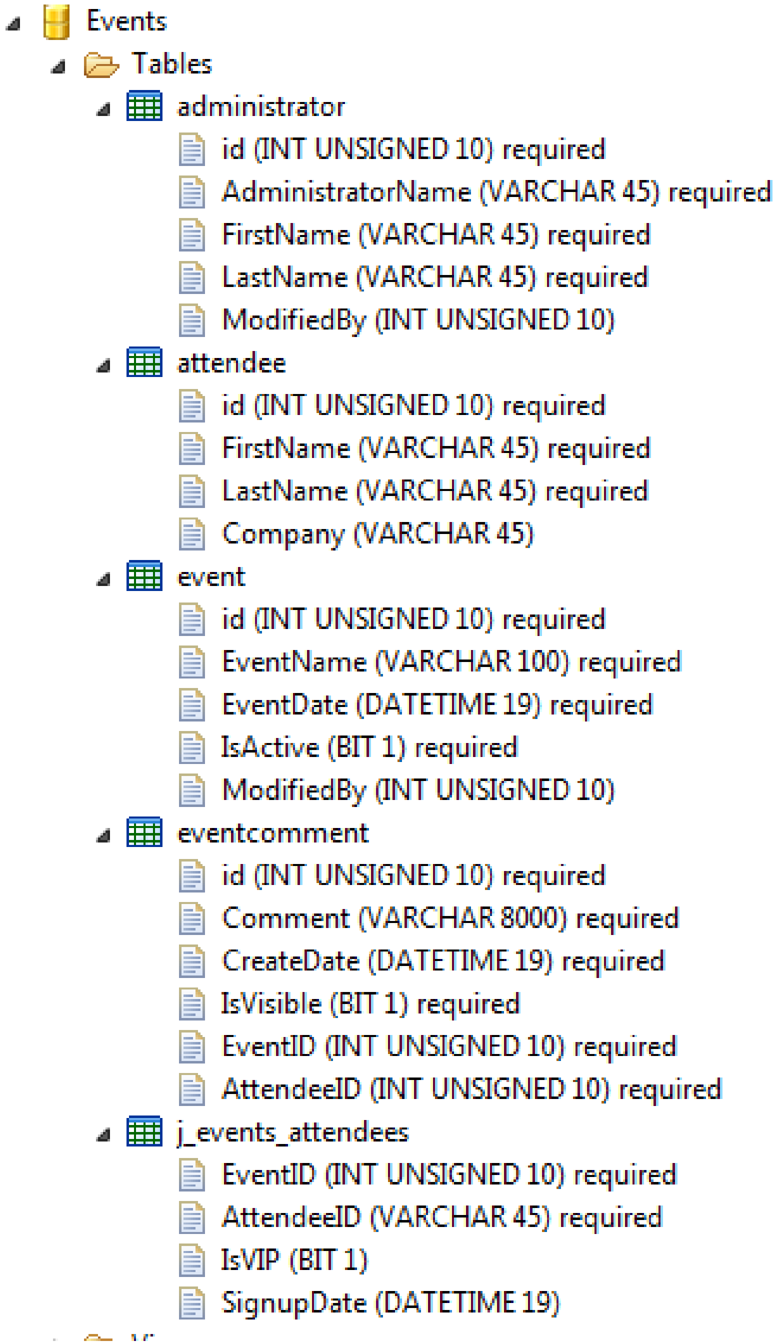
Agenda

1. **ORM Settings -- Control the Session Flush**
2. Many-to-One Relationships
3. One-to-Many Relationships
4. One-to-Many: inverse and “relationship owner”
5. One-to-Many: Adding to Collections
6. One-to-Many: Deleting from Collections
7. Hibernate Session and the ColdFusion Session scope

The Application’s Concept

An ‘Event Registration' system

- Administrator can create and modify events
- Attendees can "register" for Events
- Attendees can comment on Events



- Events
  - Tables
    - administrator
      - id (INT UNSIGNED 10) required
      - AdministratorName (VARCHAR 45) required
      - FirstName (VARCHAR 45) required
      - LastName (VARCHAR 45) required
      - ModifiedBy (INT UNSIGNED 10)
    - attendee
      - id (INT UNSIGNED 10) required
      - FirstName (VARCHAR 45) required
      - LastName (VARCHAR 45) required
      - Company (VARCHAR 45)
    - event
      - id (INT UNSIGNED 10) required
      - EventName (VARCHAR 100) required
      - EventDate (DATETIME 19) required
      - IsActive (BIT 1) required
      - ModifiedBy (INT UNSIGNED 10)
    - eventcomment
      - id (INT UNSIGNED 10) required
      - Comment (VARCHAR 8000) required
      - CreateDate (DATETIME 19) required
      - IsVisible (BIT 1) required
      - EventID (INT UNSIGNED 10) required
      - AttendeeID (INT UNSIGNED 10) required
    - j_events_attendees
      - EventID (INT UNSIGNED 10) required
      - AttendeeID (VARCHAR 45) required
      - IsVIP (BIT 1)
      - SignupDate (DATETIME 19)

