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CENTRE OF EXCELLENCE IN SIMULATION OF WEATHER AND CLIMATE IN EUROPE

Compatibility Between ESDM and NetCDF4

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Work Package:	Work Package 4 Exploitability
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Date of Submission:	30 June 2019

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Filename	Compatible	Almost Compatible	Not Compatible Yet	Almost Incompatible	Incompatible
cdm_sea_soundings.c					✓
test_szip.c					✓
tst_atts1.c					
tst_atts2.c					✓
tst_atts3.c					
tst_atts.c					
tst_attsperf.c					
tst_bug324.c					
tst_camrun.c					
tst_chunks2.c					
tst_chunks3.c					
tst_chunks.c					
tst_compounds2.c					
tst_compounds3.c					
tst_converts2.c					
tst_converts.c					
tst_coords2.c					
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tst_coords.c					
tst_create_files.c					
tst_dims2.c					
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tst_fill_attr_vanish.c					
tst_fillbug.c					
tst_fills2.c					
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tst_grps.c					
tst_h5_endians.c					
tst_hdf5_file_compat.c					
tst_h_refs.c					
tst_h_scalar.c					
tst_h_strbug.c					
tst_interops5.c					
tst_interops6.c					
tst_interops.c					
tst_large2.c					
tst_large.c					

Table 1.1

Filename	Compatible	Almost Compatible	Not Compatible Yet	Almost Incompatible	Incompatible
tst_mem.c					
tst_mode.c					
tst_opaques.c					
tst_parallel.c					
tst_put_vars.c					
tst_rename2.c					
tst_rename.c					
tst_simplerw_coll_r.c					
tst_strings2.c					
tst_strings.c					
tst_sync.c					
tst_types.c					
tst_udf.c					
tst_unlim_vars.c					
tst_utf8.c					
tst_v2.c					
tst_varms.c					
tst_vars2.c					
tst_vars3.c					
tst_vars4.c					
tst_vars.c					
tst_vl.c					
h5testszip.c	✓				
tst_atts_string_rewrite.c	✓				
tst_elatefill.c	✓				
tst_files3.c	✓				
tst_files5.c	✓				
tst_filterparser.c	✓				
tst_mpi_parallel.c	✓				
tst_rehash.c	✓				
t_type.c	✓				

Table 1.2

Filename	Justification
cdm_sea_soundings.c	ESDM does not support compound datatypes from NetCDF!
test_szip.c	ESDM does not support compression from NetCDF!
tst_atts1.c	
tst_atts2.c	ESDM does not support compound datatypes from NetCDF!
tst_atts3.c	
tst_atts.c	
tst_attsperf.c	Too long to test now.
tst_bug324.c	ESDM does not support classic format from NetCDF!
tst_camrun.c	
tst_chunks2.c	ESDM does not support compression from NetCDF!
tst_chunks3.c	ESDM does not support compression from NetCDF!
tst_chunks.c	ESDM does not support compression from NetCDF!
tst_compounds2.c	ESDM does not support compound datatypes from NetCDF!
tst_compounds3.c	ESDM does not support compound datatypes from NetCDF!
tst_converts2.c	
tst_converts.c	
tst_coords2.c	ESDM does not support groups from NetCDF!
tst_coords3.c	ESDM does not support groups from NetCDF!
tst_coords.c	ESDM does not support groups from NetCDF!
tst_create_files.c	ESDM does not support groups from NetCDF!
tst_dims2.c	ESDM does not keep the dimensions' ids once it's closed
tst_dims3.c	ESDM does not support groups from NetCDF!
tst_empty_vlen_unlim.c	ESDM does not support user-defined datatypes from NetCDF!
tst_endian_fill.c	ESDM does not support endianness from NetCDF!
tst_enums.c	ESDM does not support user-defined datatypes from NetCDF!
tst_files4.c	ESDM does not support groups from NetCDF!
tst_files6.c	ESDM does not support HDF5 file with circular group structure!
tst_files.c	
tst_fill_attr_vanish.c	WARN ESDM_set_fill():370 NOT IMPLEMENTED
tst_fillbug.c	WARN_NOT_IMPLEMENTED
tst_fills2.c	WARN_NOT_IMPLEMENTED
tst_fills.c	WARN_NOT_IMPLEMENTED
tst_grps2.c	ESDM does not support groups from NetCDF!
tst_grps.c	ESDM does not support groups from NetCDF!
tst_h5_endians.c	ESDM does not support endianness from NetCDF!
tst_hdf5_file_compat.c	ESDM does not support HDF5 format!
tst_h_refs.c	ESDM does not support HDF5 format!
tst_h_scalar.c	ESDM does not support HDF5 format!
tst_h_strbug.c	ESDM does not support HDF5 format!
tst_interops5.c	ESDM does not support HDF5 format!
tst_interops6.c	ESDM does not support HDF5 format!
tst_interops.c	ESDM does not support HDF5 format!
tst_large2.c	Broke my computer
tst_large.c	WARN ESDM_set_fill():526 NOT IMPLEMENTED (Tests successful!)

