


Open CDE APIs

Intro and Status

bSI Virtual Summit

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This presentation is available on vimeo



Presenters

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- Director Development ANZ
- Oracle



Yoram Kulbak

Pasi Paasiala

- Co-Founder and Technical Architect
- Solibri



Pasi Paasiala

Frank Weiß

- Senior Director New Products, BIM & Innovation
- Oracle



Frank Weiß

Agenda

- Mission and Purpose
- Principles and Methodology
- BCF Overview
- Roadmap
- Challenges
- Work In Progress: Foundations, Documents and Property Exchange
- Conclusion & Questions

Mission and Purpose

What do clients and users say?

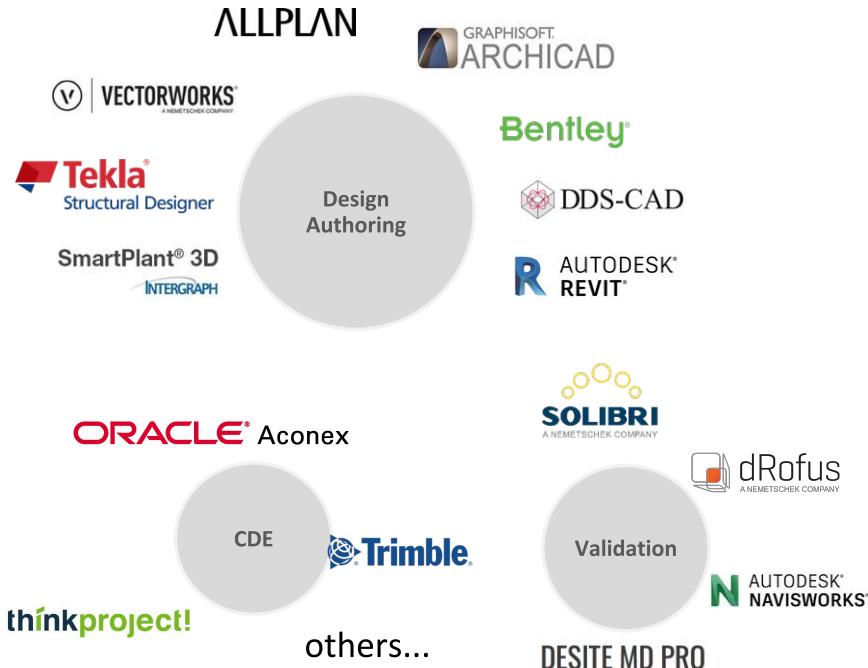
What do clients and users say?



“Vendors are often unwilling to build integrations between tools, especially the project management solutions used by owners, designers, and contractors. It is a critical need in our industry, and we have needed to engage third parties and spend significant resources to get this done.”

Brian Tighe
Skanska USA

Lots of applications used on projects...



... lead to challenges for clients and users

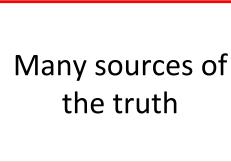
No seamless transfer of information between tools



