Edge-level authorization¶

In simple scenario, authorization can happen only at the edge level (API gateway). The API gateway can be leveraged to centralize enforcement of authorization for all downstream microservices, eliminating the need to provide authentication and access control for each of the individual services. In such case, NIST recommends to implement mitigating controls such as mutual authentication to prevent direct, anonymous connections to the internal services (API gateway bypass). It should be noted that authorization at the edge layer has a following limitations:

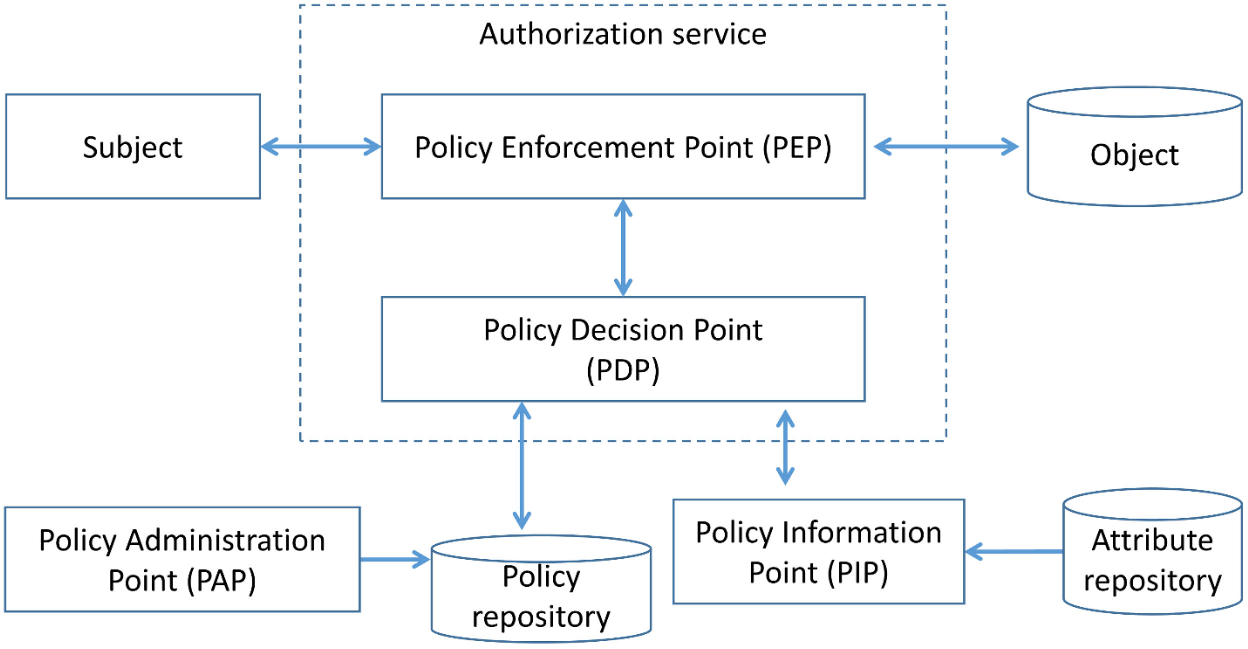
- pushing all authorization decisions to API gateway can quickly become hard to manage in complex ecosystems with many roles and access control rules;
- API gateway may become a single-point-of-decision that may violate "defense in depth" principle;
- operation teams typically own the API gateway, so development teams can not directly make authorization changes, slowing down velocity due to the additional communication and process overhead.

In most cases, development teams implement authorization in both places -- at the edge level at a coarse level of granularity and service level. To authenticate external entity edge can use access tokens (referenced token or self-contained token) transmitted via HTTP headers (e.g. "Cookie" or "Authorization") .

Service-level authorization¶

Service-level authorization gives each microservice more control to enforce access control policies. For further discussion, we use terms and definitions according with NIST SP 800-162. The functional components of access control system can be classified following way:

- Policy Administration Point (PAP) provides a user interface for creating, managing, testing, and debugging access control rules;
- Policy Decision Point (PDP) computes access decisions by evaluating the applicable access control policy;
- Policy Enforcement Point (PEP) enforces policy decisions in response to a request from a subject requesting access to a protected object;
- Policy Information Point (PIP) serves as the retrieval source of attributes, or the data required for policy evaluation to provide the information needed by the PDP to make the decisions.


Authorization service
Subject
Policy Enforcement Point (PEP)
Object
Policy Decision Point (PDP)
Policy Administration Point (PAP)
Policy repository
Policy Information Point (PIP)
Attribute repository