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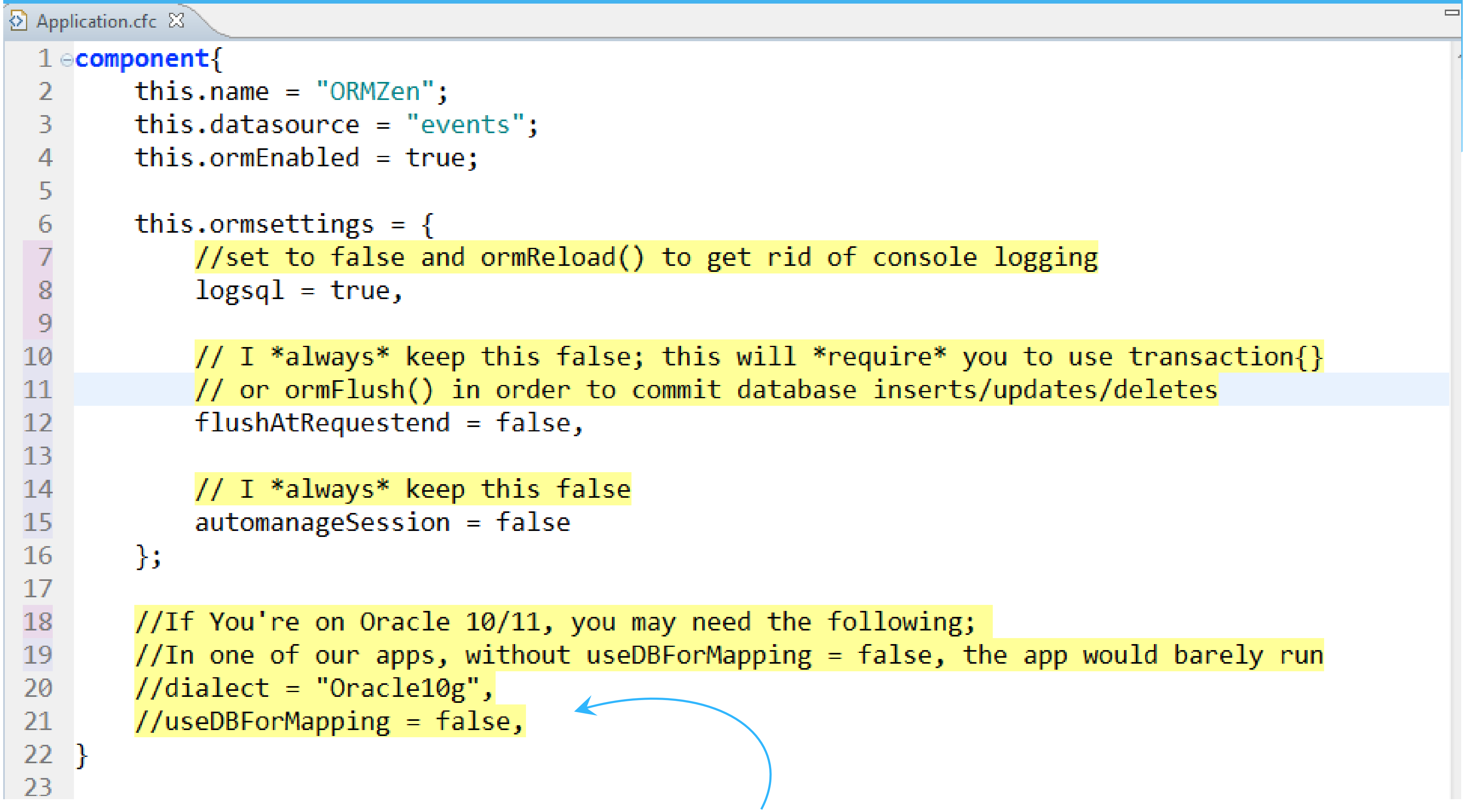
Suffering – The Early Days

- Why are objects updating even when I don’t call entitySave()?

