Windows Search

Analysis of the Windows Search Database

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Summary

Windows Search uses the Extensible Storage Engine (ESE) Database File (EDB) format to store its data. This specification is based on reverse engineering.

This document is intended as a working document for the Windows Search database format specification. Which should allow existing Open Source forensic tooling to be able to process this file type.

Document information

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Abstract: This document contains information about the Extensible Storage Engine
                 Database File format

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License

Version

Version	Author	Date	Comments
0.0.1	J.B. Metz	September 2009
October 2009	Worked on initial version.
Added information about Windows XP Search.
0.0.2	J.B. Metz	November 2009	Added information about Windows Vista Search.
0.0.3	J.B. Metz	February 2010
May 2010
June 2010	Added information about Windows 7 Search.
0.0.4	J.B. Metz	July 2010	Added information about files and Registry from [DOUGLAS09].
0.0.5	J.B. Metz	November 2010	Added information about compression types.

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1. Overview

Windows Search uses the Extensible Storage Engine (ESE) Database File (EDB) format to store its data. Windows Search stores its data in a directory named:

```
%Profiles%/All Users/Application Data/Microsoft/Search/Data/Applications/Window
s/
```

The default location of this directory is dependent on the Windows version and is controlled by the 'DataDirectory' value in the following Registry Key:

```
HKLM\Software\Microsoft\Windows Search
```

This directory contains several files of which the following:

Database file:

```
Windows.edb
```

For more information about EDB see [LIBESEDB09].

Checkpoint file:

```
MSS.chk
```

Current transaction log file:

```
MSS.chk
```

Transaction log files:

```
MSS#####.log
```

Reserved transaction log files:

```
MSSres00001.jrs
MSSres00002.jrs
```

> *These log files are created at service start and provide a reserved area for logging shutdown transactions in the event that the disk becomes full and the normal transaction logs cannot be written to.*
> *[DOUGLAS09]*

Temporary Database file:

```
tmp.edb
```

This files contains the temporary data tables and indices used during index merge operations.

1.1. Test version

The following version of programs were used to test the information within this document:
- Windows XP Search (Windows Search 4)
- Windows Vista Search
- Windows 7 Search

2. Tables

2.1. __NameTable__

The __NameTable__ contains information about the Windows Search application.

Column identifier	Column name	Column type
1	Version	Integer 32-bit signed
2	MaxDocId	Integer 32-bit signed
3	MaxSubId	Integer 32-bit signed
4	CurrentMaster	Integer 8-bit signed
5	DocCount	Integer 32-bit signed
6	StatusFlags	Integer 32-bit signed
128	AppCatName	Text
129	BaseTableName	Text

2.2. SystemIndex_0A

2.2.1. Windows XP Search

Most of the binary values in the Windows XP Search database are stored in big-endian.

Column identifier	Column name	Column type
1	DocID	Integer 32-bit signed
2	__SDID	Binary data Contains 32-bit big-endian integer value
3	System_Search_Rank	Integer 32-bit signed
4	System_Search_GatherTime	Binary data Contains big-endian filetime
5	System_Size	Binary data Contains 64-bit big-endian integer value
6	System_FileAttributes	Binary data Contains 32-bit big-endian integer value See section: 5.1 File attribute flags
7	System_DateModified	Binary data Contains big-endian filetime
8	System_DateCreated	Binary data Contains big-endian filetime
9	System_DateAccessed	Binary data Contains big-endian filetime

Column identifier	Column name	Column type
128	System_ItemFolderNameDisplay	Text
129	System_ItemTypeText	Text
130	System_ItemType	Text
256	System_Photo_GainControlText	Text
257	System_Contact_BusinessHomePage	Text
258	System_IsIncomplete	Boolean
259	System_SDID	Binary data
260	System_DRM_IsProtected	Boolean
261	System_Contact_SpouseName	Large text
262	System_DateAcquired	Binary data Contains big-endian filetime
263	System_Message_BccAddress	Large text
264	System_MIMEType	Text
265	System_IsDeleted	Boolean
266	System_Message_BccName	Large text
267	System_Message_CcAddress	Large text
268	System_Document_Contributor	Text
269	System_Search_HitCount	Integer 32-bit signed
270	System_Message_CcName	Large text
271	System_Search_AccessCount	Binary data
272	System_ItemFolderPathDisplay	Large text
273	System_Contact_EmailAddress2	Large text
274	System_ItemPathDisplay	Large text
275	System_Search_LastIndexedTotalTime	Floating point double precision (64-bit)
276	System_Search_ReverseFileName	Large text
277	System_Communication_AccountName	Text
278	System_ItemUrl	Large text
279	System_IsRead	Boolean
280	System_Importance	Integer 32-bit signed
281	System_Contact_JobTitle	Text
282	System_ItemParticipants	Large text
283	System_FlagStatus	Integer 32-bit signed
284	System_Contact_OfficeLocation	Text
285	System_Message_FromAddress	Large text
286	System_Message_FromName	Large text

Column identifier	Column name	Column type
287	System_Message_Store	Text
288	System_Message_ToAddress	Large text
289	System_Photo_FlashText	Text
290	System_Message_ToName	Large text
291	System_Contact_WebPage	Large text
292	System_Contact_PrimaryAddressCountry	Text
293	System_Message_DateSent	Binary data
294	System_Task_CompletionStatus	Text
295	System_Message_DateReceived	Binary data Contains big-endian filetime
296	System_Contact_CallbackTelephone	Text
297	System_Message_AttachmentNames	Text
298	System_Photo_ExposureTime	Floating point double precision (64-bit)
299	System_Contact_PrimaryAddressState	Text
300	System_Photo_FNumber	Floating point double precision (64-bit)
301	System_Contact_HomeTelephone	Text
302	System_FileOwner	Large text
303	System_Message_SenderName	Large text
304	System_Calendar_ShowTimeAsText	Text
305	System_Contact_PrimaryTelephone	Text
306	System_Contact_MailingAddress	Text
307	System_Contact_TTYTDDTelephone	Text
308	System_Image_HorizontalSize	Binary data
309	System_ProviderItemID	Text
310	System_Photo_MeteringModeText	Text
311	System_Image_VerticalSize	Binary data
312	System_Shell_OmitFromView	Text
313	System_Media_DateReleased	Text
314	System_ImportanceText	Text
315	System_Image_HorizontalResolution	Floating point double precision (64-bit)
316	System_Image_VerticalResolution	Floating point double precision (64-bit)
317	System_Image_BitDepth	Binary data

Column identifier	Column name	Column type
318	System_Contact_HomeAddressPostOfficeBox	Text
319	System_DateArchived	Binary data
320	System_Contact_PrimaryAddressCity	Text
321	System_Contact_MobileTelephone	Text
322	System_Photo_WhiteBalance	Binary data
323	System_FlagStatusText	Text
324	System_Media_FrameCount	Binary data
325	System_Media_Duration	Binary data
326	System_Image_Dimensions	Text
327	System_Audio_EncodingBitrate	Binary data
328	System_SharedWith	Text
329	System_Message_ToDoFlags	Integer 32-bit signed
330	System_Audio_SampleRate	Binary data
331	System_Audio_SampleSize	Binary data
332	System_Audio_ChannelCount	Binary data
333	System_EndDate	Binary data Contains big-endian filetime
334	System_Video_StreamName	Text
335	System_Video_FrameWidth	Binary data
336	System_Photo_Event	Text
337	System_GPS_Date	Binary data
338	System_Contact_Birthday	Binary data
339	System_Video_FrameHeight	Binary data
340	System_Contact_PrimaryEmailAddress	Large text
341	System_Contact_HomeFaxNumber	Text
342	System_Video_FrameRate	Binary data
343	System_Video_EncodingBitrate	Binary data
344	System_Contact_HomeAddressPostalCode	Text
345	System_Contact_FullName	Large text
346	System_Video_SampleSize	Binary data
347	System_Contact_BusinessAddressPostOfficeBox	Text
348	System_Video_Compression	Text
349	System_Calendar_IsOnline	Boolean
350	System_Priority	Binary data

Column identifier	Column name	Column type
351	System_ParentalRatingReason	Text
352	System_DateImported	Binary data Contains big-endian filetime
353	System_Status	Text
354	System_Message_HasAttachments	Boolean
355	System_Communication_HeaderItem	Boolean
356	System_Rating	Binary data
357	System_Communication_FollowupIconIndex	Integer 32-bit signed
358	System_Copyright	Text
359	System_Contact_HomeAddressCity	Text
360	System_Media_ClassPrimaryID	Text
361	System_Contact_BusinessFaxNumber	Text
362	System_Media_ClassSecondaryID	Text
363	System_Media_DateEncoded	Binary data Contains big-endian filetime
364	System_Media_DVDID	Text
365	System_Contact_OtherAddressStreet	Text
366	System_Media_MCDI	Text
367	System_Contact_PersonalTitle	Text
368	System_Media_MetadataContentProvider	Text
369	System_Media_ContentDistributor	Text
370	System_Contact_MiddleName	Large text
371	System_Music_Composer	Large text
372	System_Video_Director	Large text
373	System_Contact_Suffix	Text
374	System_ParentalRating	Text
375	System_FlagColor	Binary data
376	System_Contact_NickName	Large text
377	System_Communication_TaskStatus	Binary data
378	System_Media_Producer	Large text
379	System_Media_Writer	Large text
380	System_RecordedTV_OriginalBroadcastDate	Binary data
381	System_Media_CollectionGroupID	Text
382	System_Audio_PeakValue	Binary data