Low automation, manual work is required

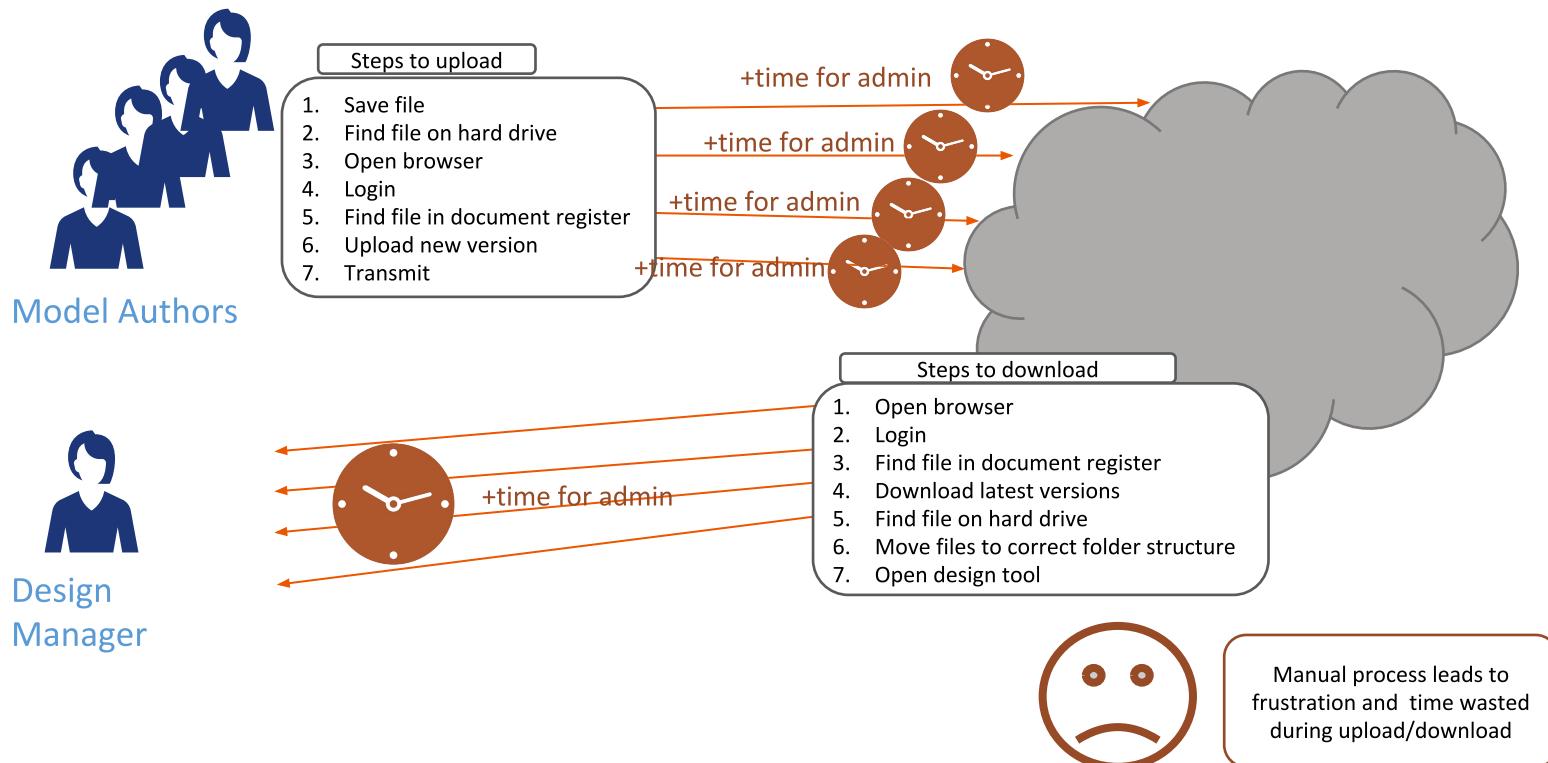


Reduces quality of the key data in the project



Many sources of the truth

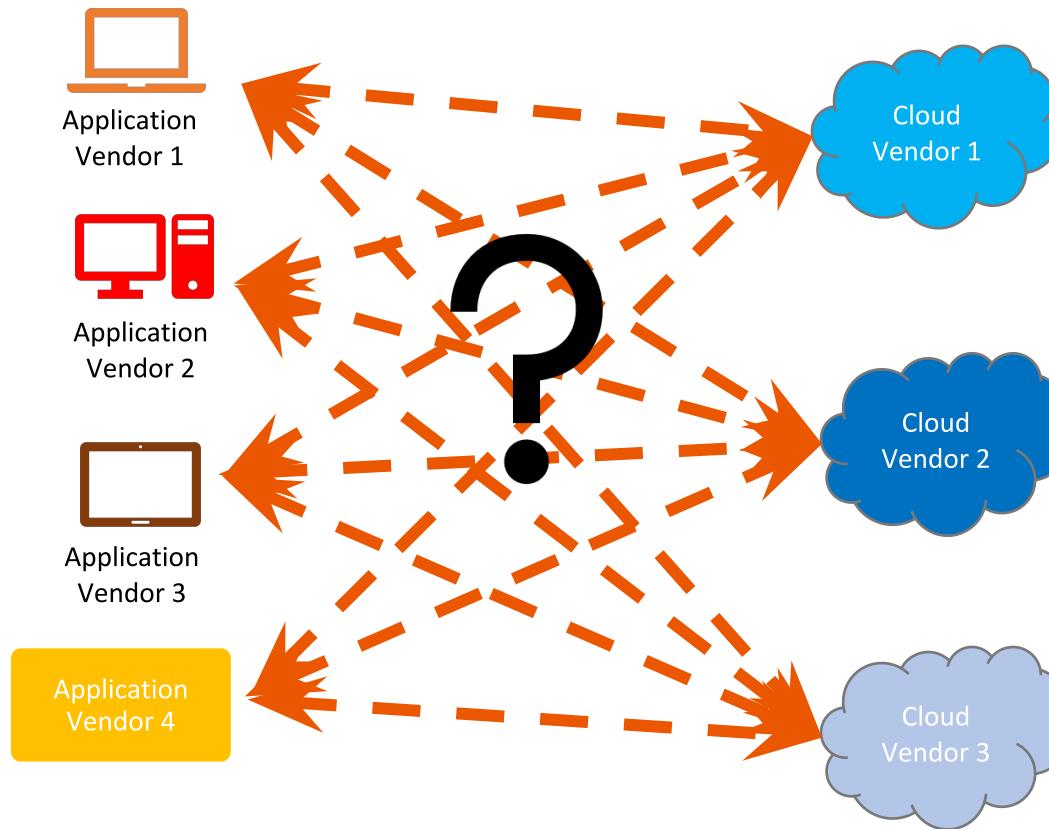
Impact on design teams



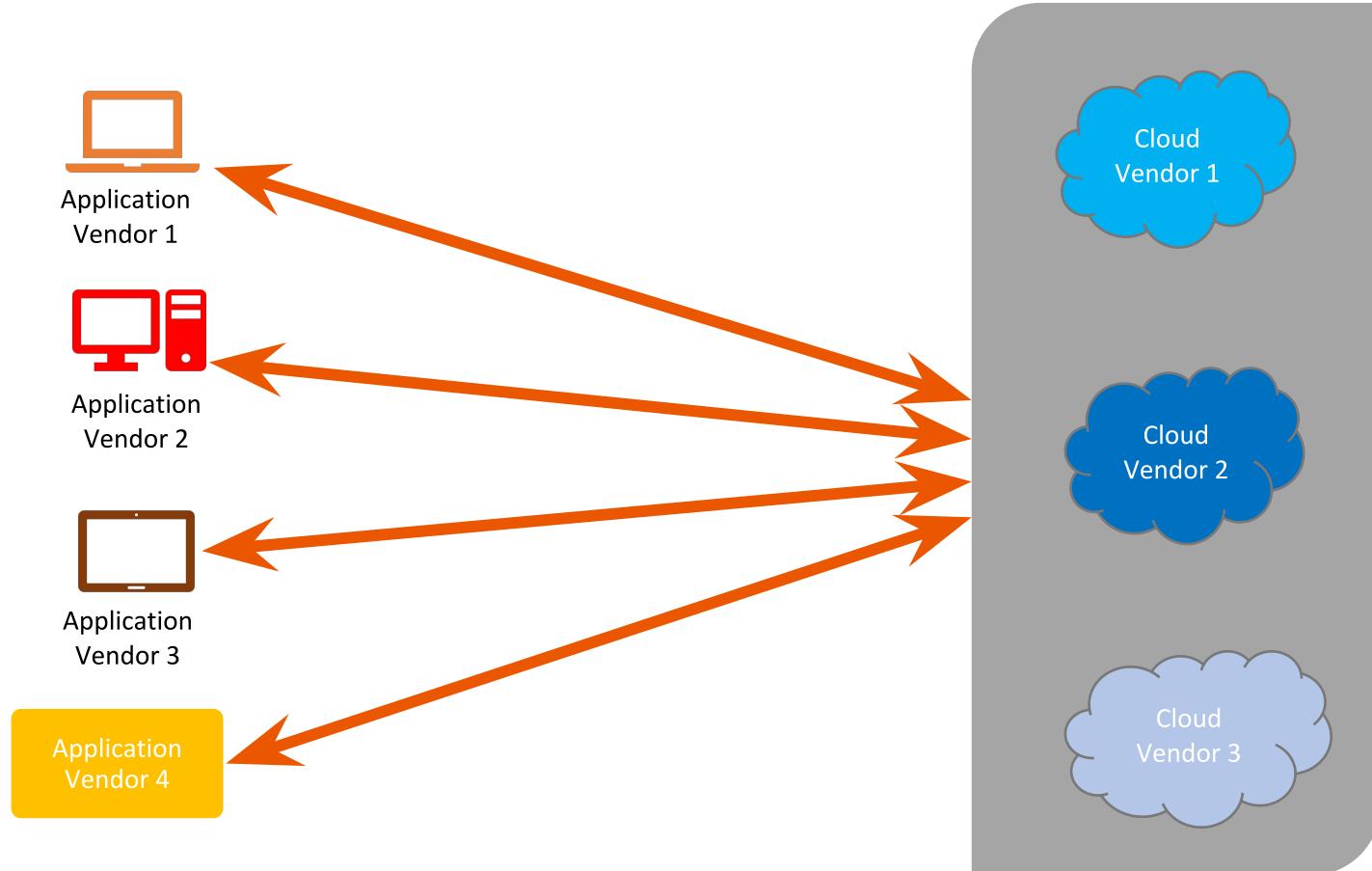


Integration Dilemma

Integration Dilemma



Open CDE APIs as a solution



Use Case: Uploading a file

Authoring tool to CDE



Step 1

Save file



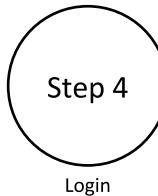
Step 2

Find file on hard drive



Step 3

Open browser



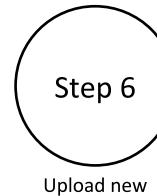
Step 4

Login



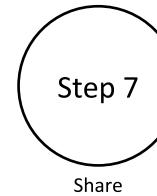
Step 5

Find file in document
register



Step 6

Upload new
version



Step 7

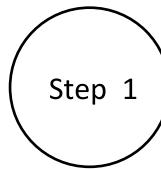
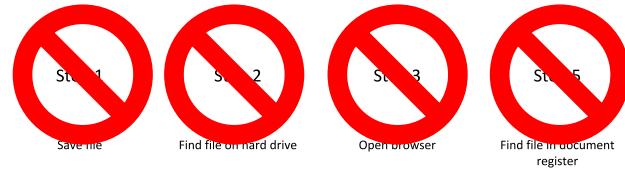
Share



