Perl to CDF Programming Interface- V3.0

Using the Package

Both CDF's Standard and Internal Interface are provided to the Perl codes in the Perl-CDF package module. In order to use either one or both from Perl, the search path needs to be set up properly. The Perl-CDF package needs to be imported to the Perl script which will access CDF library. There are two ways to accomplish this. One is to include the needed directories in the script. For examples, the following codes are required at the front section of a Perl script using the Perl-CDF package running on a DEC/Alpha/OSF1 box, xfiles:

```
use strict;

BEGIN { unshift @INC,'/home/cdf/cdf30-dist/PerlCDF30/blib/arch',
                     '/home/cdf/cdf30-dist/PerlCDF30/blib/lib')) }
use CDF;
```

The other way is to have both

```
 -I/home/cdf/cdf30-dist/PerlCDF30/blib/arch
 -I/home/cdf/cdf30-dist/PerlCDF30/blib/lib
```

at the command line while running the Perl script.

The shared version of the CDF library is used while accessing the CDF interface from the Perl. To access the most current shared CDF library, an environment variable may need to be set. On a DEC Alpha/OSF1, Sun Solaris or SGI, the environment variable LD_LIBRARY_PATH must be set to be the directory containing `libcdf.so`. For example, if the most recent CDF V3.0 is at `/usr/local/share/cdf30/lib` on xfiles, so under the C-shell, enter:

setenv LD_LIBRARY_PATH /usr/local/share/cdf30/lib

For BSD-based Mac OS X, the environment variable is DYLD_LIBRARY_PATH. The variable must be set to the directory containing the shared library `libcdf.dylib`.

For Windows 9x/NT/2000/XP, similarly, set the PATH to include the directory that contains libcdf.lib.

Two Perl test scripts, `testPerlCDFii.pl` and `testPerlCDFsi.pl`, are provided in the distribution. Both use extensive Perl-CDF interface functions: `testPerlCDFii.pl` tests CDF's Internal Interface functions while `testPerlCDFsi.pl` tests the Standard Interface functions. They can be used as sample scripts for development.

