Sexten Interop

Some evolutions in the PDL framework implementations

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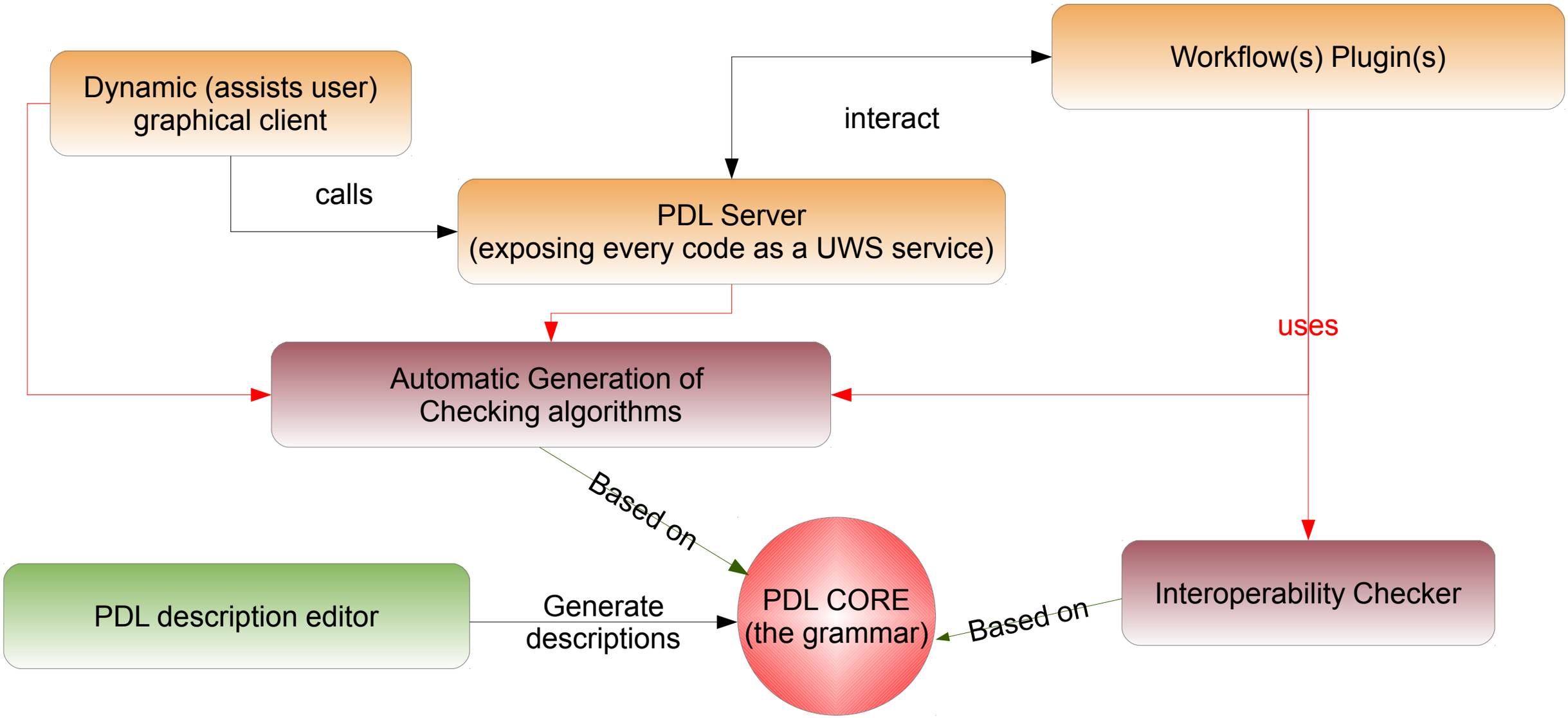
The component of the PDL framework

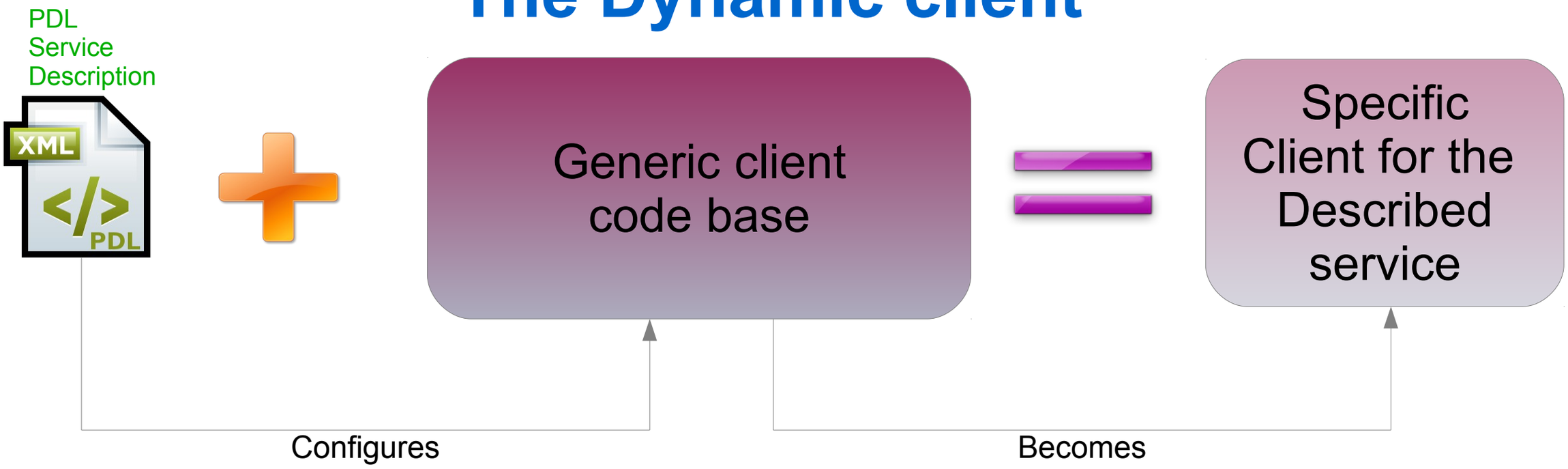
With PDL, the parameters and their related constraints are finely described with fine grained granularity:

- Generic software elements are automatically “configured” by a specific PDL description instance:
  - Services containers (PDL server)
  - Graphical User Interfaces (PDL client)
  - Workflow Plugins (Astro-Taverna plugin include the PDL layer)
- Checking algorithms and interoperability checker between service are automatically generated from descriptions