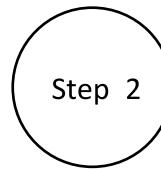
Reduce the number of steps

Use Case: Uploading a file

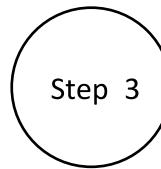
Authoring tool to CDE



Login



Upload new
version

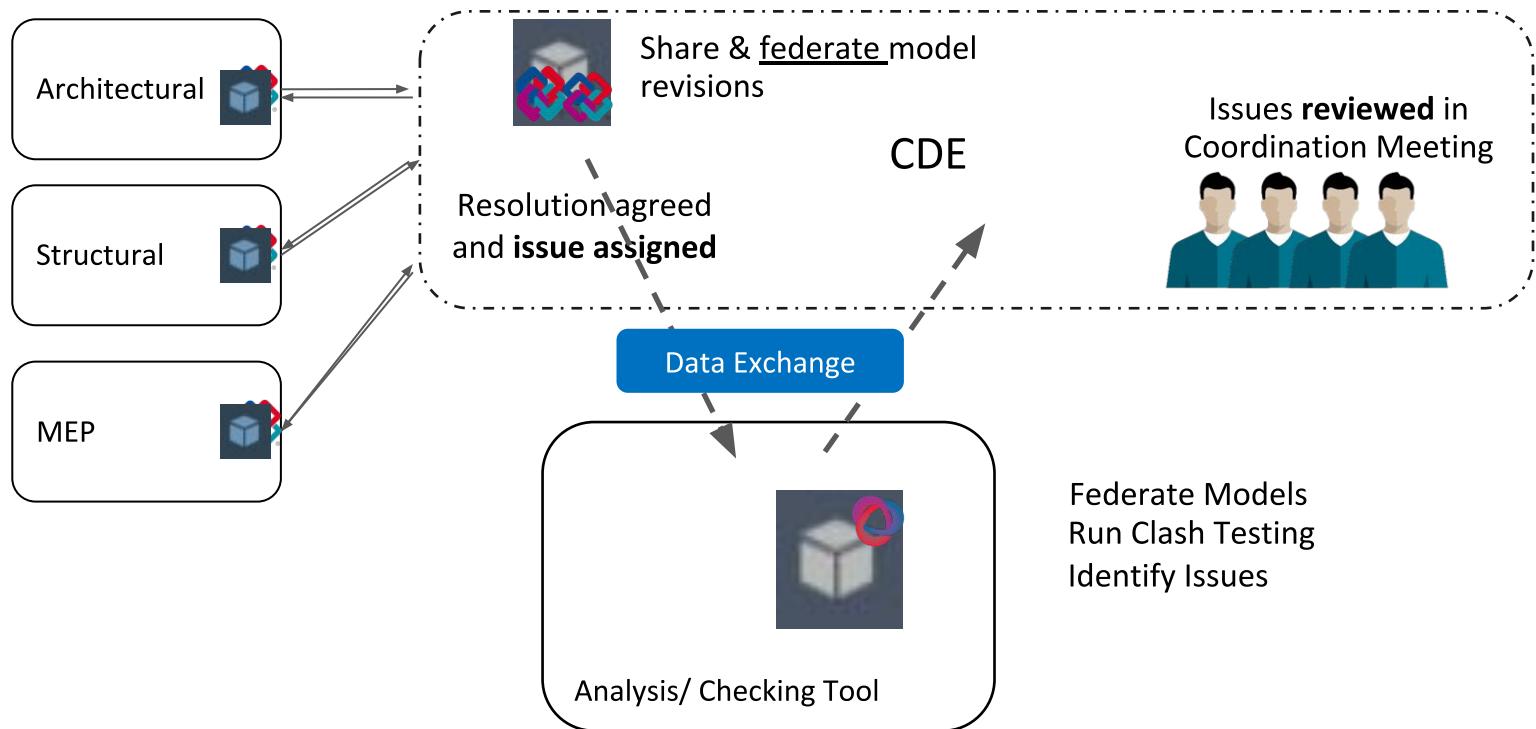


Share

Reduce manual effort to
uploading documents

Time saving across x
documents per coordination
cycle

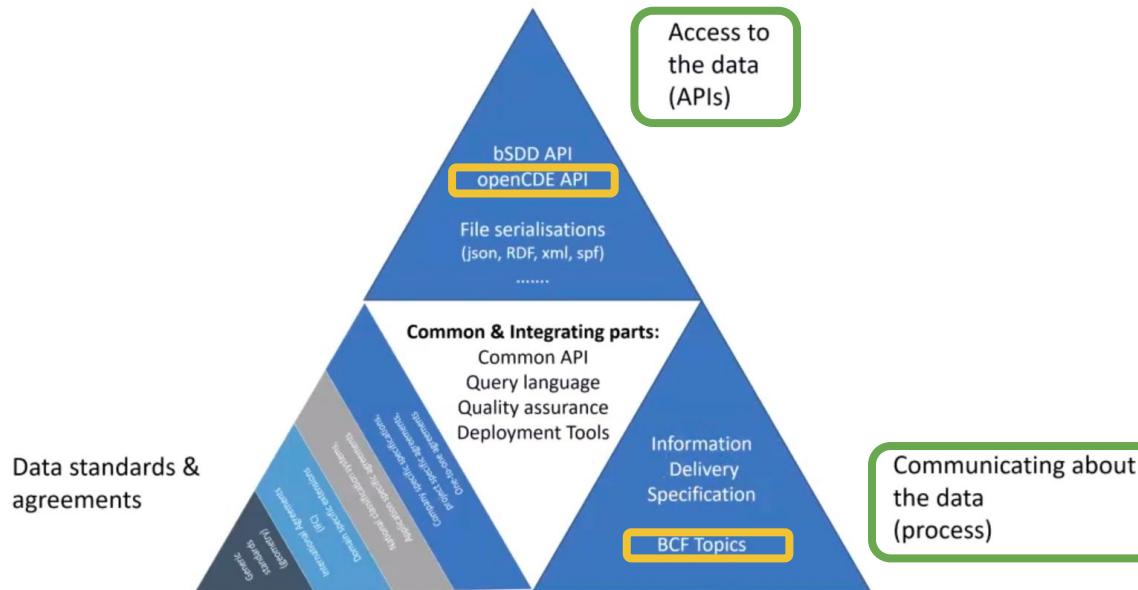
Example of an automated data flow



Models exchanged via Documents API

Design Issues exchanged via BCF API

Open CDE & the buildingSMART ecosystem



Principles and Methodology

Who is the OpenCDE working group?

Companies



thinkproject!

ORACLE® Aconex

ALLPLAN
A NEMETSCHEK COMPANY

 **Trimble**

**BIM
LAUNCHER**



DATA DESIGN SYSTEM
A NEMETSCHEK COMPANY



SOLIBRI
A NEMETSCHEK COMPANY

 | BIMcollab

GRAPHISOFT®
A NEMETSCHEK COMPANY

 **ACCA**®
ACCA SOFTWARE

 **OpenProject**

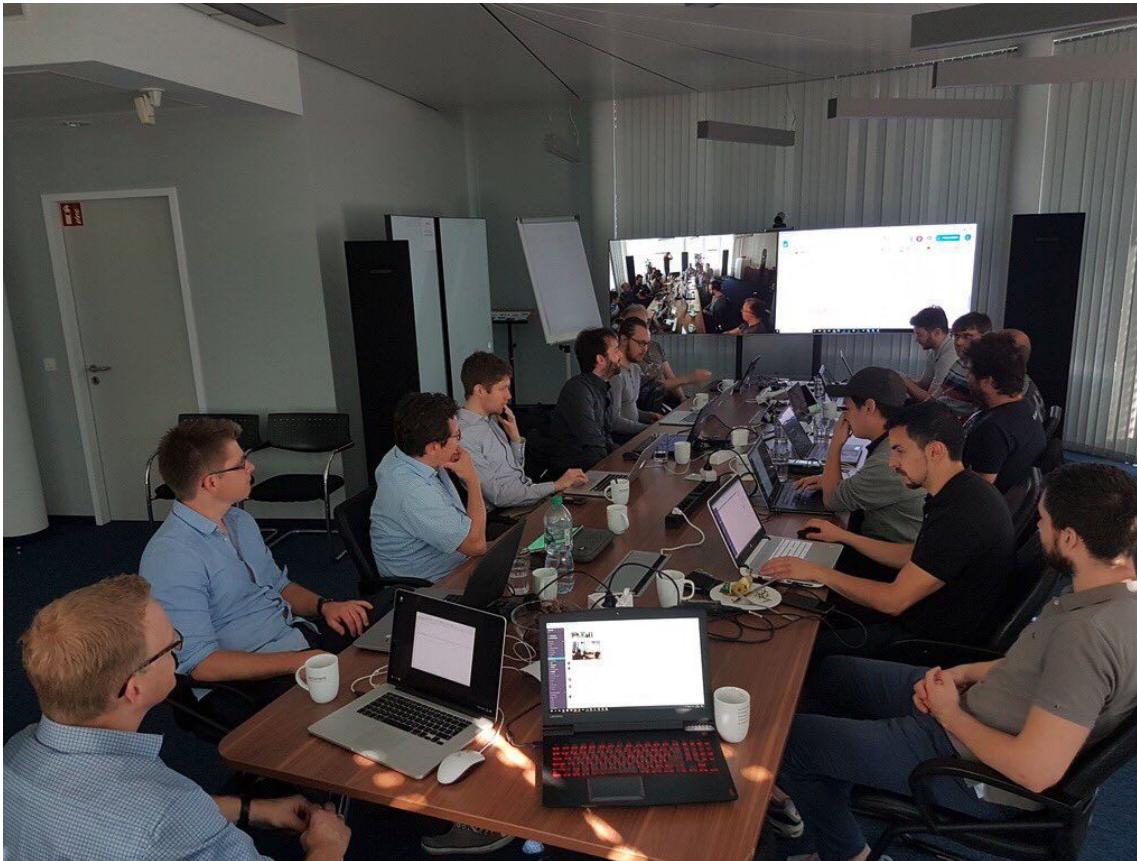
People



People



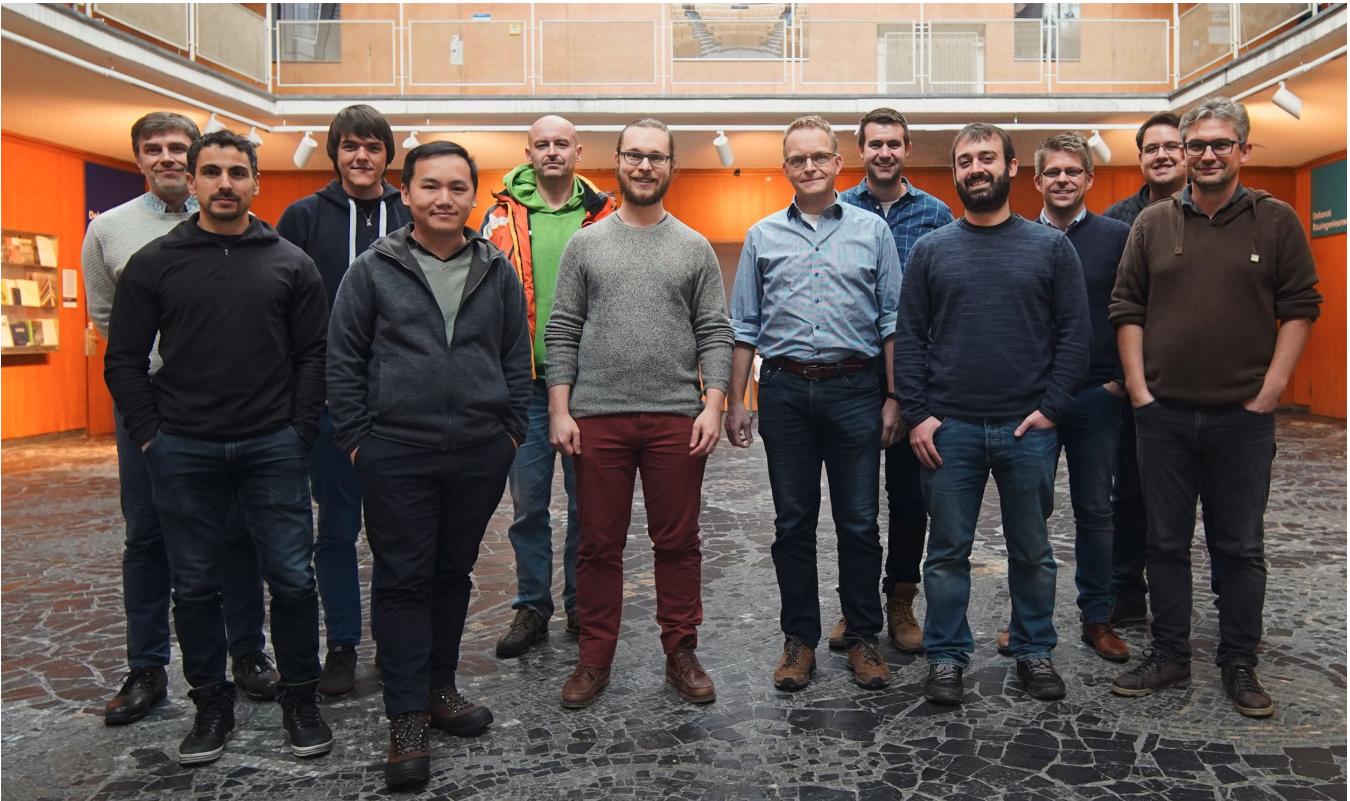
People



People



People



People



People



Open CDE Principles



Focused APIs – each addressing a specific domain or workflow



APIs work in conjunction and share a similar “Look&Feel”