Standard Interface

```
my $status=CDF::CDFcreate ($CDFpath, $numDims, \@dimSizes, $encoding,
```

```
                              $majority, \$id)
    my  $CDFpath;                                                    /* in  */
    my  $numDims;                                                    /* in  */
    my  @dimSizes;                                                   /* in  */
    my  $encoding;                                                   /* in  */
    my  $majority;                                                   /* in  */
    my  $id;                                                         /* out */


    my $status=CDF::CDFopen ($CDFpath, \$id)
    my  $CDFpath;                                                    /* in  */
    my  $id;                                                         /* out */


    my $status= CDF::CDFdoc ($id, \$version, \$release, \$text)
    my  $id;                                                         /* in  */
    my  $version;                                                    /* out */
    my  $release;                                                    /* out */
    my  $text;                                                       /* out */


    my $status=CDF::CDFinquire ($id, \$numDims, \@dimSizes, \$encoding,
                          \$majority, \$maxRec, \$numVars, \$numAttrs)
    my  $id;                                                         /* in  */
    my  $numDims;                                                    /* out */
    my  @dimSizes;                                                   /* out */
    my  $encoding;                                                   /* out */
    my  $majority;                                                   /* out */
    my  $maxRec;                                                     /* out */
    my  $numVars;                                                    /* out */
    my  $numAttrs;                                                   /* out */


    my $status=CDF::CDFclose ($id)
    my  $id;                                                         /* in  */


    my $status=CDF::CDFdelete ($id)
    my  $id;                                                         /* in  */


    my $status=CDF::CDFerror ($statusi, \$message)
    my  $statusi;                                                    /* in  */
    my  $message;                                                    /* out */


    my $status=CDF::CDFattrCreate ($id, $attrName, $attrScope, \$attrNum)
    my  $id;                                                         /* in  */
    my  $attrName;                                                   /* in  */
    my  $attrScope;                                                  /* in  */
    my  $attrNum;                                                    /* out */


    my $attrNum=CDF::CDFattrNum ($id, $attrName)
    my  $id;                                                         /* in  */
    my  $attrName;                                                   /* in  */


    my $status=CDF::CDFattrRename ($id, $attrNum, $attrName)
    my  $id;                                                         /* in  */
```

```
my  $attrNum;                                                 /* in  */
my  $attrName;                                                /* in  */


my $status=CDF::CDFattrInquire ($id, $attrNum, \$attrName, \$attrScope,
                                \$maxEntry)
my  $id;                                                      /* in  */
my  $attrNum;                                                 /* in  */
my  $attrName;                                                /* out */
my  $attrScope;                                               /* out */
my  $maxEntry;                                                /* out */


my $status=CDF::CDFattrEntryInquire ($id, $attrNum, $entryNum, \$dataType,
                                     \$numElements)
my  $id;                                                      /* in  */
my  $attrNum;                                                 /* in  */
my  $entryNum;                                                /* in  */
my  $dataType;                                                /* out */
my  $numElements;                                             /* out */


my $status=CDF::CDFattrPut ($id, $attrNum, $entryNum, $dataType, $numElements,
                            \$value)
my  $id;                                                      /* in  */
my  $attrNum;                                                 /* in  */
my  $entryNum;                                                /* in  */
my  $dataType;                                                /* in  */
my  $numElements;                                             /* in  */
my  $value;                                                   /* in  */


my $status=CDF::CDFattrGet ($id, $attrNum, $entryNum, \$value)
my  $id;                                                      /* in  */
my  $attrNum;                                                 /* in  */
my  $entryNum;                                                /* in  */
my  $value;                                                   /* out */


my $status=CDF::CDFvarCreate ($id, $varName, $dataType, $numElements,
                              $recVariances, \@dimVariances, \$varNum)
my  $id;                                                      /* in  */
my  $varName;                                                 /* in  */
my  $dataType;                                                /* in  */
my  $numElements;                                             /* in  */
my  $recVariance;                                             /* in  */
my  @dimVariances;                                            /* in  */
my  $varNum;                                                  /* out */


my $varNum=CDF::CDFvarNum ($id, $varName)
my  $id;                                                      /* in  */
my  $varName;                                                 /* in  */


my $status=CDF::CDFvarRename ($id, $varNum, $varName)
my  $id;                                                      /* in  */
my  $varNum;                                                  /* in  */
```

```
my  $varName;                                                    /* in  */


my $status=CDF::CDFvarInquire ($id, $varNum, $varName, $dataType,
                                $numElements, $recVariance, \@dimVariances)
my  $id;                                                         /* in  */
my  $varNum;                                                     /* in  */
my  $varName;                                                    /* out */
my  $dataType;                                                   /* out */
my  $numElements;                                               /* out */
my  $recVariance;                                               /* out */
my  @dimVariances;                                              /* out */


my $status=CDF::CDFvarPut ($id, $varNum, $recNum, \@indices, \$value)
my  $id;                                                         /* in  */
my  $varNum;                                                     /* in  */
my  $recNum;                                                     /* in  */
my  @indices;                                                    /* in  */
my  $value;                                                      /* in  */


my $status=CDF::CDFvarGet ($id, $varNum, $recNum, \@indices, \$value)
my  $id;                                                         /* in  */
my  $varNum;                                                     /* in  */
my  $recNum;                                                     /* in  */
my  @indices;                                                    /* in  */
my  $value;                                                      /* out */


my $status=CDF::CDFvHpPut ($id, $varNum, $recStart, $recCount,
                            $recInterval, \@indices, \@counts,
                            \@intervals, \@buffer)
my  $id;                                                         /* in  */
my  $varNum;                                                     /* in  */
my  $recStart;                                                   /* in  */
my  $recCount;                                                   /* in  */
my  $recInterval;                                                /* in  */
my  @indices;                                                    /* in  */
my  @counts;                                                     /* in  */
my  @intervals;                                                  /* in  */
my  @buffer;                                                     /* in  */


my $status=CDF::CDFvHpGet ($id, $varNum, $recStart, $recCount,
                            $recInterval, \@indices, \@counts,
                            \@intervals, \@buffer)
my  $id;                                                         /* in  */
my  $varNum;                                                     /* in  */
my  $recStart;                                                   /* in  */
my  $recCount;                                                   /* in  */
my  $recInterval;                                                /* in  */
my  @indices;                                                    /* in  */
my  @counts;                                                     /* in  */
my  @intervals;                                                  /* in  */
my  @buffer;                                                     /* out */
```