Table 1.3

Filename	Justification
tst_mem.c	Tests successful!
tst_mode.c	ESDM does not support compression from NetCDF! (Tests successful!)
tst_opaques.c	ESDM does not support user-defined datatypes from NetCDF!
tst_parallel.c	Not tested yet.
tst_put_vars.c	SUCCESS writing example file!
tst_rename2.c	
tst_rename.c	
tst_simplerw_coll_r.c	ESDM does not support collective access of metadata with HDF5!
tst_strings2.c	Tests successful!
tst_strings.c	
tst_sync.c	
tst_types.c	ESDM does not support user-defined datatypes from NetCDF!
tst_udf.c	ESDM does not support user-defined formats from NetCDF!
tst_unlim_vars.c	Not working anymore (Tests successful!)
tst_utf8.c	ESDM does not support Unicode names encoded with UTF-8!
tst_v2.c	Tests successful!
tst_varms.c	ESDM does not support mapped var operations!
tst_vars2.c	
tst_vars3.c	
tst_vars4.c	
tst_vars.c	ESDM does not support groups from NetCDF!
tst_vl.c	ESDM does not support user-defined datatypes from NetCDF!
h5testszip.c	PASS
tst_atts_string_rewrite.c	Tests successful!
tst_elatefill.c	line 41 expecting NC_ELATEFILL but got 0
tst_files3.c	Working ESDM does not support compression from NetCDF!
tst_files5.c	Not working anymore (Tests successful!)
tst_filterparser.c	SUCCESS!!
tst_mpi_parallel.c	Tests successful!
tst_rehash.c	Tests successful!
t_type.c	Tests successful!

Table 1.4: Additional comments on ESDM and NETCDF compatibility

File	Not Tested	Not Working Build	Not Working Run	Working
bigmeta.c	✓			
openbigmeta.c	✓			
bm_file.c		✓		
bm_many_atts.c		✓		
bm_many_objs.c		✓		
bm_netcdf4_recs.c		✓		
ref_bzip2.c		✓		
test_filter.c		✓		
test_filter_misc.c		✓		
tst_ar4_3d.c		✓		
tst_ar4_4d.c		✓		
tst_ar4.c		✓		
tst_files2.c		✓		
tst_h_many_atts.c		✓		
tst_knmi.c		✓		
tst_put_vars_two_unlim_dim.c		✓		
tst_utils.c		✓		
tst_compounds.c			✓	
tst_dims.c			✓	
tst_interops4.c			✓	
tst_nc4perf.c			✓	
tst_parallel3.c			✓	
tst_parallel4.c			✓	
tst_parallel5.c			✓	
tst_xplatform2.c			✓	
tst_xplatform.c			✓	

Table 1.5: List of nc_test4 files.

