# TaiRox Memo

Reindexing Sage 300 Tables

Summary

This memo describes, for a less technical audience, certain database terms related to Sage 300 performance: "unbalanced" and "fragmented" indexes. This memo also explains how Sage 300 and TaiRox tools are used to optimize index performance.

Indexes and Performance

Sage 300 indexes include account, customer, vendor and item numbers. Every Sage 300 table has between 1 and 7 indexes that are used to speed up access to the table. Each index will speed up particular operations. Indexes can become "unbalanced" or "fragmented" over time, which will degrade Sage 300 performance. Most SQL Server indexes are stored as trees.

## A Balanced Index Tree with no Fragmentation
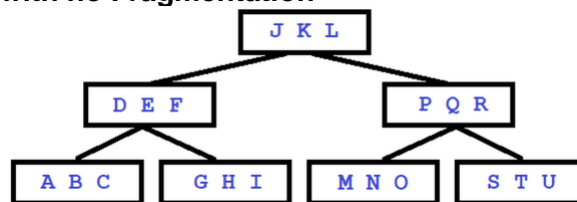
This picture shows an idealized tree with 1-character index values and up to 3 entries per page. To look up the entry "T", start at the top and navigate to the right (because T comes after L) to the next level. Then navigate to the right again (because T comes after R) to the next level. At that level you find a match and there will be a reference to the data for the T index value.

An Unbalanced Index Tree with No Fragmentation
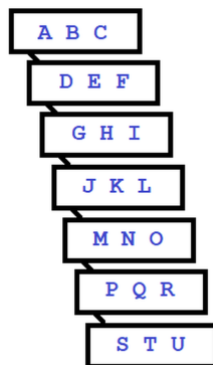
This picture shows an extremely unbalanced tree. To look up the entry "T" now involves 7 levels of navigation instead of 3. This takes more time, especially if the pages are not currently cached in memory.

An Unbalanced and Fragmented Index Tree
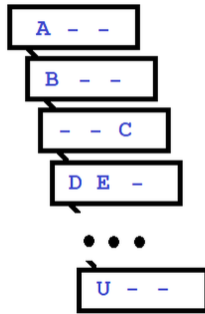
Sometimes, when there are many insertions and deletions in a table, the index values can get scattered across multiple pages resulting in performance degradation that can be minor or significant.

Optimizing an Index Tree with DBDump and DBLoad

It is a common practice of Sage 300 consultants to perform DBDump and DBLoad operations periodically to "clean up" a database. The result of these 2 operations will be, within reason, well-balanced and defragmented index trees. Caution: A Sage DBDump operation can be performed while users are connected to the database. The resulting DBDump files can be inconsistent and fail integrity tests if loaded. A DBLoad operation should be performed when users are not connected to the database and may take several hours for medium and large databases.

TaiRox Fast DBTools

Fast DBTools features include:

- Feature: An ability to lock users out while performing a DBDump operation.
  - Benefit: Data consistency is preserved.
- Feature: A DBLoad operation is 3-4 times faster than Sage's DBLoad operation.
  - Benefit: Outage time is greatly reduced.
- Feature: An ability to reindex trees while users are logged into Sage 300.
  - Benefit: Indexes are balanced and defragmented without scheduling an outage.