4

```
my $status=CDF::CDFvarClose ($id, $varNum)
my  $id;                                                             /* in  */
my  $varNum;                                                         /* in  */
```

Internal Interface

```
my $status=CDF::CDFlib ($op, ...)
my  $op;                                                             /* in  */

    CLOSE_
                CDF_
                rVAR_
                zVAR_

    CONFIRM_
                ATTR_                       \$attrNum                /* out */
                ATTR_EXISTENCE_             $attrName                /* in  */
                CDF_                        \$id                     /* out */
                CDF_ACCESS_
                CDF_CACHESIZE_              \$numBuffers             /* out */
                CDF_DECODING_               \$decoding               /* out */
                CDF_NAME_                   \$CDFpath                /* out */
                CDF_NEGtoPOSfp0_MODE_       \$mode                   /* out */
                CDF_READONLY_MODE_          \$mode                   /* out */
                CDF_STATUS_                 \$status                 /* out */
                CDF_zMODE_                  \$mode                   /* out */
                COMPRESS_CACHESIZE_         \$numBuffers             /* out */
                CURgENTRY_EXISTENCE_
                CURrENTRY_EXISTENCE_
                CURzENTRY_EXISTENCE_
                gENTRY_                     \$entryNum               /* out */
                gENTRY_EXISTENCE_           $entryNum                /* in  */
                rENTRY_                     \$entryNum               /* out */
                rENTRY_EXISTENCE_           $entryNum                /* in  */
                rVAR_                       \$varNum                 /* out */
                rVAR_CACHESIZE_             \$numBuffers             /* out */
                rVAR_EXISTENCE_             $varName                 /* in  */
                rVAR_PADVALUE_
                rVAR_RESERVEPERCENT_        \$percent                /* out */
                rVAR_SEQPOS_                \$recNum                 /* out */
                                            \@indices                /* out */
                rVARs_DIMCOUNTS_            \@counts                 /* out */
                rVARs_DIMINDICES_           \@indices                /* out */
                rVARs_DIMINTERVALS_         \@intervals              /* out */
                rVARs_RECCOUNT_             \$recCount               /* out */
                rVARs_RECINTERVAL_          \$recInterval            /* out */
                rVARs_RECNUMBER_            \$recNum                 /* out */
                STAGE_CACHESIZE_            \$numBuffers             /* out */
```

```
        zENTRY_                       \$entryNum              /* out */
        zENTRY_EXISTENCE_             $entryNum               /* in  */
        zVAR_                         \$varNum                /* out */
        zVAR_CACHESIZE_               \$numBuffers            /* out */
        zVAR_DIMCOUNTS_               \@counts                /* out */
        zVAR_DIMINDICES_              \@indices               /* out */
        zVAR_DIMINTERVALS_            \@intervals             /* out */
        zVAR_EXISTENCE_               $varName                /* in  */
        zVAR_PADVALUE_
        zVAR_RECCOUNT_                \$recCount              /* out */
        zVAR_RECINTERVAL_             \$recInterval           /* out */
        zVAR_RECNUMBER_               \$recNum                /* out */
        zVAR_RESERVEPERCENT_          \$percent               /* out */
        zVAR_SEQPOS_                  \$recNum                /* out */
                                      \@indices               /* out */

CREATE_
        ATTR_                         $attrName               /* in  */
                                      $scope                  /* in  */
                                      \$attrNum               /* out */

        CDF_                          $CDFpath                /* in  */
                                      $numDims                /* in  */
                                      \@dimSizes              /* in  */
                                      \$id                    /* out */

        rVAR_                         $varName                /* in  */
                                      $dataType               /* in  */
                                      $numElements            /* in  */
                                      $recVary                /* in  */
                                      $dimVarys               /* in  */
                                      \$varNum                /* out */

        zVAR_                         $varName                /* in  */
                                      $dataType               /* in  */
                                      $numElements            /* in  */
                                      $numDims                /* in  */
                                      \@dimSizes              /* in  */
                                      $recVary                /* in  */
                                      $dimVarys               /* in  */
                                      \$varNum                /* out */

DELETE_
        ATTR_
        CDF_
        gENTRY_
        rENTRY_
        rVAR_
        rVAR_RECORDS_                 $firstRecord            /* in  */
                                      $lastRecord             /* in  */
        zENTRY_
```

```
        zVAR_
        zVAR_RECORDS_                   $firstRecord                /* in  */
                                        $lastRecord                 /* in  */


GET_
