Neo4j workshop

Graph databases in Drupal
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Tamás Demeter-Haludka
Software developer, Pronovix

Why graph databases?

Why Neo4j

There's a module for that!

drupal.org/project/neo4j (https://drupal.org/project/neo4j)

Install Neo4j

neo4j.com/download/community-edition/ (https://neo4j.com/download/community-edition/)

localhost:7474 (http://localhost:7474)

A word on Cypher

MATCH

```
MATCH (node:Label) RETURN node.property

MATCH (node1:Label1)-->(node2:Label2)
WHERE node1.propertyA = {value}
RETURN node2.propertyA, node2.propertyB

MATCH (n1:Label1)-[rel:TYPE]->(n2:Label2)
WHERE rel.property > {value}
RETURN rel.property, type(rel)
```

CREATE / MERGE

```
CREATE (n:Person { name: 'Pablo', title: 'CFO' })

MATCH (person:Person)
MERGE (city:City { name: person.bornIn })
RETURN person.name, person.bornIn, city
```

Install Drupal

- D7 core
- Composer manager
- Neo4j module
- Rules module

Module configuration

- admin/config/system/neo4j
- Logging -> Page log

Rules integration

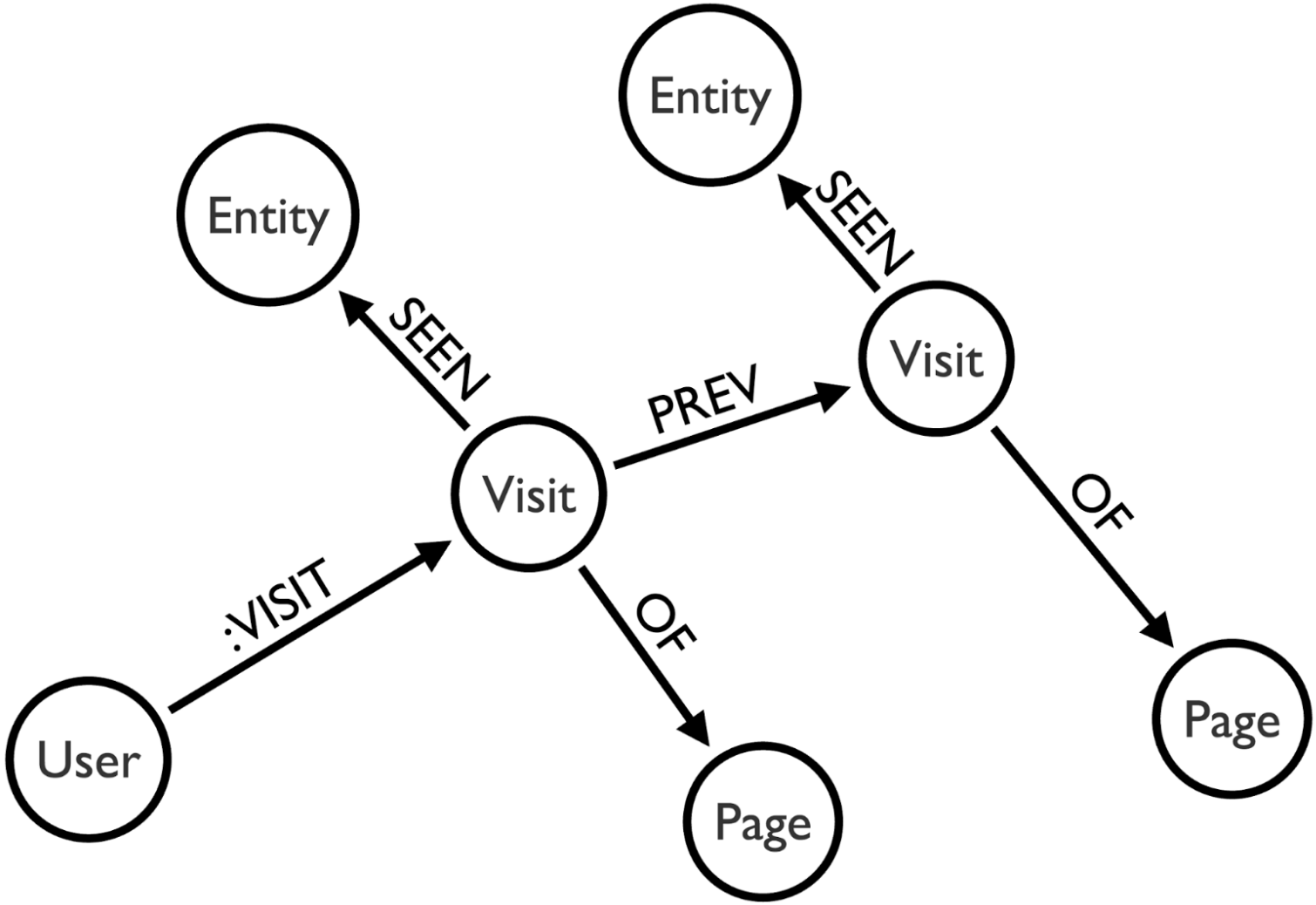
- Execute Cypher query
- Tokens hacked to work as query parameters