Essential ORM Settings



```
component{
    this.name = "ORMZen";
    this.datasource = "events";
    this.ormEnabled = true;

    this.ormsettings = {
        //set to false and ormReload() to get rid of console logging
        logsql = true,

        // I *always* keep this false; this will *require* you to use transaction{}
        // or ormFlush() in order to commit database inserts/updates/deletes
        flushAtRequestend = false,

        // I *always* keep this false
        automanageSession = false
    };

    //If You're on Oracle 10/11, you may need the following;
    //In one of our apps, without useDBForMapping = false, the app would barely run
    //dialect = "Oracle10g",
    //useDBForMapping = false,
}

```

*Many props to Dan Vega for useDBForMapping = false tip

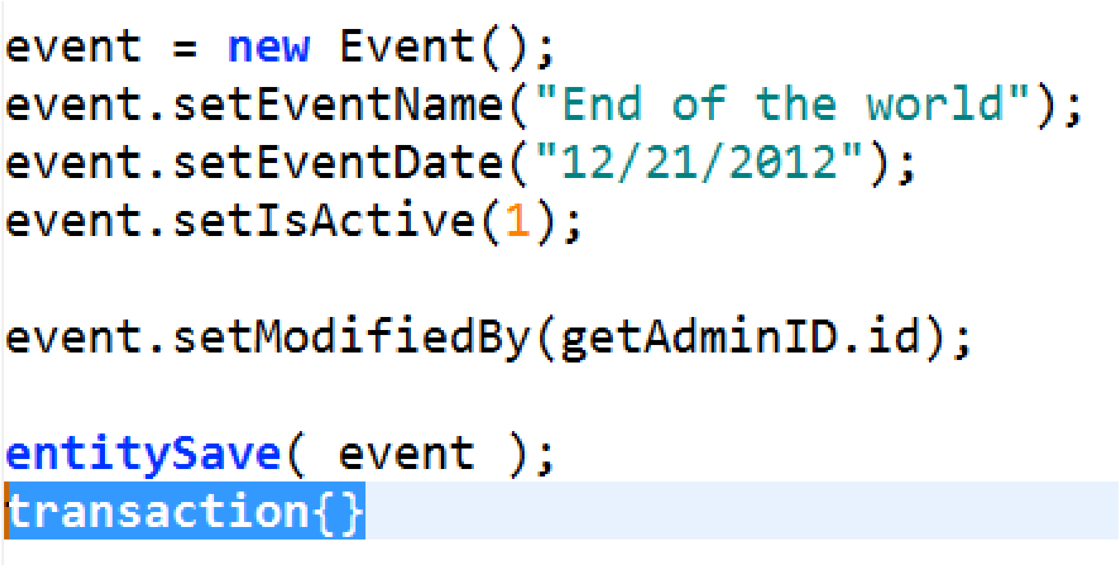
Essential ORM Settings: Session Control

autoManageSession = false

flushAtRequestEnd = false

- Consequence: use **transaction{}**
  - or use ormFlush()
- (Some would say you should wrap **ALL** state mutation in a transaction)

ORM Essentials:
Use Transactions to flush



```
event = new Event();
event.setEventName("End of the world");
event.setEventDate("12/21/2012");
event.setIsActive(1);

event.setModifiedBy(getAdminID.id);

entitySave( event );
transaction{}
```

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Suffering

- What does “The value for property java.lang.String cannot be retrieved from object of type id” mean?
- How do I **unset** a many-to-one relationship?
- CFDump just got reaaal slow. Why?
  - Happens when a many-to-one object has, itself, a big one-to-many relationship

Many-to-One

- The Simplest Relationship
- This is your typical Foreign Key Relationship
- E.g. Event has a “ModifiedBy” column, which is a relationship with the “Administrator” table’s “id”
- Think: “MANY events can have ONE current modifiedBy”
- **Three Knobs**
  - **fieldtype** = “many-to-one”
  - **fkcolumn** = Column Name in **THIS** Table
  - **cfc** = CFC Name Of Related Entity

Many-to-One Demo

Demo

Enlightenment

- What does “The value for property java.lang.String cannot be retrieved from object of type id” mean?
  - You probably changed a simple property to a many-to-one but didn’t update the code that calls the setters
  - You’re setting a simple value when it expects an object

- How do I **unset** a many-to-one value?
  - setMyM2OProperty(javacast(“null”, “”));

Enlightenment

- CFDump just got reaaal slow. Why?

  - ALWAYS use “top” when cfdumping an ORM object
    - writeDump(var=object, top=“3”);
  - In MXUnit tests:
    - debug(var=object, top=“3”);

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Suffering: one-to-many Gluttony

- I’m gonna have properties for every relationship I can think of and never write SQL Again!

- If(arrayLen(myOneToMany) GT 0)
  - Why is this so slow?