File	Not Tested	Not Working Build	Not Working Run	Working
renamegroup.c				✓
test_szip.c				✓
tst_atts1.c				✓
tst_atts2.c				✓
tst_atts3.c				✓
tst_atts.c				✓
tst_attsperf.c				✓
tst_atts_string_rewrite.c				✓
tst_bug324.c				✓
tst_camrun.c				✓
tst_chunks2.c				✓
tst_chunks3.c				✓
tst_chunks.c				✓
tst_compounds2.c				✓
tst_compounds3.c				✓
tst_converts2.c				✓
tst_converts.c				✓
tst_coords2.c				✓
tst_coords3.c				✓
tst_coords.c				✓
tst_create_files.c				✓
tst_dims2.c				✓
tst_dims3.c				✓
tst_elatefill.c				✓
tst_empty_vlen_unlim.c				✓
tst_endian_fill.c				✓
tst_enums.c				✓
tst_files3.c				✓
tst_files4.c				✓
tst_files5.c				✓
tst_files6.c				✓
tst_files.c				✓
tst_fill_attr_vanish.c				✓
tst_fillbug.c				✓
tst_fills2.c				✓
tst_fills.c				✓
tst_filterparser.c				✓
tst_grps2.c				✓
tst_grps.c				✓
tst_h5_endians.c				✓
tst_hdf5_file_compat.c				✓
tst_h_refs.c				✓
tst_h_scalar.c				✓
tst_h_strbug.c				✓
tst_interops5.c				✓
tst_interops6.c				✓
tst_interops.c				✓
tst_large2.c				✓
tst_large.c				✓
tst_mem.c				✓

Table 1.6: List of nc_test4 files.

File	Not Tested	Not Working Build	Not Working Run	Working
tst_mode.c				✓
tst_mpi_parallel.c				✓
tst_opaques.c				✓
tst_parallel.c				✓
tst_put_vars.c				✓
tst_rehash.c				✓
tst_rename2.c				✓
tst_rename.c				✓
tst_simplerw_coll_r.c				✓
tst_strings2.c				✓
tst_strings.c				✓
tst_sync.c				✓
tst_types.c				✓
tst_udf.c				✓
tst_unlim_vars.c				✓
tst_utf8.c				✓
tst_v2.c				✓
tst_varms.c				✓
tst_vars2.c				✓
tst_vars3.c				✓
tst_vars4.c				✓
tst_vars.c				✓
tst_vl.c				✓
t_type.c				✓

Table 1.7: List of nc_test4 files.

NetCDF TYPE	Number	ESDM Type	ESDM Representation
NC_BYTE	1	SMD_DTYPE_INT8	int8_t
NC_UBYTE	7	SMD_DTYPE_UINT8	uint8_t
NC_CHAR	2	SMD_DTYPE_CHAR	char
NC_SHORT	3	SMD_DTYPE_INT16	int16_t
NC_USHORT	8	SMD_DTYPE_UINT16	uint16_t
NC_INT	4	SMD_DTYPE_INT32	int32_t
NC_LONG	4	SMD_DTYPE_INT32	int32_t
NC_UINT	9	SMD_DTYPE_UINT32	uint32_t
NC_INT64	10	SMD_DTYPE_INT64	int64_t
NC_UINT64	5	SMD_DTYPE_UINT64	uint64_t
NC_FLOAT	11	SMD_DTYPE_FLOAT	32 bits
NC_DOUBLE	6	SMD_DTYPE_DOUBLE	64 bits

Table 1.8: Convertion between ESDM and NetCDF4 datatypes – Datatypes sorted by size.

