Neo4j 2.1.7: What's special about a variable length of 10?

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I have a list of history nodes attached to various objects that are connected together in a history hierarchy. I traverse the list for a particular object by following HISTORY relationships with the corresponding object id. I recently noticed that the queries are timing out and ran into the following during my investigation.

My query is as follows:

```
  MATCH (i:file { id: "foobar" })
  WITH i

  MATCH (i)-[:HISTORY*1..10 {id: i.id}]->(a:activity)
  WITH DISTINCT i, a SKIP 0 LIMIT 10

  RETURN a
```

This query is just locating a particular starting node by schema index and then trying to follow the history chain, collecting up all of the activity nodes that it finds. If I look for a chain with a maximum of 2 nodes ([:HISTORY*1..2]) it returns quickly. Same for 3, 4, 5, 6, 7, 8, and 9. However, if I try to run the query above, it takes over 200s to actually complete. The crazy part is that this particular case only has two activities in the chain.

Why does looking for a maximum of 9 return instantly but 10 take over 200s? Especially since there is only a maximum of 2 to be found in either case?

How should I be writing this query to be more perfomant?

I haven't tested with Neo4j 2.2.1 yet since I can't deploy that to production yet. I'm looking for a solution for 2.1.7.

PROFILE WITH 9

```
>   MATCH (i:file { id: "foobar" })
>   WITH i
>
>   MATCH (i)-[:HISTORY*1..9 {id: "foobar"}]->(a:activity)
>   WITH DISTINCT i, a SKIP 0 LIMIT 9
>
>   RETURN COUNT(a);
+----------+
| COUNT(a) |
```

```
+----------+
| 2        |
+----------+
1 row
```

ColumnFilter
  |
  +EagerAggregation
    |
    +Slice
      |
      +Distinct
        |
        +Filter
          |
          +PatternMatcher
            |
            +SchemaIndex

```
+-----------------+------+--------+-----------------+---------------------------------------------------------------------------------------------------------+
|        Operator | Rows | DbHits |      Identifiers |                                                                                                   Other |
+-----------------+------+--------+-----------------+---------------------------------------------------------------------------------------------------------+
|    ColumnFilter |    1 |      0 |                 |                                                                                             keep columns COUNT(a) |
| EagerAggregation |   1 |      0 |                 |                                                                                                         |
|           Slice |    2 |      0 |                 |                                                                                      {  AUTOINT2}; {  AUTOINT3} |
|        Distinct |    2 |      0 |                 |                                                                                                         |
|          Filter |    2 |      8 |                 | (hasLabel(a:activity(18)) AND all(  UNNAMED-7541039006321584207 in   UNNAMED-2669272078697603796 where Property(  UNNAMED-7541039006321584207,id(6)) == {  AUTOSTRING1})) |
|  PatternMatcher |    2 |  72838 | i, a,   UNNAMED60 |                                                                                                         |
|     SchemaIndex |    1 |      2 |            i, i |                                                                                    {  AUTOSTRING0}; :file(id) |
+-----------------+------+--------+-----------------+---------------------------------------------------------------------------------------------------------+
```

Total database accesses: 72848

PROFILE WITH 10

> MATCH (i:file { id: "foobar" })

```
> WITH i
>
> MATCH (i)-[:HISTORY*1..10 {id: "foobar"}]->(a:activity)
> WITH DISTINCT i, a SKIP 0 LIMIT 10
>
> RETURN COUNT(a);
+----------+
| COUNT(a) |
+----------+
| 2        |
+----------+
1 row

ColumnFilter
  |
  +EagerAggregation
    |
    +Slice
      |
      +Distinct
        |
        +Filter
          |
          +PatternMatcher
            |
            +SchemaIndex
```

Operator	Rows	DbHits	Identifiers	Other
ColumnFilter	1	0		keep columns COUNT(a)
EagerAggregation	1	0		
Slice	2	0		{ AUTOINT2}; { AUTOINT3}
Distinct	2	0		
Filter	2	8		(hasLabel(a:activity(18)) AND all(UNNAMED-6855841532423436547 in UNNAMED-4126485615317615815 where Property(UNNAMED-6855841532423436547,id(6)) == { AUTOSTRING1}))
PatternMatcher	2	5084198	i, a, UNNAMED60	
SchemaIndex	1	2	i, i	{ AUTOSTRING0}; :file(id)

```
+------------------+------+---------+------------------+------------------------------------------------------------------------------------------------------------------------------------------------------------------+
```

Total database accesses: 5084208