Software first, specify later



Put in front of users and get feedback



Reduce barriers to adoption



Open for all industries in all markets to join and influence



Methodology - Organisation

Meetings

- **Fortnightly meetings** - Mondays, 11am CET, advertised on bSI's event calendar
- **Hackathons** - twice a year
- **Focus groups** - as needed

Resources

- **Github**
- **Website**
- **Group mailbox** opencde@buildingSMART.org

<https://github.com/buildingSMART/BCF-XML>

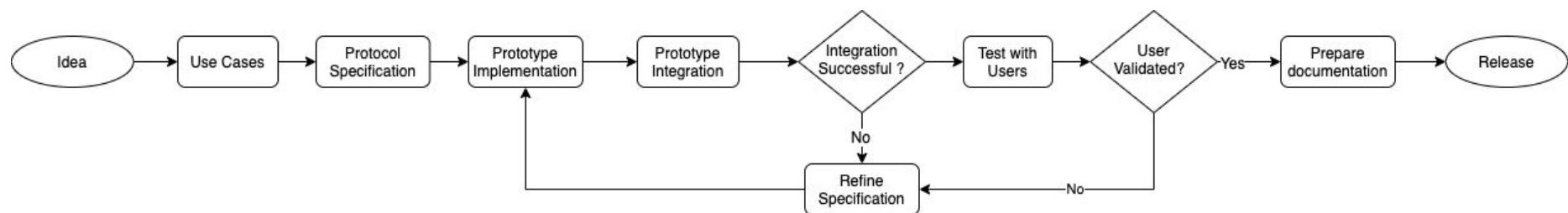
<https://github.com/buildingSMART/BCF-API>

<https://github.com/buildingSMART/OpenCDE-API>

<https://technical.buildingsmart.org/projects/opencde-api/>

<https://www.buildingsmart.org/event/common-data-environment-cde-and-bcf-online-meeting-1100-a-m-1200-p-m-cet-4/>

Standard Development Process





Methodology - Technical

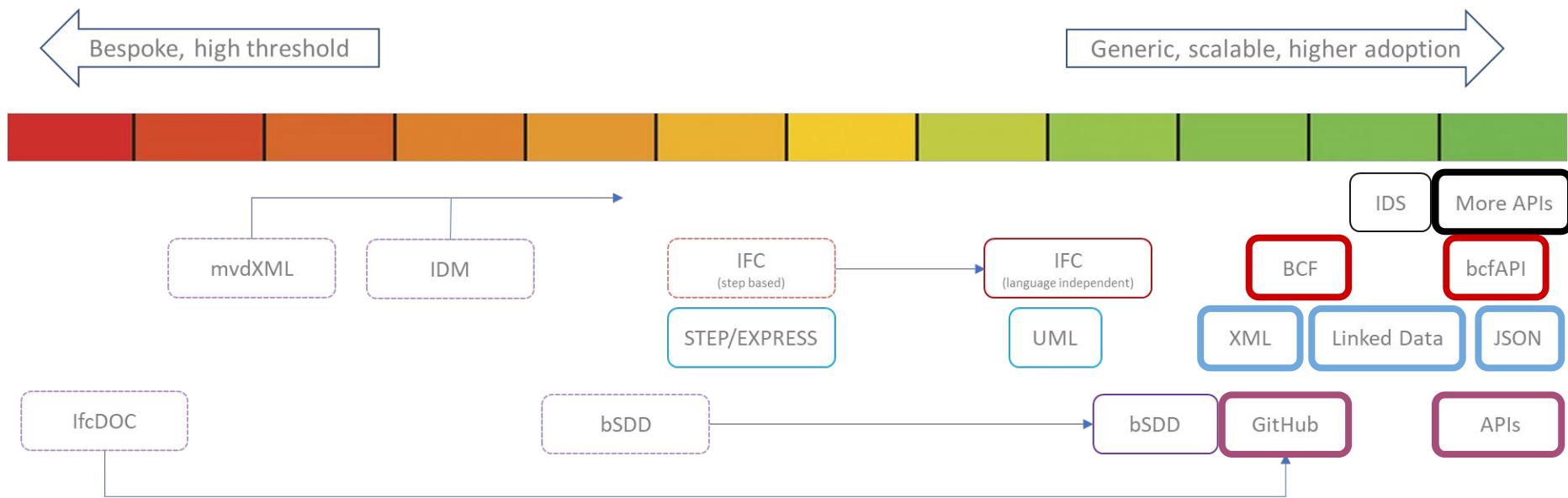
Standards

- REST/JSON
- OAUTH 2.0
- XML - for legacy BCF file exchange
- Open API (swagger)
- HATEOAS

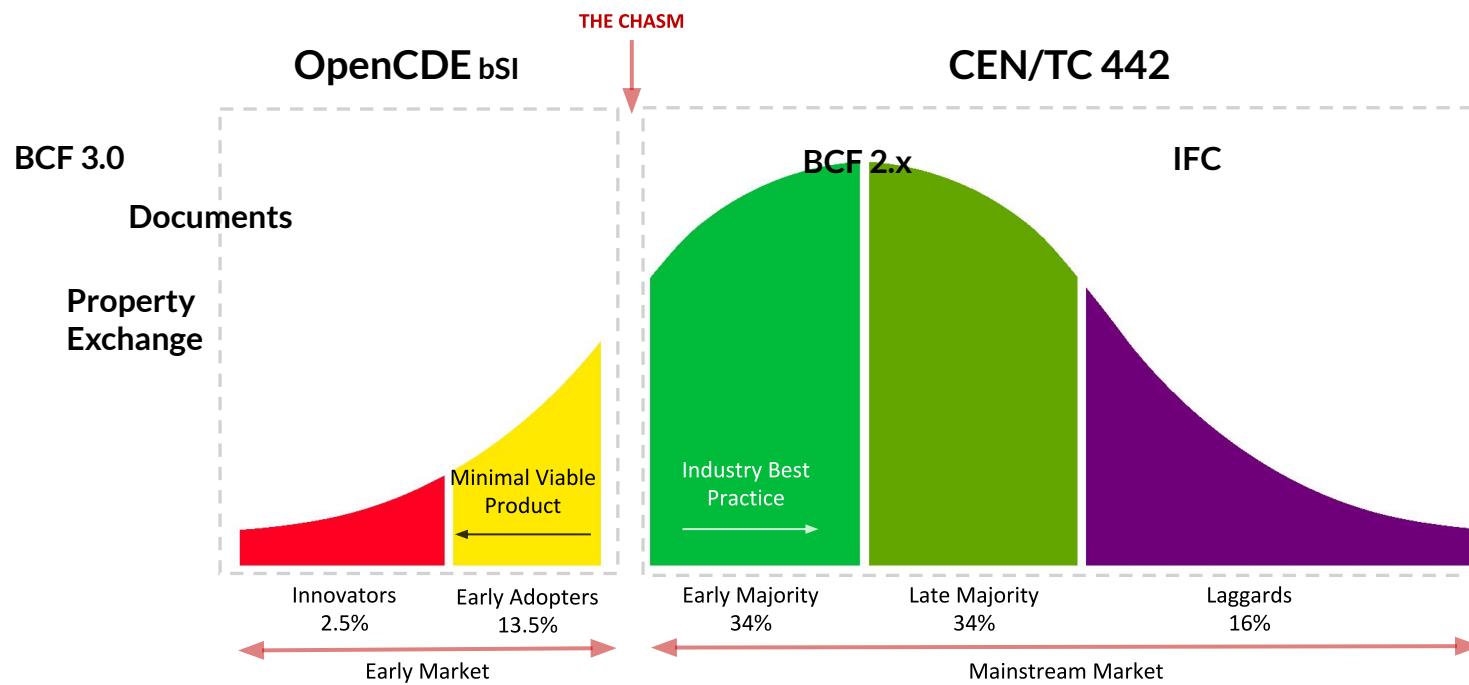
Approach

- **Minimalistic** - the simplest spec that meets the use cases
- **IFC Compatible** - BIM is referred to using IFC concepts, e.g. GUIDs