NetCDF TYPE	Number	ESDM Type	ESDM Representation
NC_BYTE	1	SMD_DTYPE_INT8	int8_t
NC_CHAR	2	SMD_DTYPE_CHAR	char
NC_SHORT	3	SMD_DTYPE_INT16	int16_t
NC_INT	4	SMD_DTYPE_INT32	int32_t
NC_LONG	4	SMD_DTYPE_INT32	int32_t
NC_UINT64	5	SMD_DTYPE_UINT64	uint64_t
NC_DOUBLE	6	SMD_DTYPE_DOUBLE	64 bits
NC_UBYTE	7	SMD_DTYPE_UINT8	uint8_t
NC_USHORT	8	SMD_DTYPE_UINT16	uint16_t
NC_UINT	9	SMD_DTYPE_UINT32	uint32_t
NC_INT64	10	SMD_DTYPE_INT64	int64_t
NC_FLOAT	11	SMD_DTYPE_FLOAT	32 bits

Table 1.9: Convertion between ESDM and NetCDF4 datatypes – Datatypes sorted by NETCDF4 description.

Functionality	NetCDF Support	ESDM Support
	Datatypes	
NC Data Type	NC Description	ESDM Data Type
NC_NAT	NAT = Not A Type (c.f. NaN)	NOT SUPPORTE
NC_BYTE	signed 1 byte integer	SMD_DTYPE_INT
NC_CHAR	ISO/ASCII character	SMD_DTYPE_CH
NC_SHORT	signed 2 byte integer	SMD_DTYPE_INT
NC_INT	signed 4 byte integer	SMD_DTYPE_INT
NC_LONG	deprecated, but required for backward compatibility	SMD_DTYPE_INT
NC_FLOAT	single precision floating point number	SMD_DTYPE_FL
NC_DOUBLE	double precision floating point number	SMD_DTYPE_DO
NC_UBYTE	unsigned 1 byte int	SMD_DTYPE_UIN
NC_USHORT	unsigned 2-byte int	SMD_DTYPE_UIN
NC_UINT	unsigned 4-byte int	SMD_DTYPE_UIN
NC_INT64	signed 8-byte int	SMD_DTYPE_INT
NC_UINT64	unsigned 8-byte int	SMD_DTYPE_UIN
NC_STRING	string	SMD_DTYPE_STI
NC_VLEN	used internally for vlen types	NOT SUPPORTE
NC_OPAQUE	used internally for opaque types	NOT SUPPORTE
NC_COMPOUND	used internally for compound types	NOT SUPPORTE
NC_ENUM	used internally for enum types	NOT SUPPORTE
	Modes – Creating a file	
NC_CLOBBER	Overwrite existing file	ESDM_CLOBBER
NC_NOCLOBBER	Do not overwrite existing file	ESDM_NOCLOBE
NC_SHARE	Limit write caching - netcdf classic files only	NOT SUPPORTE
NC_64BIT_OFFSET	Create 64-bit offset file	NOT SUPPORTE
NC_64BIT_DATA	Create CDF-5 file (alias NC_CDF5)	NOT SUPPORTE
NC_NETCDF4	Create netCDF-4/HDF5 file	NOT SUPPORTE
NC_CLASSIC_MODEL	Enforce netCDF classic mode on netCDF-4/HDF5 files	NOT SUPPORTE
NC_DISKLESS	Store data in memory	NOT SUPPORTE
NC_PERSIST	Force the NC_DISKLESS data from memory to a file	NOT SUPPORTE
	Modes – Opening a file	
NC_NOWRITE	Open the dataset with read-only access	ESDM_NOWRITE
NC_WRITE	Open the dataset with read-write access	ESDM_WRITE
NC_SHARE	Share updates, limit caching	NOT SUPPORTE
NC_WRITE—NC_SHARE	Open the dataset with read-write access Share updates, limit caching	NOT SUPPORTE
NC_DISKLESS	Store data in memory	NOT SUPPORTE
NC_PERSIST	Force the NC_DISKLESS data from memory to a file	NOT SUPPORTE

Table 1.10: Functionality Supported by NetCDF and ESDM.