Quest®

Quest® InTrust 11.3.2

SDK Reference

If you have any questions regarding your potential use of this material, contact:

Quest Software Inc.

Attn: LEGAL Dept

4 Polaris Way

Aliso Viejo, CA 92656

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Legend

CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

IMPORTANT, **NOTE**, **TIP**, **MOBILE**, or **VIDEO**: An information icon indicates supporting information.

InTrust SDK Reference
Updated - September 2018
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Contents

InTrust SDK Overview

The InTrust SDK makes InTrust functionality available to applications. At this time, the SDK includes the following components:

- Repository Services API
- Log Knowledge Base API

The InTrust SDK is included in the InTrust Server component and works on any computer where InTrust Server is deployed.

Requirements

If you want to install the SDK separately from InTrust Server, the computer must meet the following requirements (similar to the requirements for InTrust Server):

Architecture	x64
Operating System	Any of the following: • Microsoft Windows Server 2016 • Microsoft Windows Server 2012 R2 • Microsoft Windows Server 2012 • Microsoft Windows Server 2008 R2
Memory	Min. 6GB
Additional Software and Services	• Microsoft .NET Framework 4.5 with all the latest updates • Update for Universal C Runtime in Windows, available from https://support.microsoft.com/en-us/kb/2999226 at the time of this writing

CAUTION: To use the InTrust API with old versions of Windows PowerShell (2.0 and earlier), make sure you configure PowerShell to use the version of the .NET runtime that the SDK requires. For that, create the powershell.exe.config (or powershell_ise.exe.config) file in the same folder as powershell.exe (or powershell_ise.exe) file with content like the following:

```
<?xml version="1.0"?>
<configuration>
    <startup useLegacyV2RuntimeActivationPolicy="true">
        <supportedRuntime version="v4.0"/>
        <supportedRuntime version="v2.0.50727"/>
    </startup>
</configuration>
```

Required Permissions

To be able to use the features of the InTrust SDK, your code must be run under an account that is listed as an InTrust organization administrator. For details about setting up this privilege, see InTrust Organization Administrators.

Standalone Setup

To install the InTrust SDK separately from InTrust Server, run the **INTRUST_SDK.11.3.2.*.*.msi** installation package provided to you. It is located in the **InTrust\Server** folder in your InTrust distribution.

Configuring C# References

To make sure that C# bindings work, enable references to the following COM type libraries:

1. InTrust Environment 1.0 Type Library
2. Repository Record Inserter 1.0 Type Library
3. Repository Services 1.0 Type Library

For each of them, open the properties and set the **Embed Interop Types** parameter to **False**.

First Steps

To verify that InTrust SDK works and get your first test results, see Getting Started with Repository Services API.

Repository Services API

This topic describes the API that InTrust provides for repositories. This API lets you do the following:

- Connect to a repository for searching and writing
- Get records from a repository by searching
- Put records in a repository
- Manage repositories:
    - Remove (unregister) them
    - Create them
    - Work with repository properties

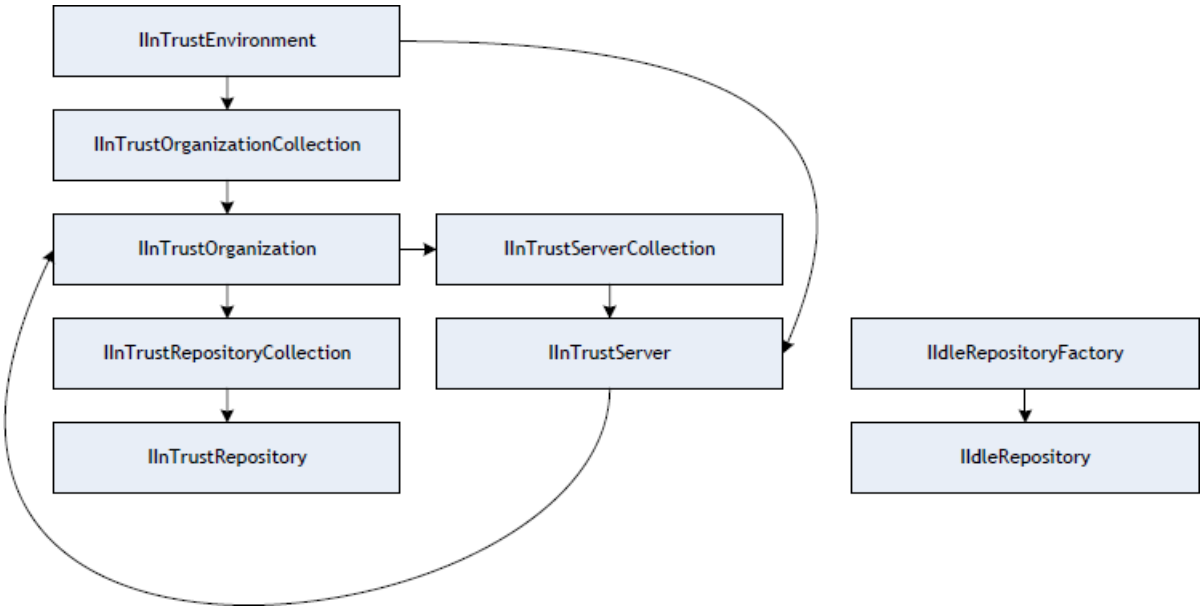
The API is implemented as a collection of COM objects that become available after you have installed the InTrust SDK. Use the interfaces described in the topics listed below; call the methods of those interfaces for access to records and repositories.

Connecting to a Repository

Use the interfaces listed below for access to an InTrust repository. Once you have gained access, you can search for records in the repository (see Getting Records) and write records to it (see Writing Records).

Overview of Repository Access

The following diagram shows the relationships between the InTrust SDK's interfaces used for getting access to a repository. An arrow indicates that an interface returns another interface.



Before you can have access to an InTrust repository, you need to initialize the InTrust environment. For that, create an object that implements the IInTrustEnvironment interface. This object makes the current InTrust organization, its servers and its repositories available to you. The relationships between these items are as follows:

- An InTrust organization provides a single configuration database for one or more InTrust servers.
- An InTrust repository is registered with an InTrust organization, and its entry is contained in the configuration shared by all InTrust servers in the organization.
- Specific InTrust servers manage specific repositories but do not “own” them; however, the organization does.

The IInTrustEnvironment interface provides the environment for working with all available InTrust organizations. You can use two methods to get the organization you need:

1. Get a collection of known organizations (**Organizations** method of the IInTrustEnvironment interface) and pick the necessary one. This involves working with the IInTrustOrganizationCollection interface. In this case, organizations are discovered by an Active Directory query.
2. Connect directly to an InTrust server by name (**ConnectToServer** method of the IInTrustEnvironment interface). This involves working with the IInTrustServer interface, which you can use to get the organization that the server is in.

Once you have gained access to an organization, use its interface (IInTrustOrganization) to get a collection of the repositories in it (IInTrustRepositoryCollection) and get the repository you are looking for (IInTrustRepository).

The information above concerns access to regular production repositories. However, a valid file structure with data can also act as an InTrust repository for the purposes of searching and writing, even if it is not included in InTrust configuration. It is called an idle repository. An idle repository has no representation in the InTrust environment, so you need to construct its interface to gain access. For details, see Creating and Removing Repositories.

Examples

If you know the name of the organization for a specific repository, follow the **organization → repository** chain of access:

```
{
    IInTrustEnvironment intrust_environment = new InTrustEnvironment();
    IInTrustOrganizationCollection organizations = intrust_
environment2.Organizations;
    IInTrustOrganization intrust_organization =
organizations.Cast<IInTrustOrganization>().Where(x => x.Name == "My
Organization").First();
    IInTrustRepositoryCollection repositories = intrust_
organization.Repositories;
    IInTrustRepository repository = repositories.Cast<IInTrustRepository>
().Where(x => x.Name == "My Repository").First();
}
```

If you only know the name of a server in the organization, follow the **server → organization → repository** chain of access:

```
{
    IInTrustEnvironment intrust_environment = new InTrustEnvironment();
    IInTrustServer intrust_server = intrust_environment.ConnectToServer("My
Server");
    IInTrustOrganization intrust_organization = intrust_server.Organization;
    IInTrustRepositoryCollection repositories = intrust_organization.Repositories;
    IInTrustRepository repository = repositories.Cast<IInTrustRepository>().Where(x
=> x.Name == "My Repository").First();
}
```

Details

Use the following interfaces for repository access and related tasks:

- IInTrustEnvironment
- IInTrustOrganizationCollection
- IInTrustOrganization
- IInTrustServerCollection
- IInTrustServer
- IInTrustRepositoryCollection
- IInTrustRepository

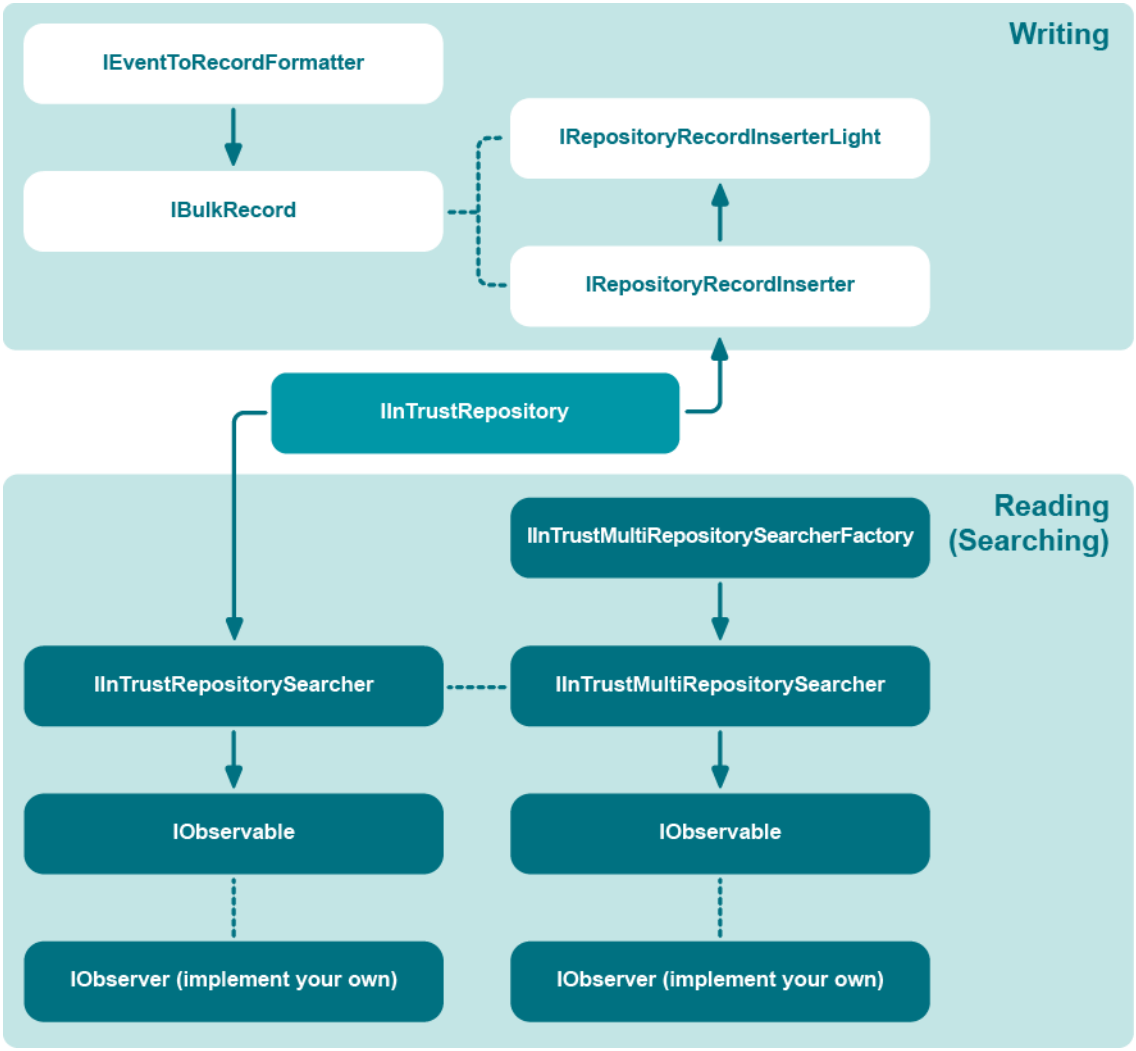
Getting and Putting Data

The InTrust repository was originally developed to store event log data, and this dictated the design choices that it is based on. However, the repository architecture is flexible enough for storing generic records containing arbitrary key-value pairs. The repository API provides tools for reading and writing both kinds of data.

