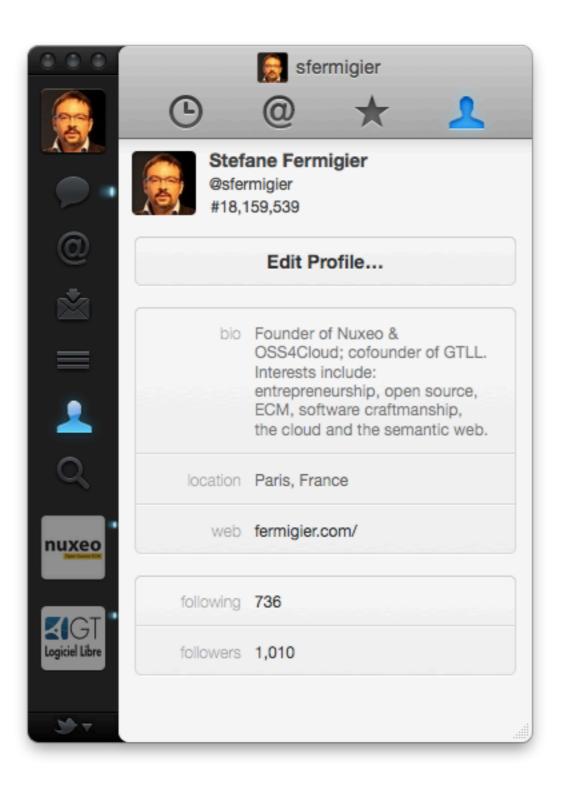
### Nuxeo at 10

Stefane Fermigier - Nuxeo Evry, Feb. 2011





# Personal journey

- Studies in mathematics (-> PhD)
- Discovered Unix and Free Software in 1988, Linux in 1991, the Web et Python in 1996
- Co-founded AFUL en 1998
- Founded Nuxeo fin 2000
- Co-founded the GTLL (F/OSS interest group) in 2007



#### The Open Source Tornado nuxeo Apps openbrauo Open Source ECM SUGARCRM. Middleware eclipse The Jakarta Project Sun Novell suse Mandriva OS redhat. Apache **Internet Infra** HTTP SERVER PROJECT SENDMAIL. **Restoring Trusted Internet Communications** 1995 2000 200

Open Source ECM

# The early years 2000-2005



## Timeline

- Nuxeo founded in 2000
- Initial technology focus on Python and Zope
- Our initial motto: "Web solutions for better collaboration"
- 2002-2005: we create the Zope-based Nuxeo CPS project
  - Which lives on at <u>www.cps-project.org</u>



# Nuxeo CPS

- Content management and portal platform
- Built on top of the Zope and CMF (Content Management Framework) open source frameworks
- Architecture: pluggable components ("Products") and events



# Growing a self-funded company

- Initial focus on services
- Market opportunity: F/OSS in the (mostly)
   French Public Administration
- Partnering with bigger players (ex: Capgemini) is both mandatory and difficult
- Starting up a company is risky (specially if you've never done it before)
- Cash is absolutely king!



# The Java EE years 2005-Now



# Timeline

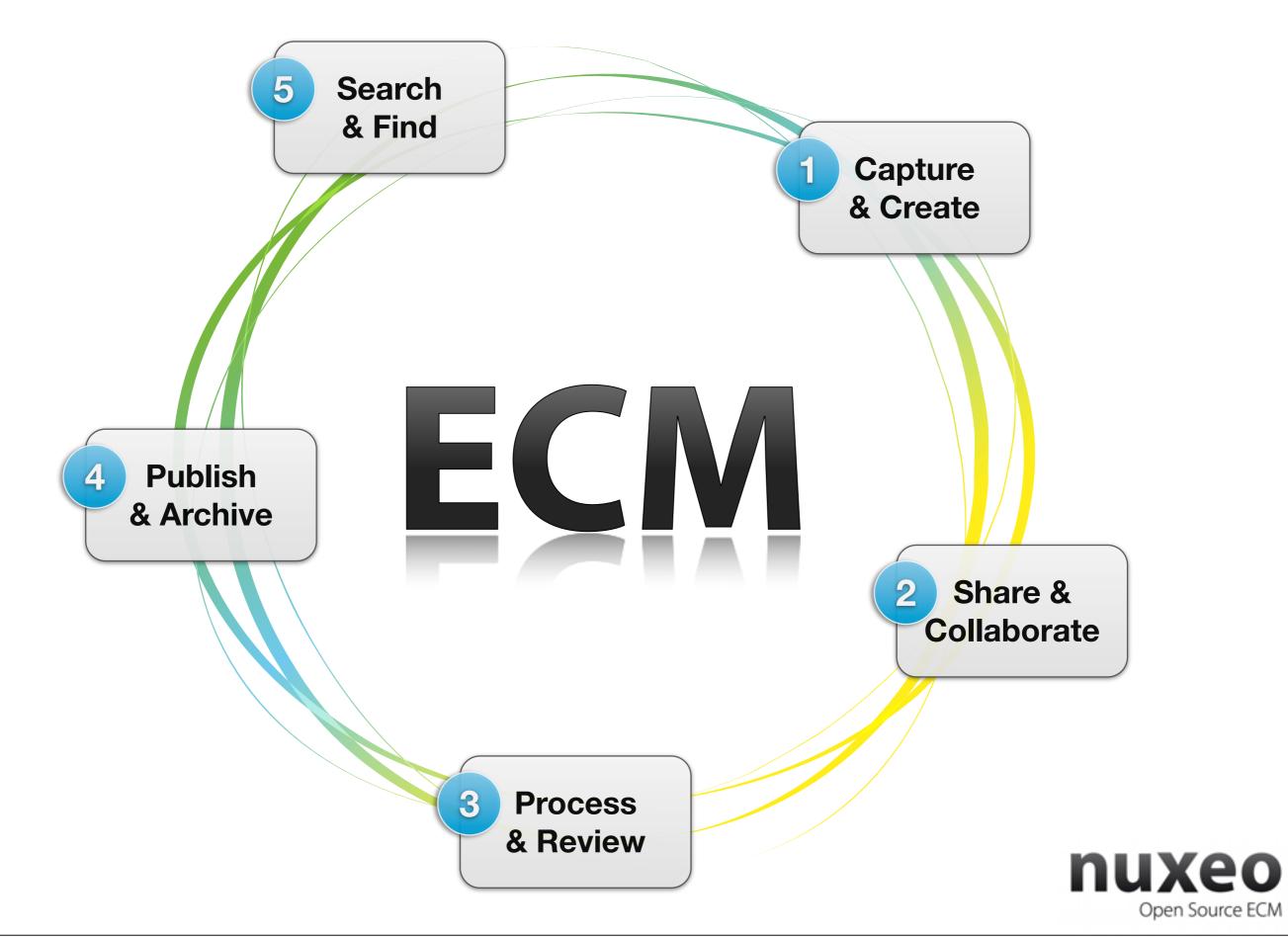
- 2005: First Eclipse RCP based project (frontend with Zope/CPS based back-end)
- 2006: Full switch to Java (Java EE 5 and OSGi)
- 2009: Raised VC funding to migrate business model from service company to OSS Software Vendor and conquer the world
- 2010 & 2011: Launched the Apache Chemistry, Apache Stanbol and Eclipse ECR projects



# What is ECM?

**ECM**, a concept that emerged in the early 2000s, represents the integrated enterprise-wide management of all forms of **non-structured** (and sometimes, semi-structured) content, including their **metadata**, across their whole lifecycle, supported by appropriate technologies and administrative infrastructure.





# What are CEVA?

- 4LA invented by Gartner in 2006: "Content Enabled Vertical Applications"
- "CEVAs typically help to automate complex processes that previously required workers to manually sort through paper documents and other forms of content (in effect, a way to manage down costs of exception handling) and optimize the remainder of the work."



# Our Goal (as of 2006)

- Create an ECM platform that enables us and partners to create generic document and content management applications as well as CEVAs
- Move towards an open source vendor business model and focus on recurring revenue (= subscription) growth



# Switch to Java: Why?

- Technical reasons:
  - ZODB doesn't scale well in terms of data volume
  - Dynamic languages don't scale well in terms of managing complexity (> 100 KLOC)
- Business reasons:
  - Java makes it much easier to work with mainstream systems integrators