Column identifier	Column name	Column type
383	System_Media_CollectionID	Text
384	System_Note_ColorText	Text
385	System_Media_ContentID	Text
386	System_RecordedTV_StationName	Text
387	System_Media_CreatorApplication	Text
388	System_Media_CreatorApplicationVersion	Text
389	System_IsFlaggedComplete	Boolean
390	System_Media_Publisher	Text
391	System_Music_Period	Text
392	System_Link_TargetParsingPath	Large text
393	System_Video_HorizontalAspectRatio	Binary data
394	System_Contact_AssistantName	Large text
395	System_Video_TotalBitrate	Binary data
396	System_Media_UserWebUrl	Large text
397	System_Video_FourCC	Binary data
398	System_Media_UniqueFileIdentifier	Text
399	System_Video_VerticalAspectRatio	Binary data
400	System_Media_EncodedBy	Text
401	System_Contact_PagerTelephone	Text
402	System_Media_ProtectionType	Text
403	System_Link_TargetSFGAOFlags	Binary data
404	System_Media_ProviderRating	Text
405	System_Media_ProviderStyle	Text
406	System_Media_UserNoAutoInfo	Text
407	System_Contact_CompanyMainTelephone	Text
408	System_IsFlagged	Boolean
409	System_Communication_SecurityFlags	Integer 32-bit signed
410	System_Contact_EmailAddresses	Large text
411	System_Calendar_OrganizerAddress	Large text
412	System_Message_IsFwdOrReply	Integer 32-bit signed
413	System_Contact_Department	Text
414	System_Communication_DateItemExpires	Binary data
415	System_DueDate	Binary data

Column identifier	Column name	Column type
416	System_Contact_BusinessAddressStreet	Text
417	System_Contact_PrimaryAddressPostal Code	Text
418	System_Contact_OtherAddressState	Text
419	System_Contact_LastName	Large text
420	System_StartDate	Binary data
421	System_Calendar_Location	Text
422	System_Photo_FocalLengthInFilm	Binary data
423	System_Calendar_IsRecurring	Boolean
424	System_Image_Compression	Binary data
425	System_Photo_OrientationText	Text
426	System_Journal_EntryType	Text
427	System_Contact_Anniversary	Binary data
428	System_ItemAuthors	Large text
429	System_IsAttachment	Boolean
430	System_Contact_HomeAddressState	Text
431	System_Message_SenderAddress	Large text
432	System_Contact_FirstName	Large text
433	System_Calendar_ShowTimeAs	Binary data
434	System_Calendar_ReminderTime	Binary data
435	System_Search_AutoSummary	Large binary data Contains a compressed string
436	System_Project	Text
437	System_IsEncrypted	Boolean
438	System_ItemDate	Binary data Contains big-endian filetime
439	System_Document_DocumentID	Text
440	System_Contact_BusinessTelephone	Text
441	System_Photo_CameraManufacturer	Text
442	System_Communication_TaskStatusText	Text
443	System_Photo_CameraModel	Text
444	System_Photo_Orientation	Binary data
445	System_Contact_BusinessAddressCity	Text
446	System_Contact_BusinessAddressPostal Code	Text
447	System_ItemNamePrefix	Large text

Column identifier	Column name	Column type
448	System_Contact_Profession	Text
449	System_Contact_OtherAddress	Text
450	System_Kind	Text
451	System_Message_ProofInProgress	Boolean
452	System_Calendar_OptionalAttendeeAddresses	Large text
453	System_Contact_OtherAddressPostalCode	Text
454	System_ThumbnailCacheId	Binary data Contains 64-bit big-endian integer value
455	System_Category	Text
456	System_Photo_ShutterSpeed	Floating point double precision (64-bit)
457	System_MileageInformation	Text
458	System_Document_PresentationFormat	Text
459	System_Photo_Aperture	Floating point double precision (64-bit)
460	System_Document_ByteCount	Integer 32-bit signed
461	System_Document_LineCount	Integer 32-bit signed
462	System_Photo_ExposureBias	Floating point double precision (64-bit)
463	System_Document_ParagraphCount	Integer 32-bit signed
464	System_Contact_CarTelephone	Text
465	System_Document_SlideCount	Integer 32-bit signed
466	System_Contact_HomeAddress	Text
467	System_Photo_SubjectDistance	Floating point double precision (64-bit)
468	System_Search_Store	Text
469	System_Photo_MeteringMode	Binary data
470	System_Document_HiddenSlideCount	Integer 32-bit signed
471	System_Calendar_Resources	Text
472	System_Photo_LightSource	Binary data
473	System_Photo_Flash	Integer 8-bit unsigned
474	System_Photo_FocalLength	Floating point double precision (64-bit)
475	System_Photo_ExposureProgram	Binary data
476	System_IconIndex	Integer 32-bit signed

Column identifier	Column name	Column type
477	System_Document_Manager	Text
478	System_Company	Text
479	System_Photo_ISOSpeed	Binary data
480	System_Contact_OtherAddressCountry	Text
481	System_SoftwareUsed	Text
482	System_Message_Flags	Integer 32-bit signed
483	System_Contact_Label	Text
484	System_PriorityText	Text
485	System_ContentType	Text
486	System_SourceItem	Text
487	System_OriginalFileName	Large text
488	System_ContentStatus	Text
489	System_Language	Text
490	System_Document_Version	Text
491	System_Document_Division	Text
492	System_Media_SubscriptionContentId	Text
493	System_Contact_EmailAddress	Large text
494	System_Title	Large text
495	System_Subject	Large text
496	System_Author	Large text
497	System_Keywords	Text
498	System_Comment	Large text
499	System_ItemNameDisplay	Large text
500	System_FileExtension	Text
501	System_Document_LastAuthor	Large text
502	System_Document_RevisionNumber	Text
503	System_Document_TotalEditingTime	Binary data
504	System_Document_DatePrinted	Binary data
505	System_Message_ConversationID	Text
506	System_Identity	Text
507	System_Document_DateCreated	Binary data Contains big-endian filetime
508	System_Contact_BusinessAddressState	Text
509	System_Message_ConversationIndex	Large binary data
510	System_Document_DateSaved	Binary data Contains big-endian filetime

Column identifier	Column name	Column type
511	System_Document_PageCount	Integer 32-bit signed
512	System_Document_WordCount	Integer 32-bit signed
513	System_Document_CharacterCount	Integer 32-bit signed
514	System_Contact_EmailName	Large text
515	System_Calendar_ResponseStatus	Binary data
516	System_Photo_ProgramModeText	Text
517	System_FileFRN	Binary data
518	System_ApplicationName	Text
519	System_ItemName	Large text
520	System_KindText	Text
521	System_ItemFolderPathDisplayNarrow	Large text
522	System_Contact_FileAsName	Large text
523	System_Sensitivity	Binary data
524	System_Image_CompressionText	Text
525	System_Task_Owner	Large text
526	System_Contact_BusinessAddress	Text
527	System_Photo_MaxAperture	Floating point double precision (64-bit)
528	System_Document_ClientID	Text
529	System_Contact_AssistantTelephone	Text
530	System_FlagColorText	Text
531	System_Contact_PrimaryAddressPostOfficeBox	Text
532	System_Contact_BusinessAddressCountry	Text
533	System_Communication_PolicyTag	Text
534	System_Photo_ExposureProgramText	Text
535	System_Music_Artist	Large text
536	System_Photo_SaturationText	Text
537	System_Music_AlbumTitle	Text
538	System_Media_Year	Binary data
539	System_Music_TrackNumber	Binary data
540	System_Contact_HomeAddressCountry	Text
541	System_Music_Genre	Text
542	System_Media_AverageLevel	Binary data
543	System_Journal_Contacts	Text

