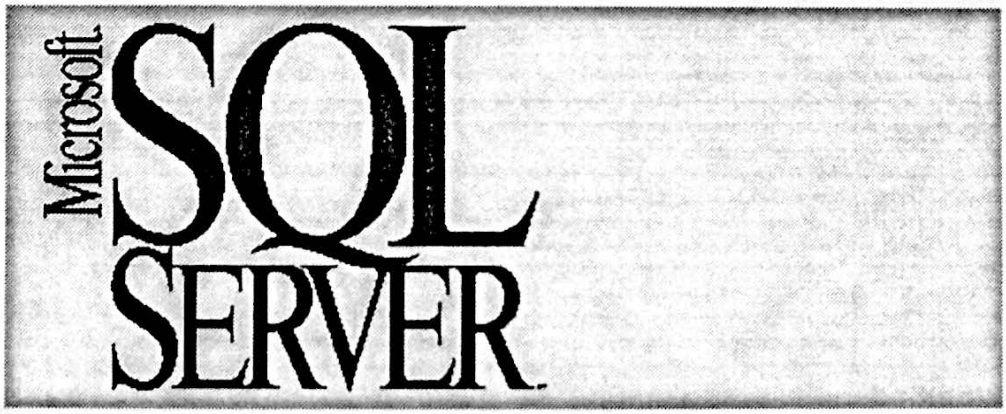
EDITED VERSION W/ REVISION MARKS 6·4·96

Banco O'Higgins Hotsite Report

Analysis of the hotsite visit conducted by the Microsoft Catalyst Group (MCG) atBanco O'Higgins ~~from~~on May 14 to~~-~~ May 18, 1996.



Prepared by:
m Catalyst Group
4 June, 1996~~22 May, 1996~~

Hotsite Summary

History

Banco O'Higgins, a Chilean bank headquartered in Santiago, has developed a mission-critical banking application system involving Microsoft SQL Server version 6.0. For many months, Banco O'Higgins was able to run all five of its applications successfully using SQL Server. However, several weeks before the visit described in this report, the bank introduced a critical new element of its application system, database replication, which is needed ~~The application system is heavily dependent on SQL Server database replication~~to make real-time transactional data available throughout the organization. Banco O'Higgins found that it was~~is~~ unable to involve more than 3~~three~~ of its 28 bank branches in its proposed SQL Server database replication model. The bank needed~~s~~ to have all of its 28 branches actively involved in the replication model and online within three weeks. The issue was ~~is r~~regarded as a showstopper for Banco O'Higginss's full application rollout. Delaying the release of this application system would~~ill~~ cost Banco O'Higgins ~~a great deal of~~ time and money.

After the replication issue surfaced, the staff of Banco O'Higgins's ~~i~~Information ~~s~~Systems (IS) unit ~~staff~~ worked for two weeks with remote Microsoft Product Support Services (PSS) engineers ~~for two weeks~~ but could not reach ~~without a~~ definite solution. Banco O'Higgins then requested on-site assistance from its Microsoft technical account manager (TAM), Mike Rosado, ~~their Microsoft Technical Account Manager (TAM) to help their IS staff gather the information necessary to diagnose the problem.~~ Microsoft Catalyst Group (MCG) engineer Matt Domo was dispatched to ~~the~~ Santiago~~, Chile site~~, where, along with Jorge Prieto and Sergio Chicago of Microsoft Chile, he worked with Banco O'Higgins's IS staff in diagnosing and devising workarounds for the bank's issues relating to SQL Server database replication. ~~to act as a technical resource for this issue.~~

Problem Description and Symptoms~~Issues and Onsite Results~~

~~Problem Description and Symptoms~~

~~Banco O'Higgins has been using all five of its applications successfully with SQL Server for the last several months. However, the replication portion of the application system was introduced during the last several weeks.~~ When the Microsoft team arrived at Banco O'Higgins, the mission agenda included only one issue, outlined below as Issue A; during the course of the visit, MCG and Banco O'Higgins agreed to add Issues B and C to the agenda. ~~While assessing the scope of the visit, MCG and Banco O'Higgins agreed that three separate and distinct issues would be addressed by MCG during the visit.~~ The following is a brief description ~~and result~~ of each issue:

Issue A: Banco O'Higgins was ~~u~~nable to schedule only ~~more than~~ 31 active SQL Server replication tasks using the scheduler functionality of SQL Executive. The ~~number of~~ active tasks included 11 ~~L~~Log ~~R~~Readers and 20 ~~D~~Distribution processes. With three bank branches actively involved in the replication scheme, all attempts to introduce more branches were unsuccessful. The Log Readers tasks failed with an error message indicating they were unable to connect to the distribution server.