The component of the PDL framework



The Dynamic client



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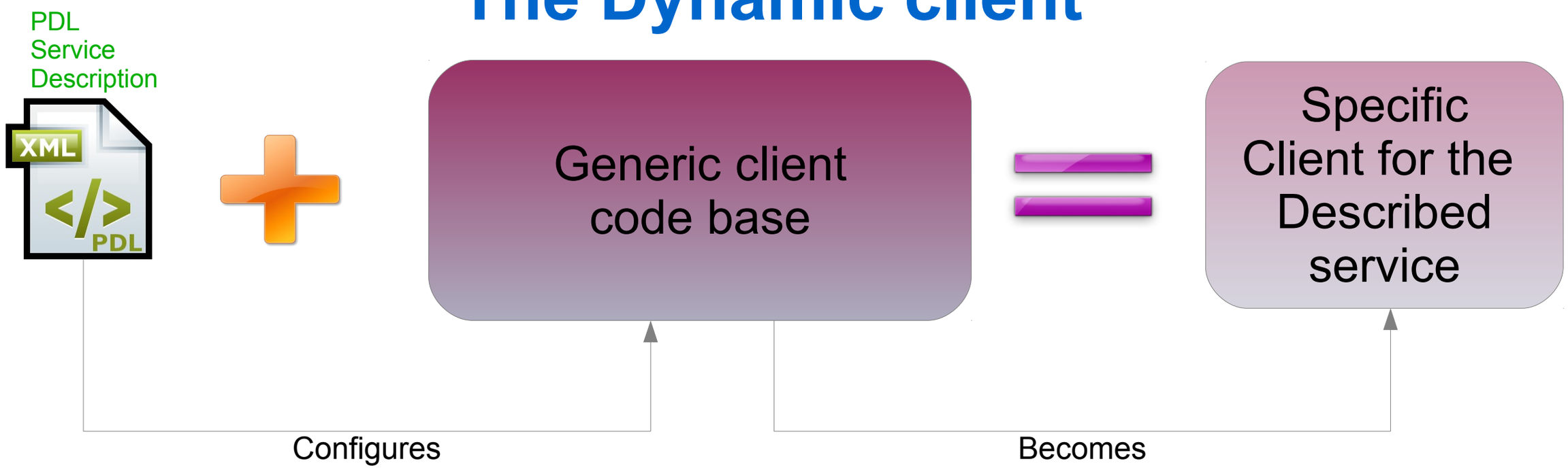
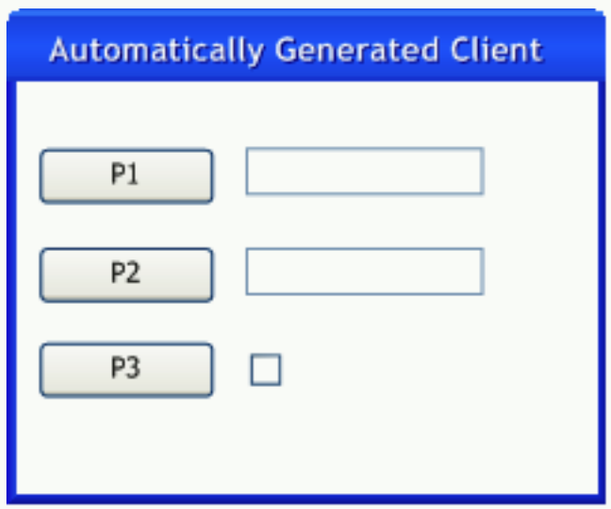


Service description:

- $p_1 \in \mathbb{R}$, $p_2 \in \mathbb{N}$ and p_3 is boolean.
- if $p_1 > 0 \implies p_2 \in \{2; 4; 6\}$ and p_3 must be false.
- if $p_1 < 0 \implies p_3$ must be true.



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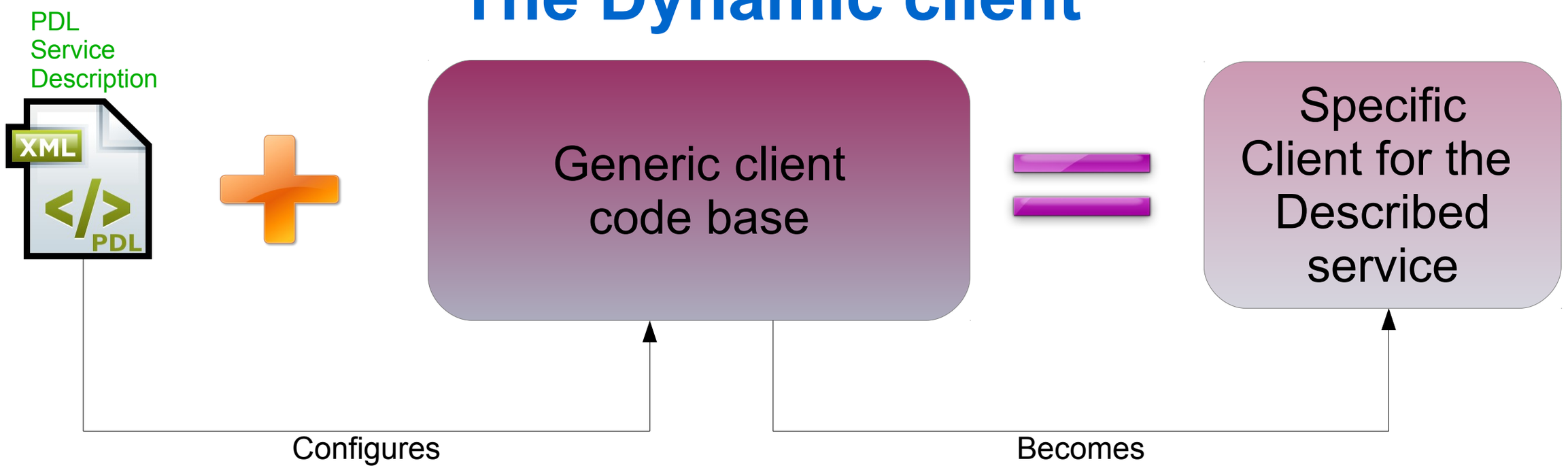

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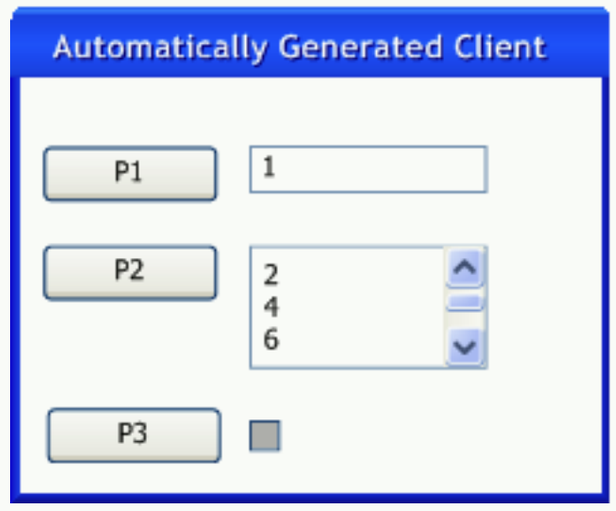

