DZ_CRS

- Build ID: 7
- TFS Change Set: 8317

Utilities for the management and manipulation of Oracle Spatial and Graph transformations and grids.

Summary

FUNCTIONS

dz_crs_main.geodetic_XY_diminfo

Function to quickly return a “default” geodetic dimensional info array.

Parameters

None

Returns

MDSYS.SDO_DIM_ARRAY collection

Notes

- Assumes 5 centimeter tolerance for all geodetic spatial information.

dz_crs_main.geodetic_XYZ_diminfo

Function to quickly return a "default" 3D geodetic dimensional info array.

Parameters

p_z_lower_bound	optional override for lower Z bound (default -15000)
p_z_upper_bound	optional override for upper Z bound (default 15000)
p_z_tolerance	optional override for Z tolerance (default 0.001 units)

Returns

MDSYS.SDO_DIM_ARRAY collection

Notes

- Assumes 5 centimeter tolerance for all geodetic spatial information.

dz_crs_main.geodetic_XYM_diminfo

Function to quickly return a "default" LRS geodetic dimensional info array.

Parameters

p_m_lower_bound	optional override for lower M bound (default 0)
p_m_upper_bound	optional override for upper M bound (default 100)
p_m_tolerance	optional override for M tolerance (default 0.00001 units)

Returns

MDSYS.SDO_DIM_ARRAY collection

Notes

- Assumes 5 centimeter tolerance for all geodetic spatial information.
- M defaults represent common reach measure system used in the US National hydrology dataset.

dz_crs_main.geodetic_XYZM_diminfo

Function to quickly return a "default" 3D LRS geodetic dimensional info array.

Parameters

p_z_lower_bound	optional override for lower Z bound (default -15000)
p_z_upper_bound	optional override for upper Z bound (default 15000)
p_z_tolerance	optional override for Z tolerance (default 0.001 units)
p_m_lower_bound	optional override for lower M bound (default 0)
p_m_upper_bound	optional override for upper M bound (default 100)
p_m_tolerance	optional override for M tolerance (default 0.00001 units)

Returns

MDSYS.SDO_DIM_ARRAY collection

Notes

- Assumes 5 centimeter tolerance for all geodetic spatial information.
- M defaults represent common reach measure system used in the US National hydrology dataset.

dz_crs_main.generic_common_mbr

Function to return a minumum bounding rectangle geometry surrounding a given named region.

Parameters

p_input	region keyword
p_srid	optional SRID override, default is 8265

Returns

MDSYS.SDO_GEOMETRY MBR surrounding desired region.

Notes

- Current regions include CONUS, ALASKA, HAWAII, PR/VI and PACTERR. Note the Alaska and Pacific Trust Territory MBRs are split into two polygons and thus do not cross the 180. In theory Oracle spatial should have no problems with a polygon crossing the 180 but at the end of the day its always safer to break on the 180.
- The srid override does not test if a user provided srid is in fact geodetic. Make sure you always use a geodetic srid.

dz_crs_main.query_generic_common_mbr

Function to return the region keyword (if any) associated with a given geometry.

Parameters

p_input	input geomety to examine
p_tolerance	optional tolerance override, default is 0.05
p_check_earth	optional test to verify that input geometry is in fact geodetic. Useful in cases where raw input may be of dubious quality.

Returns

VARCHAR2 string text region keyword or NULL if no regions .

Notes

- Current regions include CONUS, ALASKA, HAWAII, PR/VI and PACTERR.
- For geometries other than points, the first set of vertices in the geometry are used for the test.
- Any geometry input srid may be utilized as test mbrs are transformed to the input geometry srid if they do not match (default is 8265).

dz_crs_main.nadcon_grid

Function to determine the appropriate NAD27 transformation method for a given geometry location.

Parameters

p_input	input geomety to examine
p_tolerance	optional tolerance override, default is 0.05

Returns

NUMBER of NADCON grid covering the location in question or -2 to indicate no grid coverage.

Notes

- An answer of -2 would indicate to use a Molodensky transformation for NAD27 conversions.

dz_crs_main.nadcon_4267_to_8265

Utility to automate the transformation of NAD27 geometry to NAD83. Utility will utilize NADCON grids where possible or Molodensky where not.

Parameters

p_input	input NAD27 geomety to transform
p_identifier	optional NADCON grid keyword to avoid the overhead of testing the input for the correct grid. Force NULL to use Molodensky.
p_tolerance	optional tolerance override, default is 0.05

Returns

MDSYS.SDO_GEOMETRY in NAD83

Notes

- NADCON grid keywords include CONUS, HAWAII, PR/VI, ALASKA, ST. LAWRENCE ISLAND, ST. PAUL ISLAND and ST. GEORGE ISLAND

dz_crs_main.determine_srid

Somewhat specific utility intended to interpret and convert to an Oracle Spatial srid a variety of coordinate system naming inputs.