        ATTR_MAXgENTRY_                 \$maxEntry                  /* out */
        ATTR_MAXrENTRY_                 \$maxEntry                  /* out */
        ATTR_MAXzENTRY_                 \$maxEntry                  /* out */
        ATTR_NAME_                      \$attrName                  /* out */
        ATTR_NUMBER_                    $attrName                   /* in  */
                                        \$attrNum                   /* out */
        ATTR_NUMgENTRIES_               \$numEntries                /* out */
        ATTR_NUMrENTRIES_               \$numEntries                /* out */
        ATTR_NUMzENTRIES_               \$numEntries                /* out */
        ATTR_SCOPE_                     \$scope                     /* out */
        CDF_COMPRESSION_                \$cType                     /* out */
                                        \@cParms                    /* out */
                                        \$cPct                      /* out */
        CDF_COPYRIGHT_                  \$copyRight                 /* out */
        CDF_ENCODING_                   \$encoding                  /* out */
        CDF_FORMAT_                     \$format                    /* out */
        CDF_INCREMENT_                  \$increment                 /* out */
        CDF_INFO_                       $path                       /* in  */
                                        \$cType                     /* out */
                                        \@cParms                    /* out */
                                        \$cSize                     /* out */
                                        \$uSize                     /* out */
        CDF_MAJORITY_                   \$majority                  /* out */
        CDF_NUMATTRS_                   \$numAttrs                  /* out */
        CDF_NUMgATTRS_                  \$numAttrs                  /* out */
        CDF_NUMrVARS_                   \$numVars                   /* out */
        CDF_NUMvATTRS_                  \$numAttrs                  /* out */
        CDF_NUMzVARS_                   \$numVars                   /* out */
        CDF_RELEASE_                    \$release                   /* out */
        CDF_VERSION_                    \$version                   /* out */
        DATATYPE_SIZE_                  $dataType                   /* in  */
                                        \$numBytes                  /* out */
        gENTRY_DATA_                    \$value                     /* out */
        gENTRY_DATATYPE_                \$dataType                  /* out */
        gENTRY_NUMELEMS_                \$numElements               /* out */
        LIB_COPYRIGHT_                  \$copyRight                 /* out */
        LIB_INCREMENT_                  \$increment                 /* out */
        LIB_RELEASE_                    \$release                   /* out */
        LIB_subINCREMENT_               \$subincrement              /* out */
        LIB_VERSION_                    \$version                   /* out */
        rENTRY_DATA_                    \$value                     /* out */
        rENTRY_DATATYPE_                \$dataType                  /* out */
        rENTRY_NUMELEMS_                \$numElements               /* out */
        rVAR_ALLOCATEDFROM_             $startRecord                /* in  */
                                        \$nextRecord                /* out */
        rVAR_ALLOCATEDTO_               $startRecord                /* in  */
```

```
                                          \$lastRecord              /* out */
        rVAR_BLOCKINGFACTOR_              \$blockingFactor          /* out */
        rVAR_COMPRESSION_                 \$cType                   /* out */
                                          \@cParms                  /* out */
                                          \$cPct                    /* out */
        rVAR_DATA_                        \$value                   /* out */
        rVAR_DATATYPE_                    \$dataType                /* out */
        rVAR_DIMVARYS_                    \@dimVarys                /* out */
        rVAR_HYPERDATA_                   \@buffer                  /* out */
        rVAR_MAXallocREC_                 \$maxRec                  /* out */
        rVAR_MAXREC_                      \$maxRec                  /* out */
        rVAR_NAME_                        \$varName                 /* out */
        rVAR_nINDEXENTRIES_               \$numEntries              /* out */
        rVAR_nINDEXLEVELS_                \$numLevels               /* out */
        rVAR_nINDEXRECORDS_               \$numRecords              /* out */
        rVAR_NUMallocRECS_                \$numRecords              /* out */
        rVAR_NUMBER_                      $varName                  /* in  */
                                          \$varNum                  /* out */
        rVAR_NUMELEMS_                    \$numElements             /* out */
        rVAR_NUMRECS_                     \$numRecords              /* out */
        rVAR_PADVALUE_                    \$value                   /* out */
        rVAR_RECVARY_                     \$recVary                 /* out */
        rVAR_SEQDATA_                     \$value                   /* out */
        rVAR_SPARSEARRAYS_                \$sArraysType             /* out */
                                          \@sArraysParms            /* out */
                                          \$sArraysPct              /* out */
        rVAR_SPARSERECORDS_               \$sRecordsType            /* out */
        rVARs_DIMSIZES_                   \@dimSizes                /* out */
        rVARs_MAXREC_                     \$maxRec                  /* out */