Column identifier	Column name	Column type
544	System_Music_AlbumArtist	Large text
545	System_RecordedTV_EpisodeName	Text
546	System_RecordedTV_ProgramDescription	Large text
547	System_RecordedTV_StationCallSign	Text
548	System_Message_MessageClass	Text
549	System_SensitivityText	Text
550	System_Contact_IMAddress	Large text
551	System_RecordedTV_ChannelNumber	Binary data
552	System_Photo_WhiteBalanceText	Text
553	System_Calendar_OrganizerName	Large text
554	System_AcquisitionID	Integer 32-bit signed
555	System_RecordedTV_IsClosedCaptioningAvailable	Boolean
556	System_Photo_PhotometricInterpretationText	Text
557	System_RecordedTV_IsRepeatBroadcast	Boolean
558	System_RecordedTV_IsSAP	Boolean
559	System_RecordedTV_DateContentExpires	Binary data
560	System_Message_ToDoTitle	Text
561	System_IsShared	Boolean
562	System_DateCompleted	Binary data
563	System_RecordedTV_IsATSCContent	Boolean
564	System_RecordedTV_IsDTVContent	Boolean
565	System_RecordedTV_IsHDContent	Boolean
566	System_Music_ContentGroupDescription	Text
567	System_Music_InitialKey	Text
568	System_Music_BeatsPerMinute	Text
569	System_Music_Conductor	Large text
570	System_Calendar_RequiredAttendeeAddresses	Large text
571	System_Music_PartOfSet	Text
572	System_Media_SubTitle	Text
573	System_Music_Mood	Text

Column identifier	Column name	Column type
574	System_Note_Color	Binary data
575	System_Contact_JA_CompanyNamePhonetic	Large text
576	System_ComputerName	Text
577	System_Calendar_OptionalAttendeeNames	Large text
578	System_Contact_JA_FirstNamePhonetic	Text
579	System_Contact_Hobbies	Text
580	System_Contact_OtherAddressPostOfficeBox	Text
581	System_Contact_JA_LastNamePhonetic	Large text
582	System_ItemPathDisplayNarrow	Large text
583	System_RecordedTV_NetworkAffiliation	Text
584	System_Contact_TelexNumber	Text
585	System_Contact_OtherAddressCity	Text
586	System_Contact_Gender	Text
587	System_Photo_SharpnessText	Text
588	System_RatingText	Text
589	System_Photo_FlashFired	Boolean
590	System_Photo_DateTaken	Binary data Contains big-endian filetime
591	System_Photo_ContrastText	Text
592	System_FileName	Large text
593	System_Photo_DigitalZoom	Floating point double precision (64-bit)
594	System_ParsingName	Large text
595	System_Software_DateLastUsed	Binary data
596	System_SFGAOFlags	Binary data
597	System_Contact_HomeAddressStreet	Text
598	System_Contact_PrimaryAddressStreet	Text
599	System_Contact_EmailAddress3	Large text
600	System_Calendar_RequiredAttendeeNames	Large text
601	System_Calendar_Duration	Text
602	System_Contact_Children	Text
603	System_RecordedTV_RecordingTime	Binary data

Column identifier	Column name	Column type
604	Microsoft_IE_FeedItemLocalId	Large text
605	Microsoft_IE_SelectionCount	Binary data
606	Microsoft_IE_TargetUrl	Large text
607	Microsoft_IE_TargetUrlHostName	Large text
608	Microsoft_IE_TargetUrlPath	Large text
609	Microsoft_IE_Title	Large text
610	Microsoft_IE_VisitCount	Binary data

2.2.2. Windows Vista Search

Most of the binary values in the Windows Vista Search database are stored in little-endian.

Column identifier	Column name	Column type
1	DocID	Integer 32-bit signed
2	__SDID	Integer 32-bit signed
3	System_Search_GatherTime	Binary data Contains little-endian filetime
4	System_Search_Rank	Integer 32-bit signed
5	System_Size	Currency (64-bit) Contains 64-bit little-endian integer value
6	System_FileAttributes	Integer 32-bit signed See section: 5.1 File attribute flags
7	System_DateModified	Binary data Contains little-endian filetime
8	System_DateCreated	Binary data Contains little-endian filetime
9	System_DateAccessed	Binary data Contains little-endian filetime
128	System_ItemFolderNameDisplay	Binary data Contains a compressed string
129	System_ItemTypeText	Binary data Contains a compressed string
130	System_ItemType	Binary data Contains a compressed string
256	System_Music_Conductor	Large binary data
257	System_Media_Year	Integer 32-bit signed
258	System_Media_Producer	Large binary data
259	System_Media_DateReleased	Binary data

Column identifier	Column name	Column type
		Contains a compressed string
260	System_Photo_ContrastText	Binary data
261	System_Document_LineCount	Integer 32-bit signed
262	System_Message_BccAddress	Large binary data
263	System_Contact_PrimaryAddressStreet	Binary data
264	System_Sensitivity	Integer 16-bit signed
265	System_ItemFolderPathDisplayNarrow	Large binary data Contains a compressed string
266	System_FlagStatusText	Binary data Contains a compressed string
267	System_Music_PartOfSet	Binary data Contains a compressed string
268	System_Media_Writer	Large binary data
269	System_Photo_WhiteBalanceText	Binary data
270	System_Photo_ExposureProgram	Integer 32-bit signed
271	System_Document_ParagraphCount	Integer 32-bit signed
272	System_Note_Color	Integer 16-bit signed
273	System_Message_BccName	Large binary data
274	System_Contact_BusinessAddressCity	Binary data
275	System_Calendar_Location	Binary data Contains a compressed string
276	System_ItemName	Large binary data Contains a compressed string
277	System_Link_TargetParsingPath	Large binary data Contains a compressed string
278	System_Video_StreamName	Binary data
279	System_Music_TrackNumber	Integer 32-bit signed
280	System_Media_SubTitle	Binary data Contains a compressed string
281	System_Media_CollectionGroupID	Binary data Contains a compressed string
282	System_Photo_PhotometricInterpretationText	Binary data
283	System_Document_SlideCount	Integer 32-bit signed
284	System_Message_CcAddress	Large binary data Contains a compressed string
285	System_Contact_HomeTelephone	Binary data
286	System_Contact_EmailAddress3	Large binary data

Column identifier	Column name	Column type
287	System_Contact_CompanyMainTelephone	Binary data
288	System_Contact_BusinessAddressPostalCode	Binary data
289	System_Video_FrameWidth	Integer 32-bit signed
290	System_Music_Mood	Binary data
291	System_Media_CollectionID	Binary data Contains a compressed string
292	System_Photo_DateTaken	Binary data Contains little-endian filetime
293	System_Message_CcName	Large binary data
294	System_Contact_FileAsName	Large binary data
295	System_Calendar_Duration	Binary data
296	System_ItemParticipants	Large binary data Contains a compressed string
297	System_Video_FrameHeight	Integer 32-bit signed
298	System_Media_ContentID	Binary data Contains a compressed string
299	System_Photo_SaturationText	Binary data
300	System_Document_HiddenSlideCount	Integer 32-bit signed
301	System_Message_ToDoTitle	Binary data
302	System_OriginalFileName	Large binary data
303	System_ItemFolderPathDisplay	Large binary data Contains a compressed string
304	System_FileOwner	Large binary data Contains a compressed string
305	System_FileFRN	Currency (64-bit)
306	System_Media_CreatorApplication	Binary data
307	System_Contact_Children	Large binary data
308	System_ItemPathDisplay	Large binary data Contains a compressed string
309	System_FileName	Large binary data Contains a compressed string
310	System_EndDate	Binary data Contains little-endian filetime
311	System_Video_FrameRate	Integer 32-bit signed
312	System_Music_Genre	Large binary data Contains a compressed string
313	System_Media_CreatorApplicationVersi	Binary data

Column identifier	Column name	Column type
	on	
314	System_Media_AverageLevel	Integer 32-bit signed
315	System_Photo_SharpnessText	Binary data
316	System_Photo_ISOSpeed	Integer 16-bit signed
317	System_Image_Compression	Integer 16-bit signed
318	System_Contact_SpouseName	Large binary data
319	System_Contact_OtherAddressState	Binary data
320	System_Contact_HomeFaxNumber	Binary data
321	System_Contact_HomeAddressStreet	Binary data
322	System_Contact_BusinessAddressStreet	Binary data
323	System_Contact_Anniversary	Binary data
324	System_Calendar_RequiredAttendeeNames	Large binary data
325	System_MIMEType	Binary data Contains a compressed string
326	System_Contact_PrimaryTelephone	Binary data
327	System_Communication_AccountName	Binary data
328	System_Link_TargetSFGAOFlags	Integer 32-bit signed
329	System_Video_EncodingBitrate	Integer 32-bit signed
330	System_Music_AlbumArtist	Large binary data Contains a compressed string
331	System_Media_Publisher	Binary data Contains a compressed string
332	System_Contact_FullName	Large binary data
333	System_Contact_FirstName	Large binary data
334	System_Contact_AssistantTelephone	Binary data
335	System_Calendar_ShowTimeAsText	Binary data Contains a compressed string
336	System_Calendar_Resources	Large binary data
337	System_IsRead	Boolean
338	System_Search_AutoSummary	Large binary data Contains a compressed string
339	System_Video_SampleSize	Integer 32-bit signed
340	System_Music_Period	Binary data
341	System_Document_Manager	Binary data
342	System_Journal_EntryType	Binary data
343	System_Contact_TelexNumber	Binary data

