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DBV OSI II SDK Software
ZedKit for UNIX

-Z39.50 API-Definition Manual

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1. Introduction

1.1 Scope

This document is the API (Application Programmers Interface) manual for the DBV OSI II API software, also known as ZedKit for UNIX. The software is a Freeware package for the UNIX operating system that allows developers to write Z39.50 (ISO-23950) client and server applications.

The API software was been originally developed for the German Library Project, DBV OSI II, and has been subsequently extended in the scope of the European Project ONE – OPAC Network in Europe. The API software has been developed by Crossnet Systems Limited, and is marketted under the ZedKit name in accordance with other products from Crossnet.

This document is provided in two parts:

Part A provides a general description of the API and a description of the API functions.

Part B provides information on the API data structures. (This part)

This document supports release 2.2 of the API software. The main additions to the API for this version are the support for the Update Extended Service used in the Union Catalogue Profile, the second Character Set and Language Negotiation object and the Sort response ammendment.

This version also contains refinements of memory management, which do not affect the API design.

1.2 Header Files

The data definitions and structure definitions of the API which are defined in the following header files:

sidefs.h	- DBV OSI II standard definitions
sitypes.h	- DBV OSI II PDU structure type definitions
sitypes2.h	- DBV OSI II additional structure definitions
dbvproto.h	- prototypes of the API functions and definitions of errors.
iord_ext.h	- DBV OSI II SUBITO additional information structure definition

itemordr.h   - DBV OSI II item order extended service and ILL structure definition

crxtypes.h   - DBV OSI II definitions of private externals used by ESA (see note)

iord_ext1.h   - DBV OSI II definitions of private externals used in CIP spec. (see note)

cipitemordr.h   - DBV OSI II definitions of private externals used in CIP spec. (see note)

Notes:

In order to include the API library functions in origin and target applications, the header files above should be included in the origin and target program source files.

An additional header file (sil_defs.h) exists but should only be used within the build of the API libraries.

The header file calling order should be:

```
#include "sidefs.h"

#include "sitypes.h"

#include "sitypes2.h"

#include "dbvproto.h"

#include "iord_ext.h"

#include "itemordr.h"

#include "crxtypes.h" (see note)

#include "iord_ext1.h"  (see note)

#include " cipitemordr.h" (see note)
```

Note:

Observation of the header files in the following sections will indicate ifdef statements of the parameter PATCH. These apply to the API extensions which can be included to the API and should be available on the location where the API software was retrieved from. Please refer to the README files for installation of the main API software and on how to apply the software extensions in the patch form.

2 API Data Definitions

2.1 Definitions in files

The definitions defined below are located in the header files:

sitypes.h, sitypes2.h, iord_ext.h, itemordr.h, crxtypes.h, iord_ext1.h, and cipitemordr.h.

2.1.1 Responses for releasing an association

```
typedef enum DbvReleaseRspReason {
      Normal = 0,
      Not_Finished = 1
} DbvReleaseRspReason;

typedef enum DbvReleaseRspResult {
      Affirmative = 0,
      Negative = 1
} DbvReleaseRspResult;

typedef struct DbvReleaseRsp {
      DbvReleaseRspReason      *peReleaseRspReason;
      DbvReleaseRspResult       eReleaseRspResult;
} DbvReleaseRsp;
```

2.1.2 Enumeration Types

```
Events pertaining to input:
typedef enum EventLocation
          API_No_Event (0),
          API_User_Event (1),
          API_Provider_Event (2)
} EventLocation;
typedef enum EventLocation {
          API_No_Event =0,
          API_User_Event =1,
          API_Provider_Event =2
} EventLocation;*/

/* New definition of DbvEventLocation */
typedef struct DbvEventLocation {
      DbvFds      **ppulUserEvent;
```

```
        DbvAssocId  **pplProviderEvent;
} DbvEventLocation;
```

2.1.3 Protocols supported

```
typedef enum DbvApplicationProtocol {
            Unknown_Protocol = 0,
            Unidentified_Protocol = 1,
            SR_Protocol = 2,
            Z3950_Protocol = 3
} DbvApplicationProtocol;
```

2.1.4 Protocol stacks supported

```
typedef enum DbvProtocolStack {
            Unknown_Stack = 0,
            OSI_Stack = 1,
            TCP_Stack = 2
} DbvProtocolStack;
```

2.1.5 Associate Response

```
typedef enum DbvAssociateRsp {
            Accepted = 0,
            Rejected_Perm = 1,
            Rejected_Tran = 2
} DbvAssociateRsp;
```

2.1.6 Abstract syntaxes

```
typedef enum DbvAbstractSyntax {
            No_Syntaxes_Provided = 0,
            No_Common_Syntax = 1,
            Common_Syntaxes = 2
} DbvAbstractSyntax;
```

2.1.7 Association states during association/connection establishment phase

```
typedef enum DbvAssociateState {
```

```
            Associate_Null  = 0,
            Associate_Accepted  = 1,
            Associate_Rejected  = 2,
            Associate_Pending  = 3
} DbvAssociateState;
```

2.1.8 Associate rejection

```
typedef enum DbvAssociateRejectSource {
            ACSE_User = 0,
            ACSE_Provider = 1
} DbvAssociateRejectSource;


typedef enum DbvAssociateRejectResult {
            Rejected_Permanent = 0,
            Rejected_Transient = 1
} DbvAssociateRejectResult;

typedef enum DbvAssociateRejectReason {
            No_Reason_Given = 0,
            No_Common_ACSE_Version = 1,
            Application_Context_Not_Supported = 2
} DbvAssociateRejectReason;
```

2.1.9 Association states during association/connection release phase

```
typedef enum DbvReleaseState {
            Release_Null  = 0,
            Release_Accepted  = 1,
            Release_Rejected  = 2,
            Release_Pending  = 3
} DbvReleaseState;

typedef enum DbvReleaseReq {
            ReleaseReq_Normal = 0,
            ReleaseReq_Urgent = 1,
            ReleaseReq_Undefined = 2
} DbvReleaseReq;
```

2.1.10 Association state upon return of an API function

```
typedef enum DbvAssociationState {
            Association_Open = 0,
            Association_Closed = 1,
            Association_Unknown_State = 2
```

```
} DbvAssociationState;
```

2.1.11 Error classes

```
typedef enum DbvErrorClass {
            SI_Communication_Error = 0,
            SI_Interface_Error = 1,
            SI_OperatingSystem_Error = 2,
            SI_Abort = 3
} DbvErrorClass;
```

2.1.12 Abort sources

```
typedef enum DbvAbortSource {
            SI_ACSE_User = 0,
            SI_ACSE_Provider = 1,
            SI_Presentation_User = 2,
            SI_Presentation_Provider = 3,
            SI_Transport_Provider = 4
} DbvAbortSource;
```

2.1.13 Permitted SR-/Z39.50 events at the Origin system

```
typedef enum DbvOriginEvent {
            OR_InitializeConf = 0,
            OR_SearchConf = 1,
            OR_PresentConf = 2,
            OR_DeleteResultSetConf = 3,
            OR_ScanConf = 4,
            OR_ResourceReportConf = 5,
            OR_SegmentationInd = 6,
            OR_SortConf = 7,
            OR_ExtendedServicesConf = 8,
            OR_CloseConf = 9,
            OR_CloseInd = 10,
/*          OR_ReleaseInd = 11,  Target is not allowed to close the
                                    association */
            OR_Invalid_APDU = 11,
            OR_AccessCntrlInd = 12, /* AccessControlRequest from target */
            OR_ResourCntrlInd = 13  /* ResourceControlRequest from target */
} DbvOriginEvent;
```

2.1.14 Permitted SR-/Z39.50 events at the Target system

```
typedef enum DbvTargetEvent {
            TA_InitializeInd = 0,
            TA_SearchInd = 1,
            TA_PresentInd = 2,
            TA_DeleteResultSetInd = 3,
            TA_ScanInd = 4,
            TA_ResourceReportInd = 5,
            TA_SortInd = 6,
            TA_ExtendedServicesInd = 7,
            TA_CloseInd = 8,
            TA_CloseConf = 9,
            TA_ReleaseInd = 10,
            TA_Invalid_APDU = 11,
            TA_AccessCntrlConf = 12, /* AccessControlResponse from origin */
            TA_ResourCntrlConf = 13,  /* ResourceControlResponse from origin */
            TA_TrigResourCntrlInd = 14  /* TriggerResourceControlRequest from
                                            origin */

} DbvTargetEvent;
```

2.1.15 Target identification

```
typedef enum DbvTargetNameOrAddress {
            Target_Name = 0,
            Target_Address = 1
} DbvTargetNameOrAddress;
```

2.1.16 Network Address types

```
typedef enum DbvOsiOrInternetAddress {
            Osi_Address = 0,
            Internet_Address = 1
} DbvOsiOrInternetAddress;


typedef enum DbvTraceLevel {
     Trace_Off = 0,
     Trace_Low = 1,
     Trace_High = 2
} DbvTraceLevel;
```

2.2 Structure/Union Types

2.2.1 Structures associated with Association Handling functions

```
typedef struct DbvAssociateReject {
      DbvAssociateRejectSource      *peAssociateRejectSource;
      DbvAssociateRejectResult      *peAssociateRejectResult;
      DbvAssociateRejectReason      *peAssociateRejectReason;
} DbvAssociateReject;

typedef struct DbvProtocolAndSyntaxes {
      DbvApplicationProtocol          *peApplicationProtocol;
      DbvAbstractSyntax         *peAbstractSyntax;
      char               **ppcCommonSyntaxes;
/* valid <--> peAbstractSyntax == Common_Syntaxes */
} DbvProtocolAndSyntaxes;

typedef union DbvAssociateResult {
      DbvProtocolAndSyntaxes        *psProtocolAndSyntaxes;
      DbvAssociateReject            *psAssociateReject;
} DbvAssociateResult;


typedef struct DbvOsiAddress {
      char        *pcPsel;
      char        *pcSsel;
      char        *pcTsel;
      char        *pcNsap;
} DbvOsiAddress;

typedef struct DbvInternetAddress {
      char        *pcHostAddress;
      DbvPortNumber    ulPortNumber;
} DbvInternetAddress;

typedef struct DbvTargetInformation {
      DbvApplicationProtocol              *peTargetSupportedProtocol;
      DbvOsiOrInternetAddress               eOsiOrInternetAddress;
      union {
            DbvOsiAddress          *psOsiAddress;
            DbvInternetAddress     *psInternetAddress;
      }                               uOsiOrInternetAddress;
} DbvTargetInformation;


typedef struct DbvTarget {
      DbvTargetNameOrAddress              eTargetNameOrAddress;
      union {
            char             *pcTargetName;
            DbvTargetInformation   *psTargetInformation;
      }                               uNameOrAddress;
```

```
} DbvTarget;
```

2.2.2 Structures common to all functions

```
typedef struct DbvAbort {
  DbvAbortSource          eAbortSource;
  DbvAbortReason          lAbortReason;
  char                    *pcDiagnostics;
} DbvAbort;

typedef struct DbvError {
  DbvErrorClass         eErrorClass;
  union {
    DbvErrorCode    lIfOsCoError;
    DbvAbort              *psAbort;
  }               uErrorCode;
  DbvAssociationState   eAssociationState;
} DbvError;
```

2.2.3 Global type and structure definitions

2.2.3.1 Types and Sub Structures

```
typedef unsigned long   Ulong;
typedef char*           DbvProtocolVersion;
typedef char*           DbvOptions;


typedef enum DbvBool {
          DBV_FALSE = 0,
          DBV_TRUE  = 1
} DbvBool;


typedef char*           DbvObjectIdentifier;
```

2.2.3.2 OctetString

```
typedef struct DbvOctetString {
Ulong       ulLength;
char        *pcValue;
} DbvOctetString;
```

2.2.3.3 VisibleString

```
typedef char*          DbvVisibleString;
```

2.2.3.4 GeneralizedTime

```
typedef char*          DbvGeneralizedTime;
```

2.2.3.5 DbvInternationalString

```
typedef struct DbvInternationalString {
Ulong      ulLength;
char       *pcValue;
} DbvInternationalString;
```

2.2.3.6 GeneralString

```
typedef struct DbvGeneralString {
Ulong      ulLength;
char       *pcValue;
} DbvGeneralString;
```

2.2.3.7 ASN1External

```
typedef enum DbvExternalValueType {
                EVT_SingleASN1Type = 1,
                EVT_OctetAligned   = 2,
                EVT_Arbitrary      = 3
} DbvExternalValueType;

typedef enum DbvASN1Type {
        AT_UnstructuredText       = 1,
        AT_OpacRecord             = 2,
        AT_SummaryRecord          = 3,
        AT_ResourceReport1        = 4,
        AT_ResourceReport2        = 5,
        AT_EsTaskPackage          = 6,
        AT_UpdateExtendedService  = 7,
        AT_ItemOrderExtendedService = 9,
        AT_IllPdu                 = 10,
        AT_ExplainRecord          = 12,
        AT_GenericRecord          = 13,
        AT_PromptObject           = 14,
        AT_Print                  = 15,
        AT_Alert                  = 16,
```

```
            AT_Corder                    = 17,
            AT_CharSetAndLanguage        = 18,
            AT_ExportSpecification       = 19,
            AT_ExportInvocation          = 20,
            AT_UserInfoSearchResult1     = 21,
            AT_SQLResult                 = 22,
            AT_SQLResult2                = 23,
            AT_CipBItemOrderExtendedService    = 24,
            AT_CIPSpecificInfo                 = 25,
            AT_CharSetAndLanguage        = 26,
            AT_CipBItemOrderExtendedService2   = 27,
            AT_CIPSpecificInfo2          = 28,
            AT_CIPFormattedProduct       = 29,
            AT_CIPFormattedScene         = 30,
            AT_CharSetAndLanguage        = 31,
            AT_UnknownType               = 8
} DbvASN1Type;



typedef struct DbvSingleASN1Type {
DbvASN1Type           eASN1Type;
union {
    struct DbvInternationalString       *psUnstructuredText;
    struct DbvOpacRecord                *psOpacRecord;
    struct DbvSummaryRecord             *psSummaryRecord;
    struct DbvResourceReport1           *psResourceReport1;
    struct DbvResourceReport2           *psResourceReport2;
    struct DbvEsTaskPackage             *psEsTaskPackage;
    struct DbvUpdateExtendedService     *psUpdateExtendedService;
    struct DbvItemOrderExtendedService  *psItemOrderExtendedService;
    struct DbvIllPdu                    *psIllPdu; /* ILL */
    struct DbvExplainRecord             *psExplainRecord;
    struct DbvGenericRecord             *psGenericRecord;
    struct DbvPromptObject              *psPromptObject;
    struct DbvPrintExtendedService      *psPrintExtendedService;
    struct DbvAlertExtendedService      *psAlertExtendedService;
    struct DbvCOrder                    *psCOrder;
    struct DbvCOrder2                   *psCOrder2;
    struct DbvCharSetAndLanguage        *psCharSetAndLanguage;
    struct DbvCharSetAndLanguage2       *psCharSetAndLanguage2;
    struct DbvExpSpecExtendedService    *psExpSpecExtendedService;
    struct DbvExpInvoExtendedService    *psExpInvoExtendedService;
    struct DbvUserInfoSearchResult1     *psUserInfoSearchResult1;
    struct DbvSQLResult                 *psSQLResult;
    struct DbvSQLResult2                *psSQLResult2;
    struct DbvCipBItemOrderExtendedService
*psCipBItemOrderExtendedService;
    struct DbvCIPSpecificInfo           *psCIPSpecificInfo;
    struct DbvCipBItemOrderExtendedService2   *psCipBItemOrderExtendedService2;
    struct DbvCIPSpecificInfo2          *psCIPSpecificInfo2;
    struct DbvCIPFormattedProduct       *psCIPFormattedProduct;
    struct DbvCIPFormattedScene         *psCIPFormattedScene;
    struct DbvUcpUpdateExtendedService  *psUcpUpdateExtendedService;
    struct DbvOctetString               *psUnknownType;
```

```
        }                   uASN1;
} DbvSingleASN1Type;


typedef struct DbvASN1External {
DbvObjectIdentifier      pcObjectIdentifier;
DbvExternalValueType     eValueType;
union {
    DbvSingleASN1Type        *psSingleASN1Type;
    DbvOctetString           *psOctetAligned;
    DbvOctetString           *psArbitrary;
    }                   uExternalValue;
} DbvASN1External;
```

2.2.3.8 Other Information

```
typedef enum DbvInformationType {
                IT_CharacterInfo    = 1,
                IT_BinaryInfo       = 2,
                IT_ExternalInfo     = 3,
                IT_ObjectIdentifier = 4
} DbvInformationType;


typedef struct DbvInfoCategory {
DbvObjectIdentifier    pcCategoryTypeId;
Ulong                  ulCategoryValue;
} DbvInfoCategory;


typedef struct DbvOtherInformation {
DbvInfoCategory        *psInfoCategory;
DbvInformationType     eInformationType;
union {
    DbvInternationalString      *psCharacterInfo;
    DbvOctetString              *psBinaryInfo;
    DbvASN1External             *psExternallyDefinedInfo;
    DbvObjectIdentifier          pcObjectIdentifier;
    }                   uInformation;
} DbvOtherInformation;
```

2.2.3.9 IdAuthentication

```
typedef enum DbvAuthenticationType {
                AT_Open      = 1,
                AT_IdPassword = 2,
                AT_Anonymous  = 3,
                AT_Other      = 4
} DbvAuthenticationType;
```

```
typedef struct DbvIdPassword {
DbvInternationalString      *psGroupId;
DbvInternationalString      *psUserId;
DbvInternationalString      *psPassword;
} DbvIdPassword;


typedef struct DbvAuthentication{
DbvAuthenticationType   eAuthenticationType;
union {
    DbvVisibleString              psOpen;
    DbvIdPassword               *psIdPassword;
    DbvASN1External             *psOther;
  }               uAuthentication;
} DbvAuthentication;
```

2.2.3.10 DbvElementSetNames

```
typedef enum DbvElementSetType {
                 EST_Generic          = 1,
                 EST_DatabaseSpecific = 2
} DbvElementSetType;


typedef struct DbvElementSetsDbSpecific {
DbvInternationalString      *psDatabaseName;
DbvInternationalString      *psElementSetName;
} DbvElementSetsDbSpecific;


typedef struct DbvElementSetNames {
DbvElementSetType      eElementSetType;
union {
    DbvInternationalString         *psGeneric;
    DbvElementSetsDbSpecific     **ppsElementSetsDbSpecific;
  }              uElementSet;
} DbvElementSetNames;
```

2.2.3.11 Query Types

```
typedef enum DbvQueryType {
          QT_Private        = 1,
          QT_Rpn            = 2,
          QT_Iso8777        = 3,
          QT_Z3958          = 4,
          QT_Erpn           = 5,
          QT_NaturalLanguage = 6
} DbvQueryType;
```

```
typedef  enum DbvRPNStructureType {
                RST_RpnLopRopOperator = 1,
                RST_RpnOperand        = 2
} DbvRPNStructureType;


typedef enum DbvOperandType {
                OT_AttributePlusTerm       = 1,
                OT_ResultSetId             = 2,
                OT_ResultSetPlusAttributes = 3
} DbvOperandType;


typedef enum DbvTermType {
                TT_General         = 1,    /* the original, Version 2 type */
                TT_Numeric         = 2,
                TT_SimpleCharacter = 3,
                TT_ObjectIdentifier = 4,
                TT_DateTime        = 5,
                TT_External        = 6,
                TT_IntegerAndUnit  = 7,
                TT_Null            = 8
} DbvTermType;


typedef enum DbvOperatorType {
                OT_Or       = 1,
                OT_And      = 2,
                OT_AndNot   = 3,
                OT_Proximity = 4
} DbvOperatorType;

typedef enum DbvProximityUnitType {
                PUT_Known   = 1,
                PUT_Private = 2
} DbvProximityUnitType;


typedef enum DbvProximityRelationType {
                PRT_LessThan           = 1,
                PRT_LessThanOrEqual    = 2,
                PRT_Equal              = 3,
                PRT_GreaterThanOrEqual = 4,
                PRT_GreaterThan        = 5,
                PRT_NotEqual           = 6,
                PRT_Invalid            = -1
} DbvProximityRelationType;


typedef enum DbvKnownProximityUnit {
                KPU_Character   = 1,
                KPU_Word        = 2,
                KPU_Sentence    = 3,
```

```
                    KPU_Paragraph   = 4,
                    KPU_Section     = 5,
                    KPU_Chapter     = 6,
                    KPU_Document    = 7,
                    KPU_Element     = 8,
                    KPU_SubElement  = 9,
                    KPU_ElementType = 10,
                    KPU_Byte        = 11,
                    KPU_Invalid     = -1
} DbvKnownProximityUnit;


typedef struct DbvProximityUnitCode {
DbvProximityUnitType    eProximityUnitType;
union {
    DbvKnownProximityUnit  eKnownProximityUnit;
    Ulong                  ulPrivate;
  }               uProximityUnit;
} DbvProximityUnitCode;


typedef struct DbvProximityOperator {
DbvBool                 *pfExclusion;
Ulong                    ulDistance;
DbvBool                  fOrdered;
DbvProximityRelationType  eProximityRelationType;
DbvProximityUnitCode      sProximityUnitCode;
} DbvProximityOperator;


typedef struct DbvOperator {
DbvOperatorType       eOperatorType;
DbvProximityOperator *psProximityOperator; /* <--> eOperatorType ==
OT_Proximity */
} DbvOperator;
```

2.2.3.12 AttributeValue

```
typedef enum DbvAttributeValueType {
                AVT_Numeric  = 1,    /* the original one */
                AVT_Complex  = 2
} DbvAttributeValueType;
```

2.2.3.13 IntUnit

```
typedef enum DbvStringOrNumericType {
                SNT_String  = 1,
                SNT_Numeric = 2
} DbvStringOrNumericType;
```

```
typedef struct DbvStringOrNumeric {
DbvStringOrNumericType     eStringOrNumeric;
union {
    DbvInternationalString    *psString;
    Ulong                      ulNumeric;
    }                 uStringOrNumeric;
} DbvStringOrNumeric;


typedef struct DbvUnit {
DbvInternationalString *psUnitSystem;
DbvStringOrNumeric     *psUnitType;
DbvStringOrNumeric     *psUnit;
Ulong                  *pulScaleFactor;
} DbvUnit;


typedef struct DbvIntUnit {
Ulong         ulValue;
DbvUnit       sUnitUsed;
} DbvIntUnit;


typedef struct DbvComplexValue {
DbvStringOrNumeric    **ppsList;
Ulong                 **ppulSemanticAction;
} DbvComplexValue;


typedef struct DbvAttributeValue {
DbvAttributeValueType          eAttributeValueType;
union {
    Ulong                      ulNumeric;
    DbvComplexValue        *psComplexValue;
    }                     uAttributeValue;
} DbvAttributeValue;


typedef struct DbvAttributeElement {
DbvObjectIdentifier     pcAttributeSetId;
Ulong                   ulAttributeType;
DbvAttributeValue       sAttributeValue;
} DbvAttributeElement;
```

2.2.3.14 Term

```
typedef struct DbvTerm {
DbvTermType        eTermType;
union {
    DbvOctetString            *psGeneral;
    Ulong                      ulInteger;
```

```
    DbvInternationalString        *psSimpleCharacter;
    DbvObjectIdentifier            pcObjectIdentifier;
    DbvGeneralizedTime             pcDateTime;
    DbvASN1External               *psExternal;
    DbvIntUnit                    *psIntegerAndUnit;
  }              uTerm;
} DbvTerm;


typedef struct DbvAttributesPlusTerm {
DbvAttributeElement     **ppsAttributeElement;
DbvTerm                 sTerm;
} DbvAttributesPlusTerm;


typedef struct DbvResultSetPlusAttributes {
DbvInternationalString      sResultSetId;
DbvAttributeElement        **ppsAttributeElement;
} DbvResultSetPlusAttributes;


typedef struct DbvOperand {
DbvOperandType   eOperandType;
union {
    DbvAttributesPlusTerm      *psAttributesPlusTerm;
    DbvInternationalString     *psResultSetId;
    DbvResultSetPlusAttributes *psResultSetPlusAttributes;
  }          uOperand;
} DbvOperand;


typedef struct DbvRPNLopRopOperator {
struct DbvRPNStructure  *psLeftOperand;
struct DbvRPNStructure  *psRightOperand;
DbvOperator             sOperator;
} DbvRPNLopRopOperator;


typedef struct DbvRPNStructure {
DbvRPNStructureType   eRpnStructureType;
union {
    DbvRPNLopRopOperator       *psRpnLopRopOperator;
    DbvOperand                 *psRpnOperand;
  }              uRPNStructure;
} DbvRPNStructure;



typedef struct DbvRPNQuery {
DbvObjectIdentifier        pcAttributeSetId;
DbvRPNStructure            sRpnStructure;
} DbvRPNQuery;


typedef struct DbvQuery {
```

```
DbvQueryType           eQueryType;
union {
    DbvOctetString              *psPrivateQuery;
    DbvRPNQuery                 *psRpnQuery;
    DbvOctetString              *psIso8777Query;
    DbvOctetString              *psZ3958Query;
    DbvRPNQuery                 *psErpnQuery;
    DbvOctetString              *psNaturalLanguageQuery;
}              uQuery;
} DbvQuery;
```