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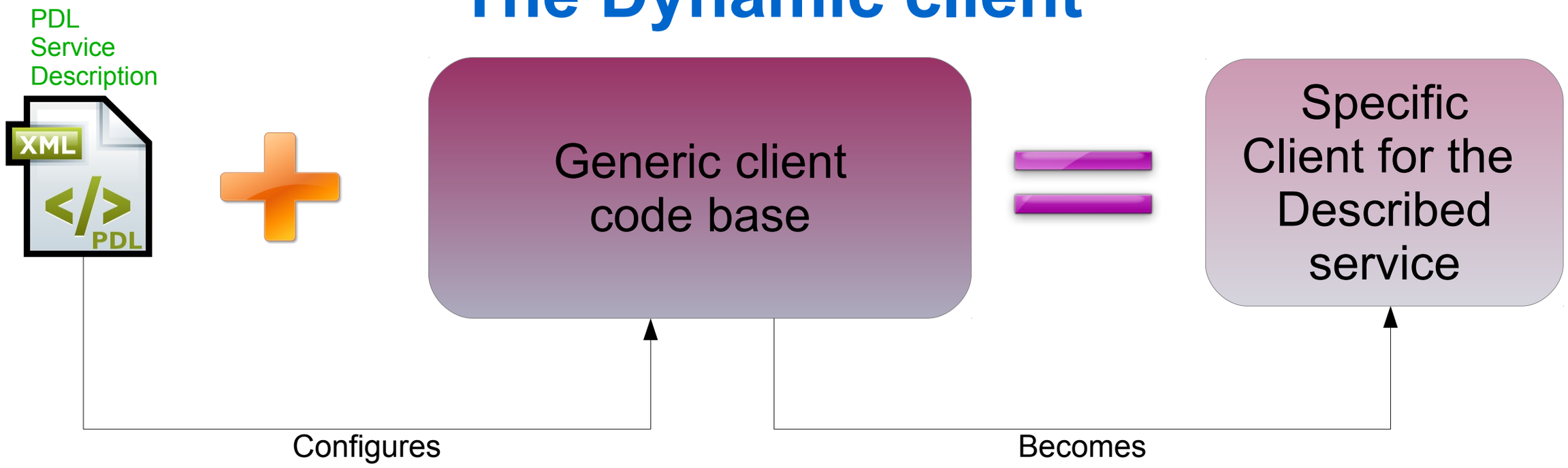

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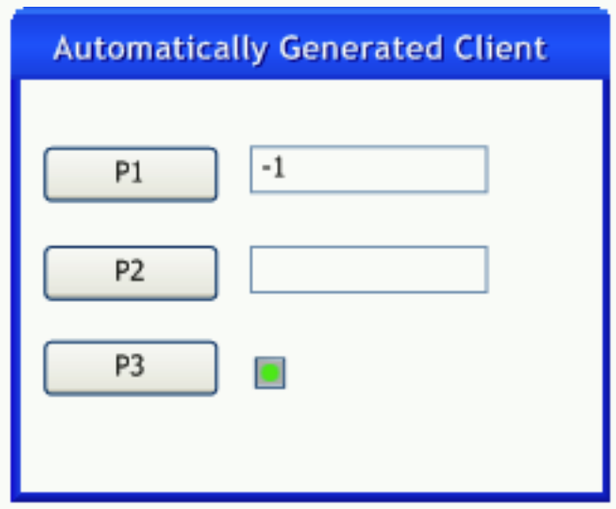

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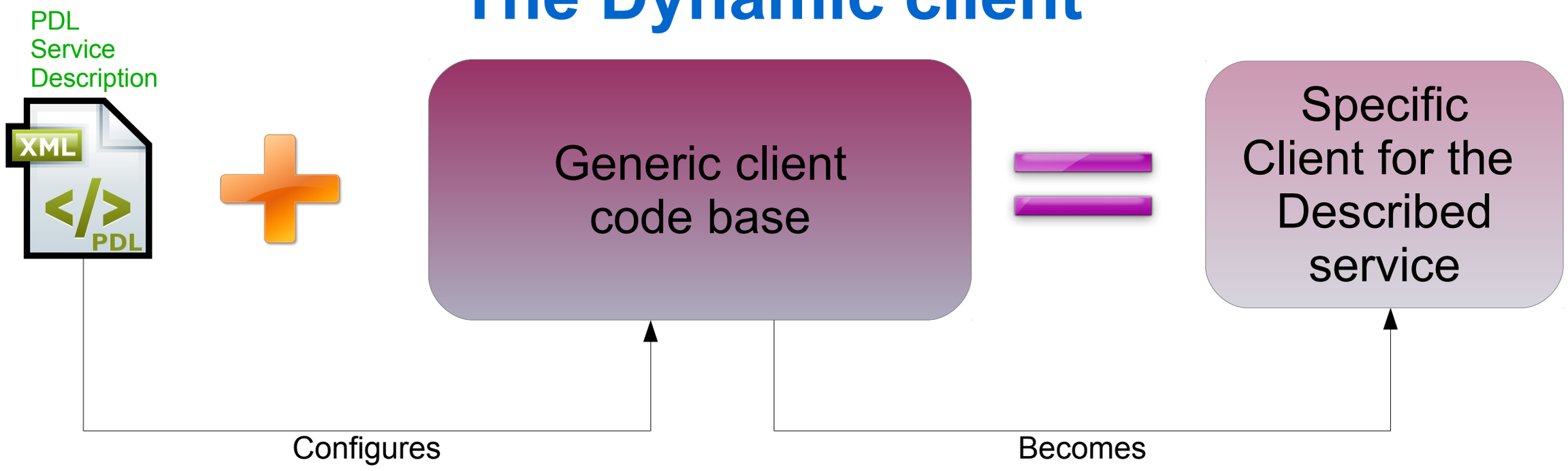
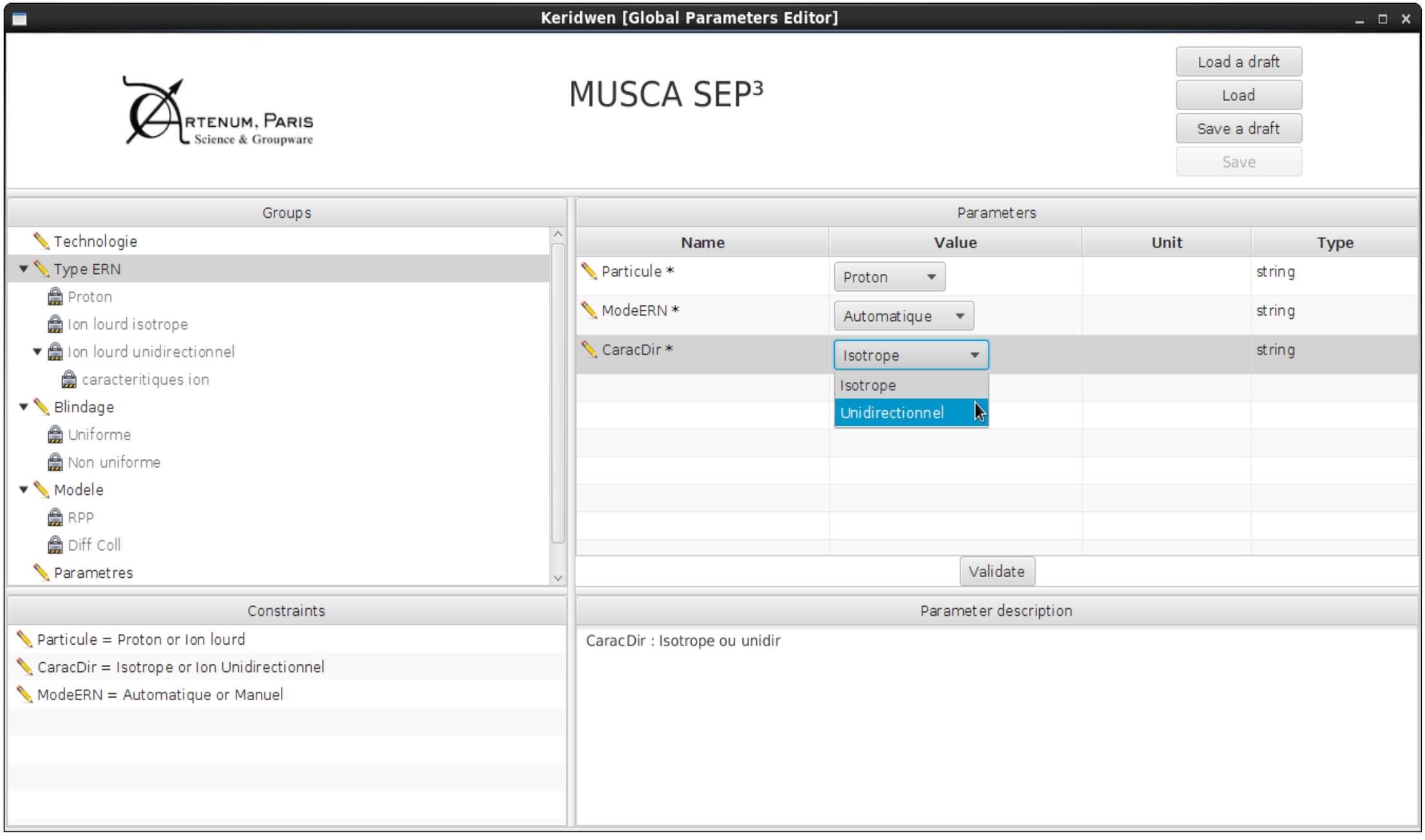