Column identifier	Column name	Column type
344	System_Contact_PrimaryAddressPostOfficeBox	Binary data
345	System_Contact_MailingAddress	Binary data
346	System_Contact_IMAddress	Large binary data
347	System_Contact_Gender	Binary data
348	System_Contact_BusinessAddressPostOfficeBox	Binary data
349	System_IsShared	Boolean
350	System_Importance	Integer 32-bit signed
351	System_Video_Compression	Binary data
352	System_Document_ClientID	Binary data
353	System_Task_Owner	Large binary data
354	System_Contact_EmailName	Large binary data
355	System_ParsingName	Large binary data Contains a compressed string
356	System_FlagStatus	Integer 32-bit signed
357	System_Company	Binary data
358	System_Video_HorizontalAspectRatio	Integer 32-bit signed
359	System_Media_DateEncoded	Binary data Contains little-endian filetime
360	System_Photo_ExposureTime	Floating point double precision (64-bit)
361	System_Message_MessageClass	Binary data Contains a compressed string
362	System_Message_IsFwdOrReply	Integer 32-bit signed
363	System_Message_FromAddress	Large binary data Contains a compressed string
364	System_Contact_OtherAddress	Binary data
365	System_Contact_AssistantName	Large binary data
366	System_SFGAOFlags	Integer 32-bit signed
367	System_Video_TotalBitrate	Integer 32-bit signed
368	System_RecordedTV_RecordingTime	Binary data Contains little-endian filetime
369	System_Media_UserWebUrl	Large binary data
370	System_Photo_MeteringModeText	Binary data
371	System_Message_FromName	Large binary data Contains a compressed string
372	System_Communication_TaskStatus	Integer 16-bit signed

Column identifier	Column name	Column type
373	System_ProviderItemID	Binary data
374	System_ItemDate	Binary data Contains little-endian filetime
375	System_Video_FourCC	Integer 32-bit signed
376	System_Media_UniqueFileIdentifier	Binary data
377	System_Message_Store	Binary data Contains a compressed string
378	System_Contact_PrimaryAddressPostal	Code Binary data
379	System_Title	Large binary data Contains a compressed string
380	System_Video_VerticalAspectRatio	Integer 32-bit signed
381	System_RecordedTV_EpisodeName	Binary data Contains a compressed string
382	System_Photo_FNumber	Floating point double precision (64-bit)
383	System_Message_ToAddress	Large binary data Contains a compressed string
384	System_Message_SenderName	Large binary data Contains a compressed string
385	System_Message_ConversationID	Binary data Contains a compressed string Can contain binary data
386	System_Contact_OtherAddressPostalCode	Binary data
387	System_Contact_HomeAddressState	Binary data
388	System_Subject	Large binary data Contains a compressed string
389	System_RecordedTV_ProgramDescription	Large binary data Contains a compressed string
390	System_Audio_PeakValue	Integer 32-bit signed
391	System_Photo_Event	Large binary data
392	System_Document_DocumentID	Binary data
393	System_Message_ToName	Large binary data Contains a compressed string
394	System_Message_ConversationIndex	Binary data
395	System_Contact_BusinessAddress	Binary data
396	System_RatingText	Binary data Contains a compressed string
397	System_IsDeleted	Boolean

Column identifier	Column name	Column type
398	System_FlagColorText	Binary data
399	System_Author	Large binary data
400	System_Media_ProtectionType	Binary data
401	System_Image_HorizontalSize	Integer 32-bit signed
402	System_Task_CompletionStatus	Binary data
403	System_Contact_WebPage	Large binary data
404	System_Contact_TTYTDDTelephone	Binary data
405	System_Contact_HomeAddressCity	Binary data
406	System_Communication_TaskStatusText	Binary data
407	System_SharedWith	Large binary data
408	System_Keywords	Large binary data
409	System_RecordedTV_StationCallSign	Binary data
410	System_RecordedTV_OriginalBroadcastDate	Binary data
411	System_Media_ProviderRating	Binary data
412	System_Photo_ShutterSpeed	Floating point double precision (64-bit)
413	System_Photo_FlashText	Binary data
414	System_Image_VerticalSize	Integer 32-bit signed
415	System_Document_Division	Binary data
416	System_Message_SenderAddress	Large binary data Contains a compressed string
417	System_Message_DateSent	Binary data Contains little-endian filetime
418	System_Contact_OtherAddressCountry	Binary data
419	System_Contact_MobileTelephone	Binary data
420	System_Contact_HomeAddressCountry	Binary data
421	System_Calendar_ReminderTime	Binary data
422	System_PriorityText	Binary data
423	System_MileageInformation	Binary data
424	System_Comment	Large binary data Contains a compressed string
425	System_Media_ProviderStyle	Binary data
426	System_Photo_CameraManufacturer	Binary data
427	System_Photo_Aperture	Floating point double precision (64-bit)

Column identifier	Column name	Column type
428	System_Image_HorizontalResolution	Floating point double precision (64-bit)
429	System_Message_DateReceived	Binary data Contains little-endian filetime
430	System_Contact_OtherAddressCity	Binary data
431	System_Calendar_ShowTimeAs	Integer 16-bit signed
432	System_Rating	Integer 32-bit signed
433	System_Identity	Binary data Contains a compressed string
434	System_DueDate	Binary data Contains little-endian filetime
435	System_RecordedTV_ChannelNumber	Integer 32-bit signed
436	System_Media_UserNoAutoInfo	Binary data
437	System_Photo_ProgramModeText	Binary data
438	System_Photo_ExposureProgramText	Binary data
439	System_Photo_CameraModel	Binary data
440	System_Image_VerticalResolution	Floating point double precision (64-bit)
441	System_Document_LastAuthor	Large binary data
442	System_Message_AttachmentNames	Large binary data
443	System_Contact_JobTitle	Binary data
444	System_ThumbnailCacheId	Currency (64-bit)
445	System_Priority	Integer 16-bit signed
446	System_IsFlagged	Boolean
447	System_Image_BitDepth	Integer 32-bit signed
448	System_Document_RevisionNumber	Binary data
449	System_Contact_PrimaryAddressCity	Binary data
450	System_Contact_PersonalTitle	Binary data
451	System_Contact_OfficeLocation	Binary data
452	System_Contact_EmailAddresses	Large binary data
453	System_Contact_EmailAddress	Large binary data
454	System_Status	Binary data
455	System_Copyright	Binary data Contains a compressed string
456	System_DRM_IsProtected	Boolean
457	System_Photo_Orientation	Integer 16-bit signed
458	System_Image_CompressionText	Binary data

Column identifier	Column name	Column type
459	System_Document_TotalEditingTime	Currency (64-bit)
460	System_Contact_OtherAddressStreet	Binary data
461	System_Contact_CarTelephone	Binary data
462	System_SoftwareUsed	Binary data
463	System_DateArchived	Binary data
464	System_ContentType	Binary data
465	System_Media_ClassPrimaryID	Binary data Contains a compressed string
466	System_Document_DatePrinted	Binary data
467	System_Message_HasAttachments	Boolean
468	System_Contact_PagerTelephone	Binary data
469	System_Contact_MiddleName	Large binary data
470	System_Contact_Hobbies	Large binary data
471	System_IsFlaggedComplete	Boolean
472	System_ContentStatus	Binary data
473	System_ComputerName	Binary data Contains a compressed string
474	System_Shell_OmitFromView	Binary data
475	System_Media_ClassSecondaryID	Binary data Contains a compressed string
476	System_Photo_MeteringMode	Integer 16-bit signed
477	System_Document_DateCreated	Binary data Contains little-endian filetime
478	System_Contact_JA_CompanyNamePhonetic	Large binary data
479	System_Contact_HomeAddressPostOfficeBox	Binary data
480	System_Contact_BusinessTelephone	Binary data
481	System_Contact_BusinessAddressCountry	Binary data
482	System_Language	Binary data
483	System_Kind	Large binary data Contains a compressed string
484	System_RecordedTV_IsClosedCaptioningAvailable	Boolean
485	System_Media_DVDID	Binary data
486	System_Document_DateSaved	Binary data Contains little-endian filetime

