3D Juump Infinite Integration Manual

[IM_EN] version 4.1

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Introduction

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This documentation is aimed at **CAD database specialists**. For *system administrators*, refer to the *Administration manual*.

Starting from your existing databases and datasets, and a functional 3D Juump Infinite cluster, it describes in details all the steps to perform so as to provide a seamless and productive user experience to the end users of 3D Juump Infinite.

The chapters Data integration and ∞CLI: Command Line Interface describe in detail the dataset generation procedures to let you integrate your own data from your information system back ends into 3D Juump Infinite.

The next section documents the various means at your disposal to customize the behaviour of the native client application.

It is also possible to develop tailored Web applications powered by 3D Juump Infinite, giving you the utmost level of freedom to suit the needs of the end users. This is explained in the chapters Web applications and HTTP API.

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1 - Documentation coverage

The information outlined in this documentation is intended to be used for the following purposes:

- creation of specialized 3D Juump Infinite datasets specific to customer needs;
- diffusion of 3D Juump Infinite datasets by the 3D Juump Infinite back end.

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The following software components are provided along with 3D Juump Infinite installers and scripts:

- Executables and plugins located in the `third-party` subfolder,
- Libraries and their dependencies (enumerated in the licensing document).

The exhaustive list of third-party components and the author’s identity is made available by AKKODIS INGENIERIE PRODUIT SAS in the menu of the Software, under the link “About”. The Licensee is responsible for their proper installation, configuration and usage in compliance with the license of each third-party software component and with its proper software deployment and security policies.

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Overview

1 - Introduction

3D Juump Infinite is a software suite allowing the users to browse an entire DMU[1] in 3D on a standard PC[2].

It relies on a management/storage server (or **∞Directory**) and a network of relays (or **∞Proxy**) for publishing and presenting data.

On the side of the end user, the 3D Juump Infinite client application, that can be summarized as a DMU browser, is simply called **3D Juump Infinite**.

[1] Digital Mock-Up

[2] Personal Computer

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2 - Definitions

In order to explain the design of 3D Juump Infinite, it is mandatory to first introduce several keywords related to the DMU and CAD products.

2.1 - Digital mock-up (DMU)

The digital mock-up (DMU) is composed of multiple elements:

`Digital mock-up`

A mock-up is a partial or complete representation of a system that allows to preview, test or validate its aspects or its behavior. A digital mock-up is built from computer files storing a tree of tridimensional geometries, displayed with a 3D rendering software, in our case, 3D Juump Infinite.

`Part`

A model or template, be it an assembly or a single element. This part is referenced by the digital mock-up but is not present (*instanced*) within it. It is not localized in the digital mock-up. Ex: a wheel.

`Part Instance`

One instance of a *part*, be it an assembly or a single element. This instance has a 3D representation located in the digital mock-up. Ex: the front-right wheel.

`Product Structure`

A hierarchy of *part instances*. Ex: a car with four wheels.

`Part Number`

The unique identifier of a *part*.

`Metadata`

Any textual or numeric information decorating a *part* or *part instance*, usually presented as a `key=value` pair. Ex: `provider='WheelEx Inc.'`.

`Annotation`

Any textual or graphical information decorating a *part* or *part instance*, represented in 3D as floating labels. Ex: contextual directions for assembly, tolerancing, etc.

`Effectivity`

A global parameter or option that changes the way the DMU should be assembled. Ex: What is the drivetrain of the car? Is this car a 4-wheel or a 2-wheel drive vehicle?

`Configuration`

A set of effectivities. A digital mock-up in a given configuration is also called a configured digital mock-up. Ex: a 4-wheel, metallic paint, 150 hp engine car.

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2.2 - 3D Juump Infinite infrastructure

Other keywords are specific to the 3D Juump Infinite infrastructure:

Project

An incremental set of data describing a DMU. It usually corresponds to a product (or product-line) level assembly. For instance, a vehicle manufacturer would probably opt for one project per car model.

Build

An optimized and packaged snapshot of the DMU, ready for publication. The DMU is processed by 3D Juump Infinite back-end components and served to 3D Juump Infinite front-end client applications.

Geometry Pool

A pool of pre-processed geometric data that can be mutualized between projects.

Connector

A piece of software that processes DMU data from one or various source providers, and generates builds using the ∞CLI.

DMU data source provider

Any component of your *information system* able to publish DMU data encompassing the part geometry, metadata and/or effectivity. These components could be a conjunction of your CMS[3], CRM[4], your ERP[5], your PDM[6], your PLM[7] or simply a file system folder containing all your geometry part files extracted from your CAD[8] software.

Document

A document is a JSON[9] exchange file used by the *Connector* and the 3D Juump Infinite back end to transmit and store data bound to DMU *build* generation. JSON is an open, standard, human-readable text format used to transmit data objects consisting of attribute–value pairs. Thus, this format is also used by 3D Juump Infinite third-party softwares and the 3D Juump Infinite front end to exchange data.

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[3] Content Management System

[4] Customer Relationship Management

[5] Enterprise Resource Planning

[6] Product Data Management

[7] Product Lifecycle Management

[8] Computer Aided Design

[9] JavaScript Object Notation

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DMU flow

A chain of components of your enterprise and 3D Juump Infinite back-end components, in charge of the DMU extraction from *DMU data source providers*, the processing and the broadcasting of DMU *builds*.

User

A person that uses 3D Juump Infinite, either through its Web *Administration portal*, through a 3D Juump Infinite client application or through one of the provided APIs. All users must be properly authenticated before being authorized to use 3D Juump Infinite.

Authenticator

A third-party server in charge with user authentication. 3D Juump Infinite relies on an OpenID Connect identity layer to delegate authentication.

Administrator

A user that can log into the ∞Directory Web *Administration portal*. Administrators can be granted various levels of administration rights. Users that have exhaustively all administration rights are labeled super-administrators. A super-administrator is able to configure the *DMU flows*, to supervise the generation of DMU *builds*, to register *users* and edit their access rights individually or through their assignation to *teams*.

Tag

A keyword used to decorate a *build*, a *user* or a server/proxy component, that defines the access rights to the DMU.

Team

A set of users. It mainly acts as a helper concept that applies a common list of tags to its users.

Asset

Any product of a 3D Juump Infinite *user* who worked on any 3D Juump Infinite client application (bookmarks, visibility layers, export configurations...). Assets can be created, manipulated and shared amongst *users* thanks to the 3D Juump Infinite back-end components.

3 - Components

3D Juump Infinite is composed of several software entities.

∞Directory

The ∞Directory is in charge of data hosting and security management. It monitors and defines the whole 3D Juump Infinite network and is responsible for access rights management. This management is accessible via a *Web Administration portal* and programmable via the ∞*Directory API*.

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∞Proxy

An ∞Proxy acts as a proximity relay for DMU broadcasting. It publishes *builds* from the ∞Directory. At least one ∞Proxy is required.

3D Juump Infinite client applications

The 3D Juump Infinite technology provides various services that revolve around the DMU. Various applications, that differ in the user experience and the functionalities they provide, can be used to access those services.

3D Juump Infinite Native client

The “Native client” is a legacy native application that lets users browse the DMU with high performance and produce specific types of deliverables (geometric exports, image exports, slideshow, etc…). It is sometimes colloquially called *3D Juump Infinite*, when this name is unambiguous.

3D Juump Infinite Web applications

The 3D Juump Infinite technology can also power Web applications, that function inside a standard Web browser, making deployment easier. 3D Juump Yuzu and 3D Juump Kiwi, for instance, are Web applications powered by 3D Juump Infinite and developed by the 3D Juump team.

3D Juump Infinite Web API and custom applications

The 3D Juump Infinite technology comes with a library called the *Web API* that allows for the development of new custom Web applications, that can be fine-tuned for specific use cases.

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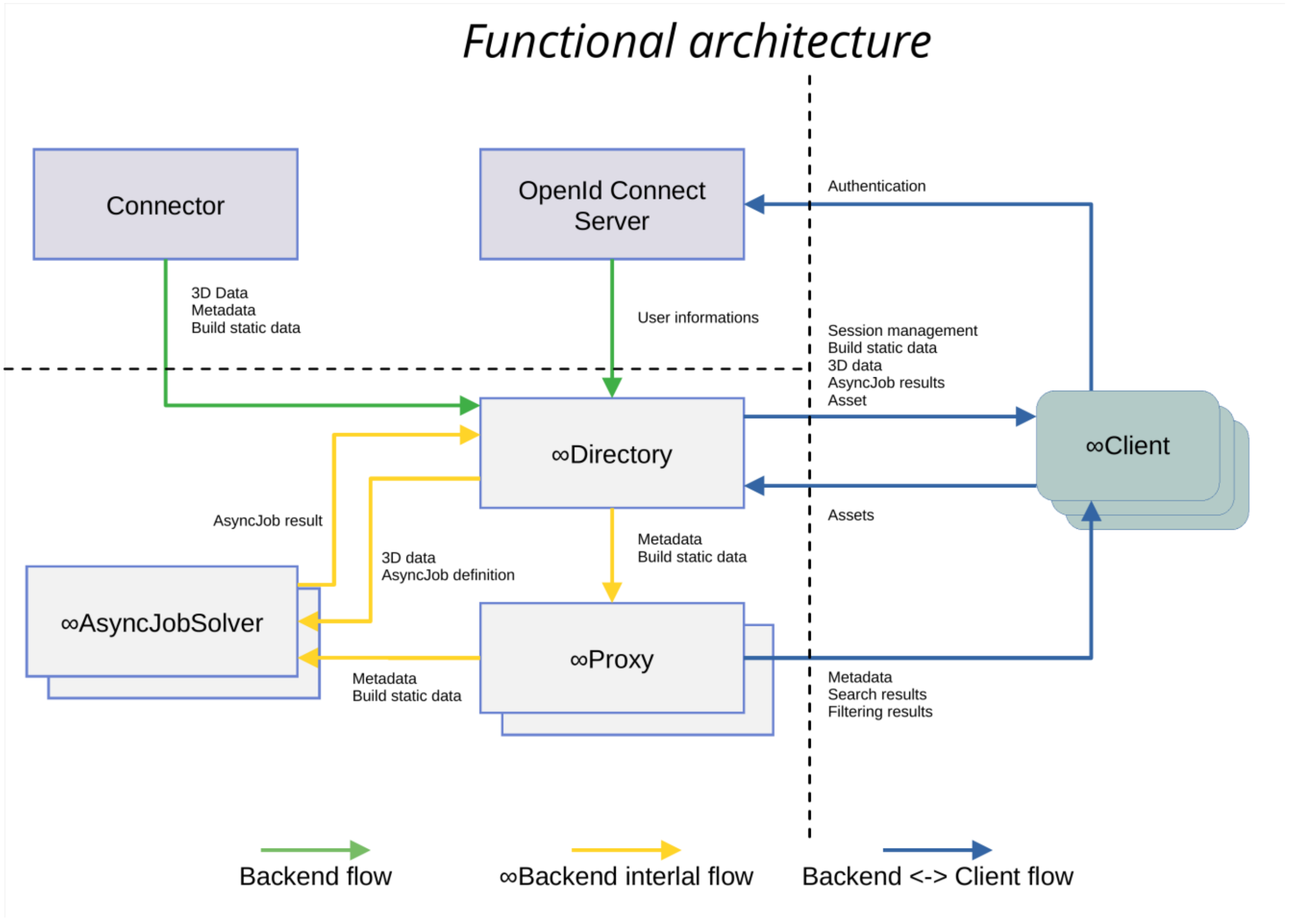

Functional architecture

The previously presented software relies on several third-party components including databases and servers. In particular:

- a PostgreSQL service,
- an ElasticSearch service,
- an Apache HTTP service,
- an optional LM-X service.

PostgreSQL (or "Postgres") is an SQL object-relational database management system (ORDBMS). It is used by the 3D Juump ∞Directory and ∞Proxy as the underlying database engine.

ElasticSearch is a distributed, multitenant-capable full-text search server with a RESTful Web interface and schema-free JSON documents. ElasticSearch is built on top of Apache Lucene, developed in Java and is released as open source under the terms of the Apache License. It provides full-text search capabilities to the 3D Juump Infinite client applications.

LM-X is a software licensing solution.

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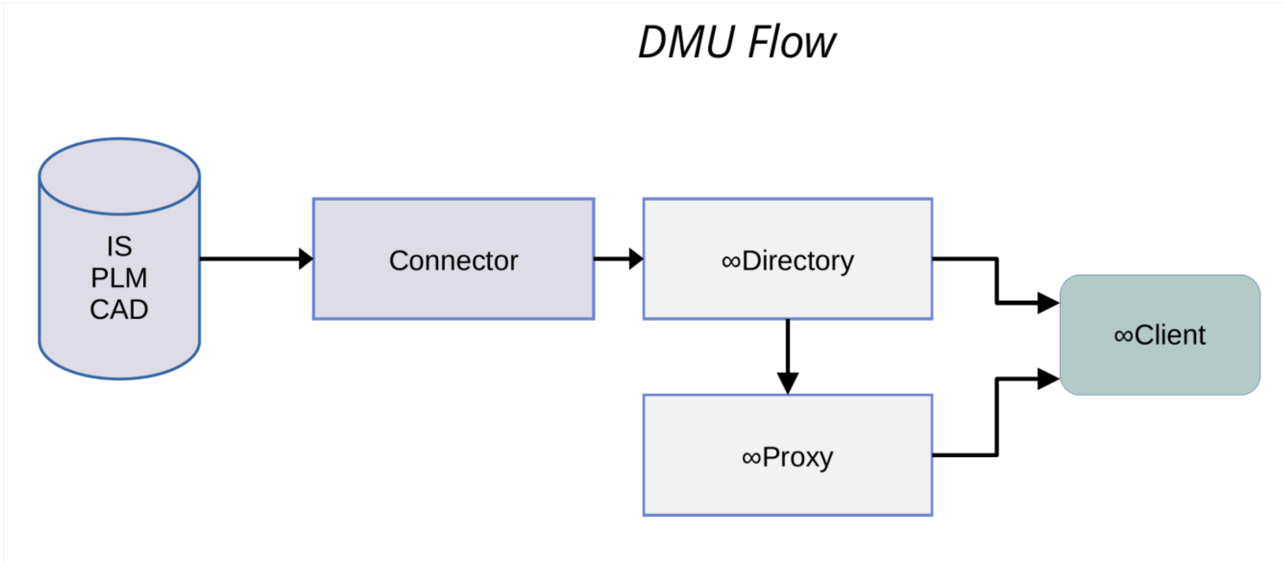
4 - DMU Flow

From the enterprise CAD data source to the 3D Juump Infinite client applications, the DMU follows several steps:

- First, your enterprise defined **Connector**, bound to your DMU data source providers, incrementally declares the 3D data to a *geometry pool* hosted on the ∞Directory using the ∞CLI PSConverter.
- Once all the 3D data is processed, the **Connector** can generate builds using ∞CLI generator build. The ∞CLI will retrieve the product structure using an ElasticSearch-like fetch query, that could be provided by ∞CLI generator docindexer, an ElasticSearch instance, or directly by a Web server embedded into the **Connector**.
- This *build* is then published on the **∞Directory**.
- Once finalized, the *build* will be published by **∞Proxies**.



DMU Flow

The Connector must be specified and implemented upon your requirements. 3D Juump Infinite only provides interfaces and helpers to feed the ∞Directory with such data. In the figure above, the enterprise DMU data source providers and your Connector are in gray.

For the sake of simplicity, we have described *one* DMU flow. 3D Juump Infinite lets you define *several* DMU flows, built upon your combination of Connectors, bound to your DMU data source providers and attached to the ∞Directory and several ∞Proxies.

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Data integration

1 - Introduction

This chapter describes all the concepts and the associated API[10] needed for the development of a **Connector**. It explains:

- what a *project* is and how it is declared
- what the *Connector API* is and how the *Connector* interacts with it
- how the *Connector* fleshes a *project* out, by feeding the ∞Directory with different types of data using the ∞CLI (product structure, 3D data, metadata, effectivities…)
- finally, a section on advanced usage of the *Connector* and *projects*.

2 - Project

In 3D Juump Infinite, a *project* is an incremental set of data describing a DMU. It usually corresponds to a product (or product-line) level assembly. For instance, a vehicle manufacturer would probably opt for one *project* per car model so that, in the 3D Juump Infinite client

[10] Application Programming Interface

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application, the user is able to configure and browse a set of variations of cars of the same model.

2.1 - Create a Project

To create a *project*, the administrator can log into the ∞Directory *Administration portal* and proceed to the `PROJECT` section. The creation of a *project* requires two parameters:

- a human-readable *project* name,
- a unique *project* identifier

A newly created *project* is empty; it does not contain any *build*. The **Connector** is in charge of generating *builds* in the *project* using the ∞CLI.

Note: it is also possible to programmatically create a new *project* through the *∞Directory HTTP API*.

2.2 - Access a Project

Once a project has been created, it appears in the project list of the `PROJECT` section. The *project identifier*, of the form `prj_` followed by a hexadecimal string, is used to access the *project interface*.

3 - Geometry Pool

In 3D Juump Infinite, a *geometrypool* is a store holding the conversion results of the *PSConverter* and the *Generator*, including pre-processed 3D data, product structure, metadata, annotations, etc. It can eventually be shared between projects to reuse common CAD files and reduce both storage consumption and processing time. It usually corresponds to a product-line level assembly. For instance, a vehicle manufacturer would probably opt for one *geometrypool* per generation of cars.

3.1 - Create a Geometry pool

The Connector is responsible of choosing the *geometrypoolid*. If it is not intended to be shared accross projects, a good practice is to use same uuid as for the *projectid* (eg : `geom_091d232caeae2c0d2e4e63b031534c5b` for `prj_091d232caeae2c0d2e4e63b031534c5b`).

A *geometrypool* will be automatically created by the ∞CLI on first use.

3.2 - Access a Geometry pool

Once a *geometrypool* has been created, it appears in the `Data Management` panel of the *Administration portal*. It can also be managed using the *∞Directory HTTP API*.

3.3 - Geometry pool cleanup

Over time, the size of a *geometrypool* will grow as it holds more *PSConverter* results. It is possible to remove old files that are not used anymore either through the *Administration portal*, or as part of an automated process using the *∞Directory HTTP API*.

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4 - Connector data flow

The **Connector** is the bridge between your CAD data source and the 3D Juump Infinite servers. It uses two interfaces to interoperate with the ∞Directory:

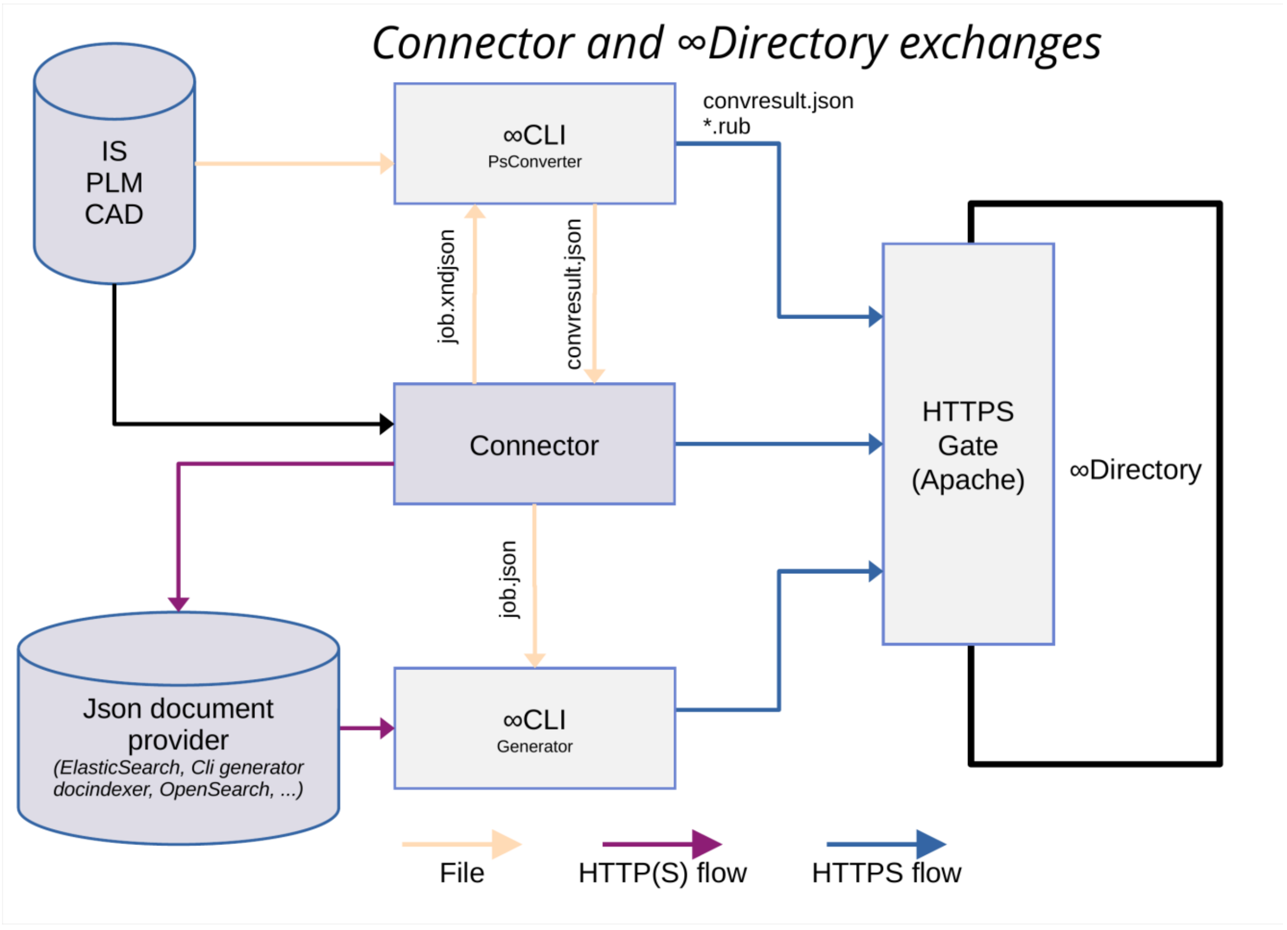
- the **∞CLI**: this tool enables the Connector to convert CAD data and to generate builds that will be pushed to the ∞*Directory*.
- the **∞Directory HTTP API**: through this interface, the *Connector* can manage *geometrypools*, *projects* and *builds*.

These two interfaces are detailed in the following chapters.

The Connector is responsible of providing the whole product structure to the *Generator* through the *JSON document provider*.

Here is a pseudo implementation :

- Convert required geometry files using the *PsConverter*
- Process JSON documents extracted by the *PsConverter* and insert them in *JSON document provider*
- Generate JSON documents from a PLM and insert them in *JSON document provider* and reference documents generated by the *PsConverter*
- Run the *Generator*



Connector

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4.1 - JSON data documents

see JSON limitations

4.1.1 - Types of data documents

The ∞CLI *generator* command needs numerous documents that, together, describe the product structure, enriched with metadata and configuration information. There are several types of documents that the *Connector* should provide for the ∞CLI to properly build a DMU.

The DMU product structure and metadata can be defined with these documents:

- *Structure documents* describe how parts are assembled from other parts (product structure tree, transforms, effectivity information) or, for single parts, what representation to use (link to a source model).
- *Metadata documents* list the *metadata* information associated to each part.

Other documents are useful to enrich the structure with additional data:

- *Annotation documents* describe *annotations* attached to a part and visible in its 3D environment.
- *Attached documents* allow to embed or reference (by using an URL) external documents and attach them to *structure* or *annotation* documents.
- *Project documents* allow to define properties accross all the builds of a project.

Moreover, if you have more than one version/configuration of the DMU, you should fill the effectivity & configuration documents:

- *Configuration documents* define configurations of the DMU in the form of a list of active effectivities.

Basically, in the 3D Juump Infinite client application, once the user selects a configuration, the instantiation links that do not match the corresponding effectivities are automatically deactivated. This results in a filtered (or *configured*) product structure.

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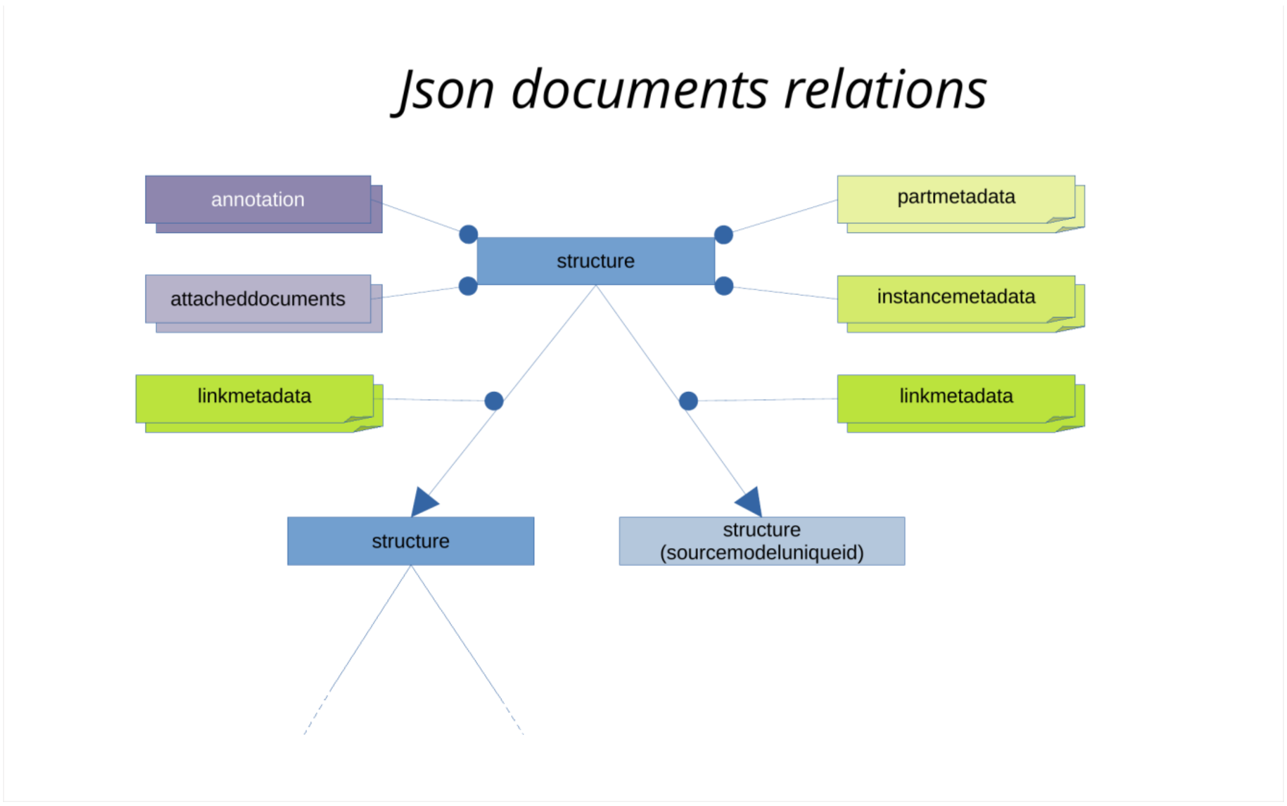

JSON documents relations

4.1.2 - Structure documents

The documents of type *`structure`* describe how parts are assembled from other parts (or how they are represented by geometries, for terminal *`Leaf`* parts). These documents are mandatory. The granularity is usually that of the source *parts*: for each part of the product structure, there should be exactly one *structure* document.

