

UNCLASSIFIED

SOFTWARE COMMUNICATIONS ARCHITECTURE SPECIFICATION

APPENDIX E-3: PLATFORM SPECIFIC MODEL - LANGUAGE SPECIFIC MAPPINGS



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4.1	Updated Informative References Removed UML to Language Specific Mappings section Added clarifications to IDL to Language Specific Mappings section ICWG Approved	20 August 2015

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APPENDIX E-3 PSM - LANGUAGE SPECIFIC MAPPINGS

E-3.1 SCOPE

This appendix defines the platform specific technology mappings for C, C++ and C++11.

E-3.2 CONFORMANCE

See SCA Appendix E.

E-3.3 CONVENTIONS

N/A.

E-3.4 NORMATIVE REFERENCES

N/A.

E-3.5 INFORMATIVE REFERENCES

The following is a list of documents referenced within this appendix or used as reference or guidance material in its development.

- [1] OMG Document formal/2012-07-02, C++ Language Mapping, Version 1.3, July 2012.
- [2] C++11 programming language, ISO/IEC 14882:2011 C++.
- [3] OMG Document formal/2014-01-01, IDL To C++11 Language Mapping, Version 1.1, January 2014.
- [4] OMG Document formal/1999-07-35, C Language Mapping Specification, Version 1.0, July 1999.

E-3.6 IDL TO LANGUAGE SPECIFIC MAPPINGS

Interface Definition Language (IDL) is the standard representation for the SCA platform independent model. IDL standard language mappings provide an industry standard approach to transform interface definitions to specific implementation technologies. The combination of IDL and its mappings supports both language and transfer mechanism independence. UML was not used because it does not have standard language mappings for C or C++.

Several IDL to programming language mappings exist, e.g. for C, CPP, C++11, but there are caveats or constraints associated with the majority of those mappings.

- The OMG C and CPP IDL to language mappings generate language elements within the CORBA name space.
- The IDL to C++11 mapping uses native language types that relate to POSIX. The IDL to C++11 mapping maps basic types to C++ types as defined by C++11 or the fixed-size

integral types of the header `<stdint>`. The POSIX library specification contains type definitions that relate to the C++ 11 types.

- No defined IDL to POSIX language mapping exists for C and CPP.

Each target programming language will require its own OMG IDL to language mapping or a port of interface code generated for a different language (e.g. from C++ to C++11).

The following tables list the OMG IDL to language specific mappings for the basic IDL data types.

E-3.6.1 IDL to C Data Type Mapping

Table 1: C Data Type Mappings

OMG IDL Representation	C Representation
short	CORBA_short
long	CORBA_long
long long	CORBA_long_long
unsigned short	CORBA_unsigned_short
unsigned long	CORBA_unsigned_long
unsigned long long	CORBA_unsigned_long_long
float	CORBA_float
double	CORBA_double
long double	CORBA_long_double
char	CORBA_char
wchar	CORBA_wchar
boolean	CORBA_boolean
octet	CORBA_octet

E-3.6.2 IDL to C++ Data Type Mapping

Table 2: CPP Data Type Mappings

OMG IDL Representation	CPP Representation
short	CORBA::Short
long	CORBA::Long
long long	CORBA::LongLong
unsigned short	CORBA::UShort
unsigned long	CORBA::ULong
unsigned long long	CORBA::ULongLong
float	CORBA::Float
double	CORBA::Double
long double	CORBA::LongDouble
char	CORBA::Char
wchar	CORBA::WChar
boolean	CORBA::Boolean
octet	CORBA::Octet

E-3.6.3 IDL to C++11 Data Type Mapping

Within this specification, the CORBA primitive and primitive sequence types are replaced using C++11 types. Each OMG IDL basic type is mapped to the listed C++ type as defined by C++11 or by the fixed-size integral types of the header `<stdint>`.

Table 3: C++11 Data Type Mappings

OMG IDL Representation	C++11 Representation	Default Value
short	int16_t	0
long	int32_t	0
long long	int64_t	0
unsigned short	uint16_t	0
unsigned long	uint32_t	0
unsigned long long	uint64_t	0
float	float	0.0
double	double	0.0
long double	long double	0.0
char	char	0
wchar	wchar_t	0
boolean	bool	false
octet	uint8_t	0

E-3.7 ATTACHMENTS

N/A.