- The client implementation realized for RFC is based on Java Swing
- A French SME (Artenum, www.artenum.com) adopted PDL and has developed a Java FX version of the dynamic client, based on our core components (released with a free license).

The Dynamic client



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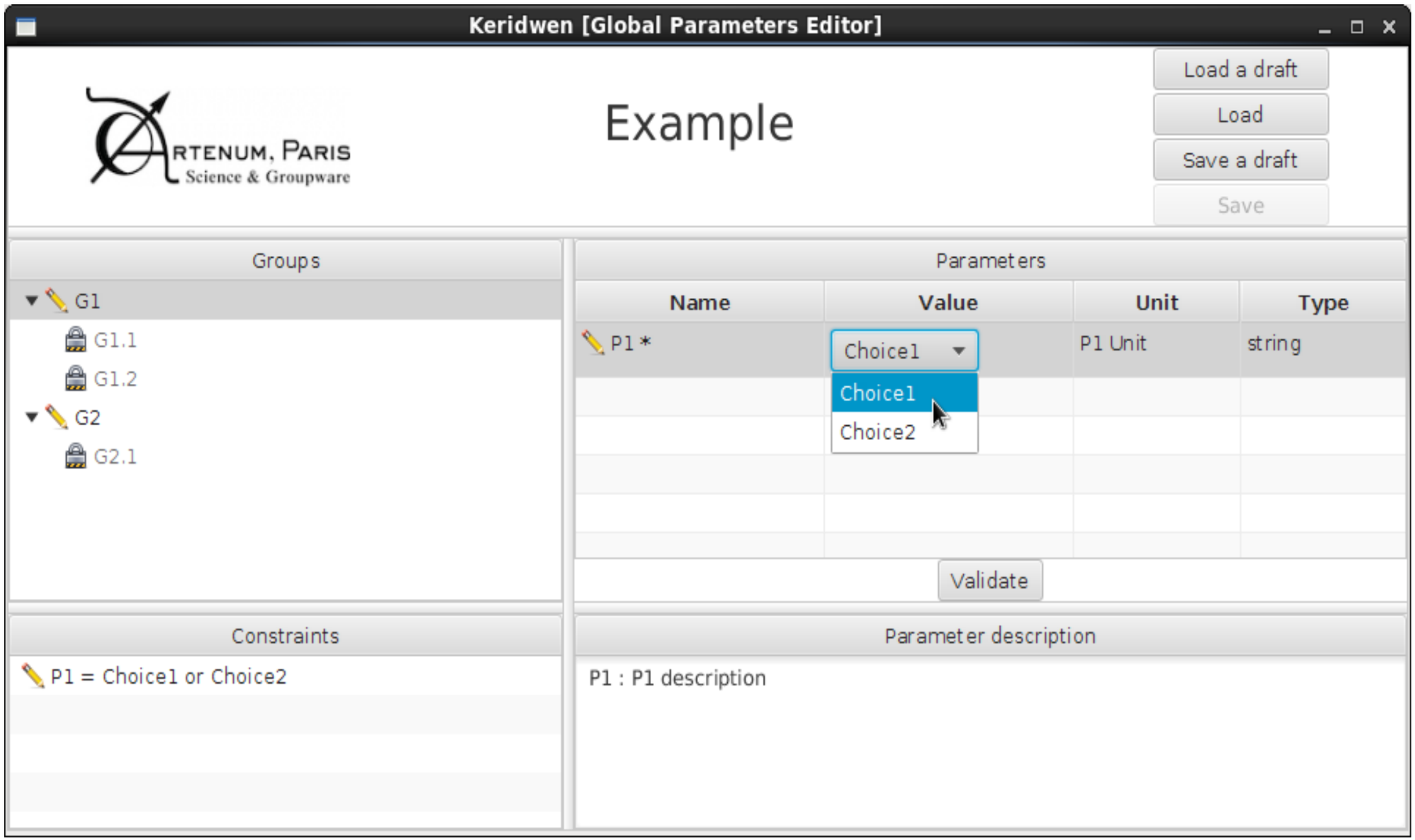