Importantly, the repository is a document-oriented store. If you need to implement any inter-document relationships, you need to define them at the document contents level.

Overview

The following diagram shows the relationships between the InTrust SDK's interfaces used for reading and writing repository data. An arrow indicates that an interface returns another interface. Dashed lines between interfaces mean they don't return one another, but are used together for particular tasks.



See below for details about building program flow that uses these relationships. For a diagram of how to obtain the IInTrustRepository interface, see Connecting to a Repository.

Writing

Whether you want to write generic records or events, first you need access to the IRepositoryRecordInserter interface. Take the following steps:

1. Connect to the repository you need, as described in Connecting to a Repository.
2. Get the IRepositoryRecordInserter interface.
   This interface manages the writing of data to a repository. To obtain it, call the **Inserter** method of the IInTrustRepository interface of the repository you are connected to. A new inserter is created every time you make this call. You should obtain it once and reuse it for all writing to the repository.

For details about the next steps, see the following topics:

- Writing Records
- Writing Events

Reading

Reading data from a repository means searching the repository for it. Search queries use the REL language described in InTrust Customization Kit. For a list of fields that you can use in search queries, see Searchable Event and Record Fields. For some important REL query specifics, see Composing REL Queries.

The data-retrieving functionality of the InTrust repository API is modeled after the push-based notification system used in the Microsoft .NET Framework. Therefore, the API provides similar interfaces (such as IObservable and IObserver).

To perform a repository search

1. Connect to the repository you need, as described in Connecting to a Repository. This gives you access to the IInTrustRepository interface.
2. Use the **Searcher** method of the IInTrustRepository interface to get the IInTrustRepositorySearcher interface.
3. Use that interface's **Search** method to get an IObservable interface.
4. Subscribe to the notification using the IObserver interface.

Example of a helper function (C#):

```
static void search_events(IInTrustRepository intrust_repository, string
query)
{
    IObservable observable = intrust_repository.Searcher().Search(query);
    MyObserver observer = new MyObserver();
    observable.Subscribe(observer, out observer.m_cookie);
}
```

The repository API also provides a way to perform searches on multiple repositories simultaneously. The IMultiRepositorySearcher interface is provided for this purpose.

To perform a multi-repository search

1. Obtain the IInTrustRepositorySearcher interfaces for the repositories you need.
2. Construct a IMultiRepositorySearcher interface using the IMultiRepositorySearcherFactory interface.
3. In the newly-created interface, specify the interfaces from the first step using the **MakeMultiSearchObject** method.
4. Use the returned interface as a regular IInTrustRepositorySearcher interface, as described above.

Example of a multi-repository search:

```
IInTrustEnvironment env = new InTrustEnvironment();
IInTrustServer server = env.ConnectToServer("10.30.38.230");
IInTrustOrganization org = server.Organization;
IInTrustEventory evs = org.Eventory;
string eventory_str = evs.Eventory;
IMultiRepositorySearcherFactory multi_searcher_fac = new
MultiRepositorySearcherFactory();
IMultiRepositorySearcher multi_searcher = multi_searcher_
fac.CreateMultiRepositorySearcher(eventory_str);
```

The example above involves an explicitly specified log knowledge base (see Log Knowledge Base API for details). To use the default log knowledge base, rewrite it as follows:

```
IMultiRepositorySearcherFactory multi_searcher_fac = new
MultiRepositorySearcherFactory();
IMultiRepositorySearcher multi_searcher = multi_searcher_
fac.CreateMultiRepositorySearcher(null);
```

For details about the next steps, see the following topics:

- Getting Records
- Getting Events

The following interfaces are involved in repository searches:

- IObservable
  Enables push-based notification. Implement this interface as the source of discovered records.
- IObserver
  Gets push-based notifications. Implement this interface as the search result handler.
- ICookie
  Keeps a search active. It is unlikely that you will need to handle this interface directly, but it helps to know that it is involved in searching.

Getting Records

A repository search returns data wrapped in a polymorphic **IUnknown** interface, as described in Getting and Putting Data. To interpret the data as repository records, cast it as IBulkRecord2.

Example (C#)

```
class MyObserver : IDisposable, REPOSITORYSERVICESLib.IObserver
{
    public REPOSITORYSERVICESLib.ICookie m_cookie;
    public MyObserver()
    {
    }
    public void OnDone()
    {
        Console.WriteLine("Search done");
    }
    public void OnError(int hr, string description)
    {
        Console.WriteLine("Search error: {0}", description);
    }
    public void OnNext(object data)
    {
        if (data != null)
        {
            IBulkRecord2 bulk_record2 = (data as IBulkRecord2);
            List<record2> records = bulk_record.GetRecords().Cast<record2>
().ToList<record2>();
            int record_count = 0;
            foreach (record2 my_record in records)
            {
                ++record_count;
            }
        }
        System.Runtime.InteropServices.Marshal.FinalReleaseComObject(data);
    }
}
```

For details about what repository records are, see Repository Record Data Structures.

Getting Events

A repository search returns data wrapped in a polymorphic **IUnknown** interface, as described in Getting and Putting Data. To interpret the data as event records, cast it as IBulkEventWithReadExtensions.

Example (C#)

```
class MyObserver : IDisposable, REPOSITORYSERVICESLib.IObserver
{
    public REPOSITORYSERVICESLib.ICookie m_cookie;
    public MyObserver()
    {
    }
    public void OnDone()
    {
        Console.WriteLine("Search done");
    }
```

```
    public void OnError(int hr, string description)
    {
        Console.WriteLine("Search error: {0}", description);
    }
    public void OnNext(object data)
    {
        if (data != null)
        {
            IBulkEventWithReadExtensions bulk_event = (data as
IBulkEventWithReadExtensions);
            List<event_with_read_extensions> events = bulk_event.GetEvents
().Cast<event_with_read_extensions>().ToList<event_with_read_extensions>();
            int event_count = 0;
            foreach (event_with_read_extensions my_event in events)
            {
                ++event_count;
            }
        }
        System.Runtime.InteropServices.Marshal.FinalReleaseComObject(data);
    }
}
```

For details about what event records are, see Event Record Data Structures.

Composing REL Queries

REL is an expression language developed specifically for InTrust, and it is used for multiple purposes besides repository searching.

The following topics about REL in the InTrust Customization Kit contain information that is fully applicable to queries used for searching in repositories:

- Words
- Expressions
- Operators
- Functions

However, due to the specifics of how repositories operate, there are some limitations on what you can include in your queries and nuances that affect performance. These peculiarities have to do with the following:

- Use of punctuation in field values
- Whether "equals" or "contains" semantics are used

Punctuation and Other Non-Alphanumeric Characters

Some characters, such as curly braces and the hyphen, are treated in a special way by the repository indexing engine. A query that includes these characters is automatically transformed during an indexed search, even though the query itself may be perfectly valid. The indexing engine splits the query into substrings at these characters and uses the substrings to make the clauses of an AND expression.

As a result, these characters are effectively removed from the index. This affects how well irrelevant data is filtered out and, consequently, how fast queries are evaluated. The following is a list of such characters:

- \ & { } ( ) [ ] < > , ! ? .

You can deal with this limitation in the following ways:

What you can do	Comments
Do nothing; leave the characters where they are.	Your query will be transformed automatically so that the indexing engine filters out as much of the repository as it can before running the search. However, punctuation characters are not part of the index, so the expected values may not be the only ones that match. A lot of similar but irrelevant matches can be present in the results. How fast your query runs and how relevant its results are depends on how many distinctive alphanumeric substrings it contains besides the punctuation: • If your query is made up of strings that have low chances of occurrence, your search will be fast and the results will be mostly relevant. • If your query contains strings that occur all the time, your search will be slow and the results will not be very useful.
Pick different fields to match by; ones that can contain only alphanumeric characters.	You can achieve maximum search performance, but it can be difficult or impossible to find equally relevant fields.

"Equals" Versus "Contains"

In a repository search, a query that uses "equals" semantics (the **striequ** REL function) is always evaluated faster than a similar query using "contains" semantics (the **substr** REL function). Queries with "does not equal" semantics are even slower.

Regular expressions (the **regexp** REL function) are slowest.

Searchable Event and Record Fields

This topic lists the field names that you can use in your REL queries when you search for events or records in a repository using the IObservable and IObserver interfaces.

The results of a search are polymorphic and can be cast to events or records as necessary. In addition, you can treat the contents of the repository as either events or records and use either event field names or record field names. However, you cannot mix event and record field names in the same query.

For example, if your repository contains custom records with filled-in insertion strings, it is convenient to treat the records as events for easy access to insertion string contents (see Insertion Strings below).

Event Fields

Field	Details
__AnyField	Look for the specified pattern in all fields.
Category	A symbolic representation of the event category. Search pattern example: **"(\\b|\\W|^)security"**
Computer	The computer where the event was logged.

Field	Details
Environment	Internally, InTrust predefines two environment ID values: • **8EAF6C85-D1FF-4CFD-9D90-64944C8E6B3E** Unix Network Environment • **9E442BEE-EAC2-4D79-9013-053FB225CFD0** Microsoft Windows Network Environment Custom environment IDs can also occur.
EventID	
PlatformID	Internally, InTrust predefines the following platform ID values: • 500 Microsoft Windows • 610 Solaris • 620 HP-UX • 630 Linux • 640 IBM AIX Custom platform IDs can also occur.
Source	The subsystem or service that the event is related to. For example, in forwarded Syslog events the source is "Syslog Device".
SourceComputer	The computer where the event originated; this can be different from the computer where it was logged.
SourceDomain	The domain of the computer where the event originated, if applicable.
Time	The timestamp in the event. **Tip:** Use filtering by date in your REL queries whenever the date range is known. This speeds up searches considerably.
Type	The predefined types are **Information**, **Warning**, **Error**, **Failure Audit** and **Success Audit**.
UserDomain	The domain of the user who produced the event.
UserName	The name of the user who produced the event.
VersionMajor	The major operating system version number of the computer on which the event occurred. For example, the major version of Windows 7 is 6.
VersionMinor	The minor operating system version number of the computer on which the event occurred. For example, the minor version of Windows 7 is 1.

Field	Details
What	A brief description of what the event is about.
Where	The computer where the event happened (had effect).
Where_From	The name or IP address of the computer from which the activity (such as a logon or configuration change) was performed. This is not necessarily the same computer as the one where the activity had effect.
Who	The plain user name of the account that caused the event.
WhoDomain	The Active Directory domain of the account that caused the event, where applicable.
Whom	The user account that was affected by the event, where applicable.

Insertion Strings

To look in insertion strings and resolved insertion strings, respectively, use the following field names:

- InsertionString*N*
- ResolvedInsertionString*N*

where *N* is the number of the string.

Examples of REL expressions:

```
in( InsertionString10, "rei", "(\\b|\\W|^)is1608133597" );
```

```
striequ(ResolvedInsertionString2,"is");
```

Record Fields

Most of the fields defined in the record data structures (see Repository Record Data Structures) can be used in search queries:

- directory_tag_1
- directory_tag_2
- directory_tag_3
- directory_tag_4
- field_1
- field_3
- field_4
- file_tag_1
- file_tag_2
- file_tag_3
- file_tag_4
- formatting_record_field
- string_field_1
- string_field_2

- string_field_3
- string_field_4
- string_field_5

Note that some fields contain integers and others strings.