Here is the typical content of a structure document:

```
{
    "id": <id of the structure document>,
    "type": "structure",
    "partmetadatadocuments": [{"docid":<id of partmetada document>,"ta
gs":[...]}, ...],
    "attacheddocuments":[{"docid":<id of attached document>,"tags":[..
.]}, ...],
    "annotationdocuments" : [{"docid":<id of annotation document>,"tag
s":[...]}, ...],
    "children": { // (only for assembly)
        "<linkmdid>": { // <id of the child instantiation link
            "linkmetadatadocuments" : [{"docid":<id of linkmetadata do
cument>,"tags":[...]}, ...],
            "effectivities":{...},// define child instantiation effect
ivities
            "tags":["confidential"],// restrict visibility of the chil
d
            "ref": <id of the child structure document>,
            "translation": [<tx>,<ty>,<tz>],
```

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```
                "rotation": [
                    <r00>,<r01>,<r02>,
                    <r10>,<r11>,<r12>,
                    <r20>,<r21>,<r22>
                ],
                "translationb" : "dGhpc3Nob3VsZGJlYmluYXJ5",
                "rotationb" : "dGhpc3Nob3VsZGJlYmluYXJ5",
                "reflection": <true or false>,
                "isworldxform": <true or false>
            },
            ...
        },
        "sourcemodeluniqueid": <id of the source model document> // (only
for single part),
        "instancemodifiers": [{
                "selectors": {
                    "worldlocation": {
                        "translation": [3330.49, -924.789, 490],
                        "rotation": [-6.24237e-14, 1, -9.89806e-14, 1, 6.2
6108e-14, -7.63826e-10, -7.63826e-10, -9.92649e-14, -1],
                        "translationb": "3 float or double in little endia
n base 64 representation",
                        "rotationb": "9 float or double in little endian b
ase 64 representation",
                        "reflection": true,
                        "xformtolerance": null
                    },
                    "path":[null,"grandparentid","","parentid","linkid"]
                },
                "actions": {
                    "linkmdid": null,
                    "instancemdid": null,
                    "addbrothers": {
                        "<linkmdid>": {
                            same as children,
                        },
                        ...
                    }
                }
            }
        ]
    }
```

Structure document

object

Depending on whether the part is described as an assembly (a node in the product structure) or a single part (a leaf in the product structure), a structure document must contain *either* a `children` field *or* a `geometry` field.

- `id` : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

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The `id` field must contain the unique identifier for the part in its current FFF[11].

- `type` : **string**, *REQUIRED*, const (**structure**)
- `partmetadatadocuments` : The list of partmetadata documents that should be attached to this definition. The number of retained documents after tag filtering is limited (see Limits). The retained documents should all have distinct tag combinations. see List of tagged doc ids
- `attacheddocuments` : The list of attached documents that should be attached to this definition. The number of retained documents after tag filtering is limited (see Limits). see List of tagged doc ids
- `annotationdocuments` : The list of annotations documents that should be attached to this definition. All those *annotation* documents will be positioned using cumulated transform to this *structure* item. The number of retained documents after tag filtering is limited (see Limits). see List of tagged doc ids
- `children` : Each key of the `children` map will be the linkid combined with the structure document id, it will generate an unique instantiation path. This field is exclusive with the `sourcemodeluniqueid` field. see Structure children
- `sourcemodeluniqueid` : **string**, length (**[23;64]**), pattern (`^[a-zA-Z0-9-_]*$`)

  Source model unique id, generated by the PSConverter when extracting 3D data from CAD files. Base64 string, 1 byte for version then the id
  `0` : retro compatibility for builds prior to v4.0
  `1` : 128bit UUID v4.
- `instancemodifiers` : The list of modifiers that will change how this part is instanciated. For each instanciation of this `structure`, each instance modifier will be evaluated and the best one will be applied. To select a modifier, all its selectors must be validated. The evaluation of modifiers has a complexity of (number of instance × number of modifiers), so to avoid infinite computations the number of modifiers is limited. see Instance Modifiers

4.1.2.1 - Tagged document list

List of tagged doc ids

array, length (**[0;255]**)

A document id could appear only once.

- items : **object**

  Reference to a document, associated with an optionnal tag restriction list.

[11] Form, fit and function

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- *`docid`* : **string**, *REQUIRED*, length (**[1;255]**), pattern (*`^[^_].{0,255}$`*)

  ID of a JSON document.

- *`tags`* : **array**, default (**[]**), length (**[0;32]**), distinct

  List of tags used to limit access to this item. The set should be contained into the union of build parameters tags and extra tags, else it will be rejected. Important: when a document is retained, if the tags do not match those of previous references, they will be merged with a warning!

  - items : **string**, length (**[1;64]**), pattern (*`^[\x21\x23-\x39\x3c-\x5B\x5d-\x7e]+$`*)

    Tag definition, because tags are also used as scopes limit them to scopes acceptable chars minus ':' and ';'. See https://www.rfc-editor.org/rfc/rfc6749#section-3.3.

4.1.2.2 - Children

Structure children

object, additional properties allowed

Each key of the *`children`* map will be the linkid combined with the structure document id, it will generate an unique instantiation path. This field is exclusive with the *`sourcemodeluniqueid`* field.

- pattern (*`^[^_].{0,255}$`*) : **object**

  - *`linkmetadatadocuments`* : A list of link metadata documents that should be attached to this instantiation link. The number of retained documents after tag filtering is limited (see Limits). The retained documents should all have distinct tag combinations. see List of tagged doc ids

  - *`effectivities`* : An array of objects, where each object represents a set of effectivities in the form *`"key": "value"`* where *`key`* is a category of the effectivity option and *`value`* is a valid option value for this category. In 3D Juump Infinite client applications, the corresponding link will be active when at least one of its sets of effectivities matches the selected configuration. Note that links that have no *effectivity* documents are considered not configurable and are thus always active regardless of the configuration. The *`key`* of an effectivity must not contain dots ('.'). see Definition of effectivity groups

  - *`tags`* : **array**, default (**[]**), length (**[0;32]**), distinct

    A list of tags used to limit access to this branch. The set should be contained into the union of build parameters tags and extra tags, else it will be rejected.

    - items : **string**, length (**[1;64]**), pattern (*`^[\x21\x23-\x39\x3c-\x5B\x5d-\x7e]+$`*)

      Tag definition, because tags are also used as scopes limit them to scopes acceptable chars minus ':' and ';'. See https://www.rfc-editor.org/rfc/rfc6749#section-3.3.

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- *`ref`* : **string**, *REQUIRED*, length (**[1;255]**), pattern (*`^[^_].{0,255}$`*)

  ID of a JSON document.

- *`translation`* : **oneOf**

  A 3D translation vector [x,y,z]. Can be in JSON text representation or binary to mitigate the floating-point error.

  - **array**, length (**[3;3]**)

    A 3D translation vector [x,y,z].

    – items : **number**, range(**]-3.4e+38;3.4e+38]**)
  - **string**, length (**[16;32]**), pattern (*`^[a-zA-Z0-9=+\/]{16}([a-zA-Z0-9=+\/]{16})?$`*)

    Binary representation, 3 IEEE-754 32bit or 64bit float in little-endian base64 representation.

- *`rotation`* : **oneOf**

  A 3D rotation matrix [r00,r01,r02, r10,r11,r12, r20,r21,r22]. Could be in JSON text representation or binary to mitigate the floating-point error.

  - **array**, length (**[9;9]**)

    – items : **number**, range(**]-1.0;1.0]**)
  - **string**, length (**[48;96]**), pattern (*`^[a-zA-Z0-9=+\/]{48}([a-zA-Z0-9=+\/]{48})?$`*)

    Binary representation, 9 IEEE-754 32bit or 64bit float in little-endian base64 representation.

- *`reflection`* : **boolean**, default (**false**)

  Indicates if the XForm should be reflected along the X axis.

- *`isworldxform`* : **boolean**, default (**false**)

  If true, the 3D transformation is assumed as relative to world and will not be relative the parent.

- *`psconverter:hidden`* : **boolean**

- *`psconverter:badxform`* : **array**, length (**[16;16]**)

  - items : **number**
- *`psconverter:xref`* : **string**

- *`psconverter:xrefmetadata`* : **object**, additional properties allowed

  DEPRECATED This field will not be generated starting from 4.1.8.

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For example, the following structure document declares a part “car” which is defined as the assembly of four wheels:

```
{
    "id": "car",
    "type": "structure",
    "children": {
        "front-right-wheel": {
            "ref": "wheel",
            "translation": [-1.5,1,0]
        },
        "front-left-wheel": {
            "ref": "wheel",
            "translation": [-1.5,-1,0]
        },
        "rear-right-wheel": {
            "ref": "wheel",
            "translation": [1.5,1,0]
        },
        "rear-left-wheel": {
            "ref": "wheel",
            "translation": [1.5,-1,0]
        }
    }
}
```

The `sourcemodeluniqueid` field references a geometry extracted by the *PSConverter* from a CAD file.

Following on the above example, this document declares the “wheel” single part whose 3D representation is detailed in the “model_wheel” *geometry* document:

```
{
    "id": "wheel",
    "type": "structure",
    "sourcemodeluniqueid": "model_wheel"
}
```

4.1.2.3 - Instance modifiers

Instance Modifiers

array, length (**[0;65536]**)

The list of modifiers that will change how this part is instanciated. For each instanciation of this `structure`, each instance modifier will be evaluated and the best one will be applied. To select a modifier, all its selectors must be validated. The evaluation of modifiers has a complexity of (number of instance × number of modifiers), so to avoid infinite computations the number of modifiers is limited.

- items : **object**
    - `selectors` : **object**, *REQUIRED*, size (**[1;+∞]**)

Selectors define how to check if the corresponding actions should be applied to a particular part instance.

- `worldlocation` : **object**, size (**[1;+∞]**)

  This selector is based on the 3D world transformation of the instance. If `rotation`, `rotationb` and `reflection` are omitted, it will behave as if `xformtolerance`.`rotation` was set to null.

  – `translation` : **oneOf**

    A 3D translation vector [x,y,z]. Can be in JSON text representation or binary to mitigate the floating-point error.

    - **array**, length (**[3;3]**)

      A 3D translation vector [x,y,z].

      – items : **number**, range(**]-3.4e+38;3.4e+38]**)
    - **string**, length (**[16;32]**), pattern (`^[a-zA-Z0-9=+\/]{16}([a-zA-Z0-9=+\/]{16})?$`)

      Binary representation, 3 IEEE-754 32bit or 64bit float in little-endian base64 representation.

  – `rotation` : **oneOf**

    A 3D rotation matrix [r00,r01,r02, r10,r11,r12, r20,r21,r22]. Could be in JSON text representation or binary to mitigate the floating-point error.

    - **array**, length (**[9;9]**)

      – items : **number**, range(**]-1.0;1.0]**)
    - **string**, length (**[48;96]**), pattern (`^[a-zA-Z0-9=+\/]{48}([a-zA-Z0-9=+\/]{48})?$`)

      Binary representation, 9 IEEE-754 32bit or 64bit float in little-endian base64 representation.

  – `reflection` : **boolean**, default (**false**)

    Indicates if the XForm should be reflected along the X axis.

  – `xformtolerance` : **oneOf**

    An optional field that can be added to overload the global xform comparison tolerance. If the `rotation` subfield is set to null, the rotation/scale part of the xform will not be tested, but will contribute to find the closest match.

    - **null**

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- **object**

  Defines a tolerance to observe when performing XForm comparisons.

  - `translation` : **number**, range(**]0;+∞]**)

    In millimeters.

  - `rotation` : **number**, range(**]0;360]**)

    In degrees.

- `path` : **array**, length (**[1;+∞]**)

  This selector is based on the instantiation path. The instantiation path is defined as an array of `structure doc id` and `child linkid` defined as follows: `['root_structid','link_A..',...,'parent_structid','link_B..']`. The `path` array can contain non consecutive of the following:

- wildcards `*` matching {0-n}

- `null` will match {1-n}

- `""` will match {1}.

- items : **oneOf**

  - **null**

  - **string**

- `actions` : **object**, *REQUIRED*, size (**[1;+∞]**)

  Actions are used to alter the default part definition.

  - `discardinstance` : **boolean**, values (**true**)

    Removes this instance.

  - `effectivities` : Replaces the value for `effectivities`. Note that this action will only be allowed if the link had no effectivities. see Definition of effectivity groups

  - `instancemetadatadocuments` : A list of instance metadata documents that should be attached to this definition. The number of retained documents after tag filtering is limited (see Limits). The retained documents should all have distinct tag combinations. see List of tagged doc ids

  - `addbrothers` : Adds new children to the parent instance. see Structure children

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- `enablemodifierdiag` : **boolean**, default (**false**)

  Enables debug logging for this modifier, allowing to understand where instance modifier is matched or rejected. This feature should not be used in a production environment as it will drastically reduce performances.

4.1.2.4 - Tuning of Instance Modifier Selectors

It can sometimes be difficult to understand why an instance metadata fails to attach. We provide a way to investigate the behavior of selectors. To log extra information about the evaluation of an instance modifier, you can add an extra field `enablemodifierdiag`.

⚠ This method SHOULD NOT be used in production as it will greatly impair the performance ! It is advised to limit its usage to a small number of instance modifiers.

```
{
    ...
    "instancemodifiers": [{
            "selectors": {...},
            "actions": {...},
            "enablemodifierdiag":true
        }
    ]
}
```

4.1.2.5 - Effectivity

For children referenced in a structure document, the *effectivities* field list the effectivity information associated to the *instantiation link*. Later, in the 3D Juump Infinite client application, the user will be able to choose a configuration: then, only the links whose effectivities match the configuration will be assembled.

The *effectivities* field is not compulsory. If your digital mock-up does not expose any configuration information, you can dispense with creating and sending this document to the ∞Server.

Here is the typical content of an *effectivities* field:

```
{
    "id": "car",
    "type": "structure",
    "children": {
        "front-right-wheel-18inch": {
            "ref": "wheel",
            "translation": [-1.5,1,0],
            "effectivities":[
                {
                    "model":["sport","gt"]
                }
            ]
        },
        "front-right-wheel-16inch": {
            "ref": "wheel",
```

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```
                "translation": [-1.5,1,0],
                "effectivities":[
                    {
                        "model":["standard"]
                    }
                ]
            },
            ...
        }
    }
```

For example, this effectivity document describes the constraints that must be met for a car to assemble a “fullcarbon” wheel trim:

```
    {
        "effectivities": [
            {
                "model": "GT"
            },
            {
                "model": "ST",
                "trim": "special"
            }
        ]
    }
```

In this example, the car will only assemble this *wheeltrim+fullcarbon* wheel trim if the selected configuration is either:

- a GT model
- a ST model with special trims

Written with logical operators, it corresponds to the condition: *(model == "GT") OR (model == "ST" AND trim == "special")*

The categories which are not listed in a set of effectivities are not taken into account for a link configuration activation. Thus, in the previous example, the “fullcarbon” wheel trim would be assembled even if the car configuration mentions, in addition to special wheel trim, that the GT model car must have a sunroof and a turbocharged engine. Since the effectivity values for the sunroof is not explicitly mentioned in this link, the sunroof effectivity category has no impact on the “fullcarbon” wheel trim instantiation.

4.1.2.6 - Effectivities

Definition of effectivity groups

array, length (**[1;128]**)

An array of objects, where each object represents a set of effectivities in the form *"key": "value"* where *key* is a category of the effectivity option and *value* is a valid option value for this category. In 3D Juump Infinite client applications, the corresponding link will be active when at least one of its sets of effectivities matches the selected configuration. Note that links that have

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no *effectivity* documents are considered not configurable and are thus always active regardless of the configuration. The `key` of an effectivity must not contain dots (‘.’).

- items : **object**, size (**[1;+∞]**), additional properties allowed
    - pattern (`^[a-zA-Z0-9][^.]*$`) : **oneOf**
        - **oneOf**
            - **[‘integer’, ‘boolean’]**
            - **string**, length (**[1;+∞]**)
        - **array**, length (**[1;+∞]**)
            - items : **oneOf**
                - **[‘integer’, ‘boolean’]**
                - **string**, length (**[1;+∞]**)

4.1.3 - Metadata documents

Metadata documents are used to enrich the product structure with metadata. There are three types of metadata documents.

Here is the typical content of a metadata document:

```
{
    "id": "partmd_wheel",
    "type": "partmetadata",
    "ts": 1522236968,
    "metadata":
    {
        "width": 185,
        "ratio": 75,
        "radial": true,
        "diameter": 14,
        "load-rating": 82,
        "speed-rating": "S",
        "instruction": "MAX LOAD SINGLE 2000 kg AT 760 kPs COLD"
    }
}
```

4.1.3.1 - Part metadata

Part metadata document

object

A part metadata can be attached to a part definition, and will be available on all the instances of the part.

- `id` : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

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ID of a JSON document.

- `ts` : **integer**, *REQUIRED*, range(**]1;9.22e+18]**)

  Timestamp of a JSON document. When the document is updated, the version with the higher timestamp will be kept.

- `type` : **string**, *REQUIRED*, const (**partmetadata**)
- `metadata` : **object**

  Object that will contain metadata. Note that 'infinite_generated' key should not be used by the Connector, it is reserved for internal use.

  - pattern (`^[a-zA-Z0-9][^.]*$`) : see Metadata field

4.1.3.2 - Link metadata

Link metadata document

object

A link metadata document can be attached to an instantiation link.

- `id` : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

  ID of a JSON document.

- `ts` : **integer**, *REQUIRED*, range(**]1;9.22e+18]**)

  Timestamp of a JSON document. When the document is updated, the version with the higher timestamp will be kept.

- `type` : **string**, *REQUIRED*, const (**linkmetadata**)
- `metadata` : **object**

  Object that will contain metadata. Note that 'infinite_generated' key should not be used by the Connector, it is reserved for internal use.

  - pattern (`^[a-zA-Z0-9][^.]*$`) : see Metadata field

4.1.3.3 - Instance metadata

Instance metadata document

object

An instance metadata document can be attached to a part instance using instance modifiers.

- `id` : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

  ID of a JSON document.

- `ts` : **integer**, *REQUIRED*, range(**]1;9.22e+18]**)

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Timestamp of a JSON document. When the document is updated, the version with the higher timestamp will be kept.

- `type` : **string**, *REQUIRED*, const (**instancemetadata**)
- `metadata` : **object**

  Object that will contain metadata. Note that 'infinite_generated' key should not be used by the Connector, it is reserved for internal use.

  - pattern (`^[a-zA-Z0-9][^.]*$`) : see Metadata field

4.1.3.4 - Metadata block

Metadata field

oneOf

- **['string', 'integer', 'number', 'boolean', 'null']**

  Scalar value.

- **object**

  Sub-object, the metadata key should start with [a-zA-Z0-9] and should not contain `'.'` or `'*'`. The name `'effectivities'` is reserved for configured nested blocks.

  - pattern (`^(?!.*(effectivities$))[a-zA-Z0-9][^*.]*$`) : see Metadata field
  - pattern (`^effectivities$`) : An array of objects, where each object represents a set of effectivities in the form `"key": "value"` where `key` is a category of the effectivity option and `value` is a valid option value for this category. In 3D Juump Infinite client applications, the corresponding link will be active when at least one of its sets of effectivities matches the selected configuration. Note that links that have no *effectivity* documents are considered not configurable and are thus always active regardless of the configuration. The `key` of an effectivity must not contain dots ('.'). see Definition of effectivity groups

- **array**

  Array of metadata entries.

  - items : see Metadata field

4.1.4 - Annotation documents

Annotation document

object

This document is used to declare 3D annotations that will be positioned relatively to an instance. An annotation is a 2D shape displayed in the 3D view. It could contain text or a vectorial picture.

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- `id` : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

  ID of a JSON document.

- `type` : **string**, *REQUIRED*, const (**annotation**)
- `groups` : **array**, *REQUIRED*

  A list of annotation groups. An annotation group contains a list of consistent and related annotation views and captures.

  - items : **object**
    - `name` : **string**, *REQUIRED*, length (**[0;128]**), pattern (`^(\S.*|)$`)

      The name of this annotation group, should be unique per type.

    - `type` : **string**, *REQUIRED*, length (**[0;128]**)

      The type of this annotation group. Can contain '/'.

    - `views` : **array**, *REQUIRED*, length (**[1;+∞]**)
      - items : An annotation view is an entity that defines the orientation and base location of an annotation collection. see Annotation view definition
    - `captures` : **array**
      - items : The implementation of captures is experimental, the definition is subject to breaking changes in the future. see Definition of an annotation capture

Here is the typical content of an annotation document:

```
{
    "id" : <id of the annotation document>,
    "type" : "annotation",
    "groups":[
      {
        "name":"GroupA",
        "type":"MyType_A",
        "views":[],
        "captures":[]
      },
      ...
    ]
}
```

4.1.4.1 - Annotation view

Annotation view definition

object

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An annotation view is an entity that defines the orientation and base location of an annotation collection.

- *name* : **string**, *REQUIRED*, length (**[0;128]**)

  The name of this view.

- *ver* : **string**

  Internal version number.

- *origin* : **array**, *REQUIRED*, length (**[3;3]**)

  A point defining the origin of the 3D basis of this view.

  - items : **number**, range(**]-3.4e+38;3.4e+38]**)
- *axis* : **array**, *REQUIRED*, length (**[3;3]**)

  A vector defining the first axis of the 3D basis of this view.

  - items : **number**, range(**]-1;1]**)
- *normal* : **array**, *REQUIRED*, length (**[3;3]**)

  A vector defining the third axis of the 3D basis of this view (the normal to the annotation plane).

  - items : **number**, range(**]-1;1]**)
- *annotations* : **array**, *REQUIRED*

  List of annotations in this view.

  - items : see Annotation definition

Here is the typical content of an *annotationview* object.

```
{
    "name" : "Right_view",
    "origin" : [0, 0, 0],
    "axis" : [-1, 0, 0],
    "normal" : [0, 1, -0],
    "annnotations":[]
}
```

4.1.4.2 - Annotation object

Annotation definition

object

- *name* : **string**

  The name of this annotation.

- *billboard* : **boolean**

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Defines the orientation policy. If false, the *annotation* will be displayed in the *annotationview* plane, if true the *annotation* will be billboarded to always face the screen.

- `screenfixedsize` : **boolean**

  If `true`, the *annotation* will be rendered at a fixed size on screen regardless of its distance to the camera.

- `color` : **string**, length (**[6;6]**), pattern (`^[0-9a-fA-F]{6}$`)

  The background color of the shape.

- `drawbackground` : **boolean**

  If `true`, the frame background will be filled with the *annotation* color.

- `dynamicscale` : **boolean**

  If `true`, the *annotation* will be automatically scaled by the renderer to ease reading.

- `framerotation` : **number**

  Defines the rotation applied to move from the SVG frame space to the *annotationview* space.

- `framescale` : **number**, range(**]0;+∞]**)

  Define the scale applied to move from the SVG frame space to the *annotationview* space.

- `framesvg` : **string**

  Defines the content of the annotation frame. Note that this SVG cannot be empty. Only a subset of the SVG specification is supported by the renderer.

- `frametranslation` : **array**, length (**[3;3]**)

  Defines the translation applied to move from the SVG frame space to the *annotationview* space.

  - items : **number**, range(**]-3.4e+38;3.4e+38]**)
- `ignoreztest` : **boolean**

  If `true`, this *annotation* will always be displayed on top of geometries.

- `leaderanchors` : **array**

  Defines a list of correspondance between a point in SVG space and a point in the *annotationview* space. A leader will be automatically created between those points in case of billboarding.

  - items : **object**

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        - `inframe` : **array**, *REQUIRED*, length (**[2;2]**)
            - items : **number**
        - `inscene` : **array**, *REQUIRED*, length (**[3;3]**)

          A 3D translation vector [x,y,z].

            - items : **number**, range(**]-3.4e+38;3.4e+38]**)

- `leaderarcs` : **array**

  Defines circular arcs in *annotationview* space to be drawn as leaders.

    - items : **object**
        - `center` : **array**, *REQUIRED*, length (**[3;3]**)

          A 3D translation vector [x,y,z].