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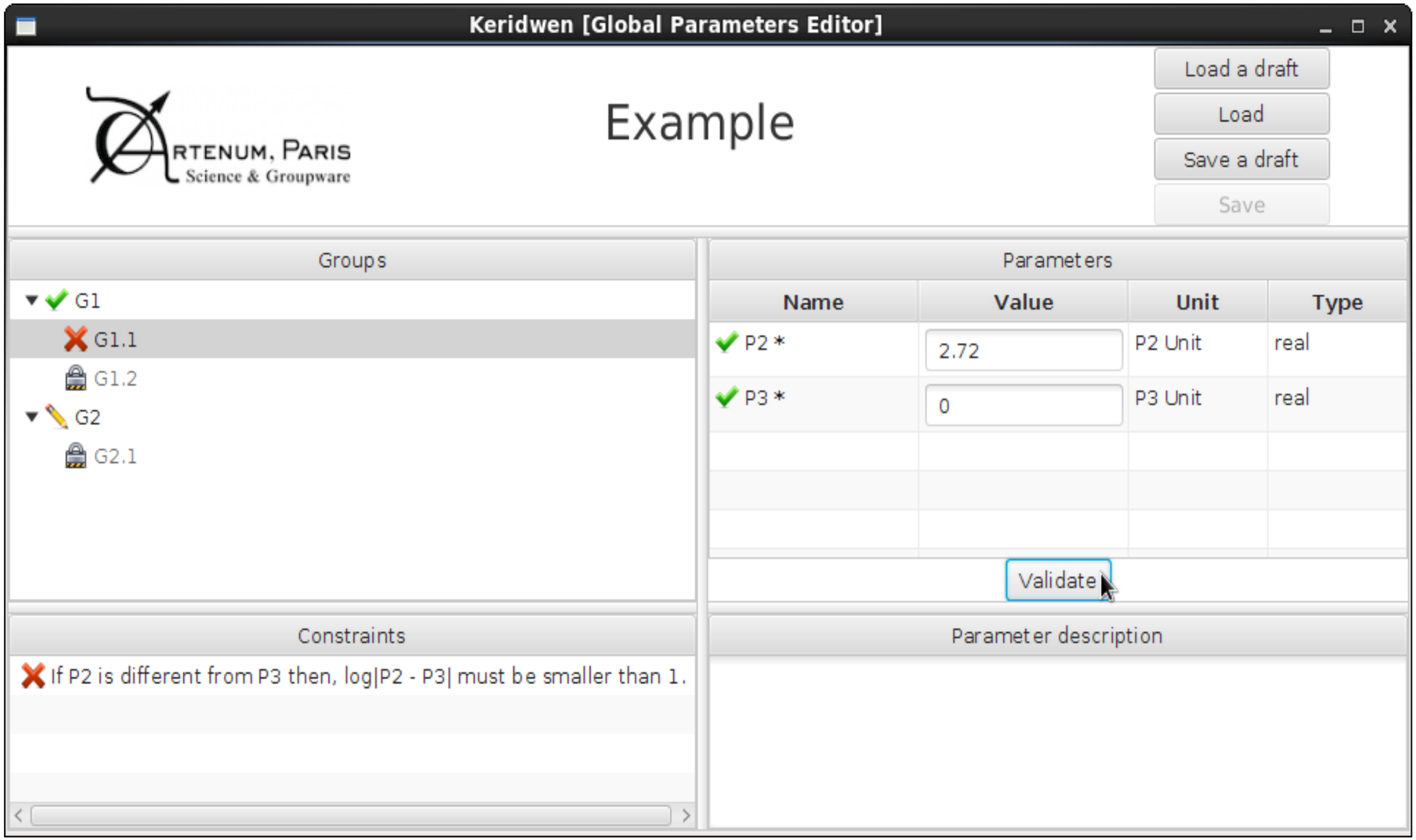

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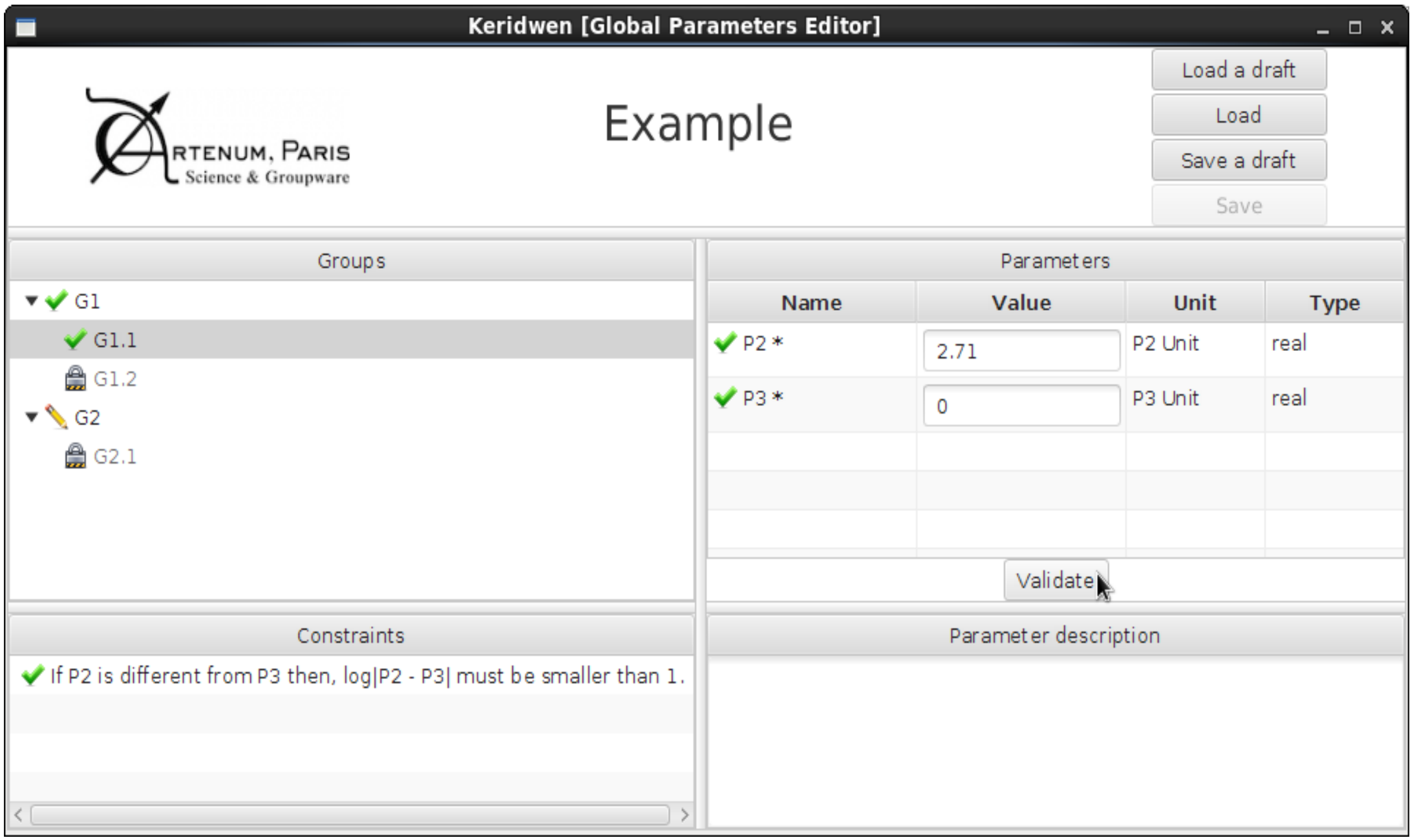

