**CREATE** **OR** **REPLACE** **PACKAGE** logs

**AUTHID** **CURRENT\_USER**

*/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\**

*%author*

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*A collection of routines responsible for logging messages to some output*

*device, be it the screen, a file and/or a logging table. Where messages are*

*directed depends upon the targets specified in the "Default Log Targets"*

*parameter (see usage and notes for further info).*

*%usage*

*The most simple and common use of this package is to call logs.dbg() to comment*

*AND instrument your code, logs.msg() whenever you want to record something*

*important, and logs.err() when you need to record context of variables and*

*database state when exceptions are trapped and handled.*

*<code>*

*logs.dbg('Attempting to open file '||l\_file\_nm);*

*...*

*logs.msg('Daily refresh started at '||dt.get\_systs);*

*...*

*logs.err('Request on pipe '||l\_pipe\_nm||' timed out.');*

*However, this API is rather flexible and provides the parameters and overloaded*

*routines needed to handle most any typical logging requirement.*

*If you wish logging to be directed at the filesystem, you must set up a few*

*parameters in the framework's parameter structures (APP\_PARM, APP\_ENV\_PARM).*

*The parameters required for a file destination are "Default Log File Directory"*

*and "Default IO File Name".*

*%note*

*Logging to the screen and logging table can only be turned on or off, not*

*redirected somewhere else. Of the three logging targets, only file logging can*

*be redirected to a specific directory and/or file. To explicitly change the*

*logging directory, change the value of the "Default Log File Directory"*

*parameter. To change the logging file name, change the value of the*

*"Default IO File Name" parameter. Or, you can dynamically change either or both*

*by using logs.set\_file\_parms(), logs.set\_file\_dir() and/or logs.set\_file\_nm()*

*for the session.*

*By default, messages to logs.dbg() are suppressed. If you wish these to*

*begin appearing in your logging targets, you must change the value of the*

*"Debug" parameter in APP\_ENV\_PARM. If you are writing unit tests or trying to*

*replicate a bug using a PL/SQL client or test harness, you can bypass the*

*table-based debug toggle altogether and override current debug settings by*

*calling set\_dbg(TRUE).*

*The name of this package should have been LOG, but LOG is an Oracle keyword,*

*so I had to use a plural noun, instead of the active verb like I was hoping,*

*otherwise various PL/SQL programming editors would uppercase the word "log"*

*every time you tried to call this package, which is opposite to the keyword*

*case style rule of most shops.*

*%design*

*PRIMARY USE OF LOGS*

*The three primary log routines dbg(), msg() and err() are meant to handle all*

*verbose debugging output, application logging and error recording. But one*

*can also use warn() and info() which wrap msg(), making informational and*

*warning messages easier to send.*

*LOGGING CONTENT TYPE*

*Application messages can be debug, exception/error, informational and warning*

*messages (see the CNST package for the message type code constants). I refer*

*to informational and warning messages as "application logging."*

*Application Logging*

*Application logging generally involves recording useful processing status*

*and context, audit trail data, records handled, before and after control*

*states, etc. Use logs.msg() with severity of cnst.INFO, or use logs.info()*

*to do application logging.*

*Error Logging*

*Error logging involves recording variable state and parameter context at the*

*time and point of error. Use logs.msg() with severity of cnst.ERROR, or use*

*logs.err() to do error logging.*

*Warnings*

*There are also warning messages that fall somewhere between application*

*logging and error handling. They are worrisome conditions that someone should*

*look at within the next few hours or days to determine if there is something*

*more sinister going on that warrants deeper attention. Use logs.msg() with*

*severity of cnst.WARN, or use logs.warn() to send warnings.*

*Debug Logging*

*Debugging messages contain detailed, low-level context that only a programmer*

*would appreciate, so they can quickly see exactly which paths a program took*

*and what happened at each step along the way. Use logs.dbg() for these. Use*

*logs.dbg() liberally so that when the inevitable production bug pops up, it is*

*trivial to turn on debugging (%see logs.dbg below) and immediately see where*

*things went wrong.*

*SUGGESTED LOG TARGETS*

*In development the targets could be set to the screen and table, both readily*

*useable. In testing, since little will be tested with SQL\*Plus, logging to the*