Column identifier	Column name	Column type
487	System_Contact_Suffix	Binary data
488	System_Contact_Profession	Binary data
489	System_Contact_Label	Binary data
490	System_Contact_JA_FirstNamePhonetic	Binary data
491	System_Calendar_OrganizerAddress	Large binary data
492	System_Calendar_OptionalAttendeeNames	Large binary data
493	System_SourceItem	Binary data
494	System_ItemNamePrefix	Large binary data Contains a compressed string
495	System_ItemNameDisplay	Large binary data Contains a compressed string
496	System_RecordedTV_IsRepeatBroadcast	Boolean
497	System_Media_MCDI	Binary data Contains a compressed string
498	System_Media_FrameCount	Integer 32-bit signed
499	System_Media_Duration	Currency (64-bit)
500	System_Photo_Flash	Integer 8-bit unsigned
501	System_Document_PageCount	Integer 32-bit signed
502	System_Journal_Contacts	Large binary data
503	System_Contact_OtherAddressPostOfficeBox	Binary data
504	System_Contact_NickName	Large binary data
505	System_Contact_JA_LastNamePhonetic	Large binary data
506	System_Contact_BusinessFaxNumber	Binary data
507	System_Calendar_IsRecurring	Boolean
508	System_ItemPathDisplayNarrow	Large binary data Contains a compressed string
509	System_ItemAuthors	Large binary data Contains a compressed string
510	System_DateImported	Binary data Contains little-endian filetime
511	System_DateAcquired	Binary data Contains little-endian filetime
512	System_Search_Store	Binary data Contains a compressed string
513	System_RecordedTV_IsSAP	Boolean
514	System_Media_MetadataContentProvide	Binary data

Column identifier	Column name	Column type
	r	
515	System_Audio_EncodingBitrate	Integer 32-bit signed
516	System_Photo_FocalLength	Floating point double precision (64-bit)
517	System_Image_Dimensions	Binary data Contains a compressed string
518	System_GPS_Date	Binary data
519	System_Document_WordCount	Integer 32-bit signed
520	System_Contact_HomeAddressPostalCode	Binary data
521	System_Calendar_OptionalAttendeeAddresses	Large binary data
522	System_Calendar_IsOnline	Boolean
523	System_Software_DateLastUsed	Binary data
524	System_RecordedTV_StationName	Binary data
525	System_RecordedTV_DateContentExpires	Binary data
526	System_Media_ContentDistributor	Binary data
527	System_Audio_SampleRate	Integer 32-bit signed
528	System_Document_CharacterCount	Integer 32-bit signed
529	System_Contact_HomeAddress	Binary data
530	System_Contact_EmailAddress2	Large binary data
531	System_Contact_BusinessAddressState	Binary data
532	System_StartDate	Binary data
533	System_SensitivityText	Binary data
534	System_ParentalRatingReason	Binary data
535	System_IsIncomplete	Boolean
536	System_FileExtension	Binary data Contains a compressed string
537	System_RecordedTV_IsATSCContent	Boolean
538	System_Music_ContentGroupDescription	Binary data
539	System_Music_Composer	Large binary data Contains a compressed string
540	System_Music_Artist	Large binary data Contains a compressed string
541	System_Audio_SampleSize	Integer 32-bit signed
542	System_Contact_CallbackTelephone	Binary data

Column identifier	Column name	Column type
543	System_Calendar_OrganizerName	Large binary data
544	System_Project	Binary data
545	System_IsAttachment	Boolean
546	System_ImportanceText	Binary data Contains a compressed string
547	System_DateCompleted	Binary data
548	System_Category	Large binary data
549	System_Video_Director	Large binary data
550	System_RecordedTV_IsDTVContent	Boolean
551	System_Music_InitialKey	Binary data
552	System_Media_SubscriptionContentId	Binary data
553	System_Audio_ChannelCount	Integer 32-bit signed
554	System_Document_PresentationFormat	Binary data
555	System_Document_Contributor	Large binary data
556	System_Note_ColorText	Binary data
557	System_Contact_PrimaryAddressState	Binary data
558	System_Contact_Department	Binary data
559	System_Contact_Birthday	Binary data
560	System_Calendar_RequiredAttendeeAddresses	Large binary data
561	System_KindText	Binary data Contains a compressed string
562	System_ItemUrl	Large binary data Contains a compressed string <mark>URL can contain binary values</mark>
563	System_ApplicationName	Binary data
564	System_RecordedTV_IsHDContent	Boolean
565	System_Music_BeatsPerMinute	Binary data
566	System_Music_AlbumTitle	Binary data Contains a compressed string
567	System_Photo_OrientationText	Binary data
568	System_Photo_GainControlText	Binary data
569	System_Document_ByteCount	Integer 32-bit signed
570	System_Contact_PrimaryEmailAddress	Large binary data
571	System_Contact_PrimaryAddressCountry	Binary data
572	System_Contact_LastName	Large binary data

Column identifier	Column name	Column type
573	System_Contact_BusinessHomePage	Binary data
574	System_ParentalRating	Binary data
575	System_FlagColor	Integer 16-bit signed
576	System_AcquisitionID	Integer 32-bit signed

2.2.3. Windows 7 Search

Most of the binary values in the Windows 7 Search database are stored in big-endian.

Some of the 64-bit binary values can contain '********' instead of a 'valid' value.

Column identifier	Column name	Column type
1	DocID	Integer 32-bit signed
2	System_Search_Rank	Integer 32-bit signed
3	System_Search_GatherTime	Binary data Contains big-endian filetime
4	System_Search_Rank	Integer 32-bit signed
5	System_Size	Currency (64-bit) Contains 64-bit big-endian integer value
6	System_FileAttributes	Integer 32-bit unsigned See section: 5.1 File attribute flags
7	System_DateModified	Binary data Contains big-endian filetime
8	System_DateCreated	Binary data Contains big-endian filetime
9	System_DateAccessed	Binary data Contains big-endian filetime
256	System_Null	Large binary data Contains a compressed string
257	Microsoft_IE_TargetUrlPath	Large text
258	System_Photo_GainControlText	Large text
259	System_Contact_BusinessHomePage	Large text
260	Microsoft_IE_Title	Large text
261	System_IsIncomplete	Boolean
262	Microsoft_IE_VisitCount	Integer 32-bit unsigned
263	System_SDID	Integer 32-bit unsigned
264	System_DRM_IsProtected	Boolean
265	System_Contact_SpouseName	Large text

Column identifier	Column name	Column type
266	System_DateAcquired	Binary data
267	System_IsFolder	Boolean
268	System_Message_BccAddress	Large text
269	System_MIMEType	Large text
270	System_IsDeleted	Boolean
271	System_Message_BccName	Large text
272	System_Message_CcAddress	Large text
273	System_Document_Contributor	Large text
274	System_Search_HitCount	Integer 32-bit signed
275	System_Message_CcName	Large text
276	System_Search_AccessCount	Integer 32-bit unsigned
277	System_ItemFolderPathDisplay	Large text
278	System_Contact_EmailAddress2	Large text
279	System_ItemPathDisplay	Large text
280	System_Search_LastIndexedTotalTime	Floating point double precision (64-bit)
281	System_Search_ReverseFileName	Large text
282	System_Communication_AccountName	Large text
283	System_ItemUrl	Large text
284	System_IsRead	Boolean
285	System_Importance	Integer 32-bit signed
286	System_ContentUrl	Large text
287	System_Contact_JobTitle	Large text
288	System_ItemParticipants	Large text
289	System_FlagStatus	Integer 32-bit signed
290	System_Contact_OfficeLocation	Large text
291	System_Message_FromAddress	Large text
292	System_Message_FromName	Large text
293	System_Music_AlbumID	Large text
294	System_Message_Store	Large text
295	System_Message_ToAddress	Large text
296	System_Photo_FlashText	Large text
297	System_Message_ToName	Large text
298	System_Contact_WebPage	Large text
299	System_Contact_PrimaryAddressCountry	Large text

Column identifier	Column name	Column type
300	System_Message_DateSent	Binary data
301	System_Task_CompletionStatus	Large text
302	System_Message_DateReceived	Binary data
303	System_Contact_CallbackTelephone	Large text
304	System_Message_AttachmentNames	Large text
305	System_Photo_ExposureTime	Floating point double precision (64-bit)
306	System_Contact_PrimaryAddressState	Large text
307	System_Photo_FNumber	Floating point double precision (64-bit)
308	System_Contact_HomeTelephone	Large text
309	System_FileOwner	Large text
310	System_Message_SenderName	Large text
311	System_Calendar_ShowTimeAsText	Large text
312	System_Contact_PrimaryTelephone	Large text
313	System_Contact_MailingAddress	Large text
314	System_Contact_TTYTDDTelephone	Large text
315	System_Image_HorizontalSize	Integer 32-bit unsigned
316	System_ProviderItemID	Large text
317	System_Photo_MeteringModeText	Large text
318	System_Image_VerticalSize	Integer 32-bit unsigned
319	System_Shell_OmitFromView	Large text
320	System_Media_DateReleased	Large text
321	System_ImportanceText	Large text
322	System_Image_HorizontalResolution	Floating point double precision (64-bit)
323	System_Image_VerticalResolution	Floating point double precision (64-bit)
324	System_Image_BitDepth	Integer 32-bit unsigned
325	System_Contact_HomeAddressPostOfficeBox	Large text
326	System_DateArchived	Binary data
327	System_Contact_PrimaryAddressCity	Large text
328	System_Contact_MobileTelephone	Large text
329	System_Photo_WhiteBalance	Integer 32-bit unsigned
330	System_FlagStatusText	Large text
331	System_Media_FrameCount	Integer 32-bit unsigned