        rVARs_NUMDIMS_                    \$numDims                 /* out */
        rVARs_RECDATA_                    $numVars                  /* in  */
                                          \@varNums                 /* in  */
                                          \@buffer                  /* out */
        STATUS_TEXT_                      \$text                    /* out */
        zENTRY_DATA_                      \$value                   /* out */
        zENTRY_DATATYPE_                  \$dataType                /* out */
        zENTRY_NUMELEMS_                  \$numElements             /* out */
        zVAR_ALLOCATEDFROM_               $startRecord              /* in  */
                                          \$nextRecord              /* out */
        zVAR_ALLOCATEDTO_                 $startRecord              /* in  */
                                          \$lastRecord              /* out */
        zVAR_BLOCKINGFACTOR_              \$blockingFactor          /* out */
        zVAR_COMPRESSION_                 \$cType                   /* out */
                                          \@cParms                  /* out */
                                          \$cPct                    /* out */
        zVAR_DATA_                        \$value                   /* out */
        zVAR_DATATYPE_                    \$dataType                /* out */
        zVAR_DIMSIZES_                    \@dimSizes                /* out */
        zVAR_DIMVARYS_                    \@dimVarys                /* out */
        zVAR_HYPERDATA_                   \@buffer                  /* out */
        zVAR_MAXallocREC_                 \$maxRec                  /* out */
```

```
            zVAR_MAXREC_                \$maxRec                /* out */
            zVAR_NAME_                  \$varName              /* out */
            zVAR_nINDEXENTRIES_         \$numEntries           /* out */
            zVAR_nINDEXLEVELS_          \$numLevels            /* out */
            zVAR_nINDEXRECORDS_         \$numRecords           /* out */
            zVAR_NUMallocRECS_          \$numRecords           /* out */
            zVAR_NUMBER_                $varName               /* in  */
                                        \$varNum               /* out */
            zVAR_NUMDIMS_               \$numDims              /* out */
            zVAR_NUMELEMS_              \$numElements          /* out */
            zVAR_NUMRECS_               \$numRecords           /* out */
            zVAR_PADVALUE_              \$value                /* out */
            zVAR_RECVARY_               \$recVary              /* out */
            zVAR_SEQDATA_               \$value                /* out */
            zVAR_SPARSEARRAYS_          \$sArraysType          /* out */
                                        \@sArraysParms         /* out */
                                        \$sArraysPct           /* out */
            zVAR_SPARSERECORDS_         \$sRecordsType         /* out */
            zVARs_MAXREC_               \$maxRec               /* out */
            zVARs_RECDATA_              $numVars               /* in  */
                                        \@varNums              /* in  */
                                        \@buffer               /* out */


OPEN_
            CDF_                        $CDFpath               /* in  */
                                        \$id                   /* out */


PUT_
            ATTR_NAME_                  $attrName              /* in  */
            ATTR_SCOPE_                 $scope                 /* in  */
            CDF_COMPRESSION_            $cType                 /* in  */
                                        \@cParms               /* in  */
            CDF_ENCODING_               $encoding              /* in  */
            CDF_FORMAT_                 $format                /* in  */
            CDF_MAJORITY_               $majority              /* in  */
            gENTRY_DATA_                $dataType              /* in  */
                                        $numElements           /* in  */
                                        \$value                /* in  */
            gENTRY_DATASPEC_            $dataType              /* in  */
                                        $numElements           /* in  */
            rENTRY_DATA_                $dataType              /* in  */
                                        $numElements           /* in  */
                                        \$value                /* in  */
            rENTRY_DATASPEC_            $dataType              /* in  */
                                        $numElements           /* in  */
            rVAR_ALLOCATEBLOCK_         $firstRecord           /* in  */
                                        $lastRecord            /* in  */
            rVAR_ALLOCATERECS_          $numRecords            /* in  */
            rVAR_BLOCKINGFACTOR_        $blockingFactor        /* in  */
            rVAR_COMPRESSION_           $cType                 /* in  */
                                        \@cParms               /* in  */
```

```
        rVAR_DATA_                  \$value              /* in  */
        rVAR_DATASPEC_              $dataType            /* in  */
                                    $numElements         /* in  */
        rVAR_DIMVARYS_              \@dimVarys           /* in  */
        rVAR_HYPERDATA_             \@buffer             /* in  */
        rVAR_INITIALRECS_           $nRecords            /* in  */
        rVAR_NAME_                  $varName             /* in  */
        rVAR_PADVALUE_              \$value              /* in  */
        rVAR_RECVARY_               $recVary             /* in  */
        rVAR_SEQDATA_               \$value              /* in  */