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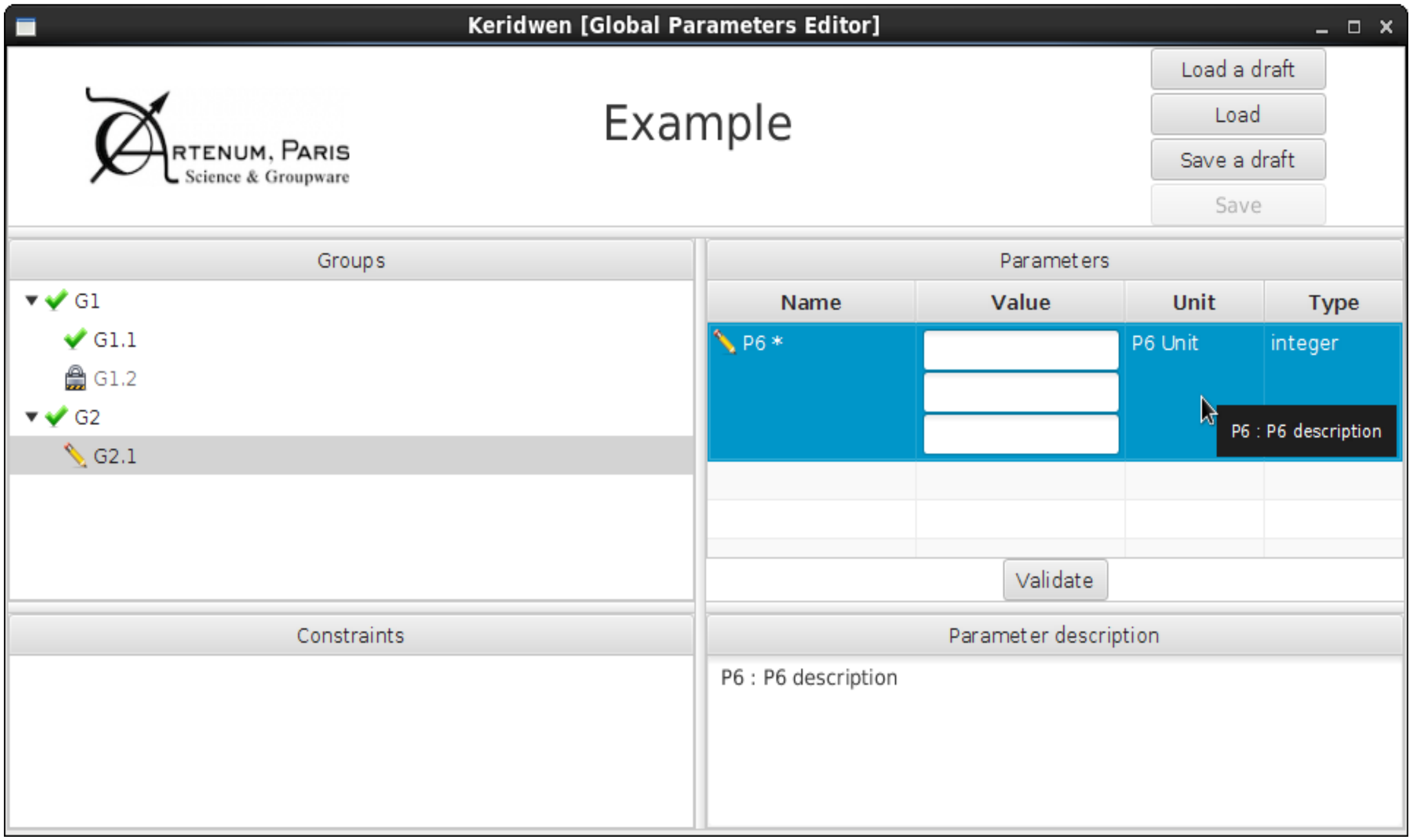

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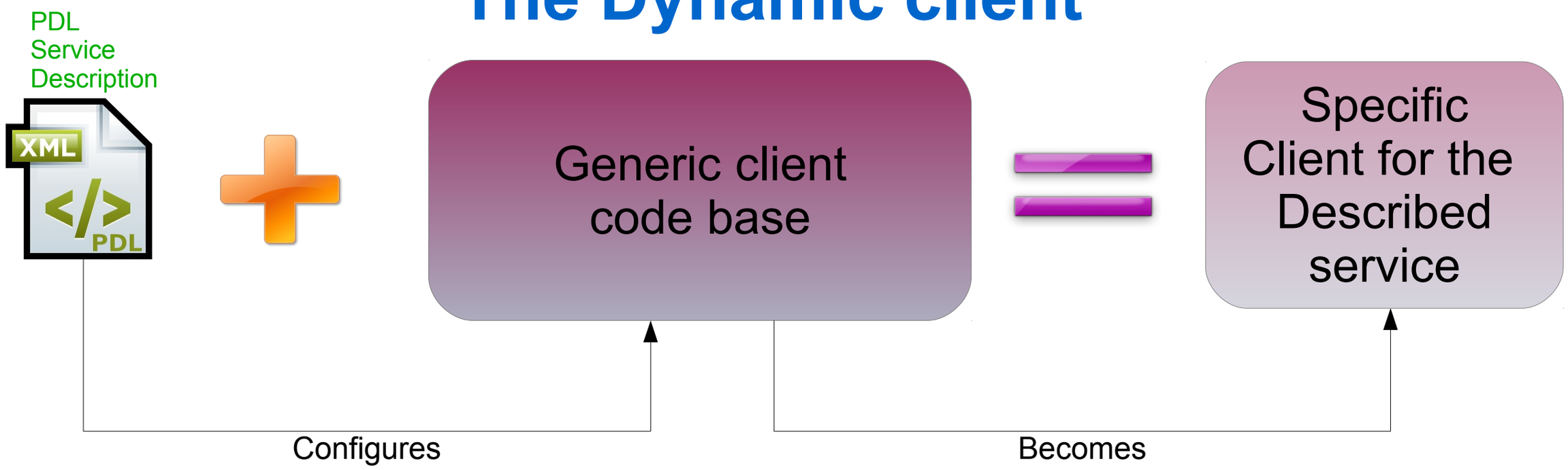
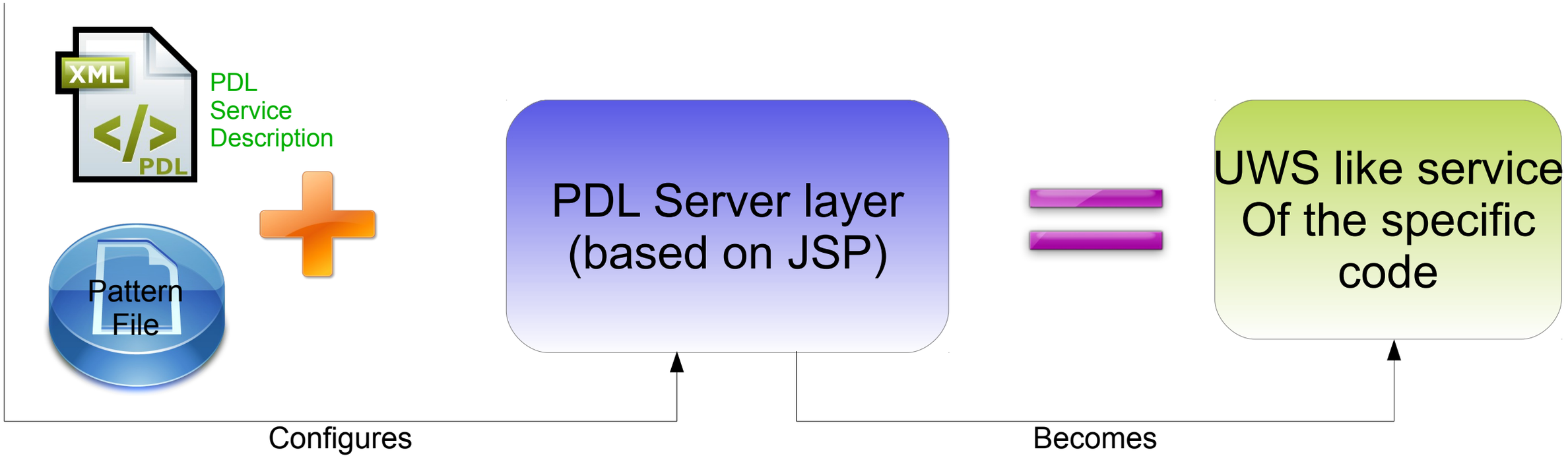