2.2.3.15 Records and Diagnostics

```
typedef enum DbvRecordType {
            RT_Response                   = 1,
            RT_NonSurrDiagnostics         = 2,
            RT_MultipleNonSurrDiagnostics = 3
} DbvRecordType;


typedef enum DbvDbRecordType {
            DRT_Retrieval            = 1,
            DRT_SurrogateDiagnostics = 2,
            DRT_StartingFragment     = 3,
            DRT_IntermediateFragment = 4,
            DRT_FinalFragment        = 5
} DbvDbRecordType;


typedef enum DbvDiagnosticsType {
            DT_DefaultFormat     = 1,
            DT_ExternallyDefined = 2
} DbvDiagnosticsType;


typedef enum DbvFragmentSyntaxType {
            FST_ExternallyTagged    = 1,
            FST_NotExternallyTagged = 2
} DbvFragmentSyntaxType;


typedef enum DbvProtocolVersionInForce {
            PVIF_Version2 = 1,
            PVIF_Version3 = 2
} DbvProtocolVersionInForce;


typedef struct DbvAdditionalInfo {
DbvProtocolVersionInForce   eProtocolVersionInForce;
union {
    DbvVisibleString          pcV2;
    DbvInternationalString    *psV3;
```

```
}                             uAdditionalInfo;
} DbvAdditionalInfo;
```

2.2.3.16 Default Diag Format

```
typedef struct DbvDefaultDiagFormat {
DbvObjectIdentifier        pcDiagnosticSetId;
Ulong                      ulCondition;
DbvAdditionalInfo          sAdditionalInfo;
} DbvDefaultDiagFormat;
```

2.2.3.17 Diag Rec

```
typedef struct DbvDiagRec {
DbvDiagnosticsType         eDiagnosticsType;
union {
    DbvDefaultDiagFormat      *psDefault;
    DbvASN1External           *psExternallyDefined;
}                  uDiagnostics;
} DbvDiagRec;
```

2.2.3.18 Fragment Syntax

```
typedef struct DbvFragmentSyntax {
DbvFragmentSyntaxType       eFragmentSyntaxType;
union {
    DbvASN1External    *psExternallyTagged;
    DbvOctetString     *psNotExternallyTagged;
}                   uFragmentSyntax;
} DbvFragmentSyntax;
```

2.2.3.19 Name Plus Record

```
typedef struct DbvNamePlusRecord {
DbvInternationalString  *psDatabaseName;
DbvDbRecordType          eDbRecordType;
union {
    DbvASN1External    *psRetrievalRecord;
    DbvDiagRec         *psSurrogateDiagnostic;
    DbvFragmentSyntax *psStartingFragment;
    DbvFragmentSyntax *psIntermediateFragment;
    DbvFragmentSyntax *psFinalFragment;
}                  uDbRecord;
} DbvNamePlusRecord;
```

2.2.3.20 Records

```
typedef struct DbvRecords {
DbvRecordType          eRecordType;
union {
    DbvNamePlusRecord     **ppsResponseRecord;
    DbvDefaultDiagFormat  *psNonSurrogateDiag;
    DbvDiagRec            **ppsMultipleNonSurrogateDiag;
    }              uRecord;
} DbvRecords;
```

2.2.3.21 Range

```
typedef struct DbvRange {
Ulong        ulStartingPosition;
Ulong        ulNumberOfRecords;
} DbvRange;
```

2.2.3.22 Record Composition

```
typedef enum DbvRecordCompositionType {
                        RCT_ElementSetNames = 1,
                        RCT_CompSpec        = 2
} DbvRecordCompositionType;
```

2.2.3.23 Element Spec Type

```
typedef enum DbvElementSpecType {
                EST_Primitive = 1,
                EST_External  = 2
} DbvElementSpecType;
```

2.2.3.24 Element Spec

```
typedef struct DbvElementSpec {
DbvElementSpecType        eElementSpecType;
union {
    DbvInternationalString  *psPrimitive;
    DbvASN1External         *psExternal;
    }              uElementSpec;
} DbvElementSpec;
```

2.2.3.25 Specification

```
typedef struct DbvSpecification {
DbvObjectIdentifier        pcSchema;
DbvElementSpec           *psElementSpec;
} DbvSpecification;


typedef struct DbvDbSpecificComp {
DbvInternationalString    sDatabaseName;
DbvSpecification          sSpecification;
} DbvDbSpecificComp;
```

2.2.3.26 Comp Spec

```
typedef struct DbvCompSpec {
DbvBool                  fSelectAlternativeSyntax;
DbvSpecification        *psGeneric;
DbvDbSpecificComp      **ppsDbSpecific;
DbvObjectIdentifier     *ppcRecordSyntax
} DbvCompSpec;
```

2.2.3.27 Record Composition

```
typedef struct DbvRecordComposition {
DbvRecordCompositionType    eRecordCompositionType;
union {
    DbvElementSetNames  *psElementSetNames;
    DbvCompSpec         *psCompSpec;
    }                    uRecordComposition;
} DbvRecordComposition;
```

2.2.3.28 ListStatus (--> DELETE-RESULT-SET response)

```
typedef enum DbvDeleteSetStatus {
                DSS_Success                   = 0,
                DSS_ResultSetDidNotExist      = 1,
                DSS_PreviouslyDeletedByTarget = 2,
                DSS_SystemProblemAtTarget     = 3,
                DSS_AccessNotAllowed          = 4,
                DSS_ResourceControlAtOrigin   = 5,
                DSS_ResourceControlAtTarget   = 6,
                DSS_BulkDeleteNotSupported    = 7,
                DSS_NotAllSetsDeletedOnBulkDlt = 8,
                DSS_NotAllRequestedSetsDeleted = 9,
```

```
                              DSS_ResultSetInUse               = 10,
                              DSS_Invalid                      = -1
} DbvDeleteSetStatus;


typedef struct DbvListStatus {
DbvInternationalString        sResultSetId;
DbvDeleteSetStatus            eDeleteSetStatus;
} DbvListStatus;
```

2.2.3.29 ListEntries (--> SCAN)

```
typedef enum DbvEntryType {
            ET_TermInfo            = 1,
            ET_SurrogateDiagnostic = 2
} DbvEntryType;


typedef enum DbvOccurrenceType {
               OT_Global     = 1,
               OT_ByDatabase = 2
} DbvOccurrenceType;


typedef struct DbvOccurrenceByDb {
DbvInternationalString        sDatabaseName;
Ulong                   *pulNumber;
DbvOtherInformation         **ppsOtherInformation;
} DbvOccurrenceByDb;


typedef struct DbvOccurrence {
DbvOccurrenceType                 eOccurrenceType;
union {
    Ulong             ulGlobal;
    DbvOccurrenceByDb  **ppsOccurrenceByDb;
  }                          uOccurence;
} DbvOccurrence;


typedef struct DbvOccurrenceByAttributes {
DbvAttributeElement      **ppsAttributeElement;
DbvOccurrence             *psOccurrence;
DbvOtherInformation      **ppsOtherInformation;
} DbvOccurrenceByAttributes;
```

2.2.3.30 Term Info

```
typedef struct DbvTermInfo {
DbvTerm                    sTerm;
DbvInternationalString    *psDisplayTerm;
DbvAttributeElement       **ppsSuggestedAttribute;
DbvAttributesPlusTerm     **ppsAlternativeTerm;
Ulong                      *pulGlobalOccurrences;
DbvOccurrenceByAttributes **ppsByAttributes;
DbvOtherInformation       **ppsOtherInformation;
} DbvTermInfo;
```

2.2.3.31 Entry

```
typedef struct DbvEntry {
DbvEntryType        eEntryType;
union {
    DbvTermInfo    *psTermInfo;
    DbvDiagRec     *psSurrogateDiagnostic;
  }               uEntry;
} DbvEntry;
```

2.2.3.32 List Entries

```
typedef struct DbvListEntries {
DbvEntry    **ppsEntry;
DbvDiagRec  **ppsNonSurrogateDiagnostics;
} DbvListEntries;
```

2.2.3.33 Sort Parameters

```
typedef enum DbvSortElementType {
                SET_Generic    = 1,
                SET_DbSpecific = 2
} DbvSortElementType;


typedef enum DbvSortRelationType {
                SRT_Ascending     = 1,
                SRT_Descending    = 2,
                SRT_FrequencyAsc  = 3,
                SRT_FrequencyDesc = 4,
                SRT_Invalid       = -1
} DbvSortRelationType;


typedef enum DbvSortCaseType {
              SCT_CaseSensitive   = 1,
```

```
                SCT_CaseInsensitive = 2,
                SCT_Invalid         = -1
} DbvSortCaseType;


typedef enum DbvSortKeyType {
                SKT_SortField      = 1,
                SKT_ElementSpec    = 2,
                SKT_SortAttributes = 3
} DbvSortKeyType;


typedef enum DbvSortMVActionType {
                SMT_Abort    = 1,
                SMT_Null     = 2,
                SMT_Constant = 3
} DbvSortMVActionType;


typedef struct DbvSortAttributes {
DbvObjectIdentifier     pcAttributeSetId;
DbvAttributeElement   **ppsAttributeElement;
} DbvSortAttributes;


typedef struct DbvSortKey {
DbvSortKeyType              eSortKeyType;
union {
    DbvInternationalString     *psSortField;
    DbvSpecification           *psElementSpec;
    DbvSortAttributes          *psSortAttributes;
    }                   uSortElement;
} DbvSortKey;


typedef struct DbvSortMVAction {
DbvSortMVActionType    eSortMVActionType;
DbvOctetString        *psOctetString;  /* <--> eSortMVActionType ==
SMT_Constant */
} DbvSortMVAction;


typedef struct DbvDbSpecificSortKey {
DbvInternationalString      sDatabaseName;
DbvSortKey                  sDbSort;
} DbvDbSpecificSortKey;


typedef struct DbvSortElement {
DbvSortElementType         eSortElementType;
union {
    DbvSortKey                 *psGeneric;
    DbvDbSpecificSortKey     **ppsDatabaseSpecific;
    }                   uSortElement;
} DbvSortElement;
```

```
typedef struct DbvSortKeySpec {
DbvSortElement          sSortElement;
DbvSortRelationType     eSortRelationType;
DbvSortCaseType         eSortCaseType;
DbvSortMVAction        *psMVActionType;
} DbvSortKeySpec;
```

2.2.3.34 Extended Service Parameters

```
typedef enum DbvPermAllowableFunctions {
                    PAF_Delete            = 1,
                    PAF_ModifyContents    = 2,
                    PAF_ModifyPermissions = 3,
                    PAF_Present           = 4,
                    PAF_Invoke            = 5,
                    PAF_Invalid           = -1
} DbvPermAllowableFunctions;
```

```
typedef struct DbvPermissions {
DbvInternationalString          sUserId;
DbvPermAllowableFunctions     **ppeAllowableFunctions;
} DbvPermissions;
```

2.2.3.35 Language Code

```
typedef DbvInternationalString DbvLanguageCode;
```

2.2.3.35 Null

```
typedef void* DbvNull;
```

2.3 PDU Datastructures

Structures associated with SR-/Z39.50 functions

2.3.0.1 Origin Data Choices

```
typedef struct DbvOriginData {
  DbvOriginEvent          eOriginEvent;
  union {
    DbvInitializeRsp       *psInitializeRsp;
    DbvSearchRsp           *psSearchRsp;
    DbvPresentRsp          *psPresentRsp;
    DbvDeleteResultSetRsp  *psDeleteResultSetRsp;
    DbvScanRsp             *psScanRsp;
    DbvResourceReportRsp   *psResourceReportRsp;
    DbvSegmentReq          *psSegmentReq;
    DbvSortRsp             *psSortRsp;
    DbvCloseReq            *psCloseReq;
    DbvExtendedServicesRsp *psExtendedServicesRsp;
/*    DbvReleaseReq         *peReleaseReq;   Target is not allowed to close the
                                            association */
    DbvOctetString         *psInvalidAPDU;
    DbvAccessControlReq     *psAccessControlReq; /* from target */
    DbvResourceControlReq   *psResourceControlReq; /* from target */

  } uOriginData;
} DbvOriginData;
```

2.3.0.2 Target Data Choices

```
typedef struct DbvTargetData {
  DbvTargetEvent  eTargetEvent;
  union {
    DbvInitializeReq               *psInitializeReq;
    DbvSearchReq                   *psSearchReq;
    DbvPresentReq                  *psPresentReq;
    DbvDeleteResultSetReq          *psDeleteResultSetReq;
    DbvScanReq                     *psScanReq;
    DbvResourceReportReq           *psResourceReportReq;
    DbvSortReq                     *psSortReq;
    DbvCloseReq                    *psCloseReq;
    DbvExtendedServicesReq         *psExtendedServicesReq;
    DbvReleaseReq                  *peReleaseReq;
    DbvOctetString                 *psInvalidAPDU;
    DbvAccessControlRsp            *psAccessControlRsp; /* from origin */
    DbvResourceControlRsp          *psResourceControlRsp; /* from origin */
```

```
    DbvTriggerResourceControlReq     *psTriggerResourceControlReq; /*
TriggerResourceControlResponse from origin */

  }                 uTargetData;
} DbvTargetData;
```

2.3.1 Initialize Request

```
typedef struct DbvInitializeReq {
DbvOctetString          *psReferenceId;
DbvProtocolVersion       pcProtocolVersion;
DbvOptions               pcOptions;
Ulong                    ulPreferredMessageSize;
Ulong                    ulMaximumMessageSize;
DbvAuthentication       *psAuthentication;
DbvInternationalString *psImplementationId;
DbvInternationalString *psImplementationName;
DbvInternationalString *psImplementationVersion;
DbvASN1External         *psUserInformationField;
DbvOtherInformation    **ppsOtherInformation;
} DbvInitializeReq;
```

2.3.2 Initialize Response

```
typedef struct DbvInitializeRsp {
DbvOctetString          *psReferenceId;
DbvProtocolVersion       pcProtocolVersion;
DbvOptions               pcOptions;
Ulong                    ulPreferredMessageSize;
Ulong                    ulMaximumMessageSize;
DbvBool                  fResult;
DbvInternationalString *psImplementationId;
DbvInternationalString *psImplementationName;
DbvInternationalString *psImplementationVersion;
DbvASN1External         *psUserInformationField;
DbvOtherInformation    **ppsOtherInformation;
} DbvInitializeRsp;
```

2.3.3 Search Request

```
typedef enum DbvResultSetStatus {
                RSS_Subset  = 1,
                RSS_Interim = 2,
                RSS_None    = 3,
                RSS_Invalid = -1
} DbvResultSetStatus;
```

```
typedef enum DbvPresentStatus {
                PS_Success   = 0,
                PS_Partial_1 = 1,
                PS_Partial_2 = 2,
                PS_Partial_3 = 3,
                PS_Partial_4 = 4,
                PS_Failure   = 5,
                PS_Invalid   = -1
} DbvPresentStatus;
```

```
typedef struct DbvSearchReq {
DbvOctetString            *psReferenceId;
Ulong                      ulSmallSetUpperBound;
Ulong                      ulLargeSetLowerBound;
Ulong                      ulMediumSetPresentNumber;
DbvBool                    fReplaceIndicator;
DbvInternationalString    sResultSetName;
DbvInternationalString  **ppsDatabaseNames;
DbvElementSetNames        *psSmallSetElementNames;
DbvElementSetNames        *psMediumSetElementNames;
DbvObjectIdentifier        pcPreferredRecordSyntax;
DbvQuery                  *psQuery;
DbvOtherInformation      **ppsAdditionalSearchInfo;
DbvOtherInformation      **ppsOtherInformation;
} DbvSearchReq;
```

2.3.4 Search Response

```
typedef struct DbvSearchRsp {
DbvOctetString          *psReferenceId;
Ulong                    ulResultCount;
Ulong                    ulNumberOfRecordsReturned;
Ulong                    ulNextResultSetPosition;
DbvBool                  fSearchStatus;
DbvResultSetStatus      *peResultSetStatus;
DbvPresentStatus        *pePresentStatus;
DbvRecords              *psRecords;
DbvOtherInformation    **ppsAdditionalSearchInfo;
DbvOtherInformation    **ppsOtherInformation;
} DbvSearchRsp;
```

2.3.5 Present Request

```
typedef struct DbvPresentReq{
```

```
DbvOctetString              *psReferenceId;
DbvInternationalString       sResultSetId;
Ulong                        ulResultSetStartPoint;
Ulong                        ulNumberOfRecordsRequested;
DbvRange                   **ppsAdditionalRanges;
DbvRecordComposition        *psRecordComposition;
DbvObjectIdentifier          pcPreferredRecordSyntax;
Ulong                       *pulMaxSegmentCount;
Ulong                       *pulMaxRecordSize;
Ulong                       *pulMaxSegmentSize;
DbvOtherInformation        **ppsOtherInformation;
} DbvPresentReq;
```

2.3.6 Present Response

```
typedef struct DbvPresentRsp {
DbvOctetString         *psReferenceId;
Ulong                   ulNumberOfRecordsReturned;
Ulong                   ulNextResultSetPosition;
DbvPresentStatus        ePresentStatus;
DbvRecords             *psRecords;
DbvOtherInformation   **ppsOtherInformation;
} DbvPresentRsp;
```

2.3.7 Delete Result Set Request

```
typedef enum DbvDeleteFunction {
                DF_List    = 0,
                DF_All     = 1,
                DF_Invalid = -1
} DbvDeleteFunction;


typedef struct DbvDeleteResultSetReq {
DbvOctetString             *psReferenceId;
DbvDeleteFunction           eDeleteFunction;
DbvInternationalString    **ppsResultSetId;
DbvOtherInformation       **ppsOtherInformation;
} DbvDeleteResultSetReq;
```

2.3.8 Delete Result Set Response

```
typedef struct DbvDeleteResultSetRsp {
DbvOctetString             *psReferenceId;
DbvDeleteSetStatus          eDeleteOperationStatus;
DbvListStatus             **ppsDeleteListStatuses;
```

```
Ulong                        *pulNumberNotDeleted;
DbvListStatus                **ppsBulkStatuses;
DbvInternationalString       *psDeleteMessage;
DbvOtherInformation          **ppsOtherInformation;
} DbvDeleteResultSetRsp;
```

2.3.9 Segment Request

```
typedef struct DbvSegmentReq {
DbvOctetString          *psReferenceId;
Ulong                    ulNumberOfRecordsReturned;
DbvNamePlusRecord       **ppsSegmentRecords;
DbvOtherInformation     **ppsOtherInformation;
} DbvSegmentReq;
```

2.3.10 Access Control Request

```
typedef enum DbvSecurityChallengeType {
                SECT_SimpleForm       = 1,
                SECT_ExternallyDefined = 2,
                SECT_Invalid              = -1
} DbvSecurityChallengeType;
```

```
typedef struct DbvSecurityChallengeReq
{
DbvSecurityChallengeType    eSecurityChallengeReqType;
union {
    DbvOctetString                *psSimpleForm;
    DbvASN1External               *psExternallyDefinedInfo;
  }                 uSecurityChallengeReq;
} DbvSecurityChallengeReq;
```

```
typedef struct DbvAccessControlReq
{
DbvOctetString               *psReferenceId;
DbvSecurityChallengeReq       sSecurityChallengeReq;
DbvOtherInformation          **ppsOtherInformation;
} DbvAccessControlReq;
```

2.3.11 Access Control Response

```
typedef struct DbvSecurityChallengeRsp
{
DbvSecurityChallengeType    eSecurityChallengeRspType;
union {
    DbvOctetString              *psSimpleForm;
    DbvASN1External             *psExternallyDefinedInfo;
  }                   uSecurityChallengeRsp;
} DbvSecurityChallengeRsp;
```

```
typedef struct DbvAccessControlRsp
{
DbvOctetString               *psReferenceId;
DbvSecurityChallengeRsp      *psSecurityChallengeRsp;
DbvDiagRec                   *psDiagnostic;
DbvOtherInformation          **ppsOtherInformation;
} DbvAccessControlRsp;
```

2.3.12 Resource Control Request

```
typedef enum DbvPartialResultsAvailable {
            PRA_Subset   = 1,
            PRA_Interim2 = 2,
            PRA_None2    = 3,
            PRA_Invalid  = -1
} DbvPartialResultsAvailable;
```

```
typedef struct DbvResourceControlReq
{
DbvOctetString               *psReferenceId;
DbvBool                      *pfSuspendedFlag;
DbvASN1External              *psResourceReport;
DbvPartialResultsAvailable   *pePartialResultsAvailable;
DbvBool                       fResponseRequired;
DbvBool                      *pfTriggeredRequestFlag;
DbvOtherInformation          **ppsOtherInformation;
} DbvResourceControlReq;
```

2.3.13 Resource Control Response

```
typedef struct DbvResourceControlRsp
{
DbvOctetString                *psReferenceId;
DbvBool                        fContinueFlag;
DbvBool                       *pfResultSetWanted;
DbvOtherInformation         **ppsOtherInformation;
} DbvResourceControlRsp;
```

2.3.14 Trigger Resource Control

```
typedef enum DbvRequestedAction {
            RA_ResourceReport1   = 1,
            RA_ResourceControl   = 2,
            RA_Cancel            = 3,
            RA_Invalid           = -1
} DbvRequestedAction;


typedef struct DbvTriggerResourceControlReq
{
DbvOctetString                *psReferenceId;
DbvRequestedAction             eRequestedAction;
DbvObjectIdentifier            pcPreferredResourceReportFormat;
DbvBool                       *pfResultSetWanted;
DbvOtherInformation         **ppsOtherInformation;
} DbvTriggerResourceControlReq;


/* TriggerResourceControlRequest is sent from origin to target.
   There is no TriggerResourceControlResponse in Z39.50 V3 */
```

2.3.15 Resource Report Request

```
typedef enum DbvResourceReportStatus {
                        RRS_Success  = 0,
                        RRS_Partial  = 1,
                        RRS_Failure_1 = 2,
                        RRS_Failure_2 = 3,
                        RRS_Failure_3 = 4,
                        RRS_Failure_4 = 5,
                        RRS_Failure_5 = 6,
```

```
                          RRS_Failure_6 = 7,
                          RRS_Invalid   = -1
} DbvResourceReportStatus;
```

```
typedef struct DbvResourceReportReq {
DbvOctetString              *psReferenceId;
DbvOctetString              *psOperationId;
DbvObjectIdentifier          pcPrefResourceReportFormat;
DbvOtherInformation        **ppsOtherInformation;
} DbvResourceReportReq;
```

2.3.16 Resource Report Response

```
typedef struct DbvResourceReportRsp {
DbvOctetString              *psReferenceId;
DbvResourceReportStatus      eResourceReportStatus;
DbvASN1External             *psResourceReport;
DbvOtherInformation        **ppsOtherInformation;
} DbvResourceReportRsp;
```

2.3.17 Scan Request

```
typedef enum DbvScanStatus {
              SCS_Success   = 0,
              SCS_Partial_1 = 1,
              SCS_Partial_2 = 2,
              SCS_Partial_3 = 3,
              SCS_Partial_4 = 4,
              SCS_Partial_5 = 5,
              SCS_Failure   = 6,
              SCS_Invalid   = -1
} DbvScanStatus;
```

```
typedef struct DbvScanReq {
DbvOctetString              *psReferenceId;
DbvInternationalString     **ppsDatabaseNames;
DbvObjectIdentifier          pcAttributeSetId;
DbvAttributesPlusTerm        sAttributesPlusTerm;
Ulong                       *pulStepSize;
Ulong                        ulNumberOfTermsRequested;
Ulong                       *pulPreferredPositionInResponse;
DbvOtherInformation        **ppsOtherInformation;
} DbvScanReq;
```

2.3.18 Scan Response

```
typedef struct DbvScanRsp {
DbvOctetString          *psReferenceId;
Ulong                   *pulStepSize;
DbvScanStatus            eScanStatus;
Ulong                    ulNumberOfEntriesReturned;
Ulong                   *pulPositionOfTerm;
DbvListEntries          *psEntries;
DbvObjectIdentifier      pcAttributeSetId;
DbvOtherInformation    **ppsOtherInformation;
} DbvScanRsp;
```

2.3.19 Sort Request

```
typedef enum DbvSortStatus {
                        SOS_Success  = 0,
                        SOS_Partial_1 = 1,
                        SOS_Failure  = 2,
                        SOS_Invalid  = -1
} DbvSortStatus;


typedef enum DbvSortResultSetStatus {
                        SRSS_Empty     = 0,
                        SRSS_Interim   = 1,
                        SRSS_Unchanged = 2,
                        SRSS_None      = 3,
                        SRSS_Invalid   = -1
} DbvSortResultSetStatus;


typedef struct DbvSortReq {
DbvOctetString          *psReferenceId;
DbvInternationalString  **ppsInputResultSetName;
DbvInternationalString    sSortedResultSetName;
DbvSortKeySpec          **ppsSortSequence;
DbvOtherInformation     **ppsOtherInformation;
} DbvSortReq;
```

2.3.20 Sort Response

```
typedef struct DbvSortRsp {
DbvOctetString           *psReferenceId;
DbvSortStatus             eSortStatus;
DbvSortResultSetStatus   *peResultSetStatus;
DbvDiagRec              **ppsDiagnostics;
```

```
DbvOtherInformation         **ppsOtherInformation;
} DbvSortRsp;
```