Examples of REL expressions:

```
field_1 = 123;

striequ(directory_tag_1,"blue");

striequ(formatting_record_field,"green");

striequ(string_field_1,"cerise");

file_tag_1 = 5385;
```

Writing Records

After you have obtained the IRepositoryRecordInserter interface (as described in Getting and Putting Data), you need to generate the data structures that you are going to write. Before you begin writing, make sure you understand the record data structures (see Repository Record Data Structures) and are able to construct them efficiently. The repository API provides two ways to write records: you can use either complete **record** structures or arrays of the smaller structures from which **record**s are made up. The next steps depend on this choice.

Approach 1: Writing Whole Record Structures

In this approach, you combine your newly generated **tags** and **contents** structures into complete **record** structures, put the **record**s in an array and supply the array to the **PutRecords** method of the IRepositoryRecordInserter interface.

Approach 2: Splitting Records for Writing

This approach requires that you plan in advance which of your record fields best to use as **tags**. This will enable you to create records with shared **tags** and different **contents**. The IRepositoryRecordInserterLight interface stores the **tags** that you want to share among your records. To get this interface, call the **BindFields** method of the IRepositoryRecordInserter interface you have obtained. This method accepts your **tags** as a parameter.

After that, supply the **contents** parts of your **record**s to the IRepositoryRecordInserterLight interface; it will form complete **record** structures and perform the writing.

Example (C#)

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading;
using System.Threading.Tasks;
using System.Windows.Forms;
using System.Runtime.InteropServices;

using REPOSITORYSERVICESLib;
using REPOSITORYRECORDINSERTERLib;

using INTRUSTENVIRONMENTLib;

namespace RepositoryRecordInserterTest2
{
    class Program
    {
        public static uint ToUnixTime(DateTime date)
        {
            var epoch = new DateTime(1970, 1, 1, 0, 0, 0, DateTimeKind.Utc);
            return (uint)Convert.ToInt64((date.ToUniversalTime() -
epoch).TotalSeconds);
        }

        public static DateTime UnixTimestampToDateTime(uint unixTime)
        {
            DateTime unixStart = new DateTime(1970, 1, 1, 0, 0, 0, 0,
System.DateTimeKind.Utc);
            long unixTimeStampInTicks = (long)(unixTime * TimeSpan.TicksPerSecond);
            return new DateTime(unixStart.Ticks + unixTimeStampInTicks);
        }

        class MyObserver : IDisposable, REPOSITORYSERVICESLib.IObserver
        {
            private AutoResetEvent m_waitHandler;

            public int event_count;

            public REPOSITORYSERVICESLib.ICookie m_cookie;

            public MyObserver(AutoResetEvent x)
            {
                m_waitHandler = x;
                event_count = 0;
            }

            public void OnDone()
            {
                Console.WriteLine("Search done");
                m_waitHandler.Set();
```

```
            }

            public void OnError(int hr, string description)
            {
                Console.WriteLine("Search error - {0}", description);
                m_waitHandler.Set();
            }

            public void OnNext(object data)
            {
                if (data != null)
                {
                    IBulkRecord bulk_event = (data as IBulkRecord);
                    List<record> records = bulk_event.GetRecords().Cast<record>
().ToList<record>();

                    foreach (record my_record in records)
                    {
                        Console.WriteLine("next record");
                        Console.WriteLine("    time - {0}", UnixTimestampToDateTime
(my_record.record_contents.gmt_time));
                        foreach (named_string my_named_string in my_record.record_
contents.named_fields)
                        {
                            Console.WriteLine("    key - {0}, value - {1}", my_named_
string.name, my_named_string.value);
                        }
                        ++event_count;
                    }
                }

                System.Runtime.InteropServices.Marshal.FinalReleaseComObject(data);
            }

            public void Dispose()
            {
                m_cookie.Stop();
            }
        }

        static tags construct_sharding_fields(string log)
        {
            // For details about using sharding keys, see the "Repository Record Data
Structures" topic
            tags tg = new tags();
            tg.directory_tag_1 = "ShardingLevel1";
            tg.directory_tag_2 = "ShardingLevel2";
            tg.directory_tag_3 = "{A9E5C7A2-5C01-41B7-9D36-E562DFDDEFA9}"; // Sharding
level 3 must be a GUID
            tg.directory_tag_4 = log;

            tg.file_tag_1 = 0;
            tg.file_tag_2 = 500;
```

```
tg.file_tag_3 = 0;
            tg.file_tag_4 = 0;
            return tg;
        }

        static contents construct_contents_fields(insertion_string[] insertion_
strings, named_string[] named_fields, string formatting_record_field)
        {
            contents ct = new contents();

            ct.string_field_1 = "string_field_1_value";
            ct.string_field_2 = "string_field_2_value";
            ct.string_field_3 = "string_field_3_value";
            ct.string_field_4 = "string_field_4_value";
            ct.string_field_5 = "string_field_5_value";

            ct.formatting_record_field = formatting_record_field;

            ct.gmt_time = ToUnixTime(DateTime.Now);

            ct.field_1 = 300;
            ct.field_2 = 50;
            ct.field_3 = 2;
            ct.field_4 = 3;

            ct.strings = insertion_strings;

            ct.named_fields = named_fields;

            return ct;
        }

        static record construct_record(uint index, string logname, insertion_string[]
insertion_strings, named_string[] named_fields, string description)
        {
            return new record() {

                record_path = construct_sharding_fields(logname),
                record_contents = construct_contents_fields(insertion_strings, named_
fields, description)
            };
        }

        static void insert_records(IRepositoryRecordInserter pInserter)
        {
            DateTime start = DateTime.Now;

            List<record> records = new List<record>();
            for (uint i = 0; i != 16000; ++i)
            {
                insertion_string[] insertion_strings =
                    {
                        new insertion_string() { index = 1, value = "My" },
```

```
new insertion_string() { index = 2, value = "String value 2" },
                        new insertion_string() { index = 6, value = "Event" },
                        new insertion_string() { index = 7, value = "String value 7" }
                    };

                named_string[] named_fields =
                    {
                        new named_string() { name = "FieldName1", value =
"FieldValue1"},
                        new named_string() { name = "FieldName2", value =
"FieldValue2"},
                        new named_string() { name = "FieldName3", value =
"FieldValue3"},
                        new named_string() { name = "FieldName4", value =
"FieldValue4"},
                        new named_string() { name = "FieldName5", value =
"FieldValue5"},
                    };

                records.Add(construct_record(i, "Log1", insertion_strings, named_
fields, "This %1 %6 description"));
            }
            pInserter.PutRecords(records.ToArray());
            pInserter.Commit();
        }

        static tags construct_naive_sharding_fields(string log)
        {
            // For details about using sharding keys, see the "Repository Record Data
Structures" topic
            tags tg = new tags();
            tg.directory_tag_1 = "ShardingLevel1";
            tg.directory_tag_2 = "ShardingLevel2";
            tg.directory_tag_3 = "{A9E5C7A2-5C01-41B7-9D36-E562DFDDEFA9}"; // Sharding
level 3 must be a GUID
            tg.directory_tag_4 = log; // ShardingLevel4
            return tg;
        }

        static contents construct_naive_contents_fields(named_string[] named_fields)
        {
            contents ct = new contents();

            ct.gmt_time = ToUnixTime(DateTime.Now);

            ct.named_fields = named_fields;

            return ct;
        }

        static record construct_naive_record(uint index, string logname, named_string
[] named_fields)
        {
```

```
return new record()
            {
                record_path = construct_naive_sharding_fields(logname),
                record_contents = construct_naive_contents_fields(named_fields)
            };
        }

        static void insert_naive_records(IRepositoryRecordInserter pInserter)
        {
            DateTime start = DateTime.Now;

            List<record> records = new List<record>();
            for (uint i = 0; i != 16000; ++i)
            {
                named_string[] named_fields =
                    {
                        new named_string() { name = "FieldName1", value =
"FieldValue1"},
                        new named_string() { name = "FieldName2", value =
"FieldValue2"},
                        new named_string() { name = "FieldName3", value =
"FieldValue3"},
                        new named_string() { name = "FieldName4", value =
"FieldValue4"},
                        new named_string() { name = "FieldName5", value =
"FieldValue5"},
                    };

                records.Add(construct_naive_record(i, "Log1", named_fields));
            }
            pInserter.PutRecords(records.ToArray());
            pInserter.Commit();
        }

        static void search_records(IInTrustRepository intrust_repository, string
query)
        {
            IObservable observable = intrust_repository.Searcher.Search(query);

            AutoResetEvent waitHandler = new AutoResetEvent(false);
            MyObserver observer = new MyObserver(waitHandler);
            observable.Subscribe(observer, out observer.m_cookie);
            waitHandler.WaitOne();
        }

        static void records_example(IInTrustRepository intrust_repository)
        {
            IRepositoryRecordInserter pInserter = intrust_repository.Inserter;
            {
                for (int i = 0; i < 1; ++i)
                    insert_naive_records(pInserter);

                search_records(intrust_repository, "(in( __AnyField, \"rei\", \"
```

```
(\\\\b|\\\\W|^)FieldValue5\" ));");
            }
            {
                for (int i = 0; i < 1; ++i)
                    insert_records(pInserter);

                search_records(intrust_repository, "(in( __AnyField, \"rei\", \"
(\\\\b|\\\\W|^)String value 7\" ));");
            }
        }

        static void Main(string[] args)
        {
            if (args.Length != 2)
            {
                Console.WriteLine("Invalid argument count.\n");
                Console.WriteLine("\tRepositoryRecordInserterTest.exe <InTrust Server
Binding String> <Reposiotry Name>\n");
                return;
            }

            try
            {
                InTrustEnvironment intrust_environment = new InTrustEnvironment();
                IInTrustRepository intrust_repository = intrust_
environment.ConnectToServer(args[0]).

Organization.

Repositories.Cast<IInTrustRepository>().Where(x => x.Name == args[1]).First();

                records_example(intrust_repository);
            }
            catch (Exception e)
            {
                Console.WriteLine("Error : {0}", e.ToString());
            }
        }
    }
}
```

Writing Events

After you have obtained the IRepositoryRecordInserter interface (as described in Getting and Putting Data), take the following steps:

1. Generate valid **event_with_extensions** structure instances; this structure is described in Event Record Data Structures.

2. Through combined use of the IEventToRecordFormatter and IRepositoryRecordInserter interfaces, supply your newly generated events for writing.
   For that, use the **Format** method of the IEventToRecordFormatter interface to wrap your events in IBulkEventWithReadExtensions, and pass the resulting wrapper interface as a parameter to the **PutRecords2** method of the IRepositoryRecordInserter interface.

Sort Order for Writing

When you write events in batches, the events must be sorted by **gmt_time**, but not necessarily throughout the entire batch. The important thing is to sort those events where the following are the same: domain, computer, log name. That is the scope where you need to sort. For example, if your event batch contains 1000 events from 1000 computers, no sorting is necessary. But if it is 1000 events from two computers, you need to do two sorts.

Out-of-Order Writing

Submitting events out of order is possible, but there is a serious caveat. Whenever the timestamp of your event is less than that of the event you submitted last, you must use the **Commit** method of your inserter interface before you write the “flashback” event. Here are some implications of this:

- Events that are newer than the last-submitted event and older than that event should not be put in the same batch. Otherwise, timestamps will not be interpreted correctly. For example, searching within a specific time range will not return events that match but were written out of order between commits.
- A huge amount of repository files (caused by frequent commits) is bad for performance. Batch your “old” events as much as possible.

Repository Record Data Structures

A record is a chunk of data that is (or has been prepared for being) stored in a repository and processed by repository searches. A record is made up of two parts: tags and contents. The tags indicate where in the file system the file with this record is located. At the same time, the tags double as record field values. The contents do not do anything other than contain record field values.

When you create records, it is important which fields you use as tags and which you use as contents. By handling tags rationally you can help speed up searches on the data you are storing and minimize disk usage by your repository contents.

When you search for records, it doesn't matter in search queries whether a value is used as a tag or as contents.

For recommendations on efficiently organizing data fields in records, see Recommendations on Setting Tags below.

tags