Column identifier	Column name	Column type
332	System_Media_Duration	Binary data
333	System_Image_Dimensions	Large text
334	System_Audio_EncodingBitrate	Integer 32-bit unsigned
335	System_Message_ToDoFlags	Integer 32-bit signed
336	System_Audio_SampleRate	Integer 32-bit unsigned
337	System_Audio_SampleSize	Integer 32-bit unsigned
338	System_Audio_ChannelCount	Integer 32-bit unsigned
339	System_EndDate	Binary data
340	System_Video_StreamName	Large text
341	System_Video_FrameWidth	Integer 32-bit unsigned
342	System_Photo_Event	Large text
343	System_GPS_Date	Binary data
344	System_Contact_Birthday	Binary data
345	System_Video_FrameHeight	Integer 32-bit unsigned
346	System_Contact_PrimaryEmailAddress	Large text
347	System_Contact_HomeFaxNumber	Large text
348	System_Video_FrameRate	Integer 32-bit unsigned
349	System_Video_EncodingBitrate	Integer 32-bit unsigned
350	System_Contact_HomeAddressPostalCode	Large text
351	System_Contact_FullName	Large text
352	System_Video_SampleSize	Integer 32-bit unsigned
353	System_Contact_BusinessAddressPostOfficeBox	Large text
354	System_Video_Compression	Large text
355	System_Calendar_IsOnline	Boolean
356	System_Priority	Integer 16-bit unsigned
357	System_ParentalRatingReason	Large text
358	System_DateImported	Binary data
359	System_Status	Large text
360	System_Message_HasAttachments	Boolean
361	System_Communication_HeaderItem	Boolean
362	System_Rating	Integer 32-bit unsigned
363	System_Communication_FollowupIconIndex	Integer 32-bit signed
364	System_Copyright	Large text

Column identifier	Column name	Column type
365	System_Contact_HomeAddressCity	Large text
366	System_Media_ClassPrimaryID	Large text
367	System_Contact_BusinessFaxNumber	Large text
368	System_Media_ClassSecondaryID	Large text
369	System_Media_DateEncoded	Binary data
370	System_Media_DVDID	Large text
371	System_Contact_OtherAddressStreet	Large text
372	System_Media_MCDI	Large text
373	System_Contact_PersonalTitle	Large text
374	System_Media_MetadataContentProvider	Large text
375	System_Media_ContentDistributor	Large text
376	System_Contact_MiddleName	Large text
377	System_Music_Composer	Large text
378	System_Video_Director	Large text
379	System_Contact_Suffix	Large text
380	System_ParentalRating	Large text
381	System_FlagColor	Integer 16-bit unsigned
382	System_Contact_NickName	Large text
383	System_Communication_TaskStatus	Integer 16-bit unsigned
384	System_Media_Producer	Large text
385	System_Media_Writer	Large text
386	System_RecordedTV_OriginalBroadcastDate	Binary data
387	System_Media_CollectionGroupID	Large text
388	System_Audio_PeakValue	Integer 32-bit unsigned
389	System_Media_CollectionID	Large text
390	System_Note_ColorText	Large text
391	System_Media_ContentID	Large text
392	System_RecordedTV_StationName	Large text
393	System_Media_CreatorApplication	Large text
394	System_Media_CreatorApplicationVersion	Large text
395	System_IsFlaggedComplete	Boolean
396	System_Media_Publisher	Large text
397	System_Music_Period	Large text

Column identifier	Column name	Column type
398	System_Link_TargetParsingPath	Large text
399	System_Video_HorizontalAspectRatio	Integer 32-bit unsigned
400	System_Contact_AssistantName	Large text
401	System_Video_TotalBitrate	Integer 32-bit unsigned
402	System_Media_UserWebUrl	Large text
403	System_Video_FourCC	Integer 32-bit unsigned
404	System_Media_UniqueFileIdentifier	Large text
405	System_Video_VerticalAspectRatio	Integer 32-bit unsigned
406	System_Media_EncodedBy	Large text
407	System_Contact_PagerTelephone	Large text
408	System_Media_ProtectionType	Large text
409	System_Link_TargetSFGAOFlags	Integer 32-bit unsigned
410	System_Media_ProviderRating	Large text
411	System_Media_ProviderStyle	Large text
412	System_Media_UserNoAutoInfo	Large text
413	System_Contact_CompanyMainTelephone	Large text
414	System_IsFlagged	Boolean
415	System_Communication_SecurityFlags	Integer 32-bit signed
416	System_Contact_EmailAddresses	Large text
417	System_Calendar_OrganizerAddress	Large text
418	System_Message_IsFwdOrReply	Integer 32-bit signed
419	System_Contact_Department	Large text
420	System_Communication_DateItemExpires	Binary data
421	System_DueDate	Binary data
422	System_Contact_BusinessAddressStreet	Large text
423	System_Contact_PrimaryAddressPostalCode	Large text
424	System_Contact_OtherAddressState	Large text
425	System_Contact_LastName	Large text
426	System_StartDate	Binary data
427	System_Calendar_Location	Large text
428	System_Photo_FocalLengthInFilm	Integer 16-bit unsigned
429	System_Calendar_IsRecurring	Boolean
430	System_Image_Compression	Integer 16-bit unsigned

Column identifier	Column name	Column type
431	System_Photo_OrientationText	Large text
432	System_Journal_EntryType	Large text
433	System_Contact_Anniversary	Binary data
434	System_ItemAuthors	Large text
435	System_IsAttachment	Boolean
436	System_Contact_HomeAddressState	Large text
437	System_Message_SenderAddress	Large text
438	System_Contact_FirstName	Large text
439	System_Calendar_ShowTimeAs	Integer 16-bit unsigned
440	System_Calendar_ReminderTime	Binary data
441	System_Search_AutoSummary	Large binary data Contains a compressed string
442	System_Project	Large text
443	System_IsEncrypted	Boolean
444	System_ItemDate	Binary data
445	System_Document_DocumentID	Large text
446	System_Contact_BusinessTelephone	Large text
447	System_Photo_CameraManufacturer	Large text
448	System_Communication_TaskStatusText	Large text
449	System_Photo_CameraModel	Large text
450	System_Link_TargetUrl	Large text
451	System_Photo_Orientation	Integer 16-bit unsigned
452	System_Contact_BusinessAddressCity	Large text
453	System_Contact_BusinessAddressPostalCode	Large text
454	System_ItemNamePrefix	Large text
455	System_Contact_Profession	Large text
456	System_Contact_OtherAddress	Large text
457	System_Kind	Large text
458	System_Message_ProofInProgress	Boolean
459	System_Calendar_OptionalAttendeeAddresses	Large text
460	System_Contact_OtherAddressPostalCode	Large text
461	System_ThumbnailCacheId	Binary data Contains 64-bit big-endian

Column identifier	Column name	Column type
		integer value
462	System_Category	Large text
463	System_Photo_ShutterSpeed	Floating point double precision (64-bit)
464	System_MileageInformation	Large text
465	System_Document_PresentationFormat	Large text
466	System_Photo_Aperture	Floating point double precision (64-bit)
467	System_Document_ByteCount	Integer 32-bit signed
468	System_Document_LineCount	Integer 32-bit signed
469	System_Photo_ExposureBias	Floating point double precision (64-bit)
470	System_Document_ParagraphCount	Integer 32-bit signed
471	System_Contact_CarTelephone	Large text
472	System_Document_SlideCount	Integer 32-bit signed
473	System_Contact_HomeAddress	Large text
474	System_Photo_SubjectDistance	Floating point double precision (64-bit)
475	System_Search_Store	Large text
476	System_Photo_MeteringMode	Integer 16-bit unsigned
477	System_Document_HiddenSlideCount	Integer 32-bit signed
478	System_Calendar_Resources	Large text
479	System_Photo_LightSource	Integer 32-bit unsigned
480	System_Photo_Flash	Integer 8-bit unsigned
481	System_Photo_FocalLength	Floating point double precision (64-bit)
482	System_Photo_ExposureProgram	Integer 32-bit unsigned
483	System_IconIndex	Integer 32-bit signed
484	System_Document_Manager	Large text
485	System_Company	Large text
486	System_Photo_ISOSpeed	Integer 16-bit unsigned
487	System_Contact_OtherAddressCountry	Large text
488	System_SoftwareUsed	Large text
489	System_Message_Flags	Integer 32-bit signed
490	System_Contact_Label	Large text
491	System_PriorityText	Large text
492	System_ContentType	Large text