- Wait… is it really doing a separate query for EVERY row? WTF?!

One-to-Many Relationships

- Think: “this ONE Administrator will have MANY modified events”
- **Four Knobs:**
  - **fieldtype** = “one-to-many”
  - **fkcolumn** = Foreign key column in the RELATED object’s table for this property
  - **cfc** = CFC Name of the related entity
  - **singularName** = how to refer to single members of this collection
- And one **devil knob named ‘inverse’** to be discussed later

One-to-Many Demo

- Demo simple one-to-many property

Enlightenment: One-to-Many…

- For me, most useful when saving relationships through them
  - E.g. linking an Attendee to Events

- Discourage use for "listing things"
  - Do you really ***need*** a property of "Adminstered Events"?
  - Prefer **HQL or SQL** instead
  - Read up on the **N+1 Selects** problem
  - Learn about **lazy="extra"**

- **Red Flag**: properties that simply take the place of "select ***** from some table where id = :myid"

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Suffering

- When I call object1.addObject2(object2), I get “Object references an unsaved transient instance”
- When I call object1.addObject2(object2), I see a SELECT, then an INSERT, then an UPDATE

Demo: The Devil Knob

There oughtta be a support group for sufferers of this knob

Enlightenment: inverse=true

- Bi-Directional: many-to-one on one side, and one-to-many on the other (they link back and forth)
- In bi-directional relationships
  - **You need inverse=true**
  - **Always**
  - **No Exceptions**
- It means, “the object **on the other side** is the **relationship owner**”

Enlightenment: set **Both** sides

- Always set **both** sides of the relationships
  - comment.setEvent(event);
  - event.addComment(comment);

Enlightenment: set **Both** sides

Preferably encapsulate this in One of the objects:

```
component name=“Event” {
  function addComment( comment ){
    arrayAppend( comments, comment );
    event.addComment( this );
  }
}
```

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Suffering

- When I add a **new** object to a one-to-many collection,

it won’t save

Demo: Whither cascade?

- Demo one-to-many saves with and without cascade

Enlightenment: Cascade

- When I add an object to a one-to-many collection, it won’t save the relationship
  - **Need cascade=“all” on the one-to-many property**

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Suffering

- When I delete an object from a one-to-many collection, I get “null” errors

- If I loop over a collection and try to remove elements from that collection, I get “ConcurrentModificationException”

Demo: Deleting from a Collection

1 is an ORM error

1 is not

Enlightenment:
Deleting from a Collection

- When I delete an object from a one-to-many collection, I get “null” errors
  - **Need cascade=“all-delete-orphan” on the one-to-many property**

- If you get “entity would be resaved” Errors
  - **You need to un-set BOTH sides of the relationship**

Enlightenment:
Deleting from a Collection

- Don’t use for(item in Array) syntax when deleting
- Use plain old index loops
- I loop backwards!

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7. **Hibernate Session and the ColdFusion Session scope**

Suffering

When I store my user object in the **ColdFusion session scope,**

and then change it and save,

I get weirdo Hibernate errors

Enlightenment:
Persistent objects and CF Session Scope

- Just don’t do it (How’s that for Zen!)

- Store simple values (userID) in session scope, then entityLoadByPK(“User”, session.userID) when you need that object

- The second you type “EntityMerge()”, you’re travelling down the trail of suffering

Enlightenment, In One Slide

- Don’t let CF auto-flush the Hibernate session
  - always use transactions
- Use one-to-many sparingly; I try to use them only when I need to save relationships through them
- Not setting “cascade” on one-to-many relationships will cause collection members not to save or delete
- Inverse=true is mandatory on bi-di relationships
- Deleting from one-to-many is simply not simple
- “linktable” is rarely useful… often you need a “join entity”
- Don’t store ORM objects in the session scope. Ever.

Thanks to my teachers

- I learned most of this stuff from
  - **Bob Silverberg**
  - **Brian Kotek**
  - **Joe Rinehart**
  - **Mark Mandel**
  - **Barney Boisvert**
  - **Dan Vega**
  - **32 bottles of Dalwhinnie 15 year Scotch**
  - **Hours upon hours of suffering**

Thanks to you!