*screen will usually be turned off. In production, logs are sent to either the*

*log table or a file, but not both (too many moving parts to manage/monitor),*

*and never to the screen. I prefer to table since it is readily available for*

*query, mining and reporting.*

*%future*

*Might add the ability to send output to a named pipe, so that a 3GL application*

*could provide a constant monitor into database messages.*

*<pre>*

*Artisan Date Comments*

*============ ========= ========================================================*

*bcoulam 1997Dec30 Creation*

*bcoulam 2008Feb08 Refactored heavily from the msg package.*

*bcoulam 2008Mar10 Added explicit getters and setters for directory and log*

*file access.*

*bcoulam 2008May15 Added line number as an optional parameter to most logging*

*routines.*

*bcoulam 2008May20 Added fine-grained filters to debug mode, so debug logs*

*only get written for certain packages, session or user.*

*<i>*

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*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/*

**AS**

*--------------------------------------------------------------------------------*

*-- PUBLIC CURSORS*

*--------------------------------------------------------------------------------*

*--------------------------------------------------------------------------------*

*-- PUBLIC TYPES*

*--------------------------------------------------------------------------------*

*--------------------------------------------------------------------------------*

*-- PUBLIC CONSTANTS, VARIABLES, EXCEPTIONS, ETC.*

*--------------------------------------------------------------------------------*

TARGET\_SCREEN **CONSTANT** **VARCHAR2**(10) := 'Screen';

TARGET\_FILE **CONSTANT** **VARCHAR2**(10) := 'File';

TARGET\_TABLE **CONSTANT** **VARCHAR2**(10) := 'Table';

*--TARGET\_PIPE CONSTANT VARCHAR2(10) := 'Pipe';*

DEBUG\_PARM\_NM **CONSTANT** app\_parm.parm\_nm%**TYPE** := 'Debug';

*--------------------------------------------------------------------------------*

*-- PUBLIC FUNCTIONS*

*--------------------------------------------------------------------------------*

*/\*\*-----------------------------------------------------------------------------*

*get\_targets:*

*Returns the current target(s) receiving output as a delimited string (useful*

*when debugging the operations of the LOGS routines).*

*------------------------------------------------------------------------------\*/*

**FUNCTION** get\_targets **RETURN** **VARCHAR2**;

*/\*\*-----------------------------------------------------------------------------*

*get\_log\_dir:*

*Returns the name of the directory being used as the destination for file logs.*

*If the caller has not explicitly set the directory using set\_log\_dir() or*

*set\_log\_parms(), this will be the directory specified by the*

*"Default Log File Directory" parameter.*

*------------------------------------------------------------------------------\*/*

**FUNCTION** get\_log\_dir **RETURN** **VARCHAR2**;

*/\*\*-----------------------------------------------------------------------------*

*get\_log\_nm:*

*Returns the name of the logging file. If the caller has not designated a*

*specific file name via set\_log\_nm() or set\_log\_parms(), this will return the*

*Default IO File Name (see io.get\_default\_filename).*

*------------------------------------------------------------------------------\*/*

**FUNCTION** get\_log\_nm **RETURN** **VARCHAR2**;

*/\*\*-----------------------------------------------------------------------------*

*get\_log\_path:*

*Returns the full path and name of the logging file. If the caller has not*

*designated a specific file via set\_log\_nm() or set\_log\_parms(), this will amount*

*to the default directory path and default file name.*

*------------------------------------------------------------------------------\*/*

**FUNCTION** get\_log\_path **RETURN** **VARCHAR2**;

*--------------------------------------------------------------------------------*

*-- PUBLIC PROCEDURES*

*--------------------------------------------------------------------------------*

*/\*\*-----------------------------------------------------------------------------*

*set\_targets:*

*Routine meant to temporarily (for this session) override the default log*

*destinations specified by the parameter "Default Log Targets".*

*%design*

*Logging can be routed to stdout, the APP\_LOG table, a log file, all three, or*

*any combination. The default logging destinations are controlled by a record*

*named "Default Log Targets" in APP\_PARM and APP\_ENV\_PARM. You should create a*

