

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF PUBLIC WELFARE

INFORMATION TECHNOLOGY STANDARD

Name Of Standard: Connection Pooling	Number: STD-DMS007
Domain: Data & Application	Category: Oracle Physical Implementation
Date Issued: 11/17/2009	Issued By Direction Of:
Date Revised: New	 James Weaver, Dir of Div of Tech Engineering

Abstract:

This document outlines the standard for setting the connection pooling parameters to be used with ODP.Net (Oracle Data Provider for .NET).

General:

Connection pooling overview:

Creating a physical connection to a database can be an expensive operation in terms of time and system resources. During the busiest times, applications with pre-created connections that can be allocated when needed, perform better than when applications create the connections on demand. Using the connection pooling feature of ODP.NET, the application can create and maintain a ready pool of pre-created connections.

By default, connection pooling is enabled in the provider. Connection pooling can be turned on or off by setting Pooling—a Boolean connection string attribute—to either TRUE or FALSE, respectively.

When the application uses connection pooling, the provider creates a pool of connections based on the connection string signature. The signature is based on the connection string parameter values. If any one of the connection string parameters is modified, ODP.NET will create a new connection pool for the application when the next connection is requested.

Subsequent connection requests can use a connection from the pool rather than go through the process of creating a new connection. When the application is finished using a connection, the Close or Dispose method returns the connection to the pool rather than physically closing or destroying it. Note that for non-pooled connections, it is best to call the Dispose method, because it explicitly frees system resources.

Connection pooling parameters:

The table below shows different parameters used in connection pooling and their default values.

Name	Default	Description
Connection Lifetime	0	When a connection is returned to the pool, its creation time is compared with the current time, and the connection is destroyed if that time span (in seconds) exceeds the value specified by Connection Lifetime. A value of zero (0) causes pooled connections to have the maximum connection timeout.
Connection Timeout	15	Maximum Time (in secs) to wait for a free connection from the pool
Enlist	'true'	When true, the pooler automatically enlists the connection in the creation thread's current transaction context. Recognized values are true, false, yes, and no. Set Enlist = "false" to ensure that connection is not context specific.
Max Pool Size	100	The maximum number of connections allowed in the pool.
Min Pool Size	1	The minimum number of connections allowed in the pool.
Pooling	'true'	When true, the SqlConnection object is drawn from the appropriate pool, or if it is required, is created and added to the appropriate pool. Recognized values are true, false, yes, and no.
Incr Pool Size	5	Controls the number of connections that are established when all the connections are used.
Decr Pool Size	1	Controls the number of connections that are closed when an excessive amount of established connections are unused.

Problem faced with default values:

One problem with default values is that if there is a firewall between application servers and database servers and there is an idle connection with no activity for more than 60 minutes, the ACE (Application Control Engine) module terminates the connection. The connection pool on the other hand will have at least one connection open in the pool even if the application has not used any for a while. So there is a possibility of a dead connection sitting in the pool. The pool thinks it has a connection ready but it has actually been terminated by the firewall. The next time the application needs to use a connection, it gets the dead connection sitting in the pool. The Application will not be able to use this and will get exception ORA-12571: TNS Packet Writer failure.

Standard:

If there is a firewall between application server and database server, and the nature of application is such that there are low or no activity periods, there is always a possibility of getting "ORA-12571: TNS Packet Writer failure" exception if the parameter for Min Pool Size is kept at default value of 1 (or more). To overcome this, the standard is to set Min Pool Size to 0. This will ensure that the pool will close all the connections if there is no demand for connections by the application for a long time, thereby eliminating the possibility of a dead connection sitting in the pool. Other parameters including "Incr Pool Size" and "Decr Pool Size" can be adjusted to an optimal value based upon the application load and after thorough testing..

Exemptions from this Standard:

Any requests for an exemption to this standard must be made to and approved by the Database Management Section.

Refresh Schedule:

All standards and referenced documentation identified in this standard will be subject to review and possible revision annually or upon request by the DPW Information Technology Standards Team.

Standard Revision Log:

Change Date	Version	Change Description	Author and Organization
11/17/2009	1.0	Initial Creation	Manpal Singh, BIS, DTE, DMS