Logging article visits

- New rule
- Event: Content is viewed of type Article
- Cypher query

```
MERGE (e:Entity { entity_id: {node__nid}, entity_type: "node" })
WITH e
MATCH (v:Visit) WHERE id(v) = {visit}
CREATE (v)-[:SEEN]->(e)
```

Graph model


Entity
SEEN
Entity
SEEN
Visit
PREV
Visit
OF
:VISIT
OF
User
Page
Page

Integration module

recommendation.info

```
name = Neo4j Recommendation
package = Neo4j
core = 7.x
dependencies[] = neo4j
```

Everything after this goes into recommendation.module

Integration module

```
/**
 * Implements hook_block_info().
 */
function neo4j_recommendation_block_info() {
    return [
        'neo4j_recommendation' => [
            'info' => t('Neo4j content recommendation'),
            'cache' => DRUPAL_NO_CACHE,
        ],
    ];
}
```

Integration module

```
/**
 * Implements hook_block_view().
 */
function neo4j_recommendation_block_view($delta = '') {
    $block = [];

    if ($delta === 'neo4j_recommendation') {
        $block['subject'] = t('Recommended content');
        $block['content'] = [];
        if (($page_node = menu_get_object()) && !empty($page_node->nid)) {
            $recommended_nodes = _neo4j_recommendation_get_recommendations($page_node->nid);
            $links = array_map(function ($node) {
                return l($node->title, "node/{$node->nid}");
            }, $recommended_nodes);

            $block['content'] = [
                '#theme' => 'item_list',
                '#items' => $links,
            ];
        }
    }

    return $block;
}
```

Integration module

```
/**
 * Retrieves a list of nodes that are usually visited by users who visit node/$nid.
 *
 * @param $nid
 *   Page node id.
 * @return array
 *   List of recommended nodes.
 */
function _neo4j_recommendation_get_recommendations($nid) {
    $client = neo4j_get_client();

    if ($client) {
        try {
            $res = $client->run("
```

Recommendation query

```
MATCH (p:Page)<-[:OF]-(:Visit)-[:SEEN]->(pe:Entity { entity_type: {entity_type}, entity_id: {entity_id}
MATCH (p)<-[:OF]-(:Visit)-[prev:PREV*..10]-(:Visit)-[:SEEN]->(e:Entity)
WHERE NOT e = pe AND e.entity_type = {entity_type}
RETURN e.entity_id AS entity_id, avg(size(prev)) AS distance
ORDER BY distance ASC
LIMIT 10
```

Integration module

```
", [
    'entity_id' => $nid,
    'entity_type' => 'node',
]);

$nids = [];

foreach ($res->records() as $record) {
    $nids[] = $record->get('entity_id');
}

$nodes = node_load_multiple($nids);

$ordered_nodes = [];
foreach ($nids as $nid) {
    $ordered_nodes[] = $nodes[$nid];
}

return $ordered_nodes;
```

Integration module

```
}
catch (Exception $e) {
    watchdog_exception('neo4j recommendation', $e);
}
}

return [];
}
```

What about your site?

Closing thoughts, shameless plug

neo4j.com/slack (https://neo4j.com/slack)

Room: #neo4j-drupal

Thank you

Tamás Demeter-Haludka
Software developer, Pronovix
tamas@pronovix.com (mailto:tamas@pronovix.com)
https://pronovix.com (https://pronovix.com)