Open CDE & bSI's technology spectrum

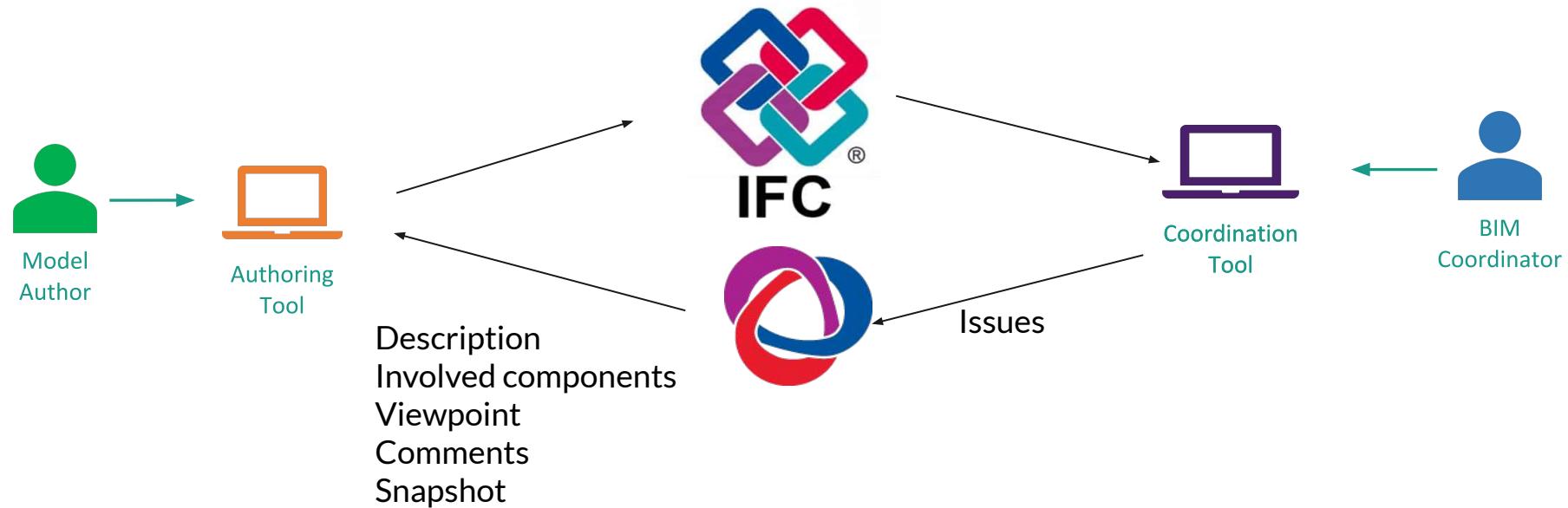


Open CDE bSI and CEN/ISO

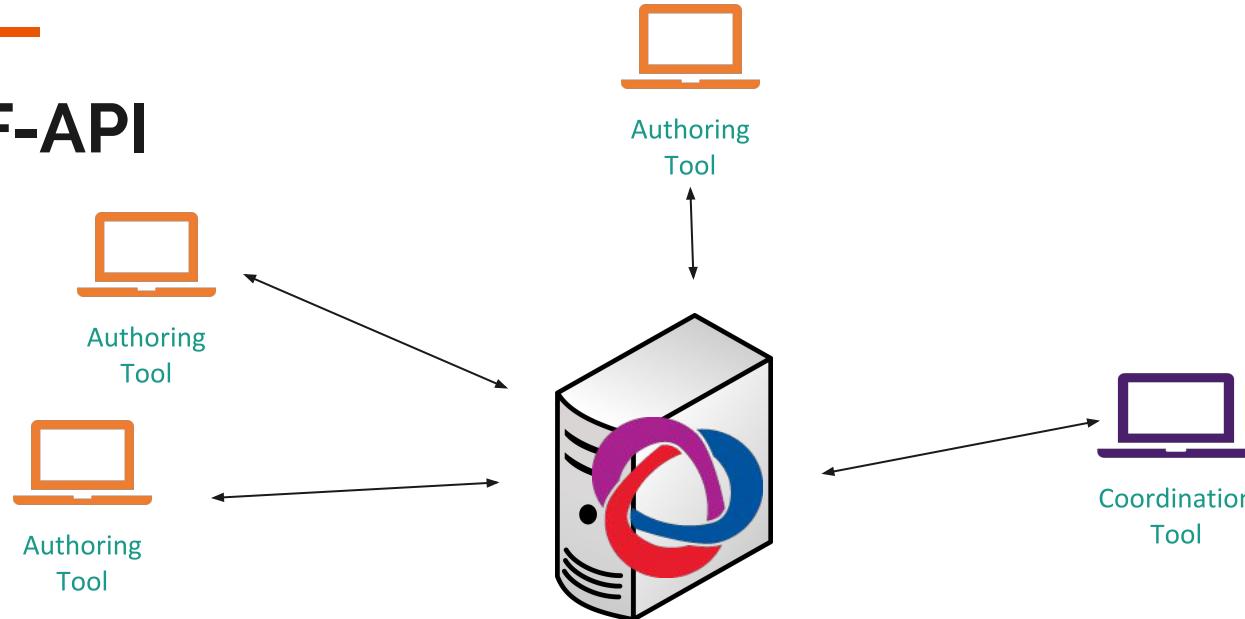


BCF - Things that already work

BCF-XML



BCF-API



Roadmap



Standard proposals in a nutshell



BCF

Design Issues
BCF-API BCF-XML

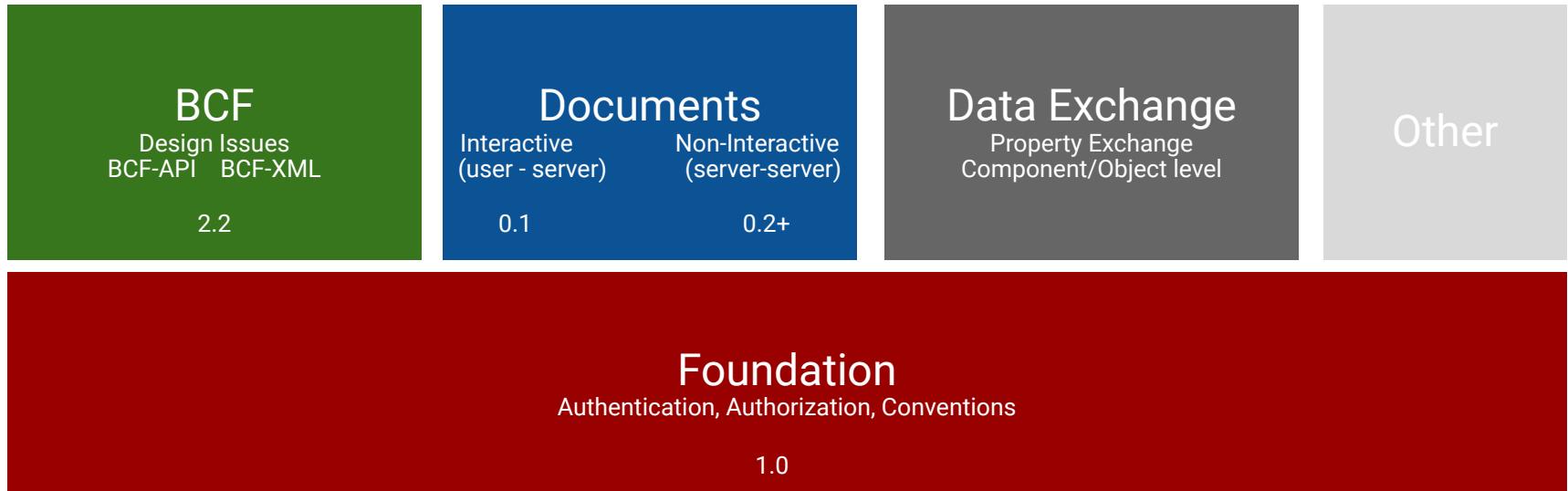
2.1



Authentication, Authorization,
Conventions



Standard proposals in a nutshell





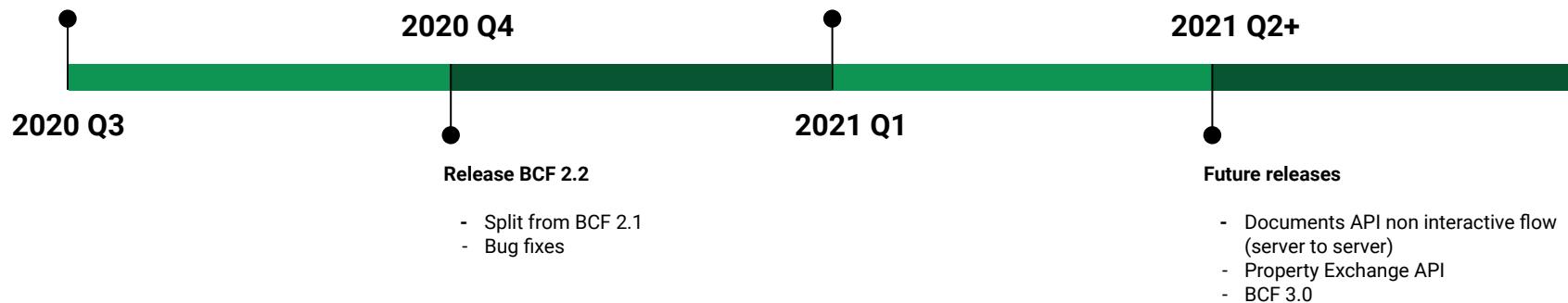
Roadmap

Release Open CDE API Foundations 1.0

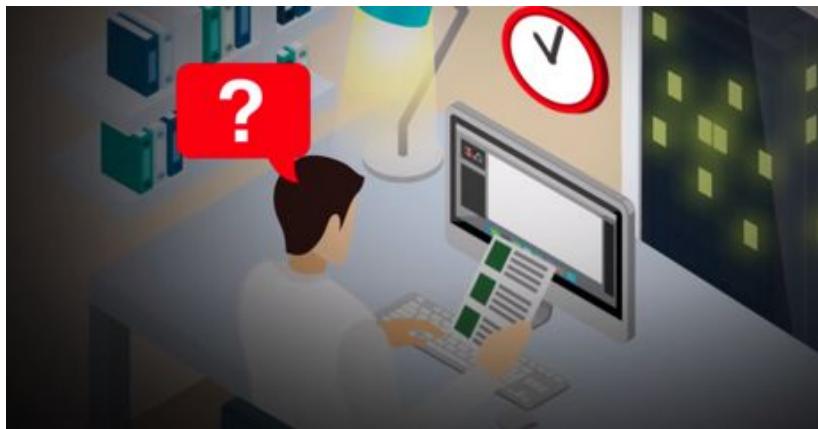
- Extract the foundations API from BCF 2.1
- Minor improvements