Column identifier	Column name	Column type
493	System_SourceItem	Large text
494	System_OriginalFileName	Large text
495	System_ContentStatus	Large text
496	System_Language	Large text
497	System_Document_Version	Large text
498	System_ItemFolderNameDisplay	Large text
499	System_Document_Division	Large text
500	System_Media_SubscriptionContentId	Large text
501	System_ItemTypeText	Large text
502	System_Contact_EmailAddress	Large text
503	System_Title	Large text
504	System_Subject	Large text
505	System_Author	Large text
506	System_Keywords	Large text
507	SSystem_Keywords	Large text
508	System_Comment	Large text
509	System_ItemNameDisplay	Large text
510	System_FileExtension	Large text
511	System_Document_LastAuthor	Large text
512	System_Document_RevisionNumber	Large text
513	System_Document_TotalEditingTime	Binary data
514	System_Document_DatePrinted	Binary data
515	System_Message_ConversationID	Large text
516	System_Identity	Large text
517	System_Document_DateCreated	Binary data
518	System_Contact_BusinessAddressState	Large text
519	System_Message_ConversationIndex	Large binary data
520	System_Document_DateSaved	Binary data
521	System_Music_IsCompilation	Boolean
522	System_Document_PageCount	Integer 32-bit signed
523	System_Document_WordCount	Integer 32-bit signed
524	System_Document_CharacterCount	Integer 32-bit signed
525	System_Contact_EmailName	Large text
526	System_Calendar_ResponseStatus	Integer 16-bit unsigned
527	System_Photo_ProgramModeText	Large text

Column identifier	Column name	Column type
528	System_FileFRN	Binary data
529	System_ApplicationName	Large text
530	System_ItemName	Large text
531	System_KindText	Large text
532	System_ItemFolderPathDisplayNarrow	Large text
533	System_Contact_FileAsName	Large text
534	System_Sensitivity	Integer 16-bit unsigned
535	System_Image_CompressionText	Large text
536	System_Task_Owner	Large text
537	System_Contact_BusinessAddress	Large text
538	System_Photo_MaxAperture	Floating point double precision (64-bit)
539	System_Document_ClientID	Large text
540	System_Contact_AssistantTelephone	Large text
541	System_Music_DisplayArtist	Large text
542	System_Photo_TagViewAggregate	Large text
543	SSystem_Photo_TagViewAggregate	Large text
544	System_Photo_PeopleNames	Large text
545	System_FlagColorText	Large text
546	System_Contact_PrimaryAddressPostOfficeBox	Large text
547	System_Contact_BusinessAddressCountry	Large text
548	System_Communication_PolicyTag	Large text
549	System_Photo_ExposureProgramText	Large text
550	System_Music_Artist	Large text
551	SSystem_Music_Artist	Large text
552	System_Photo_SaturationText	Large text
553	System_Music_AlbumTitle	Large text
554	System_Media_Year	Integer 32-bit unsigned
555	System_Music_TrackNumber	Integer 32-bit unsigned
556	System_Contact_HomeAddressCountry	Large text
557	System_Music_Genre	Large text
558	SSystem_Music_Genre	Large text
559	System_Media_AverageLevel	Integer 32-bit unsigned
560	System_Journal_Contacts	Large text

Column identifier	Column name	Column type
561	System_Music_AlbumArtist	Large text
562	System_RecordedTV_EpisodeName	Large text
563	System_RecordedTV_ProgramDescription	Large text
564	System_RecordedTV_StationCallSign	Large text
565	System_Message_MessageClass	Large text
566	System_SensitivityText	Large text
567	System_Contact_IMAddress	Large text
568	System_RecordedTV_ChannelNumber	Integer 32-bit unsigned
569	System_Photo_WhiteBalanceText	Large text
570	System_Calendar_OrganizerName	Large text
571	System_AcquisitionID	Integer 32-bit signed
572	System_RecordedTV_IsClosedCaptioningAvailable	Boolean
573	System_Photo_PhotometricInterpretationText	Large text
574	System_RecordedTV_IsRepeatBroadcast	Boolean
575	System_RecordedTV_IsSAP	Boolean
576	System_RecordedTV_DateContentExpires	Binary data
577	System_Message_ToDoTitle	Large text
578	System_DateCompleted	Binary data
579	System_RecordedTV_IsATSCContent	Boolean
580	System_RecordedTV_IsDTVContent	Boolean
581	System_RecordedTV_IsHDContent	Boolean
582	System_Music_ContentGroupDescription	Large text
583	System_Music_InitialKey	Large text
584	System_Music_BeatsPerMinute	Large text
585	System_Music_Conductor	Large text
586	System_Calendar_RequiredAttendeeAddresses	Large text
587	System_Music_PartOfSet	Large text
588	System_Media_SubTitle	Large text
589	System_Music_Mood	Large text
590	Microsoft_IE_FeedItemLocalId	Large text

Column identifier	Column name	Column type
591	System_Note_Color	Integer 16-bit unsigned
592	System_Contact_JA_CompanyNamePhonetic	Large text
593	System_ComputerName	Large text
594	System_Calendar_OptionalAttendeeNames	Large text
595	System_Contact_JA_FirstNamePhonetic	Large text
596	System_Contact_Hobbies	Large text
597	System_Contact_OtherAddressPostOfficeBox	Large text
598	System_Contact_JA_LastNamePhonetic	Large text
599	System_ItemPathDisplayNarrow	Large text
600	System_RecordedTV_NetworkAffiliation	Large text
601	System_Contact_TelexNumber	Large text
602	System_ItemType	Large text
603	System_Contact_OtherAddressCity	Large text
604	System_Contact_Gender	Large text
605	System_Contact_GenderValue	Integer 16-bit unsigned
606	System_Photo_SharpnessText	Large text
607	System_RatingText	Large text
608	System_Photo_FlashFired	Boolean
609	System_Photo_DateTaken	Binary data
610	System_Photo_ContrastText	Large text
611	System_FileName	Large text
612	System_Photo_DigitalZoom	Floating point double precision (64-bit)
613	System_ParsingName	Large text
614	System_Software_DateLastUsed	Binary data
615	System_SFGAOFlags	Integer 32-bit unsigned
616	System_Contact_HomeAddressStreet	Large text
617	System_Contact_PrimaryAddressStreet	Large text
618	System_Contact_EmailAddress3	Large text
619	System_Calendar_RequiredAttendeeNames	Large text
620	System_Calendar_Duration	Large text
621	System_Contact_Children	Large text

Column identifier	Column name	Column type
622	Microsoft_IE_SelectionCount	Integer 32-bit unsigned
623	Microsoft_IE_TargetUrl	Large text
624	System_RecordedTV_RecordingTime	Binary data
625	Microsoft_IE_TargetUrlHostName	Large text

2.3. SystemIndex_0P

The SystemIndex_0P contains information about the columns in the SystemIndex_0A table.

2.3.1. Windows XP, Vista and 7 Search

Column identifier	Column name	Column type
1	PID	Integer 32-bit signed <mark>Program identifier?</mark>
2	ColumnID	Integer 32-bit signed Contains the column identifier
3	Type	Integer 32-bit signed <mark>Windows Search data type?</mark> Similar to OLE variant types
4	MaxSize	Integer 32-bit signed
5	Fixed	Boolean
6	Sparse	Boolean
7	FastAccess	Integer 8-bit signed
8	Compress	Integer 8-bit signed
9	JetCompress	Boolean
128	Name	Text String containing the column name

2.4. SystemIndex_Gthr

<mark>Contains information about files indexed (gathered).</mark>

2.4.1. Windows XP Search

Column identifier	Column name	Column type
1	PathId	Integer 32-bit signed
2	DocumentID	Integer 32-bit signed
3	ContentIdentifierID	Integer 32-bit signed
4	CrawlNumberCrawled	Integer 32-bit signed

Column identifier	Column name	Column type
5	TimeMD5Changed	Date and time
6	FailureUpdateAttempts	Integer 32-bit signed
7	LastModified	Date and time
8	DeletedCount	Integer 32-bit signed
9	TransactionFlags	Integer 32-bit signed
10	HostDepth	Integer 32-bit signed
11	EnumerationDepth	Integer 32-bit signed
12	StartAddressIdentifier	Integer 32-bit signed
13	FirstAccess	Date and time
14	LastAccess	Date and time
15	ChangeCount	Integer 16-bit signed
16	AccessCount	Integer 16-bit signed
17	NeedsDeleting	Boolean
18	NeedsIndexing	Boolean
19	Failed	Boolean
128	FileName1	Binary data Contains UTF-16 little-endian string
256	FileName2	Large binary data Contains UTF-16 little-endian string
257	RequiredSIDs	Binary data

2.4.2. Windows Vista Search

Column identifier	Column name	Column type
1	PathId	Integer 32-bit signed
2	DocumentID	Integer 32-bit signed
3	ContentIdentifierID	Integer 32-bit signed
4	CrawlNumberCrawled	Integer 32-bit signed
5	TimeMD5Changed	Date and time
6	FailureUpdateAttempts	Integer 32-bit signed
7	LastModified	Date and time
8	DeletedCount	Integer 32-bit signed
9	TransactionFlags	Integer 32-bit signed
10	HostDepth	Integer 32-bit signed
11	EnumerationDepth	Integer 32-bit signed

