Graph Fundamentals

A graph database can store any kind of data using a few simple concepts:

1. Nodes - graph data records
2. Relationships - connect nodes
3. Properties - named data values

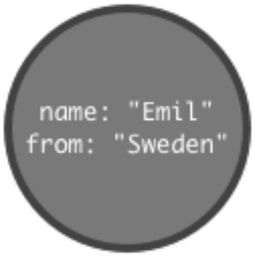
Neo4j stores data in a Graph, with records called Nodes.

1.

The simplest graph has just a single node with some named values called Properties. Let's draw a social graph of our friends on the Neo4j team:

1. Start by drawing a circle for the node
2. Add the name Emil
3. Note that he is from Sweden

Nodes are the name for data records in a graph
Data is stored as Properties
Properties are simple name/value pairs



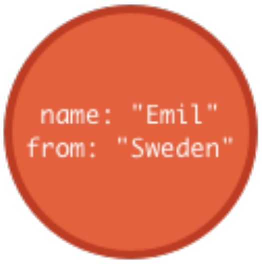
Labels

Associate a set of nodes.

Nodes can be grouped together by applying a Label to each member. In our social graph, we'll label each node that represents a Person.

1. Apply the label "Person" to the node we created for Emil
2. Color "Person" nodes red

A node can have zero or more labels
Labels do not have any properties

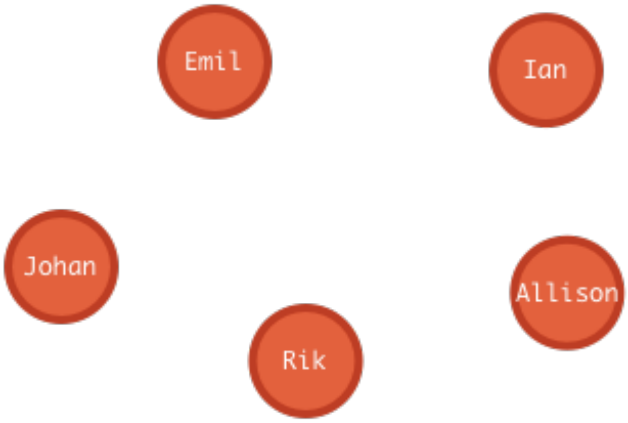


Schema-free, nodes can have a mix of common and unique properties

Like any database, storing data in Neo4j can be as simple as adding more records. We'll add a few more nodes:

1. Emil has a klout score of 99
2. Johan, from Sweden, who is learning to surf
3. Ian, from England, who is an author
4. Rik, from Belgium, has a cat named Orval
5. Allison, from California, who surfs

Similar nodes can have different properties
Properties can be strings, numbers, or booleans
Neo4j can store billions of nodes



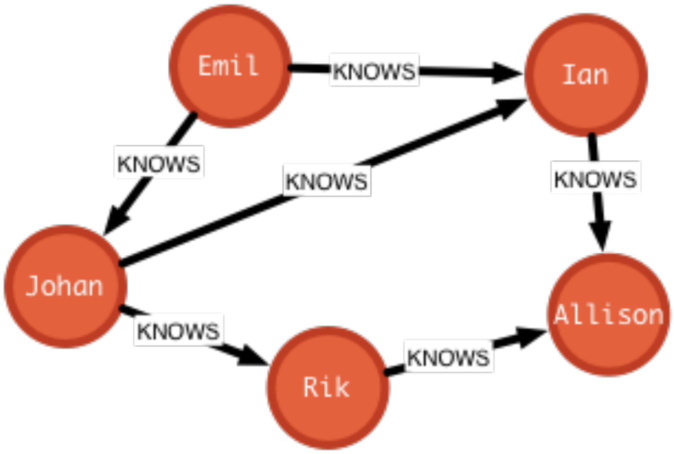
Consider Relationships

The real power of Neo4j is in connected data. To associate any two nodes, add a Relationship which describes how the records are related.

In our social graph, we simply say who KNOWS whom:

1. Emil KNOWS Johan and Ian
2. Johan KNOWS Ian and Rik
3. Rik and Ian KNOWS Allison

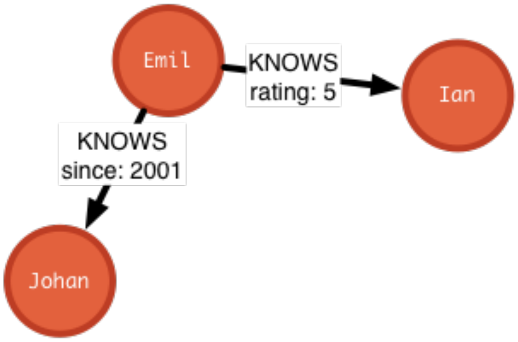
Relationships always have direction
Relationships always have a type
Relationships form patterns of data



Relationship properties

In a property graph, relationships are data records that can also contain properties. Looking more closely at Emil's relationships, note that:

Emil has known Johan since 2001
Emil rates Ian 5 (out of 5)
Everyone else can have similar relationship properties


Emil
KNOWS
rating: 5
Ian
KNOWS
since: 2001
Johan