~~**Result: Once three bank branches are actively involved in the replication scheme, all attempts to introduce more branches will be unsuccessful. The Log Readers tasks will fail with an error message indicating that they are unable to connect to the distribution server.**~~

Issue B: Attempts to upgrade ~~test~~ server DESA_RDBMS1 from SQL Server version 6.0 to version 6.5 failed. The failure occurred in the server's attempt to ~~upgrade process fails attempting to~~ upgrade a distribution database that did ~~does~~ not exist. As a result, DESA_RDBMS1 could not be used in SQL Server version 6.5 replication testing.

~~**Result: DESA_RDBMS1 cannot be used in SQL Server version 6.5 replication testing.**~~

Issue C: Remote upgrade of SQL Server version 6.0 to version 6.5 ~~caused~~s three ~~several~~ problems: ~~A~~1) the MSDTC service would ~~ill~~ not start after the upgrade, ~~B~~2) ~~T~~the SQL Server version 6.5 desktop icons were~~are~~ not installed, and ~~C~~3) the Novell bindery server name of the upgraded SQL Server changed~~s~~ to the name of the computer where the remote upgrade was performed. As a result, Novell network clients were unable to connect to SQL Server, and numerous network errors and broadcasts were produced by the Novell servers.

~~**Result: Novell network clients are unable to connect to SQL Server and a large amount of network errors and broadcasts are produced by the Novell servers.**~~

Troubleshooting Activity and Problem Resolution

All troubleshooting and problem resolution efforts for these issues revolved around creating a replication scenario. ~~Issue A was believed to involve a solid pattern at the time of MCG's arrival onsite. The onsite activity included developing a solid replication for each of these issues~~ to help discover the root cause of each problem and provide a solution or workaround, ~~or solution. Issues B and C were added to MCG's agenda during the onsite visit.~~ Below is a brief description of the troubleshooting efforts and resolution paths involved with each issue:

Issue A: Bob Ward of SQL Server Support at Microsoft's Las Calinas, Texas, support center felt that this replication issue was caused by SQL Server bug 13512, which limits to 23 ~~. This bug limits~~ the number of concurrent DB-Library connections between SQL~~:~~ Executive and SQL Server ~~to 23~~. After Banco O'Higgins demonstrated its~~their~~ replication scenario, MCG confirmed that the issue was caused by SQL Server bug 13512 and ~~. MCG~~ offered three possible workaround scenarios:

A) Stagger the start times of the LogReader replication tasks in the scheduler portion of SQL Executive,

B) Introduce additional distribution servers so that the desired number of replication tasks could be distributed across them, thus reducing the number of concurrent DB-Library connections needed on each one.

C) Upgrade to SQL Server 6.5, in which ~~where~~ the limitation imposed by SQL Server bug 13512 was addressed. ~~Using~~ With SQL Server 6.5, the limitation can be adjusted by adding the *MaxDBProcesses* Value Name *HKEY_LOCAL_MACHINE:SOFTWARE\Microsoft\MSSQLServer\SQLExecutive* registry key. The value should be added as a Data Type of REG_DWORD. Possible values are from 10 to 255 (~~D~~decimal).

After careful analysis and discussion with Banco O'Higgins' administrative staff, MCG determined that workarounds A and B were unacceptable. Banco O'Higgins cannot stagger the start times of the LogReader replication tasks because their output is needed to perform real-time account changes on the central production servers. ~~ould not be acceptable based on the environment and requirements for replication.~~ Banco O'Higgins' replication environment ~~will~~ will potentially involve over 30~~+~~ publishing servers, each with two~~2~~ published databases. ~~Banco O'Higgins cannot schedule the LogReader tasks because their output is needed to perform account changes real time on the central production servers.~~ These ~~above~~ constraints would prevent one, two, or even three ~~1, 2 or even 3~~ distribution servers from solving the problem; ~~.~~ MCG estimated that Banco O'Higgins would need at least ~~5~~five distribution servers to service their replication requirements using SQL Server 6.0. This is clearly not acceptable ~~into~~ the customer's environment.

Banco O'Higgins decided to resolve this issue through workaround C, upgrading to SQL Server 6.5 ~~to resolve this issue.~~ To confirm that this was a viable solution, MCG helped Banco O'Higgins install several SQL Server 6.5 servers in a test environment ~~to confirm this path as viable solution.~~ MCG and Banco O'Higgins were able to configure more than five~~5~~ of the bank's branch offices using the proposed production replication architecture. These test servers worked flawlessly and confirmed that the SQL Server 6.5 upgrade would be the best solution for Banco O'Higgins.