Marc Esher

@marcesher on Twitter

Test

Be Happy

Resources

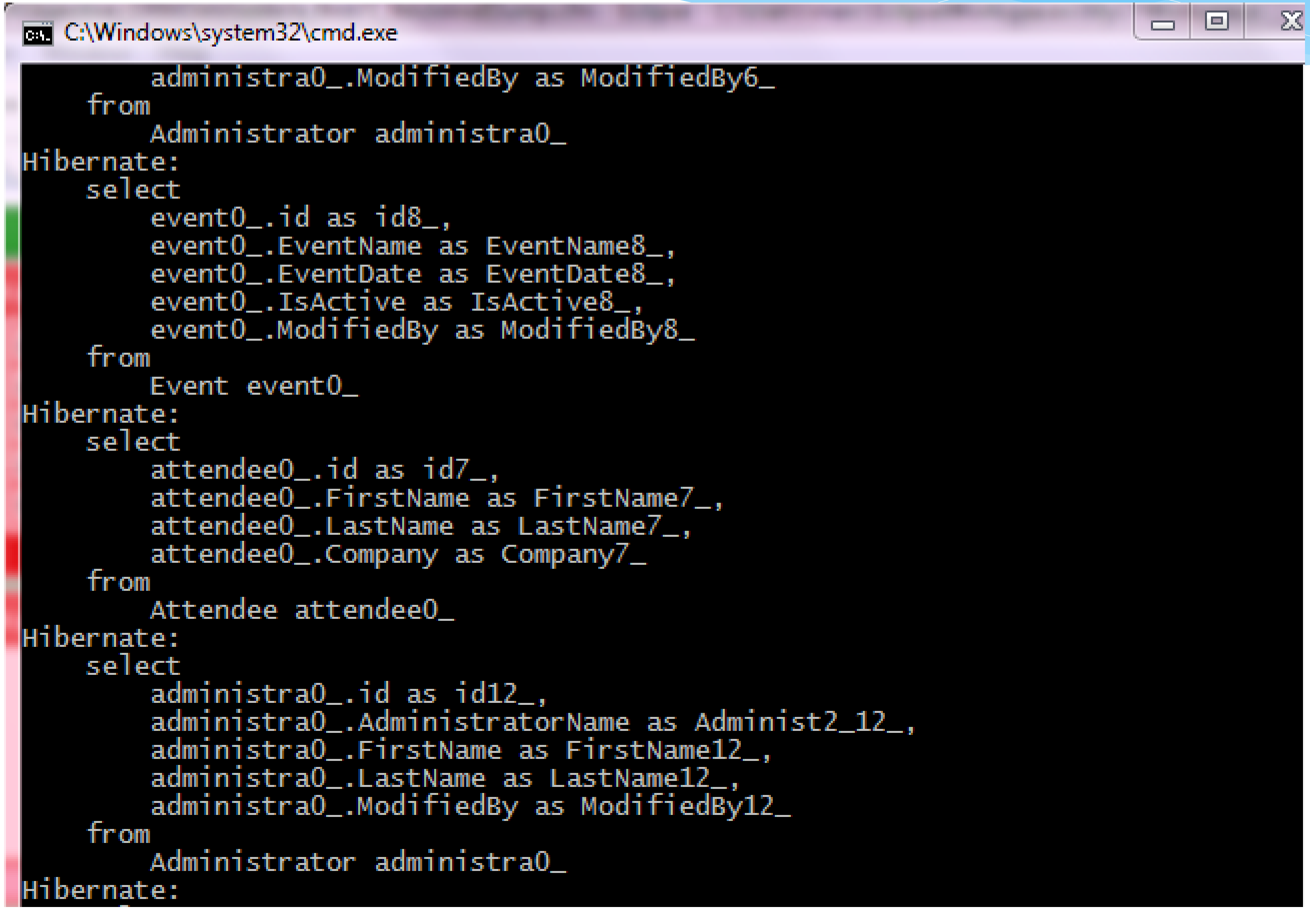
- http://www.barneyb.com/barneyblog/category/orm/ -- transactions, inverse, one-to-many, domain model integrity, etc
- http://www.silverwareconsulting.com/index.cfm/CF-ORM-Integration -- every darn thing
- http://www.compoundtheory.com/?action=displayPost&ID=419 – Hibernate Sessions and Object State
- http://www.briankotek.com/blog/index.cfm/ObjectRelational-Mapping -- Bidi relationships, HQL
- http://www.mkyong.com/hibernate/inverse-true-example-and-explanation/ -- inverse="true" and "relationship owner"
- http://www.aliaspooryorik.com/blog/index.cfm/category/hibernate-25 -- lots of useful tips on HQL, collections, logging, nested-set model, etc.