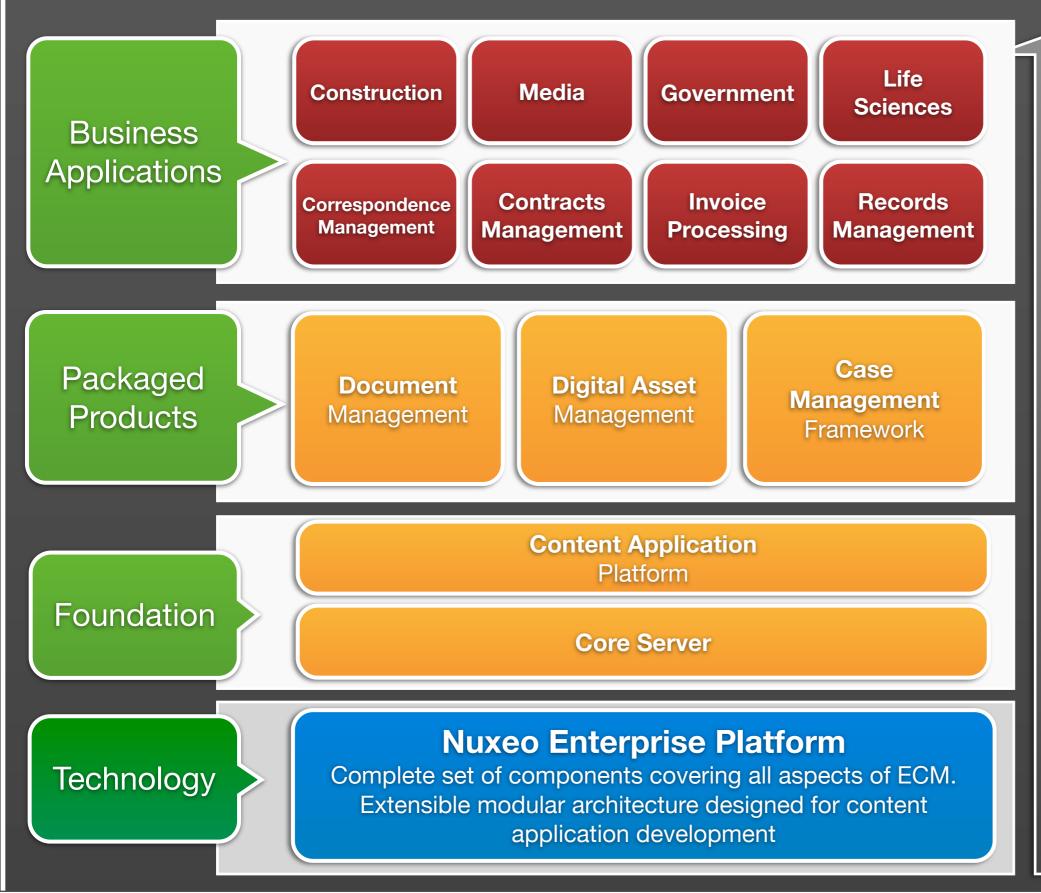
# Switch to Java: How?

- We had to maintain, for some time, both platforms
- Couldn't announce the new platform before it was ready to be sold
- Had to hire some new Java developers with a higher failure rate as before
- 10% of our developers were too emotionally attached to Python, and left (they're still good friends though)