        rVAR_SPARSEARRAYS_          $sArraysType         /* in  */
                                    \@sArraysParms       /* in  */
        rVAR_SPARSERECORDS_         $sRecordsType        /* in  */
        rVARs_RECDATA_              $numVars             /* in  */
                                    \@varNums            /* in  */
                                    \@buffer             /* in  */
        zENTRY_DATA_                $dataType            /* in  */
                                    $numElements         /* in  */
                                    \$value              /* in  */
        zENTRY_DATASPEC_            $dataType            /* in  */
                                    $numElements         /* in  */
        zVAR_ALLOCATEBLOCK_         $firstRecord         /* in  */
                                    $lastRecord          /* in  */
        zVAR_ALLOCATERECS_          $numRecords          /* in  */
        zVAR_BLOCKINGFACTOR_        $blockingFactor      /* in  */
        zVAR_COMPRESSION_           $cType               /* in  */
                                    \@cParms             /* in  */
        zVAR_DATA_                  \$value              /* in  */
        zVAR_DATASPEC_              $dataType            /* in  */
                                    $numElements         /* in  */
        zVAR_DIMVARYS_              \@dimVarys           /* in  */
        zVAR_INITIALRECS_           $nRecords            /* in  */
        zVAR_HYPERDATA_             \@buffer             /* in  */
        zVAR_NAME_                  $varName             /* in  */
        zVAR_PADVALUE_              \$value              /* in  */
        zVAR_RECVARY_               $recVary             /* in  */
        zVAR_SEQDATA_               \$value              /* in  */
        zVAR_SPARSEARRAYS_          $sArraysType         /* in  */
                                    \@sArraysParms       /* in  */
        zVAR_SPARSERECORDS_         $sRecordsType        /* in  */
        zVARs_RECDATA_              $numVars             /* in  */
                                    \@varNums            /* in  */
                                    \@buffer             /* in  */

SELECT_

        ATTR_                       $attrNum             /* in  */
        ATTR_NAME_                  $attrName            /* in  */
        CDF_                        $id                  /* in  */
        CDF_CACHESIZE_              $numBuffers          /* in  */
        CDF_DECODING_               $decoding            /* in  */
        CDF_NEGtoPOSfp0_MODE_       $mode                /* in  */
```

```
                 CDF_READONLY_MODE_              $mode                    /* in  */
                 CDF_SCRATCHDIR_                 $dirPath                 /* in  */
                 CDF_STATUS_                     $status                  /* in  */
                 CDF_zMODE_                      $mode                    /* in  */
                 COMPRESS_CACHESIZE_             $numBuffers              /* in  */
                 gENTRY_                         $entryNum                /* in  */
                 rENTRY_                         $entryNum                /* in  */
                 rENTRY_NAME_                    $varName                 /* in  */
                 rVAR_                           $varNum                  /* in  */
                 rVAR_CACHESIZE_                 $numBuffers              /* in  */
                 rVAR_NAME_                      $varName                 /* in  */
                 rVAR_RESERVEPERCENT_            $percent                 /* in  */
                 rVAR_SEQPOS_                    $recNum                  /* in  */
                                                 \@indices                /* in  */
                 rVARs_CACHESIZE_                $numBuffers              /* in  */
                 rVARs_DIMCOUNTS_                \@counts                 /* in  */
                 rVARs_DIMINDICES_               \@indices                /* in  */
                 rVARs_DIMINTERVALS_             \@intervals              /* in  */
                 rVARs_RECCOUNT_                 $recCount                /* in  */
                 rVARs_RECINTERVAL_              $recInterval             /* in  */
                 rVARs_RECNUMBER_                $recNum                  /* in  */
                 STAGE_CACHESIZE_                $numBuffers              /* in  */
                 zENTRY_                         $entryNum                /* in  */
                 zENTRY_NAME_                    $varName                 /* in  */
                 zVAR_                           $varNum                  /* in  */
                 zVAR_CACHESIZE_                 $numBuffers              /* in  */
                 zVAR_DIMCOUNTS_                 \@counts                 /* in  */
                 zVAR_DIMINDICES_                \@indices                /* in  */
                 zVAR_DIMINTERVALS_              \@intervals              /* in  */
                 zVAR_NAME_                      $varName                 /* in  */
                 zVAR_RECCOUNT_                  $recCount                /* in  */
                 zVAR_RECINTERVAL_               $recInterval             /* in  */
                 zVAR_RECNUMBER_                 $recNum                  /* in  */
                 zVAR_RESERVEPERCENT_            $percent                 /* in  */
                 zVAR_SEQPOS_                    $recNum                  /* in  */
                                                 \@indices                /* in  */
                 zVARs_CACHESIZE_                $numBuffers              /* in  */
                 zVARs_RECNUMBER_                $recNum                  /* in  */
```

