Policy Reasoning in Data Exchange Systems

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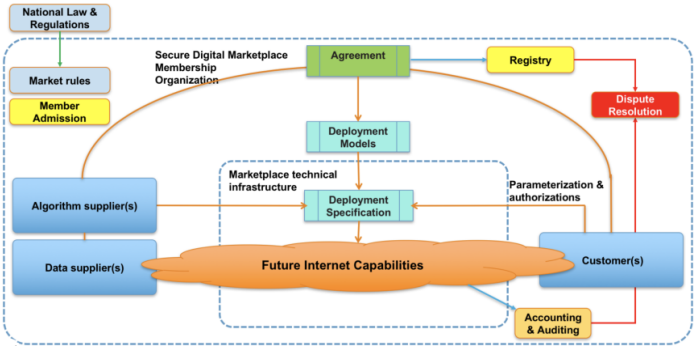
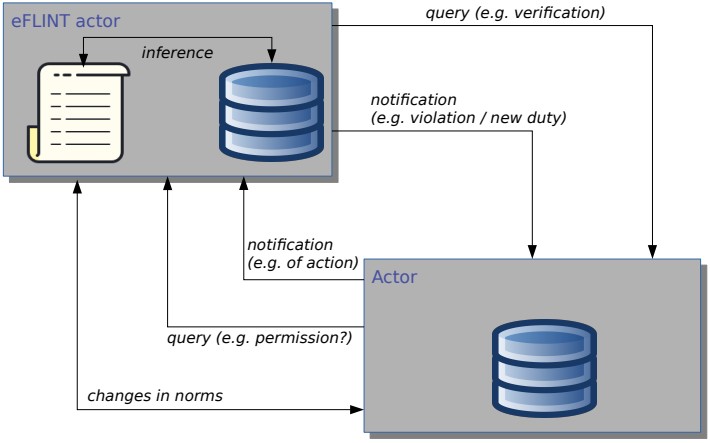
Data Marketplace

A data exchange executes data analysis **workflows** subjected to **policies** such as laws, regulations, agreements and data sharing conditions by planning **processing steps**.



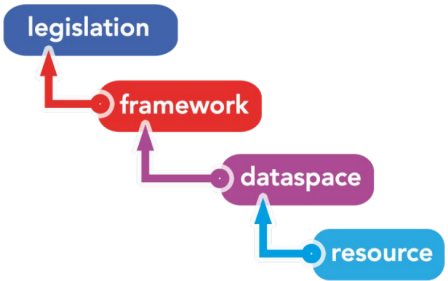
Sara Shakeri et al. "Modeling and Matching Digital Data Marketplace Policies". In: *2019 15th International Conference on eScience (eScience)*. 2019, pp. 570–577. DOI: 10.1109/eScience.2019.00078

Policy reasoning



L. Thomas van Binsbergen et al. “eFLINT: a domain-specific language for executable norm specifications”. In: *Proceedings of the 19th ACM SIGPLAN International Conference on Generative Programming: Concepts and Experiences*. ACM, 2020, pp. 124–136. DOI: 10.1145/3425898.3426958

Layered policy specification



Rule of law, International, EU and local

Trust eco-system & governance principles for sharing data

Consortium agreements "how we share data"

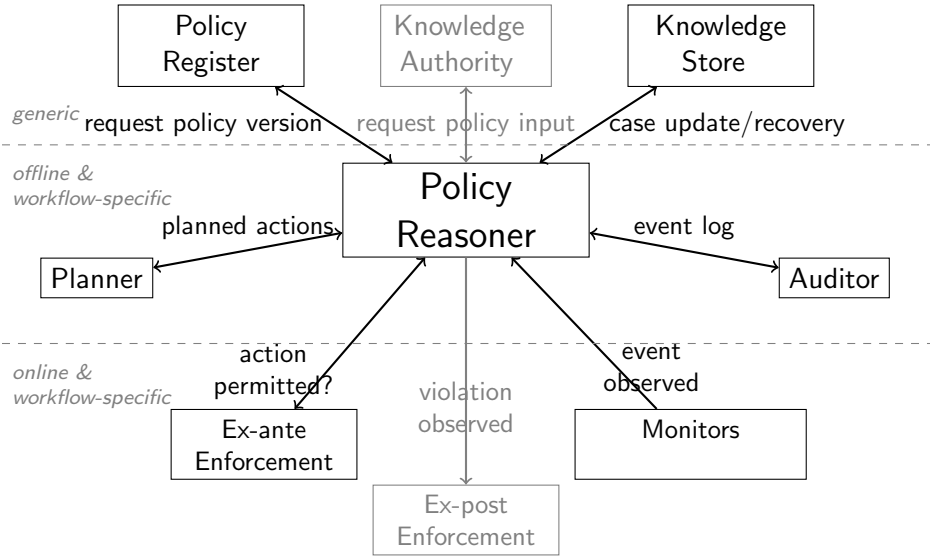
Conditions for sharing specific data, services, documents, applications

