Redpaper

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Pushing the Limit: Using Very Large Database Capabilities with DB2 for i

In IBM® i 7.1 with the latest Technology Refresh updates, the maximum size of an SQL index increased to 1.7 TB, allowing users to take advantage of Very Large Database (VLDB) capabilities.

When talking about VLDB, there are two major limits to consider: file size and the number of rows. Generally, a VLDB is when a single table (or physical file) approaches 500 GB in total size or the number of rows approaches or exceeds 1,000,000,000. Another important consideration is how quickly you might reach VLDB sizes. For example, was a new company acquired that might mean a new, larger customer base?

Here are the IBM i 7.1 limits:

- 1.7 TB or 4.3 billion (4,294,967,288) rows for a table or physical file
- 1.7 TB for an index or keyed logical file

Other SQL limits can also be found in the “IBM DB2® for i SQL reference” topic in the IBM i 7.1 Information Center at the following website:

http://pic.dhe.ibm.com/infocenter/iseries/v7r1m0/index.jsp?topic=%2Fdb2%2Frbafzintro.htm

This IBM Redpaper™ publication shows you how to view your IBM i 7.1 database file sizes from both a graphical user interface using IBM i Navigator and by using a stored procedure to help you identify when you are getting close to these system limits.

For more information about tracking of other system limits on IBM i, see *OnDemand Tracking of Important System Limits on IBM i,* found at:

http://iprodeveloper.com/systems-management/ondemand-tracking-important-system-limits-ibm-i

Using IBM i Navigator to display system limits

Although the increased limits allow for VLDB capabilities, there are still limits, and with the IBM i 7/1 technology refresh updates, it is easier to identify when you are getting close to those limits. To see the file sizes on your system, from IBM i Navigator, complete the following steps:

1. From IBM i Navigator, right-click your database and select **Health Center**, as shown in Figure 1.

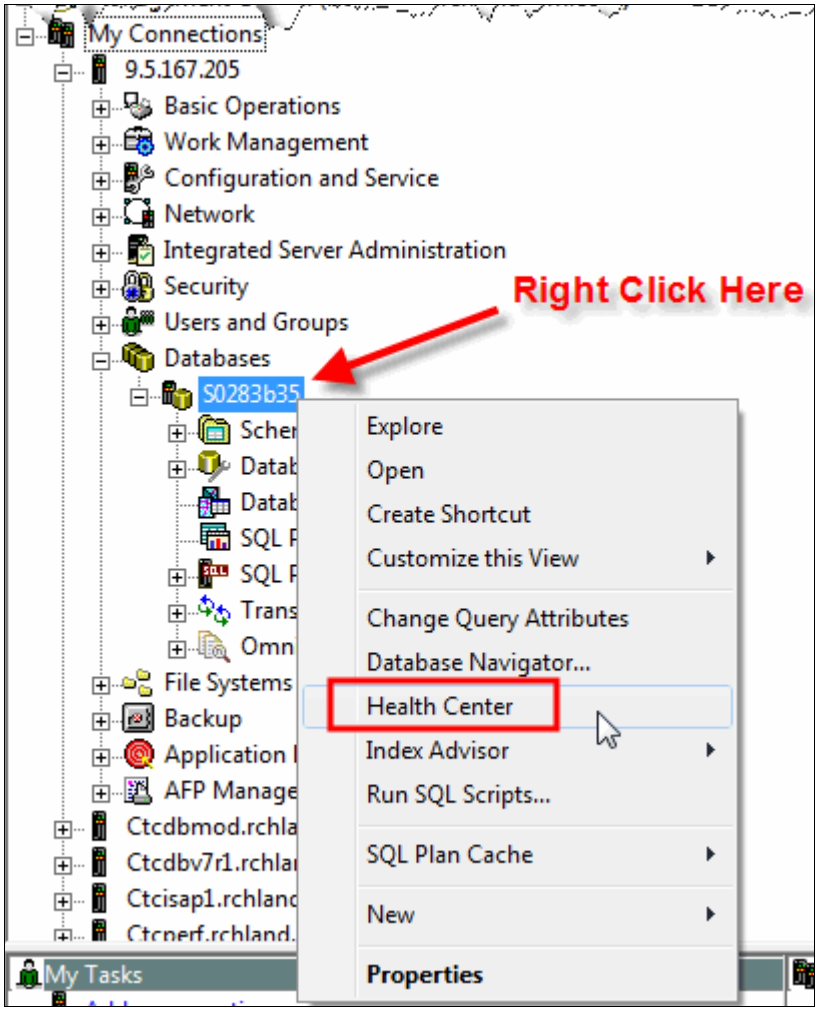

Figure 1 Starting the IBM i Health Center from IBM i Navigator

2. The Health Center contains much system information. For example, to see the size limits for the schema where the file that you are interested in resides, click the **Size Limits** tab, as shown in Figure 2.

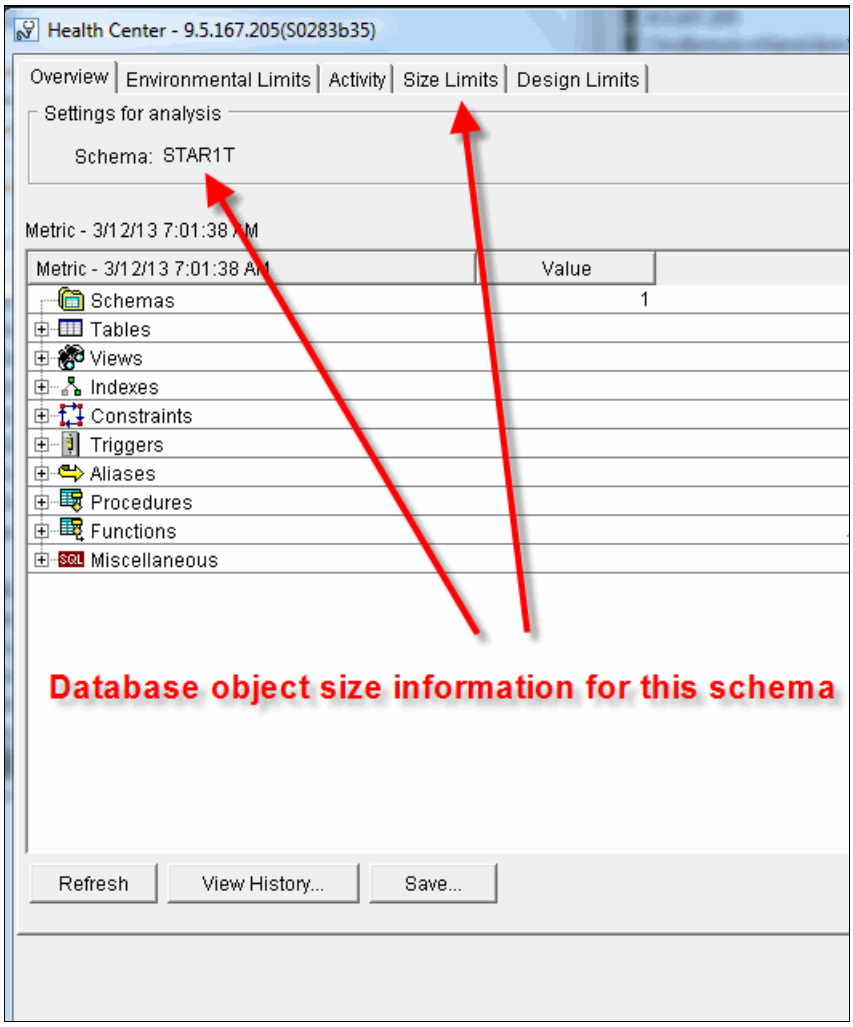

Figure 2 IBM i Health Center

3. To change the schema, click **Change** in the upper right corner (Figure 3) and select your schema from the drop-down menu.