            - items : **number**, range(**]-3.4e+38;3.4e+38]**)
        - `radius` : **number**, *REQUIRED*, range(**]0;+∞]**)
        - `startangle` : **number**, *REQUIRED*
        - `endangle` : **number**, *REQUIRED*

- `leadersegments` : **array**

  Defines segments in *annotationview* space to be drawn as leaders.

    - items : **object**
        - `A` : **array**, *REQUIRED*, length (**[3;3]**)

          A 3D translation vector [x,y,z].

            - items : **number**, range(**]-3.4e+38;3.4e+38]**)
        - `B` : **array**, *REQUIRED*, length (**[3;3]**)

          A 3D translation vector [x,y,z].

            - items : **number**, range(**]-3.4e+38;3.4e+38]**)

- `leadershapes` : **array**

  A list of leader heads defined as SVGs like `framesvg`.

    - items : **object**
        - `pos` : **array**, *REQUIRED*, length (**[3;3]**)

          A 3D translation vector [x,y,z].

            - items : **number**, range(**]-3.4e+38;3.4e+38]**)

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- *svg* : **string**, *REQUIRED*, length (**[1;+∞]**)

Here is the typical content of an *annotation* object.

```
{
  "billboard": false,
  "color": "ff00ff",
  "drawbackground" : false,
  "dynamicscale": false,
  "framerotation": 0.0,
  "framescale": 1.0,
  "framesvg": "<?xml version=\"1.0\" encoding=\"UTF-8\"?>\n<g stroke=\
"#FF00FF\" fill=\"#FF00FF\" transform=\"matrix(1 0 0 -1 0 0)\"><g tran
sform=\"matrix(1 0 -0 1 -3.99149 -2.91042)\"><g><text font-family=\"Mo
nospac821 BT\" font-size=\"4.66655\" textLength=\"2.47633\" xml:space=
\"preserve\" stroke=\"none\" fill=\"#FF00FF\" transform=\"matrix(1 0 -
0 -1 -0.314193 1.32292)\">B</text></g><path d=\"M -1.82935 0 L -1.8293
5 5.82083 L 3.99149 5.82083 L 3.99149 0 Z\" fill=\"none\" class=\"bord
er\" vector-effect=\"non-scaling-stroke\"/></g></g>\n",
  "frametranslation": [-150.2183380126953, -27.759979248046876, -175.9
222412109375],
  "ignoreztest": false,
  "leaderanchors": [{
      "inframe": [-3.0069751739501955, 2.910416603088379],
      "inscene": [-153.22531127929688, -30.670394897460939, -175.92224
12109375]
    }
  ],
  "leaderarcs": [{
      "center" : [1.,2.,3.],
      "radius" : 5.,
      "startangle" : 0.,
      "endangle" : 3.14,
  }],
  "leadersegments": [{
      "A": [-153.6520233154297, -43.532928466796878, -175.922241210937
5],
      "B": [-153.22531127929688, -30.670394897460939, -175.92224121093
75]
    }
  ],
  "leadershapes": [{
      "pos": [-153.7183380126953, -45.531829833984378, -175.9222412109
375],
      "svg": "<?xml version=\"1.0\" encoding=\"UTF-8\"?>\n<g stroke=\"
#FF00FF\" fill=\"#FF00FF\" transform=\"matrix(1 0 0 -1 0 0)\"><path d=
\"M -0.99945 0.0331567 L 0.0663133 1.9989 L 0.99945 -0.0331567 Z\" str
oke=\"none\"/></g>\n"
    }
  ],
  "name": "Simple Datum.3",
  "screenfixedsize": false
}
```

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4.1.4.3 - Annotation capture

Definition of an annotation capture

object

The implementation of captures is experimental, the definition is subject to breaking changes in the future.

- `name` : **string**, *REQUIRED*, length (**[0;128]**)
- `target` : **array**, length (**[3;3]**)

  Center Of Interest of the capture, will be used to compute the direction of the camera.

  - items : **number**, range(**]-3.4e+38;3.4e+38]**)
- `camera` : **object**
  - `location` : **array**, *REQUIRED*, length (**[3;3]**)

    The camera location.

    - items : **number**, range(**]-3.4e+38;3.4e+38]**)
  - `up` : **array**, *REQUIRED*, length (**[3;3]**)

    The up vector of the camera.

    - items : **number**, range(**]-1;1]**)
- `cutplane` : **object**
  - `origin` : **array**, *REQUIRED*, length (**[3;3]**)

    The origin of the cut plane.

    - items : **number**, range(**]-3.4e+38;3.4e+38]**)
  - `normal` : **array**, *REQUIRED*, length (**[3;3]**)

    The normal of the cut plane.

    - items : **number**, range(**]-1;1]**)
- `annotationvisibility` : **array**

  Only the views listed in this array will be displayed when the capture is activated.

  - items : **object**
    - `viewindex` : **integer**, *REQUIRED*, range(**]0;+∞]**)

      View index (starting from 0) into the annotation group.

    - `iswhitelist` : **boolean**, *REQUIRED*

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If `true`, only the annotations referenced in the list will be displayed. If `false`, all the annotations will be displayed except those referenced in the list.

- `annotationsindexes` : **array**, *REQUIRED*
  - items : **integer**, range(**]0;+∞]**)

    Annotation index (starting from 0) into the annotation view.

4.1.5 - Attached documents

Attached document

object, **oneOf**

Attached documents define a resource that will be attached to the product structure. Attached documents are available in the *ID card*. The document can either embeded an attached resource or be reference it using an URL.

- `id` : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

  ID of a JSON document.

- `ts` : **integer**, *REQUIRED*, range(**]1;9.22e+18]**)

  Timestamp of a JSON document. When the document is updated, the version with the higher timestamp will be kept.

- `type` : **string**, *REQUIRED*, const (**attacheddocument**)

- `name` : **string**, *REQUIRED*, length (**[1;+∞]**)

  The name of the resource that will be displayed to the user.

- `description` : **string**, *REQUIRED*

  Additional information to describe the content of the document.

- `mime-type` : **string**

  Specifies the type of the resource to help the application handle the document. Some mime-types could be directly displayed into the application (if data is embeded).

- `url` : **string**, length (**[1;+∞]**)

  The location of document data (for external documents).

- `datab64` : **string**, length (**[0;4194304]**), pattern (`^(?:[A-Za-z0-9+\/]{4})*(?:[A-Za-z0-9+\/]{2}==|[A-Za-z0-9+\/]{3}=)?$`)

  Base64-encoded document data (for embeded documents).

Here is the typical content of an attached document:

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```
{
    "id" : <id of the metadata document>,
    "type" : "attacheddocument",
    "ts": <timestamp>,
    "name" : "mydoc.txt",
    "description" : "a text document",
    "mime-type" : "text/plain",
    "url": <location of the document data>,
    "datab64": <document data base 64 encoded>
}
```

List of data types natively handled by the Native Client:

- Plain text (*text/plain*): data is displayed as utf-8 text.
- Rich text (*text/html*, *application/x-qt-richtext*): data is displayed as Qt compliant utf-8 rich text.
- Image (*image/jpg*, *image/jpeg*, *image/png*): data is interpreted as picture data.

This document show how to embed a picture

```
{
    "id" : "attached_picture",
    "type" : "attacheddocument",
    "ts" : 15699846,
    "name" : "png_color_4x4",
    "description" : "a png sample with a resolution of 4x4",
    "mime-type" : "image/png",
    "datab64": "iVBORw0KGgoAAAANSUhEUgAAAAQAAAAECAIAAAAmkwkpAAAAAXNSR0
IArs4c6QAAAARnQU1BAACxjwv8YQUAAAAJcEhZcwAACxIAAAsSAdLdfvwAAAAYdEVYdFNv
ZnR3YXJlAHBhaW50Lm5ldCA0LjAuNvyMY98AAAAxSURBVBhXDcdBAQAgDAMxnBRnN2Udyj
qkQH5Z0kXdItpLDLSp8NODj13xT4Ycp5L9ACpgF836zffeAAAAAElFTkSuQmCC"
}
```

This document show how to reference an external file

```
{
    "id" : "attached_odt",
    "type" : "attacheddocument",
    "ts" : 15699846,
    "name" : "open office document",
    "description" : "an external open office document",
    "mime-type" : "application/vnd.oasis.opendocument.text",
    "url": "file:///Z:/folder/document.odt"
}
```

4.1.6 - Configuration documents

A document of type *configuration* describes a valid configuration of the DMU in the form of a list of active effectivities. In the 3D Juump Infinite client application, the configurations will be presented as predefined read-only selectable items in a list of configurations. When the user selects one of these configurations, the DMU will be instantiated with the links which effectivities match with the ones enumerated in the *configuration document*.

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The configuration document is not compulsory. If your digital mock-up does not expose any configuration information, you can dispense with creating and sending this document to the ∞Server.

Configuration document

object

- `id` : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

  ID of a JSON document.

- `type` : **string**, *REQUIRED*, const (**conf**)
- `name` : **string**, *REQUIRED*, length (**[1;64]**)

  The name labeling the configuration.

- `description` : **string**, default (****), length (**[0;256]**)

  A description of the configuration.

- `tags` : **array**, default (**[]**), length (**[0;32]**), distinct

  A list of tags used to limit access to this configuration. The set should be contained into the union of build parameters tags and extra tags, else it will not be embeded in the build.

  - items : **string**, length (**[1;64]**), pattern (`^[\x21\x23-\x39\x3c-\x5B\x5d-\x7e]+$`)

    Tag definition, because tags are also used as scopes limit them to scopes acceptable chars minus ‘:’ and ‘;’. See https://www.rfc-editor.org/rfc/rfc6749#section-3.3.

- `effectivity` : **object**, size (**[1;+∞]**), additional properties allowed
  - pattern (`^[a-zA-Z0-9][^.]*$`) : **oneOf**
    - **oneOf**
      - **[‘integer’, ‘boolean’]**
      - **string**, length (**[1;+∞]**)
    - **array**, length (**[1;+∞]**)
      - items : **oneOf**
        - **[‘integer’, ‘boolean’]**
        - **string**, length (**[1;+∞]**)
- `exclusion` : **object**, size (**[1;+∞]**), additional properties allowed

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- pattern (*^[a-zA-Z0-9][^.]*$*) : **oneOf**
    - **oneOf**
        - **['integer', 'boolean']**
        - **string**, length (**[1;+∞]**)
    - **array**, length (**[1;+∞]**)
        - items : **oneOf**
            - **['integer', 'boolean']**
            - **string**, length (**[1;+∞]**)

Here is the typical content of a configuration document:

```
{
    "id": "com.3djuump.conf:<id of the configuration>",
    "type": "conf",
    "ts": <timestamp>,
    "name": "some name",
    "description": "free text",
    "effectivity": {
        "field1": ["value1", "value2"],
        "field2": "value3",
        ...
    },
    "exclusion":{
        "field3": "value4",
        ...
    }
}
```

For example, this configuration document describes a particular set of options for a car:

```
{
    "id": "com.3djuump.conf:luxury",
    "type": "conf",
    "ts": 1,
    "name": "GT Moth Turbo II",
    "description": "Luxury high-performance car (without prototype par
ts)",
    "effectivity": {
        "model": "GT",
        "spoiler": "active",
        "horsepower": ["220","250"]
    },
    "exclusion": {
        "type":"prototype"
    }
}
```

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4.1.6.1 - Configuration solving

A configuration is evaluated on each terminal part of the product structure. A terminal part is selected if one the following criteria is satisfied:

- none of its ancestors have effectivies on their link metadata documents
- all of its ancestors have at least one effectivity object which matches this configuration

An effectivity object (see Effectivity) is matched if, for each object entry:

- all values are contained in the corresponding *effectivity* entry, or the entry is not specified in *effectivity*
- none of values are contained in the corresponding *exclusion* entry, or the entry is not specified in *exclusion*

In the following example, *my_example_link* will be matched by *conf_A* and *conf_C* but will be rejected by *conf_B* and *conf_D*.

```
{
    "id": "conf_A",
    "type": "conf",
    "effectivity": {
        "model": ["GT", "Sedan"]
    }
},
{
    "id": "conf_B",
    "type": "conf",
    "effectivity": {
        "model": ["GT", "Sedan"]
    },
    "exclusion":{
        "type":"prototype"
    }
},
{
    "id": "conf_C",
    "type": "conf",
    "effectivity": {
        "horsepower": ["220","250"]
    }
},
{
    "id": "conf_D",
    "type": "conf",
    "effectivity": {
        "model": ["Break"]
    }
},
{
    "id": "my_example_link",
    "type": "structure",
    "ts": "1",
    "children": {
```

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```
            "...":{
                "effectivities":[
                    {
                        "model": "GT",
                        "type": "prototype"
                    }
                ]
            }
        }
    }
```

4.1.7 - Project-related documents

Aside from these types of documents dedicated to the description of the product structure, the ∞Directory also stores project-related documents.

Project documents

oneOf

- see Default settings project document
- see Index mapping project document
- see Customization scripts project document

4.2 - Metadata index mapping

4.2.1 - Index mapping

By default, the type of fields in metadata will be automatically discovered. However, to ensure that fields are correctly interpreted, it is possible (and advisable) to specify the index mapping. This is done thanks to the *indexmapping* project document. When this document is updated, the project index will automatically be rebuilt to take the new mapping into account.

Here is the typical content of an *indexmapping* document:

```
{
    "id" : "com.3djuump:indexmapping",
    "type" : "projectdocument",
    "subtype" : "indexmapping",
    "ts" : <timestamp>,
    "metadatamapping" : {
        ...
    },
    "dynamic_templates" : [
        ...
    ]
}
```

Index mapping project document

object

- *id* : **string**, *REQUIRED*, const (**com.3djuump:indexmapping**)

- *type* : **string**, *REQUIRED*, const (**projectdocument**)
- *ts* : **integer**, *REQUIRED*, range(**]1;9.22e+18]**)

  Timestamp of a JSON document. When the document is updated, the version with the higher timestamp will be kept.
- *subtype* : **string**, *REQUIRED*, const (**indexmapping**)
- *mapping_limits* : **object**

  See Elasticsearch ‘Mapping limit settings’ for details. Update with care as it could lead to performance degradations. If unspecified Elasticsearch default values will be applied.
  - *total_fields* : **integer**, range(**]1;10000]**)
  - *depth* : **integer**, range(**]1;30]**)
  - *nested_fields* : **integer**, range(**]1;1000]**)
  - *nested_objects* : **integer**, range(**]1;100000]**)
- *metadatamapping* : **object**, *REQUIRED*, additional properties allowed
- *dynamic_templates* : **array**

The *metadatamapping* object will be used to build the index of *metadata* objects found in *partmetadata*, *linkmetadata* and *instancemetadata*. The *dynamic_templates* array enables the declaration of additional dynamic templates (see the ElasticSearch documentation).

Here is an example of *indexmapping* document:

```
{
    "id" : "com.3djuump:indexmapping",
    "type" : "projectdocument",
    "subtype" : "indexmapping",
    "ts" : 1,
    "metadatamapping" : {
        "properties" : {
            "MyIntegerField" : {
                "type" : "integer"
            },
            "MyDoubleField" : {
                "type" : "double"
            },
            "MyDateField" : {
                "type" : "date",
                "format" : "date_optional_time"
            },
            "MySubObject":{
                "properties":{
                    "MyDateField2" : {
                        "type" : "date",
```

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```
                                   "format" : "yy/MM/dd"
                               }
                           }
                       }
                   }
               },
               "dynamic_templates" : [{
                   "SpecificMd": {
                       "path_match": "metadata.SpecificMd",
                       "mapping": {
                       "index": false,
                       "dynamic": false,
                       "type": "object"
                       }
                   }
               }]
           }
```

- *properties* object lists fields for which we want to specify the index policy.
  - *type* field, see Metadata types
  - *format* for *date* type, format can be specified to help date parsing, refer to the ElasticSearch documentation.
  - *properties* field describes types of subfields. Again, refer to the ElasticSearch documentation.

4.2.2 - Metadata types

The following types are supported in the index mapping:

- *text* : the field will be available for full text search, case insensitive and partial queries. Text fields are treated specifically through a dedicated predefined template that enables full-text search: do not interfere with the default indexation parameters. ⚠ Text fields potentially containing too much UTF-8 characters (see Limits) must not be indexed: make sure to explicitely exclude them from the mapping.
- *keyword* : the field will be indexed strictly and will only be queried with exact case sensitive match. ⚠ Keyword fields containing too much UTF-8 characters will be ignored see Limits.
- *long*, *integer*, *short*, *byte*, *double*, *float* : field will be indexed as numeric.
- *date* : will be interpreted using the *format* field.
- *boolean* : the field will be indexed as a boolean.
- *long_range*, *integer_range*, *float_range* and *double_range* : the field will be indexed as a numeric range, see Range formatting.
- *date_range* : the field will be indexed as a date range, see Range formatting.
- *object* : a simple json object containing sub fields.
- *nested* : a list of objects that will be indexed separately allowing to make complex queries consistent on each separated objects. A *nested* object cannot contain a sub *nested* field. Number of *nested* objects per metadata is limited see Limits.

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- *configured* : like *nested* but pre-filtered using configuration information see Configured metadata

4.2.3 - Range formatting

The Range data type is defined as an object that should contain lower and upper bounds defined by the following fields:

- *gte* to define lower bound included.
- *gt* to define lower bound excluded.
- *lte* to define upper bound included.
- *lt* to define upper bound excluded.

```
{
    "id" : "...",
    "type" : <documenttype>,
    "ts" : 1,
    ...,
    "metadata":{
        "name":"...",
        ...
        "my_range": {
            "gte" : 12.2,
            "lt" : 15
        }
    }
}
```

4.2.4 - Configured metadata

Configured metadata allows to specify *nested* metadata information that is valid for specific configurations. *configured* JSON objects should contain an *effectivities* field see Metadata field. Number of *configured* field is limited, see Limits.

```
{
    "id" : "...",
    "type" : <documenttype>,
    "ts" : 1,
    ...,
    "metadata":{
        "name":"...",
        ...
        "info_per_conf":[
            {
                "effectivities":[{
                    "model":["A"]
                }],
                "info":"Old model version"
            },{
                "effectivities":{
                    "model":["C","D"],
                    "year":"2020"
                },
                "info":"New model version"
```

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```
                    }
                ]
            }
        }
```

In this example, if *info_per_conf* is indexed using sub-objects with a metadata type set to `configured`, the field will be automatically filtered using the configuration context of the client application. So if the active configuration is `"model":"A"`, only `"info_per_conf"."info":"Old model version"` will be displayed.

4.2.5 - Reserved metadata field

`infinite_generated` field in `metadata` object SHOULD NOT be specified by the Connector when it defines metadata documents. This field is reserved for internal use.

4.3 - Product structure converter

4.3.1 - Introduction

The **PSConverter** is a tool available through the ∞CLI (see the ∞CLI psconverter command) that allows to extract geometry and product structure from many different file formats (see the list of supported formats). The geometry data will be stored in a `geometrypool`, to be used later by the **Generator**, and the product structure will be exposed to the Connector in JSON format.

See Connector data flow for details of interaction between connector and PsConverter.

In order to extract the product structure and metadata from CAD files, you basically pass the CAD files containing the product structure to the *PSConverter* executable. This tool then parses the files and returns the corresponding *structure* and *metadata* documents. The extracted geometry is directly stored in a `geometrypool` on the ∞Directory.

The *PSConverter* is provided as a tool, not as a *silver bullet* able to convert any data into 3D Juump Infinite *builds*. It should be completed with a proper *Connector* developed in line with the requirements of the end users. In order to generate a DMU *build*, it is up to you to adjust the conversion parameters and filter the conversion results.

4.3.2 - Incremental conversion

To limit the storage usage and speedup the processing time, the *PSConverter* uses a cache-like system that relies on unique IDs provided by the *Connector*. When relevant, the *PSConverter* will deliver a matching previous conversion result if one is available.

4.3.3 - Error handling

When a conversion job fails (invalid file, processing error, crash, out of memory, timeout, ...), the PsConverter will not always reprocess this file on next attempt. A new conversion will be attempted if job definition changes (voxel count, memory or time limit, etc ...), ∞Cli versions changes or `force` flag is set.

4.3.4 - Supported CAD file formats

3D Juump Infinite is able to process the following formats:

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Format	Ext	Version
3D Experience	.3Dxml	All - R4172, 2014x - 2022x
3DM OpenNurbs – Rhino *(Windows only)*	.3dm	All - 6
3DS	.3ds	
ACIS	.sat .sab	All - R27
ASC Medusa 3D	.asc	
CADDS (explicit parts) & CAMU	._pd ._ps	4, 5
CATIA V4	.model .dlv .exp .session	All - 4.xx
CATIA V5	.CATPART .cgr .CATProduct	R10 - R34
CATIA V6	.3Dxml	R210 - R213, 2011x - 2013
CATIA V6 3D EXPERIENCE	.3Dxml	All - R417, 2014x - 2022x
FBX	.fbx	
glTF v2	.gltf .glb	
I-DEAS	.arc .unv .asc	All - NX5
IGES	.igs .iges	5.2, 5.3
Inventor	.ipt .iam	All - 2024
JT-Format (JtOpen)	.jt	7.0 - 10.5
Nastran	.nas	
NX Unigraphics	.prt	11.1 - CR 2312
OBJ	.obj .mtl	
Parasolid XT-Format	.x_t .xmt_txt .x_b	All - 34
PlmXml *(experimental)*	.plmxml	schema v4
CREO ProEngineer	.prt .xpr .asm .xas	13 - Creo 10
CREO ProEngineer Neutral	.neu	13 - Creo 10
ROBCAD	.rf	
Solidworks	.sldprt .sldasm .prt .asm	1999 - 2023
STEP	.stp .step .stpx .stpz .stpxz	AP203, AP214, AP242
Straessle EUKLID	.edx	
STL	.stl	
VDA	.vda	FS 2.0
VRML	.wrl .wrz .vrml	97

The *PSConverter* reads the mesh/surface information only, as well as annotations when relevant. Any other information (textures, lighting information…) is ignored.

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If your geometry representation file format is not listed above, it will not be converted during the processing and will not be integrated in the DMU build. Consequently, the client applications will not be able to display these representations.

4.3.5 - Using the PSConverter

The **PSConverter** executable takes a list of files to process and produces a set of JSON and binary files.

4.3.5.1 - Input

The input of the **PSConverter** is an x-ndjson file whose first entry is general settings, followed by conversion jobs. The structure of the settings and jobs is detailed in the following chapters.

```
{settings}
{job1}
{job2}
{job3}
```

Conversion settings

PsConverter input x-ndjson settings

object

Data structure of the settings within the PSConverter job x-ndjson file.

- *log* : see Log configuration
- *system* : **object**, *REQUIRED*

  Global settings.

  - *geometrypoolid* : **string**, *REQUIRED*, length (**[37;37]**), pattern (*^geom_[a-f0-9]{32}$*)

    The unique identifier of a geometry pool.

  - *maxrammb* : **integer**, default (**4096**), range(**]512;524288]**)

    Maximum memory available for all workers. The memory limit per worker will be deduced using *workercount* (if a job ever exceeds this number of MB of RAM, it is aborted).

  - *maxtimeperworkersec* : **integer**, default (**1800**), range(**]0;172800]**)

    Maximum processing time per worker (if a job ever exceeds this duration, it is aborted).

  - *workercount* : **integer**, default (**1**), range(**]1;256]**)

    Number of subprocesses to spawn for batch treatment.

  - *threadperworker* : **integer**, default (**1**), range(**]1;256]**)

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Number of thread that each worker will be allowed to use. workercount*threadperworker will define maximum amount of cpu resources that will be used. Job processing is not fully parallelized, so to process a huge amount of small file it is recommended to let this value to 1. Increase this value when a processing a single huge file to reduce overall processing time.

- `retryworkercount` : **integer**, default (**1**), range(**]0;256]**)

  Worker count for the second conversion attempt, if the first attempt failed due to a lack of memory. The value 0 will disable the retry step.

- `tempfolder` : **string**, *REQUIRED*, length (**[1;+∞]**)

  The path of the folder where temporary files will be stored. If relative, will be resolved relative to job file.

- `generatorcachefolder` : **string**, default (****), length (**[0;+∞]**)

  Optional cache folder were data needed by the Generator will be written in addition to ∞Directory upload. This could save network bandwidth by allowing the Generator to retrieve those data without downloading them from the ∞Directory. If relative, will be resolved relative to job file.

- `jobresultbuffersize` : **integer**, default (**2097152**), range(**]0;16777216]**)

  Maximum amount of 3D data that will kept in memory per job before buffering it to disk before upload.

Conversion job

PsConverter input x-ndjson job

object

Data structure of a job within the PSConverter job x-ndjson file.

- `computeaabb` : **boolean**, default (**false**)

  Whether the PSConverter should compute the Axis-Aligned Bounding Box of the model.

- `convresult` : **string**, *REQUIRED*, length (**[1;+∞]**)

  The path of the file where the JSON documents are to be stored. It is advised to partition results into between 256 and 1024 subfolders to avoid the performance issues arising when having too many files per folder. If relative, will be resolved relative to job file.

- `copybeforeload` : **boolean**, default (**false**)

  If `true`, copies the source file to a temporary local file before loading it. This functionality is meant to improve performance when the file is loaded from a remote

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location. When loading a local file, DO NOT enable this option, since it will impair the performance.

- *`copybeforeloadbytecount`* : **integer**, default (**0**), range(**]0;+∞]**)

  When *`copybeforeload`* is enabled, specifies how many bytes to copy. If zero, the whole input file will be copied.

- *`copybeforeloadstartidx`* : **integer**, default (**0**), range(**]0;+∞]**)

  When *`copybeforeload`* is enabled, specifies the start index of data to copy from source files.

- *`experimentalextractannotcapture`* : **boolean**, default (**false**)

  Whether the PSConverter should extract annotations captures, this feature is experimental.