Experiments

- GDPR $\longrightarrow$ Financial sharing agreement $\rightarrow$ Organisational policy
- GDPR $\longrightarrow$ Medical consortium regulatory document $\rightarrow$ Resource-level access control

L. Thomas van Binsbergen et al. "Dynamic generation of access control policies from social policies". In: *The 11th International Conference on Current and Future Trends of Information and Communication Technologies in Healthcare (ICTH-2021)*. Vol. 198. Procedia Computer Science. Elsevier, 2021, pp. 140–147. DOI: 10.1016/j.procs.2021.12.221

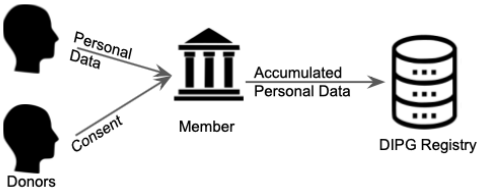
Reasoner integration



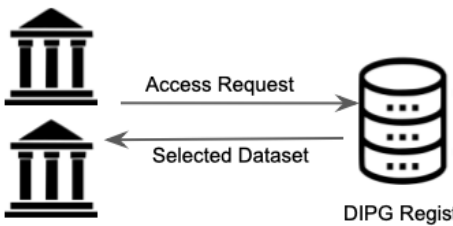
Ex-ante enforcement – DIPG network prototype

According to the GDPR and the DIPG regulatory document:

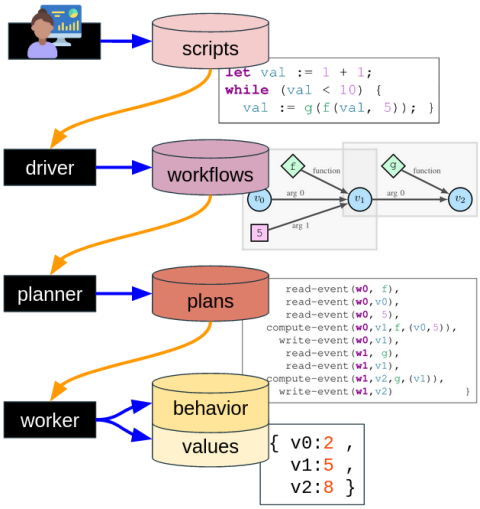
1. What conditions need to be fulfilled by a member before making data available?



2. What conditions need to be fulfilled when accessing data from the registry?

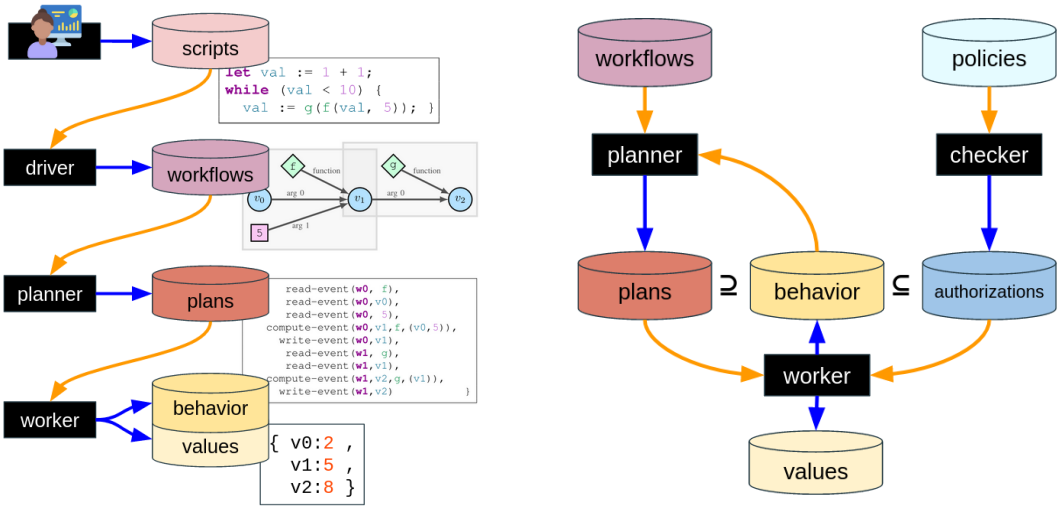


Planning policy-compliant workflow execution



Christopher A. Esterhuyse et al. "Exploring the Enforcement of Private, Dynamic Policies on Medical Workflow Execution". In: *Proceedings of ReWorDS 2022*. IEEE, 2022

Planning policy-compliant workflow execution



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On-going work

'Compute-to-N' use case

- Collaboration between N equal members
- Goal: demonstrate consortium-agreement based planning and local control

Smart-buildings use case

- Collaboration with DeXeS
- Goal: detecting conflicts between resource-level and consortium-level conditions
- Goal: integration of policy registry holding versions (of interpretations) of policies

Research data exchange (RDX) MVP v2

- Collaboration with Surf
- Goal: first demonstration of monitoring and auditing by assessing event logs

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