```
struct tags

{

    BSTR directory_tag_1;

    BSTR directory_tag_2;

    BSTR directory_tag_3; // must specify a GUID
```

```
    BSTR directory_tag_4;
    unsigned file_tag_1;
    unsigned file_tag_2;
    unsigned file_tag_3;
    unsigned file_tag_4;
};
```

Contains the values of eight of the record's fields. In addition to carrying record data, this combination of fields is used for identifying the path to a folder and the name of a file in the repository tree. Repository trees are four levels deep, and files are located only at the deepest level.

The directory tags specify the four nesting levels. The third level must be a string representation of a GUID; InTrust verifies the format. This requirement is due to the implementation of the repository services. The GUID is used for identifying event-providing data sources, and each data source type has a particular known GUID. You may want to come up with your own set of special-purpose GUIDs for your specific tasks (for example, hierarchical organization).

The file tags specify the four parts of the file's base name. A file represented by this structure contains one or more entries represented by **contents** and **contents2** structures. If the number of entries per file hits a limit, the same base name is used for creating a new file, and the entries are continued in it.

In a simplified way, the location of a repository file in the file system hierarchy can be represented as follows:

```
repository_root
└ directory_tag_1
  └ directory_tag_2
    └ directory_tag_3
      └ directory_tag_4
└ file_tag_1_file_tag_2_ file_tag_3_file_tag_4_InTrust_internal_tags
```

Because tags correlate with the file system, make sure their values do not contain characters that are disallowed in file and directory names.

contents

```
struct contents
{
    unsigned field_1;
    unsigned field_2;
    short field_3;
    short field_4;
    DATE gmt_time;
    BSTR string_field_1;
    BSTR string_field_2;
    BSTR string_field_3;
    BSTR string_field_4;
```

```
    BSTR string_field_5;
    SAFEARRAY(struct insertion_string) strings;
    SAFEARRAY(struct named_string) named_fields;
    BSTR formatting_record_field;
};
```

Used for writing records to the reposiotry and contains the remaining values of the record fields in addition to those specified by the **tags** structure. This structure is physically represented by an entry in a repository file.

NOTE: The InTrust repository is known to easily handle up to 300 strings per record. Higher numbers of strings have not been tested and cannot be recommended.

As a best practice, make sure that your string mapping is consistent; that is, the same string numbers should have the same meanings across your records. This is beneficial for repository searches.

CAUTION: At this time, the field_2 field is not indexed and cannot be processed in repository searches. Writing useful data to this field is currently not recommended.

contents2

```
struct contents2
{
    unsigned field_1;
    unsigned field_2;
    short field_3;
    short field_4;
    DATE gmt_time;
    BSTR string_field_1;
    BSTR string_field_2;
    BSTR string_field_3;
    BSTR string_field_4;
    BSTR string_field_5;
    SAFEARRAY(struct insertion_string) strings;
    SAFEARRAY(struct named_string) native_named_fields;
    SAFEARRAY(struct named_string) resolved_named_fields;
    BSTR formatting_record_field;
};
```

Used in results of repository searches and contains the remaining values of the record fields in addition to those specified by the **tags** structure. This structure is physically represented by an entry in a repository file.

Unlike the **contents** structure, the **contents2** structure contains two distinct arrays of **named_string** structures. This is because the data for the **native_named_fields** field is not known during record writing. It is only available to repository searches.

NOTE: The InTrust repository is known to easily handle up to 300 strings per record. Higher numbers of strings have not been tested and cannot be recommended.

As a best practice, make sure that your string mapping is consistent; that is, the same string numbers should have the same meanings across your records. This is beneficial for repository searches.

CAUTION: At this time, the field_2 field is not indexed and cannot be processed in repository searches. Writing useful data to this field is currently not recommended.

record

```
struct record

{

    struct tags record_path;

    struct contents record_contents;

};
```

Combines the path-specifying (**tags**) and complementary (**contents**) parts of a record into a single structure. This type of record is used for writing to the repository.

record2

```
struct record2

{

    struct tags record_path;

    struct contents2 record_contents;

};
```

Combines the path-specifying (**tags**) and complementary (**contents2**) parts of a record into a single structure. This type of record is returned by repository searches.

Recommendations on Setting Tags

Organize your record tags according to the likelihood of the value being the same in a given collection of records. That is, **directory_tag_1** should contain the value that is the same in most of the records you are about to generate. Conversely, **directory_tag_4** should contain the value that the fewest records have in common. Also note that the best way to map the tags (and thereby define how the records will be stored physically) is to make them correspond to something that falls into a meaningful hierarchy. For example, all your records might be Security log events, but it still doesn't make sense to make the log name the topmost level. You would do better to tag map **directory_tag_1**,..., **directory_tag_4** to domain, computer, data source and log name, respectively; even though there is more value variation at the top levels this way.

A repository can store heterogeneous objects, but you need a way to tell their types apart. This requires a generic ID field, and **directory_tag_3** is good for the purpose. If you come up with a GUID for each object type (file system, computer, Active Directory object and so on), you will not confuse them. A further improvement is to design a hierarchy of IDs.

Event Record Data Structures

These data structures are alternatives to generic repository record data structures. Use event records for convenience when your records represent log events. For details about the meaning of the fields used in event records, see Event Record Data Structures below.

The primary data structure is base_event. There are also two structures that extend it: event_with_extensions and event_with_read_extensions. For details about the use of these data structures, see Getting Events and Writing Events.

base_event

```
struct base_event

{

    BSTR environment;

    BSTR gathering_domain;

    BSTR gathering_computer;

    BSTR datasource_type;

    BSTR gathered_event_log;

    BSTR user_name;

    BSTR user_domain;

    BSTR source_name;

    BSTR computer_name;

    BSTR string_category;

    BSTR description_template;

    SAFEARRAY(struct insertion_string) strings;

    SAFEARRAY(unsigned char) binary_data;

    unsigned time_gmt;

    unsigned time_generated;

    long time_bias;

    unsigned record_key;

    unsigned event_id;

    unsigned computer_type;

    unsigned platform_id;

    short version_major;

    short version_minor;

    short event_type;

    short numeric_category;
```

```
    unsigned padding000;
};
```

CAUTION: The binary_data field is present only for compatibility with Windows events. This data cannot be indexed or processed in repository searches. Writing useful data to this field is not recommended.

event_with_read_extensions

```
struct event_with_read_extensions
{
    struct base_event original_event;
    BSTR formatted_description;
    SAFEARRAY(struct augmented_insertion_string) resolved_strings;
    SAFEARRAY(struct named_string) named_strings;
};
```

named_string

```
struct  named_string
{
    BSTR  name;
    BSTR  value;
};
```

insertion_string

```
struct  insertion_string
{
    BSTR value;
    int  index;
    int  padding;
};
```

A regular insertion string.

augmented_insertion_string

```
struct  augmented_insertion_string
{
    int  source_index;
    int  result_index;
    BSTR  value;
};
```

These are normalized parameters that are not originally present in native events. For a description of these parameters, see the Filter Parameters in Repository Viewer topic.

NOTE: The **source_index** field holds the index of the original insertion string. The **result_index** field holds the index of the resulting insertion string after the original has been resolved.

event_with_extensions

```
struct event_with_extensions

{

    struct base_event original_event;

    SAFEARRAY(struct resolved_string) resolved_strings;

};
```

NOTE: The InTrust repository is known to easily handle up to 300 insertion strings per event. Higher numbers of strings have not been tested and cannot be recommended.

As a best practice, make sure that your insertion string mapping is consistent; that is, the same insertion string numbers should have the same meanings across your events. This is beneficial for repository searches.

event_with_extensions2

```
struct event_with_extensions2

{

    struct base_event original_event;

    SAFEARRAY(struct resolved_string) resolved_strings;

    SAFEARRAY(struct named_string) named_fields;

};
```

resolved_string

```
struct  resolved_string
{
    BSTR  value;
    int  insertion_string_index;
    resolve_type  insertion_string_resolve_type;
};

typedef enum
{
    custom = 0,
    parameter,
    ad_object_guid_to_distinguished_name,
    user_sid_to_user_name,
    group_policy_guid_to_group_policy_object_name,
    device_name_to_path
} resolve_type;
```

The **resolve_type** enumeration specifies what kind of resolution is supposed to have taken place to get the resulting **value**. The insertion string resolution mechanism in InTrust is fairly complex, but for the purposes of the repository service API it is enough to follow this example:

```
insertion_string[]   insertion_strings   =
{
    new   insertion_string()   {   index   =   1,   padding   =   0,   value   =
"original  string"   },
    new   insertion_string()   {   index   =   2,   padding   =   0,   value   =
"%%2308"   },   // event parameter
    new   insertion_string()   {   index   =   3,   padding   =   0,   value   =   "
{9F29FD37-3CD4-4179-99F1-A6341DCC4EB3}"   },   // ad object guid (user guid)
    new   insertion_string()   {   index   =   4,   padding   =   0,   value   =
"S-1-1-0"   },   // user sid
    new   insertion_string()   {   index   =   5,   padding   =   0,   value   =   "
{29EDB5C5-B2C1-4001-9C96-EE51A6A7CAC3}"   },   // ad object guid (group policy
guid)
    new   insertion_string()   {   index   =   6,   padding   =   0,   value   =
"\\Device\\HarddiskVolume1\\SomeFolder\\SomeFile.txt"   }   };
resolved_string[]   resolved_insertion_strings   =
{
    new   resolved_string()   {insertion_string_index   =   2,   insertion_string_
resolve_type   =   resolve_type.parameter,   value   =   "The user has not been
granted   the requested logon type at this machine."},
    new   resolved_string()   {insertion_string_index   =   3,   insertion_string_
resolve_type   =   resolve_type.ad_object_guid_to_distinguished_name,   value   =
"CN=user1,DC=aa,DC=com"},
    new   resolved_string()   {insertion_string_index   =   4,   insertion_string_
resolve_type   =   resolve_type.user_sid_to_user_name,   value   =   "EDM\\User2"},
    new   resolved_string()   {insertion_string_index   =   5,   insertion_string_
resolve_type   =   resolve_type.ad_object_guid_to_distinguished_name,   value   =
"CN={B96B9D14-E2A4-47ae-8ACA-CB0460089616},DC=aa,DC=com"},
    new   resolved_string()   {insertion_string_index   =   5,   insertion_string_
resolve_type   =   resolve_type.group_policy_guid_to_group_policy_object_name,   value
 =   "MyGroupPolicyObject"},
    new   resolved_string()   {insertion_string_index   =   6,   insertion_string_
resolve_type   =   resolve_type.ad_object_guid_to_distinguished_name,   value   =
"D:\\SomeFolder\\SomeFile.txt"},
};
```

Note that in the case of resolving a group policy GUID to a group policy name you need to provide two **resolved_string** instances.

Creating and Removing Repositories

The methods for creating and removing production InTrust repositories (**Add** and **Remove**) are available in the IInTrustRepositoryCollection interface, which provides access to all repositories in a particular InTrust organization.

> **CAUTION: For these operations to succeed, the account you are using must be an InTrust organization administrator. To configure this privilege for the account, do one of the following:**
>
> - **In InTrust Deployment Manager, click Manage | Configure Access.**
> - **In InTrust Manager, open the properties of the root node.**

For details about obtaining a collection of repositories, see Connecting to a Repository.

Instead of a production repository (which is registered with InTrust, managed by an InTrust server and has an entry in the InTrust configuration), you may want to create an idle repository (which has only the raw repository file structure). For that, use the IIdleRepositoryFactory interface, which constructs IIdleRepository interfaces.

Working with Repository Properties

Repositories can have properties attached to them. They use the IProperty interface and are accessed collectively through IPropertyCollection interfaces. These collection interfaces are associated with a IInTrustRepository interface, which has getter and setter methods for supported property groupings. The following groupings are available at this time:

- Forwarding properties
  These properties are used by the event forwarding engine in InTrust (see Integration into SIEM Solutions Through Event Forwarding). For details about these properties, see Using Forwarding Properties.
- Custom attributes
  These are arbitrary properties that you can set as necessary for your own purposes. For details, see Using Custom Attributes.

Using Custom Attributes

You can associate custom attributes with InTrust repositories. They are available through the **CustomAttributes** methods of an IInTrustRepository interface.

There are no custom attribute guidelines; what custom attributes you add and how you use them is up to you. However, note that the following limits are set for the generic IProperty interface used by custom attributes:

- Name: 64 characters
- If you set a string of the BSTR type for the value: 1024 characters

It is also recommended that you keep the number of custom attributes low: tens rather than hundreds.

For details about the generic property interfaces used for custom attributes, see IProperty and IPropertyCollection.

Example (C#)