2.3.21 Close

```
typedef enum DbvCloseReason {
                CR_Finished         = 0,
                CR_ShutDown         = 1,
                CR_SystemProblem    = 2,
                CR_CostLimit        = 3,
                CR_Resources        = 4,
                CR_SecurityViolation = 5,
                CR_ProtocolError    = 6,
                CR_LackOfActivity   = 7,
                CR_PeerAbort        = 8,
                CR_Unspecified      = 9,
                CR_Invalid          = -1
} DbvCloseReason;


typedef struct DbvCloseReq {
DbvOctetString                      *psReferenceId;
DbvCloseReason                       eCloseReason;
DbvInternationalString              *psDiagnosticInformation;
DbvObjectIdentifier                  pcResourceReportFormat;
DbvASN1External                     *psResourceReport;
DbvOtherInformation               **ppsOtherInformation;
} DbvCloseReq;
```

2.3.22 Extended Services Request

```
typedef enum DbvExtServicesFunctions {
                ESF_Create = 1,
                ESF_Delete = 2,
                ESF_Modify = 3,
                ESF_Invalid     = -1
} DbvExtServicesFunctions;


typedef enum DbvExtServicesWaitAction {
                ESWA_Wait               = 1,
                ESWA_WaitIfPossible     = 2,
                ESWA_DontWait           = 3,
                ESWA_DontReturnPackage = 4,
                ESWA_Invalid           = -1
} DbvExtServicesWaitAction;


typedef enum DbvExtServicesOperationStatus {
```

```
                      ESOS_Done    = 1,
                      ESOS_Queued  = 2,
                      ESOS_Failure = 3,
                      ESOS_Invalid = -1
} DbvExtServicesOperationStatus;



typedef struct DbvExtendedServicesReq {
DbvOctetString                        *psReferenceId;
DbvExtServicesFunctions                eFunction;
DbvObjectIdentifier                    pcPackageType;
DbvInternationalString                *psPackageName;
DbvInternationalString                *psUserId;
DbvIntUnit                            *psRetentionTime;
DbvPermissions                       **ppsPermissions;
DbvInternationalString                *psDescription;
DbvASN1External                       *psOriginSpecificParameter;
DbvExtServicesWaitAction               eWaitAction;
DbvInternationalString                *psElements;
DbvOtherInformation                  **ppsOtherInformation;
} DbvExtendedServicesReq;
```

2.3.23 Extended Services Response

```
typedef struct DbvExtendedServicesRsp {
DbvOctetString                        *psReferenceId;
DbvExtServicesOperationStatus          eOperationStatus;
DbvDiagRec                           **ppsDiagnostics;
DbvASN1External                       *psTaskPackage;
DbvOtherInformation                  **ppsOtherInformation;
} DbvExtendedServicesRsp;
```

2.4 Object Identifiers

```
/* The syntax Object Identifier definitions is

   ObjectIdentifier ::= Header Trailer
   Header ::= "1.0.10163." | "1.2.840.10003."
   Trailer ::= Number"."Number"}"
   Number  ::= positive integer value
```

2.4.1 Object Identifiers - Record Syntaxes

```
#define ISO_UNIMARC                    "1.0.10163.5.1"
#define ANSI_UNIMARC                   "1.2.840.10003.5.1"
#define ISO_INTERMARC                  "1.0.10163.5.2"
#define ANSI_INTERMARC                 "1.2.840.10003.5.2"
#define ISO_CCF                        "1.0.10163.5.3"
#define ANSI_CCF                       "1.2.840.10003.5.3"
#define ISO_USMARC                     "1.0.10163.5.10"
#define ANSI_USMARC                    "1.2.840.10003.5.10"
#define ISO_UKMARC                     "1.0.10163.5.11"
#define ANSI_UKMARC                    "1.2.840.10003.5.11"
#define ISO_NORMARC                    "1.0.10163.5.12"
#define ANSI_NORMARC                   "1.2.840.10003.5.12"
#define ISO_LIBRISMARC                 "1.0.10163.5.13"
#define ANSI_LIBRISMARC                "1.2.840.10003.5.13"
#define ISO_DANMARC                    "1.0.10163.5.14"
#define ANSI_DANMARC                   "1.2.840.10003.5.14"
#define ISO_FINMARC                    "1.0.10163.5.15"
#define ANSI_FINMARC                   "1.2.840.10003.5.15"
#define ISO_MAB                        "1.0.10163.5.16"
#define ANSI_MAB                       "1.2.840.10003.5.16"
#define ISO_CANMARC                    "1.0.10163.5.17"
#define ANSI_CANMARC                   "1.2.840.10003.5.17"
#define ISO_SBN                        "1.0.10163.5.18"
#define ANSI_SBN                       "1.2.840.10003.5.18"
#define ISO_PICAMARC                   "1.0.10163.5.19"
#define ANSI_PICAMARC                  "1.2.840.10003.5.19"
#define ISO_AUSMARC                    "1.0.10163.5.20"
#define ANSI_AUSMARC                   "1.2.840.10003.5.20"

#define ISO_EXPLAIN_RECORD             "1.0.10163.5.100"
#define ANSI_EXPLAIN_RECORD            "1.2.840.10003.5.100"
#define ISO_UNSTRUCTURED_TEXT_RECORD      "1.0.10163.5.101"
#define ANSI_UNSTRUCTURED_TEXT_RECORD     "1.2.840.10003.5.101"
#define ISO_OPAC_RECORD                "1.0.10163.5.102"
#define ANSI_OPAC_RECORD               "1.2.840.10003.5.102"
#define ISO_SUMMARY_RECORD             "1.0.10163.5.103"
#define ANSI_SUMMARY_RECORD            "1.2.840.10003.5.103"
#define ISO_GENERIC_RECORD             "1.0.10163.5.105"
#define ANSI_GENERIC_RECORD            "1.2.840.10003.5.105"
#define ISO_ES_TASK_PACKAGE_RECORD "1.0.10163.5.106"
#define ANSI_ES_TASK_PACKAGE_RECORD"1.2.840.10003.5.106"
```

2.4.2 Object Identifiers - Attribute Sets

```
#define ISO_ATTRIBUTE_SET_BIB_1        "1.0.10163.3.1"
#define ANSI_ATTRIBUTE_SET_BIB_1    "1.2.840.10003.3.1"
```

```
#define ANSI_ATTRIBUTE_SET_EXP_1    "1.2.840.10003.3.2"
#define ANSI_ATTRIBUTE_SET_CIP_1    "1.2.840.10003.3.2000.99.1"
```

2.4.3 Object Identifiers - Diagnostic Sets

```
#define ISO_DIAGNOSTIC_SET_BIB_1         "1.0.10163.4.1"
#define ANSI_DIAGNOSTIC_SET_BIB_1        "1.2.840.10003.4.1"
```

2.4.4 Object Identifiers - Resource Reports

```
#define ISO_RESOURCE_REPORT_1            "1.0.10163.7.1"
#define ANSI_RESOURCE_REPORT_1           "1.2.840.10003.7.1"
#define ISO_RESOURCE_REPORT_2            "1.0.10163.7.2"
#define ANSI_RESOURCE_REPORT_2           "1.2.840.10003.7.2"
```

2.4.5 Object Identifiers - Access Control Formats

```
#define ISO_ACCESS_PROMPT_1        "1.0.10163.8.1"
#define ANSI_ACCESS_PROMPT_1       "1.2.840.10003.8.1"
```

2.4.6 Object Identifiers - Extended Services

```
#define ISO_PERSISTENTQUERY_EXTENDED_SERVICE    "1.0.10163.9.2"
#define ANSI_PERSISTENTQUERY_EXTENDED_SERVICE   "1.2.840.10003.9.2"

#define ISO_ITEMORDER_EXTENDED_SERVICE          "1.0.10163.9.4"
#define ANSI_ITEMORDER_EXTENDED_SERVICE         "1.2.840.10003.9.4"

#define ISO_UPDATE_EXTENDED_SERVICE             "1.0.10163.9.5"
#define ANSI_UPDATE_EXTENDED_SERVICE            "1.2.840.10003.9.5"

#define ISO_EXPORTSPEC_EXTENDED_SERVICE          "1.0.10163.9.6"
#define ANSI_EXPORTSPEC_EXTENDED_SERVICE         "1.2.840.10003.9.6"

#define ISO_EXPORTINVOC_EXTENDED_SERVICE         "1.0.10163.9.7"
#define ANSI_EXPORTINVOC_EXTENDED_SERVICE        "1.2.840.10003.9.7"


/* UCP update */
#define ISO_UCP_UPDATE_EXTENDED_SERVICE          "1.0.10163.9.5.1.1"
#define ANSI_UCP_UPDATE_EXTENDED_SERVICE         "1.2.840.10003.9.5.1.1"
```

2.4.7 Object Identifiers - ISO ILL

```
#define ISO_ILL_PDU              "1.2.10161.2.1"



/* ILL DbvExtension ulIdentifier int->ANY mappings */

#define SUBITO_ADDITIONAL_INFO                      800
```

2.4.8 Object Identifiers - CIP Profile

```
#define CIPSPECIFIC              "1.2.840.10003.2.1000.99.1"
#define CIPORDER                 "1.2.840.10003.9.1000.99.1"

#define CIPSPECIFIC2             "1.2.840.10003.2.1000.99.2"
#define CIPORDER2                "1.2.840.10003.9.1000.99.2"
#define CIPFORMATTEDPRODUCT      "1.2.840.10003.9.2000.99.3"
#define CIPFORMATTEDSCENE        "1.2.840.10003.9.2000.99.4"
```

2.4.9 Object Identifiers - Registered to ESA

```
/* 70 = implementor id of ESA (Esrin) */


#define ESRIN_PRINT       "1.2.840.10003.9.1000.70.1"
#define ESRIN_ALERT       "1.2.840.10003.9.1000.70.2"
#define ESRIN_ORDER       "1.2.840.10003.9.4.1000.70.1"
```

2.4.10 Object Identifiers - Character Set and Language Negotiation

```
#define ISO_CHARSET_AND_LANGUAGE_NEGOTIATION         "1.0.10163.10.2"
#define ANSI_CHARSET_AND_LANGUAGE_NEGOTIATION           "1.2.840.10003.10.2"

#define ISO_CHARSET_AND_LANGUAGE_NEGOTIATION2         "1.0.10163.15.1"
#define ANSI_CHARSET_AND_LANGUAGE_NEGOTIATION2        "1.2.840.10003.15.1"
```

2.4.11 Object Identifiers - User Information Formats

```
#define ISO_USERINFO_SEARCHRESULT1              "1.0.10163.10.1"
#define ANSI_USERINFO_SEARCHRESULT1             "1.2.840.10003.10.1"
```

2.5 Structured Record Syntaxes

2.5.1 SUTRS Record

```
typedef DbvInternationalString    DbvUnstructuredText;
```

2.5.2 OPAC Record

```
typedef struct DbvCircRecord {
DbvBool                     fAvailableNow;
DbvInternationalString      *psAvailabilityDate;
DbvInternationalString      *psAvailableThru;
DbvInternationalString      *psRestrictions;
DbvInternationalString      *psItemId;
DbvBool                      fRenewable;
DbvBool                      fOnHold;
DbvInternationalString      *psEnumAndChron;
DbvInternationalString      *psMidspine;
DbvInternationalString      *psTemporaryLocation;
} DbvCircRecord;


typedef struct DbvVolume {
DbvInternationalString        *psEnumeration;
DbvInternationalString        *psChronology;
DbvInternationalString        *psEnumAndChron;
} DbvVolume;


typedef struct DbvHoldingsAndCircData {
DbvInternationalString        *psTypeOfRecord;
DbvInternationalString        *psEncodingLevel;
DbvInternationalString        *psFormat;
DbvInternationalString        *psReceiptAcqStatus;
DbvInternationalString        *psGeneralRetention;
DbvInternationalString        *psCompleteness;
DbvInternationalString        *psDateOfReport;
DbvInternationalString        *psNucCode;
DbvInternationalString        *psLocalLocation;
```

```
DbvInternationalString          *psShelvingLocation;
DbvInternationalString          *psCallNumber;
DbvInternationalString          *psShelvingData;
DbvInternationalString          *psCopyNumber;
DbvInternationalString          *psPublicNote;
DbvInternationalString          *psReproductionNote;
DbvInternationalString          *psTermsUseRepro;
DbvInternationalString          *psEnumAndChron;
DbvVolume                       **ppsVolume;
DbvCircRecord                   **ppsCircRecord;
} DbvHoldingsAndCircData;
```

```
typedef enum DbvHoldingsRecType {
      HRT_MarcHoldingsRecord = 1,
      HRT_HoldingsAndCirc    = 2
} DbvHoldingsRecType;
```

```
typedef struct DbvHoldingsRecord {
DbvHoldingsRecType       eHoldingsRecType;
union {
    DbvASN1External           sMarcHoldingsRecord;
    DbvHoldingsAndCircData  sHoldingsAndCirc;
    }                     uMarcOrHoldAndCirc;
} DbvHoldingsRecord;
```

```
typedef struct DbvOpacRecord {
DbvASN1External          *psBibliographicRecord;
DbvHoldingsRecord        **ppsHoldingsData;
} DbvOpacRecord;
```

2.5.3 SUMMARY Record

```
typedef struct DbvFormatSpec {
DbvInternationalString          sType;
Ulong                           *pulSize;
Ulong                           *pulBestPosn;
} DbvFormatSpec;
```

```
typedef struct DbvSummaryRecord {
DbvInternationalString           sTitle;
DbvInternationalString          *psAuthor;
DbvInternationalString          *psCallNumber;
DbvInternationalString          *psRecordType;
DbvInternationalString          *psBibliographicLevel;
DbvFormatSpec                   **ppsFormat;
DbvInternationalString          *psPublicationPlace;
```

```
DbvInternationalString            *psPublicationDate;
DbvInternationalString            *psTargetSystemKey;
DbvInternationalString            *psSatisfyingElement;
Ulong                             *pulRank;
DbvInternationalString            *psDocumentId;
DbvInternationalString            *psAbstract;
DbvOtherInformation             **ppsOtherInformation;
} DbvSummaryRecord;
```

2.5.4 Extended Service Task Package Record

```
typedef enum DbvExtServicesTaskStatus {
                ESTS_Pending  = 1,
                ESTS_Active   = 2,
                ESTS_Complete = 3,
                ESTS_Aborted  = 4,
                ESTS_Invalid  = -1
} DbvExtServicesTaskStatus;
```

```
typedef struct DbvEsTaskPackage {
DbvObjectIdentifier              pcPackageType;
DbvInternationalString          *psPackageName;
DbvInternationalString          *psUserId;
DbvIntUnit                      *psRetentionTime;
DbvPermissions                 **ppsPermissions;
DbvInternationalString          *psDescription;
DbvOctetString                  *psTargetReference;
DbvGeneralizedTime               pcCreationDateTime;
DbvExtServicesTaskStatus         eExtServicesTaskStatus;
DbvDiagRec                     **ppsPackageDiagnostics;
DbvASN1External                  sTaskSpecificParameters;
} DbvEsTaskPackage;
```

2.5.5 Explain Record Syntax

2.5.5.1 Explain Record Enumerated Types

```
typedef enum DbvExplainRecordType {
                ERT_TargetInfo          = 1,
                ERT_DatabaseInfo        = 2,
                ERT_SchemaInfo          = 3,
                ERT_TagSetInfo          = 4,
                ERT_RecordSyntaxInfo    = 5,
```

```
                    ERT_AttributeSetInfo    = 6,
                    ERT_TermListInfo        = 7,
                    ERT_ExtendedServicesInfo  = 8,
                    ERT_AttributeDetails    = 9,
                    ERT_TermListDetails    = 10,
                    ERT_ElementSetDetails   = 11,
                    ERT_RetrievalRecordDetails  = 12,
                    ERT_SortDetails        = 13,
                    ERT_Processing         = 14,
                    ERT_Variants           = 15,
                    ERT_Units              = 16,
                    ERT_CategoryList       = 17,
                    ERT_Invalid            = -1
} DbvExplainRecordType;
```

2.5.5.2 Common Information

```
typedef struct DbvCommonInfo
{
DbvGeneralizedTime            pcDateAdded;
DbvGeneralizedTime            pcDateChanged;
DbvGeneralizedTime            pcExpiry;
DbvLanguageCode             *psHumanStringLanguage;
DbvOtherInformation        **ppsOtherInformation;
} DbvCommonInfo;
```

```
typedef struct DbvHumanString
{
DbvLanguageCode       *psLanguage;
DbvInternationalString  sText;
} DbvHumanString;
```

2.5.5.3 Body Type

```
typedef enum DbvBodyTypeType {
                BTT_IanaType    = 1,
                BTT_Z3950Type   = 2,
                BTT_OtherType   = 3,
                BTT_Invalid      = -1
} DbvBodyTypeType;
```

```
typedef struct DbvBodyType
{
DbvBodyTypeType    eBodyTypeType;
union {
    DbvInternationalString      *psIanaType;
    DbvInternationalString      *psZ3950Type;
    DbvInternationalString      *psOtherType;
  }                  uBodyType;
} DbvBodyType;
```

2.5.5.4 Icon Object

```
typedef struct DbvIconObject
{
DbvBodyType       sBodyType;
DbvOctetString    sContent;
} DbvIconObject;
```

```
typedef struct DbvContactInfo
{
DbvInternationalString    *psName;
DbvHumanString            **ppsDescription;
DbvHumanString            **ppsAddress;
DbvInternationalString    *psEmail;
DbvInternationalString    *psPhone;
} DbvContactInfo;
```

2.5.5.5 Database List

```
typedef struct DbvDatabaseList
{
DbvInternationalString **ppsInnerDatabases; /* mand. */
} DbvDatabaseList;
```

2.5.5.6 Network Address Type

```
typedef enum DbvNetworkAddressType {
                NAT_InternetAddress        = 1,
                NAT_OsiPresentationAddress = 2,
```

```
                NAT_OtherAddress                  = 3,
                NAT_Invalid                       = -1
} DbvNetworkAddressType;




typedef struct DbvInterAddress
{
DbvInternationalString    sHostAddress;
Ulong                     ulPort;
} DbvInterAddress;




typedef struct DbvOsiPresentationAddress
{
DbvInternationalString    sPsel;
DbvInternationalString   *psSSel;
DbvInternationalString   *psTSel;
DbvInternationalString    sNSap;
} DbvOsiPresentationAddress;




typedef struct DbvOtherAddress
{
DbvInternationalString    sType;
DbvInternationalString    sAddress;
} DbvOtherAddress;




typedef struct DbvNetworkAddress
{
DbvNetworkAddressType    eNetworkAddressType;
union {
    DbvInterAddress                  *psInternetAddress;
    DbvOsiPresentationAddress        *psOsiPresentationAddress;
    DbvOtherAddress                  *psOtherAddress;
  }                 uNetworkAddress;
} DbvNetworkAddress;
```

2.5.5.7 Query Type Details

```
typedef enum DbvQueryTypeDetailsType {
        QTDT_Private    = 1,
```

```
        QTDT_Rpn        = 2,
        QTDT_Iso8777    = 3,
        QTDT_Z39_58     = 4,
        QTDT_Erpn       = 5,
        QTDT_RankedList = 6,
        QTDT_Invalid    = -1
} DbvQueryTypeDetailsType;


typedef struct DbvOperators
{
DbvInternationalString    sOperator;
DbvHumanString            **ppsDescription;
} DbvOperators;


typedef struct DbvSearchKey
{
DbvInternationalString    sSearchKey;
DbvHumanString            **ppsDescription;
} DbvSearchKey;


typedef struct DbvHumanStringSeq
{
DbvHumanString     **ppsHumanString;
} DbvHumanStringSeq;


typedef struct DbvPrivateCapabilities
{
DbvOperators        **ppsOperators;
DbvSearchKey        **ppsSearchKeys;
DbvHumanStringSeq  **ppsDescription;
} DbvPrivateCapabilities;
```

2.5.5.8 Units Supported

```
typedef enum DbvUnitsSupportedType {
      UST_Known   = 1,
      UST_Private = 2,
      UST_Invalid = -1
} DbvUnitsSupportedType;


typedef struct DbvPrivate
```

```
{
Ulong           ulUnit;
DbvHumanString **ppsDescription;
} DbvPrivate;


typedef struct DbvUnitsSupported
{
DbvUnitsSupportedType eUnitsSupportedType;
union {
   Ulong        ulKnown;
   DbvPrivate *psPrivate;
  } uUnitsSupported;
} DbvUnitsSupported;
```

2.5.5.9 Proximity Support

```
typedef struct DbvProximitySupport
{
DbvBool               fAnySupport;
DbvUnitsSupported  **ppsUnitsSupported;
} DbvProximitySupport;
```

2.5.5.10 RPN Capabilities

```
typedef struct DbvRpnCapabilities
{
Ulong              **ppulOperators;
DbvBool              fResultSetAsOperandSupported;
DbvBool              fRestrictionOperandSupported;
DbvProximitySupport *psProximity;
} DbvRpnCapabilities;
```

2.5.5.11 ISO8777 Capabilities

```
typedef struct DbvIso8777Capabilities
{
DbvSearchKey     **ppsSearchKeys;
DbvHumanString   **ppsRestrictions;
} DbvIso8777Capabilities;
```

```
typedef struct DbvQueryTypeDetails
{
DbvQueryTypeDetailsType     eQueryTypeDetailsType;
union {
    DbvPrivateCapabilities  *psPrivate;
    DbvRpnCapabilities       *psRpn;
    DbvIso8777Capabilities  *psIso8777;
    DbvHumanString          **ppsZ39_58;
    DbvRpnCapabilities       *psErpn;
    DbvHumanString          **ppsRankedList;
  } uQueryTypeDetails;
} DbvQueryTypeDetails;
```

2.5.5.12 Access Types

```
typedef enum DbvAccessType {
    AT_Any              = 0,
    AT_Search           = 1,
    AT_Present          = 2,
    AT_SpecificElements = 3,
    AT_ExtendedServices = 4,
    AT_ByDatabase       = 5,
    AT_Invalid          = -1
} DbvAccessType;
```

2.5.5.13 Access Restrictions

```
typedef struct DbvAccessRestrictions
{
DbvAccessType           eAccessType;
DbvHumanString        **ppsAccessText;
DbvObjectIdentifier    *ppcAccessChallenges;
} DbvAccessRestrictions;
```

2.5.5.14 Charge and Costs

```
typedef struct DbvCharge
{
DbvIntUnit        sCost;
DbvUnit          *psPerWhat;
```

```
DbvHumanString **ppsText;
} DbvCharge;


typedef struct DbvOtherCharge
{
DbvHumanString **ppsForWhat;
DbvCharge        sCharge;
} DbvOtherCharge;


typedef struct DbvCosts
{
DbvCharge        *psConnectCharge;
DbvCharge        *psConnectTime;
DbvCharge        *psDisplayCharge;
DbvCharge        *psSearchCharge;
DbvCharge        *psSubscriptCharge;
DbvOtherCharge **ppsOtherCharge;
} DbvCosts;


/* A ** is not needed for ppcDiagnosticsSets etc. because
   DbvObjectIdentifier is a typedefed char * (see sitypes.h) */
```

2.5.5.15 Access Information

```
typedef struct DbvAccessInfo
{
DbvQueryTypeDetails         **ppsQueryTypesSupported;
DbvObjectIdentifier          *ppcDiagnosticsSets;
DbvObjectIdentifier          *ppcAttributeSetIds;
DbvObjectIdentifier          *ppcSchemas;
DbvObjectIdentifier          *ppcRecordSyntaxes;
DbvObjectIdentifier          *ppcResourceChallenges;
DbvAccessRestrictions       **ppsRestrictedAccess;
DbvCosts                     *psCostInfo;
DbvObjectIdentifier          *ppcVariantSets;
DbvInternationalString      **ppsElementSetNames;
DbvInternationalString      **ppsUnitSystems;
} DbvAccessInfo;
```

2.5.5.16 Target Info Record Structure

```
typedef struct DbvTargetInfo
{
DbvCommonInfo            *psCommonInfo;
DbvInternationalString    sName;
DbvHumanString          **ppsRecentNews;
DbvIconObject           **ppsIcon;
DbvBool                   fNamedResultSets;
DbvBool                   fMultipleDBSearch;
Ulong                    *pulMaxResultSets;
Ulong                    *pulMaxResultSize;
Ulong                    *pulMaxTerms;
DbvIntUnit               *psTimeoutInterval;
DbvHumanString          **ppsWelcomeMessage;
DbvContactInfo           *psContactInfo;
DbvHumanString          **ppsDescription;
DbvInternationalString  **ppsNicknames;
DbvHumanString          **ppsUsageRest;
DbvHumanString          **ppsPaymentAddr;
DbvHumanString          **ppsHours;
DbvDatabaseList         **ppsDbCombinations;
DbvNetworkAddress       **ppsAddresses;
DbvInternationalString  **ppsLanguages;
DbvAccessInfo            *psCommonAccessInfo;
} DbvTargetInfo;
```