- *`extractannot`* : **boolean**, default (**true**)

  Whether the PSConverter should extract annotations from the CAD file (producing *annotation* documents).

- *`extractfeatures`* : **boolean**, default (**true**)

  Whether the PSConverter should compute geometry features from the CAD file. Features are required for measures and vectorial export. This should be disabled only for specific parts were is pointless to compute features (organic geometries, displacement volumes, geometries altered with random noise).

- *`extracthiddenobjects`* : **boolean**, default (**false**)

  Whether the PSConverter should also extract hidden objects from the CAD file. If set, children objects of *structure* document will contain an extra field *`PSConverter:hidden`*.

- *`extractlinkmetadata`* : **boolean**, default (**true**)

  Whether the PSConverter should also extract link metadata from the CAD file (producing *linkmetadata* documents). Note that this flag has no effect if *`extractmetadata`* is set to *`false`*.

- *`extractmetadata`* : **boolean**, default (**true**)

  Whether the PSConverter should extract metadata from the CAD file (producing *partmetadata* documents).

- *`file`* : **anyOf**, *REQUIRED*

  - **string**, length (**[1;+∞]**)

    File path to the CAD file to process. If relative, will be resolved relative to job file.

  - **string**, length (**[0;1024]**), pattern (*`^https?:\/\/.*$`*), format (*`url`*)

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HTTP URL from which file will be downloaded. If basic authentication is required, cretendials will be retrieved from PSCONVERTER_HTTP_SOURCE_LOGIN and PSCONVERTER_HTTP_SOURCE_PWD environment variables.

- `fixinvalidxforms` : **string**, default (**auto**), values (**never**, **auto**, **always**)

  /! this option will break instantiation and will duplicate geometry! Bakes xforms into the final geometry or xref, leaving only identity matrices on the product structure. This is useful when the input file contains invalid xforms with various scales.
  `never` : conversion will fail if an invalid xform is found.
  `auto` : the process will bake and break instantiation on sub product structure that are under an invalid xform.
  `always` : the process will be applied to the whole product structure.

- `forceconversion` : **boolean**, default (**false**)

  If set to `true`, conversion will be forced (disabling the cache feature). This feature should be used with extreme care as it will also disable the reuse of geometries between builds.

- `geometrylevel` : Defines where, in the product structure, the geometry source models will be generated. see Subdivision level

- `geometrysettings` : Settings used to process 3D data extracted from CAD files. The values can mostly remain untouched, unless you have a DMU geometry expressed with an unit different from the millimeter. If your DMU is plagued with rogue geometric parts impeding the rendering performance, you can also tweak these settings. see Geometry settings

- `inputunit` : **oneOf**, default (**auto**)

  - **string**, const (**auto**)

    If possible scene unit will be retrieved from source file, else it will default to millimeter.

  - **string**, values (**millimeter**, **centimeter**, **decimeter**, **meter**, **inch**, **foot**)

    The length unit of the project.

- `logfile` : **oneOf**, default (**false**)

  - **boolean**

    Disables logging for this job.

  - **string**, length (**[1;+∞]**)

    The path of the file where the log will be written. As with ConvResults, it is advised to partition into subfolders. The log file will be created on the first write operation.

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- *`outputunit`* : **string**, default (**millimeter**), values (**millimeter**, **centimeter**, **decimeter**, **meter**, **inch**, **foot**)

  Output scene unit. Base on input unit xforms and geometry will be automatically scaled.

- *`overridecolor`* : **oneOf**, default (**null**)

  If specified and not null, this color will be used to override all source file colors.

  - **null**
  - **string**, length (**[7;7]**), pattern (`^#[0-9a-fA-F]{6}$`)

    An hexadecimal encoded RGB color.

- *`uniqueid`* : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

  The ID should be unique for a given file (e.g. sha256(filepath,ts)). It will be used for *structure* root documents that will be extracted from the CAD file and as key for the conversion cache.

Geometry settings

Geometry settings

object

Settings used to process 3D data extracted from CAD files. The values can mostly remain untouched, unless you have a DMU geometry expressed with an unit different from the millimeter. If your DMU is plagued with rogue geometric parts impeding the rendering performance, you can also tweak these settings.

- *`allowdynamiclowdef`* : **boolean**, default (**true**)

  If *`false`*, the associated geometry will not be a candidate for the dynamic LD (low-definition) model.

- *`allowstaticlowdef`* : **boolean**, default (**true**)

  If *`false`*, the associated geometry will not be a candidate for static LD (low-definition) model.

- *`backfaceculling`* : **string**, default (**ccw**), values (**none**, **ccw**, **cw**)

  Defines which triangles should be rendered based on the orientation of their normal. This will greatly improve rendering performances, however this might be disabled if the geometry is not correctly generated. For an in-depth explanation see https://en.wikipedia.org/wiki/Back-face_culling.

- *`connexitythreshold`* : **number**, default (**2**), range(**]0;+∞]**)

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Threshold (in millimeter) used to regroup meshes that do not share any vertices but are still the same object.

- *dynamiclowdefvoxelizationstep* : **number**, default (**50**), range(**]0;+∞]**)

  (in millimeter).

- *maxobjsize* : **number**, default (**0**)

  Maximum size (in millimeter) for objects (Oriented Bounding Box diagonal). This parameter could be used to discard corrupted geometries. Set it to zero to disable its effect.

- *maxvoxelcount* : **integer**, default (**1000000**), range(**]0;+∞]**)
- *minheuristicfordynamiclowdef* : **number**, default (**0.6**), range(**]0;1]**)
- *minheuristictoprioritizedynamiclowdef* : **number**, default (**0.98**), range(**]0;1]**)
- *minobjsizefordynamiclowdef* : **number**, default (**175**), range(**]0;+∞]**)

  Minimum length (in millimeter) of the Oriented Bounding Box diagonal for an object to be candidate for the dynamic LD (low-definition) model.

- *minobjsizeforstaticlowdef* : **number**, default (**300**), range(**]0;+∞]**)

  Minimum length (in millimeter) of the Oriented Bounding Box diagonal for an object to be candidate for the static LD (low-definition) model.

- *normalformat* : **string**, default (**xy16**), values (**xy16**, **xy32**, **xyz32**)

  The method used to store normals.

- *subgeometrylevel* : Defines the minimal granularity when exporting the source models of the geometry. see Subdivision level
- *visibilityvoxelizationstep* : **number**, default (**175**), range(**]0;+∞]**)

  (in millimeter).

- *tesselation* : **object**

  Allow to control/restrict tesselation parameters of CAD surface. Note that those parameters will have no effect if source data is already tesselated (cgr, obj, vrml, ...). Those parameters are computed automatically, however it might be needed to constraint them. Using aggressive values for those parameters may lead to an increase of geometry weight or a poor quality.

  - *sag* : **object**

    Define range of acceptable values for computed Sag value. The Sag defines the maximum distance (in millimeter) between the surface and the triangles generated to represent it.

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        - `min` : **number**, default (**0.01**), range(**]0;1000]**)
        - `max` : **number**, default (**5**), range(**]0;1000]**)

    - `angle` : **object**

      Define range of acceptable values for computed Angle value. The Angle defines the maximum angle (in degree) between the surface normal and the triangles normal generated to represent it.

        - `min` : **number**, default (**35**), range(**]0;180]**)
        - `max` : **number**, default (**55**), range(**]0;180]**)

Geometry subdivition level

Subdivision level

oneOf

The granularity of the geometry extraction. During top down traversal, the first node that meets one if this attributes will be merged as a single geometry. Must be one of or a combination of:
`nogeometry`: no geometry will be extracted (cannot be combined with other values).
`geometry`: produces one geometry per terminal item found in the CAD file.
`geometryparent`: produces one geometry for each parent node that contains only geometries.
`root`: only one geometry is extracted for the whole CAD file (cannot be combined with other values).
`body`: produces one geometry per body found in the CAD file.
`assembly`: produces one geometry per assembly found in the CAD file.
`part`: produces one geometry per part found in the CAD file.
`component`: produces one geometry per component found in the CAD file.
`geometricset`: produces one geometry per geometric set found in the CAD file.

- **array**, length (**[1;1]**)

  Those values cannot be combined with others.

    - items : **string**, values (**root**, **nogeometry**)
- **array**, length (**[1;+∞]**), distinct
    - items : **string**, values (**geometry**, **geometryparent**, **body**, **assembly**, **part**, **component**, **geometricset**)

4.3.5.2 - Output

For each job, the *PSConverter* produces a `convresult` result file and optionally a log file. The `convresult` file should then be processed by the **Connector**, it contains all the produced documents (*structure*, *partmetadata*, *linkmetadata*, *annotation*…), see Types of documents. The connector is responsible to analyze (cleanup, xref solving, …) convresult content and attach it to the product structure declared into the JSON document provider used to feed the *Generator* process. Some *partmetadata* documents may contain a `psconverter:type` field. This field will

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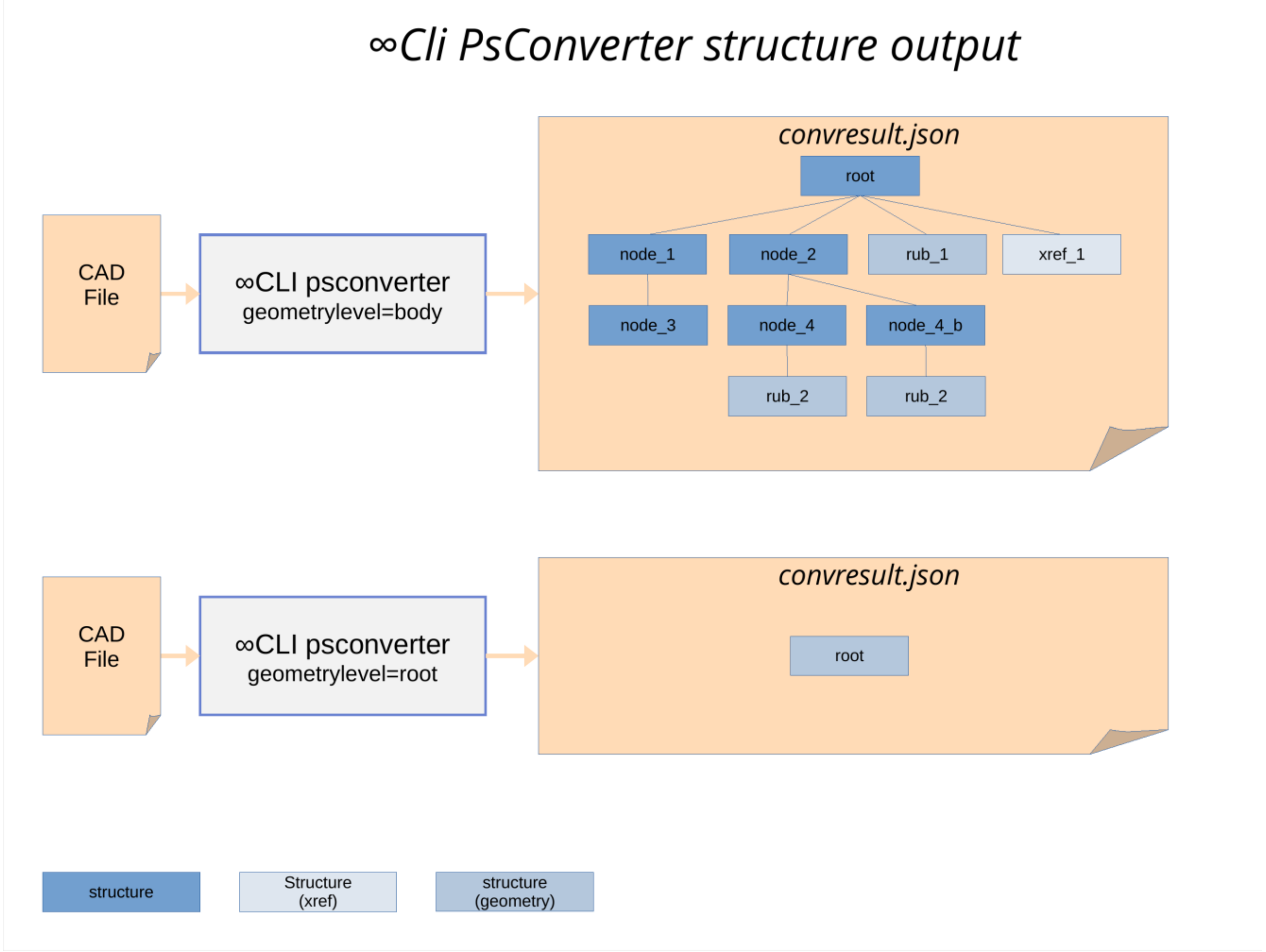
contain the CAD type of the item (see `subpartLevel`). It is up to the *Connector* to process it (remove, keep, rename).

⚠ Important note: some *structure* documents may reference external CAD files. In this case, the child object will not contain a `ref` field, but a `psconverter:xref` field containing the path read from the CAD file. It is up to the *Connector* to resolve these external references, to replace the `psconverter:xref` field with a proper `ref` field.

⚠ Important note: some *structure* documents may have invalid transform. In this case, the child object will contain the original homogeneous matrix data (in column-major order), stored in the `psconverter:badxform` field. It is up to the *Connector* to fix or remove the transform.



PsConverter structure output

Output file content

PsConverter convresult output file

object

- `docs` : **array**, *REQUIRED*
  - items : **object**, additional properties allowed

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        - `type` : **string**, *REQUIRED*, values (**structure**, **linkmetadata**, **partmetadata**, **geometry**, **annotation**)
- `infos` : see PsConverter result info

Result info

PsConverter result info

object

- `aabb` : **object**

  Axis-Aligned Bounding Box of the model.

    - `max` : **array**, *REQUIRED*, length (**[3;3]**)
        - items : **number**
    - `min` : **array**, *REQUIRED*, length (**[3;3]**)
        - items : **number**
- `builddataversion` : **string**, *REQUIRED*, values (**11.0**)

  Build data version.

- `convdate` : **string**, *REQUIRED*
- `converterversion` : **string**, *REQUIRED*
- `convresultdescriptor` : **string**, *REQUIRED*
- `copybeforeload` : **boolean**, *REQUIRED*
- `copybeforeloadbytecount` : **integer**, *REQUIRED*, range(**]0;+∞]**)
- `copybeforeloadstartidx` : **integer**, *REQUIRED*, range(**]0;+∞]**)
- `errors` : **array**
    - items : **string**
- `experimentalextractannotcapture` : **boolean**, *REQUIRED*
- `extractannot` : **boolean**, *REQUIRED*
- `extractfeatures` : **boolean**, default (**true**)
- `extracthiddenobjects` : **boolean**, *REQUIRED*
- `extractlinkmetadata` : **boolean**, *REQUIRED*
- `extractmetadata` : **boolean**, *REQUIRED*
- `fixinvalidxforms` : **string**, *REQUIRED*

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- *geometrylevel* : The granularity of the geometry extraction. During top down traversal, the first node that meets one if this attributes will be merged as a single geometry. Must be one of or a combination of:
  nogeometry: no geometry will be extracted (cannot be combined with other values).
  geometry: produces one geometry per terminal item found in the CAD file.
  geometryparent: produces one geometry for each parent node that contains only geometries.
  root: only one geometry is extracted for the whole CAD file (cannot be combined with other values).
  body: produces one geometry per body found in the CAD file.
  assembly: produces one geometry per assembly found in the CAD file.
  part: produces one geometry per part found in the CAD file.
  component: produces one geometry per component found in the CAD file.
  geometricset: produces one geometry per geometric set found in the CAD file. see Subdivision level

- *geometrysettings* : Settings used to process 3D data extracted from CAD files. The values can mostly remain untouched, unless you have a DMU geometry expressed with an unit different from the millimeter. If your DMU is plagued with rogue geometric parts impeding the rendering performance, you can also tweak these settings. see Geometry settings

- *inputunit* : **string**, *REQUIRED*

- *logfile* : **string**, *REQUIRED*

- *outputunit* : **string**, *REQUIRED*

- *overridecolor* : **string**, *REQUIRED*

- *processingtimeins* : **number**, *REQUIRED*, range(**]0;+∞]**)

- *statistics* : **object**, *REQUIRED*, additional properties allowed

- *ts* : **integer**, *REQUIRED*, range(**]1;+∞]**)

- *uniqueid* : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

  ID of a JSON document.

- *warnings* : **array**

  - items : **string**

- *workermaxramlimit* : **integer**, *REQUIRED*

  Maximum memory threshold applied during conversion.

- *workermaxthreadlimit* : **integer**, *REQUIRED*

  Maximum concurrent threads allowed per worker during conversion.

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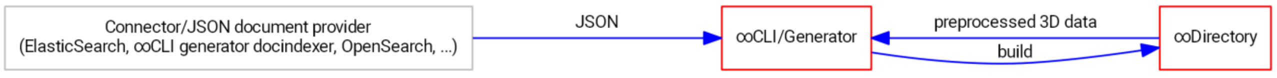
- `workermaxtimelimit` : **integer**, *REQUIRED*

  Maximum time threshold applied during conversion.

4.4 - Generator

4.4.1 - Introduction

The **Generator** is a tool available through the ∞CLI (see the [∞CLI psconverter]() command) allowing to process the product structure declared by the **Connector** and the geometry data extracted by the **PSConverter** to generate a `build`. This `build` must be attached to a `project`. Multiple instances of the **Generator** can be run concurrently. However it is advised not to run the **Connector** and **Generator** concurrently to ensure the integrity of builds.


Connector/JSON document provider
(ElasticSearch, ∞CLI generator docindexer, OpenSearch, ...)
JSON
∞CLI/Generator
preprocessed 3D data
build
∞Directory

Generator - Data flow

The structure definition will be fetched by the **Generator** using an ElasticSearch-like query from a Json document provider. The provider could be an ElasticSearch index (or compatible implementation like OpenSearch), the [∞CLI generator docindexer]() or directly the **Connector**. The Json document provider should expose a `_search` endpoint complient with the one described in `manual/3DJuump Infinite CLI doc indexer*.html`.

4.4.2 - Product Structure declaration guidelines

To achieve best performances during both build generation and exploitation some good practices should be observed by the **Connector** when it declares the product structure.

- Only declare and reference non-empty metadata document.
- Specify effectivities and tags only on children where they change. Effectivities and tags are automatically cascaded during product structure traversal.
- Ensure to reuse source models (**PsConverter** results) between builds if they didn't change.
- Do not instantiate the product structure

4.4.3 - Troubleshooting

To troubleshoot unexpected generation results and understand behavior of the **Generator**, it is possible to enable extended intermediate outputs by setting log level to `TRACE`. Integrators can then look into generated logs and csv files to track how documents or source models were processed. ⚠ This should not be maintained in production as it may impact performances and generate large log files.

4.4.4 - System parameters

Infinite Generator input

object

Data structure of an Infinite Generator job file.

- *`build`* : **object**, *REQUIRED*
  - *`buildparameters`* : see [Build parameters]()
  - *`geometrypoolid`* : **string**, *REQUIRED*, length (**[37;37]**), pattern (*`^geom_[a-f0-9]{32}$`*)

    The unique identifier of a geometry pool.
  - *`projectid`* : **string**, *REQUIRED*, length (**[36;36]**), pattern (*`^prj_[a-f0-9]{32}$`*)

    The unique identifier of the project.
- *`generatorcachefolder`* : **string**, default (****), length (**[0;+∞]**)

  Optional cache folder were Generator will search data before downloading them from the ∞Directory. This could save network bandwidth if Generator is executed on same server as the PSConverter, or if multiple run of the Generator will use same data. If relative, will be resolved relative to job file.
- *`log`* : see [Log configuration]()
- *`connectorinfo`* : **string**, *REQUIRED*, length (**[1;128]**)

  Name and version of the connector. This information will be added into ‘generatorfullversion’ field of build properties.
- *`system`* : **object**, *REQUIRED*

  Global settings.
  - *`workercount`* : **integer**, *REQUIRED*, range(**]1;+∞]**)

    The number of concurrent thread to use for batch treatment.
  - *`workingfolder`* : **string**, *REQUIRED*, length (**[1;+∞]**)

    The path of the folder where temporary files will be stored. If relative, will be resolved relative to job file.
  - *`maxrammb`* : **integer**, default (**524288**), range(**]1024;524288]**)

    Maximum memory that the generator is allowed to use. If it start using more than this threshold process will be killed.

4.4.5 - Build parameters

Build parameters

object

- *`applicableconfigurations`* : **oneOf**, default (**null**)

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References the applicable *configurations*. It contains a list of *configuration* document ids. Note: if set to `null` or if absent, all available configurations are considered applicable; if set to `[]`, then no configuration is applicable.

- **null**
- **array**, length (**[0;9999]**)

  This array should not contain duplicate values, uniqueItems is not specified in the schema for performance reasons.

  - items : **string**, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

    ID of a JSON document.

- `buildcomment` : **string**, *REQUIRED*, length (**[1;128]**)

  The human readable name of the build.

- `extratags` : **array**, default (**[]**), length (**[0;32]**), distinct

  A list of extra optional tags required to access some parts of the product structure.

  - items : **string**, length (**[1;64]**), pattern (`^[\x21\x23-\x39\x3c-\x5B\x5d-\x7e]+$`)

    Tag definition, because tags are also used as scopes limit them to scopes acceptable chars minus ':' and ';'. See https://www.rfc-editor.org/rfc/rfc6749#section-3.3.

- `limitpstoconfigurations` : **boolean**, *REQUIRED*

  If enabled, the product structure will be filtered to keep only branches that are complient with applicable configurations.

- `lowdeftrlcount` : **integer**, *REQUIRED*, range(**]10000;4000000]**)

  Triangle budget for the static LD representation of the DMU. 1000000 is a good all-round number.

- `modelaabblimit` : **object**, *REQUIRED*

  Defines the limits (in millimeter) of the exploitable DMU during the client session. Your DMU will not be truncated at the given boundaries but in the ∞Client 3D view, the camera will be properly centered and the end user will be able to extract geometric data out of these boundaries.

  - `xmax` : **number**, default (**250000**)
  - `xmin` : **number**, default (**-250000**)
  - `ymax` : **number**, default (**250000**)
  - `ymin` : **number**, default (**-250000**)

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  - `zmax` : **number**, default (**50000**)
  - `zmin` : **number**, default (**-50000**)

- `modelframe` : Defines the up and front vectors of the DMU. This information will be used to define the orientation of the view at the startup of native and Web clients. see Model frame

- `rootstructuredocid` : **string**, *REQUIRED*, length (**[1;255]**), pattern (`^[^_].{0,255}$`)

  structure document identifier to use as the root of the product structure.

- `strictmodelaabblimit` : **boolean**, default (**true**)

  If enabled, instances whose xform and/or aabb are not strictly inside modelaabblimit will be discarded. This prevent generation errors induced by degenerated or flying parts.

- `tags` : **array**, *REQUIRED*, length (**[1;32]**), distinct

  The minimal set of tags required to access a build.

  - items : **string**, length (**[1;64]**), pattern (`^[\x21\x23-\x39\x3c-\x5B\x5d-\x7e]+$`)

    Tag definition, because tags are also used as scopes limit them to scopes acceptable chars minus ‘:’ and ‘;’. See https://www.rfc-editor.org/rfc/rfc6749#section-3.3.

- `unit` : **string**, *REQUIRED*, values (**millimeter**, **centimeter**, **decimeter**, **meter**, **inch**, **foot**)

  The length unit of the project.

- `visiblercount` : **integer**, default (**10000**), range(**]500;65535]**)

- `xformtolerance` : **object**, *REQUIRED*

  Defines the tolerance of the matrix-matching algorithm in terms of position (`translation` in scene units) and orientation (`rotation` in degrees). Those values cannot be omitted or null. To run strict matching, set them to zero.

  - `rotation` : **number**, *REQUIRED*, range(**]0;+∞]**)
  - `translation` : **number**, *REQUIRED*, range(**]0;+∞]**)

4.4.6 - Model frame

Model frame

object

Defines the up and front vectors of the DMU. This information will be used to define the orientation of the view at the startup of native and Web clients.

- `up` : **array**, *REQUIRED*, length (**[3;3]**)

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Up vector.

    - items : **number**, range(**]-1;1]**)

- `front` : **array**, *REQUIRED*, length (**[3;3]**)

  Front vector, perpendicular to the up vector.

    - items : **number**, range(**]-1;1]**)

5 - Advanced usage

5.1 - EvoJuump to Connector

5.1.1 - Introduction

In specific scenarios, you might need to create a new build with product structure modifications from an EvoJuump. The ∞CLI tool can be used to unpack an EvoJuump and retrieve its metadata and geometries, which can then be reprocessed by a *Connector* to generate new builds.

See the documentation of the ∞CLI `evojuump unpack` command for a description of its parameters.

5.2 - Metadata update

During the build creation process, the metadata documents of the project are automatically updated to reflect the data provided to the *Generator*, and assigned a document timestamp specified in a `ts` field. However some may want to update the content of the metadata documents without generating a new build. This operation can be performed by using the `/docstore` endpoints of the HTTP API of the ∞Directory. See `/directory/api/docstore` in the documentation of the HTTP API. The API is designed for data enrichment, and is thus limited to consulting and modifying existing documents.

If you want to combine a build distribution flow with a metadata update flow, please pay attention to the timestamp of the documents: you should ensure that timestamps from the metadata update flow are superseded by timestamps from the build distribution flow. One possible way to achieve this is to reserve the MSB (Most Significant Bytes) part of the timestamps to the main *Connector* and leave the LSB (Least Significant Bytes) part to the metadata updater: thus, whenever a document is modified by the main *Connector*, it will supersede any local metadata update.

5.3 - Customization scripts

Some features might need to be customized per usage. This is made possible through various customization scripts, detailed in the following chapter. Customization scripts are JavaScript code executed by the Qt Script Engine in the case of the native client or the browser.