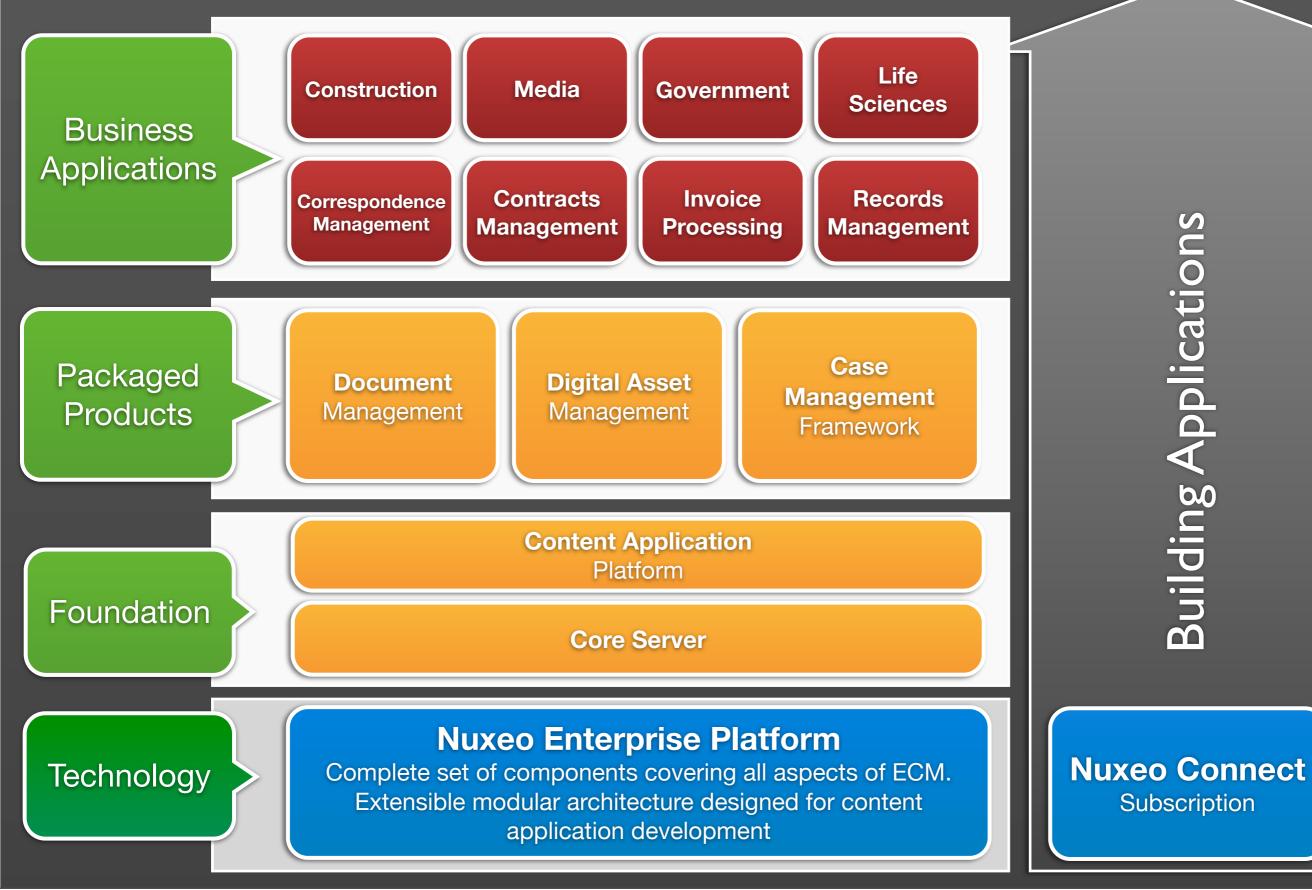


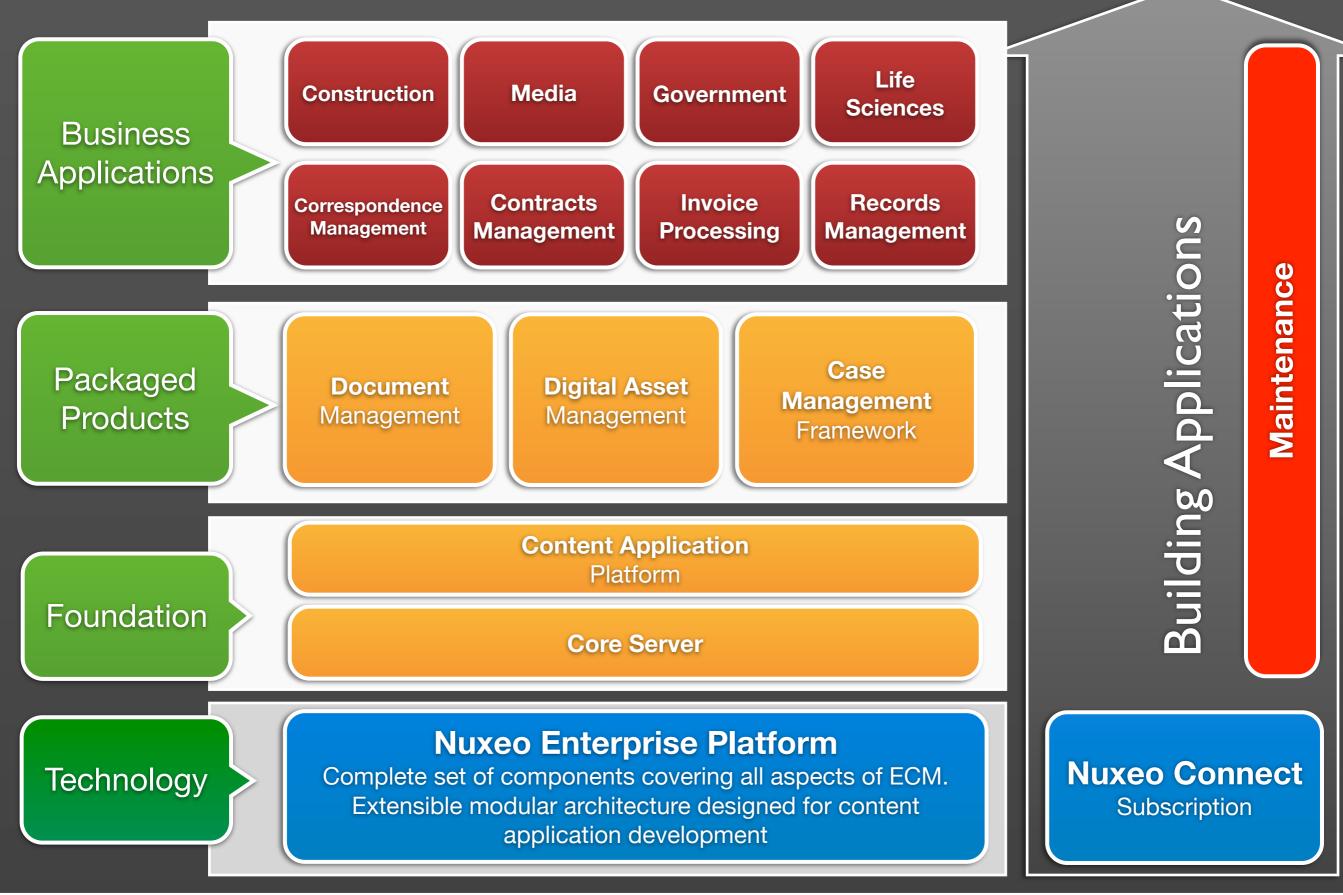
# Products and Services

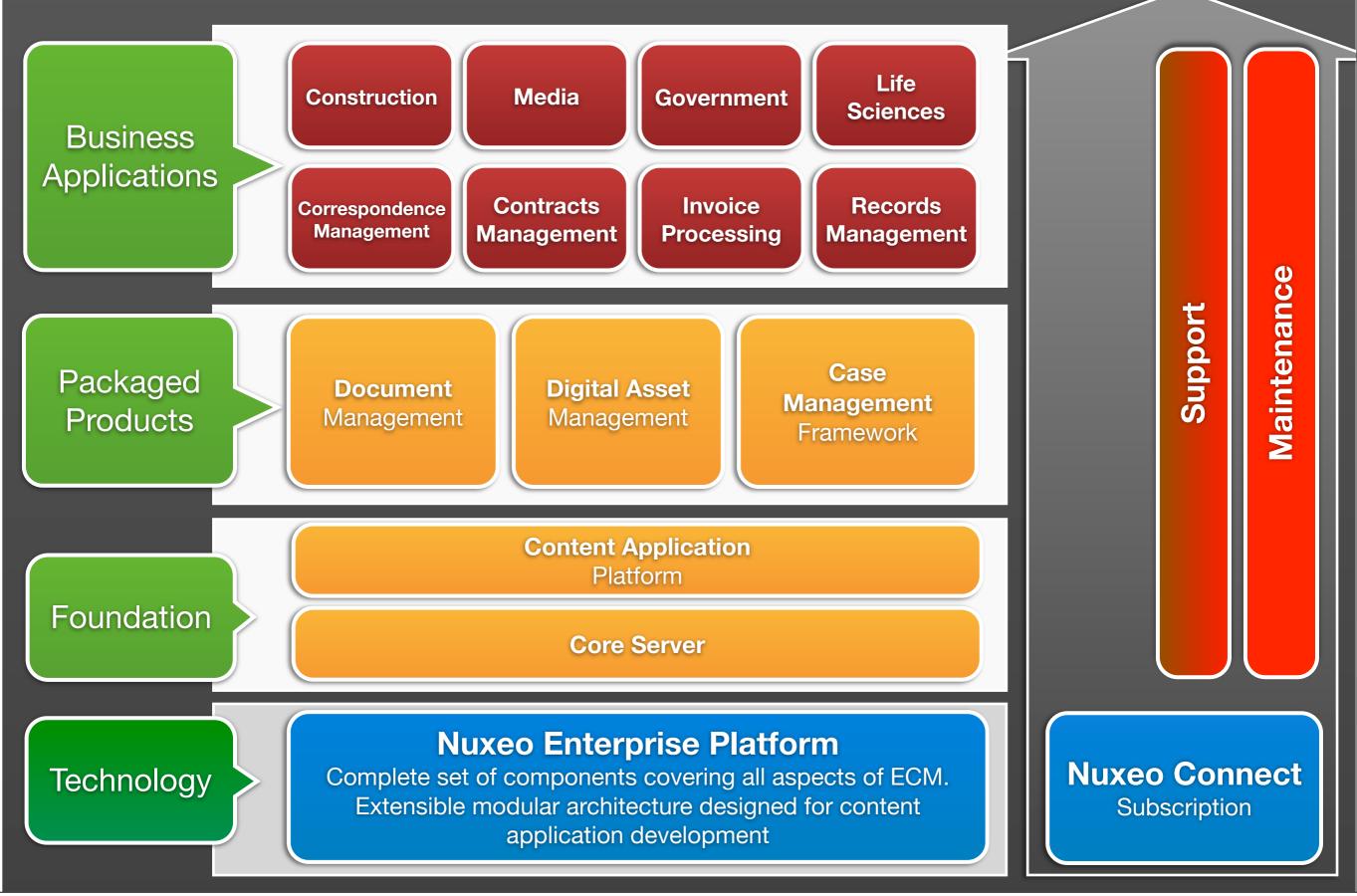


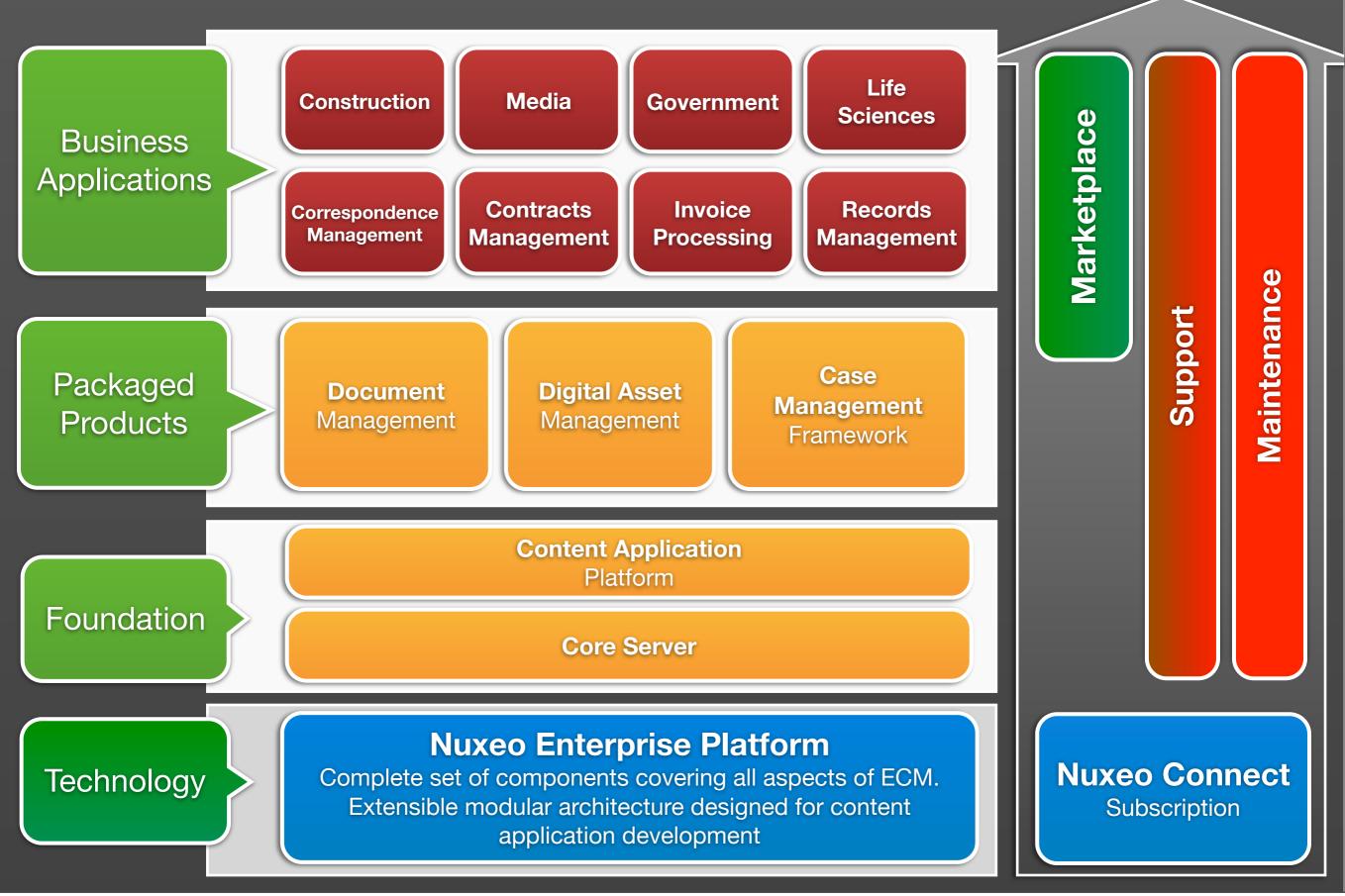


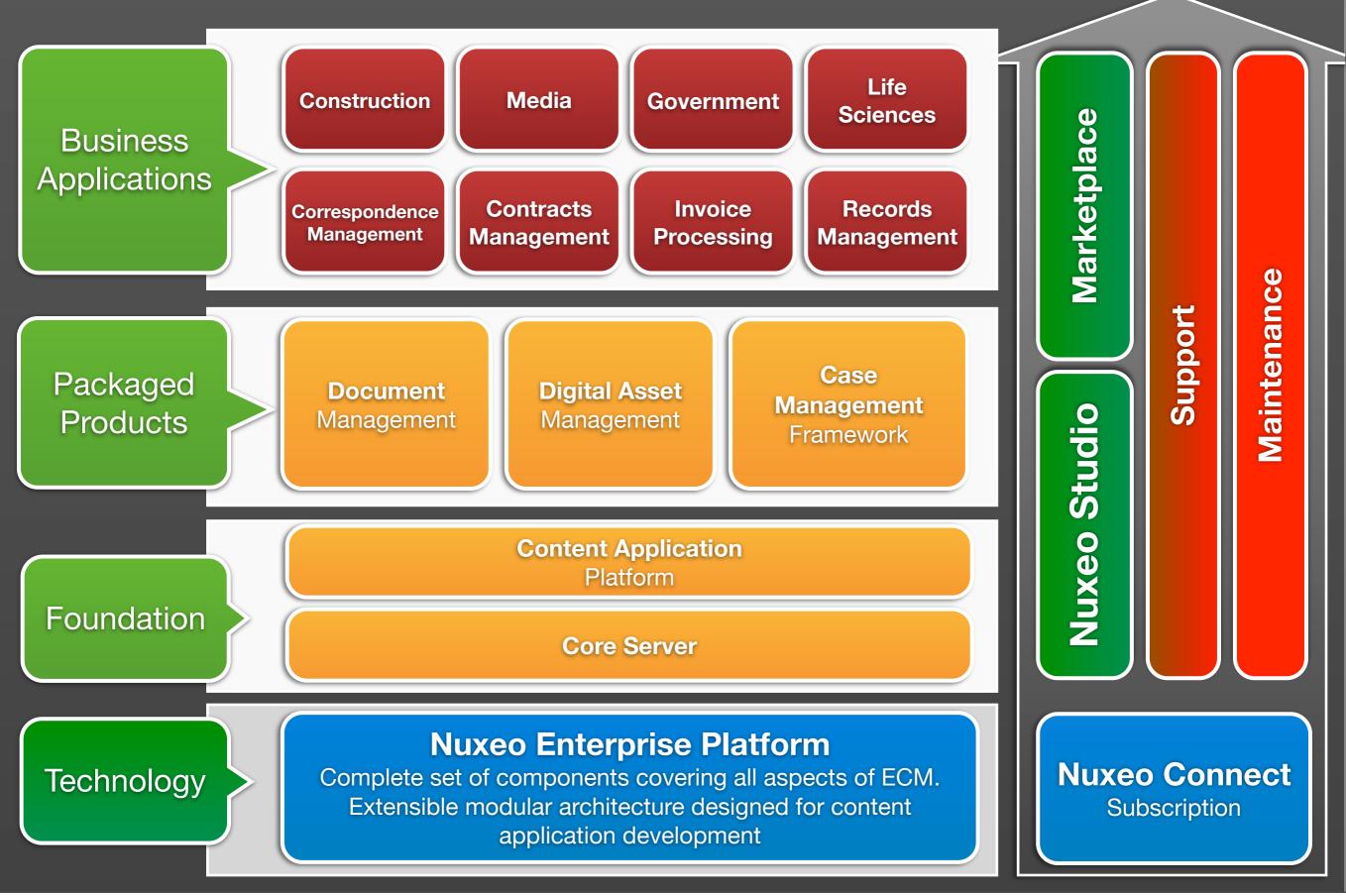
Building Applications





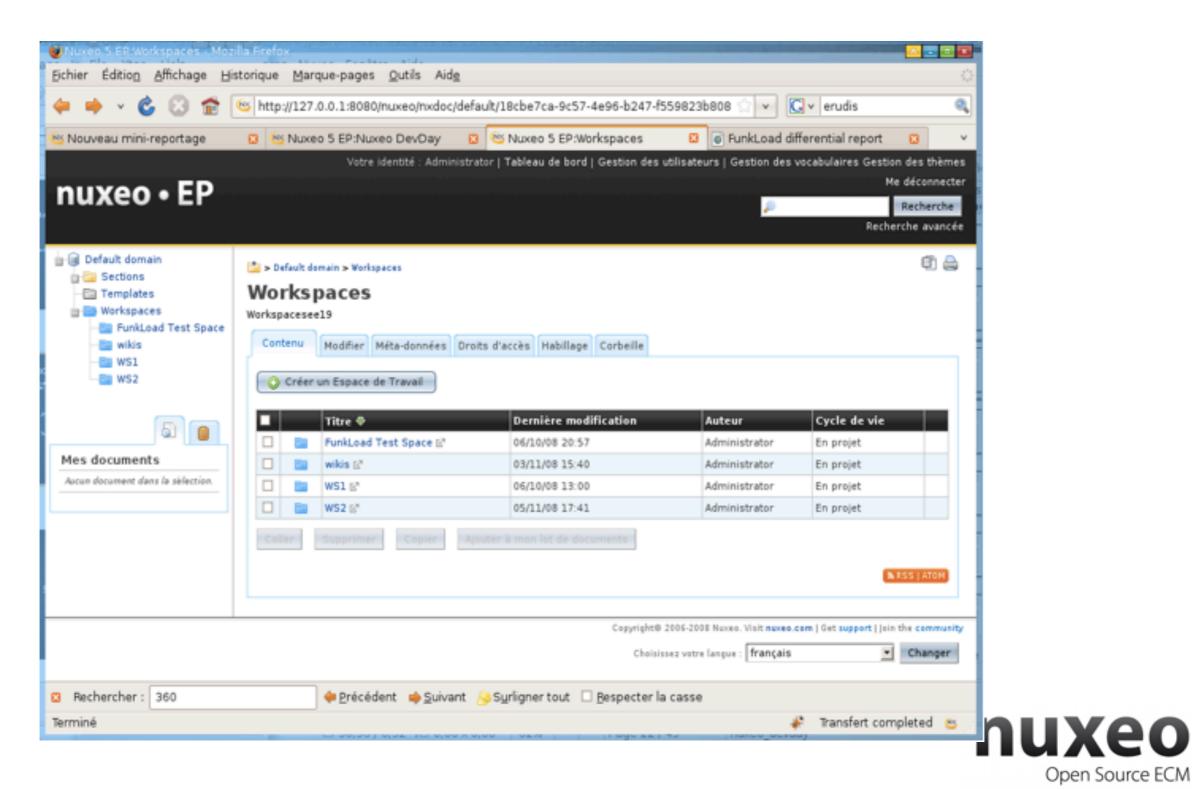




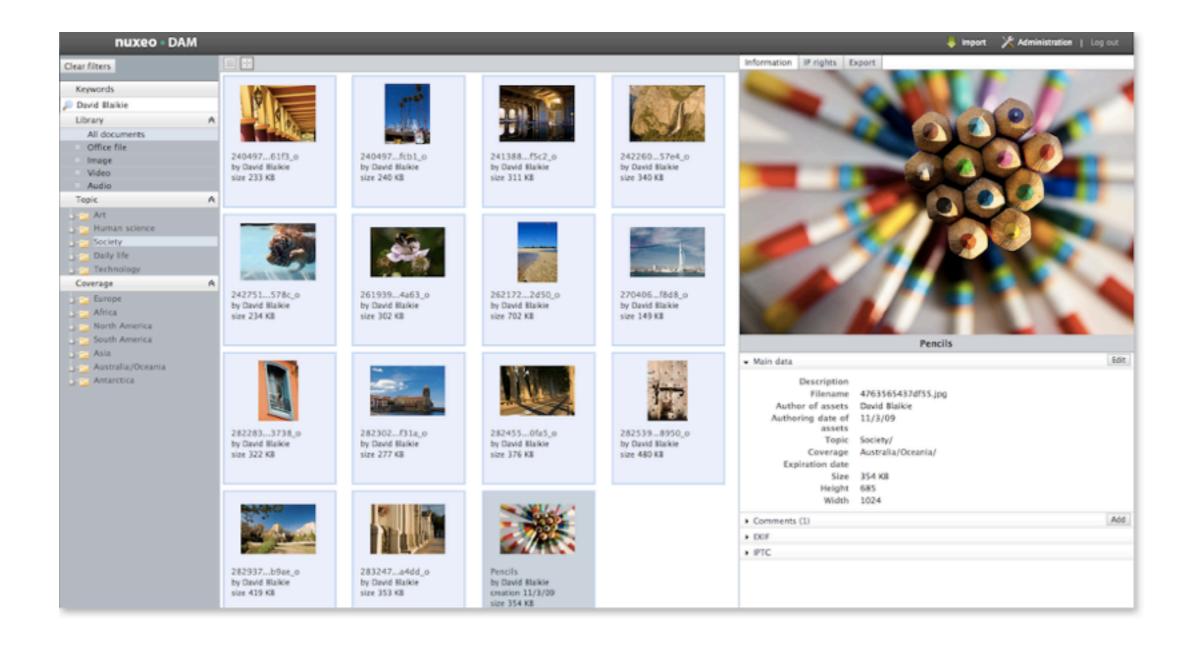


Wednesday, March 2, 2011

# Document Management

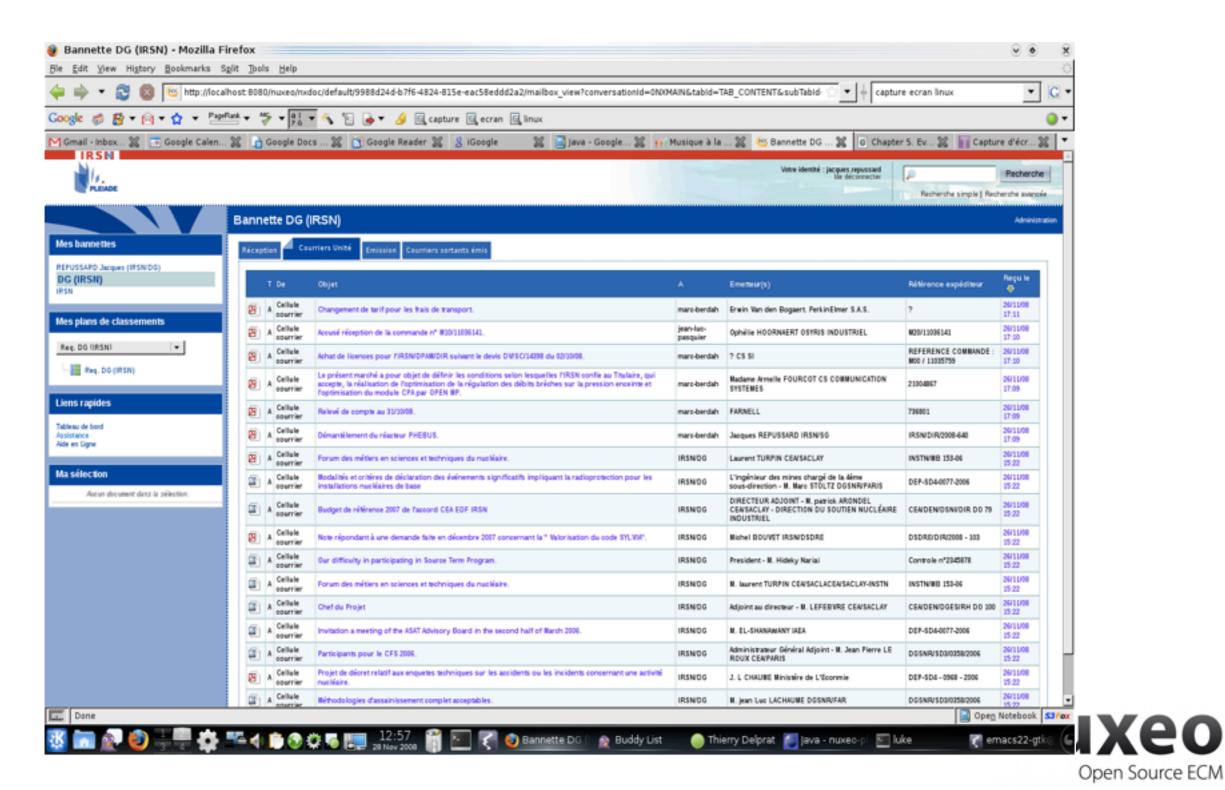


### DAM





# Case Management



### Web Sites

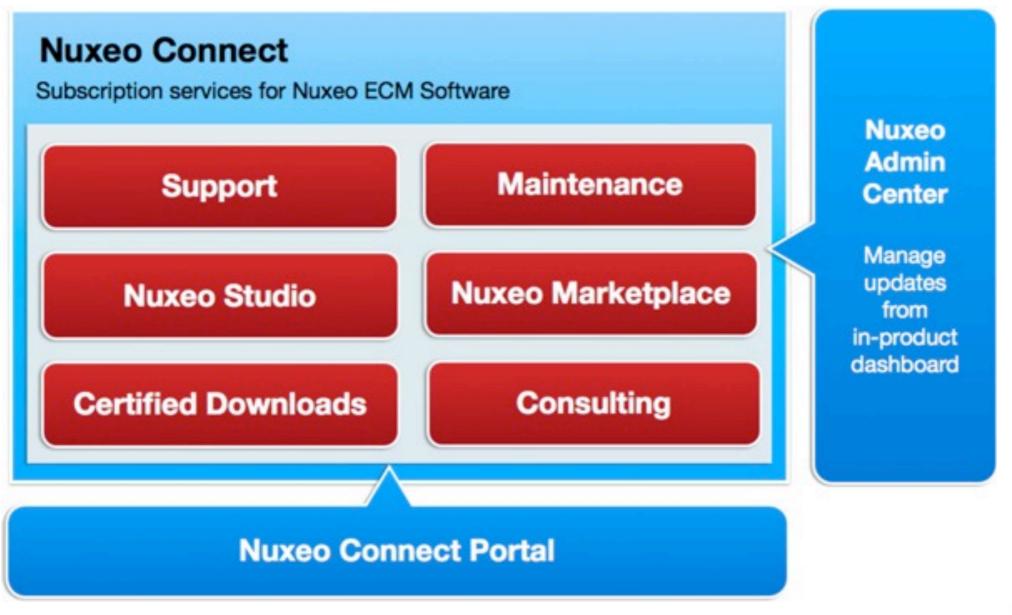


# A Few Numbers

- Nuxeo EP+DM is a 400 KLOC Java project
- Comprises ~190 independent modules (JARs)
- Developed over the last 4 1/2 years by a core team of 20 developers and 50 community contributors
- Has generated ~20 MEUR of revenue for Nuxeo, ~50 MEUR for partners



# Our Service Offer



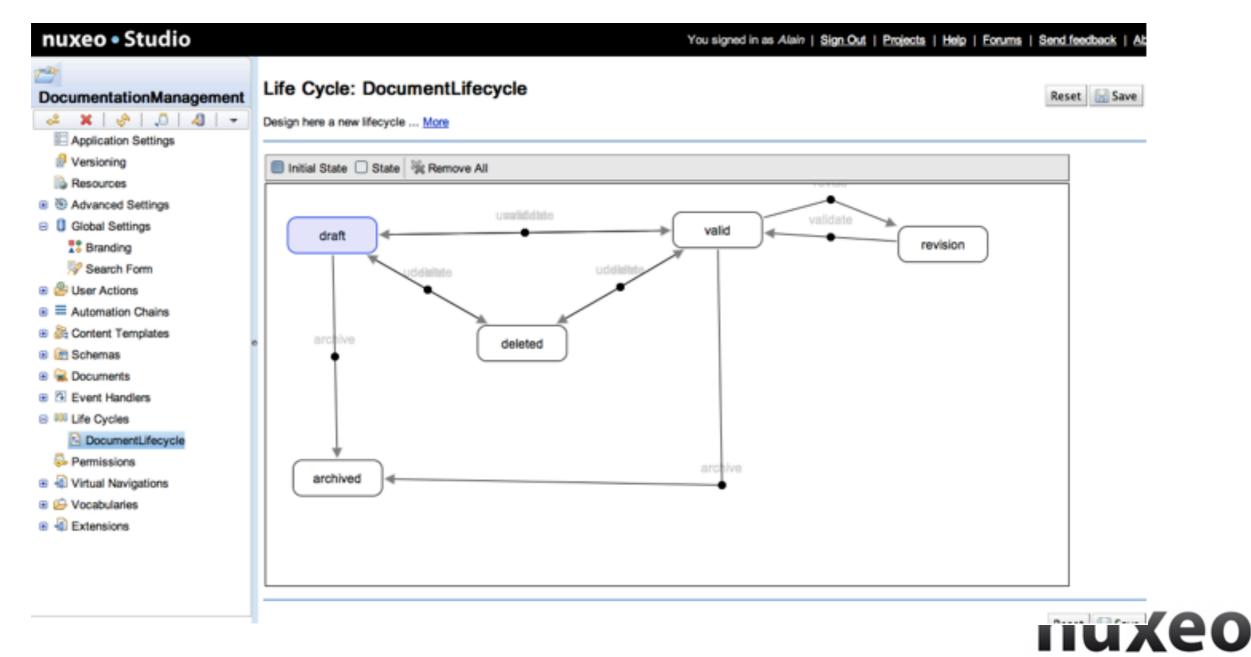


# Three SLA levels

Nuxeo Connect - Operations	Silver	Gold	Platinum
Hours	Business hours	Business hours	24/7
Contacts	1	2	5
Critical Bug Fixing	Unlimited	Unlimited	Unlimited