Column identifier	Column name	Column type
12	StartAddressIdentifier	Integer 32-bit signed
13	FirstAccess	Date and time
14	LastAccess	Date and time
15	ChangeCount	Integer 16-bit signed
16	AccessCount	Integer 16-bit signed
17	TimesUnvisited	Integer 32-bit signed
18	CheckpointVersion	Binary data
128	FileName1	Binary data
256	FileName2	Large binary data

2.4.3. Windows 7 Search

Column identifier	Column name	Column type
1	ScopeID	Integer 32-bit signed
2	DocumentID	Integer 32-bit signed
3	SDID	Integer 32-bit signed
4	LastModified	Binary data Contains big-endian filetime
5	TransactionFlags	Integer 32-bit signed
6	CrawlNumberCrawled	Integer 32-bit signed
7	StartAddressIdentifier	Integer 16-bit unsigned
8	Priority	Integer 8-bit unsigned
256	FileName	Large text Contains a compressed string
257	UserData	Large binary data
258	RequiredSIDs	Binary data
259	DeletedCount	Integer 32-bit signed
260	RunTime	Integer 32-bit signed
261	FailureUpdateAttempts	Integer 8-bit unsigned
262	ClientID	Integer 32-bit unsigned
263	LastRequestedRunTime	Integer 32-bit unsigned

2.5. SystemIndex_GthrPth

Contains information about locations (paths) indexed (gathered).

2.5.1. Windows XP Search

Column identifier	Column name	Column type
1	LookupMD5	Integer 32-bit signed
256	LookupValue	Large text

2.5.2. Windows Vista Search

Column identifier	Column name	Column type
1	LookupMD5	Integer 32-bit signed
2	CheckpointVersion	Binary data
256	LookupValue	Large text

2.5.3. Windows 7 Search

Column identifier	Column name	Column type
1	Scope	Integer 32-bit signed
2	Parent	Integer 32-bit signed
256	Name	Large text

2.6. SystemIndex_Gthr_RecCount

2.6.1. Windows XP and VIsta Search

Column identifier	Column name	Column type
1	PrimKey	Integer 32-bit signed
2	RecordCount	Integer 32-bit signed

2.7. SystemIndex_MaxDoc

Contains the largest (maximum) document identifier.

2.7.1. Windows XP Search

Column identifier	Column name	Column type
1	DocumentId	Integer 32-bit signed

2.7.2. Windows Vista Search

Column identifier	Column name	Column type
1	DocumentId	Integer 32-bit signed

Column identifier	Column name	Column type
2	CheckpointVersion	Binary data

2.8. SystemIndex_DeletedDocIds

Contains the deleted document identifiers.

2.8.1. Windows XP Search

Column identifier	Column name	Column type
1	DocumentId	Integer 32-bit signed

2.8.2. Windows Vista Search

Column identifier	Column name	Column type
1	DocumentId	Integer 32-bit signed
2	CheckpointVersion	Binary data

3. Shadow tables

The Window Vista Search database contains copies of tables. These copies are referred to as shadow tables.

Shadow table	Copy of table
SystemIndex_Gthr_S	SystemIndex_Gthr
SystemIndex_GthrPth_S	SystemIndex_GthrPth
SystemIndex_MaxDoc_S	SystemIndex_MaxDoc
SystemIndex_DeletedDocIds_S	SystemIndex_DeletedDocIds

4. String compression

Within the Windows Vista Search database most text data is stored in binary data containing compressed text. In Windows XP and 7 Search only a few strings are stored in this manner.

Part of the compression method is the following obfuscation method.

```
bitmask32  = 0x05000113;

bitmask32 ^= (uint32_t) encoded_data_size;

for( encoded_data_iterator = 0;
     encoded_data_iterator < encoded_data_size;
     encoded_data_iterator++ )
{
        switch( encoded_data_iterator & 0x03 )
        {
```

```
                        case 3:
                            bitmask = (uint8_t) ( ( bitmask32 >> 24 ) & 0xff );
                            break;

                        case 2:
                            bitmask = (uint8_t) ( ( bitmask32 >> 16 ) & 0xff );
                            break;

                        case 1:
                            bitmask = (uint8_t) ( ( bitmask32 >> 8 ) & 0xff );
                            break;

                        default:
                            bitmask = (uint8_t) ( bitmask32 & 0xff );
                            break;
            }
            bitmask ^= encoded_data_iterator;

            data[ data_iterator++ ] = encoded_data[ encoded_data_iterator ]
                                      ^ bitmask;
}
```

The initial bitmask (bitmask32) is created by a 32-bit XOR of the values in the SID:

```
S-1-5-12
```

Which is stored as the following byte values:

```
01 01 00 00 00 00 00 05 12 00 00 00
```

The first byte of the decoded data contains a compression type byte:

Value	Description
0x00	Run-length compressed UTF-16 little-endian string
0x01	8-bit compressed UTF-16 little-endian string
0x02	Byte index-based run-length compressed UTF-16 little-endian string
0x03	Byte index-based 8-bit compressed UTF-16 little-endian string
0x04	Uncompressed data
0x06	Unknown
0x08	Unknown

4.1. Run-length compressed UTF-16 little-endian string

For the compressed data
1. read the byte containing the 'compression size'
2. read the 'compressed byte'
3. for the 'compression size' greater than 0
    1. read a byte from the compressed data and add it to the uncompressed data
    2. add the 'compressed byte' to the uncompressed data

4.2. 8-bit compressed UTF16 little-endian string

For the compressed data
1. read a byte from the compressed data and set it in the uncompressed data
2. set a zero byte in the uncompressed data

Note: seems to be using a codepage, although the decompression algorithm doesn't seems to provide compensation for this

4.3. Byte index-based compressed data

The data is stored compressed if the compressed data is smaller than the uncompressed data.

offset	size	value	description
0	2		The uncompressed data size
2	256		The byte index table
258	...		The compressed data

1. Build a compression value table based on the byte index table
2. Decompress the compressed data using the compression value table
    1. if the compression value is compressed
        1. determine the compression offset
        2. determine the compression size, similar to DIRECT2
        3. copy a part of the uncompressed buffer, similar to LZ77
    2. otherwise use the byte value

Note: seems to be using a codepage for the 8-bit value, although the decompression algorithm doesn't seems to provide compensation for this

4.3.1. Byte index-based run-length compressed UTF-16 little-endian string

The byte index-based compressed data contains a run-length compressed UTF-16 little-endian string.

Note that some strings seem to be cut short.

4.3.2. Byte index-based 8-bit compressed UTF-16 little-endian string

The byte index-based compressed data contains a 8-bit compressed UTF-16 little-endian string.

5. Windows definitions

5.1. File attribute flags

The file attribute flags consist of the following values:

Value	Identifier	Description
0x00000001	FILE_ATTRIBUTE_READONLY	Is read-Only
0x00000002	FILE_ATTRIBUTE_HIDDEN	Is hidden
0x00000004	FILE_ATTRIBUTE_SYSTEM	Is a system file or directory
0x00000008		<mark>Is a volume label</mark>
0x00000010	FILE_ATTRIBUTE_DIRECTORY	Ia s directory
0x00000020	FILE_ATTRIBUTE_ARCHIVE	Should be archived
0x00000040	FILE_ATTRIBUTE_DEVICE	<mark>Is a device</mark>
0x00000080	FILE_ATTRIBUTE_NORMAL	Is normal None of the other flags should be set
0x00000100	FILE_ATTRIBUTE_TEMPORARY	Is temporary
0x00000200	FILE_ATTRIBUTE_SPARSE_FILE	Is a sparse file
0x00000400	FILE_ATTRIBUTE_REPARSE_POINT	Is a reparse point or symbolic link
0x00000800	FILE_ATTRIBUTE_COMPRESSED	Is compressed
0x00001000	FILE_ATTRIBUTE_OFFLINE	Is offline The data of the file is stored on an offline storage.
0x00002000	FILE_ATTRIBUTE_NOT_CONTENT_INDEXED	Do not index content The content of the file or directory should not be indexed by the indexing service.
0x00004000	FILE_ATTRIBUTE_ENCRYPTED	Is encrypted
0x00010000	FILE_ATTRIBUTE_VIRTUAL	Currently reserved for future use Is virtual

Appendix A. References

[DOUGLAS09]
Title: Forensic Artefacts Present in Microsoft Windows Desktop Search
Author(s):   John Douglas
Date: February 2009

[LIBESEDB09]
Title: Extensible Storage Engine (ESE) Database File (EDB) format
Author(s):   Joachim Metz
Date: September 2009
URL: http://sourceforge.net/projects/libesedb/

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Version 1.1, March 2000

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