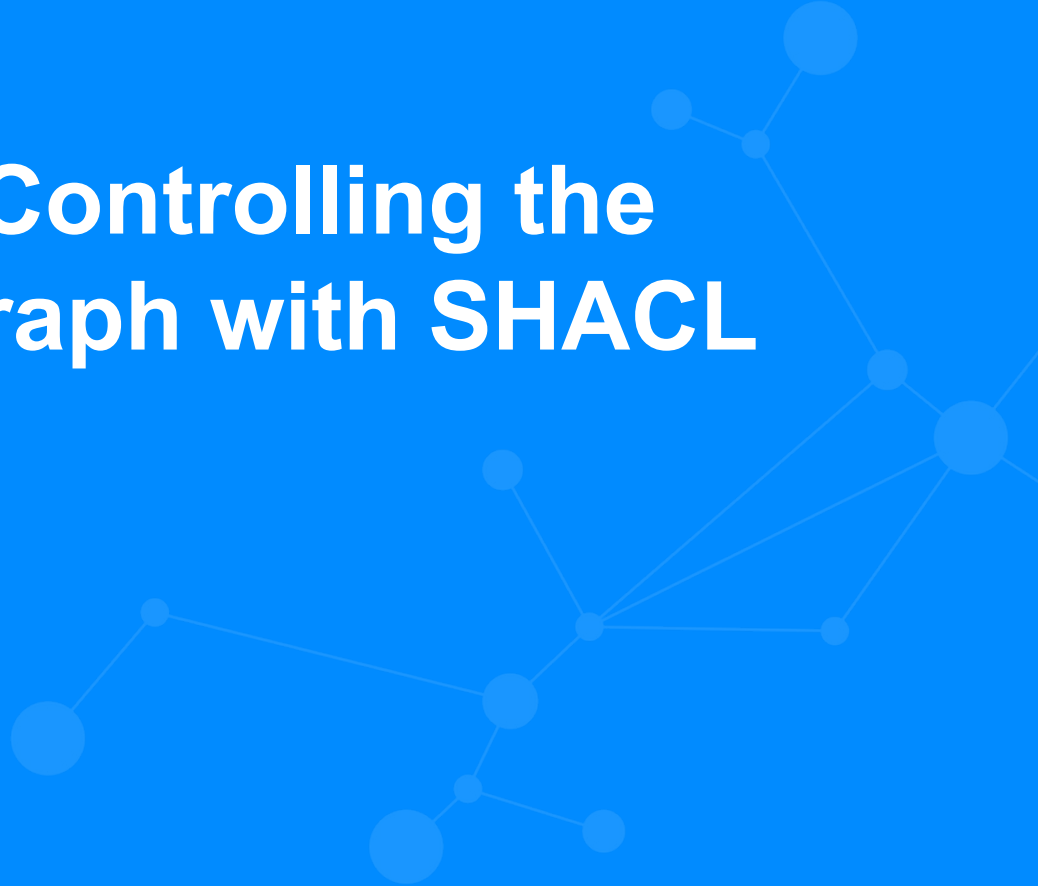


Going Meta #3: Controlling the shape of your graph with SHACL



What's the problem?

We want to report on (sometimes enforce) the **structure** of our graph without having to write a series of custom cypher queries.

Examples:

- *The phone number property in a node of type Customer has to follow this regular expression.*
- *A Product node needs to be connected to at least three suppliers.*
- *A Supplier must have one and only one name.*
- *An order node cannot have properties outside this list.*

What's SHACL?

The SHACL Shapes Constraint Language is a language for validating RDF graphs against a set of conditions.

W3C Recommendation

TABLE OF CONTENTS

1. Introduction

1.1 Terminology

1.2 Document Conventions

1.3 Conformance

1.4 SHACL Example

1.5 Relationship between SHACL and RDFS Inferencing

1.6 Relationship between SHACL and SPARQL

2. Shapes and Constraints

2.1 Shapes

2.1.1 Constraints, Parameters and Constraint Components

2.1.2 Focus Nodes

2.1.3 Targets

2.1.3.1 Node targets (sh:targetNode)

2.1.3.2 Class-based Targets (sh:targetClass)

2.1.3.3 Implicit Class Targets

2.1.3.4 Subjects-of targets (sh:targetSubjectsOf)

2.1.3.5 Objects-of targets (sh:targetObjectsOf)

2.1.4 Declaring the Severity of a Shape

2.1.5 Declaring Messages for a Shape

2.1.6 Deactivating a Shape

2.2 Node Shapes

2.3 Property Shapes

2.3.1 SHACL Property Paths


2.3.1.1 Predicate Paths

2.3.1.2 Sequence Paths

2.3.1.3 Alternative Paths

Shapes Constraint Language (SHACL)

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<https://www.w3.org/TR/shacl/>

How do I use SHACL with my Neo4j Graph?

```
@prefix ex: <http://example.neo4j.com/graphvalidation#> .
@prefix sh: <http://www.w3.org/ns/shacl#> .
@prefix neo4j: <neo4j://graph.schema#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
```

Namespaces are important in RDF

```
ex:ProdShape a sh:NodeShape ;
sh:targetClass neo4j:Product ;
```

We are defining the shape of nodes labelled as **Product**

```
sh:property [
  sh:path neo4j:productName ;
  sh:pattern "^[\\w[\\s\\w\\.]]*$" ;
  sh:maxCount 1 ;
  sh:datatype xsd:string ;
];
```

The property **productName** is optional (max card but no min), is of type string and must match this regular expression...

```
sh:property [
  sh:path neo4j:unitPrice ;
  sh:minExclusive 10 ;
  sh:maxInclusive 100 ;
  sh:maxCount 1 ;
];
```

...

```
sh:property [
  sh:path neo4j:supplied_by ;
  sh:class neo4j:Supplier ;
  sh:minCount 2 ;
];
```

The relationship **supplied_by** has a minimum cardinality of 2 and must point to a node of type **Supplier**



Let's do it!

What else?

- Enforce your constraints: Use SHACL transactionally
- Keep my graph aligned with an ontology (FIBO, schema.org,...)
 - You'll need to translate OWL -> SHACL
- Try this session at home:
 - <https://github.com/jbarrasa/goingmeta>
- What's coming up?
 - Node shape granularity
 - Export an RDF serialization of a node shape (for external use)
 - SHACL skeleton generation from your data importer model
 - UI for editing shapes