EPOCH Utility Routines

```
my $epoch=CDF::computeEPOCH ($year, $month, $day, $hour, $minute, $second,
                             $msec)
my  $year;                                                        /* in  */
my  $month;                                                       /* in  */
my  $day;                                                         /* in  */
my  $hour;                                                        /* in  */
my  $minute;                                                      /* in  */
my  $second;                                                      /* in  */
```

```
my  $msec;                                                      /* in  */

 CDF::EPOCHbreakdown ($epoch, \$year, \$month, \$day, \$hour, \$minute,
                          \$second, \$msec)
my  $epoch;                                                     /* in  */
my  $year;                                                      /* out */
my  $month;                                                     /* out */
my  $day;                                                       /* out */
my  $hour;                                                      /* out */
my  $minute;                                                    /* out */
my  $second;                                                    /* out */
my  $msec;                                                      /* out */

 CDF::encodeEPOCH ($epoch, \$epString)
my  $epoch;                                                     /* in  */
my  $epString;                                                  /* out */

 CDF::encodeEPOCH1 ($epoch, \$epString)
my  $epoch;                                                     /* in  */
my  $epString;                                                  /* out */

 CDF::encodeEPOCH2 ($epoch, \$epString)
my  $epoch;                                                     /* in  */
my  $epString;                                                  /* out */

 CDF::encodeEPOCH3 ($epoch, \$epString)
my  $epoch;                                                     /* in  */
my  $epString;                                                  /* out */

 CDF::encodeEPOCHx ($epoch, $format, \$epString)
my  $epoch;                                                     /* in  */
my  $format;                                                    /* in  */
my  $epString;                                                  /* out */

my $epoch=CDF::parseEPOCH ($epString)
my  $epString;                                                  /* in  */

my $epoch=CDF::parseEPOCH1 ($epString)
my  $epString;                                                  /* in  */

my $epoch=CDF::parseEPOCH2 ($epString)
my  $epString;                                                  /* in  */

my $epoch=CDF::parseEPOCH3 ($epString)
my  $epString;                                                  /* in  */
```