```
/* Connect to repository */
IInTrustEnvironment2 env = new InTrustEnvironment();
IInTrustServer server = env.ConnectToServerWithCredentials("8.8.8.8",
@"domain\user_name", "password");
IInTrustOrganization org = server.Organization;
IInTrustRepository rep = org.Repositories.Item("Default InTrust Audit Repository");

/* Get collection of custom attributes */
IPropertyCollection fwd_props = rep.CustomAttributes;

/* Set custom attributes */
fwd_props.Set("NumberAttr", 12);
fwd_props.Set("StringAttr", "Initial status");

/* Get attribute by name */
IProperty stringAttr = fwd_props.Item("StringAttr");
/* Get value */
System.Console.WriteLine("String attribute value is {0}", stringAttr.PropertyValue);
/* Set new value */
stringAttr.PropertyValue = "Updated status";

/* Enumerate all attributes */
foreach (IProperty prop in fwd_props)
{
    System.Console.WriteLine("Attibute : {0}, Value : {1}", prop.PropertyName,
prop.PropertyValue);
}

/* Delete attribute */
fwd_props.Remove("NumberAttr");

/* Create new collection */
PropertyCollection coll = new PropertyCollection();
coll.Set("FirstAttr", "First value");
coll.Set("SecondAttr", "Second value");
rep.CustomAttributes = coll;
```

Using Forwarding Properties

These properties control how the InTrust event forwarding engine handles the repository. They are available through the **ForwardingProperties** methods of an IInTrustRepository interface.

The table below lists the supported properties and explains their values. For details about the event forwarding feature, see Integration into SIEM Solutions Through Event Forwarding.

> **CAUTION: Although the generic IProperty interface used by forwarding properties supports the polymorphic VARIANT type for values, you should set them to strings of the BSTR type. Internally, InTrust assumes forwarding property values to be strings.**

Name	Format	Details
ForwardingEnabled	"0" or "1"	"0"—forwarding is disabled "1"—forwarding is enabled
ForwardingServer	GUID in curly braces	The ID of the InTrust server that forwards the events. Forwarding does not work if this property is empty.
Formatter	GUID in curly braces	The following values are acceptable: • Dell SecureWorks: {c7789ad6-5e47-4553-8e09-21627545fced} • Tibco LogLogic: {281E5204-28CD-4949-97C1-ABEACAA41A17} • Splunk (_json): {0207AD28-4DDA-4C45-A555-82F9313D0ED4} • IBM QRadar: {905040C9-6197-447E-86A0-780A9A0F2389} • Custom format: {06F5C239-CB32-4cf0-905F-9547365D0B6D}
CustomFormatScript	JavaScript code	Used only if **Formatter** is set to "{06F5C239-CB32-4cf0-905F-9547365D0B6D}" (custom format).
Sender	GUID in curly braces	At this time, only UDP is supported as the sender, with the GUID {943e412f-f58a-450d-bec7-96cfa954645e}.
Host	Address of the host that forwards events	
Port	Port that is used for forwarding	
MessageEncodingCodePage	Character encoding to expect in the messages	If omitted, Windows-1251 is assumed.
ForwardingFilter	One of the following: • Path made up of GUIDs in curly braces with the "\" separator • REL query	If forwarding is configured through InTrust Deployment Manager, the value can be a path of GUIDs representing an existing Repository Viewer search folder. You can set a custom REL query for message filtering prior to forwarding.

Getting Started with Repository Services API

To check that the functionality of repository services API is available, use the **RepositoryRecordInserterExample.exe** test application, which is installed with the InTrust SDK. Run this application from the command prompt as follows:

```
RepositoryRecordInserterTest.exe <InTrust_server_binding_string> <repository_name>
```

<InTrust_server_binding_string> can be the name of the InTrust server.

<repository_name> is either the name of the repository as it appears in the InTrust UI (InTrust Deployment Manager, Repository Viewer, InTrust Manager).

Example:

```
RepositoryRecordInserterExample.exe intrust01 "Default InTrust Audit Repository"
```

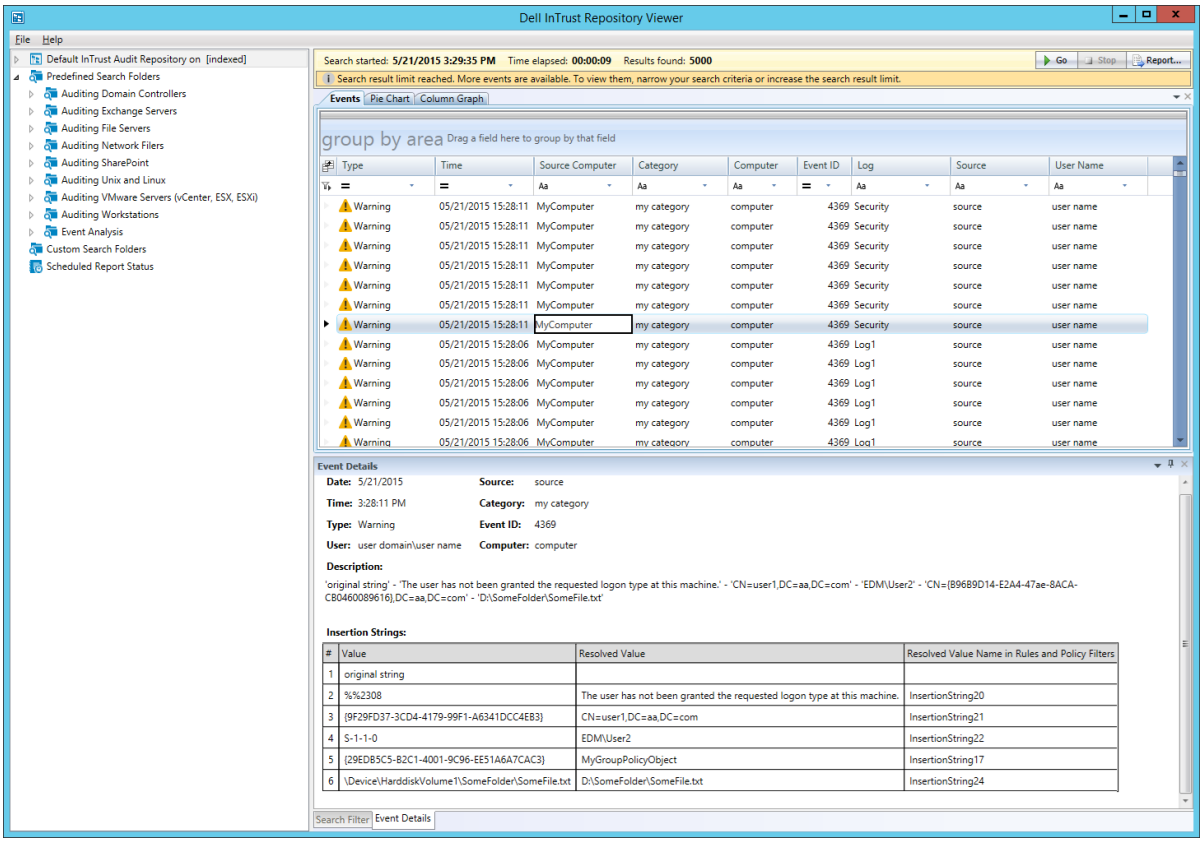
The example uses the “Default InTrust Audit Repository” name. A repository with this name is created during InTrust deployment, so unless it has been renamed, it is present in every InTrust environment.

Testing Repository Searching

If the test program runs successfully, you should see event data in the command prompt's standard output. Getting the data is actually the second stage of the program's operation. The first stage is writing that data.

Testing Event Writing

The program writes a number of events to the specified repository. To examine them in detail, connect to the repository with Repository Viewer. For all these events, “MyComputer” is used as the **Source Computer** parameter value and “computer” as the **Computer** parameter value.



Next Steps

The sources of **RepositoryRecordInserterExample.exe** should have been provided to you together with the InTrust SDK installer. Open the project in Visual Studio, study it, try to customize it and test the effects of your changes.

Log Knowledge Base API

The log knowledge base contains settings for transforming data from original log formats to the repository format. The API does not work with predefined log definitions, which are completely out of its scope; it is designed only for user-defined logs.

To work with the log knowledge base, use the following interfaces:

- IInTrustEventory
- IInTrustEventoryItemCollection
- IInTrustEventoryItem

To begin working with the log knowledge base, get a collection of known organizations (**Organizations** method of the IInTrustEnvironment interface) and pick the necessary one. This involves working with the IInTrustOrganizationCollection interface. Organizations are discovered by an Active Directory query.

The IInTrustOrganization that you get has the **Eventory** method, which provides access to the organization-wide log knowledge base.

For details about the format of rules for matching log events and mapping fields, see Log Transformation Rule Format.

> **CAUTION: If you modify the knowledge base for a specific log, this will invalidate all existing index data for that log in all repositories that contain the log. Indexed searches will no longer find this log's events gathered prior to the modification. Data gathered after the modification will be indexed correctly and be searchable.**
>
> **If the unavailability of old data is not a problem for you, you don't have to do anything. Otherwise, you will need to recreate valid indexes for all repositories that contain the log. However, it is not feasible to recreate an index for a large production repository without taking it offline for a long time. If you need to experiment with log knowledge base editing, use a dedicated test organization and small repositories, which can be reindexed quickly.**
>
> **For details about repository reindexing, see Recreating the Index.**

Example

```
static void GetFullEventory()
{
    IInTrustEnvironment env = new InTrustEnvironment();
    IInTrustServer server = env.ConnectToServer("8.8.8.8");
    IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    string eventory = ev.Eventory;
    Console.WriteLine("Full eventory : " + eventory);
}
static void AddNewLog()
{
    IInTrustEnvironment env = new InTrustEnvironment();
    IInTrustServer server = env.ConnectToServer("8.8.8.8");
    IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    IInTrustEventoryItemCollection logs = ev.Logs;
```

```
    IInTrustEventoryItem log = logs.Add("NewLog",
        @"<FieldInfo>
            <Fields>
                <Field FieldName = ""New_field"" DisplayName = ""NewField"" IsIndexed
= ""true""></Field>
            </Fields>
            <EventRules>
                <Event EventID = ""701"">
                    <Field Name = ""Who"" Index = ""11""></Field>
                    <Field Name = ""What"" Index = ""12""></Field>
                    <Field Name = ""Object_Type"" Index = ""13""></Field>
                    <Field Name = ""Object_Name"" Index = ""14""></Field>
                </Event>
            </EventRules>
        </FieldInfo>");
}
static void GetLogAndChangeRule()
{
    IInTrustEnvironment env = new InTrustEnvironment();
    IInTrustServer server = env.ConnectToServer("8.8.8.8");
    IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    IInTrustEventoryItemCollection logs = ev.Logs;
    IInTrustEventoryItem log = logs.Item("NewLog");
    log.Rules = @"<FieldInfo>
        <Fields>
            <Field FieldName = ""New_field"" DisplayName = ""NewField"" IsIndexed =
""true""></Field>
        </Fields>
        <EventRules>
            <Event EventID = ""701"">
                <Field Name = ""Who"" Index = ""11""></Field>
            </Event>
        </FieldInfo>";
}
static void EnumLogs()
{
    IInTrustEnvironment env = new InTrustEnvironment();
    IInTrustServer server = env.ConnectToServer("8.8.8.8");
    IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    IInTrustEventoryItemCollection logs = ev.Logs;
    foreach (IInTrustEventoryItem cur_log in logs)
    {
        string log_name = cur_log.Name;
        string log_rule = cur_log.Rules;
        Console.WriteLine("Log name : " + log_name);
        Console.WriteLine("Log rule : " + log_rule);
    }
}
static void RemoveLog()
{
    IInTrustEnvironment env = new InTrustEnvironment();
```