Release Open CDE Documents API 0.1

- Interactive flow (user to server) only



Demo



Challenges



Challenges

Challenge	Opportunity
Calling more users to join and give feedback	Better Implementations Improved standard quality
Calling more vendors to join and implement	Faster standard development Improved standard quality

Work In Progress

Foundation API



Foundation API

Standard Exchanges

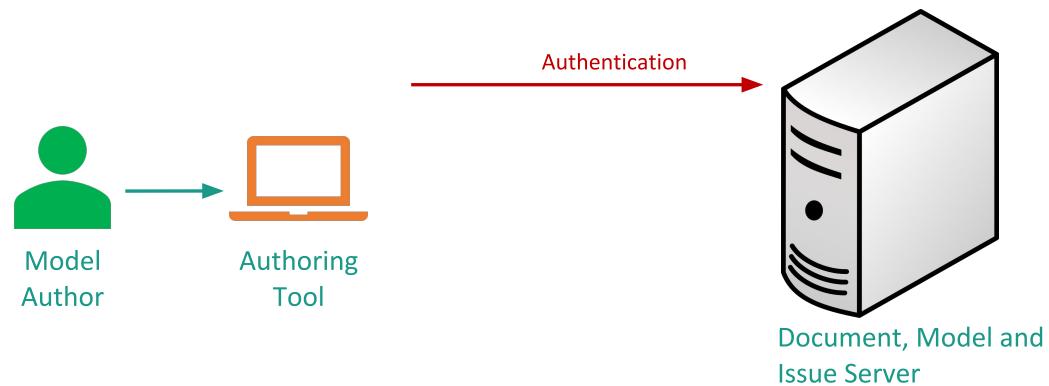
- Authentication
- User Information
- Supported APIs and versions
- Error Response Body Format
- Authorization

Conventions

- Additional request and response properties
- Caching
- Updating Resources via HTTP PUT
- Cross Origin Resource Sharing (CORS)
- Http Status Codes
- DateTime Format
- Binary File Uploads

Documents API - interactive

Documents API - interactive use case

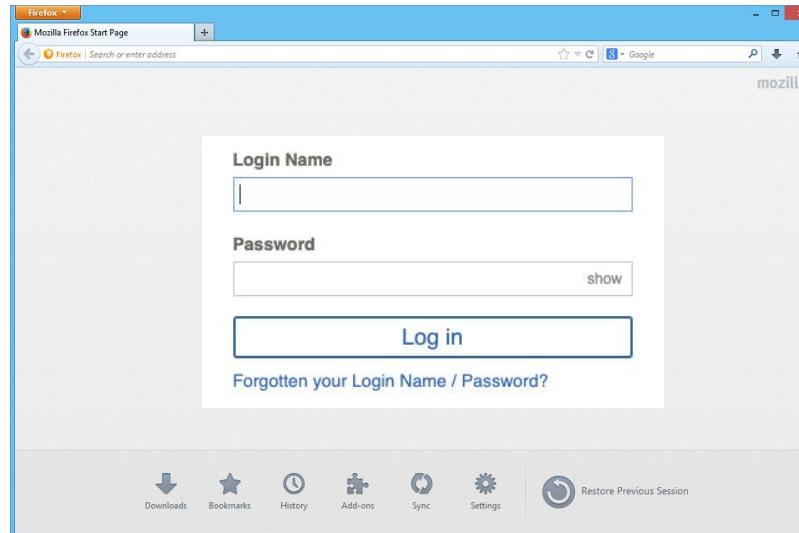


Documents API - interactive use case

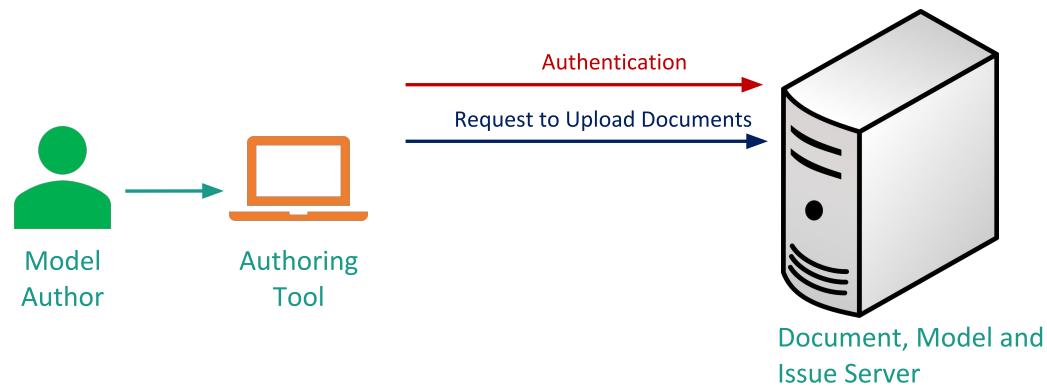


Model
Author

Authenticate



Documents API - interactive use case

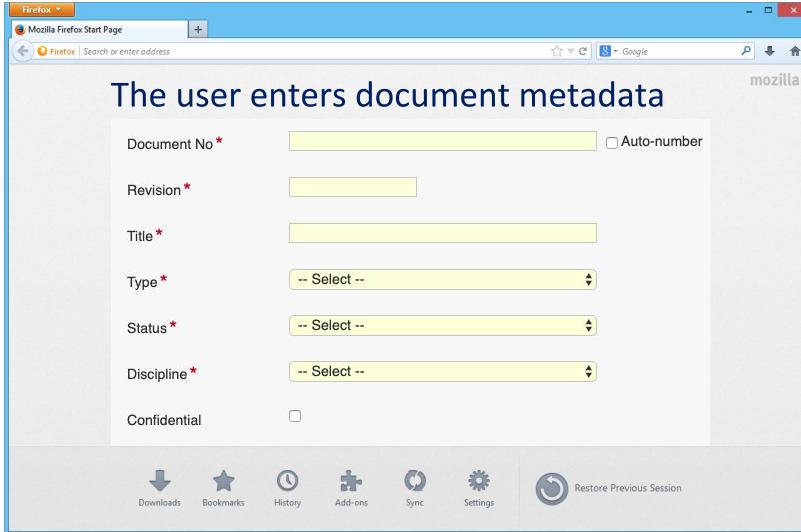


Documents API - interactive use case

 Model Author

New Upload Request

The user enters document metadata

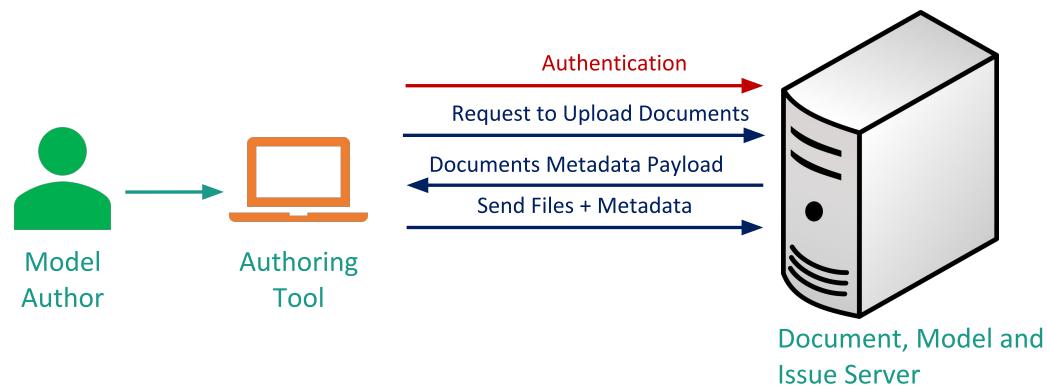


Document No*	<input type="text"/>	<input type="checkbox"/> Auto-number
Revision*	<input type="text"/>	
Title*	<input type="text"/>	
Type*	<input type="button" value="-- Select --"/>	
Status*	<input type="button" value="-- Select --"/>	
Discipline*	<input type="button" value="-- Select --"/>	
Confidential	<input type="checkbox"/>	

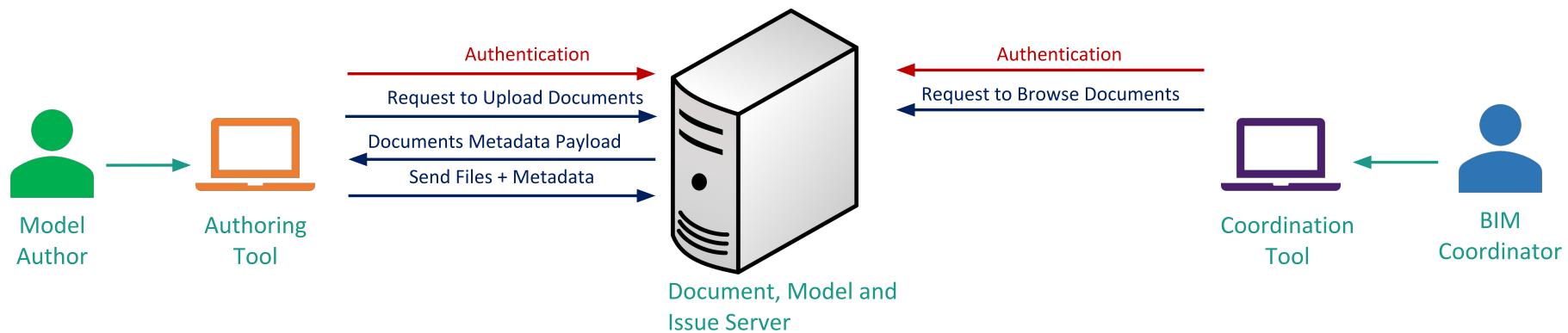
Firefox | Mozilla Firefox Start Page | Mozilla | Search or enter address | Google | mozilla