*"Default Log Targets" record in these tables for each environment. The parm\_val*

*for "Default Log Targets" should adhere to this scheme:*

*"Screen=Y|N,Table=Y|N,File=Y|N"*

*You would only call this routine, logs.set\_targets(), if you need to*

*temporarily override the defaults set by that parameter.*

*If set\_targets isn't called AND "Default Log Targets" isn't configured, all*

*logging will default to the table target (APP\_LOG).*

*If you set the file toggle to TRUE, the filename will default to what is*

*specified by the "Default IO File Name" parameter that should have already been*

*set up for the IO package. If you wish the log file name to be different from*

*the default you should use logs.set\_log\_nm() to change it. This will remain in*

*effect for the session.*

*One call at the top of the driving procedure to set\_targets() is usually*

*sufficient. If, in the middle of your code you have a special block that*

*needs to go to a different target than that set for the rest of the session,*

*you may call logs.to\_table() or logs.to\_file() directly.*

*%usage*

*<code>*

*BEGIN*

*logs.set\_targets(FALSE,TRUE,TRUE);*

*-- OR optionally use named notation, like so:*

*logs.set\_targets(*

*i\_stdout => FALSE*

*, i\_table => TRUE*

*);*

*io.p(... -- ignores targets, goes to screen*

*logs.dbg(... -- uses targets if debug toggle is turned on*

*logs.msg(... -- uses targets*

*END;*

*<code>*

*%param i\_stdout TRUE means log messages will be routed to the screen (via io.p).*

*%param i\_table TRUE means log messages will be routed to the APP\_LOG table.*

*%param i\_file TRUE means log messages will be routed to a file.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** set\_targets

(

i\_stdout **IN** **BOOLEAN** **DEFAULT** **FALSE**,

i\_table **IN** **BOOLEAN** **DEFAULT** **FALSE**,

i\_file **IN** **BOOLEAN** **DEFAULT** **FALSE**

);

*/\*\*-----------------------------------------------------------------------------*

*set\_log\_parms:*

*Sets the target directory and/or file name for all logging. This directory and*

*file name are set system-wide by the "Default Log File Directory" and*

*"Default IO File Name" parameters seen in APP\_PARM\_VW. If you wish them to be*

*other than the default, call this routine to change one, or the other, or both*

*explicitly. If you leave either of the parameters blank, the default will be*

*used instead.*

*%param i\_file\_dir The name of the directory where you wish log files to be*

*written if different than the default.*

*%param i\_file\_nm The name of the file if you wish the logging to go to a file*

*named other than the default.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** set\_log\_parms

(

i\_file\_dir **IN** **VARCHAR2** **DEFAULT** io.get\_default\_filename,

i\_file\_nm **IN** **VARCHAR2** **DEFAULT** io.get\_default\_dir

);

*/\*\*-----------------------------------------------------------------------------*

*set\_log\_dir:*

*Sets the target directory for all logging, overriding the directory indicated by*

*the system-wide "Default Log File Directory" parameter.*

*%param i\_file\_dir The name of the logging directory (should match the name of*

*an Oracle directory object).*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** set\_log\_dir(i\_file\_dir **IN** **VARCHAR2**);

*/\*\*-----------------------------------------------------------------------------*

*set\_log\_nm:*

*Sets the target file name for all logging, overriding the fiel name indicated*

*by the system-wide "Default IO File Name" parameter.*

*%param i\_file\_nm The name of the logging file.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** set\_log\_nm(i\_file\_nm **IN** **VARCHAR2**);

*/\*\*-----------------------------------------------------------------------------*

*set\_dbg:*

*Toggles the state of debugging for the current session in which it is called.*

*This method of turning on debugging is really meant only for development where*

*unit tests are being conducted through SQL\*Plus scripts. If you need to turn*

*debugging on in production, use the "Debug" parameter in APP\_ENV\_PARM.*

*%see logs.dbg() for further info on the dynamic debug toggle.*

*set\_dbg(BOOLEAN) is meant for SQL\*Plus and PL/SQL-fluent callers.*

*TRUE turns debugging on*

*FALSE turns it off*

*set\_dbg(VARCHAR2) is meant for non-Oracle speakers, like Java and other layers*