2.5.5.17 Database Info Record Structure

```
typedef enum DbvRecordCountType {
     RCT_ActualNumber = 1,
     RCT_ApproxNumber = 2,
     RCT_Invalid      = -1
} DbvRecordCountType;


typedef struct DbvRecordCount
{
DbvRecordCountType eRecordCountType;
union {
     Ulong ulActualNumber;
     Ulong ulApproxNumber;
  } uRecordCount;
} DbvRecordCount;
```

```
typedef struct DbvDataBaseInfoSeq
{
DbvHumanString          **ppsDataBaseInfo;
} DbvDataBaseInfoSeq;


typedef struct DbvDatabaseInfo
{
DbvCommonInfo            *psCommonInfo;
DbvInternationalString   sName;
DbvNull                  pvExplainDatabase; /* Set to either NULL or
                                  1 alloced byte */
DbvInternationalString  **ppsNicknames;
DbvIconObject           **ppsIcon;
DbvBool                   fUserFee;
DbvBool                   fAvailable;
DbvHumanString          **ppsTitleString;
DbvDataBaseInfoSeq      **ppsKeywords;
DbvHumanString          **ppsDescription;
DbvInternationalString  **ppsAssociatedDbs;
DbvInternationalString  **ppsSubDbs;
DbvHumanString          **ppsDisclaimers;
DbvHumanString          **ppsNews;
DbvRecordCount           *psRecordCount;
DbvHumanString          **ppsDefaultOrder;
Ulong                    *pulAvRecordSize;
Ulong                    *pulMaxRecordSize;
DbvHumanString          **ppsHours;
DbvHumanString          **ppsBestTime;
DbvGeneralizedTime        pcLastUpdate;
DbvIntUnit               *psUpdateInterval;
DbvHumanString          **ppsCoverage;
DbvBool                  *pfProprietary;
DbvHumanString          **ppsCopyrightText;
DbvHumanString          **ppsCopyrightNotice;
DbvContactInfo           *psProducerContactInfo;
DbvContactInfo           *psSupplierContactInfo;
DbvContactInfo           *psSubmissionContactInfo;
DbvAccessInfo            *psAccessInfo;
} DbvDatabaseInfo;
```

2.5.5.18 Schema Info Record Structure

```
typedef struct DbvTagTypeMapping {
Ulong                   ulTagType;
```

```
DbvObjectIdentifier     pcTagSet;
DbvNull                 pvDefaultTagType; /* Set to either NULL or
                                 1 alloced byte */
} DbvTagTypeMapping;



typedef struct DbvPath {
Ulong               ulTagType;
DbvStringOrNumeric  sTagValue;
} DbvPath;



typedef struct DbvElementInfo {
DbvInternationalString      sElementName;
DbvPath                  **ppsElementTagPath;
struct DbvElementDataType  *psDataType;
DbvBool                    fRequired;
DbvBool                    fRepeatable;
DbvHumanString           **ppsDescription;
} DbvElementInfo;



typedef enum DbvElementDataTypeType {
   EDTT_Primitive  = 1,
   EDTT_Structured = 2,
   EDTT_Invalid    = -1
} DbvElementDataTypeType;



typedef enum DbvPrimitiveDataType {
   PDT_OctetString    = 0,
   PDT_Numeric        = 1,
   PDT_Date           = 2,
   PDT_External       = 3,
   PDT_String         = 4,
   PDT_TrueOrFalse    = 5,
   PDT_Oid            = 6,
   PDT_IntUnit        = 7,
   PDT_Empty          = 8,
   PDT_NoneOfTheAbove = 100,
   PDT_Invalid        = -1
} DbvPrimitiveDataType;
```

```
typedef struct DbvElementDataType {
DbvElementDataTypeType eElementDataTypeType;
union {
     DbvPrimitiveDataType        ePrimitive;
     DbvElementInfo            **ppsStructured;
  } uElementDataType;
} DbvElementDataType;
```

```
typedef struct DbvSchemaInfo {
DbvCommonInfo             *psCommonInfo;
DbvObjectIdentifier       pcSchema;
DbvInternationalString    sName;
DbvHumanString          **ppsDescription;
DbvTagTypeMapping       **ppsTagTypeMapping;
DbvElementInfo          **ppsRecordStructure;
} DbvSchemaInfo;
```

2.5.5.19 Tag Set Info Record Structure

```
typedef struct DbvElements
{
DbvInternationalString   sElementName;
DbvInternationalString **ppsNicknames;
DbvStringOrNumeric       sElementTag;
DbvHumanString         **ppsDescription;
DbvPrimitiveDataType    *peDataType;
DbvOtherInformation    **ppsOtherInformation;
} DbvElements;
```

```
typedef struct DbvTagSetInfo
{
DbvCommonInfo           *psCommonInfo;
DbvObjectIdentifier      pcTagSet;
DbvInternationalString   sName;
DbvHumanString         **ppsDescription;
DbvElements            **ppsElements;
} DbvTagSetInfo;
```

2.5.5.20 Record Syntax Record Structure

```
typedef struct DbvRecordSyntaxInfo
{
DbvCommonInfo          *psCommonInfo;
DbvObjectIdentifier     pcRecordSyntax;
DbvInternationalString  sName;
DbvObjectIdentifier    *ppcTransferSyntaxes;
DbvHumanString        **ppsDescription;
DbvInternationalString *psAsn1Module;
DbvElementInfo        **ppsAbstractStructure;
} DbvRecordSyntaxInfo;
```

2.5.5.21 Attribute Set Record Structure

```
typedef struct DbvAttributeDescription
{
DbvInternationalString  *psName;
DbvHumanString        **ppsDescription;
DbvStringOrNumeric      sAttributeValue;
DbvStringOrNumeric    **ppsEquivalentAttributes;
} DbvAttributeDescription;
```

```
typedef struct DbvAttributeType
{
DbvInternationalString   *psName;
DbvHumanString         **ppsDescription;
Ulong                    ulAttributeType;
DbvAttributeDescription **ppsAttributeValues;
} DbvAttributeType;
```

```
typedef struct DbvAttributeSetInfo
{
DbvCommonInfo           *psCommonInfo;
DbvObjectIdentifier      pcAttributeSetId;
DbvInternationalString   sName;
DbvAttributeType       **ppsAttributes;
DbvHumanString         **ppsDescription;
} DbvAttributeSetInfo;
```

2.5.5.22 Term List Info Record Structure

```
typedef enum DbvSearchCost {
   SC_Optimized = 0,
   SC_Normal    = 1,
   SC_Expensive = 2,
   SC_Filter    = 3,
   SC_Invalid   = -1
} DbvSearchCost;
```

```
typedef struct DbvTermList
{
DbvInternationalString    sName;
DbvHumanString          **ppsTitle;
DbvSearchCost            *peSearchCost;
DbvBool                   fScanable;
DbvInternationalString  **ppsBroader;
DbvInternationalString  **ppsNarrower;
} DbvTermList;
```

```
typedef struct DbvTermListInfo
{
DbvCommonInfo          *psCommonInfo;
DbvInternationalString  sDatabaseName;
DbvTermList           **ppsTermLists;
} DbvTermListInfo;
```

2.5.5.23 Extended Servies Info Record Structure

```
typedef enum DbvExtendedServicesInfoInt
{
   ESII_WaitSupported    = 1,
   ESII_WaitAlways       = 2,
   ESII_WaitNotSupported = 3,
   ESII_Depends          = 4,
   ESII_NotSaying        = 5,
   ESII_Invalid          = -1
} DbvExtendedServicesInfoInt;
```

```
typedef struct DbvExtendedServicesInfo
{
```

```
DbvCommonInfo                 *psCommonInfo;
DbvObjectIdentifier            pcType;
DbvInternationalString        *psName;
DbvBool                        fPrivateType;
DbvBool                        fRestrictionsApply;
DbvBool                        fFeeApply;
DbvBool                        fAvailable;
DbvBool                        fRetentionSupported;
DbvExtendedServicesInfoInt   eWaitAction;
DbvHumanString              **ppsDescription;
DbvASN1External              *psSpecificExplain;
DbvInternationalString       *psEsASN;
} DbvExtendedServicesInfo;
```

2.5.5.24 Attribute Details Record Structure

```
typedef struct DbvOmittedAttributeInterpretation
{
DbvStringOrNumeric  *psDefaultValue;
DbvHumanString      **ppsDefaultDescription;
} DbvOmittedAttributeInterpretation;


typedef struct DbvAttributeValues
{
DbvStringOrNumeric    sValue;
DbvHumanString      **ppsDescription;
DbvStringOrNumeric  **ppsSubAttributes;
DbvStringOrNumeric  **ppsSuperAttributes;
DbvNull             pvPartialSupport; /* Set to either NULL or
                            1 alloced byte */
} DbvAttributeValues;



typedef struct DbvAttributesByType
{
Ulong                           ulAttributeType;
DbvOmittedAttributeInterpretation *psDefaultIfOmitted;
DbvAttributeValues              **ppsAttributeValues;
} DbvAttributesByType;


typedef struct DbvAttributesBySet
{
DbvObjectIdentifier        pcAttributeSet;
```

```
DbvAttributesByType      **ppsAttributesByType;
} DbvAttributesBySet;


typedef enum DbvAttributeOccurrenceChoiceType {
    AOT_AnyOrNone           = 1,
    AOT_Specific            = 2,
    AOT_Invalid             = -1
} DbvAttributeOccurrenceChoiceType;



typedef struct DbvAttributeOccurrenceChoice
{
DbvAttributeOccurrenceChoiceType    eAttributeOccurrenceChoiceType;
union {
     DbvNull              pvAnyOrNone;  /* mand - set to 1 alloced byte */
     DbvStringOrNumeric  **ppsSpecific;
  } uAttributeOccurrenceChoiceType;
} DbvAttributeOccurrenceChoice;



typedef struct DbvAttributeOccurrence
{
DbvObjectIdentifier                 pcAttributeSet;
Ulong                               ulAttributeType;
DbvNull                             pvMustBeSupplied; /* Set to either NULL or
                                    1 alloced byte */
DbvAttributeOccurrenceChoice        sAttributeValues;
} DbvAttributeOccurrence;


typedef struct DbvAttributeCombination
{
DbvAttributeOccurrence          **ppsAttributeOccurrence;
} DbvAttributeCombination;


typedef struct DbvAttributeCombinations
{
DbvObjectIdentifier             pcDefaultAttributeSet;
DbvAttributeCombination         **ppsLegalCombinations;
} DbvAttributeCombinations;



typedef struct DbvAttributeDetails
```

```
{
DbvCommonInfo            *psCommonInfo;
DbvInternationalString   sDatabaseName;
DbvAttributesBySet      **ppsAttributesBySet;
DbvAttributeCombinations *psAttributeCombinations;
} DbvAttributeDetails;
```

2.5.5.25 Term List Details Record Structure

```
typedef struct DbvScanInfo
{
Ulong           *pulMaxStepSize;
DbvHumanString **ppsCollatingSequence;
DbvBool         *pfIncreasing;
} DbvScanInfo;
```

```
typedef struct DbvTermListDetails
{
DbvCommonInfo            *psCommonInfo;
DbvInternationalString    sTermListName;
DbvHumanString          **ppsDescription;
DbvAttributeCombinations  *psAttributes;
DbvScanInfo              *psScanInfo;
Ulong                    *pulEstNumberTerms;
DbvTerm                 **ppsSampleTerms;
} DbvTermListDetails;
```

2.5.5.26 Element Set Details

```
typedef struct DbvRecordTag
{
DbvStringOrNumeric *psQualifier;
DbvStringOrNumeric  sTagValue;
} DbvRecordTag;
```

```
typedef struct DbvPathA {
DbvPath                 **ppsSchemaTags;
} DbvPathA;
```

```
typedef struct DbvDetailsPerElement
{
```

```
DbvInternationalString    *psName;
DbvRecordTag               *psRecordTag;
DbvPathA                  **ppsSchemaTags;
Ulong                      *pulMaxSize;
Ulong                      *pulMinSize;
Ulong                      *pulAvgSize;
Ulong                      *pulFixedSize;
DbvBool                     fRepeatable;
DbvBool                     fRequired;
DbvHumanString            **ppsDescription;
DbvHumanString            **ppsContents;
DbvHumanString            **ppsBillingInfo;
DbvHumanString            **ppsRestrictions;
DbvInternationalString   **ppsAlternateNames;
DbvInternationalString   **ppsGenericNames;
DbvAttributeCombinations  *psSearchAccess;
} DbvDetailsPerElement;
```

```
typedef struct DbvElementSetDetails
{
DbvCommonInfo            *psCommonInfo;
DbvInternationalString    sDatabaseName;
DbvInternationalString    sElementSetName;
DbvObjectIdentifier       pcRecordSyntax;
DbvObjectIdentifier       pcSchema;
DbvHumanString          **ppsDescription;
DbvDetailsPerElement    **ppsDetailsPerElement;
} DbvElementSetDetails;
```

2.5.5.27 Retrieval Record Details

```
typedef struct DbvRetrievalRecordDetails
{
DbvCommonInfo            *psCommonInfo;
DbvInternationalString    sDatabaseName;
DbvObjectIdentifier       pcSchema;
DbvObjectIdentifier       pcRecordSyntax;
DbvHumanString          **ppsDescription;
DbvDetailsPerElement    **ppsDetailsPerElement;
} DbvRetrievalRecordDetails;
```

2.5.5.28 Sort Details

```
typedef enum DbvSortTypeType {
    STT_Character  = 1,
    STT_Numeric    = 2,
    STT_Structured = 3,
    STT_Invalid    = -1
} DbvSortTypeType;
```

```
typedef struct DbvSortType
{
DbvSortTypeType        eSortTypeType;
union {
    DbvHumanString **ppsStructured; /* Set if eSortTypeType == STT_Structured
*/
    } uSortType;
} DbvSortType;
```

```
typedef enum DbvCaseSensitivity
{
    CSE_Always     = 0,
    CSE_Never      = 1,
    CSE_DefaultYes = 2,
    CSE_DefaultNo  = 3,
    CSE_Invalid    = -1
} DbvCaseSensitivity;
```

```
typedef struct DbvSortKeys
{
DbvHumanString            **ppsDescription;
DbvSpecification          **ppsElementSpecifications;
DbvAttributeCombinations  *psAttributeSpecifications;
DbvSortType               *psSortType;
DbvCaseSensitivity        *peCaseSensitivity;
} DbvSortKeys;
```

```
typedef struct DbvSortDetails
{
DbvCommonInfo          *psCommonInfo;
DbvInternationalString  sDatabaseName;
DbvSortKeys            **ppsSortKeys;
```

```
} DbvSortDetails;
```

2.5.5.29 Processing Information

```
typedef enum DbvProcessingContext
{
    PC_Access            = 0,
    PC_Search            = 1,
    PC_Retrieval         = 2,
    PC_RecordPresentation = 3,
    PC_RecordHandling    = 4,
    PC_Invalid           = -1
} DbvProcessingContext;
```

```
typedef struct DbvProcessingInformation
{
DbvCommonInfo           *psCommonInfo;
DbvInternationalString    sDatabaseName;
DbvProcessingContext      eProcessingContext;
DbvInternationalString    sName;
DbvObjectIdentifier       pcOid;
DbvHumanString          **ppsDescription;
DbvASN1External          *psInstructions;
} DbvProcessingInformation;
```

2.5.5.30 Variant Set Info

```
typedef enum DbvValueSetType {
    VT_Range      = 1,
    VT_Enumerated = 2,
    VT_Invalid    = -1
} DbvValueSetType;
```

```
typedef enum DbvValueDescriptionType {
    VDT_Integer      = 1,
    VDT_String       = 2,
    VDT_Octets       = 3,
    VDT_Oid          = 4,
    VDT_Unit         = 5,
    VDT_ValueAndUnit = 6,
    VDT_Invalid      = -1
} DbvValueDescriptionType;
```

2.5.5.31 Value Description

```
typedef struct DbvValueDescription
{
DbvValueDescriptionType eValueDescriptionType;
union {
     Ulong                 ulInteger;
     DbvInternationalString *psString;
     DbvOctetString         *psOctets;
     DbvObjectIdentifier     pcOid;
     DbvUnit                *psUnit;
     DbvIntUnit             *psValueAndUnit;
 } uValueDescription;
} DbvValueDescription;
```

2.5.5.32 Value Range

```
typedef struct DbvValueRange
{
DbvValueDescription *psLower;
DbvValueDescription *psUpper;
} DbvValueRange;
```

2.5.5.33 Value Set

```
typedef struct DbvValueSet
{
DbvValueSetType   eValueSetType;
union {
     DbvValueRange       *psRange;
     DbvValueDescription **ppsEnumerated;
     } uValueSet;
} DbvValueSet;
```

```
typedef struct DbvVariantValue
{
DbvPrimitiveDataType  eDataType;
DbvValueSet          *psValues;
} DbvVariantValue;
```

2.5.5.34 Variant Types

```
typedef struct DbvVariantTypes
{
DbvInternationalString   *psName;
DbvHumanString          **ppsDescription;
Ulong                     ulVariantType;
DbvVariantValue          *psVariantValue;
} DbvVariantTypes;
```

2.5.5.34 Variant Class

```
typedef struct DbvVariantClass
{
DbvInternationalString  *psName;
DbvHumanString         **ppsDescription;
Ulong                    ulVariantClass;
DbvVariantTypes        **ppsVariantTypes;
} DbvVariantClass;
```

2.5.5.35 Variant Set Info

```
typedef struct DbvVariantSetInfo
{
DbvCommonInfo          *psCommonInfo;
DbvObjectIdentifier     pcVariantSet;
DbvInternationalString  sName;
DbvVariantClass       **ppsVariants;
} DbvVariantSetInfo;
```

2.5.5.36 Unit Info

```
typedef struct DbvUnits
{
DbvInternationalString  *psName;
DbvHumanString         **ppsDescription;
DbvStringOrNumeric       sUnit;
} DbvUnits;
```

```
typedef struct DbvUnitType
{
DbvInternationalString  *psName;
DbvHumanString          **ppsDescription;
DbvStringOrNumeric       sUnitType;
DbvUnits                **ppsUnits;
} DbvUnitType;


typedef struct DbvUnitInfo
{
DbvCommonInfo            *psCommonInfo;
DbvInternationalString   sUnitSystem;
DbvHumanString          **ppsDescription;
DbvUnitType             **ppsUnitTypes;
} DbvUnitInfo;
```

2.5.5.37 Category List Record Structure

```
typedef struct DbvCategoryInfo
{
DbvInternationalString   sCategory;
DbvInternationalString  *psOriginalCategory;
DbvHumanString          **ppsDescription;
DbvInternationalString  *psAsn1Module;
} DbvCategoryInfo;


typedef struct DbvCategoryList
{
DbvCommonInfo      *psCommonInfo;
DbvCategoryInfo  **ppsCategories;
} DbvCategoryList;
```

2.5.5.38 Explain Record Choices

```
typedef struct DbvExplainRecord
{
DbvExplainRecordType   eExplainRecordType;
union {
    DbvTargetInfo               *psTargetInfo;
    DbvDatabaseInfo             *psDatabaseInfo;
    DbvSchemaInfo               *psSchemaInfo;
```

```
    DbvTagSetInfo               *psTagSetInfo;
    DbvRecordSyntaxInfo         *psRecordSyntaxInfo;
    DbvAttributeSetInfo         *psAttributeSetInfo;
    DbvTermListInfo             *psTermListInfo;
    DbvExtendedServicesInfo     *psExtendedServicesInfo;
    DbvAttributeDetails         *psAttributeDetails;
    DbvTermListDetails          *psTermListDetails;
    DbvElementSetDetails        *psElementSetDetails;
    DbvRetrievalRecordDetails   *psRetrievalRecordDetails;
    DbvSortDetails              *psSortDetails;
    DbvProcessingInformation    *psProcessing;
    DbvVariantSetInfo           *psVariants;
    DbvUnitInfo                 *psUnits;
    DbvCategoryList             *psCategoryList;
  }                 uExplainRecord;
} DbvExplainRecord;
```

2.5.6 GRS.1 Record

2.5.6.1 GRS.1 Sub Structures

```
typedef enum DbvElementDataGType {
    EDT_Octets          = 1,
    EDT_Numeric         = 2,
    EDT_Date            = 3,
    EDT_Ext             = 4,
    EDT_String          = 5,
    EDT_TrueOrFalse     = 6,
    EDT_Oid             = 7,
    EDT_IntUnit         = 8,
    EDT_ElementNotThere = 9,
    EDT_ElementEmpty    = 10,
    EDT_NoDataRequested = 11,
    EDT_Diagnostic      = 12,
    EDT_Subtree         = 13,
    EDT_Invalid         = -1
} DbvElementDataGType;


typedef struct DbvOrder
{
DbvBool fAscending;
Ulong   ulOrder;
} DbvOrder;
```

```
typedef enum DbvUsageIntType {
   UIT_Redistributable = 1,
   UIT_Restricted      = 2,
   UIT_LicensePointer  = 3,
   UIT_Invalid         = -1
} DbvUsageIntType;
```

```
typedef struct DbvUsage
{
DbvUsageIntType         eType;
DbvInternationalString *psRestriction;
} DbvUsage;
```

```
typedef struct DbvHits
{
DbvTerm        *psSatisfier;
DbvIntUnit     *psOffsetIntoElement;
DbvIntUnit     *psLength;
Ulong          *pulHitRank;
DbvOctetString *psTargetToken;
} DbvHits;
```

2.5.6.2 GRS.1 Variant Value Type

```
typedef enum DbvVariantValueType {
    VVT_Int               = 1,
    VVT_InternationalString = 2,
    VVT_Octs              = 3,
    VVT_Oid               = 4,
    VVT_Bool              = 5,
    VVT_Null              = 6,
    VVT_Unit              = 7,
    VVT_ValueAndUnit      = 8,
    VVT_Invalid           = -1
} DbvVariantValueType;
```

2.5.6.3 GRS.1 Value

```
typedef struct DbvValue
```

```
{
DbvVariantValueType eVariantValueType;
union {
     Ulong                ulInt1;
     DbvInternationalString *psInternationalString;
     DbvOctetString       *psOcts;
     DbvObjectIdentifier   pcOid;
     DbvBool               fBool;
     DbvUnit              *psUnit;
     DbvIntUnit           *psValueAndUnit;
   } uVariantValueType;
} DbvValue;
```

2.5.6.4 GRS.1 Triples

```
typedef struct DbvTriples
{
DbvObjectIdentifier  pcVariantSetId;
Ulong                ulClass;
Ulong                ulType;
DbvValue             sValue;
} DbvTriples;
```

2.5.6.5 GRS.1 Variant

```
typedef struct DbvVariant
{
DbvObjectIdentifier  pcGlobalVariantSetId;
DbvTriples        **ppsTriples;
} DbvVariant;
```

2.5.6.6 GRS.1 Tag Path

```
typedef struct DbvTagPath
{
Ulong                *pulTagType;
DbvStringOrNumeric   sTagValue;
Ulong                *pulTagOccurrence;
} DbvTagPath;
```

2.5.6.7 GRS.1 Element Meta Data

```
typedef struct DbvElementMetaData
{
DbvOrder                 *psSeriesOrder;
DbvUsage                 *psUsageRight;
DbvHits               **ppsHits;
DbvInternationalString  *psDisplayName;
DbvVariant              **ppsSupportedVariants;
DbvInternationalString  *psMessage;
DbvOctetString           *psElementDescriptor;
DbvTagPath              **ppsSurrogateFor;
DbvTagPath              **ppsSurrogateElement;
DbvASN1External          *psOther;
} DbvElementMetaData;
```

2.5.6.8 GRS.1 Element Data G

```
typedef struct DbvElementDataG
{
DbvElementDataGType   eElementDataGType;
union {
    DbvOctetString            *psOctets;
    Ulong                      ulNumeric;
    DbvGeneralizedTime         pcDate;
    DbvASN1External           *psExt;
    DbvInternationalString    *psString;
    DbvBool                    fTrueOrFalse;
    DbvObjectIdentifier        pcOid;
    DbvIntUnit                *psIntUnit;
    DbvASN1External           *psDiagnostic;
    struct DbvTaggedElement  **ppsSubTree;
   } uElementDataG;
} DbvElementDataG;
```

2.5.6.9 GRS.1 Tagged Element

```
typedef struct DbvTaggedElement
{
Ulong                 *pulTagType;
DbvStringOrNumeric     sTagValue;
Ulong                 *pulTagOccurrence;
DbvElementDataG        sContent;
DbvElementMetaData    *psMetaData;
```

```
DbvVariant              *psAppliedVariant;
} DbvTaggedElement;
```

2.5.6.7 GRS.1 Record Structure

```
typedef struct DbvGenericRecord

{

DbvTaggedElement        **ppsTaggedElement;

} DbvGenericRecord;
```

2.5.7 Resource Report Formats

2.5.7.1 Resource Estimate Type Sub Structures

```
typedef enum DbvEstimateType {
                ET_CurrentSearchRecords   = 1,
                ET_FinalSearchRecords     = 2,
                ET_CurrentPresentRecords  = 3,
                ET_FinalPresentRecords    = 4,
                ET_CurrentOpTimeProcessing = 5,
                ET_FinalOpTimeProcessing  = 6,
                ET_CurrentAssocTime       = 7,
                ET_CurrentOperationCost   = 8,
                ET_FinalOperationCost     = 9,
                ET_CurrentAssocCost       = 10,
                ET_FinalOpTimeElapsed     = 11,
                ET_PercentComplete        = 12,
                ET_CurrentSearchAssocCost = 13,
                ET_CurrentPresentAssocCost = 14,
                ET_CurrentConnectAssocCost = 15,
                ET_CurrentOtherAssocCost  = 16,
                ET_Invalid                = -1
} DbvEstimateType;


typedef struct DbvEstimate1 {
DbvEstimateType         eEstimateType;
Ulong                   ulValue;
Ulong                   *pulCurrencyCode;
} DbvEstimate1;
```

2.5.7.2 Resource Report Format 1

```
typedef struct DbvResourceReport1 {
DbvEstimate1                    **ppsEstimate;
DbvInternationalString          sMessage;
} DbvResourceReport1;


typedef struct DbvEstimate2 {
DbvStringOrNumeric        sType;
DbvIntUnit                sValue;
} DbvEstimate2;
```