Major Bug Fixing	No	Unlimited	Unlimited
Questions	Unlimited	Unlimited	Unlimited
Custom Release	No	No	Yes
Critical Bug Fixing Time	3 business days	1 business day	4 business hours
Major Bug Fixing Time	No	5 business days	1 business day
Response Time for Questions	2 business days	1 business day	4 business hours



# Nuxeo Studio





# Business Constraints and Requirements



# **Business Vision**

- Address the full ECM scope
  - Initial focus on Document Management
  - Architecture must be extensible and modular
- Enable and sustain the Ecosystem
  - Easy to work with, designed for participation



# **Business Vision**

- Low barrier of entry for:
  - End-users (e.g. pleasant UI)
  - Developers (e.g. clean model and API, leverage existing knowledge)
  - Sysadmins / operations
- "Enterprise-class" software
  - I0 000s of users, millions of documents



# Our Original Roadmap

- Don't reinvent the wheel
  - Leverage existing standards, work on a few emerging ones (ex: JCR2, CMIS)
  - Build on proven open source libraries (JBoss, Apache, Sun, Eclipse)
- Use a robust software engineering process
  - Make it transparent for our community



# Technical Challenges



## Business Goals

- First, create a **MVP** (minimal viable product) to ensure company sustainability
- Base it on a clean, **extensible** architecture
- With the end goal of enabling the creation of a rich **ecosystem** of extensions and application profiles



### The Strongest Requirement

- Applications (horizontal, vertical or custom) must be buildable just by **assembling components** (packaged as Java JARs)
- Architecture must allow behavior modification at the repository level (e.g. new document type), at the UI level (e.g. new actions), and at the service level (e.g. adding new services) without recompilation



# Standards Choice

- Switch to Java was motivated by the desire to be more "standards-compliant"
- But the problem with standards, is that there are too many to choose from!
- Old vs. new or emerging
- Open standards vs. de facto standards
- Overlapping standards (hardest issue!)