*in the application stack that might need to persist debugging messages.*

*'all','on','y','yes','true' all turn debugging on*

*'none','off','n','no','false' all turn debugging off*

*'session=','unit=','user=' will filter debugging (%see logs.dbg for explanation)*

*%usage*

*Developer logs into SQL\*Plus or writes an anonymous block. In either*

*case, the developer calls logs.set\_dbg(TRUE);*

*Then from the same session or PL/SQL block, the developer runs the desired*

*PL/SQL routine.*

*Any calls to logs.dbg in the underlying layers will then be routed to the*

*target(s) set either through the "Default Log Targets" parameter in*

*APP\_ENV\_PARM, or through the set\_targets overriding routine. If you do not set*

*any logging targets for the session through either method, then all debugging*

*will default to being routed to the APP\_LOG table.*

*%param i\_dbg\_val Meant for non-PL/SQL callers.*

*{\*} 'all','on','y','yes','true' all turn debugging on*

*{\*} 'none','off','n','no','false' all turn debugging off*

*{\*} 'session=','unit=','user=' will filter debugging (%see logs.dbg for explanation)*

*%param i\_state Meant for SQL\*Plus and PL/SQL-fluent callers.*

*{\*} TRUE turns debugging on*

*{\*} FALSE turns it off*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** set\_dbg (i\_dbg\_val **IN** **VARCHAR2**);

**PROCEDURE** set\_dbg (i\_state **IN** **BOOLEAN**);

*/\*\*-----------------------------------------------------------------------------*

*msg:*

*Call this version of msg() when you have a named, pre-built message in APP\_MSG*

*to call upon. Pass the message code (app\_msg.msg\_cd) and leave the i\_msg*

*parameter blank; this will be filled in for you as the framework looks up the*

*message based on the message code. Ensure you let msg() know what type of*

*message you want logged (%see cnst.DEBUG, cnst.INFO, cnst.WARN and cnst.ERROR).*

*If are inventing a one-off message on the spot, you may pass*

*any short string, name or identifier you wish for the message code AND a*

*message. You might use msgs.DEFAULT\_MSG\_CD for your ad-hoc message code. If the*

*i\_msg parameter is filled, log will not bother to look up the code in app\_msg.*

*All three msg() routines are built to be used within exception handlers. If*

*you just want the message to be logged, leave the i\_reraise parameter blank. If*

*you want to halt processing, set i\_reraise to TRUE. For example, wrap your*

*PL/SQL in a sub-block and give it its own exception block. This allows you to*

*trap errors, log them if you wish and continue with the next statement or*

*iteration, e.g.*

*Remember to explicitly pass in ERROR or WARN for the severity. If you don't, your*

*exceptions will default to INFO messages and won't be picked up by the log-*

*scanning application. The log-scanning app does not come with the framework. It*

*must be custom-built per each shop's needs. It is usually implemented as a cron*

*or scheduled Oracle job that reads through the latest N minutes of APP\_LOG*

*records, recording the last-scanned timestamp somewhere. It then emails certain*

*people or groups with high-severity errors so that issues in production can be*

*proactively detected and sometimes handled before the end users even notice or*

*report them.*

*%design*

*I was unable to give i\_sev\_cd a default. By doing so, the 1st and 3rd overloads*

*of msg() conflicted. They would compile, but would conflict at runtime.*

*%usage*

*<code>*

*--- simple use of logs.msg (3rd overload)*

*logs.msg('Parameter was '||l\_length||' characters long. Must be 500 or less.');*

*-- better use, inventing message on the spot*

*logs.msg('Invalid Parameter', cnst.ERROR, 'Parameter must be 500 characters or less');*

