# Query & Search Optimization Cheat Sheet

### Overview

When building queries, list views, and reports, it's best to create filter conditions that are selective so Force.com scans only the rows necessary in the objects your queries target—the Force.com query optimizer doesn't use an index to drive queries containing unselective filter conditions, even if the fields those filter conditions reference already have indexes on them. (This cheat sheet's "Index Selectivity Exceptions" section points to several things that automatically make filter conditions unselective.) Because filter conditions are also unselective if they exceed the Force.com query optimizer's thresholds, selectivity is especially important when your queries target objects containing more than one million records. Read on to learn how to write selective filter conditions, minimize your query response times, and optimize the database's overall performance.

## Fields with Database Indexes

### Indexed Standard Fields, All Objects

Td

Name

OwnerId

CreatedDate

SystemModstamp

RecordType (indexed for all standard objects that feature it)

Master-detail fields

Lookup fields

#### Other Indexed Fields

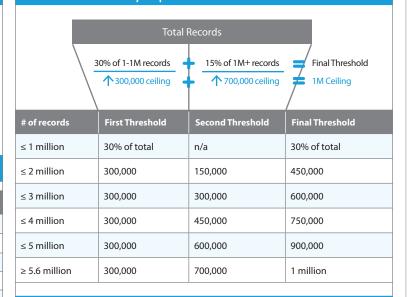
Unique fields

External ID fields

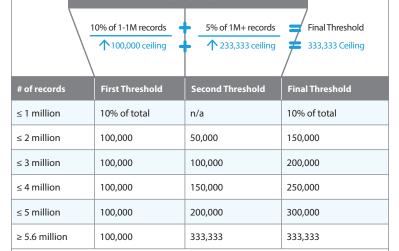
# Index Selectivity Conditions and Thresholds

Condition	Thresholds	Index Used
Unary: standard index	Filter targets less than:  • 30% of the first million records  • 15% of records after the first million records  • 1 million total records	Standard index
Unary: custom index	Filter targets less than:  • 10% of the first million records  • 5% of records after the first million records  • 333,333 total records	Custom index
AND	Filter targets less than:  • Twice the index selectivity thresholds for each filter  • The index selectivity thresholds for the intersection of the fields  The Force.com query optimizer can detect date and number ranges, and treats their filters on the same field as a single, combined filter.	Composite index
OR	Filter targets less than:  • The index selectivity thresholds for each filter  • The index selectivity thresholds for the sum of those fields	Index union
LIKE	For conditions that don't start with a leading wildcard, Force.com tests the first 100,000 rows for selectivity.	Standard index or custom index

# Force.com Query Optimizer - Standard Index



# Force.com Query Optimizer - Custom Index



## Index Selectivity Exceptions

Filter Conditions With	In SOQL	In Reports and List Views
Negative filter operators	•!= •NOT LIKE •EXCLUDES	<ul><li>not equal to</li><li>does not contain</li><li>excludes</li></ul>
Comparison operators paired with text fields	<pre>•text_field &lt; •text_field &gt; •text_field &lt;= •text_field &gt;=</pre>	<ul> <li>text field less than</li> <li>text field greater than</li> <li>text field less or equal</li> <li>text field greater or equal</li> </ul>
Leading "%" wildcards	LIKE '%string%'	contains
References to non- deterministic formula fields	Cross-object formula fields	



## SOSL

#### Search Selectivity Tips

Be as selective as possible. For example, use Michael\*, not Mich\*.

Remember that Chatter feed searches aren't affected by the scope of your search, and that their results include matches across all objects.

Search for exact phrases using advanced searches.

Limit scope by targeting:

- Specific objects
- Rows owned by the searcher
- · Rows within a division, when applicable

#### Fields with Search Indexes (Vary by Object)

Name fields

Phone fields

Text fields

Picklist fields

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www.facebook.com/forcedotcom

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## **Related Resources**

 $On\ Architect\ Core\ Resources:\ developer.sales force.com/architect$ 

A Guide to Application Performance Profiling in Force.com (article)

Best Practices for Deployments with Large Data Volumes (paper)

Inside the Force.com Query Optimizer (webinar recording)

On the Sales force Developers Blog: developer. sales force. com/blogs

"Collecting Selectivity Statistics for Force.com Queries"

"Dealing with Exception Filters in Force.com"

"Force.com Formula Fields, Indexes, and Performance Gotchas"

"Force.com SOQL Best Practices: Nulls and Formula Fields"

"Maximizing the Performance of Force.com SOQL, Reports, and List Views"

#### In the Salesforce Help: help.salesforce.com

"Build Effective Filters" (documentation)

"Getting the Most Out of Filter Logic" (documentation)

"How to Improve Listview Performance" (Salesforce Knowledge article)

"Improve Report Performance" (documentation)

"Search Overview" (documentation)