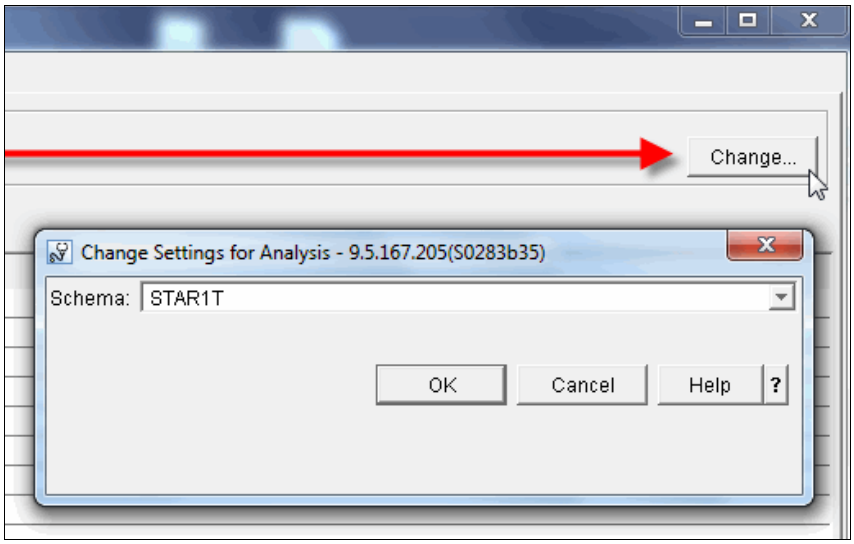

Figure 3 Selecting a different schema

4. Click the **Size Limits** tab (Figure 4) to see your file size and the system limit.

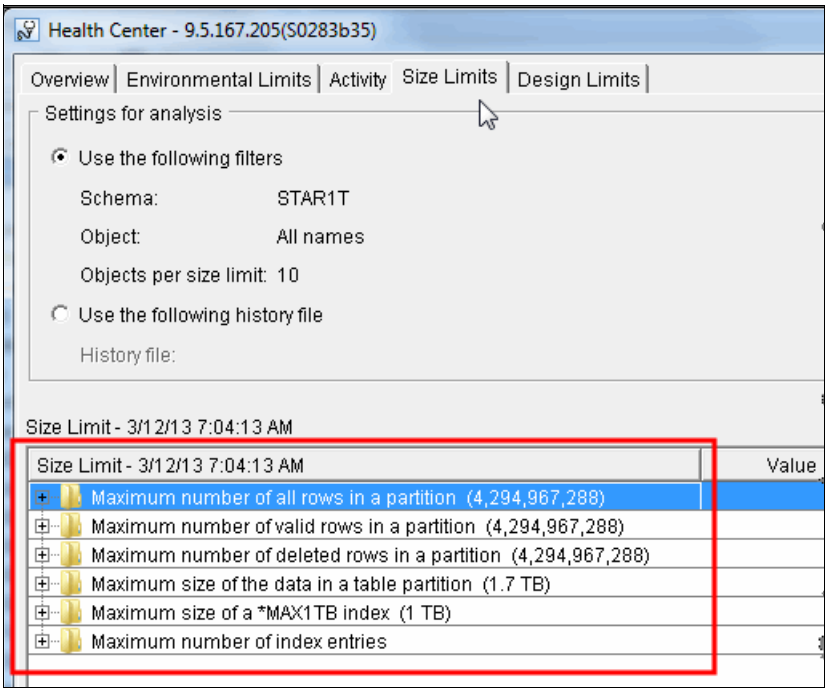

Figure 4 Current file size and system limits for selected schema

5. When your file approaches the size limit, a warning flag is displayed, as shown in Figure 5.

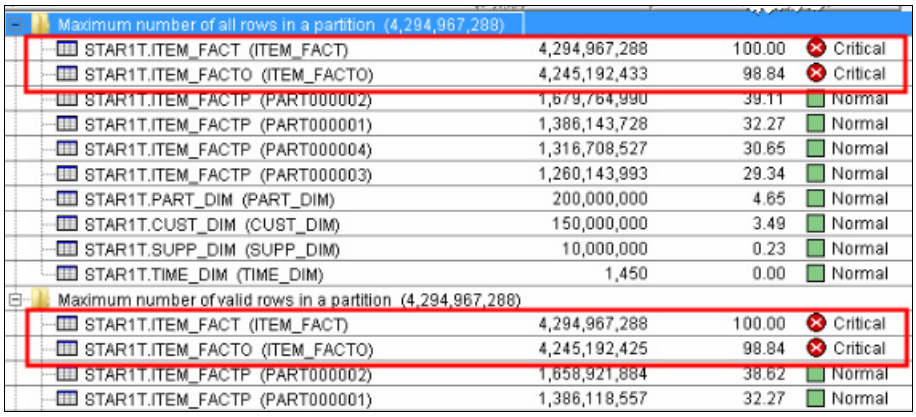

Figure 5 Warning flag that a file is approaching the size limit

6. To see the index size, select that object type as shown in Figure 6.

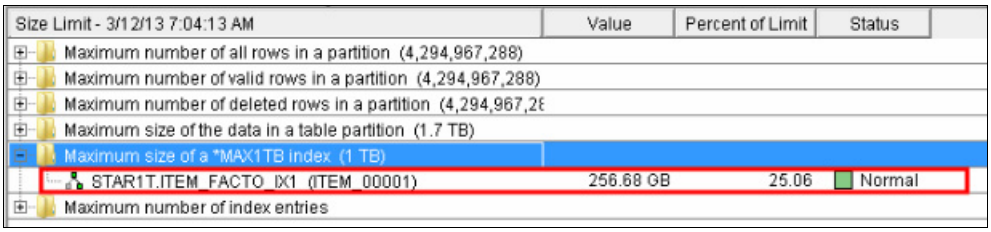

Figure 6 Selecting an object to see the index size

Using a stored procedure to display system limits

If you want a programmatic approach to reviewing your table and index sizes as compared to viewing the limits, there is a stored procedure that is called `QSYS2.Health_Size_Limits ()` that you can use to accomplish this task. For more information about this stored procedure, see the “QSYS2.Health_Size_Limits ()” topic in the IBM i 7.1 Information Center, found at:

`http://pic.dhe.ibm.com/infocenter/iseries/v7r1m0/index.jsp?topic=%2Frzajq%2Frzajqhealthsizelimits.htm`

There are also enhancements in SF99601 level 31 and Sf99701 level 26 to track additional system limits, such as the maximum number of active jobs, maximum number of spool files on an IASP, maximum number of members, and many more limits. These limits are categorized by function in the Health Center.