*-- even better use of the canned messages in APP\_MSG*

*logs.msg('Invalid Parameter', cnst.ERROR);*

*-- best use of LOGS and parameterized canned messages in APP\_MSG*

*logs.msg('Invalid Parameter', cnst.ERROR,*

*msgs.fill\_msg('Invalid Parameter', 'i\_copyright', '500'));*

*BEGIN*

*-- do some stuff, probably start a loop*

*FOR i in ...*

*BEGIN -- begin sub-block*

*... do more stuff*

*EXCEPTION*

*WHEN lx\_whatever THEN*

*logs.msg('Invalid Product', cnst.WARN);*

*WHEN DUP\_VAL\_ON\_INDEX THEN*

*logs.msg(c.DEFAULT\_MSG\_CD, cnst.ERROR,*

*'That row is already in '||l\_table, TRUE);*

*WHEN OTHERS THEN*

*logs.err(TRUE);*

*END; -- end sub-block*

*END; -- end outer block*

*</code>*

*%future*

*Add parameterized versions of logs.msg to match the signature of msgs.fill\_msg*

*so that msgs.fill\_msg does not need to be called explicitly. It could then be*

*called implicitly by logs.msg when it detects parameters are being fed to it*

*to replaced placeholders in the canned message.*

*%param i\_msg\_cd Named message, found in APP\_MSG table. You can also invent one*

*on the spot, like "My Awesome Message", or use the default Ad-Hoc*

*Message code found in msgs.DEFAULT\_MSG\_CD.*

*%param i\_sev\_cd Message severity. cnst.ERROR, cnst.WARN, cnst.INFO, cnst.DEBUG*

*%param i\_msg Error/Application message. Will be truncated if longer than 32K.*

*%param i\_reraise TRUE or FALSE. Whether you want the exception raised again*

*(which will halt most programs unless they have a higher-level*

*exception handler).*

*%param i\_routine\_nm This will be determined automatically for you. Only pass*

*this if you want to record a source name different than*

*what the call stack says. If you do pass this in, it is*

*usually the package.routine where the message came from.*

*Could be the name of a trigger, object method, type body, etc.*

*%param i\_line\_num This will be determined automatically for you. Only pass this*

*in if you want to record a line number for the debug message*

*that is different from the line on which logs.dbg is called.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** msg

(

i\_msg\_cd **IN** app\_log.msg\_cd%**TYPE**,

i\_sev\_cd **IN** app\_log.sev\_cd%**TYPE**,

i\_msg **IN** **VARCHAR2** **DEFAULT** **NULL**,

i\_reraise **IN** **BOOLEAN** **DEFAULT** **FALSE**,

i\_routine\_nm **IN** app\_log.routine\_nm%**TYPE** **DEFAULT** **NULL**,

i\_line\_num **IN** app\_log.line\_num%**TYPE** **DEFAULT** **NULL**

);

*/\*\*-----------------------------------------------------------------------------*

*msg:*

*This version of msg() is primarily used in exception handlers when dealing with*

*built-in or application-specific error codes. The Core framework provides a way*

*to associate error IDs with each standard message (%see APP\_MSG). However, it is*

*much easier, and recommended, to mainly deal with and code to the message code,*

*not the numeric identifier.*

*Do not call RAISE\_APPLICATION\_ERROR explicitly. Use this version of logs.msg()*

*instead. If reraise is TRUE and the ID is positive (from APP\_MSG or invented*

*ad-hoc), or if the ID is in the -20000 to -20999 range, RAISE\_APPLICATION\_ERROR*

*will be called for you after logging the message.*

*Remember to explicitly pass in ERROR or WARN for the severity. If you don't, your*

*exceptions will default to INFO messages and won't be picked up by the log-*

*scanning application. The log-scanning app does not come with the framework. It*

*must be custom-built per each shop's needs. It is usually implemented as a cron*

*or scheduled Oracle job that reads through the latest N minutes of APP\_LOG*

*records, recording the last-scanned timestamp somewhere. It then emails certain*