Scripts can be written directly in JavaScript or in TypeScript by implementing the provided interfaces. A list of the functions that must be implemented can be found as TypeScript interfaces in `dist/share/customization_script_interfaces`.

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5.3.1 - Client customization script

This script is used to customize the behavior of various native and Web clients. Based on the user context (teams, active configurations, ..), it could be used to:

- Filter displayed metadata
- Add virtual fields
- Change exported fields
- Format clipboard data
- Define the preferred filter type
- Add highlight colors on metadata fields and the tree view

⚠ this script is executed on client side and SHOULD NOT be used to implement security features.

For deployment see this chapter.

5.3.2 - Annotation task customization script

This script is only used by the native client. It is responsible for defining types of annotations and the corresponding forms that are available in the Annotation task.

For deployment see this chapter.

5.3.3 - Migration customization script

With each new version of the 3D Juump Infinite software, it is necessary to migrate existing *builds*. This is done through a specific migration procedure described in the *Administration manual*. However, this procedure relies on the usage of a connector-defined script to migrate metadata and project documents when needed (for example in case of an API change). This script is used when using the ∞CLI `evojuump migrate` command.

5.3.4 - TypeScript build stack

The folder `dist/share/customization_script_interfaces` contains a TypeScript project which is ready to generate customization scripts compatible with QtScript using tsc and a python post-processor.

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∞CLI: Command Line Interface

1 - Introduction to the Infinite CLI

The **3D Juump Infinite CLI** is a binary executable that performs various common operations related to 3D Juump Infinite servers components, like configuring backends, managing Evojuumps, converting CAD data, generating builds… One could compare it to a remote control room or a toolbox, provided to system administrators and data integrators of 3D Juump Infinite. Depending on the tasks that are undertaken, it can be used either from the user's personal machine or from the server machine, using a command line shell. It can serve for:

- 3D Juump Infinite Directory or Proxy configuration and initialization *(on the server machine)*
  - directory conf
  - directory init
  - proxy conf
  - proxy init
- 3D Juump Infinite Directory administration *(from the administrator's machine)*
  - directory registersuperadmin
  - directory registeroidc
- Data integration: generating and managing builds *(from the administrator's machine)*

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    - generator ...
    - psconverter ...
    - evojuump ...
- Running side services *(on the machine destined to run the service)*
    - generator docindexer
    - asyncjob ...
- Managing and configuring the Infinite CLI itself
    - cli conf
    - cli ...
    - directory list
    - directory registerapikey

The **3D Juump Infinite CLI** is shipped alongside the **∞Directory** and **∞Proxy** binaries, so that you can perform initialization operations with the server packages.

As usual with command-line tools, a detailed “usage” is available in the executable itself. We invite you to consult it for exact and up-to-date information about commands: - Executing *`./3dJuumpInfiniteCli.exe help -d`* will list all the available commands with their arguments and a short description. - You may notice that commands are grouped by topic. Executing *`./3dJuumpInfiniteCli.exe psconverter`* will list all the subcommands grouped under the *`psconverter`* topic.

Many commands require that you configure the **∞CLI** in order to contact the **∞Directory** you want to interact with. The Infinite CLI stores the specified credentials only locally, with encryption.

For instance, a first step would be to execute…

```
./3dJuumpInfiniteCli.exe directory registerapikey MyServerNickname 'https://p
reprod.3djuump.com:443/directory' 'MySecurePassword'
```

…before running various tasks on that server, for instance restoring on an Evojuump:

```
./3dJuumpInfiniteCli.exe evojuump restore 'C:\MyEvojuump.evojuump' 'my_evojuu
mp_password' MyServerNickname --worker-count 4
```

You may also refer to the detailed documentation below for a description of commands.

2 - ∞Directory

Commands starting with ***`directory ...`***

Regroups the various commands operating the ∞Directory.

2.1 - directory conf ...

Manages the ∞Directory configuration file.

2.1.1 - directory conf init

Initializes the ∞Directory configuration file with default fields.

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```
directory conf init [--conf-file|-c <val>]
```

Optional arguments:

- *`--conf-file|-c <val>`* : Path to the ∞Directory configuration file. If left empty, it will default to '*`%PROGRAMDATA%/3djuump-infinite-directory/conf_4_1.json`*' on Windows or '*`/etc/3djuump-infinite-directory/conf_4_1.json`*' on Linux.
  default: ""
  maxLength: 1024
  minLength: 0

2.1.2 - directory conf consolidate

Validates the content of the ∞Directory configuration file and ciphers all the sensitive fields. See the *`cipher`* CLI option to pre-cipher values.

```
directory conf consolidate [--conf-file|-c <val>]
```

Optional arguments:

- *`--conf-file|-c <val>`* : Path to the ∞Directory configuration file. If left empty, it will default to '*`%PROGRAMDATA%/3djuump-infinite-directory/conf_4_1.json`*' on Windows or '*`/etc/3djuump-infinite-directory/conf_4_1.json`*' on Linux.
  default: ""
  maxLength: 1024
  minLength: 0

2.2 - directory init

Initializes/Updates ∞Directory resources (PostgreSQL database, folders, …). If the PostgreSQL database does not exists, a connection to the 'postgres' database will be made to create it. This command should be executed after each binary update.

```
directory init [--conf-file|-c <val>] [--pg-wait-timeout <val>]
```

Optional arguments:

- *`--conf-file|-c <val>`* : Path to the ∞Directory configuration file. If left empty, it will default to '*`%PROGRAMDATA%/3djuump-infinite-directory/conf_4_1.json`*' on Windows or '*`/etc/3djuump-infinite-directory/conf_4_1.json`*' on Linux.
  default: ""
  maxLength: 1024
  minLength: 0
- *`--pg-wait-timeout <val>`* : The maximum wait duration when testing the availability of the PostgreSQL server.
  default: 10
  maximum: 360
  minimum: 10

2.3 - directory registersuperadmin

Registers a user on the ∞Directory as a super administrator.

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```
directory registersuperadmin <directory_nickname> <registration_code>
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- *`<directory_nickname>`* : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: *`\S+`*
- *`<registration_code>`* : A registration code retrieved from the endpoint *`/directory/api/directorysession/requestsuperadminregistrationcode`*.
  example: “0123456789abcdef0123456789abcdef0123456789abcdef0123456789abcdef”
  minLength: 1

2.4 - directory registerapikey

Registers API key credentials in the configuration file to access an ∞Directory.

```
directory registerapikey <directory_nickname> <directory_url> <api_key> [--lo
cation|-l <.|userscope|systemscope|auto>] [--nosslcheck] [--mtls-cert-p12 <va
l>] [--mtls-cert-pwd <val>]
```

Arguments:

- *`<directory_nickname>`* : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: *`\S+`*
- *`<directory_url>`* : Directory API URL for public usage. The port has to be explicited as this attribute is part of the license.
  example: “https://127.0.0.1:443/directory”
  maxLength: 1024
  pattern: *`^https?:\/\/[^@\/A-Z]+?(:[1-9][0-9]{0,4})(\/.*)?\/directory$`*
- *`<api_key>`* :
  minLength: 1

Optional arguments:

- *`--location|-l <.|userscope|systemscope|auto>`* : Predefined location of the configuration file. ‘*`.`*’ will be in the current working directory. ‘*`userscope`*’ will be in *`%APPDATA%`* on Windows and *`~/`* on Linux. ‘*`systemscope`*’ will be in *`%PROGRAMDATA%`* on Windows and *`/etc/`* on Linux. ’*`auto`* will use search path to find configuration file and will default to userscope if no existing file was found.
  default: “auto”
  enum: [‘.’, ‘userscope’, ‘systemscope’, ‘auto’]

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- `--nosslcheck` : Disable SSL peer verification for directory calls.
  default: False
- `--mtls-cert-p12 <val>` : Path to a mTLS p12 client certificate.
  default: ""
- `--mtls-cert-pwd <val>` : The mTLS p12 password.
  default: ""

2.5 - directory registeroidc

Registers OpenId Connect credentials in the configuration file to access an ∞Directory.

```
directory registeroidc <directory_nickname> <directory_url> <oidc_conf_url> <
client_id> <client_secret> [--location|-l <.|userscope|systemscope|auto>] [--
nosslcheck] [--mtls-cert-p12 <val>] [--mtls-cert-pwd <val>] [--noproxyforoidc
]
```

Arguments:

- `<directory_nickname>` : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: `\S+`
- `<directory_url>` : Directory API URL for public usage. The port has to be explicited as this attribute is part of the license.
  example: “https://127.0.0.1:443/directory”
  maxLength: 1024
  pattern: `^https?:\/\/[^@\/A-Z]+?(:[1-9][0-9]{0,4})(\/.*)?\/directory$`
- `<oidc_conf_url>` : OpenID Provider configuration URL (https://openid.net/specs/openid-connect-discovery-1_0.html#ProviderConfigurationRequest).
  example: “https://myapp.auth0.com/.well-known/openid-configuration”
  maxLength: 1024
  pattern: `^https:\/\/([^\/]*?)\/.*$`
- `<client_id>` :
  minLength: 1
- `<client_secret>` :
  minLength: 1

Optional arguments:

- `--location|-l <.|userscope|systemscope|auto>` : Predefined location of the configuration file. ‘`.`’ will be in the current working directory. ‘`userscope`’ will be in `%APPDATA%` on Windows and `~/` on Linux. ‘`systemscope`’ will be in `%PROGRAMDATA%` on Windows and `/etc/` on Linux. ’`auto` will use search path to find configuration file and will default to userscope if no existing file was found.
  default: “auto”
  enum: [‘.’, ‘userscope’, ‘systemscope’, ‘auto’]

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- `--nosslcheck` : Disable SSL peer verification for directory calls.
  default: False
- `--mtls-cert-p12 <val>` : Path to a mTLS p12 client certificate.
  default: ""
- `--mtls-cert-pwd <val>` : The mTLS p12 password.
  default: ""
- `--noproxyforoidc` : Disables the use of an HTTP proxy for directory calls.
  default: False

2.6 - directory unregister

Unregisters from the configuration file the credentials associated to an ∞Directory.

```
directory unregister <directory_nickname> [--location|-l <.|userscope|systems
cope|auto>]
```

Arguments:

- `<directory_nickname>` : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: `\S+`

Optional arguments:

- `--location|-l <.|userscope|systemscope|auto>` : Predefined location of the configuration file. ‘`.`’ will be in the current working directory. ‘`userscope`’ will be in `%APPDATA%` on Windows and `~/` on Linux. ‘`systemscope`’ will be in `%PROGRAMDATA%` on Windows and `/etc/` on Linux. ’`auto` will use search path to find configuration file and will default to userscope if no existing file was found.
  default: “auto”
  enum: [‘.’, ‘userscope’, ‘systemscope’, ‘auto’]

2.7 - directory list

Lists ∞Directories credentials registered in the configuration file.

```
directory list [--location|-l <.|userscope|systemscope|auto>] [--ext-info|--v
erbose|-v]
```

Optional arguments:

- `--location|-l <.|userscope|systemscope|auto>` : Predefined location of the configuration file. ‘`.`’ will be in the current working directory. ‘`userscope`’ will be in `%APPDATA%` on Windows and `~/` on Linux. ‘`systemscope`’ will be in `%PROGRAMDATA%` on Windows and `/etc/` on Linux. ’`auto` will use search path to find configuration file and will default to userscope if no existing file was found.
  default: “auto”
  enum: [‘.’, ‘userscope’, ‘systemscope’, ‘auto’]

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- *--ext-info|--verbose|-v* : Print extended informations.
  default: False

3 - ∞Proxy

Commands starting with ***proxy ...***

Regroups the various commands operating the ∞Proxy.

3.1 - proxy conf ...

Manages the ∞Proxy configuration file.

3.1.1 - proxy conf init

Initializes the ∞Proxy configuration file with default fields.

```
proxy conf init [--conf-file|-c <val>]
```

Optional arguments:

- *--conf-file|-c <val>* : Path to the ∞Proxy configuration file. If left empty, it will default to '*%PROGRAMDATA%/3djuump-infinite-proxy/conf_4_1.json*' on Windows or '*/etc/3djuump-infinite-proxy/conf_4_1.json*' on Linux.
  default: ""
  maxLength: 1024
  minLength: 0

3.1.2 - proxy conf consolidate

Validates the content of the ∞Proxy configuration file and ciphers all the sensitive fields. See the *cipher* CLI option to pre-cipher values.

```
proxy conf consolidate [--conf-file|-c <val>]
```

Optional arguments:

- *--conf-file|-c <val>* : Path to the ∞Proxy configuration file. If left empty, it will default to '*%PROGRAMDATA%/3djuump-infinite-proxy/conf_4_1.json*' on Windows or '*/etc/3djuump-infinite-proxy/conf_4_1.json*' on Linux.
  default: ""
  maxLength: 1024
  minLength: 0

3.2 - proxy init

Initializes/Updates ∞Proxy resources (PostgreSQL database, folders, ...). If the PostgreSQL database does not exists, a connection to the 'postgres' database will be made to create it. This command should be executed after each binary update.

```
proxy init [--conf-file|-c <val>] [--pg-wait-timeout <val>]
```

Optional arguments:

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- `--conf-file|-c <val>` : Path to the ∞Proxy configuration file. If left empty, it will default to ‘`%PROGRAMDATA%/3djuump-infinite-proxy/conf_4_1.json`’ on Windows or ‘`/etc/3djuump-infinite-proxy/conf_4_1.json`’ on Linux.
  default: ""
  maxLength: 1024
  minLength: 0
- `--pg-wait-timeout <val>` : The maximum wait duration when testing the availability of the PostgreSQL server.
  default: 10
  maximum: 360
  minimum: 10

4 - ∞AsyncJobSolver

4.1 - asyncjob solver

Start an instance of asynchronous job solver. Note that if used directory API key could only be used as credentials if all proxies also have an API key configured.

```
asyncjob solver <directory_nickname> <tmp_folder> [--maxmemorymb <val>] [--ma
xcpu <val>] [--jobtypes <val>] [--openglprovider <none|system|mesa>]
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- `<directory_nickname>` : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: `\S+`
- `<tmp_folder>` : Path to a temporary folder in which worker will write temporary files.

Optional arguments:

- `--maxmemorymb <val>` : Maximum amount of memory that could be used to solve jobs. A minimum of 2048MB is recommended. If 0 80% of RAM will be used.
  default: 0
  minimum: 0
- `--maxcpu <val>` : Maximum number of cpu that could be used to solve jobs. A minimum of 2 is recommended. If 0 all cpu will be used.
  default: 0
  minimum: 0
- `--jobtypes <val>` : Comma separated list of accepted job types, if empty all supported job types will be accepted.
  default: "“
  example:”test,export3d"

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- *--openglprovider <none|system|mesa>* : Allows to choose which OpenGL implementation should be used. *none* : will not load OpenGL support, making some export jobs unprocessable. *system* : will use OpenGL implementation provided by the OS. *mesa* : will use Mesa3D LLVM software renderer (only available on Windows).
  default: "system"
  enum: ['none', 'system', 'mesa']

5 - PSConverter

Commands starting with ***psconverter ...***

Performs the conversion of CAD/3D file.

5.1 - psconverter convert

Processes the given PSConverter job file.

```
psconverter convert <job_file> <directory_nickname>
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- *<job_file>* : An x-ndjson file containing a settings JSON, followed by a list of jobs that should be processed by the PSConverter. See PSConverter section in Integration manual for details.
  example: C:/psconverter_input_file.x-ndjson
  minLength: 1
- *<directory_nickname>* : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: "my_directory"
  maxLength: 64
  minLength: 1
  pattern: `\S+`

5.2 - psconverter version

Returns the version of the PSConverter.

```
psconverter version
```

5.3 - psconverter supportedfileformats

Returns list of supported file extensions.

```
psconverter supportedfileformats
```

6 - Generator

Commands starting with ***generator ...***

Regroups various operations relative to the build generation process.

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6.1 - generator canbuild

Checks that the specified project exists and that the licence allows this tool to generate builds.

```
generator canbuild <project_id> <directory_nickname> [--ifmissingcreatewithna
me <val>]
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- `<project_id>` : The unique identifier of the project.
  example: “prj_091d232caeae2c0d2e4e63b031534c5b”
  maxLength: 36
  minLength: 36
  pattern: `^prj_[a-f0-9]{32}$`
- `<directory_nickname>` : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: `\S+`

Optional arguments:

- `--ifmissingcreatewithname <val>` : If project does not exists, it will be created with provided name.
  default: ""
  maxLength: 128
  minLength: 1

6.2 - generator build

Launches the generation of a build.

```
generator build <build_description_file> <index_url> <directory_nickname>
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- `<build_description_file>` : A file containing the various build parameters. See Generator section in Integration manual for details.
  example: C:/generator_input_file.json
  minLength: 1
- `<index_url>` : Full URL to the JSON document provider index (elasticsearch, CLI doc indexer, ...).
  example: “http://127.0.0.1:9200/prj_195df47ecc0c2f7d2d6ab832b28a3e84_connector”
  minLength: 1
  pattern: `^https?:\/\/.*$`
- `<directory_nickname>` : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.

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example: “my_directory”
maxLength: 64
minLength: 1
pattern: `\S+`

6.3 - generator syncmetadata

Imports new metadata from a connector index into a project DocStore.

```
generator syncmetadata <index_url> <directory_nickname> <projectid> [--worker
-count|-w <val>]
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- *`<index_url>`* : Full URL to the JSON document provider index (elasticsearch, CLI doc indexer, …).
  example: “http://127.0.0.1:9200/prj_195df47ecc0c2f7d2d6ab832b28a3e84_connector”
  minLength: 1
  pattern: `^https?:\/\/.*$`
- *`<directory_nickname>`* : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: `\S+`
- *`<projectid>`* : The unique identifier of the project.
  example: “prj_091d232caeae2c0d2e4e63b031534c5b”
  maxLength: 36
  minLength: 36
  pattern: `^prj_[a-f0-9]{32}$`

Optional arguments:

- *`--worker-count|-w <val>`* : The maximum number of concurrent workers.
  default: 4
  maximum: 16
  minimum: 1

6.4 - generator docindexer

Runs a local in-memory document indexer that can act as a substitute to ElasticSearch in its role of input for build generation.

```
generator docindexer <listeningport> [--close-with-parent] [--log-file <val>]
[--validate-documents] [--cleanup-documents] [--compress] [--http-compress] [
--swap-folder <val>] [--max-memory-before-swap-mb <val>] [--dump-out <val>] [
--dump-in <val>] [--dump-format <dataonly|_index|folder>]
```

Cancelable using CTRL+C/SIGTERM events.

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Arguments:

- `<listeningport>` :
  maximum: 65535
  minimum: 1025

Optional arguments:

- `--close-with-parent` : If set, the process will exit if its parent process is closed.
  default: False
- `--log-file <val>` : Overrides the location of the log file specified in the CLI configuration.
  default:
- `--validate-documents` : Enable JSON document validation when inserting them into the index. This option SHOULD NOT BE used in production as it will reduce performances.
  default: False
- `--cleanup-documents` : Enable JSON document cleanup, by removing unexpected field in root object. This option SHOULD NOT BE used in production as it will reduce performances and will cause a restreaming of JSON document which could alter numeric values. Cleanup will be done before document validation.
  default: False
- `--compress` : Compresses documents, it will reduce memory usage but will be slower to index.
  default: False
- `--http-compress` : Allow compression of HTTP response. This will reduce bandwith but will cost CPU and add latency.
  default: False
- `--swap-folder <val>` : If set JSON data will be dumped into this folder to limit memory usage. Only index will reside in memory. Using swap file will obviously reduce indexation and fetch speed.
  default:
- `--max-memory-before-swap-mb <val>` : If –swap-folder is specified, will be the maximum amound of document data kept in memory before starting storing data on swap file. Note that total used memory will be greater than this limit as index will be kept in memory.
  default: 32
  minimum: 0
- `--dump-out <val>` : File location where index content will be dumped on exit or first search.
- `--dump-in <val>` : File location from which to initialize doc indexer.
- `--dump-format <dataonly|_index|folder>` : Dump file format.
  `_index` : same format as /_index API endpoint.
  `dataonly` : an x-ndjson containing only documents. It is more suitable for interoperability but will be slower to import.
  `folder` : a folder containing a JSON file per document. Folder will be scanned recursively. Only supported as input format.
  default: "_index"
  enum: [‘dataonly’, ’_index’, ‘folder’]

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6.4.1 - generator geometrypool dump

Dump generation data from the geometry pool. This dump is intended for debug purposes, to be transfered to 3D Juump Infinite support team.

```
generator geometrypool dump <output_file> <geometry_pool_id> <directory_nickn
ame>
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- *`<output_file>`* : A file that will contain dumped data.
  example: C:/geometry_pool_content.dump
  minLength: 1
- *`<geometry_pool_id>`* : The unique identifier of a geometry pool.
  example: “geom_091d232caeae2c0d2e4e63b031534c5b”
  maxLength: 37
  minLength: 37
  pattern: *`^geom_[a-f0-9]{32}$`*
- *`<directory_nickname>`* : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: *`\S+`*

6.5 - generator elasticsearch dump

Dump an elasticsearch index content, to a format compatible with docindexer dump. This dump is intended for debug purposes, to be transfered to 3D Juump Infinite support team.

```
generator elasticsearch dump <output_file> <index_url>
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- *`<output_file>`* : A file that will contain dumped data.
  example: C:/geometry_pool_content.dump
  minLength: 1
- *`<index_url>`* : Full URL to the JSON document provider index (elasticsearch, CLI doc indexer, ...).
  example: “http://127.0.0.1:9200/prj_195df47ecc0c2f7d2d6ab832b28a3e84_connector”
  minLength: 1
  pattern: *`^https?:\/\/.*$`*

7 - Evojuump

Commands starting with ***`evojuump ...`***

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Regroups various operations relative to EvoJuump files.

7.1 - evojuump info

Displays the properties of the given EvoJuump. Integrity will be checked if correct password is provided.

```
evojuump info <evojuump> [--password <val>]
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- `<evojuump>` : An EvoJuump file.
  example: C:/mybuild.evojuump
  minLength: 1

Optional arguments:

- `--password <val>` : The password to test, could be omitted.
  default: ""
  minLength: 0

7.2 - evojuump restore

Restores the specified EvoJuump to an ∞Directory.

```
evojuump restore <srcevojuump> <passphrase> <directory_nickname> [--worker-co
unt|-w <val>]
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- `<srcevojuump>` : An EvoJuump file.
  example: C:/mybuild.evojuump
  minLength: 1
- `<passphrase>` : The passphrase of the EvoJuump.
  example: “mypassphrase1”
  minLength: 0
- `<directory_nickname>` : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: `\S+`

Optional arguments:

- `--worker-count|-w <val>` : The maximum number of concurrent workers.
  default: 2
  maximum: 8
  minimum: 1

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7.3 - evojuump migrate

Migrates an old EvoJuump to the current version of the CLI. The migration log will be saved next to the resulting EvoJuump.

```
evojuump migrate <srcevojuump> <passphrase> <dstevojuump> <postgresurl> <tmpf
older> [--script <val>] [--diag-script] [--worker-count|-w <val>]
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- `<srcevojuump>` : An EvoJuump file.
  example: C:/mybuild.evojuump
  minLength: 1
- `<passphrase>` : The passphrase of the EvoJuump.
  example: “mypassphrase1”
  minLength: 0
- `<dstevojuump>` : The destination for the migrated EvoJuump file.
  example: C:/mybuild_migrated.evojuump
  minLength: 1
- `<postgresurl>` : The URL to the PostgreSQL cluster of an ∞Proxy, that will be used for the migration.
  example: “pg://login:pwd@127.0.0.1:5400”
  pattern: `^(pg|postgres|postgresql):\/\/(.+@)?([^@]+?):[1-9][0-9]{0,4}$`
- `<tmpfolder>` : A temporary folder used to unpack the EvoJuump.
  minLength: 1

Optional arguments:

- `--script <val>` : A migration script to update metadata documents.
  default:
  minLength: 1
- `--diag-script` : If set each script call will be logged (as DEBUG) with input and output. This operation will be slow and will generate a huge amount of log.
  default: False
- `--worker-count|-w <val>` : The maximum number of concurrent workers.
  default: 2
  maximum: 32
  minimum: 1

7.4 - evojuump checkintegrity

Checks the integrity of a EvoJuump without need of password. Only EvoJuump generated by version 4.0 or upper are supported. For older EvoJuump use ‘EvoJuump info’.

```
evojuump checkintegrity <srcevojuump>
```

Arguments:

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- *`<srcevojuump>`* : An EvoJuump file.
  example: C:/mybuild.evojuump
  minLength: 1

7.5 - evojuump dump

Generates an EvoJuump (pack file) of a build. It is recommended to perform this operation when no build generation or metadata update is in progress on the associated project.

```
evojuump dump <dstevojuump> <passphrase> <directory_nickname> <buildid> [--wo
rker-count|-w <val>] [--checksum-file <val>] [--no-generation-stats]
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- *`<dstevojuump>`* : The destination for the EvoJuump file.
  example: C:/mybuild.evojuump
  minLength: 1
- *`<passphrase>`* : The passphrase of the EvoJuump.
  example: “mypassphrase1”
  minLength: 0
- *`<directory_nickname>`* : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: `\S+`
- *`<buildid>`* : The unique identifier of a build.
  example: “{48577a06-4733-4510-a49a-ce2202134617}”
  maxLength: 38
  minLength: 38
  pattern: `^\{[a-f0-9]{8}-[a-f0-9]{4}-[a-f0-9]{4}-[a-f0-9]{4}-[a-f0-9]{12}\}$`

Optional arguments:

- *`--worker-count|-w <val>`* : The maximum number of concurrent workers.
  default: 2
  maximum: 8
  minimum: 1
- *`--checksum-file <val>`* : The file where to store checksums of the EvoJuump file.
  default:
  minLength: 1
- *`--no-generation-stats`* : When set to true, does not pack the files *`generation_statistics.json`* and *`generation_statistics.html`* within the EvoJuump.
  default: False

7.6 - evojuump unpack

Unpacks the given EvoJuump to allow data processing by a connector.