2.5.7.3 Resource Report Format 2

```
typedef struct DbvResourceReport2 {
DbvEstimate2                    **ppsEstimate;
DbvInternationalString          *psMessage;
} DbvResourceReport2;
```

2.5.8 Access Control Prompt 1

```
typedef enum DbvPromptObjectType {
    POT_Challenge = 1,
    POT_Response  = 2,
    POT_Invalid   = -1
} DbvPromptObjectType;



typedef enum DbvPromptIdType {
    PIT_EnumeratedPrompt     = 1,
    PIT_NoneEnumeratedPrompt = 2,
    PIT_Invalid              = -1
} DbvPromptIdType;



typedef enum DbvEPromptIdType {
    EPIT_GroupId     = 0,
    EPIT_UserId      = 1,
    EPIT_Password    = 2,
    EPIT_NewPassword = 3,
    EPIT_Copyright   = 4,
    EPIT_SessionId   = 5,
    EPIT_Invalid     = -1
```

```
} DbvEPromptIdType;


typedef struct DbvEnumeratedPrompt
{
DbvEPromptIdType        eType;
DbvInternationalString  *psSuggestedString;
} DbvEnumeratedPrompt;




typedef struct DbvPromptId
{
DbvPromptIdType ePromptIdType;
union {
     DbvEnumeratedPrompt     *psEnumeratedPrompt;
     DbvInternationalString *psNonEnumeratedPrompt;
  } uPromptId;
} DbvPromptId;


typedef enum DbvPromptInfoType
{
    PIIT_Character = 1,
    PIIT_Encrypted = 2,
    PIIT_Invalid   = -1
} DbvPromptInfoType;




typedef struct DbvEncryption
{
DbvOctetString *psCryptType;
DbvOctetString *psCredential;
DbvOctetString  sData;
} DbvEncryption;




typedef struct DbvPromptInfo
{
DbvPromptInfoType ePromptInfoType;
union {
     DbvInternationalString *psCharacter;
     DbvEncryption          *psEncrypted;
  } uPromptInfo;
} DbvPromptInfo;
```

```
typedef enum DbvDataType {
   DTTT_Integer     = 1,
   DTTT_Date1       = 2,
   DTTT_Float       = 3,
   DTTT_AlphaNumeric = 4,
   DTTT_UrlUrn      = 5,
   DTTT_Boolean     = 6,
   DTTT_Invalid     = -1
} DbvDataType;


typedef struct DbvChallenge
{
DbvPromptId             sPromptId;
DbvInternationalString  *psDefaultResponse;
DbvPromptInfo           *psPromptInfo;
DbvInternationalString  *psRegExpr;
DbvNull                 pvResponseRequired; /* Set to either NULL or
                                      1 alloced byte */
DbvInternationalString **ppsAllowedValues;
DbvNull                 pvShouldSave; /* Set to either NULL or
                              1 alloced byte */
DbvDataType             *peDataType;
DbvASN1External         *psDiagnostic;
} DbvChallenge;


typedef enum DbvResponseType {
   RT_String      = 1,
   RT_Accept      = 2,
   RT_Acknowledge = 3,
   RT_Diagnostic  = 4,
   RT_Encrypted   = 5,
   RT_Invalid     = -1
} DbvResponseType;



/* NOTE: No union member for RT_Acknowledge */
typedef struct DbvPromptResponse
{
DbvResponseType eResponseType;
union {
    DbvInternationalString *psString;       /* RT_String */
    DbvBool                 fAccept;        /* RT_Accept */
```

```
    DbvDiagRec              *psDiagnostic;  /* RT_Diagnostic */
    DbvEncryption           *psEncryption;  /* RT_Encrypted */
  } uResponse;
} DbvPromptResponse;



typedef struct DbvResponse
{
DbvPromptId       sPromptId;
DbvPromptResponse sPromptResponse;
} DbvResponse;



typedef struct DbvPromptObject
{
DbvPromptObjectType ePromptObjectType;
union {
     DbvChallenge **ppsChallenge;
     DbvResponse  **ppsResponse;
   } uPromptObject;
} DbvPromptObject;
```

2.5.9 User Info Format "Search Result 1"

```
typedef enum DbvResultsByDBChoiceType
{
    RBDSCT_All  = 1,
    RBDSCT_List = 2,
    RBDSCT_Invalid = -1
} DbvResultsByDBChoiceType;



typedef enum DbvQueryExpressionType {
   QET_Term    = 1,
   QET_Query   = 2,
   QET_Invalid = -1
} DbvQueryExpressionType;



typedef struct DbvQueryExpressionSeq
{
DbvTerm                 sQueryTerm;
DbvInternationalString *psTermComment;
} DbvQueryExpressionSeq;
```

```
typedef struct DbvQueryExpression
{
DbvQueryExpressionType eQueryExpressionType;
union {
     DbvQueryExpressionSeq *psTerm;
     DbvQuery              *psQuery;
   } uQueryExpression;
} DbvQueryExpression;


typedef struct DbvResultsByDBChoice
{
DbvResultsByDBChoiceType eResultsByDBChoiceType;
union {
   DbvInternationalString **ppsList;
  } uResultsByDBChoice;
} DbvResultsByDBChoice;


typedef struct DbvResultsByDB
{
DbvResultsByDBChoice    sDatabases;
Ulong                  *pulCount;
DbvInternationalString  *psResultSetName;
} DbvResultsByDB;


typedef struct DbvSearchInfoReport {
DbvInternationalString *psSubqueryId;
DbvBool                fFullQuery;
DbvQueryExpression     *psSubqueryExpression;
DbvQueryExpression     *psSubqueryInterpretation;
DbvQueryExpression     *psSubqueryRecommendation;
Ulong                  *pulSubqueryCount;
DbvIntUnit             *psSubqueryWeight;
DbvResultsByDB        **ppsResultsByDB;
} DbvSearchInfoReport;


typedef struct DbvUserInfoSearchResult1
{
DbvSearchInfoReport     **ppsSearchInfoReport;
} DbvUserInfoSearchResult1;
```

2.5.10 Character Set And Language Negotiation

```
This is the originally defined external.

typedef enum DbvCharSetAndLanguageType {
   CSALT_Proposal = 1,
   CSALT_Response = 2,
   CSALT_Invalid  = -1
} DbvCharSetAndLanguageType;


typedef enum DbvProposedCharSetType {
   PRCST_Iso2022  = 1,
   PRCST_Iso10646 = 2,
   PRCST_Private  = 3,
   PRCST_Invalid  = -1
} DbvProposedCharSetType;


typedef enum DbvIso2022Type {
   I2022T_OriginProposal  = 1,
   I2022T_TargetResponse  = 2,
   I2022T_Invalid         = -1
} DbvIso2022Type;


typedef enum DbvEnvironmentType {
   ENT_SevenBit  = 1,
   ENT_EightBit = 2,
   ENT_Invalid  = -1
} DbvEnvironmentType;


typedef struct DbvEnvironment {
DbvEnvironmentType eEnvironmentType;
} DbvEnvironment;


typedef struct DbvInitialSet {
Ulong             ulG0;
Ulong             ulG1;
Ulong             ulG2;
Ulong             ulG3;
Ulong             ulC0;
Ulong             ulC1;
} DbvInitialSet;
```

```
typedef struct DbvLeftAndRight {
Ulong              ulGLeft;
Ulong              ulGRight;
} DbvLeftAndRight;


typedef struct DbvIso2022Proposal {
DbvEnvironment             *psProposedEnvironment;
Ulong                      **ppulProposedSets;
DbvInitialSet              **ppsProposedInitialSets;
DbvLeftAndRight            *psProposedLeftAndRight;
} DbvIso2022Proposal;


typedef struct DbvIso2022Response {
DbvEnvironment             *psSelectedEnvironment;
Ulong                      **ppulSelectedSets;
DbvInitialSet              *psSelectedInitialSet;
DbvLeftAndRight            *psSelectedLeftAndRight;
} DbvIso2022Response;


typedef struct DbvIso2022 {
DbvIso2022Type eIso2022Type;
union {
     DbvIso2022Proposal           *psOriginProposal;
     DbvIso2022Response           *psTargetResponse;
   } uIso2022Type;
} DbvIso2022;


typedef struct DbvIso10646 {
DbvObjectIdentifier        pcCollections;
DbvObjectIdentifier        pcEncodingLevel;
} DbvIso10646;


typedef enum DbvPrivateCharacterSetType {
   PCST_ViaOid             = 1,
   PCST_ExternallySpecified = 2,
   PCST_PreviouslyAgreedUpon = 3,
   PCST_Invalid            = -1
} DbvPrivateCharacterSetType;


typedef struct DbvPrivateCharacterSet {
DbvPrivateCharacterSetType ePrivateCharacterSetType;
union {
```

```
    DbvObjectIdentifier            *ppcViaOid;
    DbvASN1External                *psExternallySpecified;
  } uPrivateCharacterSet;
} DbvPrivateCharacterSet;


typedef struct DbvProposedCharSet {
DbvProposedCharSetType eProposedCharSetType;
union {
    DbvIso2022           *psIso2022;
    DbvIso10646          *psIso10646;
    DbvPrivateCharacterSet *psPrivate;
  } uProposedCharSet;
} DbvProposedCharSet;


typedef struct DbvOriginProposal {
DbvProposedCharSet           **ppsProposedCharSets;
DbvLanguageCode              **ppsProposedLanguages;
DbvBool                       *pfRecordsInSelectedCharSets;
} DbvOriginProposal;


typedef enum DbvSelectedCharSetType {
   SCST_Iso2022  = 1,
   SCST_Iso10646 = 2,
   SCST_Private  = 3,
   SCST_None     = 4,
   SCST_Invalid  = -1
} DbvSelectedCharSetType;


typedef struct DbvSelectedCharSet {
DbvSelectedCharSetType eSelectedCharSetType;
union {
    DbvIso2022           *psIso2022;
    DbvIso10646          *psIso10646;
    DbvPrivateCharacterSet *psPrivate;
  } uSelectedCharSet;
} DbvSelectedCharSet;


typedef struct DbvTargetResponse {
DbvSelectedCharSet           *psSelectedCharSets;
DbvGeneralString             *psSelectedLanguage;
DbvBool                      *pfRecordsInSelectedCharSets;
} DbvTargetResponse;
```

```
typedef struct DbvCharSetAndLanguage {
DbvCharSetAndLanguageType eCharSetAndLanguageType;
union {
     DbvOriginProposal *psProposal;
     DbvTargetResponse *psResponse;
   } uCharSetAndLanguage;
} DbvCharSetAndLanguage;
```

2.5.11 Character Set And Language Negotiation 2

the seconf defined external.

```
typedef enum DbvCharSetAndLanguageType DbvCharSetAndLanguageType2;
typedef enum DbvProposedCharSetType DbvProposedCharSetType2;
typedef enum DbvIso2022Type DbvIso2022Type2;
typedef enum DbvEnvironmentType DbvEnvironmentType2;


typedef struct DbvEnvironment2 {
DbvEnvironmentType2 eEnvironmentType;
} DbvEnvironment2;


typedef struct DbvInitialSet2 {
Ulong             *pulG0;
Ulong             *pulG1;
Ulong             *pulG2;
Ulong             *pulG3;
Ulong              ulC0;
Ulong             *pulC1;
} DbvInitialSet2;


typedef struct DbvLeftAndRight2 {
Ulong              ulGLeft;
Ulong             *pulGRight;
} DbvLeftAndRight2;


typedef struct DbvIso2022Proposal2 {
DbvEnvironment2            *psProposedEnvironment;
Ulong                   **ppulProposedSets;
DbvInitialSet2           **ppsProposedInitialSets;
DbvLeftAndRight2          *psProposedLeftAndRight;
} DbvIso2022Proposal2;
```

```
typedef struct DbvIso2022Response2 {
DbvEnvironment2              *psSelectedEnvironment;
Ulong                      **ppulSelectedSets;
DbvInitialSet2              *psSelectedInitialSet;
DbvLeftAndRight2            *psSelectedLeftAndRight;
} DbvIso2022Response2;


typedef struct DbvIso20222 {
DbvIso2022Type2 eIso2022Type;
union {
    DbvIso2022Proposal2            *psOriginProposal;
    DbvIso2022Response2            *psTargetResponse;
  } uIso2022Type;
} DbvIso20222;


typedef struct DbvIso106462 {
DbvObjectIdentifier         pcCollections;
DbvObjectIdentifier         pcEncodingLevel;
} DbvIso106462;


typedef enum DbvPrivateCharacterSetType DbvPrivateCharacterSetType2;

typedef struct DbvPrivateCharacterSet2 {
DbvPrivateCharacterSetType2 ePrivateCharacterSetType;
union {
    DbvObjectIdentifier           *ppcViaOid;
    DbvASN1External               *psExternallySpecified;
  } uPrivateCharacterSet;
} DbvPrivateCharacterSet2;


typedef struct DbvProposedCharSet2 {
DbvProposedCharSetType2 eProposedCharSetType;
union {
    DbvIso20222          *psIso2022;
    DbvIso106462         *psIso10646;
    DbvPrivateCharacterSet2 *psPrivate;
  } uProposedCharSet;
} DbvProposedCharSet2;


typedef struct DbvOriginProposal2 {
DbvProposedCharSet2         **ppsProposedCharSets;
```

```
DbvLanguageCode              **ppsProposedLanguages;
DbvBool                       *pfRecordsInSelectedCharSets;
} DbvOriginProposal2;


typedef enum DbvSelectedCharSetType   DbvSelectedCharSetType2;


typedef struct DbvSelectedCharSet2 {
DbvSelectedCharSetType2 eSelectedCharSetType;
union {
     DbvIso20222            *psIso2022;
     DbvIso106462           *psIso10646;
     DbvPrivateCharacterSet2 *psPrivate;
   } uSelectedCharSet;
} DbvSelectedCharSet2;


typedef struct DbvTargetResponse2 {
DbvSelectedCharSet2          *psSelectedCharSets;
DbvGeneralString             *psSelectedLanguage;
DbvBool                      *pfRecordsInSelectedCharSets;
} DbvTargetResponse2;


typedef struct DbvCharSetAndLanguage2 {
DbvCharSetAndLanguageType2 eCharSetAndLanguageType;
union {
     DbvOriginProposal2 *psProposal;
     DbvTargetResponse2 *psResponse;
   } uCharSetAndLanguage;
} DbvCharSetAndLanguage2;
```


2.5.12 Extended Services Externals

2.5.12.1 Update Extended Service

```
typedef enum DbvUpdtAction {
                    UA_RecordInsert  = 1,
                    UA_RecordReplace = 2,
                    UA_RecordDelete  = 3,
                    UA_ElementUpdate = 4,
                    UA_Invalid       = -1
```

```
} DbvUpdtAction;


typedef enum DbvUpdtTaskStatus {
                UTS_Success  = 1,
                UTS_Partial  = 2,
                UTS_Failure  = 3,
                UTS_Invalid  = -1
} DbvUpdtTaskStatus;


typedef enum DbvUpdtRecordStatus {
                URST_Success   = 1,
                URST_Queued    = 2,
                URST_InProcess = 3,
                URST_Failure   = 4,
                URST_Invalid   = -1
} DbvUpdtRecordStatus;


typedef enum DbvUpdtRecordOrDiagType {
                URDT_Record     = 1,
                URDT_Diagnostic = 2
} DbvUpdtRecordOrDiagType;


typedef enum DbvUpdtSupplementalIdType {
                USIT_Time            = 1,
                USIT_Version         = 2,
                USIT_PreviousVersion = 3
} DbvUpdtSupplementalIdType;


typedef enum DbvUpdtRecordIdType {
                URIT_Number = 1,
                URIT_String = 2,
                URIT_Opaque = 3
} DbvUpdtRecordIdType;


typedef struct DbvUpdtRecordOrDiag {
DbvUpdtRecordOrDiagType       eUpdtRecordOrDiag;
union {
    DbvASN1External       *psRecord;
    DbvDiagRec            *psDiagnostic;
    }                      uUpdtRecordOrDiag;
} DbvUpdtRecordOrDiag;


typedef struct DbvCorrelationInfo {
DbvInternationalString  *psNote;
Ulong                   *pulId;
} DbvCorrelationInfo;
```

```
typedef struct DbvTaskPackageRecord {
DbvUpdtRecordOrDiag        *psUpdtRecordOrDiag;
DbvCorrelationInfo         *psCorrelationInfo;
DbvUpdtRecordStatus         eUpdtRecordStatus;
} DbvTaskPackageRecord;


typedef struct DbvUpdateTargetPart {
DbvUpdtTaskStatus           eTaskStatus;
DbvDiagRec                **ppsGlobalDiagnostics;
DbvTaskPackageRecord      **ppsTaskPackageRecord;
} DbvUpdateTargetPart;


typedef struct DbvUpdtSupplementalId {
DbvUpdtSupplementalIdType    eSupplementalIdType;
union {
    DbvGeneralizedTime      pcTime;
    DbvInternationalString *psVersion;
    DbvASN1External        *psPreviousVersion;
  }                           uUpdtSupplementalId;
} DbvUpdtSupplementalId;


typedef struct DbvUpdtRecordId {
DbvUpdtRecordIdType    eRecordIdType;
union {
    Ulong                   ulNumber;
    DbvInternationalString *psString;
    DbvOctetString         *psOpaque;
  }                  uUpdtRecordId;
} DbvUpdtRecordId;


typedef struct DbvSuppliedRecord {
DbvUpdtRecordId            *psUpdtRecordId;
DbvUpdtSupplementalId      *psUpdtSupplementalId;
DbvCorrelationInfo         *psCorrelationInfo;
DbvASN1External             sRecord;
} DbvSuppliedRecord;


typedef struct DbvOriginPartToKeep {
DbvUpdtAction               eAction;
DbvInternationalString      sDatabaseName;
DbvObjectIdentifier         pcSchema;
DbvInternationalString     *psElementSetName;
} DbvOriginPartToKeep;


typedef struct DbvUpdateTaskPackage {
DbvOriginPartToKeep       sOriginPartToKeep;
DbvUpdateTargetPart       sTargetPart;
} DbvUpdateTaskPackage;
```

```
typedef struct DbvUpdateRequestPackage {
DbvOriginPartToKeep    sOriginPartToKeep;
DbvSuppliedRecord    **ppsSuppliedRecord;
} DbvUpdateRequestPackage;


typedef enum DbvUpdateReqOrRsp {
                   UROR_Request  = 1,
                   UROR_Response = 2
} DbvUpdateReqOrRsp;


typedef struct DbvUpdateExtendedService {
DbvUpdateReqOrRsp     eUpdateReqRsp;
union {
    DbvUpdateRequestPackage  *psUpdateRequest;
    DbvUpdateTaskPackage     *psUpdateResponse;
}                 uUpdateReqOrRsp;
} DbvUpdateExtendedService;
```

2.5.12.2 Export Specification Extended Service

```
typedef enum DbvExpSpecReqOrRsp {
                   ESROR_Request  = 1,
                   ESROR_Response = 2,
                   ESROR_Invalid = -1
} DbvExpSpecReqOrRsp;


typedef struct DbvExpSpecOriginPartToKeep
{
DbvCompSpec     sComposition;
DbvDestination  sExportDestination;
} DbvExpSpecOriginPartToKeep;


typedef struct DbvExpSpecRequestPackage
{
DbvExpSpecOriginPartToKeep sToKeep;
} DbvExpSpecRequestPackage;


typedef struct DbvExpSpecTaskPackage
{
DbvExpSpecOriginPartToKeep sOriginPart;
} DbvExpSpecTaskPackage;
```

```
typedef struct DbvExpSpecExtendedService
{
DbvExpSpecReqOrRsp eExpSpecReqOrRsp;
union {
    DbvExpSpecRequestPackage    *psExpSpecRequest;
    DbvExpSpecTaskPackage       *psExpSpecResponse;
  } uExpSpecReqOrRsp;
} DbvExpSpecExtendedService;
```

2.5.12.3 Export Invocation Extended Service

```
typedef enum DbvExpInvoReqOrRsp {
                  EIROR_Request  = 1,
                  EIROR_Response = 2,
                  EIROR_Invalid = -1
} DbvExpInvoReqOrRsp;


typedef enum DbvExpInvoOriginPartToKeepChoiceType {
   EI_PackageName = 1,
   EI_PackageSpec = 2,
   EI_Invalid     = -1
} DbvExpInvoOriginPartToKeepChoiceType;


typedef struct DbvExpInvoOriginPartToKeepChoice
{
DbvExpInvoOriginPartToKeepChoiceType eExpInvoOriginPartToKeepChoiceType;
union {
     DbvInternationalString        *psPackageName;
     DbvExpSpecExtendedService     *psPackageSpec;
   } uExpInvoOriginPartToKeepChoice;
} DbvExpInvoOriginPartToKeepChoice;


typedef struct DbvExpInvoOriginPartToKeep
{
DbvExpInvoOriginPartToKeepChoice    sExportSpec;
Ulong                               ulNumberOfCopies;
} DbvExpInvoOriginPartToKeep;


typedef enum DbvExpInvoRecordsType {
  RTT_All     = 1,
```

```
  RTT_Ranges   = 2,
  RTT_Invalid  = -1
} DbvExpInvoRecordsType;


typedef struct DbvRanges
{
Ulong   ulstart;
Ulong  *pulCount;
} DbvRanges;


typedef struct DbvExpInvoRecords
{
DbvExpInvoRecordsType eExpInvoRecordsType;
union {
     DbvRanges **ppsRanges;
  } uExpInvoRecords;
} DbvExpInvoRecords;


typedef struct DbvExpInvoOriginPartNotToKeep
{
DbvInternationalString       sResultSetId;
DbvExpInvoRecords            sRecords;
} DbvExpInvoOriginPartNotToKeep;


typedef struct DbvExpInvoRequestPackage
{
DbvExpInvoOriginPartToKeep    sToKeep;
DbvExpInvoOriginPartNotToKeep sNotToKeep;
} DbvExpInvoRequestPackage;


typedef struct DbvExpInvoTargetPart
{
DbvIntUnit  *psEstimatedQuantity;
DbvIntUnit  *psQuantitySoFar;
DbvIntUnit  *psEstimatedCost;
DbvIntUnit  *psCostSoFar;
} DbvExpInvoTargetPart;


typedef struct DbvExpInvoTaskPackage
{
DbvExpInvoOriginPartToKeep sOriginPart;
DbvExpInvoTargetPart       sTargetPart;
```

```
} DbvExpInvoTaskPackage;


typedef struct DbvExpInvoExtendedService
{
DbvExpInvoReqOrRsp eExpInvoReqOrRsp;
union {
    DbvExpInvoRequestPackage    *psExpInvoRequest;
    DbvExpInvoTaskPackage       *psExpInvoResponse;
  } uExpInvoReqOrRsp;
} DbvExpInvoExtendedService;
```

2.5.12.4 Item Order Extended Service

```
/* When using this file with other DBV-OSI II includes, include as follows

#include "sidefs.h"
#include "sitypes.h"
#include "sitypes2.h"
#include "dbvproto.h"
#include "iord_ext.h"
#include "itemordr.h"

*/



#if !defined(ITEMORDER_H)
#define ITEMORDER_H


typedef enum DbvEsIoAuxiliaryStatus {
            IOAS_NotReceived      = 1,
            IOAS_LoanQueue        = 2,
            IOAS_Forwarded        = 3,
            IOAS_UnfilledCopyright = 4,
            IOAS_FilledCopyright  = 5,
            IOAS_Invalid          = -1
} DbvEsIoAuxiliaryStatus;

typedef enum DbvEsIoPaymentMethodType {
            IOPM_BillInvoice          = 1,
            IOPM_Prepay               = 2,
            IOPM_DepositAccount       = 3,
            IOPM_CreditCard           = 4,
            IOPM_CardInfoPrevSupplied = 5,
```

```
            IOPM_PrivateKnown           = 6,
            IOPM_PrivateNotKnown        = 7,
            IOPM_Invalid                = -1
} DbvEsIoPaymentMethodType;


typedef struct DbvEsIoTargetPart {
DbvASN1External               *psItemRequest;          /* ILL ItemOrder PDU */
DbvASN1External               *psStatusOrErrorReport;
DbvEsIoAuxiliaryStatus        *peAuxiliaryStatus;
} DbvEsIoTargetPart;


typedef struct DbvEsIoResultSetItem {
DbvInternationalString    sResultSetId;
Ulong                     ulItem;
} DbvEsIoResultSetItem;


typedef struct DbvEsIoOriginPartNotToKeep {
DbvEsIoResultSetItem      *psResultSetItem;
DbvASN1External           *psItemRequest;      /* ILL ItemOrder */
} DbvEsIoOriginPartNotToKeep;


typedef struct DbvEsIoCreditCardInfo {
DbvInternationalString    sNameOnCard;
DbvInternationalString    sExpirationDate;
DbvInternationalString    sCardNumber;
} DbvEsIoCreditCardInfo;


typedef union uPaymentMethod {
    DbvEsIoCreditCardInfo  *psCreditCardInfo;
    DbvASN1External        *psPrivateNotKnown;
} uPaymentMethod;

typedef struct DbvEsIoPaymentMethod {
DbvEsIoPaymentMethodType          ePaymentMethodType;
uPaymentMethod                    *puPaymentMethod;
} DbvEsIoPaymentMethod;


typedef struct DbvEsIoAdditionalBilling {
DbvEsIoPaymentMethod      sPaymentMethod;
DbvInternationalString    *psCustomerReference;
DbvInternationalString    *psCustomerPONumber;
```

```
} DbvEsIoAdditionalBilling;


typedef struct DbvEsIoContact {
DbvInternationalString    *psName;
DbvInternationalString    *psPhone;
DbvInternationalString    *psEmail;
} DbvEsIoContact;


typedef struct DbvEsIoOriginPartToKeep {
DbvASN1External           *psSupplementalDescription;
DbvEsIoContact            *psContact;
DbvEsIoAdditionalBilling *psAdditionalBilling;
} DbvEsIoOriginPartToKeep;


typedef struct DbvEsIoRequest {
DbvEsIoOriginPartToKeep      *psToKeep;
DbvEsIoOriginPartNotToKeep    sNotToKeep;
} DbvEsIoRequest;


typedef struct DbvEsIoTaskPackage {
DbvEsIoOriginPartToKeep      *psOriginPart;
DbvEsIoTargetPart           sTargetPart;
} DbvEsIoTaskPackage;



typedef enum DbvItemOrderReqOrRsp {
                  IOROR_Request  = 1,
                  IOROR_Response = 2
} DbvItemOrderReqOrRsp;


typedef struct DbvItemOrderExtendedService {
DbvItemOrderReqOrRsp     eItemOrderReqRsp;
union {
    DbvEsIoRequest              *psItemOrderRequest;
    DbvEsIoTaskPackage         *psItemOrderResponse;
  }               uItemOrderReqOrRsp;
} DbvItemOrderExtendedService;
```