Issue B: Attempts to upgrade ~~test~~ server DESA_RDBMS1 from SQL Server version 6.0 to version 6.5 failed. The failure occurred in the server's attempt to ~~upgrade process fails attempting to~~ upgrade a distribution database that ~~did~~does not exist. Discussion ~~Disuession~~ with Banco O'Higgins's administrative staff revealed that this server was once a replication distribution server in a test environment. ~~Once~~After those tests were completed, the distribution tasks and databases had been~~were~~ removed. With this information, MCG was able to determine that ~~T~~the upgrade process was failing because the server~~it~~ felt, mistakenly, that it still contained the distribution database ~~was still present on the server~~.

MCG retraced the steps Banco O'Higgins took to remove the distribution capabilities of this server and ~~. MCG~~ found that the system ~~-~~stored procedure sp_helpserver was returninged information indicating that the server was still a distribution server. Attempts to drop the local server failed because the server could not find certain stored procedures in the (now nonexistent) distribution database, ~~that no longer existed.~~ MCG discovered that this issue was caused because the distribution server information had not been ~~was not~~ removed from the registry. MCG set the *Distribution* and *WorkingDirectory* key values to blanks in the *HKEY_LOCAL_MACHINE:SOFTWARE\Microsoft\MSSQLServer\Replication* registry key. MCG then dropped and re-added the local server, and the upgrade was able to complete successfully.

Issue C: Remote upgrade of SQL Server version 6.0 to version 6.5 causeds threeseveral problems: ~~A~~1) the MSDTC service wouldill not start after the upgrade, ~~B~~2) The SQL Server version 6.5 desktop icons ~~are~~were not installed, and ~~C~~3) the Novell bindery server name of the upgraded SQL Server changeds to the name of the computer where the remote upgrade was performed.

During the site visit, MCG forwarded data on the MSDTC service behavior to Bob Ward in Las Calinas. ~~during the site visit.~~ Bob discovered that this behavior was a result of SQL Server bug 14794. The bug is encountered by the upgrade process if the SQL Server 6.5 .exe~~EXE~~ and .dll~~Dll~~ files are installed on a different drive than the ~~m~~Master.dat device file. The established workaround for this problem is to reset the MSDTC log to the same directory as ~~m~~Master.dat, but MCG discovered that when the upgrade was performed remotely the workaround did not work and a dialog box appeared displaying the message "Unknown error." However, when the upgrade was redone from the local machine, the workaround succeeded. ~~MCG discovered that the workaround worked if the upgrade was not performed remotely. If upgrade was performed remotely, the workaround does not work and a dialogue box appears displaying the message "Unknown Error". The only way to enable the workaround to work properly is to redo upgrade from the local machine.~~

For the second problem caused by remote upgrade to SQL Server 6.5, the absence of desktop icons, MCG provided two possible workarounds, ~~that created icons for a server that had been remotely upgrade. The first workaround~~ The first was to create the icons manually using program manager. The second ~~workaround~~ involved running SQL Server 6.5 setup locally on the newly upgraded server and then choosing the Install Utilities Only ~~O~~option.

For the third remote upgrade problem, concerning the Novell bindery name, MCG also discovered two possible workarounds, ~~that enabled the Banco O'Higgins administrative staff to change the Novell bindery name used by the upgraded server.~~ The first ~~workaround~~ was to change the bindery name via SQL Server setup locally on the upgraded server. The second ~~workaround~~ involved changing the Novell bindery name stored in the *ListenOn* key value (in the *HKEY_LOCAL_MACHINE:SOFTWARE\Microsoft\MSSQLServer\MSSQLServer* registry key) to the name of the upgraded server.

Post~~m~~-Mortem

While on-site at Banco O'Higgins, MCG sent information concerning the remote upgrade issues to Bob Ward and Tim Bitzer, who ~~concerning the remote upgrade issues. They~~ were able to duplicate all of these issues in the Las Calinas support center, ~~in the Las Calinas support center while MCG was onsite.~~ Bob and Tim are going to file bugs on SQL Server 6.5 setup to address these issues. Mike Rosado, Banco O'Higgins's TAM, ~~Mike Rosado, i~~is now monitoring the bank's situation ~~Banco O'Higgins situation~~ and will act as the focal point on~~of~~ future issues. As events develop, Banco O'Higgins will continue to work with Mike as well as ~~and~~ SQL Server ~~s~~Support ~~on all further issues.~~

Conclusion

The Catalyst visit to Banco O'Higgins produced significant discoveries and results surrounding the bank's ~~their~~ ongoing issues with SQL Server. Banco O'Higgins is now able to move forward with its ~~their~~ SQL Server replication implementation plans. Banco O'Higgins is extremely happy. Microsoft SQL Server Support and Mike Rosado, Banco O'Higgins's TAM, are continuing to monitor the situation.