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```
evojuump unpack <srcevojuump> <passphrase> <directory_nickname>
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- *`<srcevojuump>`* : An EvoJuump file.
  example: C:/mybuild.evojuump
  minLength: 1
- *`<passphrase>`* : The passphrase of the EvoJuump.
  example: “mypassphrase1”
  minLength: 0
- *`<directory_nickname>`* : A nickname used to reference an ∞Directory/credentials pair previously registered on the CLI.
  example: “my_directory”
  maxLength: 64
  minLength: 1
  pattern: `\S+`

8 - ∞CLI misc

8.1 - version

Outputs the version of the tool on the standard output (stdout).

```
version [--output-file|-o <val>]
```

Optional arguments:

- *`--output-file|-o <val>`* : Instead of stdout, specifies a destination file within which the version string should be written.
  default:

8.2 - help

List all CLI commands. Command detail documentation is available by calling desired command without arguments.

```
help [--description|-d]
```

Optional arguments:

- *`--description|-d`* : Display command description.
  default: False

8.3 - systeminfo

Generates a system/hardware info report on the standard output.

```
systeminfo [--output-file|-o <val>]
```

Optional arguments:

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- `--output-file|-o <val>` : Instead of stdout, specifies a destination file within which the report should be written.
  default:

8.4 - cipher

Ciphers a value for use within configuration files (like `conf consolidate`). If called without -v, command will be interactive.

```
cipher [--value|-v <val>]
```

Optional arguments:

- `--value|-v <val>` :
  maxLength: 1024
  minLength: 1
  pattern: `^(?!cipher=).*$`

8.5 - cli conf ...

Manages the configuration file of the ∞CLI.

8.5.1 - cli conf init

Initializes the configuration file with default fields.

```
cli conf init [--location|-l <.|userscope|systemscope|auto>]
```

Optional arguments:

- `--location|-l <.|userscope|systemscope|auto>` : Predefined location of the configuration file. '`.`' will be in the current working directory. '`userscope`' will be in `%APPDATA%` on Windows and `~/` on Linux. '`systemscope`' will be in `%PROGRAMDATA%` on Windows and `/etc/` on Linux. '`auto` will use search path to find configuration file and will default to userscope if no existing file was found.
  default: "auto"
  enum: ['.', 'userscope', 'systemscope', 'auto']

8.5.2 - cli conf consolidate

Validates the content of the configuration file and ciphers all the sensitive fields. See the `cipher` CLI option to pre-cipher values.

```
cli conf consolidate [--location|-l <.|userscope|systemscope|auto>]
```

Optional arguments:

- `--location|-l <.|userscope|systemscope|auto>` : Predefined location of the configuration file. '`.`' will be in the current working directory. '`userscope`' will be in `%APPDATA%` on Windows and `~/` on Linux. '`systemscope`' will be in `%PROGRAMDATA%` on Windows and `/etc/` on Linux. '`auto` will use search path to find configuration file and will default to userscope if no existing file was found.
  default: "auto"
  enum: ['.', 'userscope', 'systemscope', 'auto']

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8.5.3 - cli conf searchpath

Shows the current search path for the configuration file.

```
cli conf searchpath
```

9 - Diagnostic tools

9.1 - diag httpapi accesslog

Analyse the access logs of the HTTP API implementation (.*log and* .log_[0-9]+.back) to extract usage statistics.

```
diag httpapi accesslog <outputfolder> <filebasename> [--date-min <val>] [--no
auto] [--logfolder|-f <val>] [--no-recurse] [--workers|-w <val>]
```

Cancelable using CTRL+C/SIGTERM events.

Arguments:

- `<outputfolder>` : Result file path.
  example: C:/mystatsoutput
- `<filebasename>` : Base name of result files.
  minLength: 1

Optional arguments:

- `--date-min <val>` : Ignore log entries whose date is lower than this value.
  default: “1970-01-31”
  pattern: `[0-9]{4}-[0-9]{2}-[0-9]{2}`
- `--noauto` : Disable automatic log discovery (from conf_x_y.json files and default log locations).
  default: False
- `--logfolder|-f <val>` : Specify folder containing logs.
  default:
- `--no-recurse` : Disable recurse search for logs.
  default: False
- `--workers|-w <val>` : The amount of concurrent workers.
  default: 0

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Native client customization

1 - Client customization script deployment

Customization scripts project document

object

- *`id`* : **string**, *REQUIRED*, const (**com.3djuump:scripts**)
- *`type`* : **string**, *REQUIRED*, const (**projectdocument**)
- *`ts`* : **integer**, *REQUIRED*, range(**]1;9.22e+18]**)

  Timestamp of a JSON document. When the document is updated, the version with the higher timestamp will be kept.

- *`subtype`* : **string**, *REQUIRED*, const (**scripts**)
- *`scriptbase64`* : **string**, length (**[0;4194304]**), pattern (*`^(?:[A-Za-z0-9+\/]{4})*(?:[A-Za-z0-9+\/]{2}==|[A-Za-z0-9+\/]{3}=)?$`*)

  Base64 string.

- *`taskscripts`* : **object**

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- *AnnotationTask* : **string**, length (**[0;4194304]**), pattern (*^(?:[A-Za-z0-9+\/]{4})*(?:[A-Za-z0-9+\/]{2}==|[A-Za-z0-9+\/]{3}=)?$*)

  Customization script related to the Annotation task.

See Customization scripts for implementation details.

2 - Client default settings

The *client default settings* document assigns default values to a subset of settings used by all the 3D Juump Infinite client applications. This document has a fixed id: *"com.3djuump:defaultsettings"*. Here is the typical content of this document:

```
{
    "id": "com.3djuump:defaultsettings",
    "type": "projectdocument",
    "subtype": "defaultsettings",
    "ts": <timestamp>,
    "version": "11.0",
    "settings": {
        "fieldofview":{
            "degree":25,
            "orientation":"vertical"
        },
        "dynamiclowdefprofiles": {
            "standard":1048576,
            "high":2097152
        }
    },
    "profiles": [<list of profiles>],
    "tasksettings": {
        "<task>": { <task settings> },
        ...
    }
}
```

Default settings project document

object

- *id* : **string**, *REQUIRED*, const (**com.3djuump:defaultsettings**)
- *type* : **string**, *REQUIRED*, const (**projectdocument**)
- *ts* : **integer**, *REQUIRED*, range(**]1;9.22e+18]**)

  Timestamp of a JSON document. When the document is updated, the version with the higher timestamp will be kept.

- *subtype* : **string**, *REQUIRED*, const (**defaultsettings**)
- *settings* : **object**, *REQUIRED*
  - *fieldofview* : **object**

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Specify the default field of view of the camera for a project.

        - *degree* : **number**, *REQUIRED*, range(**]1;179]**)
        - *orientation* : **string**, *REQUIRED*, values (**vertical**, **horizontal**)
    - *dynamiclowdefprofiles* : **object**

        This setting allows to tune the polygon budgets allocated to the dynamic low-def algorithm. It supports two budgets that the user will be able to chose from: *standard* and *high*.

        - *standard* : **number**, *REQUIRED*, range(**]1;+∞]**)
        - *high* : **number**, *REQUIRED*, range(**]2;+∞]**)
- *profiles* : **array**

    This settings makes it possible to define project-wide export profiles. When a user explores the DMU of a given project, the settings of the ∞Client automatically populate with the corresponding project-wide export profiles for the user to chose from.

    - items : see [Export profiles]
- *tasksettings* : **object**

    Regroups all the task-specific settings.

    - *PresentationTask* : **object**
        - *aspectratio* : **array**, length (**[2;2]**)

            The default aspect ratio of the presentation, defined as an array of two numbers (width vs. height).

            – items : **integer**, range(**]1;+∞]**)

2.1 - Export profiles

These export profiles affect only the 3D Juump Infinite native client.

Export profiles

allOf

- **oneOf**
    - Export profile related to Presentation tasks. The *commandLineResultExt* field is not supported in combination with the *image* profile. see [Presentation task export profile]
    - Export profile related to Datapackage tasks. The *commandLineResultExt* field is not supported in combination with *geometric* and *metadata* profiles. see [Datapackage task export profile]

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  - see Metadata export profile
  - Export profile related to image data export. see Image export profile
  - Export profile related to 3D data export. see Geometric 3D export profile
  - see Annotation task export profile
- **object**, additional properties allowed
  - `id` : **string**, *REQUIRED*, length (**[1;+∞]**)
  - `name` : **string**, *REQUIRED*, length (**[1;+∞]**)

2.1.1 - Image

Image export profile

object

Export profile related to image data export.

- `backgroundColor` : **string**, length (**[7;9]**), pattern (`^#[0-9A-Fa-f]{6,8}$`)

  A string coding the color to use when `useBackgroundColor` is set to `true` (HTML encoding in the form “#AARRGGBB”, where AA is the alpha channel - a value of `00` means transparent).

- `commandLine` : **string**, default (****), length (**[0;+∞]**)

  A string defining an optional post-process command line. If left empty, it means no post-process. When not empty, its content will be interpreted as a command line in the context of the user’s computer. In particular, all paths used in this `commandLine` field must exist on the target computers, thus it is advised that the post-process tools are either available as global executables (in the %PATH% environment variable on Windows, for instance) or on a common network file share. To reference the exported file in the command line definition, one can use the `%s` notation. 3D Juump Infinite will automatically replace `%s` with the actual path to the exported file before it executes the command line. If `commandLineResultExt` is specified `%o` notation will be used to reference final file choosen by the user. The provided command-line will be executed as-is on the user’s computer and in the user’s context. It is your responsibility to make sure that the command-line is properly tested and does not alter the user’s computer or any connected computers accessible in the user’s context in any damaging way.

- `commandLineResultExt` : **string**, default (****), length (**[0;+∞]**)

  An optional string allowing to specify the extension of the commandLine result. If specified, the user will be asked to choose a result file with this extension.

- `formatname` : **string**, *REQUIRED*, values (**Format_Image_PNG**, **Format_Image_JPEG**, **Format_Image_TIFF**)

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    - Format_Image_PNG: for PNG format
    - Format_Image_JPEG: for JPEG format
    - Format_Image_TIFF: for TIFF format.

- *`height`* : **integer**, range(**]0;+∞]**)

  Height of the image in pixels. Only useful with custom resolution.

- *`highQuality`* : **boolean**

  If *`false`*, the image is directly shot from the scene as seen by the user (geometry level of detail is not guaranteed, the background is set to the current 3D view background and the resolution is fixed to dimensions of the 3D view).
  If *`true`*, the generation process makes sure that every visible geometry is loaded in its highly detailed version and rendered at the chosen resolution. Shooting high-quality images can be significantly longer but the level of detail is guaranteed and the final image background and resolution can be freely chosen (see below).

- *`id`* : **string**

- *`name`* : **string**, default (****), length (**[0;+∞]**)

  Name of the profile as seen by the user in the ∞Client. This field should be empty for sub export profiles.

- *`overrideBackground`* : **boolean**

  If enabled current viewer background will be overrided using ‘useBackgroundColor’ and ‘backgroundColor’.

- *`resolution`* : **integer**, range(**]0;8]**)

  0: means that the resolution is not set and should match the current 3D view resolution
  1: corresponds to 4096x2160
  2: corresponds to 2560x1600
  3: corresponds to 1920x1080
  4: corresponds to 1600x1200
  5: corresponds to 1280x720
  6: corresponds to 800x600
  7: corresponds to 320x200
  8: means that the resolution is none of the above and should be customized thanks to the *`width`* and *`height`* fields.
  When *`highQuality`* is set to *`false`*, this field is ignored and defaults to *`0`*.

- *`type`* : **string**, *REQUIRED*, const (**image**)

- *`exportBom`* : **boolean**

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- `constraint` : **integer**

  Aspect ratio / resolution constraint. 0 : NOCONSTRAINT, 1 : WIDTH, 2 : HEIGHT.

- `useBackgroundColor` : **boolean**

  In `highQuality` tells whether the image uses the same background as the 3D view or if it uses a defined color.

- `version` : **integer**, *REQUIRED*, const (**2**)

  Export profile version.

- `width` : **integer**, range(**]0;+∞]**)

  Width of the image in pixels. Only useful with custom resolution.

2.1.2 - Geometric/3D

Geometric 3D export profile

object

Export profile related to 3D data export.

- `commandLine` : **string**, default (****), length (**[0;+∞]**)

  A string defining an optional post-process command line. If left empty, it means no post-process. When not empty, its content will be interpreted as a command line in the context of the user's computer. In particular, all paths used in this `commandLine` field must exist on the target computers, thus it is advised that the post-process tools are either available as global executables (in the %PATH% environment variable on Windows, for instance) or on a common network file share. To reference the exported file in the command line definition, one can use the `%s` notation. 3D Juump Infinite will automatically replace `%s` with the actual path to the exported file before it executes the command line. If `commandLineResultExt` is specified `%o` notation will be used to reference final file choosen by the user. The provided command-line will be executed as-is on the user's computer and in the user's context. It is your responsibility to make sure that the command-line is properly tested and does not alter the user's computer or any connected computers accessible in the user's context in any damaging way.

- `commandLineResultExt` : **string**, default (****), length (**[0;+∞]**)

  An optional string allowing to specify the extension of the commandLine result. If specified, the user will be asked to choose a result file with this extension.

- `formatname` : **string**, *REQUIRED*, values (**Format_3D_FBX**, **Format_3D_GLTF**, **Format_3D_JT**, **Format_3D_OBJ**, **Format_3D_STEP+JT**, **Format_3D_STEP+WRL**, **Format_3D_WRL**, **Format_3D_WRL+WRL**, **Format_3D_WRL+WRZ**)

  Format_3D_FBX: for FBX format

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  - Format_3D_GLTF: for glTF v2 format
  - Format_3D_JT: for JT format
  - Format_3D_OBJ: for OBJ format
  - Format_3D_STEP+JT: for composite STEP/JT format (the product structure is exported in STEP AP242 Part 21 and the geometries in JT)
  - Format_3D_STEP+WRL: for composite STEP/VRML format (the product structure is exported in STEP AP242 Part 21 and the geometries in VRML)
  - Format_3D_WRL: for VRML format
  - Format_3D_WRL+WRL: for composite VRML/VRML format
  - Format_3D_WRZ+WRZ: for composite compressed VRML/VRML format.
- *id* : **string**
- *name* : **string**, default (****), length (**[0;+∞]**)

  Name of the profile as seen by the user in the ∞Client. This field should be empty for sub export profiles.
- *nodenaming* : **integer**

  0 : PartMdDocName, 1 : PartInstanceId.
- *simplification* : **number**, range(**]0;+∞]**)

  Number denoting the desired simplification factor. 0 means no simplification, between 0 and 1, it gives a ratio of simplification, above 1, it is interpreted as a target number of triangles.
- *type* : **string**, *REQUIRED*, const (**geometry**)
- *version* : **integer**, *REQUIRED*, const (**2**)

  Export profile version.

2.1.3 - Metadata

Metadata export profile

object

- *commandLine* : **string**, default (****), length (**[0;+∞]**)

  A string defining an optional post-process command line. If left empty, it means no post-process. When not empty, its content will be interpreted as a command line in the

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context of the user’s computer. In particular, all paths used in this `commandLine` field must exist on the target computers, thus it is advised that the post-process tools are either available as global executables (in the %PATH% environment variable on Windows, for instance) or on a common network file share. To reference the exported file in the command line definition, one can use the `%s` notation. 3D Juump Infinite will automatically replace `%s` with the actual path to the exported file before it executes the command line. If `commandLineResultExt` is specified `%o` notation will be used to reference final file choosen by the user. The provided command-line will be executed as-is on the user’s computer and in the user’s context. It is your responsibility to make sure that the command-line is properly tested and does not alter the user’s computer or any connected computers accessible in the user’s context in any damaging way.

- `commandLineResultExt` : **string**, default (****), length (**[0;+∞]**)

  An optional string allowing to specify the extension of the commandLine result. If specified, the user will be asked to choose a result file with this extension.

- `formatname` : **string**, *REQUIRED*, values (**Format_Metadata_CSV**, **Format_Metadata_CSVFR**, **Format_Metadata_XML**, **Format_Metadata_JSON**, **Format_Metadata_JSON_AllMetadata**)
  - Format_Metadata_CSV: for international CSV format (export part metadata with instance count)
  - Format_Metadata_CSVFR: for French CSV format (export part metadata with instance count)
  - Format_Metadata_XML: for XML format (export part metadata with instance count)
  - Format_Metadata_JSON: for JSON format (export product structure with part metadata)
  - Format_Metadata_JSON_AllMetadata: for JSON format (export part, link and instance metadata).
- `id` : **string**
- `name` : **string**, default (****), length (**[0;+∞]**)

  Name of the profile as seen by the user in the ∞Client. This field should be empty for sub export profiles.

- `type` : **string**, *REQUIRED*, const (**metadata**)
- `version` : **integer**, *REQUIRED*, const (**2**)

  Export profile version.

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2.1.4 - Datapackage task

Datapackage task export profile

object

Export profile related to Datapackage tasks. The *commandLineResultExt* field is not supported in combination with *geometric* and *metadata* profiles.

- *commandLine* : **string**, default (****), length (**[0;+∞]**)

  A string defining an optional post-process command line. If left empty, it means no post-process. When not empty, its content will be interpreted as a command line in the context of the user's computer. In particular, all paths used in this *commandLine* field must exist on the target computers, thus it is advised that the post-process tools are either available as global executables (in the %PATH% environment variable on Windows, for instance) or on a common network file share. To reference the exported file in the command line definition, one can use the *%s* notation. 3D Juump Infinite will automatically replace *%s* with the actual path to the exported file before it executes the command line. If *commandLineResultExt* is specified *%o* notation will be used to reference final file choosen by the user. The provided command-line will be executed as-is on the user's computer and in the user's context. It is your responsibility to make sure that the command-line is properly tested and does not alter the user's computer or any connected computers accessible in the user's context in any damaging way.

- *commandLineResultExt* : **string**, default (****), length (**[0;+∞]**)

  An optional string allowing to specify the extension of the commandLine result. If specified, the user will be asked to choose a result file with this extension.

- *exportBom* : **boolean**

  Tells whether this datapackage export profile exports the metadata alongside the geometries.

- *formatname* : **string**, *REQUIRED*, values (**Format_Datapackage**)
- *geometric* : A valid geometry export profile. see Geometric 3D export profile
- *id* : **string**
- *metadata* : A valid metadata export profile. see Metadata export profile
- *name* : **string**, default (****), length (**[0;+∞]**)

  Name of the profile as seen by the user in the ∞Client. This field should be empty for sub export profiles.

- *type* : **string**, *REQUIRED*, const (**datapackage**)
- *version* : **integer**, *REQUIRED*, const (**2**)

  Export profile version.

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2.1.5 - Presentation task

Presentation task export profile

object

Export profile related to Presentation tasks. The `commandLineResultExt` field is not supported in combination with the `image` profile.

- `commandLine` : **string**, default (****), length (**[0;+∞]**)

  A string defining an optional post-process command line. If left empty, it means no post-process. When not empty, its content will be interpreted as a command line in the context of the user's computer. In particular, all paths used in this `commandLine` field must exist on the target computers, thus it is advised that the post-process tools are either available as global executables (in the %PATH% environment variable on Windows, for instance) or on a common network file share. To reference the exported file in the command line definition, one can use the `%s` notation. 3D Juump Infinite will automatically replace `%s` with the actual path to the exported file before it executes the command line. If `commandLineResultExt` is specified `%o` notation will be used to reference final file choosen by the user. The provided command-line will be executed as-is on the user's computer and in the user's context. It is your responsibility to make sure that the command-line is properly tested and does not alter the user's computer or any connected computers accessible in the user's context in any damaging way.

- `commandLineResultExt` : **string**, default (****), length (**[0;+∞]**)

  An optional string allowing to specify the extension of the commandLine result. If specified, the user will be asked to choose a result file with this extension.

- `formatname` : **string**, *REQUIRED*, values (**Format_Presentation_JSON**)

- `id` : **string**

- `image` : A valid image export profile. see Image export profile

- `name` : **string**, default (****), length (**[0;+∞]**)

  Name of the profile as seen by the user in the ∞Client. This field should be empty for sub export profiles.

- `type` : **string**, *REQUIRED*, const (**presentation**)

- `version` : **integer**, *REQUIRED*, const (**2**)

  Export profile version.

2.1.6 - Annotation task

Annotation task export profile

object

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- *`commandLine`* : **string**, default (****), length (**[0;+∞]**)

  A string defining an optional post-process command line. If left empty, it means no post-process. When not empty, its content will be interpreted as a command line in the context of the user's computer. In particular, all paths used in this *`commandLine`* field must exist on the target computers, thus it is advised that the post-process tools are either available as global executables (in the %PATH% environment variable on Windows, for instance) or on a common network file share. To reference the exported file in the command line definition, one can use the *`%s`* notation. 3D Juump Infinite will automatically replace *`%s`* with the actual path to the exported file before it executes the command line. If *`commandLineResultExt`* is specified *`%o`* notation will be used to reference final file choosen by the user. The provided command-line will be executed as-is on the user's computer and in the user's context. It is your responsibility to make sure that the command-line is properly tested and does not alter the user's computer or any connected computers accessible in the user's context in any damaging way.

- *`commandLineResultExt`* : **string**, default (****), length (**[0;+∞]**)

  An optional string allowing to specify the extension of the commandLine result. If specified, the user will be asked to choose a result file with this extension.

- *`formatname`* : **string**, *REQUIRED*, values (**Format_MetaAnnotation_JSON**)

- *`id`* : **string**

- *`name`* : **string**, default (****), length (**[0;+∞]**)

  Name of the profile as seen by the user in the ∞Client. This field should be empty for sub export profiles.

- *`type`* : **string**, *REQUIRED*, const (**metaAnnotation**)

- *`version`* : **integer**, *REQUIRED*, const (**2**)

  Export profile version.

2.1.7 - Alternative profile declaration

It is also possible to declare profiles that are not project-related. This is done on the client side by deploying custom executables alongside the 3D Juump Infinite client application.

The ∞Client installation includes a *`postexports`* folder containing custom profile declarator executables (*`.exe`*, *`.py`* or *`.bat`*) stored in subfolders. At startup, the ∞Client calls each executable with the following parameters *`-generatedefaultprofiles <filename>.json`* where *`<filename>.json`* is a destination file where the executable should write an array of profile objects.

3 - Interoperability

The 3D Juump Infinite native client application is interoperable via URL. Technically, the client application installer registers a system-wide custom handler for a specific URI scheme. All URLs

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with the `infinite` scheme are then automatically redirected to the client application. Such URLs only support `localhost` or `127.0.0.1` as host.

3.1 - Search URL

The `infinite://localhost/search?cql=...` URL lets other applications trigger a search in 3D Juump Infinite client application. It requires one query parameter:

- `cql`: this is the CQL search string to use (see the User Manual for a detailed explanation on CQL). Don't forget to %-encode this string.

3.2 - Select URL

The `infinite://localhost/select` URL allows to select part instances in the client application. It requires several query parameters:

- `type`: allows to chose the means of selection, either:
  - `metadata`: selects part instances according to their metadata thanks to a CQL filter,
  - `boxing`: selects part instances according to their 3D bounding box.
- `cql` (for `metadata` selection only): this is the CQL search string to use (see the User Manual for a detailed explanation on CQL). Don't forget to %-encode this string.
- `xmin` (for `boxing` selection only): lowest world coordinate of the box along the X axis.
- `xmax` (for `boxing` selection only): highest world coordinate of the box along the X axis.
- `ymin` (for `boxing` selection only): lowest world coordinate of the box along the Y axis.
- `ymax` (for `boxing` selection only): highest world coordinate of the box along the Y axis.
- `zmin` (for `boxing` selection only): lowest world coordinate of the box along the Z axis.
- `zmax` (for `boxing` selection only): highest world coordinate of the box along the Z axis.
- `goto` (optional, default `false`): whether the client application should also move the camera to the resulting selection.
- `ghost` (optional, default `false`): whether the client application should also ghost the rest of the DMU.

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Web applications

title: 3D Juump Infinite
author: -
language: en
version: 2

Web applications are applications accessible through a Web browser, that are able to exploit the capabilities of 3D Juump Infinite using the 3D Juump Infinite Web API.

Third-party Web applications have to be registered or installed on the ∞*Directory Administration portal*. Then, the access to these Web applications will be controlled by the ∞Directory, and can be fine-tuned per user using tags.

1 - Package installation

The ∞Directory allows to install and serve ‘React-like Web applications’, without using a dedicated server. Web applications can be installed and then updated by uploading a zip package using the ∞*Directory Administration portal*. See Packaging a Web application for detailed information. Note that the resources of the application will be publicly available.

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2 - External hosting

When the application is hosted on a dedicated server, the final redirect URL needs to be registered on the ∞Directory. In this situation, there is no constraint on the structure of the application but for a better integration it is recommended to follow the structure described in Packaging a Web application.

3 - Include Web API JavaScript file

It is preferable to use the JavaScript Web API delivered by the directory to automatically tak advantage of bug fixes without having to rebuild/redeploy your application. The JavaScript Web API is available on the following URL `https://directory_name:${apache_https_port}/{optionnal_prefix}directory/api/getwebapi?version=4.1`. You may (and should) adjust the `version` URL parameter to fetch the version needed by your application.

4 - Packaging a Web application

4.1 - Content

The zip package of your Web application must contain at least the following files:

- `index.html`
- `favicon.ico`
- `manifest.webmanifest`

4.2 - Name and URL

The **Home** and the **Authentication Redirect URL** will be in the form `https://directory_name:${apache_https_port}/{optionnal_prefix}directory/app/{webappurlname}/`, were `webappurlname` is the `applicationid` specified when installing the package on the *Administration portal*. The name and the description will be retrieved from the file `manifest.webmanifest`.