2.5.12.5 Update Extended Service for Union Catalogue Profile

```
typedef enum DbvUcpUpdtAction {
                        UUA_RecordInsert  = 1,
                        UUA_RecordReplace = 2,
                        UUA_RecordDelete  = 3,
                        UUA_ElementUpdate = 4,
                        UUA_SpecialUpdate = 5,
                        UUA_Invalid       = -1
} DbvUcpUpdtAction;


typedef struct DbvUcpOriginPartToKeep {
DbvUcpUpdtAction            eAction;
DbvInternationalString      sDatabaseName;
DbvObjectIdentifier         pcSchema;
DbvInternationalString     *psElementSetName;
DbvASN1External            *psActionQualifier;
} DbvUcpOriginPartToKeep;


typedef struct DbvUcpUpdtRecordOrSurDiag {
DbvUpdtRecordOrSurDiagType      eUpdtRecordOrSurDiag;
union {
    DbvASN1External        *psRecord;
    DbvDiagRec            **ppsSurrogateDiagnostics;
  }                         uUpdtRecordOrSurDiag;
} DbvUcpUpdtRecordOrSurDiag;


typedef struct DbvUcpTaskPackageRecord {
DbvUcpUpdtRecordOrSurDiag    *psUpdtRecordOrSurDiag;
DbvCorrelationInfo           *psCorrelationInfo;
DbvUpdtRecordStatus           eUpdtRecordStatus;
DbvDiagRec                  **ppsSupplementalDiagnostics;
} DbvUcpTaskPackageRecord;


typedef struct DbvUcpUpdateTargetPart {
DbvUpdtTaskStatus            eTaskStatus;
DbvDiagRec                 **ppsGlobalDiagnostics;
DbvUcpTaskPackageRecord    **ppsTaskPackageRecord;
} DbvUcpUpdateTargetPart;


typedef struct DbvUcpUpdateTaskPackage {
DbvUcpOriginPartToKeep      sOriginPartToKeep;
DbvUcpUpdateTargetPart      sTargetPart;
```

```
} DbvUcpUpdateTaskPackage;


typedef struct DbvUcpUpdateRequestPackage {
DbvUcpOriginPartToKeep     sOriginPartToKeep;
DbvSuppliedRecord          **ppsSuppliedRecord;
} DbvUcpUpdateRequestPackage;


typedef struct DbvUcpUpdateExtendedService {
DbvUpdateReqOrRsp      eUpdateReqRsp;
union {
    DbvUcpUpdateRequestPackage  *psUpdateRequest;
    DbvUcpUpdateTaskPackage     *psUpdateResponse;
   }              uUpdateReqOrRsp;
} DbvUcpUpdateExtendedService;
```

2.6 External for SUBITO Project

```
typedef enum DbvRequesterGroup {
          RG_UserGroup1           = 1,
          RG_UserGroup2           = 2
} DbvRequesterGroup;


typedef enum DbvStatusLevelUser {
          SLU_All      = 1,
          SLU_Negative      = 2,
          SLU_None     = 3
} DbvStatusLevelUser;


typedef enum DbvStatusLevelRequester {
          SLO_All      = 1,
          SLO_Negative      = 2,
          SLO_None     = 3
} DbvStatusLevelRequester;


typedef enum DbvBillingInvoiceType {
          BIT_Single  = 1,
          BIT_Collective    = 2
} DbvBillingInvoiceType;


typedef enum DbvAddBillingType {
          ABT_BankInfo                = 1,
          ABT_CreditCardInfo          = 2,
          ABT_InvoiceType        = 3,
          ABT_PrepaidType             = 4,
          ABT_DepositType             = 5
} DbvAddBillingType;


/* ----------------------------------------------------------------
   additional requester information
----------------------------------------------------------------*/

typedef struct DbvAddRequesterInfo {
DbvRequesterGroup *peRequesterGroup;          /* default RG_UserGroup1 */
DbvVisibleString   pcRequesterEmailAddress;   /* opt. */
} DbvAddRequesterInfo;
```

```
/* ---------------------------------------------------------------------
   additional delivery information
----------------------------------------------------------------------*/

typedef struct DbvAddDeliveryInfo {
DbvStatusLevelUser        *peStatusLevelUser;          /* default SLU_Negative
*/
DbvStatusLevelRequester  *peStatusLevelOrigin;        /* default SLO_None */
DbvVisibleString    pcDeliveryNotes;              /* opt. */
DbvVisibleString    pcCountryDeliveryTarget;      /* opt */
DbvBool                  *pfAlternativePostalDelivery;/* default FALSE */
} DbvAddDeliveryInfo;


/* ---------------------------------------------------------------------
   additional billing information
----------------------------------------------------------------------*/

typedef struct DbvBillingBankInfo {
DbvVisibleString    pcBankAccountHouse;           /* mand */
DbvVisibleString    pcBankAccountRoutingSymbol;  /* mand */
DbvVisibleString         pcBankAccountNo;               /* mand */
DbvBool                  fBankAuthority;
} DbvBillingBankInfo;


typedef struct DbvBillingCreditCardInfo {
DbvVisibleString  pcCardCompany;          /* mand */
DbvVisibleString  pcCardNo;         /* mand */
DbvVisibleString  pcCardValidFrom;  /* opt */
DbvVisibleString  pcCardValidThru;  /* mand */
} DbvBillingCreditCardInfo;


typedef struct DbvAddBillingInfo {
DbvAddBillingType        eAddBillingType;
union {
     DbvBillingBankInfo           *psBillingBankInfo;
     DbvBillingCreditCardInfo     *psBillingCreditCardInfo;
     DbvBillingInvoiceType         eBillingInvoiceType;
     DbvVisibleString         pcPrepaidId;
     DbvVisibleString         pcDepositId;
  }                 uAddBillingInfo;
} DbvAddBillingInfo;


typedef struct DbvSubitoAdditionalInfo {
DbvBool                       *pfCustomerInfoToKeep; /* default FALSE */
```

```
DbvAddRequesterInfo              *psAddRequesterInfo;
DbvAddDeliveryInfo               *psAddDeliveryInfo;
DbvAddBillingInfo        *psAddBillingInfo;
} DbvSubitoAdditionalInfo;
```

2.7 Externals Private to European Space Agency for use in EINS/MIRO

2.7.1 Print Extended Service

This is used to request the target issues a print-out of the selected records.

```
typedef enum DbvPrintOriginPartToKeepType {
                POPKT_Create = 1,
                POPKT_Delete = 2,
                POPKT_Invalid = -1
} DbvPrintOriginPartToKeepType;


typedef enum DbvCreateOptionType {
                COPT_ResultSetReference = 1,
                COPT_AccessionReference  = 2,
                COPT_Invalid            = -1
} DbvCreateOptionType;


typedef struct DbvAddress {
DbvInternationalString       sPostalAddress;
DbvInternationalString      *psEmailAddress;
} DbvAddress;


typedef struct DbvResultSetReference {
DbvInternationalString       sResultSetId;
Ulong                        ulResultSetStartPoint;
Ulong                        ulNumberOfRecordsRequested;
DbvRange                   **ppsAdditionalRanges;
DbvRecordComposition        *psRecordComposition;
DbvAddress                   sAddress;
} DbvResultSetReference;


typedef struct DbvAccessionReference {
DbvInternationalString       sReferenceId;
DbvRecordComposition        *psRecordComposition;
DbvAddress                   sAddress;
} DbvAccessionReference;


typedef struct DbvCreateOption {
DbvCreateOptionType     eCreateOptionType;
```

```
union {
    DbvResultSetReference  *psResultSetReference;
    DbvAccessionReference  *psAccessionReference;
  }                uCreateOption;
} DbvCreateOption;


typedef struct DbvDeleteOption {
DbvInternationalString      sJobReference;
} DbvDeleteOption;


typedef struct DbvPrintOriginPartToKeep {
DbvPrintOriginPartToKeepType    ePrintOriginPartToKeepType;
union {
    DbvCreateOption  *psCreateOption;
    DbvDeleteOption  *psDeleteOption;
  }                uPrintOriginPartToKeep;
} DbvPrintOriginPartToKeep;


typedef struct DbvPrintRequestPackage {
DbvPrintOriginPartToKeep    *psOriginPartToKeep;
/* No OrignPartNotToKeep */
} DbvPrintRequestPackage;


typedef struct DbvPrintTargetPartToKeep {
DbvInternationalString      sJobReference;
} DbvPrintTargetPartToKeep;


typedef struct DbvPrintTaskPackage {
DbvPrintOriginPartToKeep      *psOriginPartToKeep;
DbvPrintTargetPartToKeep      sTargetPart;
} DbvPrintTaskPackage;


typedef enum DbvPrintReqOrRsp {
                PROR_Request  = 1,
                PROR_Response = 2,
                PROR_Invalid  = -1
} DbvPrintReqOrRsp;


typedef struct DbvPrintExtendedService {
DbvPrintReqOrRsp     ePrintReqRsp;
union {
```

```
    DbvPrintRequestPackage  *psPrintRequest;
    DbvPrintTaskPackage     *psPrintResponse;
  }                 uPrintReqOrRsp;
} DbvPrintExtendedService;
```

2.7.2 Alert Extended Service

The Alert Extended service allows the origin/target to assign a name to a
session which can be re-invoked at any subsequent sesison, also used for SDI
operations.

```
typedef struct DbvAlertOriginPartToKeep {
DbvInternationalString      sAlertName;
DbvAddress                  *psAddress;
} DbvAlertOriginPartToKeep;


typedef struct DbvAlertRequestPackage {
DbvAlertOriginPartToKeep     *psOriginPartToKeep;
/* No OrignPartNotToKeep */
} DbvAlertRequestPackage;


typedef struct DbvAlertTaskPackage {
DbvAlertOriginPartToKeep     *psOriginPartToKeep;
/* No TargetPart */
} DbvAlertTaskPackage;


typedef enum DbvAlertReqOrRsp {
                  AROR_Request  = 1,
                  AROR_Response = 2,
                  AROR_Invalid  = -1
} DbvAlertReqOrRsp;


typedef struct DbvAlertExtendedService {
DbvAlertReqOrRsp     eAlertReqRsp;
union {
    DbvAlertRequestPackage  *psAlertRequest;
    DbvAlertTaskPackage     *psAlertResponse;
  }                 uAlertReqOrRsp;
} DbvAlertExtendedService;
```

2.7.3 COrder Extended Service

Allows for a range of items to be ordered from a result set.

```
typedef struct DbvNormalOrder {
DbvRange                **ppsOrderRanges;
Ulong                   ulQuantity;
} DbvNormalOrder;


typedef enum DbvOrderRequestType {
                  ORT_NormalOrder = 1,
                  ORT_OrderRefs   = 2,
                  ORT_Invalid     = -1
} DbvOrderRequestType;


typedef struct DbvOrderRequest {
DbvOrderRequestType       eOrderRequestType;
union {
    DbvNormalOrder              *psNormalOrder;
    DbvInternationalString    **ppsOrderRefs;
  }             uOrderRequest;
} DbvOrderRequest;


typedef enum DbvCOrderType {
                  COT_OrderRequest  = 1,
                  COT_OrderResponse = 2,
                  COT_Invalid       = -1
} DbvCOrderType;


typedef struct DbvCOrder {
DbvCOrderType         eCOrderType;
union {
    DbvOrderRequest                *psOrderRequest;
    DbvInternationalString     **ppsOrderResponse;
  }             uCOrder;
} DbvCOrder;
```

2.7.4 COrder Extended Service - issue 2

Allows for a range of items to be ordered from a result set.

```
typedef struct DbvNormalOrder2 {
```

```
DbvRange                **ppsOrderRanges;
Ulong                   ulQuantity;
} DbvNormalOrder2;


typedef enum DbvOrderRequestType2 {
                   ORT2_NormalOrder = 1,
                   ORT2_OrderRefs   = 2,
                   ORT2_Invalid     = -1
} DbvOrderRequestType2;


typedef struct DbvOrderRequest2 {
DbvOrderRequestType2         eOrderRequestType;
union {
    DbvNormalOrder2              *psNormalOrder;
    DbvInternationalString    **ppsOrderRefs;
  }               uOrderRequest2;
} DbvOrderRequest2;


typedef enum DbvCOrderType2 {
                   COT2_OrderRequest  = 1,
                   COT2_OrderResponse = 2,
                   COT2_Invalid       = -1
} DbvCOrderType2;


typedef struct DbvCOrder2 {
DbvCOrderType2        eCOrderType;
union {
    DbvOrderRequest2             *psOrderRequest;
    DbvInternationalString    **ppsOrderResponse;
  }               uCOrder;
} DbvCOrder2;
```

2.8 Externals used in CIP 2.2

2.8.1 CIP 2.2 Specific Info External

```
typedef enum DbvSearchControlInt1 {
      SCI1_LocalSearch  = 1,
      SCI1_WideSearch         = 2
} DbvSearchControlInt1;


typedef enum DbvSearchControlInt {
      SCI_CollectionDescriptorSearch      = 1,
      SCI_ProductDescriptorSearch   = 2
} DbvSearchControlInt;


typedef DbvInternationalString DbvCoordinate;

typedef struct DbvTemporalPeriod
{
DbvInternationalString sStartDate;
DbvIntUnit                sPeriodDuration;
DbvIntUnit                sPeriodCycle;
} DbvTemporalPeriod;


typedef struct DbvAdditionalSemanticAttributes {
DbvInternationalString *psShortMeaning;
DbvUnit               *psUnit;
DbvInternationalString *psSpecificInstance;
DbvInternationalString *psComment;
DbvInternationalString  sVersion;
DbvInternationalString  sValueSyntax;
} DbvAdditionalSemanticAttributes;


typedef struct DbvSearchControl {
DbvSearchControlInt  eItemDescriptorType;
DbvSearchControlInt1 eSearchScope;
} DbvSearchControl;


typedef struct DbvWRSGRSSpatialCoverage {
Ulong   ulTrack;
Ulong **ppsFrames;
```

```
} DbvWRSGRSSpatialCoverage;


typedef struct DbvPoint {
DbvCoordinate sLatitude;
DbvCoordinate sLongitude;
} DbvPoint;


typedef struct DbvCircle {
DbvPoint    sPoint;
DbvIntUnit sRadius;
} DbvCircle;


typedef enum DbvCIPTermType {
        CTT_Wrsgrs          = 1,
        CTT_Circle          = 2,
        CTT_TemporalPeriod  = 3
} DbvCIPTermType;


typedef struct DbvCIPTerm {
DbvCIPTermType eCIPTermType;
union {
    DbvWRSGRSSpatialCoverage *psWrsgrs;
    DbvCircle                *psCircle;
    DbvTemporalPeriod        *psTemporalPeriod;
    }                   uCIPTermType;
} DbvCIPTerm;


typedef enum DbvCIPSpecificInfoType {
        CSIT_SearchControl   = 1,
        CSIT_Term            = 2,
        CSIT_ExplainInfo     = 3
} DbvCIPSpecificInfoType;


typedef struct DbvCIPSpecificInfo {
DbvCIPSpecificInfoType eCIPSpecificInfoType;
union {
    DbvSearchControl                *psSearchControl;
    DbvCIPTerm                      *psTerm;
    DbvAdditionalSemanticAttributes *psExplainInfo;
    }                   uCIPSpecificInfo;
```

```
} DbvCIPSpecificInfo;
```