EPOCH16 Utility Routines

```
my $status=CDF::computeEPOCH16 ($year, $month, $day, $hour, $minute, $second,
```

```
                        $msec, $usec, $nsec, $psec, \@epoch16)
my  $year;                                                      /* in  */
my  $month;                                                     /* in  */
my  $day;                                                       /* in  */
my  $hour;                                                      /* in  */
my  $minute;                                                    /* in  */
my  $second;                                                    /* in  */
my  $msec;                                                      /* in  */
my  $usec;                                                      /* in  */
my  $nsec;                                                      /* in  */
my  $psec;                                                      /* in  */
my  @epoch16;                                                   /* out */

 CDF::EPOCH16breakdown (\@epoch16, \$year, \$month, \$day, \$hour, \$minute,
                        \$second, \$msec, \$usec, \$nsec, \$psec)
my  @epoch16;                                                   /* in  */
my  $year;                                                      /* out */
my  $month;                                                     /* out */
my  $day;                                                       /* out */
my  $hour;                                                      /* out */
my  $minute;                                                    /* out */
my  $second;                                                    /* out */
my  $msec;                                                      /* out */
my  $usec;                                                      /* out */
my  $nsec;                                                      /* out */
my  $psec;                                                      /* out */

 CDF::encodeEPOCH16 (\@epoch16, \$epString)
my  @epoch16;                                                   /* in  */
my  $epString;                                                  /* out */

 CDF::encodeEPOCH16_1 (\@epoch16, \$epString)
my  @epoch16;                                                   /* in  */
my  $epString;                                                  /* out */

 CDF::encodeEPOCH16_2 (\@epoch16, \$epString)
my  @epoch16;                                                   /* in  */
my  $epString;                                                  /* out */

 CDF::encodeEPOCH16_3 (\@epoch16, \$epString)
my  @epoch16;                                                   /* in  */
my  $epString;                                                  /* out */

 CDF::encodeEPOCH16_x (\@epoch16, $format, \$epString)
my  @epoch16;                                                   /* in  */
my  $format;                                                    /* in  */
my  $epString;                                                  /* out */

my $status=CDF::parseEPOCH16 ($epString, \@epoch16)
my  $epString;                                                  /* in  */
my  @epoch16;                                                   /* out */
```

```
my $status=CDF::parseEPOCH16_1 ($epString, \@epoch16)
my  $epString;                                                           /* in  */
my  @epoch16;                                                            /* out */

my $status=CDF::parseEPOCH16_2 ($epString, \@epoch16)
my  $epString;                                                           /* in  */
my  @epoch16;                                                            /* out */

my $status=CDF::parseEPOCH16_3 ($epString, \@epoch16)
my  $epString;                                                           /* in  */
my  @epoch16;                                                            /* out */
```

Summary

```
C Interface (Input)             Perl Interface
---------------------------     --------------
CDFid  varname;                 $varname
char   varname;                 $varname
char   *varname;                $varname
char   varname[];               $varname
double varname;                 $varname
long   varname;                 $varname
long   varname[];               \@varname
void   *buffer; (>= 1 value)    \@buffer
void   *value; (1 value)        \$value
double epoch16[];               \@epoch16

C Interface (Output)            Perl Interface
---------------------------     --------------
CDFid  *varname;                \$varname
char   *varname;                \$varname
char   varname[];               \$varname
long   *varname;                \$varname
long   varname[];               \@varname
void   *buffer; (>= 1 value)    \@buffer
void   *value; (1 value)        \$value
double *epoch16                 \@epoch16
```