SYBASE®

TECHNICAL NOTE

Sybase IQ 15.x Migration Checklist

This document was prepared by Sybase Technical Support and is intended for Sybase DBAs who are preparing to migrate their existing Sybase IQ software to IQ 15.x. The purpose of this document is to provide a single source for the steps needed to help ensure an efficient and seamless migration to the latest Sybase IQ version. As all DBAs know, however, any enterprise level database migration is never a trivial task and this document is to be used as a guideline and you should always refer to the Sybase manuals and resources as posted online for additional information.

It is strongly recommended that you also closely review the following documents:

Migration Guide for Sybase IQ 15.x: http://www.sybase.com/detail?id=1064952

New Features Guide for Sybase IQ 15.x:
http://infocenter.sybase.com/help/topic/com.sybase.infocenter.dc00171.1500/pdf/iqnew.pdf
http://infocenter.sybase.com/help/topic/com.sybase.infocenter.dc01087.1510/pdf/iqnew.pdf

Release Bulletin and Installation Guide for the particular platform on which your Sybase IQ is currently installed and the new install.

Any migration plan is typically comprised of 3 major phases:

- Pre-migration planning
- Pre-migration phase (including actual migration)
- Post-migration phase

In this document, we have put together a checklist of significant steps (and common issues encountered) that can be "checked" off. It will also serve as a ready reference to show your progress as you move from one phase of your migration to another. The pages following the checklist provide the details about each step.

Before continuing the migration process, be sure to check that you have referred to the latest version of this document, since this document will be updated as we streamline the migration process.

1. PRE-MIGRATION PLANNING

Step 1.1: Determine method of migration

Step 1.2: Multiplex or Single Node upgrade?

Step 1.3: Evaluate new IQ 15.x license requirements

Step 1.4: Evaluate increased IQ 15.x resource requirements

Step 1.5: Consider implementation of table partitions?

Step 1.6: Deprecated feature of Local storage and other changes:
http://infocenter.sybase.com/help/topic/com.sybase.infocenter.dc00171.1500/pdf/iqnew.pdf
http://infocenter.sybase.com/help/topic/com.sybase.infocenter.dc01087.1510/pdf/iqnew.pdf

Step 1.7: Ensure you use the latest IQ release

Step 1.8: Read through the Release Bulletin on particular platform:
http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.infocenter.help.iq.15.1/title.htm

Step 1.9: Create a tactical/project plan

Step 1.10: Build a test plan

2. PRE-MIGRATION STEPS

Step 2.1: Record base line performance of queries.

Step 2.2: Generate and save query plans

```
SET TEMPORARY OPTION Query_Plan = 'ON';
SET TEMPORARY OPTION Query_Detail = 'ON';
SET TEMPORARY OPTION Query_Timing = 'ON';
SET TEMPORARY OPTION Query_Plan_After_Run = 'ON';
SET TEMPORARY OPTION Query_Plan_As_HTML = 'ON';
SET TEMPORARY OPTION index_advisor = 'ON';
```

Step 2.3: Check consistency of the database. If there are any errors, correct them before proceeding further.

Step 2.4: Select * from following system tables and keep this information safe.

a. SYSFILE

b. SYSIQFILE

c. SYSLOGIN

d. SYSUSERPERM

e. SYSIQTABLE

f. If Multiplex, then , IQ_MPX_INFO

If you have some specific requirements like remote users/logins etc., it is good idea to have soft copy of data from appropriate system tables.

Step 2.5: Collect information about all the options set in your 12.7 or 12.6 environment. For this, execute command "set" within the server. If you have a server where users set their own options, you might need to run the command for each such user. Alternatively you can execute sp_iqcheckoptions stored procedure.

Step 2.6: Backup thedatabase.