- The client implementation realized for RFC is based on Java Swing
- A French SME (Artenum, www.artenum.com) adopted PDL and has developed a Java FX version of the dynamic client, based on our core components (released with a free license).
- I am thinking at providing a full web version of the client, and started testing prototypes with Google Web Toolkit.
  - Do you think this is useful?
  - Do you see any particular feature to include? (e.g. embedded workflow engine, cf. Final remarks)

Focus on the PDL server



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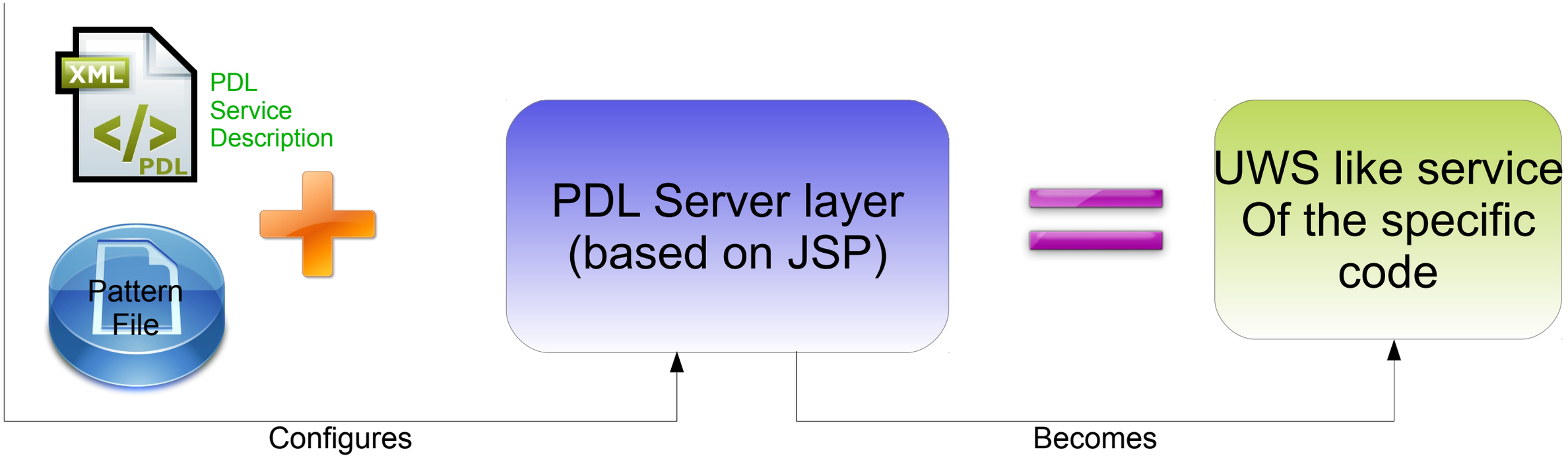
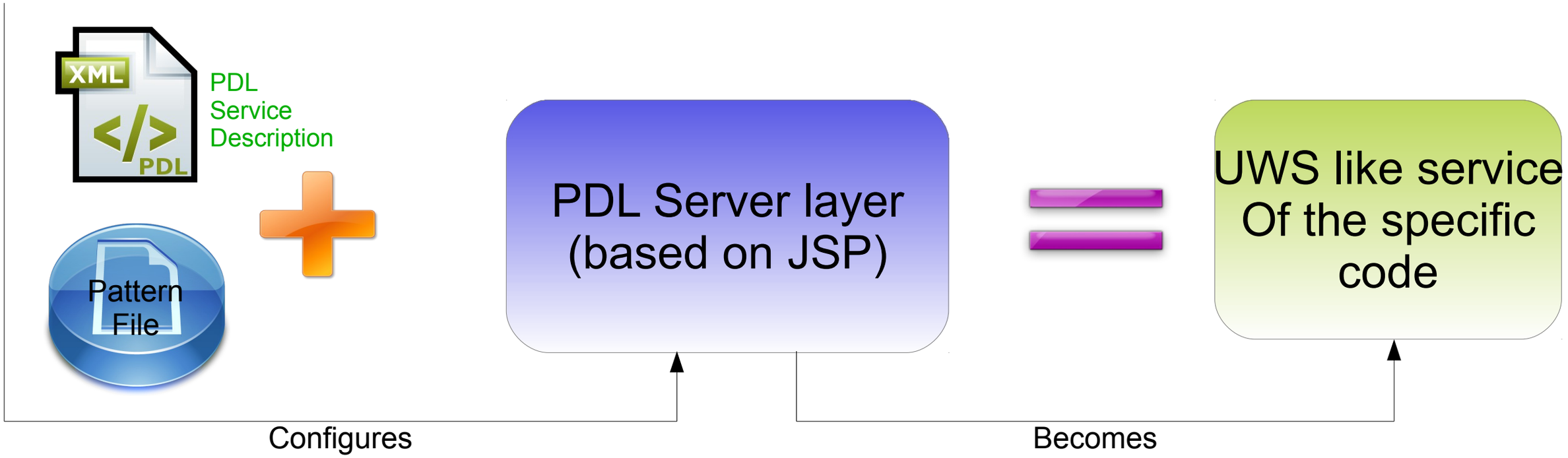


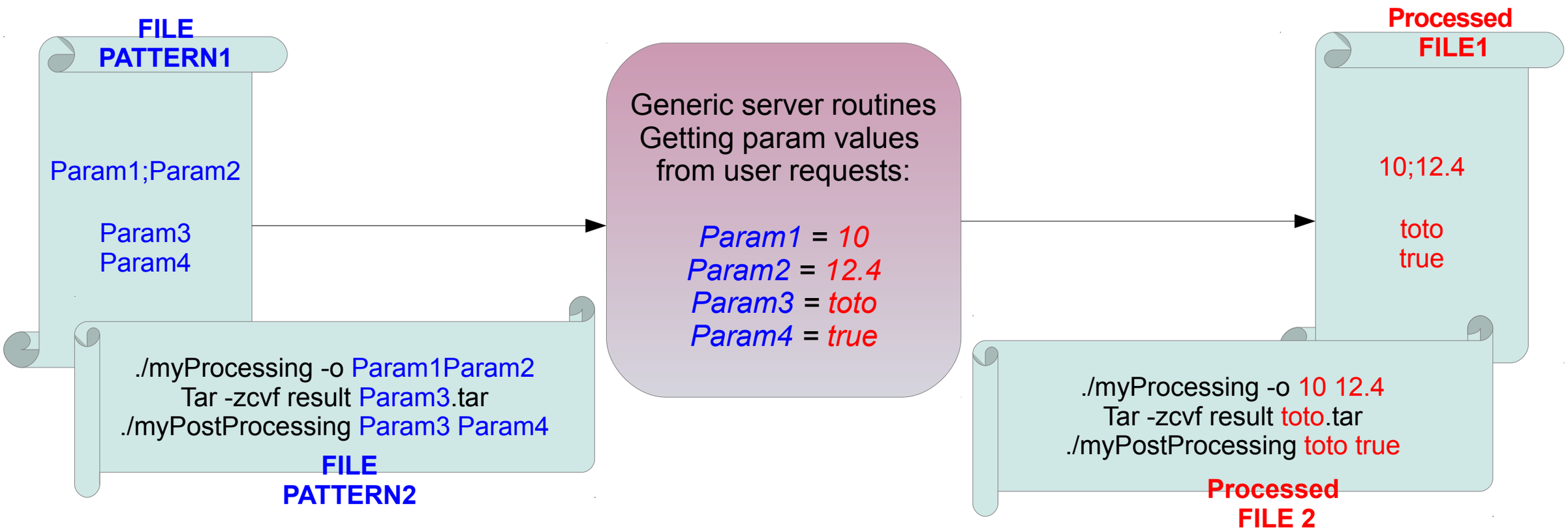
- Read the PDL description and
  - For each expected parameter, try to get the parameter provided by the user
  - Verify if the set of the provided parameters verify all the PDL constraints
    - Ok → the new job is created
    - No → PDL errors are notified to user as a server response