Appendix

- SQL Logging
- ORMReload()

Essential ORM Settings: Logging

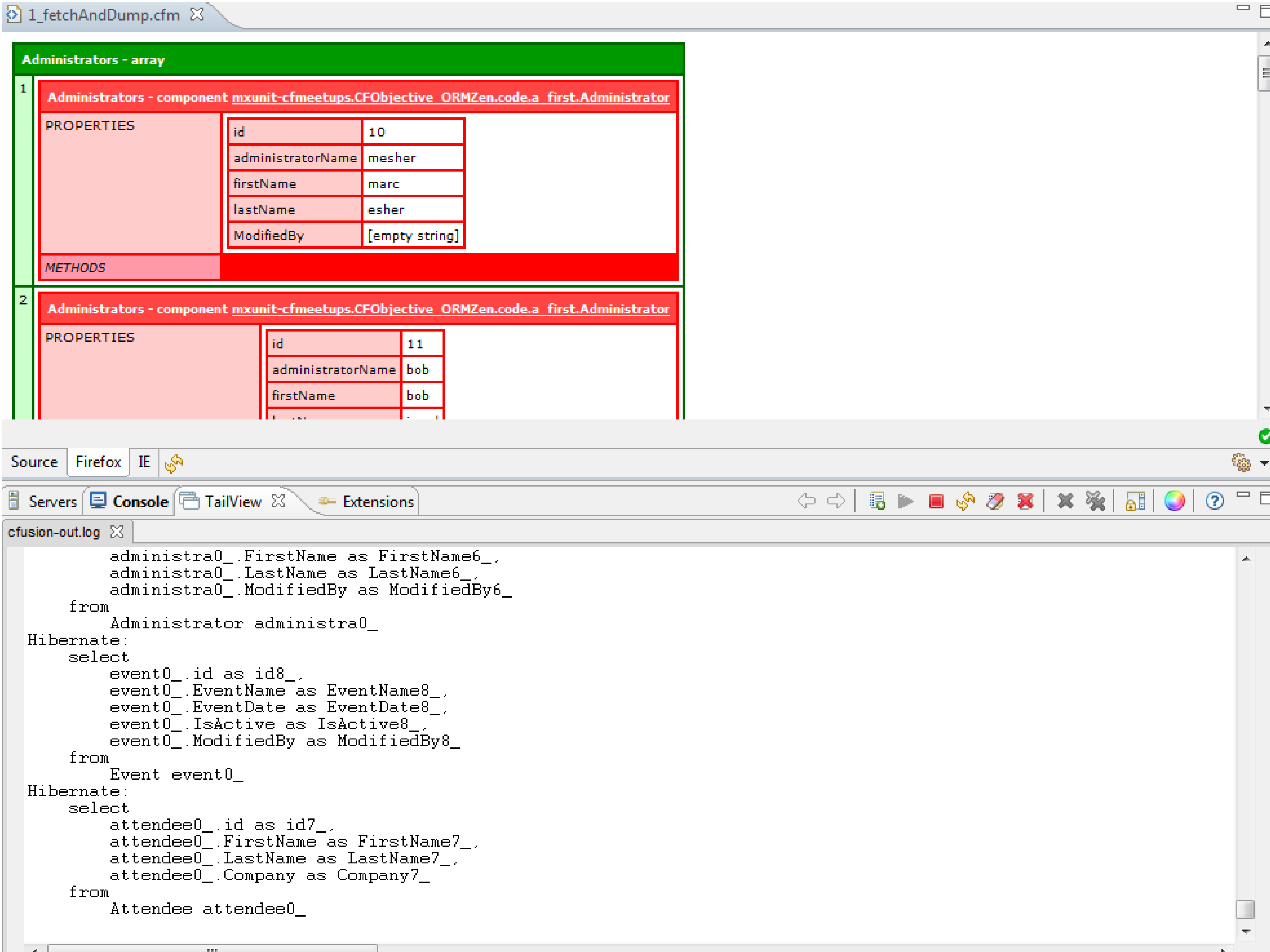
- **logSQL = true**



```
        administra0_.ModifiedBy as ModifiedBy6_
    from
        Administrator administra0_
Hibernate:
    select
        event0_.id as id8_,
        event0_.EventName as EventName8_,
        event0_.EventDate as EventDate8_,
        event0_.IsActive as IsActive8_,
        event0_.ModifiedBy as ModifiedBy8_
    from
        Event event0_
Hibernate:
    select
        attendee0_.id as id7_,
        attendee0_.FirstName as FirstName7_,
        attendee0_.LastName as LastName7_,
        attendee0_.Company as Company7_
    from
        Attendee attendee0_
Hibernate:
    select
        administra0_.id as id12_,
        administra0_.AdministratorName as Administ2_12_,
        administra0_.FirstName as FirstName12_,
        administra0_.LastName as LastName12_,
        administra0_.ModifiedBy as ModifiedBy12_
    from
        Administrator administra0_
Hibernate:
```