```
IInTrustServer server = env.ConnectToServer("8.8.8.8");
    IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    IInTrustEventoryItemCollection logs = ev.Logs;
    logs.Remove("NewLog");
}
static void AddNewDataSource()
{
    IInTrustEnvironment env = new InTrustEnvironment();
    IInTrustServer server = env.ConnectToServer("8.8.8.8");
    IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    IInTrustEventoryItemCollection dataSources = ev.DataSources;
    IInTrustEventoryItem dataSource = dataSources.Add("{10000000-0000-0000-0000-
000000000001}",@"<FieldInfo>
  <Fields>
    <Field FieldName = ""New_field"" DisplayName = ""NewField"" IsIndexed =
""true""></Field>
  </Fields>
  <EventRules>
    <Event EventID = ""701"">
      <Field Name = ""Who"" Index = ""11""></Field>
      <Field Name = ""What"" Index = ""12""></Field>
      <Field Name = ""Object_Type"" Index = ""13""></Field>
      <Field Name = ""Object_Name"" Index = ""14""></Field>
    </Event>
  </EventRules>
</FieldInfo>");
}
static void GetDataSourceAndChangeRule()
{
    IInTrustEnvironment env = new InTrustEnvironment();
    IInTrustServer server = env.ConnectToServer("8.8.8.8");
    IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    IInTrustEventoryItemCollection dataSources = ev.DataSources;
    IInTrustEventoryItem dataSource = dataSources.Item("{10000000-0000-0000-0000-
000000000001}");
    dataSource.Rules = @"<FieldInfo>
        <Fields>
            <Field FieldName = ""New_field"" DisplayName = ""NewField"" IsIndexed =
""true""></Field>
        </Fields>
        <EventRules>
            <Event EventID = ""701"">
                <Field Name = ""Who"" Index = ""11""></Field>
            </Event>
        </FieldInfo>";
}
static void EnumDataSources()
{
    IInTrustEnvironment env = new InTrustEnvironment();
    IInTrustServer server = env.ConnectToServer("8.8.8.8");
```

```
IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    IInTrustEventoryItemCollection dataSources = ev.DataSources;
    foreach (IInTrustEventoryItem curDataSource in dataSources)
    {
        string ds_name = curDataSource.Name;
        string ds_rule = curDataSource.Rules;
        Console.WriteLine("Data source name : " + ds_name);
        Console.WriteLine("Data source rule : " + ds_rule);
    }
}
static void RemoveDataSources()
{
    IInTrustEnvironment env = new InTrustEnvironment();
    IInTrustServer server = env.ConnectToServer("8.8.8.8");
    IInTrustOrganization org = server.Organization;
    IInTrustEventory ev = org.Eventory;
    IInTrustEventoryItemCollection dataSources = ev.DataSources;
    dataSources.Remove("{10000000-0000-0000-0000-000000000001}");
}
```

NOTE: In the functions that handle data sources, the data source name must be in GUID format; for example:

```
{10000000-0000-0000-0000-000000000001}
```

Log Transformation Rule Format

Log transformation rules are defined as XML. The structure of a rule is shown in the example below, which contains all of the tags and parameters available.

```
<FieldInfo>
  <Fields>
    <Field FieldName = "TTF" DisplayName = "TTest Field" IsIndexed = "true"></Field>
    <Field FieldName = "TTF2" DisplayName = "TTest Field 2" IsIndexed =
"true"></Field>
  </Fields>
  <EventRules>
    <Event EventID = "701">
      <Field Name = "TTF" Index = "1"></Field>
      <Field Name = "TTF2" Index = "3"></Field>
    </Event>
  </EventRules>
</FieldInfo>
```

Log events are matched by Event ID, and the **Field** tags specify how the original event fields are mapped to repository record fields. The **Index** parameter specifies the index of the target insertion string.

The following is a variation of the example above:

```
<FieldInfo>
    <Fields>
        <Field FieldName = "TTF" DisplayName = "TTest Field" IsIndexed =
"true"></Field>
        <Field FieldName = "TTF2" DisplayName = "TTest Field 2" IsIndexed =
```

```
"true"></Field>
    </Fields>
    <EventRules>
        <Field Name = "TTF" Index = "1"></Field>
        <Field Name = "TTF2" Index = "3"></Field>
    </EventRules>
</FieldInfo>
```

In this second snippet, the rule applies to all event IDs in a log.

Interfaces

The following is a list of all interfaces available with the InTrust repository API:

Interface	Details
IBulkEventWithReadExtensions	Results of a repository search as an array of event_with_read_extensions structures.
IBulkRecord	Records packed into a single batch as an array of record structures for writing to the repository.
IBulkRecord2	Results of a repository search as an array of record2 structures.
ICookie	Acts as the owner of a repository search and can stop the search.
IEventToRecordFormatter	Transforms event records to a representation suitable for insertion into a repository by the **PutRecords2** method of IRepositoryRecordInserter.
IIdleRepository	An *idle* repository has the correct structure on the file system, but is not registered with an InTrust organization. Currently, you can search in idle repositories using the repository API, but you cannot write to them.
IIdleRepositoryFactory	Creates an idle InTrust repository.
IIndexManager	Provides access to indexing-related operations.
IIndexManagerFactory	Creates an instance of IIndexManager for a production or idle repository.
IInTrustEnvironment	Entry point for access to InTrust organizations, servers and repositories.
IInTrustEventory	Provides access to the log knowledge base, which contains rules that govern the transformation of log entries into repository and event records.

Interface	Details
IInTrustEventoryItem	Represents an entry in the log knowledge base.
IInTrustEventoryItemCollection	Provides a collection of IInTrustEventoryItem interfaces.
IInTrustOrganization	Provides access to an InTrust organization.
IInTrustOrganizationCollection	Provides a collection of all available InTrust organizations.
IInTrustRepository	Provides the searching and writing capabilities of a repository.
IInTrustRepositoryCollection	Provides a collection of all repositories available in the InTrust organization.
IInTrustRepositorySearcher	Provides repository search capabilities.
IInTrustServer	Provides access to an InTrust server.
IInTrustServerCollection	Provides a collection of all InTrust servers in the InTrust organization.
IMultiRepositorySearcher	A container for search objects that lets you search in all of the specified repositories simultaneously.
IMultiRepositorySearcherFactory	Creates an instance of IMultiRepositorySearcher.
IObservable	Defines a provider for push-based notification.
IObserver	Provides a mechanism for receiving push-based notifications. You need to create your own implementation of this interface.
IProperty	Property attached to an InTrust repository. A property is a way to tag repositories for arbitrary purposes.
IPropertyCollection	Collection of properties associated with an InTrust repository. Access to the collections is gained through specialized methods of the IInTrustRepository interface (such as **CustomAttributes** and **ForwardingProperties**),

Interface	Details
	which filter the available properties by purpose.
IRepositoryRecordInserter	Provides write access to the repository that it is associated with and manages one or more IRepositoryRecordInserterLight interfaces, which do the actual writing.
IRepositoryRecordInserterLight	Generates valid record structures from predefined and significant values and writes them to the repository.

IBulkEventWithReadExtensions

Use this interface to represent the results of a repository search as an array of event_with_read_extensions structures.

Method

GetRecords

Gets records represented by event_with_read_extensions structures.

Syntax

```
GetRecords(
     [out,retval]  SAFEARRAY(struct  event_with_read_extensions)*  events
);
```

Parameter

Name	Type	Meaning
events	SAFEARRAY(struct event_with_read_extensions)*	Records represented by event_with_read_extensions structures.

IBulkRecord

Represents a batch of repository records as an array of record structures for writing.

Method

GetRecords

Gets records that match search terms.

Syntax

```
GetRecords(
     [out,retval]  SAFEARRAY(struct  record)*  records
);
```

Parameter

Name	Type	Meaning
events	SAFEARRAY(struct record)*	Packed repository records.

IBulkRecord2

Represents the results of a repository search as an array of record2 structures.

Method

GetRecords

Gets records that match search terms.

Syntax

```
GetRecords(
     [out,retval]  SAFEARRAY(struct  record2)*  records
);
```

Parameter

Name	Type	Meaning
events	SAFEARRAY(struct record2)*	Discovered repository records.

ICookie

Acts as the owner of a repository search and can stop the search.

Method

Stop

Stops the search that this interface is associated with. This method is called automatically when the last reference to the interface is destroyed.

> **CAUTION: This is a synchronous method. It must never be called from notifications received through IObserver, because this will result in a deadlock.**

Syntax

```
HRESULT Stop()
```

IEventToRecordFormatter

Transforms event records to a representation suitable for insertion into a repository by the **PutRecords2** method of IRepositoryRecordInserter. For details about event records, see Event Record Data Structures.

Method

Format

Performs the event-to-record transformation.

Syntax

```
HRESULT Format(
    [in] SAFEARRAY(struct event_with_extensions) events,
    [out, retval] IBulkRecord** ppBulkRecord
);
```

Parameters

Name	Type	Meaning
events	SAFEARRAY(struct event_with_extensions)	Event records to put into the repository.
ppBulkRecord	IBulkRecord**	Repository records prepared for insertion.

IIdleRepository

Represents an idle repository. An *idle* repository has the correct structure on the file system, but is not registered with an InTrust organization. Currently, you can search in idle repositories using the repository API, but you cannot write to them.

Method

Searcher

Returns a searcher interface for the idle repository.

Syntax

```
HRESULT Searcher(
    [in, optional] VARIANT pIndexManager,
    [out, retval] IInTrustRepositorySearcher** ppSearcher);
```

Parameters

Name	Type	Meaning
pIndexManager	VARIANT	Interface that contains details about the index to use for searching in the repository. See IIndexManager for details.
ppSearcher	IInTrustRepositorySearcher	Searcher interface that you can supply your query to.

IIdleRepositoryFactory

Creates an idle InTrust repository. An *idle* repository has the correct structure on the file system, but is not registered with an InTrust organization.

Method

MakeIdleRepository

Returns an idle InTrust repository.

Syntax

```
HRESULT MakeIdleRepository(
    [in] BSTR bstrPath,
    [in] BSTR bstrUser,
    [in] BSTR bstrPassword,
    [out, retval] IIdleRepository **ppRepository);
```

Parameters

Name	Type	Meaning
bstrPath	BSTR	Search query.
bstrUser	BSTR	User account to use for the operation.

Name	Type	Meaning
bstrPassword	BSTR	Password to use for the operation.
ppRepository	IIdleRepository	The newly-created idle repository.

IIndexManager

Provides access to indexing-related operations.

Methods

GetID

Returns the ID of the index manager.

Syntax

```
HRESULT  GetID(
    [out,  retval]  BSTR*
);
```

Parameter

Name	Type	Meaning
	BSTR*	ID of the index manager.

Shutdown

Shuts down the index manager.

Syntax

```
HRESULT Shutdown();
```

IIndexManagerFactory

Creates an instance of IIndexManager for a production or idle repository.

Methods

GetRemoteIndexManager

Creates an IIndexManager instance for a production repository.

Syntax

```
HRESULT  GetRemoteIndexManager(
     [in]  BSTR  pszServerName,
     [in]  BSTR  pszRepositoryIdentity,
     [out]  IIndexManager**  ppManager
);
```

Parameters

Name	Type	Meaning
pszServerName	BSTR	Name of an InTrust server in the same organization as the repository.
pszRepositoryIdentity	BSTR	ID of the production repository that you need.
ppManager	IIndexManager**	Index manager for the production repository.

GetLocalIndexManager

Creates an IIndexManager instance for an idle repository.

Syntax