Feature: Lock Out Users During a DBDump Operation

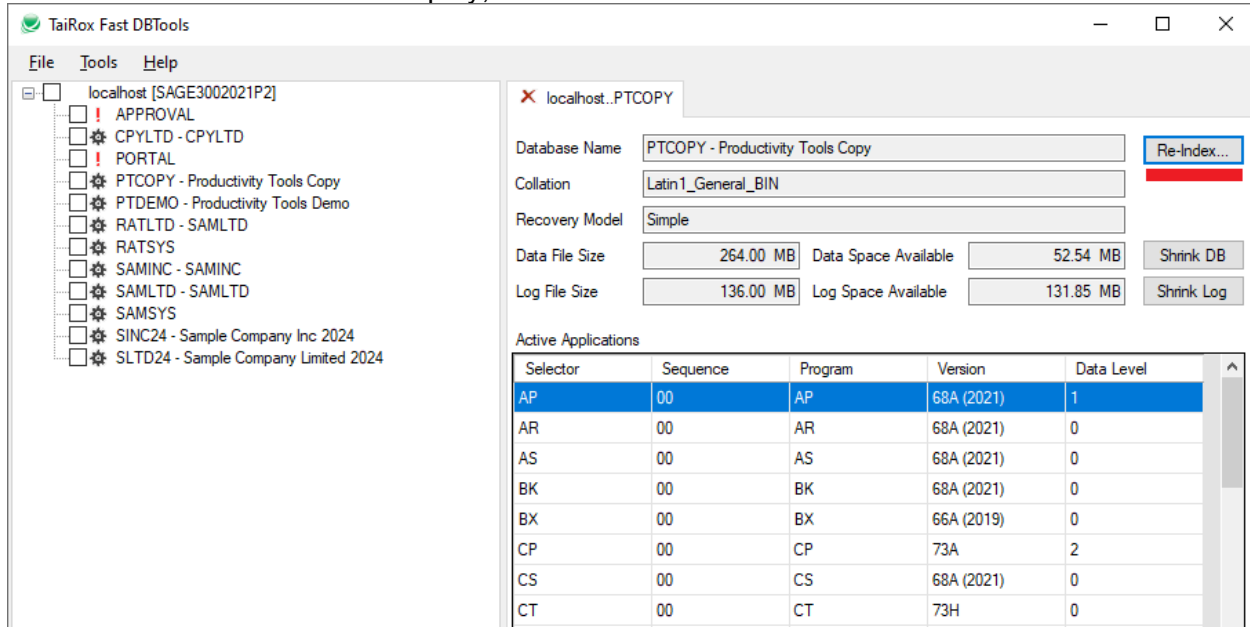Requiring Exclusive Access is highly recommended:
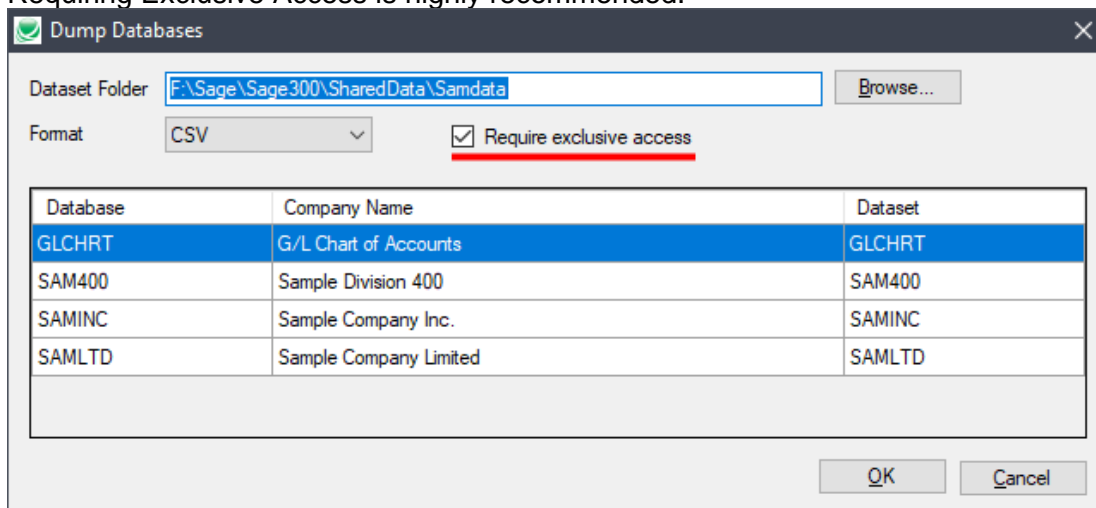
Feature: A DBLoad Operation is 3-4 times faster

A testimonial says it best:

> "As if you need further testimonials ... Load complete in 1:20 ... a 40 GB database, had taken 4.5 hours" **Scott A. Schreiner, Axis Integrated Solutions.**
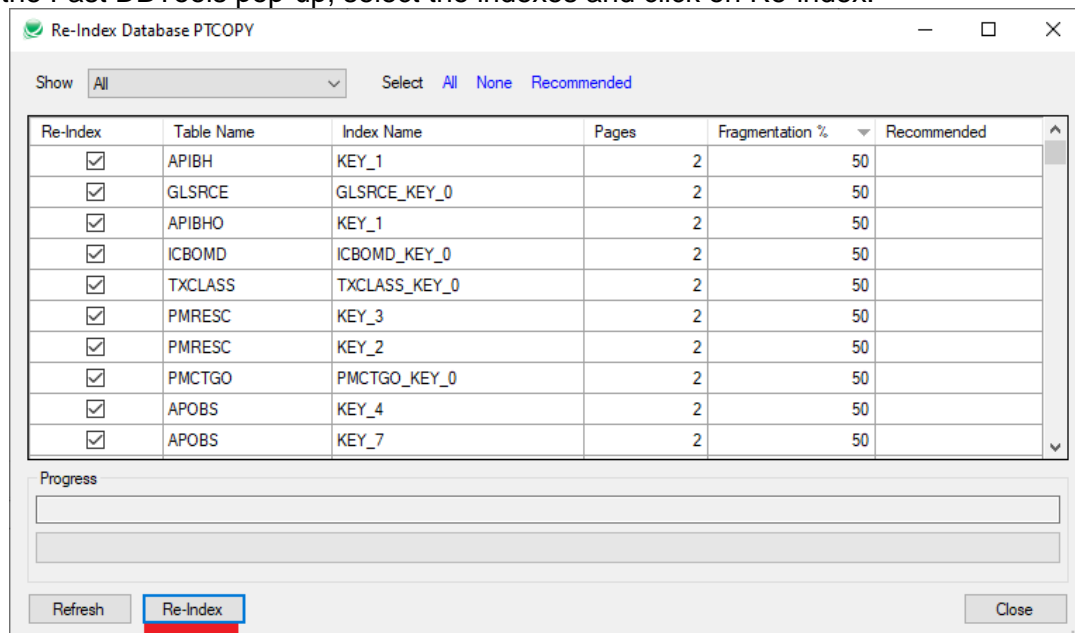
Feature: Reindex Trees While Users Are Logged In

From the Fast DBTools main display, click on Re-index:

From the Fast DBTools pop-up, select the indexes and click on Re-index.

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More Details for the Technically Inclined

Performing either Sage 300 or TaiRox DBDump and DBLoad operations will change "heap indexes" from older Sage 300 databases into "clustered indexes", a good thing to do but beyond the scope of this memo.

SQL Server queries are optimized based on "statistics". Turning statistics on or off and understanding how this relates to balanced trees is beyond the scope of this memo.

The use of SQL Server maintenance plans and how these relate to balanced trees is beyond the scope of this memo.

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