### Initial Standards

- Java EE 5, as the structuring general framework for the server-based application (but not for the core services)
- OSGi, as a packaging model for components
- The JCR (Java Content Repository), as the model API to manage content and metadata at the most basic level
- JBoss Seam (not really a standard, actually)



### Notes

- Java EE 5 was really new and still "wet" at the time
- Seam was not a standard, but its concepts eventually merged into one (JCDI)
- In 2006 OSGi had credibility in the embedded and rich client spaces, not yet on the server
- We dropped JCR support in 2010



# **Open Source Libraries**

- The Open Source Java ecosystem started to grow in the late 90s (Apache) and had a huge boost in the early 00s (Eclipse, JBoss, OW2, etc.)
- Like with standards, there are usually many OSS implementations to choose from
- FYI: Nuxeo EP now embeds more that 200 external open source libraries!



# Choosing an OSS Library

- License compatibility with the LGPL (this excludes proprietary and GPL licenses)
- Compliance to a chosen standard
- Quality, as witnessed by visual inspection of the source code
- Confidence in the development process (e.g. are there unit tests?) and the community behind the project



# Benefits and Challenges of Using OSS Libraries

- With OSS, it's easier to evaluate options
- Forking a library is sometimes the only way to fix a bug or add a missing functionality
- But it comes with a tremendous price because now you have to maintain your own branch
- Becoming a contributor is also sometimes needed, but comes at a price too
- Risk of "JAR hell" (conflicting libraries reqs)



### Architectural Solutions



# Architectural Solutions

- Layered architecture
- High-level APIs
- Component system
- Extension points



# Layer Cake

**Nuxeo EP Architecture** 

Nuxeo UI Frameworks Flexible choice of interfaces

Nuxeo ECM Services Modular set of content services

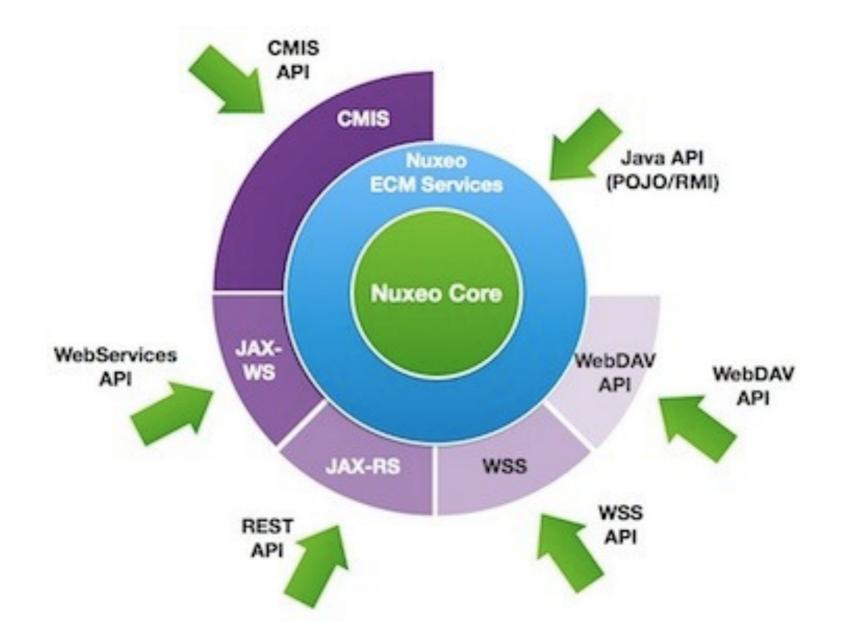
Nuxeo Core Advanced content repository

Nuxeo Runtime

Component and service model

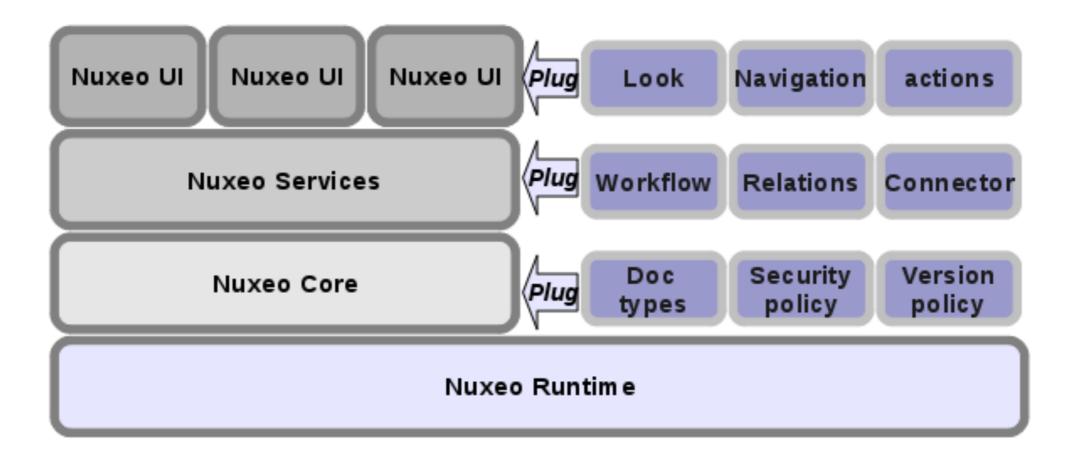


### **APIs**



Den Source ECM

# Everything Pluggable



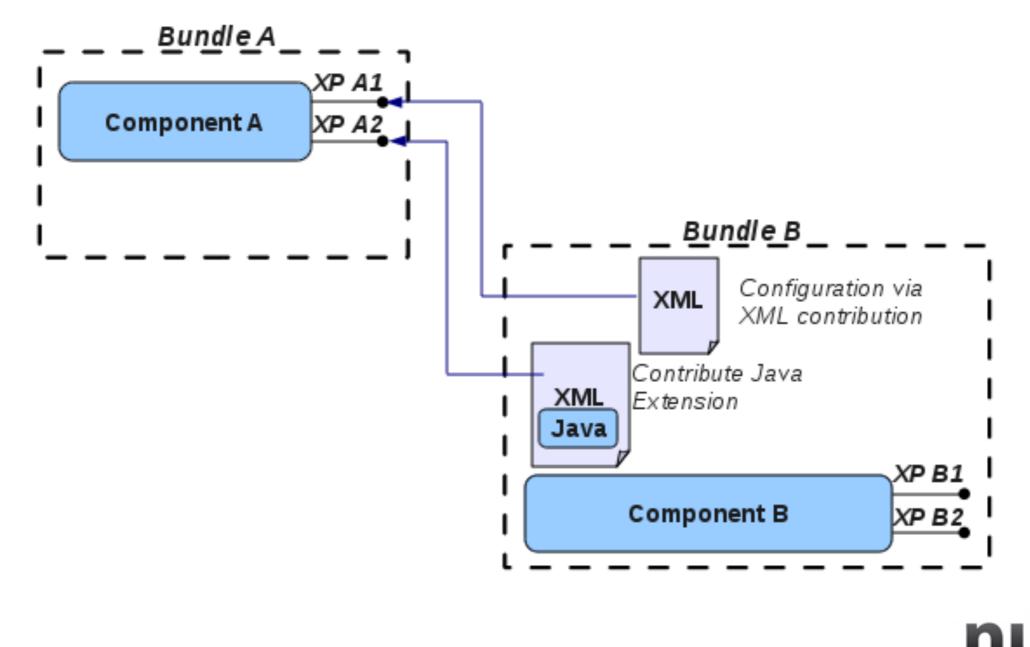


### Plugins and Extension Points

- Inspired by the Eclipse architecture
- Eclipse = a core runtime engine + a set of plugins
- Plugin: the smallest extensible unit to contribute additional functions to the system
- Extension points: boundaries between plug-ins
- A plugin (bundle) can contribute either configuration (pure XML contribution) or code (XML + Java)



# Plugins and Extension Points



# Note

- This "core + extensions" pattern is very common in successful open source projects
  - Linux kernel + drivers (modules)
  - Firefox + plugins
  - Emacs + Emacs LISP macros
- It's a key to enabling an architecture of participation



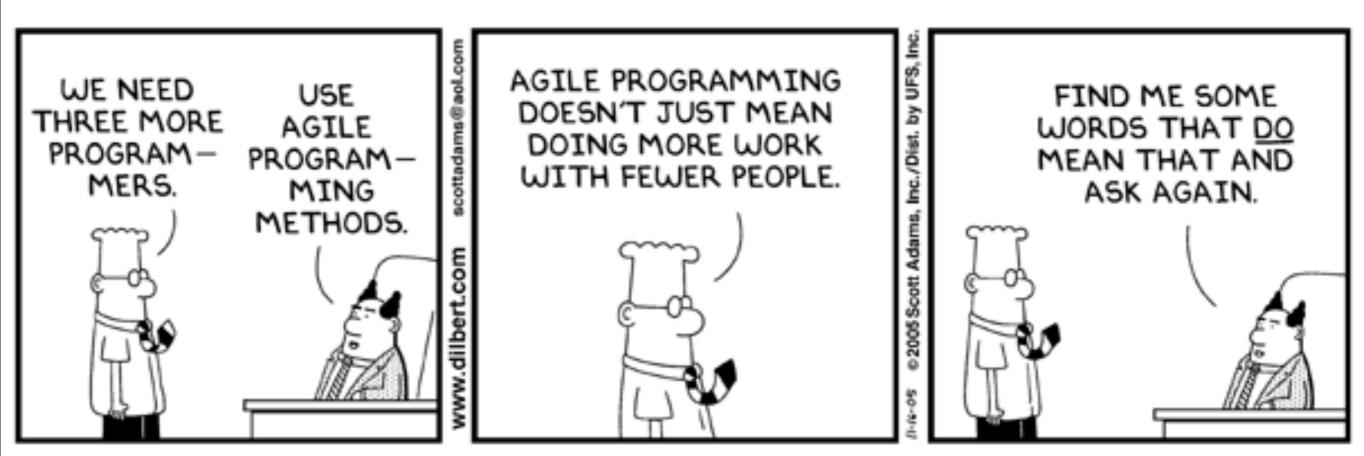
## Lessons Learned

- Allow users of our platform to extend it without touching its source code
- Or, even better, without writing code at all!
- Keep your options open, but don't overengineer flexibility