2.8.1 CIP 2.2 Order Extended Service

```
typedef struct DbvCipBEsIoTargetPart {
DbvInternationalString orderId;
DbvOrderSpecification *orderSpecification;        /* OPTIONAL */
DbvOrderStatusInfo *orderStatusInfo;              /* OPTIONAL */
DbvUserInformation *userInformation;              /* OPTIONAL */
DbvOtherInformation **otherInfo;            /* OPTIONAL */
} DbvCipBEsIoTargetPart;


typedef struct DbvCipBEsIoResultSetItem {
DbvInternationalString    sResultSetId;
Ulong                     ulItem;
} DbvCipBEsIoResultSetItem;


typedef struct DbvCipBEsIoOriginPartNotToKeep {
DbvInternationalString orderId;                          /* OPTIONAL */
DbvOrderSpecification *orderSpecification;        /* OPTIONAL */
DbvUserInformation *userInformation;              /* OPTIONAL */
DbvOtherInformation **otherInfo;            /* OPTIONAL */
} DbvCipBEsIoOriginPartNotToKeep;

typedef struct DbvCipBEsIoOriginPartToKeep {
DbvOriginPartToKeepInt action;                          /* IMPLICIT */
DbvInternationalString orderId;                         /* OPTIONAL */
DbvOrderSpecification *orderSpecification;        /* OPTIONAL */
DbvStatusUpdateOption *statusUpdateOption;        /* OPTIONAL */
DbvUserInformation *userInformation;              /* OPTIONAL */
DbvOtherInformation **otherInfo;            /* OPTIONAL */
} DbvCipBEsIoOriginPartToKeep;


typedef struct DbvCipBEsIoRequest {
DbvCipBEsIoOriginPartToKeep    *psToKeep;
DbvCipBEsIoOriginPartNotToKeep       *psNotToKeep;
} DbvCipBEsIoRequest;


typedef struct DbvCipBEsIoTaskPackage {
DbvCipBEsIoOriginPartToKeep    *psOriginPart;
DbvCipBEsIoTargetPart          *psTargetPart;
} DbvCipBEsIoTaskPackage;
```

```
typedef enum DbvCipBItemOrderReqOrRsp {
                   IOROR_CipBRequest  = 1,
                   IOROR_CipBResponse = 2
} DbvCipBItemOrderReqOrRsp;


typedef struct DbvCipBItemOrderExtendedService {
DbvCipBItemOrderReqOrRsp      eItemOrderReqRsp;
union {
    DbvCipBEsIoRequest                 *psItemOrderRequest;
    DbvCipBEsIoTaskPackage             *psItemOrderResponse;
  }              uItemOrderReqOrRsp;
} DbvCipBItemOrderExtendedService;


typedef enum DbvOriginPartToKeepInt2 {
              OKI_OrderEstimate       = 1,
              OKI_OrderQuoteandSubmit = 2,
              OKI_OrderMonitor1       = 3,
              OKI_OrderCancel1        = 4
} DbvOriginPartToKeepInt2;


typedef enum DbvPaymentMethodType2 {
        PMT2_BillInvoice              = 1,
        PMT2_Prepay                   = 2,
        PMT2_DepositAccount           = 3,
        PMT2_PrivateKnown             = 4,
        PMT2_PrivateNotKnown          = 5
} DbvPaymentMethodType2;


typedef struct DbvPaymentMethod2 {
DbvPaymentMethodType2 ePaymentMethodType;
union {
    DbvNull               pvBillInvoice;
    DbvNull               pvPrepay;
    DbvNull               pvDepositAccount;
    DbvNull               pvPrivateKnown;
    DbvASN1External       *psPrivateNotKnown;
  }                       uPaymentMethod;
} DbvPaymentMethod2;


typedef struct DbvCustomerReference {
```

```
DbvInternationalString      sCustomerId;
DbvInternationalString  **ppsAccounts;
} DbvCustomerReference;


typedef struct DbvBilling2 {
DbvPaymentMethod2          sPaymentMethod;
DbvCustomerReference       sCustomerReference;
DbvInternationalString  *psCustomerPONumber;
} DbvBilling2;


/* No account in this structure */
typedef struct DbvUserInformation2 {
DbvInternationalString  sUserId;
DbvInternationalString *psUserName;
DbvCipBPostalAddress    *psUserAddress;
DbvInternationalString *psTelNumber;
DbvInternationalString *psFaxNumber;
DbvInternationalString *psEmailAddress;
DbvInternationalString *psNetworkAddress;
DbvInternationalString *psAccount;
DbvBilling2             *psBilling;
} DbvUserInformation2;


/*   Need   this   redefiniton   because   of   DbvOriginPartToKeepInt2   and
DbvUserInformation2 change */
typedef struct DbvCipBEsIoOriginPartToKeep2 {
DbvOriginPartToKeepInt2         eAction;
DbvInternationalString          sOrderId;
struct DbvOrderSpecification2  *psOrderSpecification;
DbvStatusUpdateOption          *psStatusUpdateOption;
DbvUserInformation2            *psUserInformation;
DbvOtherInformation          **ppsOtherInfo;
} DbvCipBEsIoOriginPartToKeep2;


typedef struct DbvCipBEsIoOriginPartNotToKeep2 {
DbvInternationalString          sOrderId;
struct DbvOrderSpecification2  *psOrderSpecification;
DbvUserInformation2            *psUserInformation;
DbvOtherInformation          **ppsOtherInfo;
} DbvCipBEsIoOriginPartNotToKeep2;


typedef struct DbvCipBEsIoRequest2 {
DbvCipBEsIoOriginPartToKeep2  *psToKeep;
```

```
DbvCipBEsIoOriginPartNotToKeep2      *psNotToKeep;
} DbvCipBEsIoRequest2;


typedef enum DbvOrderStatusInfoType2 {
        OSIT2_StaticState        = 1,
        OSIT2_DynamicState       = 2
} DbvOrderStatusInfoType2;


typedef enum DbvStaticState {
        SS_OrderNotValid         = 1,
        SS_OrderEstimated        = 2,
        SS_OrderCompleted        = 3
} DbvStaticState;


typedef enum DbvDynamicState {
        DS_OrderBeingEstimated   = 1,
        DS_OrderBeingQuoted      = 2,
        DS_OrderBeingProcessed   = 3,
        DS_OrderBeingCancelled   = 4,
        DS_OrderBeingDeleted     = 5
} DbvDynamicState;


/* Putting in proper enumeration types for StaticState and
 DynamicState */
typedef struct DbvOrderStatusInfoChoice2 {
DbvOrderStatusInfoType2 eOrderStatusInfoType;
union {
    DbvStaticState  eStaticState;
    DbvDynamicState eDynamicState;
  }                  uOrderStatusInfo;
} DbvOrderStatusInfoChoice2;


typedef struct DbvOrderStatusInfo2 {
DbvOrderStatusInfoChoice2       sOrderState;
DbvInternationalString          *psAdditionalStatusInfo;
} DbvOrderStatusInfo2;


typedef enum DbvPackageSpecSecondChoiceType {
        PSSC_PredefinedPackage       = 1,
        PSSC_AdhocPackage            = 2
} DbvPackageSpecSecondChoiceType;
```

```
typedef enum DbvProcessingOptionsType {
        POT_FormattedProcessingOptions         = 1,
        POT_UnformattedProcessingOptions       = 2
} DbvProcessingOptionsType;


typedef struct DbvProcessingOptions
{
DbvProcessingOptionsType eProcessingOptionsType;
union {
    DbvASN1External            *psFormattedProcessingOptions;
    DbvInternationalString    *psUnformattedProcessingOptions;
    }                     uProcessingOptions;
} DbvProcessingOptions;


typedef enum DbvSceneSelectionOptionsType {
        POT_FormattedSceneSelectionOptions        = 1,
        POT_UnformattedSceneSelectionOptions      = 2
} DbvSceneSelectionOptionsType;


typedef struct DbvSceneSelectionOptions {
DbvSceneSelectionOptionsType eSceneSelectionOptionsType;
union {
    DbvASN1External            *psFormattedSceneSelectionOptions;
    DbvInternationalString    *psUnformattedSceneSelectionOptions;
    }                     uSceneSelectionOptions;
} DbvSceneSelectionOptions;


typedef struct DbvOrderItemSecond {
DbvInternationalString      sProductId;
DbvPriceInfo                *psProductPrice;
DbvProductDeliveryOptions *psProductDeliveryOptions;
DbvProcessingOptions       *psProcessingOptions;
DbvSceneSelectionOptions  *psSceneSelectionOptions;
DbvOrderStatusInfo2        *psOrderStatusInfo;
DbvOtherInformation       **ppsOtherInfo;
} DbvOrderItemSecond;


typedef struct DbvPredefinedPackage2 {
DbvInternationalString        sCollectionId;
DbvOrderItemSecond         **ppsOrderItems;
DbvOtherInformation        **ppsOtherInfo;
} DbvPredefinedPackage2;
```

```
typedef struct DbvPackageSpecSecondChoice {
DbvPackageSpecSecondChoiceType ePackageSpecSecondChoiceType;
union {
    DbvPredefinedPackage2  *psPredefinedPackage;
    DbvOrderItemSecond     **ppsAdHocPackage;
  }                     uPackageSpecSecondChoice;
} DbvPackageSpecSecondChoice;


typedef struct DbvPackageSpecSecond {
DbvInternationalString        sPackageId;
DbvPriceInfo                 *psPackagePrice;
DbvPackageSpecSecondChoice   *psPackage;
DbvInternationalString        sPackageMedium;
Ulong                         ulPackageKByteSize;
DbvOtherInformation          **ppsOtherInfo;
} DbvPackageSpecSecond;


typedef struct DbvDeliveryUnitSpecSecond {
DbvInternationalString  sDeliveryUnitId;
DbvPriceInfo            *psDeliveryUnitPrice;
DbvDeliveryMethod       *psDeliveryMethod;
DbvBilling2             *psBilling;
DbvPackageSpecSecond    **ppsPackages;
DbvOtherInformation     **ppsOtherInfo;
} DbvDeliveryUnitSpecSecond;


typedef struct DbvOrderSpecification2 {
DbvInternationalString        sOrderingCentreId;
DbvPriceInfo                 *psOrderPrice;
DbvInternationalString        sOrderDeliverDate;
DbvInternationalString        sOrderCancellationDate;
DbvDeliveryUnitSpecSecond **ppsDeliveryUnits;
DbvOtherInformation          **ppsOtherInfo;
} DbvOrderSpecification2;


typedef struct DbvCipBEsIoTargetPart2 {
DbvInternationalString  sOrderId;
DbvOrderSpecification2  *psOrderSpecification;
DbvOrderStatusInfo2     *psOrderStatusInfo;
DbvUserInformation2     *psUserInformation;
DbvOtherInformation     **ppsOtherInfo;
} DbvCipBEsIoTargetPart2;
```

```
typedef struct DbvCipBEsIoTaskPackage2 {
DbvCipBEsIoOriginPartToKeep2  *psOriginPart;
DbvCipBEsIoTargetPart2        *psTargetPart;
} DbvCipBEsIoTaskPackage2;


typedef struct DbvCipBItemOrderExtendedService2 {
DbvCipBItemOrderReqOrRsp     eItemOrderReqRsp;
union {
    DbvCipBEsIoRequest2               *psItemOrderRequest;
    DbvCipBEsIoTaskPackage2          *psItemOrderResponse;
  }              uItemOrderReqOrRsp;
} DbvCipBItemOrderExtendedService2;



#define AB_PUSH 0
#define AB_PULL 1

typedef Ulong DbvFTPDeliveryInt; /* INTEGER { PUSH(0), PULL(1) }  */

#define AB_EMAIL 1

typedef Ulong DbvStatusUpdateOptionInt; /* INTEGER { EMAIL(1) }  */

#define AB_ORDERQUOTEANDVALIDATE 1
#define AB_ORDERSUBMIT 2
#define AB_ORDERMONITOR 3
#define AB_ORDERCANCEL 4

typedef Ulong DbvOriginPartToKeepInt; /* INTEGER { ORDERQUOTEANDVALIDATE(1),
ORDERSUBMIT(2), ORDERMONITOR(3), ORDERCANCEL(4) }  */

#define AB_ORDERSUBMITTED 1
#define AB_ORDERBEINGPROCESSED 2
#define AB_ORDERCOMPLETED 3
#define AB_ORDERCANCELLED 4



typedef enum DbvPaymentMethodType {
     PMT_BILLINVOICE                  = 1,
     PMT_PREPAY               = 2,
     PMT_DEPOSITACCOUNT               = 3,
     PMT_CREDITCARD                   = 4,
     PMT_CARDINFOPREVIOUSLYSUPPLIED       = 5,
```

```
    PMT_PRIVATEKNOWN          = 6,
    PMT_PRIVATENOTKNOWN             = 7
} DbvPaymentMethodType;



typedef struct DbvCipCreditCardInfo {
DbvInternationalString sNameOnCard;
DbvInternationalString sExpirationDate;
DbvInternationalString sCardNumber;
} DbvCipCreditCardInfo;



typedef struct DbvPaymentMethod {
DbvPaymentMethodType ePaymentMethodType;
union {
    DbvNull              pvBillInvoice;
    DbvNull              pvPrepay;
    DbvNull              pvDepositAccount;
    DbvCipCreditCardInfo *psCreditCard;
    DbvNull              pvCardInfoPreviouslySupplied;
    DbvNull              pvPrivateKnown;
    DbvASN1External      *psPrivateNotKnown;
  }                      uPaymentMethod;
} DbvPaymentMethod;



typedef struct DbvBilling {
DbvPaymentMethod        sPaymentMethod;
DbvInternationalString  *psCustomerReference;
DbvInternationalString  *psCustomerPONumber;
} DbvBilling;



typedef enum DbvOtherInformationSeqChoiceChoiceId
{
    ABT__CHARACTERINFO,
    ABT_BINARYINFO,
    ABT_EXTERNALLYDEFINEDINFO,
    ABT_OID
} DbvOtherInformationSeqChoiceChoiceId;



typedef struct DbvOtherInformationSeqChoice /* CHOICE */
```

```
{
    DbvOtherInformationSeqChoiceChoiceId choiceId;
    union DbvOtherInformationSeqChoiceChoiceUnion
    {
    DbvInternationalString* characterInfo; /* [2] IMPLICIT InternationalString
*/
    DbvOctetString* binaryInfo; /* [3] IMPLICIT OCTET STRING */
    DbvASN1External* externallyDefinedInfo; /* [4] IMPLICIT EXTERNAL */
    DbvObjectIdentifier* oid; /* [5] IMPLICIT OBJECT IDENTIFIER */
    } a;
} DbvOtherInformationSeqChoice;




typedef struct DbvOtherInformationSeq /* SEQUENCE */
{
    DbvInfoCategory* category; /* [1] IMPLICIT InfoCategory OPTIONAL */
    DbvOtherInformationSeqChoice* information; /* OtherInformationSeqChoice */
} DbvOtherInformationSeq;




typedef enum DbvStatusUpdateOptionChoiceId
{
      ABT_MANUAL,
      ABT_AUTOMATIC
} DbvStatusUpdateOptionChoiceId;




typedef struct DbvStatusUpdateOption /* CHOICE */
{
    DbvStatusUpdateOptionChoiceId choiceId;
    union DbvStatusUpdateOptionChoiceUnion
    {
    DbvNull manual; /* [1] NULL */
    DbvStatusUpdateOptionInt automatic; /* [2] IMPLICIT StatusUpdateOptionInt
*/
    } a;
} DbvStatusUpdateOption;




typedef struct DbvFTPDelivery /* SEQUENCE */
{
    DbvFTPDeliveryInt transferDirection; /* [1] IMPLICIT FTPDeliveryInt */
    DbvInternationalString ftpAddress; /* [2] InternationalString */
} DbvFTPDelivery;
```

```
typedef struct DbvCipBPostalAddress /* SEQUENCE */
{
    DbvInternationalString streetaddress; /* [1] InternationalString */
    DbvInternationalString city; /* [2] InternationalString */
    DbvInternationalString state; /* [3] InternationalString */
    DbvInternationalString postalcode; /* [4] InternationalString */
    DbvInternationalString country; /* [5] InternationalString */
} DbvCipBPostalAddress;




typedef struct DbvUserInformation /* SEQUENCE */
{
    DbvInternationalString userId; /* [1] InternationalString */
    DbvInternationalString userName; /* [2] InternationalString OPTIONAL */
    DbvCipBPostalAddress* userAddress; /* [3] PostalAddress OPTIONAL */
    DbvInternationalString telNumber; /* [4] InternationalString OPTIONAL */
    DbvInternationalString faxNumber; /* [5] InternationalString OPTIONAL */
    DbvInternationalString emailAddress; /* [6] InternationalString OPTIONAL */
    DbvInternationalString networkAddress; /* [7] InternationalString OPTIONAL
*/
    DbvInternationalString account; /* [8] InternationalString OPTIONAL */
    DbvBilling* billing; /* [9] Billing OPTIONAL */
} DbvUserInformation;




typedef enum DbvDeliveryMethodChoiceId
{
        ABT_EMAIL,
        ABT_FTP,
        ABT_MAIL,
        ABT_OTHERINFO
} DbvDeliveryMethodChoiceId;




typedef struct DbvDeliveryMethod /* CHOICE */
{
    DbvDeliveryMethodChoiceId choiceId;
    union DbvDeliveryMethodChoiceUnion
    {
    DbvInternationalString* eMail; /* [1] InternationalString */
    DbvFTPDelivery* ftp; /* [2] FTPDelivery */
    DbvCipBPostalAddress* mail; /* [3] PostalAddress */
```

```
    DbvOtherInformation** otherInfo; /* [4] OtherInformation */
    } a;
} DbvDeliveryMethod;



typedef struct DbvProductDeliveryOptions /* SEQUENCE */
{
    Ulong* ProductByteSize; /* [1] INTEGER OPTIONAL */
    DbvInternationalString productFormat; /* [2] InternationalString OPTIONAL
*/
    DbvInternationalString  productCompression;  /*  [3]  InternationalString
OPTIONAL */
    DbvOtherInformation** otherInfo; /* [4] OtherInformation OPTIONAL */
} DbvProductDeliveryOptions;



typedef struct DbvPriceInfo /* SEQUENCE */
{
    DbvIntUnit* price; /* [1] IntUnit */
    DbvInternationalString priceExpirationDate; /* [2] InternationalString */
    DbvInternationalString  additionalPriceInfo;  /*  [3]  InternationalString
OPTIONAL */
} DbvPriceInfo;



typedef struct DbvOrderItem /* SEQUENCE */
{
    DbvInternationalString productId; /* [1] ItemDescriptorId */
    DbvPriceInfo* productPrice; /* [2] PriceInfo OPTIONAL */
    DbvProductDeliveryOptions*        productDeliveryOptions;        /*        [3]
ProductDeliveryOptions OPTIONAL */
    DbvInternationalString processingType; /* [4] InternationalString */
    DbvInternationalString  processingOptions;  /*  [5]  InternationalString
OPTIONAL */
    DbvInternationalString  sceneSelectionOptions;  /*  [6]  InternationalString
OPTIONAL */
    DbvOtherInformation** otherInfo; /* [7] OtherInformation OPTIONAL */
} DbvOrderItem;



typedef DbvOrderItem DbvPredefinedPackageSeqOf; /* SEQUENCE OF OrderItem */

typedef struct DbvPredefinedPackage /* SEQUENCE */
{
```

```
    DbvInternationalString collectionId; /* [1] ItemDescriptorId */
    DbvPredefinedPackageSeqOf** orderItems; /* [2] PredefinedPackageSeqOf */
    DbvOtherInformation** otherInfo; /* [3] OtherInformation OPTIONAL */
} DbvPredefinedPackage;



typedef DbvOrderItem DbvAdHocPackage; /* SEQUENCE OF OrderItem */

typedef enum DbvPackageSpecChoiceChoiceId
{
        ABT_PREDEFINEDPACKAGE,
        ABT_ADHOCPACKAGE
} DbvPackageSpecChoiceChoiceId;



typedef struct DbvPackageSpecChoice /* CHOICE */
{
    DbvPackageSpecChoiceChoiceId choiceId;
    union DbvPackageSpecChoiceChoiceUnion
    {
    DbvPredefinedPackage* predefinedPackage; /* [1] PredefinedPackage */
    DbvAdHocPackage** adHocPackage; /* [2] AdHocPackage */
    } a;
} DbvPackageSpecChoice;



typedef struct DbvPackageSpec /* SEQUENCE */
{
    DbvInternationalString packageId; /* [1] InternationalString OPTIONAL */
    DbvPriceInfo* packagePrice; /* [2] PriceInfo OPTIONAL */
    DbvPackageSpecChoice* package; /* [3] PackageSpecChoice */
    DbvInternationalString packageMedium; /* [4] InternationalString */
    Ulong PackageKByteSize; /* [5] INTEGER */
    DbvOtherInformation** otherInfo; /* [6] OtherInformation OPTIONAL */
} DbvPackageSpec;



typedef DbvPackageSpec DbvDeliveryUnitSpecSeqOf; /* SEQUENCE OF PackageSpec */

typedef struct DbvDeliveryUnitSpec /* SEQUENCE */
{
    DbvInternationalString deliveryUnitId; /* [1] InternationalString OPTIONAL
*/
    DbvPriceInfo* deliveryUnitPrice; /* [2] PriceInfo OPTIONAL */
```

```
    DbvDeliveryMethod* deliveryMethod; /* [3] DeliveryMethod OPTIONAL */
    DbvBilling* billing; /* [4] Billing OPTIONAL */
    DbvDeliveryUnitSpecSeqOf** packages; /* [5] DeliveryUnitSpecSeqOf */
    DbvOtherInformation** otherInfo; /* [6] OtherInformation OPTIONAL */
} DbvDeliveryUnitSpec;



typedef  DbvDeliveryUnitSpec  DbvOrderSpecificationSeqOf;  /*  SEQUENCE  OF
DeliveryUnitSpec */

typedef struct DbvOrderSpecification /* SEQUENCE */
{
    DbvInternationalString sOrderingCentreId;
    DbvPriceInfo* orderPrice; /* [1] PriceInfo OPTIONAL */
    DbvInternationalString   orderDeliverDate;   /*   [2]   InternationalString
OPTIONAL */
    DbvInternationalString   orderCancellationDate;  /*  [3]  InternationalString
OPTIONAL */
    DbvOrderSpecificationSeqOf** deliveryUnits; /* [4] OrderSpecificationSeqOf
*/
    DbvOtherInformation** otherInfo; /* [5] OtherInformation OPTIONAL */
} DbvOrderSpecification;


typedef enum DbvOrderStatusInfoType  {
     OSIT_STATICSTATE  = 1,
      OSIT_DYNAMICSTATE    = 2
} DbvOrderStatusInfoType;



typedef struct DbvOrderStatusInfoChoice {
DbvOrderStatusInfoType eOrderStatusInfoType;
union {
    Ulong ulStaticState;
    Ulong ulDynamicState;
    }              uOrderStatusInfo;
} DbvOrderStatusInfoChoice;


typedef struct DbvOrderStatusInfo {
DbvOrderStatusInfoChoice         sOrderState;
DbvInternationalString          *psAdditionalStatusInfo;
} DbvOrderStatusInfo;
```

2.9 Externals used in CIP 2.4

2.9.1 CIP 2.4 Specific Info External

```
typedef enum DbvCIPSpecificInfoType2 {
        CSIT2_SearchControl        = 1,
        CSIT2_Term                 = 2,
        CSIT2_ExplainInfo          = 3,
        CSIT2_ChildrenResourceReport    = 4
} DbvCIPSpecificInfoType2;


typedef enum DbvCIPTermType2 {
        CTT2_Wrsgrs        = 1,
        CTT2_Circle        = 2
} DbvCIPTermType2;


typedef struct DbvCIPTerm2 {
DbvCIPTermType2 eCIPTermType2;
union {
    DbvWRSGRSSpatialCoverage *psWrsgrs;
    DbvCircle                 *psCircle;
    }                    uCIPTermType2;
} DbvCIPTerm2;


typedef enum DbvChildrenResourceReportType {
        CRRT_TerminalCollection        = 1,
        CRRT_NonTerminalCollection     = 2
} DbvChildrenResourceReportType;


typedef struct DbvChildrensReports {
DbvInternationalString  sCollectionId;
DbvInternationalString  sCollectionName;
DbvASN1External         sChildReport;
} DbvChildrensReports;


typedef struct DbvChildrenResourceReport {
DbvChildrenResourceReportType eChildrenResourceReportType;
union {
    DbvNull                    pvTerminalCollection;
```

```
    DbvChildrensReports        *psNonTerminalCollection;
   }                          uChildrenResourceReport;
} DbvChildrenResourceReport;


typedef struct DbvCIPSpecificInfo2 {
DbvCIPSpecificInfoType2 eCIPSpecificInfoType;
union {
    DbvSearchControl                 *psSearchControl;
    DbvCIPTerm2                       *psTerm;
    DbvAdditionalSemanticAttributes  *psExplainInfo;
    DbvChildrenResourceReport        *psChildrenResourceReport;
  }                     uCIPSpecificInfo2;
} DbvCIPSpecificInfo2;
```

2.9.2 CIP 2.4 Formatted Product Processing Options External

```
The following are for the CIP 2.4 Formatted Product Processing Options External

typedef enum DbvProcessingOptionValueType {
   POVT_Numeric = 1,
   POVT_String  = 2,
   POVT_Invalid = -1
} DbvProcessingOptionValueType;


typedef struct DbvProcessingOptionValue
{
DbvProcessingOptionValueType eProcessingOptionValueType;
union {
     DbvInternationalString  *psNumericProcessingOptionValue;
     DbvInternationalString  *psStringProcessingOptionValue;
  } uProcessingOptionValue;
} DbvProcessingOptionValue;


typedef struct DbvCipProcessingOptionSelection
{
DbvInternationalString      sProcessingOptionName;
DbvProcessingOptionValue  **ppsProcessingOptionSelectedValues;
} DbvCipProcessingOptionSelection;


typedef struct DbvCIPFormattedProduct
{
DbvCipProcessingOptionSelection **ppsProcessingOptionSelection;
```

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```
} DbvCIPFormattedProduct;
```

2.9.3 CIP 2.4 Formatted Scene Selection Option

The following are for the CIP 2.4 Formatted Scene Selection Options External

```
typedef enum DbvHorizontalSelectionType {
   HST_RectangleSceneSelection    = 1,
   HST_BoundingRectangleSelection = 2,
   HST_PolygonSelection           = 3,
   HST_CircleSelection            = 4,
   HST_Invalid                    = -1
} DbvHorizontalSelectionType;


typedef enum DbvAlongGridUnitType {
   AGUT_Relative    = 0,
   AGUT_TimeBased   = 1
} DbvAlongGridUnitType;


typedef struct DbvRectangleSceneSelection
{
Ulong                   ulAcrossGrid;
DbvAlongGridUnitType     eAlongGridUnitType;
Ulong                   ulAlongGrid;
Ulong                   ulAcrossSize;
Ulong                   ulAlongSize;
Ulong                   ulAcrossCentre;
Ulong                   ulAlongCentre;
} DbvRectangleSceneSelection;


typedef DbvInternationalString DbvCoordinate1;


typedef struct DbvBoundingRectangleSelection
{
DbvCoordinate1 sWestBoundingCoordinate;
DbvCoordinate1 sEastBoundingCoordinate;
DbvCoordinate1 sNorthBoundingCoordinate;
DbvCoordinate1 sSouthBoundingCoordinate;
} DbvBoundingRectangleSelection;


typedef DbvInternationalString DbvMapProjection;
```

```
typedef struct DbvPolygonSelection
{
DbvMapProjection        *psPolygonProjection;
struct DbvPoint       **ppsGPolygonOuterRing;
} DbvPolygonSelection;


typedef struct DbvPoint1
{
DbvCoordinate1        sLatitude;
DbvCoordinate1        sLongitude;
} DbvPoint1;


typedef struct DbvCircleSelection
{
DbvPoint1       sCenter;
DbvIntUnit      sRadiusValue;
} DbvCircleSelection;


typedef struct DbvHorizontalSelection
{
DbvHorizontalSelectionType eHorizontalSelectionType;
union {
     DbvRectangleSceneSelection      *psRectangleSceneSelection;
     DbvBoundingRectangleSelection *psBoundingRectangleSelection;
     DbvPolygonSelection             *psPolygonSelection;
     DbvCircleSelection              *psCircleSelection;
  } uProcessingOptionValue;
} DbvHorizontalSelection;


typedef struct DbvVerticalSelection
{
DbvInternationalString     sLowAltitude;
DbvInternationalString     sHighAltitude;
} DbvVerticalSelection;


typedef DbvInternationalString DbvTime;


typedef struct DbvTemporalSelection
{
DbvTime sStartDate;
```

```
DbvTime sEndDate;
} DbvTemporalSelection;


typedef struct DbvCIPFormattedScene
{
DbvInternationalString    sSceneType;
DbvHorizontalSelection    *psHorizontalSelection;
DbvVerticalSelection      *psVerticalSelection;
DbvTemporalSelection      *psTemporalSelection;
} DbvCIPFormattedScene
```

2.9.4 CIP 2.4 Order Extended Service

```
This is the CIP 2.4 Order Extended Service, note that this is similar to the
CIP 2.2 Order service, and therefore several sub structures have simplar names.


typedef enum DbvOriginPartToKeepInt2 {
                OKI_OrderEstimate      = 1,
                OKI_OrderQuoteandSubmit = 2,
                OKI_OrderMonitor1       = 3,
                OKI_OrderCancel1        = 4
} DbvOriginPartToKeepInt2;


typedef enum DbvPaymentMethodType2 {
        PMT2_BillInvoice             = 1,
        PMT2_Prepay                  = 2,
        PMT2_DepositAccount          = 3,
        PMT2_PrivateKnown            = 4,
        PMT2_PrivateNotKnown         = 5
} DbvPaymentMethodType2;


typedef struct DbvPaymentMethod2 {
DbvPaymentMethodType2 ePaymentMethodType;
union {
    DbvNull              pvBillInvoice;
    DbvNull              pvPrepay;
    DbvNull              pvDepositAccount;
    DbvNull              pvPrivateKnown;
    DbvASN1External      *psPrivateNotKnown;
  }                          uPaymentMethod;
} DbvPaymentMethod2;
```

```
typedef struct DbvCustomerReference {
DbvInternationalString    sCustomerId;
DbvInternationalString  **ppsAccounts;
} DbvCustomerReference;


typedef struct DbvBilling2 {
DbvPaymentMethod2         sPaymentMethod;
DbvCustomerReference      sCustomerReference;
DbvInternationalString  *psCustomerPONumber;
} DbvBilling2;


/* No account in this structure */
typedef struct DbvUserInformation2 {
DbvInternationalString  sUserId;
DbvInternationalString *psUserName;
DbvCipBPostalAddress    *psUserAddress;
DbvInternationalString *psTelNumber;
DbvInternationalString *psFaxNumber;
DbvInternationalString *psEmailAddress;
DbvInternationalString *psNetworkAddress;
DbvInternationalString *psAccount;
DbvBilling2            *psBilling;
} DbvUserInformation2;


/*   Need   this   redefiniton   because   of   DbvOriginPartToKeepInt2   and
DbvUserInformation2 change */
typedef struct DbvCipBEsIoOriginPartToKeep2 {
DbvOriginPartToKeepInt2        eAction;
DbvInternationalString         sOrderId;
struct DbvOrderSpecification2  *psOrderSpecification;
DbvStatusUpdateOption          *psStatusUpdateOption;
DbvUserInformation2            *psUserInformation;
DbvOtherInformation          **ppsOtherInfo;
} DbvCipBEsIoOriginPartToKeep2;


typedef struct DbvCipBEsIoOriginPartNotToKeep2 {
DbvInternationalString         sOrderId;
struct DbvOrderSpecification2  *psOrderSpecification;
DbvUserInformation2            *psUserInformation;
DbvOtherInformation          **ppsOtherInfo;
} DbvCipBEsIoOriginPartNotToKeep2;
```

```
typedef struct DbvCipBEsIoRequest2 {
DbvCipBEsIoOriginPartToKeep2    *psToKeep;
DbvCipBEsIoOriginPartNotToKeep2  *psNotToKeep;
} DbvCipBEsIoRequest2;


typedef enum DbvOrderStatusInfoType2 {
        OSIT2_StaticState       = 1,
        OSIT2_DynamicState      = 2
} DbvOrderStatusInfoType2;


typedef enum DbvStaticState {
        SS_OrderNotValid        = 1,
        SS_OrderEstimated       = 2,
        SS_OrderCompleted       = 3
} DbvStaticState;


typedef enum DbvDynamicState {
        DS_OrderBeingEstimated  = 1,
        DS_OrderBeingQuoted     = 2,
        DS_OrderBeingProcessed  = 3,
        DS_OrderBeingCancelled  = 4,
        DS_OrderBeingDeleted    = 5
} DbvDynamicState;


/* Putting in proper enumeration types for StaticState and
 DynamicState */
typedef struct DbvOrderStatusInfoChoice2 {
DbvOrderStatusInfoType2 eOrderStatusInfoType;
union {
    DbvStaticState  eStaticState;
    DbvDynamicState eDynamicState;
    }                   uOrderStatusInfo;
} DbvOrderStatusInfoChoice2;


typedef struct DbvOrderStatusInfo2 {
DbvOrderStatusInfoChoice2       sOrderState;
DbvInternationalString         *psAdditionalStatusInfo;
} DbvOrderStatusInfo2;


typedef enum DbvPackageSpecSecondChoiceType {
        PSSC_PredefinedPackage         = 1,
        PSSC_AdhocPackage              = 2
```