The name will be extracted from `short_name` if available, otherwise from `name`.

It is advised to include versioning information in the `description` field. If enclosed between C-style comment markers `/* my versioning information */`, this information will be hidden on the *Home page*.

4.3 - Technical constraints

To allow serving the Web application without knowing the base path and remain compatible with `ReactRouter`, a set of behaviors and rules are enforced.

4.3.1 - HTTP server

The Web server will have the following specific behaviors:

- If the app URL references an unexisting resource, `index.html` will be served instead of returning a 404 error. This allow to use `ReactRouter`.

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- A file named *infinite.config.js* will be dynamically generated.
- When serving *index.html*, the following patterns will be automatically replaced:
  - */APP_BASE_URL/* by */{optionnal_prefix}directory/app/{webappurlname}/*
  - */DIRECTORY_BASE_URL/* by */{optionnal_prefix}directory/*
  - */getwebapi?version=API_VERSION* by */getwebapi?version=4.1*

The dynamically generated *infinite.config.js* file will allow to configure the Web application to function with the host ∞Directory at runtime.

```
// 3D Juump Infinite standard infinite.config.js file for self hosted
Web applications
// URL and Path will always endswith a slash '/'
// directory base URL
const directoryURL = 'https://directory_name:${apache_https_port}/{opt
ionnal_prefix}directory/'
// application home URL and trusted redirect URL
const appHomeURL = 'https://directory_name:${apache_https_port}/{optio
nnal_prefix}directory/app/{webappurlname}'
const appHomePath = '/{optionnal_prefix}directory/app/{webappurlname}'
const appName = '{webappurlname}'
window.config = { directoryURL , appHomeURL, appHomePath }
```

4.3.2 - Application structure

The following requirements should be met:

- *index.html* should contain exactly *<base href="/APP_BASE_URL/"*
- *index.html* should contain exactly *<link rel="manifest" href="./manifest.webmanifest"*
- *index.html* should contain exactly *<link rel="icon" href="./favicon.ico"*
- all the resources should be referenced using relatives path (eg : *./favicon.ico*)
- the fields *name* and *description* in the *manifest.webmanifest* file should not be empty nor missing
- the field *start_url* in the *manifest.webmanifest* file should be *./*
- the file size is limited to 4MB (after compression if supported)
- the file count is limited to 128
- the total file size is limited to 64MB (after compression if supported)

It is recommended to use the JavaScript Web API delivered by the ∞Directory by adding *<script src="/DIRECTORY_BASE_URL/api/getwebapi?version=API_VERSION"></script>* in *index.html*. Or a compatibility one by adding *<script src="/DIRECTORY_BASE_URL/api/getwebapi?version=X.Y"></script>*.

4.3.3 - React application tips

ReactRouter can be configured like this:

```
<Router basename= { window.config.appHomePath.length > 1 ? window.conf
ig.appHomePath.substring(0,window.config.appHomePath.length - 1) : '/'
}>
  <div className="overflow-hidden">
```