Viewing SQL logging in Tail View

- This works in ColdFusion Builder or CFEclipse with the Adobe 8.0.1 Extensions
- Add the xxxxx-out.log file to the tail view
- Rejoice



Administrators - array

1

Administrators - component mxunit-cfmeetups.CFObjective_ORMZen.code.a_first.Administrator

PROPERTIES

id	10
administratorName	mesher
firstName	marc
lastName	esher
ModifiedBy	[empty string]

METHODS

2

Administrators - component mxunit-cfmeetups.CFObjective_ORMZen.code.a_first.Administrator

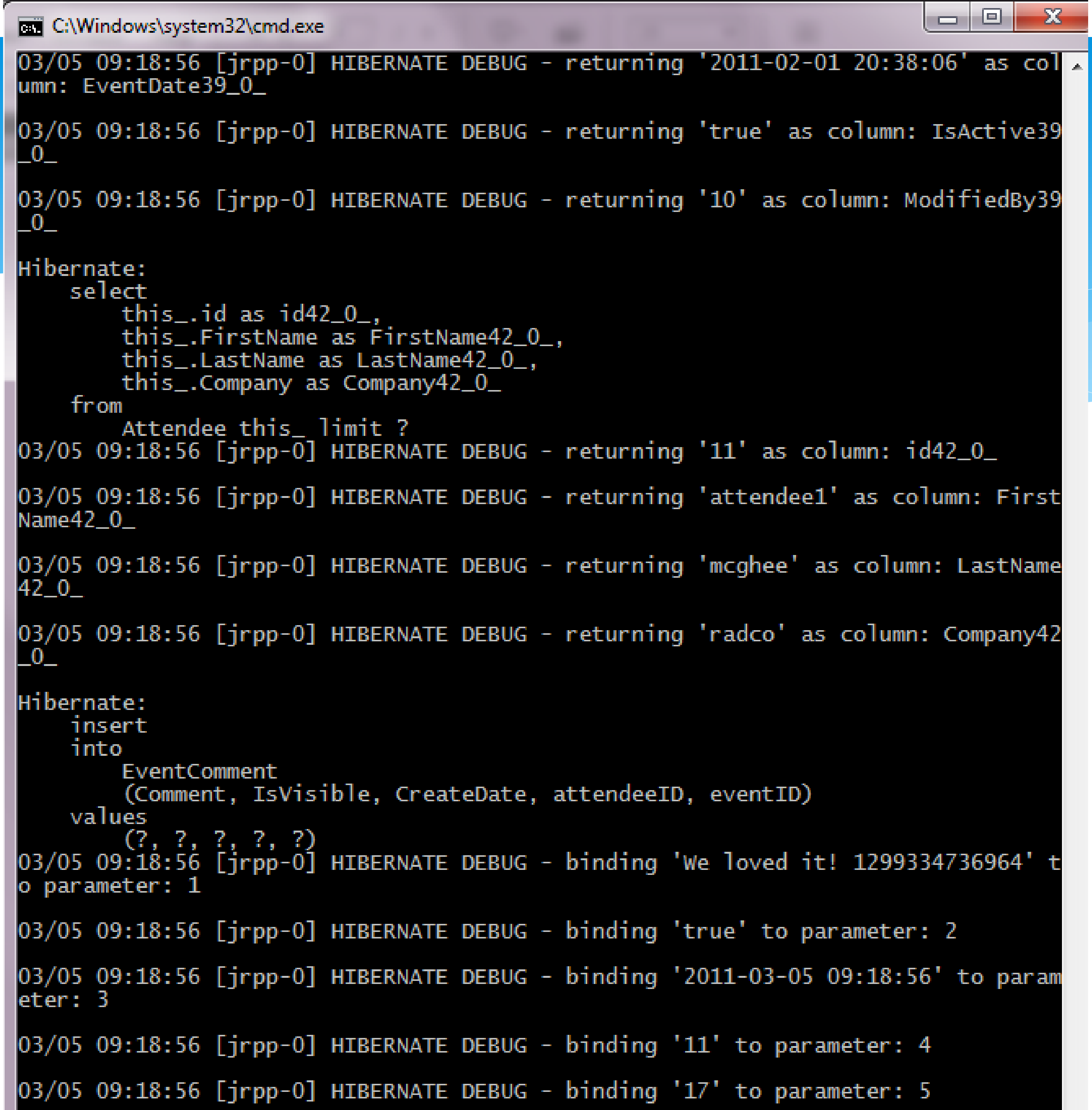
PROPERTIES

id	11
administratorName	bob
firstName	bob

```
        administra0_.FirstName as FirstName6_,
        administra0_.LastName as LastName6_,
        administra0_.ModifiedBy as ModifiedBy6_
    from
        Administrator administra0_
Hibernate:
    select
        event0_.id as id8_,
        event0_.EventName as EventName8_,
        event0_.EventDate as EventDate8_,
        event0_.IsActive as IsActive8_,
        event0_.ModifiedBy as ModifiedBy8_
    from
        Event event0_
Hibernate:
    select
        attendee0_.id as id7_,
        attendee0_.FirstName as FirstName7_,
        attendee0_.LastName as LastName7_,
        attendee0_.Company as Company7_
    from
        Attendee attendee0_
```