Generic server routines
Getting param values
from user requests:

Param1 = *10*
Param2 = *12.4*
Param3 = *toto*
Param4 = *true*

Focus on the PDL server





Focus on the PDL server

PDL server main features:

- It supports user authentication (a user cannot see the jobs or jobs lists of other users).
- It supports Grids of models
  - Jobs for parametric studies may be grouped into arbitrary sets of runs (GridID for each grid).

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PDL server main features:

- It supports user authentication (a user cannot see the jobs or jobs lists of other users).
- It supports Grids of models
  - Jobs for parametric studies may be grouped into arbitrary sets of runs (GridID for each grid).
- It has three interfaces for job administration:
  - Two machine oriented
    - The first “speaking XML” (e.g. used by Taverna plugin)
    - The second “speaking Json” (for alternate clients e.g. PDR-code client).
  - One human readable
    - The old one (based on java servlet) has been redesigned using Google Web Toolkit
      - Three static web pages have been replaced by a unique dynamic page.

Focus on the PDL server


```
{
   "errors": [
      {
         "errorMessage": "the following condition is not verified in the Grains Properties group: Grains max radius
                                 belongs to range 1e-6 - 1e-4",
         "involvedParameter(s)": [
            "los_ext",
            "rrr",
            "metal",
            "cdunit",
            "gratio",
            "q_pah",
            "alpgr",
            "rgrmin",
            "rgrmax",
            "F_DUST_P"
         ]
      }
   ]
}
```

```
{
   "ExpectedResultsURLs": [
      "http://tepig.obspm.fr:8081/pdrlight//output/PDRlight.zip"
   ],
   "UserMail": "test-pdr@obspm.fr",
   "JobID": 8,
   "ManagementURL": "http://tepig.obspm.fr:8081/pdrJobManager/userId=27&mail=test-pdr@obspm.fr",
   "UserID": 27,
   "ServiceId": "http://tepig.obspm.fr:8081/pdrlight/"
}
```

Focus on the PDL server

PDL Service

Job list for user antoine.gusdorf@googlemail.com

Job Id	Job Phase	Demand Date	End Date
233	finished	2015/04/08 15:13:26	2015/04/10 09:45:02
232	running	2015/04/08 11:47:13	
201	finished	2014/10/14 11:14:52	2014/10/14 12:30:03
182	finished	2014/04/21 11:52:16	2014/05/02 22:21:03
181	finished	2014/04/21 11:33:51	2014/05/02 22:12:02
180	finished	2014/04/21 11:32:59	2014/05/02 21:41:02
179	finished	2014/04/21 11:32:22	2014/05/02 21:27:02
178	finished	2014/04/21 11:29:30	2014/05/01 20:57:03
172	finished	2014/04/21 11:44:29	2014/04/27 00:01:02
169	finished	2014/04/21 11:45:05	2014/04/25 20:56:02
138	finished	2014/04/21 11:43:39	2014/04/19 19:02:02
135	finished	2014/04/21 11:42:55	2014/04/19 16:51:03
132	finished	2014/03/24 15:42:30	2014/03/24 16:49:02
131	finished	2014/03/24 15:40:25	2014/03/24 16:32:03
130	finished	2014/03/24 15:40:07	2014/03/24 16:19:03

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Focus on the PDL server

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233	finished	2015/04/08 15:13:26	2015/04/10 09:45:02
232	running	2015/04/08 11:47:13	
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172	finished	2014/04/21 11:44:29	2014/04/27 00:01:02
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Detail for the selected Job (Id=233)

Delete this job

ParisDurhamFileResult: http://pdl-calc.obspm.fr:8081/ParisDurham/output/233.pdshock.tgz

Parameter Name	Parameter Value
xll	1e9
shockType	C
nHi	1e4
ikinH2	2
iforH2	1
epsV	1e-8
Zeta	5e-17
Vs	26.5
Vdi	1e3
TimeJ	2e7
Ti	10
Tg	15
SOS	FD
OpH2	3
NstepW	5
NstepMax	10000
Nfluids	3
NH2Lines	200
NH2Lev	150
MaxTimeN	1e6
LIOS	integrated
LEOS	ln(N/g)
Bbeta	1

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Focus on the PDL server

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182	finished	2014/04/21 11:52:16	2014/05/02 22:21:03
181	finished	2014/04/21 11:33:51	2014/05/02 22:12:02
180	finished	2014/04/21 11:32:59	2014/05/02 21:41:02
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LEOS	ln(N/g)
LIOS	integrated
MaxTimeN	1e6
NH2Lev	150
NH2Lines	200
Nfluids	3
NstepMax	10000
NstepW	5
OpH2	3
SOS	FD
Tg	15
Ti	10
TimeJ	2e7
Vdi	1e3
Vs	26.5
Zeta	5e-17
epsV	1e-8
iforH2	1
ikinH2	2
nHi	1e4
shockType	C
xll	1e9

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Focus on the PDL server

It is based on UWS but:

- Uses Java servlets for job management (functional architecture and not REST) Recall, REST is just a binding example (actually the only) for UWS. It is not the core part of the norm and historically a soap binding was proposed.

- Has extra features for dealing with
  - Grids of jobs (e.g. search jobs by GridID)

  - User authentication/authorisation

  - Live notification of violated constraints.

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What could be done to approach (and ideally converge) the UWS and the PDL server?
Is it convenient to do so?

PDL provides some answers to issues discussed into Massive and complex data session
- Final remarks-

- It is a very convenient way for exposing codes (thus bringing processes to data).
  - It is fast to deploy services using PDL framework
  - PDL avoids “dummy computation” (runs with non-sense parameters): parameters verifications performed before jobs creation.
  - PDL server is ready to work with computer clusters, cloud & computing grids.
- Enable “transversal interoperability” between services (PDL may be seen as a meta-language for describing workflows, cf. PDL presentation of interop@Pune)

Ongoing efforts:

- Should a new client embed a sort of graphical workflow engine.
  - Users can actually build “script-oriented” workflows, using the Json interface of PDL server.
- What can we do in GWS to boost the operational adoption of PDL?
  - Politically?
  - Pratically? (e.g. how to register PDL services into registries?)