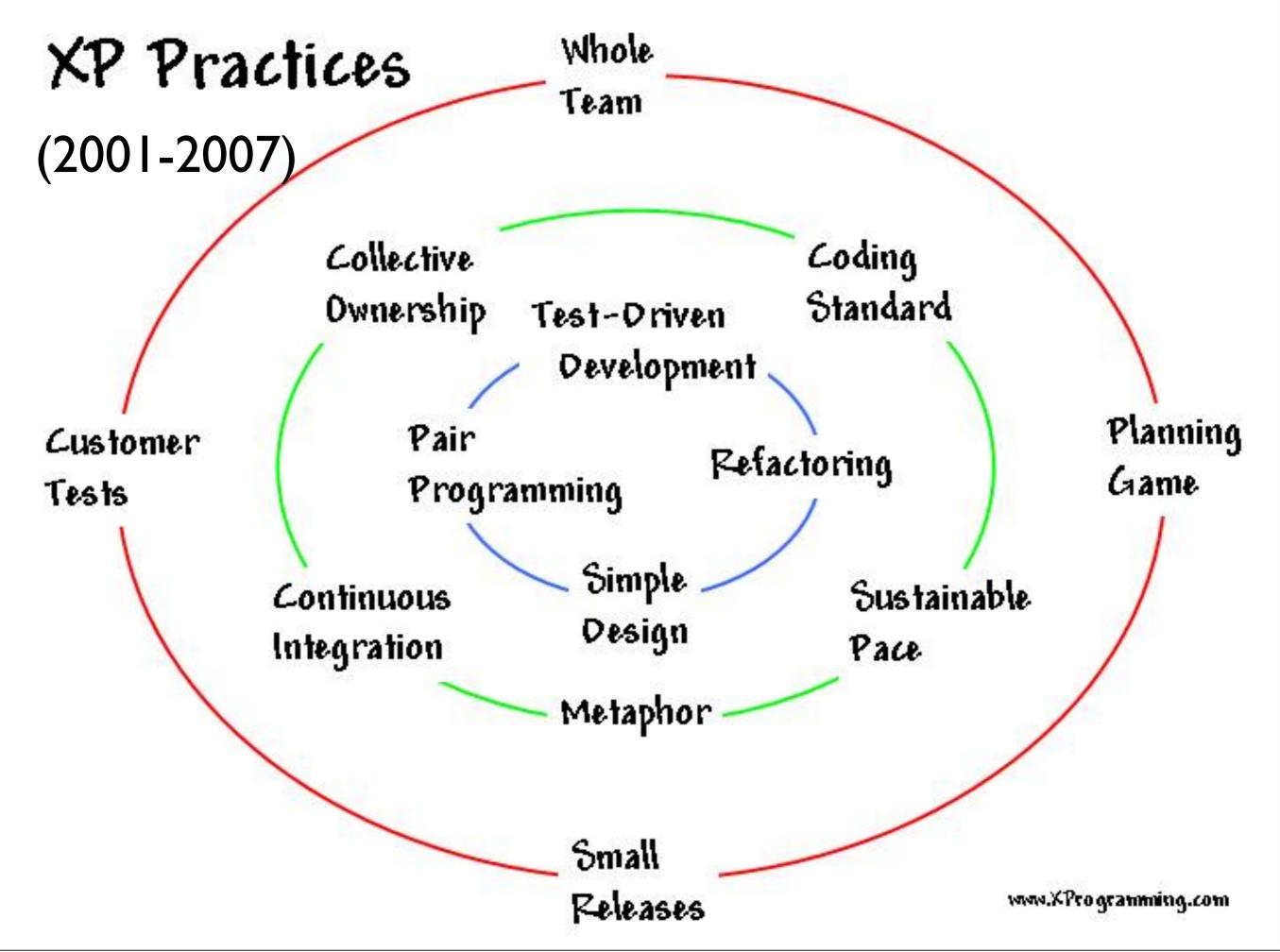
### Process





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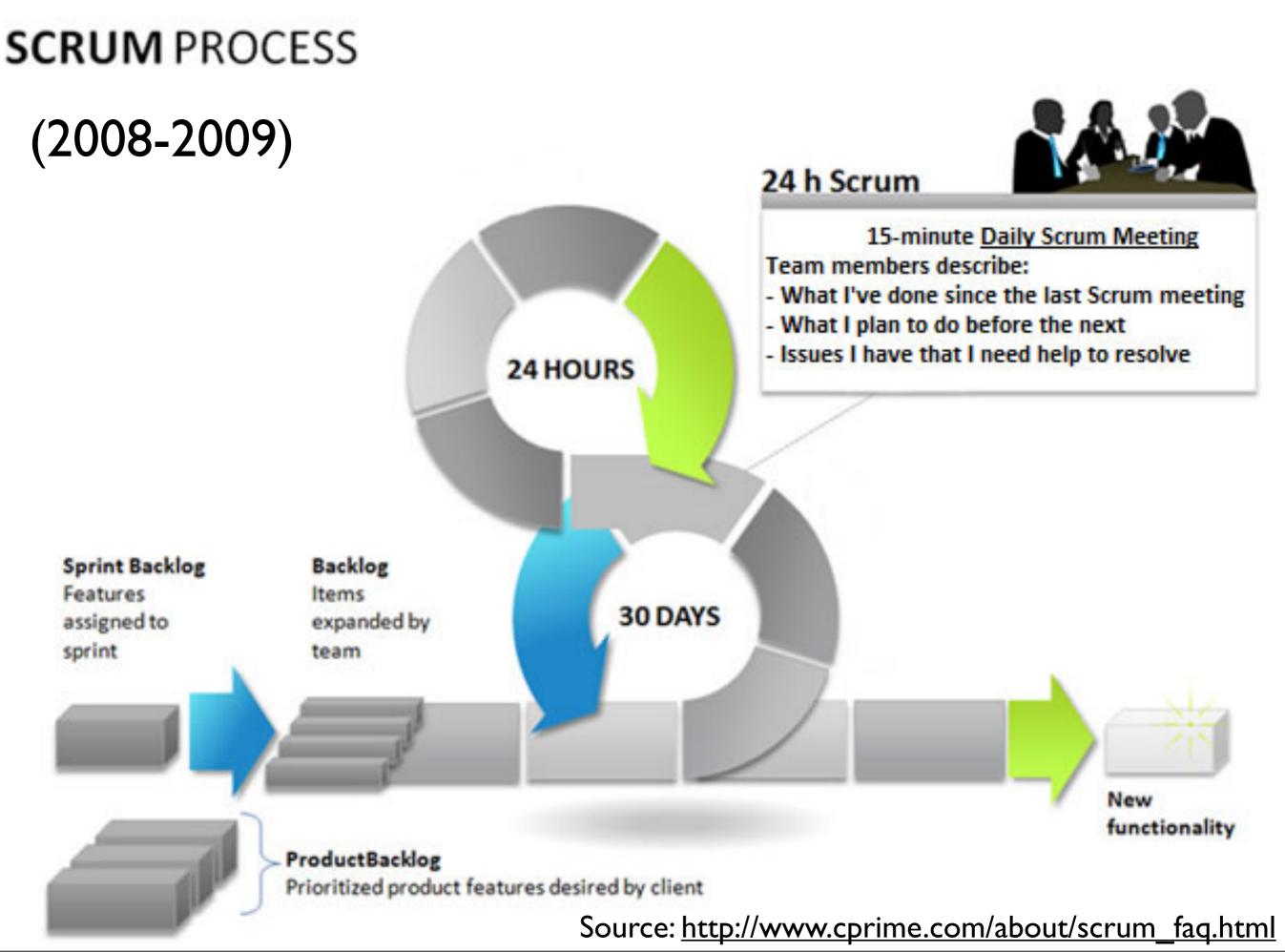






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Wednesday, March 2, 2011



# Community Engagement



### Goals

- Must enable the participation of third party contributors (partners, community)
- Must improve synchronization between
   custom developments and F/OSS projects
- Must complement internal focussed agile development processes with scalable outbound communication and practices



### "Every successful open source project I know uses **PRIM**. Every closed source project I know, doesn't. People wonder how open source projects manage to create high-quality products without managers or accountability. The answer: we're accountable to our infrastructure. **PRIM is the open source secret sauce**."

Ted Husted http://jroller.com/TedHusted/entry/prim



### P = Portal

Don't miss a thing!

Cheryl's Nuxea Bog Dric's Nuxea Bog Nuxeo Developers Bog Nuxeo Lounge

February 25, 2010 01:40 PM All times are UTC.

10.8 Nuxeo on the Road

10.9 Stefane Fermigier's

Nuxeo Blog: Preliminary Nuxeo EP

10.0 Cheryl's Nuxeo Blog:

(and On the Web)

roadmap for 2010

Numen DAM - First

CMIS-enabled Digital

Asset Management -

We're Launched!