Downloads Bookmarks History Add-ons Sync Settings Restore Previous Session

Documents API - interactive use case



Documents API - interactive use case



Documents API - interactive use case

The user searches and selects Documents

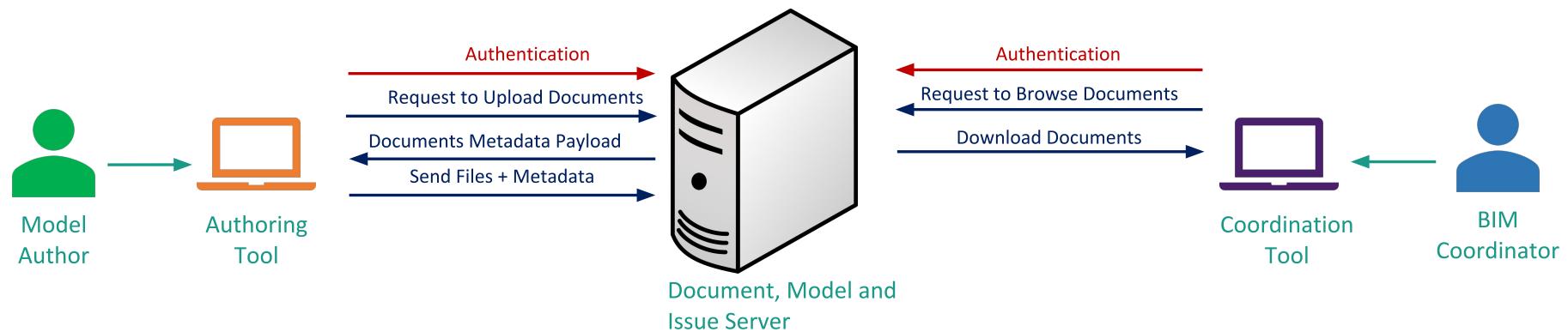
File	Document No.	Title	Revision	Status	Discipline	Created By	Date Modified	Revision Date	Type	Size	Lock
<input checked="" type="checkbox"/>	HRZ_AC_00_02_M3_A_0001	South Tower Hotel	P3	For Information	Architectural	Aconex	03/10/2017	03/10/2017	Drawing	7.9 MB	
<input checked="" type="checkbox"/>	HRZ_AC_00_02_M3_E_0001	South Tower Hotel	P2	For Information	Electrical	Aconex	03/10/2017	03/10/2017	Drawing	180.5 KB	
<input type="checkbox"/>	HRZ_AC_00_02_M3_E_0002	South Tower Hotel	P1	Approved	Electrical	Aconex	03/10/2017	03/10/2017	Drawing	1.3 MB	
<input type="checkbox"/>	HRZ_AC_00_02_M3_I_0001	South Tower Hotel	P3	Approved	Electrical	Aconex	03/10/2017	03/10/2017	Drawing	137 KB	