```
} DbvPackageSpecSecondChoiceType;


typedef enum DbvProcessingOptionsType {
        POT_FormattedProcessingOptions       = 1,
        POT_UnformattedProcessingOptions     = 2
} DbvProcessingOptionsType;


typedef struct DbvProcessingOptions
{
DbvProcessingOptionsType eProcessingOptionsType;
union {
    DbvASN1External            *psFormattedProcessingOptions;
    DbvInternationalString   *psUnformattedProcessingOptions;
    }                   uProcessingOptions;
} DbvProcessingOptions;


typedef enum DbvSceneSelectionOptionsType {
        POT_FormattedSceneSelectionOptions       = 1,
        POT_UnformattedSceneSelectionOptions     = 2
} DbvSceneSelectionOptionsType;


typedef struct DbvSceneSelectionOptions {
DbvSceneSelectionOptionsType eSceneSelectionOptionsType;
union {
    DbvASN1External            *psFormattedSceneSelectionOptions;
    DbvInternationalString   *psUnformattedSceneSelectionOptions;
    }                   uSceneSelectionOptions;
} DbvSceneSelectionOptions;


typedef struct DbvOrderItemSecond {
DbvInternationalString     sProductId;
DbvPriceInfo                 *psProductPrice;
DbvProductDeliveryOptions *psProductDeliveryOptions;
DbvProcessingOptions       *psProcessingOptions;
DbvSceneSelectionOptions *psSceneSelectionOptions;
DbvOrderStatusInfo2         *psOrderStatusInfo;
DbvOtherInformation       **ppsOtherInfo;
} DbvOrderItemSecond;


typedef struct DbvPredefinedPackage2 {
DbvInternationalString         sCollectionId;
DbvOrderItemSecond               **ppsOrderItems;
```

```
DbvOtherInformation          **ppsOtherInfo;
} DbvPredefinedPackage2;


typedef struct DbvPackageSpecSecondChoice {
DbvPackageSpecSecondChoiceType ePackageSpecSecondChoiceType;
union {
    DbvPredefinedPackage2  *psPredefinedPackage;
    DbvOrderItemSecond     **ppsAdHocPackage;
    }                      uPackageSpecSecondChoice;
} DbvPackageSpecSecondChoice;


typedef struct DbvPackageSpecSecond {
DbvInternationalString         sPackageId;
DbvPriceInfo                   *psPackagePrice;
DbvPackageSpecSecondChoice    *psPackage;
DbvInternationalString         sPackageMedium;
Ulong                          ulPackageKByteSize;
DbvOtherInformation          **ppsOtherInfo;
} DbvPackageSpecSecond;


typedef struct DbvDeliveryUnitSpecSecond {
DbvInternationalString  sDeliveryUnitId;
DbvPriceInfo            *psDeliveryUnitPrice;
DbvDeliveryMethod       *psDeliveryMethod;
DbvBilling2             *psBilling;
DbvPackageSpecSecond   **ppsPackages;
DbvOtherInformation    **ppsOtherInfo;
} DbvDeliveryUnitSpecSecond;


typedef struct DbvOrderSpecification2 {
DbvInternationalString         sOrderingCentreId;
DbvPriceInfo                   *psOrderPrice;
DbvInternationalString         sOrderDeliverDate;
DbvInternationalString         sOrderCancellationDate;
DbvDeliveryUnitSpecSecond **ppsDeliveryUnits;
DbvOtherInformation       **ppsOtherInfo;
} DbvOrderSpecification2;


typedef struct DbvCipBEsIoTargetPart2 {
DbvInternationalString  sOrderId;
DbvOrderSpecification2  *psOrderSpecification;
DbvOrderStatusInfo2     *psOrderStatusInfo;
DbvUserInformation2     *psUserInformation;
```

```
DbvOtherInformation    **ppsOtherInfo;
} DbvCipBEsIoTargetPart2;


typedef struct DbvCipBEsIoTaskPackage2 {
DbvCipBEsIoOriginPartToKeep2   *psOriginPart;
DbvCipBEsIoTargetPart2          *psTargetPart;
} DbvCipBEsIoTaskPackage2;


typedef struct DbvCipBItemOrderExtendedService2 {
DbvCipBItemOrderReqOrRsp     eItemOrderReqRsp;
union {
    DbvCipBEsIoRequest2              *psItemOrderRequest;
    DbvCipBEsIoTaskPackage2         *psItemOrderResponse;
  }              uItemOrderReqOrRsp;
} DbvCipBItemOrderExtendedService2;
```

2.10 ISO ILL definitions

```
typedef enum  DbvIllStringType {
            ST_GeneralString = 1,
            ST_EdifactString = 2
} DbvIllStringType;



typedef struct DbvIllString {
DbvIllStringType  eStringType;
union {
      DbvGeneralString   *psGeneralString;
      DbvVisibleString    pcVisibleString;
    }                   uString;
} DbvIllString;




/* enumeration types IllRequest */

typedef char*  DbvPrintableString;

typedef enum DbvIllProtocolVersion {
            PV_Version1 = 1,
            PV_Version2 = 2,
            PV_Invalid  = -1
}DbvIllProtocolVersion;

typedef enum DbvNameOfPersOrInstType {
            NPI_NameOfPerson      = 1,
              NPI_NameOfInstitution = 2
} DbvNameOfPersOrInstType;


typedef enum  DbvPersOrInstSymbolType {
            SPI_PersonSymbol      = 1,
              SPI_InstitutionSymbol = 2
} DbvPersOrInstSymbolType;


typedef enum  DbvTransactionType {
            TT_Simple      = 1,
              TT_Chained    = 2,
              TT_Partitioned = 3,
              TT_Invalid     = -1
```

```
} DbvTransactionType;


typedef enum  DbvDeliveryServiceType {
            DST_PhysicalDelivery   = 1,
                DST_ElectronicDelivery = 2,
                DST_Invalid            = -1
} DbvDeliveryServiceType;


typedef enum DbvElDeliveryDetailsType {
            DDT_SystemAddress = 1,
            DDT_SystemId      = 2
} DbvElDeliveryDetailsType;


typedef enum  DbvServiceType {
            ST_Loan               = 1,
                ST_CopyNonReturnable = 2,
            ST_Locations          = 3,
            ST_Estimate           = 4,
            ST_ResponderSpecific  = 5,
            ST_Invalid            = -1
} DbvServiceType;


typedef enum  DbvOptionalMsgRequirements {
            OMR_Requires = 1,
            OMR_Desires = 2,
            OMR_Neither = 3,
            OMR_Invalid = -1
} DbvOptionalMsgRequirements;


typedef enum  DbvExpiry {
            EXP_NeedBeforeDate = 1,
            EXP_OtherDate      = 2,
            EXP_NoExpiry       = 3,
            EXP_Invalid        = -1
} DbvExpiry;


typedef enum DbvSupplyMediumType {
            SMT_Printed             = 1,
            SMT_Photocopy           = 2,
            SMT_Microform           = 3,
            SMT_FilmOrVideoRecording = 4,
            SMT_AudioRecording       = 5,
```

```
                SMT_MachineReadable      = 6,
                SMT_Other                = 7,
                SMT_Invalid             = -1
} DbvSupplyMediumType;


typedef enum  DbvPlaceOnHold {
                POH_Yes              = 1,
                POH_No               = 2,
                POH_ResponderPolicy = 3,
                POH_Invalid         = -1
} DbvPlaceOnHold;


typedef enum DbvItemType {
                IT_Monograph = 1,
                IT_Serial    = 2,
                IT_Other     = 3,
                IT_Invalid   = -1
} DbvItemType;


typedef enum  DbvMediumType {
                MT_Printed             = 1,
                MT_Microform           = 3,
                MT_FilmOrVideoRecording = 4,
                    MT_AudioRecording      = 5,
                    MT_MachineReadable     = 6,
                MT_Other               = 7,
                MT_Invalid             = -1
} DbvMediumType;


typedef enum  DbvPreference {
                PRE_Ordered   = 1,
                PRE_Unordered = 2,
                PRE_Invalid   = -1
} DbvPreference;


/* enumeration types StatusOrErrorReport */

typedef enum  DbvTransactionResults {
                TR_Conditional       = 1,
                TR_Retry             = 2,
                TR_Unfilled          = 3,
                TR_LocationsProvided = 4,
                TR_WillSupply        = 5,
```

```
            TR_HoldPlaced        = 6,
            TR_Estimate          = 7,
            TR_Invalid           = -1
} DbvTransactionResults;


typedef enum  DbvMostRecentService {
            MRS_IllRequest          = 1,
            MRS_Forward             = 21,
            MRS_ForwardNotification = 2,
            MRS_Shipped             = 3,
            MRS_IllAnswer           = 4,
            MRS_ConditionalReply    = 5,
            MRS_Cancel              = 6,
            MRS_CancelReply         = 7,
            MRS_Received            = 8,
            MRS_Recall              = 9,
            MRS_Returned            = 10,
            MRS_CheckedIn           = 11,
            MRS_Overdue             = 12,
            MRS_Renew               = 13,
            MRS_RenewAnswer         = 14,
            MRS_Lost                = 15,
            MRS_Damaged             = 16,
            MRS_Message             = 17,
            MRS_StatusQuery         = 18,
            MRS_StatusOrErrorReport = 19,
            MRS_Expired             = 20,
            MRS_Invalid             = -1
} DbvMostRecentService;


typedef enum  DbvShippedServiceType {
            SST_Loan             = 1,
            SST_CopyNonReturnable = 2,
            SST_Invalid          = -1
} DbvShippedServiceType;


typedef enum  DbvCurrentState {
            CS_NotSupplied       = 1,
            CS_Pending           = 2,
            CS_InProcess         = 3,
            CS_Forward           = 4,
            CS_Conditional       = 5,
            CS_CancelPending     = 6,
            CS_Cancelled         = 7,
            CS_Shipped           = 8,
```

```
            CS_Received          = 9,
            CS_RenewPending      = 10,
            CS_NotReceivedOverdue = 11,
            CS_RenewOverdue      = 12,
            CS_Overdue           = 13,
            CS_Returned          = 14,
            CS_CheckedIn         = 15,
            CS_Recall            = 16,
            CS_Lost              = 17,
            CS_Unknown           = 18,
            CS_Invalid           = -1
} DbvCurrentState;

typedef enum  DbvIllAPDUType {
            IAT_IllRequest          = 1,
            IAT_ForwardNotification = 2,
            IAT_Shipped             = 3,
            IAT_IllAnswer           = 4,
            IAT_ConditionalReply    = 5,
            IAT_Cancel              = 6,
            IAT_CancelReply         = 7,
            IAT_Received            = 8,
            IAT_Recall              = 9,
            IAT_Returned            = 10,
            IAT_CheckedIn           = 11,
            IAT_Overdue             = 12,
            IAT_Renew               = 13,
            IAT_RenewAnswer         = 14,
            IAT_Lost                = 15,
            IAT_Damaged             = 16,
            IAT_Message             = 17,
            IAT_StatusQuery         = 18,
            IAT_StatusOrErrorReport = 19,
            IAT_Expired             = 20,
            IAT_Invalid             = -1
} DbvIllAPDUType;


typedef enum  DbvReportSource {
            RS_User     = 1,
            RS_Provider = 2
} DbvReportSource;


typedef enum  DbvIntermediaryProblem {
            IP_CannotSendOnward = 1,
            IP_Invalid          = -1
} DbvIntermediaryProblem;
```

```
typedef enum  DbvUnableToPerform {
          UTP_NotAvailable       = 1,
          UTP_ResourceLimitation = 2,
          UTP_Other              = 3,
          UTP_Invalid            = -1
} DbvUnableToPerform;


typedef enum  DbvUserErrorReportType {
          UER_AlreadyForwarded    = 1,
          UER_IntermediaryProblem = 2,
          UER_SecurityProblem     = 3,
          UER_UnableToPerform     = 4
} DbvUserErrorReportType;


typedef enum  DbvProviderErrorReportType {
          PER_GeneralProblem            = 1,
          PER_TransactionIdProblem      = 2,
          PER_StateTransitionProhibited = 3
} DbvProviderErrorReportType;


typedef enum  DbvTransactionIdProblem {
          TIP_DuplicateTransactionId = 1,
          TIP_InvalidTransactionId   = 2,
          TIP_UnknownTransactionId   = 3,
          TIP_Invalid                = -1
} DbvTransactionIdProblem;

typedef enum DbvReasonNoReport {
          RNR_Temporary = 1,
          RNR_Permanent = 2,
          RNR_Invalid   = -1
} DbvReasonNoReport;

typedef enum  DbvGeneralProblem {
          GP_UnrecognizedAPDU            = 1,
          GP_MistypedAPDU                = 2,
          GP_BadlyStructuredAPDU         = 3,
          GP_ProtocolVersionNotSupported = 4,
          GP_Other                       = 5,
          GP_Invalid                     = -1
} DbvGeneralProblem;

/* end enumeration types StatusOrErrorReport */
```

2.10.1 ILL Request

```
/* structures IllRequest */

/* SystemId  */

typedef struct DbvPersonOrInstitutionSymbol {
DbvPersOrInstSymbolType        eSymbolType;
DbvIllString                   sSymbol;
} DbvPersonOrInstitutionSymbol;


typedef struct  DbvNameOfPersonOrInstitution {
DbvNameOfPersOrInstType        eNameType;
DbvIllString                   sName;
} DbvNameOfPersonOrInstitution;


typedef struct  DbvSystemId {
DbvPersonOrInstitutionSymbol  *psSymbol;
DbvNameOfPersonOrInstitution  *psName;
} DbvSystemId;


/* TransactionId */

typedef struct  DbvTransactionId {
DbvSystemId        *psInitialRequesterId;
DbvIllString               sTransactionGroupQualifier;
DbvIllString               sTransactionQualifier;
DbvIllString             *psSubTransactionQualifier;
} DbvTransactionId;


/* ServiceDateTime */

typedef struct  DbvDateTime {
DbvVisibleString  pcDate;  /* YYYYMMDD,  mand. */
DbvVisibleString  pcTime;  /* HHMMSS, opt. */
} DbvDateTime;


typedef struct  DbvServiceDateTime {
DbvDateTime        sThisService;
```

```
DbvDateTime          *psOriginalService;
} DbvServiceDateTime;


/* DeliveryAddress, SystemAddress */

typedef struct  DbvPostalAddress {
DbvNameOfPersonOrInstitution  *psNameOfPersonOrInstitution;
DbvIllString                  *psExtendedPostalDeliveryAddress;
DbvIllString                  *psStreetAndNumber;
DbvIllString                  *psPostOfficeBox;
DbvIllString                  *psCity;
DbvIllString                  *psRegion;
DbvIllString                  *psCountry;
DbvIllString                  *psPostalCode;
} DbvPostalAddress;


typedef struct  DbvSystemAddress {
DbvIllString          *psTelecomServiceIdentifier;
DbvIllString          *psTelecomServiceAddress;
} DbvSystemAddress;


typedef struct  DbvDeliveryAddress {
DbvPostalAddress  *psPostalAddress;
DbvSystemAddress  *psElectronicAddress;
} DbvDeliveryAddress;


/* DeliveryService */

typedef struct  DbvElDeliveryDetails {
DbvElDeliveryDetailsType     eDeliveryDetailsType;
union {
     DbvSystemAddress   *psSystemAddress;
     DbvSystemId    *psSystemId;
    }                  uDeliveryDetails;
} DbvElDeliveryDetails;



typedef union uDeliveryParameter {
     DbvASN1External         *psDummy;  /* mand. */
} uDeliveryParameter;


typedef struct  DbvElDeliveryParameter {
```

```
DbvObjectIdentifier       pcDeliveryMode;        /* opt. */
uDeliveryParameter       *puDeliveryParameter;  /* opt. */
} DbvElDeliveryParameter;


typedef union uDocumentTypeParameter {
     DbvASN1External        *psDummy;  /* mand. */
} uDocumentTypeParameter;


typedef struct  DbvDocumentTypeParameter {
DbvObjectIdentifier      pcDocumentTypeId;         /* opt. */
uDocumentTypeParameter  *puDocumentTypeParameter; /* opt. */
} DbvDocumentTypeParameter;


typedef struct  DbvElectronicDeliveryService {
DbvElDeliveryParameter         *psDeliveryParameter;
DbvDocumentTypeParameter       *psDocumentTypeParameter;
DbvIllString                   *psDeliveryDescription;
DbvElDeliveryDetails            sDeliveryDetails;
DbvIllString                   *psNameOrCode;
DbvVisibleString        pcDeliveryTime;    /* opt. */
} DbvElectronicDeliveryService;


typedef struct  DbvDeliveryService {
DbvDeliveryServiceType        eDeliveryServiceType;
union {
     DbvIllString                    *psPhysicalDelivery;
     DbvElectronicDeliveryService  **ppsElectronicDelivery;
   }                 uDeliveryService;
} DbvDeliveryService;


/* RequesterOptionalMessageType */

typedef struct  DbvRequesterOptionalMessages {
DbvBool                 fCanSendReceived;
DbvBool                 fCanSendReturned;
DbvOptionalMsgRequirements   eRequesterShipped;
DbvOptionalMsgRequirements   eRequesterCheckedIn;
} DbvRequesterOptionalMessages;


typedef struct  DbvSearchType {
DbvIllString            *psLevelOfService;
DbvVisibleString   pcNeedBeforeDate;  /* opt. */
```

```
DbvExpiry          *peExpiryFlag;      /* default 3 */
DbvVisibleString   pcExpiryDate;       /* opt. */
} DbvSearchType;



/* SupplyMediumInfoType */

typedef struct  DbvSupplyMediumInfo {
DbvSupplyMediumType     eSupplyMediumType;
DbvIllString            *psMediumCharacteristics;
} DbvSupplyMediumInfo;



/* ClientId */

typedef struct  DbvClientId {
DbvIllString            *psClientName;
DbvIllString            *psClientStatus;
DbvIllString            *psClientIdentifier;
} DbvClientId;



/* ItemId */

typedef struct  DbvItemId {
DbvItemType        *peItemType;
DbvMediumType           *peMediumType;
DbvIllString            *psCallNumber;
DbvIllString            *psAuthor;
DbvIllString            *psTitle;
DbvIllString            *psSubTitle;
DbvIllString            *psSponsoringBody;
DbvIllString            *psPlaceOfPublication;
DbvIllString            *psPublisher;
DbvIllString            *psSeriesTitleNumber;
DbvIllString            *psVolumeIssue;
DbvIllString            *psEdition;
DbvIllString            *psPublicationDate;
DbvIllString            *psPublicationDateOfComponent;
DbvIllString            *psAuthorOfArticle;
DbvIllString            *psTitleOfArticle;
DbvIllString            *psPagination;
DbvASN1External         *psNationalBibliographyNo;
DbvIllString            *psIsbn;
DbvIllString            *psIssn;
DbvASN1External         *psSystemNo;
DbvIllString            *psAdditionalNoLetters;
DbvIllString            *psVerificationReferenceSource;
```

```
} DbvItemId;


/* CostInfoType */

typedef struct DbvAmount {
DbvPrintableString      pcCurrencyCode;    /* opt. */
DbvPrintableString      pcMonetaryValue;   /* mand */
} DbvAmount;


typedef struct DbvCostInfo {
DbvIllString            *psAccountNumber;
DbvAmount          *psMaximumCost;
DbvBool                 *pfReciprocalAgreement;  /* default FALSE */
DbvBool                 *pfWillPayFee;           /* default FALSE */
DbvBool                 *pfPaymentProvided;      /* default FALSE */
} DbvCostInfo;


/* ThirdPartyInfoType */

typedef struct DbvSendToList {
DbvSystemId        sSystemId;
DbvIllString            *psAccountNumber;
DbvSystemAddress   *psSystemAddress;
} DbvSendToList;


typedef struct DbvThirdPartyInfo {
DbvBool                 *pfPermissionToForward;         /* default FALSE */
DbvBool                 *pfPermissionToChain;           /* default FALSE */
DbvBool                 *pfPermissionToPartition;       /* default FALSE */
DbvBool                 *pfPermissionToChangeSendToList; /* default FALSE */
DbvSystemAddress    *psInitialRequesterAddress;
DbvPreference           *pePreference;                  /* default 2 */
DbvSendToList           **ppsSendToList;
DbvSystemId        **ppsAlreadyTriedList;
} DbvThirdPartyInfo;

typedef struct DbvExtension {
Ulong        ulIdentifier;
DbvBool          *pfCritical;    /* default FALSE */
union {
     DbvSubitoAdditionalInfo *psAddIllReqInfo;
    }             uItem;
} DbvExtension;
```

```
typedef struct DbvIllRequest {
DbvIllProtocolVersion          eProtocolVersion;
DbvTransactionId         sTransactionId;
DbvServiceDateTime             sServiceDateTime;
DbvSystemId            *psRequesterId;
DbvSystemId            *psResponderId;
DbvTransactionType             *peTransactionType;     /* default 1 */
DbvDeliveryAddress             *psDeliveryAddress;
DbvDeliveryService             *psDeliveryService;
DbvDeliveryAddress             *psBillingAddress;
DbvServiceType               **ppeServiceType;
DbvASN1External                *psResponderSpecificService;
DbvRequesterOptionalMessages   sRequesterOptionalMessages;
DbvSearchType                  *psSearchType;
DbvSupplyMediumInfo          **ppsSupplyMediumInfo;
DbvPlaceOnHold                 *pePlaceOnHold;         /* default 3 */
DbvClientId              *psClientId;
DbvItemId                sItemId;
DbvASN1External               **ppsSupplementalItemDescription;
DbvCostInfo              *psCostInfo;
DbvIllString                   *psCopyrightCompliance;
DbvThirdPartyInfo        *psThirdPartyInfo;
DbvBool                     *pfRetry;  /* default FALSE */
DbvBool                     *pfForward;      /* default FALSE */
DbvIllString                   *psRequesterNote;
DbvIllString                   *psForwardNote;
DbvExtension                 **ppsRequestExtension;
} DbvIllRequest;
```

2.10.2 ILL Status or Error Report

```
/* structures StatusOrErrorReport */


typedef struct  DbvHistoryReport {
DbvVisibleString        pcDateRequested;          /* opt. */
DbvIllString              *psAuthor;
DbvIllString              *psTitle;
DbvIllString              *psAuthorOfArticle;
DbvIllString              *psTitleOfArticle;
DbvVisibleString        pcDateOfLastTransition;    /* opt. */
DbvMostRecentService         eMostRecentService;
DbvVisibleString        pcDateOfMostRecentService; /* mand. */
DbvSystemId             sSystemId;
DbvShippedServiceType         *peShippedServiceType;
```

```
DbvTransactionResults          *peTransactionResults;
DbvIllString                   *psMostRecentServiceNote;
} DbvHistoryReport;


typedef struct  DbvStateTransitionProhibited {
DbvIllAPDUType          eAPDUType;
DbvCurrentState         eCurrentState;
} DbvStateTransitionProhibited;


typedef struct  DbvAlreadyForwarded {
DbvSystemId       sResponderId;
DbvSystemAddress  *psResponderAddress;
} DbvAlreadyForwarded;


typedef struct  DbvProviderErrorReport {
DbvProviderErrorReportType    eReportType;
union {
     DbvGeneralProblem        eGeneralProblem;
     DbvTransactionIdProblem       eTransactionIdProblem;
     DbvStateTransitionProhibited *psStateTransitionProblem;
     }                   uProviderErrorReport;
} DbvProviderErrorReport;


typedef struct  DbvUserErrorReport {
DbvUserErrorReportType        eReportType;
union {
     DbvAlreadyForwarded       *psAlreadyForwarded;
     DbvIntermediaryProblem     eIntermediaryProblem;
     DbvIllString              *psSecurityProblem;
     DbvUnableToPerform         eUnableToPerform;
     }                    uUserErrorReport;
} DbvUserErrorReport;

typedef struct DbvUserOrProviderErrorReport {
DbvReportSource        eReportSource;
union {
     DbvProviderErrorReport  *psProviderErrorReport;
     DbvUserErrorReport      *psUserErrorReport;
     }          uReport;
} DbvUserOrProviderErrorReport;

typedef struct  DbvErrorReport {
DbvIllString                   sCorrelationInfo;
DbvUserOrProviderErrorReport   sReport;
```

```
} DbvErrorReport;


typedef struct  DbvStatusReport {
DbvHistoryReport  sUserStatusReport;
DbvCurrentState         eProviderStatusReport;
} DbvStatusReport;


typedef struct  DbvStatusOrErrorReport {
DbvIllProtocolVersion           eProtocolVersion;
DbvTransactionId         sTransactionId;
DbvServiceDateTime               sServiceDateTime;
DbvSystemId             *psRequesterId;
DbvSystemId             *psResponderId;
DbvReasonNoReport        *peReasonNoReport;
DbvStatusReport                *psStatusReport;
DbvErrorReport                 *psErrorReport;
DbvIllString                  *psNote;
DbvExtension                  **ppsStOrErReportExtension;
} DbvStatusOrErrorReport;
```

2.10.3 ILL APDU Definition Structure

```
/* Note ILL_Invalid in the typedef enum below.
   An Invalid option is not normally
   used in DBV-OSI II union enums but is needed here because
   DbvIllReport only supports two of the many possible
   ILL Report types which may be received.

   ILL_Invalid should never be used when setting up
   an ILL request for sending, it will be set
   internally by the API if an ILL report unsupported
   by DBV-OSI II is received.

*/


typedef enum DbvIllPduType {
          ILL_IllRequest            = 1,
          ILL_StatusOrErrorReport   = 19,
          ILL_Invalid               = -1
} DbvIllPduType;
```

```
typedef struct DbvIllPdu {
DbvIllPduType           eIllPduType;
union {
    struct DbvIllRequest                *psIllRequest;
    struct DbvStatusOrErrorReport       *psStatusOrErrorReport;
  }               uIllPdu;
} DbvIllPdu;
```