*people or groups with high-severity errors so that issues in production can be*

*proactively detected and sometimes handled before the end users even notice or*

*report them.*

*%usage*

*<code>*

*EXCEPTION*

*WHEN excp.gx\_row\_locked THEN*

*-- This example uses SQLCODE, but substitutes a contextual message*

*-- then proceeds with processing*

*logs.msg(SQLCODE, cnst.INFO, 'Another session has item'||l\_item\_id||' locked.');*

*WHEN lx\_control\_violation THEN*

*-- This example uses a programmer-defined error ID, raising an error*

*-- to the GUI*

*logs.msg(-20001, cnst.WARN, 'The number of records processed does not equal*

*the number of records input.', TRUE);*

*WHEN OTHERS THEN*

*-- This example uses the err() incarnation of msg which*

*-- automatically logs an ERROR-level SQLERRM and re-raises the exception.*

*logs.err;*

*</code>*

*%param i\_msg\_id Positive or negative error number, either from APP\_MSG or from*

*list of Oracle error num.*

*%param i\_sev\_cd Message severity. cnst.ERROR, cnst.WARN, cnst.INFO, cnst.DEBUG*

*%param i\_msg Error/Application message. Will be truncated to 32K if longer.*

*%param i\_reraise TRUE or FALSE. Whether you want the exception raised again*

*(which will halt most programs unless they have a higher-level*

*exception handler).*

*%param i\_routine\_nm This will be determined automatically for you. Only pass*

*this if you want to record a source name different than*

*what the call stack says. If you do pass this in, it is*

*usually the package.routine where the message came from.*

*Could be the name of a trigger, object method, type body, etc.*

*%param i\_line\_num This will be determined automatically for you. Only pass this*

*in if you want to record a line number for the debug message*

*that is different from the line on which logs.dbg is called.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** msg

(

i\_msg\_id **IN** app\_msg.msg\_id%**TYPE**,

i\_sev\_cd **IN** **VARCHAR2**,

i\_msg **IN** **VARCHAR2** **DEFAULT** **NULL**,

i\_reraise **IN** **BOOLEAN** **DEFAULT** **FALSE**,

i\_routine\_nm **IN** app\_log.routine\_nm%**TYPE** **DEFAULT** **NULL**,

i\_line\_num **IN** app\_log.line\_num%**TYPE** **DEFAULT** **NULL**

);

*/\*\*-----------------------------------------------------------------------------*

*msg:*

*This version of msg is provided to allow very quick and easy additions to the*

*log targets. Any calls to this version of log will have the severity defaulted*

*to INFO, the msg code to "Ad-Hoc Msg", and the routine to Unknown if it can't*

*be determined from the call stack.*

*This version of msg is especially helpful for quick-and-dirty debugging during*

*development when lots of errors are causing rollbacks, and you wish to see*

*what is going on, by taking advantage of the autonomous transactions that the*

*LOGS routines provide.*

*%param i\_msg Error/Application message. Will be truncated to 32K if longer.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** msg(i\_msg **IN** **VARCHAR2**);

*/\*\*-----------------------------------------------------------------------------*

*err:*

*This barebones version of err() will automatically fill the msg with SQLERRM*

*before logging to the targets. It is primarily used in rare (should be outlawed)*

*WHEN OTHERS sections.*

*%param i\_reraise Defaults to TRUE, which will raise an error after logging the*

*message. If you wish to prevent the program from halting its*

*processing, you will need an exception handler, pass FALSE in*

*this parameter to keep the exception from raising.*

*%param i\_routine\_nm This will be determined automatically for you. Only pass*

*this if you want to record a source name different than*

*what the call stack says. If you do pass this in, it is*

*usually the package.routine where the message came from.*

*Could be the name of a trigger, object method, type body, etc.*

*%param i\_line\_num This will be determined automatically for you. Only pass this*

*in if you want to record a line number for the debug message*

*that is different from the line on which logs.dbg is called.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** **err**

(

i\_reraise **IN** **BOOLEAN** **DEFAULT** **TRUE**,

i\_routine\_nm **IN** app\_log.routine\_nm%**TYPE** **DEFAULT** **NULL**,

i\_line\_num **IN** app\_log.line\_num%**TYPE** **DEFAULT** **NULL**

);