ORM Essentials: Parameter Logging

- If you *need* to see the parameters for the SQL statements, turn it on
  - WEB-INF/cfusion/lib/log4j.properties
  - Uncomment this line:
    - ### Also log the parameter binding to the prepared statements.
    - #log4j.logger.org.hibernate.type=DEBUG
  - This will get extremely noisy, so use with care

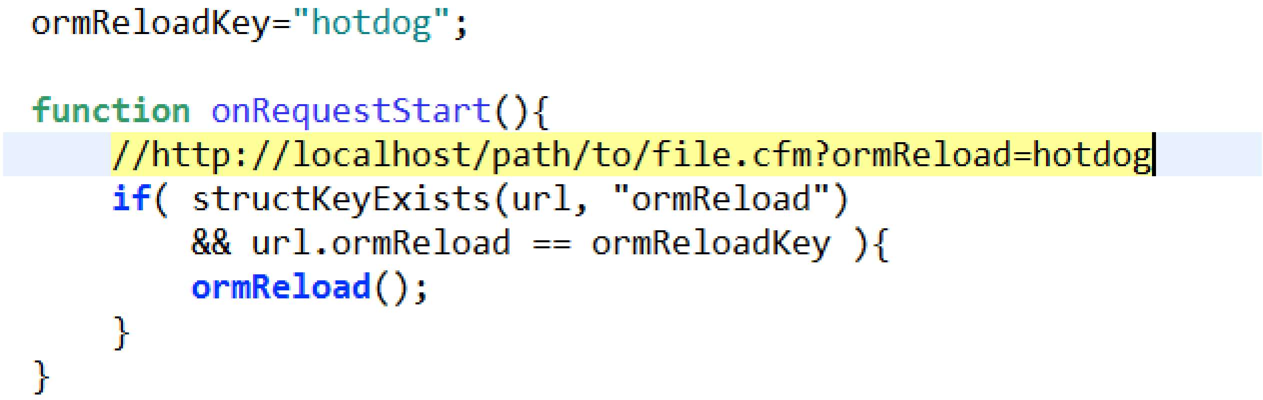


```
03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - returning '2011-02-01 20:38:06' as col
umn: EventDate39_0_

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - returning 'true' as column: IsActive39
_0_

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - returning '10' as column: ModifiedBy39
_0_

Hibernate:
    select
        this_.id as id42_0_,
        this_.FirstName as FirstName42_0_,
        this_.LastName as LastName42_0_,
        this_.Company as Company42_0_
    from
        Attendee this_ limit ?
03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - returning '11' as column: id42_0_

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - returning 'attendee1' as column: First
Name42_0_

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - returning 'mcghee' as column: LastName
42_0_

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - returning 'radco' as column: Company42
_0_

Hibernate:
    insert
    into
        EventComment
        (Comment, IsVisible, CreateDate, attendeeID, eventID)
    values
        (?, ?, ?, ?, ?)
03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - binding 'We loved it! 1299334736964' t
o parameter: 1

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - binding 'true' to parameter: 2

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - binding '2011-03-05 09:18:56' to param
eter: 3

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - binding '11' to parameter: 4

03/05 09:18:56 [jrpp-0] HIBERNATE DEBUG - binding '17' to parameter: 5
```

ORM Essentials: ormReload()

- ANY changes to ORM components require ormReload()
- Sometimes, ORM will lose its mind and you’ll need to restart CF (It’s not often, but don’t be surprised by it)
- Usually control with a URL flag in onRequestStart()
- Don’t forget them in your MXUnit tests!
  - Use beforeTests() for best performance

ORM Essentials: ormReload()



```
ormReloadKey="hotdog";

function onRequestStart(){
    //http://localhost/path/to/file.cfm?ormReload=hotdog
    if( structKeyExists(url, "ormReload")
        && url.ormReload == ormReloadKey ){
        ormReload();
    }
}
```

*For this presentation, I’ll include ormReload() at the top of each page so I don’t forget to do it