Step 2.7: Perform migration. Detailed information can be found at http://www.sybase.com/detail?id=1064952

3. POST-MIGRATION STEPS

Step 3.1: Create range partitions if required

Step 3.2: Reconfigure with additional resources

Step 3.3: Set appropriate database options

Step 3.4: Gather post-migration baseline performance info

DETAILED INSTRUCTIONS FOR EACH STEP

1. PRE-MIGRATION PLANNING STEP DETAILS

Step 1.1: Determine Method of Migration

In the past, the basic method of upgrading an IQ server is to install new version of IQ, start the existing IQ database using newly installed IQ version and then run "alter database upgrade" command. This is called as an upgrade in place. With IQ 15, this option is NOT available.

One of the methods available in IQ 15 to upgrade from a previous version is to run iqunload tool. Details can be seen in http://www.sybase.com/detail?id=1064952. The migration white paper can be viewed at http://www.sybase.com/files/White_Papers/WP-Migration-General-1.0.pdf

Another option includes extracting the entire data from an existing IQ database. This can be done using either bcp or the extract option and loading this data in a newly created IQ 15 server. However, this method is usually time consuming and also requires a lot of disk space. This method can be useful if you are planning to change the schema significantly and also need to change disk layout.

Step 1.2: Multiplex or Single Node Upgrade?

If you have a Multiplex server then you need to upgrade the reader and writer servers. Also with IQ 15 you can have multiple writers with additional nodes as a coordinator node. Make sure to read detailed documentation on this in the *New Features Guide* for IQ 15.

IQ 15 will require Sybase Central installed as part of IQ 15 release. Older versions of Sybase Central will not work with IQ 15; similarly Sybase Central which is installed as part of IQ 15 will not able to manage older versions of IQ. It is possible to install both versions of Sybase Central on the same Windows environment on a PC or laptop, when you install them in different directories.

Careful planning is essential for a Multiplex upgrade. If you are considering converting your current single node IQ server to Multiplex, be sure to read all the requirements for multiplex, including shared disk architecture.

IQ 15 supports multiple writers in a multiplex environment and hence there is a coordinator node. Understand the functionality of this node while upgrading the earlier Multiplex environment.

More detailed information about IQ Multiplex can be found at: http://infocenter.sybase.com/help/topic/com.sybase.infocenter.dc01014.1500/pdf/qsiq.pdf

Step 1.3: Evaluate New IQ 15.x License Requirements

IQ 15.x uses the new SYSAM 2.0 system.

Please check well in advance that you have access to the software and licenses keys from the Sybase Products Download Center

Some of the new features that you need to evaluate/estimate for you server are as follows:

1. Determine which product edition you will need. The licenses that are generated for your product are edition specific. Be sure that you know your product edition (PE) prior to installing the software.
2. Determine which license type you will need. The licenses that are generated for your product are type specific. Be sure that you know your license type (LT) prior to installing the software.
3. If your server is unable to check out a license, it will start in grace mode and can function for 30 days until you have a valid/working license in place.
4. Licenses are made available and generated at the Sybase Product Download Center (SPDC) at https://sybase.subscribenet.com/. If you do not see your product, you will need to contact your Sales Representative to have your profile updated on this website.
5. Some features of IQ (such as Encryption, and LOB) require a license to be generated. These licenses can be contained in a single file to simplify maintenance (the website offers an option to save a file with all licenses for a particular host).
6. Licenses are generated specific to a host machine. You must have your Host ID (the website contains a checklist/instructions for each platform) when generating the license. These licenses cannot be directly swapped between machines. You have to check the license back in at the website and regenerate it for the new host if moving your server to different host machine.
7. Determine the type of licensing, served or un-served, that best suits your environment prior to generating the license files. There are guidelines to help you with this process at: http://infocenter.sybase.com/help/topic/com.sybase.infocenter.dc00171.1500/pdf/iqnew.pdf

Check for license management through SySAM2.

8. For more specific assistance with the new SYSAM process, please review the online *User Guide for Sybase Software Asset Management*. Please refer to Installation and configuration guide for your particular platform and check the chapter on Licensing.