*/\*\*-----------------------------------------------------------------------------*

*err:*

*This version of err is a lazy way of calling logs.msg, as it automatically*

*assumes a sev\_cd of ERROR and dispenses with standard message codes.*

*%param i\_msg A message about the detected error and its context. Will be sent*

*to the log targets.*

*%param i\_reraise Defaults to TRUE, which will raise an error after logging the*

*message. If you wish to prevent the program from halting its*

*processing, you will need an exception handler, pass FALSE in*

*this parameter to keep the exception from raising.*

*%param i\_routine\_nm This will be determined automatically for you. Only pass*

*this if you want to record a source name different than*

*what the call stack says. If you do pass this in, it is*

*usually the package.routine where the message came from.*

*Could be the name of a trigger, object method, type body, etc.*

*%param i\_line\_num This will be determined automatically for you. Only pass this*

*in if you want to record a line number for the debug message*

*that is different from the line on which logs.dbg is called.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** **err**

(

i\_msg **IN** **VARCHAR2**,

i\_reraise **IN** **BOOLEAN** **DEFAULT** **TRUE**,

i\_routine\_nm **IN** app\_log.routine\_nm%**TYPE** **DEFAULT** **NULL**,

i\_line\_num **IN** app\_log.line\_num%**TYPE** **DEFAULT** **NULL**

);

*/\*\*-----------------------------------------------------------------------------*

*warn:*

*warn() is a lazy way of calling logs.msg, as it automatically*

*assumes a sev\_cd of WARN and dispenses with standard message codes.*

*%param i\_msg The warning you wish to record and its context, which will be sent*

*to the log targets.*

*%param i\_routine\_nm This will be determined automatically for you. Only pass*

*this if you want to record a source name different than*

*what the call stack says. If you do pass this in, it is*

*usually the package.routine where the message came from.*

*Could be the name of a trigger, object method, type body, etc.*

*%param i\_line\_num This will be determined automatically for you. Only pass this*

*in if you want to record a line number for the debug message*

*that is different from the line on which logs.dbg is called.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** warn

(

i\_msg **IN** **VARCHAR2**,

i\_routine\_nm **IN** app\_log.routine\_nm%**TYPE** **DEFAULT** **NULL**,

i\_line\_num **IN** app\_log.line\_num%**TYPE** **DEFAULT** **NULL**

);

*/\*\*-----------------------------------------------------------------------------*

*info:*

*info() is a lazy way of calling logs.msg, as it automatically assumes a*

*severity of INFO and dispenses with standard message codes.*

*%param i\_msg The information or notes you wish to record, which will be sent*

*to the log targets.*

*%param i\_routine\_nm This will be determined automatically for you. Only pass*

*this if you want to record a source name different than*

*what the call stack says. If you do pass this in, it is*

*usually the package.routine where the message came from.*

*Could be the name of a trigger, object method, type body, etc.*

*%param i\_line\_num This will be determined automatically for you. Only pass this*

*in if you want to record a line number for the debug message*

*that is different from the line on which logs.dbg is called.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** **info**

(

i\_msg **IN** **VARCHAR2**,

i\_routine\_nm **IN** app\_log.routine\_nm%**TYPE** **DEFAULT** **NULL**,

i\_line\_num **IN** app\_log.line\_num%**TYPE** **DEFAULT** **NULL**

);

*/\*\*-----------------------------------------------------------------------------*

*dbg:*

*Logs debug messages. Enables dynamic "peeking" into the workings and context of*

*routines without having to attach a debugger, take downtime, recompile code,*

*etc. Simply pass a detailed, formatted message in the first parameter. The*

*routine name and line number from which logs.dbg() was called will be found*

*transparently, unless you choose to pass in the routine and line number*

*explicitly.*

*%design*

*Know that the various logs.msg routines are meant for error\_handling and logging*

*that should always be on. Calls to the logs.dbg routine are transient. They will*