Parameters

p_input	input coordinate reference system

Returns

NUMBER of best matching SDO_SRID

Notes

- SRID=1234 will return 1234
- SRSNAME=SDO:1234 or SDO:1234 will return 1234
- SRSNAME=EPSG:1234 or EPSG:1234 will return 1234
- A limited number of SRSNAME urns are supported such as urn:ogc:def:crs:OGC:*:crs84 returns 8307 urn:ogc:def:crs:OGC:*:crs83 returns 8265 urn:ogc:def:crs:EPSG:*:1234 returns 1234
- All derived SRIDs are then tested against the local Oracle Spatial installation for validity.
- For more detailed feedback on any problems encountered utilize the procedure version which provides an error code and detailed status message.

dz_crs_main.parse_ogc_urn

Simple utility to quickly parse an OGC urn into component parts.

Parameters

p_input	input urn to decompose

Returns

p_urn	first component
p_ogc	second component
p_def	third component
p_objectType	fourth component
p_authority	fifth component
p_version	sixth component
p_code	seventh component

dz_crs_main.epsg2srid

Simply utility to convert epsg style srids to old Oracle equivalents

Parameters

p_input	input epsg srid

Returns

NUMBER of old Oracle Spatial srid

Notes

- Used to quickly swap 4269 for 8265 and 4326 to 8307.
- Any unknown srids are just returned in the output.

dz_crs_main.srs2srid

Utility to convert SRS coordinate system identifiers into Oracle Spatials srids.

Parameters

p_input	input SRS identifier

Returns

NUMBER of old Oracle Spatial srid

Notes

- As SRS identifiers may provide critical information as to the order of the axes in a given spatial dataset, utilize the procedure version which returns an additional p_axes_latlong parameter of TRUE/FALSE indicating the whether the axes are reversed with latitude first.

dz_crs_main.srid2srs

Simplistic utility to return srs values for a very limited number of Oracle Spatial srids.

Parameters

p_input	input srid

Returns

VARCHAR2 SRS value

dz_crs_main.smart_transform

Somewhat obnoxiously named wrapper to avoid running transformations on srid equivalents and also will force spherical math transformations when srid 3785 is utilized.

Parameters

p_input	input geometry to transform
p_srid	srid to use for transformation

Returns

MDSYS.SDO_GEOMETRY

dz_crs_main.grid_clob_to_header

Utility to extract from a NADCOD grid the header information.

Parameters

p_clob	NADCON grid

Returns

p_col_count	grid column count
p_row_count	grid row count
p_z_count	grid z count
p_min_long	grid minimum longitude p_long_cell -grid longitude cell value
p_min_lat	grid minimum latitude
p_lat_cell	grid latitude cell value

dz_crs_main.grid_to_mbr

Utility to extract from a NADCON grid the MBR surrounding it.

Parameters

p_coord_op_param	coordinate op number of a given grid

Returns

MDSYS.SDO_GEOMETRY

dz_crs_main.unwrap_etype3

Utility to extract from a Oracle Spatial optimized rectangle (MBR) the min and max point. Includes option to remove third and fourth dimensions.

Parameters

p_input	optimized rectangle geometry to decompose
p_2d_flag	optional TRUE/FALSE flag to remove any third or fourth dimensions

Returns

p_min_point	minimum (lower left) MBR vertice
p_max_point	maximum (upper right) MBR vertice

dz_crs_main.wrap_etype3

Utility to build an optimized rectangle (MBR) from two input points. Includes option to remove third and fourth dimensions.

Parameters

p_min_point	minimum (lower left) MBR vertice
p_max_point	maximum (upper right) MBR vertice
p_2d_flag	optional TRUE/FALSE flag to remove any third or fourth dimensions

Returns

p_output	optimized rectangle geometry

dz_crs_main.transform_etype3

Utility to allow the direct transformation of an optimized rectangle into a another coordinate reference system. When using SDO_TRANSFORM directly upon a geodetic optimized rectangle, the rectangle will be converted to a densified polygon which may not be desired. This utility decomposes the rectangle into components points, transforms those points, and then puts the rectangle back together.

Parameters

p_input	optimized rectangle geometry to transform
p_output_srid	srid to use in transformation
p_2d_flag	optional TRUE/FALSE flag to remove any third or fourth dimensions

Returns

MDSYS.SDO_GEOMETRY