```
HRESULT  GetLocalIndexManager(
     [in]  BSTR  pszIndexPath,
     [in]  BSTR  pszRepositoryPath,
     [in]  BSTR  pszAcount,
     [in]  BSTR  pszPassword,
     [in]  enum  modeOpen  mode,
     [out,  retval]  IIndexManager**
);
```

Parameters

Name	Type	Meaning
pszIndexPath	BSTR	Path to the index data for the idle repository.
pszRepositoryPath	BSTR	Path to the idle repository file structure.
pszAcount	BSTR	User name for access to the idle repository.
pszPassword	BSTR	Password for access to the idle repository.
mode	enum	MODE_OPEN = 0 MODE_CREATE = 1
	IIndexManager**	Index manager to use for indexing-related operations.

IInTrustEnvironment

Entry point for access to InTrust organizations, servers and repositories.

Methods

ConnectToServer

Provides access to the specified InTrust server.

> **CAUTION: For this operation to succeed, the account you are using must be a member of the AMS Readers local group on the InTrust server you want to connect to.**
>
> **Alternatively, it can be an InTrust organization administrator. To configure this privilege for the account, do one of the following:**
>
> - **In InTrust Deployment Manager, click Manage | Configure Access.**
> - **In InTrust Manager, open the properties of the root node.**

Syntax

```
HRESULT ConnectToServer(
    [in] BSTR bstrServerBinding,
    [out, retval] IInTrustServer** ppServer
);
```

Parameters

Name	Type	Meaning
bstrServerBinding	BSTR	Name of the InTrust server.
	IInTrustServer**	InTrust server interface.

Organizations

Provides a collection of available InTrust organizations.

Syntax

```
HRESULT Organizations(
    [out, retval] IInTrustOrganizationCollection** ppOrganization
);
```

Parameter

Name	Type	Meaning
ppOrganization	IInTrustOrganizationCollection**	Collection of available InTrust organizations.

Eventory

Provides access to the log knowledge database associated with the InTrust organization.

Syntax

```
HRESULT  Eventory(
    [out,  retval]  IInTrustEventory  **ppVal
);
```

Parameter

Name	Type	Meaning
ppVal	IInTrustEventory**	Log knowledge database associated with the InTrust organization.

IInTrustEventory

Provides access to the log knowledge base, which contains rules that govern the transformation of log entries into repository and event records.

Methods

Eventory

Returns a string representation of the log knowledge base.

Syntax

```
HRESULT  Eventory(
    [out,  retval]  BSTR*  bstrEventory
);
```

Parameters

Name	Type	Meaning
bstrEventory	BSTR*	String representation of the log knowledge base.

Logs

Provides access to the log knowledge base entries through an IInTrustEventoryItemCollection.

Syntax

```
HRESULT  Logs(
    [out,  retval]  IInTrustEventoryItemCollection**  pVal
);
```

Parameters

Name	Type	Meaning
pVal	IInTrustEventoryItemCollection**	Log knowledge base entries.

DataSources

```
HRESULT  DataSources(
    [out,  retval]  IInTrustEventoryItemCollection**  pVal
);
```

Parameters

Name	Type	Meaning
pVal	IInTrustEventoryItemCollection**	Log knowledge base entries.

IInTrustEventoryItem

Represents an entry in the log knowledge base.

Methods

Name

Returns the name of the log knowledge database entry.

Syntax

```
HRESULT Name(
    [out, retval] BSTR* bstrName
);
```

Parameter

Name	Type	Meaning
bstrName	BSTR*	Name of the log knowledge database entry.

Rules (out parameter)

Returns the rules defined for the log knowledge database entry. For details about the rule format, see Log Transformation Rule Format.

Syntax

```
HRESULT Rules(
    [out, retval] BSTR* bstrRules
```

```
);
```

Parameter

Name	Type	Meaning
bstrRules	BSTR*	Textual representation of the rules defined for the log knowledge database entry.

Rules (in parameter)

Sets the rules defined for the log knowledge database entry. For details about the rule format, see Log Transformation Rule Format.

Syntax

```
HRESULT Rules(
    [in] BSTR bstrRules
);
```

Parameter

Name	Type	Meaning
bstrRules	BSTR	Textual representation of the rules defined for the log knowledge database entry.

IInTrustEventoryItemCollection

Provides a collection of IInTrustEventoryItem interfaces.

Methods

Item

Gets a log knowledge base entry from the collection by name.

Syntax

```
HRESULT  Item(
     [in]  BSTR  bstrLogName,
     [out,  retval]  IInTrustEventoryItem**  ppEventoryItem
);
```

Parameters

Name	Type	Meaning
bstrLogName	BSTR	Name of the log knowledge base entry. This name must exist in the collection.

Name	Type	Meaning
ppEventoryItem	IInTrustEventoryItem **	The log knowledge base entry.

_NewEnum

Constructs the collection.

Syntax

```
HRESULT _NewEnum(
    [out, retval] LPUNKNOWN* pVal
);
```

Parameters

Name	Type	Meaning
pVal	LPUNKNOWN*	Collection constructor.

Add

Adds the specified entry.

Syntax

```
HRESULT Add(
    [in] BSTR bstrItemName,
    [in] BSTR bstrItemRules,
    [out, retval] IInTrustEventoryItem** ppEventoryItem
);
```

Parameters

Name	Type	Meaning
bstrItemName	BSTR	Name of the entry to add. The name must be unique.
bstrItemRules	BSTR	Textual definition of the entry.
ppEventoryItem	IInTrustEventoryItem	The new log knowledge base entry.

Remove

Removes an entry from the collection by name.

Syntax

```
HRESULT Remove(
    [in] BSTR bstrItemName
);
```

Parameter

Name	Type	Meaning
bstrItemName	BSTR	Name of the entry to remove.

IInTrustOrganization

Provides access to an InTrust organization.

Methods

Name

Returns the name of the InTrust organization.

Syntax

```
HRESULT  Name(
    [out,  retval]  BSTR*  pVal
);
```

Parameter

Name	Type	Meaning
pVal	BSTR	Name of the InTrust organization.

Servers

Provides access to a collection of the InTrust servers in an InTrust organization.

Syntax

```
HRESULT  Servers(
    [out,  retval]  IInTrustServerCollection**  ppVal
);
```

Parameter

Name	Type	Meaning
ppVal	IInTrustServerCollection**	Collection of InTrust servers.

Repositories

Provides access to a collection of repositories in an InTrust organization.

Syntax

```
HRESULT Repositories(
    [out, retval] IInTrustRepositoryCollection** ppVal
);
```

Parameter

Name	Type	Meaning
ppVal	IInTrustRepositoryCollection**	Collection of repositories.

Eventory

Provides access to the organization-wide log knowledge base. See Log Knowledge Base API for details.

Syntax

```
HRESULT Eventory(
    [out, retval] IInTrustEventory **ppVal
);
```

Parameter

Name	Type	Meaning
ppVal	IInTrustEventory**	Log knowledge base.

IInTrustOrganizationCollection

Provides a collection of all available InTrust organizations.

Methods

Item

Provides access to the specified InTrust organization.

Syntax

```
HRESULT Item(
    [in] BSTR bstrOrganizationIdentity,
    [out, retval] IInTrustOrganization**
);
```

Parameters

Name	Type	Meaning
bstrOrganizationIdentity	BSTR	Name of the InTrust organization.
	IInTrustOrganization**	InTrust organization interface.

_NewEnum

References InTrust organizations in a collection.

Syntax

```
HRESULT _NewEnum(
    [out, retval] LPUNKNOWN* pVal
);
```

Parameter

Name	Type	Meaning
pVal	LPUNKNOWN*	Enumerated InTrust organizations.

IInTrustRepository

Provides the searching and writing capabilities of a repository.

Methods

ID

Returns the GUID of the repository.

Syntax

```
HRESULT ID(
    [out, retval] GUID* pID
);
```

Parameter

Name	Type	Meaning
pID	GUID*	GUID of the repository.

Name

Returns the name of the repository.

Syntax

```
HRESULT  Name(
     [out,  retval]  BSTR*  pVal
);
```

Parameter

Name	Type	Meaning
pVal	BSTR*	Name of the repository. The name is not necessarily unique in an organization.

Path

Returns the path to the repository.

Syntax

```
HRESULT  Path(
     [out,  retval]  BSTR*  pVal
);
```

Parameter

Name	Type	Meaning
pVal	BSTR*	UNC path to the share that contains the repository.

IsIndexingEnabled

Indicates whether indexing is enabled for the repository.

Syntax

```
HRESULT  IsIndexingEnabled(
     [out,  retval]  VARIANT*  pVal
);
```

Parameter

Name	Type	Meaning
pVal	VARIANT*	Whether indexing is enabled for the repository.

Inserter

Provides an interface for inserting records into the repository. For details, see Writing Records.

> **CAUTION: A new inserter is created every time you call this method. It's likely that you only want a single unique inserter per repository for all of your writing activity.**

Syntax

```
HRESULT  Inserter(
     [out,  retval]  IRepositoryRecordInserter**  ppInserter
);
```

Parameter

Name	Type	Meaning
ppInserter	IRepositoryRecordInserter**	Record-inserting interface associated with a particular repository.

Searcher

Provides an interface for finding records in the repository. For details, see Getting Records.

Syntax

```
HRESULT  Searcher(
     [out,  retval]  IInTrustRepositorySearcher**  ppSearcher
);
```

Parameter

Name	Type	Meaning
ppSearcher	IInTrustRepositorySearcher	A searcher interface that accepts search queries and provides results.

CustomAttributes (getter)

Provides access to the collection (instance of IPropertyCollection) of custom attributes attached to an InTrust repository (instances of IProperty).

Syntax

```
HRESULT  CustomAttributes(
     [out,  retval]  IPropertyCollection**  pVal
);
```

Parameter

Name	Type	Meaning
pVal	IPropertyCollection**	Collection of custom attributes attached to the repository.

CustomAttributes (setter)

Applies a collection (instance of IPropertyCollection) of custom attributes attached to an InTrust repository (instances of IProperty).

Syntax

```
HRESULT CustomAttributes(
    [in] IPropertyCollection* pVal
);
```

Parameter

Name	Type	Meaning
pVal	IPropertyCollection*	Custom attribute collection to attach to the repository.

ForwardingProperties (getter)

Provides access to the collection (instance of IPropertyCollection) of event forwarding properties configured for an InTrust repository (instances of IProperty).

Syntax

```
HRESULT ForwardingProperties(
    [out, retval] IPropertyCollection** ppForwardingProperties
);
```

Parameter

Name	Type	Meaning
ppForwardingProperties	IPropertyCollection **	Collection of event forwarding properties associated with the repository.

ForwardingProperties (setter)

Applies a collection (instance of IPropertyCollection) of event forwarding properties configured for an InTrust repository (instances of IProperty).

Syntax

```
HRESULT ForwardingProperties(
    [out, retval] IPropertyCollection* pProperties
);
```

Parameter

Name	Type	Meaning
pProperties	IPropertyCollection*	Collection of event forwarding properties to associate with the repository.

IInTrustRepositoryCollection

Provides a collection of all repositories available in the InTrust organization.

Methods

Item

Gets the specified repository from a collection.

Syntax

```
HRESULT  Item(
     [in]  BSTR  bstrRepositoryIdentity,
     [out,  retval]  IInTrustRepository**
);
```

Parameters

Name	Type	Meaning
bstrRepositoryIdentity	BSTR	A piece of information that identifies the repository. You can specify one of the following: • Repository name • Repository GUID • UNC path to the repository share The **Item** method tries to interpret its input parameter as each of these identifiers, in that order.
	IInTrustRepository**	Repository interface.

Add

Creates a repository with the specified properties in a collection.

> **CAUTION: For this operation to succeed, the account you are using must be an InTrust organization administrator. To configure this privilege for the account, do one of the following:**
>
> - **In InTrust Deployment Manager, click Manage | Configure Access.**
> - **In InTrust Manager, open the properties of the root node.**

Syntax