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```
        <Routes>
          <Route path="*" element={<Navigate to='/'/>} />
        </Routes>
        ...
      </div>
    </Router>
```

5 - Application secure resources

It is possible to attach secure resources on application. Those resources will only be available to users that are authenticated on the application. This could be used to customize Kiwi with customer data that will be retained across software updates.

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HTTP API

1 - Introduction

The 3D Juump Infinite ∞Directory and ∞Proxy serve a group of well-known URLs. A documentation of the exposed endpoints is available in the *manual/HTTP API* folder of the release package.

- *3D Juump Infinite [Directory|Proxy|CLI] API documentation [version number].html* files contain the OpenAPI documentation of the public endpoints
- *3D Juump Infinite HTTP API security summary table [version].html* file list all the exposed endpoints
- *resources/3D Juump Infinite [Directory|Proxy|CLI] API documentation [version number].yaml* files contain the OpenAPI documentation of the public endpoints in yaml format
- *resources/3D Juump Infinite [Directory|Proxy|CLI] API security summary table [version].json* files list all the exposed endpoints in json format

Three HTTP APIs are documented:

- The ∞Directory API, exposed by ∞Directory servers
- The ∞Proxy API, exposed by ∞Proxy servers
- The Document indexer API, exposed by the ∞CLI for generation

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2 - Authentication

Authentication methods vary depending on HTTP API endpoints, see the *3D Juump Infinite <*> API documentation* documents for details.

💡 Some endpoints do not require any authentication at all.

3 - mTLS: Mutual authentication

On top of HTTP authentication, it is possible to enable **Client certificate authentication**. When enabled, each client will have to present a valid SSL certificate to the server in order to be authorized.

3.1 - Backend configuration

To enable mTLS at the installation, you have to provide a root certificate (`provided_mTLS_root_ca`) that will be used by Apache to validate client certificates. This will set the Apache setting `SSLVerifyClient` to `require`. The ∞Directory and ∞Proxy will be configured to present their own certificate. Note that every server certificate must be derived from the mTLS root certificate.

3.2 - Client configuration

The ∞CLI can be configured using the `client_certificate` field in the HTTP client configuration.

The 3D Juump Infinite native client can be configured to use a certificate using the fields `Security/SSLClientCertificate`, `Security/SSLClientKey` and `Security/SSLClientKeyPassword` within the `Settings.ini` file.

Web browsers like Chrome will prompt a dialog to select which certificate should be used.

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Annexes

1 - Configuration files

1.1 - Generalities on configuration files

Configuration files are JSON documents. They can be initialized using ∞CLI * conf init, and consolidated (to cipher sensitive data) using ∞CLI * conf consolidate.

see JSON limitations

1.2 - ∞Directory configuration

The ∞Directory configuration file is located in `/etc/3djuump-infinite-directory/conf_4_1.json` on Linux and in `%PROGRAMDATA%\3djuump-infinite-directory\conf_4_1.json` on Windows.

1.2.1 - Schema of the configuration file

∞Directory configuration file

object

- `$schema` : **string**, length (**[1;64]**), pattern (`^\./.*\.schema\.json$`)
- `directoryapi` : **object**, *REQUIRED*

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- *apikey* : **oneOf**, *REQUIRED*
  - **null**

    If null HTTP.*_key authentication methods will be disabled.
  - **string**, length (**[1;+∞]**)

    API key secret used to protect API endpoints, this secret will be used as HTTP Basic authentication with 'infinite' login. It will be preferred over OAuth2 method if both are specified.
- *backendvhosts* : **array**, length (**[0;7]**)
  - items : Optional directory API vhost for backend or administration usage, if specified this vhost will not accept client security schemes. Using separate vhosts allows to implement custom security rules (mTLS, ip filtering, ...) on the HTTP gate based on API usage. see Directory VHost
- *bindport* : **integer**, *REQUIRED*, range(**]1;65535]**)

  Bind port for ∞Directory API HTTP implementation.
- *httpaccesslog* : **boolean**, default (**true**)

  Enables log of received HTTP requests.
- *jwtcachelifetime* : **integer**, *REQUIRED*, range(**]0;500]**)

  How long (in secondes) a bearer is kept in cache.
- *publicbind* : **boolean**, default (**false**)

  Specify if directory API HTTP implementation should listen on any addresses, if false only loopback will be bound.
- *publicvhost* : Main directory vhost always used by client applications. If a backendvhost security schemes is defined, implicit restrictions will be applied to this vhost. Should use HTTPS ! see Directory VHost
- *hostsearchorder* : Define which headers should be used to determine host and port used by the client.Unfortunately 2 sets of headers ('Forwarded' and 'X-Forwarded-*') exist for reverse proxy. So depending on your infrastructure you might need to change evaluation order. Evaluation will stop on the first header found. If no headers were found the 'Host' header will be used. Sometimes exotic configuration (like AWS) may preserve the Host header, add X-forwarded-port and discard X-forwarded-Host, in this case, the policy host-with-x-forwarded-port may be used. see Host search order
- *disableauthforgetversion* : **boolean**, default (**false**)

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If true, authorization and vhost check will be disabled for /api/getversion endpoint. This is useful to run healthcheck of containers behind a load balancer were load balancer will use internal IP or hostname.

- *http_client_configuration* : HTTP configuration. see Http client global configuration
- *log* : see Log configuration
- *openidconnect* : **object**, *REQUIRED*
  - *common* : Common OpenId Connect settings. see OpenID connect common settings
  - *user_auth* : Configure user identification and session access token using OpenId Connect code flow. see OpenID Connect user identification ∞Directory settings
  - *m2m_auth* : **oneOf**, *REQUIRED*
    - **null**

      No OAuth2 configuration for machine to machine communication, HTTP.m2m_bearer will be disabled and API key will be used.
    - Configure OAuth2 machine to machine identification using OpenId Connect client credentials flow. See HTTP.m2m_bearer authentication method. Those settings will be used to acquire a token and to validate received tokens. see OpenID Connect M2M settings
- *postgres* : see PostgreSQL configuration
- *filerstorage* : **oneOf**, *REQUIRED*
  - **object**

    Filer storage implemented using OS or network share filesystem. Used folder should be dedicated to this ∞Directory as it will automatically create/delete files !
    - *type* : **string**, *REQUIRED*, const (**filesystem**)
    - *folder* : **string**, *REQUIRED*, length (**[1;+∞]**)

      Folder in which data will be stored. If relative, will be resolved relative to job file.
  - **object**

    Filer storage implemented using a Microsoft Azure storage account. This storage account should be dedicated to this ∞Directory as it will automatically create/delete blob containers !
    - *http_client_configuration* : HTTP configuration for calls to Azure blob rest API. see Http client override configuration

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- `type` : **string**, *REQUIRED*, const (**azureblob**)
- `url` : **string**, *REQUIRED*, length (**[1;+∞]**)

  Azure storage account URL.

- `storage_account` : **string**, *REQUIRED*, length (**[1;+∞]**)

  Azure storage account name. Storage account name could not be deduced from the URL as URL format might differ due to use of reverse proxy or azurite. Example is the default storage account for Azurite emulator.

- `shared_key` : **string**, *REQUIRED*, length (**[0;4194304]**), pattern (`^(?:[A-Za-z0-9+\/]{4})*(?:[A-Za-z0-9+\/]{2}==|[A-Za-z0-9+\/]{3}=)?$`)

  Azure storage shared key. Example is the default shared_key for Azurite emulator.

- **object**

  Filer storage implemented using an Amazon S3 or Minio bucket storage. This bucket should be dedicated to this ∞Directory !

  - `http_client_configuration` : HTTP configuration for calls to bucket storage rest API. see Http client override configuration
  - `type` : **string**, *REQUIRED*, const (**s3bucket**)
  - `url` : **string**, *REQUIRED*, length (**[1;+∞]**)

    Bucket URL.

  - `region` : **string**, *REQUIRED*, length (**[1;+∞]**)

    AWS region, for Minio use us-east-1.

  - `access_key` : **string**, *REQUIRED*, length (**[1;+∞]**)

    The 'public' access key.

  - `secret_key` : **string**, *REQUIRED*, length (**[1;+∞]**)

    The 'private' secret key.

1.2.2 - Schema of an ∞Directory virtual host

Directory VHost

object

Directory Virtual Host definition.

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- *`url`* : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^https?:\/\/[^@\/A-Z]+?(:[1-9][0-9]{0,4})(\/.*)?\/directory$`)

  Directory API URL for public usage. The port has to be explicited as this attribute is part of the license.

- *`endpoints`* : **object**, *REQUIRED*

  Allow to disable specified API endpoints.

  - *`enabledocstoreeditor`* : **boolean**, default (**false**)

    If set, docstoreeditor gui (/directory/docstoreeditor) will be available. This gui should not be used in production.

  - *`enablegetsuperadminregistrationcode`* : **boolean**, default (**false**)

    Unset this to disable /directory/api/directorysession/requestsuperadminregistrationcode and /directory/api/backend/registersuperadmin.

  - *`enablewebapidoc`* : **boolean**, default (**false**)

    If set, Web API documentation will be available under /directory/webapidoc/. This is not recommanded for production servers.

- *`securityflows`* : **oneOf**, *REQUIRED*

  Allows to restrict security flows accepted on this vhost.

  - **null**

    Accept all security schemes.

  - **array**, length (**[1;+∞]**)

    List of security flows accepted by the ∞Directory.

    - items : **string**, values (**app.admin**, **app.client**, **back.admin**, **back.connector**, **back.infinite**)

- *`securityschemes`* : **oneOf**, *REQUIRED*

  Allows to restrict security schemes accepted on this vhost.

  - **null**

    Accept all security schemes.

  - **array**, length (**[1;+∞]**)

    List of security schemes accepted by the ∞Directory.

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    - items : **string**, values (**http.directory_key**, **http.m2m_bearer**, **http.session_bearer**, **infinitebearer.data_session**, **infinitebearer.data_session_download_token**, **infinitebearer.data_session_extended**, **infinitebearer.directory_session**, **infinitebearer.directory_session_download_token**, **infinitebearer.directory_session_extended**, **infiniteprivate**)

1.2.3 - Schema of HTTP Host search order

Host search order

array, distinct

Define which headers should be used to determine host and port used by the client.Unfortunately 2 sets of headers (‘Forwarded’ and ’X-Forwarded-*‘) exist for reverse proxy. So depending on your infrastructure you might need to change evaluation order. Evaluation will stop on the first header found. If no headers were found the ’Host’ header will be used. Sometimes exotic configuration (like AWS) may preserve the Host header, add X-forwarded-port and discard X-forwarded-Host, in this case, the policy host-with-x-forwarded-port may be used.

- items : **string**, values (**forwarded**, **x-forwarded-***, **host-with-x-forwarded-port**)

1.3 - ∞Proxy configuration

The ∞Proxy configuration file is located in `/etc/3djuump-infinite-proxy/conf_4_1.json` on Linux and in `%PROGRAMDATA%\3djuump-infinite-proxy\conf_4_1.json` on Windows.

1.3.1 - Schema of the configuration file

∞Proxy configuration file

object

- `$schema` : **string**, length (**[1;64]**), pattern (`^\./.*\.schema\.json$`)
- `directoryapi` : **object**, *REQUIRED*
  - `apikey` : **oneOf**, *REQUIRED*

    ∞Directory API key, if null m2m bearer will be used.

    - **null**

      If null HTTP.*_key authentication methods will be disabled.

    - **string**, length (**[1;+∞]**)

      API key secret used to protect API endpoints, this secret will be used as HTTP Basic authentication with ‘infinite’ login. It will be preferred over OAuth2 method if both are specified.

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   - `url` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^https?:\/\/[^@\/A-Z]+?(:[1-9][0-9]{0,4})(\/.*)?\/directory$`)

     URL to the directory, preferably a backend vhost.

- `elasticsearch` : **object**, *REQUIRED*

  Host and port of elasticsearch node HTTP interface. The node should be fully dedicated to this proxy. It is preferable to host the node on the same server as proxy service.

   - `url` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^http:\/\/[^@\/]+?(:[1-9][0-9]{0,4})(\/.*)?$`)

     URL to the local elasticsearch cluster.

   - `login` : **string**, default (****), length (**[0;+∞]**)

     Elasticsearch connection login, could be empty if xpack.security is disabled.

   - `password` : **string**, default (****), length (**[0;+∞]**)

     Elasticsearch connection password, could be empty if xpack.security is disabled.

- `debugdocriver` : **boolean**, default (**false**)

  Enables rfDebug for doc river.

- `http_client_configuration` : HTTP configuration. see Http client global configuration

- `log` : see Log configuration

- `openidconnect` : **object**, *REQUIRED*

   - `common` : Common OpenId Connect settings. see OpenID connect common settings

   - `user_auth` : see OpenID Connect user identification ∞Proxy settings

   - `m2m_auth` : **oneOf**, *REQUIRED*

      - **null**

        No OAuth2 configuration for machine to machine communication, HTTP.m2m_bearer will be disabled and API key will be used.

      - Configure OAuth2 machine to machine identification using OpenId Connect client credentials flow. See HTTP.m2m_bearer authentication method. Those settings will be used to acquire a token and to validate received tokens. see OpenID Connect M2M settings

- `postgres` : see PostgreSQL configuration

- `proxyapi` : **object**, *REQUIRED*

   - `apikey` : **oneOf**, *REQUIRED*

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  - **null**

    If null HTTP.*_key authentication methods will be disabled.

  - **string**, length (**[1;+∞]**)

    API key secret used to protect API endpoints, this secret will be used as HTTP Basic authentication with ‘infinite’ login. It will be preferred over OAuth2 method if both are specified.

- *`backendvhost`* : **oneOf**, default (**null**)

  - **null**

  - Optional proxy API vhost for backend usage (used by proxy service and directory), if specified this vhost will not accept client security schemes. This vhost should be accessible by all directory instances. see Proxy VHost

- *`bindport`* : **integer**, *REQUIRED*, range(**]1;65535]**)

  Bind port for proxy API HTTP implementation.

- *`enablehttpaccess`* : **boolean**, default (**true**)

  Enables log of received HTTP requests.

- *`jwtcachelifetime`* : **integer**, *REQUIRED*, range(**]0;500]**)

  How long (in secondes) a bearer is kept in cache.

- *`publicvhost`* : Main proxy vhost always used by client. If a backendvhost security schemes is defined, implicit restrictions will be applied to this vhost. Should use HTTPS ! see Proxy VHost

- *`publicbind`* : **boolean**, default (**false**)

  Specify if proxy API HTTP implementation should listen on any addresses, if false only loopback will be bound.

- *`httpaccesslog`* : **boolean**, default (**true**)

  Enables log of received HTTP requests.

- *`hostsearchorder`* : Define which headers should be used to determine host and port used by the client.Unfortunately 2 sets of headers (‘Forwarded’ and ’X-Forwarded-*‘) exist for reverse proxy. So depending on your infrastructure you might need to change evaluation order. Evaluation will stop on the first header found. If no headers were found the ’Host’ header will be used. Sometimes exotic configuration (like AWS) may preserve the Host header, add X-forwarded-port and discard X-forwarded-Host, in this case, the policy host-with-x-forwarded-port may be used. see Host search order

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  - `disableauthforgetversion` : **boolean**, default (**false**)

    If true, authorization and vhost check will be disabled for /api/getversion endpoint. This is useful to run healthcheck of containers behind a load balancer were load balancer will use internal IP or hostname.

- `workingfolder` : **string**, *REQUIRED*

  Working folder were ∞Proxy data are stored. If relative, will be resolved relative to job file.

- `replication` : **object**, *REQUIRED*

  Defines replication restriction, allowing to retrieve only a subset of builds available on the Directory.

  - `oneoftags` : **array**, *REQUIRED*, length (**[0;+∞]**), distinct

    To be replicated a build should have at least one tag from this list (if the list is not empty).

    - items : **string**, length (**[1;64]**), pattern (`^[\x21\x23-\x39\x3c-\x5B\x5d-\x7e]+$`)

      Tag definition, because tags are also used as scopes limit them to scopes acceptable chars minus ':' and ';'. See https://www.rfc-editor.org/rfc/rfc6749#section-3.3.

  - `noneoftags` : **array**, *REQUIRED*, length (**[0;+∞]**), distinct

    To be replicated a build should not have a tag from this list (if the list is not empty).

    - items : **string**, length (**[1;64]**), pattern (`^[\x21\x23-\x39\x3c-\x5B\x5d-\x7e]+$`)

      Tag definition, because tags are also used as scopes limit them to scopes acceptable chars minus ':' and ';'. See https://www.rfc-editor.org/rfc/rfc6749#section-3.3.

- `asyncjobsolver` : Configuration of asynchronous job solver. see Asynchronous job solver

1.3.2 - Schema of an ∞Proxy virtual host

Proxy VHost

object

Proxy Virtual Host definition.

- `url` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^https?:\/\/[^@\/A-Z]+?(:[1-9][0-9]{0,4})(\/.*)?\/proxy$`)

- `securityflows` : **oneOf**, *REQUIRED*

  Allows to restrict security flows accepted on this vhost.

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    - **null**

      Accept all security schemes.

    - **array**, length (**[1;+∞]**)

      List of security flows accepted by the ∞Proxy.

      - items : **string**, values (**app.admin**, **app.client**, **back.admin**, **back.connector**, **back.infinite**)

- *securityschemes* : **oneOf**, *REQUIRED*

  Allows to restrict security schemes accepted on this vhost.

  - **null**

    Accept all security schemes.

  - **array**, length (**[1;+∞]**)

    List of security schemes accepted by the ∞Proxy.

    - items : **string**, values (**http.m2m_bearer**, **http.proxy_key**, **http.session_bearer**, **infinitebearer.data_session**, **infiniteprivate**)

1.3.3 - Schema ∞AsyncJobSolver configuration on an ∞Proxy

Asynchronous job solver

object

Configuration of asynchronous job solver.

- *enable* : **boolean**, *REQUIRED*

  Enable or disable asynchronous job handling.

- *maxmemorymb* : **integer**, *REQUIRED*, range(**]1024;65536]**)

  Maximum memory that the solver is allowed to dedicate for workers. See administration manual to check memory requirements per job types.

- *maxcpu* : **integer**, *REQUIRED*, range(**]1;64]**)

  Maximum cpu count that the solver is allowed to dedicate for workers.

- *supportedjobtypes* : **array**, default (**[]**), length (**[0;+∞]**), distinct

  List of supported async job types. If the list is empty assums all job types are acceptable.

  - items : **string**, values (**export2draster**, **export2dvecto**, **export3d**)

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export2draster: 2D raster image export.*export2dvecto*: 2D vectorial image export.*export3d*: 3D or BOM export.

- *openglprovider* : **string**, default (**system**), values (**none**, **system**, **mesa**)

  Allows to choose which OpenGL implementation should be used. *none* : will not load OpenGL support, making some export jobs unprocessable. *system* : will use OpenGL implementation provided by the OS. *mesa* : will use Mesa3D LLVM software renderer (only available on Windows).

1.4 - ∞CLI configuration file

1.4.1 - Search path

The ∞CLI will search for its configuration file in the following locations:

- *.* in the working directory of the executable
- *%APPDATA%\3djuump-infinite-proxy\conf_4_1.json* (Windows only)
- *%PROGRAMDATA%\3djuump-infinite-proxy\conf_4_1.json* (Windows only)
- */etc/3djuump-infinite-cli/conf_4_1.json* (Linux only)

1.4.2 - Schema of the configuration file

∞Cli configuration file

object

- *$schema* : **string**, length (**[1;64]**), pattern (*^\./.*\.schema\.json$*)
- *http_client_configuration* : HTTP configuration. see Http client global configuration
- *log* : see Log configuration
- *directory_collection* : **object**

  Connection settings per ∞Directory. Object key is the ∞Directory URL with explicit port, eg https://mydirectory:443/prefix/directory.

  - additional properties : **oneOf**
    - **object**
      - *url* : **string**, *REQUIRED*, length (**[0;1024]**), pattern (*^https?:\/\/[^@\/A-Z]+?(:[1-9][0-9]{0,4})(\/.*)?\/directory$*)

        Directory API URL for public usage. The port has to be explicited as this attribute is part of the license.
      - *http_client_configuration* : HTTP configuration to access the ∞Directory. see Http client global configuration
      - *apiKey* : **string**, *REQUIRED*, length (**[1;+∞]**)

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API key secret used to protect API endpoints, this secret will be used as HTTP Basic authentication with ‘infinite’ login. It will be preferred over OAuth2 method if both are specified.

- **object**
  - `url` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^https?:\/\/[^@\/A-Z]+?(:[1-9][0-9]{0,4})(\/.*)?\/directory$`)

    Directory API URL for public usage. The port has to be explicited as this attribute is part of the license.
  - `http_client_configuration` : HTTP configuration to access the ∞Directory. see Http client global configuration
  - `openidconnect` : **object**, *REQUIRED*
    - `common` : Common OpenId Connect settings. see OpenID connect common settings
    - `m2m_auth` : **object**, *REQUIRED*
      - `additional_scopes` : **string**, default (****), length (**[0;1024]**), pattern (`^(()|([\x21\x23-\x5B\x5d-\x7e]+)( [\x21\x23-\x5B\x5d-\x7e]+)*)$`)

        Additional scope string that will be passed to the OpenID server on the token call to obtain and access_token. infinite.* scopes will be added automatically.
      - `client_id` : **string**, *REQUIRED*, length (**[1;+∞]**)

        OpenID application id.
      - `client_secret` : **string**, *REQUIRED*, length (**[1;+∞]**)

        OpenID application secret.

1.5 - Configuration of an HTTP client

1.5.1 - Standard schema

Http client global configuration

object

Main HTTP client configuration, could be override localy on sub configuration depending on the server to contact.

- `verify_ssl_peer` : **boolean**, default (**true**)

  Set this value to false to disable SSL peer verification.

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- `client_certificate` : **oneOf**, default (**false**)
    - **object**
        - `crt` : **string**, *REQUIRED*, length (**[1;+∞]**)

          File path to client PEM certificate.
        - `key` : **string**, *REQUIRED*, length (**[1;+∞]**)

          File path to client PEM private key.
        - `password` : **string**

          Private key password if any.
    - **object**
        - `p12` : **string**, *REQUIRED*, length (**[1;+∞]**)

          File path to client P12 certificate.
        - `password` : **string**

          Private key password if any.
    - **boolean**, values (**false**)

      Disable use of certificate.
- `http_proxy` : **oneOf**, default (**false**)
    - **string**, length (**[0;1024]**), pattern (`^https?:\/\/.*$`)

      Enforce use of provided HTTP proxy for HTTP calls.
    - **boolean**, values (**false**)

      Disable use of any HTTP proxy for HTTP calls.
    - **boolean**, values (**true**)

      Enforce use of the automatic HTTP proxy configuration from the system for HTTP calls.

1.5.2 - Schema when overriding

Http client override configuration

object

Allow to override HTTP global configuration.

- `verify_ssl_peer` : **oneOf**, default (**null**)

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    - **null**

      Use global configuration.

    - **boolean**

      Set this value to false to disable SSL peer verification.

- `client_certificate` : **oneOf**, default (**null**)
    - **null**

      Use global configuration.

    - **object**
        - `crt` : **string**, *REQUIRED*, length (**[1;+∞]**)

          File path to client PEM certificate.

        - `key` : **string**, *REQUIRED*, length (**[1;+∞]**)

          File path to client PEM private key.

        - `password` : **string**

          Private key password if any.

    - **object**
        - `p12` : **string**, *REQUIRED*, length (**[1;+∞]**)

          File path to client P12 certificate.

        - `password` : **string**

          Private key password if any.

    - **boolean**, values (**false**)

      Disable use of certificate.

- `http_proxy` : **oneOf**, default (**null**)
    - **null**

      Use global configuration.

    - **string**, length (**[0;1024]**), pattern (`^https?:\/\/.*$`)

      Enforce use of provided HTTP proxy for HTTP calls.

    - **boolean**, values (**false**)

      Disable use of any HTTP proxy for HTTP calls.

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- **boolean**, values (**true**)

  Enforce use of the automatic HTTP proxy configuration from the system for HTTP calls.

1.6 - Logging configuration for services and tools

1.6.1 - Main schema

Log configuration

object

- *debugtypeblacklist* : **array**, default (**[]**), distinct

  RfDebug output that should be omitted.

  - items : **string**, length (**[1;+∞]**)
- *enablediag* : **boolean**, default (**false**)

  DEPRECATED *loglevel* should be used instead. Enables DEBUG log level. This SHOULD NOT BE MAINTAINED IN PRODUCTION as it will log sensitive data and have a negative impact on overall performances.

- *loglevel* : **string**, default (**INFO**), values (**INFO**, **DEBUG**, **TRACE**)

  Specifies log level. *INFO* > *DEBUG* > *TRACE*. A log level lower than *INFO* SHOULD NOT BE MAINTAINED IN PRODUCTION as it will log sensitive data and have a negative impact on overall performances.

- *folder* : **oneOf**, default (****)

  - **string**, length (**[1;+∞]**)

    Change default log location. If relative, will be resolved relative to configuration or job file.

  - **string**, length (**[0;0]**)

    Use default log location.

  - **null**

    Disable file logging.

- *rotatecount* : **integer**, default (**64**), range(**]-1;512]**)

  Number of backup log to keep, if -1 all logs will be kept.

- *maxfilesizemb* : **integer**, default (**64**), range(**]16;1024]**)

  Maximum log file size.

- *timerotate* : **string**, default (**weekly**), values (**disabled**, **daily**, **weekly**, **monthly**)

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Enable time base log rotation.

- `loki` : see Loki http log handler configuration
- `log2console` : **boolean**, default (**true**)

  Enable log output to console.

1.6.2 - Schema of the Loki configuration

Loki http log handler configuration

oneOf

- **null**
- **object**

  Configuration for Grafana Loki HTTP push log handler.

  - `posturl` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^https?:\/\/[^@\/]+?(\/.*)$`)

    An URL that should point to an endpoint compatible with POST /loki/api/v1/push, body will be gziped JSON, this endpoint is expected to return 200 or 204 on success. URL should not contains credentials.

  - `login` : **['string', 'null']**, default (**null**)

    Loki connection login.

  - `password` : **['string', 'null']**, default (**null**)

    Loki connection password.

  - `http_client_configuration` : HTTP configuration for calls to calls to loki endpoint. see Http client override configuration
  - `label` : **object**, additional properties allowed

    Optional labels that will be added to loki streams.

    - pattern (`^(?!log$).*$`) : **string**, length (**[1;64]**)
  - `max_entry_length` : **integer**, default (**4096**), range(**]0;+∞]**)

    Maximum size in bytes of log message send to loki, if log entry is longer it will be truncated. If zero full message will not be truncated.

1.7 - PostgreSQL configuration

PostgreSQL configuration

object

- `login` : **string**, *REQUIRED*, length (**[0;+∞]**)

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PostgreSQL database connection login, could be empty if using SSPI or GSS authentication.

- *`password`* : **string**, *REQUIRED*, length (**[0;+∞]**)

  PostgreSQL database connection password, could be empty if using SSPI or GSS authentication.

- *`database`* : **string**, *REQUIRED*, length (**[1;+∞]**)

  Target database name.

- *`connect_timeout`* : **integer**, default (**15**), range(**]2;+∞]**)

  Maximum wait duration per host while trying to establish a connection. Value is in secondes.

- *`ssl`* : **object**, *REQUIRED*
  - *`enable`* : **boolean**, *REQUIRED*

    Should we use SSL connection.

  - *`verify_ssl_peer`* : **boolean**, default (**true**)

    If disabled, server certificat will not be validated.

  - *`rootCA`* : **string**, default (****)

    File path to rootCA.crt that will be used to verify server certificat, if empty default libpq cert location will be used.

  - *`client_certificate`* : **oneOf**, default (**false**)
    - **object**
      - *`crt`* : **string**, *REQUIRED*, length (**[1;+∞]**)

        File path to client PEM certificate.

      - *`key`* : **string**, *REQUIRED*, length (**[1;+∞]**)

        File path to client PEM private key.

      - *`password`* : **string**

        Private key password if any.

    - **object**
      - *`p12`* : **string**, *REQUIRED*, length (**[1;+∞]**)

        File path to client P12 certificate.

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        - `password` : **string**

            Private key password if any.

    - **boolean**, values (**false**)

        Disable use of certificate.

- `hosts` : **array**, *REQUIRED*, length (**[1;8]**)

    List of host, allowing to specify primary and replicat servers. Connection attempt will respect list order, to distribute read-only load on hot standby servers, put them first in the list.

    - items : **object**

        - `host` : **string**, *REQUIRED*, length (**[1;+∞]**)

            Hostname or ip.

        - `port` : **integer**, *REQUIRED*, range(**]1;65535]**)

            Tcp port.

1.8 - OpenID Connect configuration

1.8.1 - Common settings

OpenID connect common settings

object

Common OpenId Connect settings.

- `configuration_endpoint` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^https:\/\/([^\/]*?)\/.*$`)

    OpenID Provider configuration URL (https://openid.net/specs/openid-connect-discovery-1_0.html#ProviderConfigurationRequest).

- `http_client_configuration` : HTTP configuration for calls to calls to the OpenID server. see Http client override configuration

1.8.2 - User identification for the ∞Directory

OpenID Connect user identification ∞Directory settings

object

Configure user identification and session access token using OpenId Connect code flow.

- `additional_query_parameters` : **object**

    Specifies additional query parameters that should be added to OpenId Connect endpoint calls.

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    - `authorization_endpoint` : **object**

      Additional query parameters for authorization_endpoint.

      - additional properties : **string**
    - `revocation_endpoint` : **object**

      Additional query parameters for revocation_endpoint.

      - additional properties : **string**
    - `token_endpoint` : **object**

      Additional query parameters for token_endpoint.

      - pattern (`^(?!scope$).*$`) : **string**
- `additional_scopes` : **object**, *REQUIRED*
  - `primo_token` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^(()|([\x21\x23-\x5B\x5d-\x7e]+)( [\x21\x23-\x5B\x5d-\x7e]+)*)$`)

    Additional scope string that will be passed to the OpenID server on the authorize call to obtain first id_token and access_token that will be passed to authentication_webhook.
  - `client_token` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^(()|([\x21\x23-\x5B\x5d-\x7e]+)( [\x21\x23-\x5B\x5d-\x7e]+)*)$`)

    Additional scope string that will be passed to the OpenID server to obtain access_token that will be passed to the client.
- `allowed_jwt_alg` : **array**, *REQUIRED*, distinct

  List of algorithm that will be allowed for JWT (id_token and access_token) delivered by the OpenID server.

  - items : **string**, values (**RS256**, **RS384**, **RS512**)
- `authentication_webhook` : **oneOf**, *REQUIRED*
  - **null**

    No authentication webhook.
  - **object**

    Define authentication webhook that will be called on each user identification.

    - `url` : **string**, *REQUIRED*, length (**[0;1024]**), pattern (`^https:\/\/.*$`)
    - `http_client_configuration` : HTTP configuration for calls to calls to the authentication webhook. see Http client override configuration
- `client_id` : **string**, *REQUIRED*, length (**[1;+∞]**)

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OpenID application id.

- *`client_secret`* : **string**, *REQUIRED*, length (**[1;+∞]**)

  OpenID application secret.

- *`hmac_secret`* : **oneOf**, *REQUIRED*

  - **null**

    Set to null if HS* sign algorithm are not allowed.

  - **string**, length (**[0;+∞]**)

    OpenID secret for HS* sign algorithm, only supported of id_token. If not null HS256, HS384 and HS512 alg will be accepted.

- *`id_token_alias`* : **object**, *REQUIRED*

  Allows to copy and optionally remap id_token extra fields (except some sensitive ones) to standard fields to customize user information display. Object keys are extra field name to copy.

  - pattern (*`^(?!client_id$|nonce$|aud$|azp$|exp$|iat$|nbf$|acr$|iss$).*$`*) : **oneOf**

    - **string**, values (**address**, **email_verified**, **email**, **family_name**, **given_name**, **locale**, **middle_name**, **name**, **nickname**, **phone_number_verified**, **phone_number**, **picture**, **preferred_username**, **profile**, **updated_at**, **zoneinfo**)

      Remap target field name.

    - **null**

      Only copy.

- *`token_aud`* : **oneOf**, default (**null**)

  - **null**

    Audience (aud) value is assumed to contain client_id.

  - **boolean**, const (**false**)

    Disable aud field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.

  - **string**, length (**[1;+∞]**)

    Value that should be contained in access tokens aud field.

  - **array**, length (**[1;16]**)

    List of potential aud field values. At least one should be equal to access tokens aud field.

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    - items : **string**, length (**[1;+∞]**)

      Value that should be contained in access tokens aud field.

- *token_iss* : **oneOf**, default (**null**)
  - **null**

    Issuer (iss) value will be retrieved from configuration endpoint.

  - **boolean**, const (**false**)

    Disable iss field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.

  - **string**, length (**[1;+∞]**)

    Value that should be contained in access tokens iss field.

  - **array**, length (**[1;16]**)

    List of potential iss field values. At least one should be equal to access tokens iss field.

    - items : **string**, length (**[1;+∞]**)

      Value that should be contained in access tokens iss field.

- *token_azp* : **oneOf**, default (**null**)
  - **null**

    Authorized party (azp) value is assumed to contain client_id.

  - **boolean**, const (**false**)

    Disable azp field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.

  - **array**, length (**[1;32]**), distinct

    List of accepted azp values, at least one should be contained in access tokens azp field.

    - items : **string**, length (**[1;+∞]**)
- *use_oidc_access_token* : **boolean**, *REQUIRED*

  Enable use of access_token (OpendID server should also return a refresh_token) delivered by OpenID server to protect ∞Directory and ∞Proxy API calls from client applications (HTTP.session_bearer security scheme). If disabled, tokens delivered by the Directory will be used.

- *use_PKCE* : **boolean**, *REQUIRED*

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Enable use of Proof Key for Code Exchange (rfc7636) (https://tools.ietf.org/html/rfc7636).

- `user_unique_id` : **string**, *REQUIRED*, values (**oidc**, **email**, **azureoid**)

  Define which field of id token will be used as user unique id.
  OpenId Connect : sub of OpenId id
  email : user email /! email should not be reused later for an other user
  azureoid : Azure AD user object id.

1.8.3 - User identification for the ∞Proxy

OpenID Connect user identification ∞Proxy settings

object

- `allowed_jwt_alg` : **array**, *REQUIRED*, distinct

  List of algorithm that will be allowed for JWT (id_token and access_token) delivered by the OpenID server.

  - items : **string**, values (**RS256**, **RS384**, **RS512**)
- `token_aud` : **oneOf**, default (**null**)
  - **null**

    Audience (aud) value is assumed to contain client_id.
  - **boolean**, const (**false**)

    Disable aud field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.
  - **string**, length (**[1;+∞]**)

    Value that should be contained in access tokens aud field.
  - **array**, length (**[1;16]**)

    List of potential aud field values. At least one should be equal to access tokens aud field.
    - items : **string**, length (**[1;+∞]**)

      Value that should be contained in access tokens aud field.
- `token_iss` : **oneOf**, default (**null**)
  - **null**

    Issuer (iss) value will be retrieved from configuration endpoint.
  - **boolean**, const (**false**)

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Disable iss field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.

- **string**, length (**[1;+∞]**)

  Value that should be contained in access tokens iss field.

- **array**, length (**[1;16]**)

  List of potential iss field values. At least one should be equal to access tokens iss field.

  - items : **string**, length (**[1;+∞]**)

    Value that should be contained in access tokens iss field.

- `token_azp` : **oneOf**, default (**null**)

  - **null**

    Authorized party (azp) value is assumed to contain client_id.

  - **boolean**, const (**false**)

    Disable azp field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.

  - **array**, length (**[1;32]**), distinct

    List of accepted azp values, at least one should be contained in access tokens azp field.

    - items : **string**, length (**[1;+∞]**)

- `use_oidc_access_token` : **boolean**, *REQUIRED*

  Enable use of access_token (OpendID server should also return a refresh_token) delivered by OpenID server to protect ∞Directory and ∞Proxy API calls from client applications (HTTP.session_bearer security scheme). If disabled, tokens delivered by the Directory will be used.

1.8.4 - Machine to Machine identification

OpenID Connect M2M settings

object

Configure OAuth2 machine to machine identification using OpenId Connect client credentials flow. See HTTP.m2m_bearer authentication method. Those settings will be used to acquire a token and to validate received tokens.

- `additional_query_parameters` : **object**

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Specifies additional query parameters that should be added to OpenId Connect endpoint calls.

- *token_endpoint* : **object**

  Additional query parameters for token_endpoint.

  - pattern (`^(?!scope$).*$`) : **string**

- *additional_scopes* : **string**, default (****), length (**[0;1024]**), pattern (`^(()|([\x21\x23-\x5B\x5d-\x7e]+)( [\x21\x23-\x5B\x5d-\x7e]+)*)$`)

  Additional scope string that will be passed to the OpenID server on the token call to obtain and access_token. infinite.* scopes will be added automatically.

- *allowed_jwt_alg* : **array**, *REQUIRED*, distinct

  List of algorithm that will be allowed for JWT (id_token and access_token) delivered by the OpenID server.

  - items : **string**, values (**RS256**, **RS384**, **RS512**)

- *client_id* : **string**, *REQUIRED*, length (**[1;+∞]**)

  OpenID application id.

- *client_secret* : **string**, *REQUIRED*, length (**[1;+∞]**)

  OpenID application secret.

- *token_aud* : **oneOf**, default (**null**)

  - **null**

    Audience (aud) value is assumed to contain client_id.

  - **boolean**, const (**false**)

    Disable aud field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.

  - **string**, length (**[1;+∞]**)

    Value that should be contained in access tokens aud field.

  - **array**, length (**[1;16]**)

    List of potential aud field values. At least one should be equal to access tokens aud field.

    - items : **string**, length (**[1;+∞]**)

      Value that should be contained in access tokens aud field.

- *token_iss* : **oneOf**, default (**null**)

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- **null**

  Issuer (iss) value will be retrieved from configuration endpoint.

- **boolean**, const (**false**)

  Disable iss field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.

- **string**, length (**[1;+∞]**)

  Value that should be contained in access tokens iss field.

- **array**, length (**[1;16]**)

  List of potential iss field values. At least one should be equal to access tokens iss field.

  - items : **string**, length (**[1;+∞]**)

    Value that should be contained in access tokens iss field.

- `token_azp` : **oneOf**, default (**null**)

  - **null**

    Authorized party (azp) value is assumed to contain client_id.

  - **boolean**, const (**false**)

    Disable azp field validation. Not recommanded but could be usefull when dealing with a weird OpenId Connect server.

  - **array**, length (**[1;32]**), distinct

    List of accepted azp values, at least one should be contained in access tokens azp field.

    - items : **string**, length (**[1;+∞]**)

2 - Range of use

This annex summarizes the range of use of the software.

2.1 - Minimum requirements

2.1.1 - Native application requirements

The client application can run on a broad range of CPUs, from a mobile to a high-end x86-64 central processing unit (CPU). The amounts of CPU power and required RAM depend on the complexity of your DMU and the availability of a dedicated graphic processing unit (GPU).

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A dedicated graphic card (GPU) is not required but when it is available, it should be installed with an OpenGL 3.1 and above driver. Any NVIDIA GeForce 8 and above, AMD Radeon 4xxx and above or Intel HD4000 and above may fit. Without a dedicated GPU, the 3D Juump client application is able to run with the integrated GPU.

Eventually, you should also reserve enough hard disk space to store your digital mock-up data and workspaces. The disk space required for the installation of the ∞Client application and the Local DMU Manager is only a negligible fraction of the occupied size, respectively 200MB and 800MB.

Minimal requirements of the ∞Client:

- **Windows 11 64-bit version**
- Dual Core CPU x86-64
- 4GB RAM
- 4GB disk space for binaries and caches
- GPU with OpenGL 3.1 and GLSL 140 support with 3GB RAM
- 1280 x 800 pixel display

Recommended requirements of the ∞Client:

- Windows 11 64-bit version
- Quad Core CPU x86-64
- 6GB RAM
- 8GB disk space for binaries and caches (SSD)
- GPU with OpenGL 3.1 and GLSL 140 support with 4GB dedicated RAM
- 1920 x 1080 pixel display

Minimal requirements for Web Applications / Web Browser:

- Dual Core CPU x86-64
- 8GB RAM
- WebGL 2.0 support
- `deflate` and `br` decompression support
- 64 bit browser, Chromium based, Firefox or Safari (tested on latest Chromium)

Recommended requirements for Web Applications / Web Browser:

- Quad Core CPU x86-64
- Dedicated GPU
- 64 bit Chromium based browser

A keyboard and a mouse are mandatory for fully using 3D Juump Infinite. Touchscreen support is limited to navigation.

When using the Local DMU Manager, it is recommended to add **+2 cores** to the CPU and add **+2GB** of RAM, for the minimal and recommended requirements above.

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⚠ In order to install the Local DMU Manager on the user host, you must have an **administrator** account. Note the *administrator* account is only required for the installation. Once the application is deployed, the user can have access to their data with their regular account.

2.2 - Supported input formats

3D Juump Infinite is able to process the following formats:

Format	Ext	Version
3D Experience	.3Dxml	All - R4172, 2014x - 2022x
3DM OpenNurbs – Rhino *(Windows only)*	.3dm	All - 6
3DS	.3ds	
ACIS	.sat .sab	All - R27
ASC Medusa 3D	.asc	
CADDS (explicit parts) & CAMU	._pd ._ps	4, 5
CATIA V4	.model .dlv .exp .session	All - 4.xx
CATIA V5	.CATPART .cgr .CATProduct	R10 - R34
CATIA V6	.3Dxml	R210 - R213, 2011x - 2013
CATIA V6 3D EXPERIENCE	.3Dxml	All - R417, 2014x - 2022x
FBX	.fbx	
glTF v2	.gltf .glb	
I-DEAS	.arc .unv .asc	All - NX5
IGES	.igs .iges	5.2, 5.3
Inventor	.ipt .iam	All - 2024
JT-Format (JtOpen)	.jt	7.0 - 10.5
Nastran	.nas	
NX Unigraphics	.prt	11.1 - CR 2312
OBJ	.obj .mtl	
Parasolid XT-Format	.x_t .xmt_txt .x_b	All - 34
PlmXml *(experimental)*	.plmxml	schema v4
CREO ProEngineer	.prt .xpr .asm .xas	13 - Creo 10
CREO ProEngineer Neutral	.neu	13 - Creo 10
ROBCAD	.rf	
Solidworks	.sldprt .sldasm .prt .asm	1999 - 2023
STEP	.stp .step .stpx .stpz .stpxz	AP203, AP214, AP242
Straessle EUKLID	.edx	

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STL	.stl	
VDA	.vda	FS 2.0
VRML	.wrl .wrz .vrml	97

2.2.1 - Geometry

3D Juump Infinite only accepts surface information. All other geometric information is ignored (in particular, vector and point data are not supported).

2.2.2 - Metadata

3D Juump Infinite is able to extract product structure, including external references. It also extracts textual, numeric and datum metadata, plus any combination of lists and maps of the above.

2.2.3 - Annotations

3D Juump Infinite is able to retrieve annotation from source files. Textual information should be supported in all cases. The rendering of NOA and PMI is supported to our best effort, there may be limitations in corner cases or small divergences in rendering compared to their original source file.

2.3 - Supported output formats

2.3.1 - Geometry

Supported output formats for geometry export are:

- FBX
- GLTF2
- JT
- OBJ
- STEP[12]+JT
- STEP+WRL
- VRML
- WRL+WRL
- WRZ+WRZ

Exported geometries are tessellated. Annotations are not exported.

2.3.2 - Image

Supported output formats for image export are:

- JPEG
- PNG

[12] STEP AP242 Part 21

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- TIFF

Transparency support depends on the output format.

2.3.3 - Metadata

Supported output formats for metadata export are:

- CSV (comma separated)
- CSV (semi-colon separated)
- JSON
- XML

2.3.4 - Presentation

Supported output formats for presentation export are:

- HTML
- HTML with DZSlide embedded viewer
- JSON
- Markdown
- ODP

Note: Markdown and ODP do not support rich-text, thus when slide comments containing rich-text are found, they are exported as raw-text instead.

2.4 - Limits

Data structure limitations are documented inside JSON schema definitions.

2.4.1 - JSON limits

3D Juump Infinite enforce restriction on JSON document content.

- JSON data should be UTF-8 or ASCII encoded.
- ASCII non printable characters (range [0x00-0x1F] except ‘\r’ ‘\n’ ‘\t’) are forbidden.

2.4.2 - Metadata limits

- Maximum length of utf-8 document ids (in byte) : 255
- Maximum number of `nested` sub objects per metadata document: 10000
- Maximum number of `configured` field in index mapping: 8
- Maximum number of bytes for `text` and `keyword` metadata fields: 32767
- Maximum number of clauses per search/filter : 10000
- Maximum number of terms per attribute filter : 65536
- Maximum number of attribute values to allow enumeration : 1024
- Maximum size of attribute value to allow enumeration (in byte) : 100

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2.4.3 - Per build limits :

- Minimum number of assemblies[13]: 1
- Minimum number of single parts[14]: 1
- Maximum number of parts[15]: 268435455
- Maximum number of links[16]: 268435455
- Maximum number of instance metadata[17]: 536870911
- Maximum number of ids[18]: 1073741823
- Maximum number of instances (nodes + leaves): 134217727
- Maximum number of geometry instances[19]: 16777215
- Maximum number of distinct materials: 32767
- Maximum number of annotation views: 1073741823
- Maximum number of annotation types: 1024
- Maximum number of annotations visible at the same time: 262143
- Maximum number of configuration per build : 9999
- Maximum scene size : [-2e6;+2e6] around origin along each axis
- Maximum number of distinct tag groups combination : 2048
- Maximum number of tag groups on which a resource (metadata document, instance, geometry, ...) could appear : 64
- Maximum number of distinct combination of tag groups in restriction table : 32767
- Maximum number of distinct group of configuration : 1000000
- Maximum number of disting extra tags : 32
- Maximum number of metadata documents per anchor point (part, link, instance) : 4
- Maximum number of attached documents per part : 32
- Maximum number of annotation documents per part : 128
- Maximum product structure depth : 100
- Maximum number of vertex and index per source model : 16777215

[13] Structure document with children

[14] Structure document with geometric representation

[15] PartMetadata documents

[16] LinkMetadata documents

[17] InstanceMetadata documents

[18] Distinct `id` fields

[19] One source model instantiated at one world position

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2.5 - Local Web Application limits

Local Web application (backed by the Local DMU Manager) have limitation compared to standard web applications (backed by an ∞Directory server).

- AssetManager is not available (No store/share features).
- Access rights limitation is not available (No data level access control or feature limitations).
- Only one session can be opened (Only one browser tab).
- ∞AsyncJobSolver are not available (No 2D or 3D export services, etc …)

2.6 - Async Job solver limits

Async Job solvers shoult respect a CPU, RAM and time enveloppe. Those restrictions are set to ensure that a faulty job will not consum too many resources and will harm the backend. Note that solvers are allowed to exceed temporarily the RAM enveloppe.

- Export 2D jobs should end in less than 600 seconds using less than 2560 MB of RAM. They will use between 1 and 2 cpu core
- Export Vectorial jobs should end in less than 600 seconds using less than 2560 MB of RAM. They will use between 1 and 2 cpu core
- Export 3D jobs should end in less than 600 seconds using less than 2048 MB of RAM. They will use between 1 and 1 cpu core
- Export result file size should be smaller than ${SV_LIMITS_ASYNCJOB_RESULT_SIZE_LIMIT_MB} MB.

3 - Third-party software licenses

The details of licenses is available on the 3D Juump Infinite Third-party License manual provided with the software.

4 - Export control classification

The Software, which integrates dual use information security items of American origin (ECCN 5D992.c <10%), is subject to the US Export Administrative Regulations (EAR) 15 C.F.R. part 730 et seq. for the country Group E:1 and E:2 which are, at the date of the License Terms and Conditions: Iran, North Korea, Sudan, Syria and Cuba. In particular, the User shall not use, export or re-export the Software in those countries and with end users or for end uses in breach of the US export control regulations.

The Software has been the subject of a declaration of operations relating to a means of cryptology to the ANSSI (Declaration N ° 17070363). However, the Software does not come under Regulation (EC) N ° 428/2009 of May 5, 2009, setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items, as confirmed by the Direction Générales des Entreprises / Services des Biens à Double-Usage Goods in his mail N ° FR 80404.

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