Step 1.4: Evaluate Increased IQ 15.x Resource Requirements

This step is provided to give you early and advanced notice that IQ 15.x requires additional resources. Your current hardware platform may need to be reconfigured to support these additional requirements under IQ 15.x. Steps 3.2 and 3.3 provide more detailed information on how to specifically reconfigure various IQ parameters.

Step 1.5: Consider Implementation of Table Partitions?

IQ 15.0 now supports range partitioning,

Storage space is partitioned into tablespaces,

Tables can be partitioned into table partitions

Table objects can be table partitions, columns, indexes, IQ base tables, join indexes, unique constraints, primary keys or foreign keys.

Sybase IQ 15 range partitioning divides a table into logical partitions based on the values of a single table column. Only base tables can be partitioned.

Table partitioning in IQ is mainly useful for Information Life Cycle Management. There are some restrictions on loading the partitioned table. Please read through the documentation about partitioned table.

This feature requires license, please refer to IQ documentation for licensing requirements.

Step 1.6: Deprecated Feature of Local Storage and Other Changes

IQ 15 has deprecated Local Store. You need to use a different method of read only dbspaces and other options available in IQ 15 to implement similar features of local store. Also you should use *iqlsunload* tool to migrate Local store information.

There are more deprecated options and commands in IQ 15, including startup options. Please refer to New Features Guide for complete list.

IQ 15 also changed the start and stop IQ script name and environment variables.

IQ 15 now use "start_iq", "stop_iq" as start and stop IQ scripts.

The directory structure is changed and there will not be any separate OCS (Open Client Server) directory. Required OCS libraries are available in appropriate lib directory. If you have any scripts which depends on these, you need to change these scripts. These OCS libraries are provided for all the necessary run time requirement for appropriate function of IQ. If you need full OCS libraries, you need to obtain proper OCS SDK license from Sybase.

Step 1.7: Ensure You Use the Latest IQ Release

Given the continual improvements being made to IQ, in new features, it is imperative that you use the most recent, feature rich and stable version of IQ 15.x when you begin your migration.

Step 1.8: Read through Release Bulletin for your platform

The Release Bulletin on every platform contains more specific information about how to make sure you have the correct operating system version and patches. It is also important to check with your hardware vendor to have the most appropriate and latest patches for the operating system. Sybase documentation usually refers to minimum required patches; your hardware vendor may ask you to install more latest patches.

http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.infocenter.help.iq.15.1/title.htm

Step 1.9: Create a Tactical/Project Plan

Having determined the specific upgrade method as in step 1.1, develop a tactical plan that outlines the specific steps to be taken, dates and owner/responsibilities assigned for each step. Include any inter-step dependencies and rollback plan in case something goes wrong. As part of the tactical plan, evaluate all aspects of upgrade migration and also include any potential pitfalls. Following this document and other IQ documentation will help you in minimizing your risk of failure during the upgrade/migration process.

Step 1.10: Build a Test Plan

A detailed test plan is important for successful migration. This should include actual migration as well as testing of all your applications to make sure they work properly and you have the desired performance on the migrated server. For query performance it is important that you have baseline information available from your old server for comparison purposes.

2. PRE-MIGRATION STEPS

Step 2.1: Record Base Line Performance

In order to determine how well IQ is performing after the upgrade, it is crucial to have a quantitative understanding of how it is performing prior to the upgrade. One way of measuring this base line performance is to execute your key stored procedures and queries in a test mode and measure the amount of time they require to complete. There are various ways of accomplishing this.

While measuring the performance, make sure you are measuring them on the same hardware platform and same resources. As with any database software, there is a rare chance that some query or load operation may not perform as well as older versions of IQ and in this situation help from Sybase Tech Support can be requested to figure out the cause.

Step 2.2: Generate and Save Query Plans

It is very important to capture html query plans, including query timing after run option so as to compare them later with IQ 15. Without such information it will be almost impossible to find out the exact cause of performance issues which can cause existing queries/load to run slower on IQ 15 than on the older version of IQ.

