

# ProFact: A Provenance-based Analytics Framework for Access Control Policies



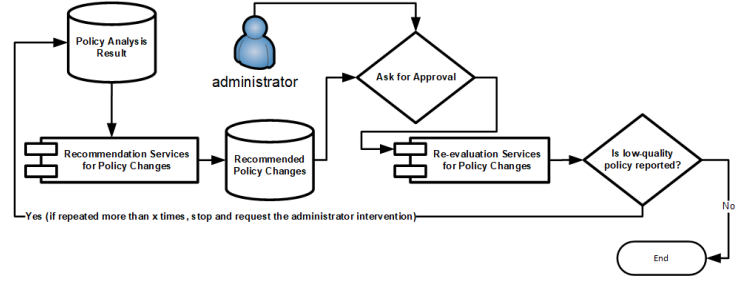
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## Policy Quality Requirements

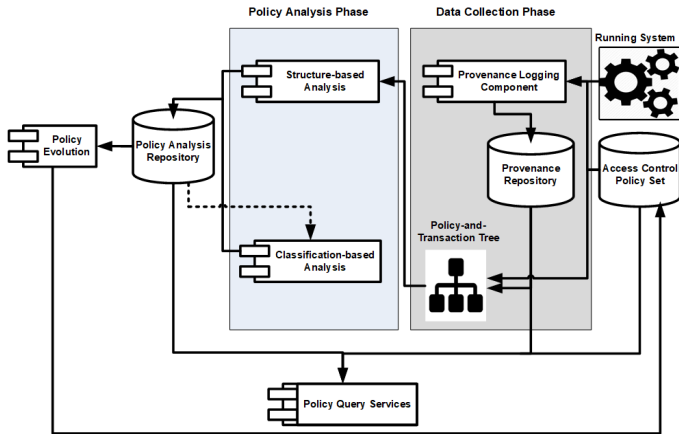
“Good Quality” Policies should be:

- **Consistent:** to reduce conflicts.
- **Complete:** to enhance the predictability of device behaviors.
- **Minimal:** to reduce the size of the policy set and enhance security.
- **Relevant:** to minimize exploitations.
- **With minimal exceptions:** to reduce the number of user administrative actions at run-time.

## Policy Evolution

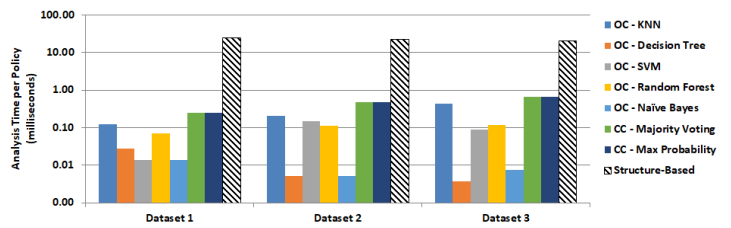


## Framework Architecture

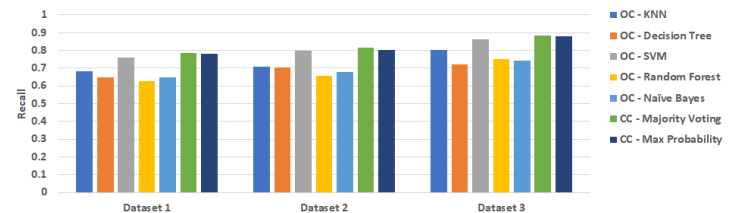


## Experimental Results

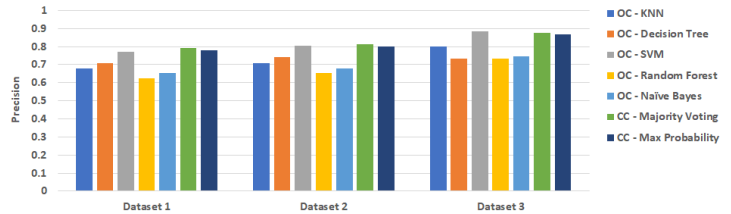
### Performance



### Recall



### Precision



## Policy Analysis Services

### Structure-based Analysis:

Policy analysis using the policy and transaction trees.

	Policy-based Analysis	Transaction-based Analysis
Inconsistency	✓	✓
Exception	✗	✓
Incompleteness	✗	✓
Redundancy	✓	✓
Irrelevancy	✓	✗

### Classification-based Analysis:

Generate patterns of policies that are of “low quality” and create categories (i.e., classes) of policies.

- **One Classifier:** uses one of the state-of-the-art classifiers (e.g., SVM).
- **Combined Classifiers:** a set of classifiers.

## Publication(s) & Impact

- Paper accepted for publication in IEEE Transactions on Services Computing.
- Paper presented at the IEEE SERVICES 2017 Congress.