Our blogs

Last updated:

.

**Top Posts** 

by Stefane Fermigier at February 22, 2010 06:59 PM

February 19, 2010

Cheryl's Nuxeo Blog

C ROOKPHERK C SUBSCREE

Stefane Fermioler's Nuxeo Blog

About Us

documents.

We're the friendly employees

of Nuxeo, a leading open source software vendor,

which develops a complete

Management (ECM) software

platform to help companies

publish, archive, expose and

digital assets to transactional

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PRODUCTS

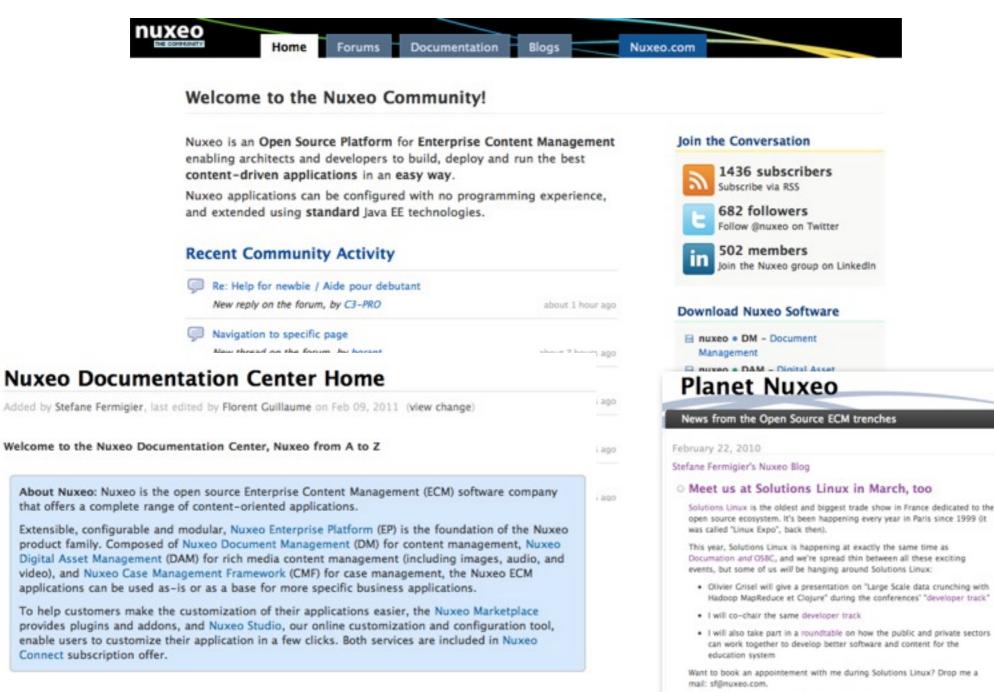
Open Source ECM

\* Visit Nuxeo.com

find their information from

better produce, process,

**Enterprise Content** 



### Map to the documentation

The links below are the main entry points to the Nuxeo online documentation.

**Get Started** 

### Wednesday, March 2, 2011

# R = Repository

Repositories list			1.0	Mercurial	
Name addons	Description Nuxeo Addons	Contact Florent Guillaum		I zip RSS Atom	
addons/nuxeo-core-folder-versioning	Nuxeo Core Folder Versioning	Florent Guillaum		I zip BSS Atom	
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addons/nuxeo-platform-documentLink	Application Level document proxies for Nuxeo5	II all commits Com	mits by owner	52 week participation	bdelbosc (Delbosc Benoit) 0 public repos, 0 followers
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Open Source ECM

### I = Issue Tracker

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Core SQL Storage	19 🍏 <u>5.3.1</u>	63 - Unscheduled	- Updated recently
Desktop Integration	4 🍏 <u>5.3.2</u>	2 - Assigned to me - Reported by me	- Most important
Cirectory	9 🍏 <u>5.3.x</u>	206	
E Flex	3 🍏 <u>6.0</u>	5 Project Summ	nary
Linstallers / Admin tools	27 Unscheduled	334 🗳 <u>Open</u>	186 4%
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### M = Mailing List (+ foruM)

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			Iooking for Nuxeo DM tomcat + Oracle 10g configuration	bulan bintang	243	3	Feb 22, 2010 8:11 PM	sfermigier (83)	I first looked into using an event handling listen	ing to the	
				100000				••••• rdariea (44)	aboutToCreate event, but this does not work as any	changes to the	L
		0	Gestion des courriers	Valinoir	101	1	Feb 22, 2010 9:58 AM	eeeee ogrisel (43)	document path of the passed-in DocumentModel are no reflected/persisted. (Cannot remember the details)		
			How can I configure a multi-					eeeee danietelez (38)	keeps a reference to the original name/path and us		
		•	repository Nuxeo?	enriqueperez	66	1	Feb 19, 2010 3:28 PM	••••• JohanG (37)	name/path that comes back in the DocumentHodel pas	sed in the Event).	
		1000		1323327.4				eeeee enriqueperez (37)	As a fall-back I decided to override DocumentAction	caleas with my own	
		•	LAN Web Access	abernut	47	1	Feb 19, 2010 3:24 PM		class (higher Seam install precedence) and modified		
			stuck on a custom workflow					Popular Discussions	saveDocument(DocumentModel) appropriately.		
			learning curve issue?	thesandman	1,260	8	Feb 18, 2010 7:20 PM	G remove tabs			
		-		100000	1	1.00	Second second second	Reples : 6 Last Post By; imh			
			SOS problem de compilation de code source	talato	30	0	Feb 18, 2010 6:00 PM	Last Post At: Feb 25, 2010 10:07			
								AM			
			Is it possible to use complex type fields in NXQL query?	alexander.itv	in 278	2	Feb 18, 2010 9:57 AM	Search can't find short Replies : 5			
			type news in revial: query?					Last Post By: alex2398			
			Hidding Nuxeo Types	aldago	127	4	Feb 17, 2010 3:08 PM	Last Post At: Feb 25, 2010 1:15 PM			

### Open Innovation Collaborative R&D Projects

- EDOS: software quality in open source projects
- SCRIBO and IKS: semantic technologies
- Compatible One: cloud computing
- Easy SOA:
- DORM: development tools

# Development Tools



# Tools

- Mercurial (distributed SCM), now Git
- Maven (Dependency management, build, packaging, releasing)
- Hudson Jenkins (Continuous integration)
- Jira (Bug / task tracking, Scrum iteration backlogs)



# TDD and CI

Hudson												ENABLE AUTO P	
People	All	CMIS	Desktop-Int	My Projects	NX 5.2	NX 5.2 Addons	NX 5.3	NX 5.3 Addons	NX 5.4	NX 5.4 addons	NX DAM	NX Deployme	
Build History	S	-	w	Job ↓							Last Su	ccess	
Project Relationship	0		(A)	FT-nuxeo-5.4-cmis								2 mo 9 days ( <u>#133</u> )	
Check File Fingerprint	0	FT-nuxeo-5.4-funkload-bench								17 hr (#	17 hr ( <u>#727</u> )		
Claim Report	0		*	FT-nuxeo-5.4	funkload	-rest-and-web					18 min (	(#1980)	
uild Queue			*	FT-nuxeo-5.4	selenium	-cap-jboss					7 hr 56	min ( <u>#432</u> )	
o builds in the queue.	0		2 Aug	FT-nuxeo-5.4	selenium	-cap-tomcat					8 hr 22	min (#33)	
uild Executor Status	-		679										
Master Idle			*	FT-nuxeo-5.4	7 hr 27	7 hr 27 min (#1815)							
Idle			46	FT-nuxeo-5.4	selenium	-dm-jboss_pern	anentCh	eck			1 hr 10	min (#2543)	
albany Idle						S 5.							
amour	i I 🔘		*	FT-nuxeo-5.4-selenium-dm-tomcat						7 hr 56	min ( <u>#506</u> )		
Building nuxeo-docs- nightly #294			633	FT-nuxeo-5.4-selenium-dm-tomcat_permanentCheck 4						4 hr 10 min ( <u>#470</u> )			
chipolata Building FT-nuxeo-5.4- selenium-cap-tomcat #34	0		and a	nuxeo-5.4							5 days 5	5 hr ( <u>#57</u> )	
dvalinn	0		¢ <mark>č</mark> á	nuxeo-5.4-ful	lbuild-dai	ly					1 day 14	4 hr ( <u>#155</u> )	
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Idle muradin	0		1	nuxeo-apogee	2.0						2 mo 18	days (#430)	

Open Source ECM

### More Tools

- IDEs (Eclipse mostly)
- Testing (JUnit, Selenium, WebDriver)
- Static code analysis (FindBugs, IDEA inspections, Checkstyle, Enerjy)
- Various profilers and debuggers



### Conclusion



# Key Technical Findings

- Layered approach (start with the foundations, then applications, then tools) has been working well for us
- The Nuxeo EP architecture did fit both the OSS "architecture of participation" vision and our business model and goals



# (A few) Business Findings

- Of course people are your most critical asset!
  - (Good) developers are mostly motivated by interesting projects and technologies
  - Sales people are mostly motivated by money, and are the most highly risky hires
  - Community was and still is key to our growth
- You still need money to scale up marketing and mitigate hiring risks





# Merci!

Harrys

### More Information

• <u>www.nuxeo.com</u>

- www.nuxeo.org
- blogs.nuxeo.com