Since IQ 12.x, query plan can be used to generate html plans for queries, which can be used to diagnose performance related issues. It is important to keep these plans available on your existing system so as to compare performance of IQ 15, in case there are some differences in terms of performance degradation.

Use the following options while executing queries on 12.7/12.6 as well as the migrated IQ 15.x server to get proper data for analysis:

```
SET TEMPORARY OPTION Query_Plan = 'ON';
SET TEMPORARY OPTION Query_Detail = 'ON';
SET TEMPORARY OPTION Query_Timing = 'ON';
SET TEMPORARY OPTION Query_Plan_After_Run = 'ON';
SET TEMPORARY OPTION Query_Plan_As_HTML = 'ON';
SET TEMPORARY OPTION index_advisor = 'ON';
```

The query plans will be generated in the directory where IQ was started.

Step 2.3: Check Consistency of the Database

Run *sp_iqcheckdb* on the current database and make sure the consistency check is clean on the database. If there are any errors given by the consistency check, then resolve those errors before upgrading your database to Sybase IQ 15.

In the following document search for *sp_iqcheckdb* for detailed information:

http://infocenter.sybase.com/help/topic/com.sybase.infocenter.dc36584.1270/pdf/iqtroubl.pdf

Step 2.4: Select * From Following System Tables and Keep this Information Safe

Keep the soft copy of data from the following system tables in case of rare situations

Command you can execute is,

```
Select * from SYSFILE
```

Replace SYSFILE with other system table names as below,

a. SYSFILE
b. SYSIQFILE
c. SYSLOGIN
d. SYSIQTABLE
e. If Multiplex server, then , IQ_MPX_INFO

Step 2.5: Collect Information About all the Options Set in Your 12.7 or 12.6 Environment

For this execute command "set" within the server.

As mentioned earlier, there are changes in a few options and deprecated options. In case Sybase support needs some additional information related to query performance, it is important that they need to know if any specific options are set on the servers.

Step 2.6: Backup the Database

Make sure you have a clean backup of the existing database, in case upgrade fails with some reason. You can make a good virtual backup or full database backup as per your setup.

It you have another test system it would be prudent to confirm the backup is good by loading it on another system or breaking the virtual backup link and validating that the server can be brought online on copied disks.

Always keep a good copy of the catalog db of your system.

Step 2.7: Perform Migration

To perform upgrade and migration to IQ 15 from your existing IQ 12.7 version or 12.6 ESD 11, run *iqunload* on the catalog database after installing the IQ 15 on your system. The *iqunload* process will convert the existing catalog database to a new IQ 15 catalog database. Using this converted catalog db, you can then start the IQ 15 server.

For detailed instructions on how to run *iqunload* and setting up the entire environment please refer to IQ 15 documentation and IQ 15 upgrade and migration paper, here: http://www.sybase.com/detail?id=1064952

And if you have a local store on the reader nodes, then: http://www.sybase.com/detail?id=1063855

3. POST-MIGRATION STEPS

Step 3.1: Create Range Partitions if required

If you have a license for partitioned tables, create range partitions on desired tables.

Step 3.2: Reconfigure With Additional Resources

IQ 15.x requires slightly more resources; please refer to the release bulletin guide for resource requirements.

Step 3.3: Set appropriate Database Options

Since with IQ migration you have different database options (if options are changed or deprecated), you might need to set them as per documentation. In some specific conditions you may need to change some options when using a particular client application, if they are setting them specifically. Testing is important.

Step 3.4: Gather Post-Migration Baseline Performance Information

Use the following options while executing queries, to get proper data for analysis:

```
SET TEMPORARY OPTION Query_Plan = 'ON';
SET TEMPORARY OPTION Query_Detail = 'ON';
SET TEMPORARY OPTION Query_Timing = 'ON';
SET TEMPORARY OPTION Query_Plan_After_Run = 'ON';
SET TEMPORARY OPTION Query_Plan_As_HTML = 'ON';
SET TEMPORARY OPTION index_advisor = 'ON';
```

The query plans will be generated in the directory where IQ is started.

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