In addition, the limits are kept in a system table called `QSYS2/SYSLIMTBL`. A view that is called `QSYS2/SYSLIMITS` is built over the `SYSLIMTBL` physical file and provides a wealth of contextual information regarding the rows in the table. For example, you can query a table to discover how close it is to reaching the maximum active jobs limit:

```
SELECT SBS_NAME, SIZING_NAME, CURRENT_VALUE, MAXIMUM_VALUE , A.*
FROM QSYS2.SYSLIMITS A
WHERE LIMIT_ID = 19000
ORDER BY CURRENT_VALUE DESC
```

Comparing SYSLMTBL to IBM i Navigator Health Center

It is useful to compare SYSLIMTBL with IBM i Navigator Health Center:

- SYSLIMTBL has the following characteristics:
  - It is fast.
  - It returns estimated sizes instead of actual sizes.
  - It allows users to keep high water marks and spot trends.
  - You can add triggers to SYSLIMTBL to take action for certain limits.
- IBM i Navigator Health Center has the following characteristics:
  - It is much slower.
  - It returns exact size limits.
  - By saving the limits in a history, it is possible (though it is not done automatically) to keep high water marks and spot trends.
  - It does not allow users to take action.

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This paper was produced by a technical specialist working at the International Technical Support Organization, Rochester Center.

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Thanks to the following people for their contributions to this project:

Mike Cain and Scott Forstie
IBM Rochester Development Lab

Debbie Landon
International Technical Support Organization, Rochester Center

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This document REDP-5084-00 was created or updated on March 7, 2014.

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