```
HRESULT  Add(
     [in]  BSTR  bstrRepositoryName,
     [in]  BSTR  bstrRepositoryPath,
     [in]  BSTR  bstrUserName,
     [in]  BSTR  bUserPassword,
     [in]  BSTR  bstrIndexServer,
     [out,  retval]  IInTrustRepository**
);
```

Parameters

Name	Type	Meaning
bstrRepositoryName	BSTR	Name of the repository.
bstrRepositoryPath	BSTR	UNC path to the share that contains the repository.
bstrUserName	BSTR	User name of the account to use for connection to the repository (for both searching and writing). This account must be a member of the local **AMS Readers** group on the InTrust server that manages the repository, specified by the **bstrIndexServer** parameter. If **bstrUserName** is empty, the account set for the InTrust server will be used for connection.
bUserPassword	BSTR	Password of the account specified by the **bstrUserName** parameter.
bstrIndexServer	BSTR	Name of the InTrust server that manages the index for the repository.
	IInTrustRepository **	Repository interface.

Remove

Removes the specified repository from the collection, deleting it from the InTrust organization configuration.

> **CAUTION: For this operation to succeed, the account you are using must be an InTrust organization administrator. To configure this privilege for the account, do one of the following:**
>
> - **In InTrust Deployment Manager, click Manage | Configure Access.**
> - **In InTrust Manager, open the properties of the root node.**

Syntax

```
HRESULT  Remove(
     [in]  BSTR  bstrRepositoryIdentity
);
```

Parameter

Name	Type	Meaning
bstrRepositoryIdentity	BSTR	A piece of information that identifies the repository. You can specify one of the following: • Repository name • Repository GUID • UNC path to the repository share The **Item** method tries to interpret its input parameter as each of these identifiers, in that order.

_NewEnum

References repositories in a collection.

Syntax

```
HRESULT _NewEnum(
    [out, retval] LPUNKNOWN* pVal
);
```

Parameter

Name	Type	Meaning
pVal	LPUNKNOWN*	Access to repositories in a collection.

IInTrustRepositorySearcher

Provides repository search capabilities.

Method

Search

Runs a repository search using the specified query.

Syntax

```
HRESULT ID(
    [in] BSTR rel_query,
    [out] IObservable** search_object
);
```

Parameters

Name	Type	Meaning
rel_query	BSTR	Search query.
search_object	IObservable	Interface that you can subscribe to for search results.

IInTrustServer

Provides access to an InTrust server.

Methods

Name

Returns the name of the InTrust server.

Syntax

```
HRESULT  Name(
     [out,  retval]  BSTR*  pVal
);
```

Parameter

Name	Type	Meaning
pVal	BSTR*	Name of the InTrust server.

Organization

The InTrust organization that the InTrust server belongs to.

Syntax

```
HRESULT  Organization(
     [out,  retval]  IInTrustOrganization**  pVal
);
```

Parameter

Name	Type	Meaning
pVal	IInTrustOrganization**	InTrust organization interface.

IInTrustServerCollection

Provides a collection of all InTrust servers in the InTrust organization.

Methods

Item

Provides access to the specified InTrust server.

Syntax

```
HRESULT  Item(
     [in]  BSTR  bstrServerIdentity,
     [out,  retval]  IInTrustServer**
);
```

Parameters

Name	Type	Meaning
bstrServerIdentity	BSTR	Name of the InTrust server.
	IInTrustServer**	InTrust server interface.

_NewEnum

References InTrust servers in a collection.

Syntax

```
HRESULT  _NewEnum(
     [out,  retval]  LPUNKNOWN*  pVal
);
```

Parameter

Name	Type	Meaning
pVal	LPUNKNOWN*	Enumerated InTrust servers.

IMultiRepositorySearcher

A container for search objects that lets you search in all of the specified repositories simultaneously.

> **CAUTION: This container is optimized for shared use. Therefore, it is strongly recommended that you create only one IMultiRepositorySearcher and reuse it rather than creating different IMultiRepositorySearcher instances for different search queries and sets of repositories.**

Methods

MakeMultiSearchObject

Creates a search object that uses multiple repositories at once.

Syntax

```
HRESULT MakeMultiSearchObject(
    [in] BSTR rel_query,
    [in] SAFEARRAY(IDispatch) psaSeachers,
    [out, retval] IObservable** search_object
```

```
);
```

Parameters

Name	Type	Meaning
rel_query	BSTR	Search query.
psaSeachers	SAFEARRAY(IDispatch)	Searcher interfaces for the repositories you want to search in.
search_object	IObservable**	Interface that provides search functionality.

IMultiRepositorySearcherFactory

Creates an instance of IMultiRepositorySearcher.

CreateMultiRepositorySearcher

Creates the IMultiRepositorySearcher.

Syntax

```
HRESULT  CreateMultiRepositorySearcher(
     [in]  VARIANT  eventory_xml,
     [out,  retval]  IMultiRepositorySearcher**  rep_searcher
);
```

Parameters

Name	Type	Meaning
eventory_xml	VARIANT	String representation of the log knowledge base to use with the multi-repository searches. To use the fallback knowledge base, specify **null**.
rep_searcher	IMultiRepositorySearcher**	The searcher interface capable of working with multiple repositories at once.

IObservable

Defines a provider for push-based notification.

Method

Subscribe

Syntax

```
HRESULT  Subscribe(
     [in]  IObserver*  observer,
     [out]  ICookie**  cookie
);
```

Parameters

Name	Type	Meaning
observer	IObserver*	Source of push-based notifications.
cookie	ICookie**	Keeps the search active while present.

IObserver

Provides a mechanism for receiving push-based notifications. You need to create your own implementation of this interface.

Methods

OnDone

Notifies the observer that the provider has finished sending push-based notifications.

Syntax

```
void OnDone();
```

OnError

Notifies the observer that the provider has experienced an error condition.

Syntax

```
void OnError(
    [in] HRESULT hr,
    [in] BSTR description
);
```

Parameters

Name	Type	Meaning
hr	HRESULT	Operation result.
description	BSTR	Additional information about the error.

OnNext

Provides the observer with new data.

Syntax

```
void OnNext(
    [in] IUnknown* data
);
```

Parameter

Name	Type	Meaning
data	IUnknown*	The current notification information.

IProperty

Represents a property attached to an InTrust repository. A property is a way to tag repositories for arbitrary purposes.

Methods

PropertyName (setter)

Sets the name of the property.

Syntax

```
HRESULT  PropertyName(
     [in]  BSTR  pVal
);
```

Parameter

Name	Type	Meaning
pVal	BSTR	Name of the property. The name must be unique in the property collection (see IPropertyCollection).

PropertyValue (getter)

Returns the value of the property.

Syntax

```
HRESULT PropertyValue(
    [out, retval] VARIANT *pVal
);
```

Parameter

Name	Type	Meaning
pVal	VARIANT*	Value of the property.

PropertyValue (setter)

Sets the value of the property.

Syntax

```
HRESULT PropertyValue(
    [in] VARIANT pVal
);
```

Parameter

Name	Type	Meaning
pVal	VARIANT	Value of the property.

PropertyName

Returns the name of the property.

NOTE: There is no setter method for the name of a property. Instead of renaming an existing property, you need to create a new one in the property collection (IPropertyCollection) and assign it the value you need. The old property can be deleted using the collection's **Remove** method.

Syntax

```
HRESULT PropertyName(
    [out, retval] BSTR *pVal
);
```

Parameter

Name	Type	Meaning
pVal	BSTR*	Name of the property.

IPropertyCollection

Represents a collection of properties associated with an InTrust repository. Access to the collections is gained through specialized methods of the IInTrustRepository interface (such as **CustomAttributes** and **ForwardingProperties**), which filter the available properties by purpose.

Methods

Item

Gets a property from the collection by name.

Syntax

```
HRESULT  Item(
     [in]  BSTR  bstrPropertyName,
     [out,  retval]  IProperty**  ppProperty
);
```

Parameters

Name	Type	Meaning
bstrPropertyName	BSTR	Name of the property. This name must exist in the collection.
ppProperty	IProperty**	The property.

_NewEnum

Constructs the collection.

Syntax

```
HRESULT  _NewEnum(
     [out,  retval]  LPUNKNOWN*  pVal
);
```

Parameters

Name	Type	Meaning
pVal	LPUNKNOWN*	Collection constructor.

Set

Sets the specified property if it exists or creates it if it doesn't.

Syntax

```
HRESULT  Set(
  [in]  BSTR  bstrPropertyName,
     [in]  VARIANT  varPropertyValue
);
```

Parameters

Name	Type	Meaning
bstrPropertyName	BSTR	Name of the property to add. The name must be unique.
varPropertyValue	BSTR	The value to set.

Remove

Removes a property from the collection by name.

Syntax

```
HRESULT  Remove(
     [in]  BSTR  bstrPropertyName
);
```

Parameter

Name	Type	Meaning
bstrPropertyName	BSTR	Name of the property to remove.

IRepositoryRecordInserter

Provides write access to the repository that it is associated with and manages one or more IRepositoryRecordInserterLight interfaces, which do the actual writing. For each IRepositoryRecordInserterLight, it also stores predefined field values that are the same in all records written by that IRepositoryRecordInserterLight.

Incoming records are pushed to the repository at regular intervals. However, you can force an immediate write by calling the **Commit** method.

Methods

BindFields

Sets the values of the path-specifying fields for records that will be written to the same repository file.

Syntax

```
HRESULT BindFields(
```

```
    [in] tags path,
    [out, retval] IRepositoryRecordInserterLight**
);
```

Parameters

Name	Type	Meaning
path	tags	The field record values that you specify here are supposed to be the same for all records generated by the IRepositoryRecordInserterLight that will be initialized.
	IRepositoryRecordInserterLight **	Record-inserting interface with some record field values predefined.

PutRecords

Writes the specified records to the repository asynchronously.

Syntax

```
HRESULT PutRecords(
    [in] SAFEARRAY(struct record) records
);
```

Parameter

Name	Type	Meaning
records	SAFEARRAY(struct record)	Records to put in the repository.

PutRecords2

Writes the specified records to the repository asynchronously. This method is similar to **PutRecords**, except the type of the input parameter. Using the IBulkRecord interface for input makes it possible to write event records converted by IEventToRecordFormatter. For details, see Event Record Data Structures.

Syntax

```
HRESULT PutRecords2(
    [in] IBulkRecord* pBulkRecord
);
```

Parameter

Name	Type	Meaning
records	IBulkRecord* pBulkRecord	Records (normally, converted from events) to put in the repository.

Commit

Performs all deferred record writes synchronously.

> **CAUTION: This operation is resource-intensive and should not be used needlessly. For example, committing after each record is strongly discouraged. InTrust commits records automatically every 60 seconds.**
>
> **Forcing a commit is acceptable in situations like the following:**
>
> - **You need to confirm that a batch of events or records has safely arrived in the repository.**
> - **You are writing events or records out of order. See the corresponding note in Writing Events.**

Syntax

```
HRESULT Commit();
```

IRepositoryRecordInserterLight

Generates valid record structures from predefined and significant values and writes them to the repository.

> **NOTE: IRepositoryRecordInserterLight or IRepositoryRecordInserter: when to use which?**
>
> Use IRepositoryRecordInserterLight if you need to write large numbers of records with coinciding values in specific fields. Otherwise, using IRepositoryRecordInserter should be more efficient.

Method

PutRecords

Syntax

```
HRESULT PutRecords(
    [in] SAFEARRAY(struct contents) recordFields
);
```

Parameter

Name	Type	Meaning
recordFields	SAFEARRAY (struct contents)	Field value structures to convert to records. Missing fields will be filled in based on the tags structure instance associated with this IRepositoryRecordInserterLight.

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