*only log output when debugging is turned on either by parameter or by override*

*(see below). If debugging has been switched on, the debug message will be*

*written to the targets you set by parameter or override (%see set\_targets).*

*TURNING ON DEBUG MODE BY PARAMETER*

*In APP\_PARM is a shared parameter named "Debug". Its value in APP\_ENV\_PARM for*

*a given application and environment follows the syntax:*

*off|all|session=<session\_id>|unit=<pkg1[,proc1,trigger1,etc...]>|user=<client\_id>*

*This means there are four "filters" that can be applied to debug logging:*

*1) all = log all calls to logs.dbg().*

*2) session = log any calls to logs.dbg() that belong to the given session ID.*

*3) unit = log any calls to logs.dbg() that come from the given PL/SQL unit(s).*

*4) user = log any calls to logs.dbg() attributed to the given client identifier.*

*and of course*

*5) off = all calls to logs.dbg() will be ignored.*

*Filters for all, session and user are single-valued. They can't be combined and*

*they can only have one value. The only filter that is multi-valued is unit.*

*If you want to show dbg() calls coming out of more than one package, just write*

*a comma or space-delimited list of package names in the parm\_val column for parameter*

*"Debug". Here are examples of app\_env\_parm.parm\_val values for parameter "Debug":*

*off*

*all*

*session=18*

*unit=DRIVER, DAILY\_LOAD\_PKG, GIS\_MAP\_PKG, AIUD\_REF\_TRG*

*user=doejohn*

*When done capturing debug messages for your filter, be sure to update parm\_val*

*back to off.*

*TURNING ON DEBUG MODE BY OVERRIDE*

*%see set\_dbg. Just call set\_dbg('on') or set\_dbg(TRUE) to turn debugging on*

*for your current session. This is usually only used by anonymous PL/SQL blocks*

*or SQL\*Plus scripts in unit test harnesses.*

*DEBUG CHECK INTERVAL*

*This was designed to not impose unecessary overhead in environments with heavy*

*transaction/record processing. So rather than checking the parameters for an*

*updated Debug value on every call of logs.dbg(), it only checks every N minutes,*

*N being another configurable parameter, specified by the value of the*

*"Debug Toggle Check Interval", which defaults to checking every minute if not*

*configured.*

*This means that you cannot turn debug mode on and expect immediate output.*

*When you discover a session, PL/SQL unit or user that requires a look into the*

*debug logs of their process, turn on debug mode using the value in APP\_ENV\_PARM*

*as outlined above, then wait the N minutes before you inform the user they can*

*try again. At that point, you should be able to monitor the new data in APP\_LOG*

*or the logging file to see the new debug data.*

*This polling, table-based design allows you to leave your logs.dbg() calls*

*peppered throughout your code. There is no need to comment them out or use 10g*

*conditional compilation syntax to hide them for production. Since we are often*

*verbose and detailed in debugging/info messages, this is a great way of*

*documenting the code as well.*

*DESIGN ALTERNATIVES REJECTED*

*We rejected the option of checking the parameter table upon every call to*

*logs.dbg(). We felt this was simply too much overhead for most systems'*

*performance goals.*

*We were forced to reject the idea of using global application contexts,*

*dbms\_pipe or dbms\_alert, as all these mechanisms do not work at all, or well,*

*in Oracle RAC clusters.*

*%param i\_msg Fully formatted debug message. The format is up to the user of the*

*framework.*

*%param i\_routine\_nm This will be determined automatically for you. Only pass*

*this if you want to record a source name different than*

*what the call stack says. If you do pass this in, it is*

*usually the package.routine where the message came from.*

*Could be the name of a trigger, object method, type body, etc.*

*%param i\_line\_num This will be determined automatically for you. Only pass this*

*in if you want to record a line number for the debug message*

*that is different from the line on which logs.dbg is called.*

*------------------------------------------------------------------------------\*/*

**PROCEDURE** dbg

(

i\_msg **IN** app\_log.log\_txt%**TYPE**,

i\_routine\_nm **IN** app\_log.routine\_nm%**TYPE** **DEFAULT** **NULL**,

i\_line\_num **IN** app\_log.line\_num%**TYPE** **DEFAULT** **NULL**

);

**END** logs;