Browse and select documents

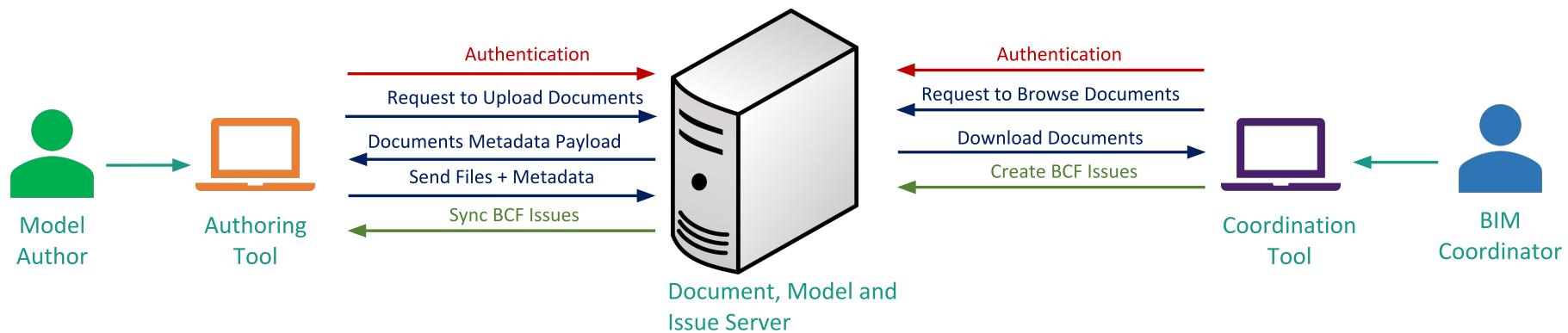


BIM
Coordinator

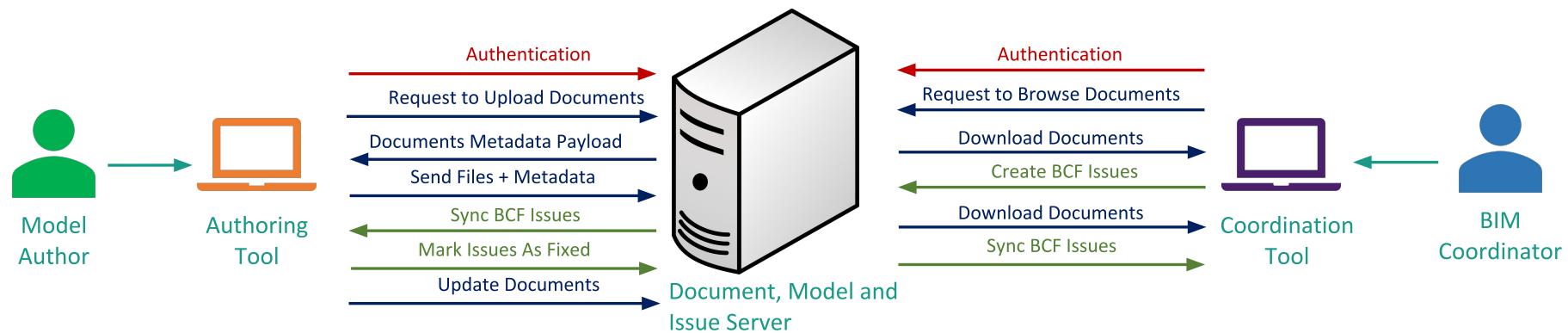
Documents API - interactive



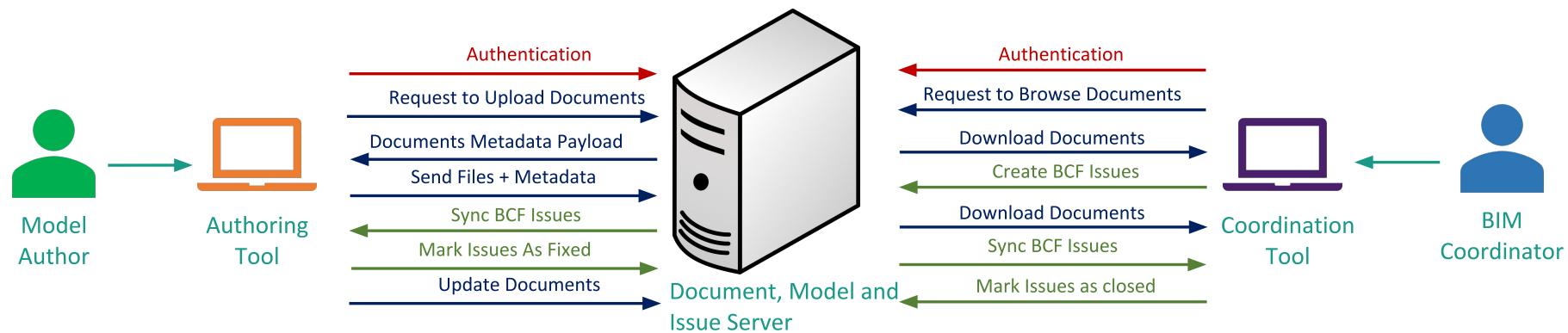
Documents API - interactive use case



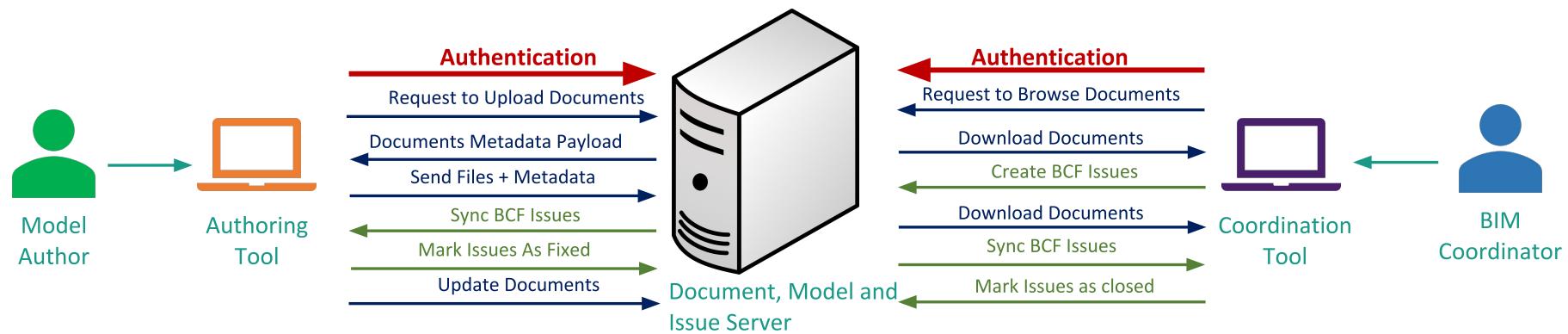
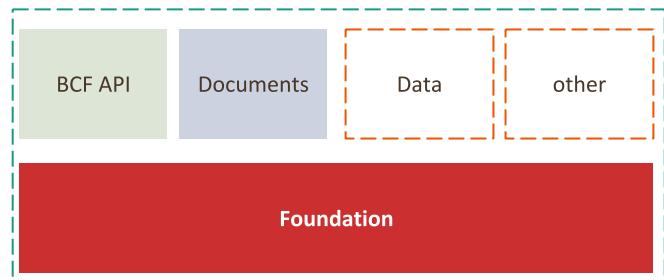
Documents API - interactive use case

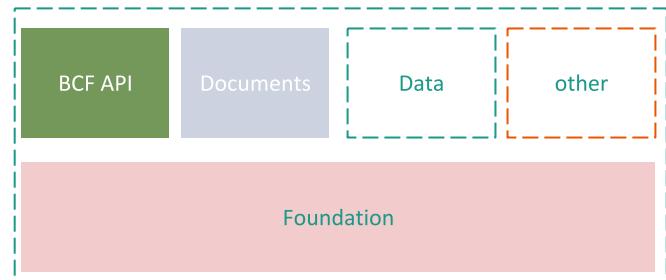


Documents API - interactive use case

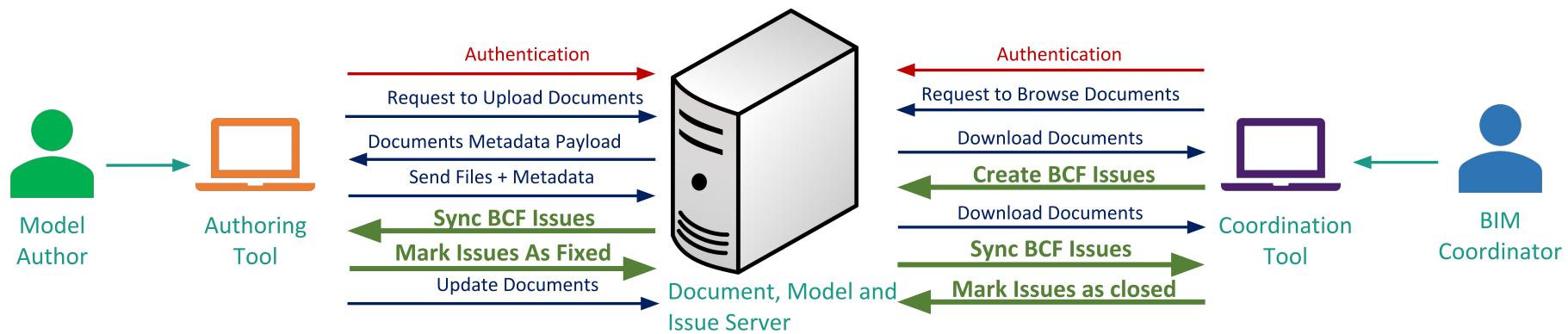


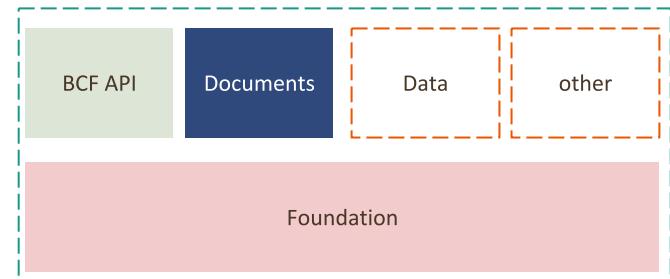
Documents API - interactive



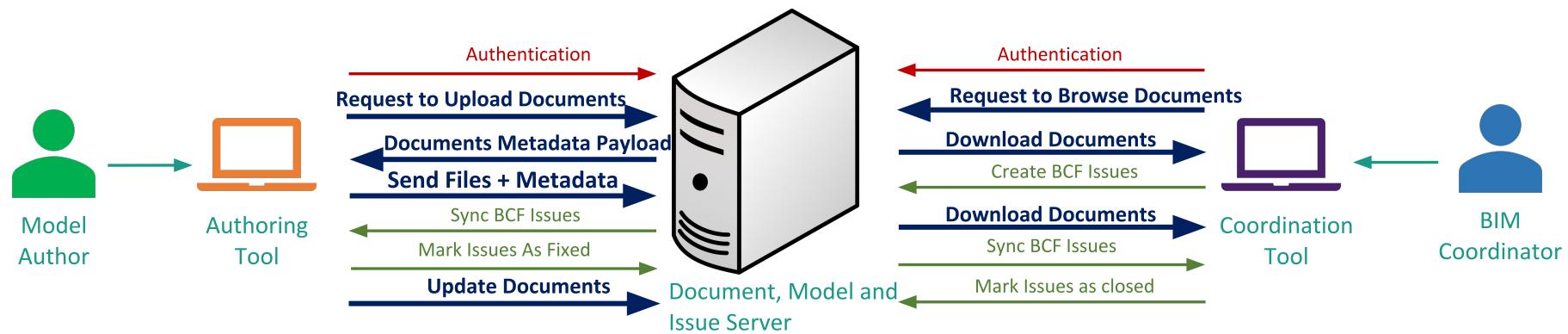


Documents API - interactive





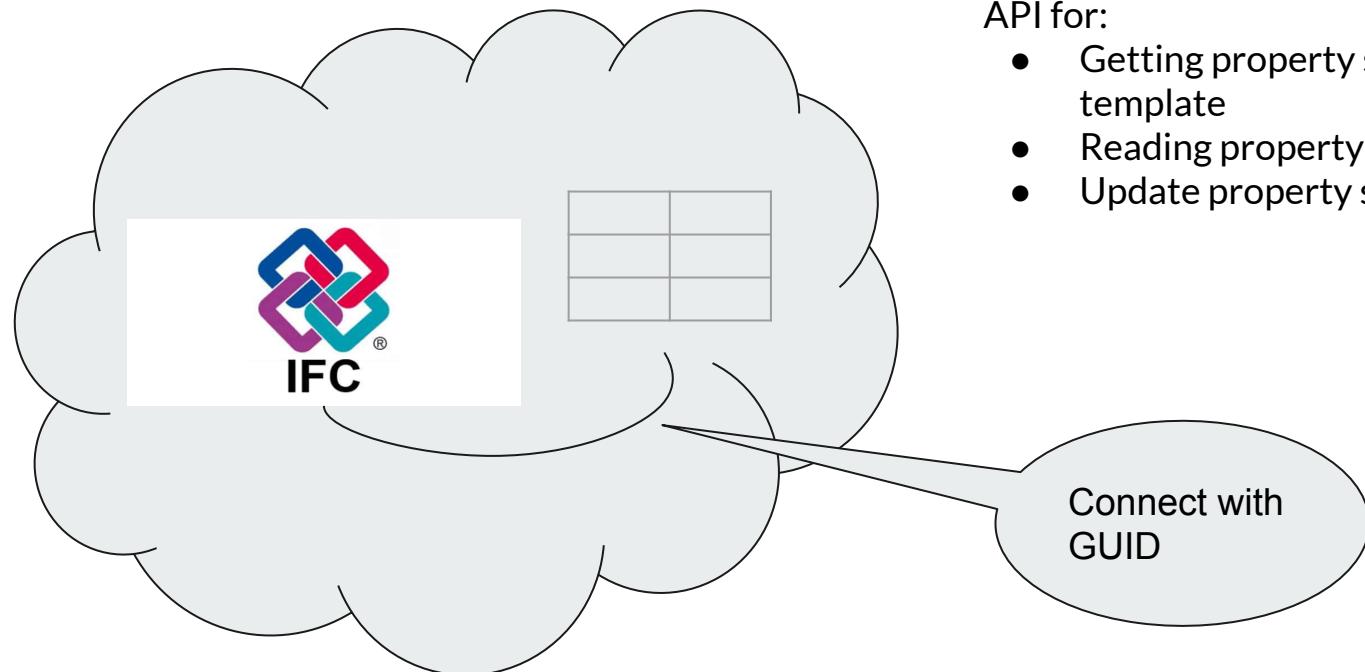
Documents API - interactive



Property Exchange API

How to set property values

Property Exchange API



API for:

- Getting property set template
- Reading property sets
- Update property sets

Property Exchange API - Use Cases

Fire Rating

Specify fire rating requirements for doors, walls, and windows

Cast In Place

Specify readiness for cast in place (CIP) components.

Room Requirements

Specify room requirements (temperature, number of electric outlets)

Conclusion



**Do the right
things**

**Do the
things right**

**Deliver
practice-
oriented
outcomes**